



Vehicle Access Control
Pedestrian Access Control
Safety & Security Equipment

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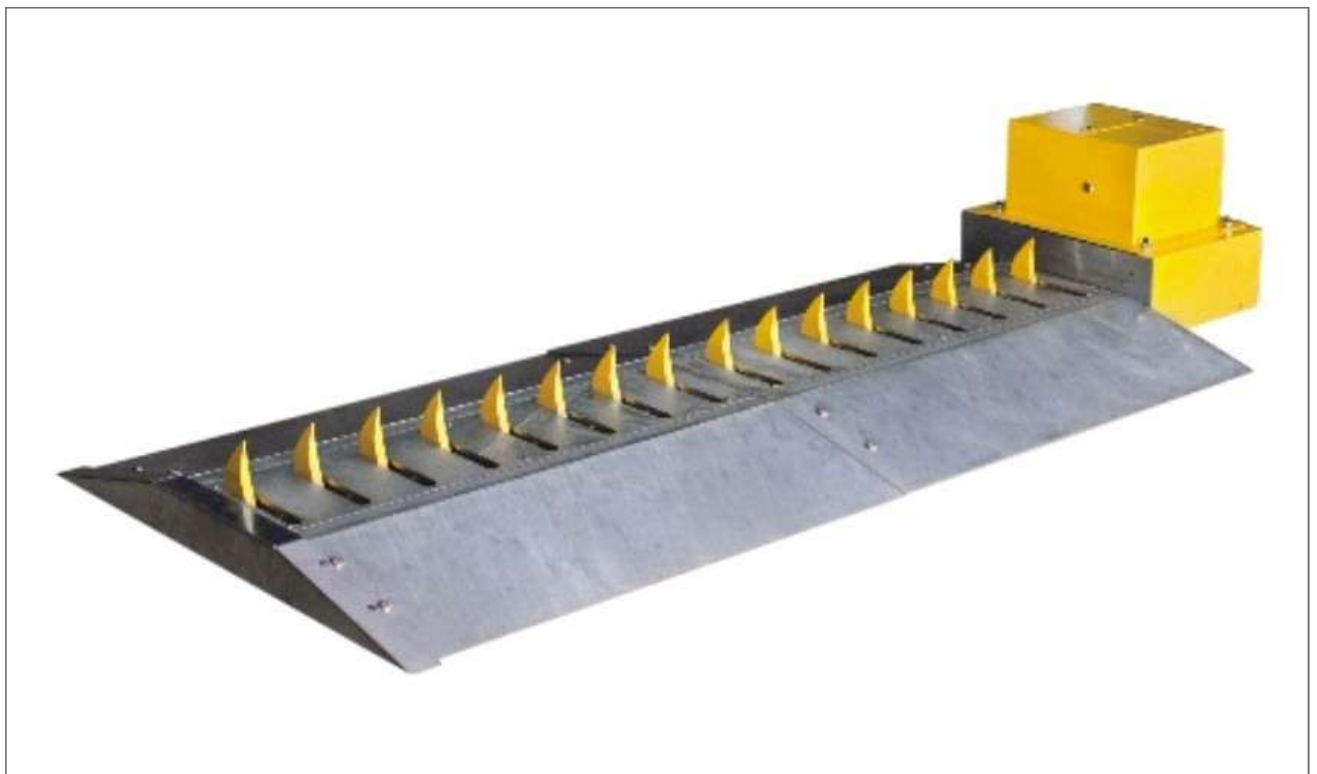
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SENTINEL TYRE SPIKES

Installation Instructions
Right Hand Similar Impact
Direction - Surface Mount

(V0923)



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Icons used in this manual



This icon indicates tips and other information that could be useful during the installation.



This icon denotes variations and other aspects that should be considered during installation.



This icon indicates warning, caution or attention! Please take special note of critical aspects that **MUST be adhered to in order to prevent injury.**



This icon indicates areas where mechanical crushing may occur

IMPORTANT SAFETY INSTRUCTIONS

ATTENTION

To ensure the safety of people and possessions, it is important that you read all the following instructions.

Incorrect installation or incorrect use of the product may cause serious harm to people and / or property.

The installer, being either professional or DIY, is the last person on the site who can ensure that the operator is safely installed, and that the whole system can be operated safely.



Warnings for the installer

CAREFULLY READ AND FOLLOW ALL INSTRUCTIONS before beginning to install the product.

- All installation, repair, and service work to this product must be done by a suitably qualified person
- Do not activate the **CLAWS** unless you can see them and can determine that the **CLAWS** are clear of people, pets, vehicles or any obstructions
- Nothing must be placed, and nobody must be near the trench covers at any time. Always keep people and objects away from the spikes' area of travel
- Children should be supervised to ensure that they do not play with or around the spikes and trench cover
- This device is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety
- Secure all easily-accessed **CLAWS** controls in order to prevent unauthorised use
- Do not in any way modify the components of the automated system
- Do not install the equipment in an explosive atmosphere. The presence of flammable gas or fumes is a serious danger to safety
- Before attempting any work on the system, cut electrical power and disconnect the batteries
- The mains power supply of the automated system must be fitted with an all-pole switch with contact opening distance of 3mm or greater. Use of a 5A thermal breaker with all-pole circuit break is recommended
- Make sure that an earth leakage circuit breaker with a threshold of 30mA is fitted upstream of the system
- Never short-circuit the battery and do not try to recharge the batteries with power supply units other than that supplied with the product, or manufactured by Centurion Systems (Pty) Ltd

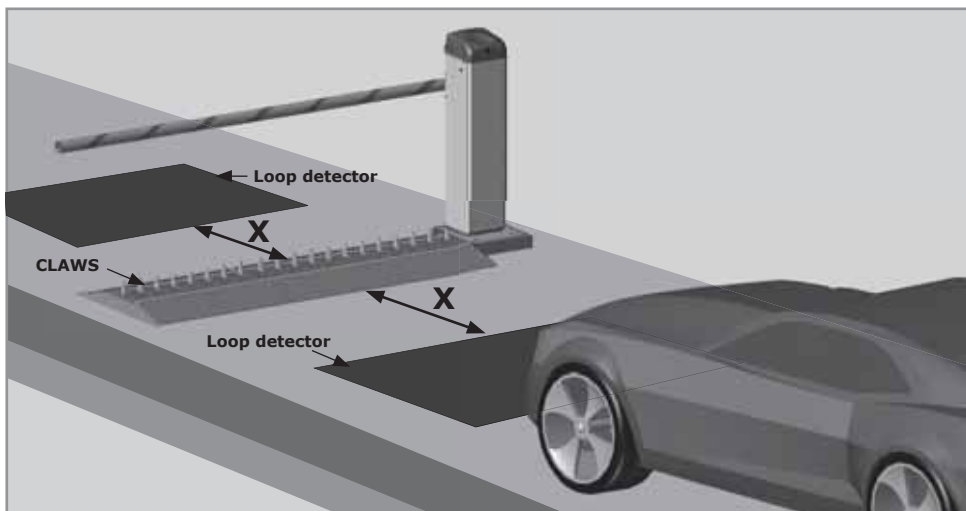
- Make sure that the earthing system is correctly constructed, and that all metal parts of the system are suitably earthed
- Safety devices must be fitted to the installation to guard against mechanical movement risks such as crushing, dragging and shearing
- It is recommended that at least one warning indicator light be fitted to every system
- Always fit a warning sign visibly to the inside and outside of the entrance and exit
- The installer must explain and demonstrate the manual operation of the system in case of an emergency, and must hand the User Guide and Safety Instructions over to the end-user
- Explain these safety instructions to all persons authorised to use the system, and be sure that they understand the hazards associated with the system
- Do not leave packing materials (plastic, polystyrene, etc.) within reach of children as such materials are potential sources of danger
- Dispose of all waste products like packaging materials, worn-out batteries, etc. according to local regulations
- Always check the obstruction detection system and safety devices for correct operation
- Neither Centurion Systems (Pty) Ltd, nor its subsidiaries, accepts any liability caused by improper use of the product, or for use other than that for which the automated system was intended
- This product was designed and built strictly for the use indicated in this documentation. Any other use, not expressly indicated here, could compromise the service life/operation of the product and/or be a source of danger
- Everything not expressly specified in these instructions is not permitted



ATTENTION

For the detection of vehicles, we recommend installing Inductive Loop Detectors in preference to infrared beams. When installing the Loop detectors, positioning is very important for the safety of the vehicle

- X refers to the distance required between the loops and CLAWS for free-exit
- Free-exit for uni-directional traffic, X must be greater than 500mm from the CLAWS
- For bi-directional traffic, X must also be greater than 500mm from the CLAWS



1. General Description

CLAWS barrier spikes are designed to enhance the security at the entrance to high-volume application. They provide a formidable deterrent to would-be criminals and due to their robust construction they are very difficult to defeat.

Clever modular design allows the **CLAWS** to be ordered ex-stock and can be configured into a variety of different lengths. The orientation of the spikes can also be easily changed depending on the direction of the traffic flow. Their external limit switches allow for safe operation of the system.

CLAWS are easy to install and use a standard Boom Gate controller and a standard Boom Gate gearbox, saving you time and reducing your spares inventor. They boast all-weather construction and have been designed to allow for all moving parts to be removed easily for quick and easy maintenance.

CLAWS also provide onboard support for a traffic light interface, and the Independent Drive **CLAWS** models have variable speed control and multiple Modes of Operation. The **CLAWS** Independent Drive system has its own drive mechanism and controller, and can work independently of traffic barriers, etc. It is available in both Flush Mount and Surface Mount variants.

The Flush Mount models are ideal for installations that require seamless access control for smooth-flowing traffic, whereas the Surface Mount models are mounted above the general surface of the roadway and create a traffic-calming bump for a safer access control point.

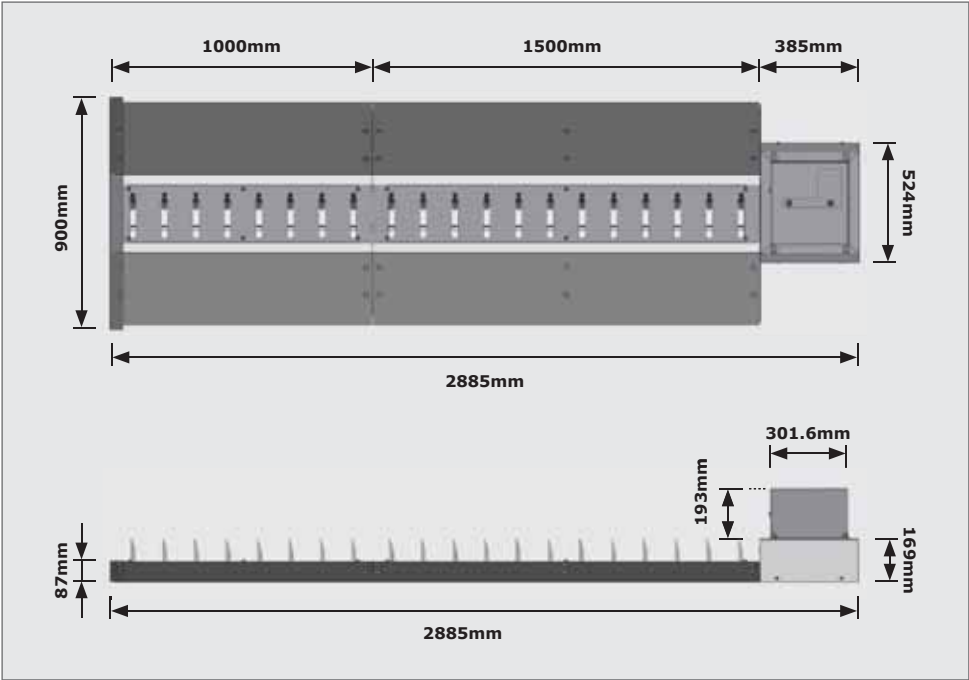
2. Product Specifications

Technical Specifications

Input Voltage	220V AC +/-10% @ 50Hz ¹
Motor Voltage	12V DC
Current Draw	
Wiring Requirements	Battery-driven ² - 2A charger
Spike Modules - Available lengths	1 metre and 1.5 metre
Spikes raise / lower time	1.2 sec
Daily operations - Max	
Daily Operations - Mains present	3000
Anti-corrosion - Main chassis	Hot dip galvanised Mild Steel
Spike material	85mm Mild Steel, electroplated and powder-coated
Maximum allowable axel weight	4000kg
Onboard receiver specifications	CENTURION code-hopping, multichannel, 433MHz with 500 remote control button storage capacity

Product Dimensions

Surface Mount



3. Product Identification

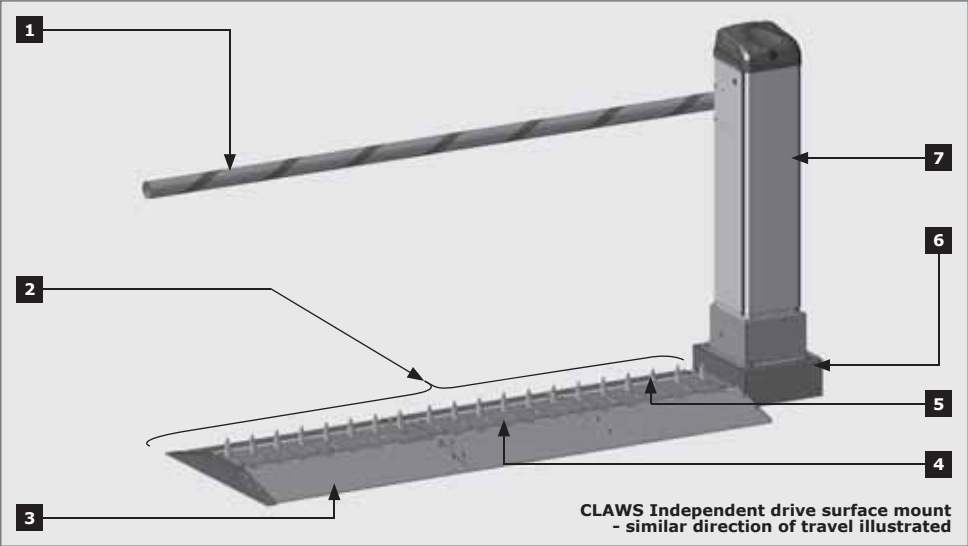

















FIGURE 1. PRODUCT IDENTIFICATION

- | | |
|---------------------------|---------------------------|
| 1. Boom pole | 5. Spikes |
| 2. Spikes module assembly | 6. Drive linkage assembly |
| 3. Ramp plates | 7. Boom Gate |
| 4. Trench cover plate | |

	Module Frame
	Linkage Frame
	Sandwich Plate
	Top Coupler
	Bottom Coupler
	8x20 Dowel Pin

	Drive Linkage Arm
	Driven Linkage Arm
	Drive Link Pin
	Bearing Housing
	Hold Down Bracket
	Linkage End Cover
	Blanking Plate
	Gearbox Cover
	Module End Cover

4. Tools Required

- 13mm, 17mm, and 19mm Spanners
- Ratchet
- 19mm, and 24mm Sockets
- Allen Key Set
- Mallet
- Tape Measure
- Spirit Level
- Torque Wrench

5. Introduction

This document describes the basic steps to follow when installing the surface-mountable **CLAWS** Spikes driven by an independently-powered gearbox. The installation described in this document is a 2.5 meter installation. For other installations, modules of 1.5 or 1.0 meters can be combined to achieve different widths.



The installation of the **CLAWS** Spikes requires a minimum of two persons.

Installation Configurations

The surface-mountable **CLAWS** Spikes can be installed in four different configurations. The configuration is dependent on two factors:

- Orientation of installation
- Direction of spike impact

5.1.1. Orientation of Installation

The orientation of installation is described as the side at which the drive linkage is installed when approaching the **CLAWS** Spikes. In other words, when driving up to the **CLAWS** Spikes, in the correct direction for traffic flow, and the drive is installed on the right-hand side of the vehicle, it's deemed a right-hand installation. And when driving up to the **CLAWS** Spikes, in the correct direction for traffic flow, and the drive is installed on the left-hand side of the vehicle, it's deemed a left-hand installation.



FIGURE 2. RHS CONFIGURATION



FIGURE 3. LHS CONFIGURATION

Spike Impact Direction

The **CLAWS** Spikes are designed to take a much larger impact in one direction. Thus, the **CLAWS** Spikes can be installed to take larger or more frequent impact in one direction. In other words, the spikes can be installed to face either towards oncoming traffic (similar) or face towards traffic (opposing) trying to enter from the wrong direction or lane (Section 3, Figure 1).

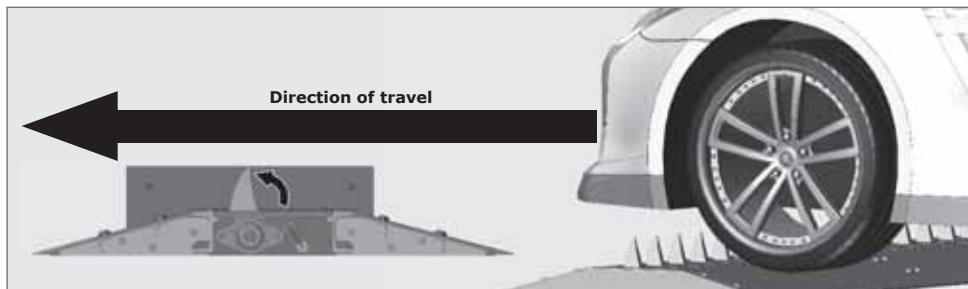


FIGURE 4. SPIKE IMPACT DIRECTION - SIMILAR

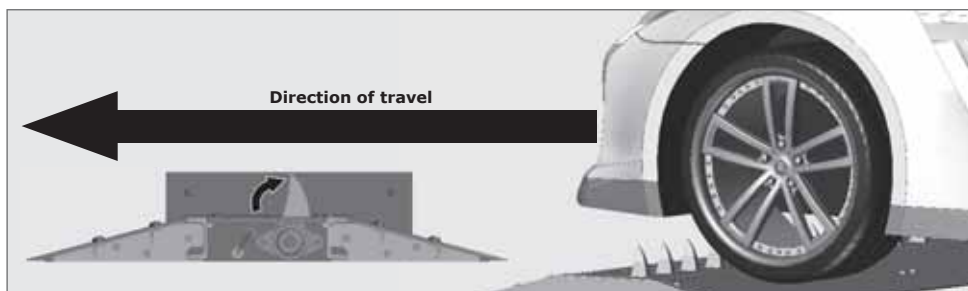


FIGURE 5. SPIKE IMPACT DIRECTION - OPPOSING

There are four types of typical installations. Refer to Section 5, Figures 2 and 3 to determine if the installation is left- or right-hand orientated.

Secondly; pay attention to the spike impact direction:

- **Similar direction of travel** prevents vehicles from exiting whilst the boom pole is still down (Normal direction of traffic)
- **Opposing direction of travel** prevents vehicles entering against the flow of traffic whilst the boom pole is down

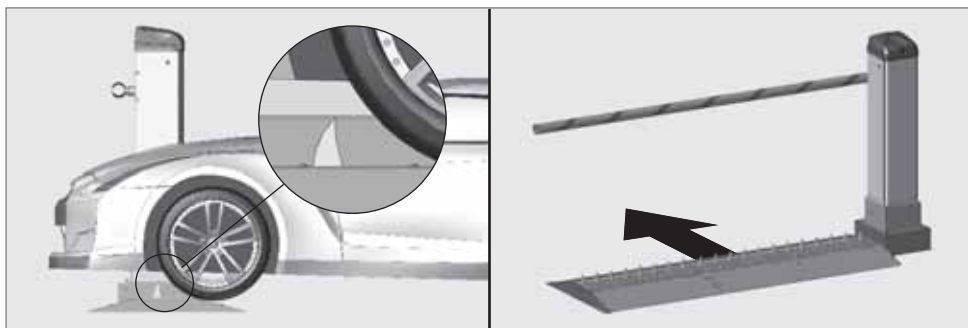


FIGURE 6. RHS SIMILAR DIRECTION OF TRAVEL

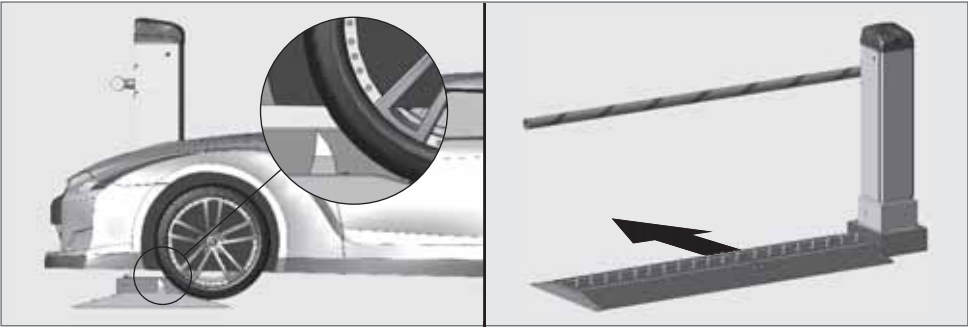


FIGURE 7. RHS OPPOSED DIRECTION OF TRAVEL



FIGURE 8. LHS SIMILAR DIRECTION OF TRAVEL

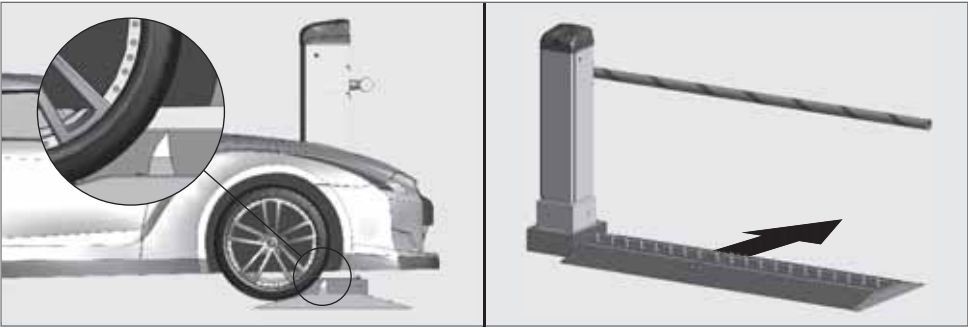
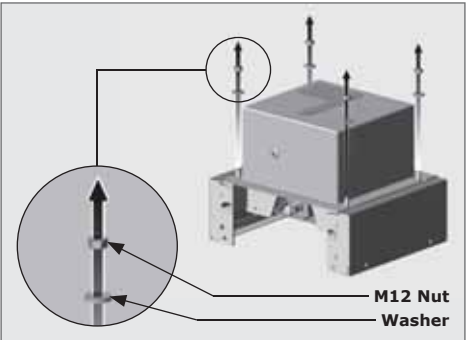


FIGURE 9. LHS OPPOSED DIRECTION OF TRAVEL

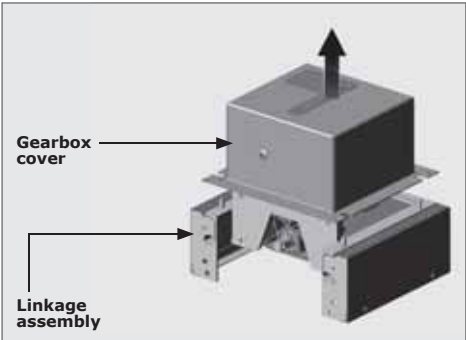
6. RHS Surface Mount - Similar Direction of Travel

Preparing the Drive Linkage Assembly



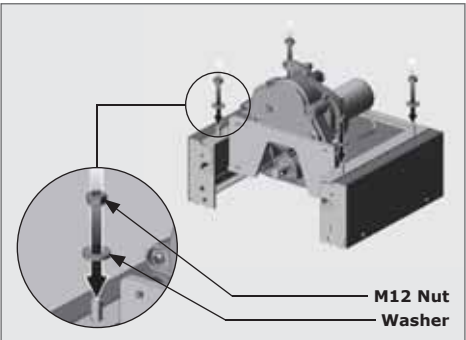
STEP 1

FIGURE 10



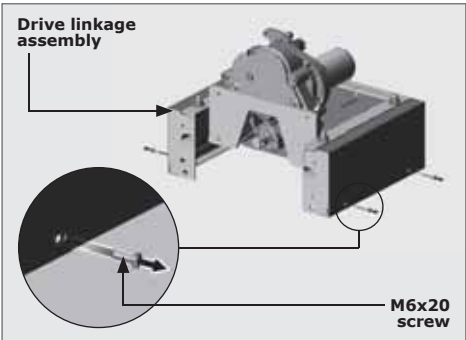
STEP 2

FIGURE 11



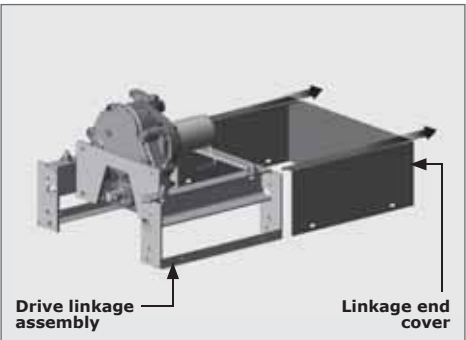
STEP 3

FIGURE 12



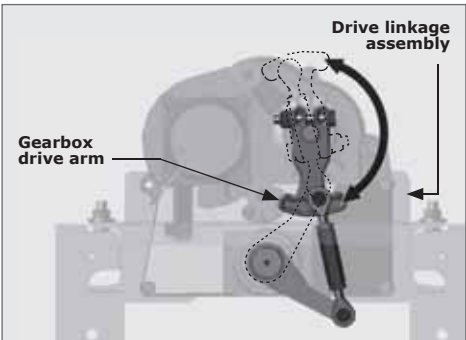
STEP 4

FIGURE 13



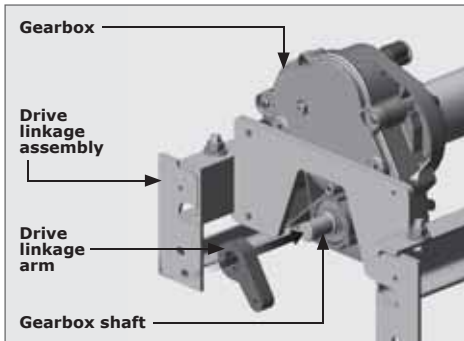
STEP 5

FIGURE 14



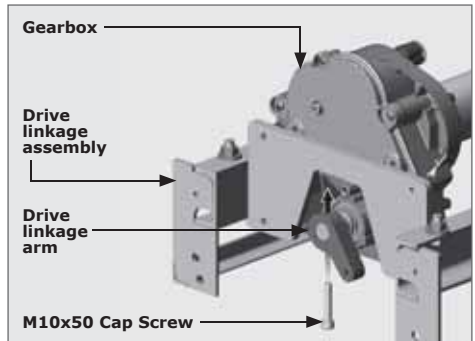
STEP 6

FIGURE 15



STEP 7

FIGURE 16

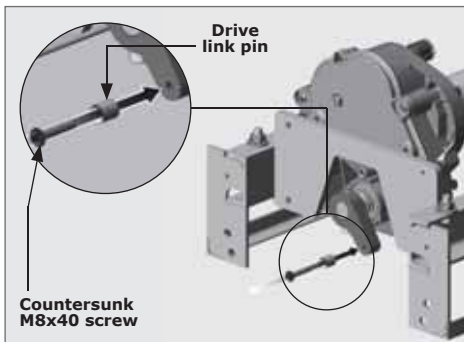


STEP 8

FIGURE 17



The drive linkage arm should point to a 5 o'clock position and the holes of the gearbox shaft and the linkage arm must line up as shown above.



STEP 9

FIGURE 18

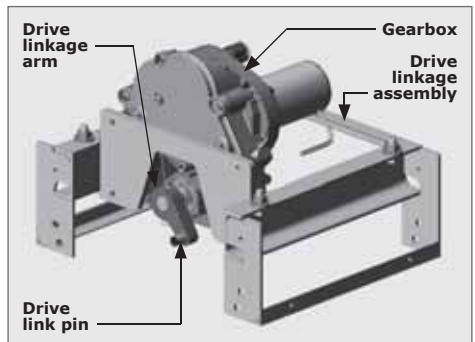


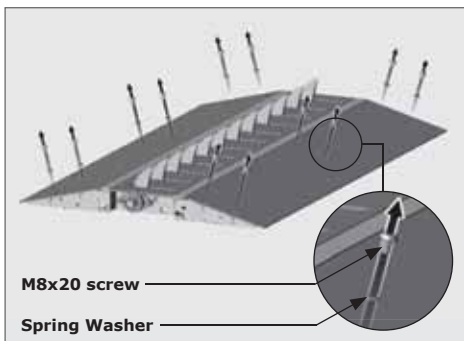
FIGURE 19



Tighten the Countersunk M8x40 screw to 20Nm (Section 6, Figure 18).

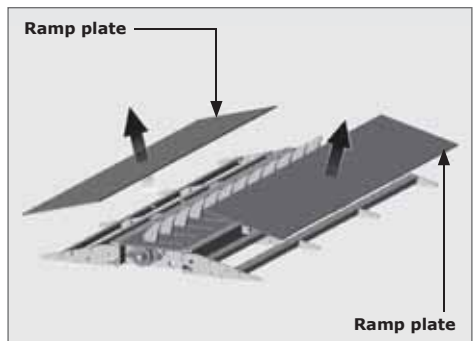
Spike Module Assembly

Preparing the Spike Model assembly(ies) for installation



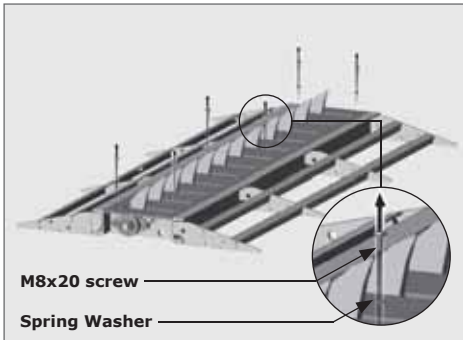
STEP 1

FIGURE 20



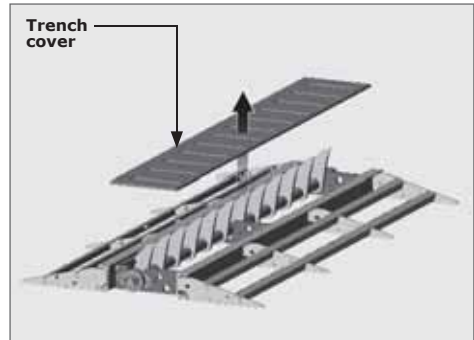
STEP 2

FIGURE 21



STEP 3

FIGURE 22



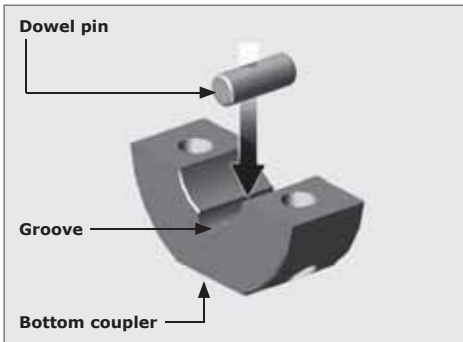
STEP 4

FIGURE 23

Attaching the Driven Link to the first spike module

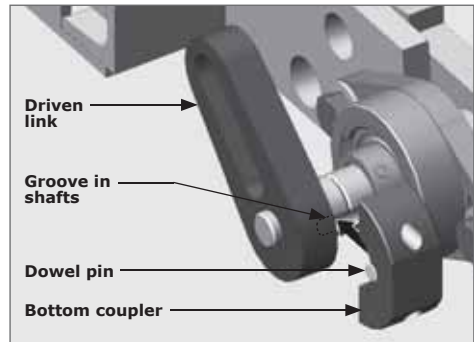


Place the spikes into the down position to aid in the fitment of all the shaft couplings.



STEP 1

FIGURE 24

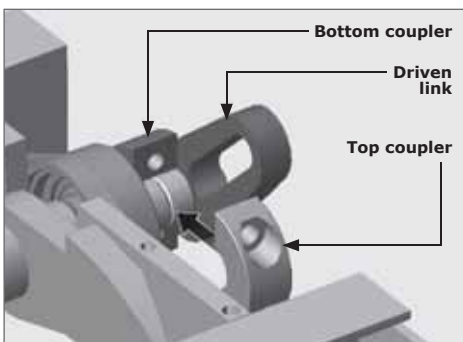


STEP 2

FIGURE 25

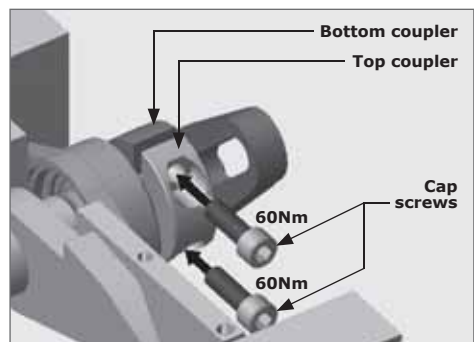


Ensure the Driven Link and the spikes are pointing in the same direction. (Section 6, Figures 25 to 28).



STEP 3

FIGURE 26



STEP 4

FIGURE 27

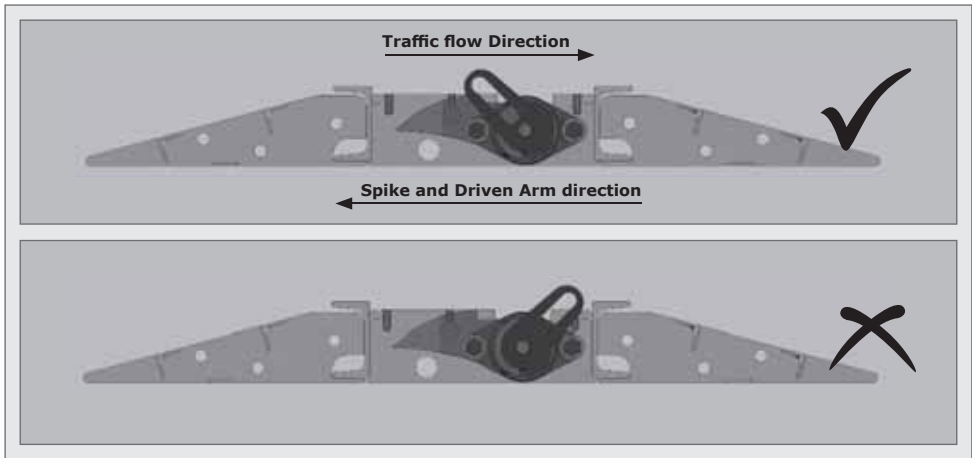


FIGURE 28

Aligning the Driven Linkage Arm to the Drive Linkage Arm.

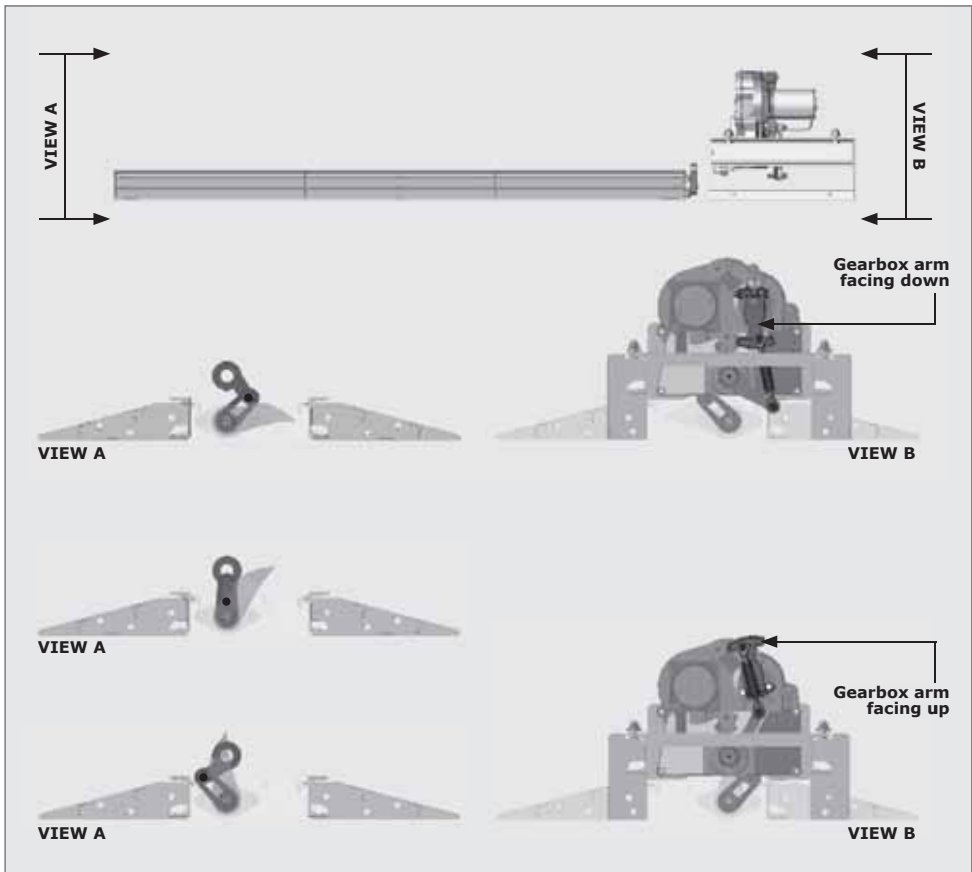
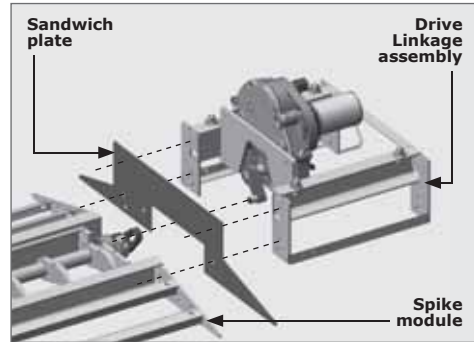


FIGURE 29

Attaching the drive linkage assembly to the spike module

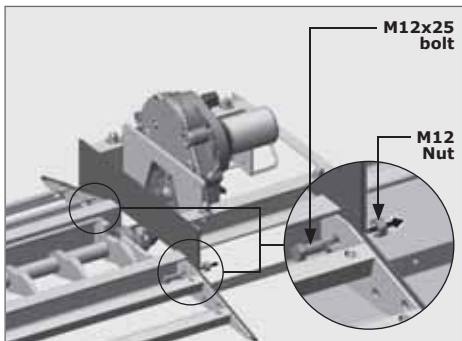


Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 6, Figure 30).



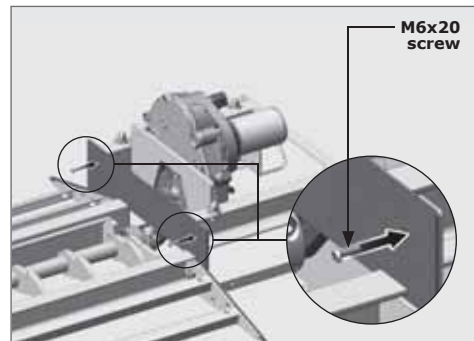
STEP 1

FIGURE 30



STEP 2

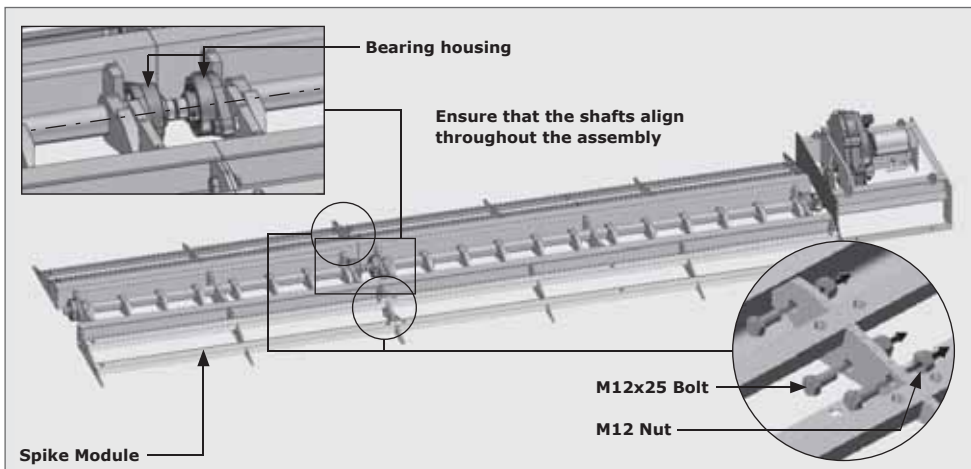
FIGURE 31



STEP 3

FIGURE 32

Using six M12x25 bolts, fix one spike module to another (Section 6, Figure 33).



STEP 4

FIGURE 33



To assist with the alignment and adjustment of the shafts, loosen (but do not remove) the bolts on all of the bearing housings.

Assembling the shaft couplings

The coupler is used to connect and align the shafts together.



It is essential that the coupler is assembled correctly; failing to do so will result in slipping of the spikes which is undesirable.

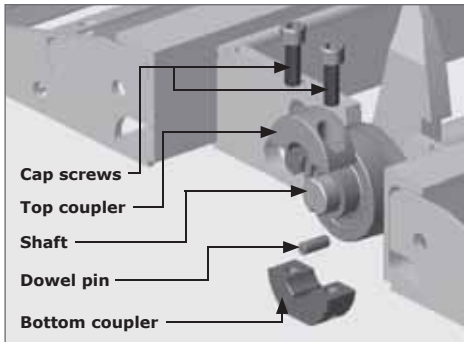


FIGURE 34. SHAFT COUPLER

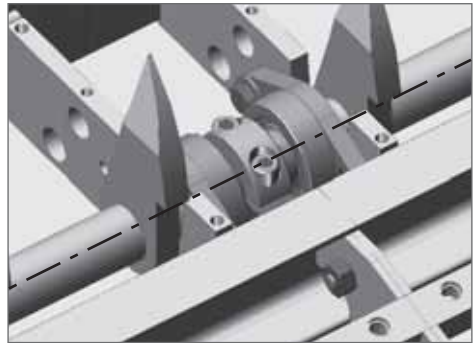
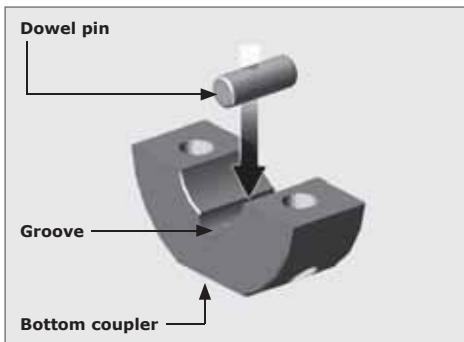


FIGURE 35

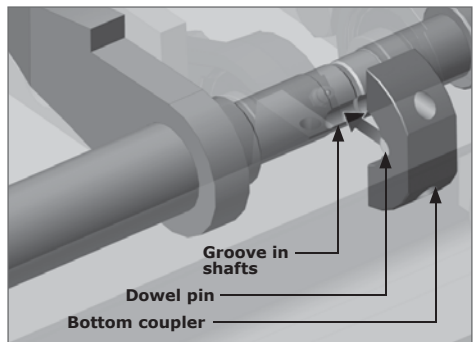


Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



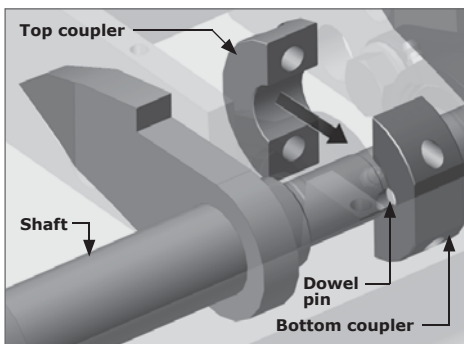
STEP 1

FIGURE 36



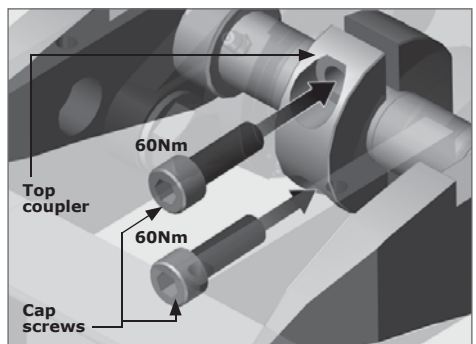
STEP 2

FIGURE 37



STEP 3

FIGURE 38

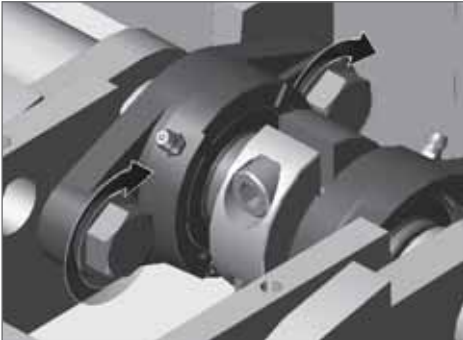


STEP 4

FIGURE 39

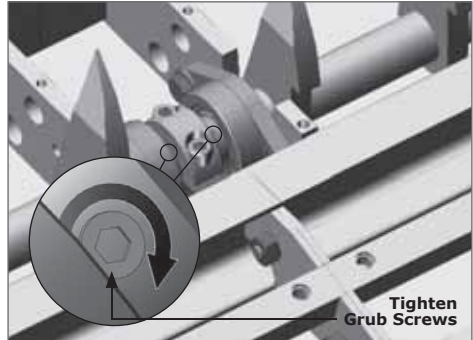
STEP 5

Repeat this coupling process for additional spike modules. Once all shafts have been coupled, check that they rotate freely.



STEP 6

FIGURE 40



STEP 7

FIGURE 41

Bolting down the assembly to the ground



If the Boom Gate and **CLAWS** are to be separated, a trench for the conduit and cables will need to be dug, and the wiring harnesses will need to be extended in relation to the distance between the gearbox and Boom Gate. (Section 6.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

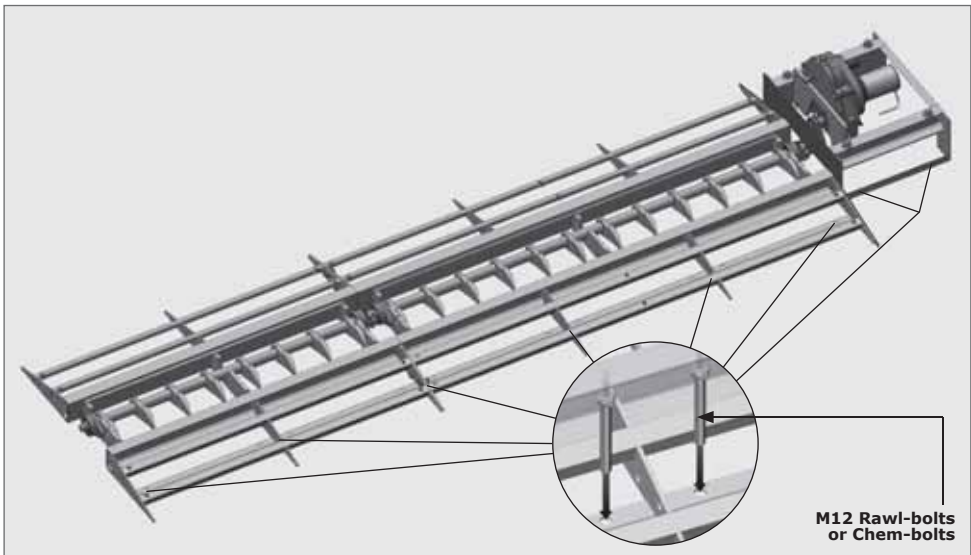
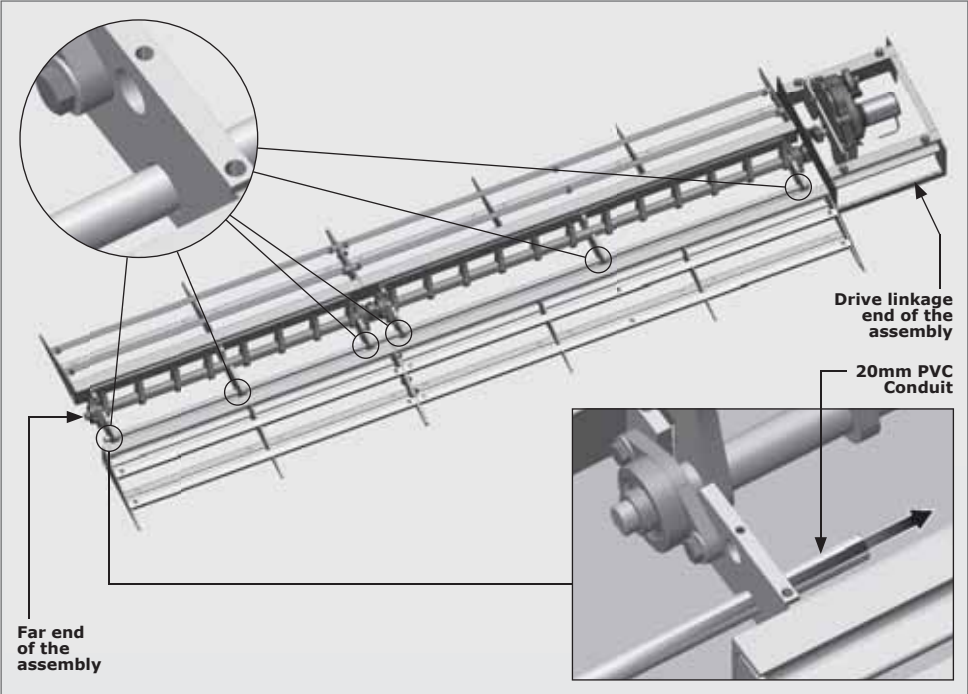


FIGURE 42



It is crucial that the surface it's mounted on is a reasonably even surface as an uneven surface could result in an uneven binding of the spike shafts. This will result in premature failure.

Proximity sensor installation



STEP 1

FIGURE 43



The length of the PVC conduit will be relative to the length of the spike modules and drive linkage unit combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 6, Figure 44).

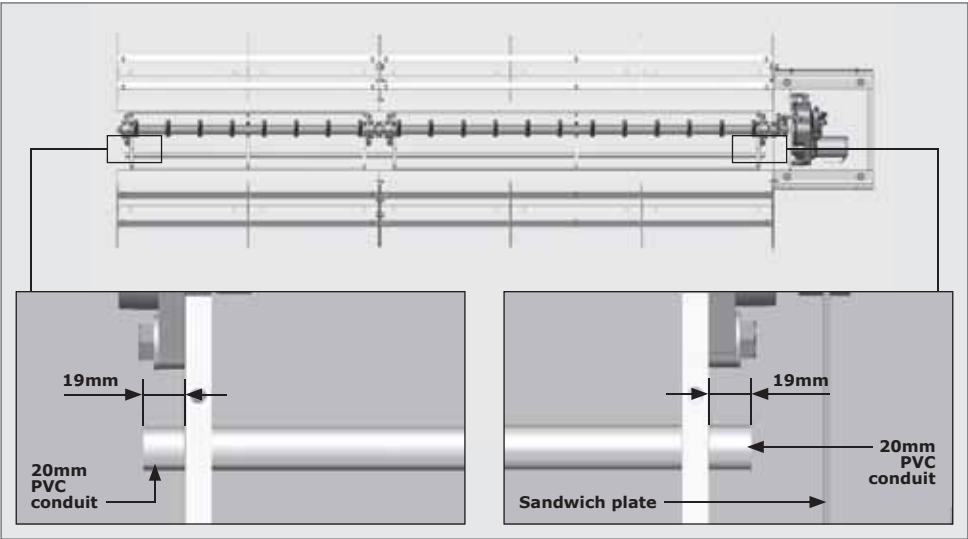
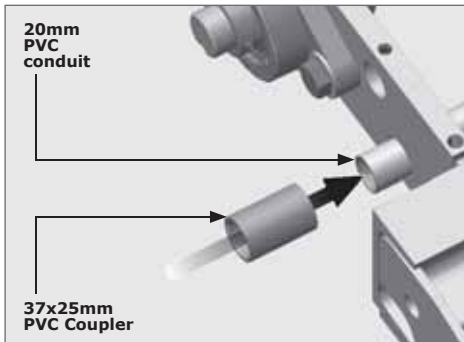


FIGURE 44

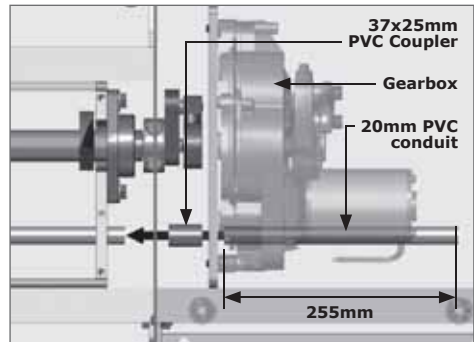


Use an appropriate PVC adhesive to bond all conduit lengths, access elbows and couplers to one another.



STEP 2

FIGURE 45

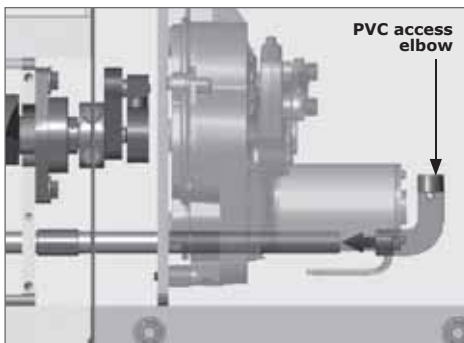


STEP 3

FIGURE 46

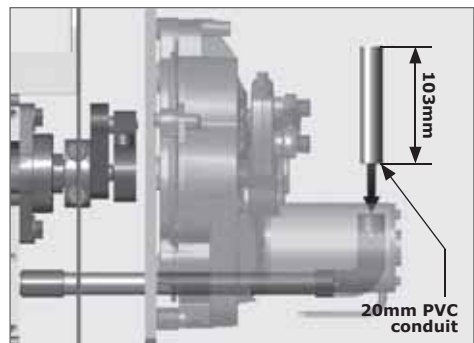


Steps 4-7 is only applicable if the Boom Gate will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted separately, a trench for the conduit and proximity sensor cable will need to be dug (Section 6.).



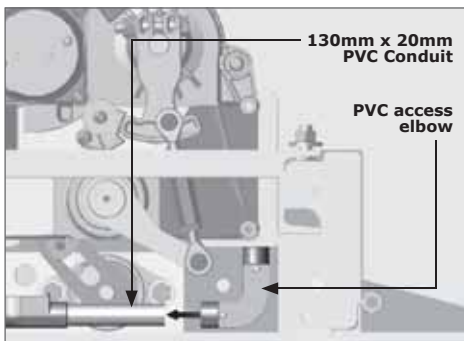
STEP 4

FIGURE 47



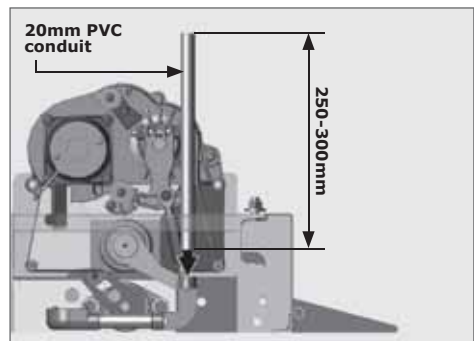
STEP 5

FIGURE 48



STEP 6

FIGURE 49



STEP 7

FIGURE 50



Please ensure that the moving mechanical parts do not rub against the conduit or cables.

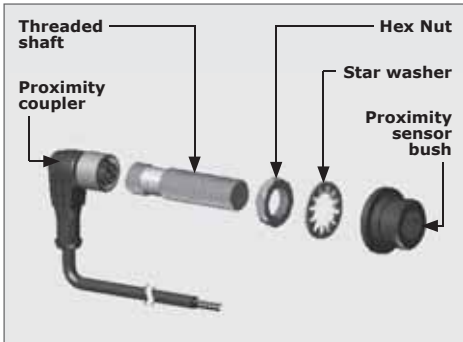


FIGURE 51. PROXIMITY SENSOR

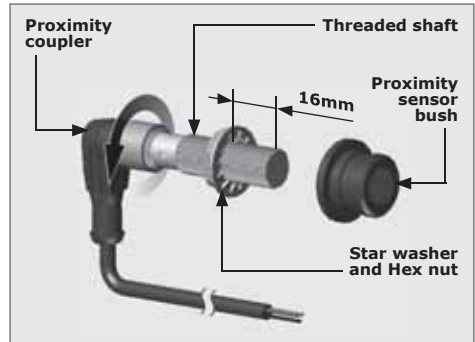


FIGURE 52. PROXIMITY SENSOR

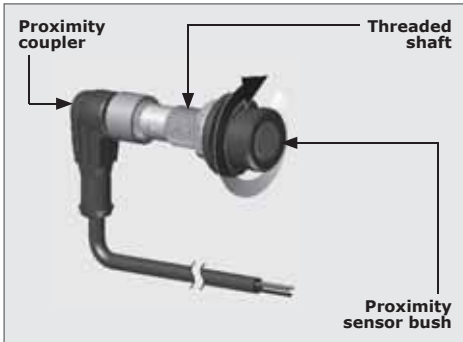
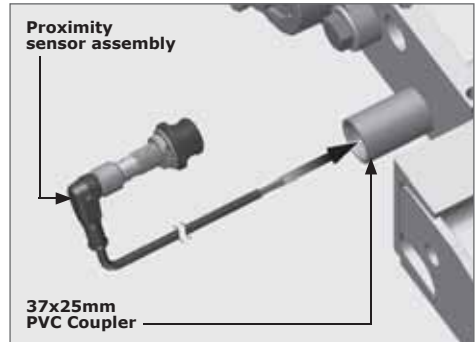


FIGURE 53. PROXIMITY SENSOR



STEP 8

FIGURE 54

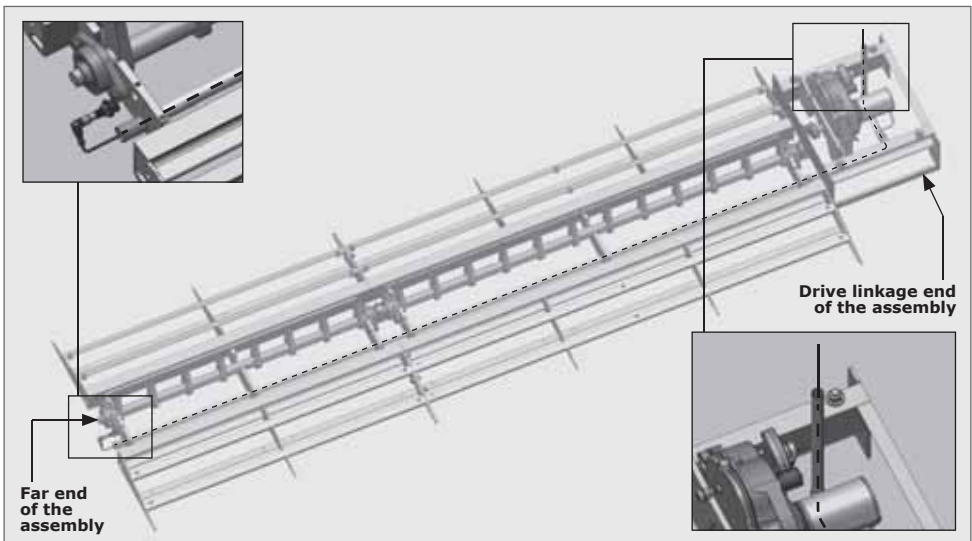
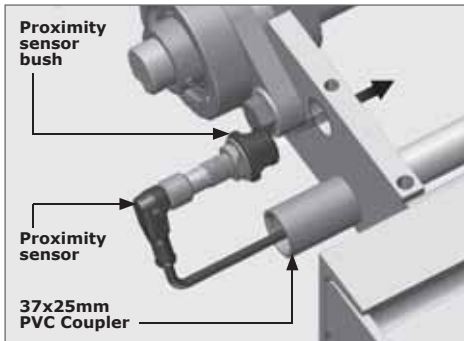


FIGURE 55

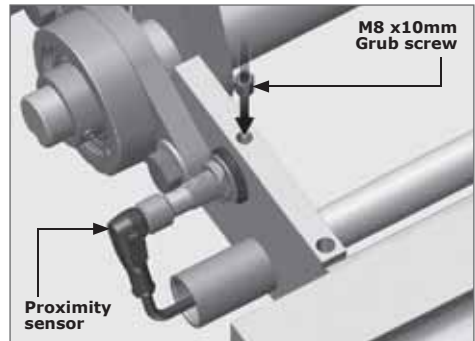


There should be ample cable left over on the drive linkage end, as the wiring will need to be routed to the Boom Gate at a later stage.



STEP 9

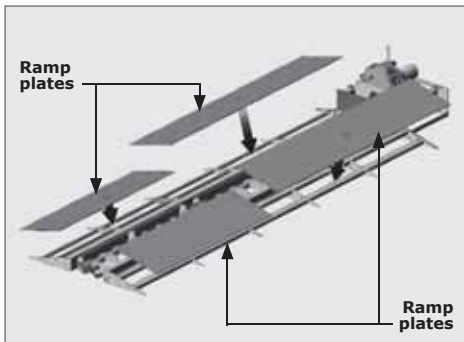
FIGURE 56



STEP 10

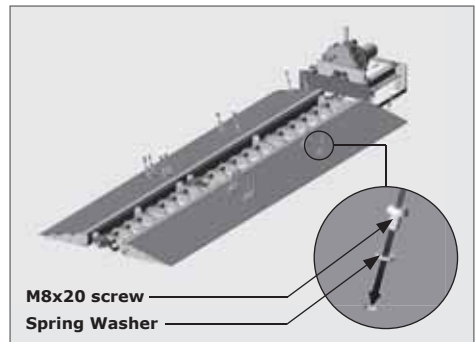
FIGURE 57

Re-assembling the ramp plates and linkage cover



STEP 1

FIGURE 58

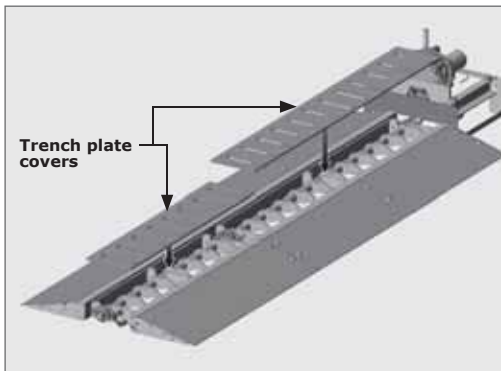


STEP 2

FIGURE 59



Leave out the four M8 screws and Spring Washers on the far end of the assembly as the module end cover will be assembled later.



STEP 3

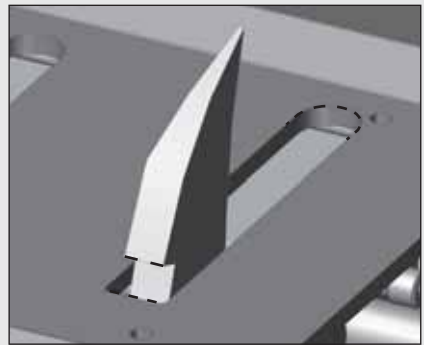
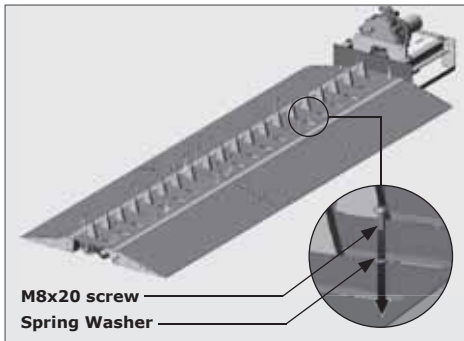


FIGURE 60

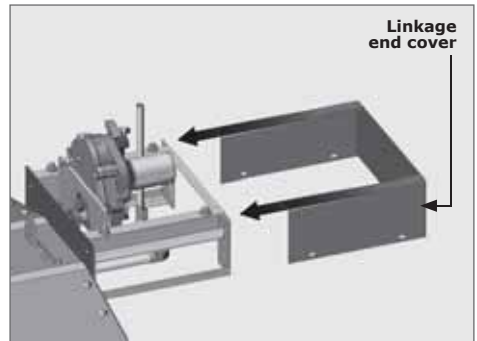


Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



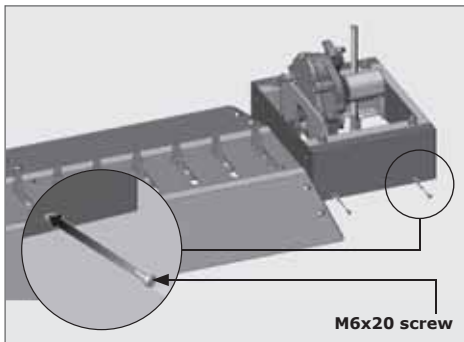
STEP 4

FIGURE 61



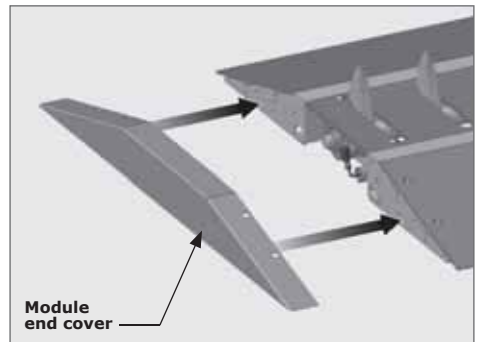
STEP 5

FIGURE 62



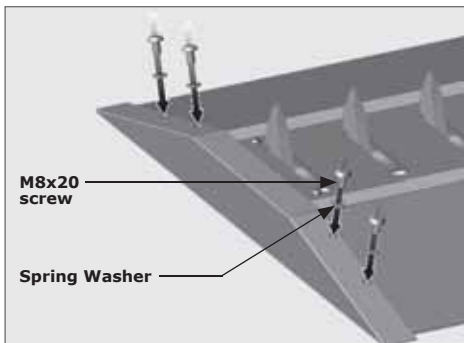
STEP 6

FIGURE 63



STEP 7

FIGURE 64

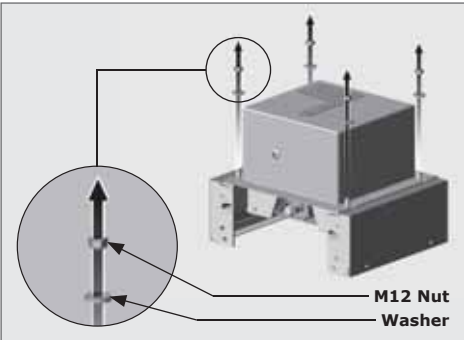


STEP 8

FIGURE 65

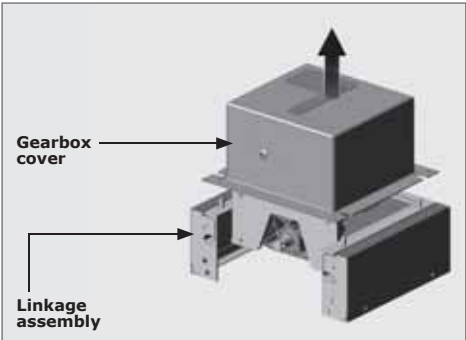
7. RHS Surface Mount - Opposing Direction of Travel

Preparing the Drive Linkage Assembly



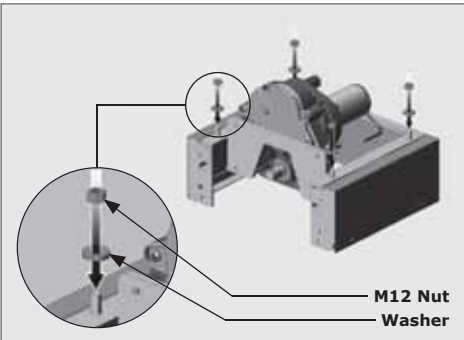
STEP 1

FIGURE 1



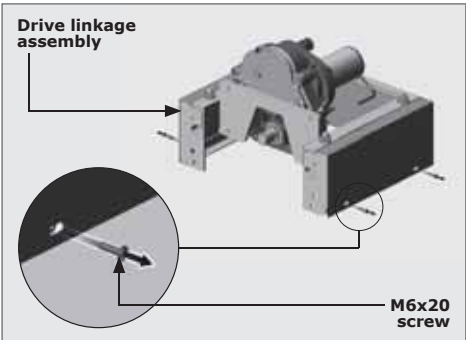
STEP 2

FIGURE 2



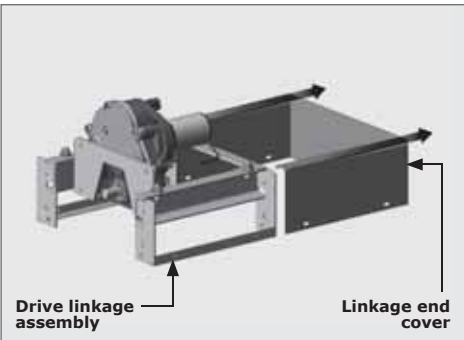
STEP 3

FIGURE 3



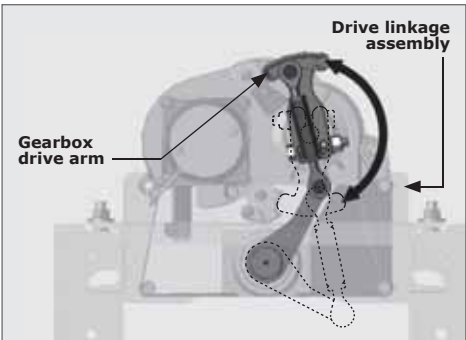
STEP 4

FIGURE 4



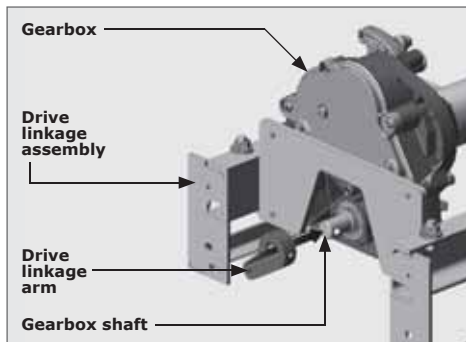
STEP 5

FIGURE 5



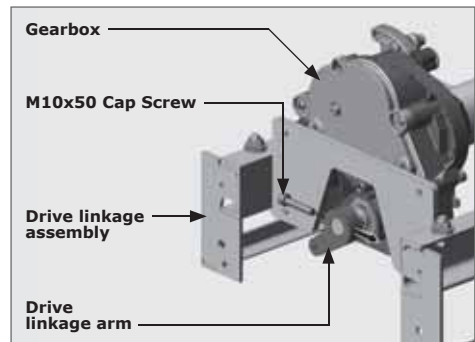
STEP 6

FIGURE 6



STEP 7

FIGURE 7

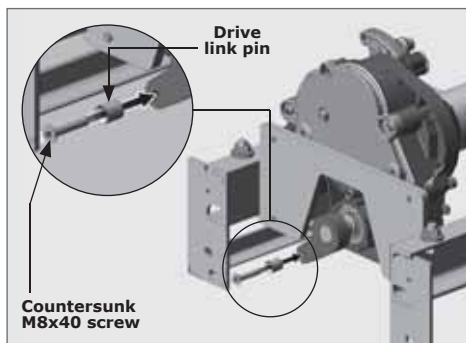


STEP 8

FIGURE 8



The drive linkage arm should point to a 7 o'clock position and the holes of the gearbox shaft and the linkage arm must line up as shown above.



STEP 9

FIGURE 9

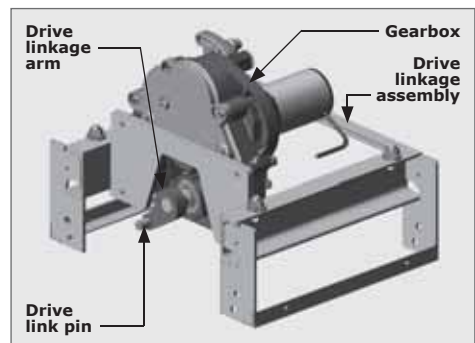


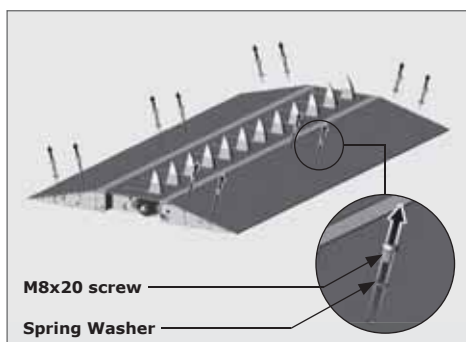
FIGURE 10



Tighten the Countersunk M8x40 screw to 20Nm (Section 7, Figure 9).

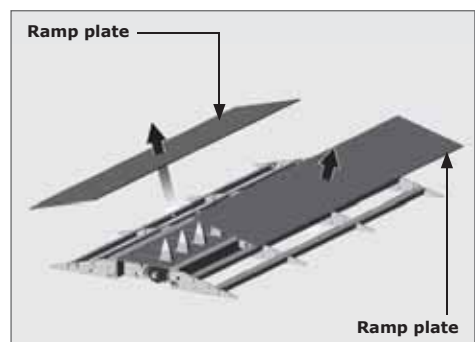
Spike Module Assembly

Preparing the Spike Model assembly(ies) for installation



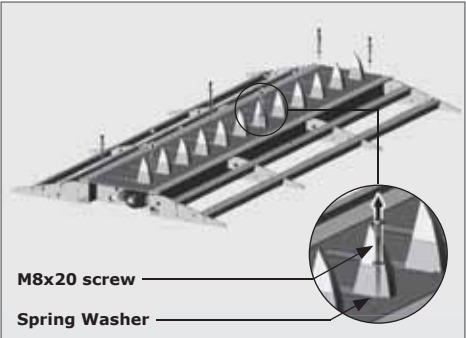
STEP 1

FIGURE 11



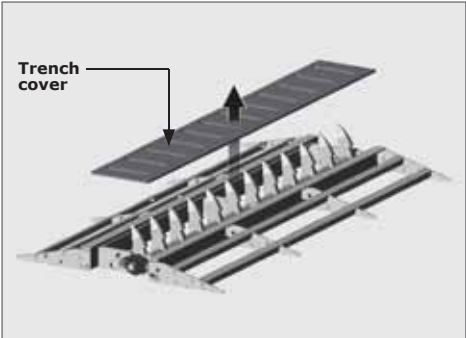
STEP 2

FIGURE 12



STEP 3

FIGURE 13



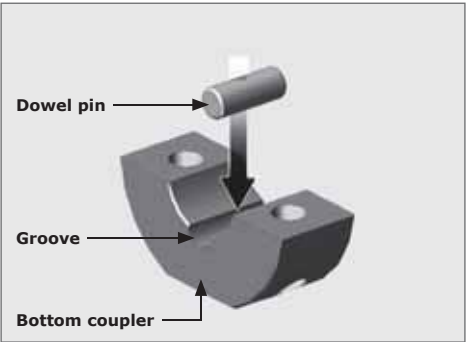
STEP 4

FIGURE 14

Attaching the Driven Link to the first spike module

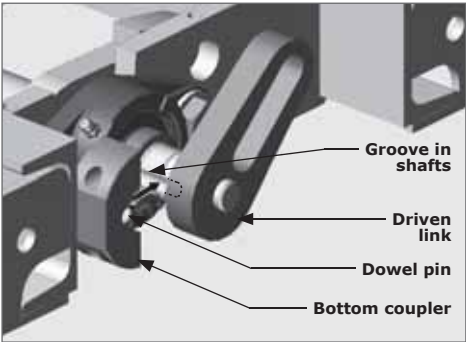


Place the spikes into the down position to aid in the fitment of all the shaft couplings.



STEP 1

FIGURE 15

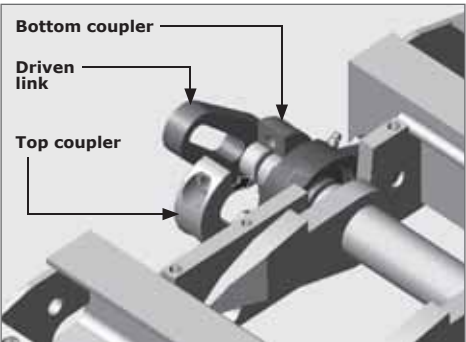


STEP 2

FIGURE 16

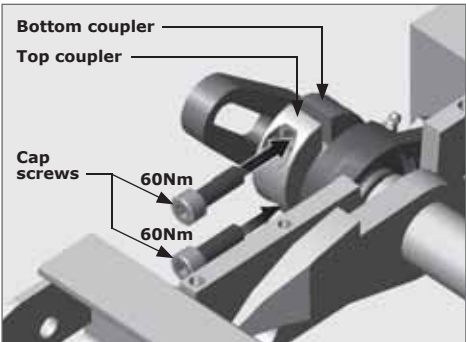


Ensure the Driven Link and the spikes are pointing in the same direction. (Section 7, Figures 16 to 19).



STEP 3

FIGURE 17



STEP 4

FIGURE 18

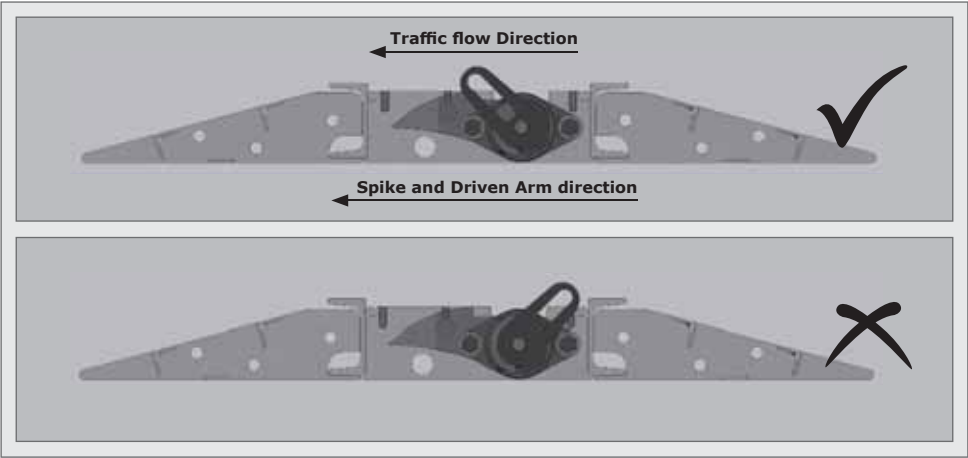


FIGURE 19

Aligning the Driven Linkage Arm to the Drive Linkage Arm.

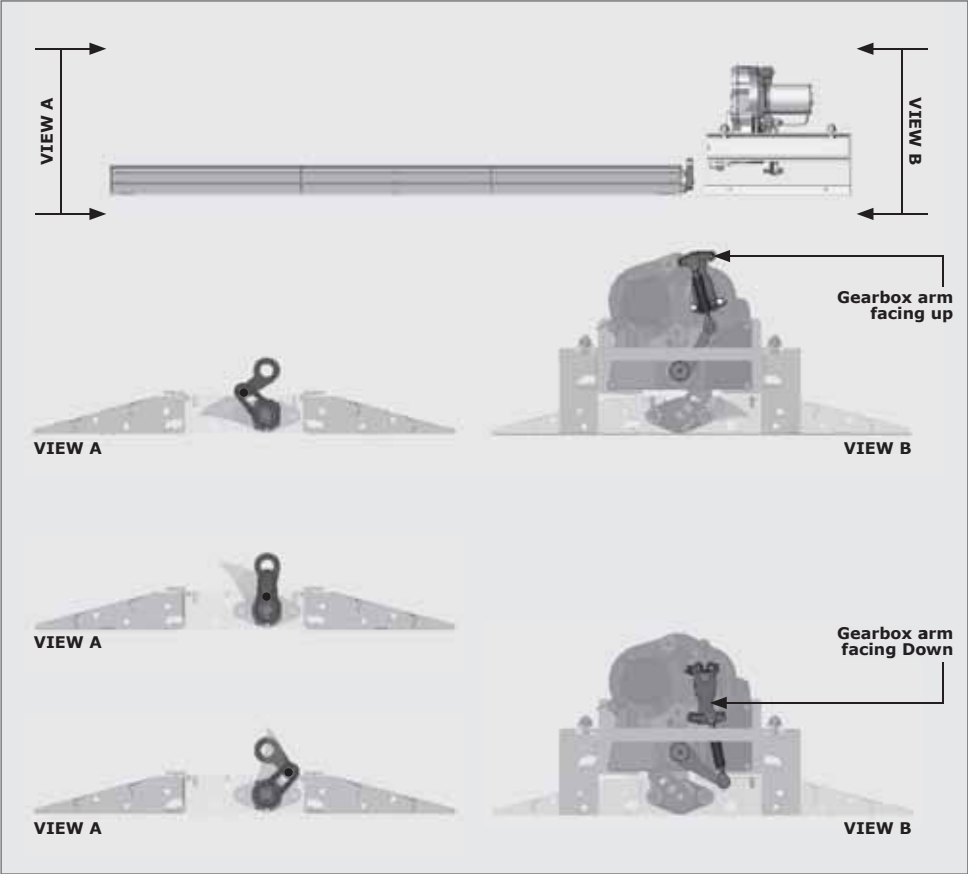
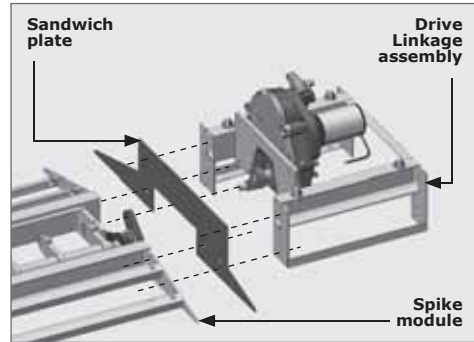


FIGURE 20

Attaching the drive linkage assembly to the spike module

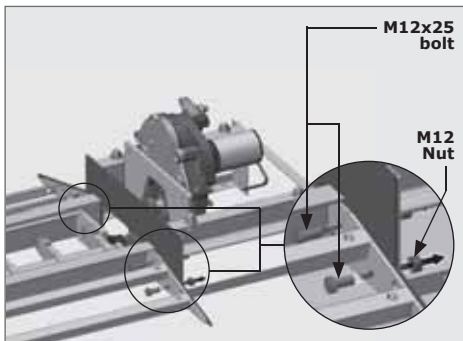


Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 7, Figure 21).



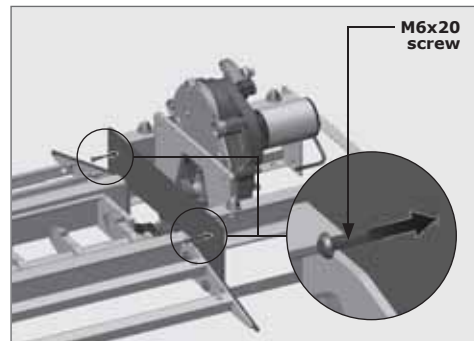
STEP 1

FIGURE 21



STEP 2

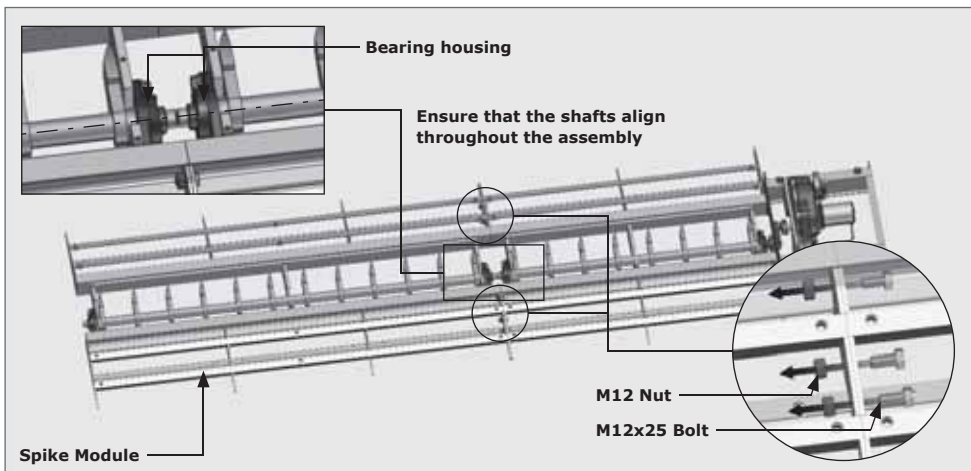
FIGURE 22



STEP 3

FIGURE 23

Using six M12x25 bolts, fix one spike module to another (Section 7, Figure 24).



STEP 4

FIGURE 24



To assist with the alignment and adjustment of the shafts, loosen (but do not remove) the bolts on all of the bearing housings.

Assembling the shaft couplings

The coupler is used to connect and align the shafts together.



It is essential that the coupler is assembled correctly; failing to do so will result in slipping of the spikes which is undesirable.

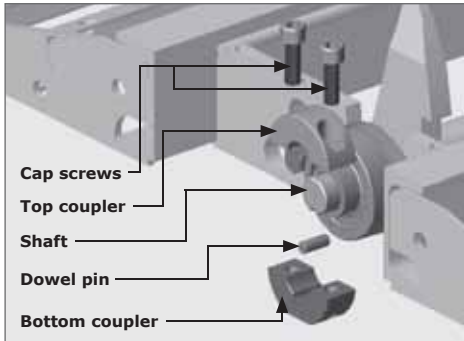


FIGURE 25. SHAFT COUPLER

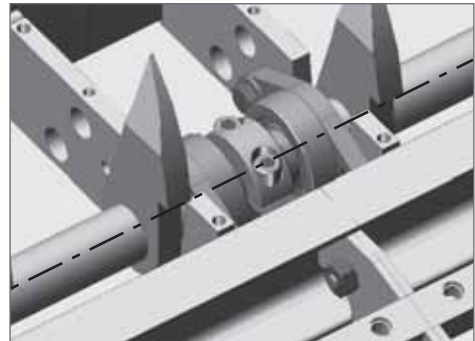
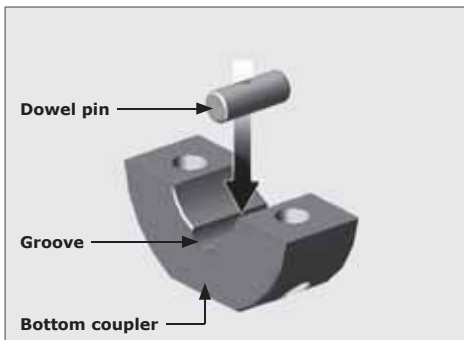


FIGURE 26

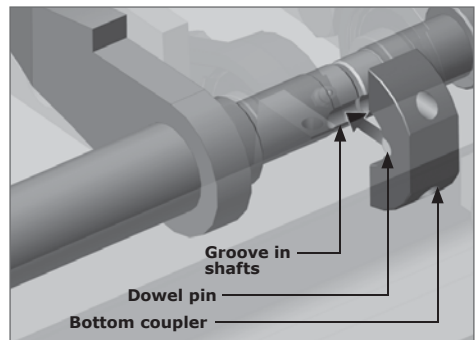


Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



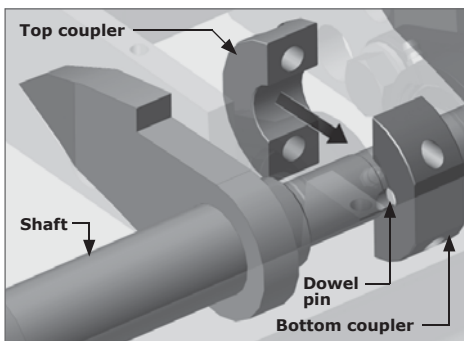
STEP 1

FIGURE 27



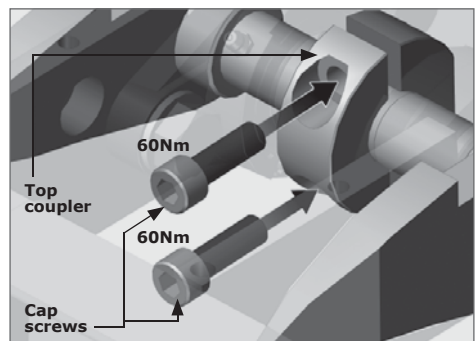
STEP 2

FIGURE 28



STEP 3

FIGURE 29

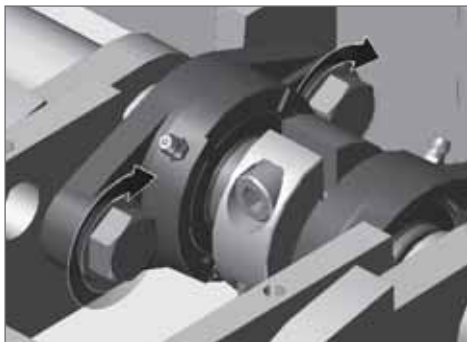
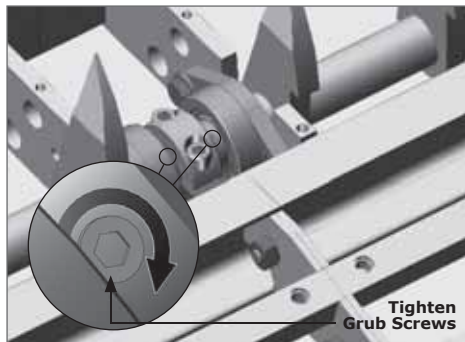


STEP 4

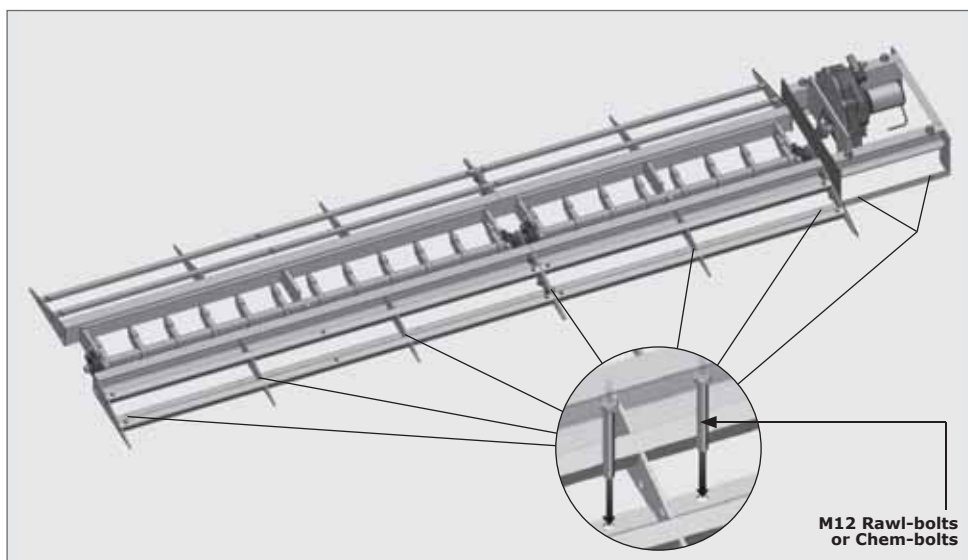
FIGURE 30

STEP 5

Repeat this coupling process for additional spike modules. Once all shafts have been coupled, check that they move freely.

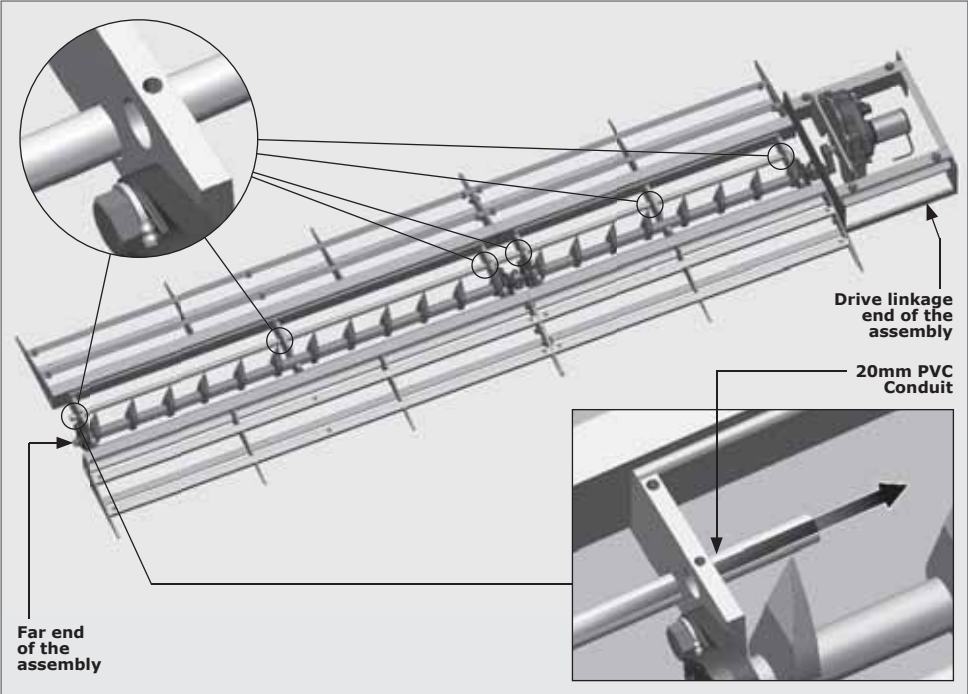
**STEP 6****FIGURE 31****STEP 7****FIGURE 32****Bolting down the assembly to the ground**

If the Boom Gate and **CLAWS** are to be separated, a trench for the conduit and cables will need to be dug, and the wiring harnesses will need to be extended in relation to the distance between the gearbox and Boom Gate. (Section 7.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

**FIGURE 33**

It is crucial that the surface it's mounted on is a reasonably even surface as an uneven surface could result in an uneven binding of the spike shafts. This will result in premature failure.

7. Proximity sensor installation



STEP 1

FIGURE 34



The length of the PVC conduit will be relative to the length of the spike modules and drive linkage unit combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 7, Figure 35).

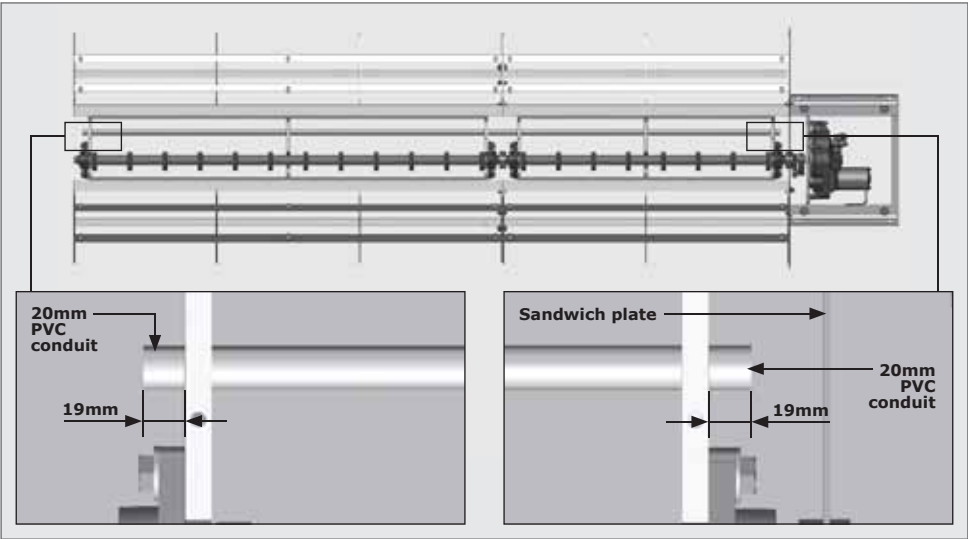
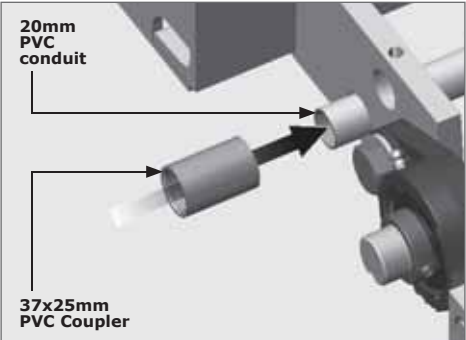


FIGURE 35

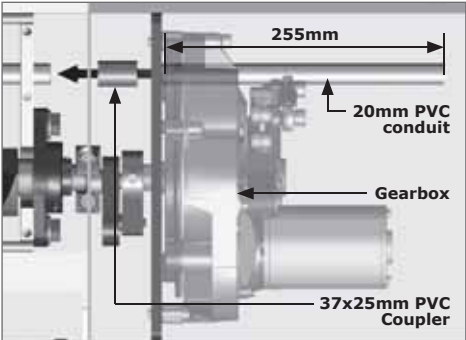


Use an appropriate PVC adhesive to bond all conduit lengths, access elbows and couplers to one another.



STEP 2

FIGURE 36

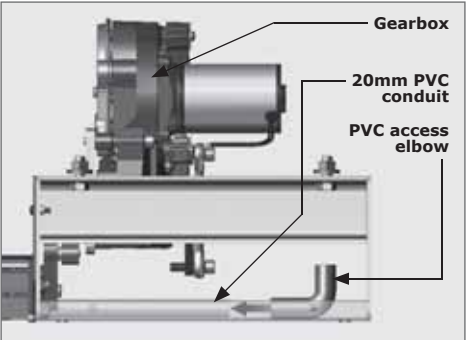


STEP 3

FIGURE 37

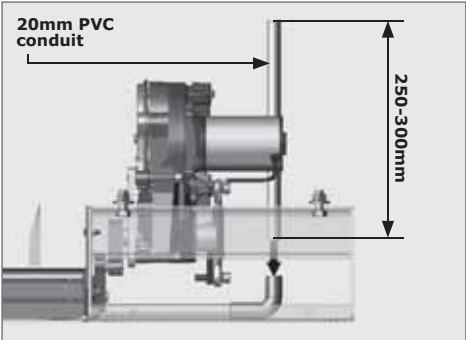


Steps 4-5 is only applicable if the Boom Gate will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted separately, a trench for the conduit and proximity sensor cable will need to be dug (Section 7.).



STEP 4

FIGURE 38



STEP 5

FIGURE 39



Please ensure that the moving mechanical parts do not rub against the conduit or cables.

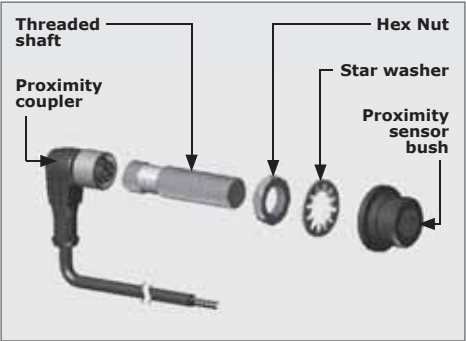


FIGURE 40. PROXIMITY SENSOR

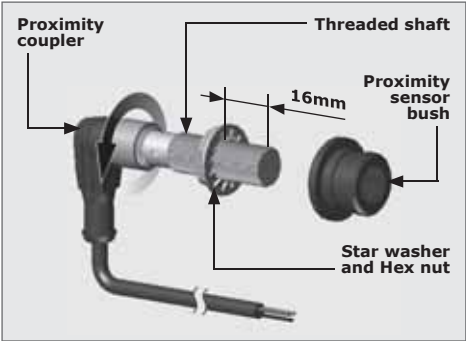


FIGURE 41. PROXIMITY SENSOR

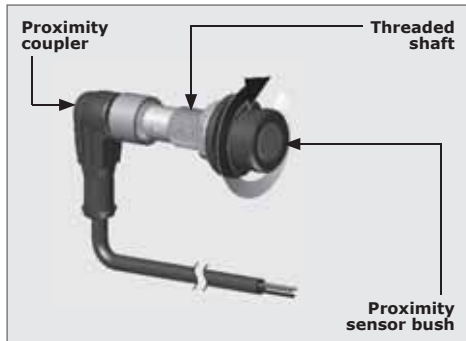
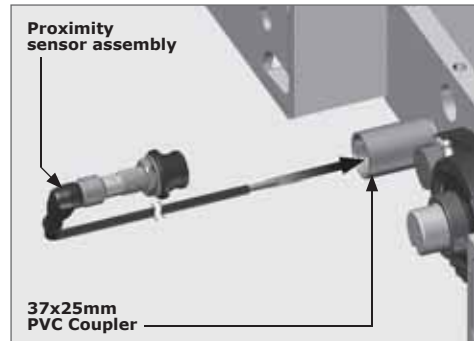


FIGURE 42. PROXIMITY SENSOR



STEP 8

FIGURE 43

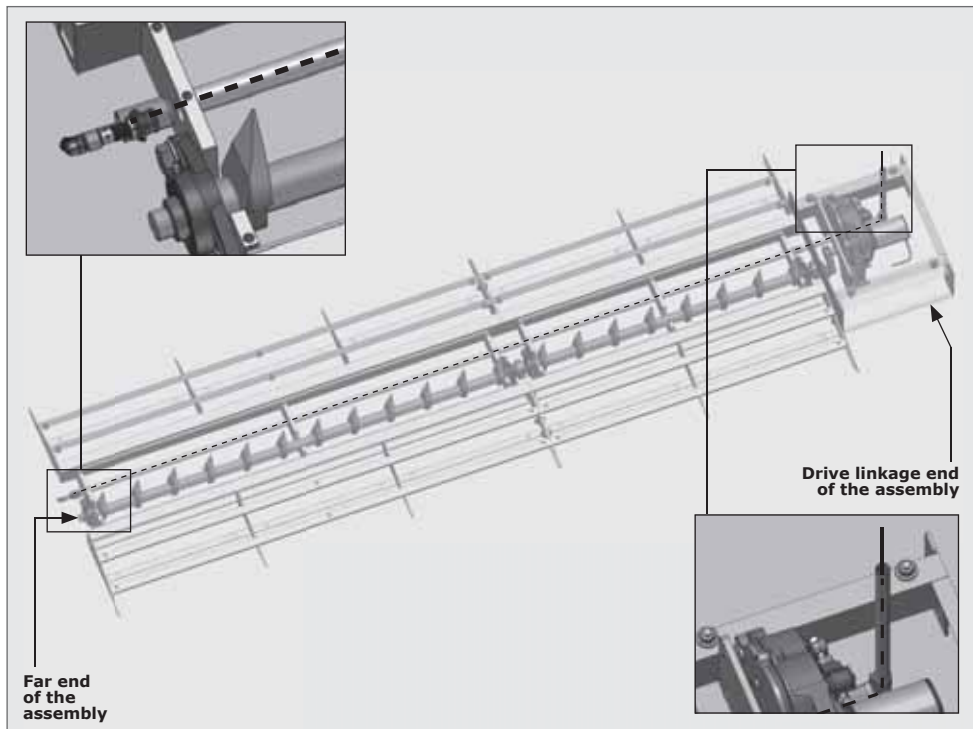
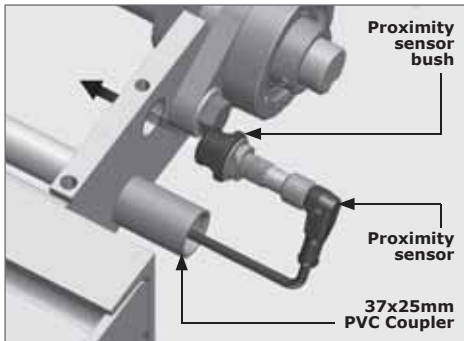


FIGURE 44

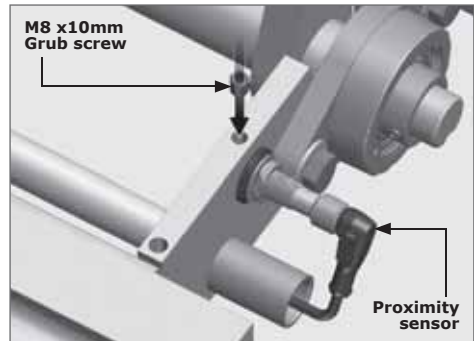


There should be ample cable left over on the drive linkage end, as the wiring will need to be routed to the Boom Gate at a later stage.



STEP 9

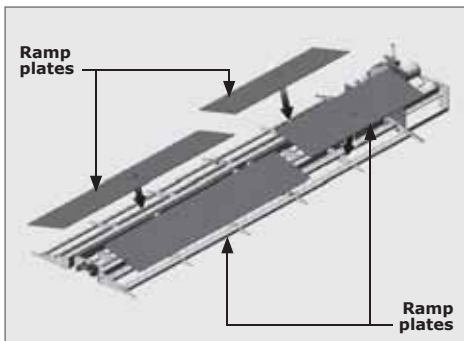
FIGURE 45



STEP 10

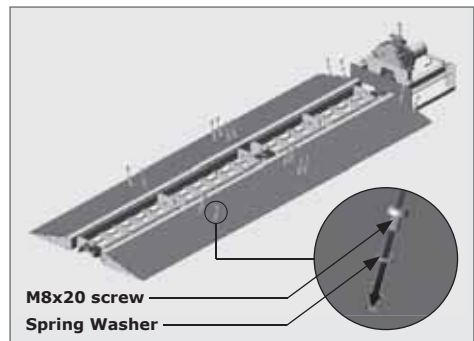
FIGURE 46

Re-assembling the ramp plates and linkage cover



STEP 1

FIGURE 47

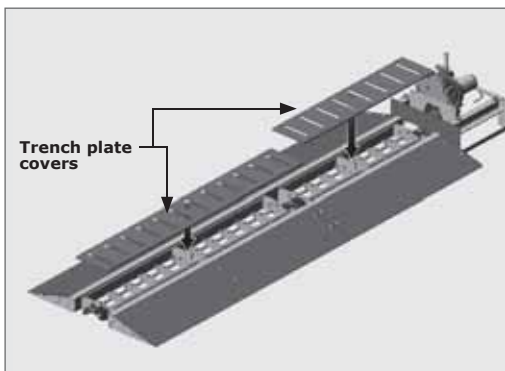


STEP 2

FIGURE 48



Leave out the four M8 screws and Spring Washers on the far end of the assembly as the module end cover will be assembled later.



STEP 3

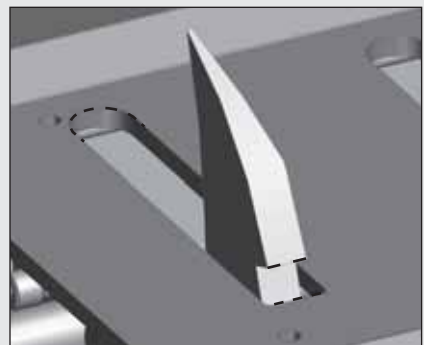
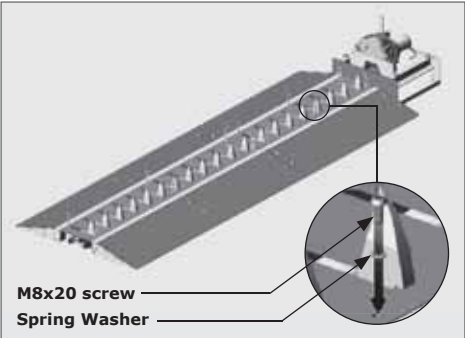


FIGURE 49

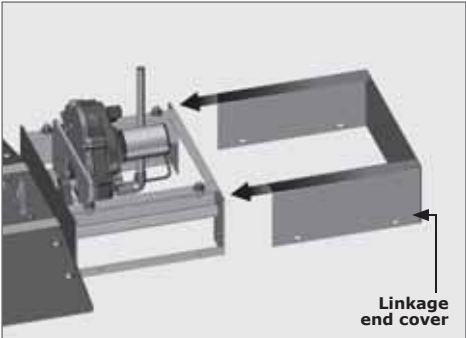


Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



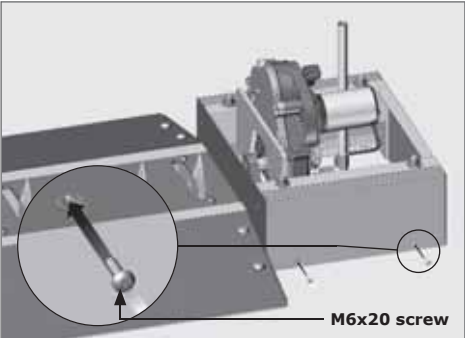
STEP 4

FIGURE 50



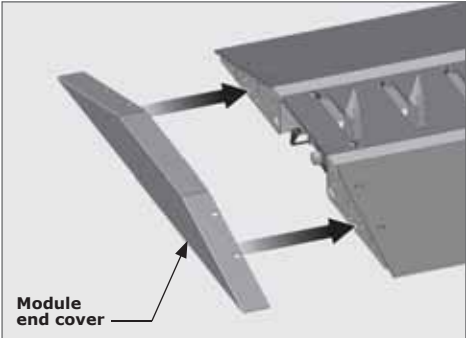
STEP 5

FIGURE 51



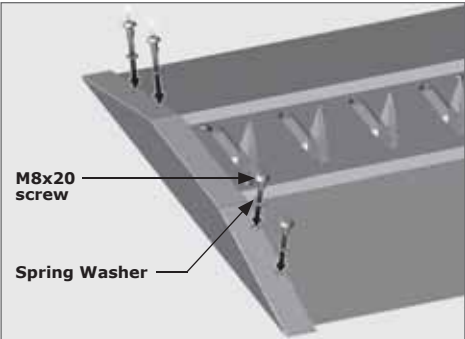
STEP 6

FIGURE 52



STEP 7

FIGURE 53

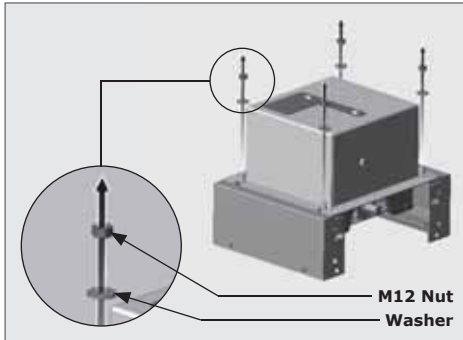


STEP 8

FIGURE 54

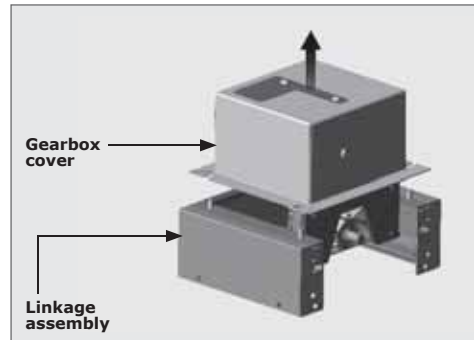
8. LHS Surface Mount - Similar Direction of Travel

Preparing the Drive Linkage Assembly



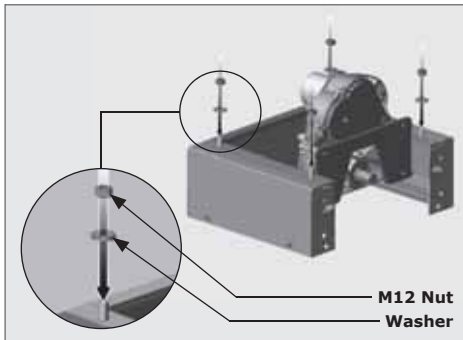
STEP 1

FIGURE 1



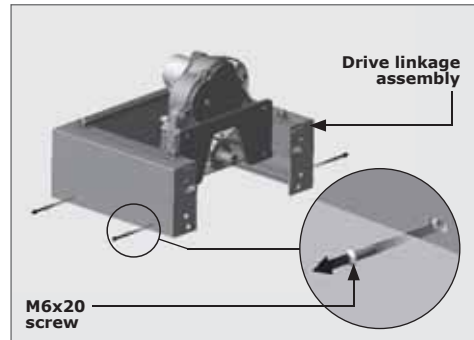
STEP 2

FIGURE 2



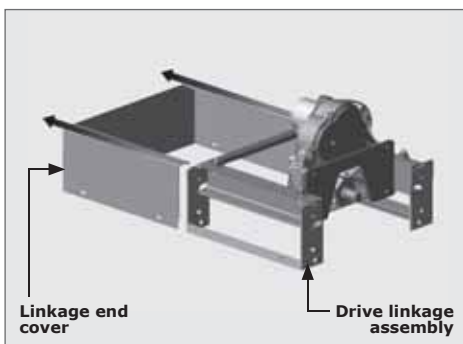
STEP 3

FIGURE 3



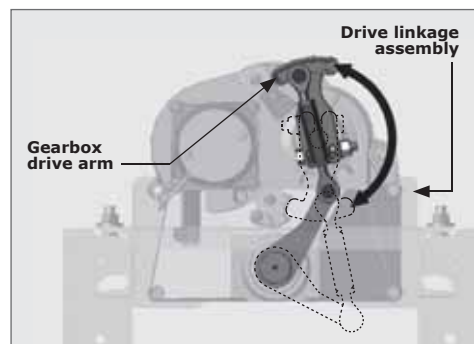
STEP 4

FIGURE 4



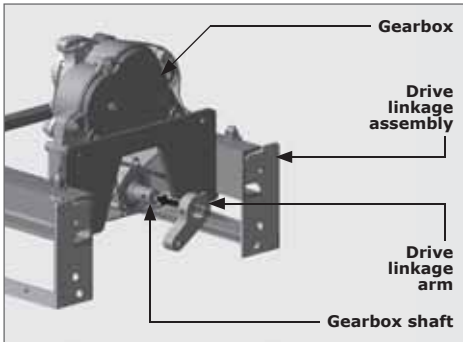
STEP 5

FIGURE 5



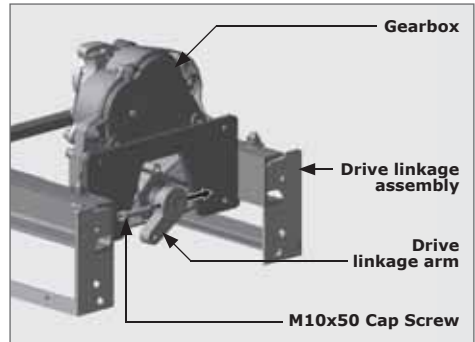
STEP 6

FIGURE 6



STEP 7

FIGURE 7

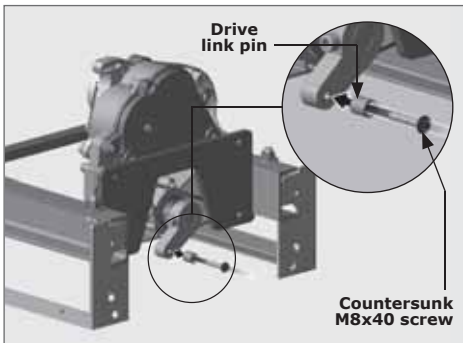


STEP 8

FIGURE 8



The drive linkage arm should point to a 7 o'clock position and the holes of the gearbox shaft and the linkage arm must line up as shown above.



STEP 9

FIGURE 9

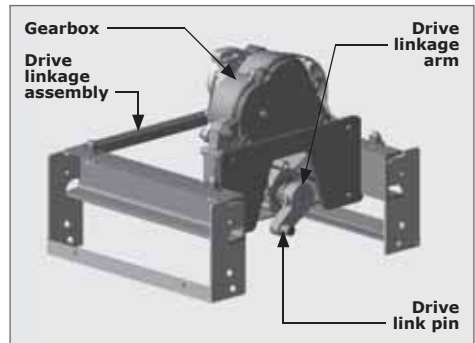


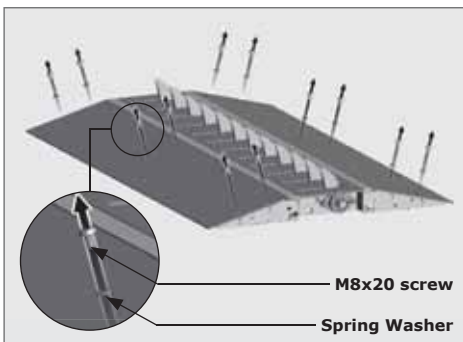
FIGURE 10



Tighten the Countersunk M8x40 screw to 20Nm (Section 8, Figure 9).

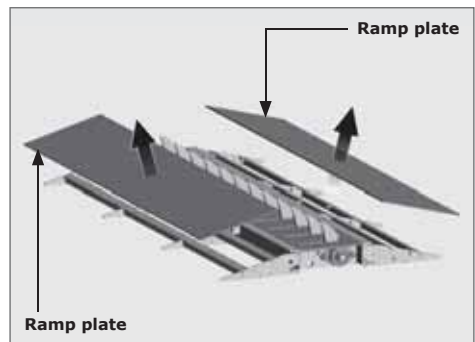
Spike Module Assembly

Preparing the Spike Model assembly(ies) for installation



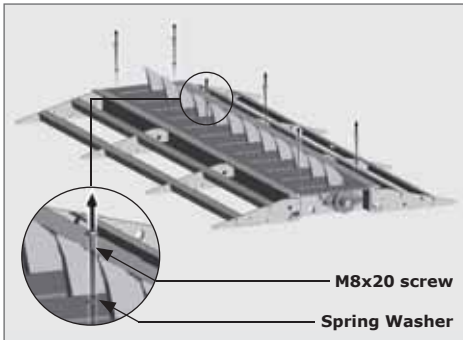
STEP 1

FIGURE 11



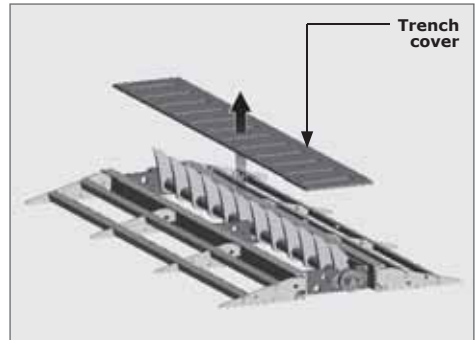
STEP 2

FIGURE 12



STEP 3

FIGURE 13



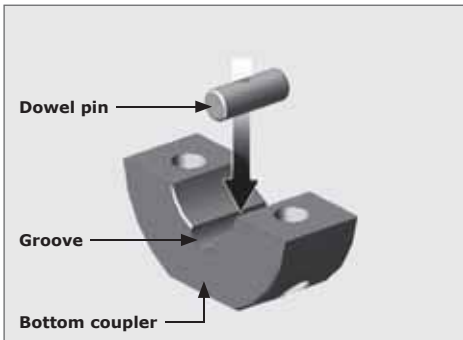
STEP 4

FIGURE 14

Attaching the Driven Link to the first spike module

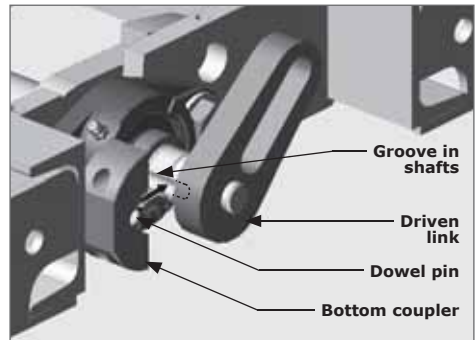


Place the spikes into the down position to aid in the fitment of all the shaft couplings.



STEP 1

FIGURE 15

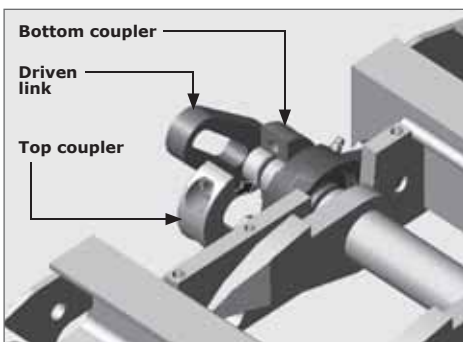


STEP 2

FIGURE 16

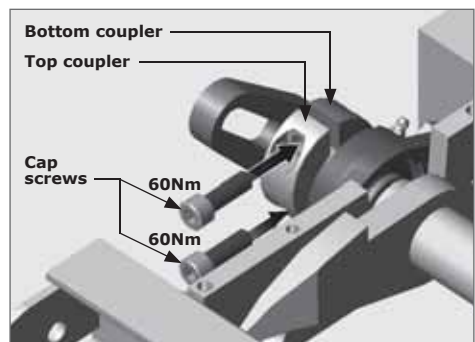


Ensure the Driven Link and the spikes are pointing in the same direction. (Section 8, Figures 16 to 19).



STEP 3

FIGURE 17



STEP 4

FIGURE 18

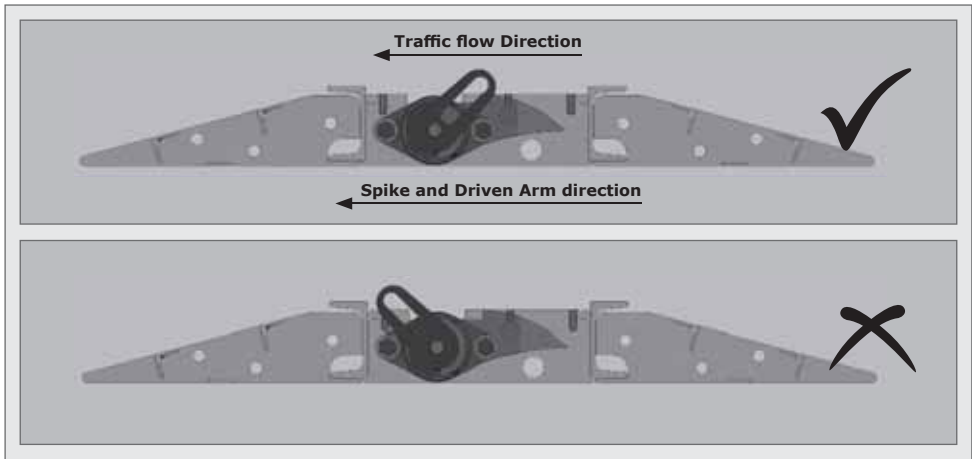


FIGURE 19

Aligning the Driven Linkage Arm to the Drive Linkage Arm.

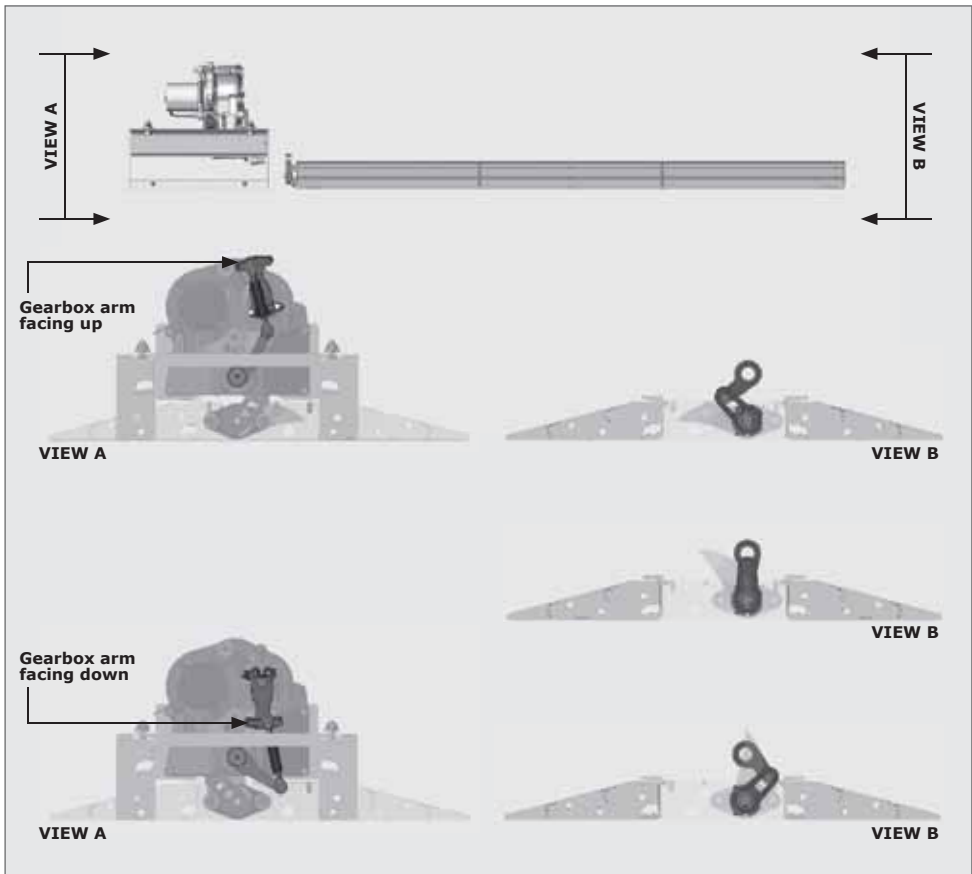
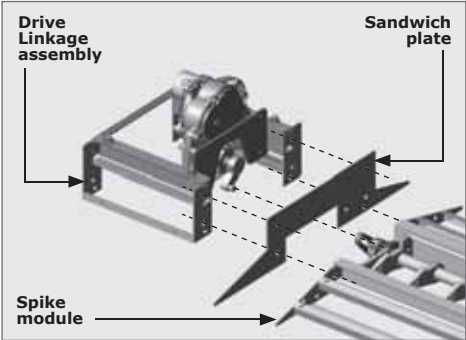


FIGURE 20

Attaching the drive linkage assembly to the spike module

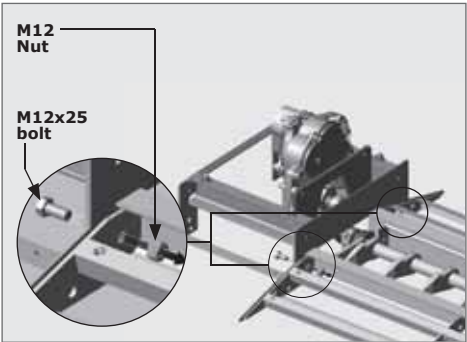


Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 8, Figure 21).



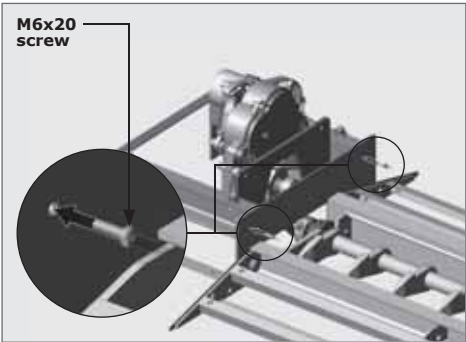
STEP 1

FIGURE 21



STEP 2

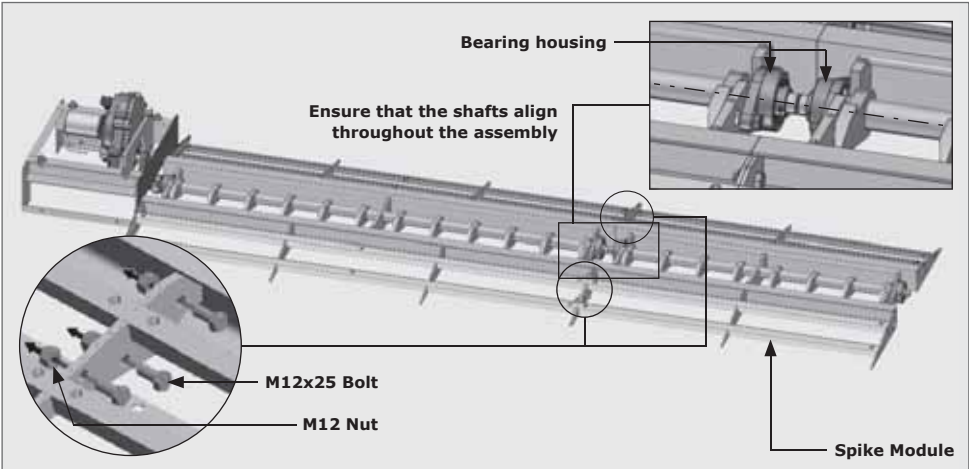
FIGURE 22



STEP 3

FIGURE 23

Using six M12x25 bolts, fix one spike module to another (Section 8, Figure 24).



STEP 4

FIGURE 24



To assist with the alignment and adjustment of the shafts, loosen (but do not remove) the bolts on all of the bearing housings.

Assembling the shaft couplings

The coupler is used to connect and align the shafts together.



It is essential that the coupler is assembled correctly; failing to do so will result in slipping of the spikes which is undesirable.

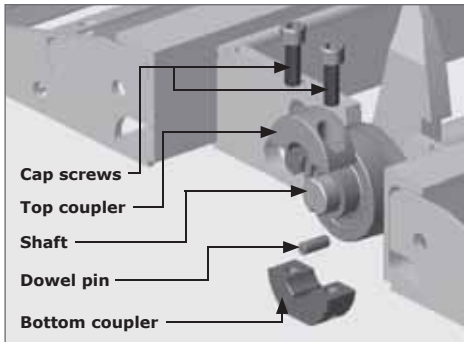


FIGURE 25. SHAFT COUPLER

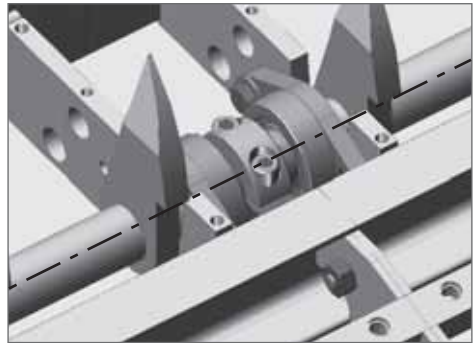
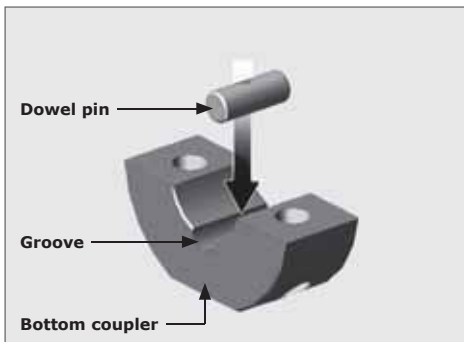


FIGURE 26

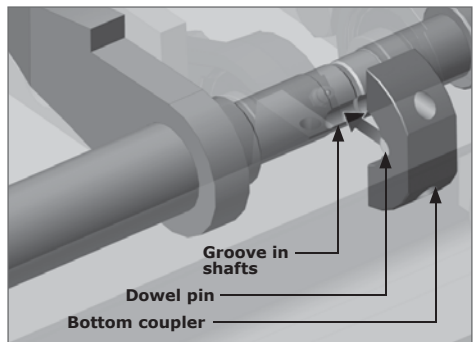


Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



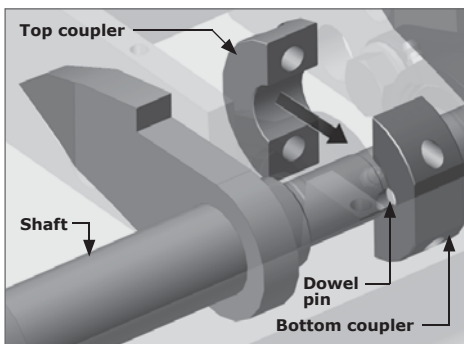
STEP 1

FIGURE 27



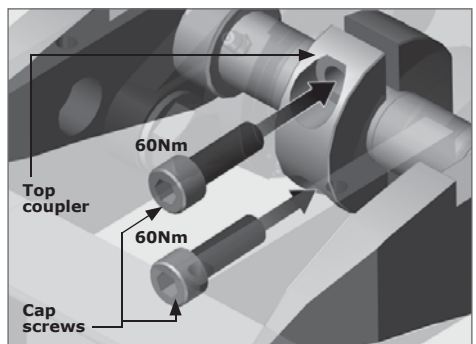
STEP 2

FIGURE 28



STEP 3

FIGURE 29

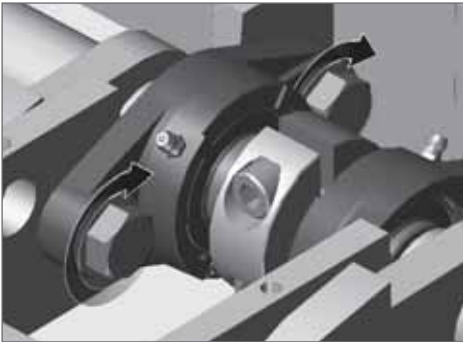


STEP 4

FIGURE 30

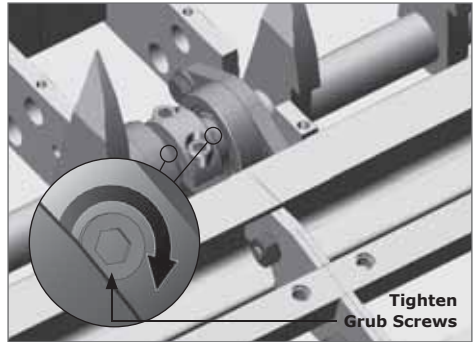
STEP 5

Repeat this coupling process for additional spike modules. Once all shafts have been coupled, check that they move freely.



STEP 6

FIGURE 31



STEP 7

FIGURE 32

Bolting down the assembly to the ground



If the Boom Gate and **CLAWS** are to be separated, a trench for the conduit and cables will need to be dug, and the wiring harnesses will need to be extended in relation to the distance between the gearbox and Boom Gate. (Section 8.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

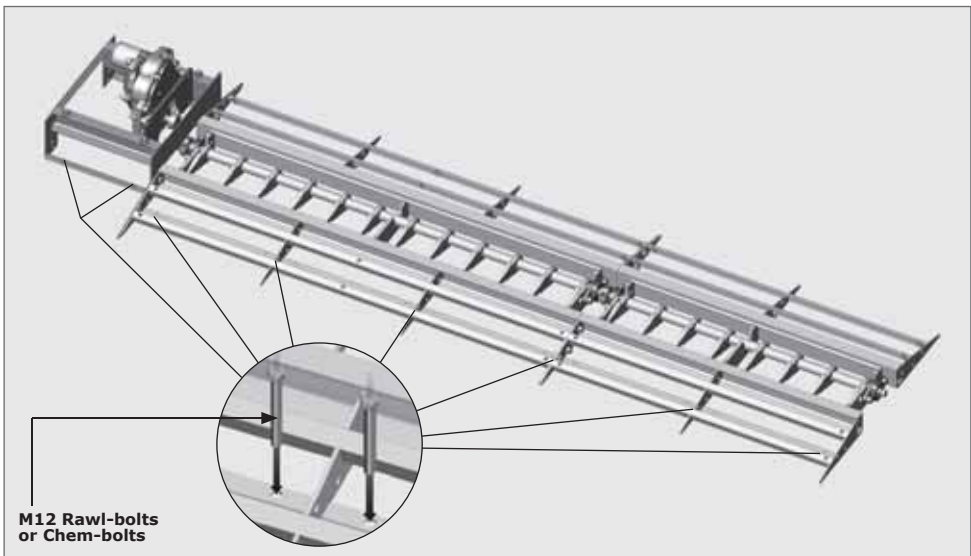
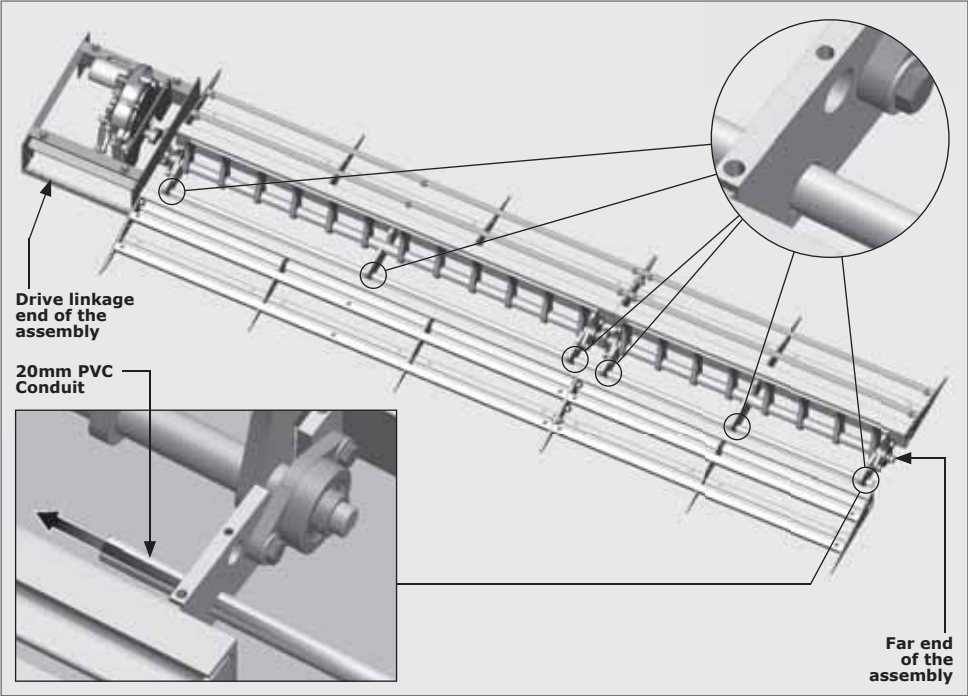


FIGURE 33



It is crucial that the surface it's mounted on is a reasonably even surface as an uneven surface could result in an uneven binding of the spike shafts. This will result in premature failure.

Proximity sensor installation



STEP 1



The length of the PVC conduit will be relative to the length of the spike modules and drive linkage unit combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 8, Figure 35).

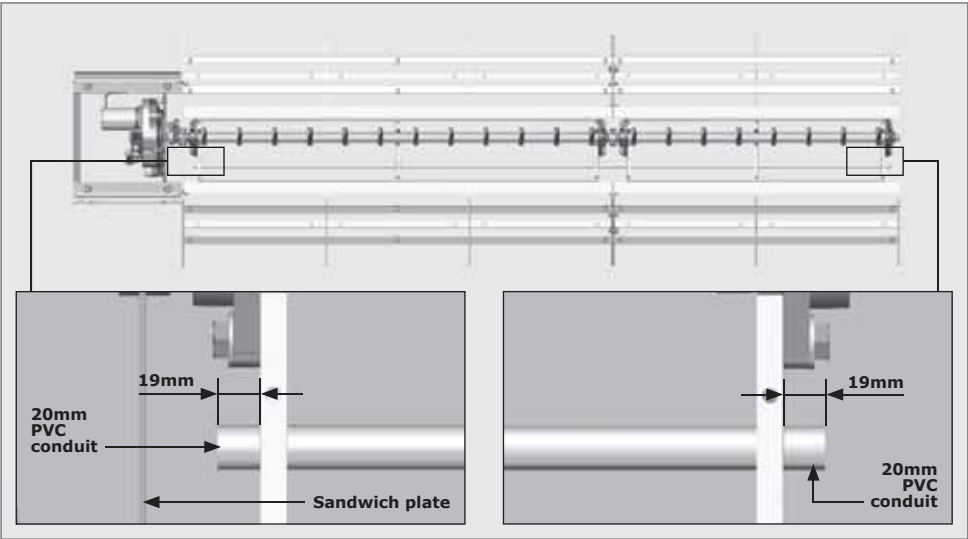
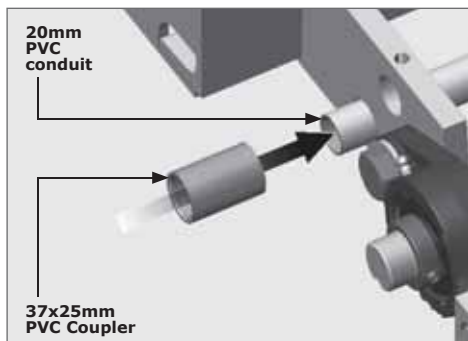


FIGURE 35

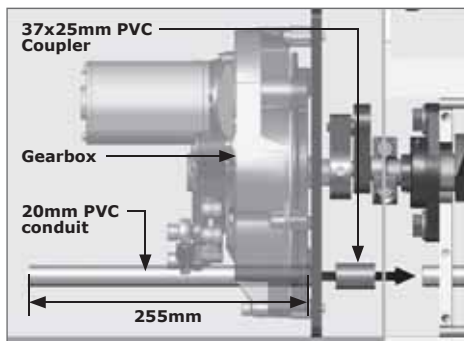


Use an appropriate PVC adhesive to bond all conduit lengths, access elbows and couplers to one another.



STEP 2

FIGURE 36

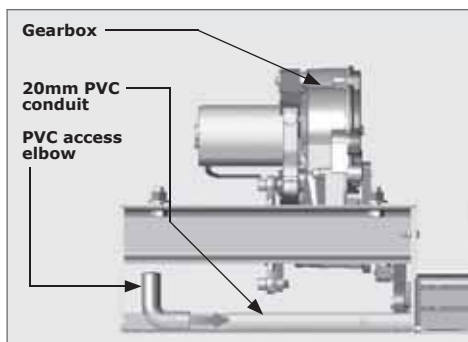


STEP 3

FIGURE 37

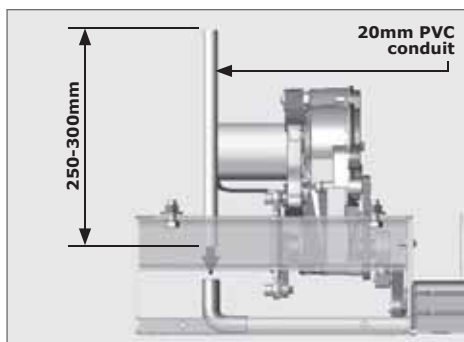


Steps 4-7 is only applicable if the Boom Gate will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted separately, a trench for the conduit and proximity sensor cable will need to be dug (Section 8.4.2.).



STEP 4

FIGURE 38



STEP 5

FIGURE 39



Please ensure that the moving mechanical parts do not rub against the conduit or cables.

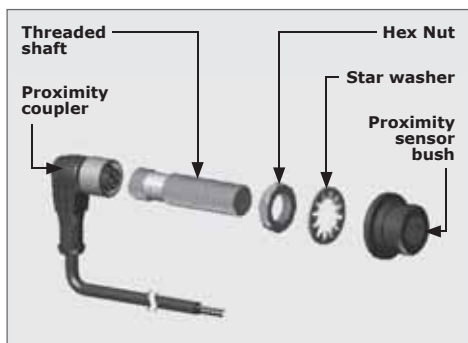


FIGURE 40. PROXIMITY SENSOR

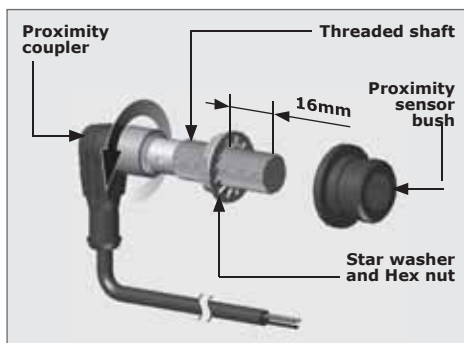


FIGURE 41. PROXIMITY SENSOR

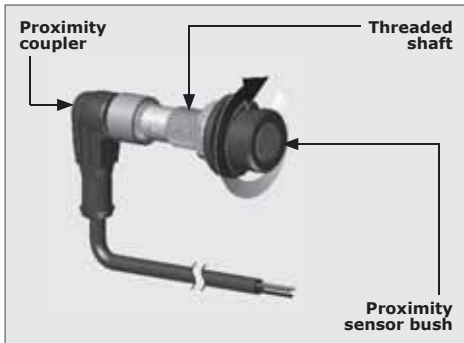
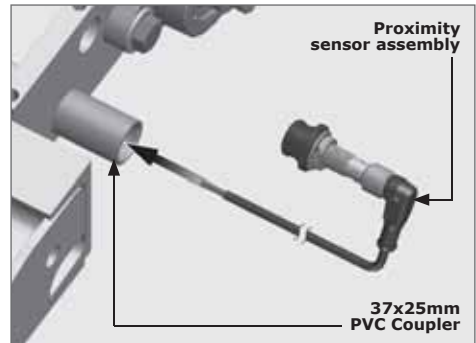


FIGURE 42. PROXIMITY SENSOR



STEP 8

FIGURE 43

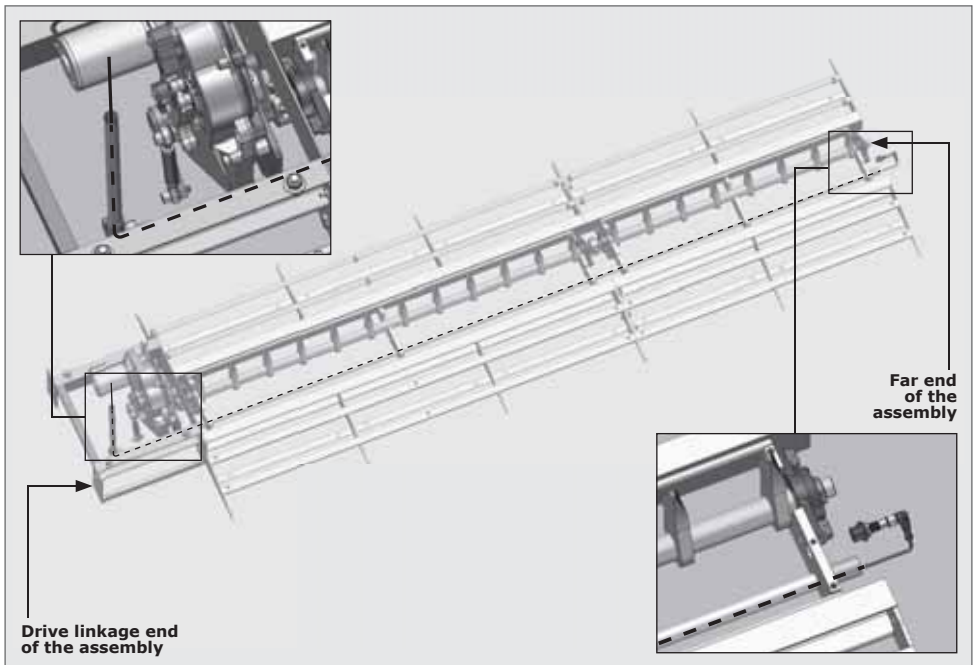
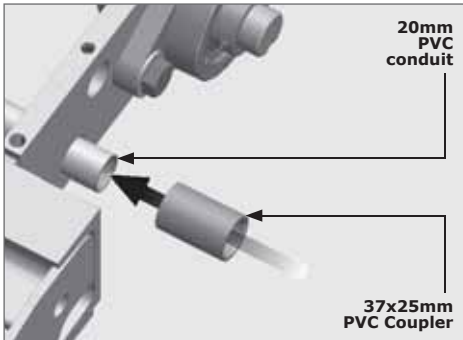


FIGURE 44

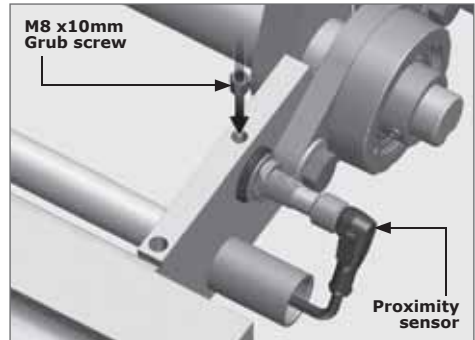


There should be ample cable left over on the drive linkage end, as the wiring will need to be routed to the Boom Gate at a later stage.



STEP 9

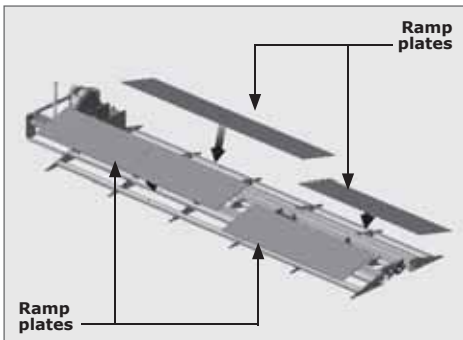
FIGURE 47



STEP 10

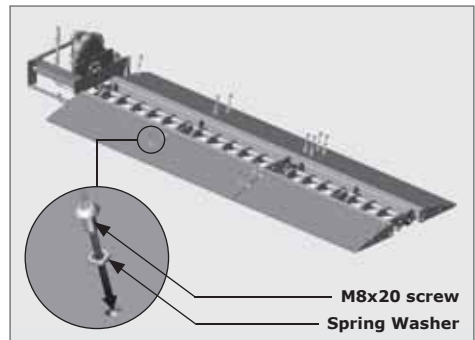
FIGURE 48

8.3. Re-assembling the ramp plates and linkage cover



STEP 1

FIGURE 49

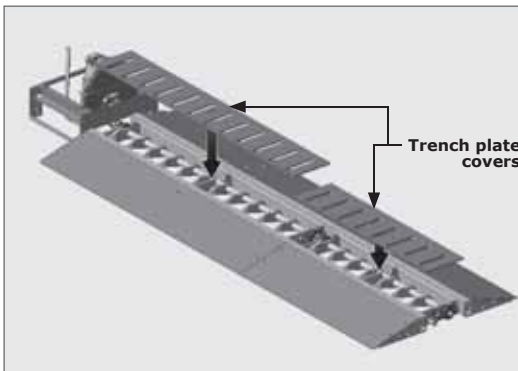


STEP 2

FIGURE 50

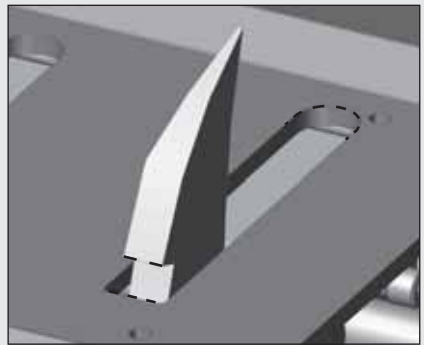


Leave out the four M8 screws and Spring Washers on the far end of the assembly as the module end cover will be assembled later.

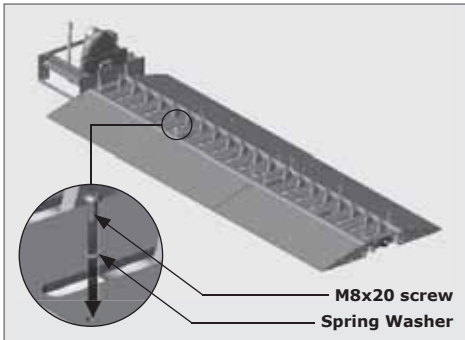


STEP 3

FIGURE 51

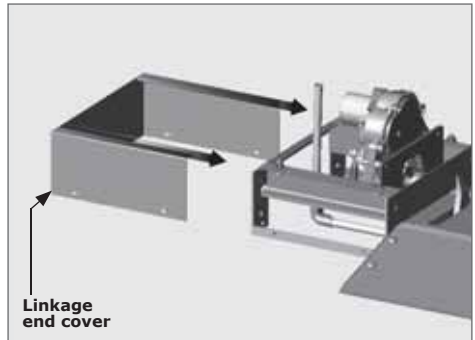


Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



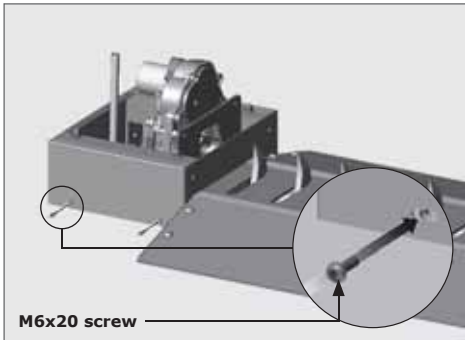
STEP 4

FIGURE 52



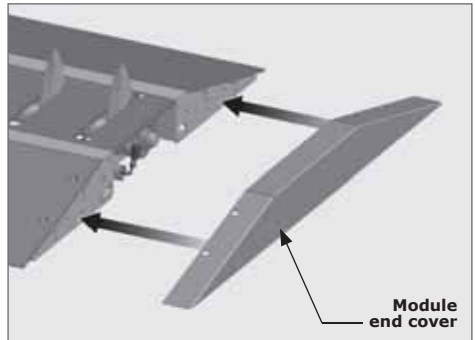
STEP 5

FIGURE 53



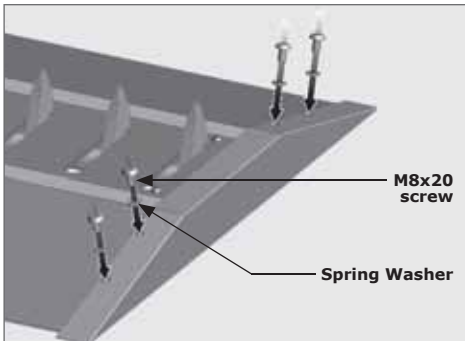
STEP 6

FIGURE 54



STEP 7

FIGURE 55

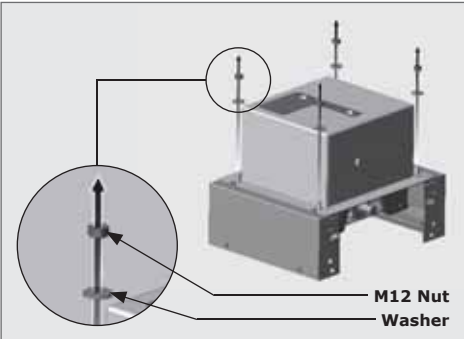


STEP 8

FIGURE 56

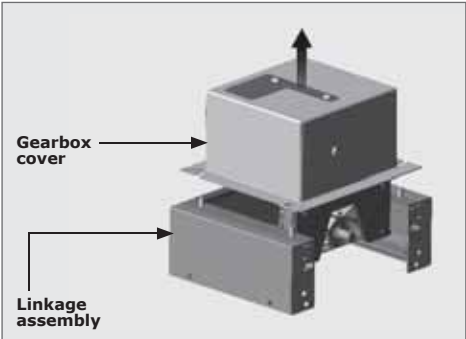
9. RHS Surface Mount - Opposing Direction of Travel

Preparing the Drive Linkage Assembly



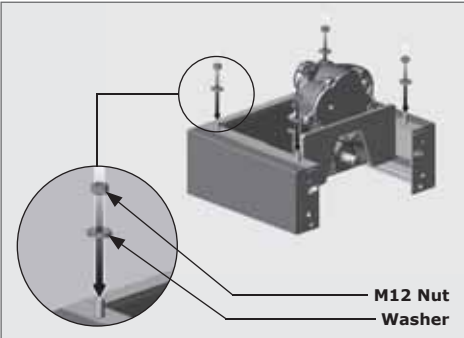
STEP 1

FIGURE 1



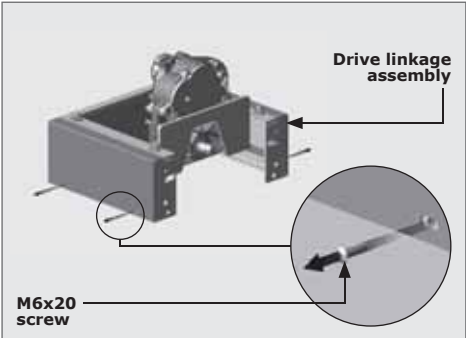
STEP 2

FIGURE 2



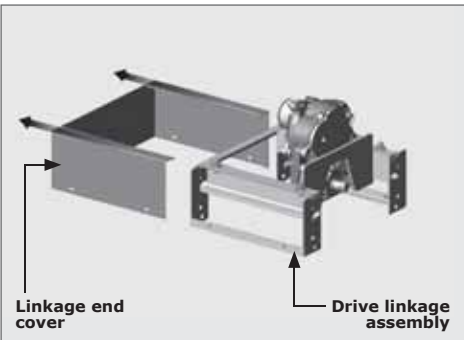
STEP 3

FIGURE 3



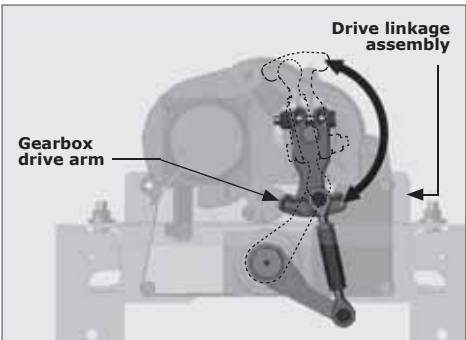
STEP 4

FIGURE 4



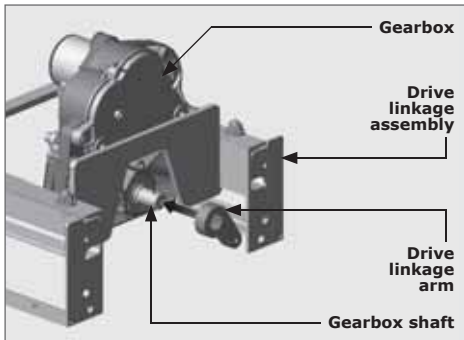
STEP 5

FIGURE 5



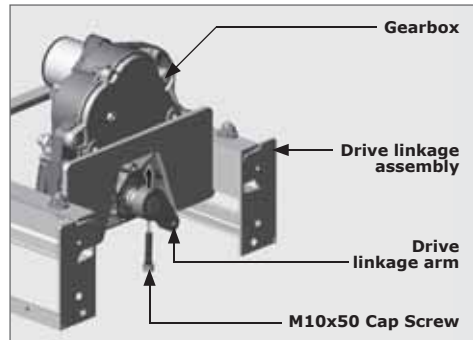
STEP 6

FIGURE 6



STEP 7

FIGURE 7

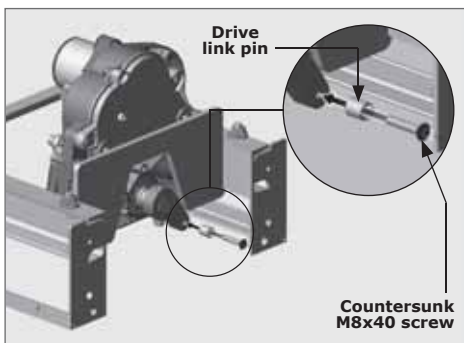


STEP 8

FIGURE 8



The drive linkage arm should point to a 5 o'clock position and the holes of the gearbox shaft and the linkage arm must line up as shown above.



STEP 9

FIGURE 9

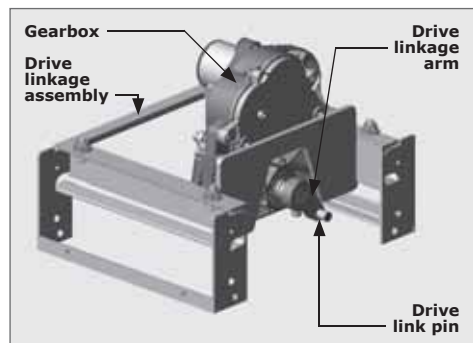


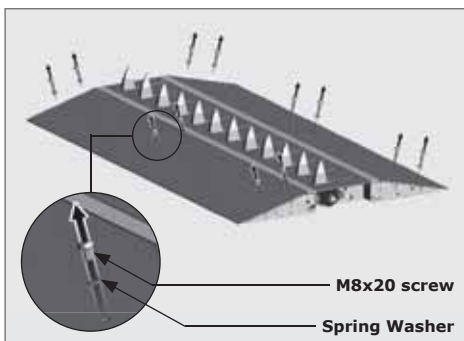
FIGURE 10



Tighten the Countersunk M8x40 screw to 20Nm (Section 9, Figure 9).

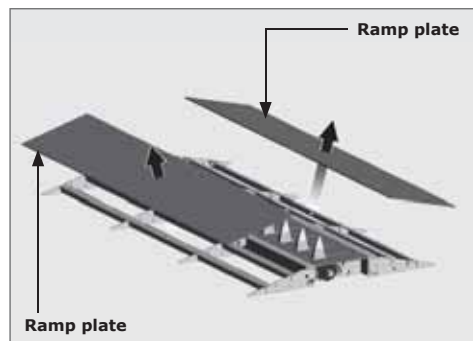
Spike Module Assembly

Preparing the Spike Model assembly(ies) for installation



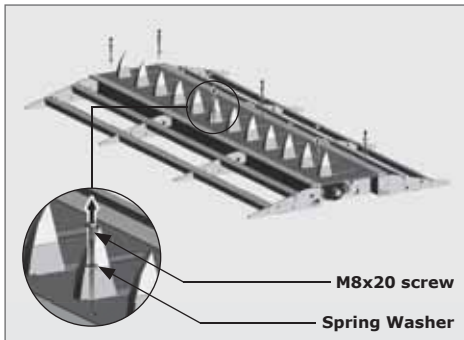
STEP 1

FIGURE 11



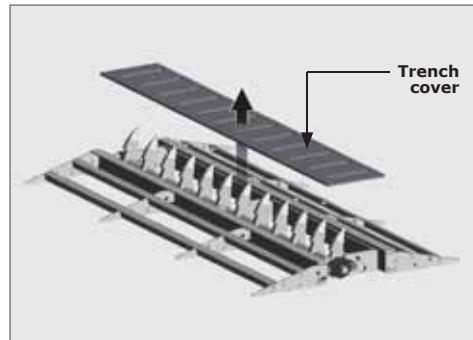
STEP 2

FIGURE 12



STEP 3

FIGURE 13



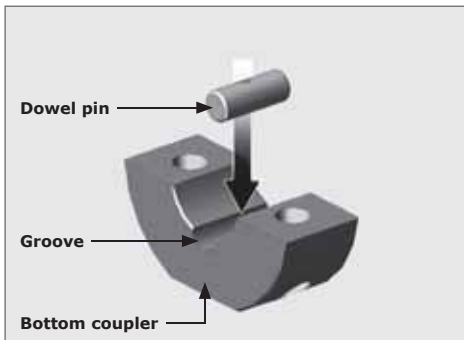
STEP 4

FIGURE 14

Attaching the Driven Link to the first spike module

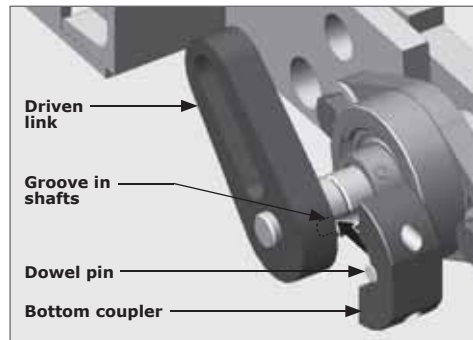


Place the spikes into the down position to aid in the fitment of all the shaft couplings.



STEP 1

FIGURE 15

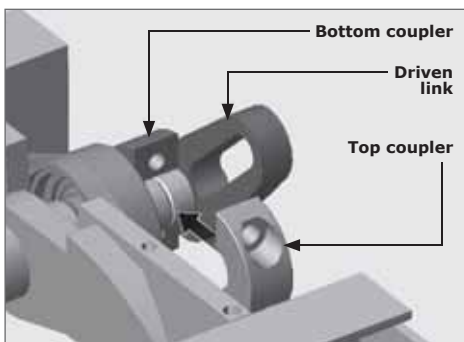


STEP 2

FIGURE 16

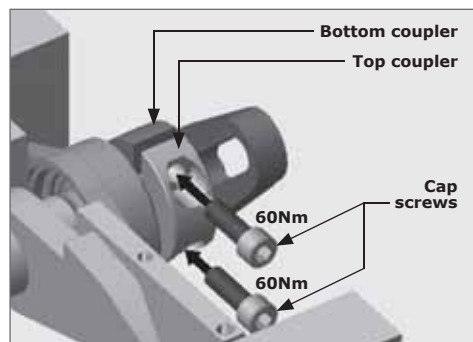


Ensure the Driven Link and the spikes are pointing in the same direction. (Section 9, Figures 16 to 19).



STEP 3

FIGURE 17



STEP 4

FIGURE 18

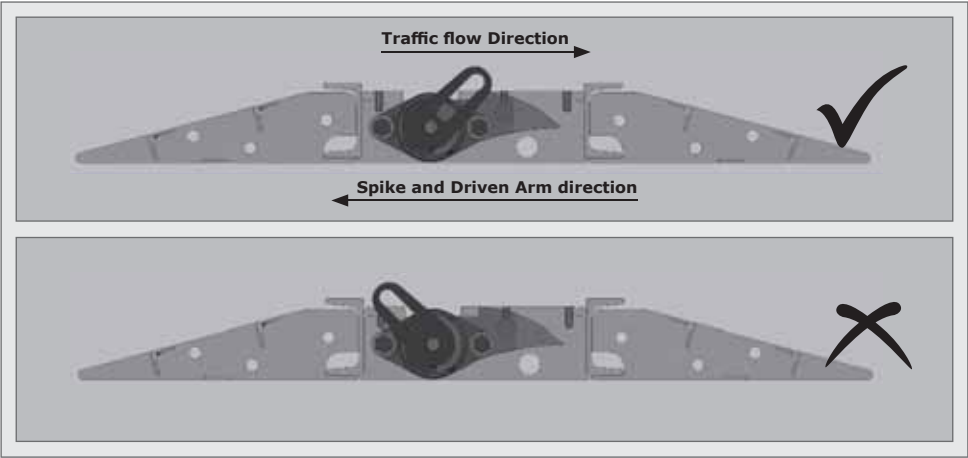


FIGURE 19

Aligning the Driven Linkage Arm to the Drive Linkage Arm.

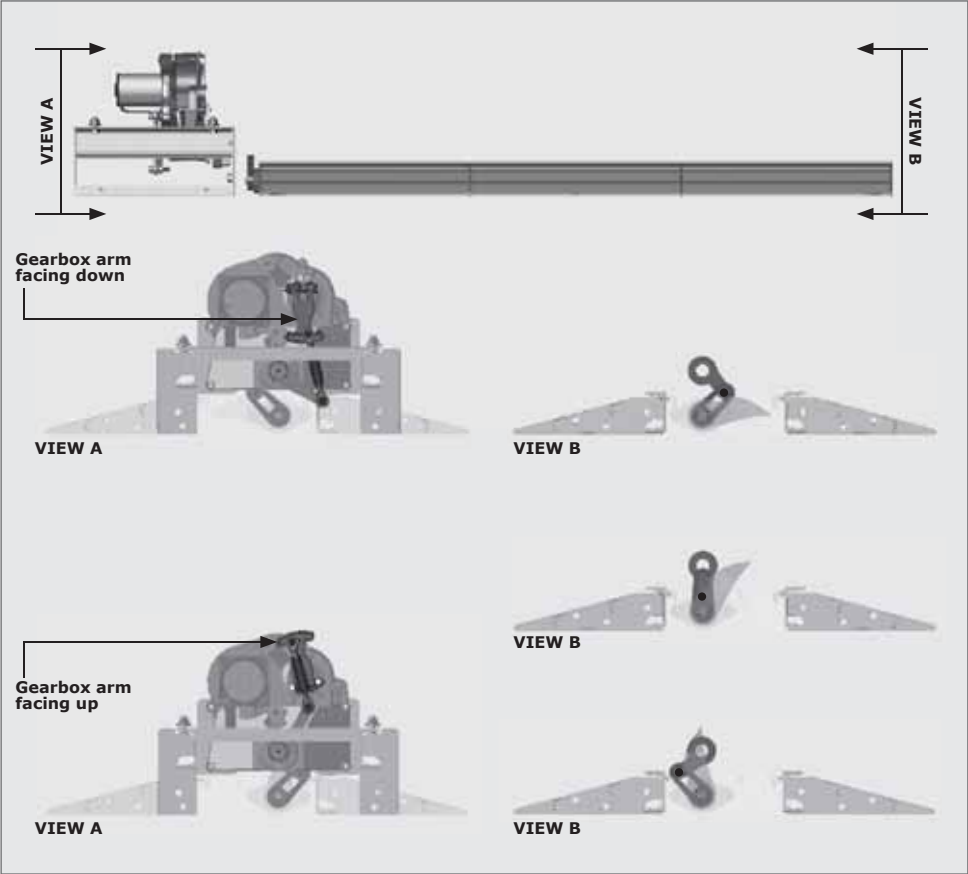
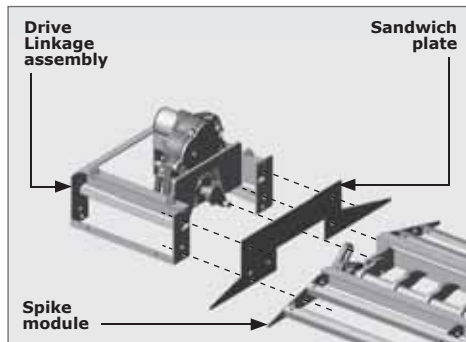


FIGURE 20

Attaching the drive linkage assembly to the spike module

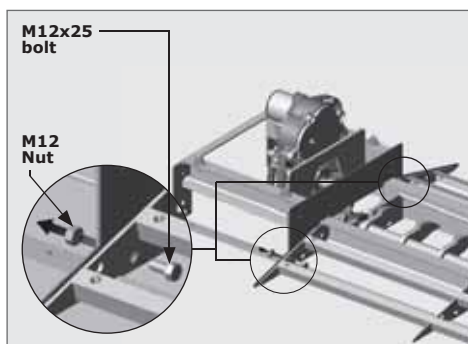


Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 9, Figure 21).



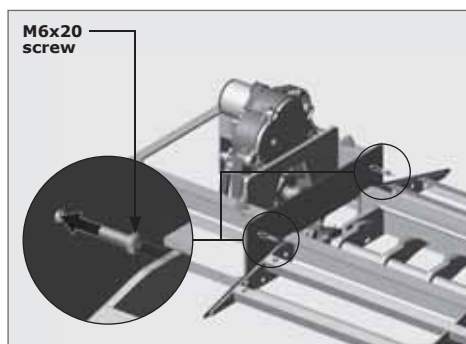
STEP 1

FIGURE 21



STEP 2

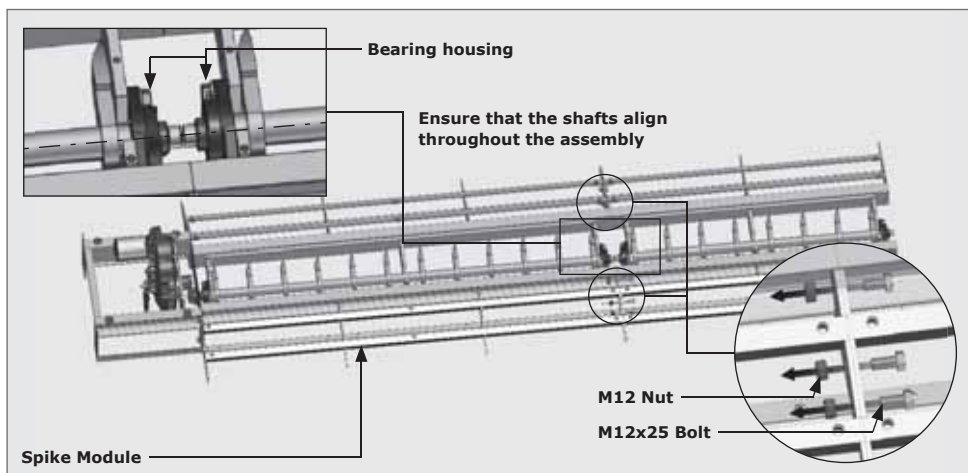
FIGURE 22



STEP 3

FIGURE 23

Using six M12x25 bolts, fix one spike module to another (Section 9, Figure 24).



STEP 4

FIGURE 24



To assist with the alignment and adjustment of the shafts, loosen (but do not remove) the bolts on all of the bearing housings.

Assembling the shaft couplings

The coupler is used to connect and align the shafts together.



It is essential that the coupler is assembled correctly; failing to do so will result in slipping of the spikes which is undesirable.

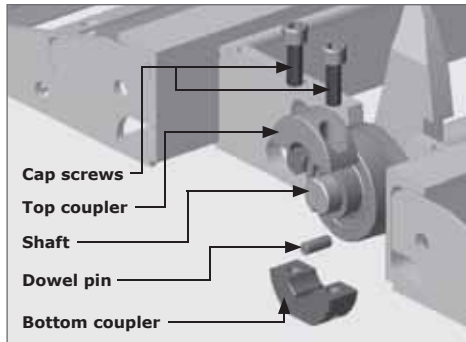


FIGURE 25. SHAFT COUPLER

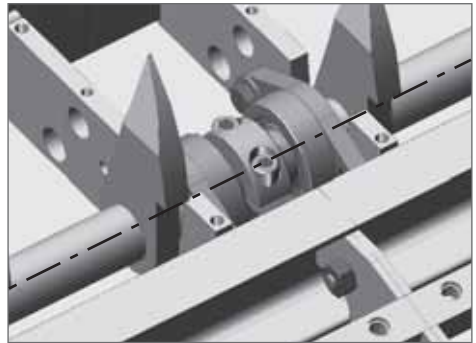
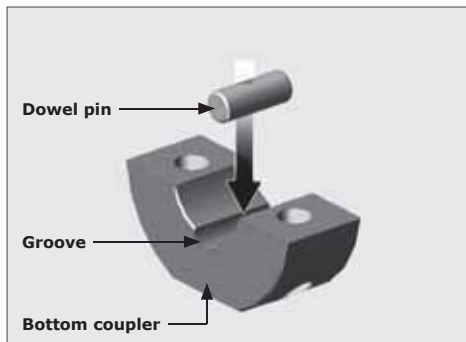


FIGURE 26

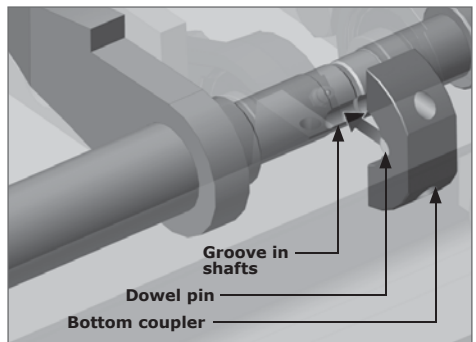


Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



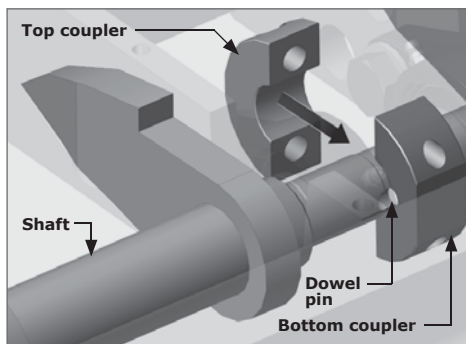
STEP 1

FIGURE 27



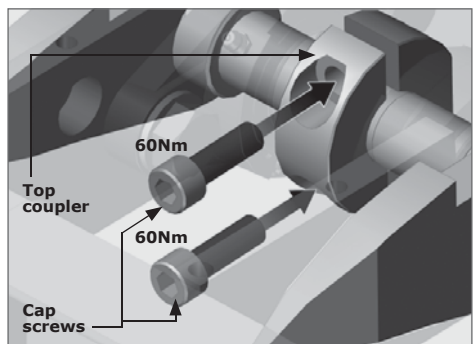
STEP 2

FIGURE 28



STEP 3

FIGURE 29

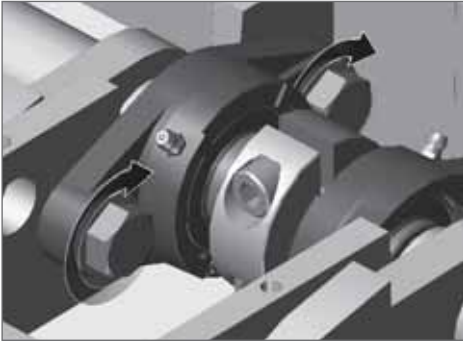
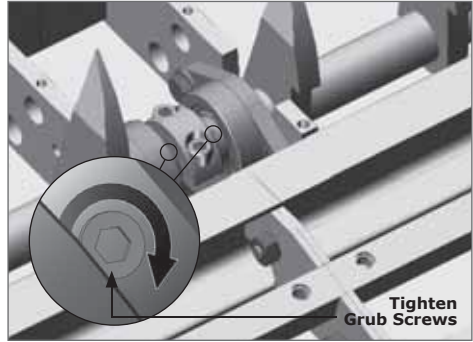


STEP 4

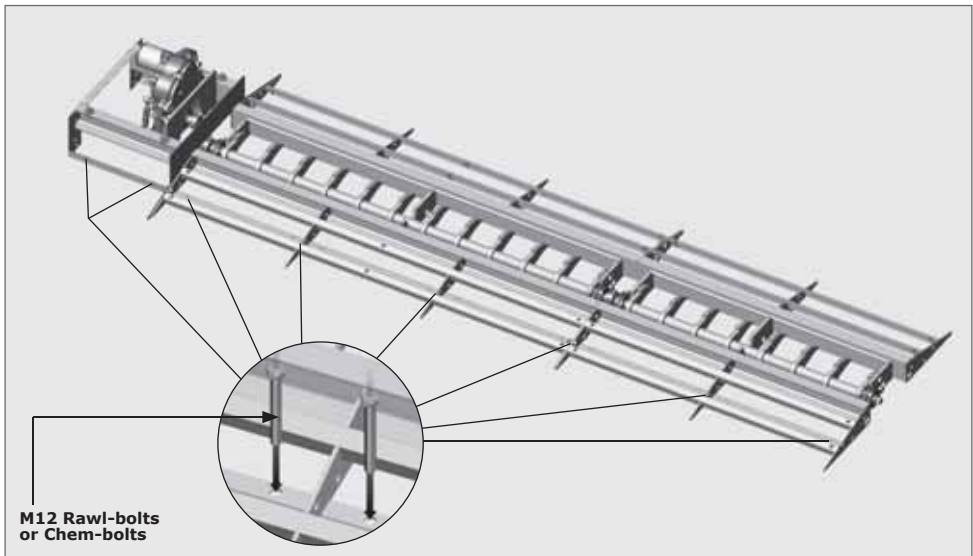
FIGURE 30

STEP 7

Repeat this coupling process for additional spike modules. Once all shafts have been coupled, check that they move freely.

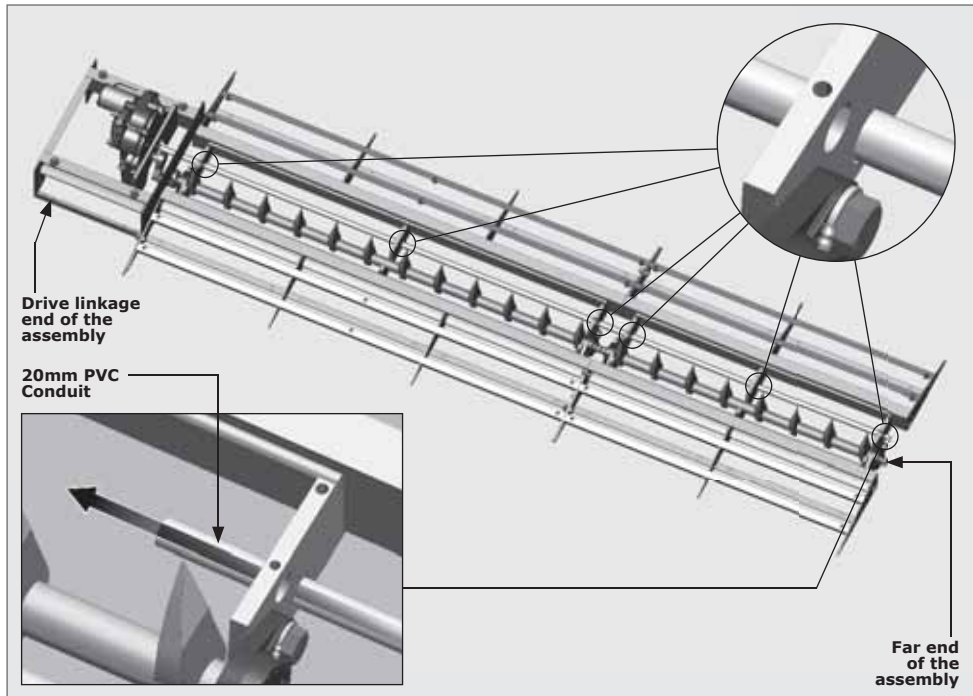
**STEP 5****FIGURE 31****STEP 6****FIGURE 32****Bolting down the assembly to the ground**

If the Boom Gate and **CLAWS** are to be separated, a trench for the conduit and cables will need to be dug, and the wiring harnesses will need to be extended in relation to the distance between the gearbox and Boom Gate. (Section 9.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

**FIGURE 33**

It is crucial that the surface it's mounted on is a reasonably even surface as an uneven surface could result in an uneven binding of the spike shafts. This will result in premature failure.

Proximity sensor installation



STEP 1



The length of the PVC conduit will be relative to the length of the spike modules and drive linkage unit combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 9, Figure 35).

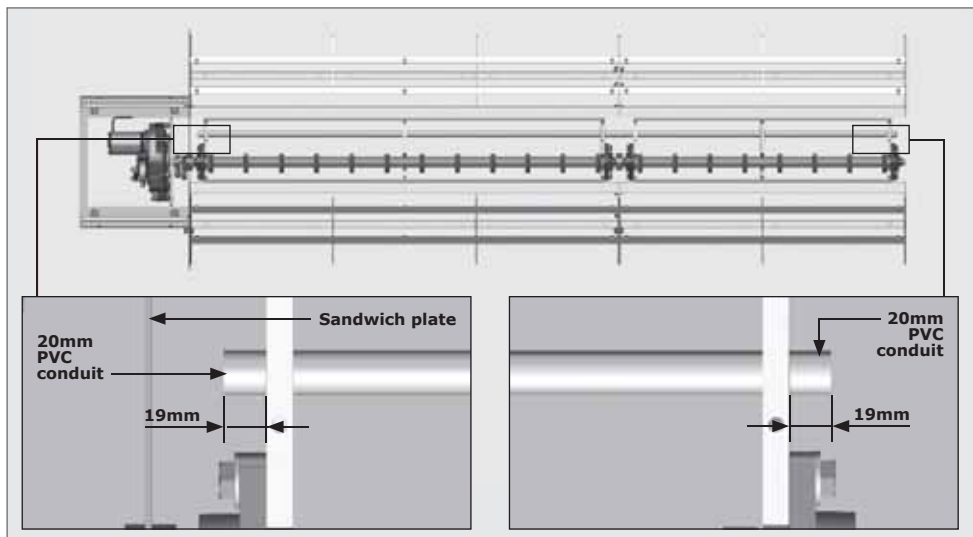
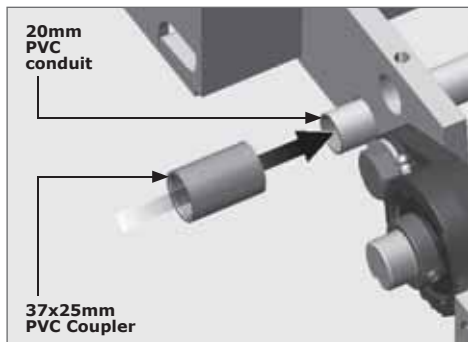


FIGURE 35

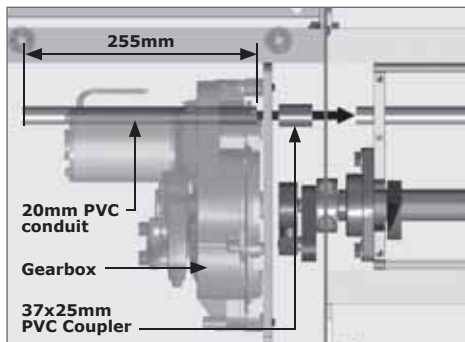


Use an appropriate PVC adhesive to bond all conduit lengths, access elbows and couplers to one another.



STEP 2

FIGURE 36

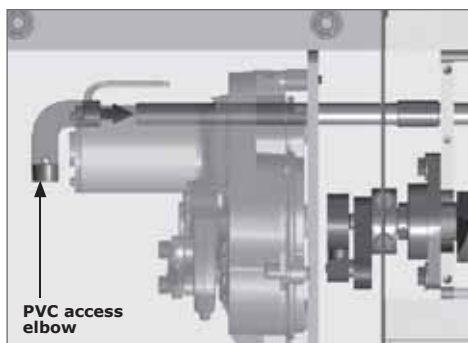


STEP 3

FIGURE 37

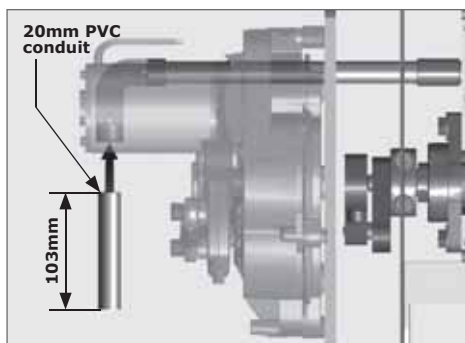


Steps 4-7 is only applicable if the Boom Gate will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted separately, a trench for the conduit and proximity sensor cable will need to be dug (Section 9.).



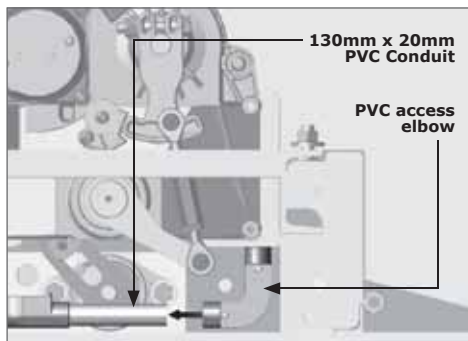
STEP 4

FIGURE 38



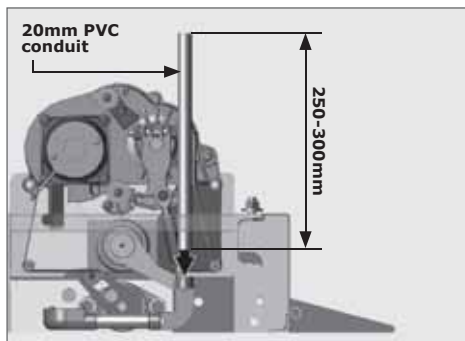
STEP 5

FIGURE 39



STEP 6

FIGURE 40



STEP 7

FIGURE 41



Please ensure that the moving mechanical parts do not rub against the conduit or cables.

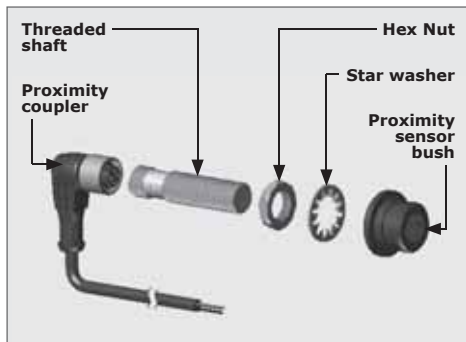


FIGURE 42. PROXIMITY SENSOR

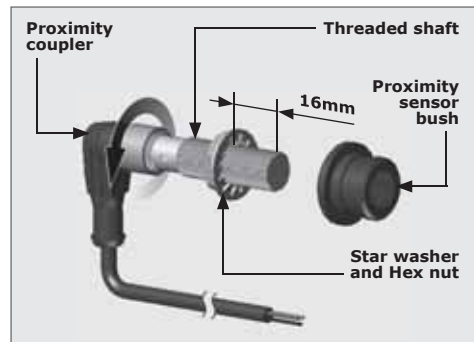


FIGURE 43. PROXIMITY SENSOR

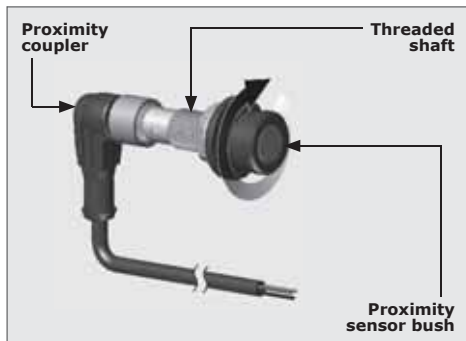
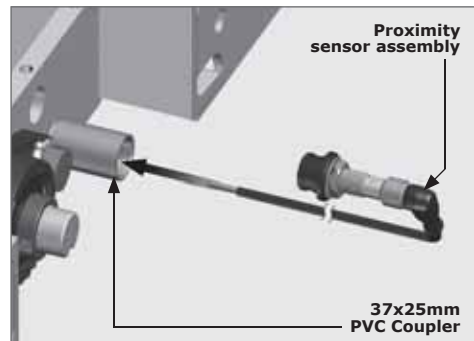


FIGURE 44. PROXIMITY SENSOR



STEP 8

FIGURE 45

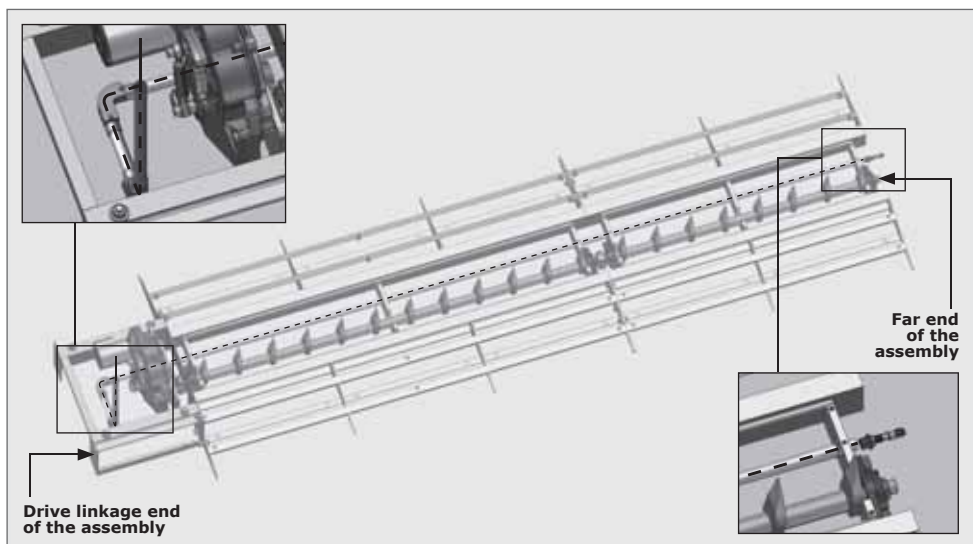
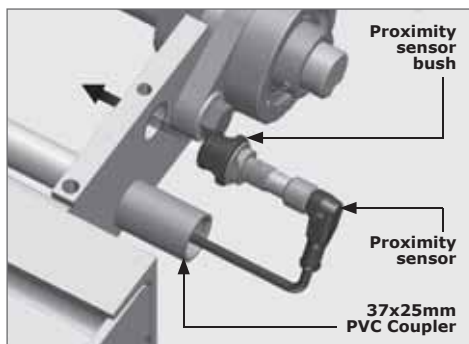


FIGURE 46

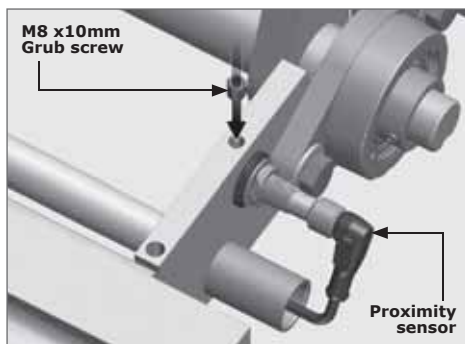


There should be ample cable left over on the drive linkage end, as the wiring will need to be routed to the Boom Gate at a later stage.



STEP 9

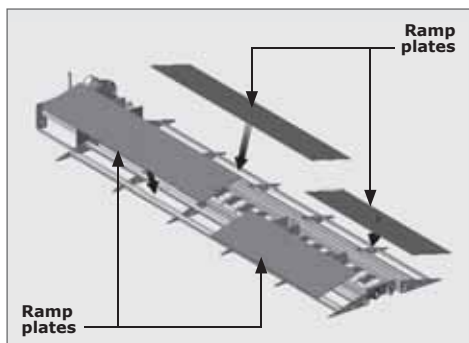
FIGURE 47



STEP 10

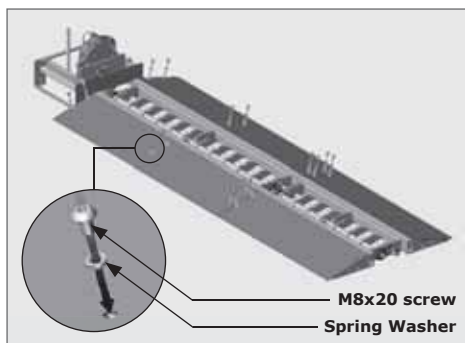
FIGURE 48

Re-assembling the ramp plates and linkage cover



STEP 1

FIGURE 49

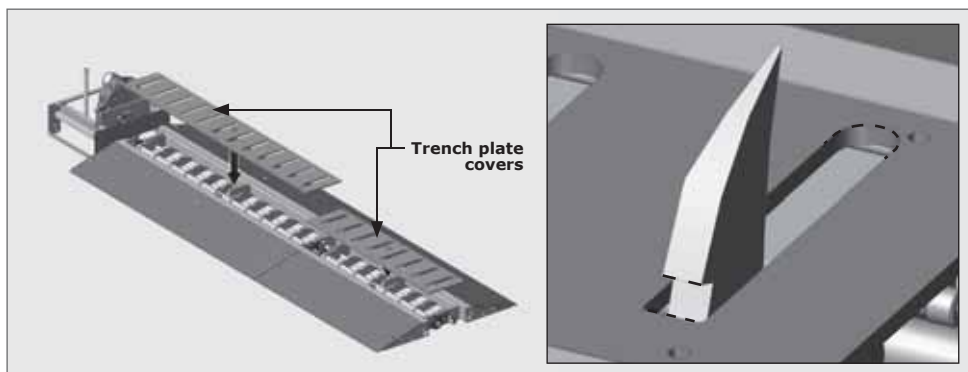


STEP 2

FIGURE 50



Leave out the four M8 screws and Spring Washers on the far end of the assembly as the module end cover will be assembled later.

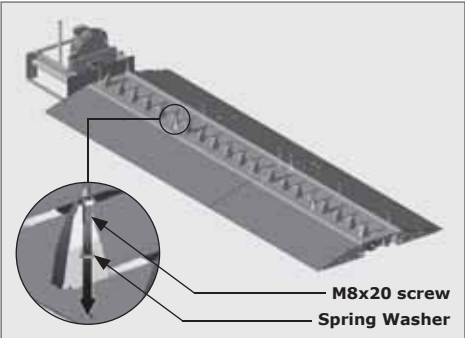


STEP 3

FIGURE 51

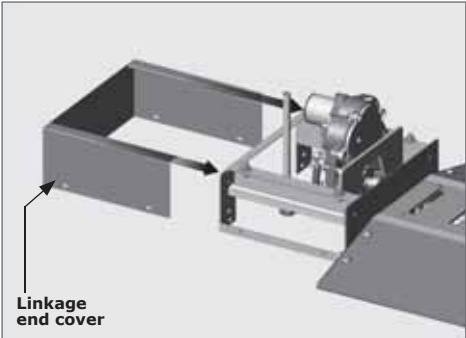


Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



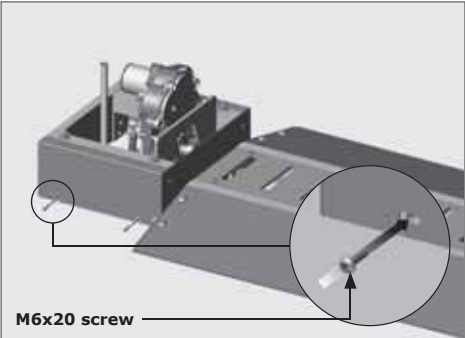
STEP 4

FIGURE 52



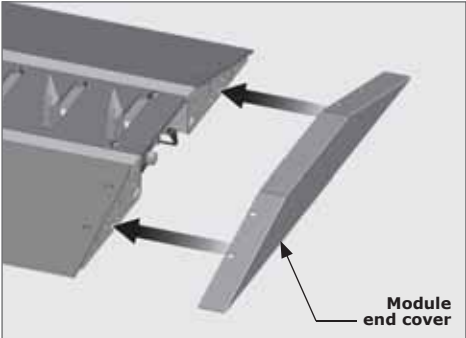
STEP 5

FIGURE 53



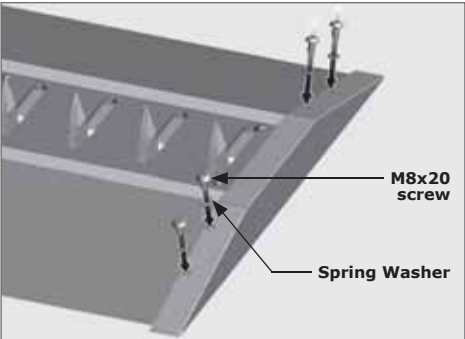
STEP 6

FIGURE 54



STEP 7

FIGURE 55



STEP 8

FIGURE 56

CLAWS CONTROLLER

