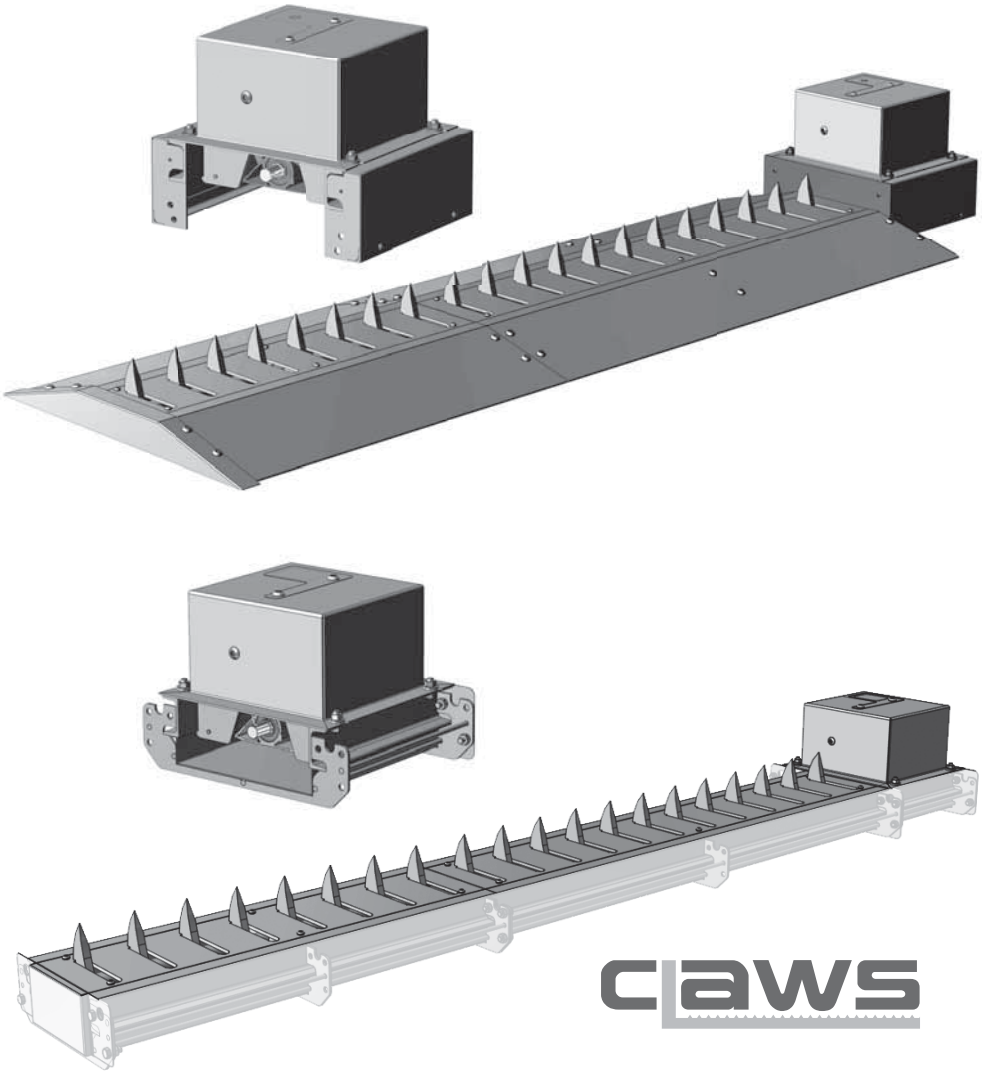
CLAWS - INDEPENDENT DRIVE INSTALLATION MANUAL



claws

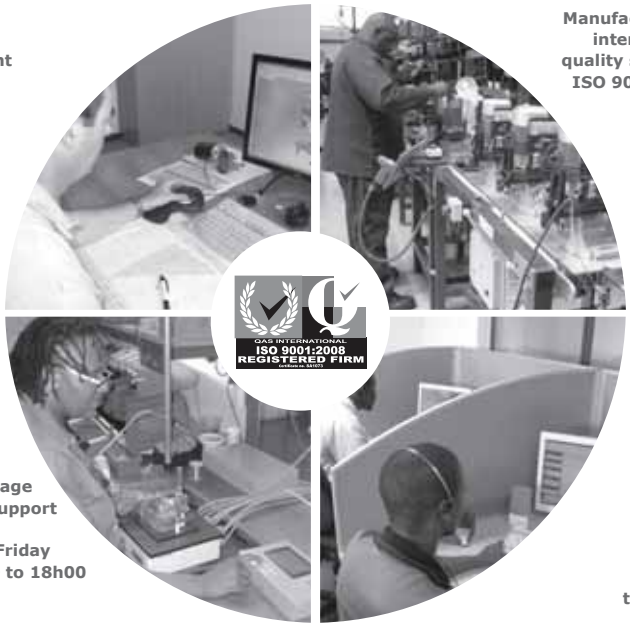
Centurion Systems (Pty) Ltd
www.centsys.com

Company Profile

1986 1990 1995 1999 Today

In-house R&D development team

Manufactures to international quality standard ISO 9001:2008



After-sales multi-language Technical Support

Monday to Friday from 07h00 to 18h00 GMT+2
Saturdays 08h00 to 16h30 GMT +2

100% testing of products

Sales and technical support to Africa, Europe, Asia, the Americas, Australia and the Pacific

Contents

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

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 SECTOR controller and a standard SECTOR gearbox, saving you time and reducing your spares inventory. 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.

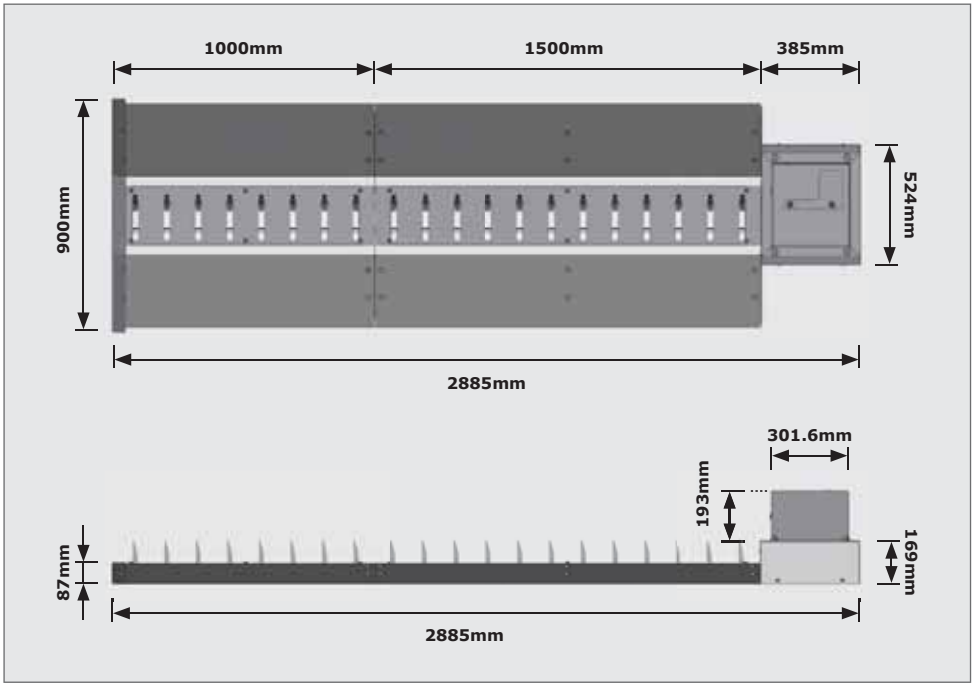
2. Product Specifications

2.1. Technical Specifications

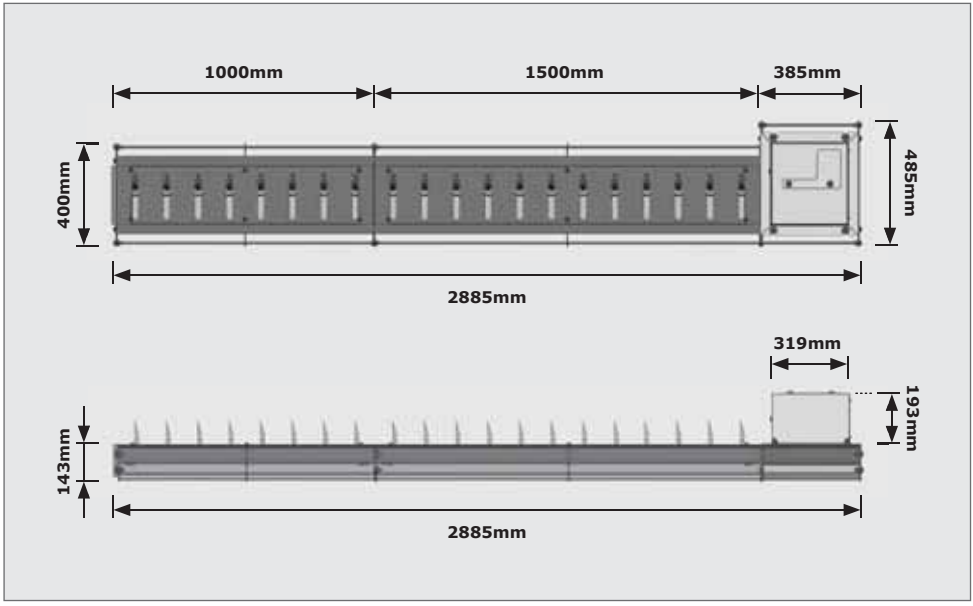
Input Voltage	220V AC +/-10% @ 50Hz[1]
Motor Voltage	12V DC
Current Draw	
Wiring Requirements	Battery-driven[2] - 2A charger
Spike Modules - Available lengths	1 metre and 1.5 metre
Spikes raise / lower time	1.2 sec
Daily operations - Max	As per co-installed SECTOR II
Daily Operations - Mains present	As per co-installed SECTOR II
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

2.2. Product Dimensions

2.2.1. Surface Mount

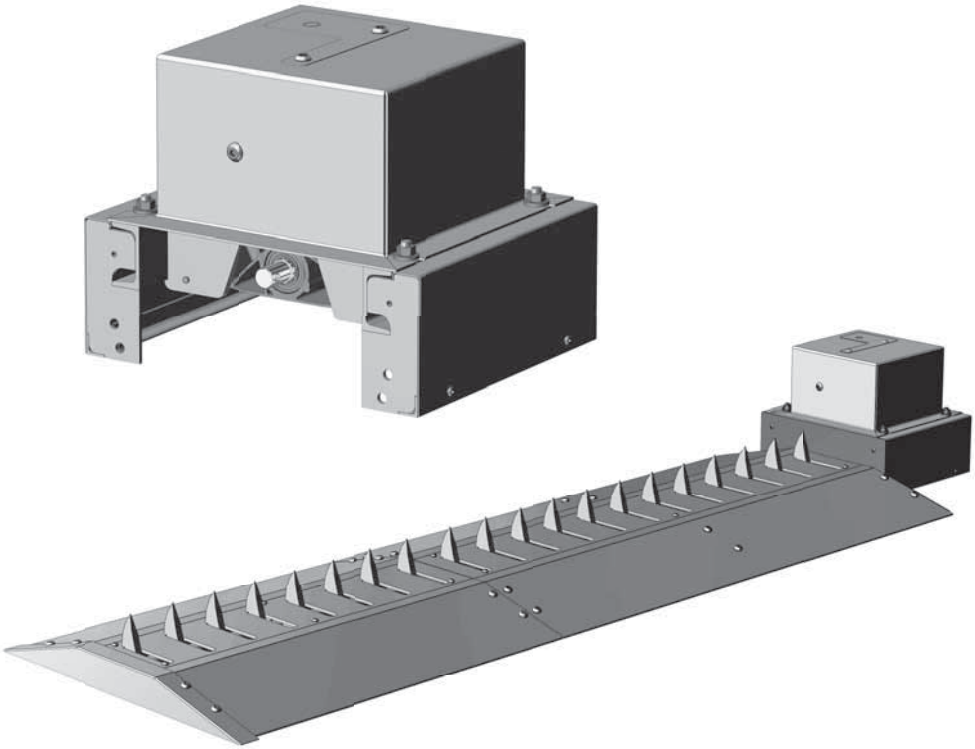


2.2.2. Flush Mount



INDEPENDENT DRIVE SURFACE MOUNT INSTALLATIONS

CLAWS



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3. Product Identification

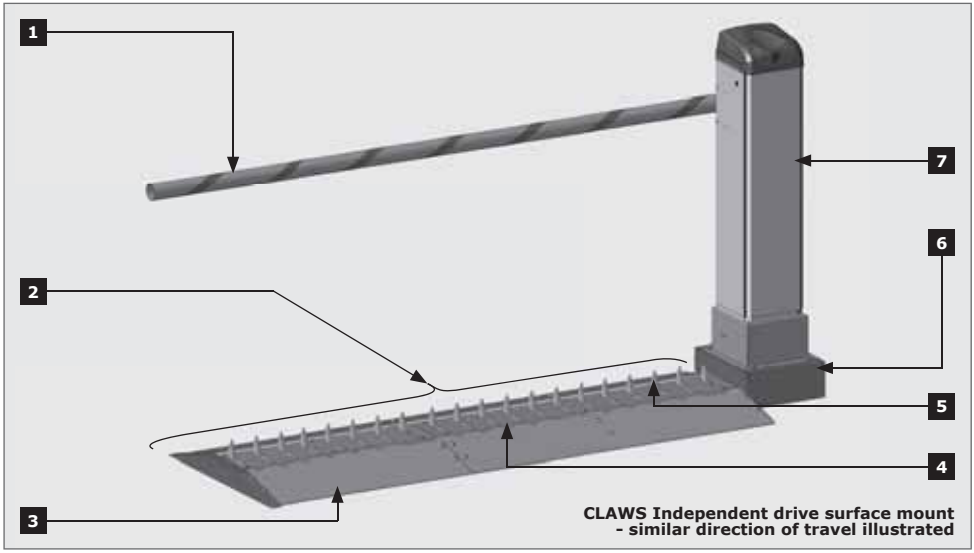
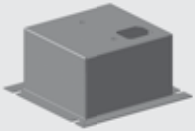


FIGURE 1. PRODUCT IDENTIFICATION

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

	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.

5.1. 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

5.1.2. 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).

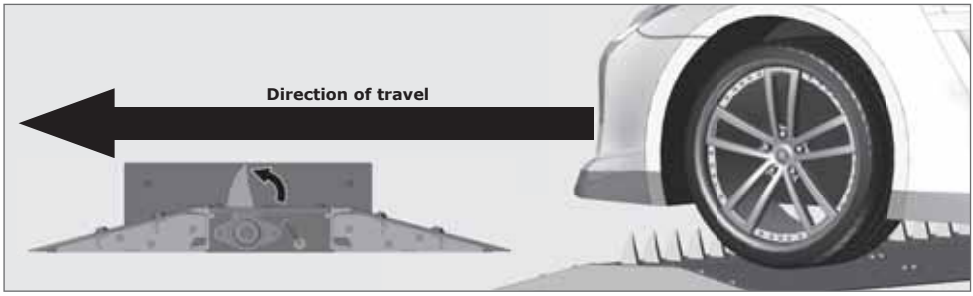


FIGURE 4. SPIKE IMPACT DIRECTION - SIMILAR

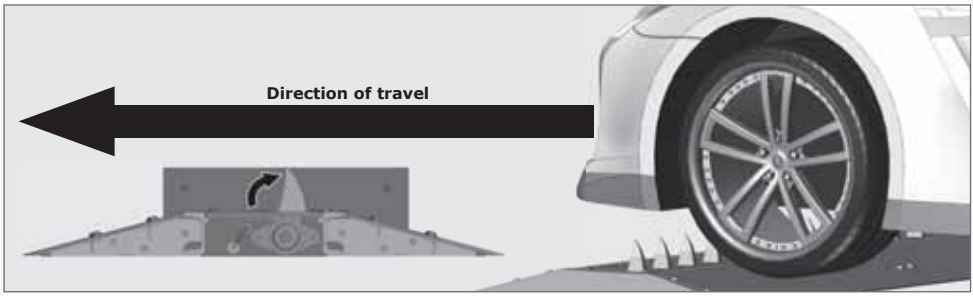


FIGURE 5. SPIKE IMPACT DIRECTION - OPPOSING

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

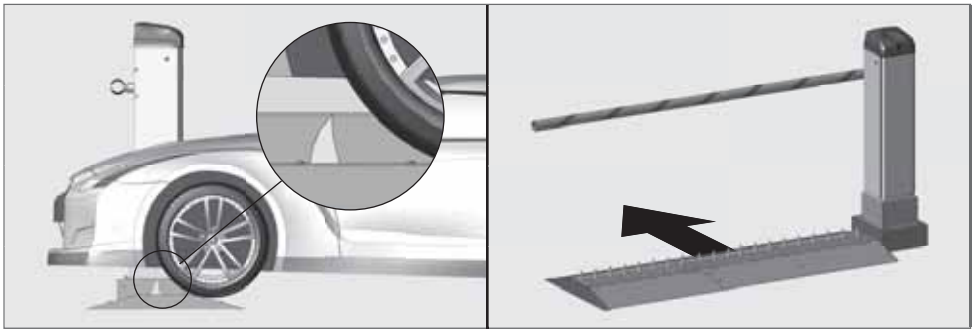


FIGURE 6. RHS SIMILAR DIRECTION OF TRAVEL

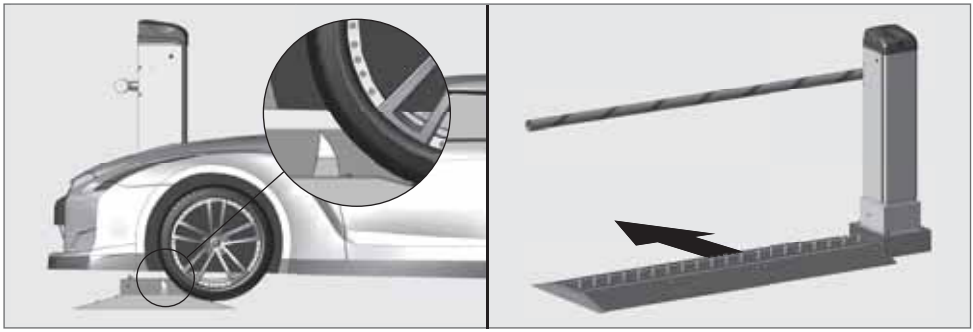


FIGURE 7. RHS OPPOSED DIRECTION OF TRAVEL

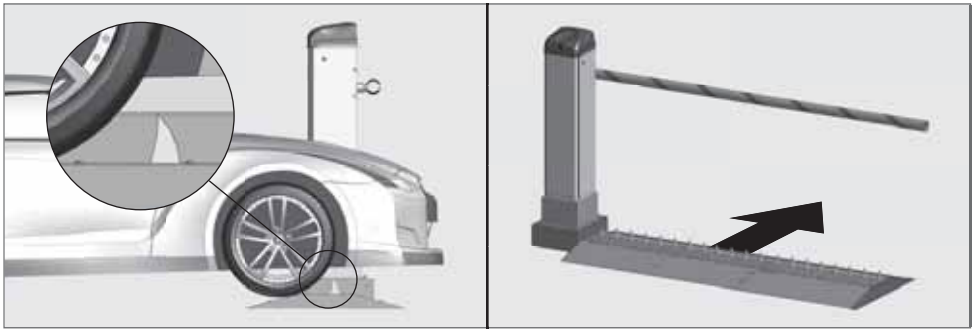


FIGURE 8. LHS SIMILAR DIRECTION OF TRAVEL

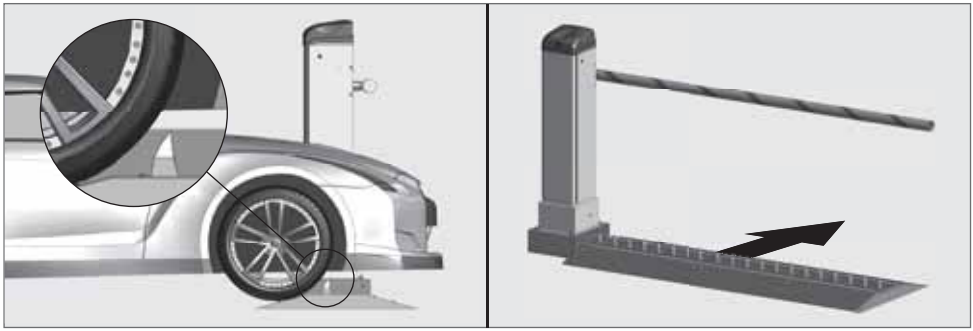
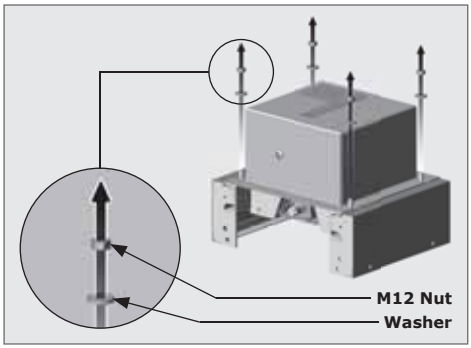


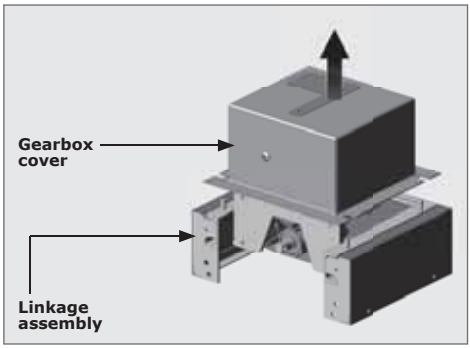
FIGURE 9. LHS OPPOSED DIRECTION OF TRAVEL

6. RHS Surface Mount - Similar Direction of Travel

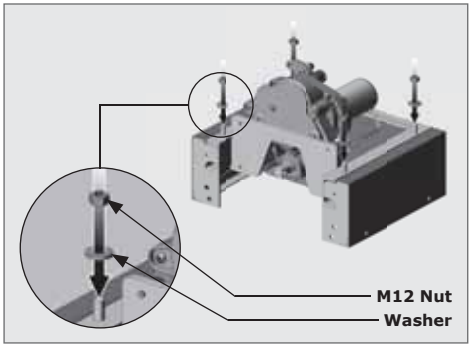
6.1. Preparing the Drive Linkage Assembly



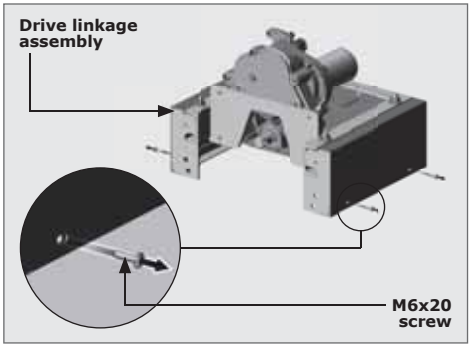
STEP 1 FIGURE 10



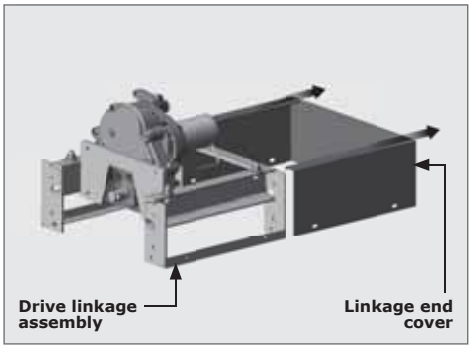
STEP 2 FIGURE 11



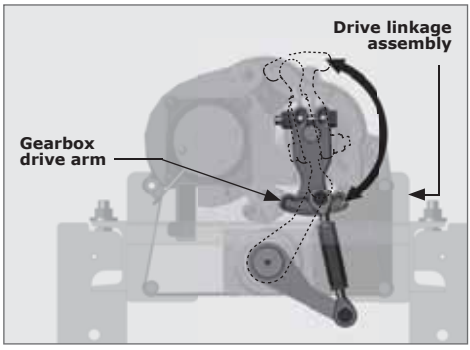
STEP 3 FIGURE 12



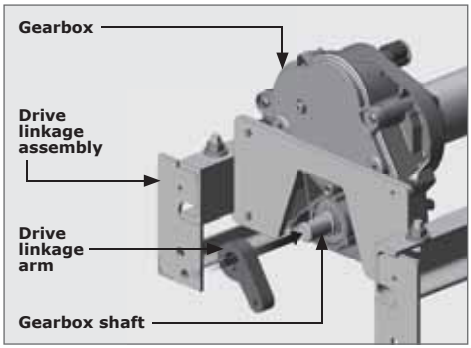
STEP 4 FIGURE 13



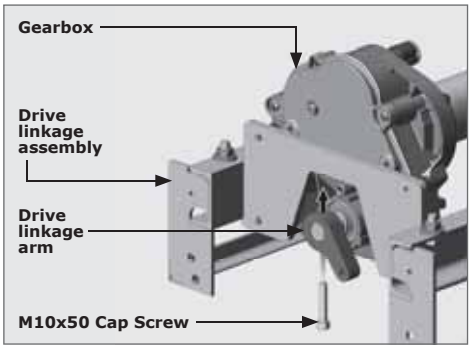
STEP 5 FIGURE 14



STEP 6 FIGURE 15

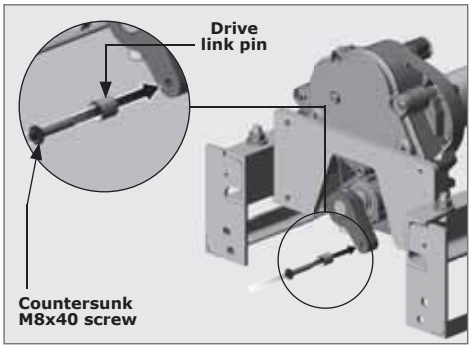


STEP 7 FIGURE 16



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

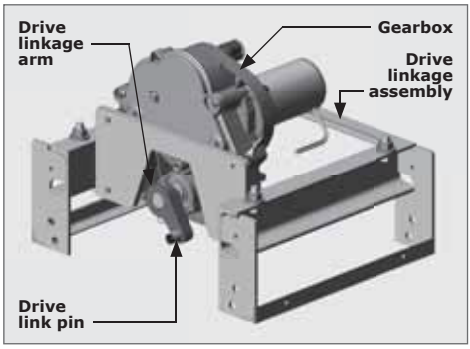
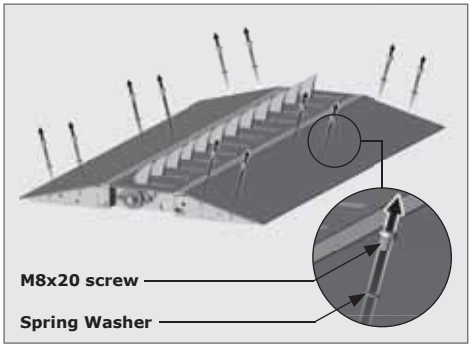


FIGURE 19

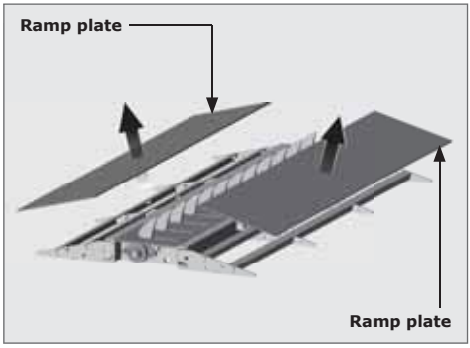
Tighten the Countersunk M8x40 screw to 20Nm (Section 6, Figure 18).

6.2. Spike Module Assembly

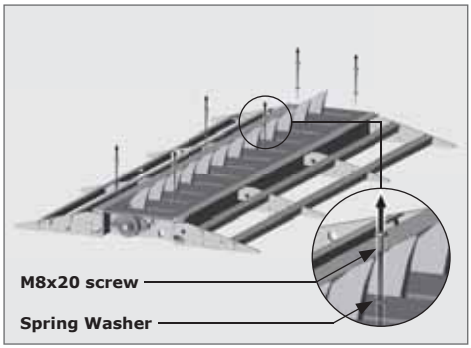
6.2.1. Preparing the Spike Model assembly(ies) for installation



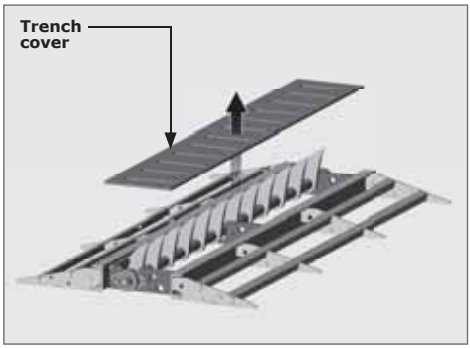
STEP 1 FIGURE 20



STEP 2 FIGURE 21



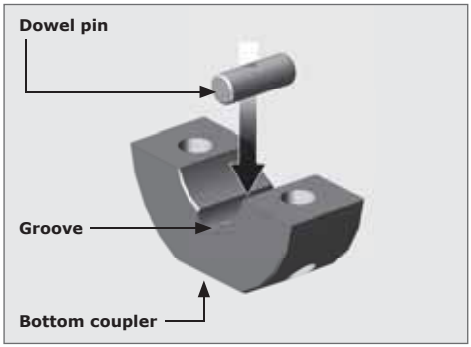
STEP 3 FIGURE 22



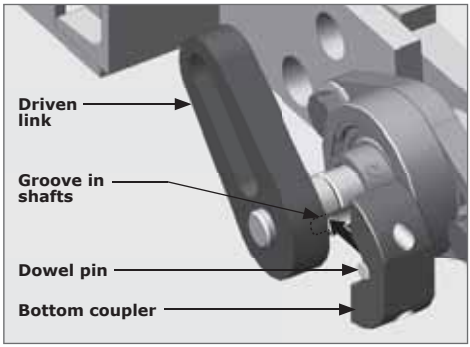
STEP 4 FIGURE 23

6.2.2. 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.

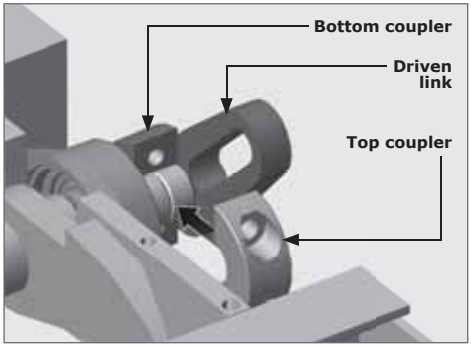


STEP 1 FIGURE 24

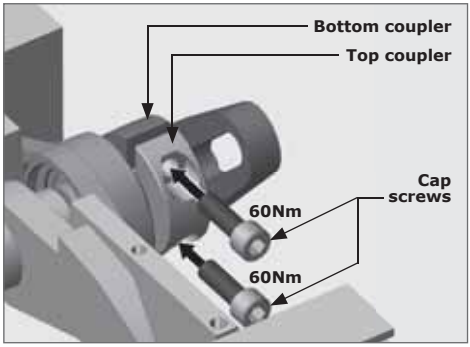


STEP 2 FIGURE 25

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

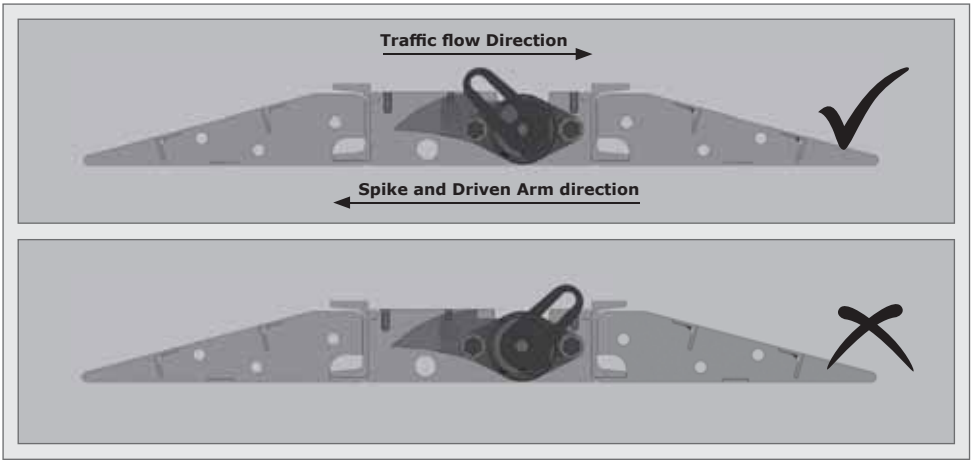


FIGURE 28

6.2.3. Aligning the Driven Linkage Arm to the Drive Linkage Arm.

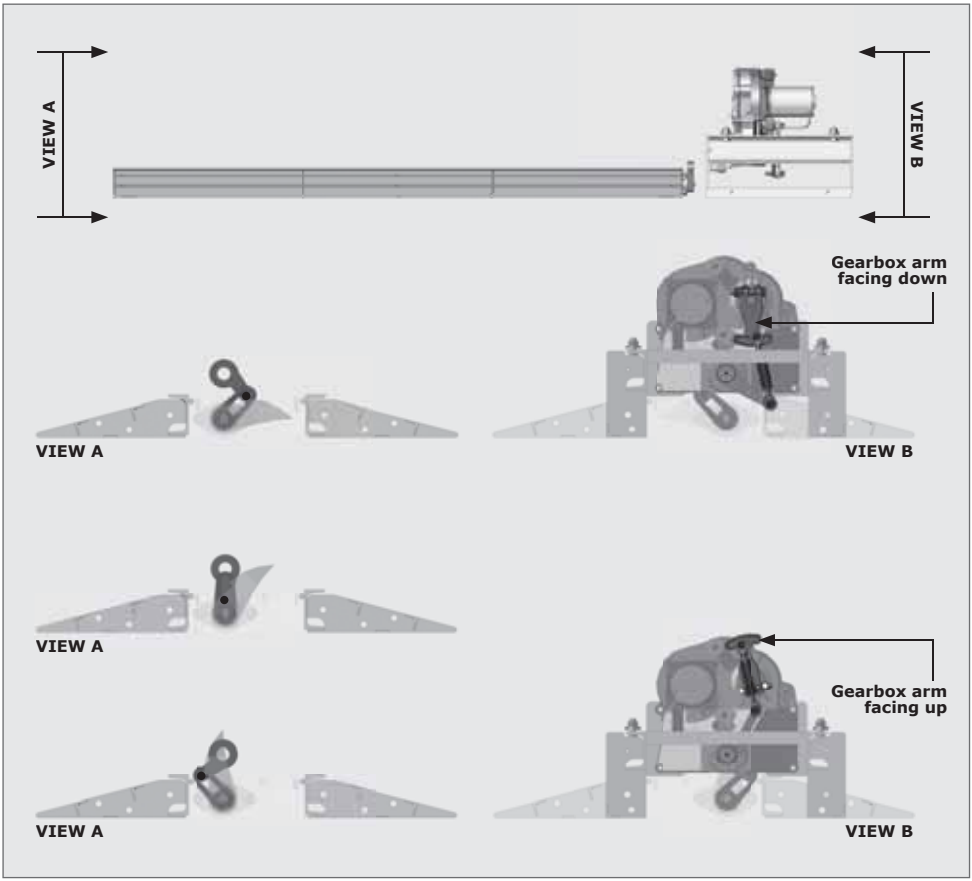
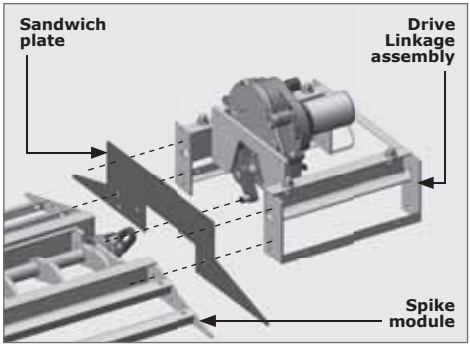


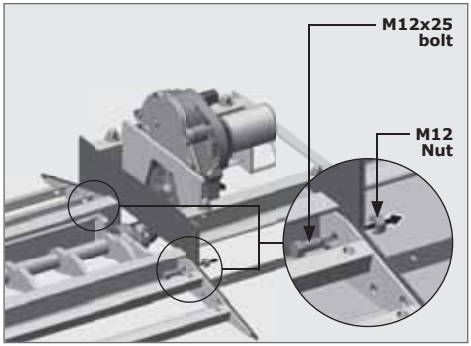
FIGURE 29

6.2.4. Attaching the drive linkage assembly to the spike module

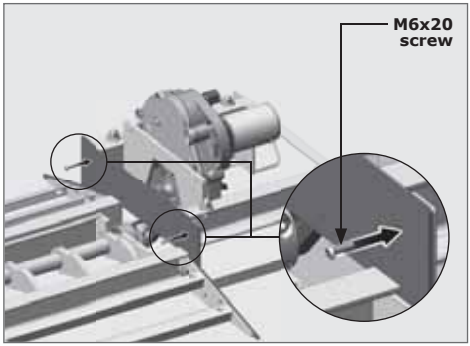
Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 6, Figure 30).



STEP 1 **FIGURE 30**

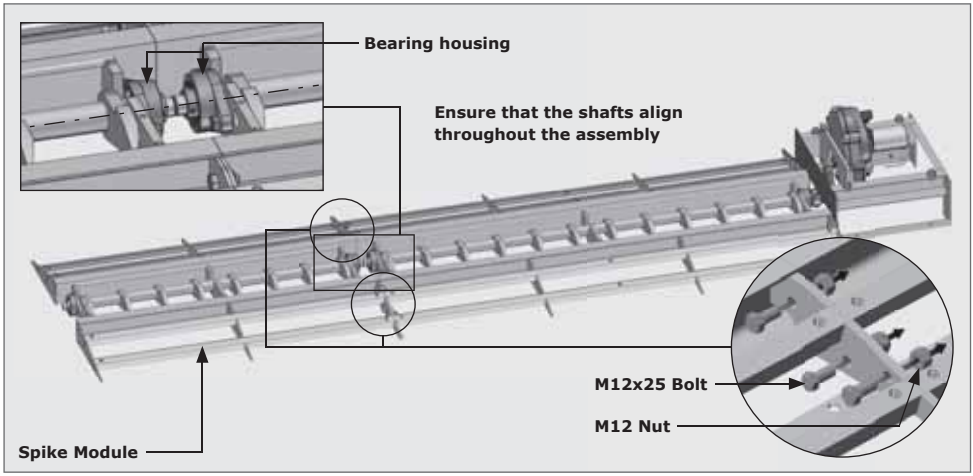


STEP 2 **FIGURE 31**



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.

6.2.5. 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.

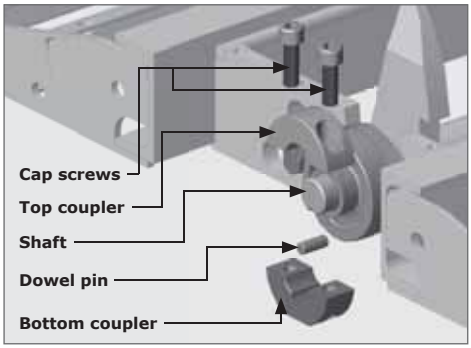


FIGURE 34. SHAFT COUPLER

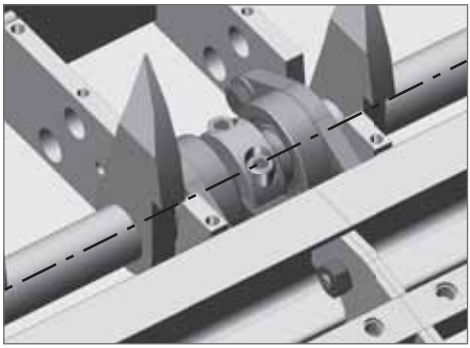
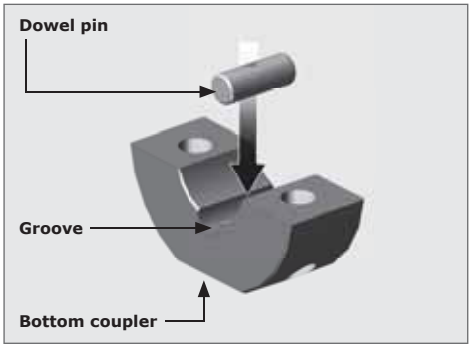
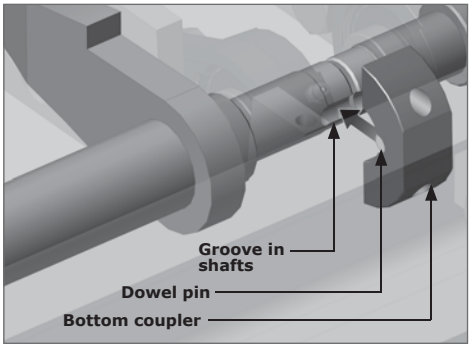


FIGURE 35

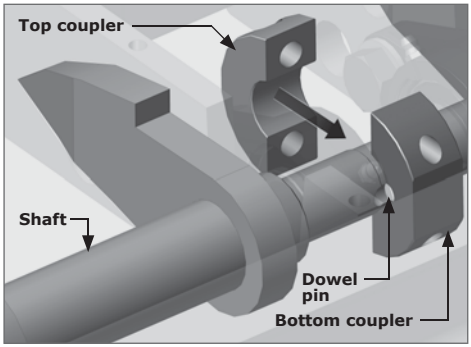
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



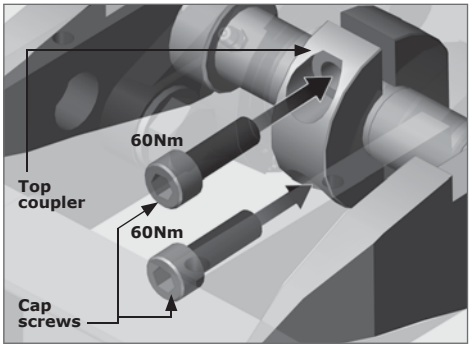
STEP 1 FIGURE 36



STEP 2 FIGURE 37

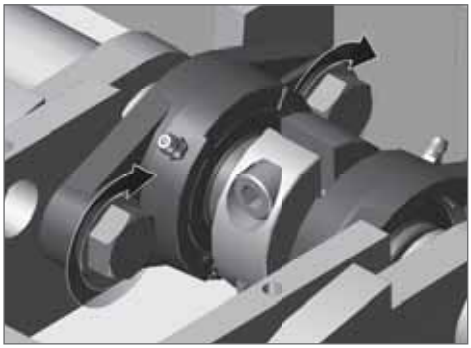


STEP 3 FIGURE 38

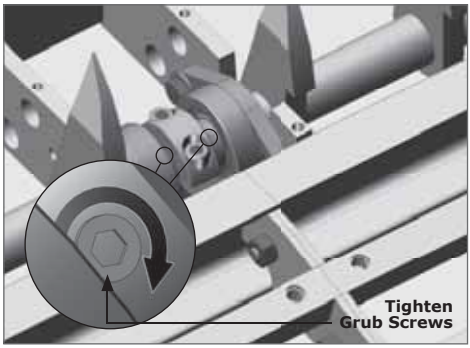


STEP 4 FIGURE 39

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**

6.2.6. Bolting down the assembly to the ground

If the SECTOR II and **CLAWS** are to be seperated, 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 SECTOR II. (Section 6.4.2.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

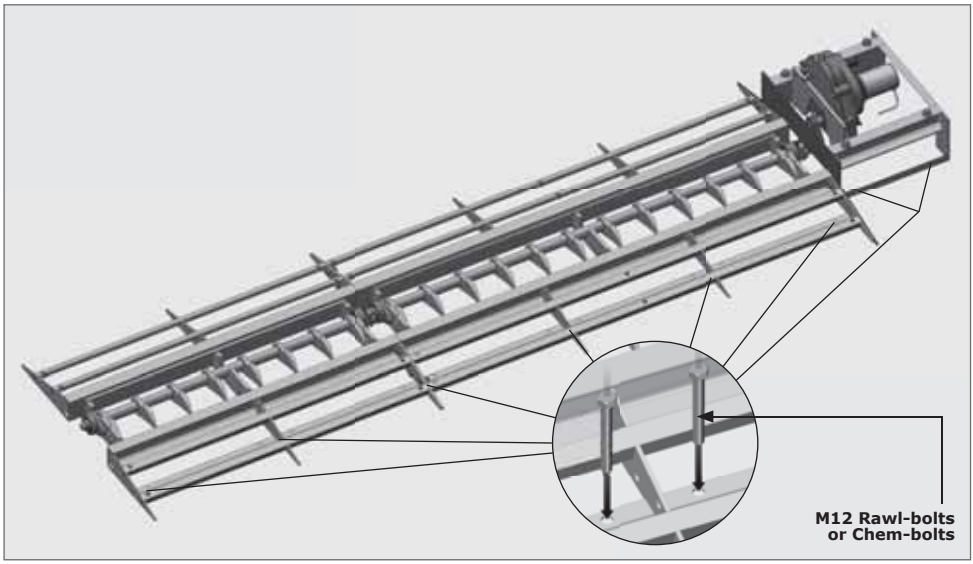
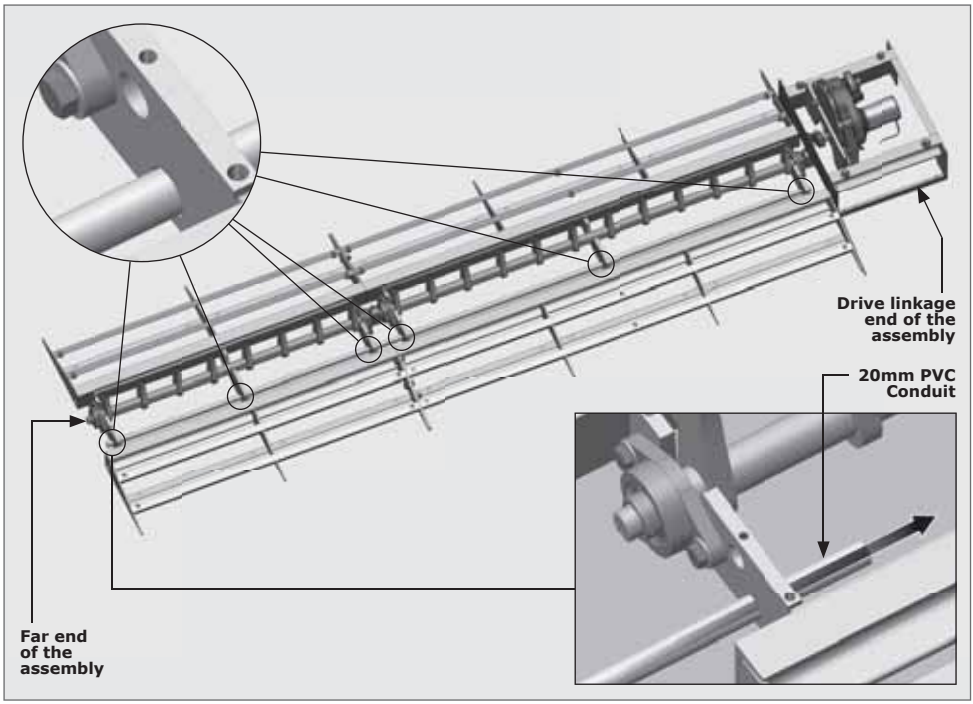


FIGURE 42

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.

6.2.7. 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).

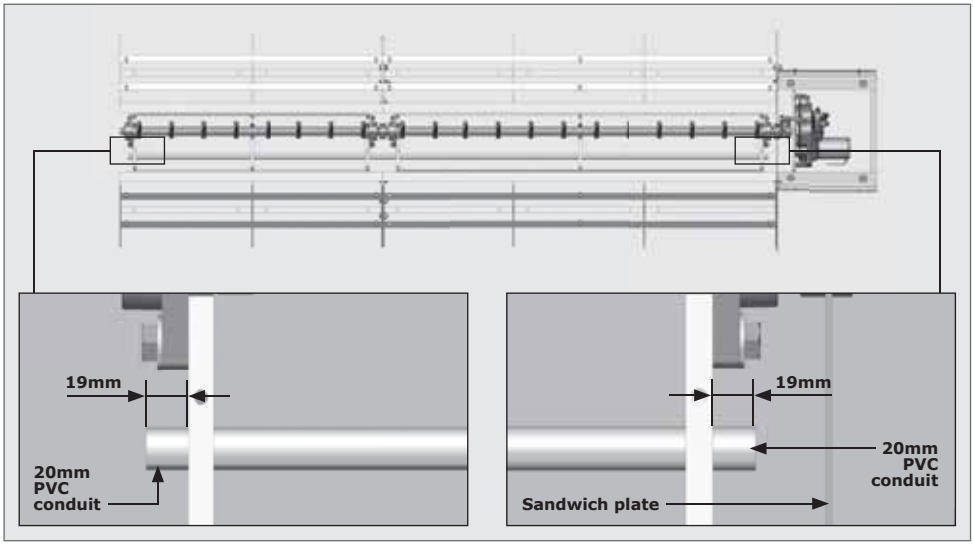
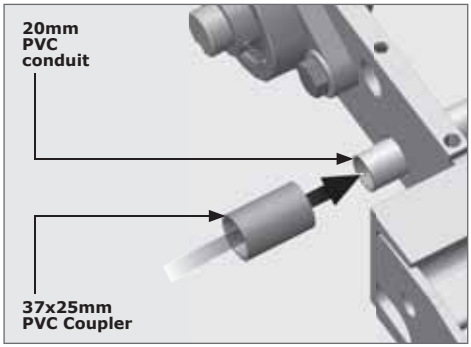
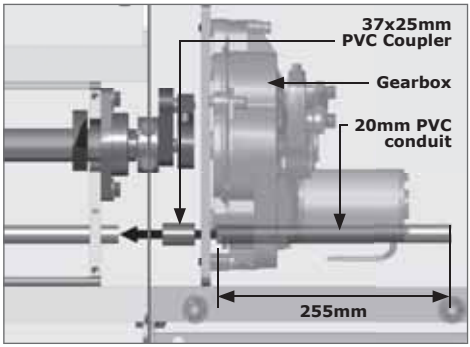


FIGURE 44

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

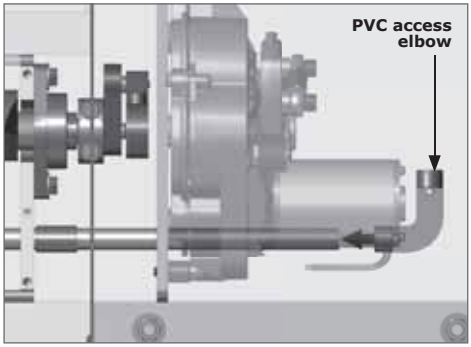


STEP 2 FIGURE 45

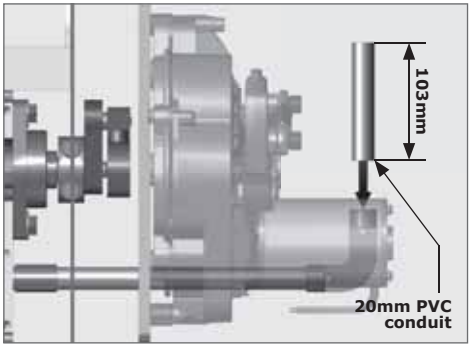


STEP 3 FIGURE 46

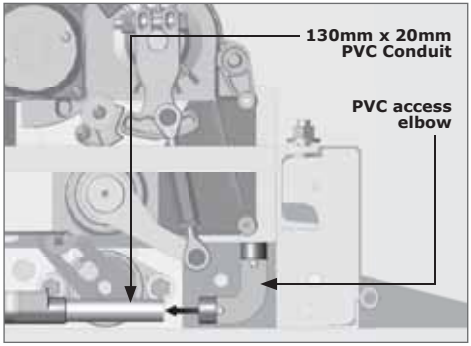
Steps 4-7 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, a trench for the conduit and proximity sensor cable will need to be dug (Section 6.4.2.).



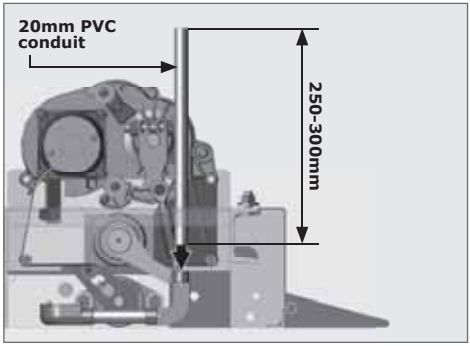
STEP 4 FIGURE 47



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.

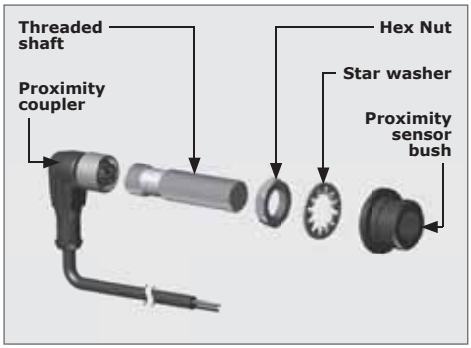


FIGURE 51. PROXIMITY SENSOR

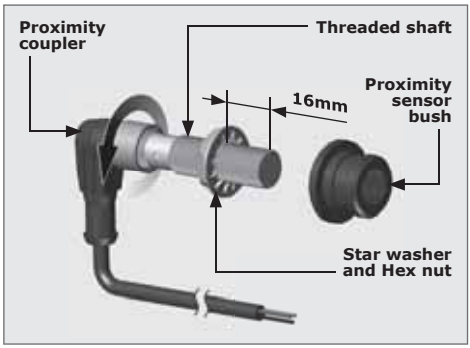


FIGURE 52. PROXIMITY SENSOR

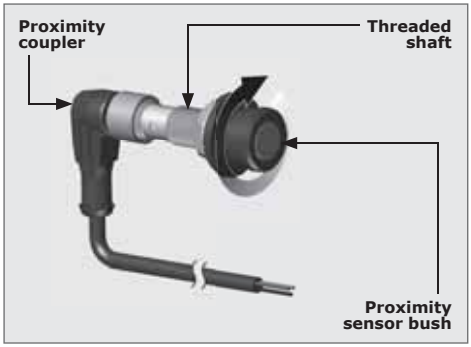
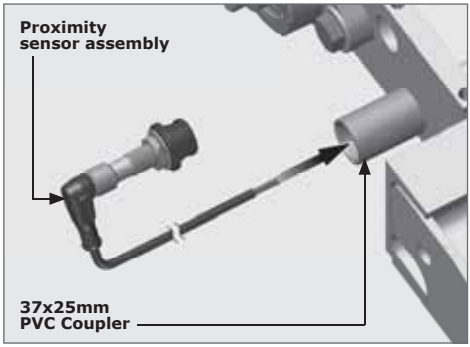


FIGURE 53. PROXIMITY SENSOR



STEP 8

FIGURE 54

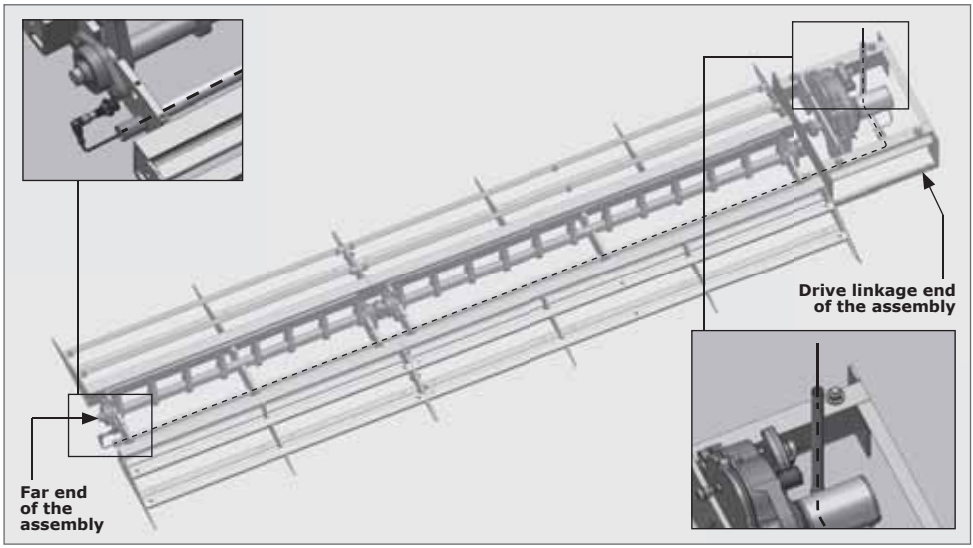
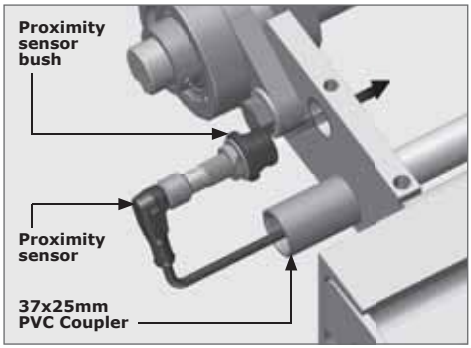
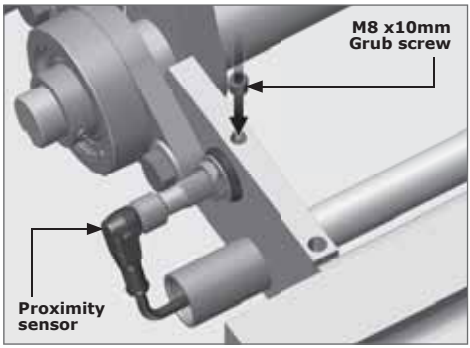


FIGURE 55

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

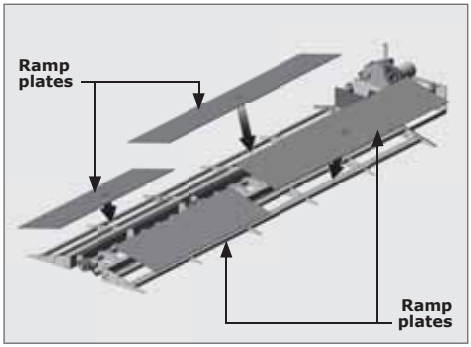


STEP 9 FIGURE 56

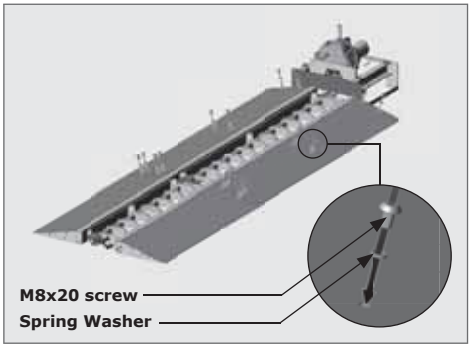


STEP 10 FIGURE 57

6.3. Re-assembling the ramp plates and linkage cover

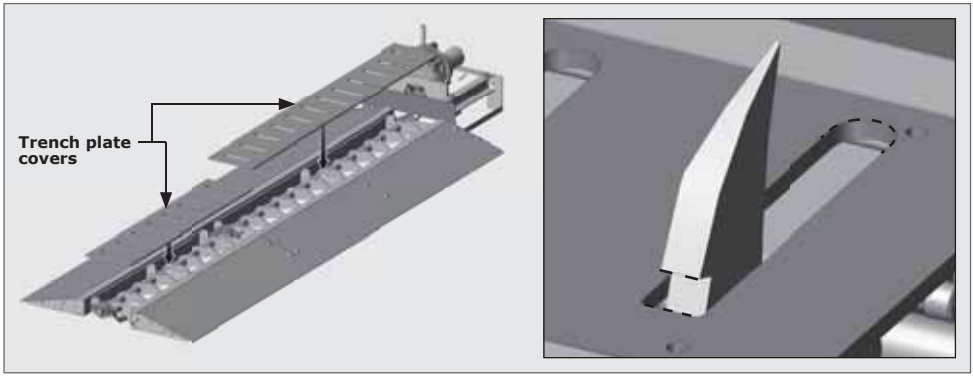


STEP 1 FIGURE 58



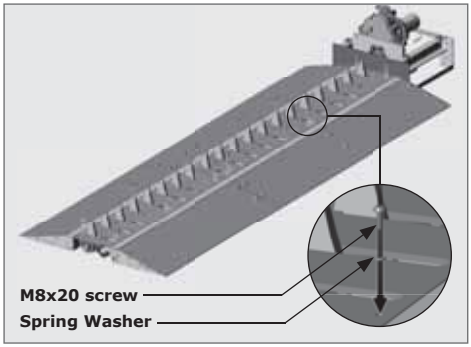
STEP 2 FIGURE 59

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.

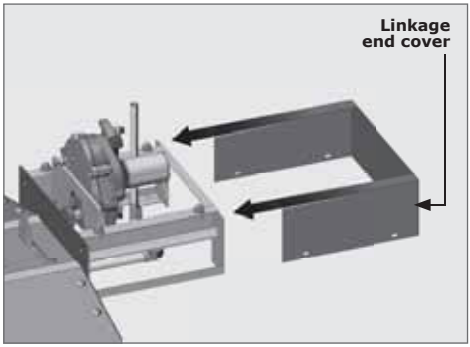


STEP 3 FIGURE 60

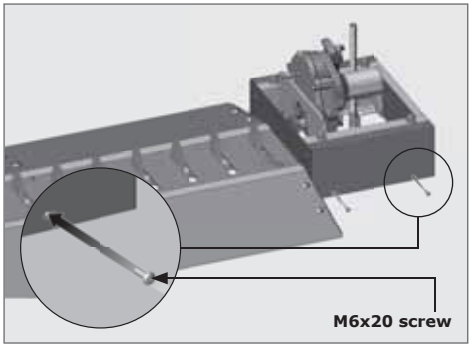
Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



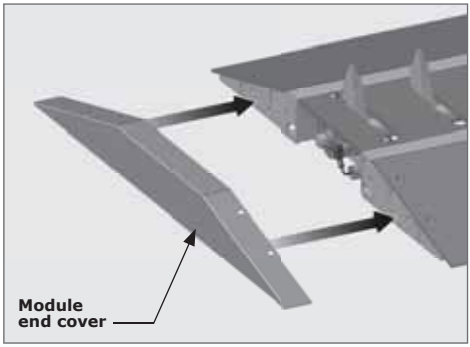
STEP 4 FIGURE 61



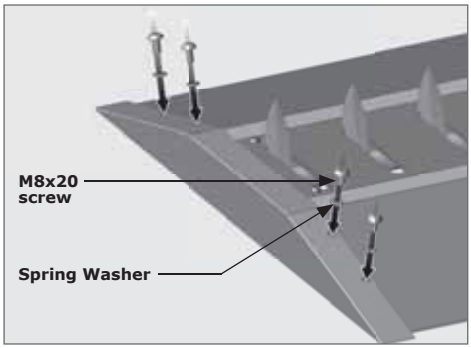
STEP 5 FIGURE 62



STEP 6 FIGURE 63



STEP 7 FIGURE 64

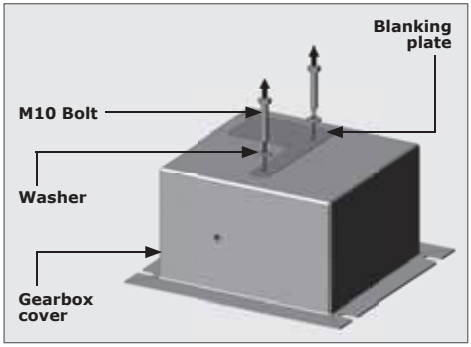


STEP 8 FIGURE 65

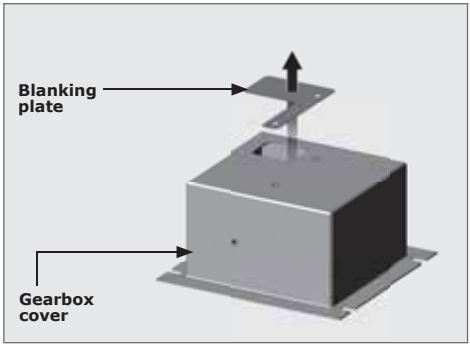
6.4. Integrating the SECTOR II with the CLAWS

6.4.1. Directly mount THE SECTOR II onto the Independent Drive

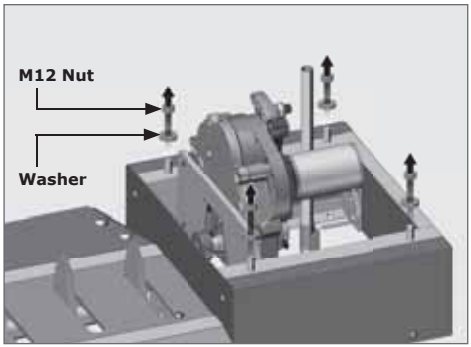
6.4.1.1. Placing the gearbox cover into position



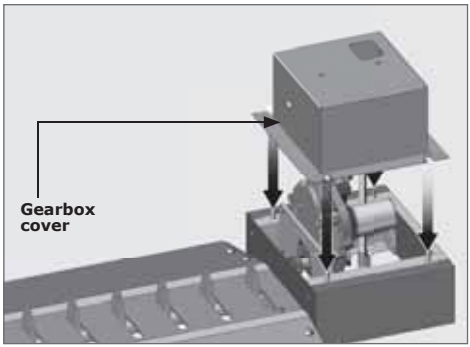
STEP 1 FIGURE 66



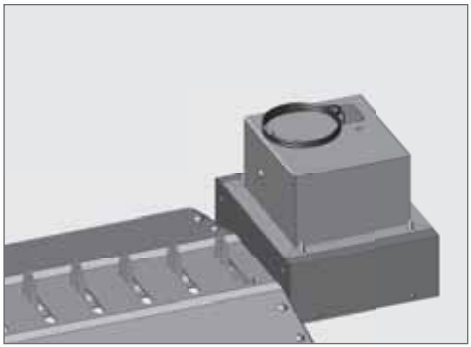
STEP 2 FIGURE 67



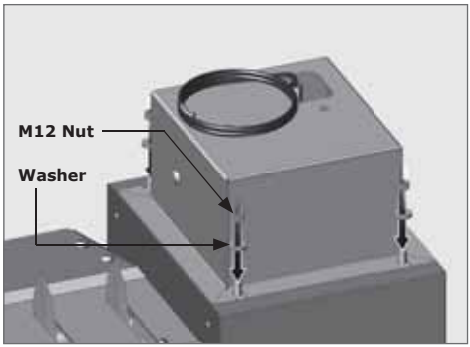
STEP 3 FIGURE 68



STEP 4 FIGURE 69



STEP 5 FIGURE 70



STEP 6 FIGURE 71

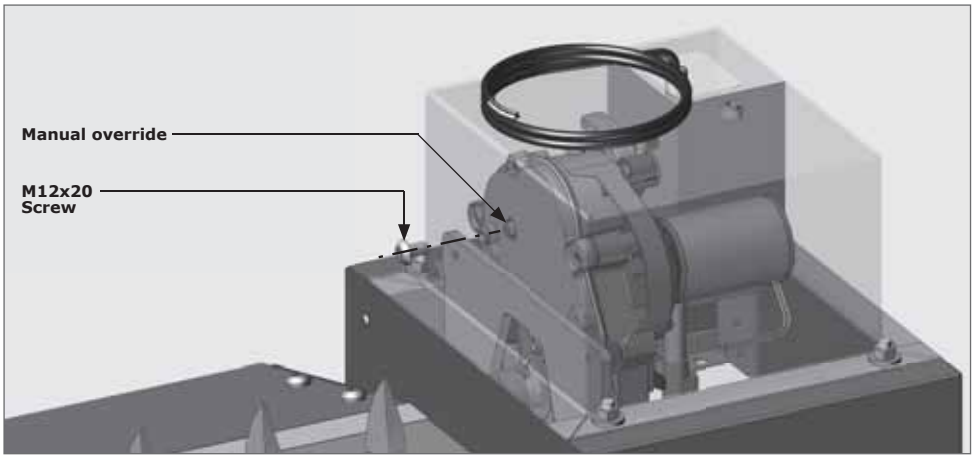
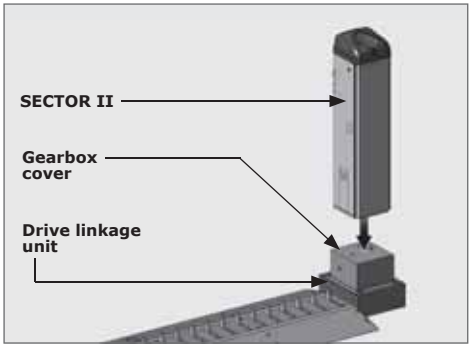
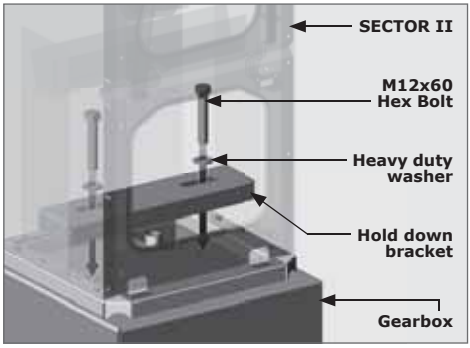


FIGURE 72. MANUAL OVERRIDE

6.4.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 73



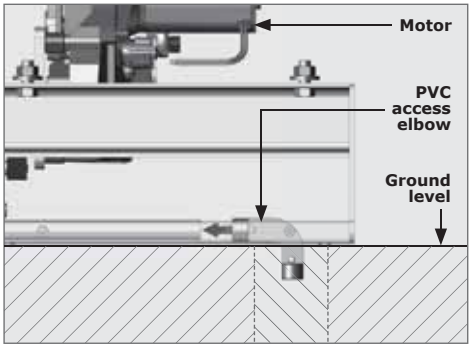
STEP 2 FIGURE 74

6.4.2. Seperately-placed CLAWS and SECTOR II

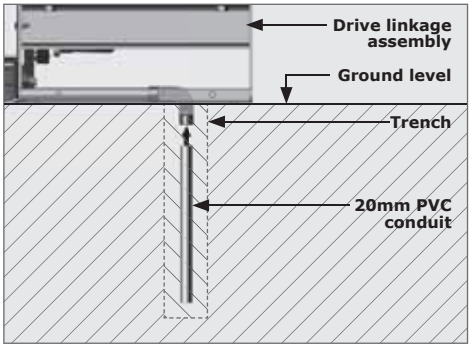
6.4.2.1. Running the conduit from the gearbox to the SECTOR II

STEP 1

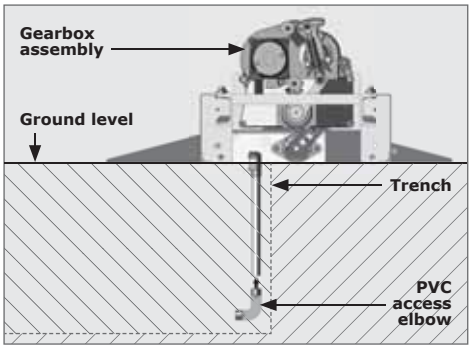
Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.



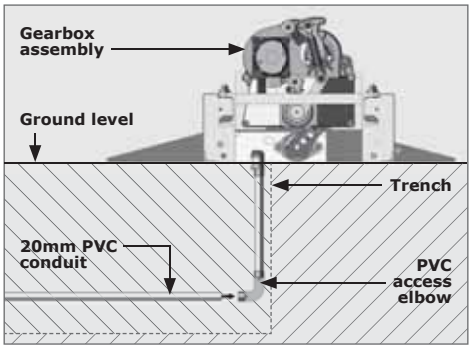
STEP 2 FIGURE 75



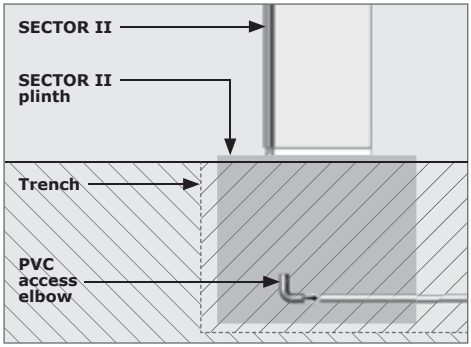
STEP 3 FIGURE 76



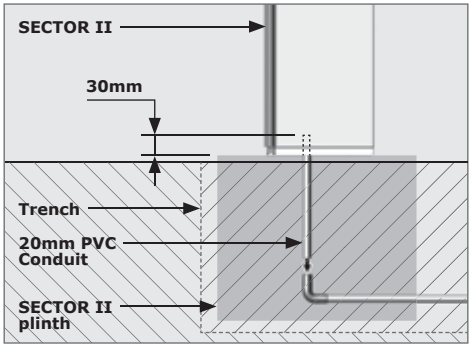
STEP 4 FIGURE 77



STEP 5 FIGURE 78



STEP 6 FIGURE 79

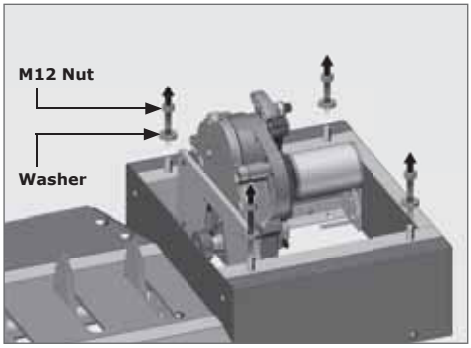


STEP 7 FIGURE 80

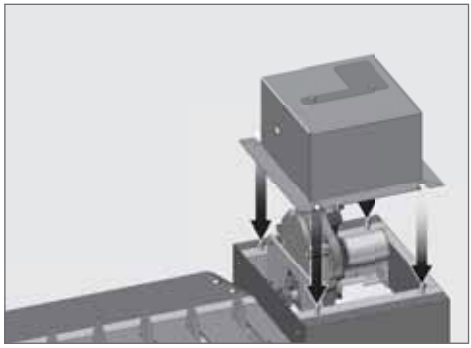
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

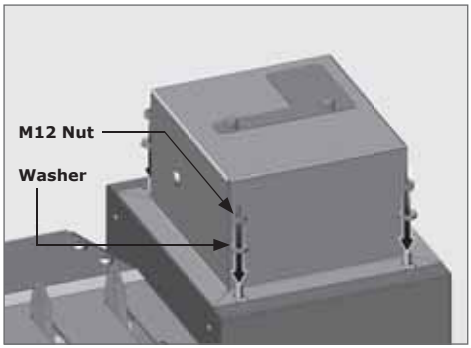
6.4.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 81



STEP 2 FIGURE 82



STEP 3 FIGURE 83

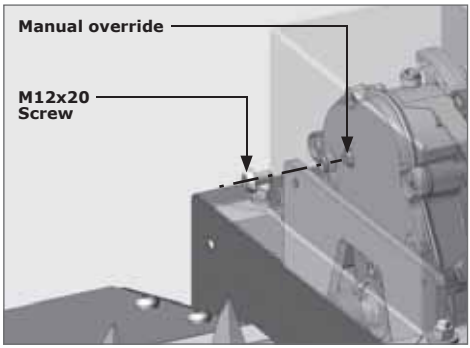
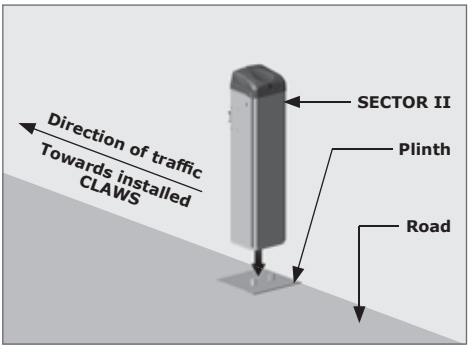


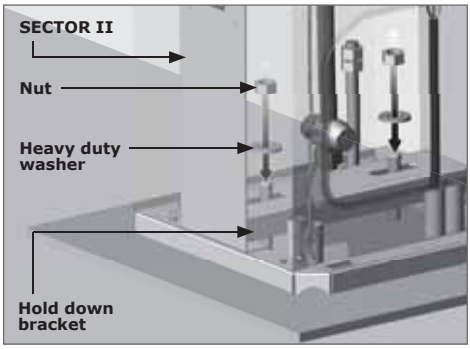
FIGURE 84. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

6.4.2.3. Placing the SECTOR II into position

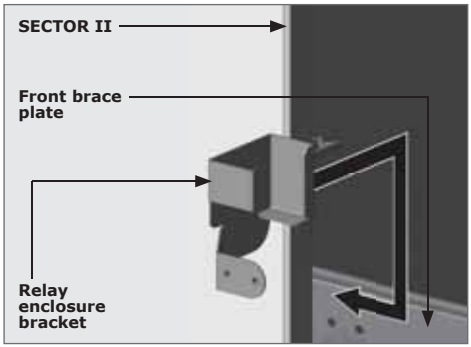


STEP 1 FIGURE 85

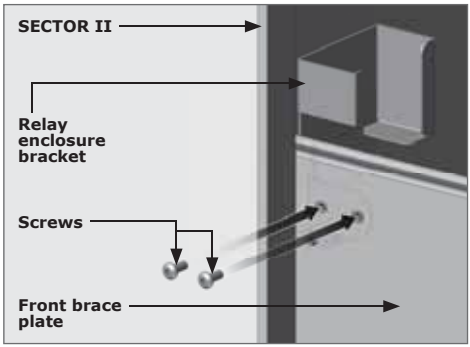


STEP 2 FIGURE 86

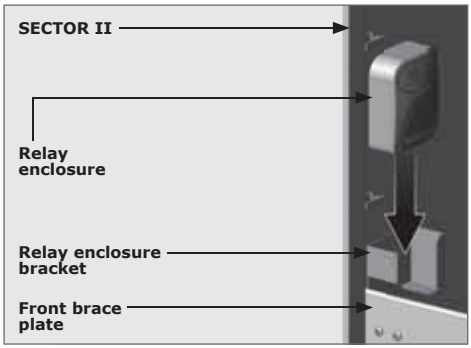
6.4.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 87



STEP 2 FIGURE 88

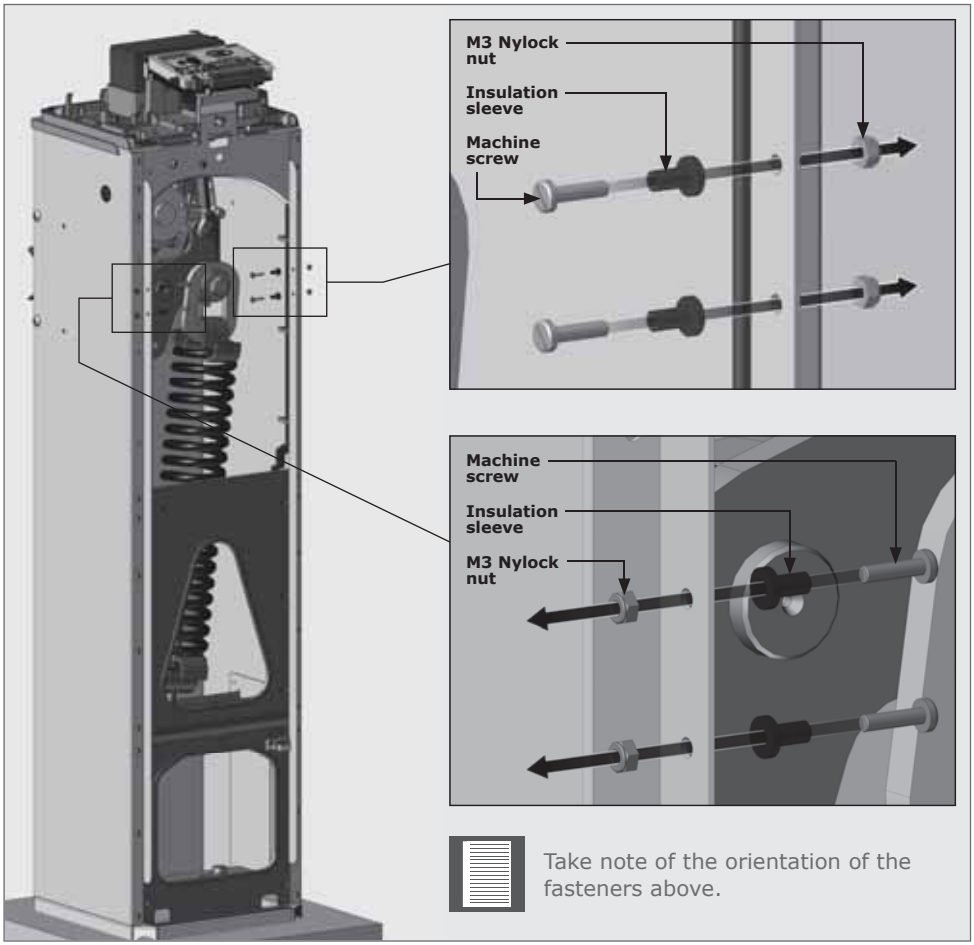


STEP 1 FIGURE 89

Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

6.4.5. Fitting the CLAWS controller to the SECTOR II



STEP 1 FIGURE 90

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

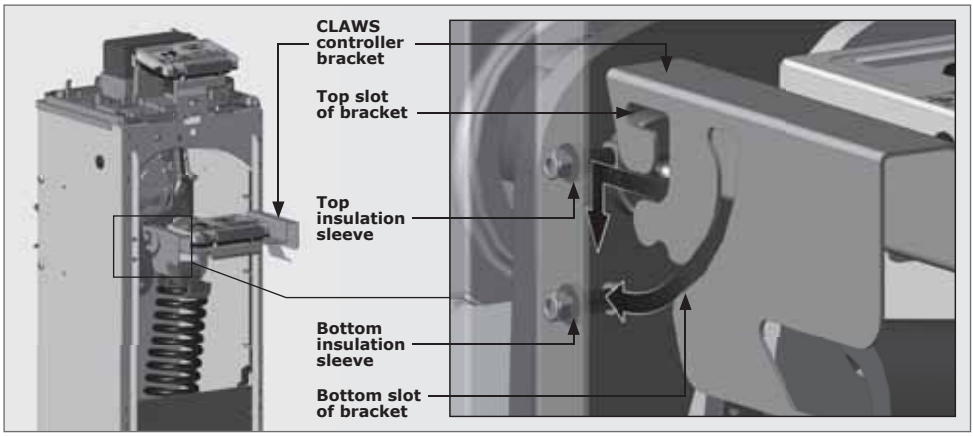


FIGURE 91

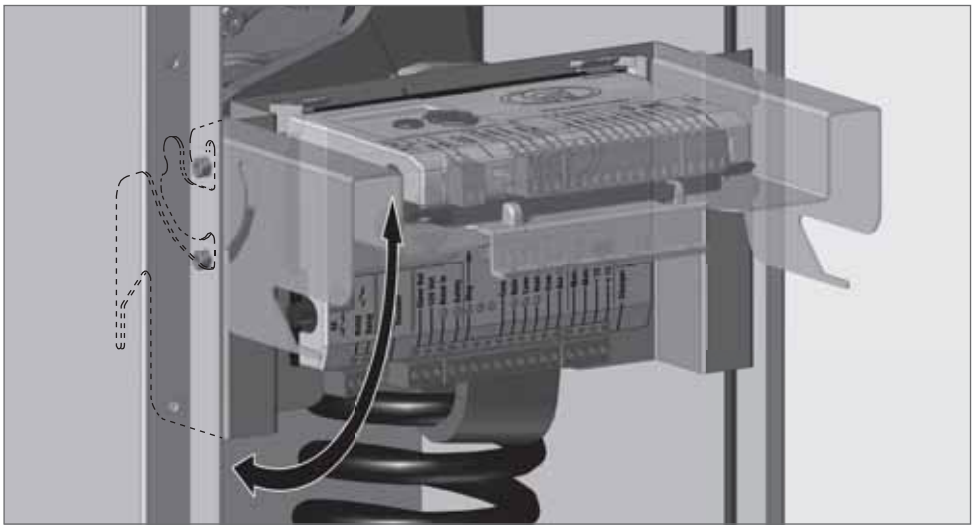


FIGURE 92

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 6, Figure 93).

It can also be moved lower down for optimum space when working on the gearbox (Section 6, Figure 94).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 6, Figure 91).

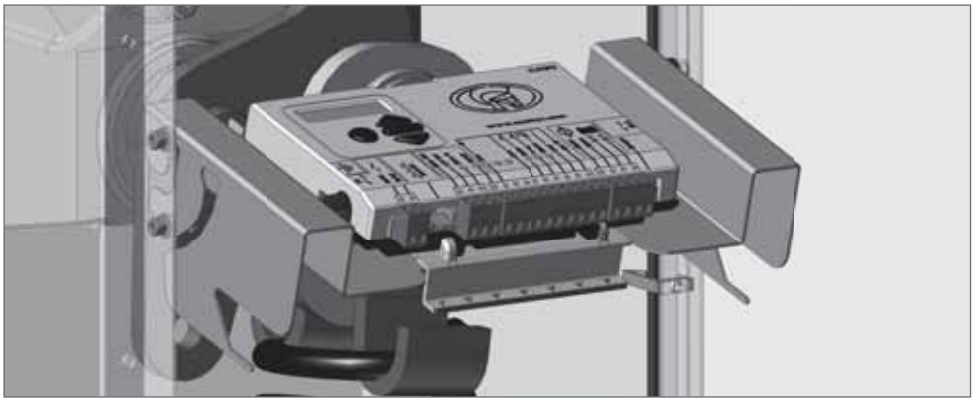


FIGURE 93. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

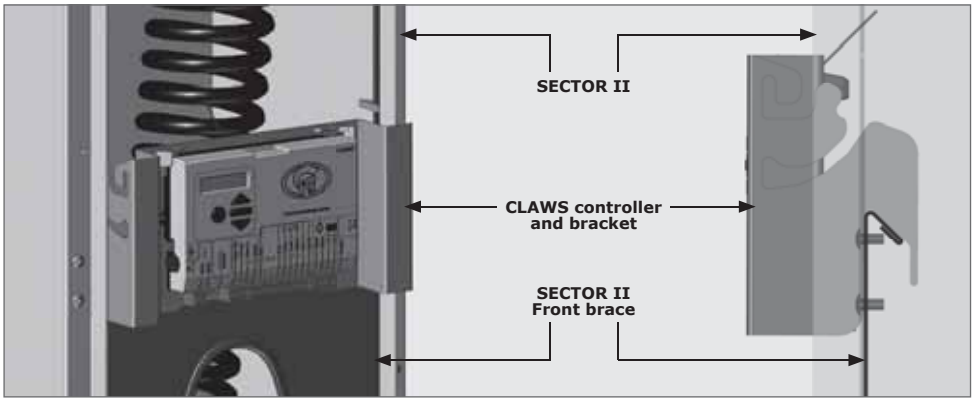


FIGURE 94. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

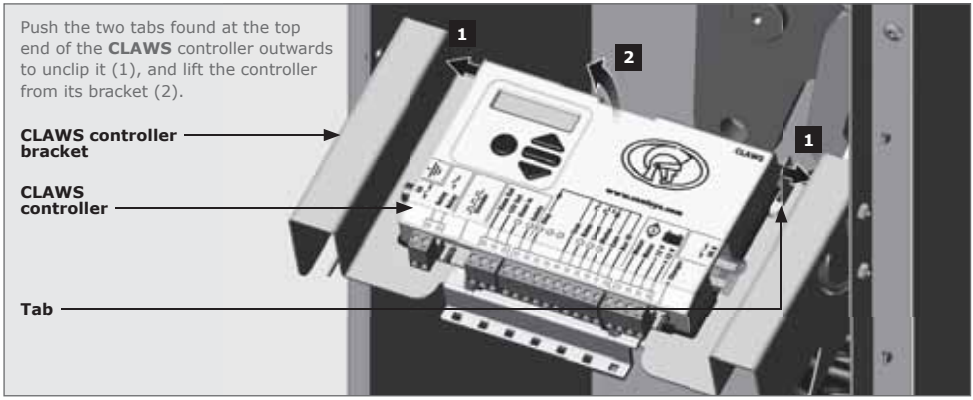


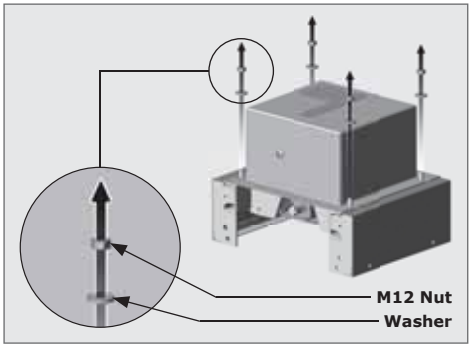
FIGURE 95. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

STEP 3

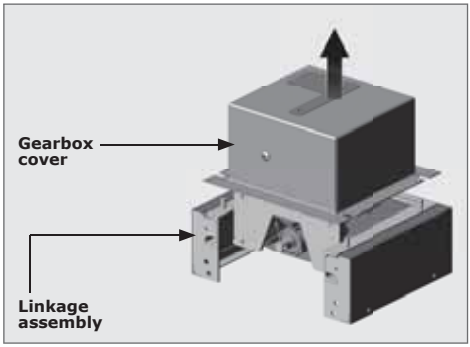
Connect harness and power supply. Refer to the wiring diagrams and controller settings.

7. RHS Surface Mount - Opposing Direction of Travel

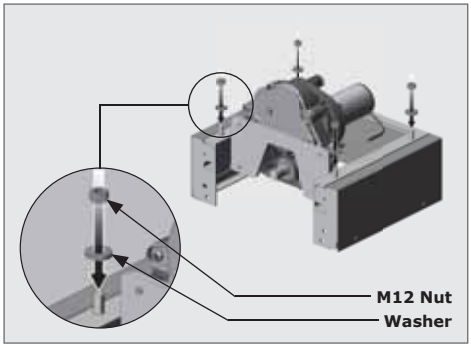
7.1. Preparing the Drive Linkage Assembly



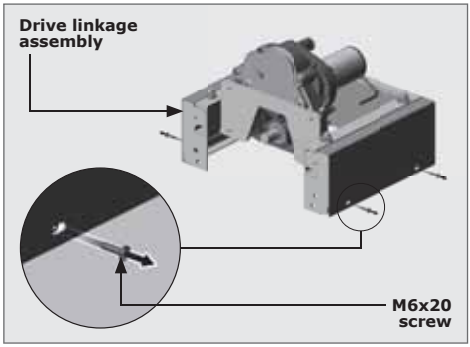
STEP 1 FIGURE 1



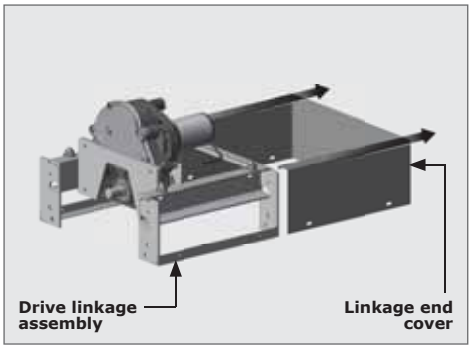
STEP 2 FIGURE 2



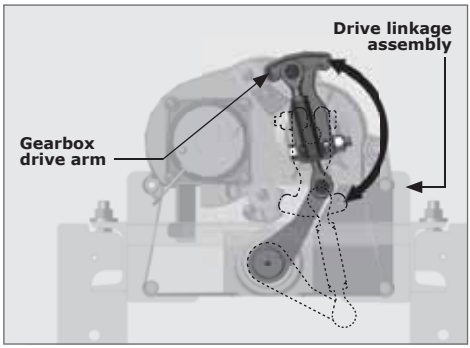
STEP 3 FIGURE 3



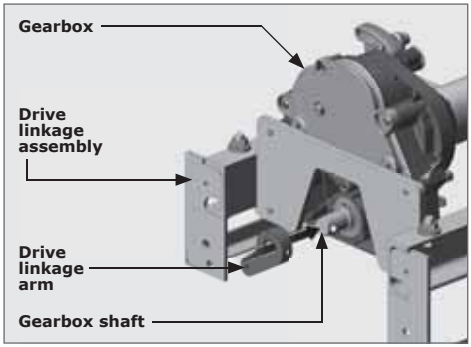
STEP 4 FIGURE 4



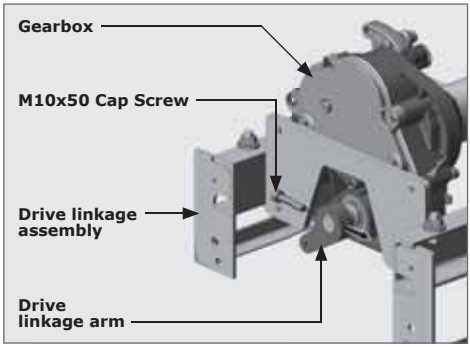
STEP 5 FIGURE 5



STEP 6 FIGURE 6

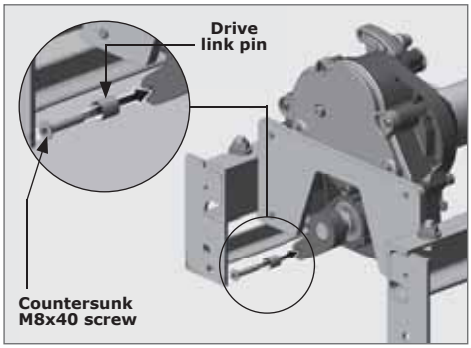


STEP 7 FIGURE 7



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

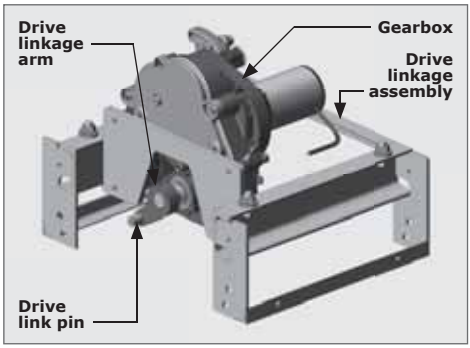
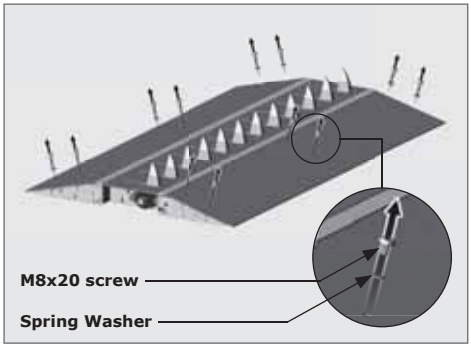


FIGURE 10

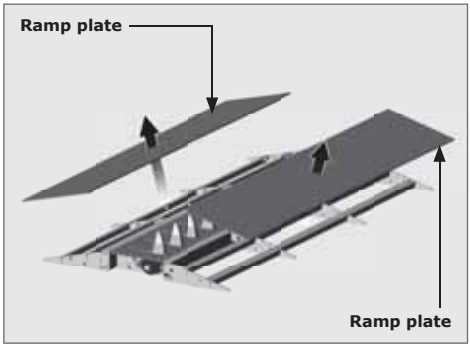
Tighten the Countersunk M8x40 screw to 20Nm (Section 7, Figure 9).

7.2. Spike Module Assembly

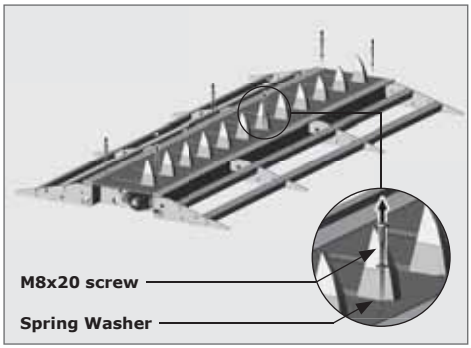
7.2.1. Preparing the Spike Model assembly(ies) for installation



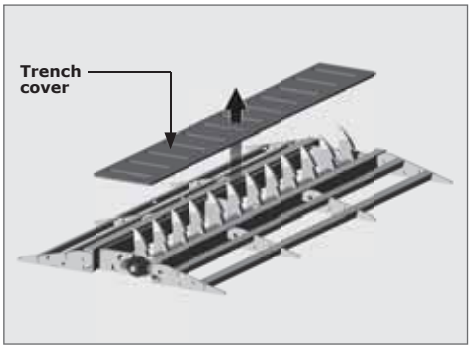
STEP 1 FIGURE 11



STEP 2 FIGURE 12



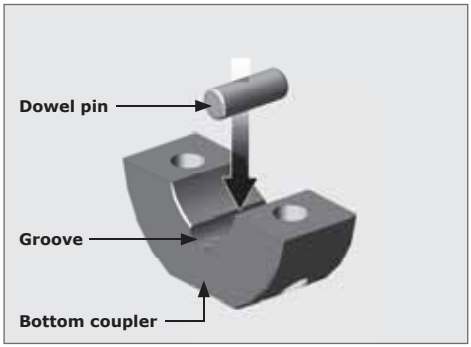
STEP 3 FIGURE 13



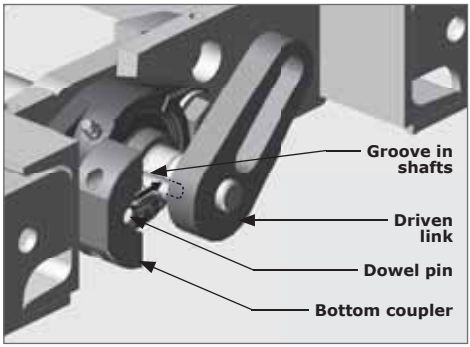
STEP 4 FIGURE 14

7.2.2. 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.

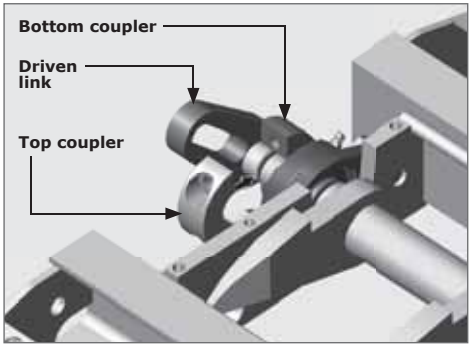


STEP 1 FIGURE 15

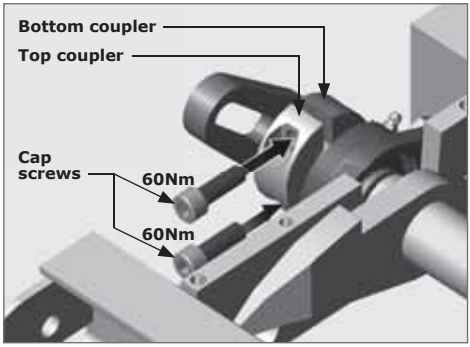


STEP 2 FIGURE 16

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

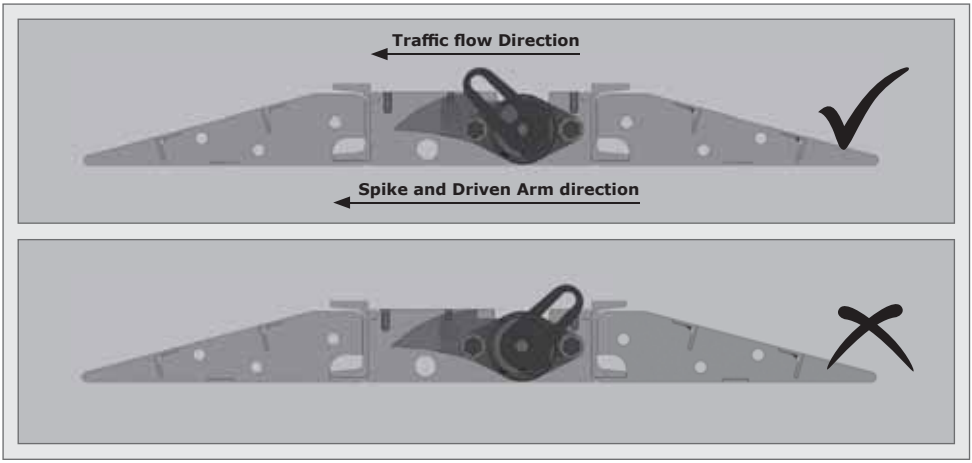


FIGURE 19

7.2.3. Aligning the Driven Linkage Arm to the Drive Linkage Arm.

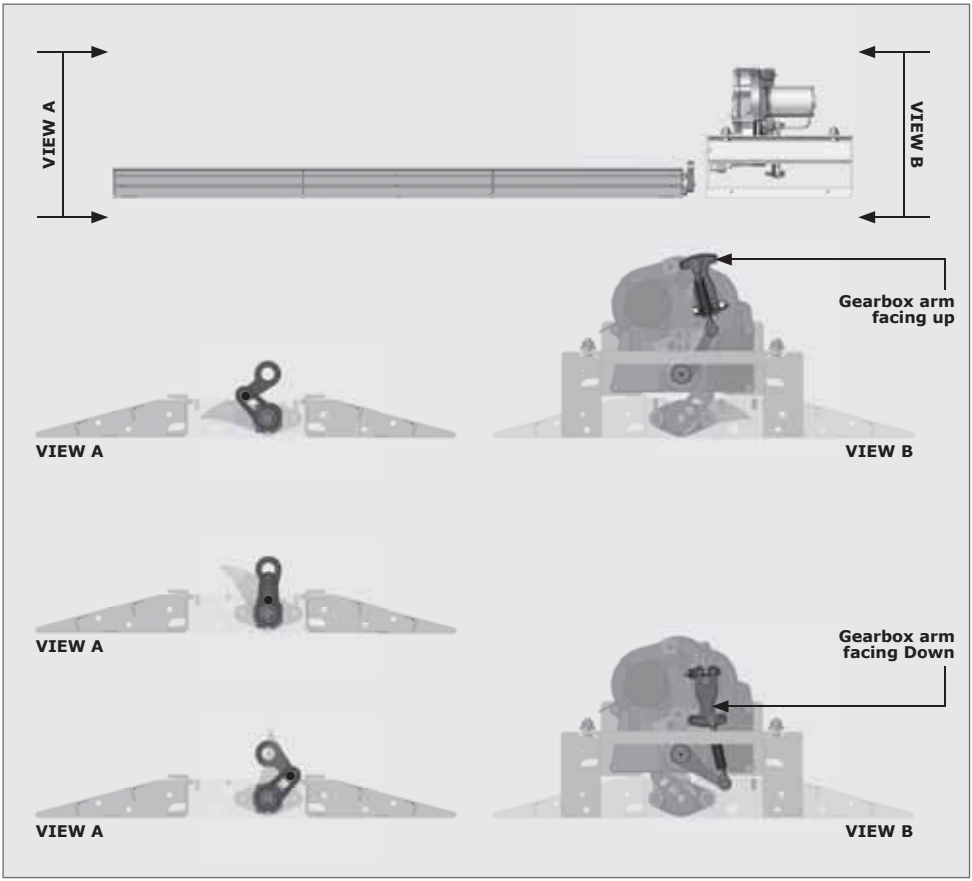
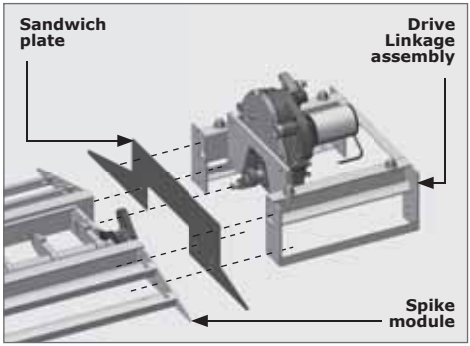


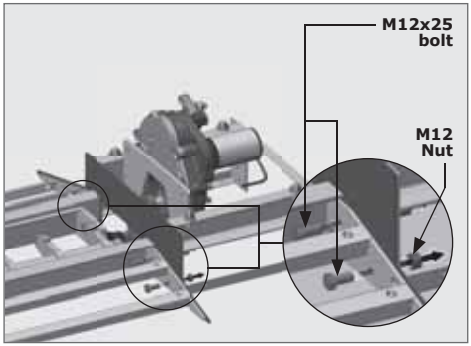
FIGURE 20

7.2.4. Attaching the drive linkage assembly to the spike module

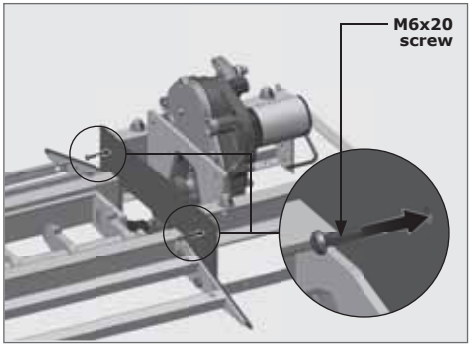
Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 7, Figure 21).



STEP 1 FIGURE 21

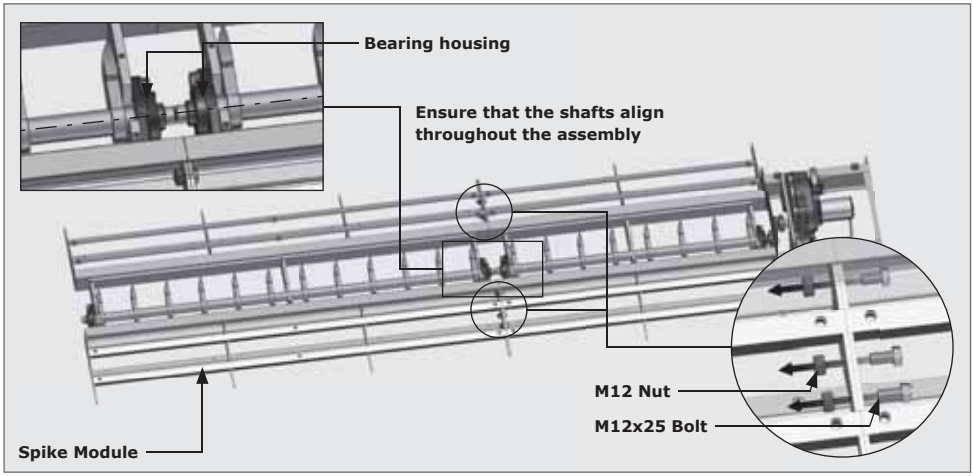


STEP 2 FIGURE 22



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.

7.2.5. 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.

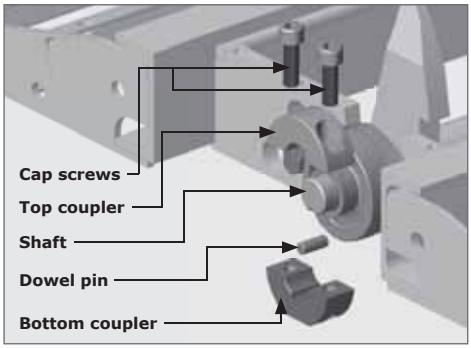


FIGURE 25. SHAFT COUPLER

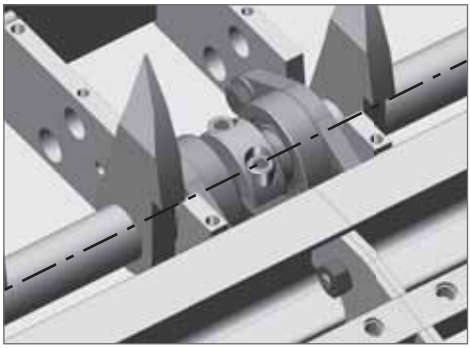
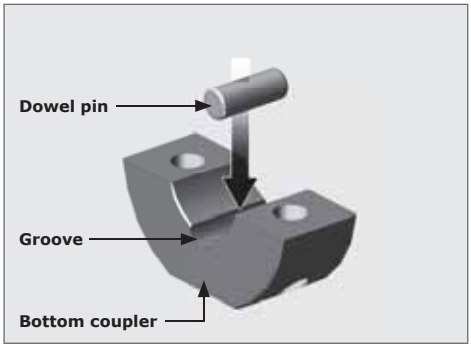
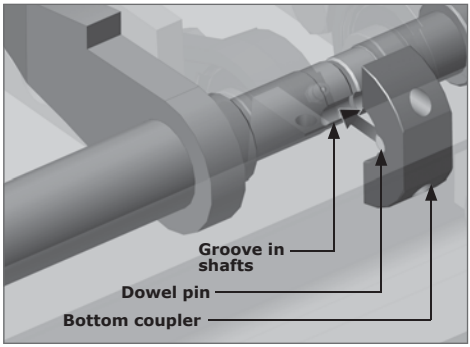


FIGURE 26

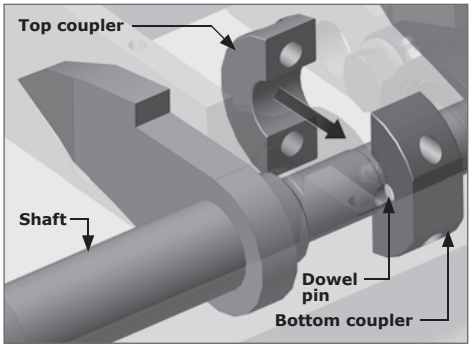
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



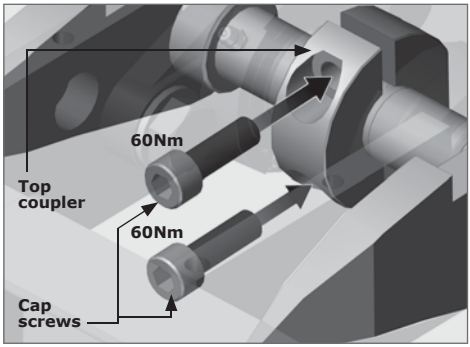
STEP 1 FIGURE 27



STEP 2 FIGURE 28

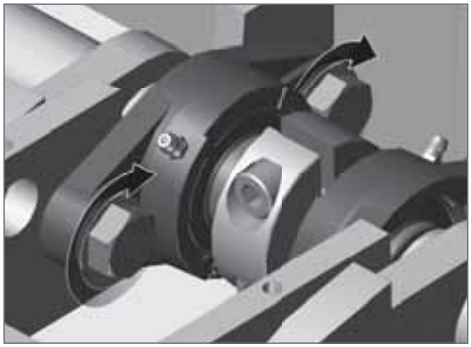


STEP 3 FIGURE 29

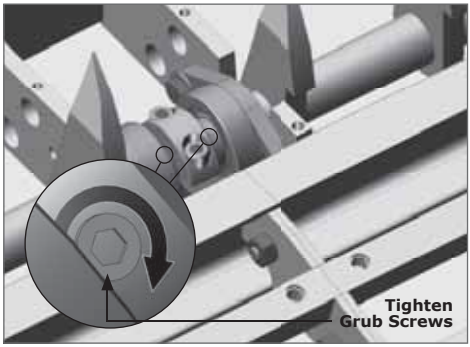


STEP 4 FIGURE 30

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**

7.2.6. Bolting down the assembly to the ground

If the SECTOR II and **CLAWS** are to be seperated, 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 SECTOR II. (Section 7.4.2.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

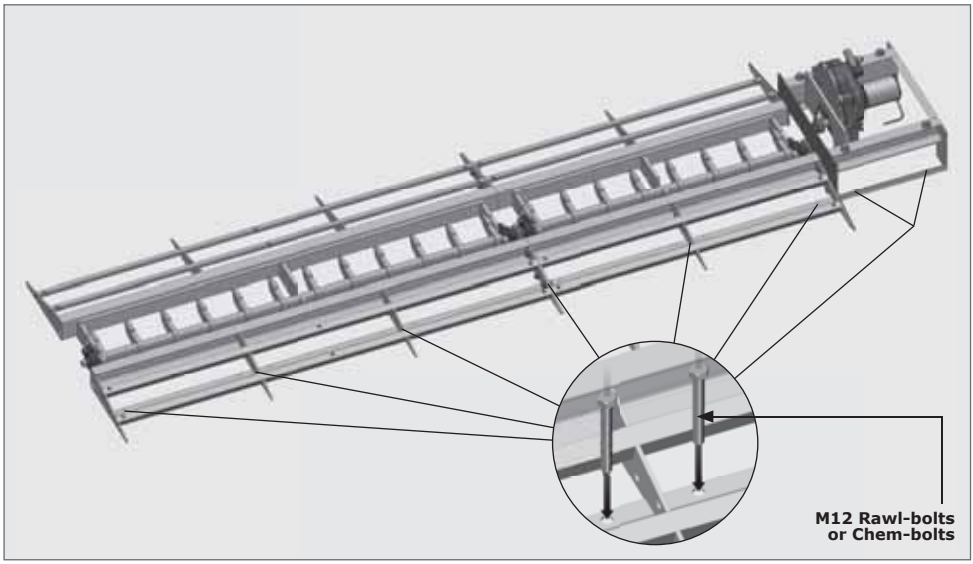
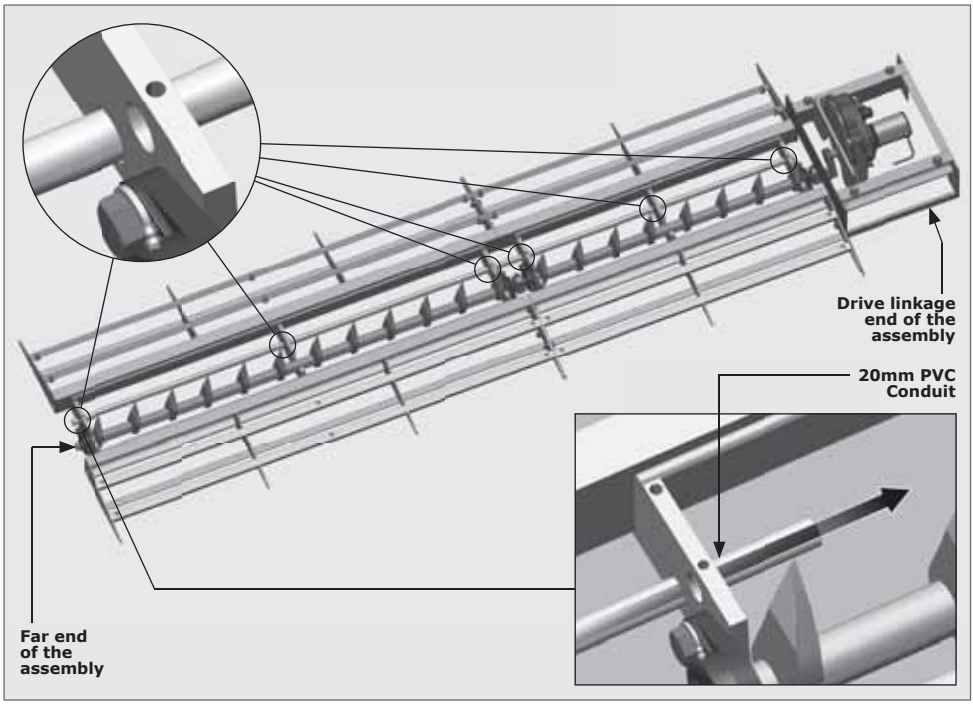


FIGURE 33

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.

7.2.7. 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).

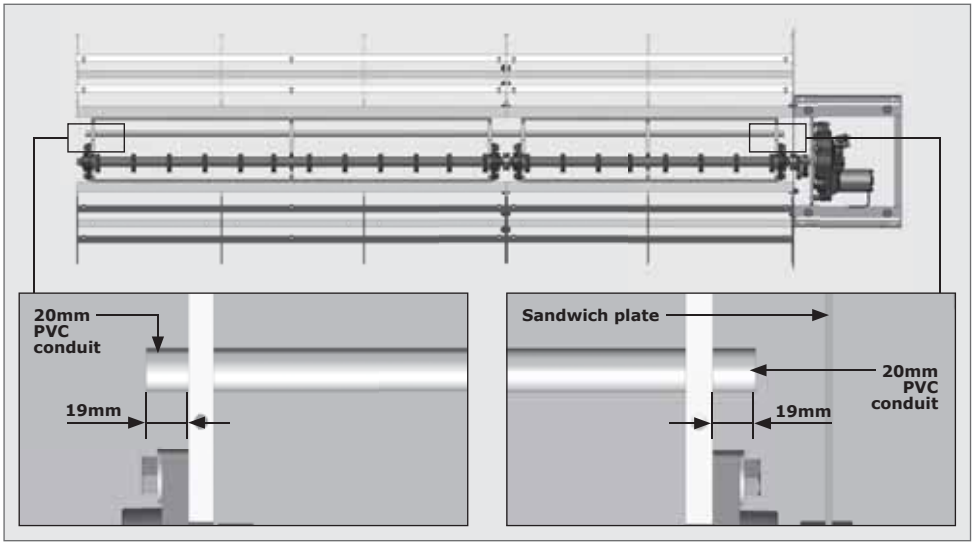
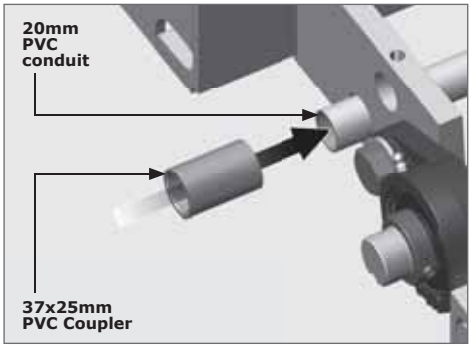
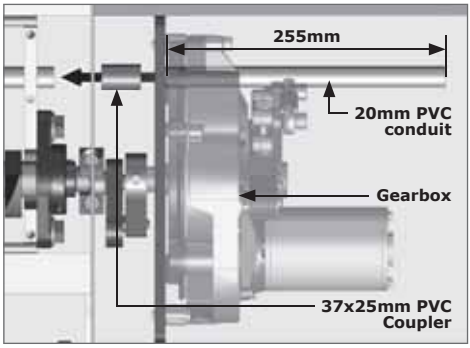


FIGURE 35

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

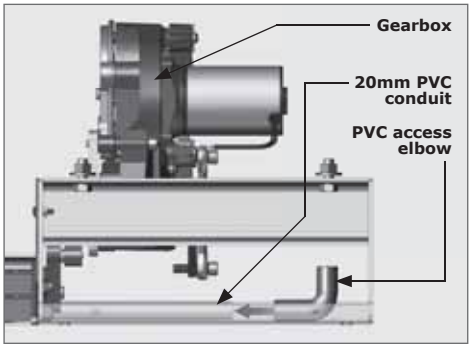


STEP 2 FIGURE 36

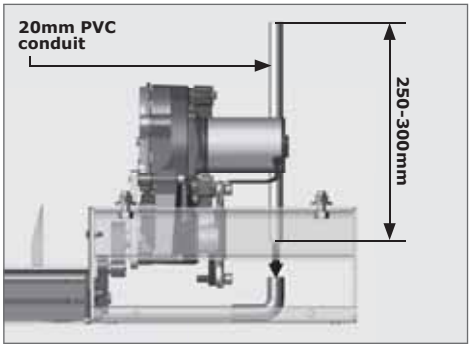


STEP 3 FIGURE 37

Steps 4-5 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, a trench for the conduit and proximity sensor cable will need to be dug (Section 7.4.2.).



STEP 4 FIGURE 38



STEP 5 FIGURE 39

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

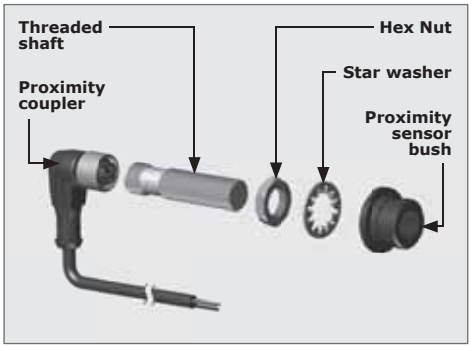


FIGURE 40. PROXIMITY SENSOR

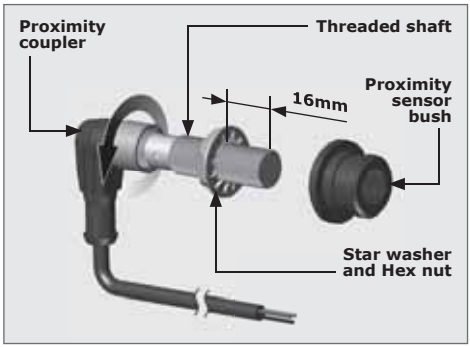


FIGURE 41. PROXIMITY SENSOR

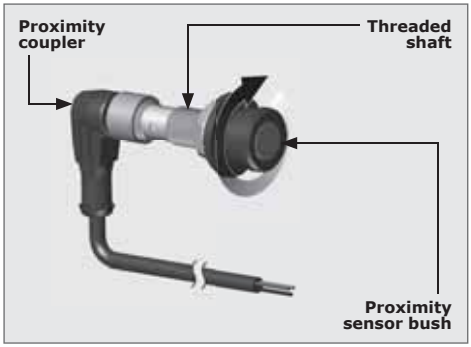
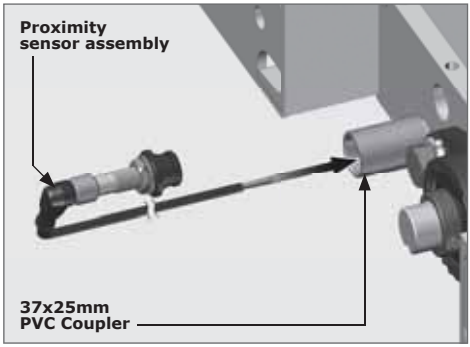


FIGURE 42. PROXIMITY SENSOR



STEP 8 FIGURE 43

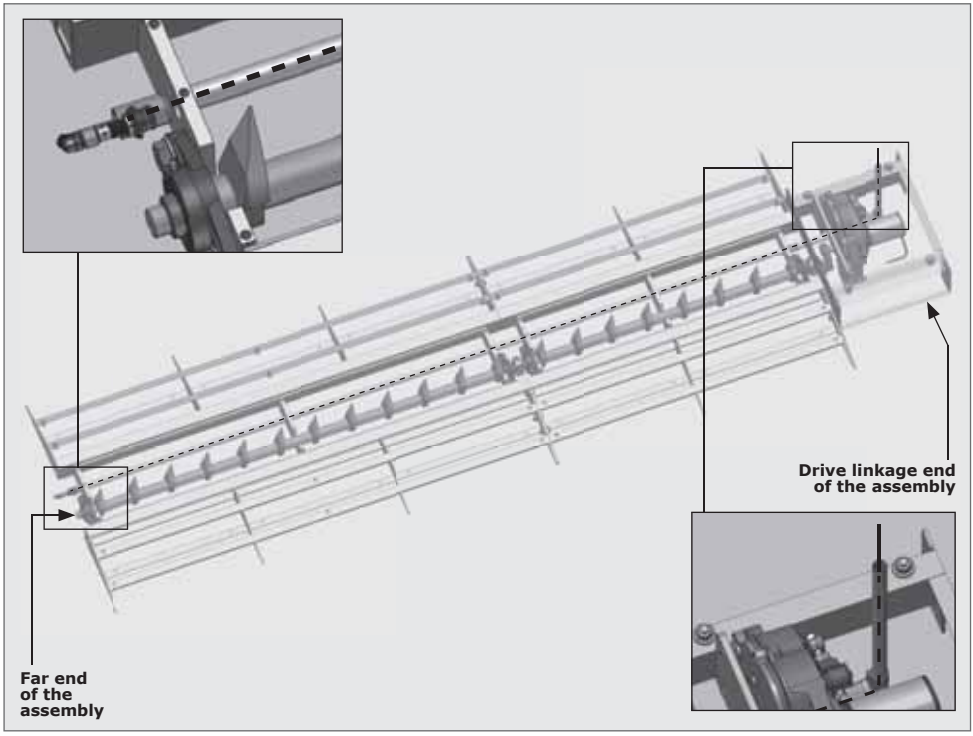
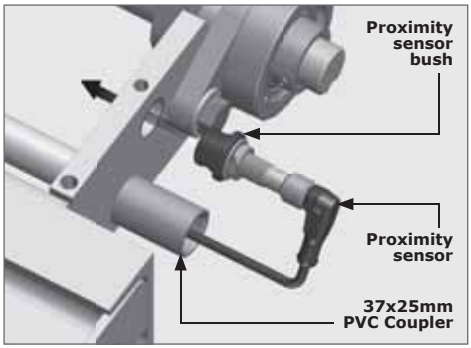
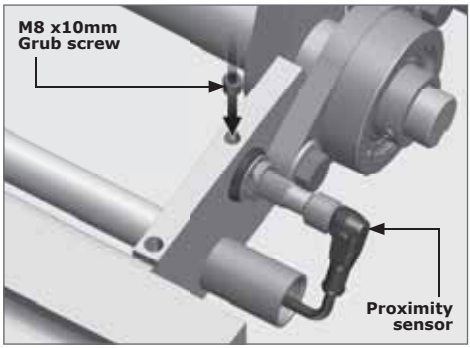


FIGURE 44

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

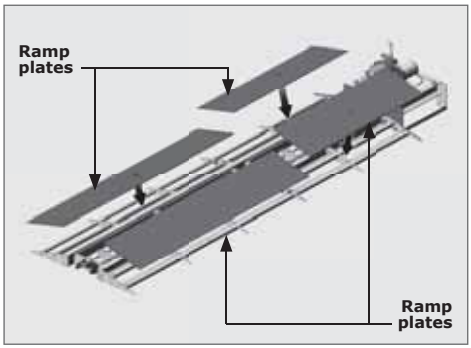


STEP 9 FIGURE 45

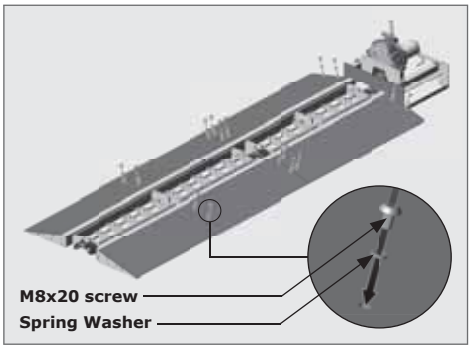


STEP 10 FIGURE 46

7.3. Re-assembling the ramp plates and linkage cover

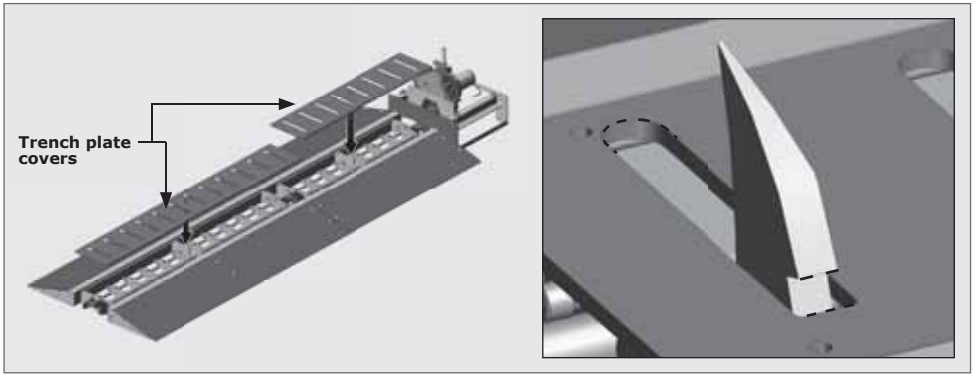


STEP 1 FIGURE 47



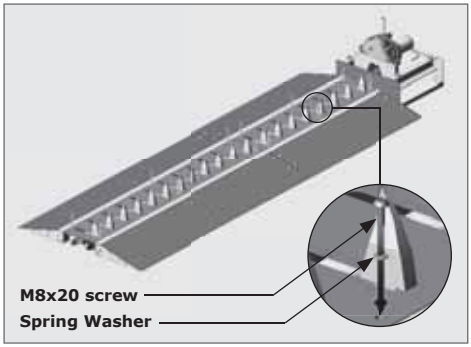
STEP 2 FIGURE 48

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.

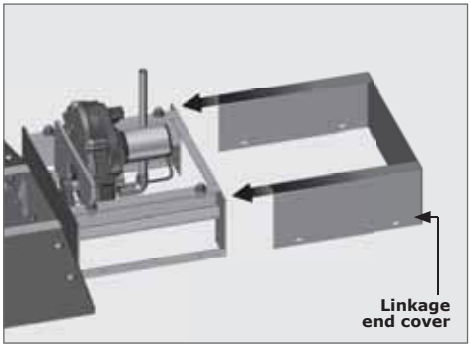


STEP 3 FIGURE 49

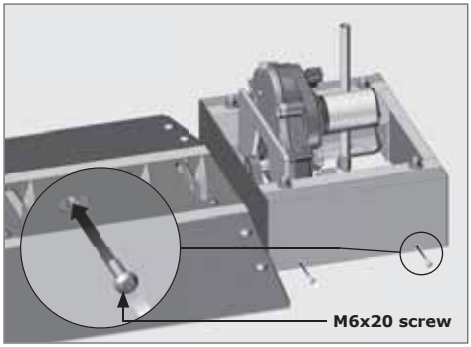
Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



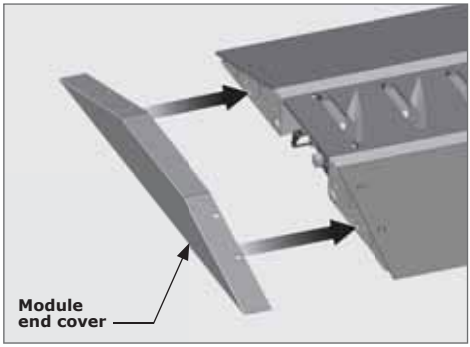
STEP 4 FIGURE 50



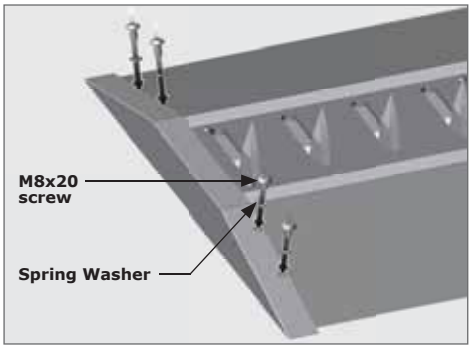
STEP 5 FIGURE 51



STEP 6 FIGURE 52



STEP 7 FIGURE 53

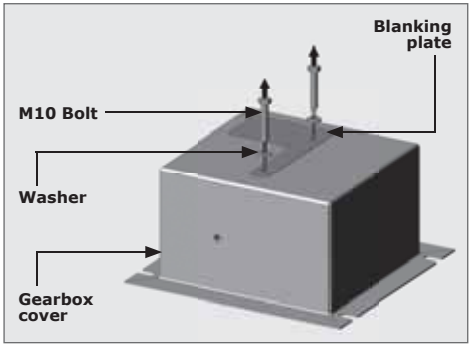


STEP 8 FIGURE 54

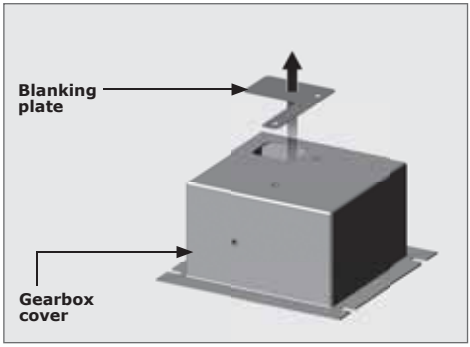
7.4. Integrating the SECTOR II with the CLAWS

7.4.1. Directly mount the SECTOR II onto the Independent Drive

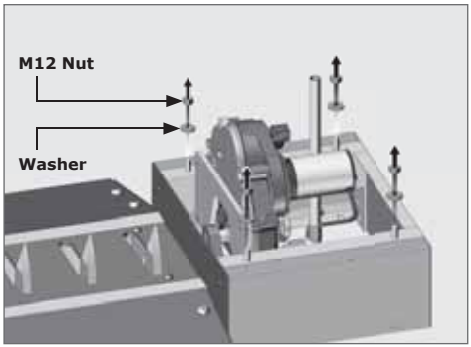
7.4.1.1. Placing the gearbox cover into position



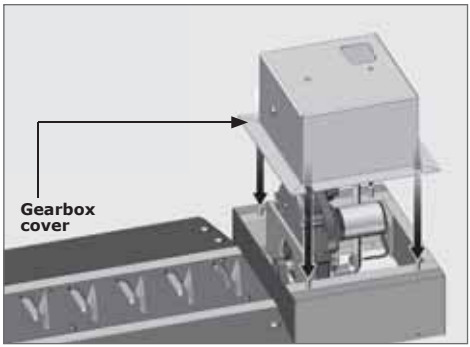
STEP 1 FIGURE 55



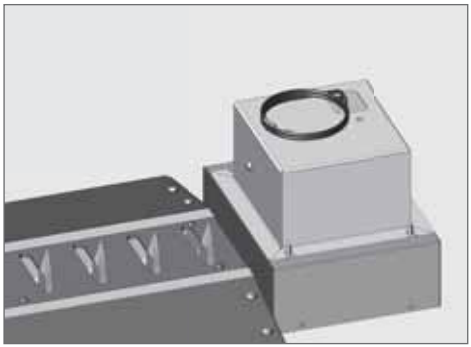
STEP 2 FIGURE 56



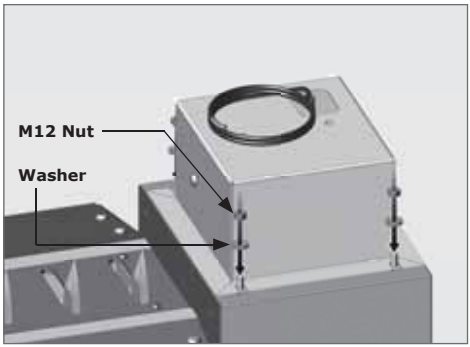
STEP 3 FIGURE 57



STEP 4 FIGURE 58



STEP 5 FIGURE 59



STEP 6 FIGURE 60

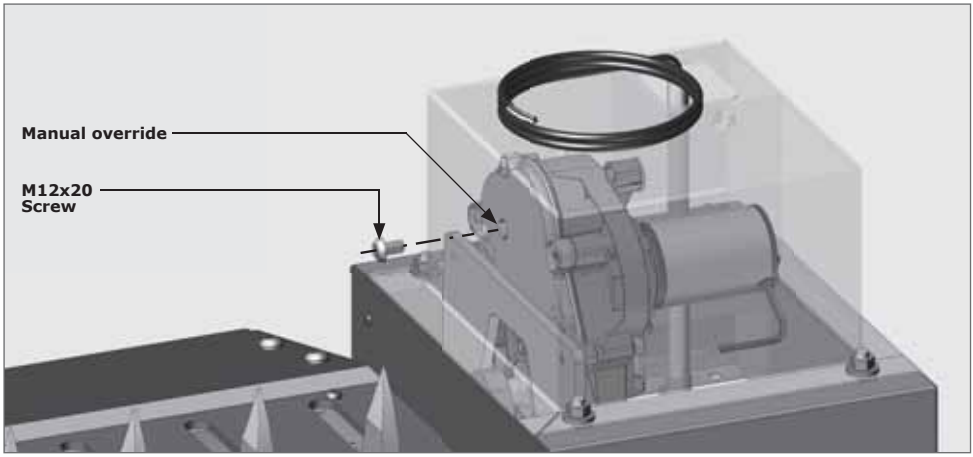
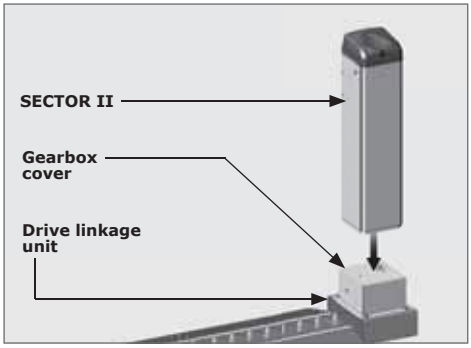
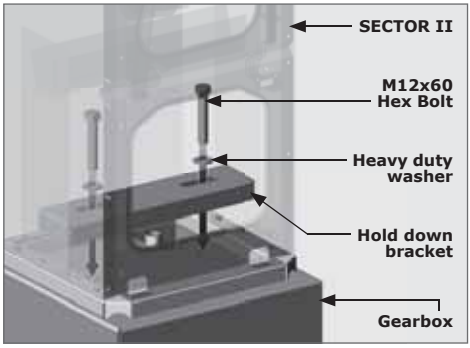


FIGURE 61. MANUAL OVERRIDE

7.4.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 62



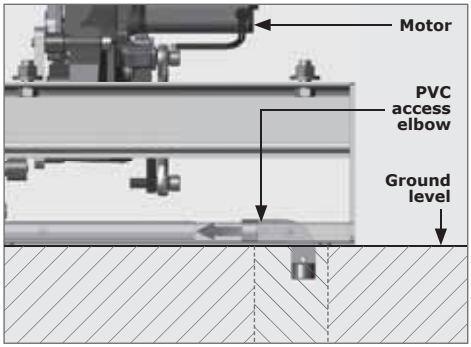
STEP 2 FIGURE 63

7.4.2. Seperately-placed CLAWS and SECTOR II

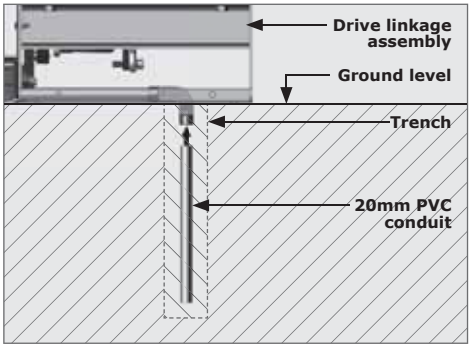
7.4.2.1. Running the conduit from the gearbox to the SECTOR II

STEP 1

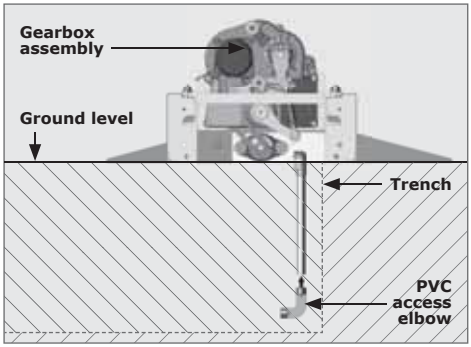
Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.



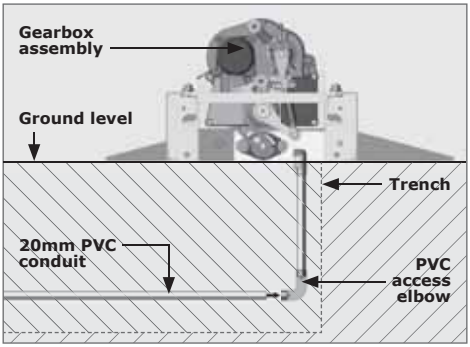
STEP 2 FIGURE 64



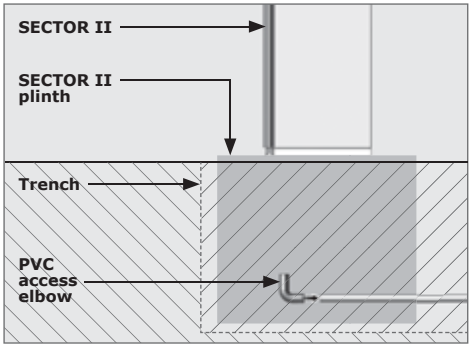
STEP 3 FIGURE 65



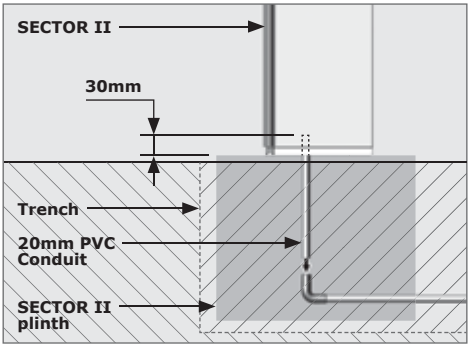
STEP 4 FIGURE 66



STEP 5 FIGURE 67



STEP 6 FIGURE 68

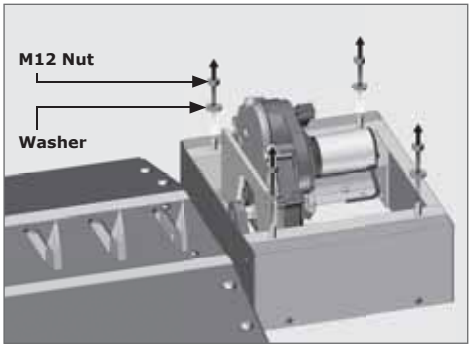


STEP 7 FIGURE 69

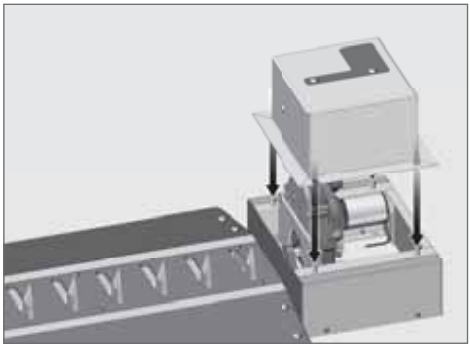
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

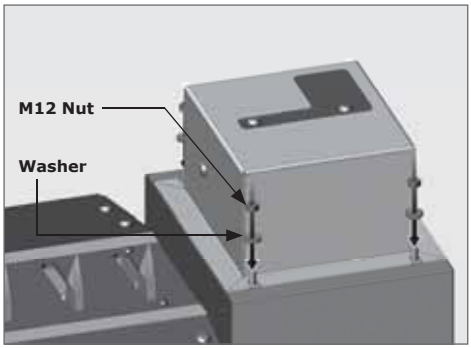
7.4.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 70



STEP 2 FIGURE 71



STEP 3 FIGURE 72

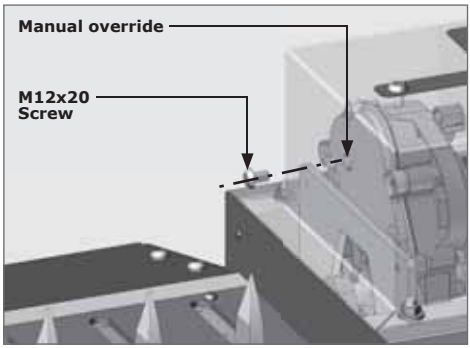
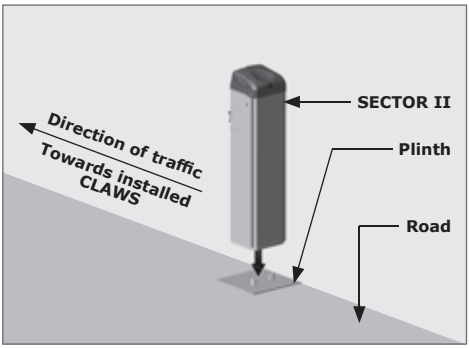


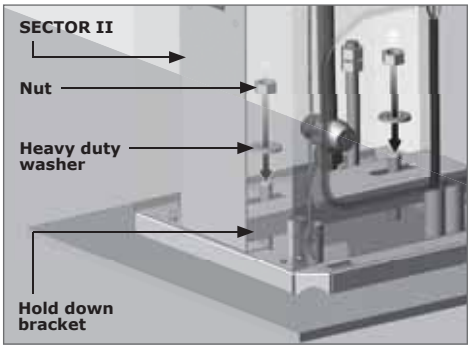
FIGURE 73. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

7.4.2.3. Placing the SECTOR II into position

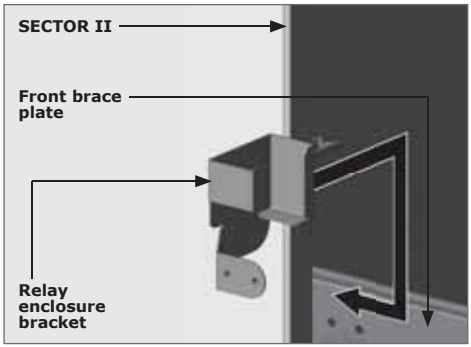


STEP 1 FIGURE 74

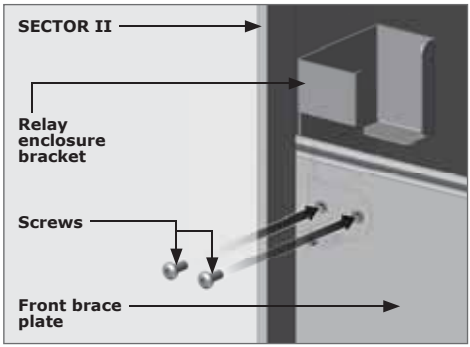


STEP 2 FIGURE 75

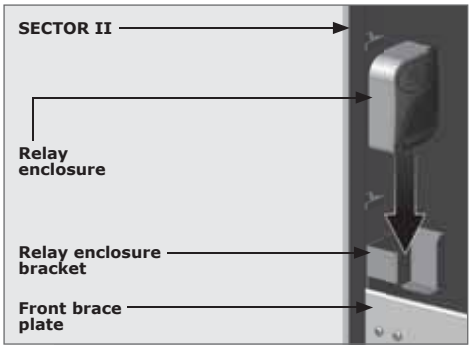
7.4.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 76



STEP 2 FIGURE 77

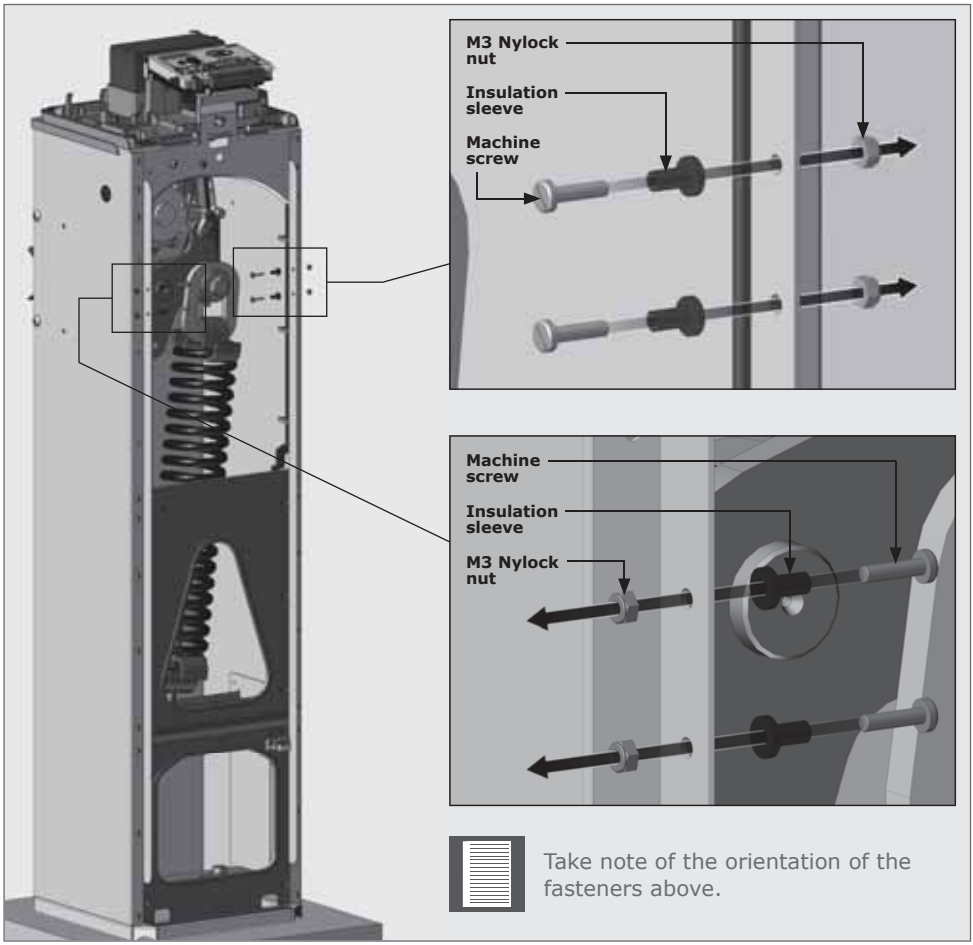


Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

STEP 1 FIGURE 78

7.4.5. Fitting the CLAWS controller to the SECTOR II



STEP 1 FIGURE 79

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

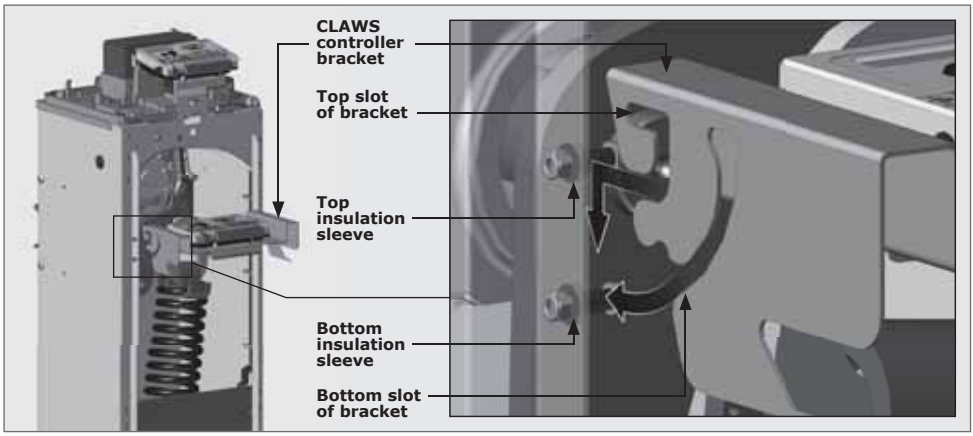


FIGURE 80

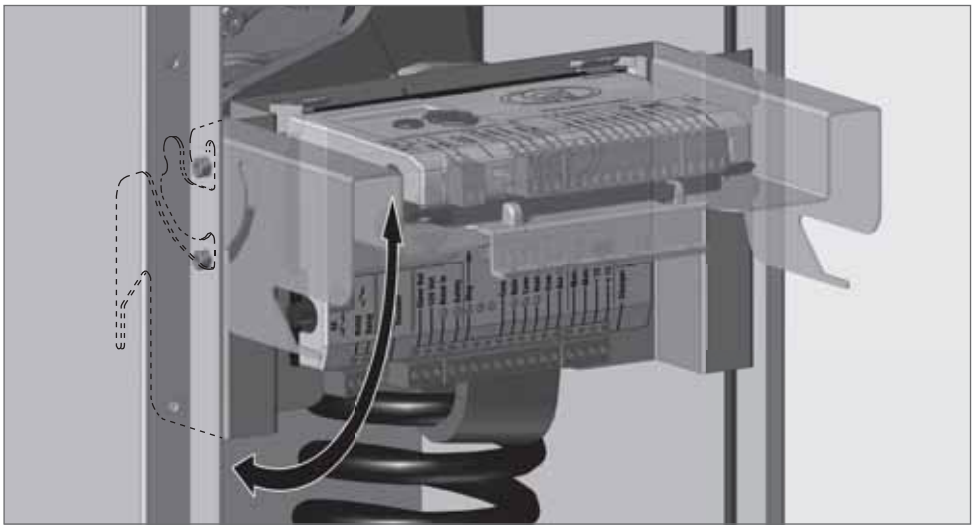


FIGURE 81

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 7, Figure 82).

It can also be moved lower down for optimum space when working on the gearbox (Section 7, Figure 83).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 7, Figure 80).

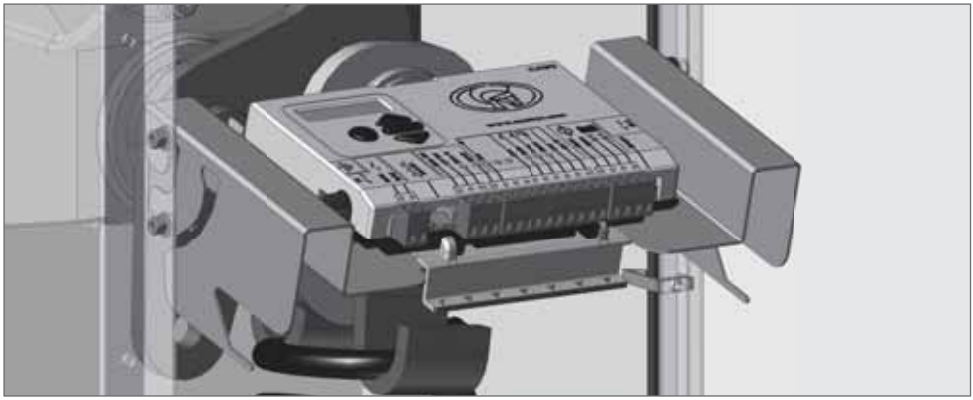


FIGURE 82. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

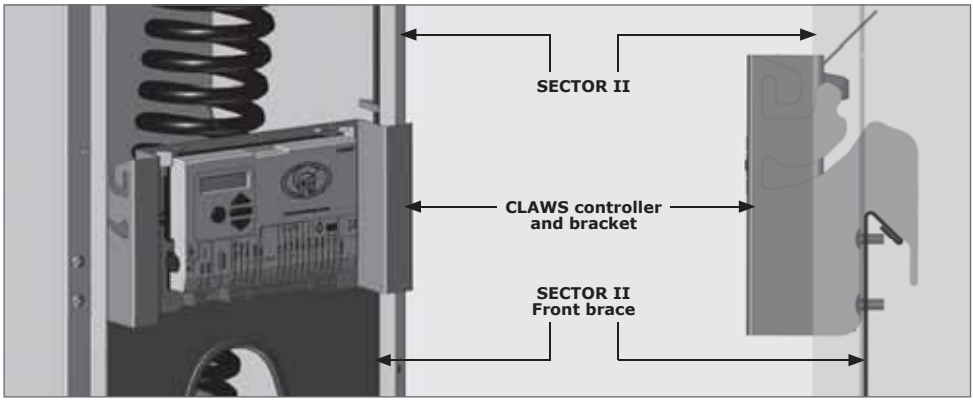


FIGURE 83. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

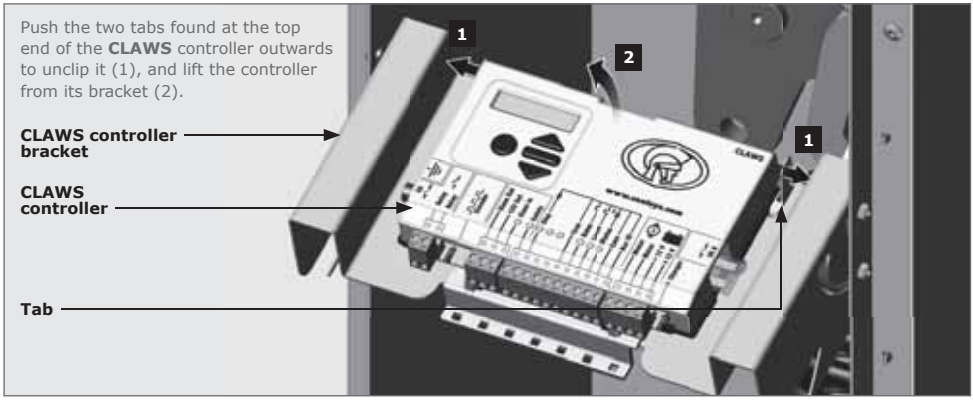


FIGURE 84. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

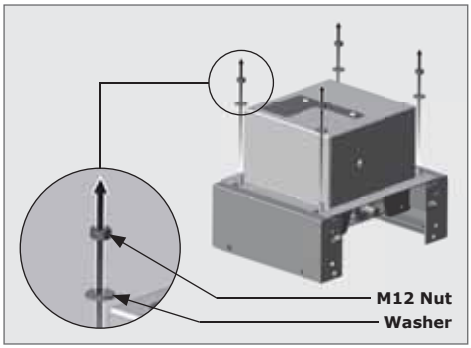
STEP 3

Connect harness and power supply. Refer to the wiring diagrams and controller settings.

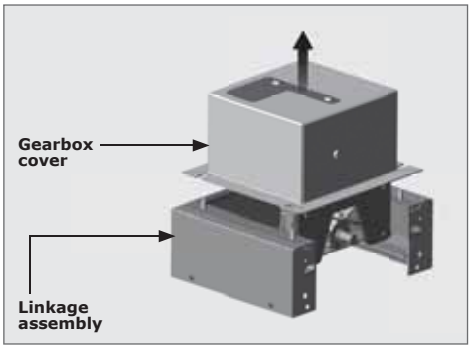
Notes

8. LHS Surface Mount - Similar Direction of Travel

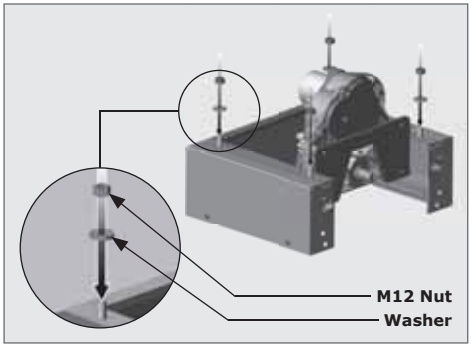
8.1. Preparing the Drive Linkage Assembly



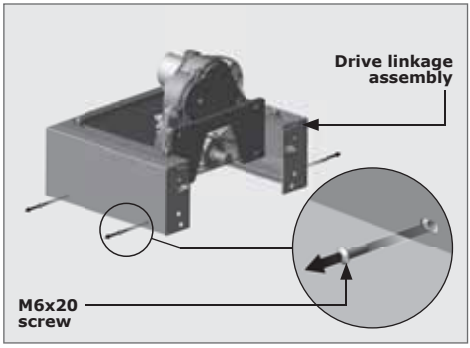
STEP 1 FIGURE 1



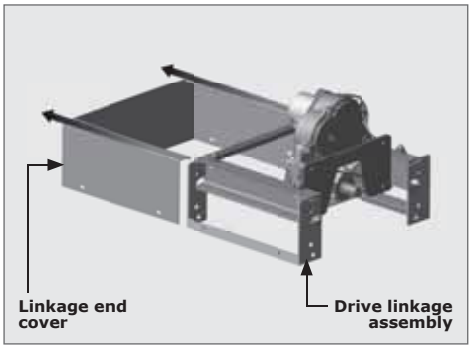
STEP 2 FIGURE 2



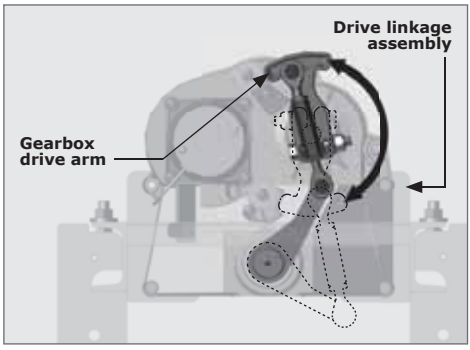
STEP 3 FIGURE 3



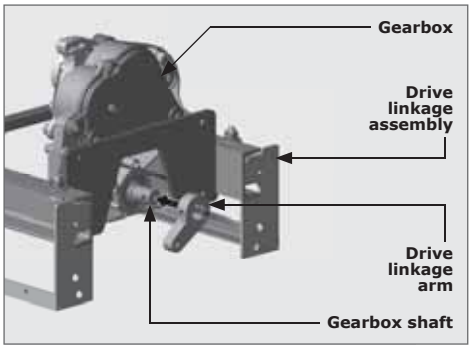
STEP 4 FIGURE 4



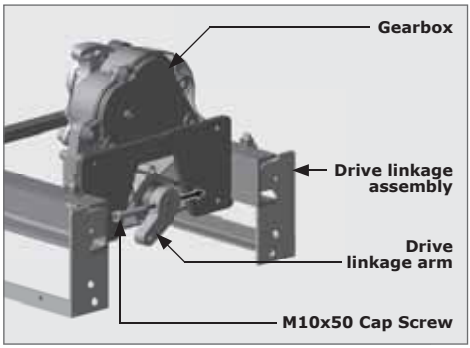
STEP 5 FIGURE 5



STEP 6 FIGURE 6

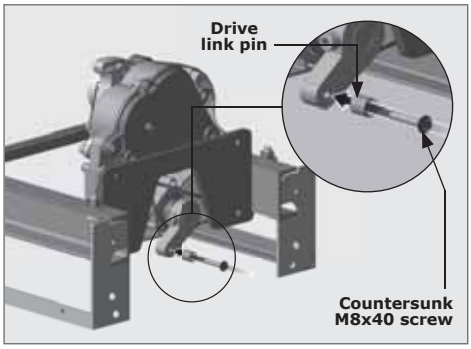


STEP 7 FIGURE 7



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

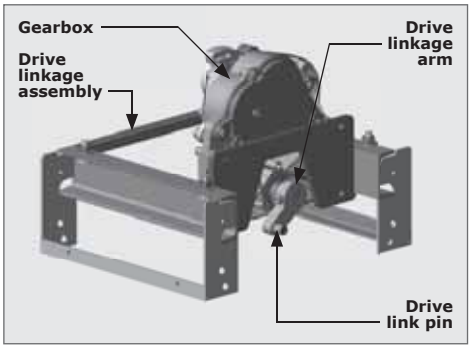
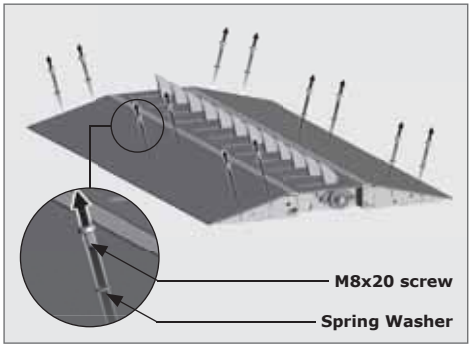


FIGURE 10

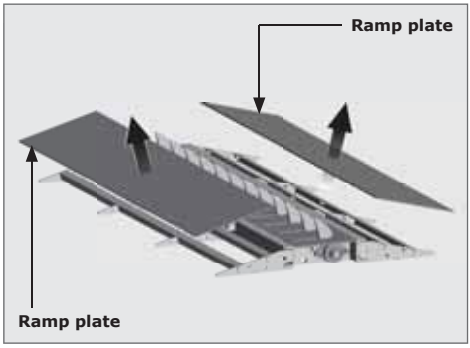
Tighten the Countersunk M8x40 screw to 20Nm (Section 8, Figure 9).

8.2. Spike Module Assembly

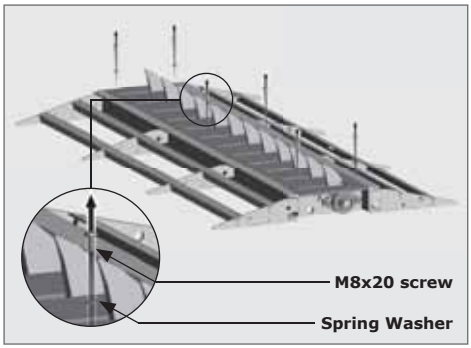
8.2.1. Preparing the Spike Model assembly(ies) for installation



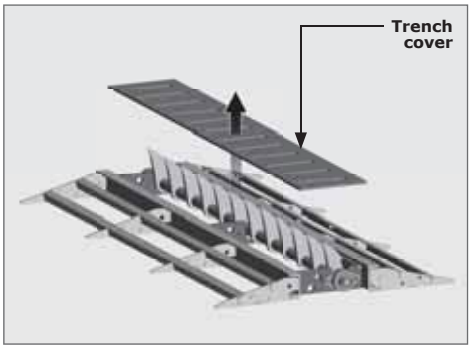
STEP 1 FIGURE 11



STEP 2 FIGURE 12



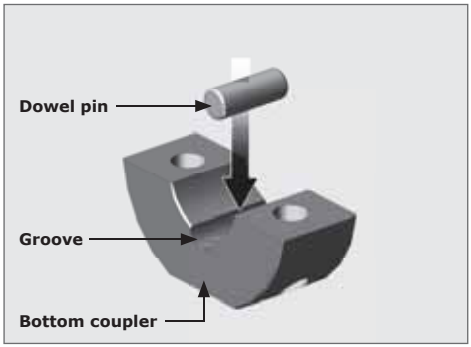
STEP 3 FIGURE 13



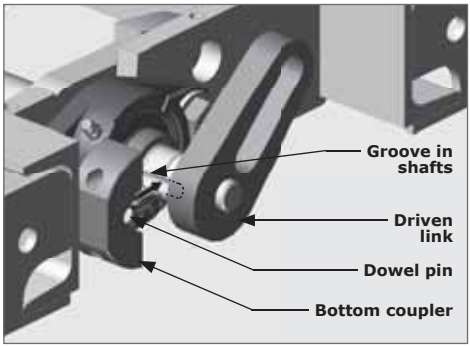
STEP 4 FIGURE 14

8.2.2. 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.

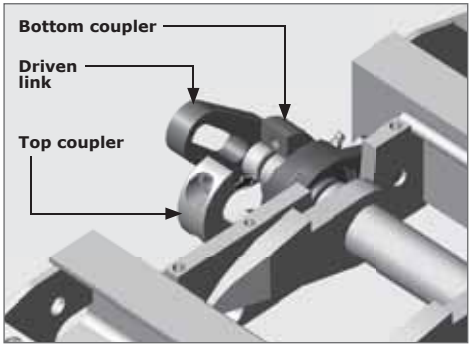


STEP 1 FIGURE 15

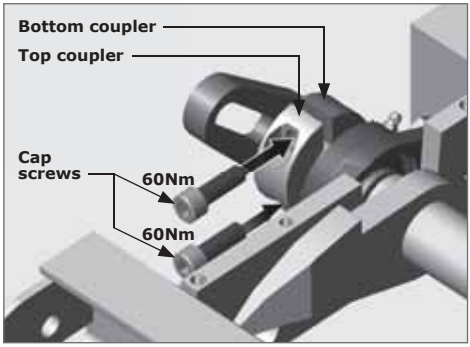


STEP 2 FIGURE 16

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

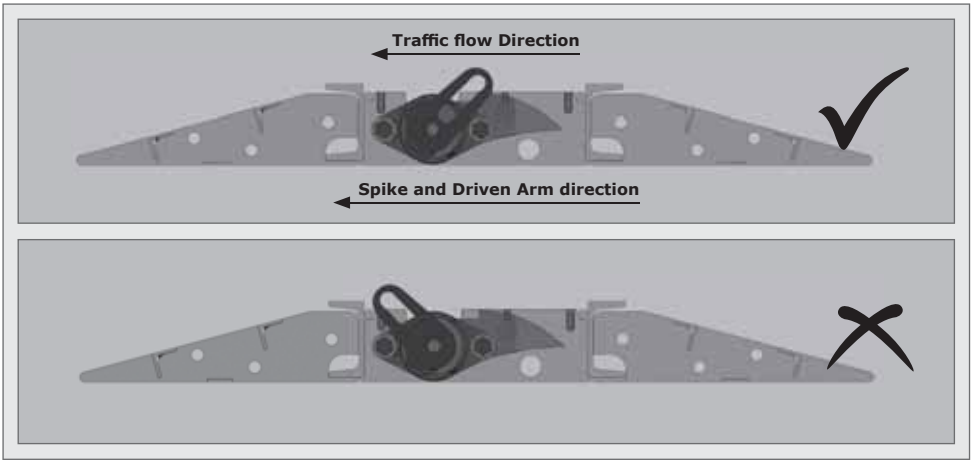


FIGURE 19

8.2.3. Aligning the Driven Linkage Arm to the Drive Linkage Arm.

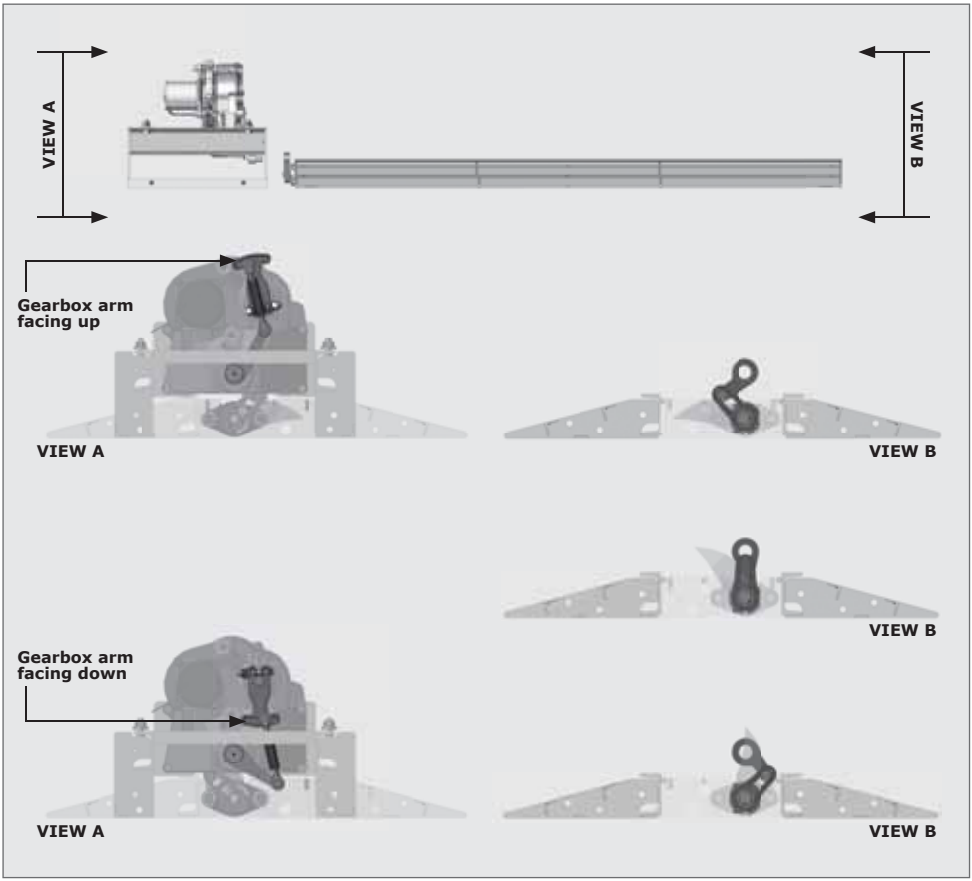
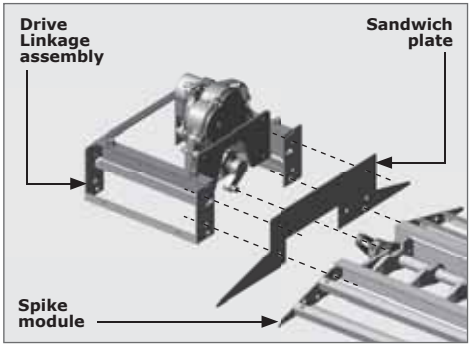


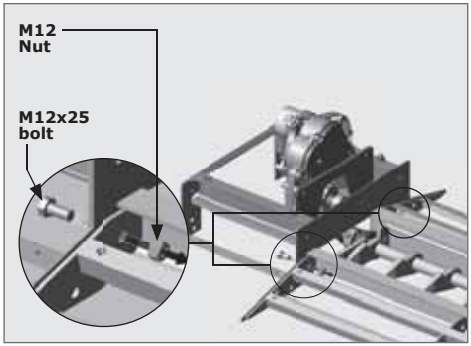
FIGURE 20

8.2.4. Attaching the drive linkage assembly to the spike module

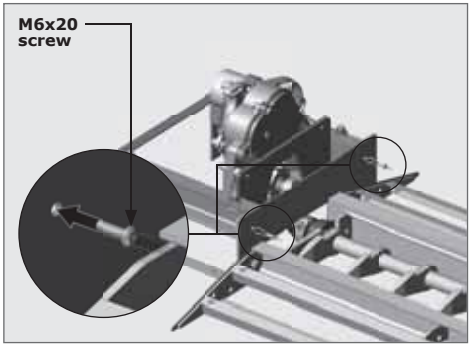
Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 8, Figure 21).



STEP 1 **FIGURE 21**

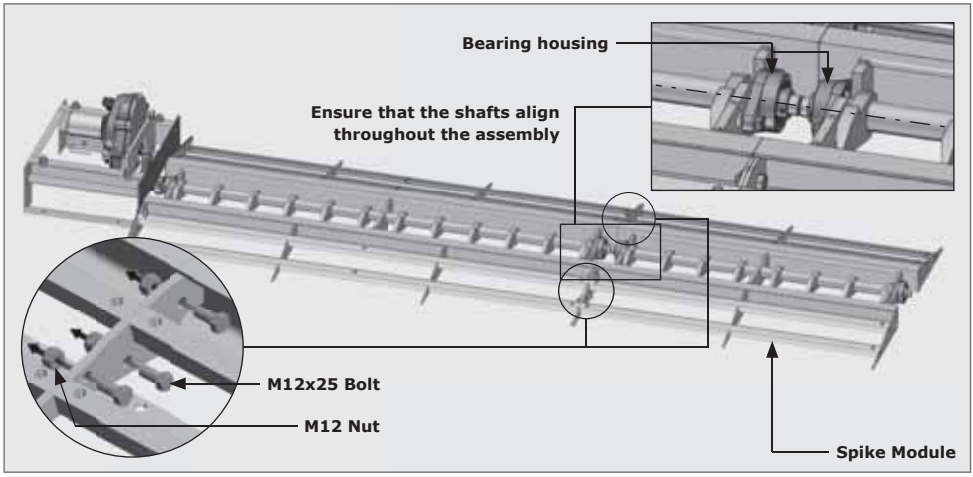


STEP 2 **FIGURE 22**



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.

8.2.5. 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.

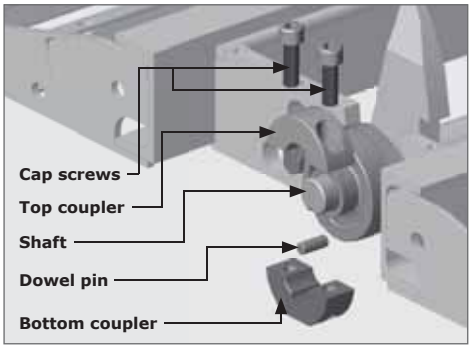


FIGURE 25. SHAFT COUPLER

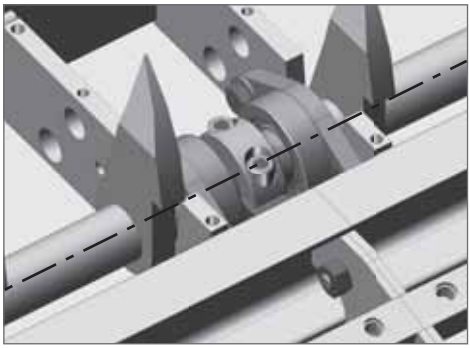
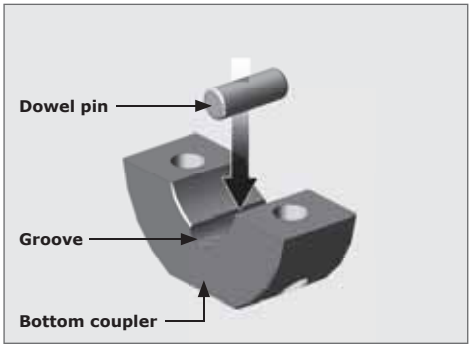
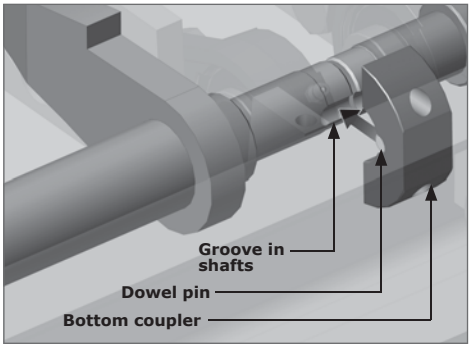


FIGURE 26

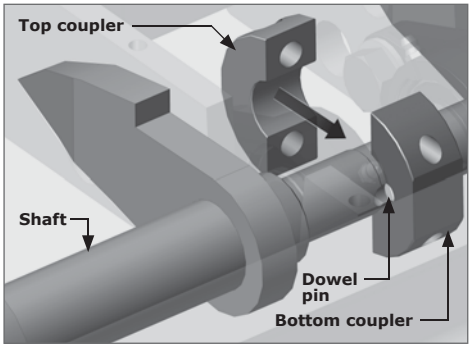
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



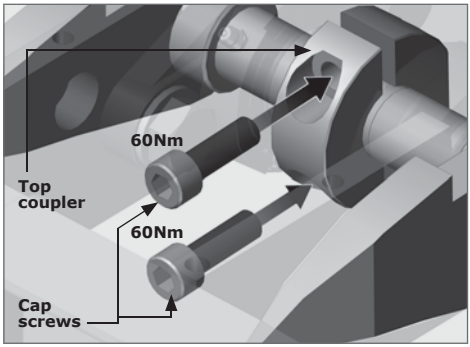
STEP 1 FIGURE 27



STEP 2 FIGURE 28

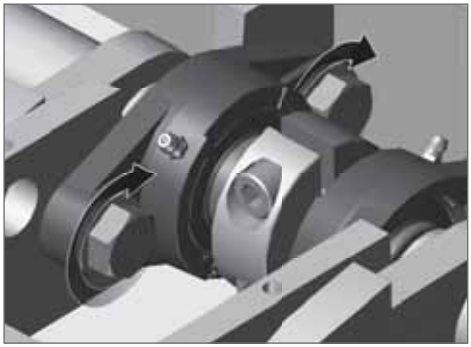


STEP 3 FIGURE 29

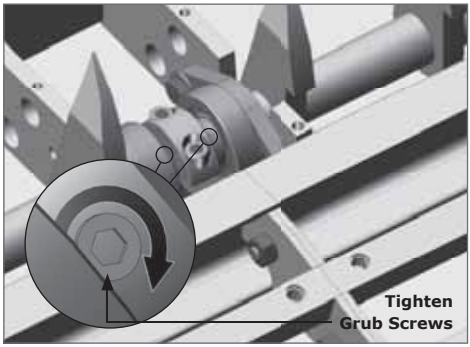


STEP 4 FIGURE 30

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**

8.2.6. Bolting down the assembly to the ground

If the SECTOR II and **CLAWS** are to be seperated, 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 SECTOR II. (Section 8.4.2.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

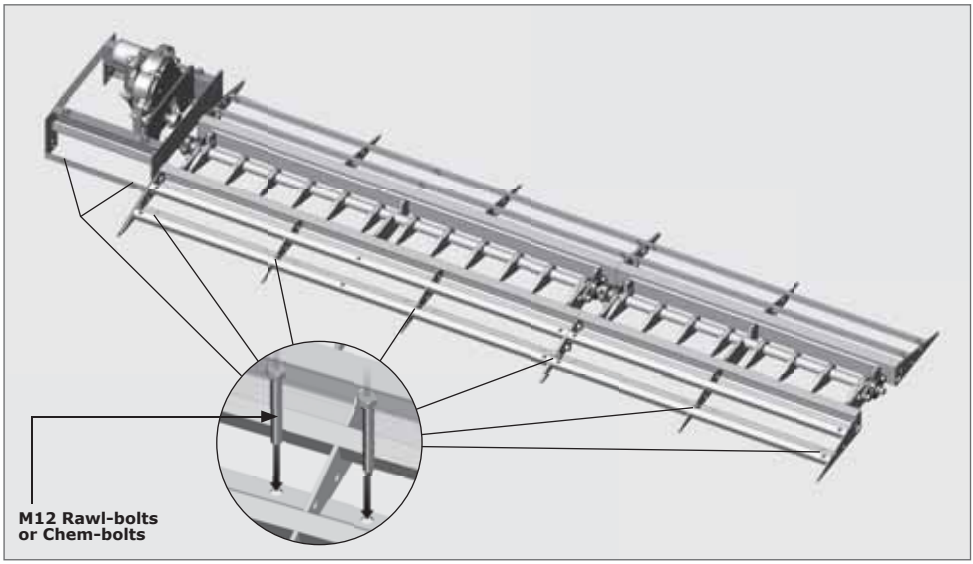
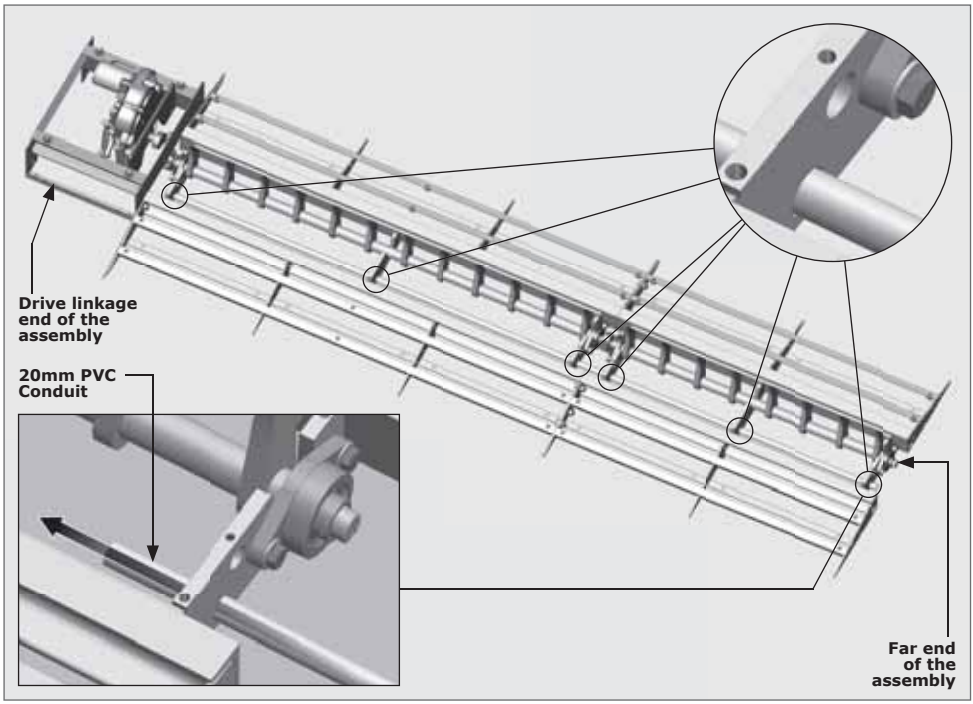


FIGURE 33

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.

8.2.7. 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 8, Figure 35).

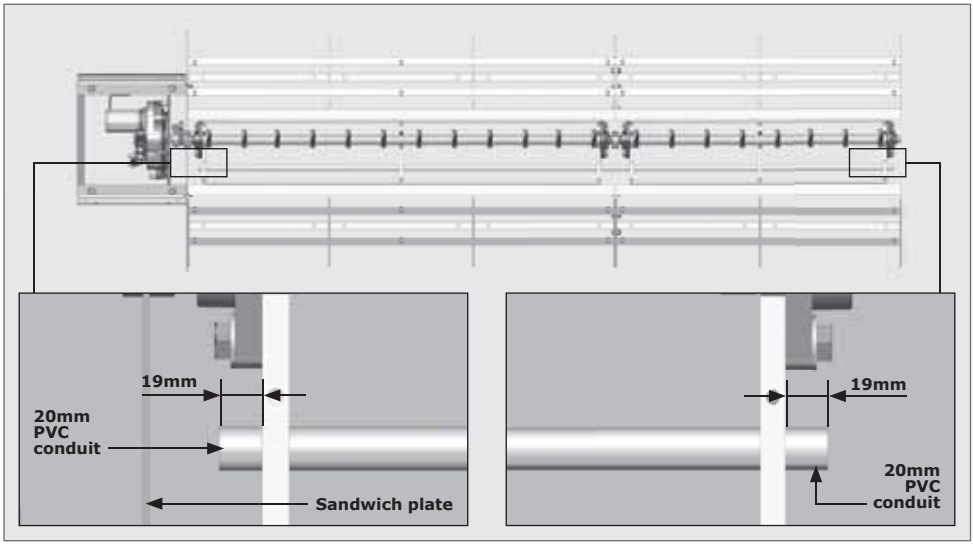
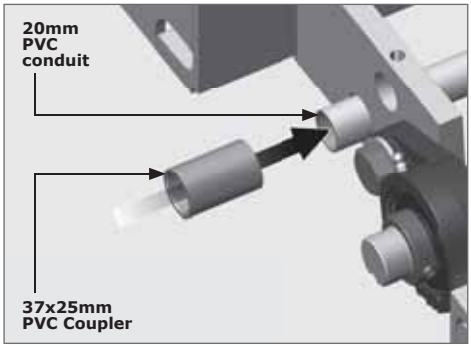
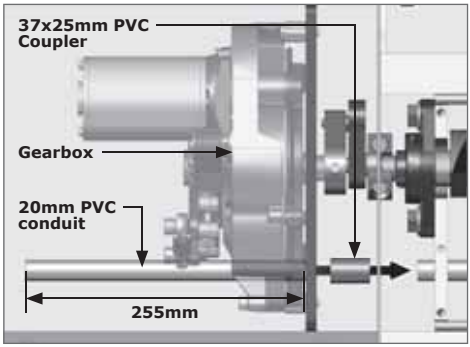


FIGURE 35

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

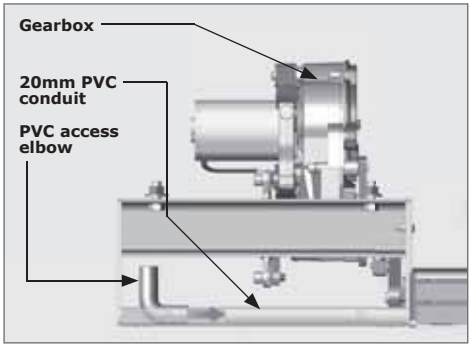


STEP 2 FIGURE 36

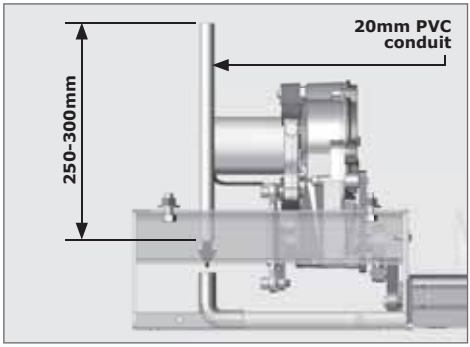


STEP 3 FIGURE 37

Steps 4-7 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, 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.

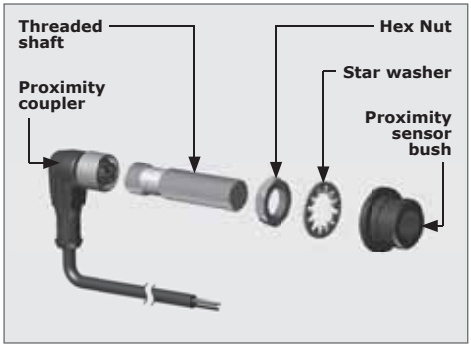


FIGURE 40. PROXIMITY SENSOR

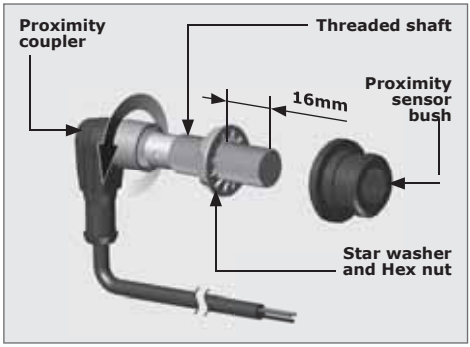


FIGURE 41. PROXIMITY SENSOR

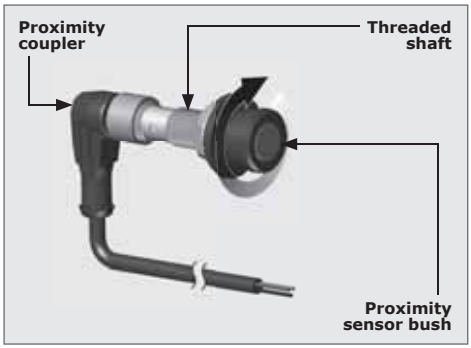
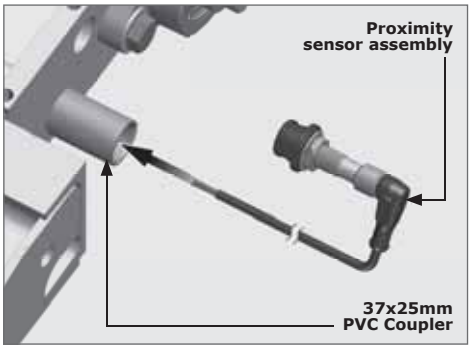


FIGURE 42. PROXIMITY SENSOR



STEP 8

FIGURE 43

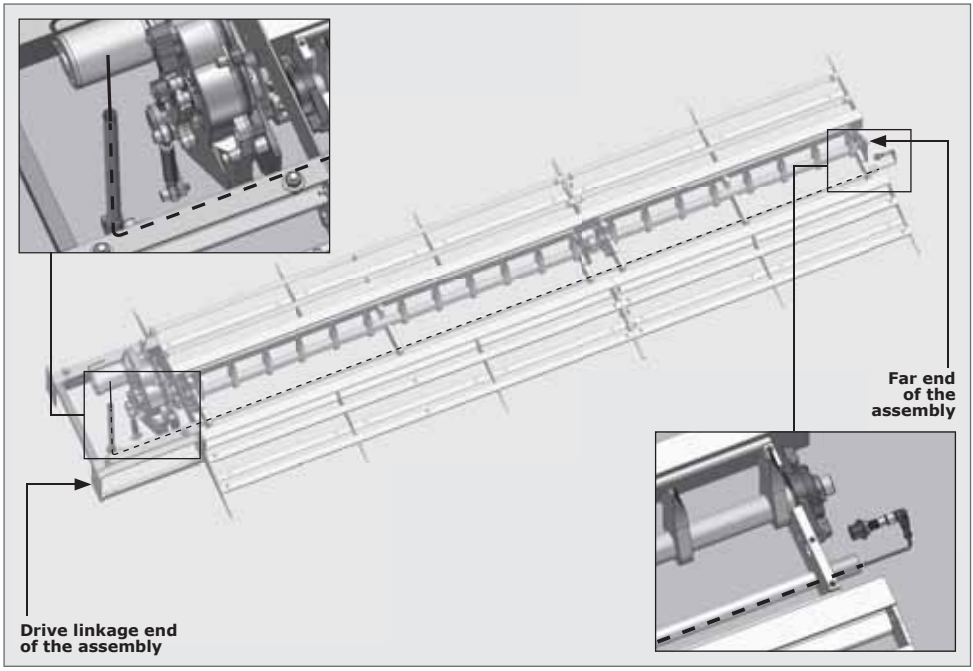
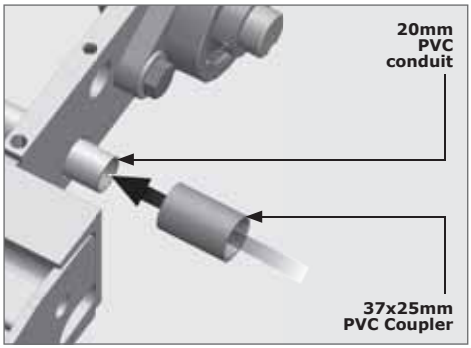
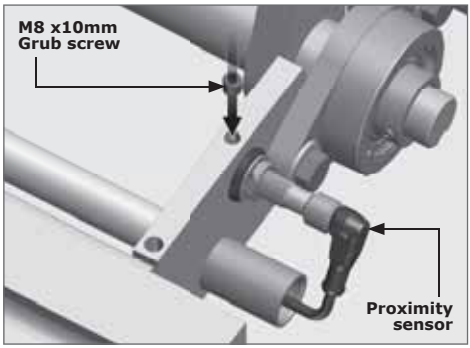


FIGURE 44

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

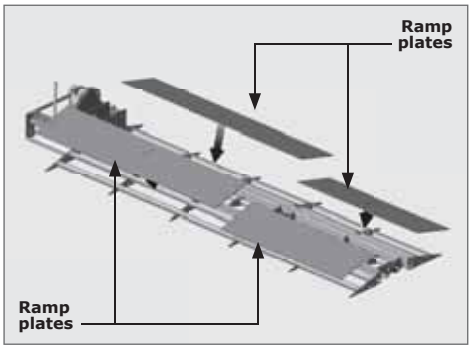


STEP 9 FIGURE 47

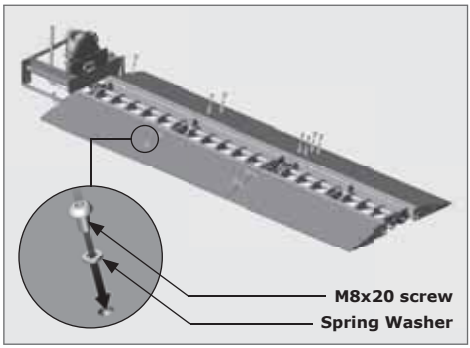


STEP 10 FIGURE 48

8.3. Re-assembling the ramp plates and linkage cover

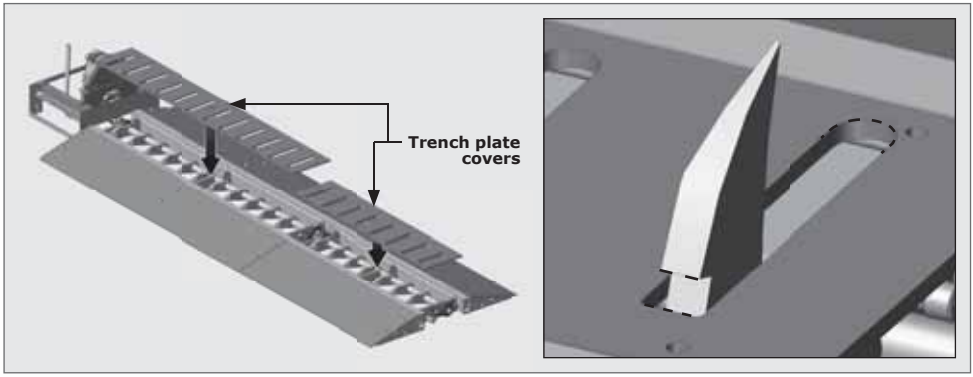


STEP 1 FIGURE 49



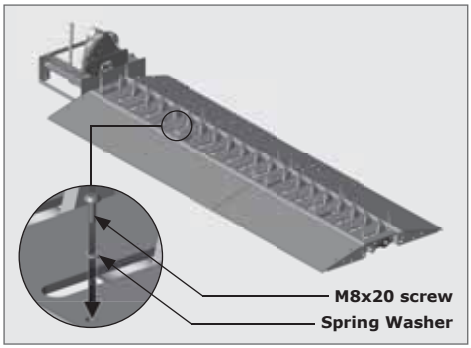
STEP 2 FIGURE 50

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.

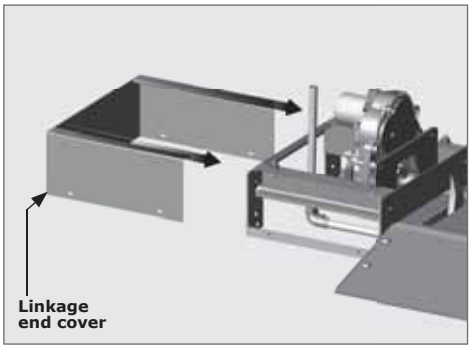


STEP 3 FIGURE 51

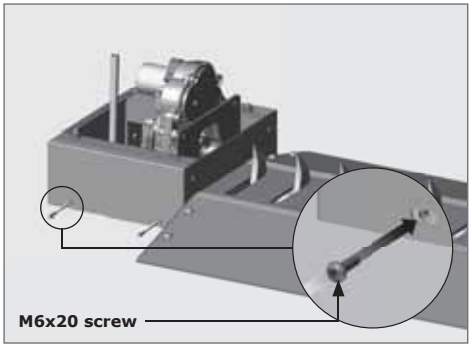
Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



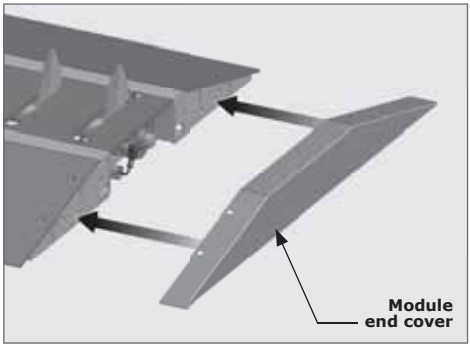
STEP 4 FIGURE 52



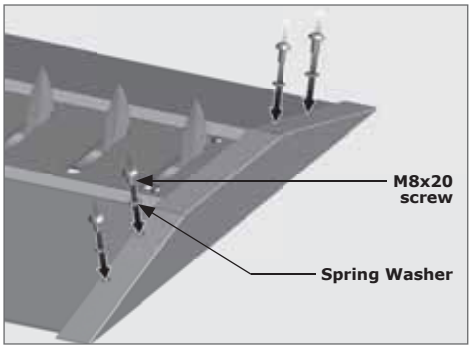
STEP 5 FIGURE 53



STEP 6 FIGURE 54



STEP 7 FIGURE 55

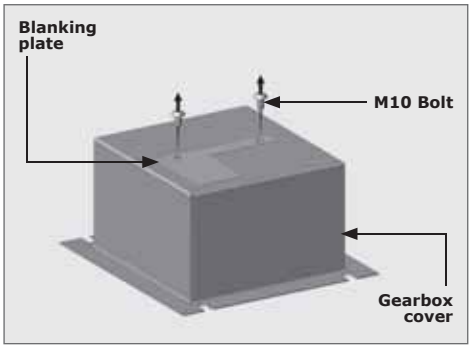


STEP 8 FIGURE 56

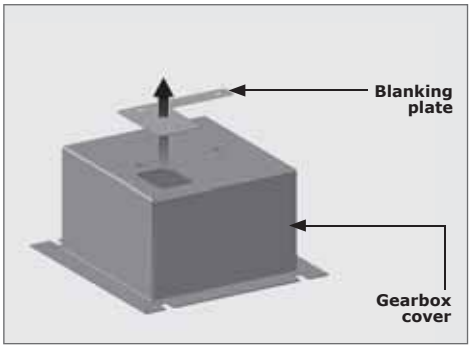
8.4. Integrating the SECTOR II with the CLAWS

8.4.1. Directly mount THE SECTOR II onto the Independent Drive

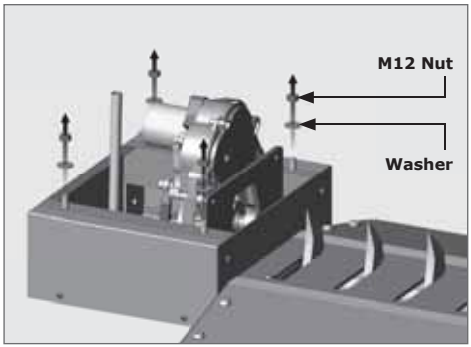
8.4.1.1. Placing the gearbox cover into position



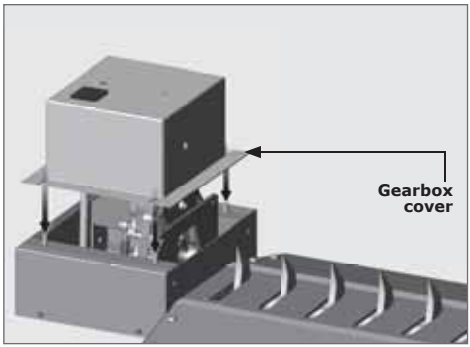
STEP 1 FIGURE 57



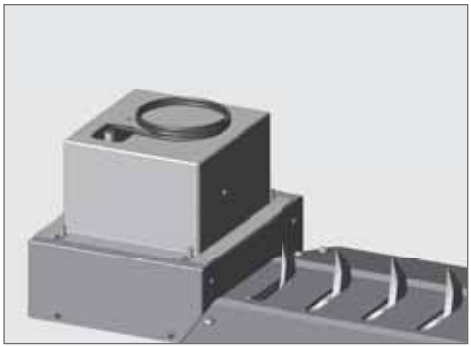
STEP 2 FIGURE 58



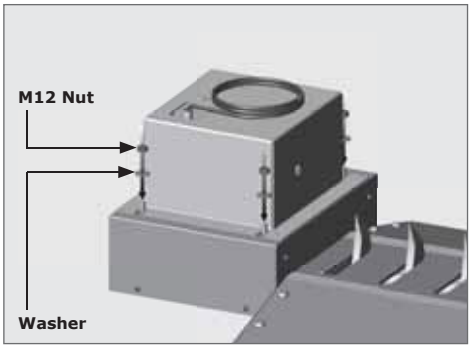
STEP 3 FIGURE 59



STEP 4 FIGURE 60



STEP 5 FIGURE 61



STEP 6 FIGURE 62

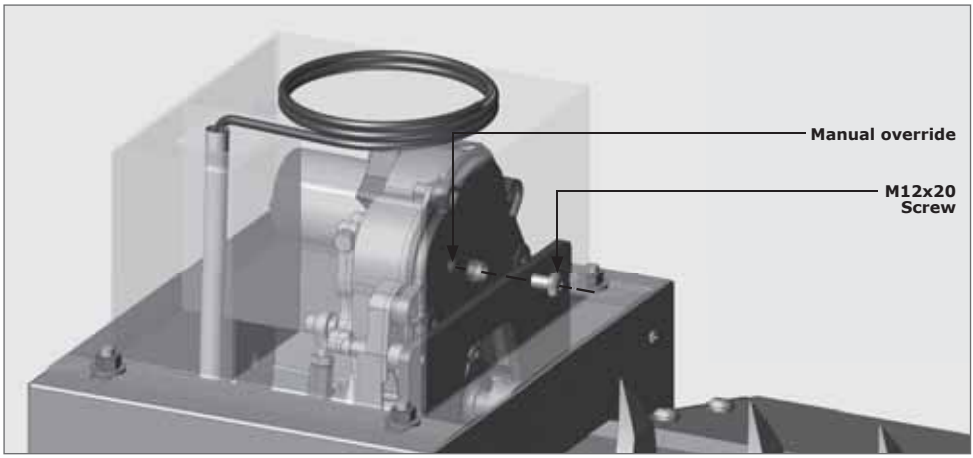
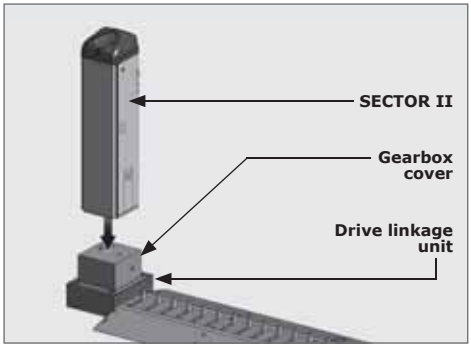
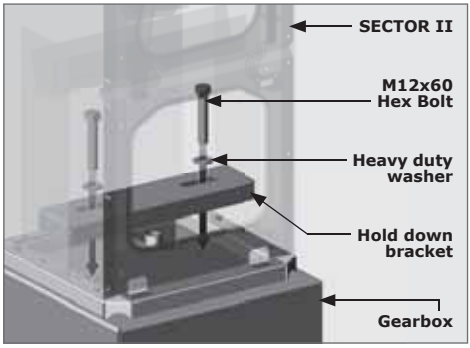


FIGURE 63. MANUAL OVERRIDE

8.4.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 64



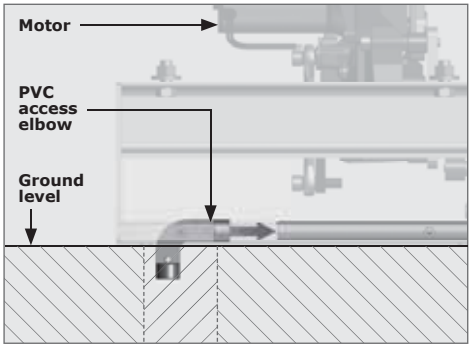
STEP 2 FIGURE 65

8.4.2. Seperately-placed CLAWS and SECTOR II

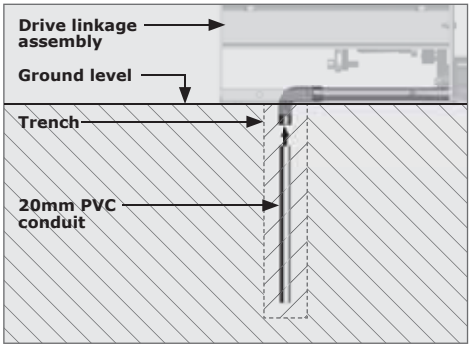
8.4.2.1. Running the conduit from the gearbox to the SECTOR II

STEP 1

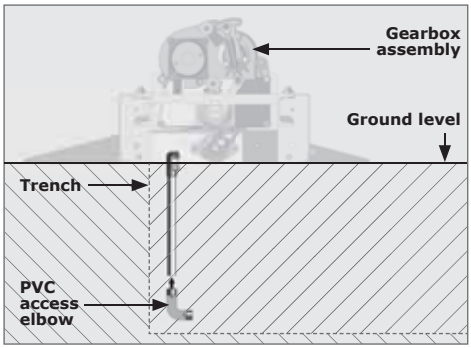
Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.



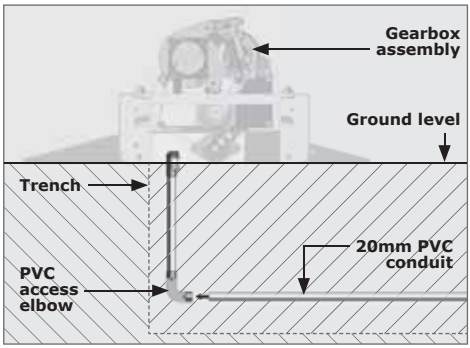
STEP 2 FIGURE 66



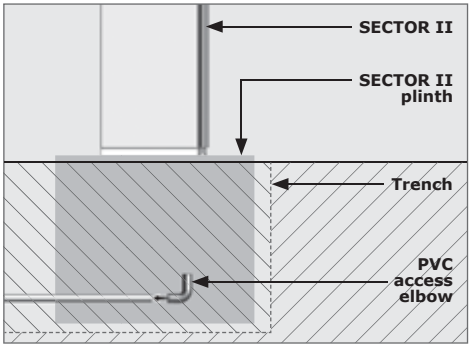
STEP 3 FIGURE 67



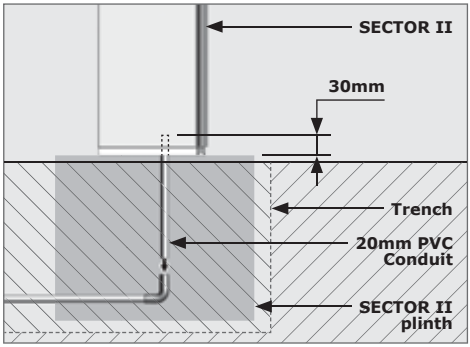
STEP 4 FIGURE 68



STEP 5 FIGURE 69



STEP 6 FIGURE 70

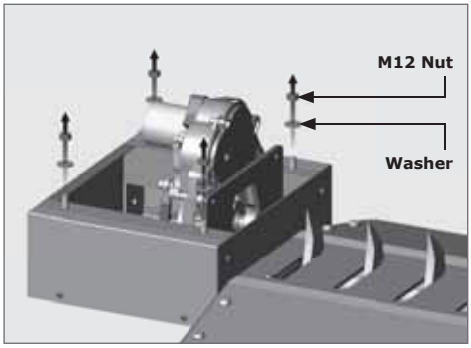


STEP 7 FIGURE 71

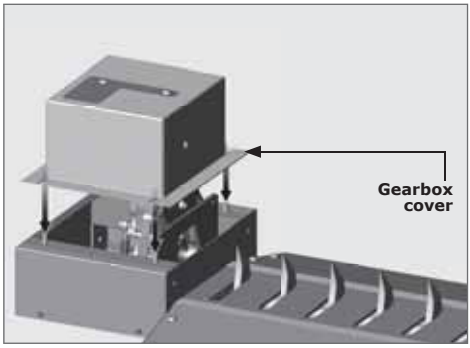
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

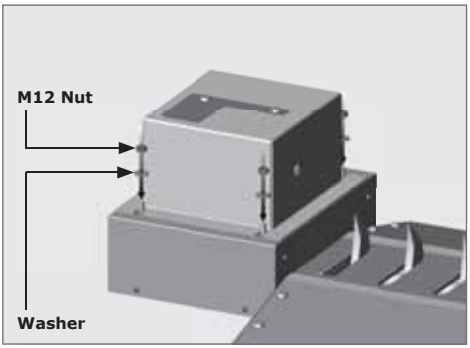
8.4.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 72



STEP 2 FIGURE 73



STEP 3 FIGURE 74

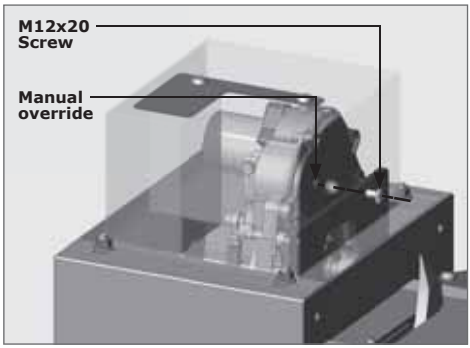
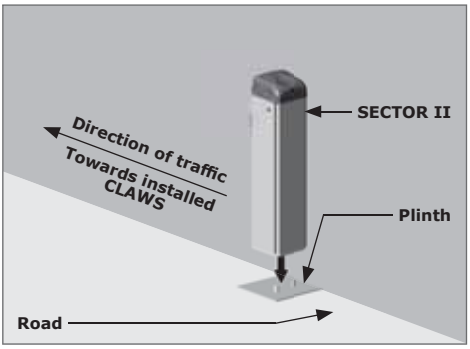


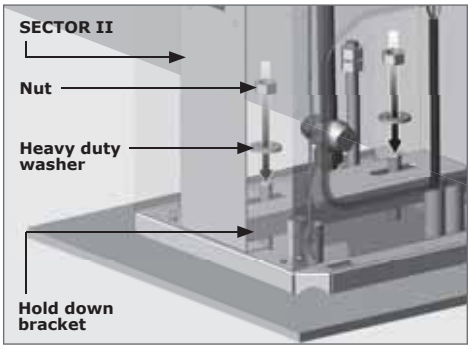
FIGURE 75. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

8.4.2.3. Placing the SECTOR II into position

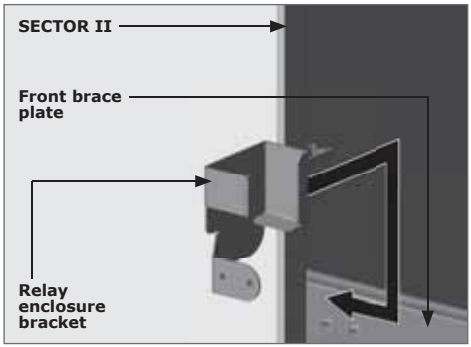


STEP 1 FIGURE 76

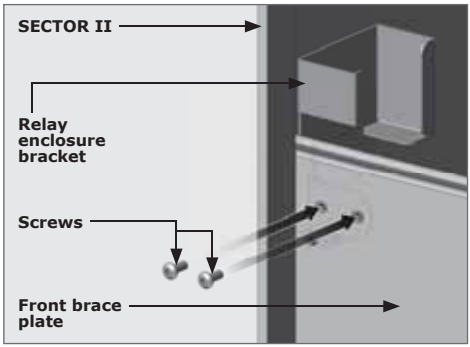


STEP 2 FIGURE 77

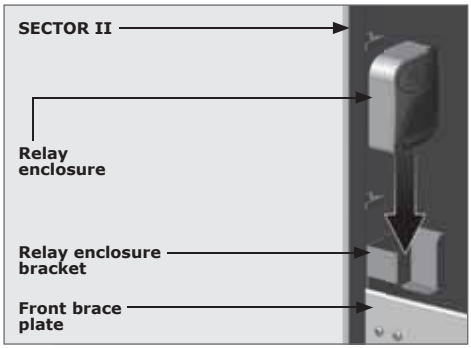
8.4.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 78



STEP 2 FIGURE 79

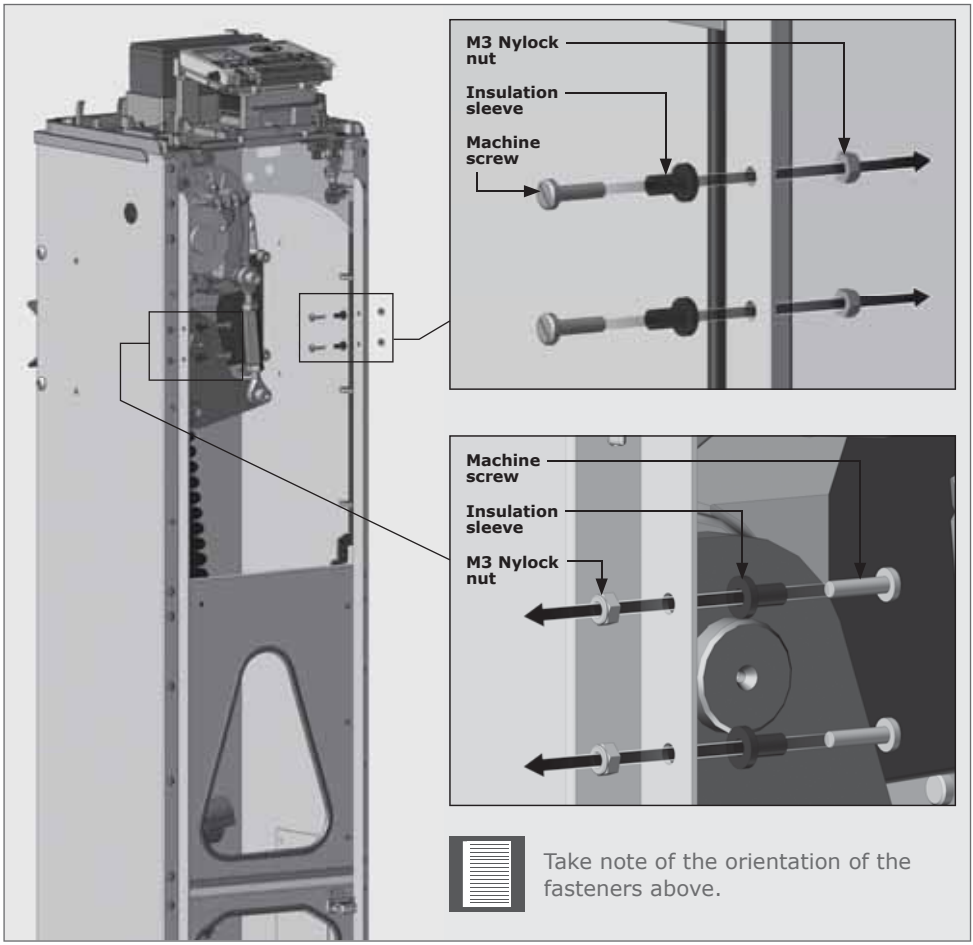


STEP 1 FIGURE 80

Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

8.4.5. Fitting the CLAWS controller to the SECTOR II



Take note of the orientation of the fasteners above.

STEP 1 FIGURE 81

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

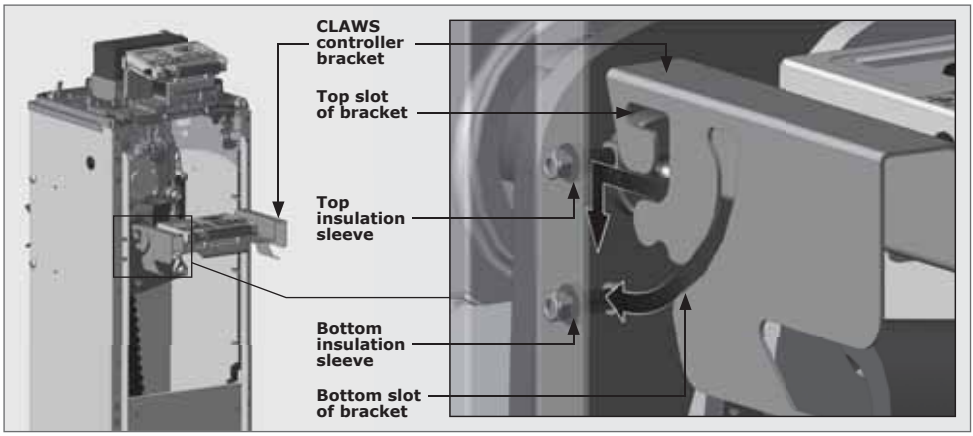


FIGURE 82

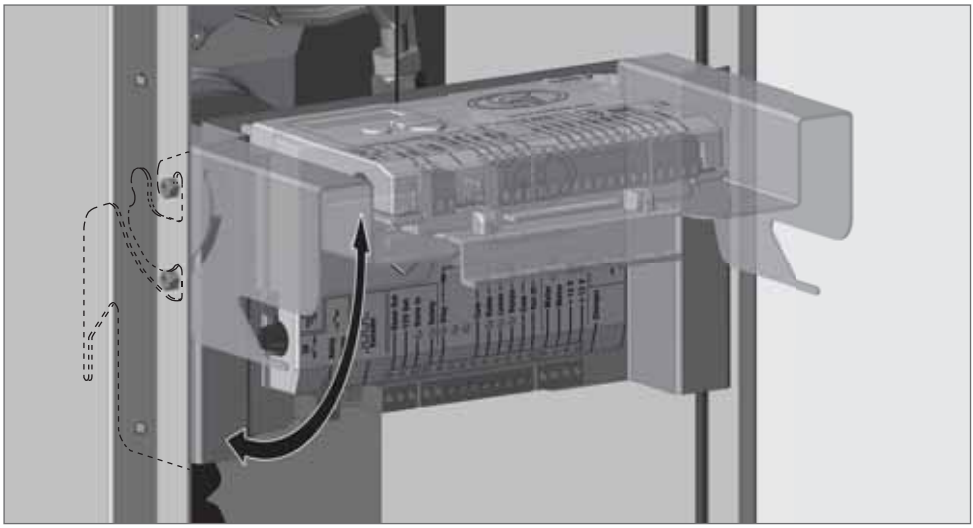


FIGURE 83

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 8, Figure 84).

It can also be moved lower down for optimum space when working on the gearbox (Section 8, Figure 85).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 8, Figure 82).

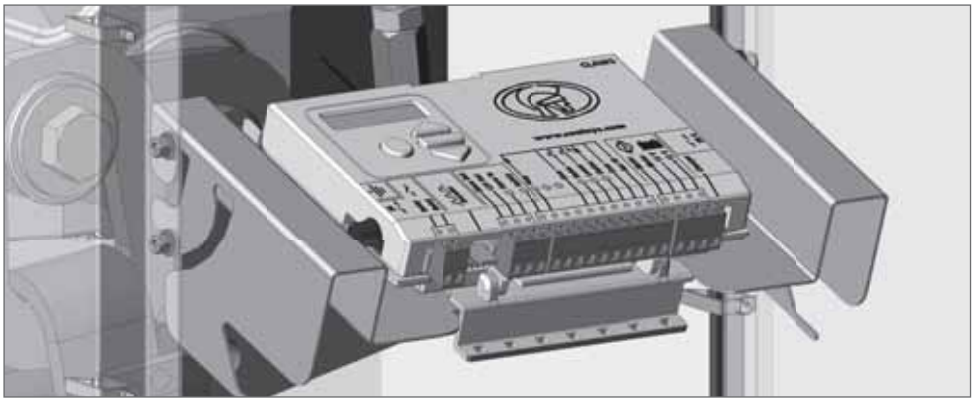


FIGURE 84. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

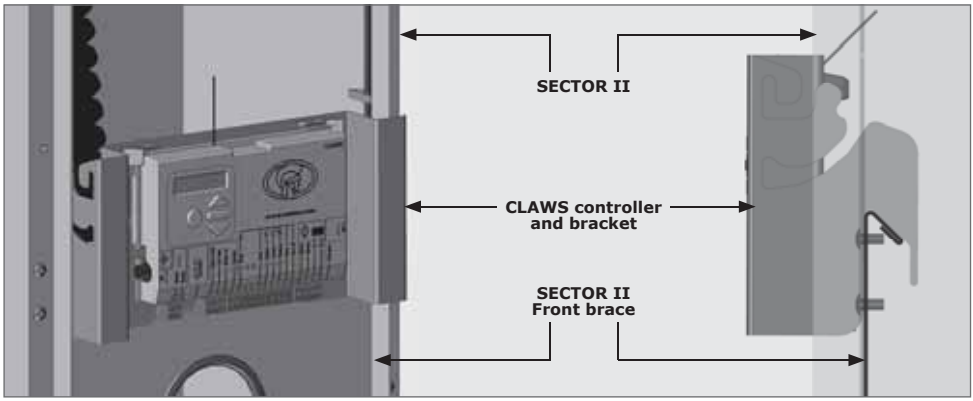


FIGURE 85. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

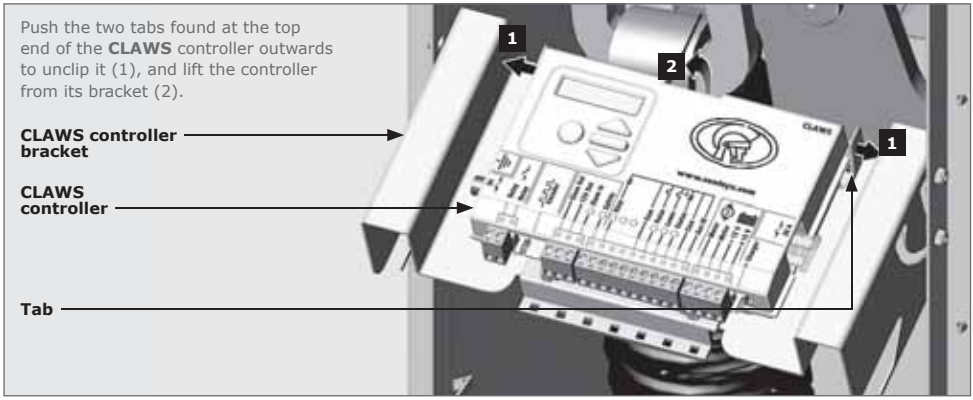


FIGURE 86. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

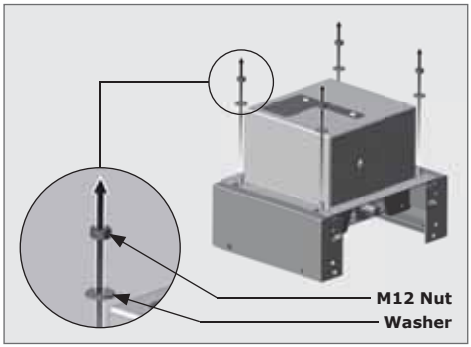
STEP 3

Connect harness and power supply. Refer to the wiring diagrams and controller settings.

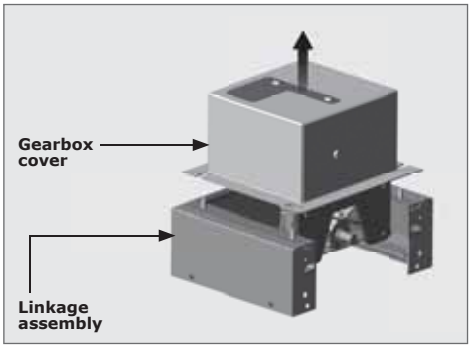
Notes

9. RHS Surface Mount - Opposing Direction of Travel

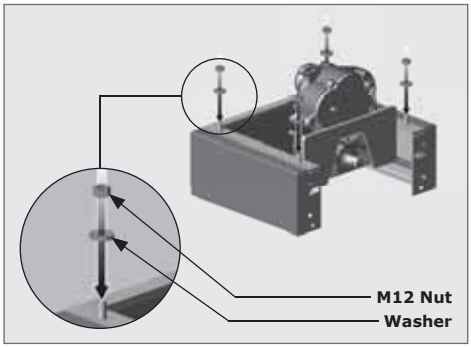
9.1. Preparing the Drive Linkage Assembly



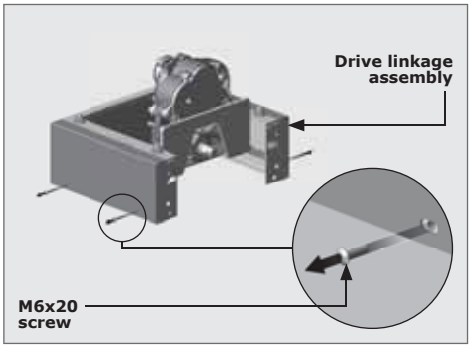
STEP 1 FIGURE 1



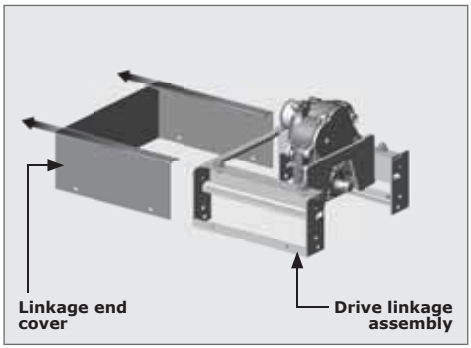
STEP 2 FIGURE 2



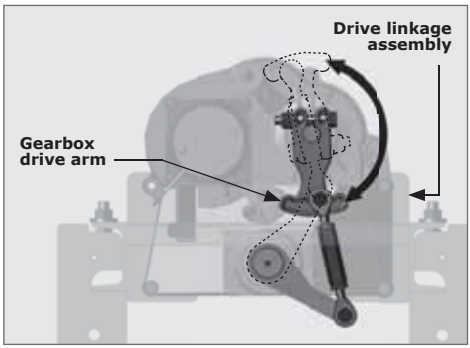
STEP 3 FIGURE 3



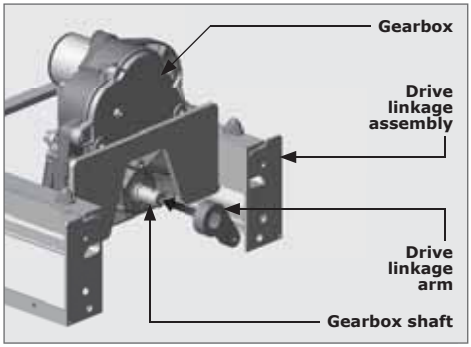
STEP 4 FIGURE 4



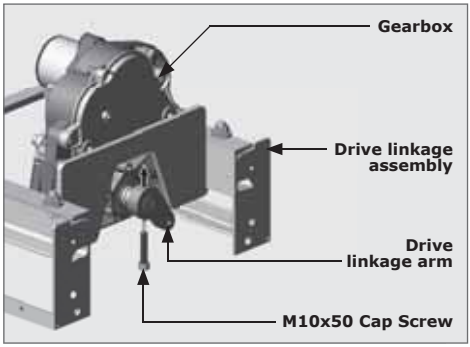
STEP 5 FIGURE 5



STEP 6 FIGURE 6

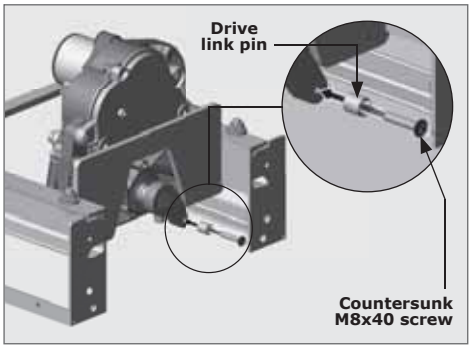


STEP 7 FIGURE 7



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

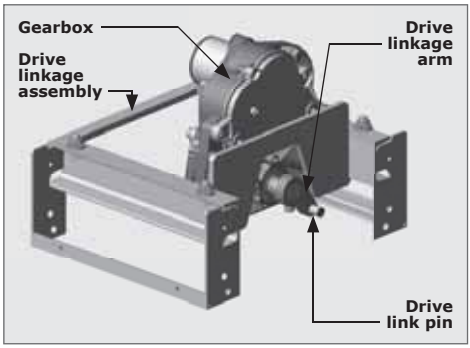
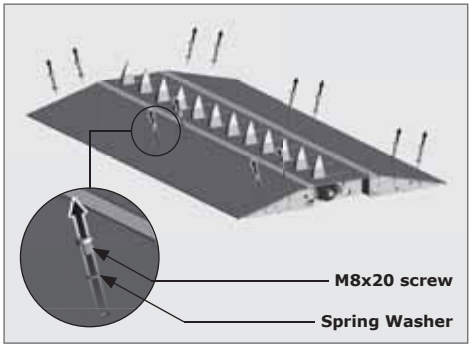


FIGURE 10

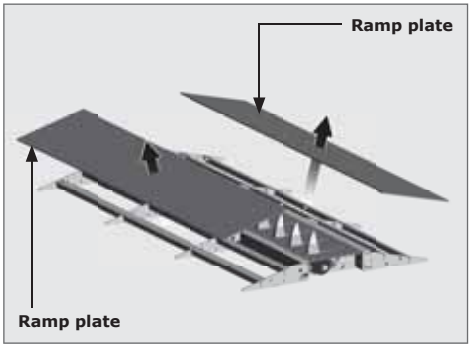
Tighten the Countersunk M8x40 screw to 20Nm (Section 9, Figure 9).

9.2. Spike Module Assembly

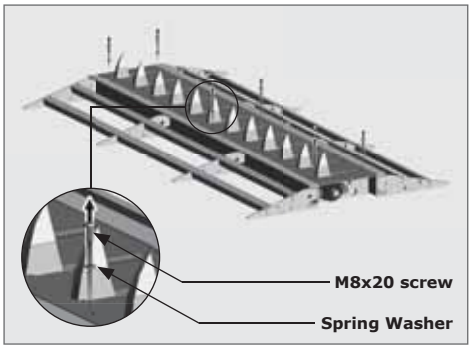
9.2.1. Preparing the Spike Model assembly(ies) for installation



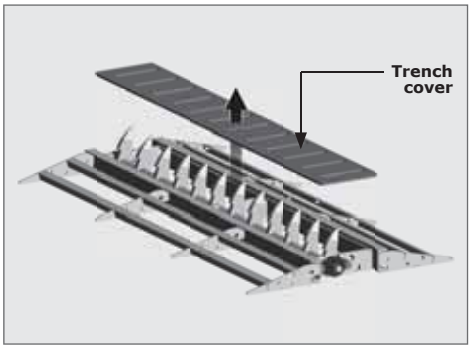
STEP 1 FIGURE 11



STEP 2 FIGURE 12



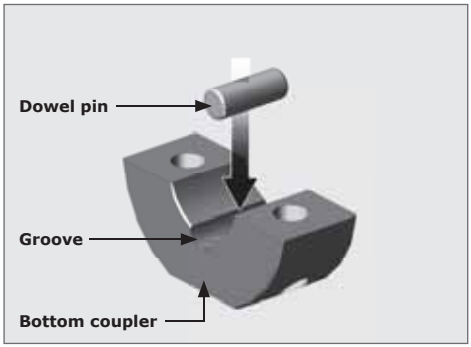
STEP 3 FIGURE 13



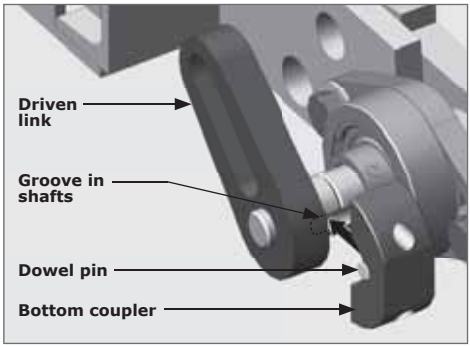
STEP 4 FIGURE 14

9.2.2. 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.

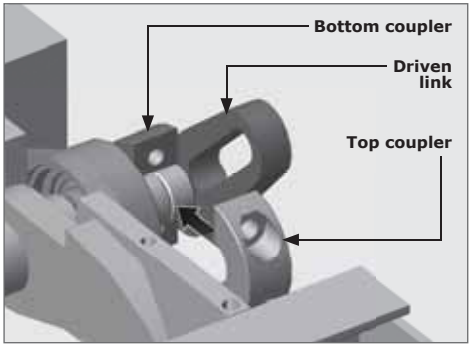


STEP 1 FIGURE 15

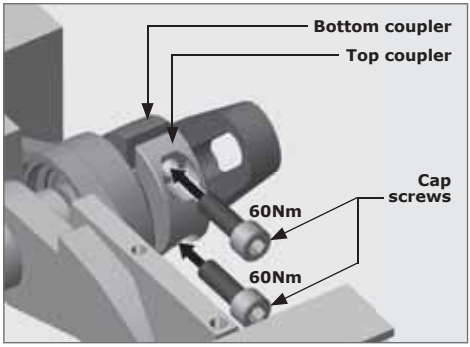


STEP 2 FIGURE 16

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

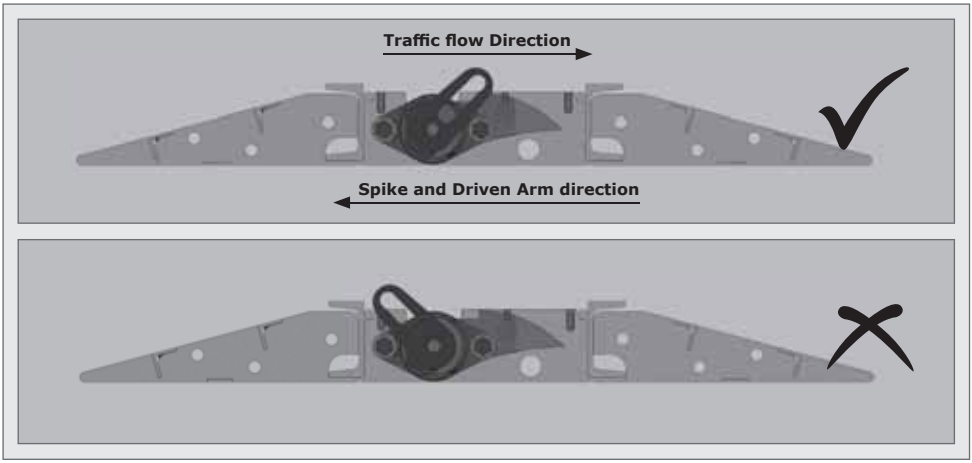


FIGURE 19

9.2.3. Aligning the Driven Linkage Arm to the Drive Linkage Arm.

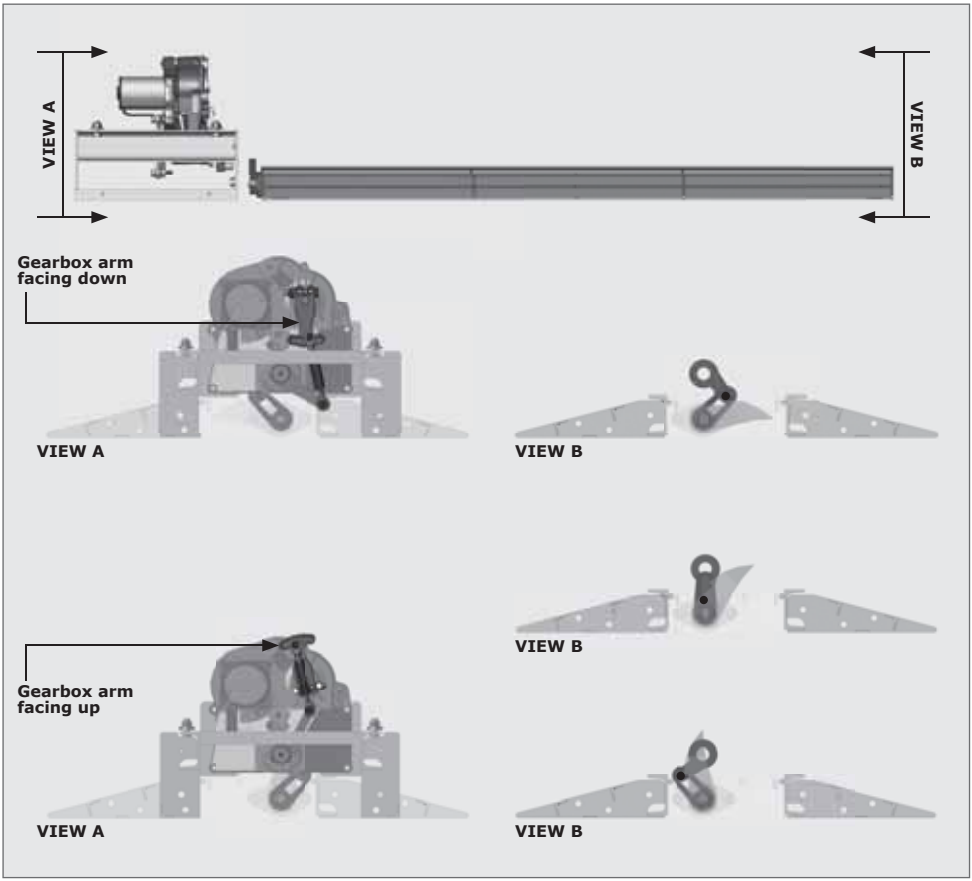
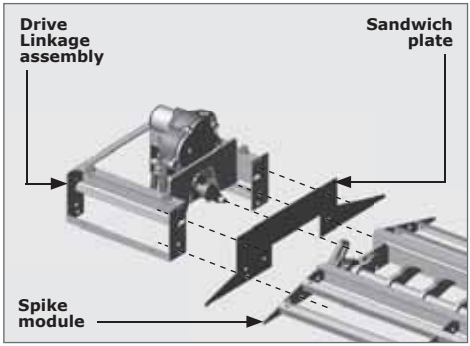


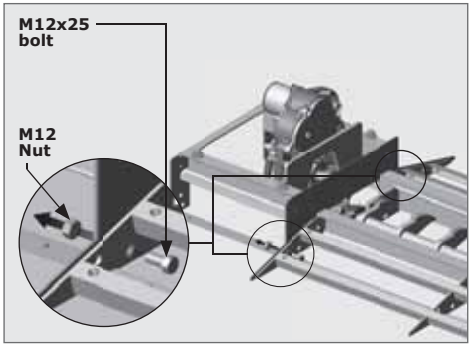
FIGURE 20

9.2.4. Attaching the drive linkage assembly to the spike module

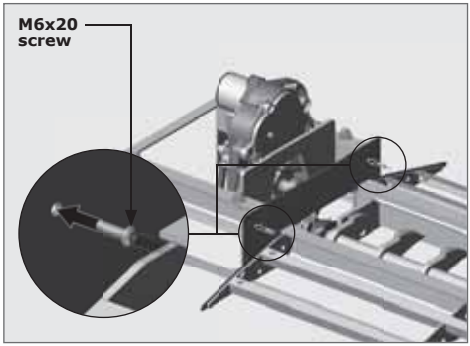
Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly. Ensure that the Sandwich Plate is lifted over the Driven Linkage Arm, so that the Driven Linkage Arm sits flush with the Drive Linkage Arm (Section 9, Figure 21).



STEP 1 FIGURE 21

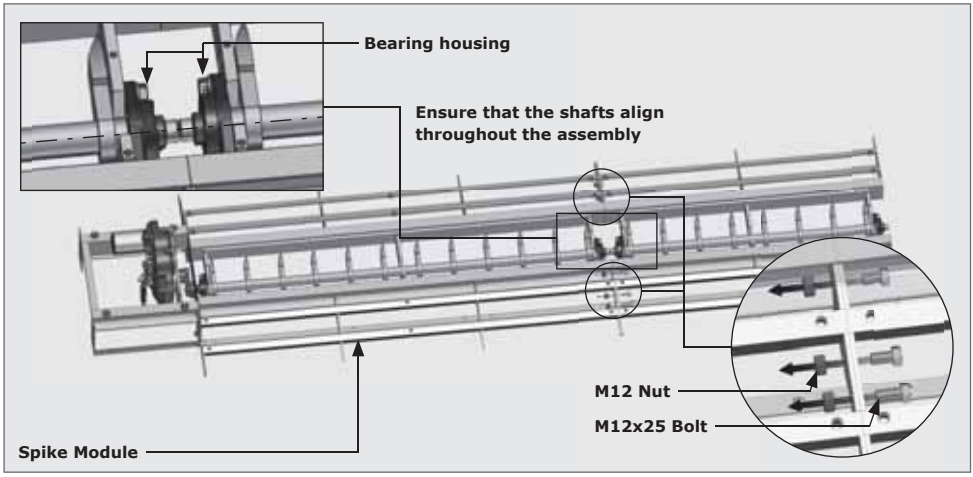


STEP 2 FIGURE 22



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.

9.2.5. 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.

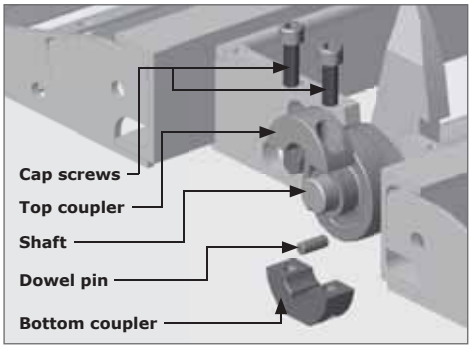


FIGURE 25. SHAFT COUPLER

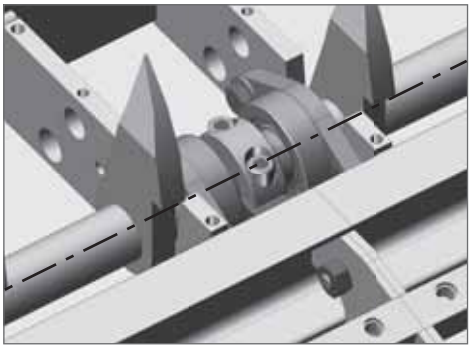
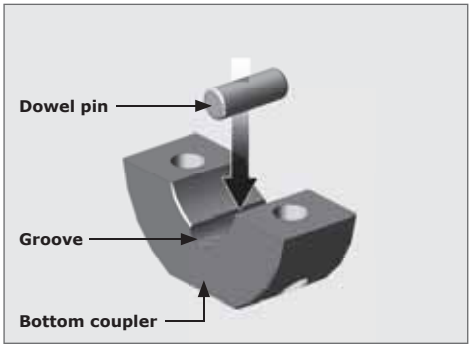
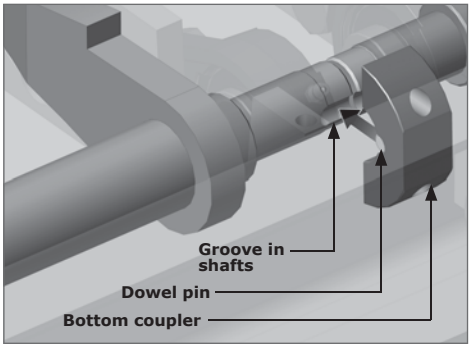


FIGURE 26

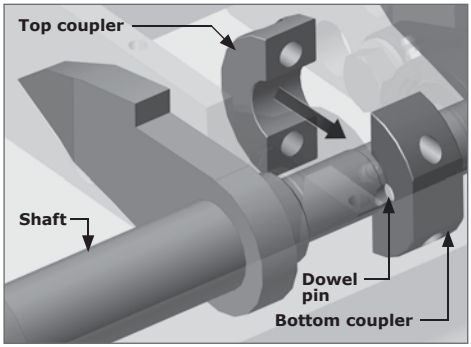
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



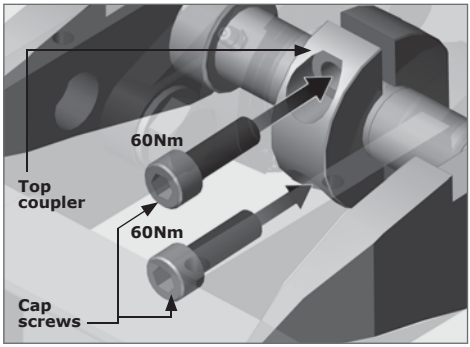
STEP 1 FIGURE 27



STEP 2 FIGURE 28

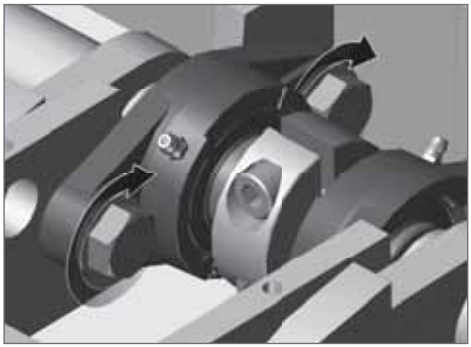


STEP 3 FIGURE 29

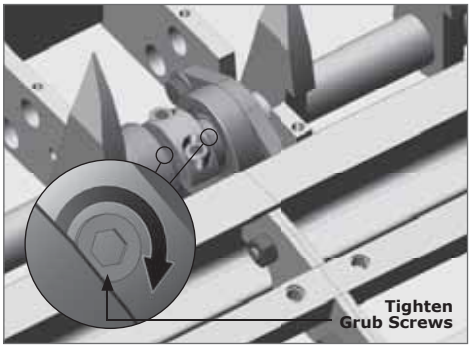


STEP 4 FIGURE 30

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**

9.2.6. Bolting down the assembly to the ground

If the SECTOR II and **CLAWS** are to be seperated, 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 SECTOR II. (Section 9.4.2.) These must be done before bolting the assembly to the ground. Once this preparation work has been completed, proceed with the installation below.

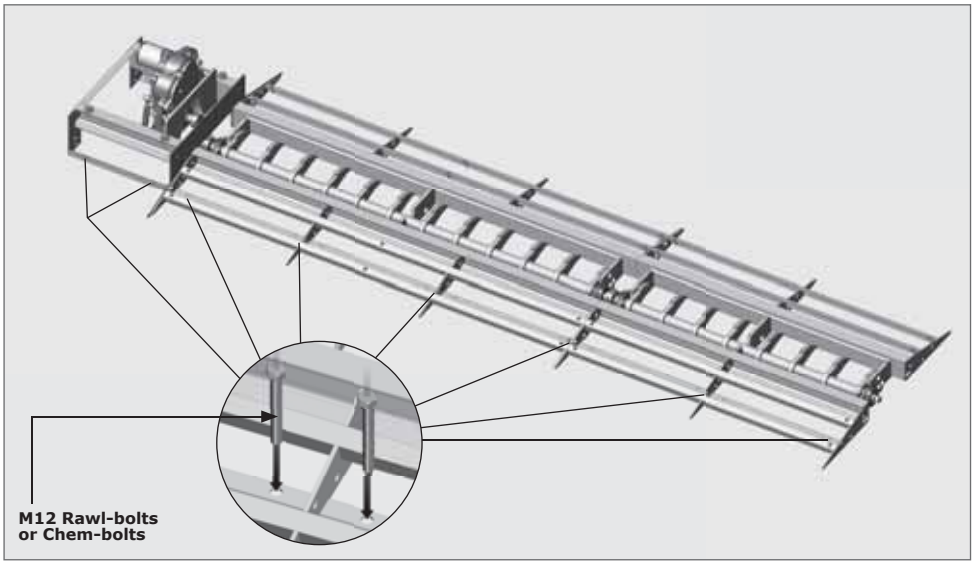
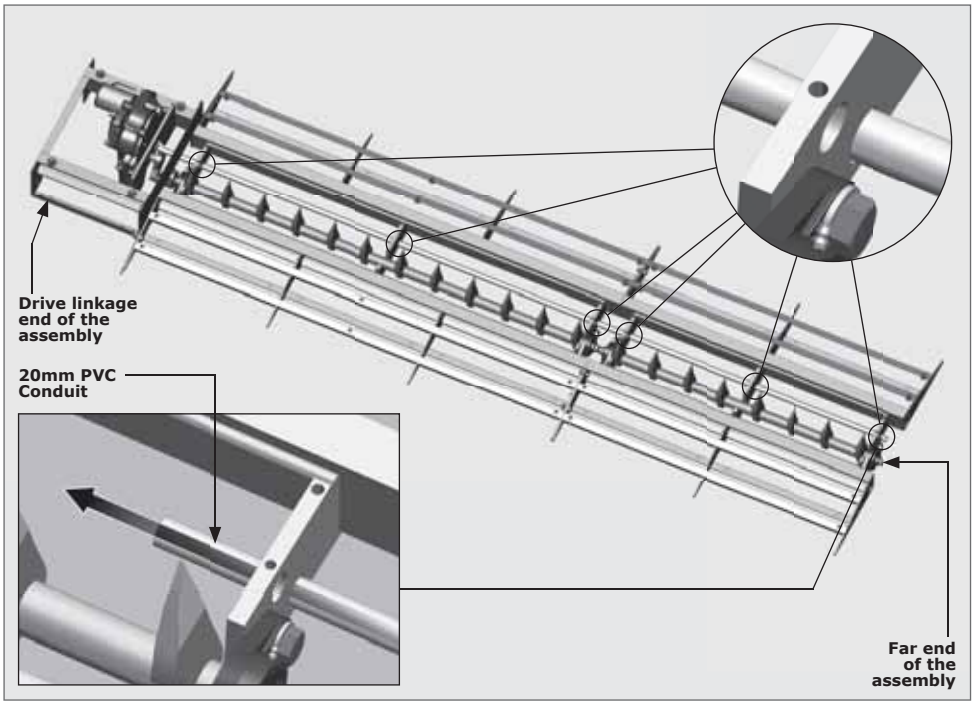


FIGURE 33

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.

9.2.5. 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 9, Figure 35).

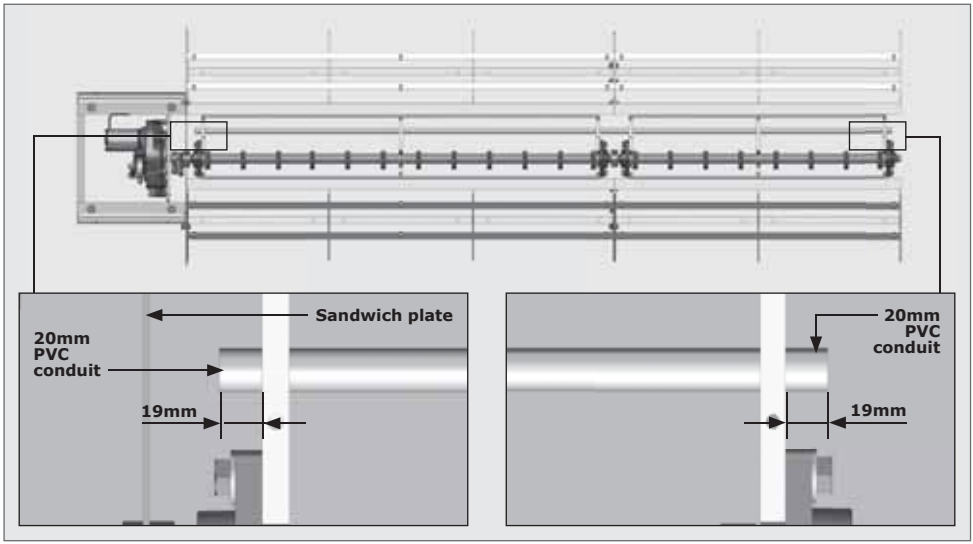
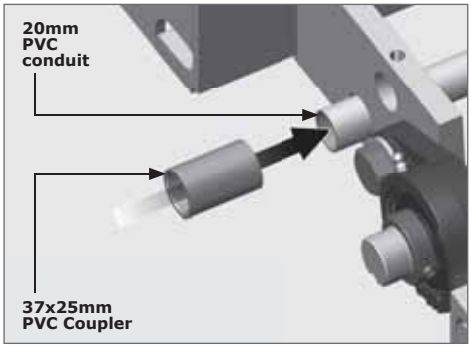
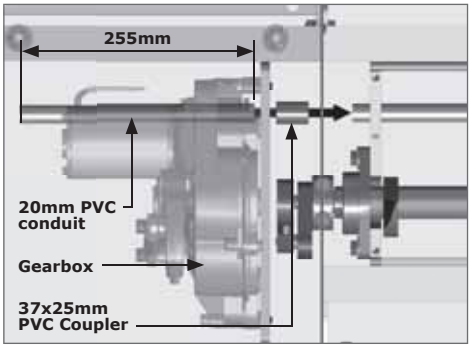


FIGURE 35

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

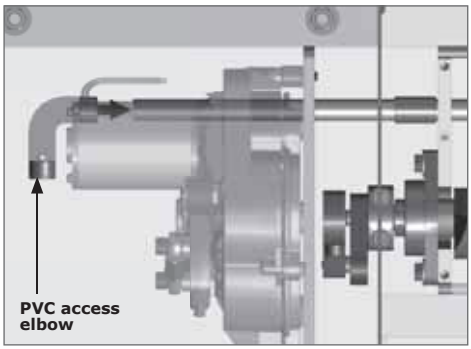


STEP 2 FIGURE 36

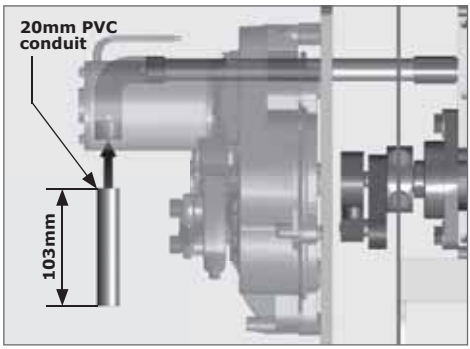


STEP 3 FIGURE 37

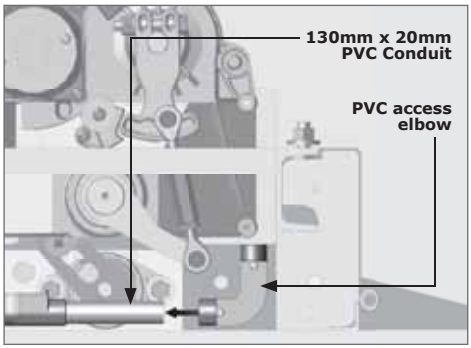
Steps 4-7 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, a trench for the conduit and proximity sensor cable will need to be dug (Section 9.4.2.).



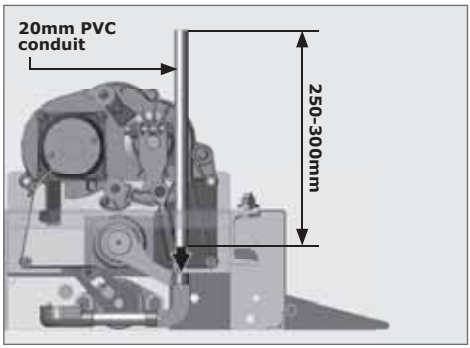
STEP 4 FIGURE 38



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.

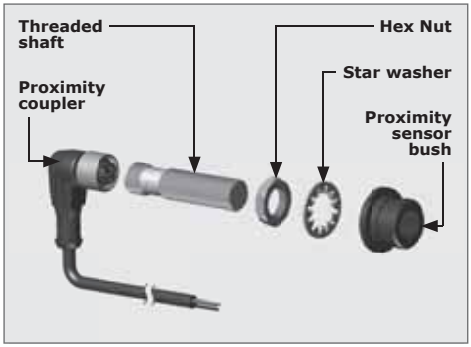


FIGURE 42. PROXIMITY SENSOR

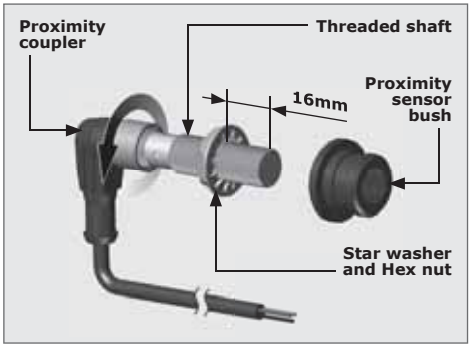


FIGURE 43. PROXIMITY SENSOR

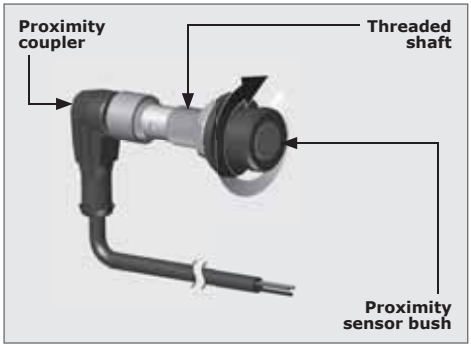
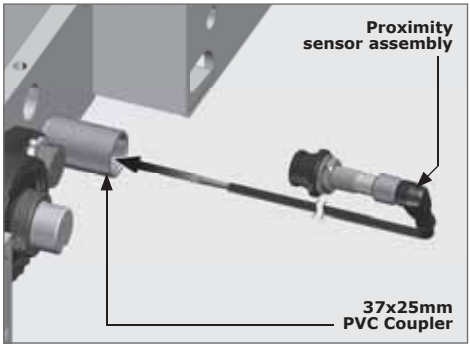


FIGURE 44. PROXIMITY SENSOR



STEP 8 FIGURE 45

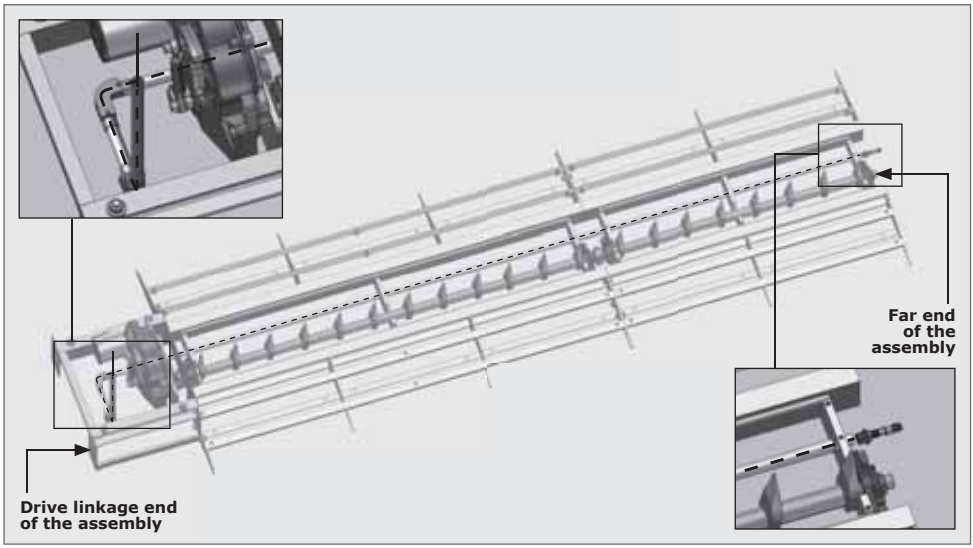
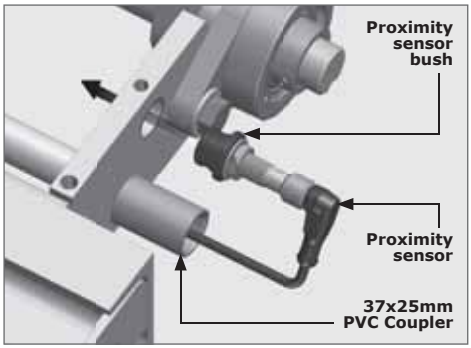
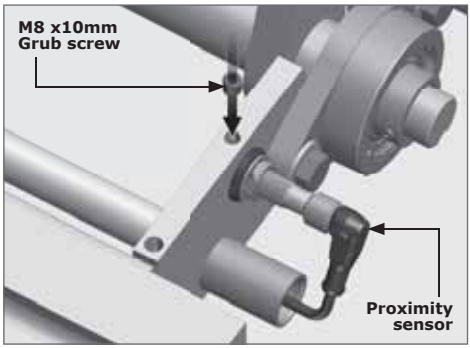


FIGURE 46

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

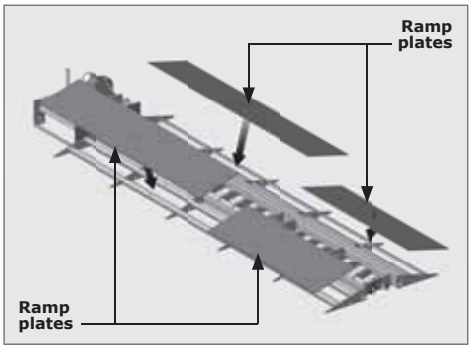


STEP 9 FIGURE 47

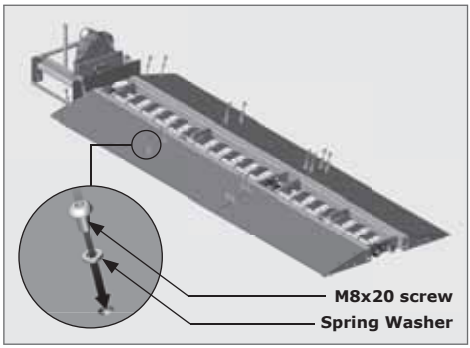


STEP 10 FIGURE 48

8.3. Re-assembling the ramp plates and linkage cover

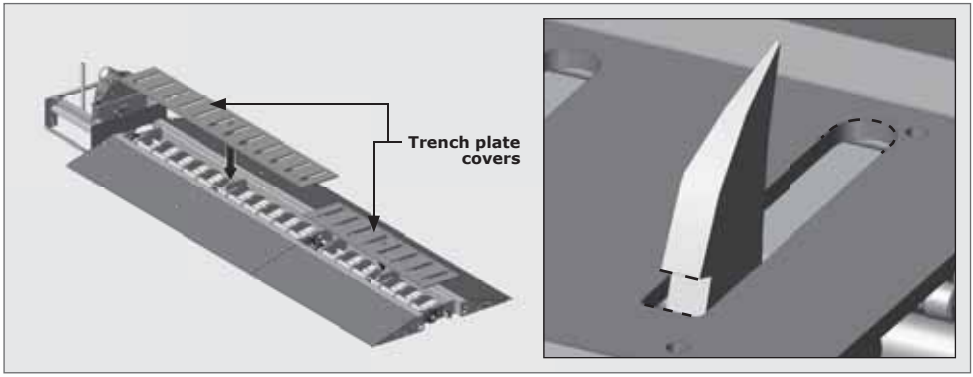


STEP 1 FIGURE 49



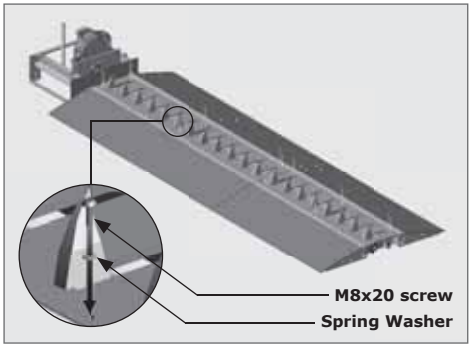
STEP 2 FIGURE 50

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.

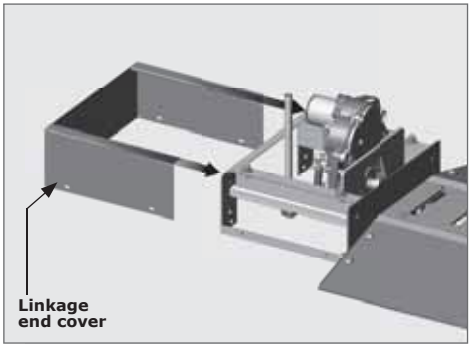


STEP 3 FIGURE 51

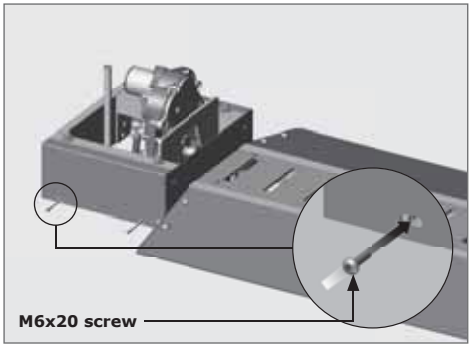
Take note of the slot orientation in the trench cover plates before it is placed back into position. The spike must rest on the straight edge of the slot when it is in its upright position.



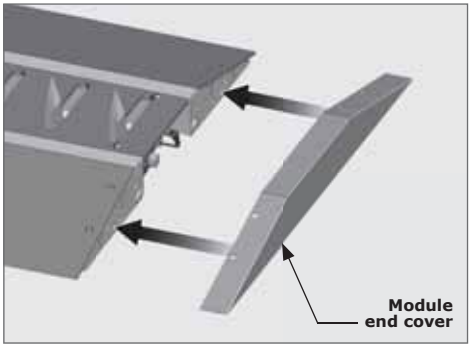
STEP 4 FIGURE 52



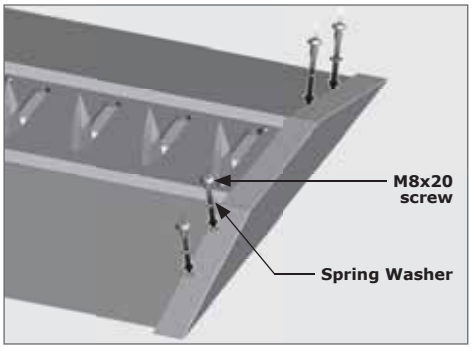
STEP 5 FIGURE 53



STEP 6 FIGURE 54



STEP 7 FIGURE 55

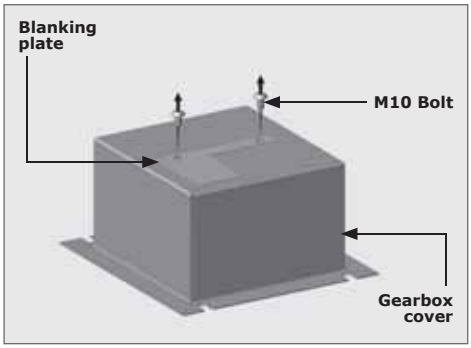


STEP 8 FIGURE 56

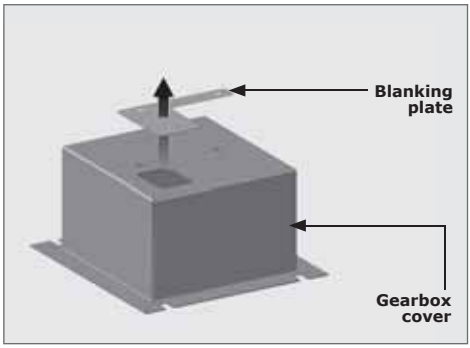
9.4. Integrating the SECTOR II with the CLAWS

9.4.1. Directly mount THE SECTOR II onto the Independent Drive

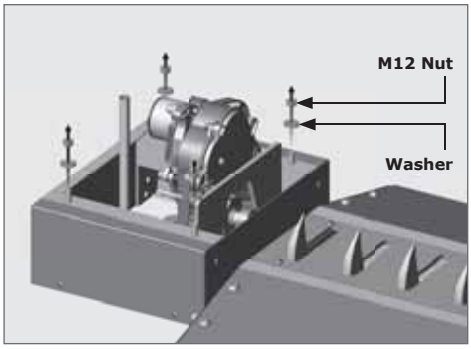
9.4.1.1. Placing the gearbox cover into position



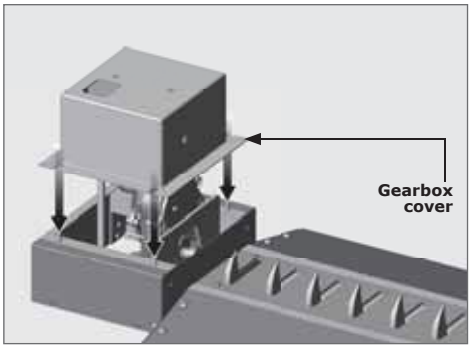
STEP 1 FIGURE 57



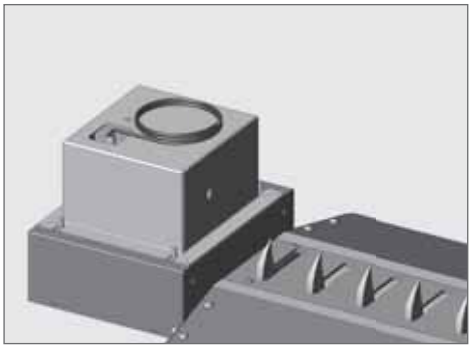
STEP 2 FIGURE 58



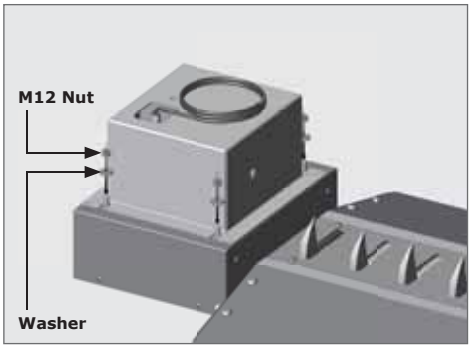
STEP 3 FIGURE 59



STEP 4 FIGURE 60



STEP 5 FIGURE 61



STEP 6 FIGURE 62

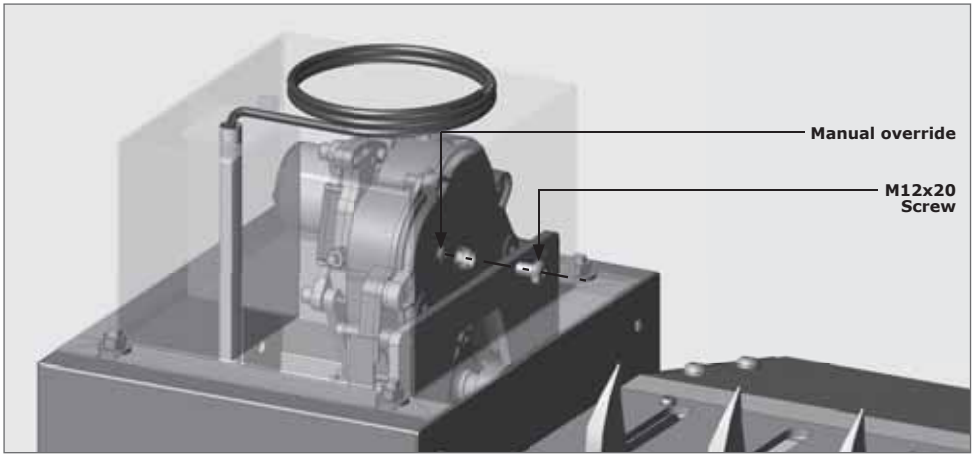
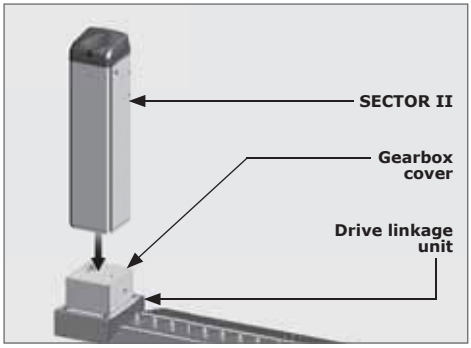
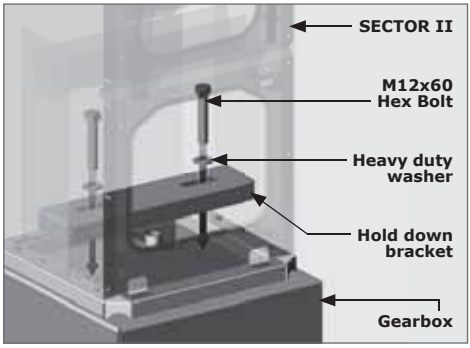


FIGURE 63. MANUAL OVERRIDE

9.4.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 64



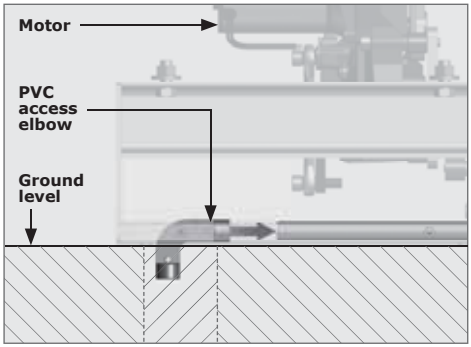
STEP 2 FIGURE 65

9.4.2. Seperately-placed CLAWS and SECTOR II

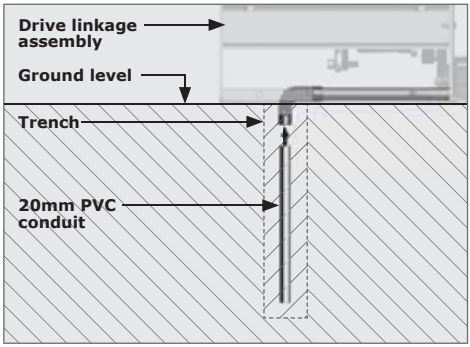
9.4.2.1. Running the conduit from the gearbox to the SECTOR II

STEP 1

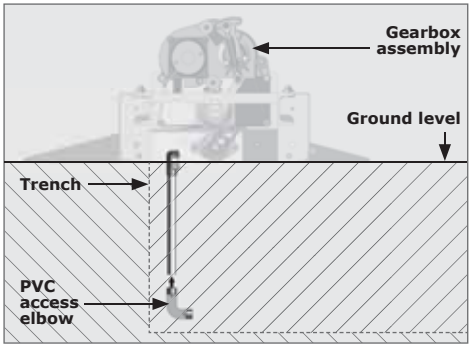
Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.



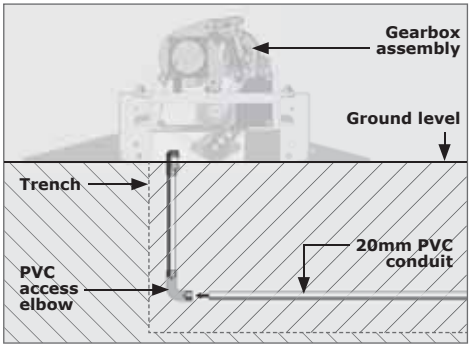
STEP 2 FIGURE 66



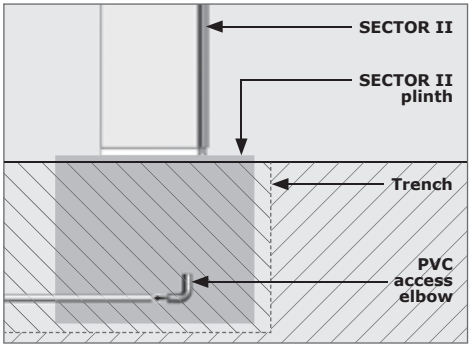
STEP 3 FIGURE 67



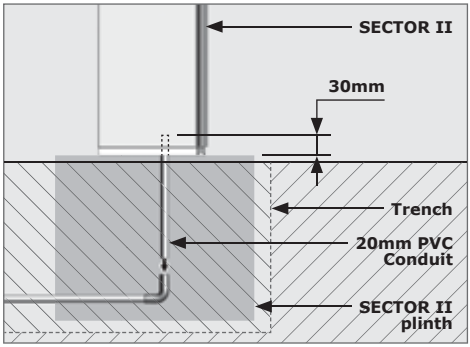
STEP 4 FIGURE 68



STEP 5 FIGURE 69



STEP 6 FIGURE 70

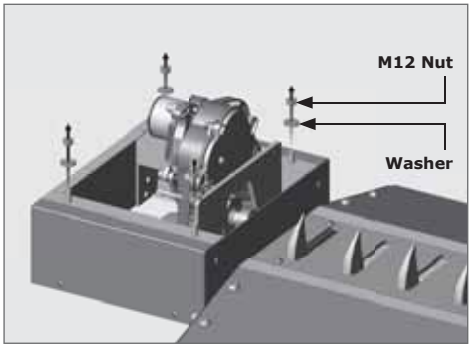


STEP 7 FIGURE 71

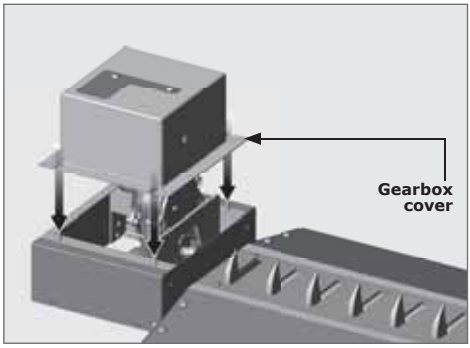
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

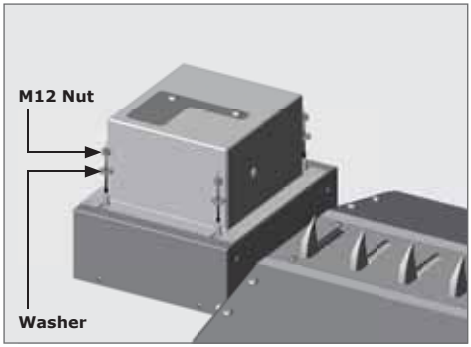
9.4.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 72



STEP 2 FIGURE 73



STEP 3 FIGURE 74

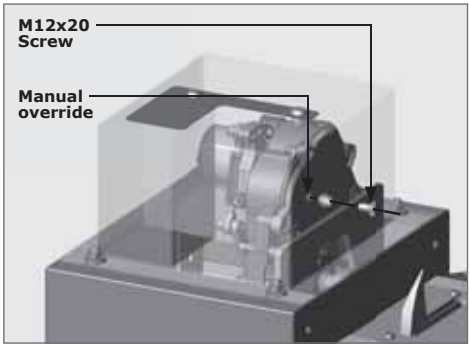
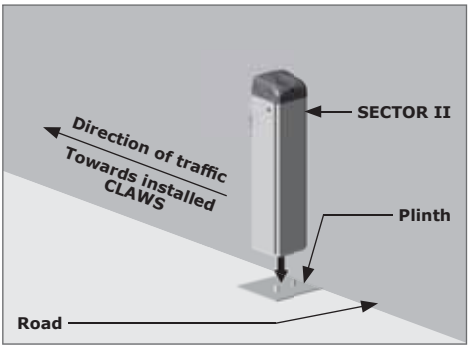


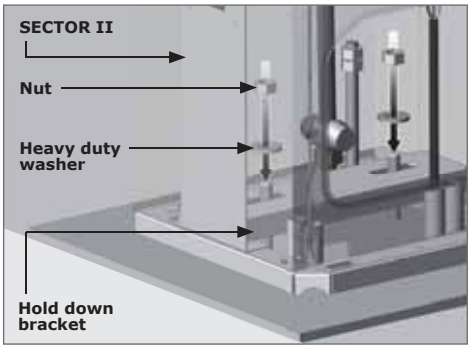
FIGURE 75. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

9.4.2.3. Placing the SECTOR II into position

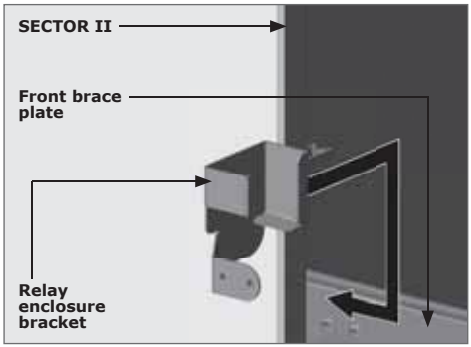


STEP 1 FIGURE 76

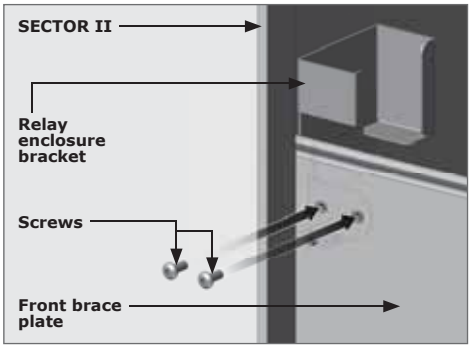


STEP 2 FIGURE 77

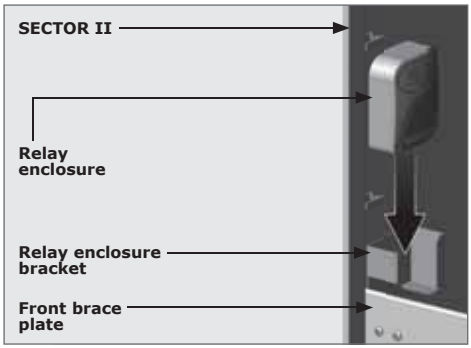
9.4.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 78



STEP 2 FIGURE 79

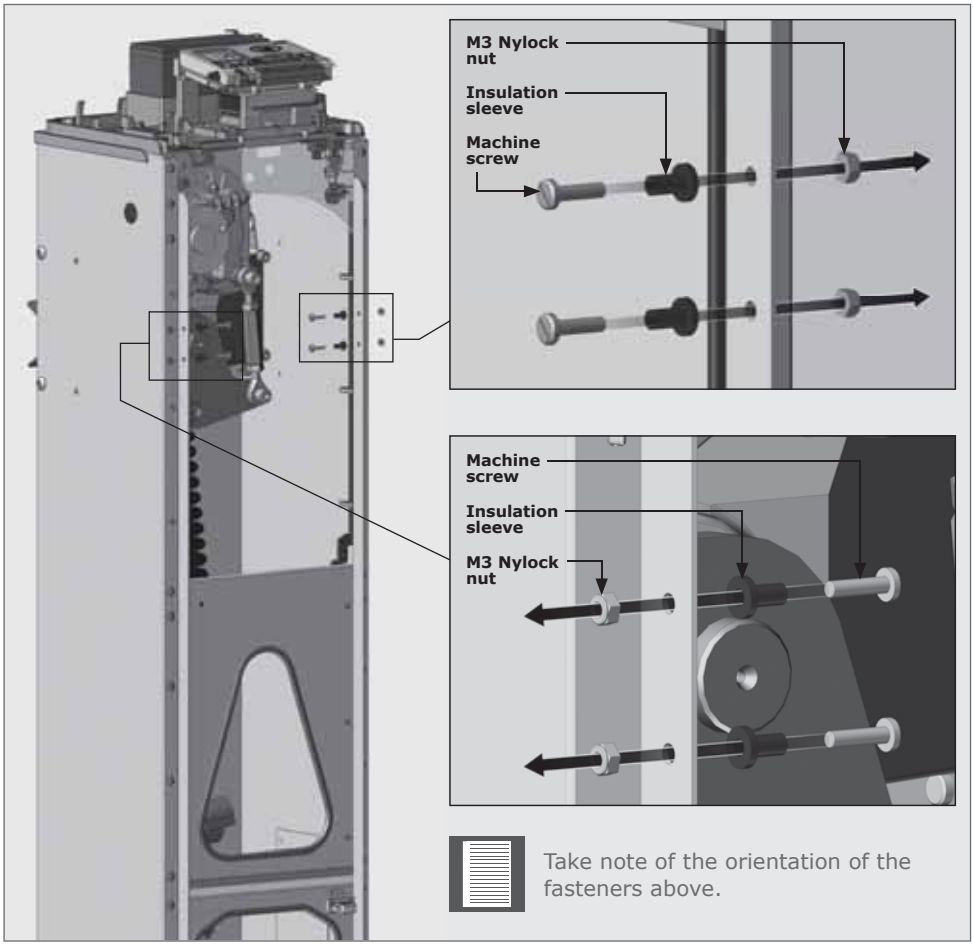


Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

STEP 1 FIGURE 80

8.4.5. Fitting the CLAWS controller to the SECTOR II



Take note of the orientation of the fasteners above.

STEP 1 FIGURE 81

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

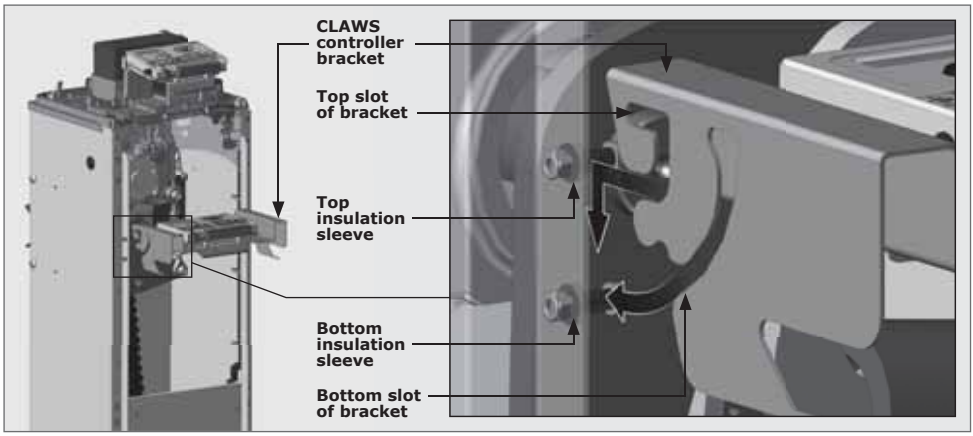


FIGURE 82

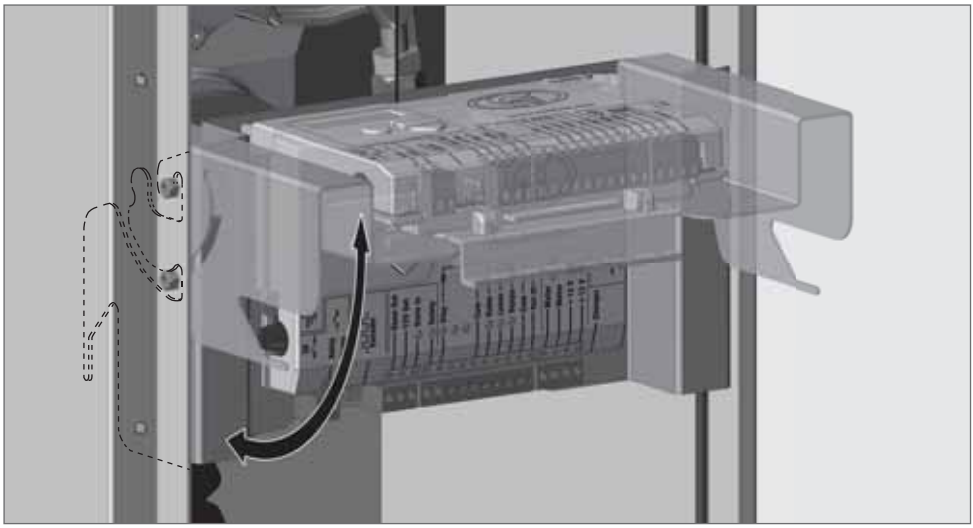


FIGURE 83

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 9, Figure 84).

It can also be moved lower down for optimum space when working on the gearbox (Section 9, Figure 85).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 9, Figure 82).

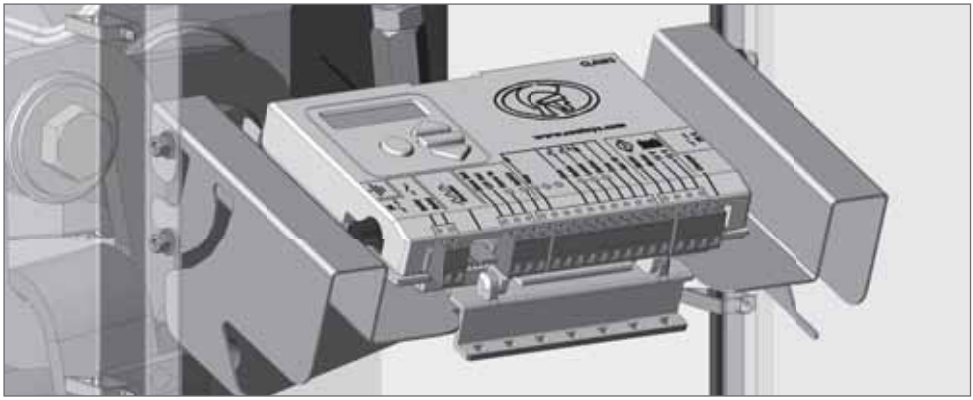


FIGURE 84. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

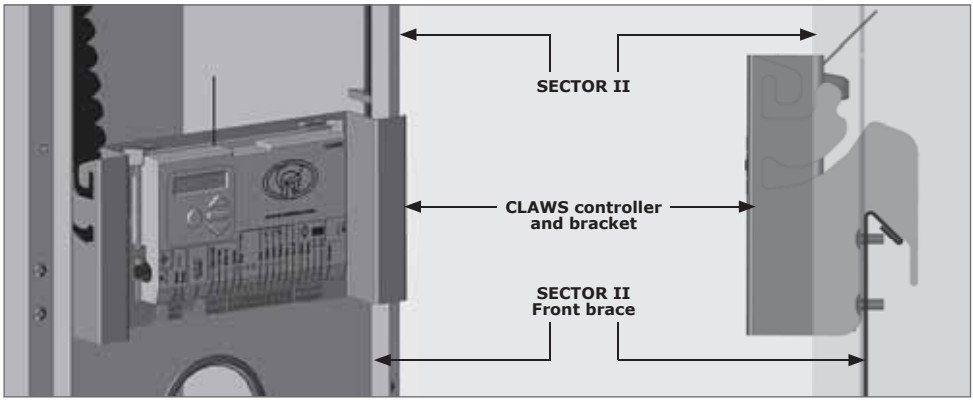


FIGURE 85. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

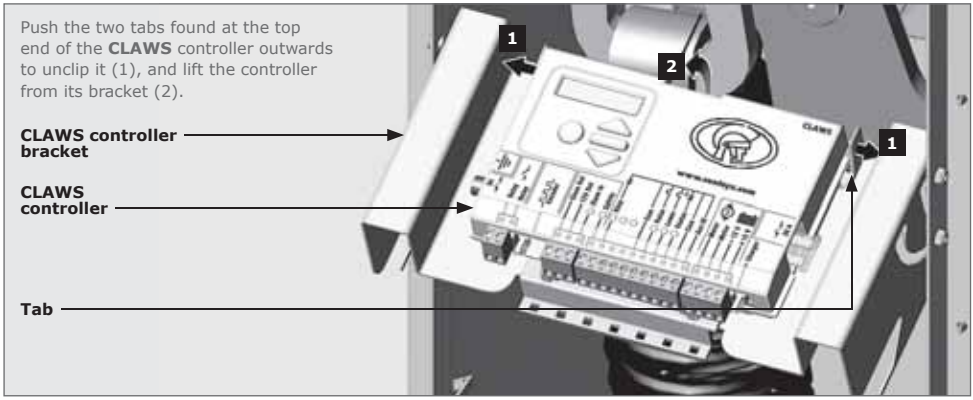


FIGURE 86. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

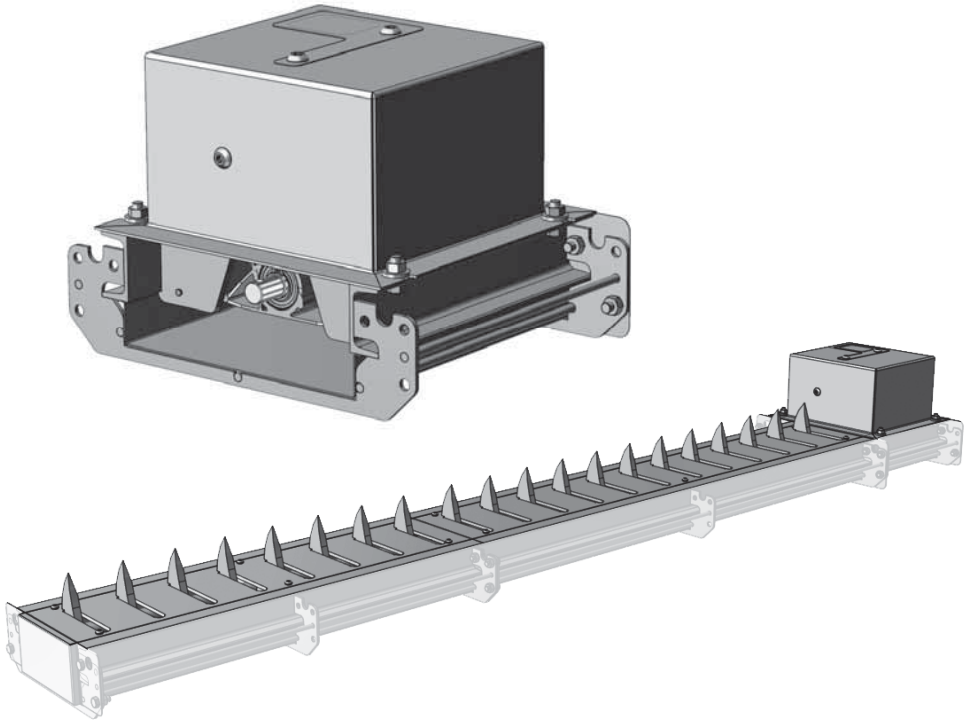
STEP 3

Connect harness and power supply. Refer to the wiring diagrams and controller settings.

Notes

INDEPENDENT DRIVE
FLUSH MOUNT INSTALLATIONS

CLAWS



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10. Product Identification

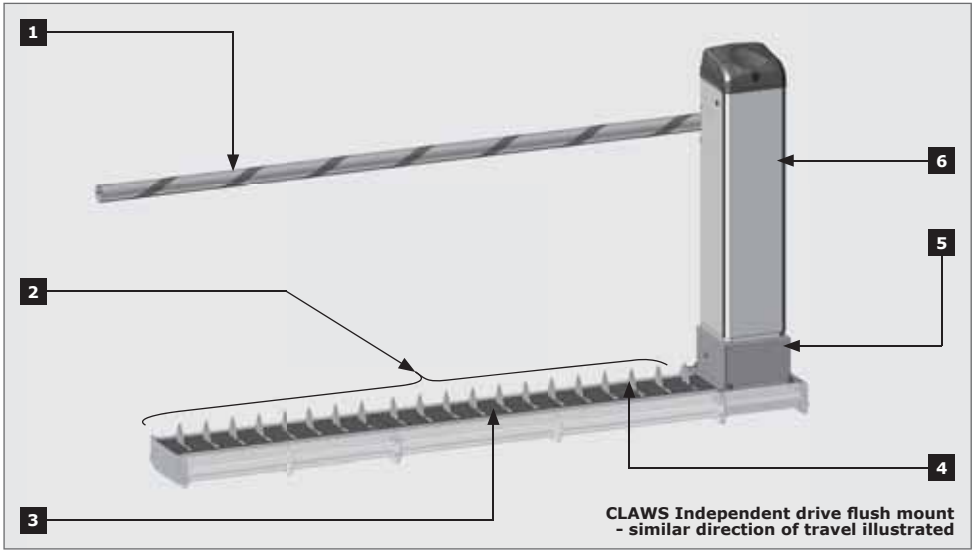
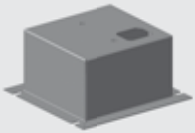


FIGURE 1. PRODUCT IDENTIFICATION

1. Boom pole
2. Spikes module assembly
3. Trench cover plate
4. Spikes
5. Drive linkage assembly
6. SECTOR II

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

	Gearbox Coupler
	Bearing Housing
	Hold Down Bracket
	Linkage End Cover
	Blanking Plate
	Gearbox Cover
	Module End Cover

11. Tools Required

- 13mm,17mm, and 19mm Spanners
- Ratchet
- 19mm, and 24mm Sockets
- Allen Key Set
- 20mm and 50mm Hole Saw
- Mallet
- Tape Measure
- Spirit Level
- Torque Wrench
- Conduit Spring for 20mm conduit

12. Introduction

This document describes the basic steps to follow when installing the flush-mountable **CLAWS** Spikes driven directly from a SECTOR II Barrier by a "push-pull" linkage system. The installation described in this document is a 2.5 meter installation which utilises modules of 1.5 and 1.0 meters.

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

12.1. Installation Configurations

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

- Orientation of installation
- Direction of spike impact

12.1.1. 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.

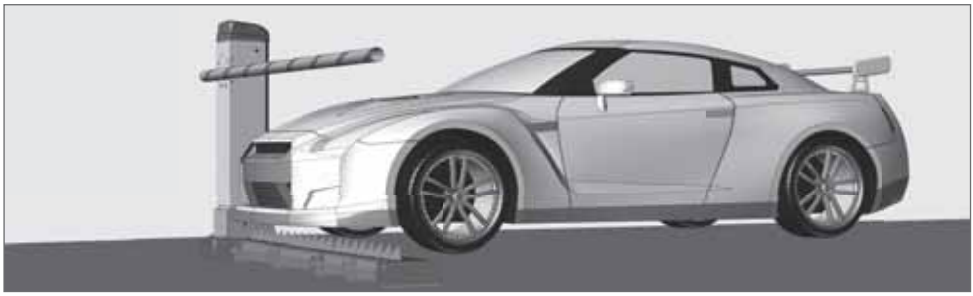


FIGURE 2. RHS CONFIGURATION

FIGURE 3. LHS CONFIGURATION

12.1.2. Spike Impact Direction

The **CLAWS** Spikes are designed to take a much larger or more frequent impact in one direction. 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.

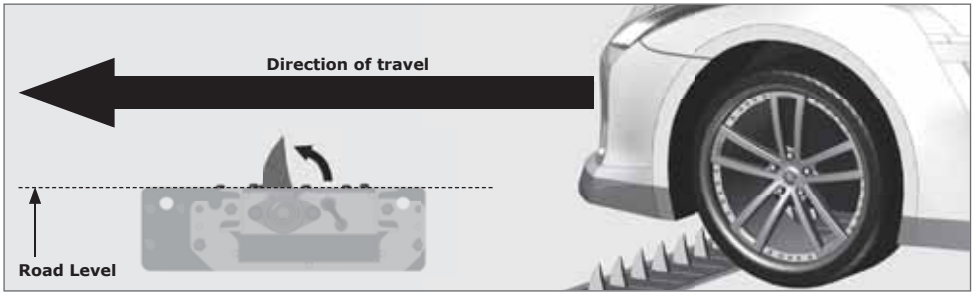


FIGURE 4. SPIKE IMPACT DIRECTION - SIMILAR

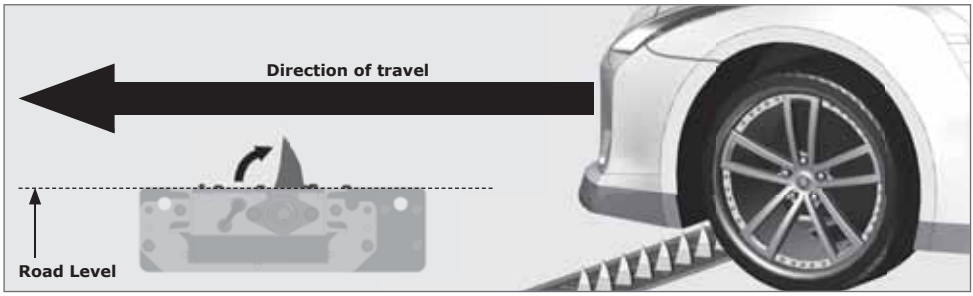


FIGURE 5. SPIKE IMPACT DIRECTION - OPPOSING

There are four types of typical installations. Refer to Section 11, 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

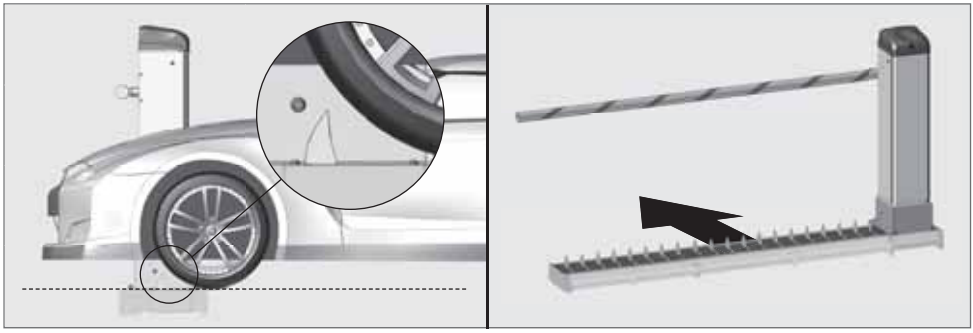


FIGURE 6. RHS SIMILAR DIRECTION OF TRAVEL

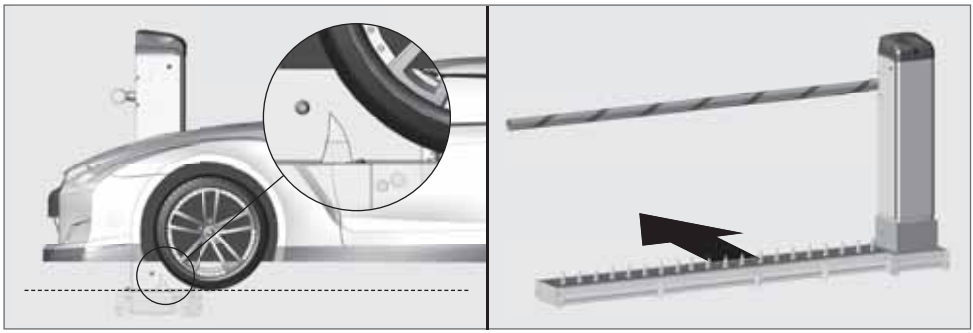


FIGURE 7. RHS OPPOSED DIRECTION OF TRAVEL

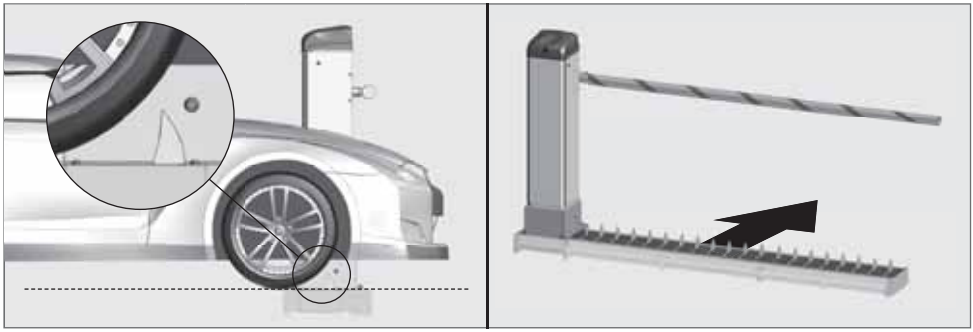


FIGURE 8. LHS SIMILAR DIRECTION OF TRAVEL

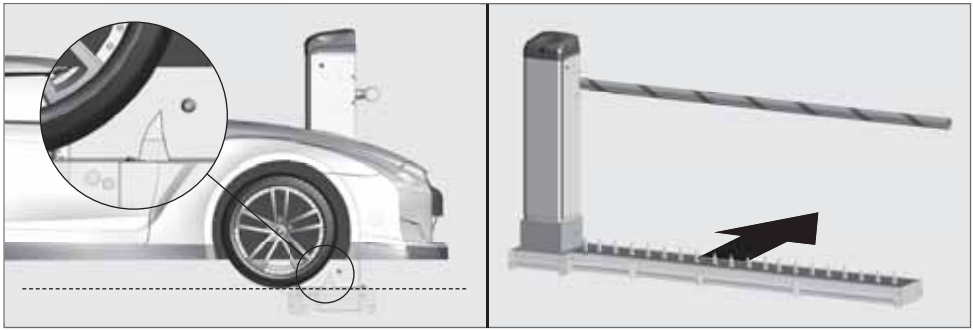
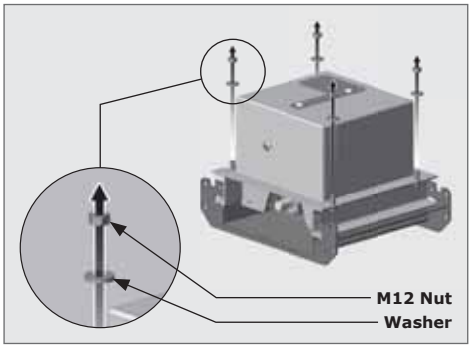


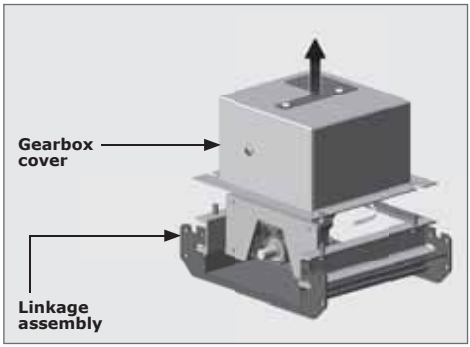
FIGURE 9. LHS OPPOSED DIRECTION OF TRAVEL

13. RHS Flush Mount - Similar Direction of Travel

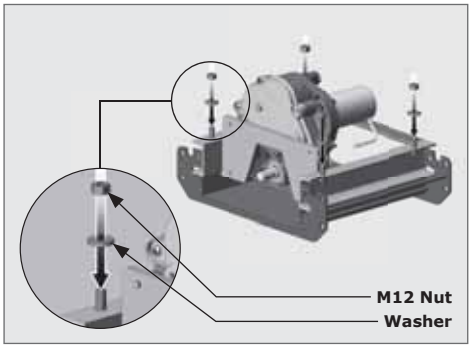
13.1. Preparing the Drive Linkage Assembly



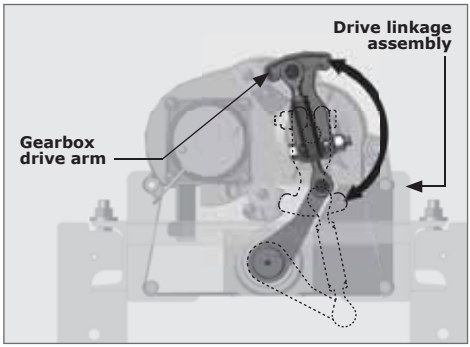
STEP 1 FIGURE 10



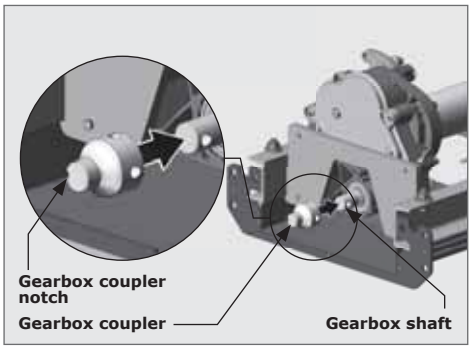
STEP 2 FIGURE 11



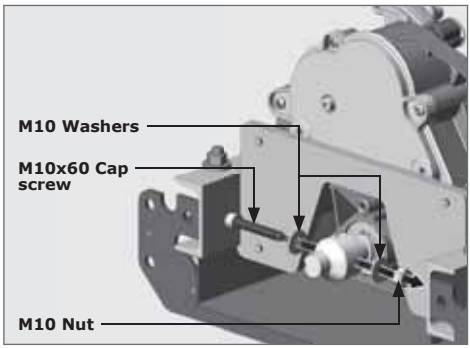
STEP 3 FIGURE 12



STEP 4 FIGURE 13



STEP 5 FIGURE 14

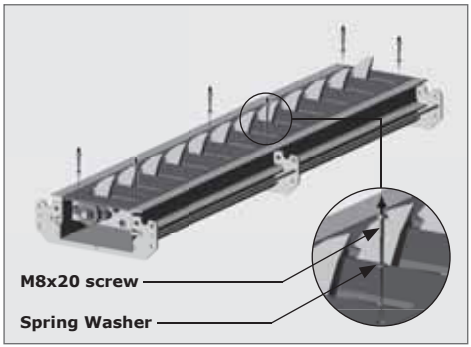


STEP 6 FIGURE 15

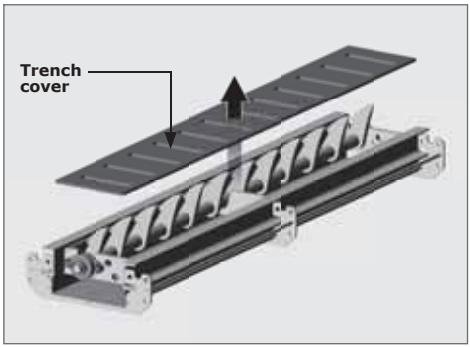
Note the orientation of the gearbox coupler notch is at the 9 o'clock position and that the gearbox drive arm is up as shown in Section 13, Figure 14.

13.2. Spike Module Assembly

13.2.1. Preparing the Spike Module assembly(ies) for installation

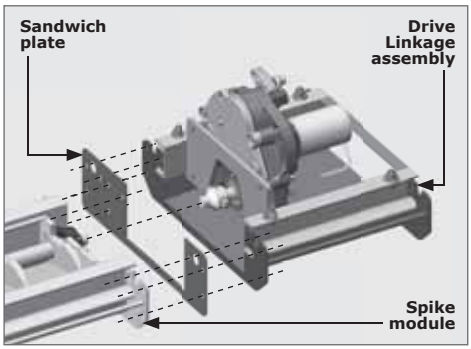


STEP 1 FIGURE 16

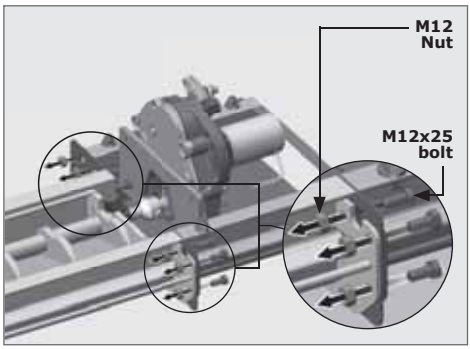


STEP 2 FIGURE 17

13.2.2. Attaching the drive linkage assembly to the spike module



STEP 1 FIGURE 18



STEP 2 FIGURE 19

Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly.

STEP 3

Using six M12x25 bolts, fix one spike module to another (Section 13, Figure 20).

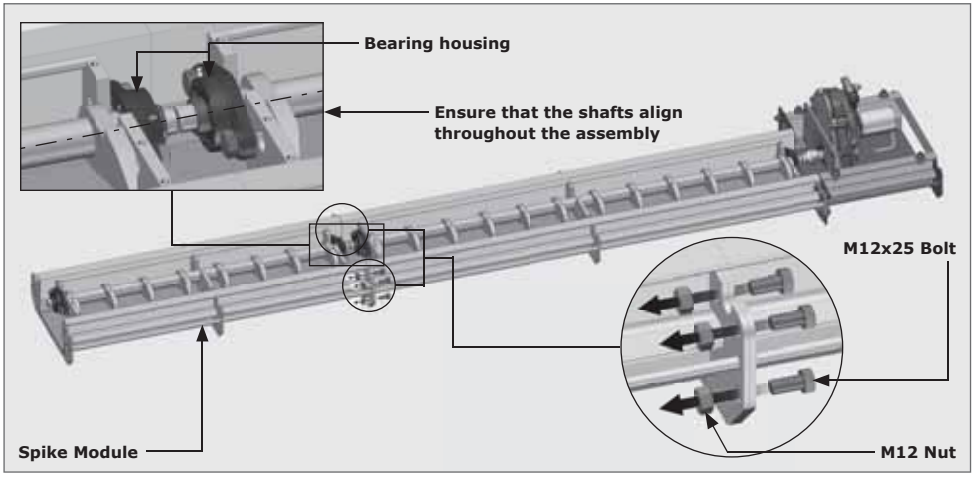


FIGURE 20

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

13.2.3. 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.

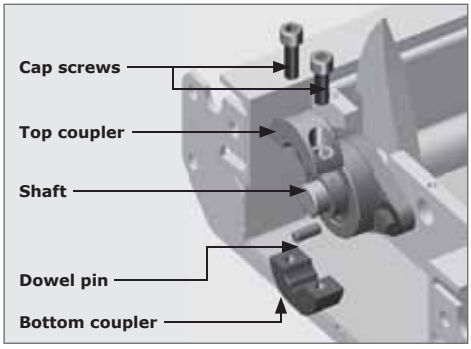


FIGURE 21. SHAFT COUPLER

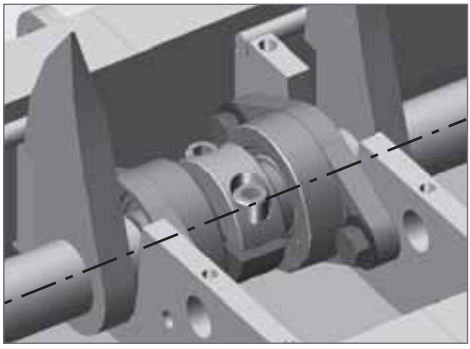
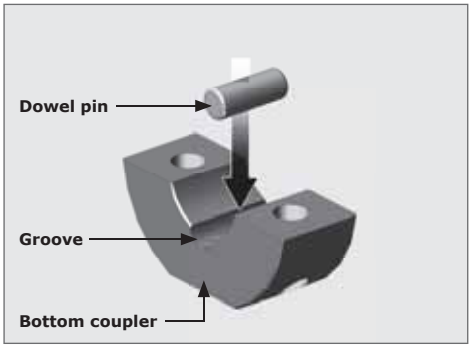
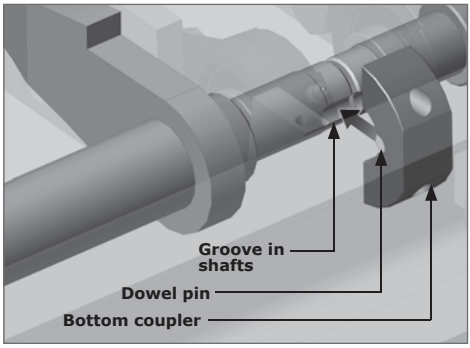


FIGURE 22

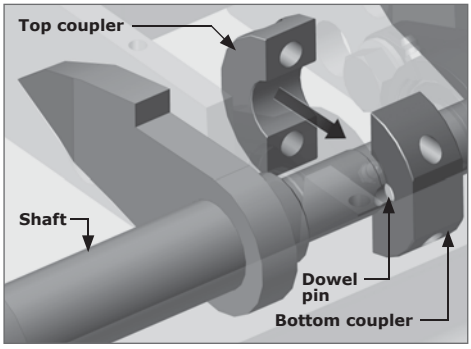
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



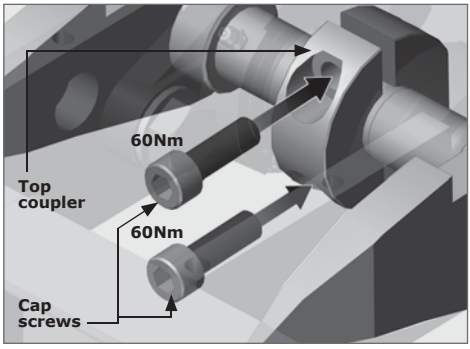
STEP 1 FIGURE 23



STEP 2 FIGURE 24



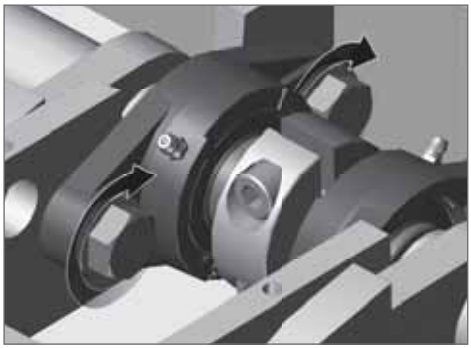
STEP 3 FIGURE 25



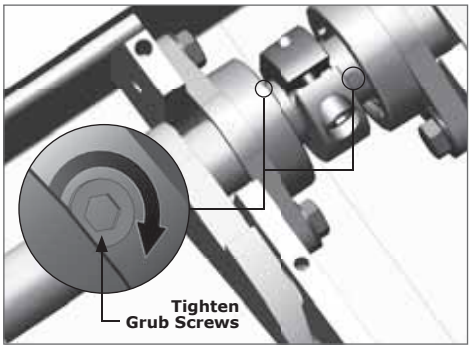
STEP 4 FIGURE 26

STEP 5

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



STEP 6 FIGURE 27



STEP 7 FIGURE 28

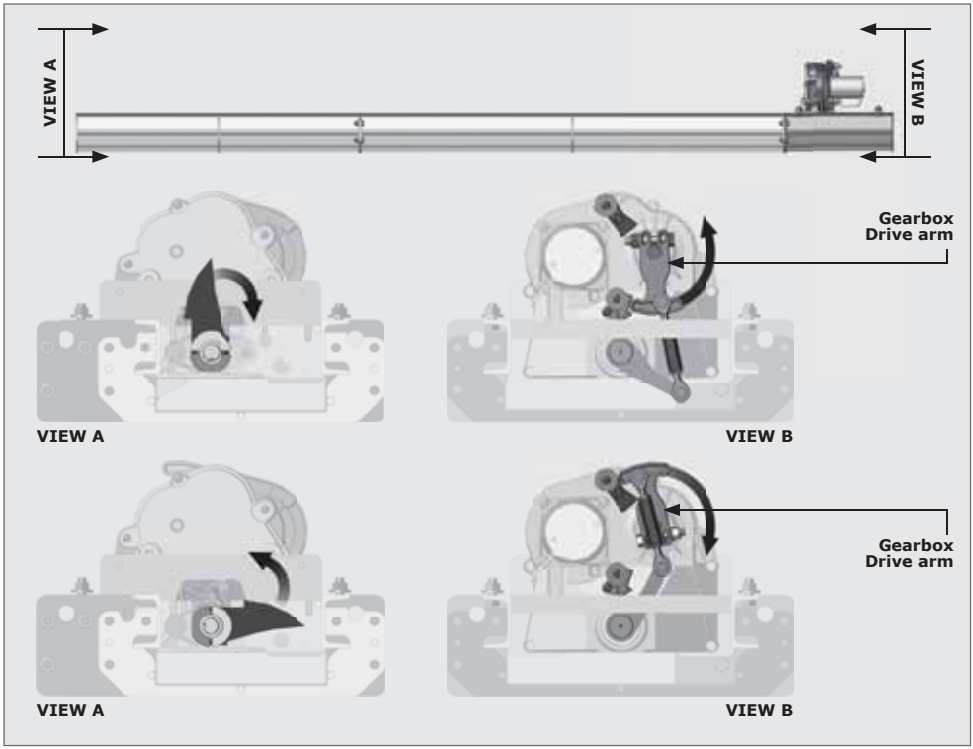
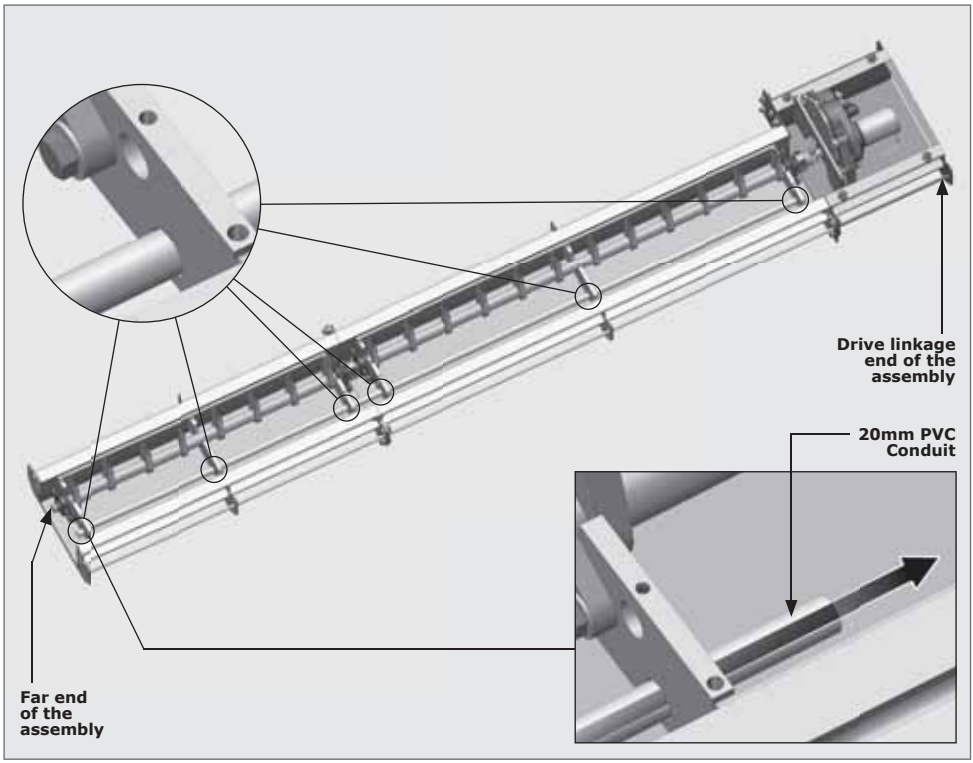


FIGURE 29. CORRECTLY ALIGNED SPIKE AND DRIVE MODULES

13.2.4. Proximity sensor installation



STEP 1 **FIGURE 30**

The length of the PVC conduit will be relative to the length of the spike modules combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 13, Figure 31).

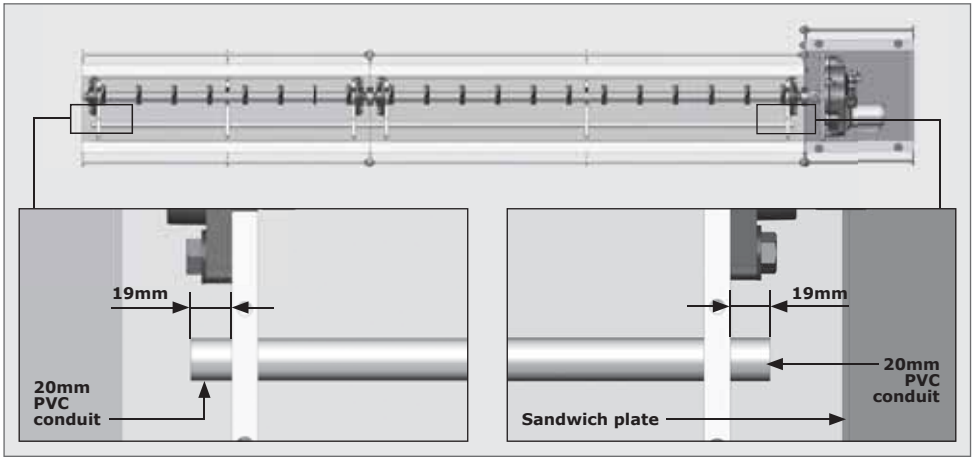
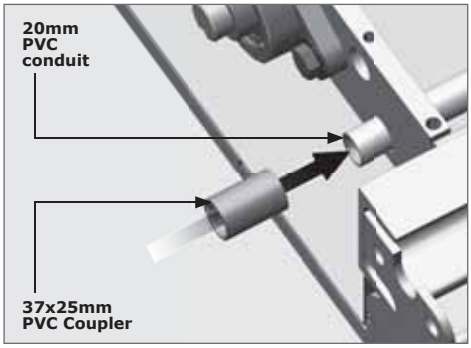
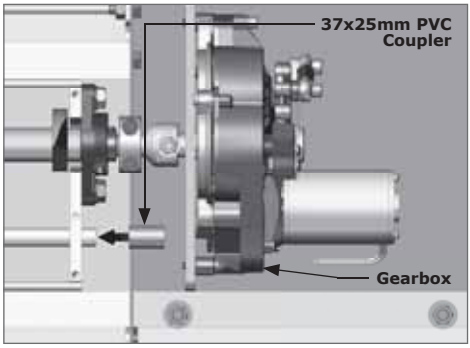


FIGURE 31

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

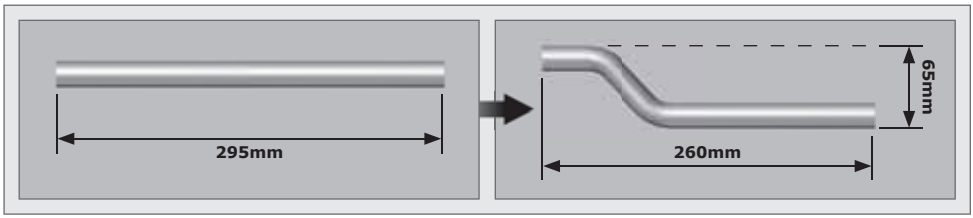


STEP 2 FIGURE 32



STEP 3 FIGURE 33

It is necessary to bend PVC conduit to circumvent the gearbox bulkhead to continue. The use of a conduit spring is recommended to avoid collapsing the pipe. Section 13, Figure 34 below is a guideline that can be used to achieve this.



STEP 4 FIGURE 34

STEP 5

Connect the bent piece of conduit to the PVC coupler installed in Section 13, Figure 33 Step 3. After it is connected, it should resemble Section 13, Figure 35.

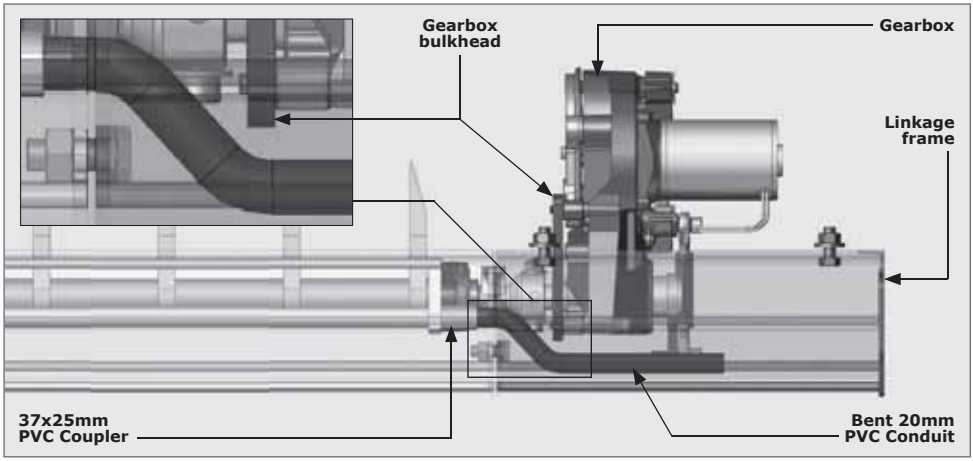
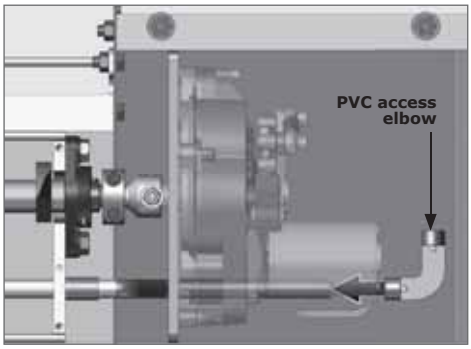
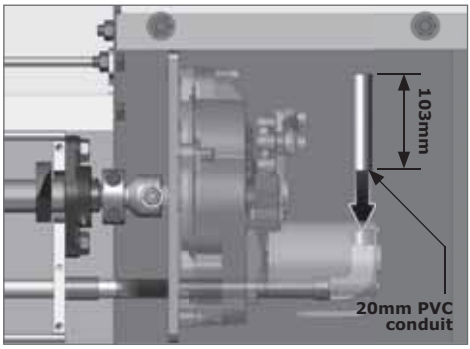


FIGURE 35

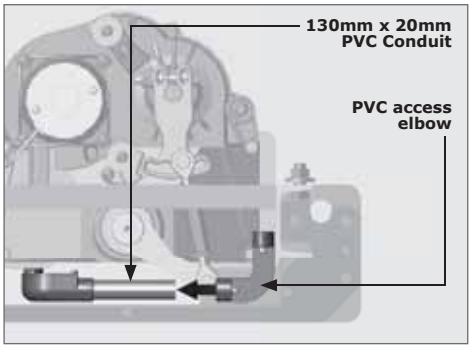
Steps 6-9 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, a trench for the conduit and cables will need to be dug (Refer to Section 13.5.2.).



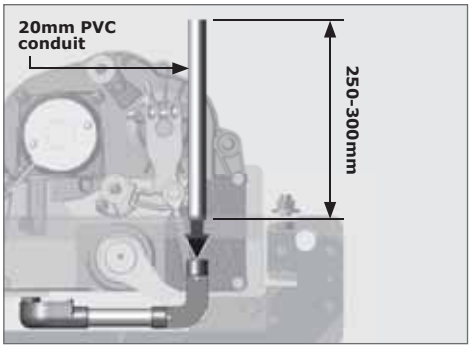
STEP 6 FIGURE 36



STEP 7 FIGURE 37



STEP 8 FIGURE 38



STEP 9 FIGURE 39

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

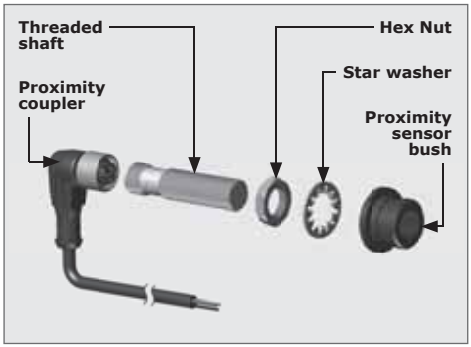


FIGURE 40. PROXIMITY SENSOR

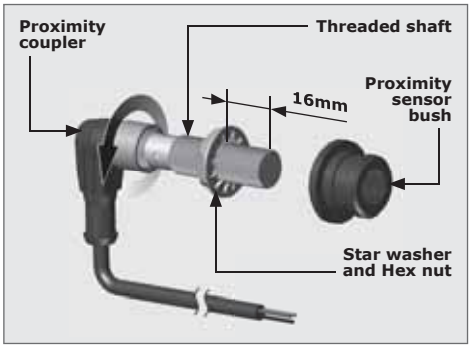


FIGURE 41. PROXIMITY SENSOR

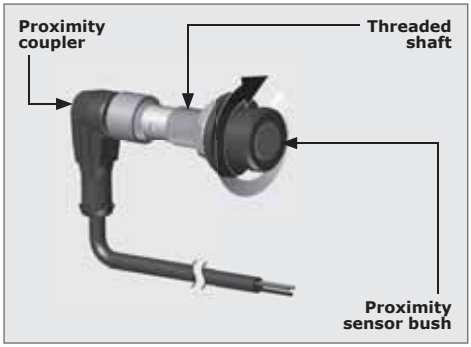
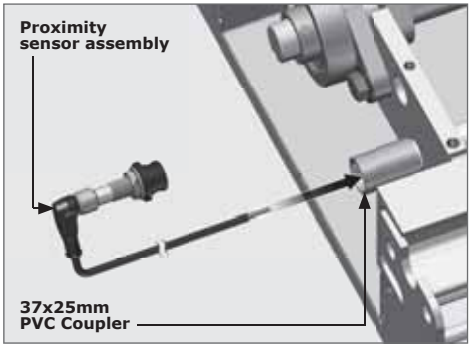


FIGURE 42. PROXIMITY SENSOR



STEP 6 FIGURE 43

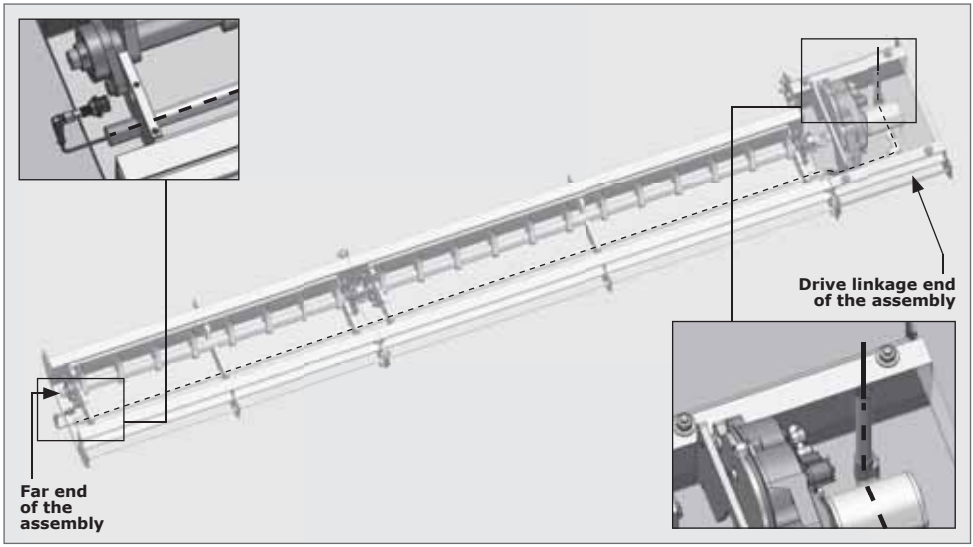
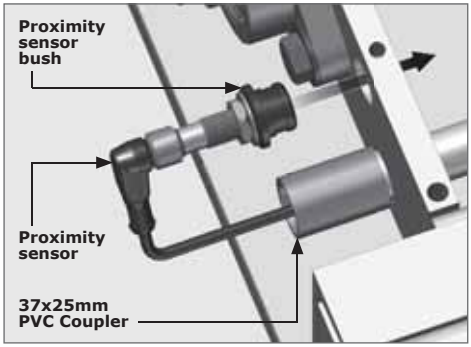
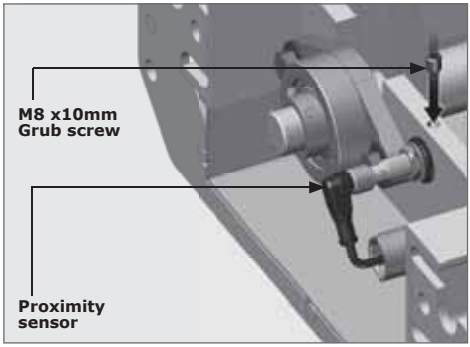


FIGURE 44

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



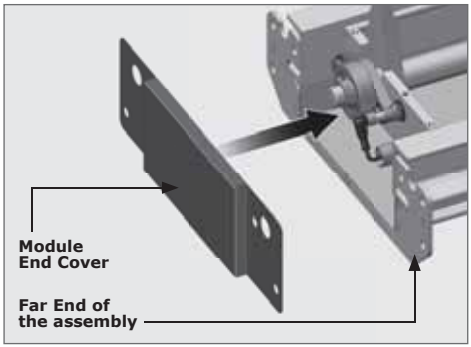
STEP 7 FIGURE 45



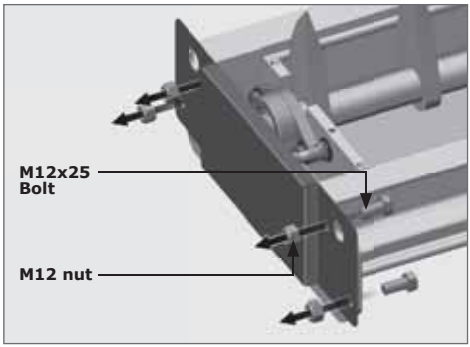
STEP 8 FIGURE 46

13.2.5. Attaching the End Covers to the Assembly

13.2.5.1. Attaching the Module End cover

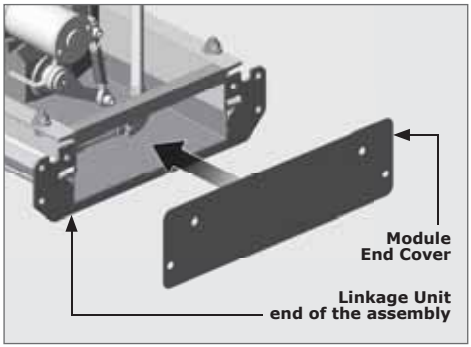


STEP 1 FIGURE 47

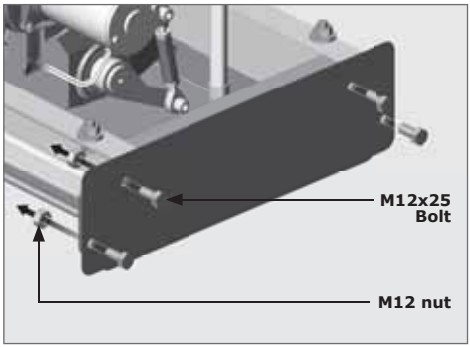


STEP 2 FIGURE 48

13.2.5.2. Attaching the Linkage Unit End cover



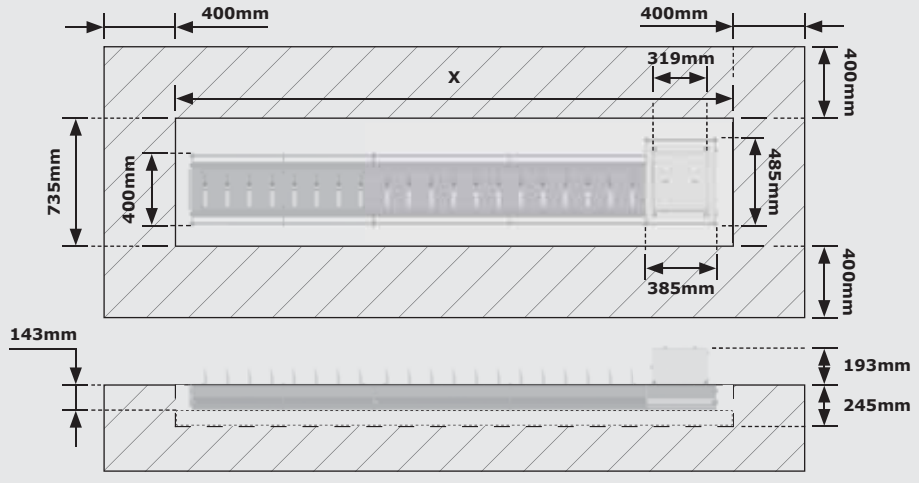
STEP 1 FIGURE 49



STEP 2 FIGURE 50

13.3. Preparing the Trench and Drainage System

Dig a hole following the dimensions below.

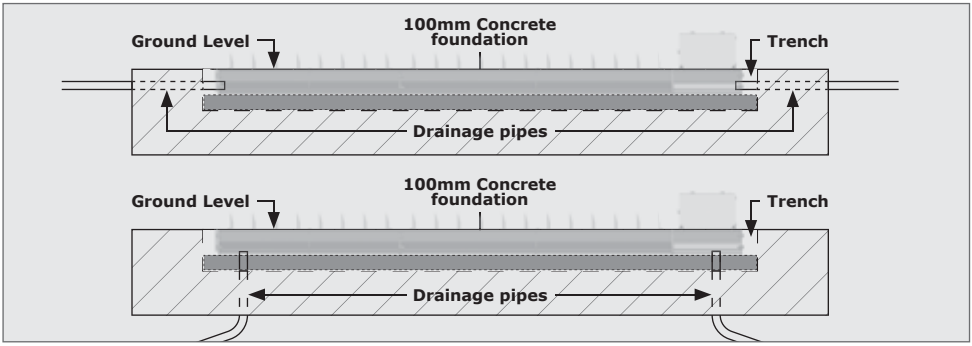


The Value of 'X' in a:
3m Configuration: 3 420mm **4.5m Configuration**: 4 920mm **6m Configuration**: 6 420mm

STEP 1 **FIGURE 51**

Drainage pipes must be laid at one or both ends of the trench to allow water to flow either into storm water drains or into any other area away from the installation. Section 13, Figure 52 shows two recommended drainage configurations. Once complete, hold the draining pipes in place by pouring a 100mm concrete foundation and level off.

If the SECTOR II 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 SECTOR II. This must be done before any concrete is poured (Section 13.5.2.).



STEP 2 **FIGURE 52**

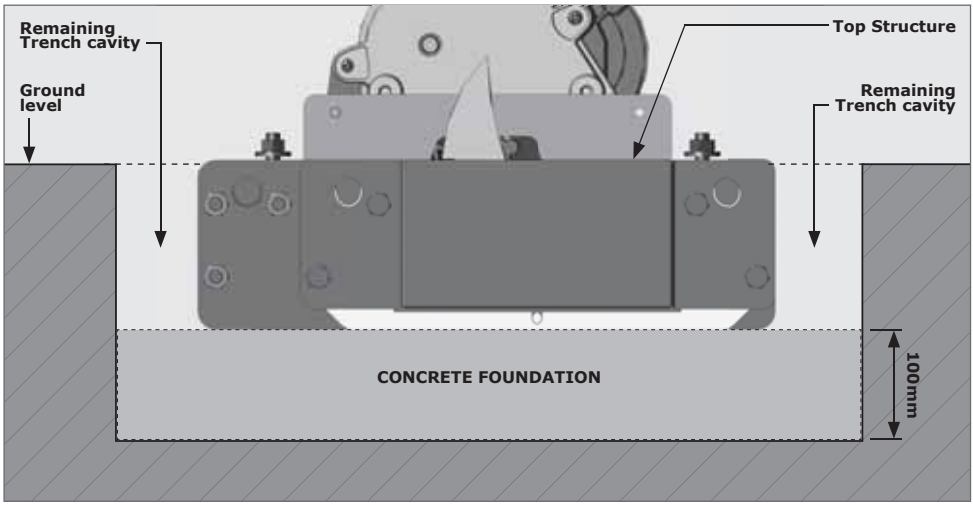
Make sure the drain pipes do not interfere with the structure when it is in the trench.

13.3.1. Concreting the Assembly into the Trench.

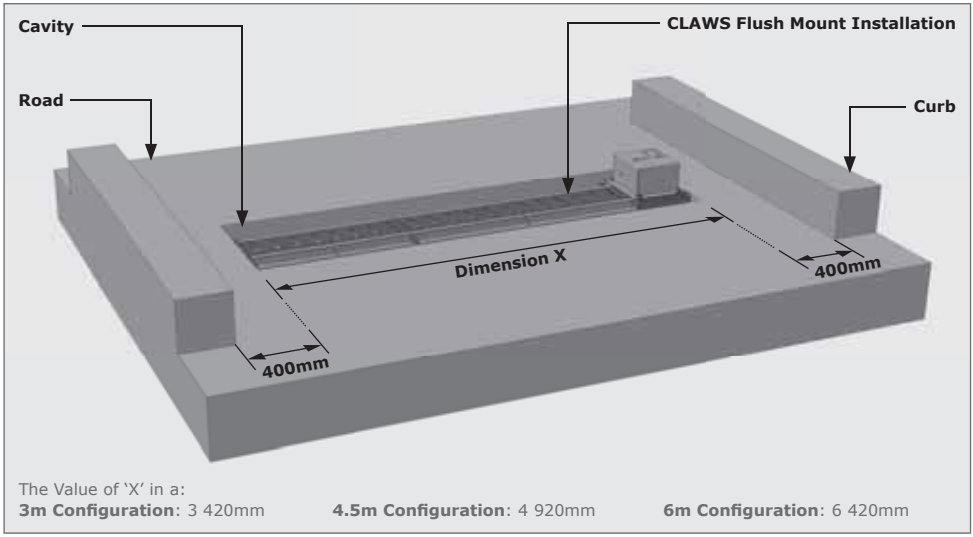
Ensure that the drain pipes will not interfere with the structure when it is placed in the trench.

Place the assembly in the trench and level the assembly using any type of propping or jacking method. Make sure that the top of the assembly is either in line with or a little higher than the ground level and pour concrete (minimum 45MPa after 28 days) into the cavity that remains.

Do not pour any concrete into the gutter of the spikes module or drive link assembly.



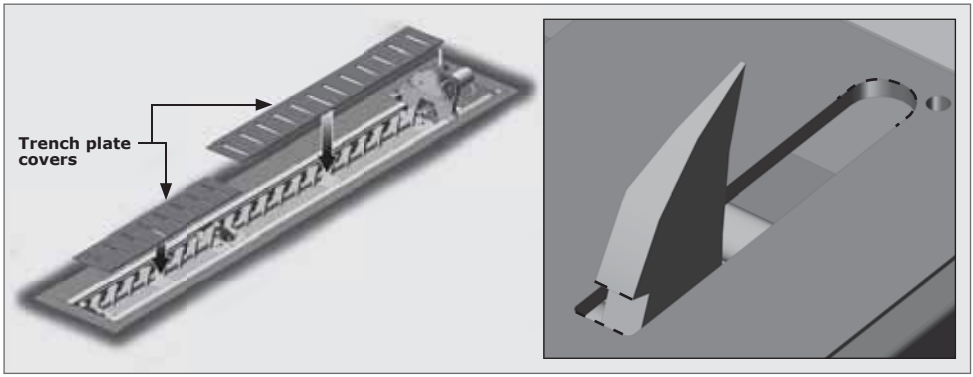
STEP 3 FIGURE 53



The Value of 'X' in a:
3m Configuration: 3 420mm **4.5m Configuration**: 4 920mm **6m Configuration**: 6 420mm

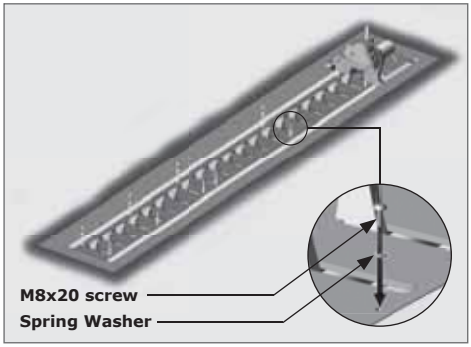
FIGURE 54. OVERVIEW OF CIVIL LAYOUT

13.4. Re-assembling the trench plates



STEP 1 **FIGURE 55**

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.

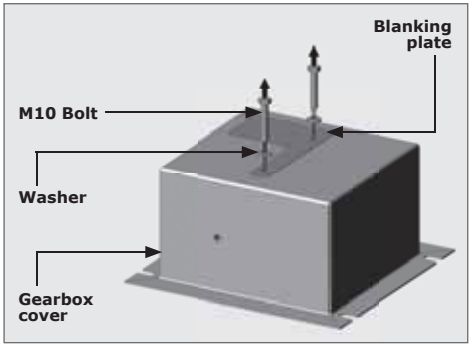


STEP 2 **FIGURE 56**

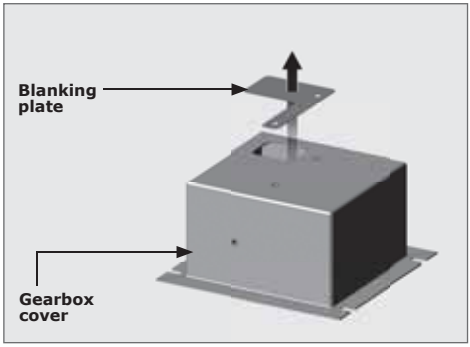
13.5. Integrating the SECTOR II with the CLAWS

13.5.1. Directly mount THE SECTOR II onto the Independent Drive

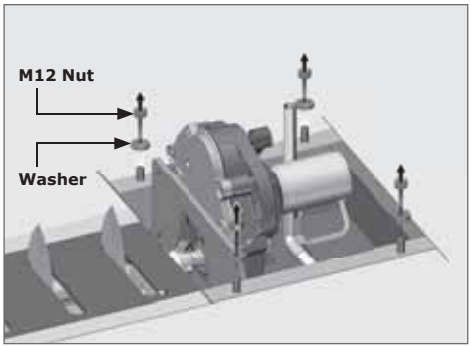
13.5.1.1. Placing the gearbox cover into position



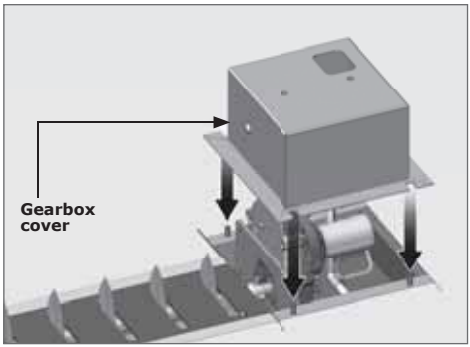
STEP 1 FIGURE 57



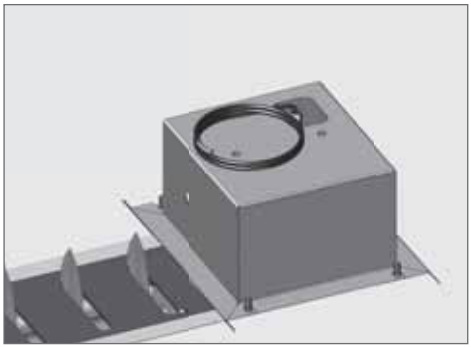
STEP 2 FIGURE 58



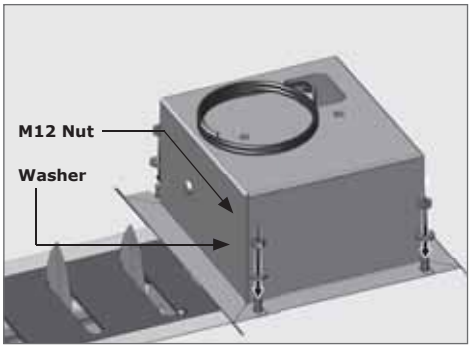
STEP 3 FIGURE 59



STEP 4 FIGURE 60



STEP 5 FIGURE 61



STEP 6 FIGURE 62

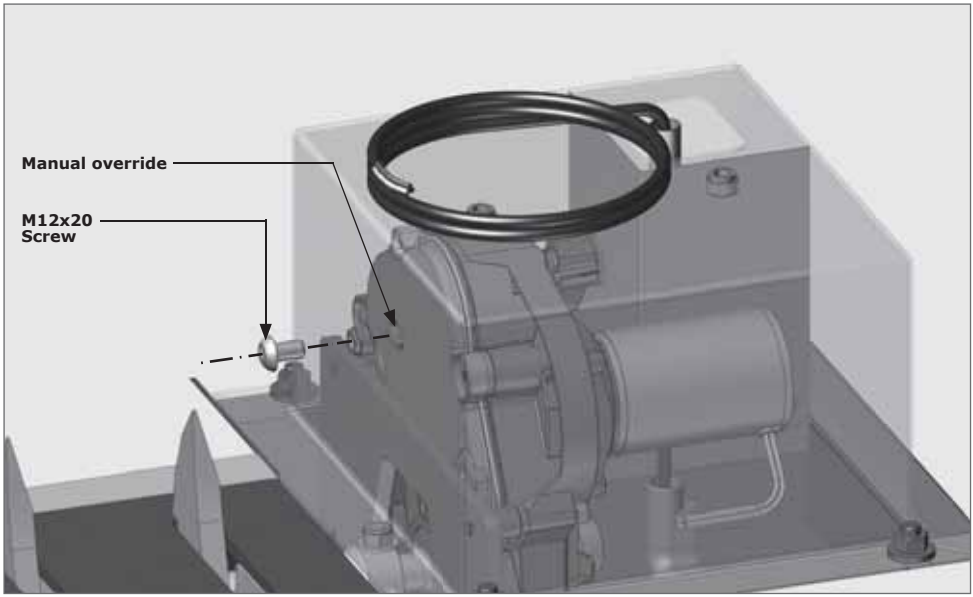
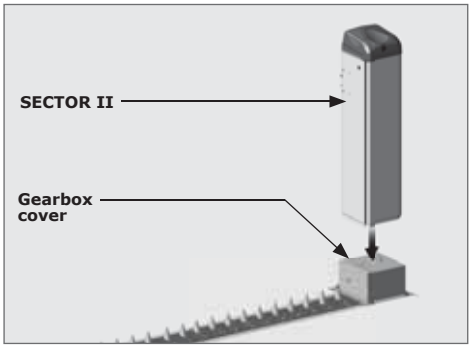
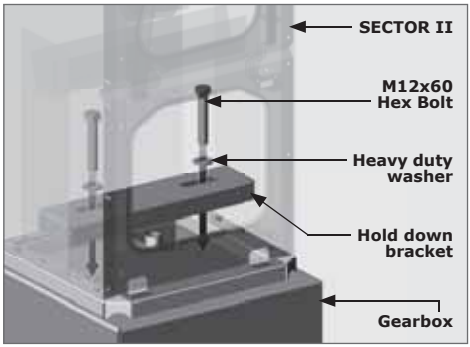


FIGURE 63. MANUAL OVERRIDE

13.5.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 64



STEP 2 FIGURE 65

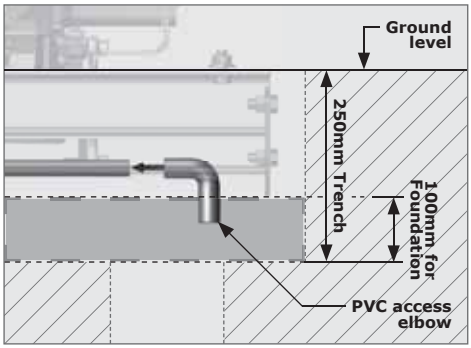
13.5.2. Seperately-placed CLAWS and SECTOR II

13.5.2.1. Running the conduit from the gearbox to the SECTOR II

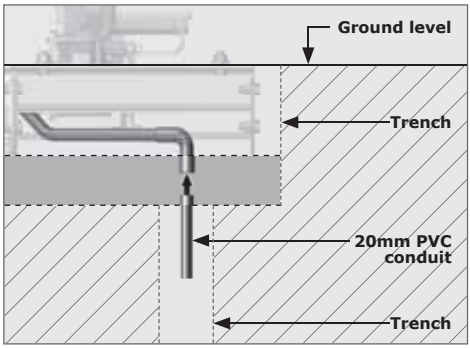
STEP 1

Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.

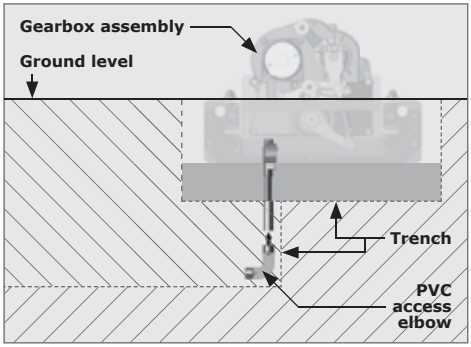
Drill a 20mm hole through the gutter plate using a 20mm hole saw for the proximity sensor conduit



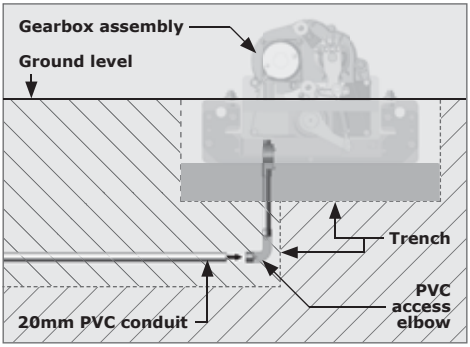
STEP 2 FIGURE 66



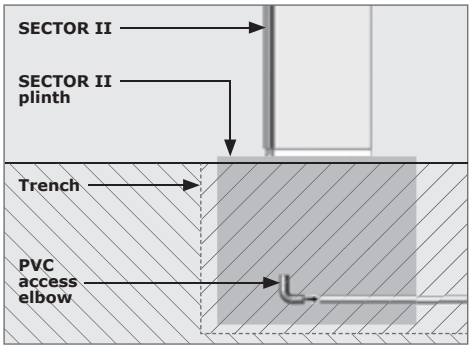
STEP 3 FIGURE 67



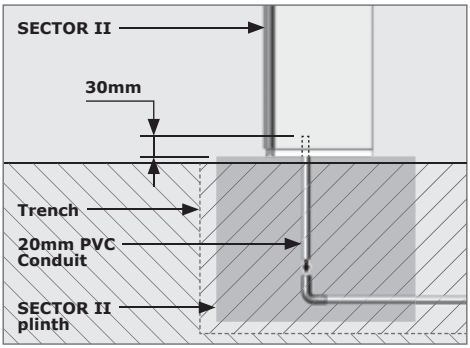
STEP 4 FIGURE 68



STEP 5 FIGURE 69



STEP 6 FIGURE 70

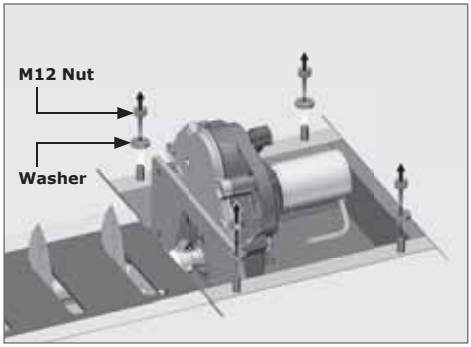


STEP 7 FIGURE 71

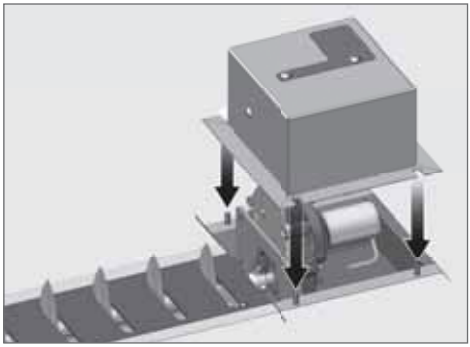
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

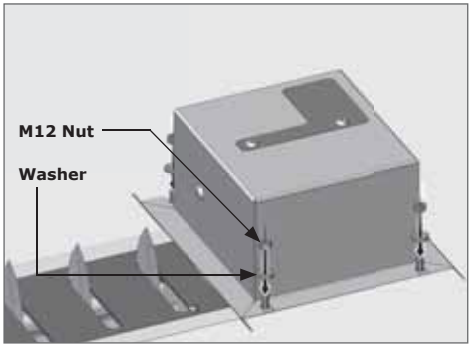
13.5.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 72



STEP 2 FIGURE 73



STEP 3 FIGURE 74

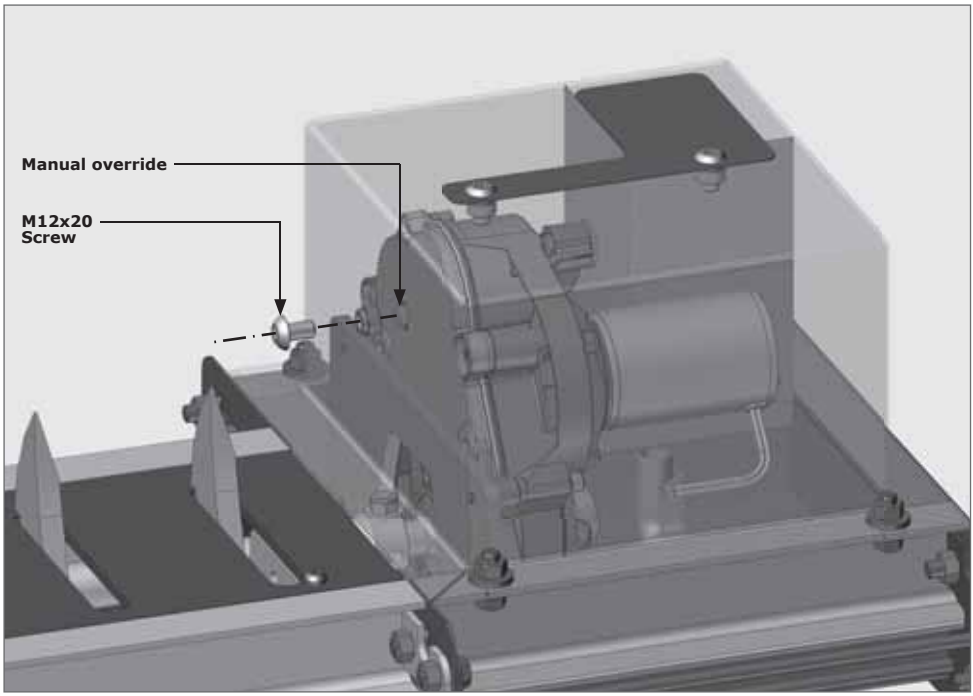
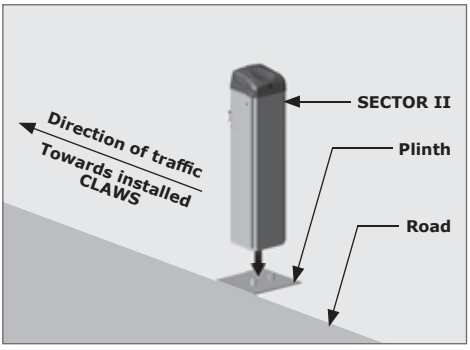


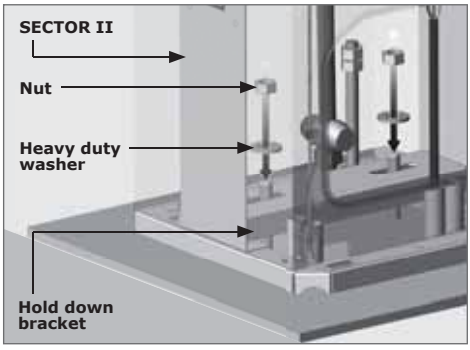
FIGURE 75. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

13.5.2.3. Placing the SECTOR II into position

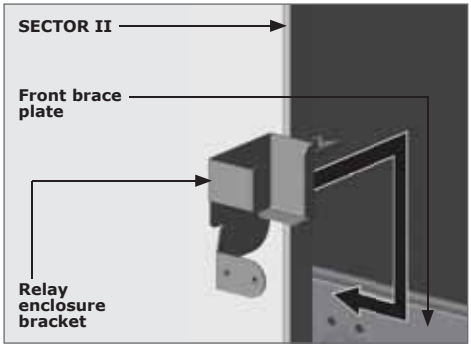


STEP 1 FIGURE 76

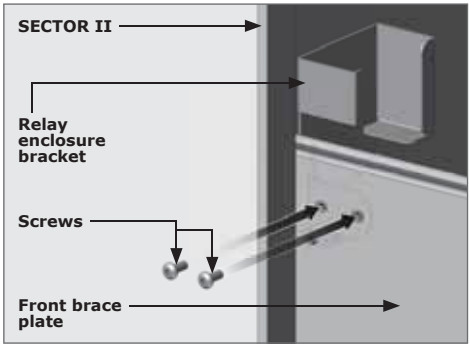


STEP 2 FIGURE 77

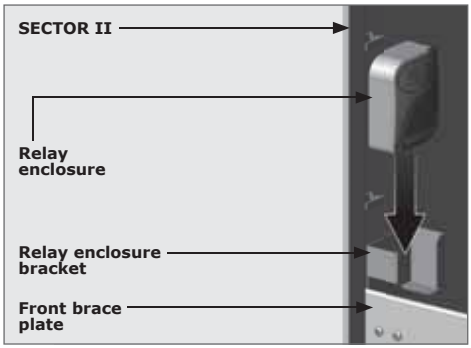
13.5.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 78



STEP 2 FIGURE 79

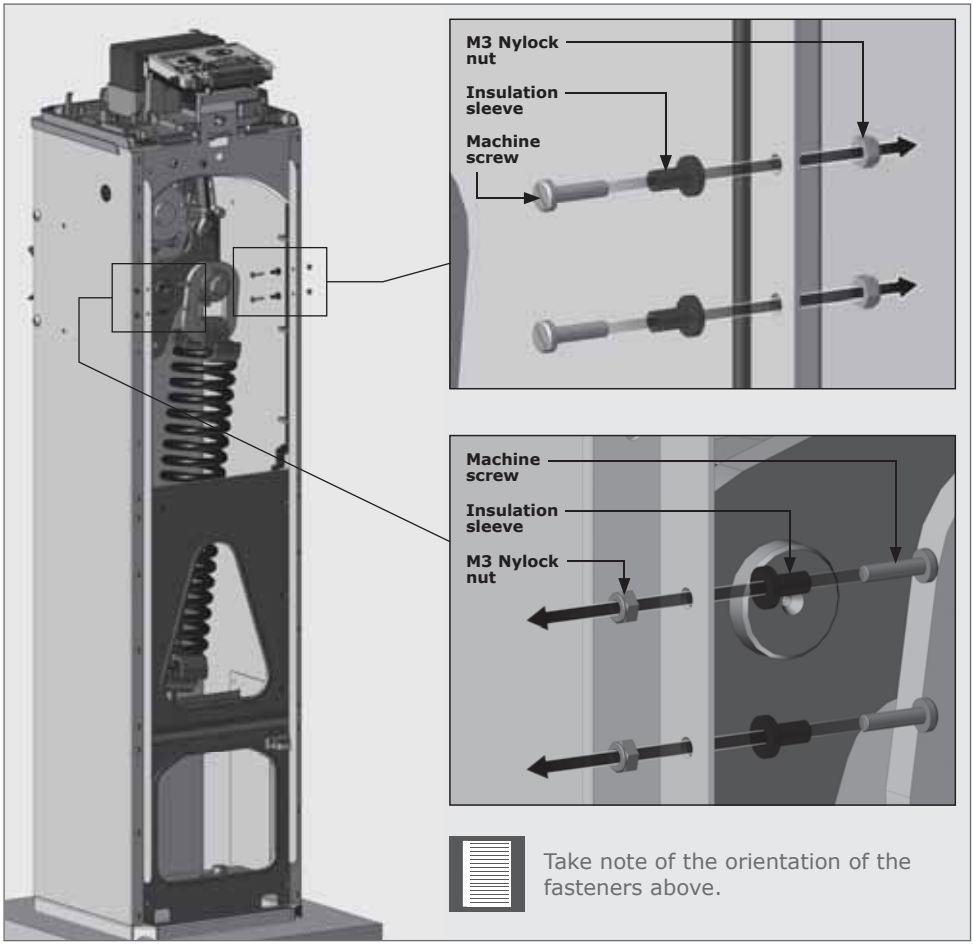


STEP 3 FIGURE 80

Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

13.5.4. Fitting the CLAWS controller to the SECTOR II



STEP 1 **FIGURE 81**

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

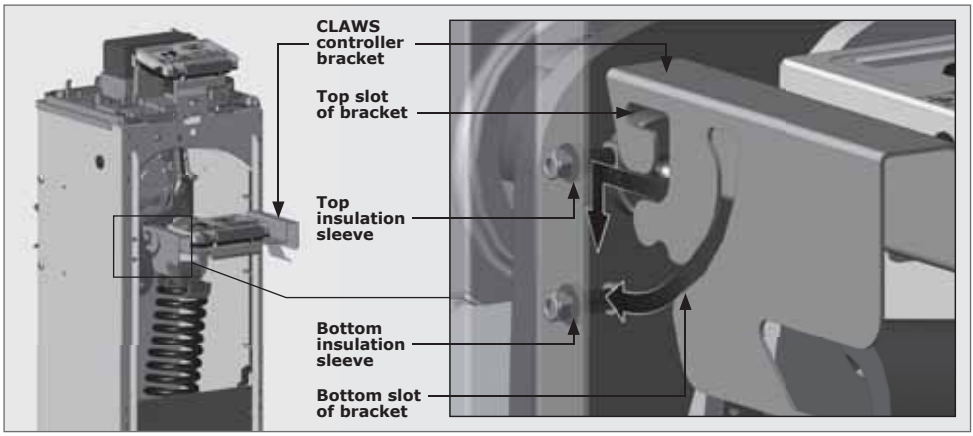


FIGURE 82

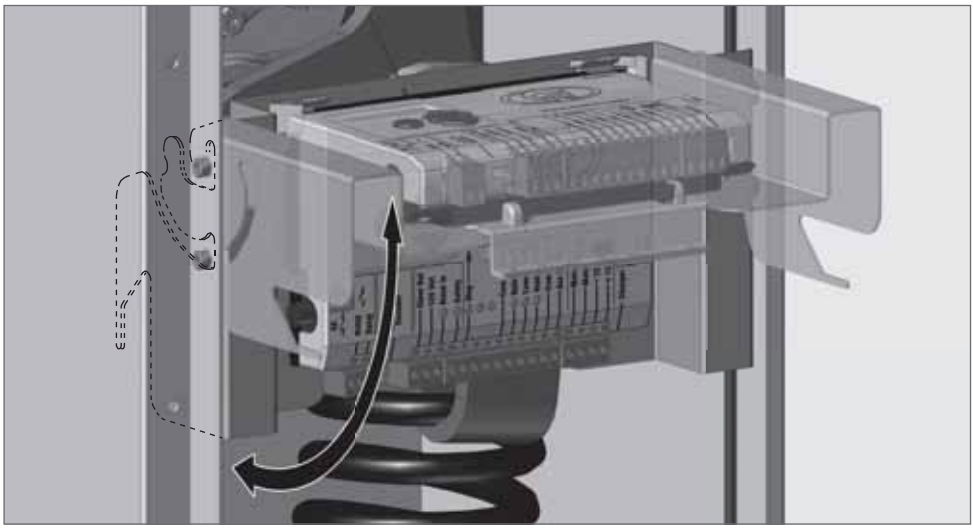


FIGURE 83

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 13, Figure 84).

It can also be moved lower down for optimum space when working on the gearbox (Section 13, Figure 85).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 13, Figure 82).

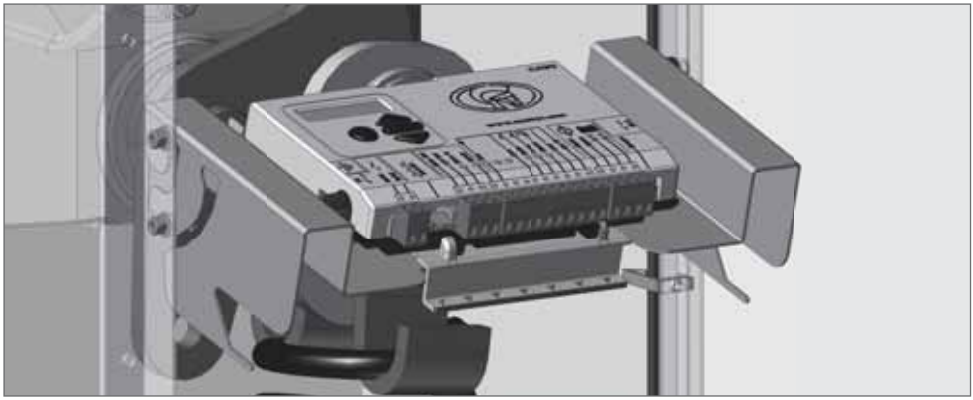


FIGURE 84. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

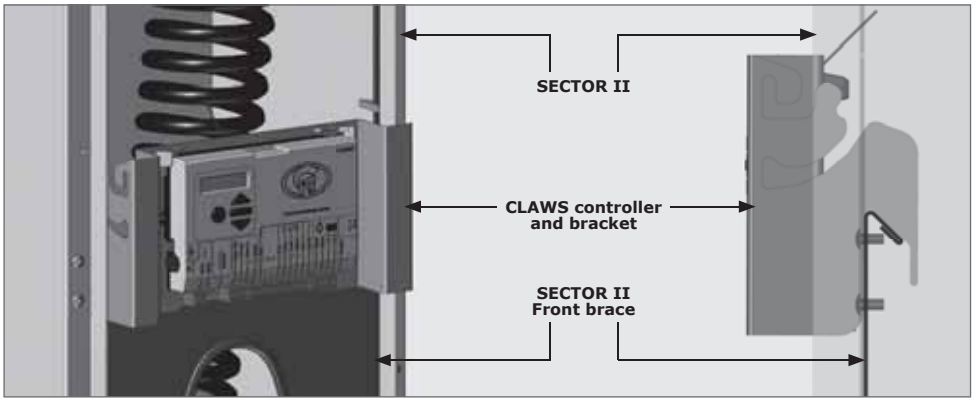


FIGURE 85. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

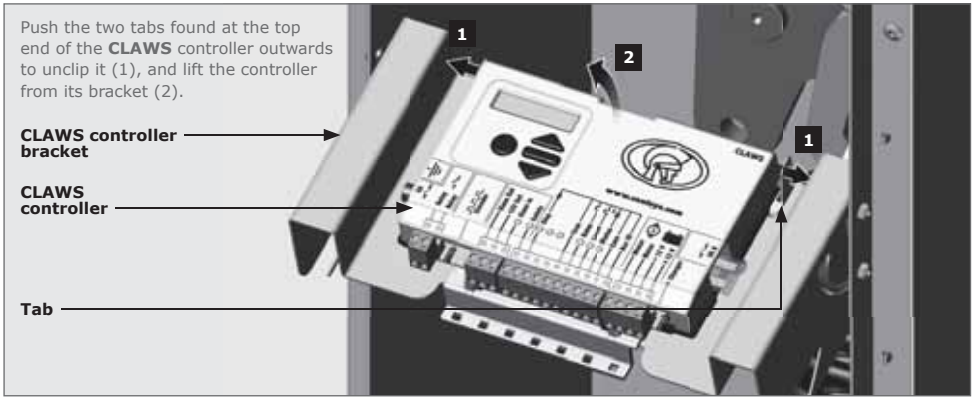


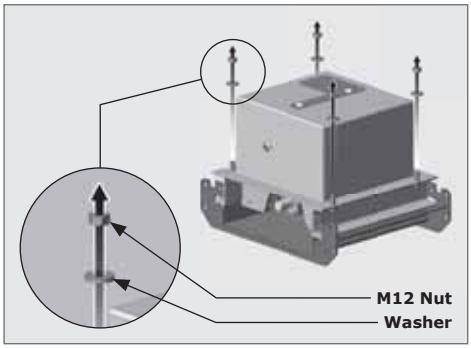
FIGURE 86. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

STEP 3

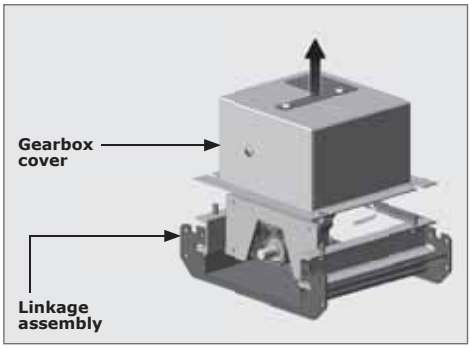
Connect harness and power supply. Refer to the wiring diagrams and controller settings.

14. RHS Flush Mount - Opposing Direction of Travel

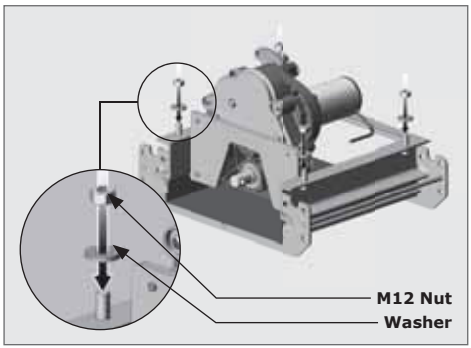
14.1. Preparing the Drive Linkage Assembly



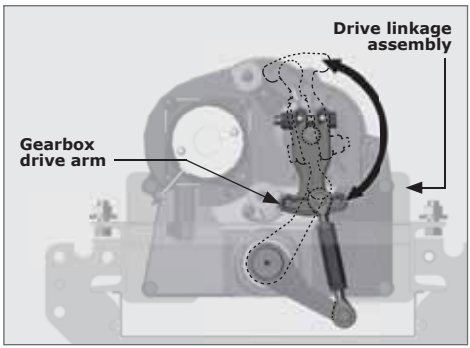
STEP 1 FIGURE 1



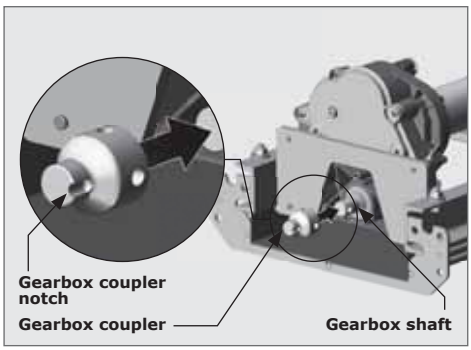
STEP 2 FIGURE 2



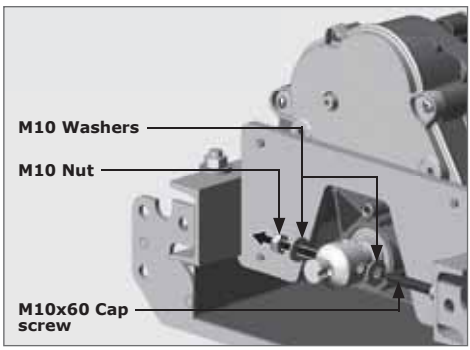
STEP 3 FIGURE 3



STEP 4 FIGURE 4



STEP 5 FIGURE 5

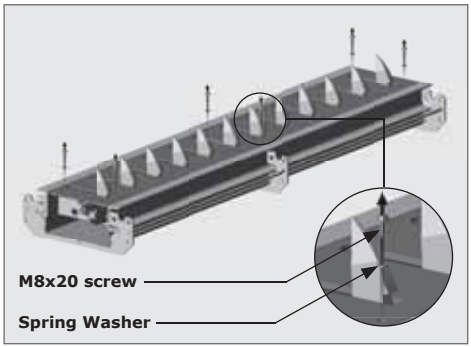


STEP 6 FIGURE 6

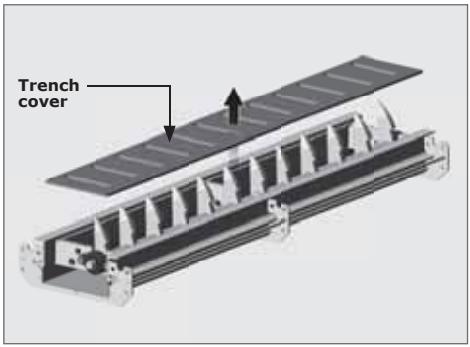
Note the orientation of the gearbox coupler notch is at the 3 o'clock position and that the gearbox drive arm is down as shown in Section 14, Figure 5.

14.2. Spike Module Assembly

14.2.1. Preparing the Spike Module assembly(ies) for installation

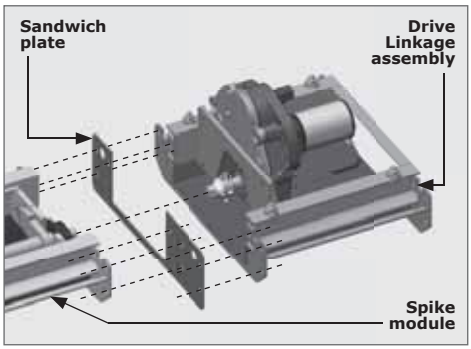


STEP 1 FIGURE 7

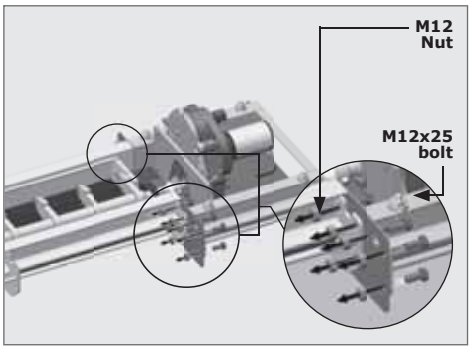


STEP 2 FIGURE 8

14.2.2. Attaching the drive linkage assembly to the spike module



STEP 1 FIGURE 9



STEP 2 FIGURE 10

Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly.

STEP 3

Using six M12x25 bolts, fix one spike module to another (Section 14, Figure 11).

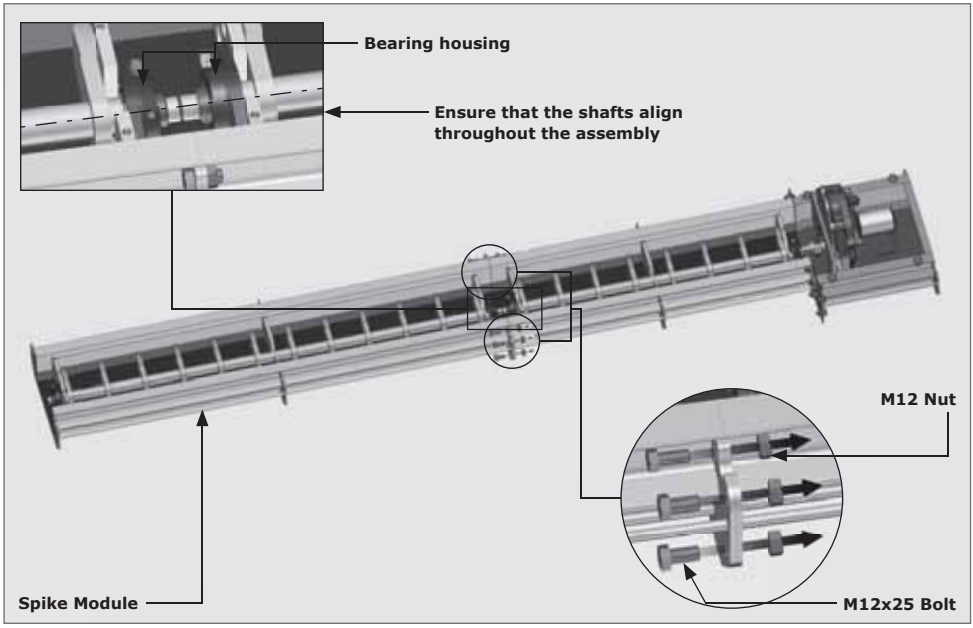


FIGURE 11

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

14.2.3. 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.

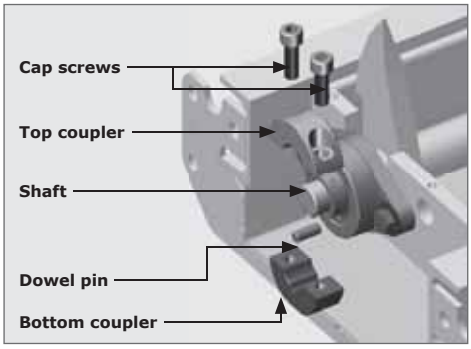


FIGURE 12. SHAFT COUPLER

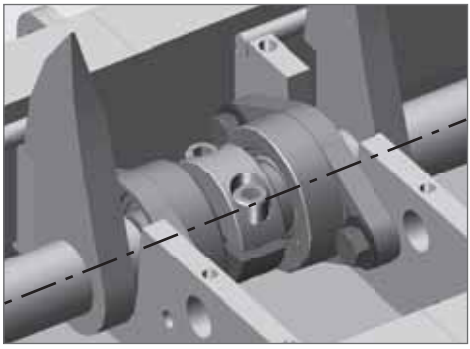
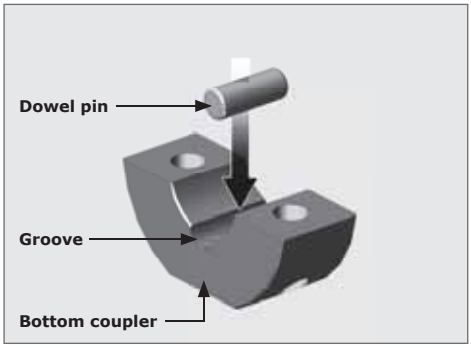
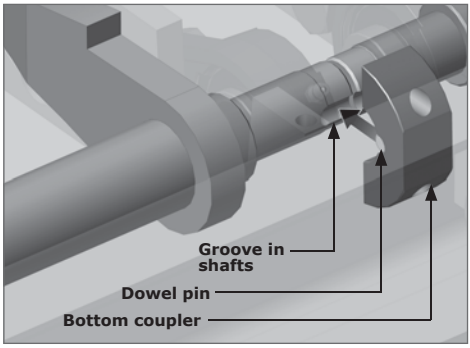


FIGURE 13

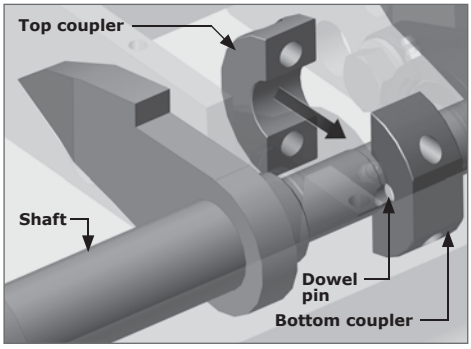
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



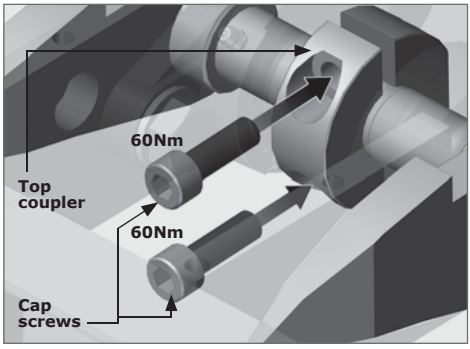
STEP 1 FIGURE 14



STEP 2 FIGURE 15



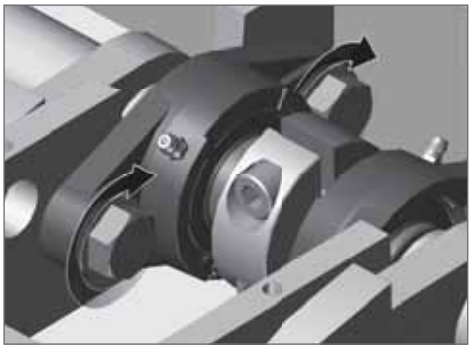
STEP 3 FIGURE 16



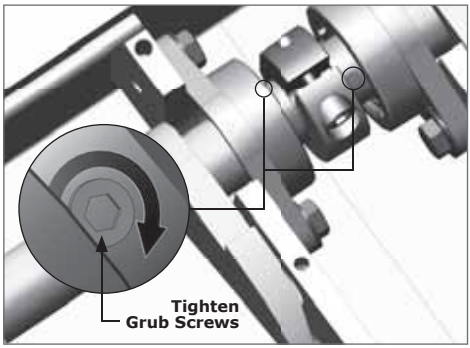
STEP 4 FIGURE 17

STEP 5

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



STEP 6 FIGURE 18



STEP 7 FIGURE 19

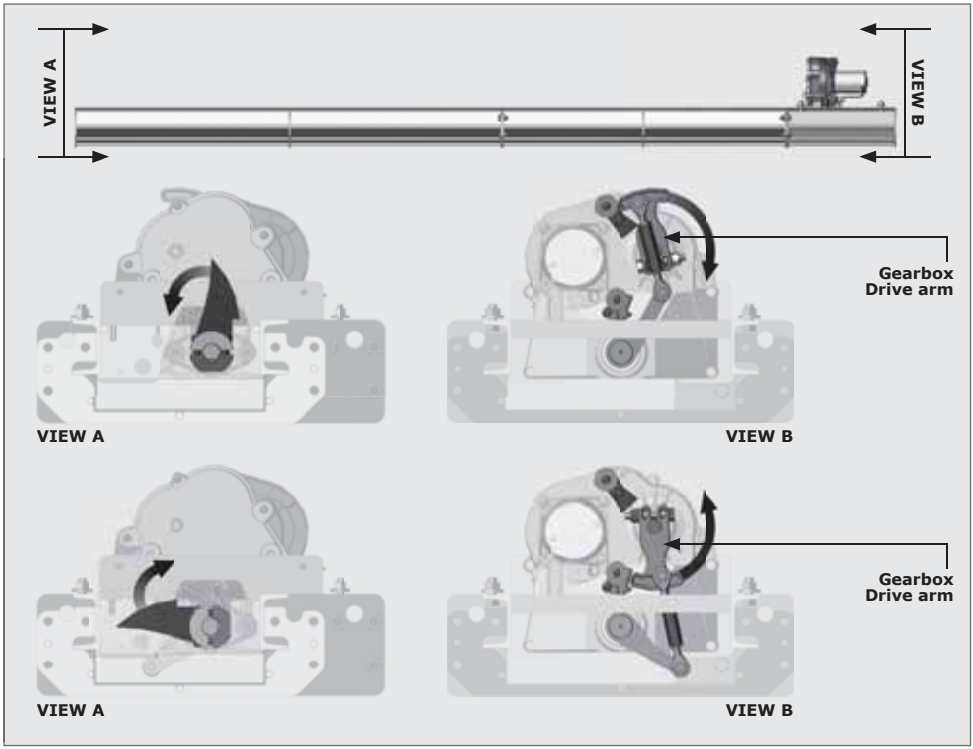
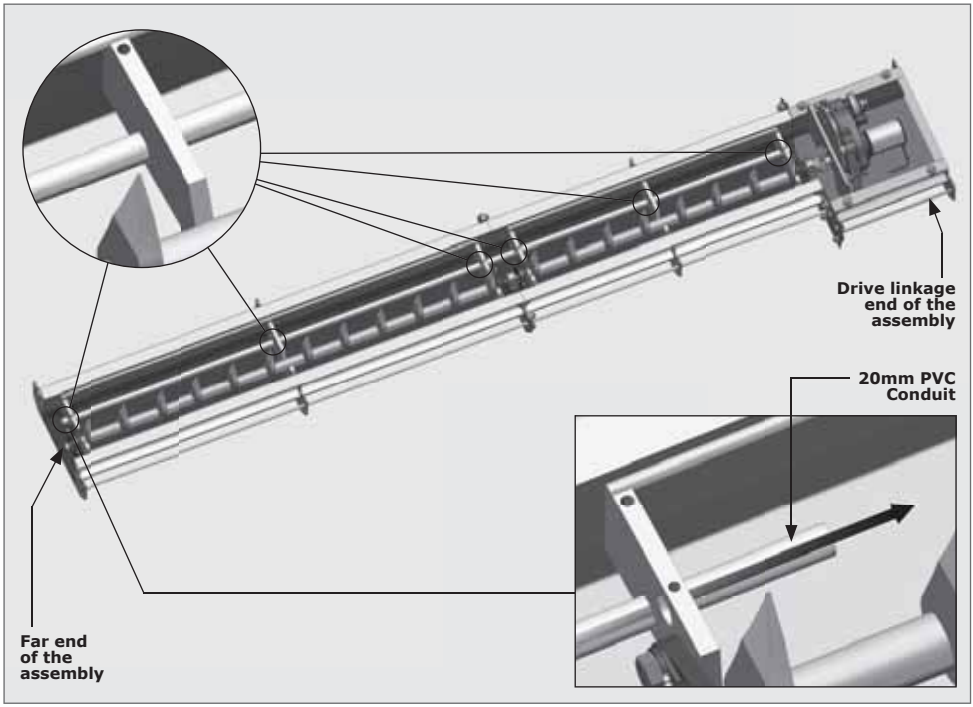


FIGURE 20. CORRECTLY ALIGNED SPIKE AND DRIVE MODULES

14.2.4. Proximity sensor installation



STEP 1 **FIGURE 21**

The length of the PVC conduit will be relative to the length of the spike modules combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 14, Figure 22).

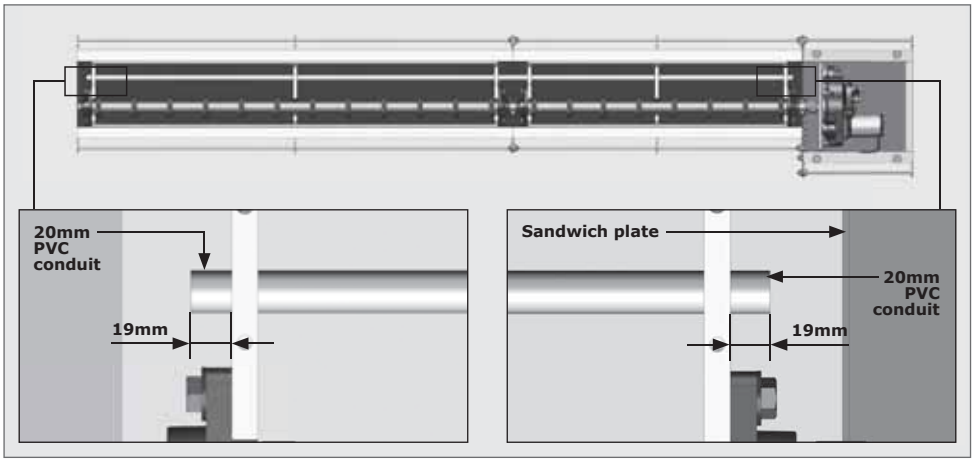
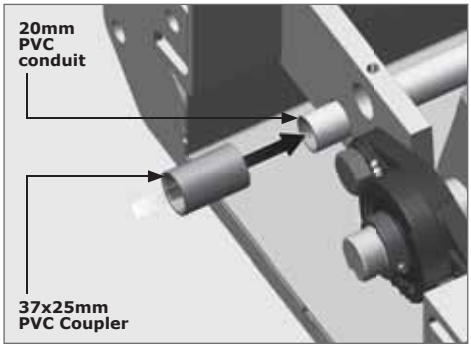
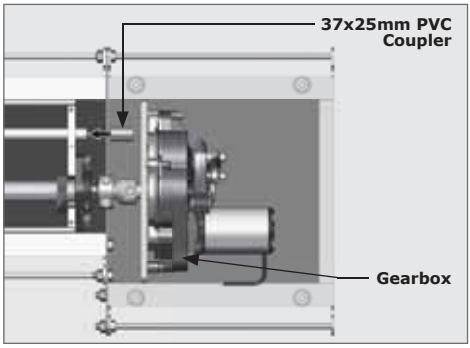


FIGURE 22

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

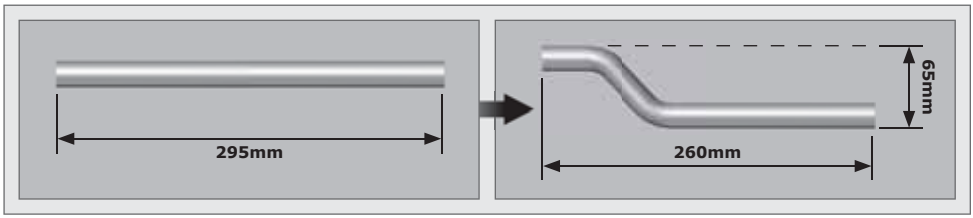


STEP 2 **FIGURE 23**



STEP 3 **FIGURE 24**

It is necessary to bend PVC conduit to circumvent the gearbox bulkhead to continue. The use of a conduit spring is recommended to avoid collapsing the pipe. Section 14, Figure 25 below is a guideline that can be used to achieve this.



STEP 4 **FIGURE 25**

STEP 5

Connect the bent piece of conduit to the PVC coupler installed in Section 14, Figure 24 Step 3. After it is connected, it should resemble Section 14, Figure 26.

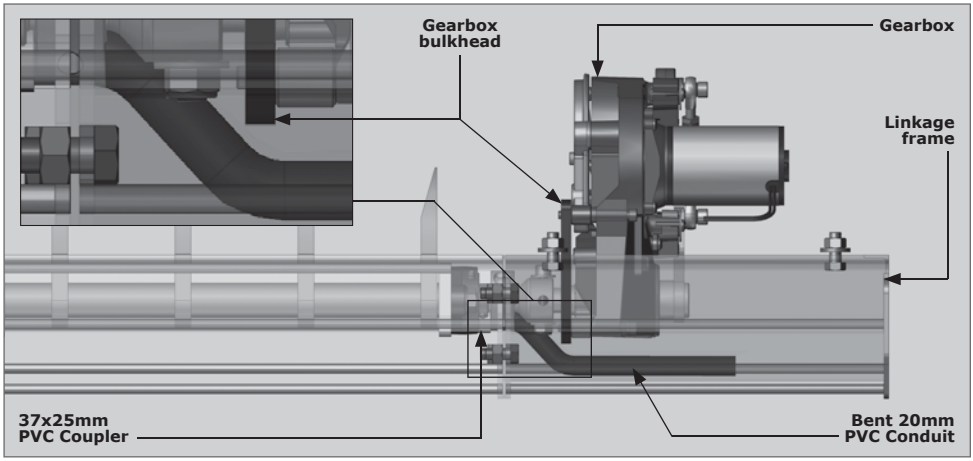
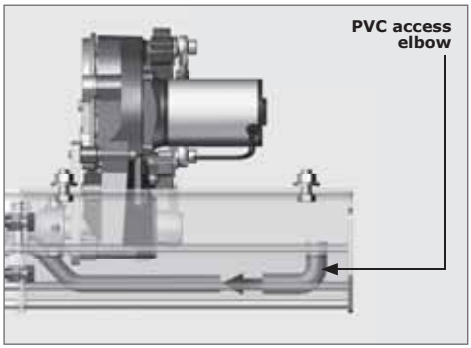
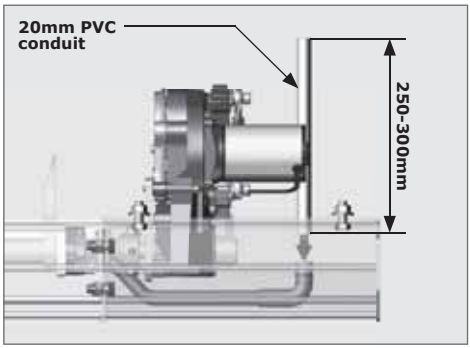


FIGURE 26

Steps 6-9 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, a trench for the conduit and cables will need to be dug (Refer to Section 14.5.2.).



STEP 6 FIGURE 27



STEP 7 FIGURE 28

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

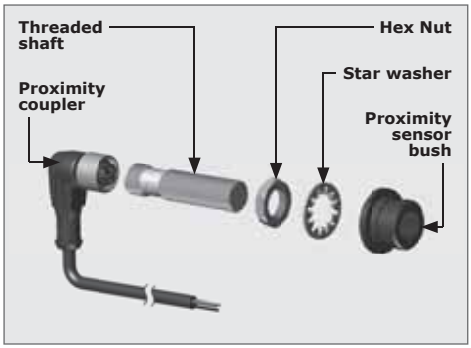


FIGURE 29. PROXIMITY SENSOR

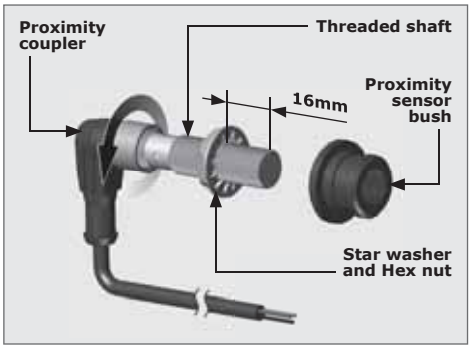


FIGURE 30. PROXIMITY SENSOR

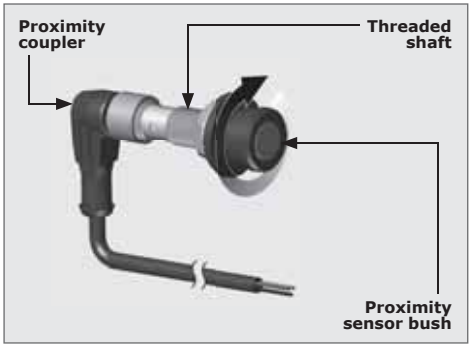
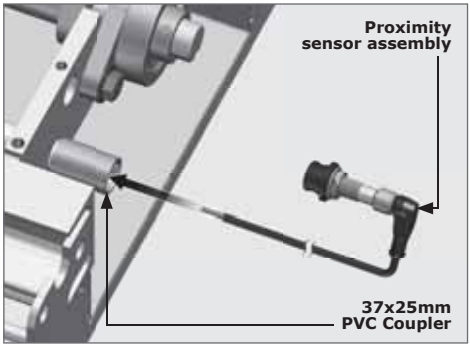


FIGURE 31. PROXIMITY SENSOR



STEP 6 FIGURE 32

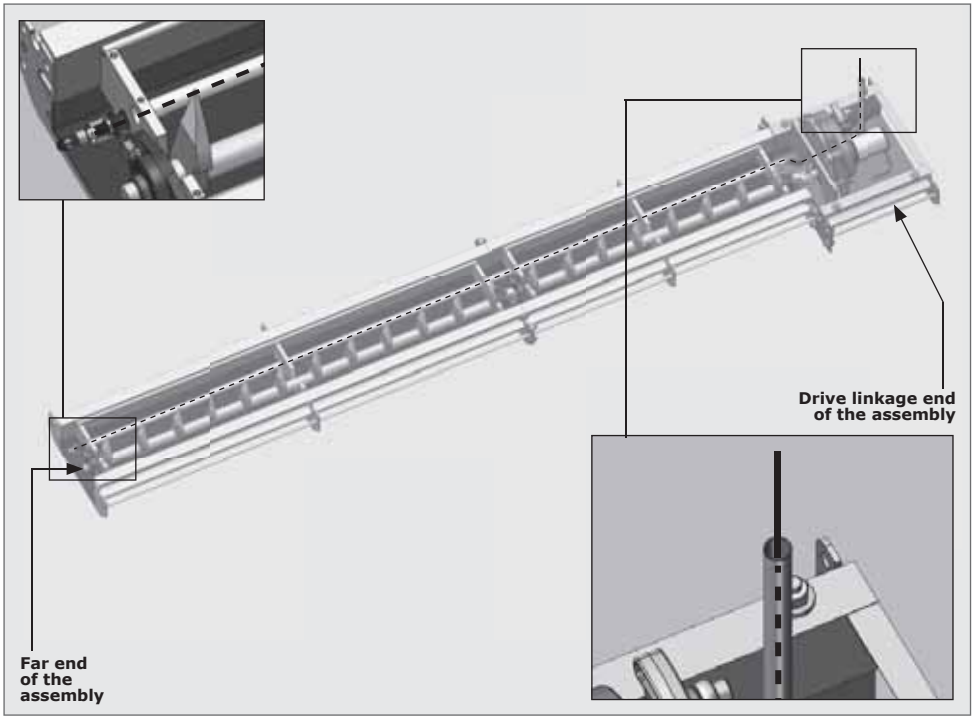
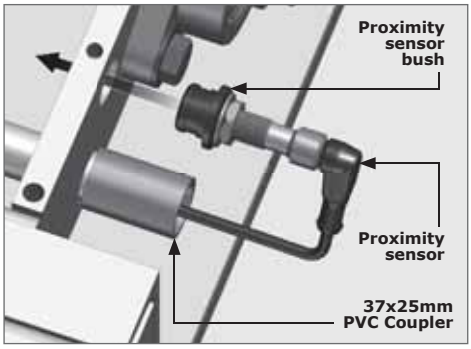
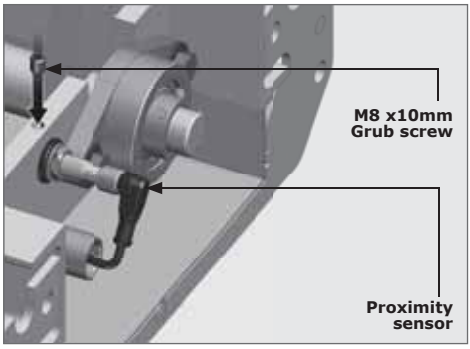


FIGURE 33

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



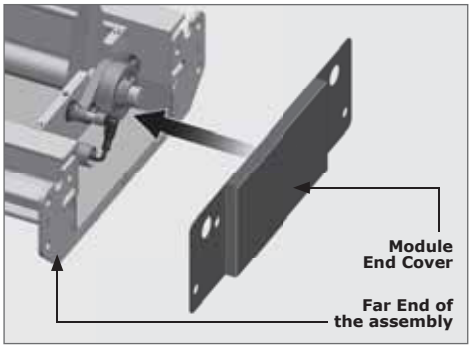
STEP 7 FIGURE 34



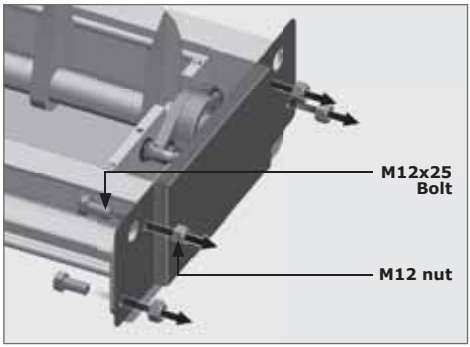
STEP 8 FIGURE 35

14.2.5. Attaching the End Covers to the Assembly

14.2.5.1. Attaching the Module End cover

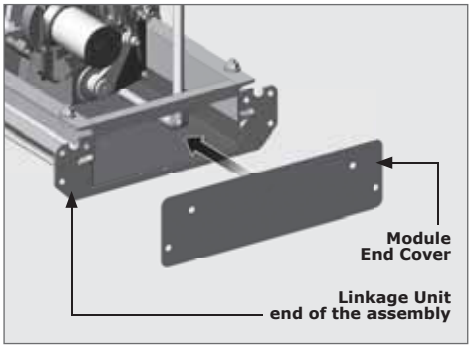


STEP 1 FIGURE 36

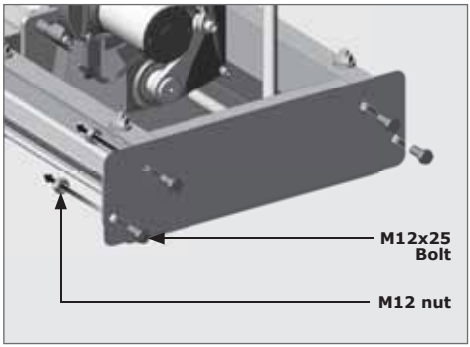


STEP 2 FIGURE 37

14.2.5.2. Attaching the Linkage Unit End cover

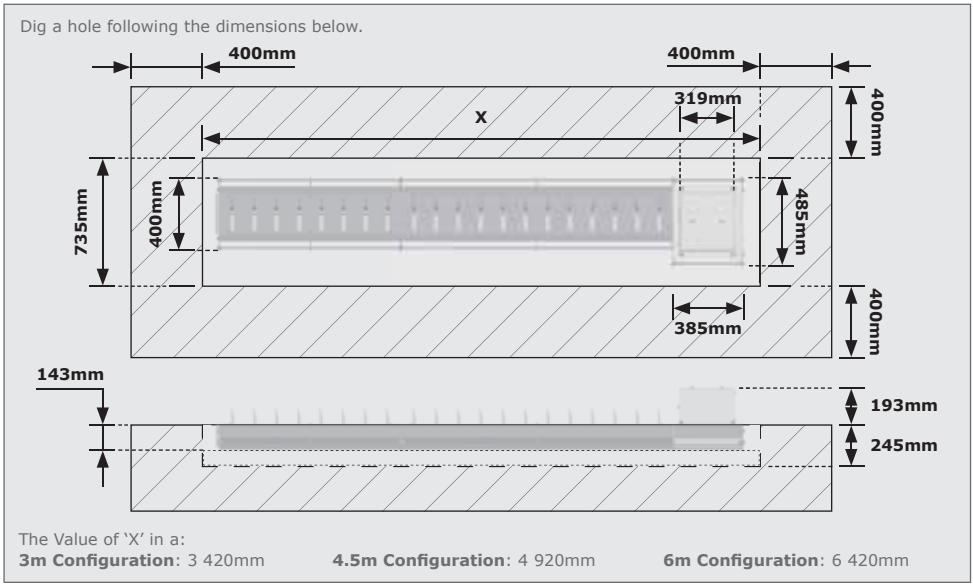


STEP 1 FIGURE 38



STEP 2 FIGURE 39

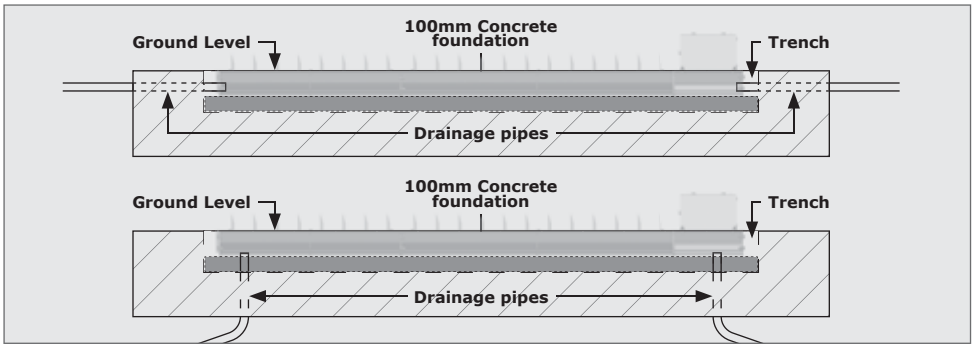
14.3. Preparing the Trench and Drainage System



STEP 1 **FIGURE 40**

Drainage pipes must be laid at one or both ends of the trench to allow water to flow either into storm water drains or into any other area away from the installation. Section 14, Figure 41 shows two recommended drainage configurations. Once complete, hold the drainage pipes in place by pouring a 100mm concrete foundation and level off.

If the SECTOR II 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 SECTOR II. This must be done before any concrete is poured (Section 14.5.2.).



STEP 2 **FIGURE 41**

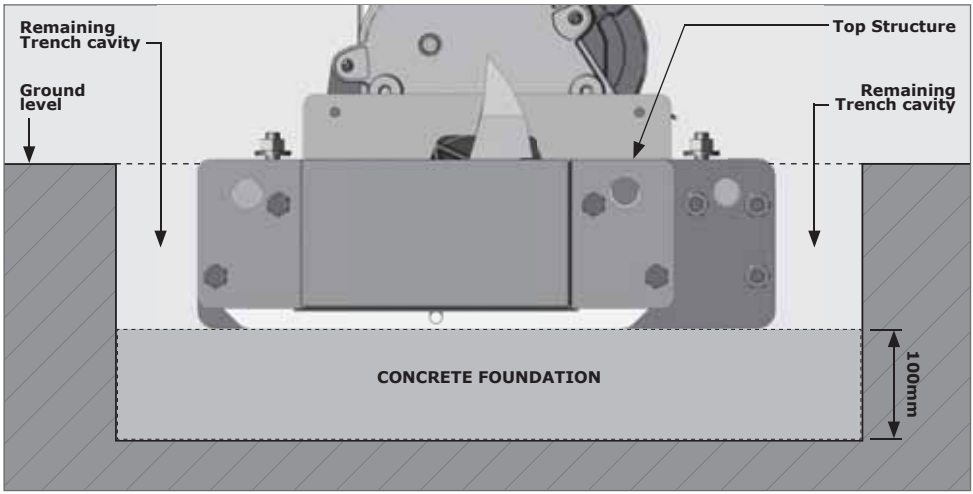
Make sure the drain pipes do not interfere with the structure when it is in the trench.

14.3.1. Concreting the Assembly into the Trench.

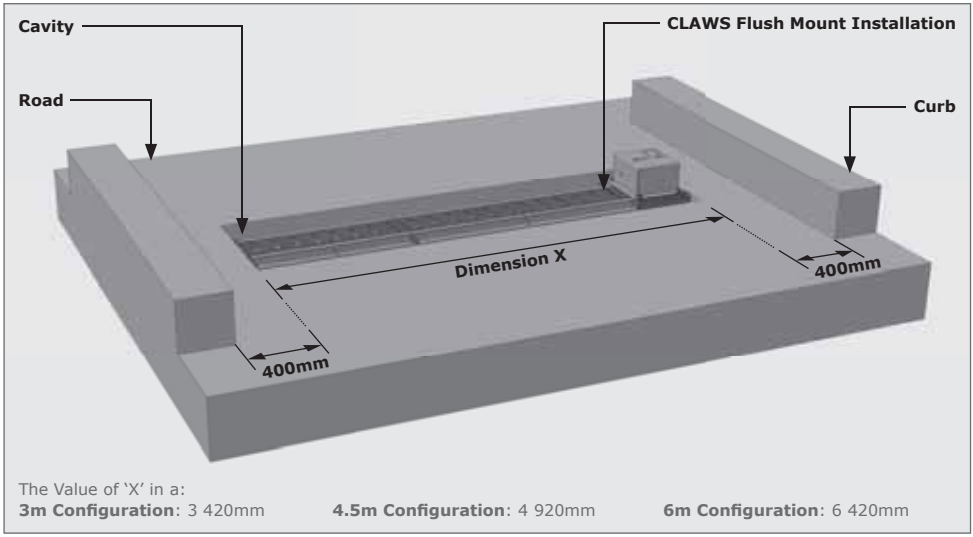
Ensure that the drain pipes will not interfere with the structure when it is placed in the trench.

Place the assembly in the trench and level the assembly using any type of propping or jacking method. Make sure that the top of the assembly is either in line with or a little higher than the ground level and pour concrete (minimum 45MPa after 28 days) into the cavity that remains.

Do not pour any concrete into the gutter of the spikes module or drive link assembly.



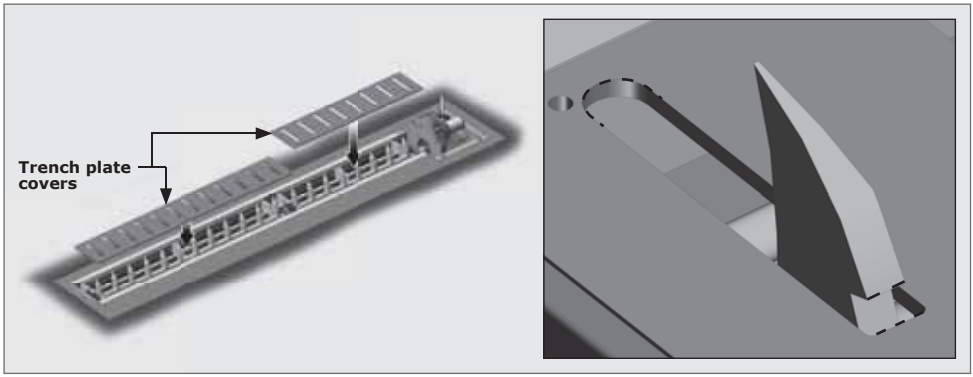
STEP 3 **FIGURE 42**



The Value of 'X' in a:
3m Configuration: 3 420mm **4.5m Configuration**: 4 920mm **6m Configuration**: 6 420mm

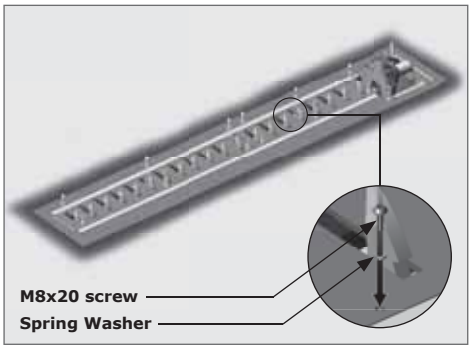
FIGURE 43. OVERVIEW OF CIVIL LAYOUT

14.4. Re-assembling the trench plates



STEP 1 **FIGURE 44**

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.

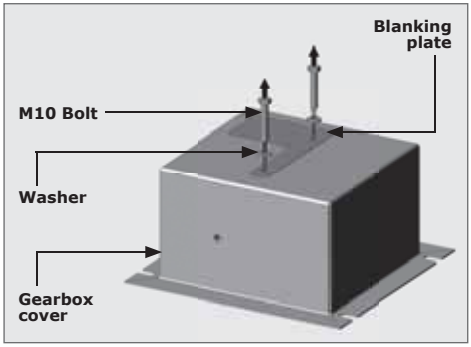


STEP 2 **FIGURE 45**

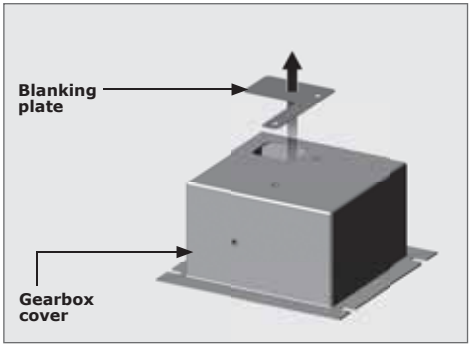
14.5. Integrating the SECTOR II with the CLAWS

14.5.1. Directly mount THE SECTOR II onto the Independent Drive

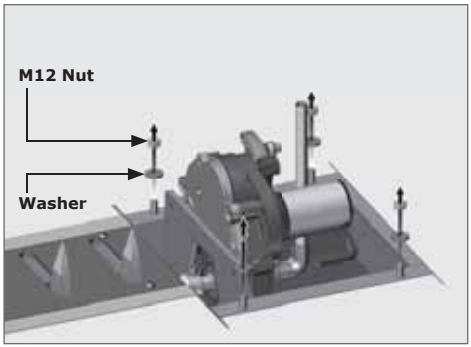
14.5.1.1. Placing the gearbox cover into position



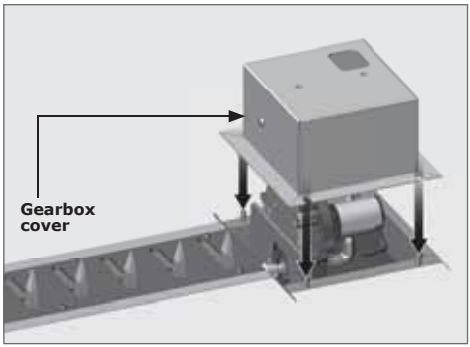
STEP 1 FIGURE 46



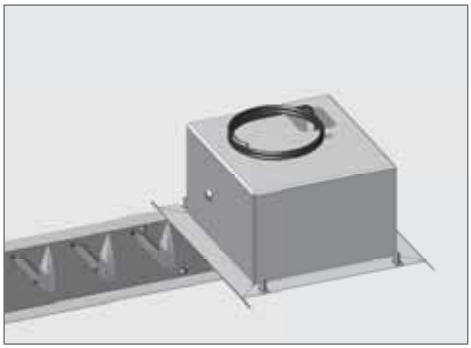
STEP 2 FIGURE 47



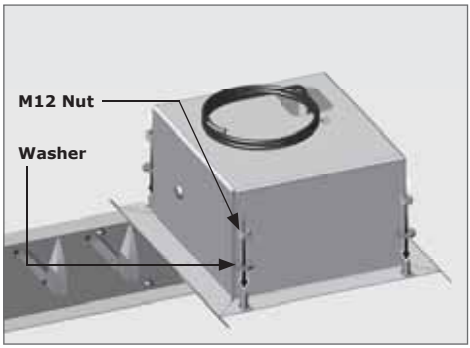
STEP 3 FIGURE 48



STEP 4 FIGURE 49



STEP 5 FIGURE 50



STEP 6 FIGURE 51

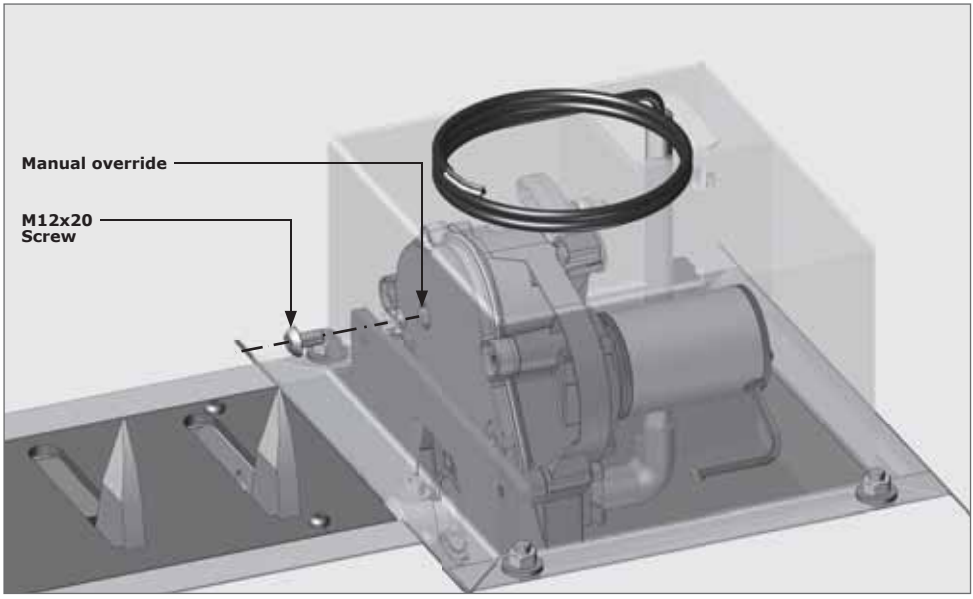
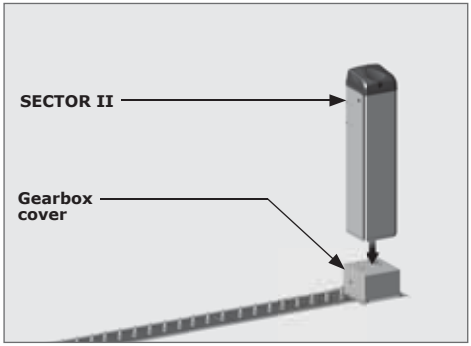
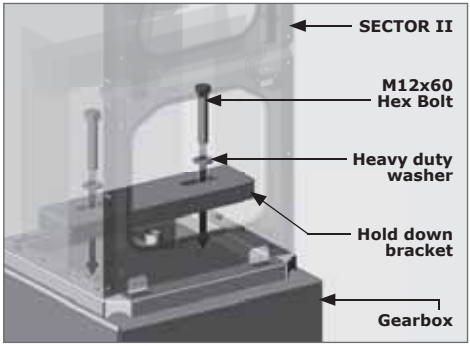


FIGURE 52. MANUAL OVERRIDE

14.5.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 53



STEP 2 FIGURE 54

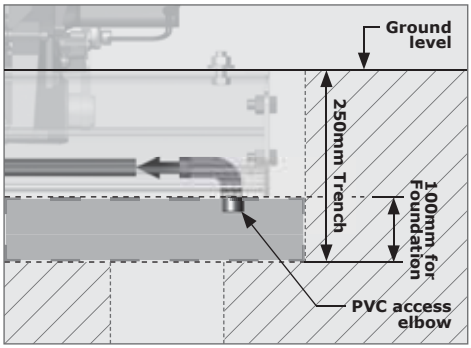
14.5.2. Seperately-placed CLAWS and SECTOR II

14.5.2.1. Running the conduit from the gearbox to the SECTOR II

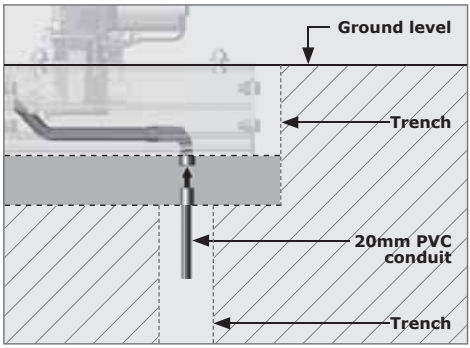
STEP 1

Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.

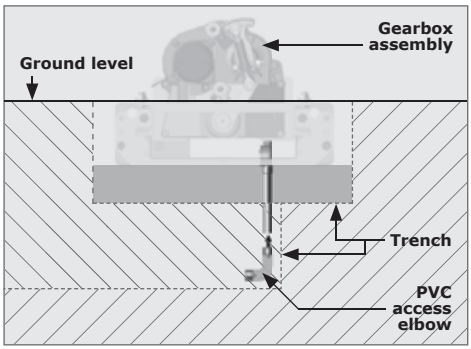
Drill a 20mm hole through the gutter plate using a 20mm hole saw for the proximity sensor conduit



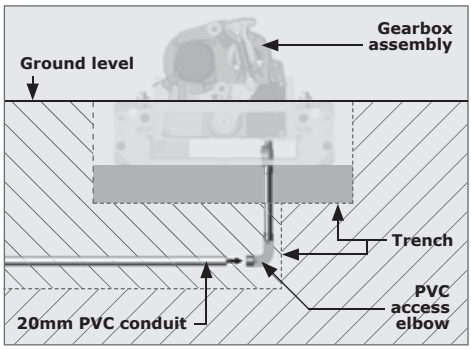
STEP 2 **FIGURE 55**



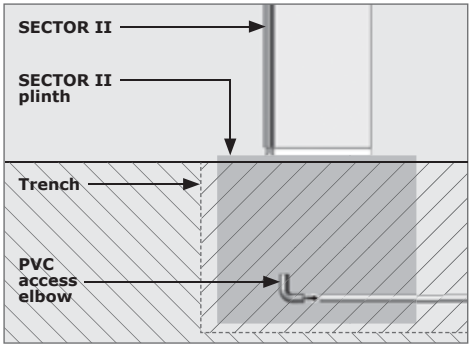
STEP 3 **FIGURE 56**



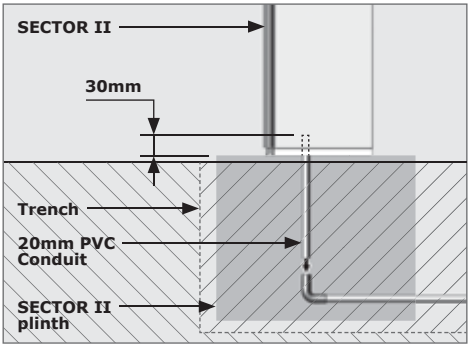
STEP 4 **FIGURE 57**



STEP 5 **FIGURE 58**



STEP 6 FIGURE 59

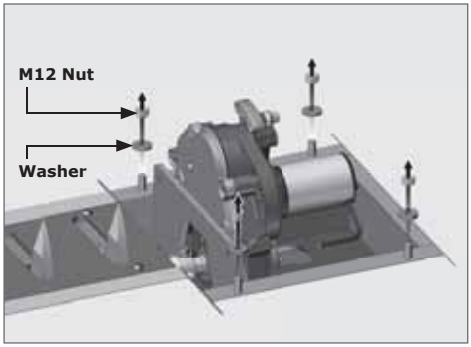


STEP 7 FIGURE 60

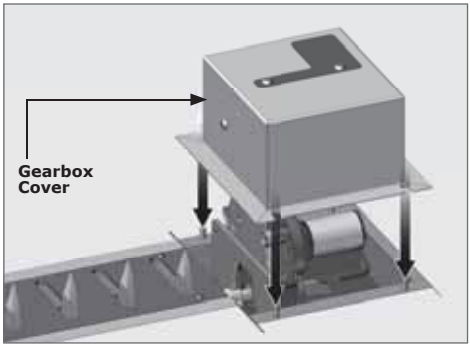
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

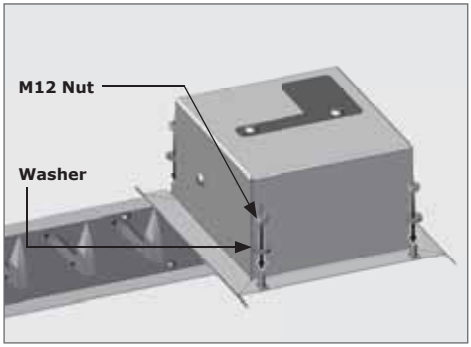
14.5.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 61



STEP 2 FIGURE 62



STEP 3 FIGURE 63

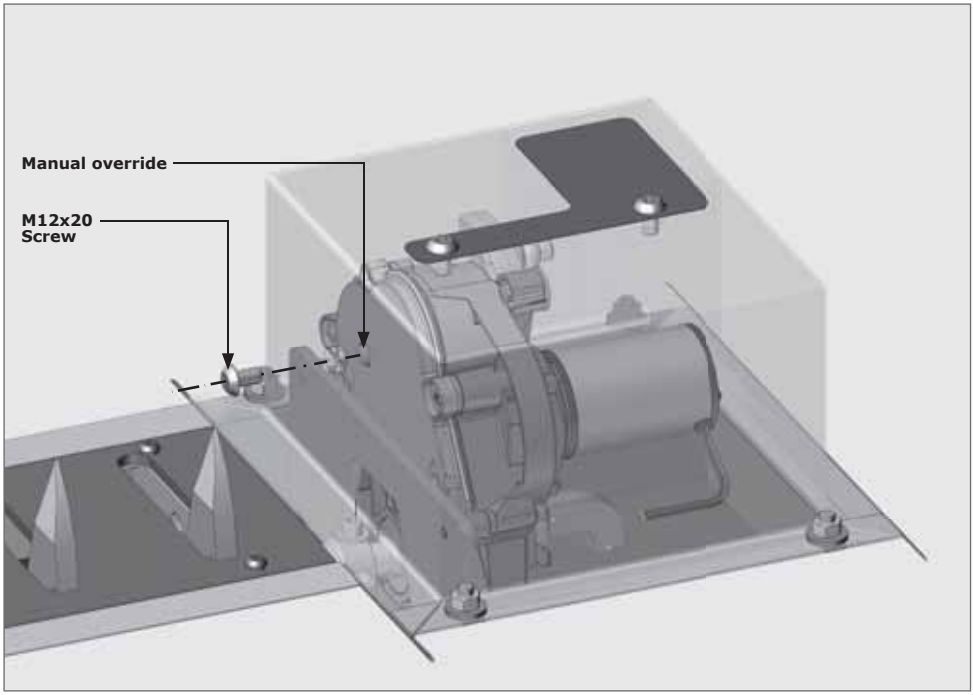
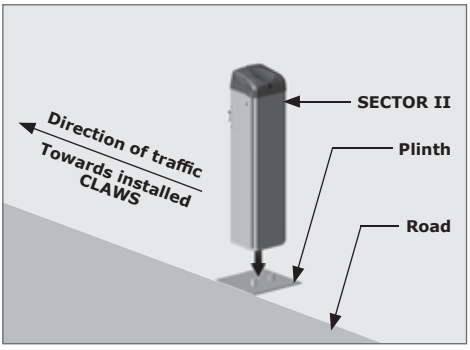


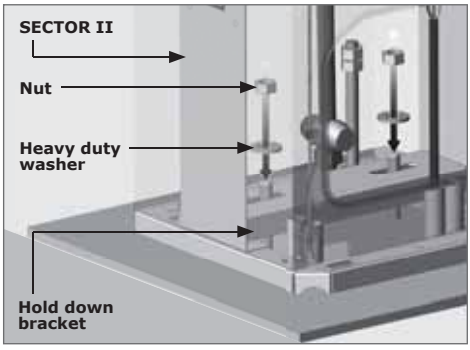
FIGURE 64. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

14.5.2.3. Placing the SECTOR II into position

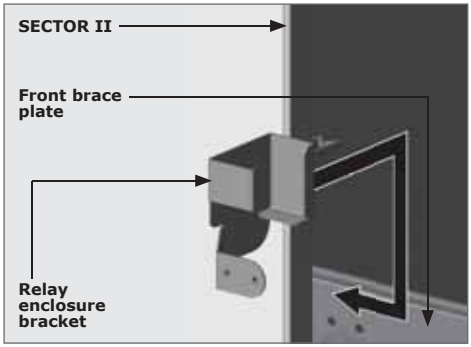


STEP 1 **FIGURE 65**

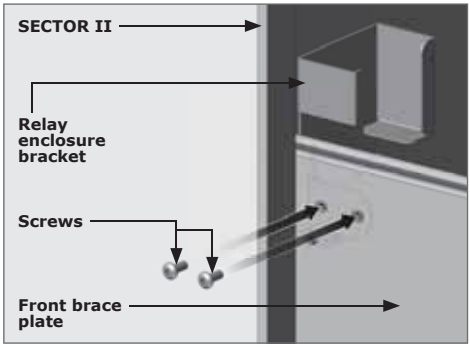


STEP 2 **FIGURE 66**

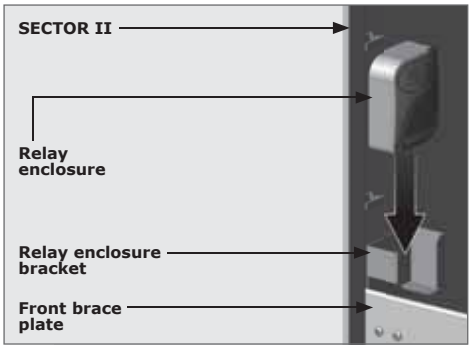
14.5.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 67



STEP 2 FIGURE 68

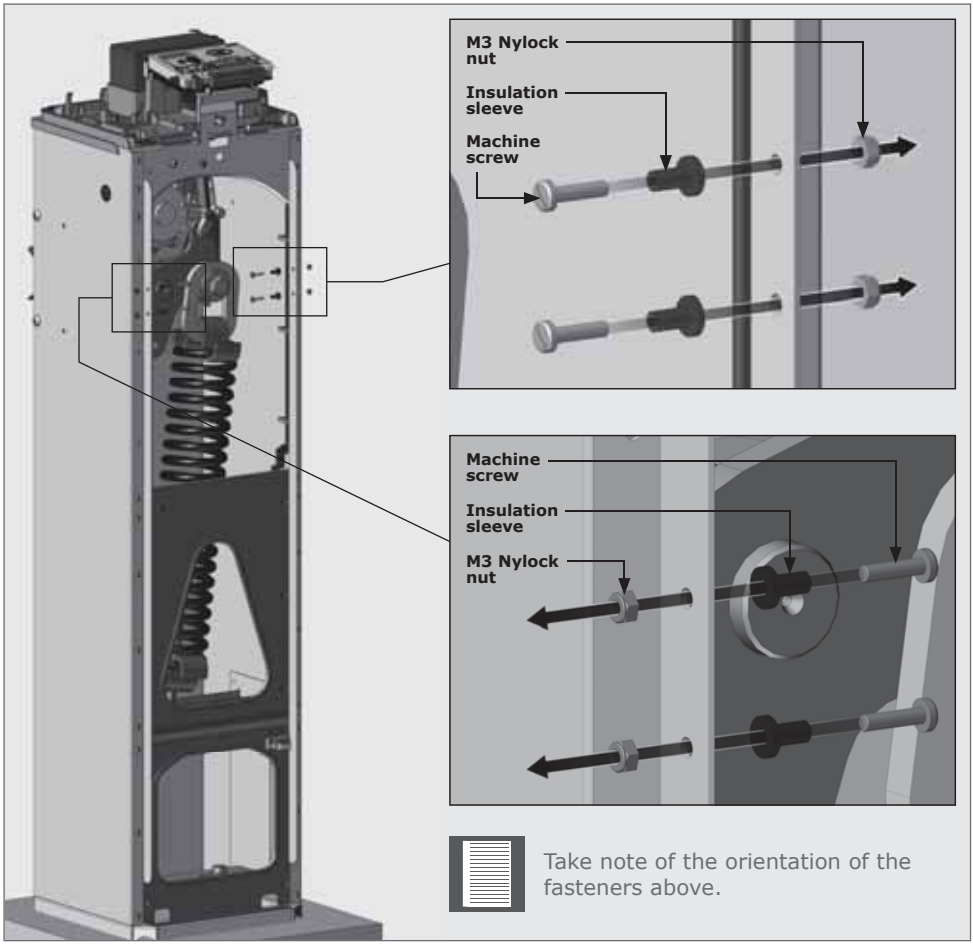


STEP 3 FIGURE 69

Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

14.5.4. Fitting the CLAWS controller to the SECTOR II



STEP 1 **FIGURE 69**

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

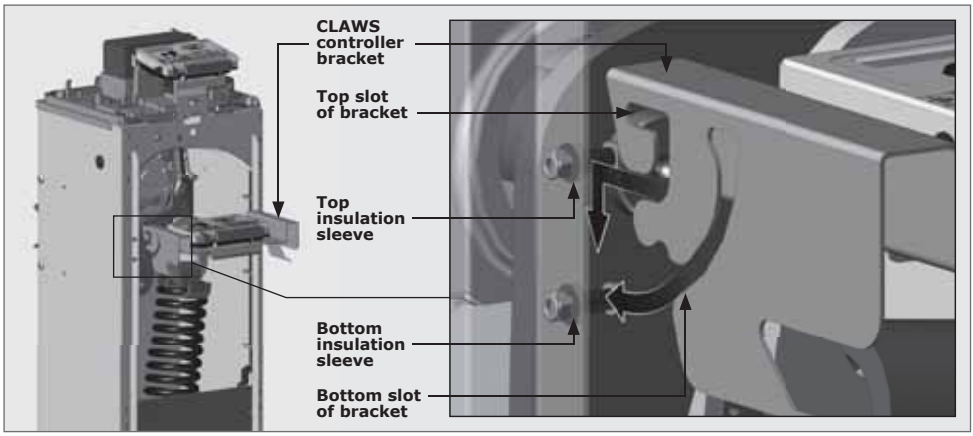


FIGURE 70

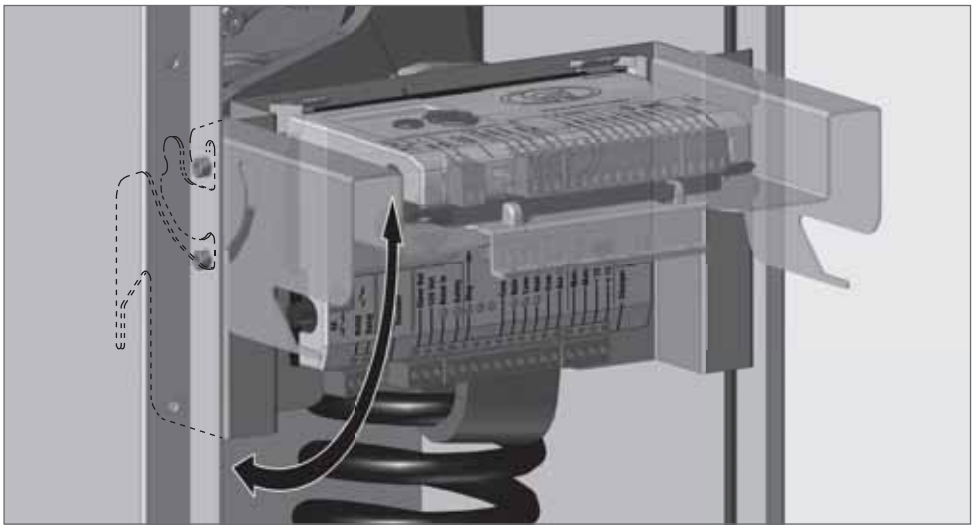


FIGURE 71

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 14, Figure 72).

It can also be moved lower down for optimum space when working on the gearbox (Section 14, Figure 73).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 14, Figure 70).

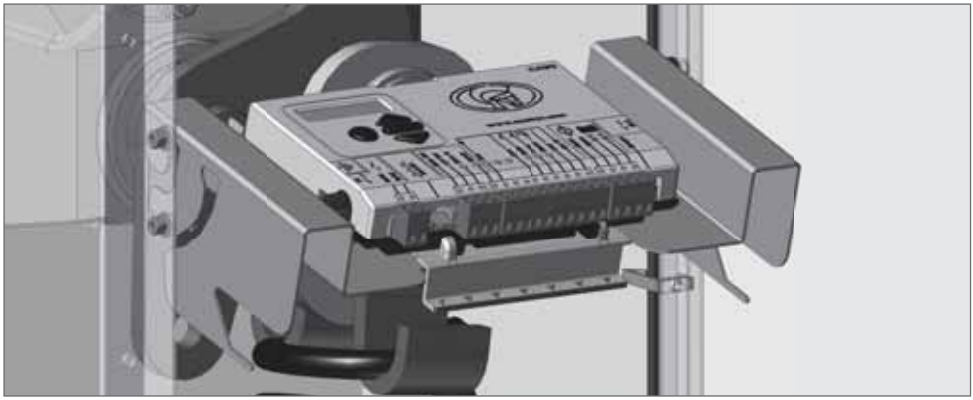


FIGURE 72. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

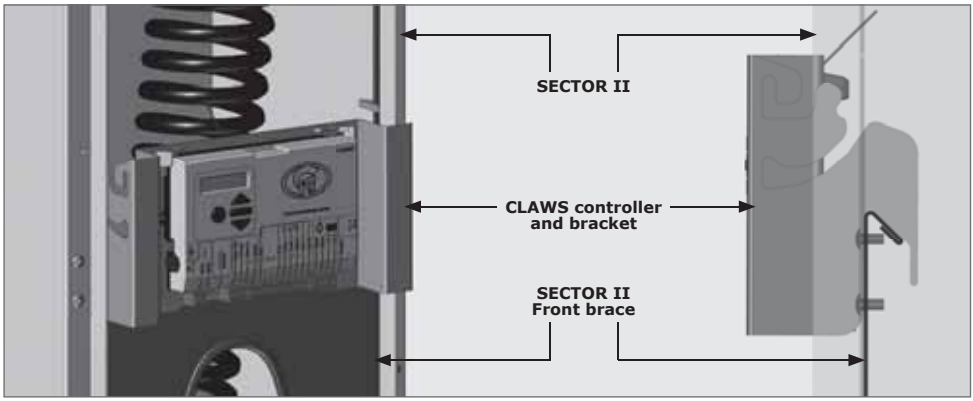


FIGURE 73. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

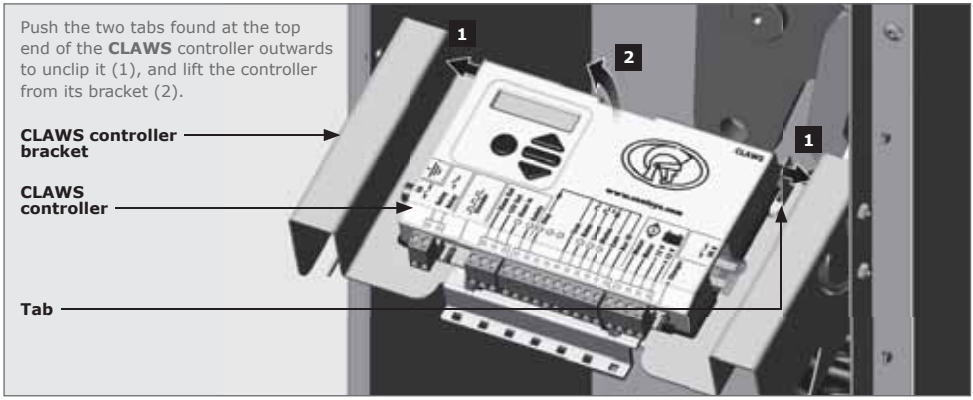


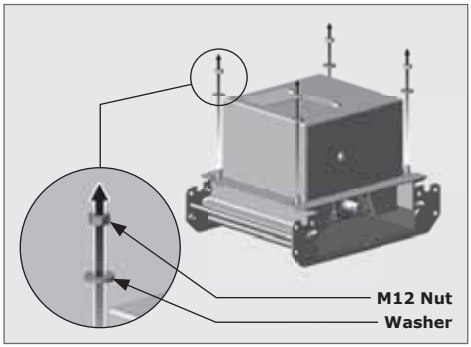
FIGURE 74. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

STEP 3

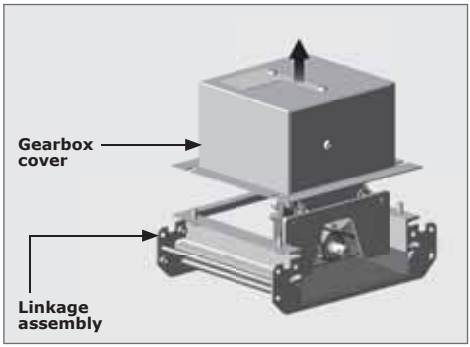
Connect harness and power supply. Refer to the wiring diagrams and controller settings.

15. LHS Flush Mount - Similar Direction of Travel

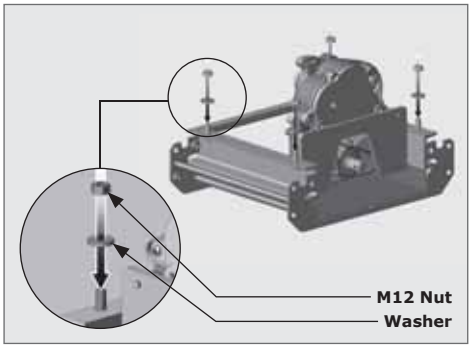
15.1. Preparing the Drive Linkage Assembly



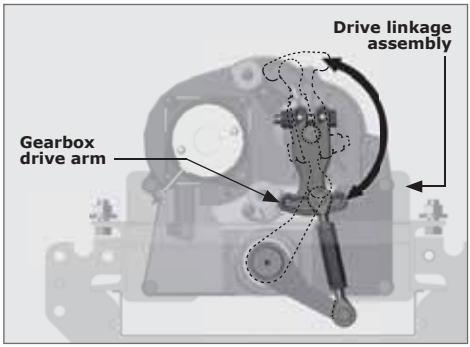
STEP 1 FIGURE 1



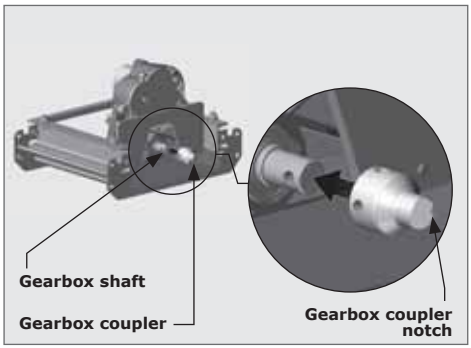
STEP 2 FIGURE 2



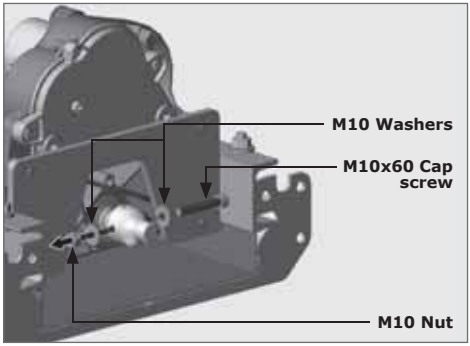
STEP 3 FIGURE 3



STEP 4 FIGURE 4



STEP 5 FIGURE 5

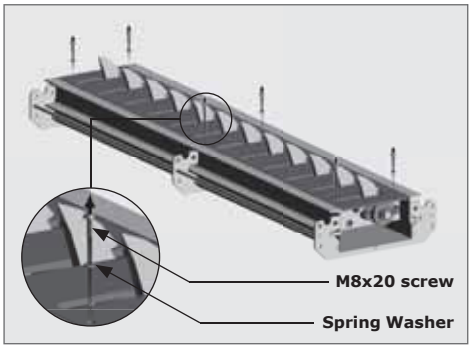


STEP 6 FIGURE 6

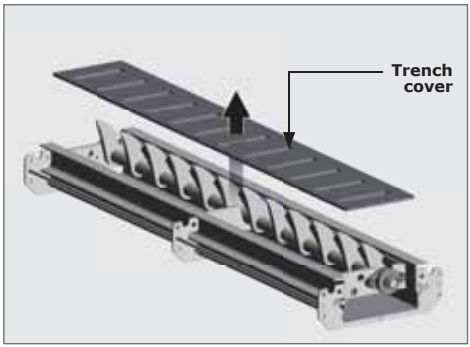
Note the orientation of the gearbox coupler notch is at the 3 o'clock position and that the gearbox drive arm is down as shown in Section 15, Figure 5.

15.2. Spike Module Assembly

15.2.1. Preparing the Spike Module assembly(ies) for installation

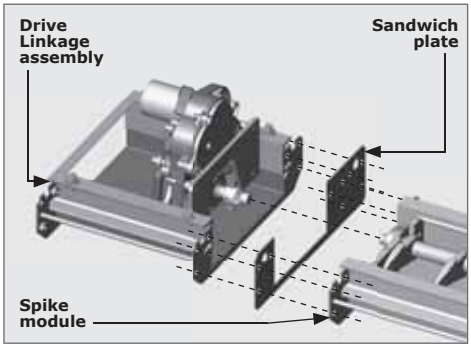


STEP 1 FIGURE 7

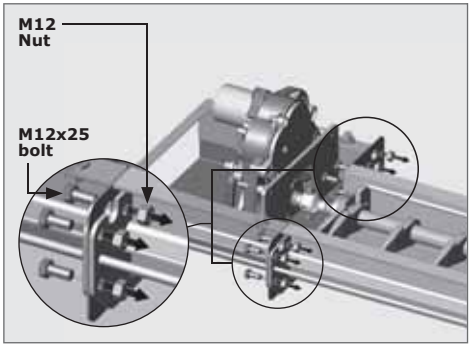


STEP 2 FIGURE 8

15.2.2. Attaching the drive linkage assembly to the spike module



STEP 1 FIGURE 9



STEP 2 FIGURE 10

Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly.

STEP 3

Using six M12x25 bolts, fix one spike module to another (Section 15, Figure 11).

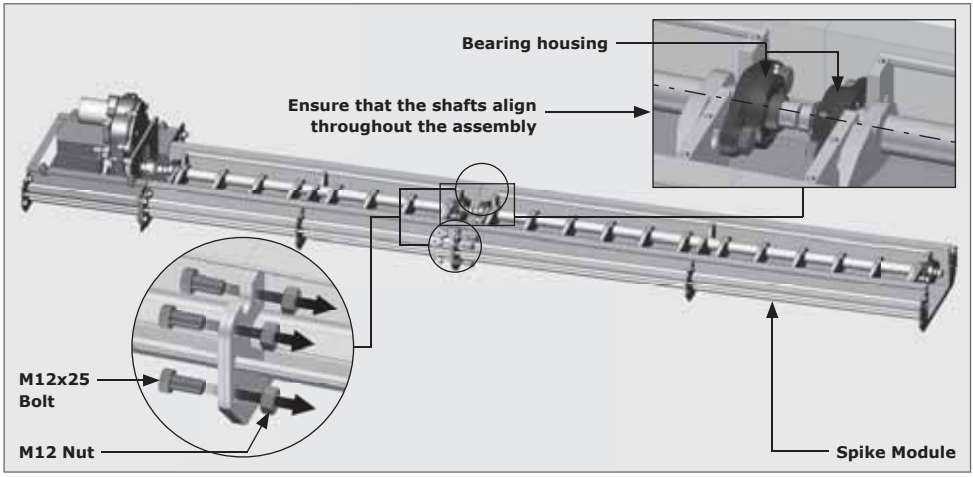


FIGURE 11

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

15.2.3. 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.

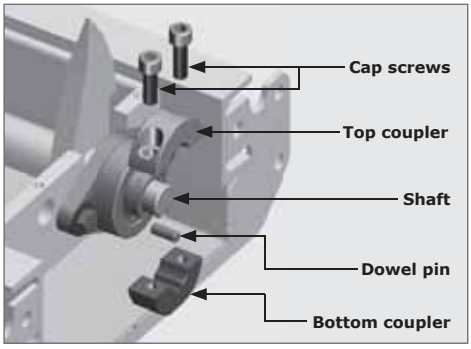


FIGURE 12. SHAFT COUPLER

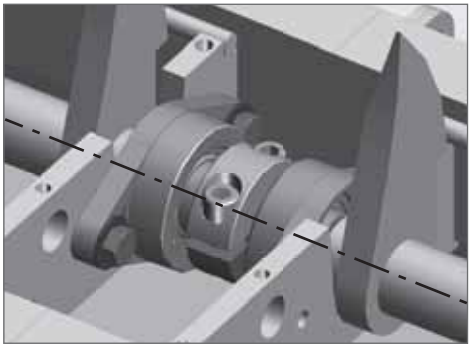
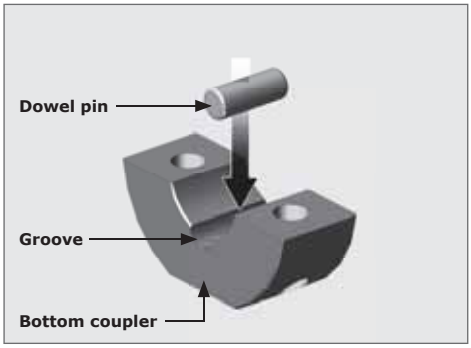
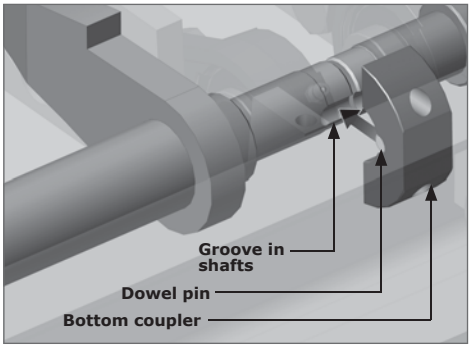


FIGURE 13

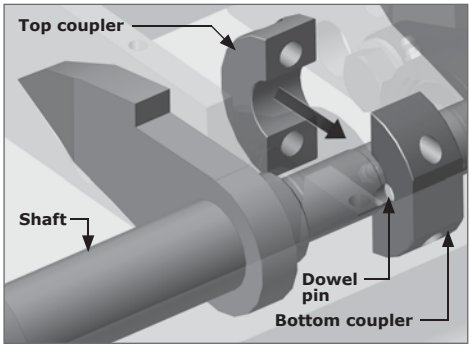
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



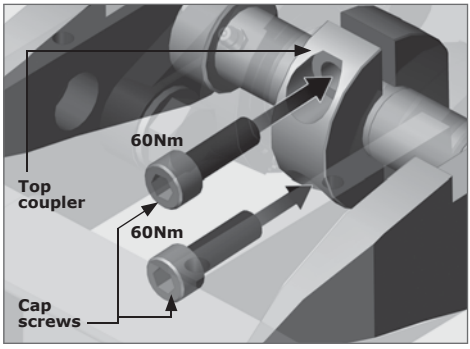
STEP 1 FIGURE 14



STEP 2 FIGURE 15



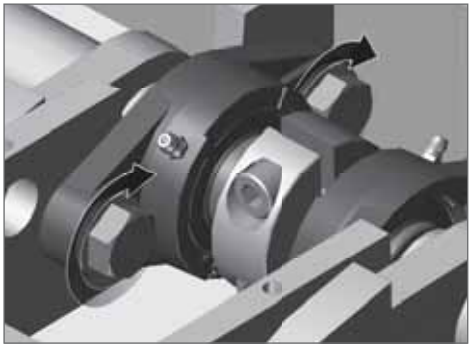
STEP 3 FIGURE 16



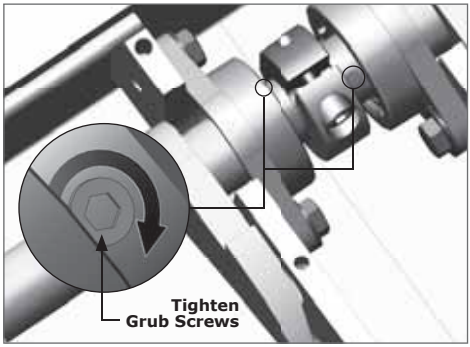
STEP 4 FIGURE 17

STEP 5

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



STEP 6 FIGURE 18



STEP 7 FIGURE 19

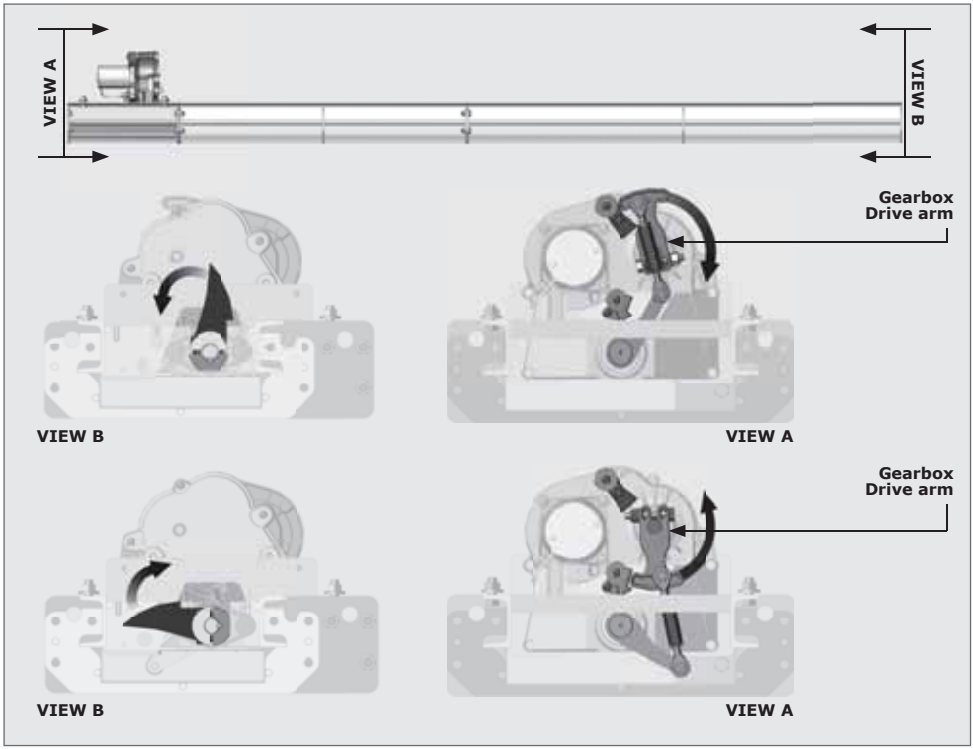
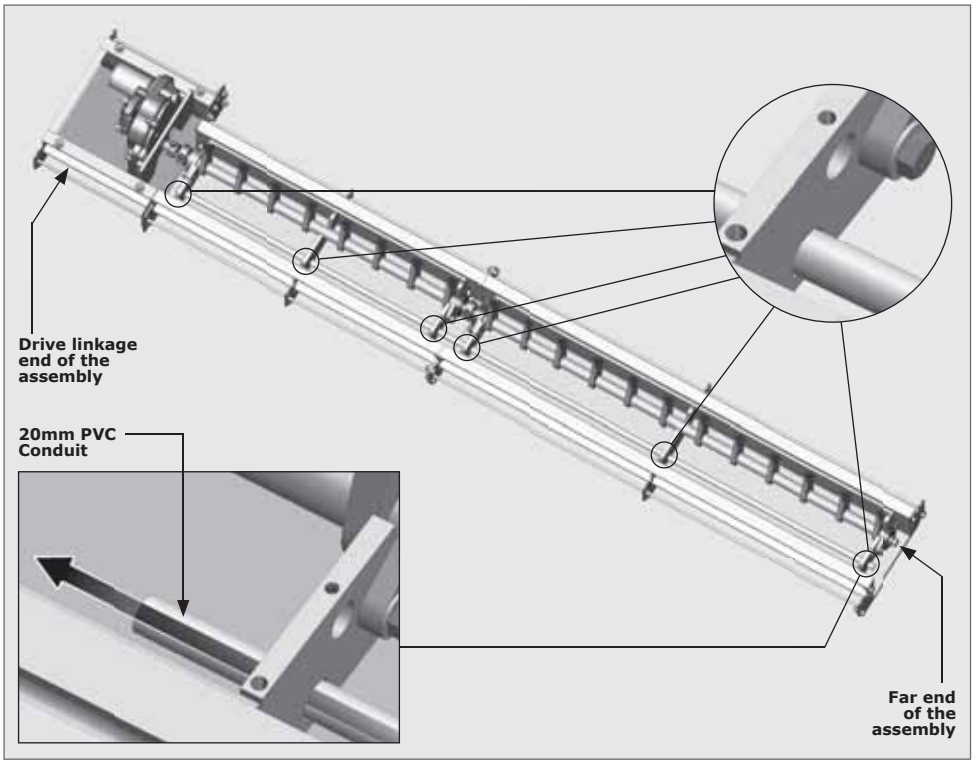


FIGURE 20. CORRECTLY ALIGNED SPIKE AND DRIVE MODULES

15.2.4. Proximity sensor installation



STEP 1 FIGURE 21

The length of the PVC conduit will be relative to the length of the spike modules combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 15, Figure 22).

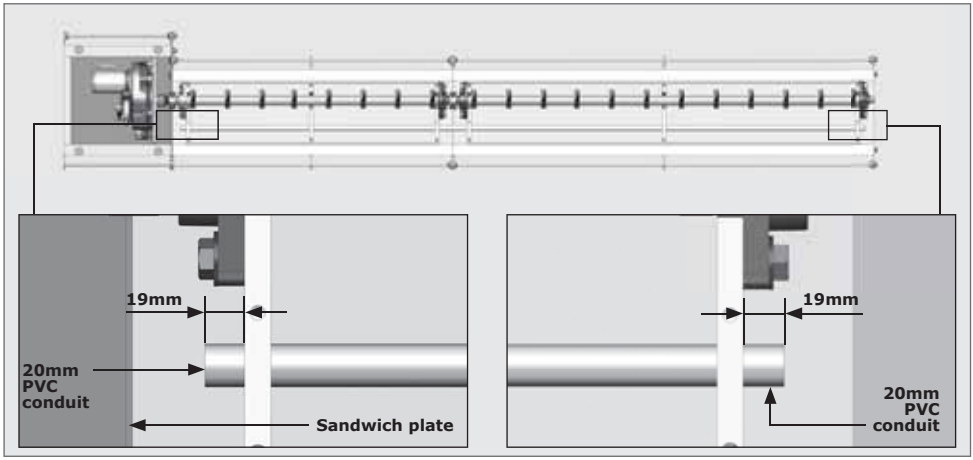
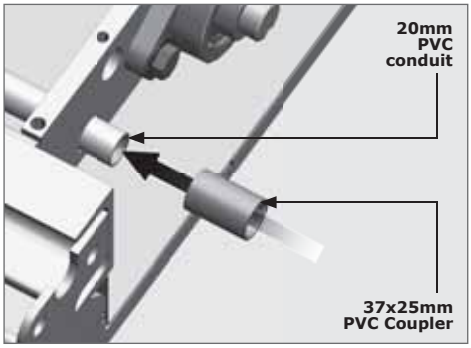
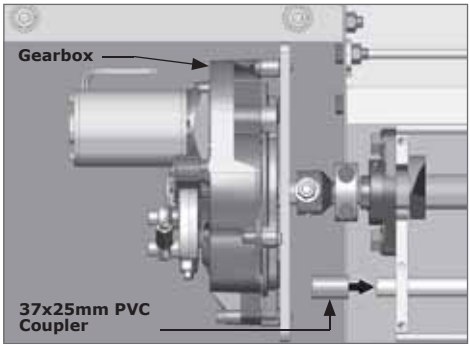


FIGURE 22

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

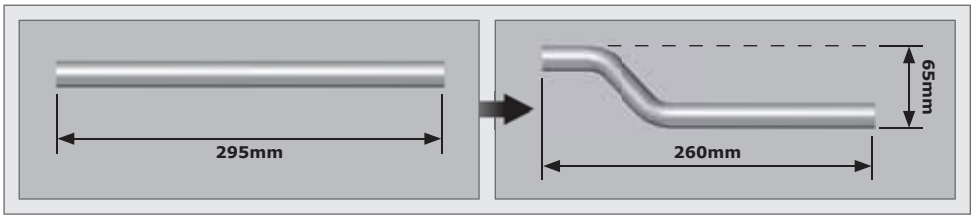


STEP 2 **FIGURE 23**



STEP 3 **FIGURE 24**

It is necessary to bend PVC conduit to circumvent the gearbox bulkhead to continue. The use of a conduit spring is recommended to avoid collapsing the pipe. Section 15, Figure 25 below is a guideline that can be used to achieve this.



STEP 4 **FIGURE 25**

STEP 5

Connect the bent piece of conduit to the PVC coupler installed in Section 14, Figure 24 Step 3. After it is connected, it should resemble Section 15, Figure 26.

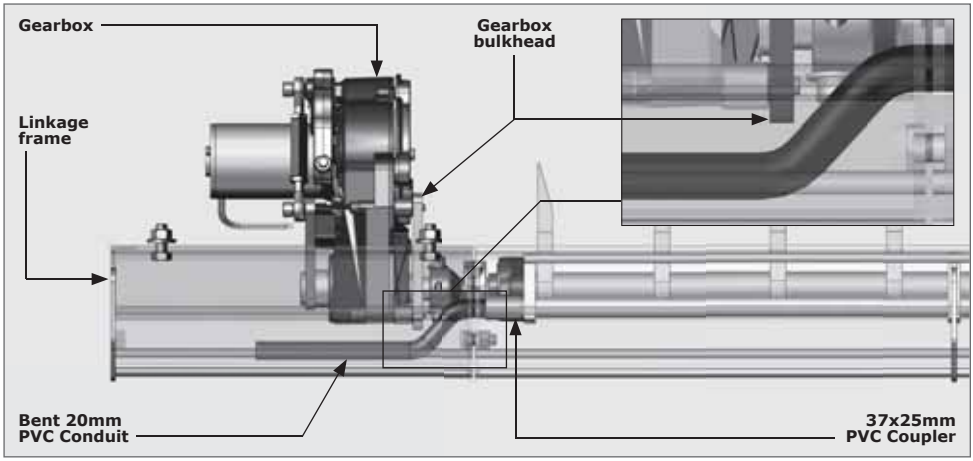
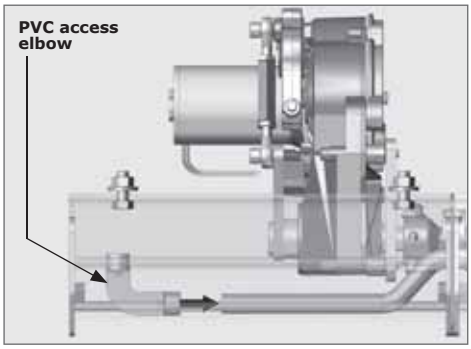
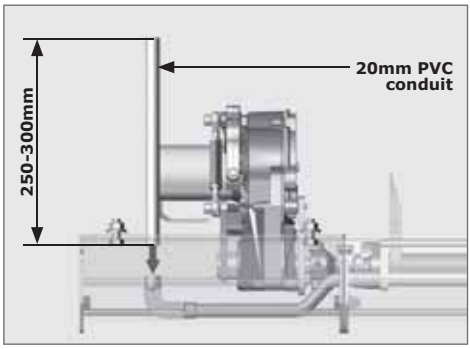


FIGURE 26

Steps 6-7 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, a trench for the conduit and cables will need to be dug (Refer to Section 15.5.2.).



STEP 6 FIGURE 27



STEP 7 FIGURE 28

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

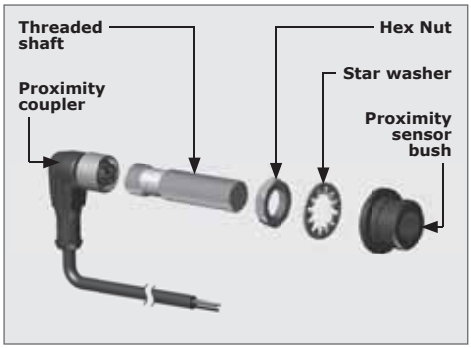


FIGURE 29. PROXIMITY SENSOR

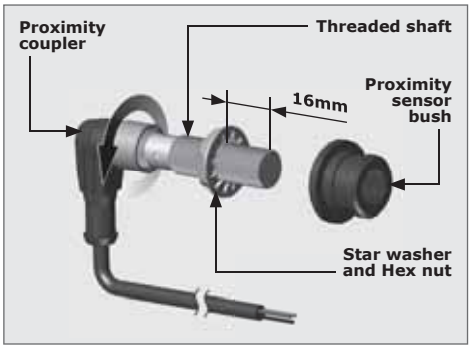


FIGURE 30. PROXIMITY SENSOR

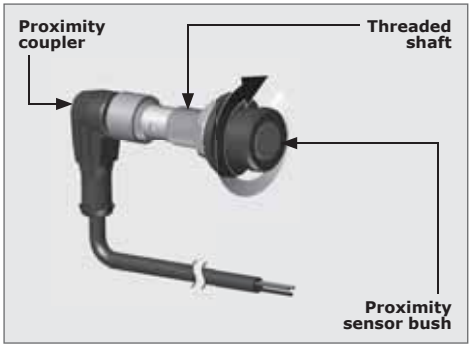
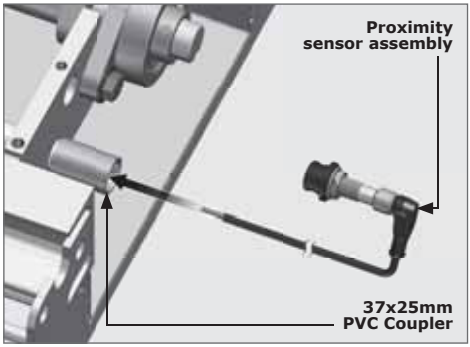


FIGURE 31. PROXIMITY SENSOR



STEP 6 FIGURE 32

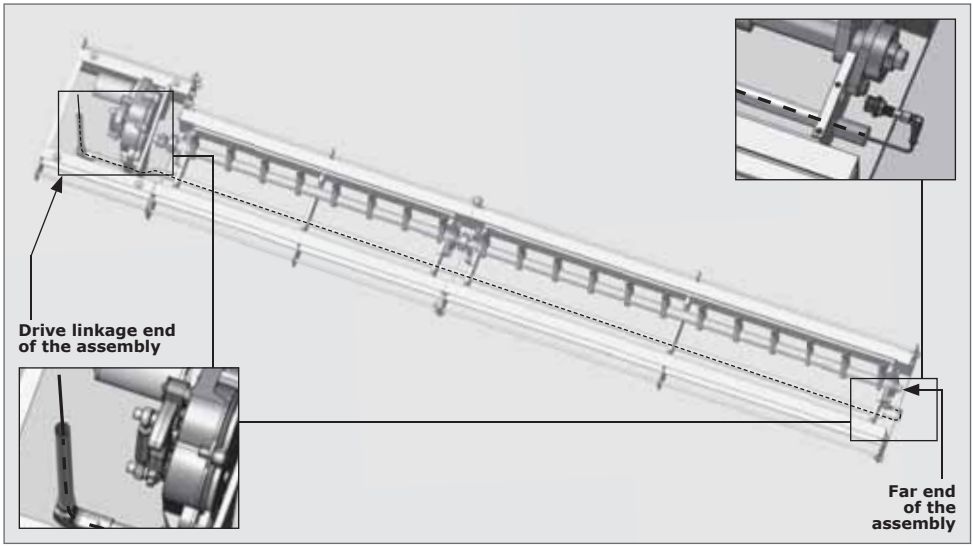
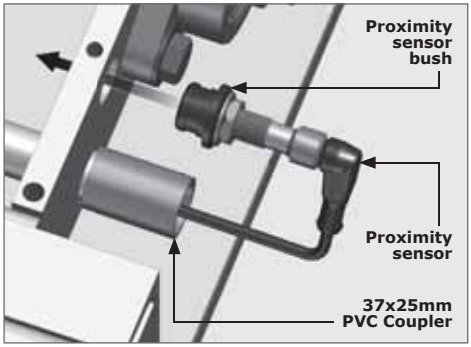
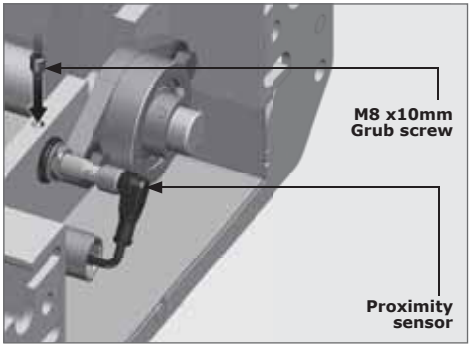


FIGURE 33

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



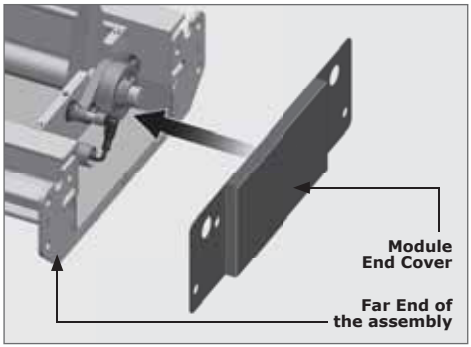
STEP 7 FIGURE 34



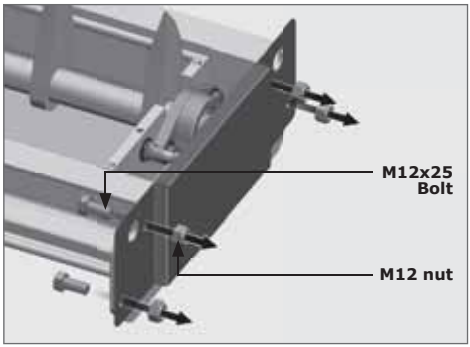
STEP 8 FIGURE 35

15.2.5. Attaching the End Covers to the Assembly

15.2.5.1. Attaching the Module End cover

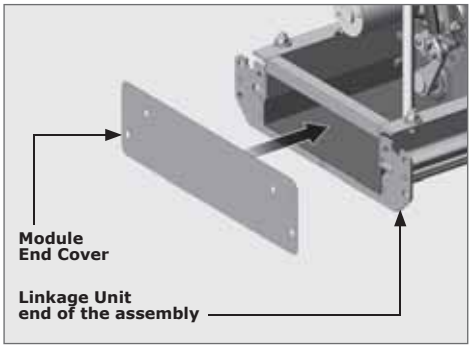


STEP 1 FIGURE 36

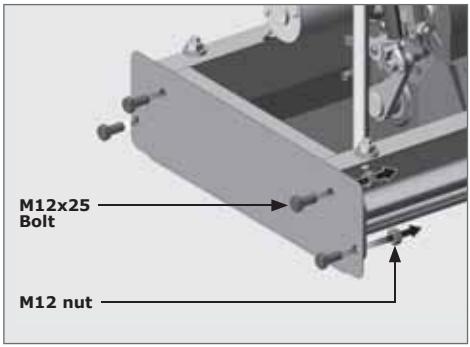


STEP 2 FIGURE 37

15.2.5.2. Attaching the Linkage Unit End cover



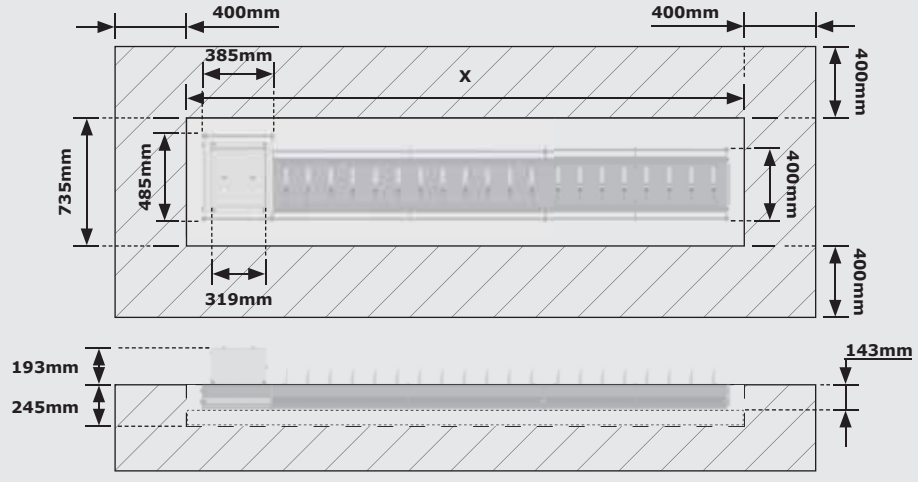
STEP 1 FIGURE 38



STEP 2 FIGURE 39

15.3. Preparing the Trench and Drainage System

Dig a hole following the dimensions below.

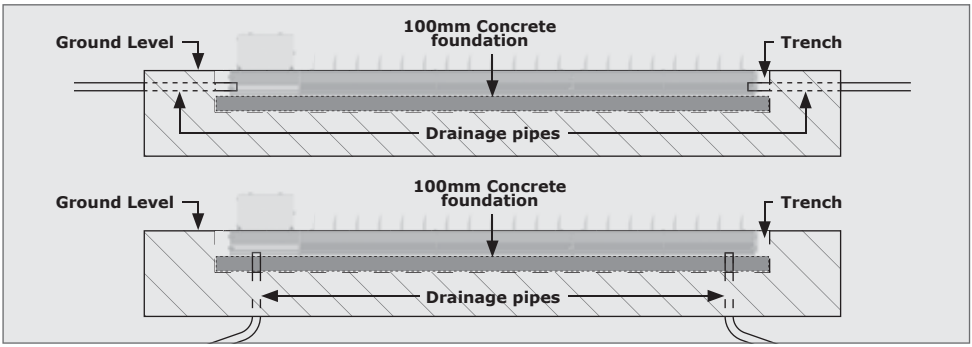


The Value of 'X' in a:
3m Configuration: 3 420mm **4.5m Configuration**: 4 920mm **6m Configuration**: 6 420mm

STEP 1 **FIGURE 40**

Drainage pipes must be laid at one or both ends of the trench to allow water to flow either into storm water drains or into any other area away from the installation. Section 15, Figure 41 shows two recommended drainage configurations. Once complete, hold thedrainage pipes in place by pouring a 100mm concrete foundation and level off.

If the SECTOR II 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 SECTOR II. This must be done before any concrete is poured (Section 15.5.2.).



STEP 2 **FIGURE 41**

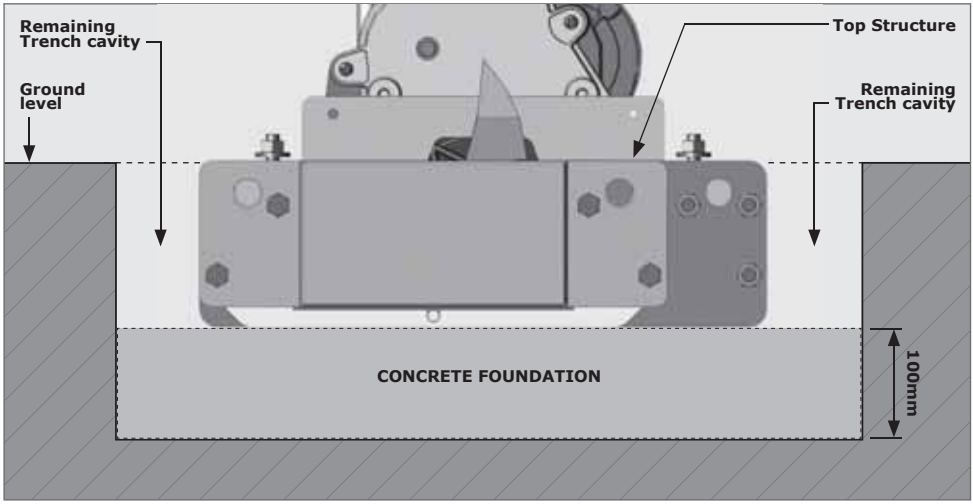
Make sure the drain pipes do not interfere with the structure when it is in the trench.

14.3.1. Concreting the Assembly into the Trench.

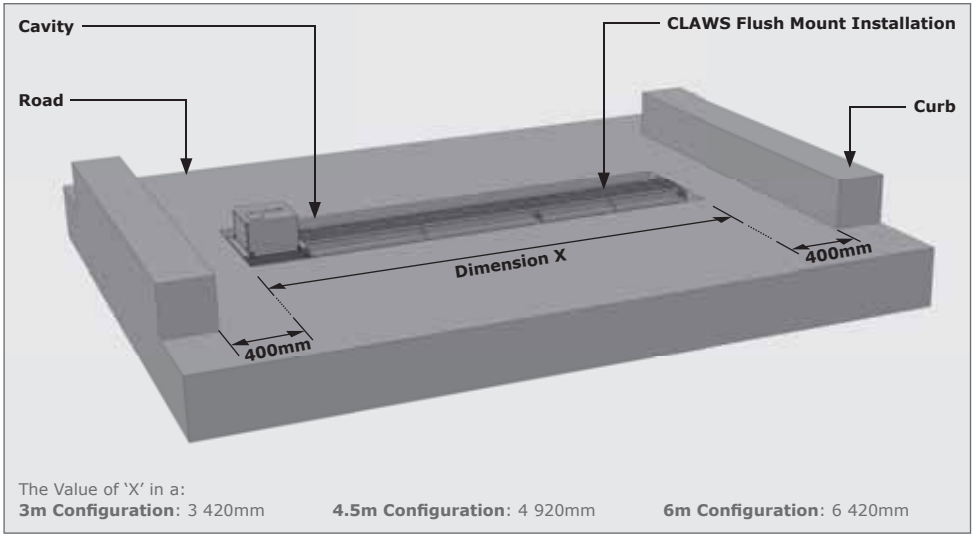
Ensure that the drain pipes will not interfere with the structure when it is placed in the trench.

Place the assembly in the trench and level the assembly using any type of propping or jacking method. Make sure that the top of the assembly is either in line with or a little higher than the ground level and pour concrete (minimum 45MPa after 28 days) into the cavity that remains.

Do not pour any concrete into the gutter of the spikes module or drive link assembly.



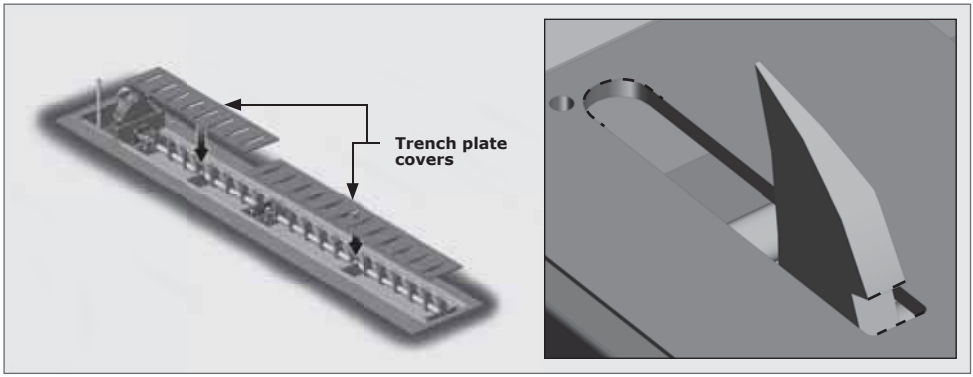
STEP 3 **FIGURE 42**



The Value of 'X' in a:
3m Configuration: 3 420mm **4.5m Configuration**: 4 920mm **6m Configuration**: 6 420mm

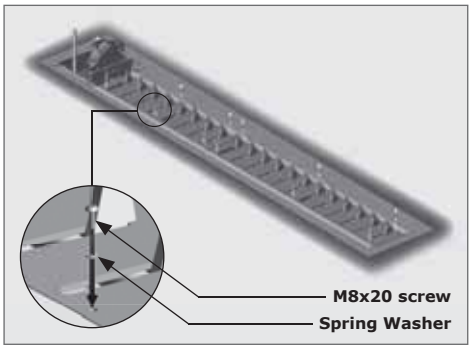
FIGURE 43. OVERVIEW OF CIVIL LAYOUT

15.4. Re-assembling the trench plates



STEP 1 **FIGURE 44**

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.

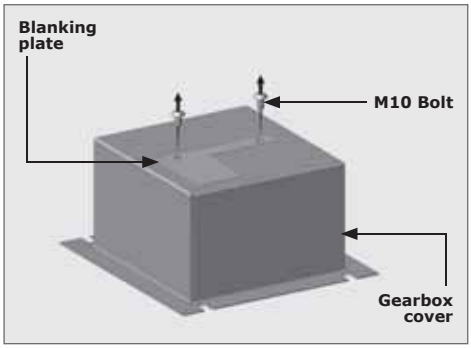


STEP 2 **FIGURE 45**

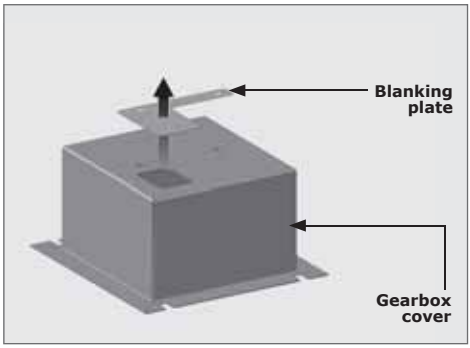
15.5. Integrating the SECTOR II with the CLAWS

15.5.1. Directly mount THE SECTOR II onto the Independent Drive

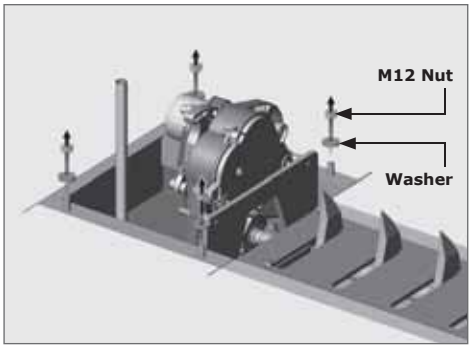
15.5.1.1. Placing the gearbox cover into position



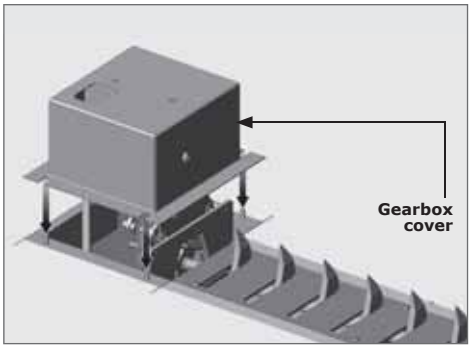
STEP 1 FIGURE 46



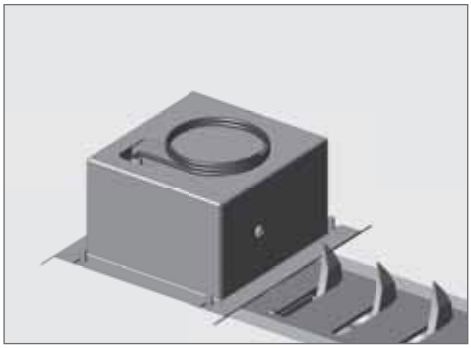
STEP 2 FIGURE 47



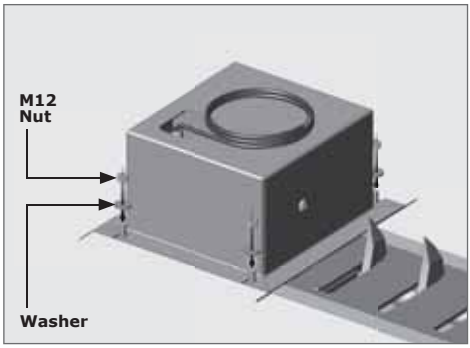
STEP 3 FIGURE 48



STEP 4 FIGURE 49



STEP 5 FIGURE 50



STEP 6 FIGURE 51

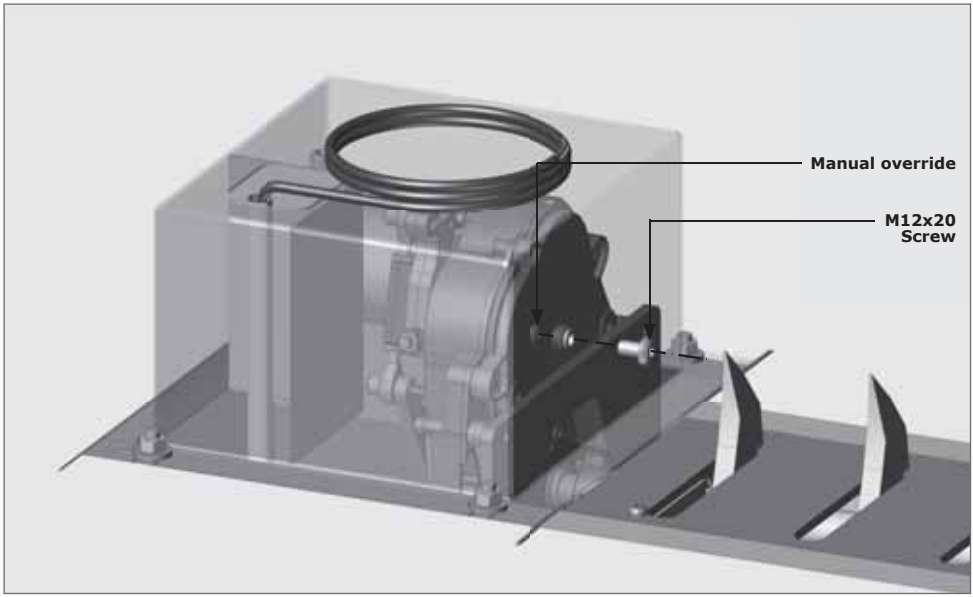
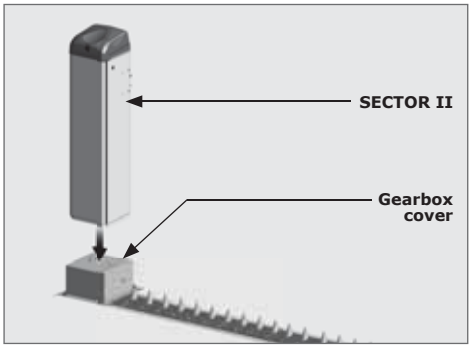
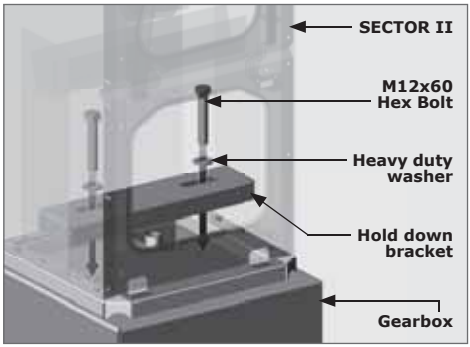


FIGURE 52. MANUAL OVERRIDE

15.5.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 53



STEP 2 FIGURE 54

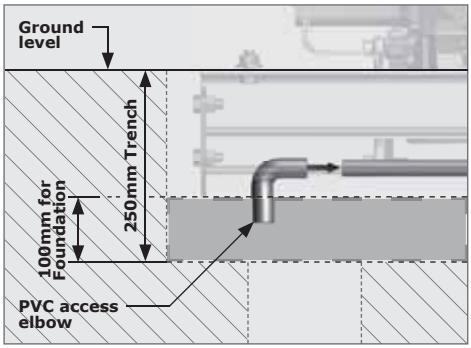
15.5.2. Seperately-placed CLAWS and SECTOR II

15.5.2.1. Running the conduit from the gearbox to the SECTOR II

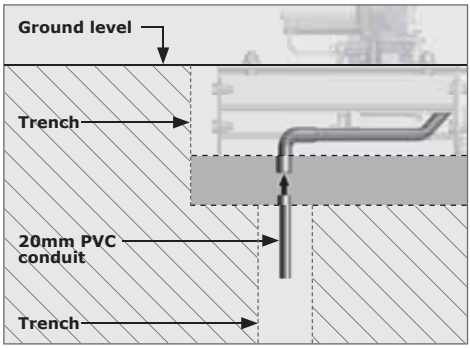
STEP 1

Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.

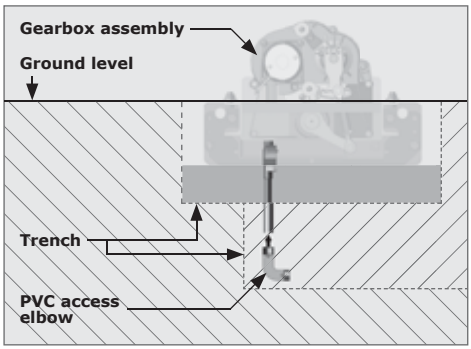
Drill a 20mm hole through the gutter plate using a 20mm hole saw for the proximity sensor conduit



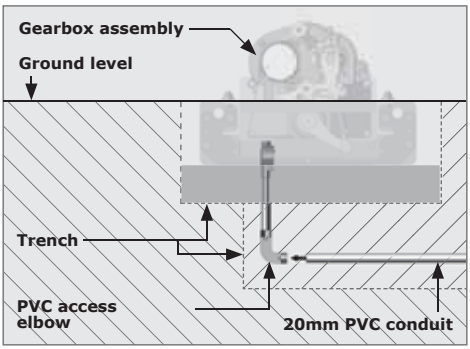
STEP 2 FIGURE 55



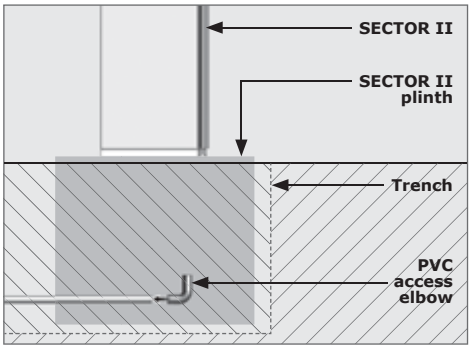
STEP 3 FIGURE 56



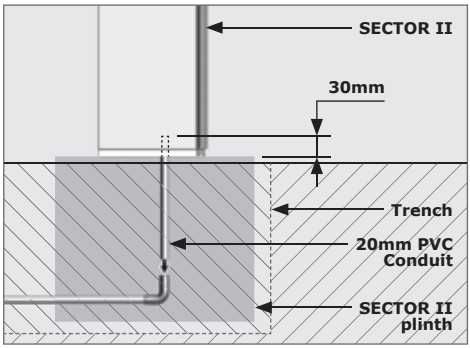
STEP 4 FIGURE 57



STEP 5 FIGURE 58



STEP 6 FIGURE 59

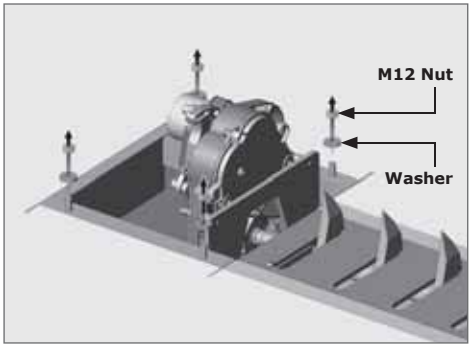


STEP 7 FIGURE 60

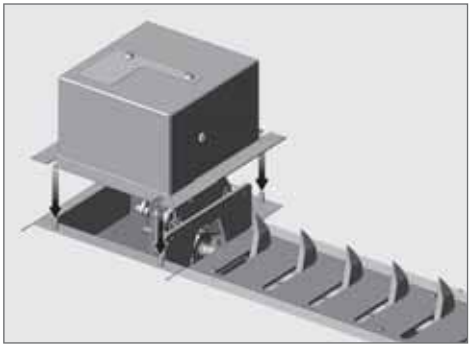
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

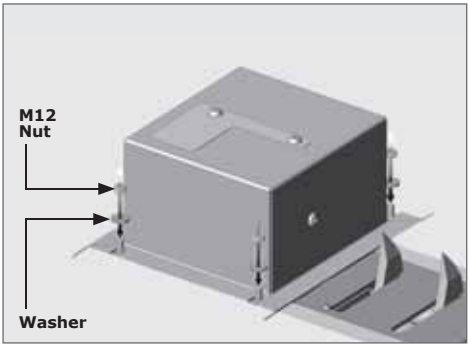
15.5.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 61



STEP 2 FIGURE 62



STEP 3 FIGURE 63

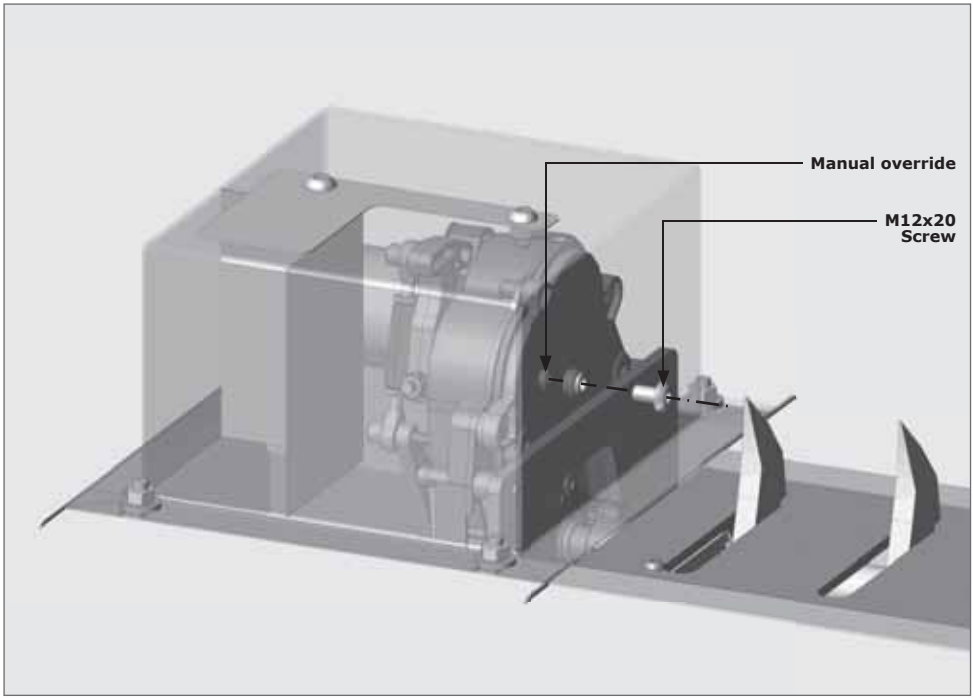
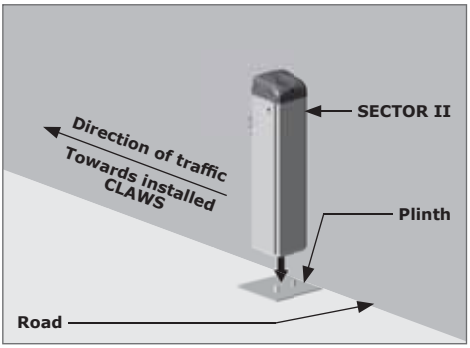


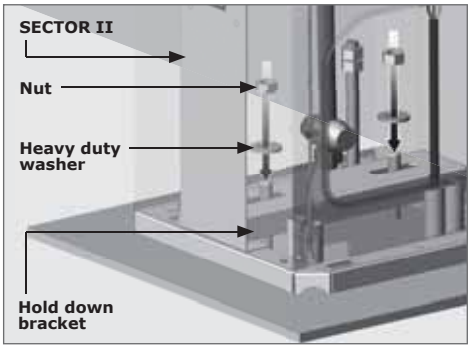
FIGURE 64. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

15.5.2.3. Placing the SECTOR II into position

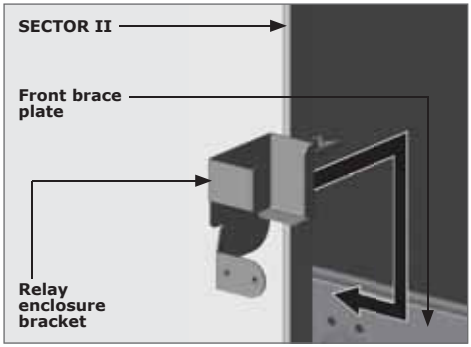


STEP 1 FIGURE 65

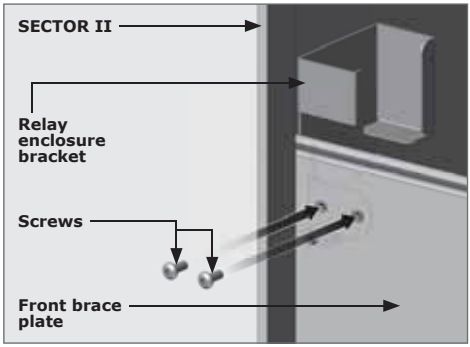


STEP 2 FIGURE 66

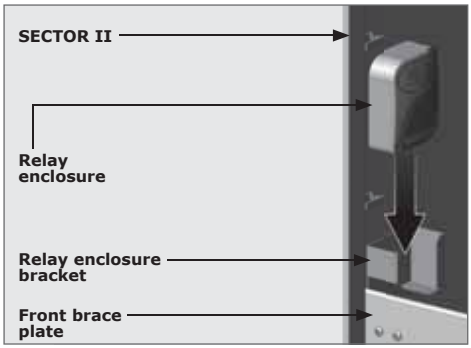
15.5.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 67



STEP 2 FIGURE 68

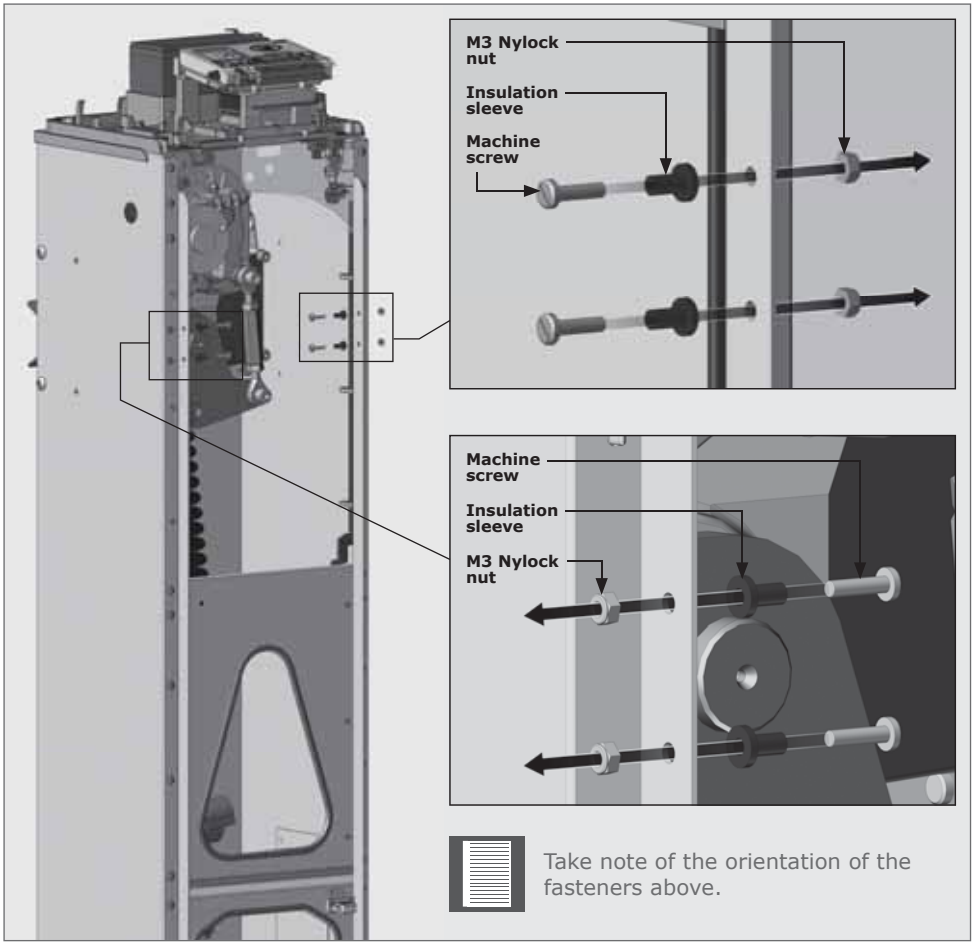


STEP 3 FIGURE 69

Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

15.5.5. Fitting the CLAWS controller to the SECTOR II



STEP 1 **FIGURE 70**

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

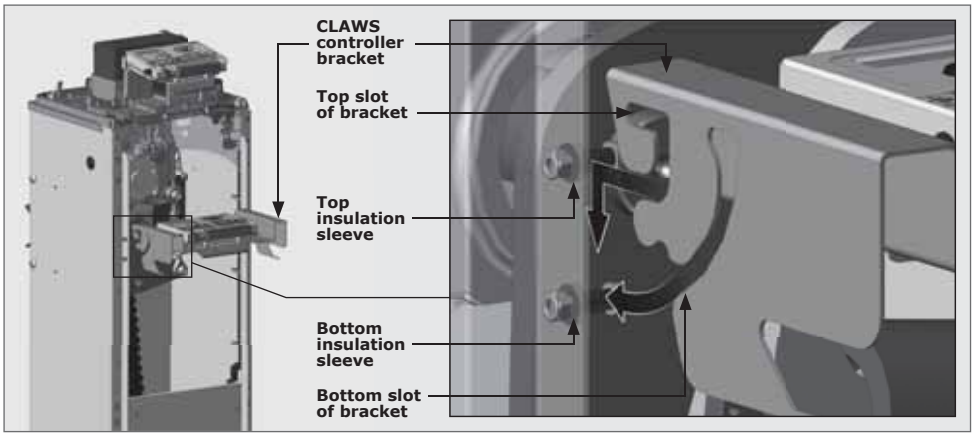


FIGURE 71

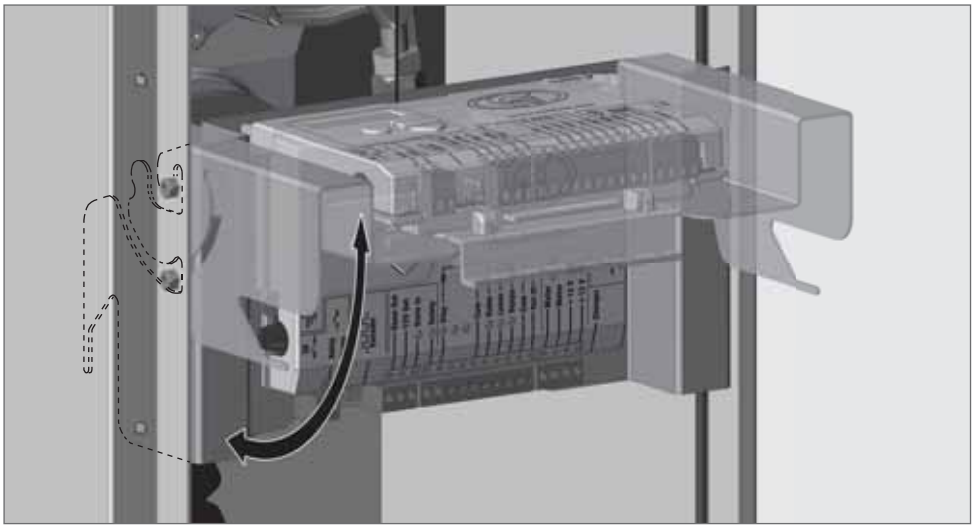


FIGURE 72

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 15, Figure 73).

It can also be moved lower down for optimum space when working on the gearbox (Section 15, Figure 74).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 15, Figure 71).

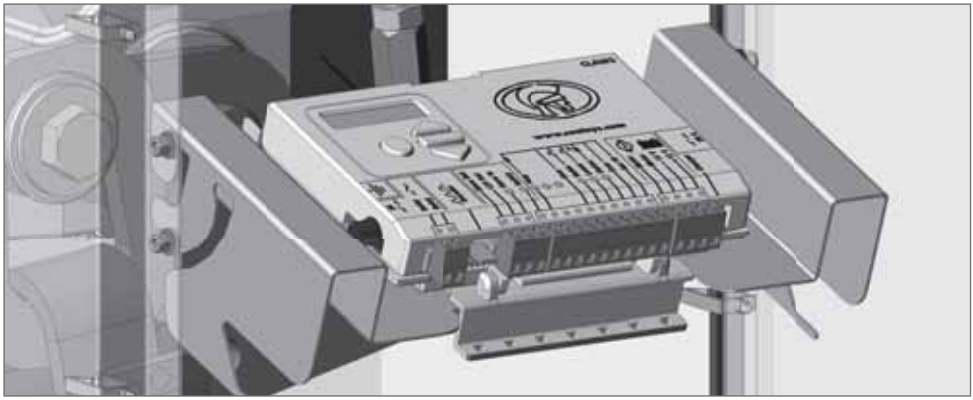


FIGURE 73. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

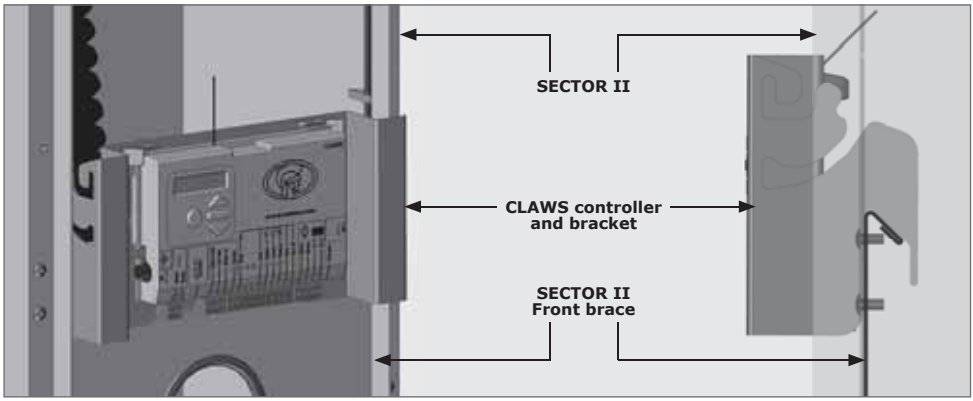


FIGURE 74. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

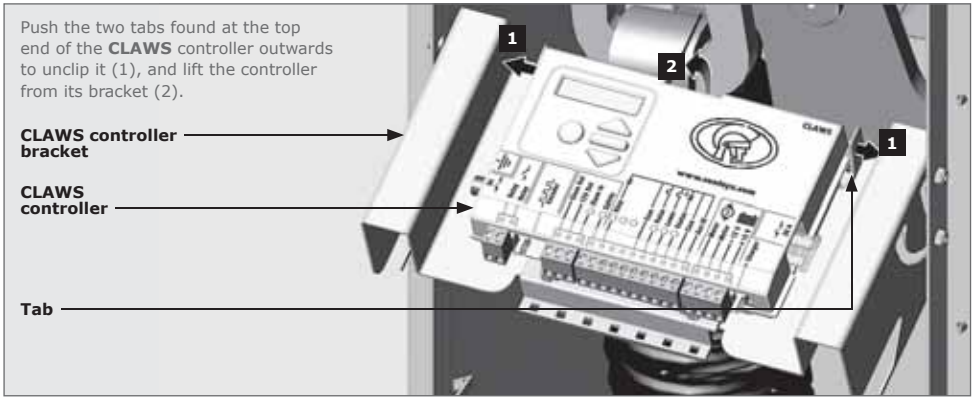


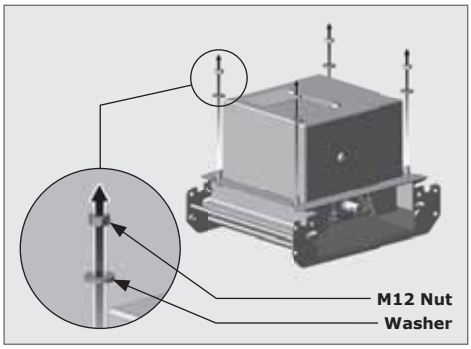
FIGURE 75. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

STEP 3

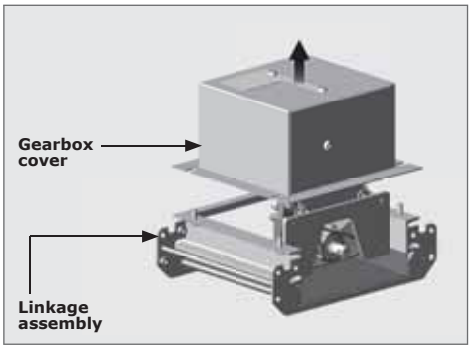
Connect harness and power supply. Refer to the wiring diagrams and controller settings.

16. LHS Flush Mount - Opposing Direction of Travel

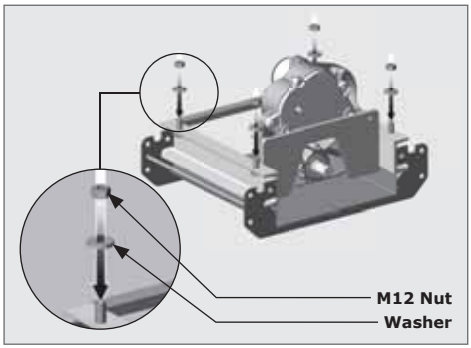
16.1. Preparing the Drive Linkage Assembly



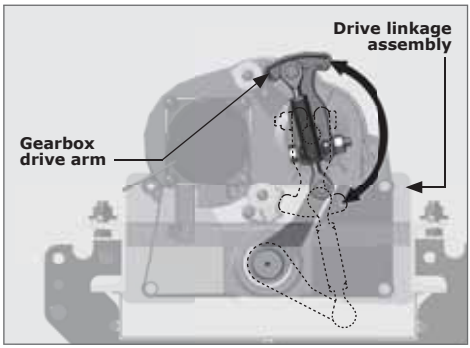
STEP 1 FIGURE 1



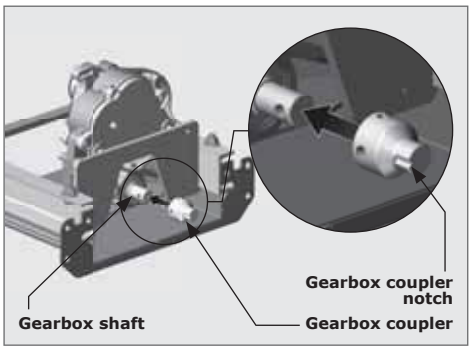
STEP 2 FIGURE 2



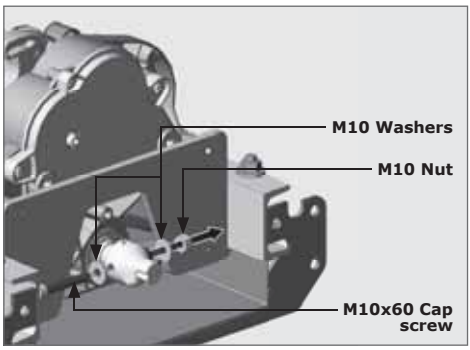
STEP 3 FIGURE 3



STEP 4 FIGURE 4



STEP 5 FIGURE 5

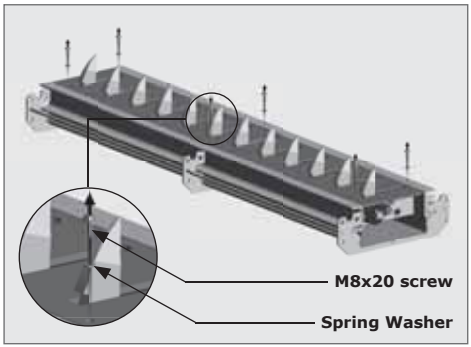


STEP 6 FIGURE 6

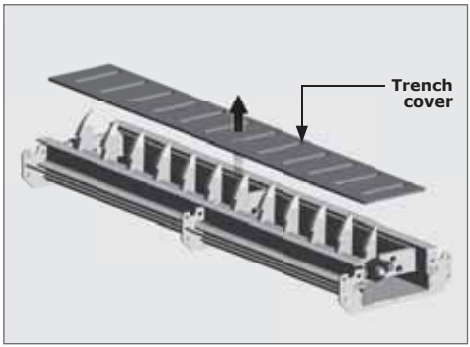
Note the orientation of the gearbox coupler notch is at the 9 o'clock position and that the gearbox drive arm is up as shown in Section 16, Figure 5.

16.2. Spike Module Assembly

16.2.1. Preparing the Spike Module assembly(ies) for installation

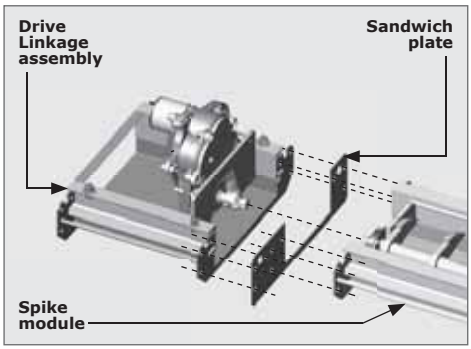


STEP 1 FIGURE 7

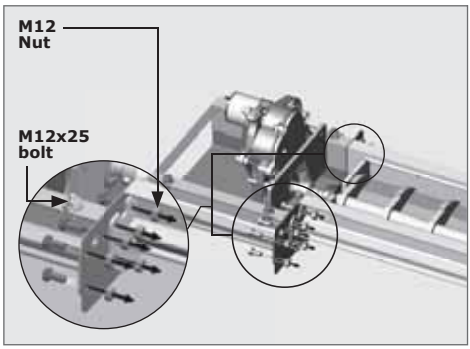


STEP 2 FIGURE 8

16.2.2. Attaching the drive linkage assembly to the spike module



STEP 1 FIGURE 9



STEP 2 FIGURE 10

Take note of the orientation of the Sandwich Plate to the Linkage Assembly before fixing them to the spike module assembly.

STEP 3

Using six M12x25 bolts, fix one spike module to another (Section 16, Figure 11).

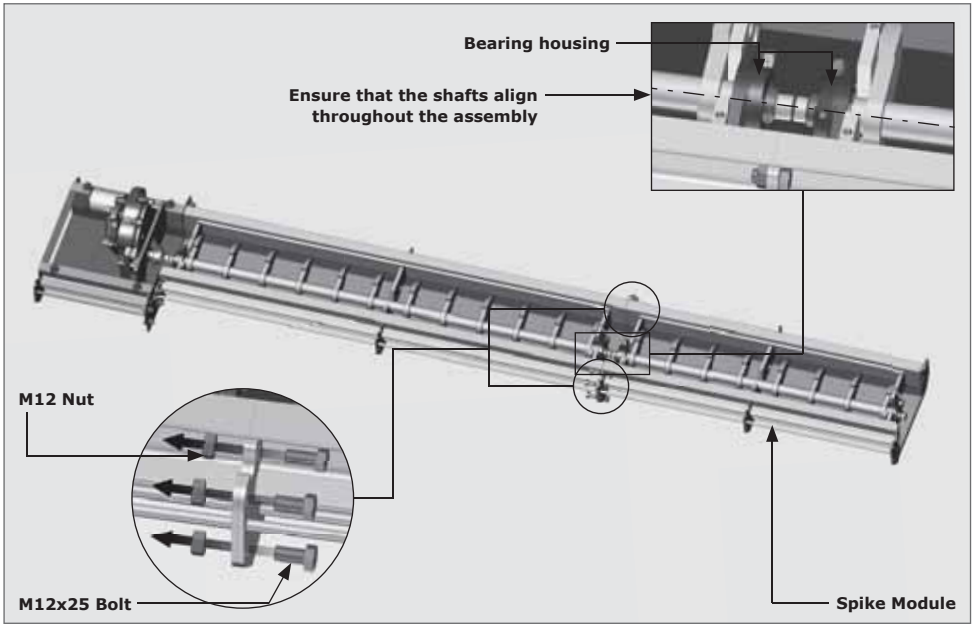


FIGURE 11

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

16.2.3. 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.

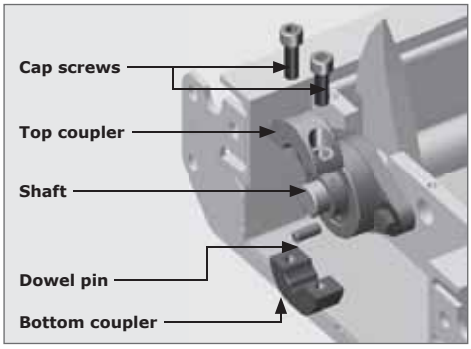


FIGURE 12. SHAFT COUPLER

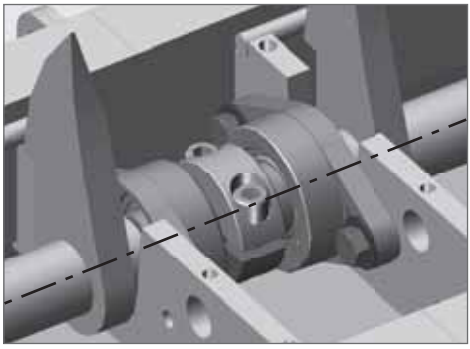
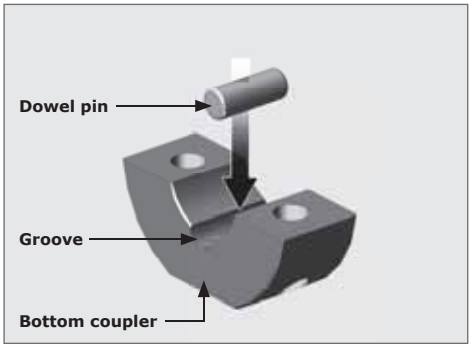
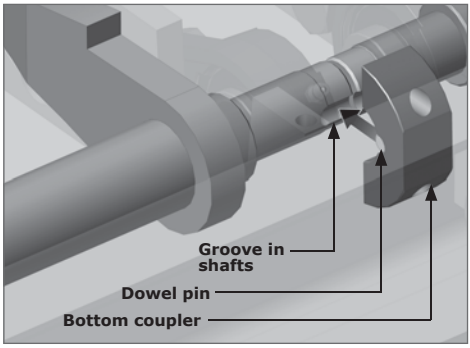


FIGURE 13

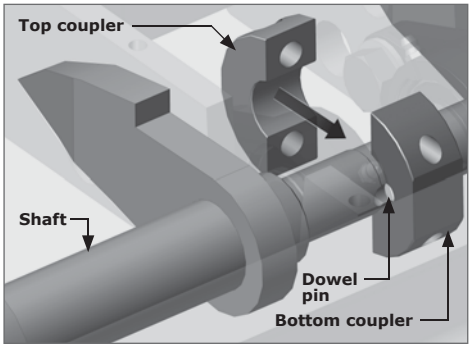
Place the spikes into the down position (and the drive arm pointing upwards) to aid in the fitment of all the shaft couplings.



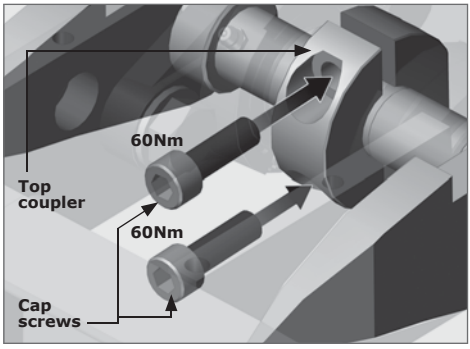
STEP 1 FIGURE 14



STEP 2 FIGURE 15



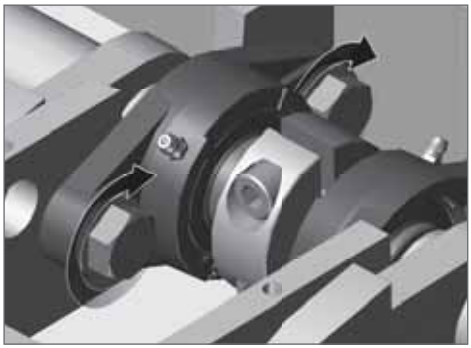
STEP 3 FIGURE 16



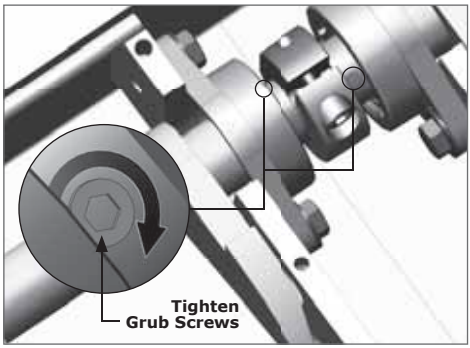
STEP 4 FIGURE 17

STEP 5

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



STEP 6 FIGURE 18



STEP 7 FIGURE 19

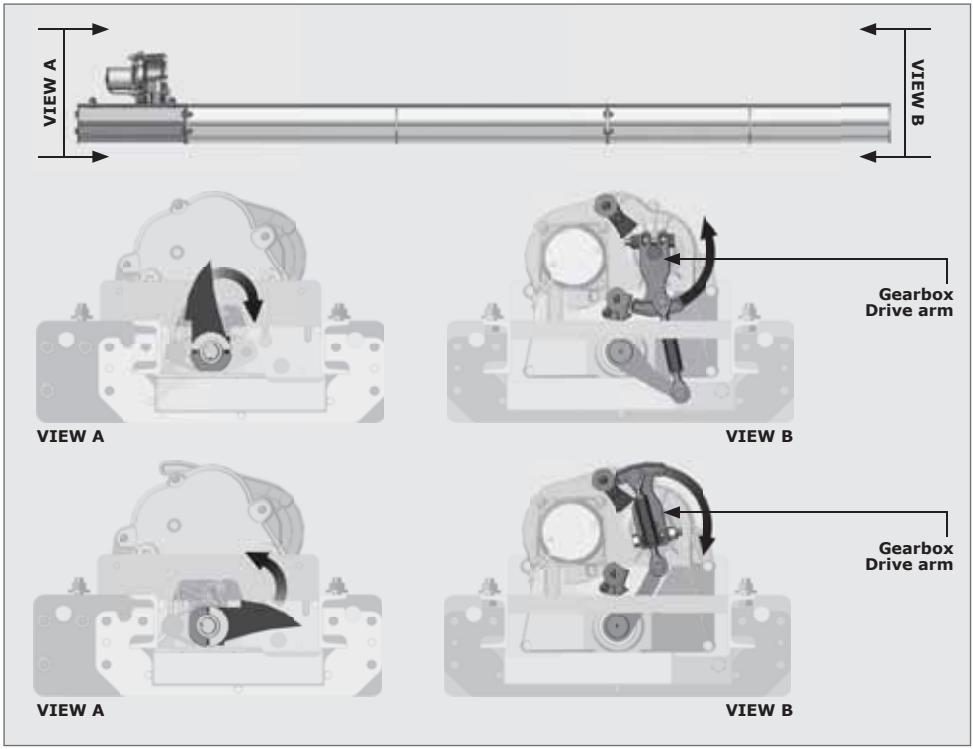
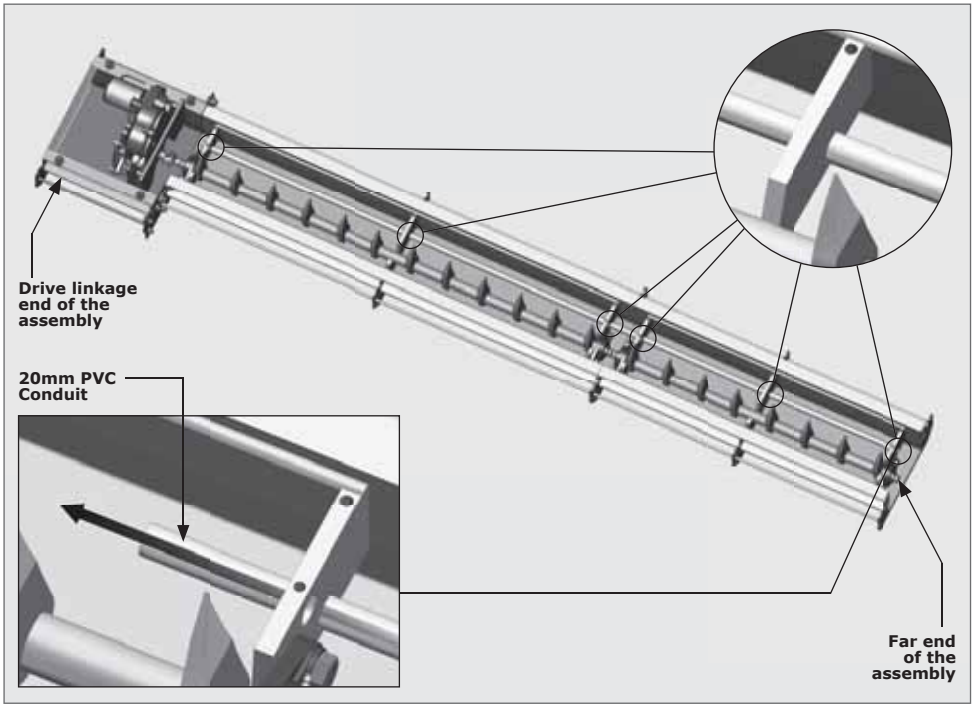


FIGURE 20. CORRECTLY ALIGNED SPIKE AND DRIVE MODULES

STEP 7
Repeat this coupling process for additional spike modules. Once all shafts have been coupled, check that they move freely.

16.2.4. Proximity sensor installation



STEP 1 **FIGURE 21**

The length of the PVC conduit will be relative to the length of the spike modules combined. Ensure that a further 38mm is added to this to account for the modules and coupling (Refer to Section 16, Figure 22).

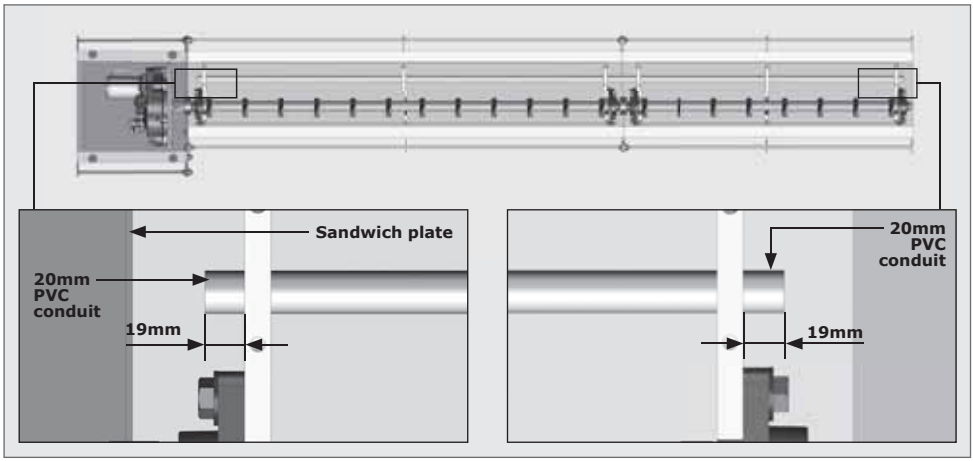
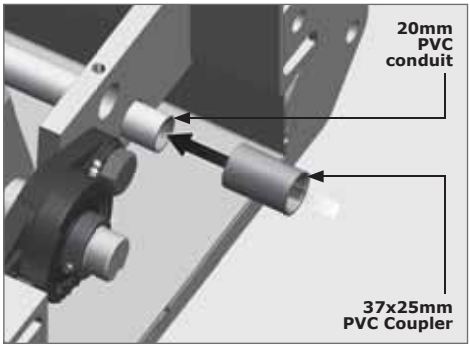
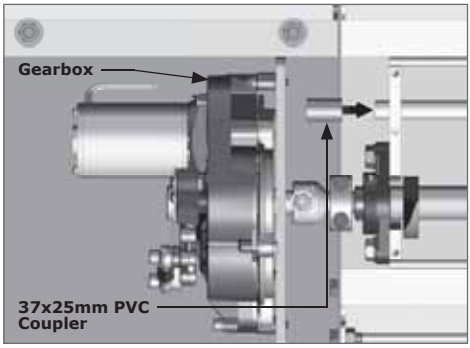


FIGURE 22

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

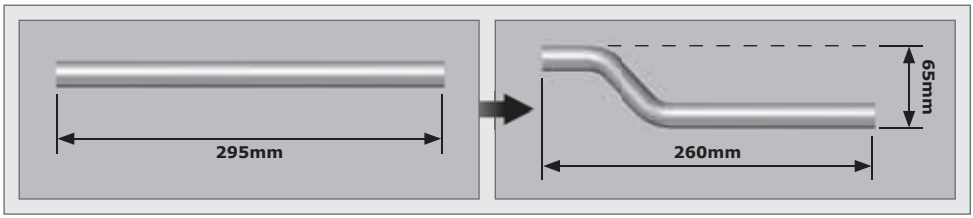


STEP 2 FIGURE 23



STEP 3 FIGURE 24

It is necessary to bend PVC conduit to circumvent the gearbox bulkhead to continue. The use of a conduit spring is recommended to avoid collapsing the pipe. Section 16, Figure 25 below is a guideline that can be used to achieve this.



STEP 4 FIGURE 25

STEP 5

Connect the bent piece of conduit to the PVC coupler installed in Section 16, Figure 24 Step 3. After it is connected, it should resemble Section 16, Figure 26.

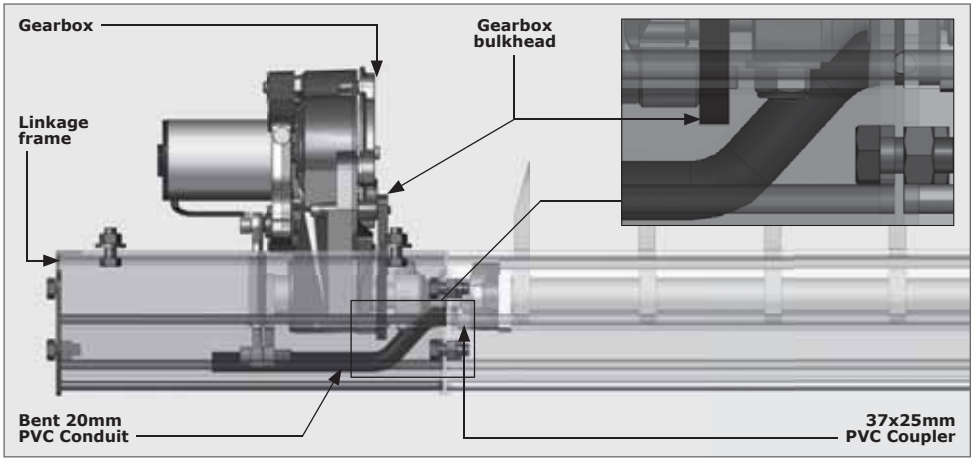
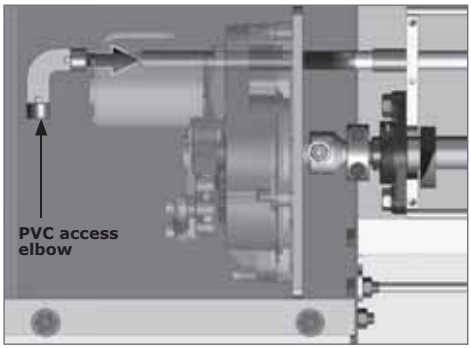
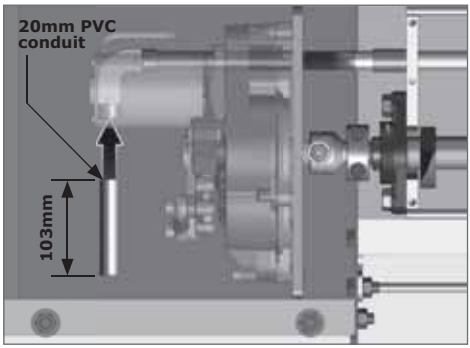


FIGURE 26

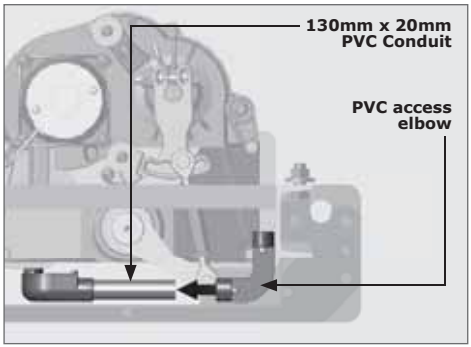
Steps 6-9 is only applicable if the SECTOR II will be mounted directly onto the **CLAWS** Gearbox. If they are going to be mounted seperately, a trench for the conduit and cables will need to be dug (Refer to Section 16.5.2.).



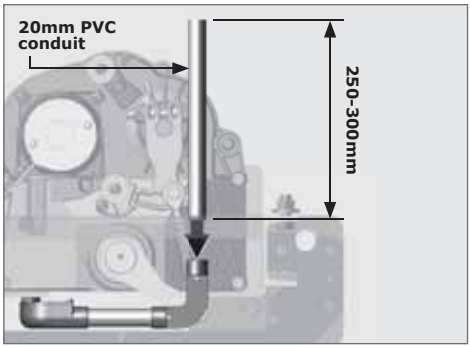
STEP 6 FIGURE 27



STEP 7 FIGURE 28



STEP 8 FIGURE 29



STEP 9 FIGURE 30

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

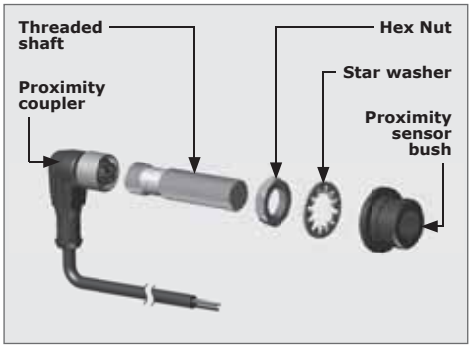


FIGURE 31. PROXIMITY SENSOR

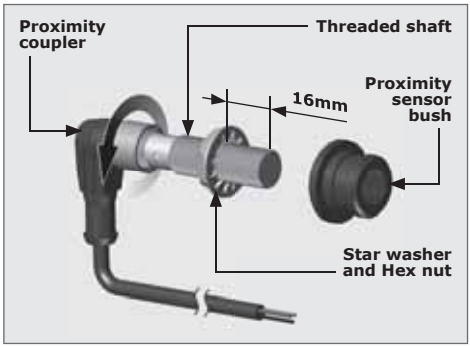


FIGURE 32. PROXIMITY SENSOR

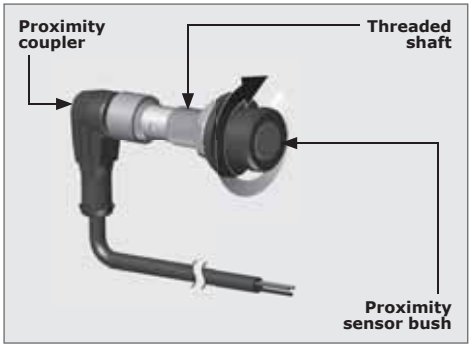
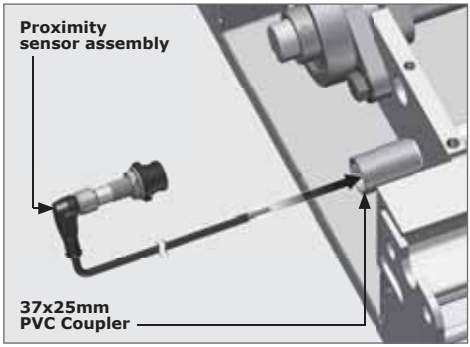


FIGURE 33. PROXIMITY SENSOR



STEP 6 FIGURE 34

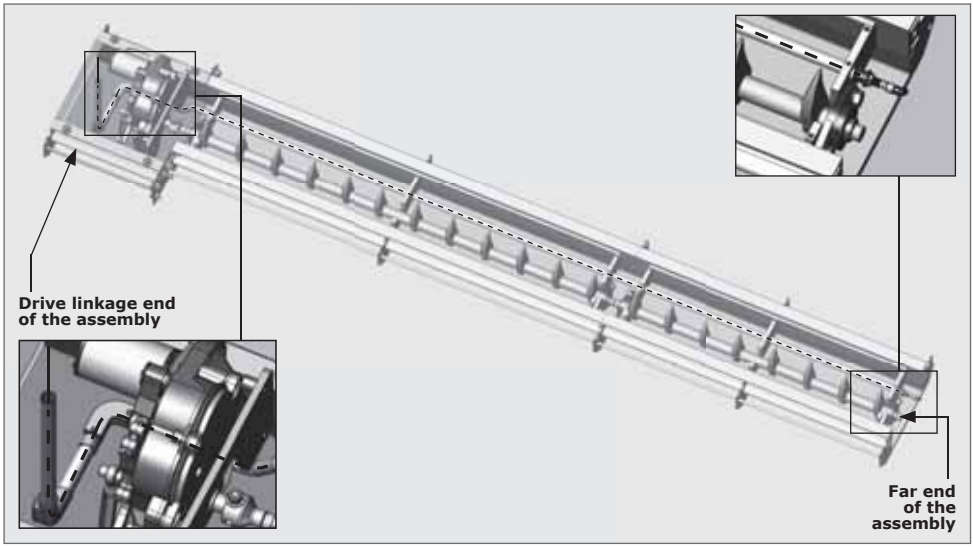
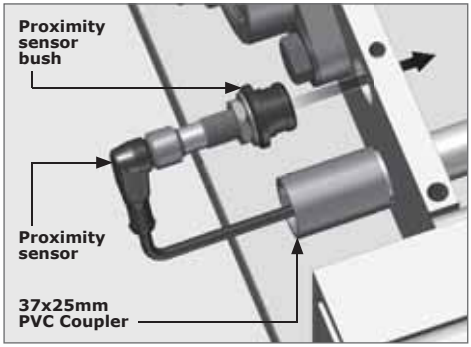
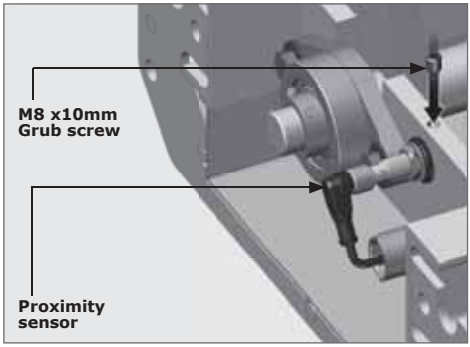


FIGURE 35

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



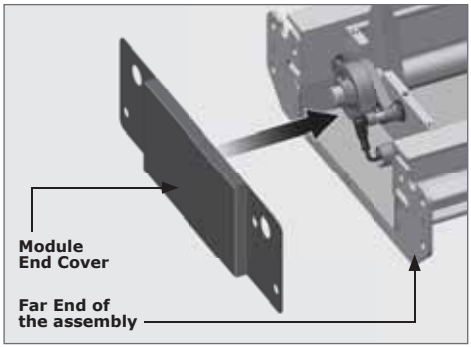
STEP 7 FIGURE 36



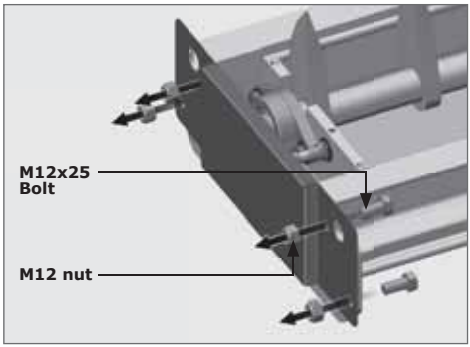
STEP 8 FIGURE 37

16.2.5. Attaching the End Covers to the Assembly

16.2.5.1. Attaching the Module End cover

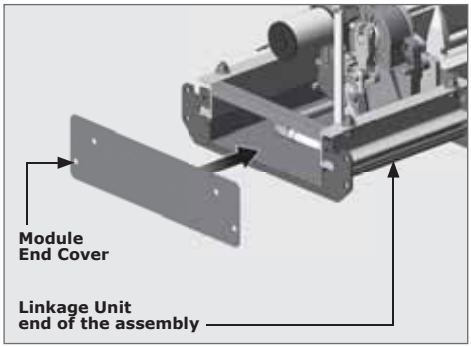


STEP 1 FIGURE 38

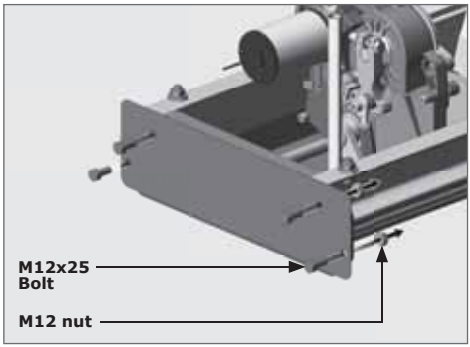


STEP 2 FIGURE 39

16.2.5.2. Attaching the Linkage Unit End cover

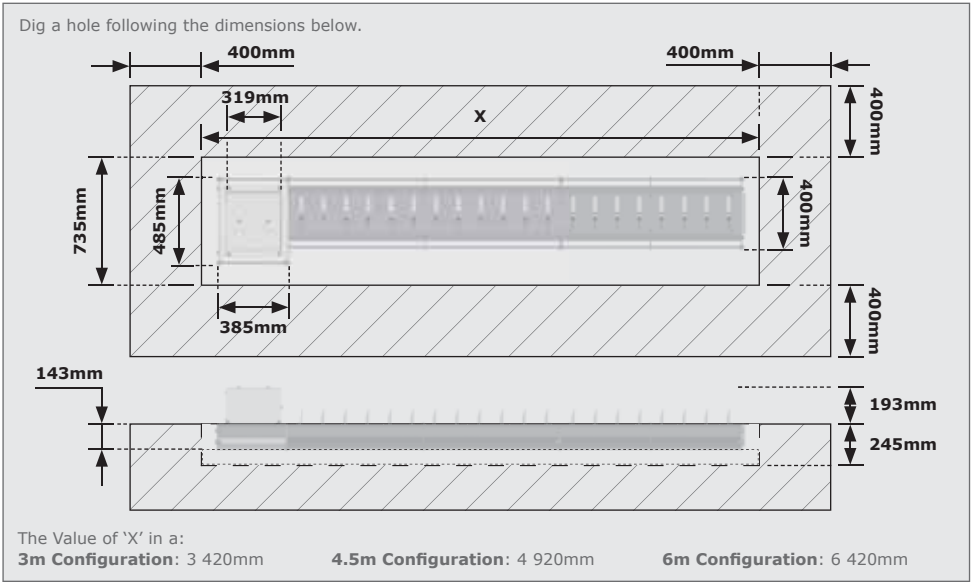


STEP 1 FIGURE 40



STEP 2 FIGURE 41

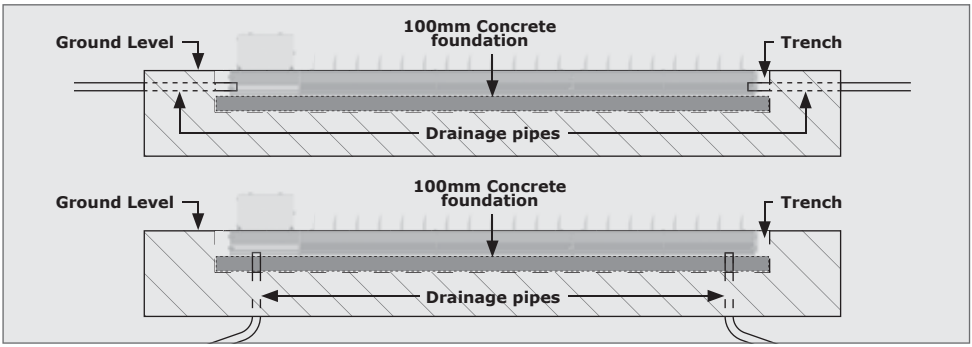
16.3. Preparing the Trench and Drainage System



STEP 1 **FIGURE 42**

Drainage pipes must be laid at one or both ends of the trench to allow water to flow either into storm water drains or into any other area away from the installation. Section 16, Figure 43 shows two recommended drainage configurations. Once complete, hold the drainage pipes in place by pouring a 100mm concrete foundation and level off.

If the SECTOR II 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 SECTOR II. This must be done before any concrete is poured (Section 16.5.2.).



STEP 2 **FIGURE 43**

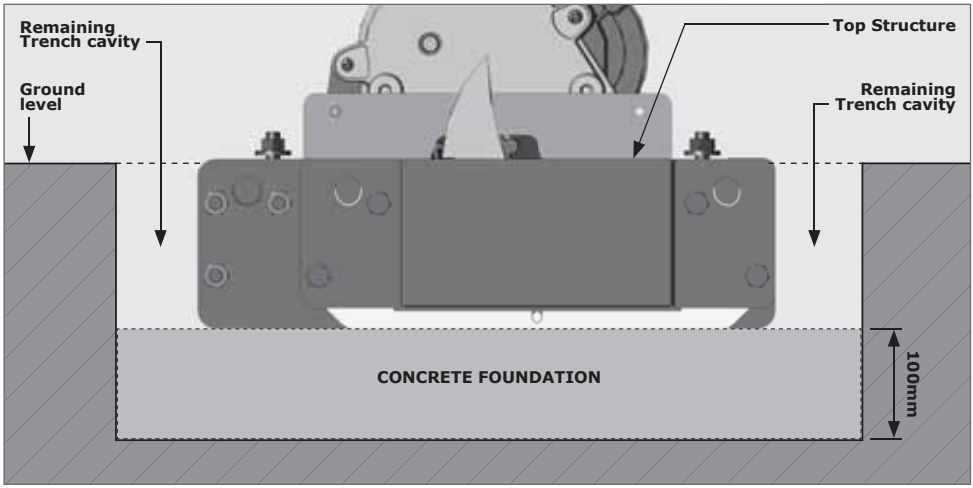
Make sure the drain pipes do not interfere with the structure when it is in the trench.

16.3.1. Concreting the Assembly into the Trench.

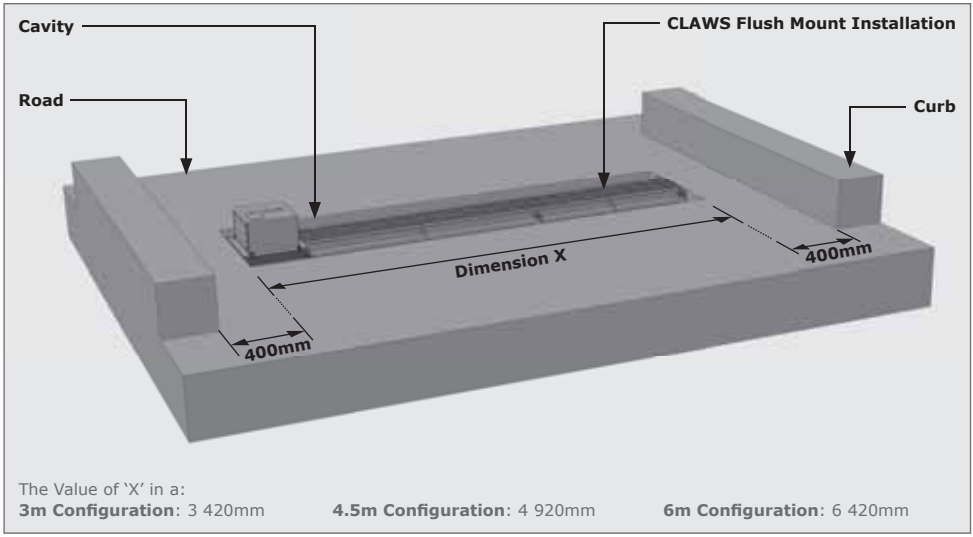
Ensure that the drain pipes will not interfere with the structure when it is placed in the trench.

Place the assembly in the trench and level the assembly using any type of propping or jacking method. Make sure that the top of the assembly is either in line with or a little higher than the ground level and pour concrete (minimum 45MPa after 28 days) into the cavity that remains.

Do not pour any concrete into the gutter of the spikes module or drive link assembly.



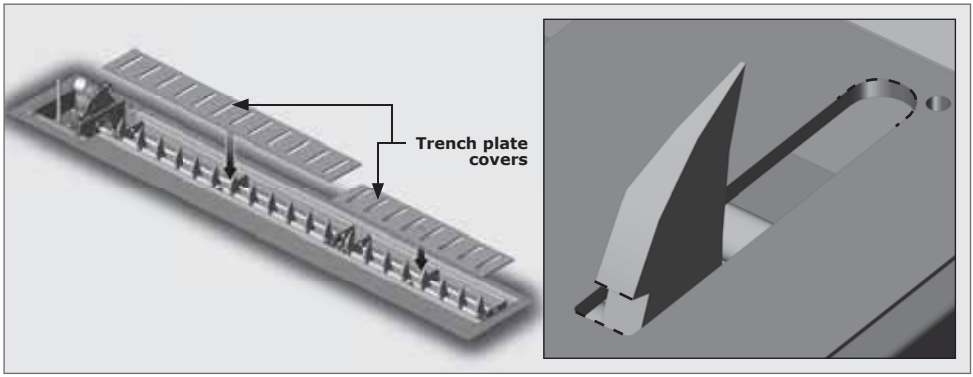
STEP 3 **FIGURE 44**



The Value of 'X' in a:
3m Configuration: 3 420mm **4.5m Configuration**: 4 920mm **6m Configuration**: 6 420mm

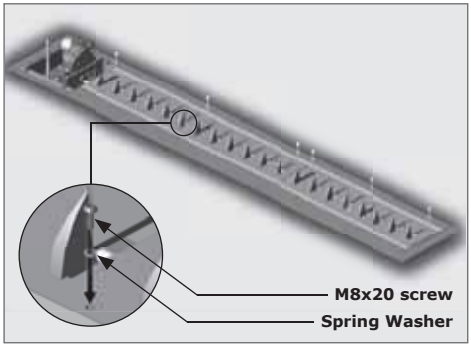
FIGURE 45. OVERVIEW OF CIVIL LAYOUT

16.4. Re-assembling the trench plates



STEP 1 **FIGURE 46**

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.

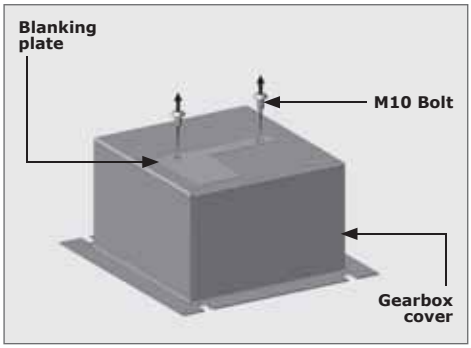


STEP 2 **FIGURE 47**

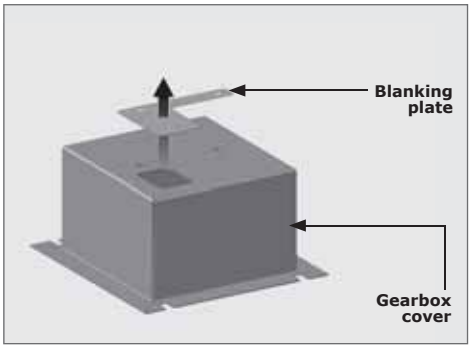
16.5. Integrating the SECTOR II with the CLAWS

16.5.1. Directly mount THE SECTOR II onto the Independent Drive

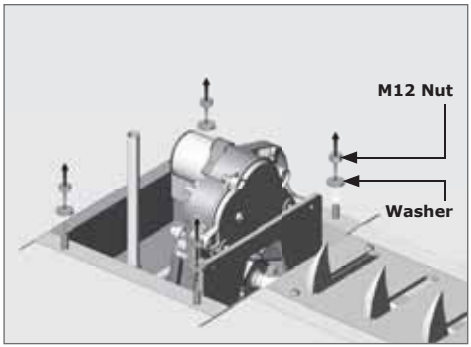
15.5.1.1. Placing the gearbox cover into position



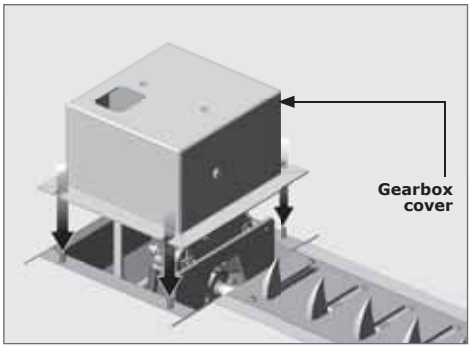
STEP 1 FIGURE 48



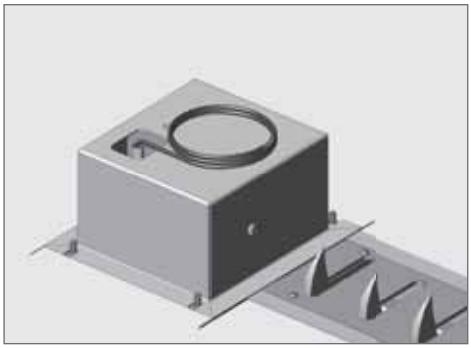
STEP 2 FIGURE 49



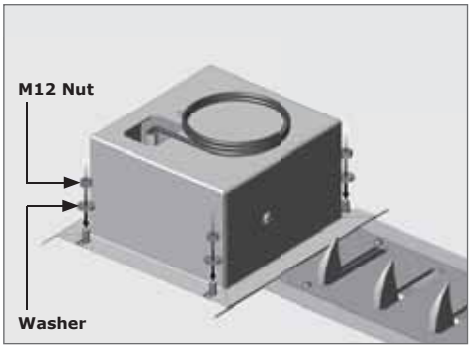
STEP 3 FIGURE 50



STEP 4 FIGURE 51



STEP 5 FIGURE 52



STEP 6 FIGURE 53

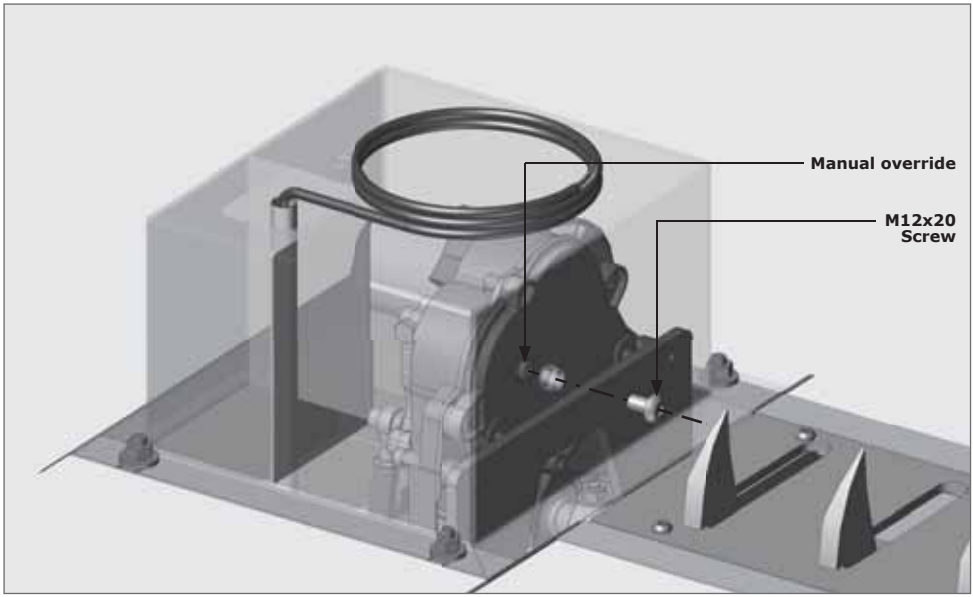
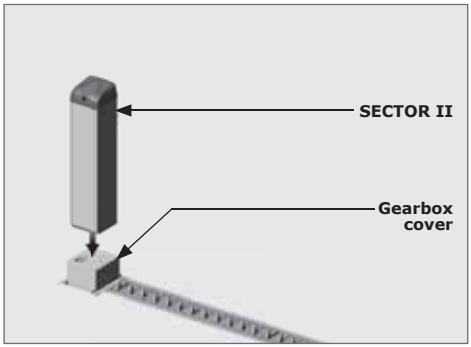
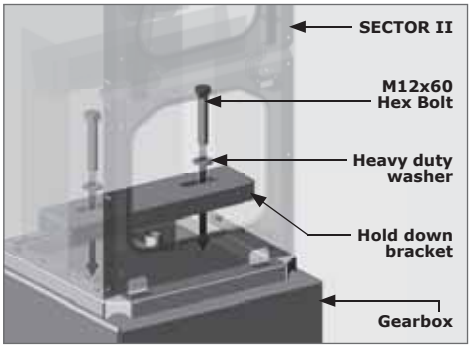


FIGURE 54. MANUAL OVERRIDE

16.5.1.2. Placing the SECTOR II into position



STEP 1 FIGURE 55



STEP 2 FIGURE 56

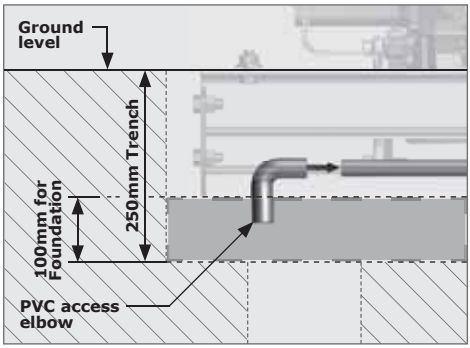
16.5.2. Seperately-placed CLAWS and SECTOR II

16.5.2.1. Running the conduit from the gearbox to the SECTOR II

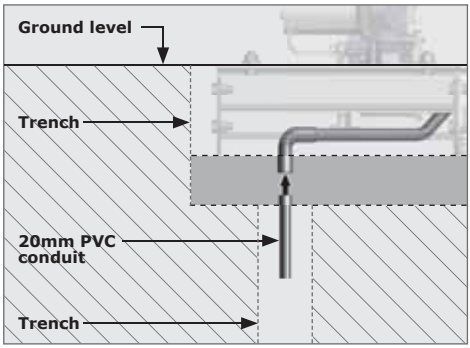
STEP 1

Dig a trench for the conduit from the gearbox to the desired position of the SECTOR II.

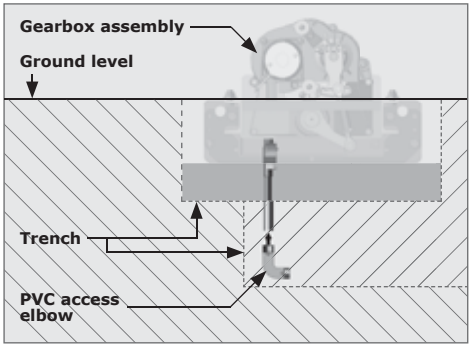
Drill a 20mm hole through the gutter plate using a 20mm hole saw for the proximity sensor conduit



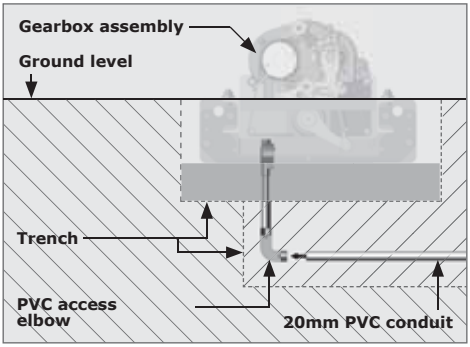
STEP 2 FIGURE 57



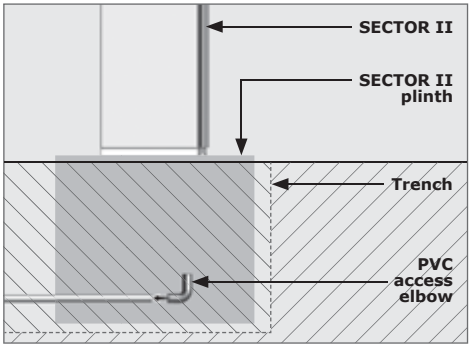
STEP 3 FIGURE 58



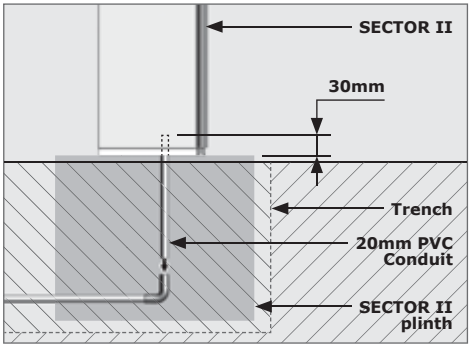
STEP 4 FIGURE 59



STEP 5 FIGURE 60



STEP 6 FIGURE 61

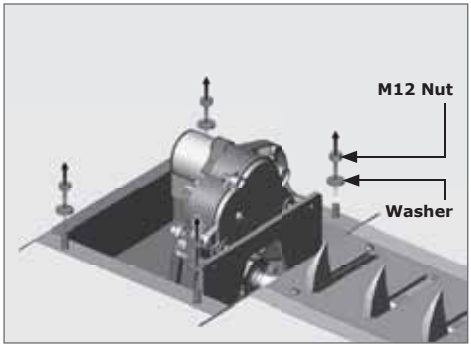


STEP 7 FIGURE 62

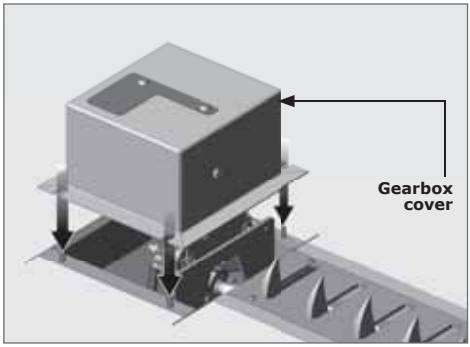
STEP 8
Route the **CLAWS** and Proximity sensor cables in the conduit to the SECTOR II.

STEP 9
Cast a plinth for the SECTOR II according to the SECTOR II installation manual.

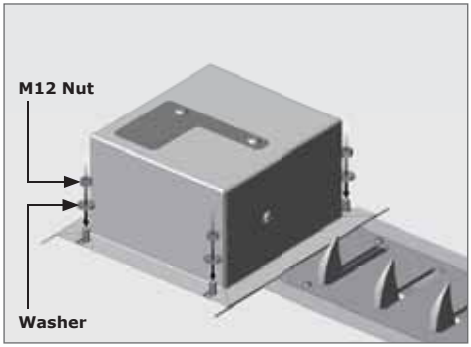
16.5.2.2. Placing the gearbox cover into position



STEP 1 FIGURE 63



STEP 2 FIGURE 64



STEP 3 FIGURE 65

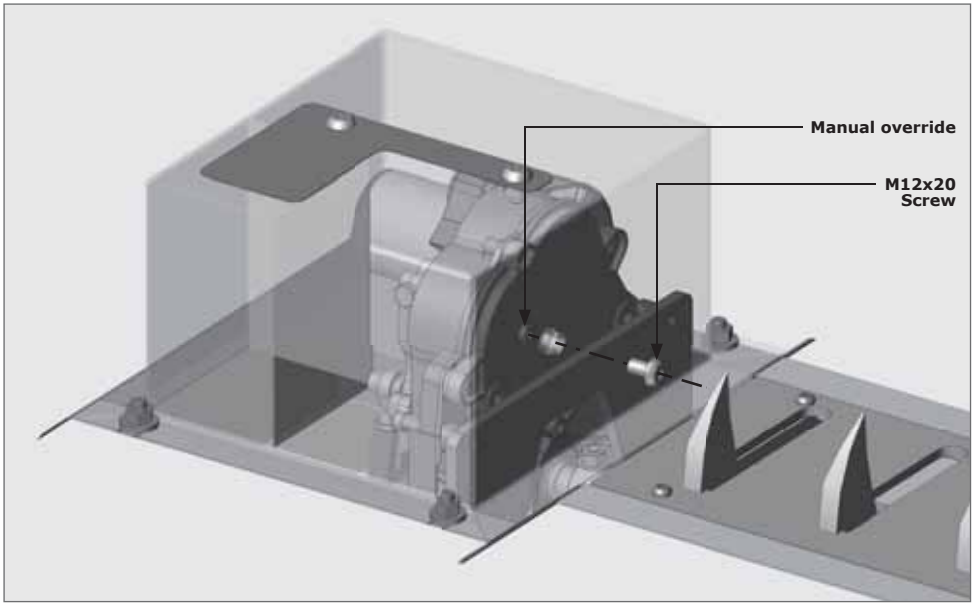
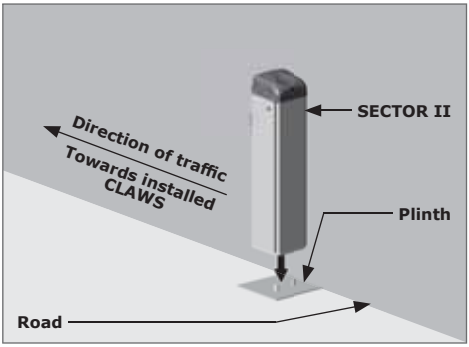


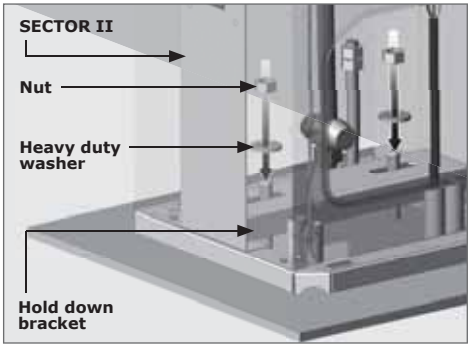
FIGURE 66. MANUAL OVERRIDE

By removing the M12x20 screw and placing an allen key through the hole, the gearbox release screw can be loosened.

16.5.2.3. Placing the SECTOR II into position

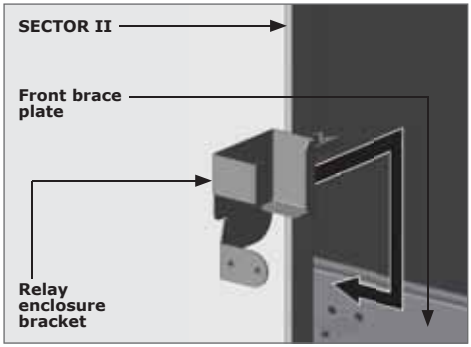


STEP 1 FIGURE 67

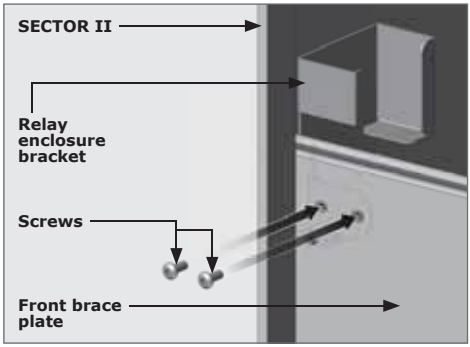


STEP 2 FIGURE 68

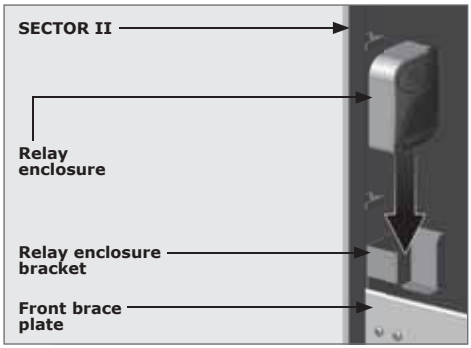
16.5.3. Fitting the relay enclosure and its bracket



STEP 1 FIGURE 69



STEP 2 FIGURE 70

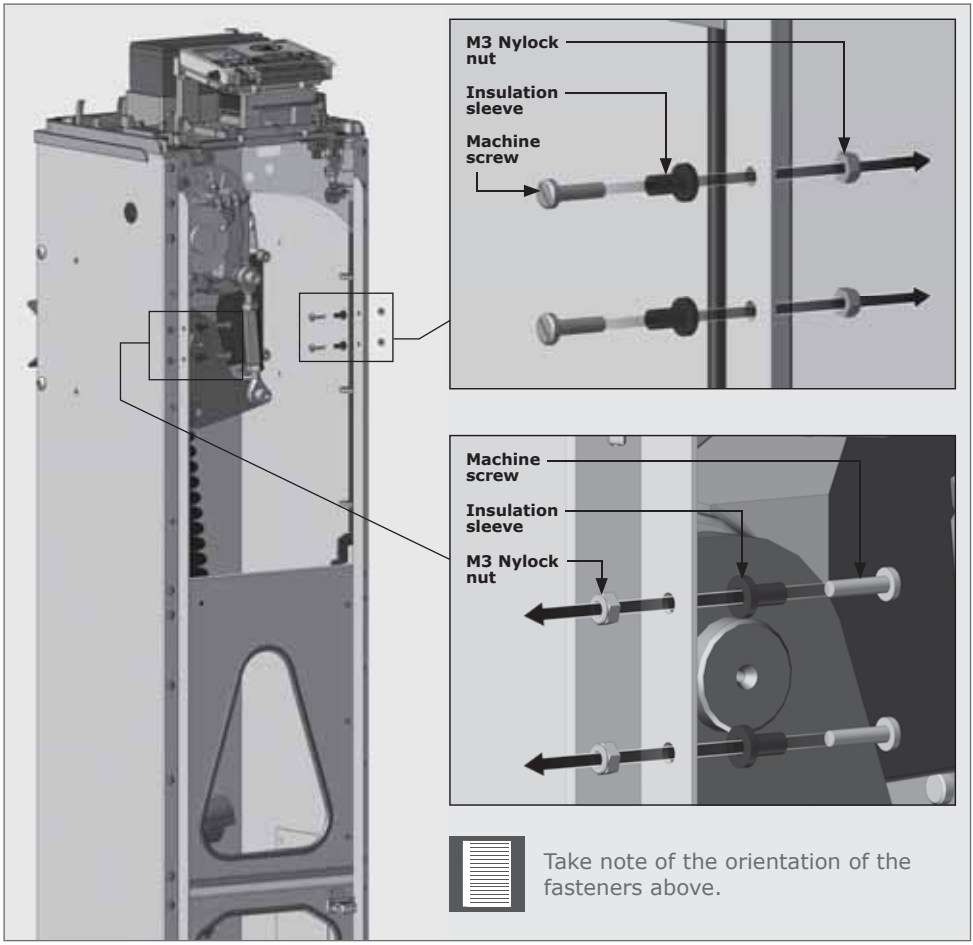


STEP 3 FIGURE 71

Route the excess wire from the proximity sensor, and wire it to the relay by referring to the wiring diagram (Section 17).

Complete the installation of the SECTOR II as per its full installation manual.

16.5.4. Fitting the CLAWS controller to the SECTOR II



STEP 1 **FIGURE 72**

STEP 2

Keeping the **CLAWS** Controller bracket horizontal, slide the top insulation sleeves into the top slot of the bracket. Ensure that the bottom insulation sleeves line up with the bottom slot of the bracket to follow the slot as the bracket drops to its resting place.

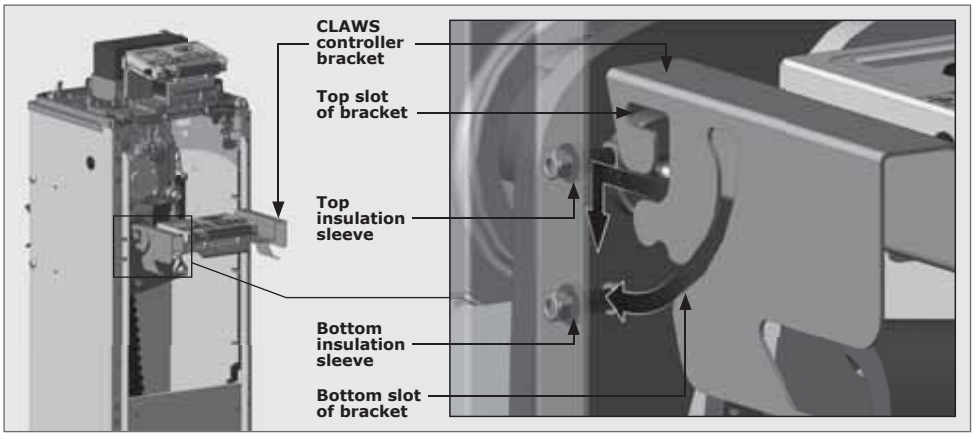


FIGURE 73

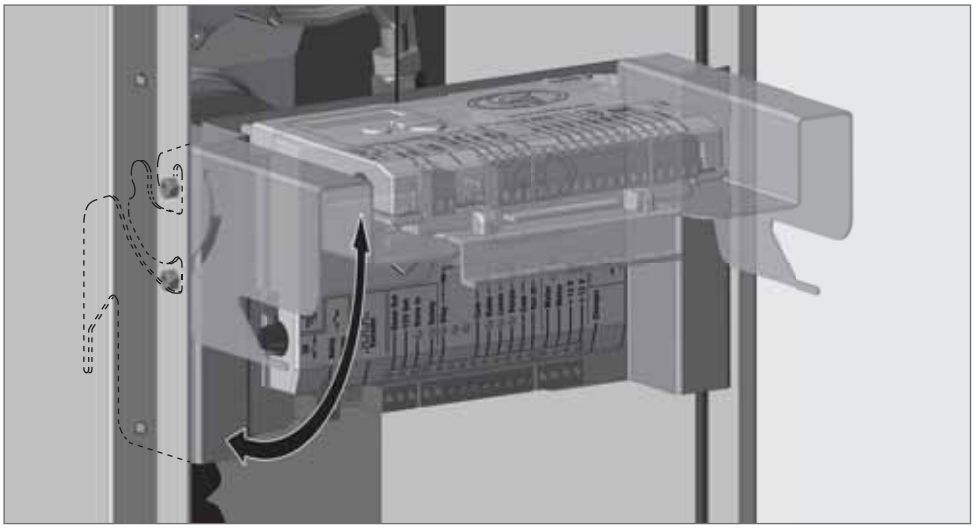


FIGURE 74

The bracket can be moved into a set angle of 70º by pivoting it upward from the bottom for better viewing of the LCD screen (Section 16, Figure 75).

It can also be moved lower down for optimum space when working on the gearbox (Section 16, Figure 76).

Ensure that the bracket is placed in the standard vertical position when done to enable the SECTOR II access door to be closed (Section 16, Figure 73).

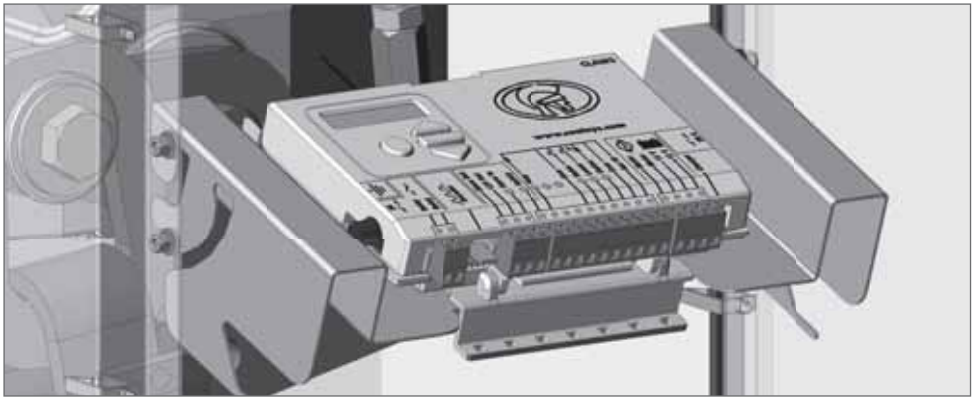


FIGURE 75. CLAWS CONTROLLER AND BRACKET AT FIXED 70º POSITION

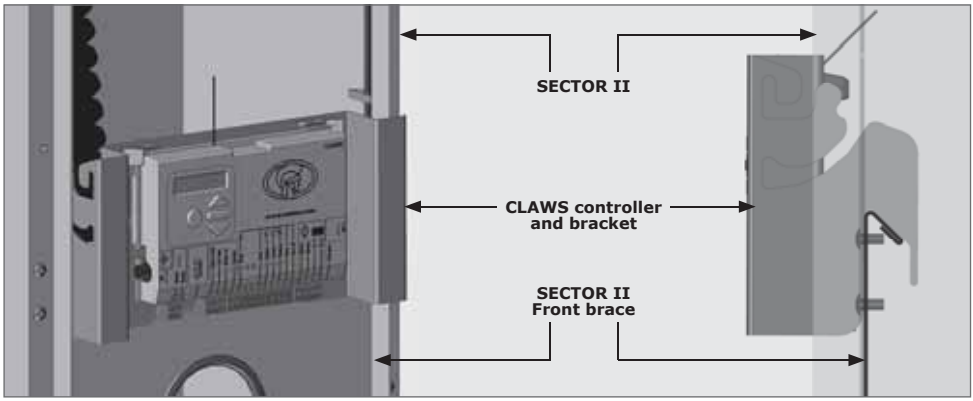


FIGURE 76. TEMPORARY CLAWS CONTROLLER AND BRACKET POSITION

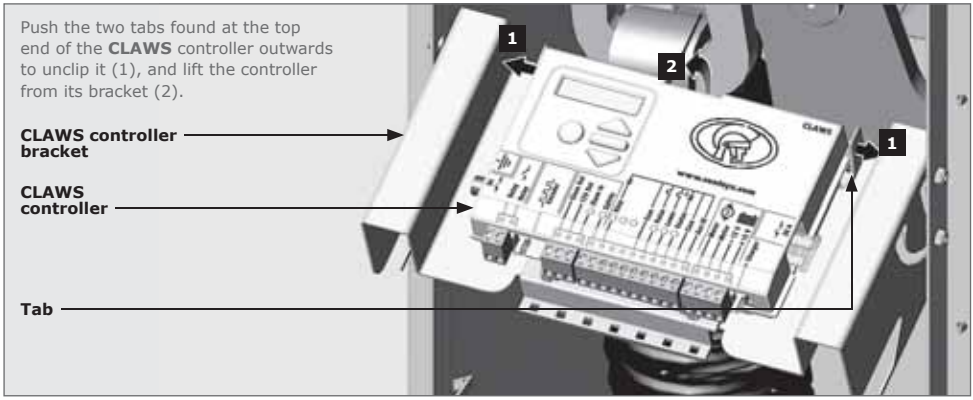


FIGURE 77. UNCLIPPING THE CLAWS CONTROLLER FROM ITS BRACKET

STEP 3

Connect harness and power supply. Refer to the wiring diagrams and controller settings.

17. Wiring Diagram

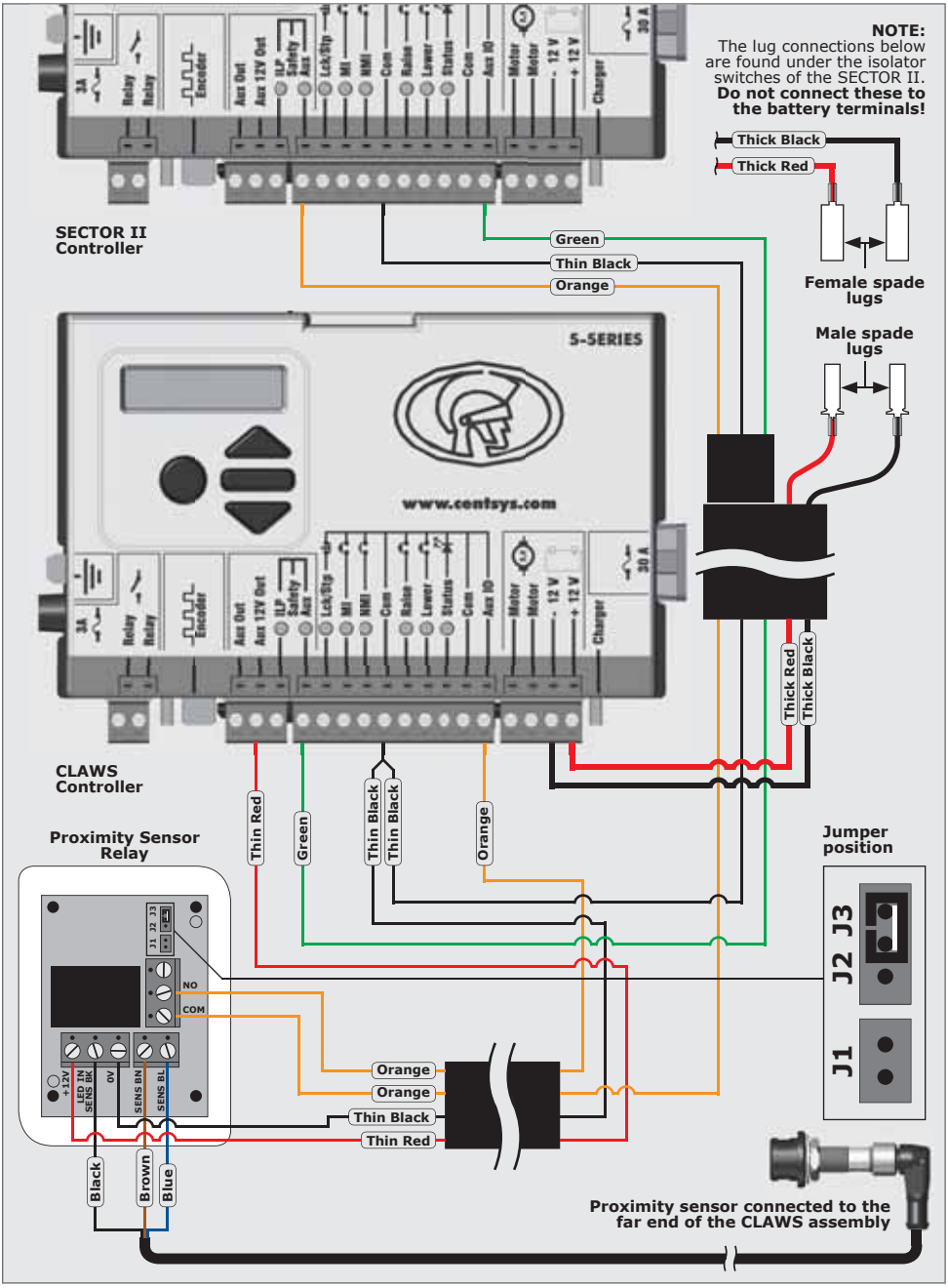


FIGURE 78. CONNECTING THE TWO CONTROLLERS

18. SECTOR II & CLAWS Controller Settings

18.1. SECTOR II Controller settings

4. Modes of Operation

4.1. Operating mode

(Set to any mode applicable, ***Simplex (SMX)***, ***Complex (CMX)*** or ***PLC (PLC)***)

11. Spikes Mode

11.1. Spike interface

(Set to any mode applicable, ***Safe (SAF)***, or ***Secure (SEC)***)

TABLE 1

18.2. CLAWS Controller settings

4. Modes of Operation

4.1. Operating mode

(Set to ***Spike Mode (SPK)***)

TABLE 2

19. Installation Handover

Once the installation has been successfully completed and tested, it is important to explain the operation and safety requirements of the system to the end-user.

NEVER ASSUME THE USER KNOWS HOW TO SAFELY OPERATE AUTOMATED ROADWAY SPIKES!

Even if the user has used such a system before, it does not mean he knows how to SAFELY operate it. Make sure that the user fully understands the following safety requirements before finally handing over the site.

The following needs to be understood by the user:

- How to operate the manual override mechanism
  (Show them how by demonstration)
- How co-installed safety loops and all other safety features work
  (Show them how by demonstration)
- All the features and benefits of the spikes
- **All the safety considerations associated with operating automated roadway spikes.**
  The user should be able to pass this knowledge on to all other users of the automated system and must be made aware of this responsibility

- Do not activate the **CLAWS** unless you can see it and can determine that its area of travel is clear of people, pets, or other obstructions
- **NO ONE MAY PASS OVER RAISING SPIKES**. Always keep people and objects away from the spikes
- **NEVER LET CHILDREN OPERATE OR PLAY WITH THE SPIKE CONTROLS**, and do not allow children or pets near the spike area
- Be careful with moving parts and avoid close proximity to areas where fingers or hands could be pinched
- Secure all easily-accessed spike controls in order to prevent its unauthorised use
- Keep the automated spikes system properly maintained, and ensure that all working areas are free of objects that could affect its operation and safety
- On a monthly basis, check the obstruction detection system and safety devices for correct operation
- All repair and service work to this product must be done by a suitably qualified person
- This product was designed and built strictly for the use indicated in this documentation. Any other use, not expressly indicated here, could compromise the good condition/operation of the product and/or be a source of danger!

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.

Ensure that the customer is in possession of the user guide and that you have completed the installation details in the back of the manual.

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