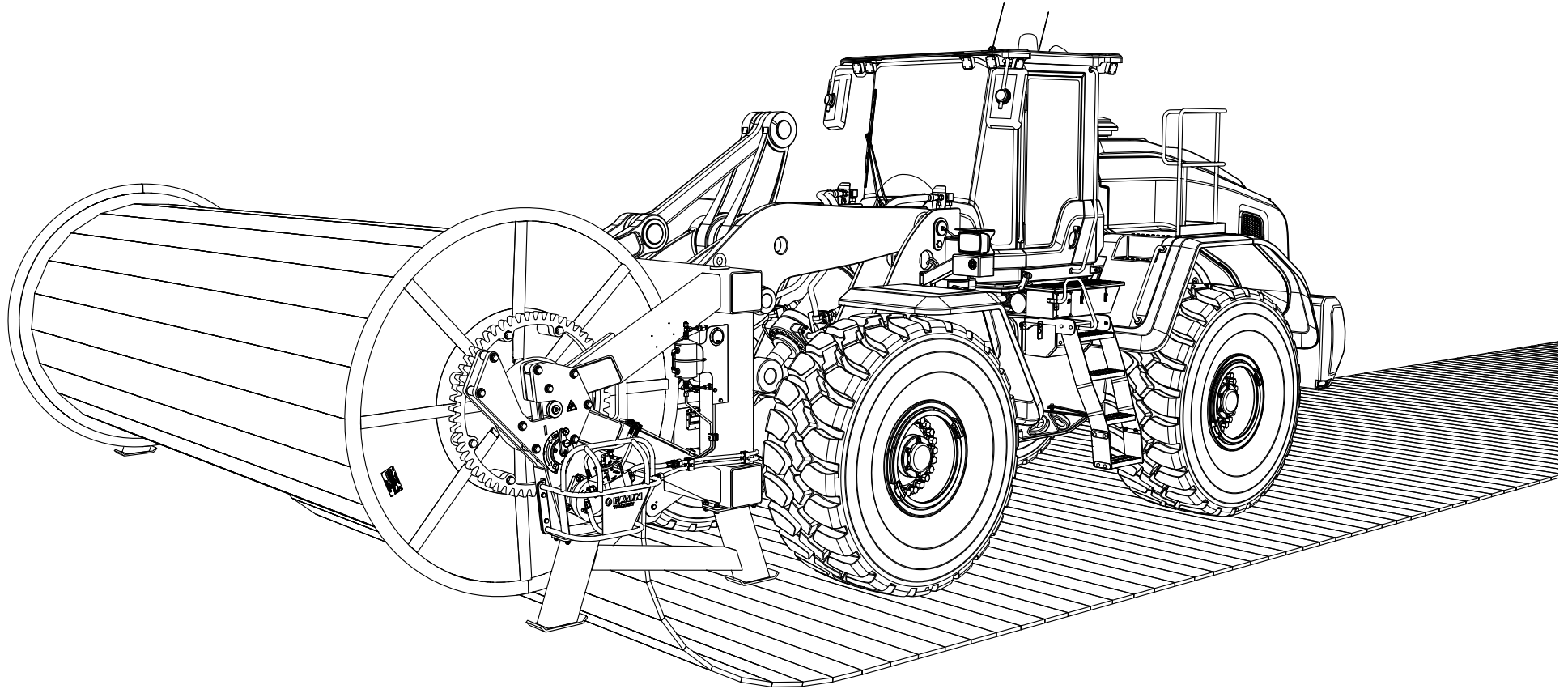


BOAT RAMP KIT  
C90 TRACKWAY®  
90PA (PLANT ADAPTER)  
OPERATOR MANUAL



Part Number: 5814285

REF: FTW-5814285

Rev: 1.0





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### 3. OVERVIEW

#### 3.1 General

This manual is for the person (the Vehicle Operator and Assistant) whose roles are to operate the 90PA on a routine basis. To ensure the users have a thorough understanding of how to use the system to deploy and recover Trackway® and to perform routine maintenance and repair of the system, this manual provides:

- Technical data;
- Instruction on the standard operation of the system;
- Checks and routine maintenance to keep the system functioning safely;
- Troubleshooting guidance for simple repair of the system.

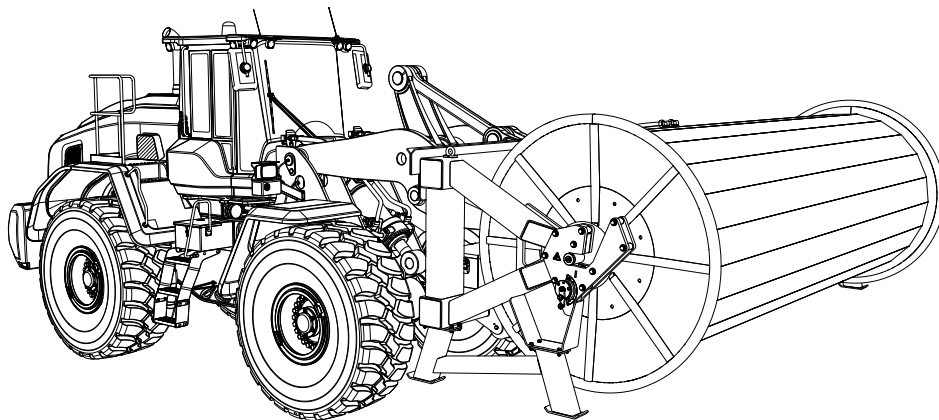


Fig. 3-1 90PA

#### 3.2 System Description

The 90PA is FAUN Trackway Limited's versatile system for rapidly deploying modular aluminum panels, providing temporary access to areas where there are no roads or damaged roads.

The 90PA allows up to 30m lengths of C90 Trackway® to be laid and recovered by only two personnel and a vehicle capable of hosting the system.

The 90PA kit consists of:

- 90PA (Plant Adapter)
- Flatrack
- Spool of C90 Trackway®
- Vehicle Interface Kit
- Trackway® Anchorage Kit

### 3.3 Abbreviations and Definitions

PA	Plant Adapter
CM	Corrective Maintenance
IPC	Illustrated Parts Catalogue
PM	Preventative Maintenance
WLL	Work Load Limit

### 3.4 Limitations of Use

#### 3.4.1 General

This section documents the limitations that apply to the use of Trackway®.

#### 3.4.2 Maximum Slope

The maximum incline/decline along the direction of the Trackway® is 1 in 5 (20% gradient).

The maximum incline/decline across the width of the Trackway® is 1 in 20 (5% gradient).

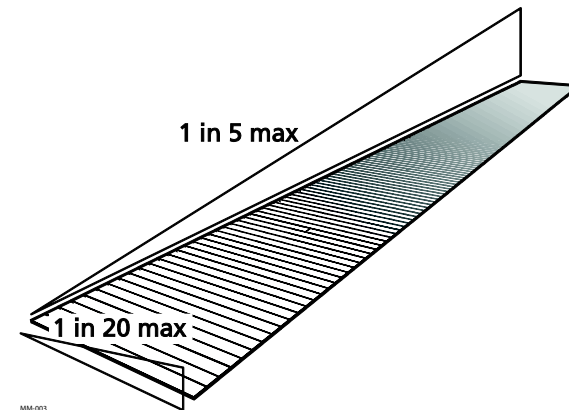


Fig. 3-2 Maximum Slope for Trackway® Deployment

#### 1.1.1 Uneven Ground

Trackway® may be laid over hummocks or depressions that do not exceed 150 mm, but open ditches should be filled.

Tree stumps or rocks greater than 150 mm should be cleared before laying Trackway®.

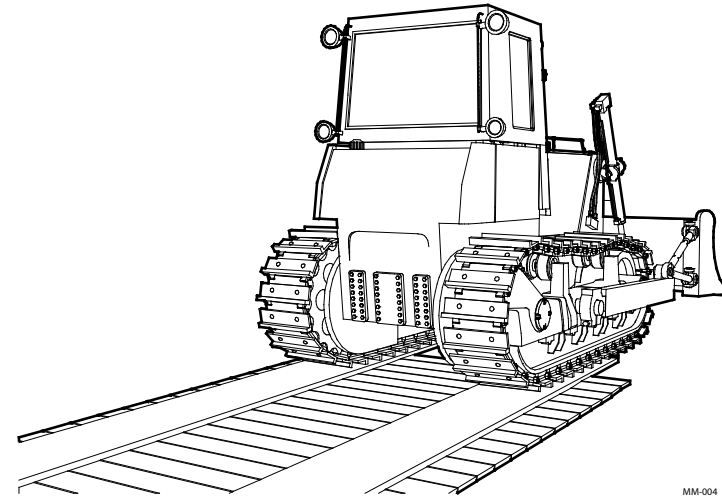
#### 1.1.2 Vehicle Types

The Trackway® is designed for rubber-tyred or rubber-padded vehicles.

If tracked vehicles with steel grouser blades are to use the Trackway®, then timber dunnage should be used to protect the surface of the Trackway® from the tracks.

#### 1.1.3 Tracked Vehicle Operation

Tracked vehicles should preferably enter and leave the Trackway® at the ends and not over the sides to eliminate the risk of track horns locking under the Trackway® edges when slewing.



MM-004

Fig. 1-3 Protect the Trackway® from Metal Tracked Vehicles

### 3. HEALTH AND SAFETY

#### 3.1 General

Whilst working with the 90PA equipment, it is important that risks to personnel's health and safety are properly controlled. Health and safety is about preventing injury or illness whilst at work. This section outlines the major health and safety issues during the use of the 90PA, but it is up to individuals to ensure that they comply with these guidelines.

At all times, the guidelines given in this manual must be followed when using any of the 90PA equipment. Personnel should also:

- Take reasonable care of their own and other people's health and safety;
- Co-operate with colleagues and superiors on health and safety where necessary;
- Tell someone (supervisor or health and safety representative) if it is thought that the work or inadequate precautions are putting anyone's health and safety at serious risk.

This section covers the main health and safety aspects of the 90PA with which all personnel must be familiar. For more in-depth information, consult with local documentation.

#### 3.2 Manual Handling

Work related injuries resulting in Musculoskeletal Disorders (MSDs) account for around half of all work related ill-health, many of these are caused by the poor management and practice of manual handling.

Those engaged in manual handling are to inform their line manager or supervisor about any physical or medical condition that could affect their ability to undertake manual handling operations safely.

Personnel are to risk assess the transporting or supporting of a load including lifting, putting down, carrying, pushing, pulling, moving by hand or bodily force to reduce the risk of injury to a level that is as low as is reasonably practicable.

All personnel should comply with safe work processes and training provided by line management for manual handling activities and report any deficiencies that may be evident.

#### 3.3 Handling Oils and Lubricants

When handling oils and lubricants the following safety precautions must be followed at all times. For additional safety information regarding symptoms and first aid, consult with local documentation.

##### 3.3.1 Skin Contact

Personnel may be exposed to skin contact with oils and lubricants through direct handling, using petroleum to clean equipment, or if they are stored within the workplace. A common source of skin contact is from personnel leaving oil soaked rags in their coverall pockets. The following precautions must be taken:

- Personnel must ensure that they wear personal protective equipment (PPE);
- All personnel must handle oils and lubricants carefully especially during transfer from a container;
- Face and hands are to be washed frequently with hot water and soap.

- Nails are to be scrubbed with a nail brush.
- On no account are personnel to practice the cleaning of hands with a petroleum product.
- Working clothes are not to be worn outside of working hours and personnel are to ensure that such clothes are laundered weekly.
- Hot baths or showers are to be taken at the end of each working day; this must also take place immediately if contamination has occurred.

#### 1.1.1 Ingestion

After handling petroleum products, toxic substances can be transferred to food and drink as a result of poor hygiene.

Prolonged exposure to this type of poisoning can cause mouth and throat cancer and stomach ulcers.

A severe form of lung damage called pneumonitis may occur if liquid petrol is inhaled directly onto the lungs, for example, whilst manually siphoning a tank or from inhaling vomit after swallowing petrol. This is why it is important not to make someone sick if they have swallowed petrol and to seek immediate medical advice.

Ingestion precautions are as follows:

- General hygiene precautions are to be taken and enforced.
- Food or beverages must not be taken into or consumed within a hazardous area.
- Personnel are to wash their hands before eating, drinking, smoking and using the lavatory.
- The mouth is to be rinsed with water before eating or drinking.

If oils and lubricants are ingested seek immediate medical advice.

#### 1.1.2 Eye Contact

Eye contact could occur through splashing or pressurisation of fuel during transfer operations. Personnel could simply contaminate the eye by brushing the face with a soiled glove or from

the skin because of poor hygiene. As a safety precaution, personnel must wear the correct eye protection to avoid contact.

If oils and lubricants come into contact with the eye seek immediate medical advice.

#### 1.1.3 Dermatitis

Dermatitis is inflammation of the skin caused by skin contact with a range of materials that dry out and damage the skin. It can affect all parts of the body, but it is most common to see the hands affected.

Sometimes the consequences of skin contact with a material are immediately visible, sometimes skin contact occurs without apparent effect. However, every contact can cause minute amounts of invisible damage to the skin that can build up until more serious signs are seen, i.e. dermatitis.

Personnel must ensure regular skin checks are carried out to look for early signs of dermatitis.



## 1.1 Plant Moving Equipment

Unauthorised persons are not permitted to operate or interfere with the 90PA.

In addition to the general safety precautions detailed in this section, additional safety precautions applying to the operation of the 90PA contained in this manual and further particular circumstances whether detailed in the partner Maintainer manual or contained in unit orders or local instructions are to be observed.

### 1.1.1 Before work preparation

Before approaching the 90PA personnel must ensure that they:

- Have read and understood all relevant safety instructions.
- Are aware of the existence of any overhead wires or underground cables or pipes within the work area.
- Are conversant with the 90PA and are aware of the location and operation of all controls, indicators, warning devices, instrumentation and fail safe devices.
- Are correctly dressed and have the appropriate safety equipment.

### 1.1.2 90PA Host Vehicle

Having carried out the routine checks and maintenance, carry out a routine safety check. Personnel must:

- Check the load capacity of the Host Vehicle to ensure stability.
- Clean all windscreens and windows to ensure the greatest possible visibility.
- Check engine areas for any waste material that could cause a fire.
- Check that all stowed items are secure and unable to fall off or jam working parts.
- Check that all safety guards and pins are in position and correctly fitted.
- Remove all grease, oil and mud from hand-rails, steps and floors.
- Check that the Fire Extinguisher, if authorised, is present with seals intact.
- Walk around the Vehicle to ensure there are no obstacles, tools, equipment or personnel

near or under it.

### 1.1.3 Mounting and Dismounting

When mounting and dismounting the Vehicle personnel should always ensure that they:

- Use available handrails, ladders or steps.
- Face the Vehicle .
- Have 3 points of contact at all times.
- Have hands and boots that are free from mud and grease.
- Do not use the steering wheel or other controls as hand holds when entering the cab.

### 1.1.4 Pre-working checks

Having started the system ensure that:

- All controls are working correctly.
- All gauges are functioning and reading correctly for the ambient working conditions.
- The meaning of all warning lights and alerts is understood.

### 1.1.5 Safe operating

To ensure safe operation of the 90PA personnel must:

- Ensure all other personnel are clear of the 90PA before starting.
- Never reverse unless it is safe to do so.
- Adjust speed to suit the conditions.
- Not operate close to the edge of a bank without ensuring that the bank is strong enough to support the 90PA and Host Machine when working.
- Ensure that they have read, signed and understand any site safety orders.

### 1.1.1 Parking

When stopping the Vehicle, for however short a period, if it entails personnel dismounting:

- Park on level, firm ground wherever possible.
- Lower all equipment to the ground or en-sure they are locked in the correct stowage positions.
- Place all controls in the neutral or parking position.
- Apply the parking brake.
- Switch off the engine and remove the key.

### 1.1.2 Maintenance

As a part of 90PA maintenance personnel must:

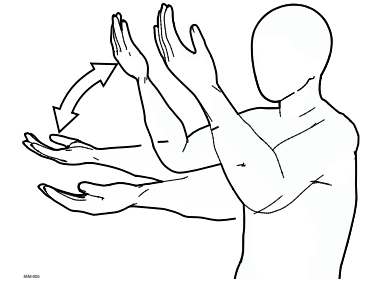
- Never attempt to clean, lubricate or adjust moving machinery.
- When servicing hydraulic equipment ensure that all safety locks have been applied.
- If working under or on equipment ensure that all moving parts are securely blocked including the Vehicle.
- Never use an open flame to check fuel, battery or coolant.

## 1.1 Generic Hand Signals

It is important to know the generic hand signals that are used to direct the Vehicle Operator when moving and positioning the Vehicle.

Forward

With both arms out in front and the palms towards the chest, perform a pulling motion by moving both hands backwards and forwards.

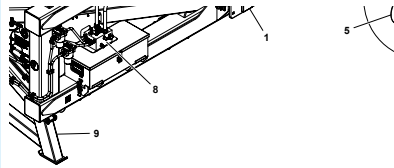


Reverse

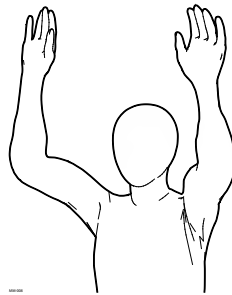
With both arms out in front and the palms towards the Vehicle, perform a pushing motion by moving both hands backwards and forwards.



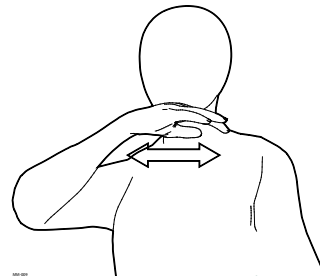
Turn to Left/Right  
Using the hand on the side of the body in which the Vehicle is to be turned, swipe the hand from the shoulder to out-stretched at the side.



Halt/Stop  
With palms towards the Vehicle, raise one or both hands above the head.



Switch Engine OFF  
With the elbow kept high, perform a cutting motion across the throat with the hand.



## 1.2 System Warnings

This section is a compilation of all the warnings made throughout this manual.



WARNING: Personnel should not work under the elevated Interface Plate.



WARNING: While the 90PA is being prepared, ground guides should ensure the work area is clear of unauthorized personnel.



WARNING: Ensure the Host Vehicle is stationary before disengaging Constant Tension.



WARNING: During recovery, ground guides should ensure the work area is clear of unauthorized personnel.



WARNING: The optional Torque Multiplier must NEVER be fitted during powered operation.



WARNING: Maintenance tasks that are to be performed on the 90PA shall be governed by local regulations for working from height. Where possible, dismount the system to carry out maintenance tasks.



CAUTION: Collect used and excess grease including cleaning cloths and dispose of according to local environmental regulations.



CAUTION: The 90PA should be at ground level for preventative maintenance tasks to be carried out.



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CAUTION: The 90PA should be at ground level for preventative maintenance tasks to be carried out.

## 1.1 System Cautions

This section is a compilation of all the cautions made throughout this manual.



CAUTION: During peacetime training / exercises the area commander must ensure that a suitably qualified and experienced Operator or Ground Guide is present to guide the Driver and perform ground recce.



CAUTION: Record all faults in the Pre- and Post-Operation Checklist and do not use the equipment if it does not pass the inspection.



CAUTION: Wear personal protective equipment (gloves, goggles, hard hat, protective footwear and ear protection) when undertaking preventative maintenance tasks.

### 3. TECHNICAL DATA

#### 3.1 Spool

Width	1,800 mm
Length	5,255 mm
Height	1,800 mm

Table 3-1: Spool Dimensions (mm)

Empty	945 kg
25m of Trackway®	3,733 kg
Total	4,678 kg

Table 3-2: Spool Weights (kg)

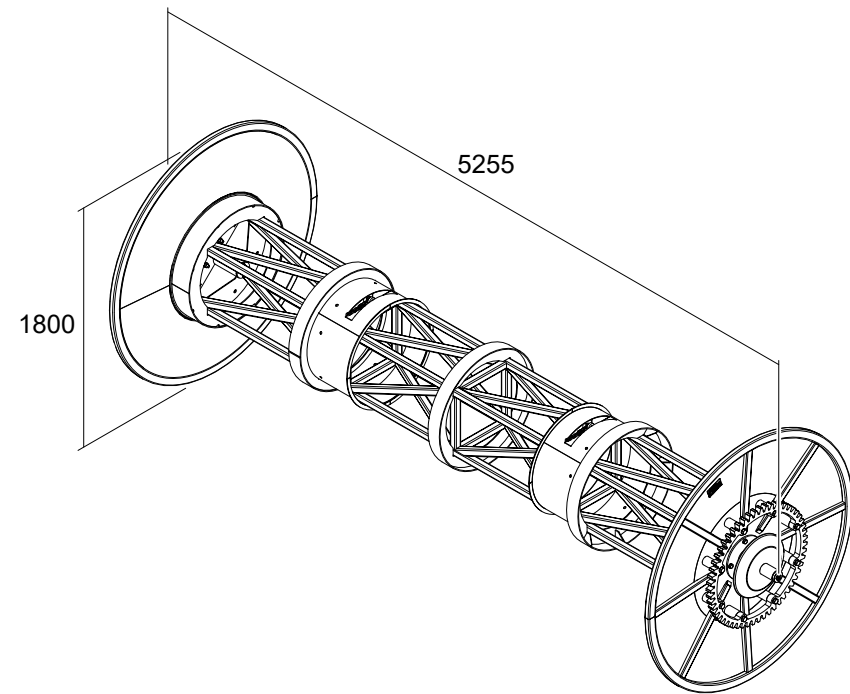


Fig. 3-1 Spool Dimensions (mm)

## 1.1 90PA

Width	1,730 mm
Length	5,704 mm
Height	1,642 mm

Table 1-1: 90PA Dimensions (mm)

Empty	1,780 kg
Spool	945 kg
25m of Trackway®	3,733 kg
Total	6,458 kg

Table 1-2: 90PA Weights (kg)

### 1.1.1 Interface Plates (Typical)

The typical weight of the Interface Plates is 350kg.

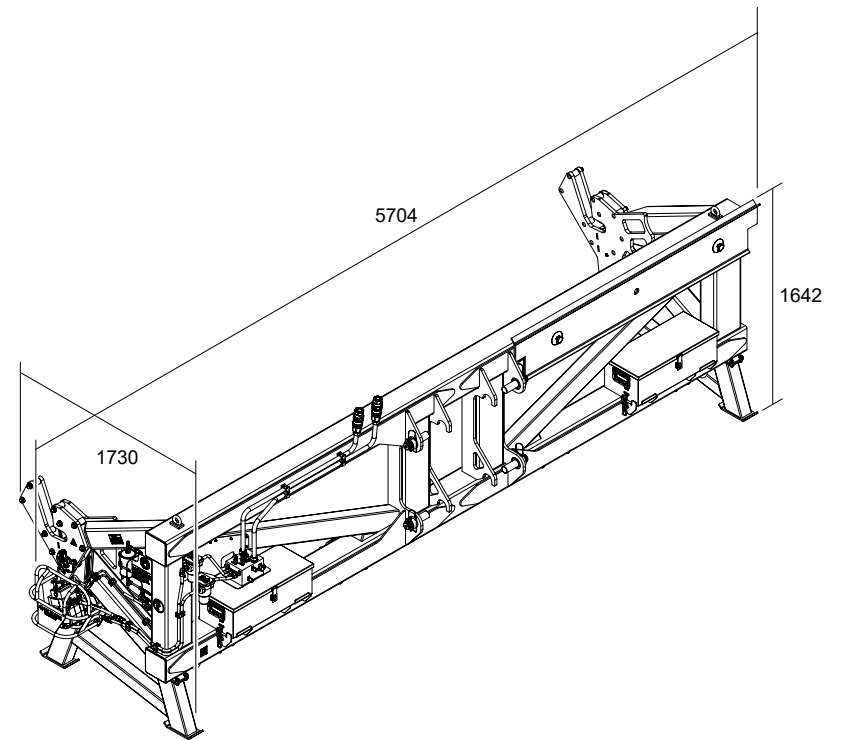


Fig. 1-1 90PA Dimensions (mm)

## 1.2 Shipping Frame

Width	2,100 mm
Length	5,623 mm
Height	453 mm
Weight	1,390 kg

Table 1-3: Shipping Frame Technical Data

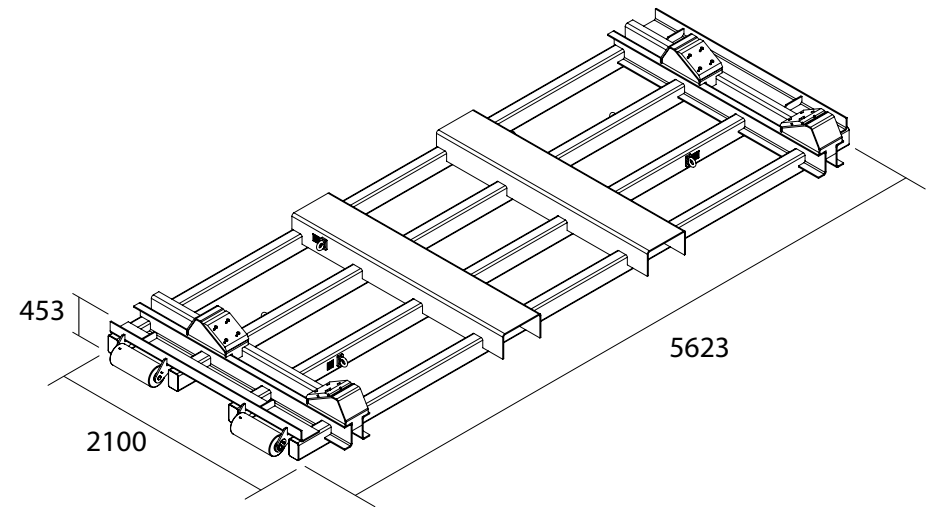


Fig. 1-2 Shipping Frame Dimensions (mm)

## 1.1 Trackway®

The C90 Trackway® consists of a number of interlocking panels that form a section 4.57m wide and 25m long.

Sets of Split Panels are fitted approximately every 5m to allow sections of Trackway® to be removed or joined more easily.

	Full Panel	Half Panel
Width	4,572 mm	2,286 mm
Length	230 mm	230 mm
Running Length	214 mm	214 mm
Thickness	32 mm	32 mm
Weight	31.9 kg	16.1 kg
# per 25m Section	113	8

Table 1-1: MLC Panel Data

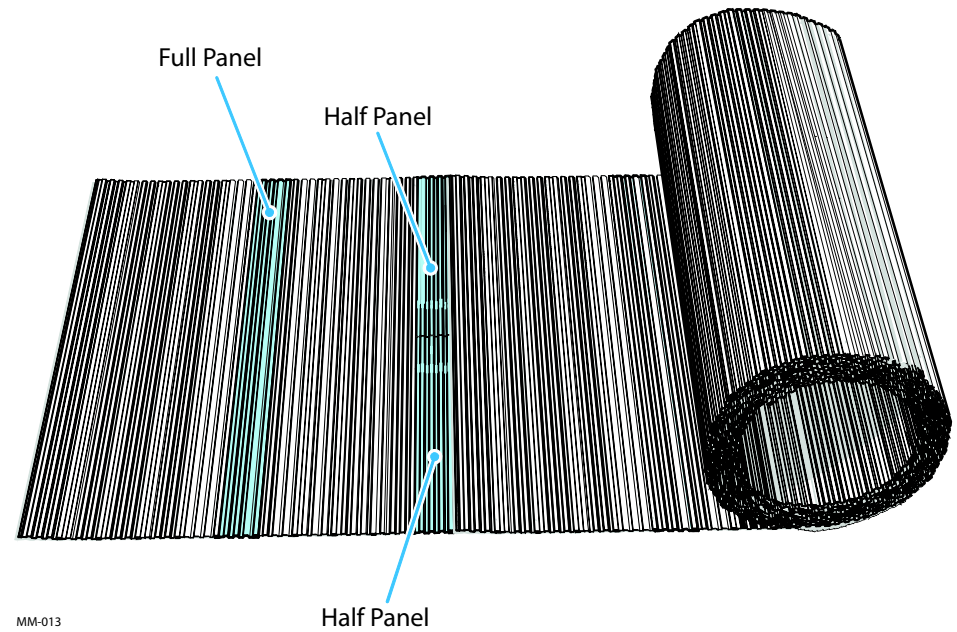


Fig. 1-1 Trackway® Panels

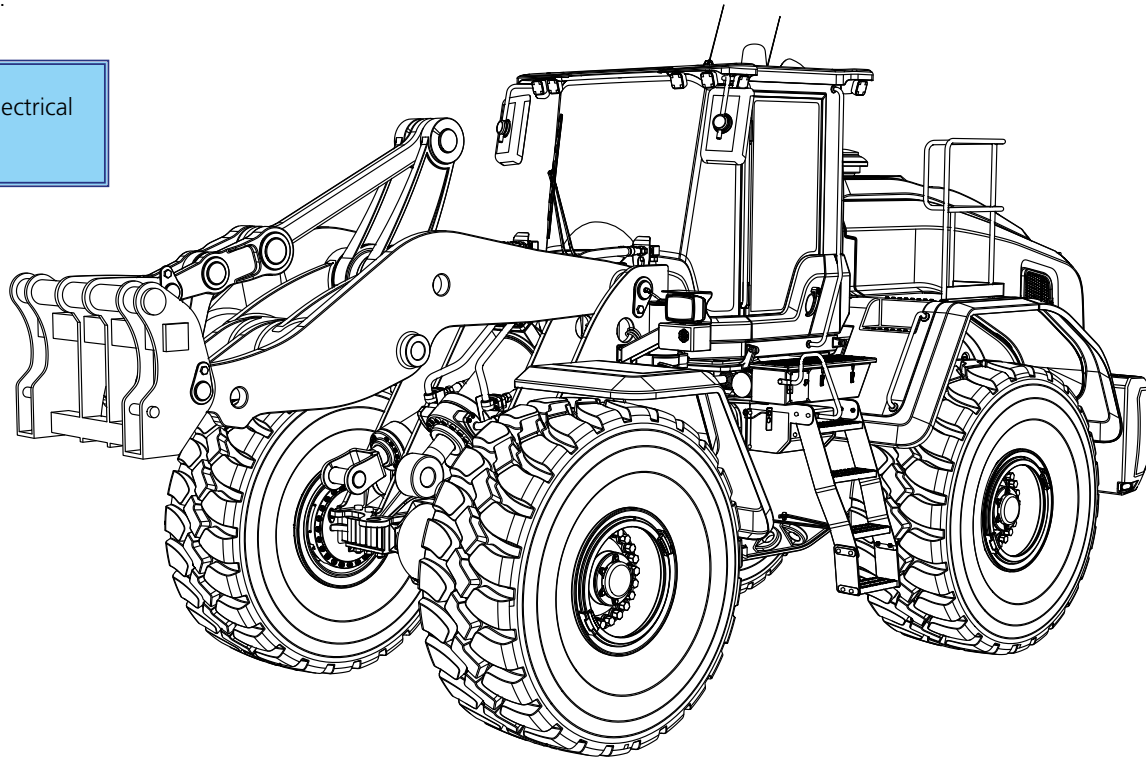


## 1.2 Host Vehicle Requirements

The Host Vehicle must comply with following requirements:

- Front end loader, excavator or telescopic handler;
- Machine must be capable of lifting and maneuvering a 10,000kg payload in a safe and stable manner.
- Auxiliary connections from the A & B port of the host machine's auxiliary system;
- Nominal hydraulic requirement 180 bar @ 40 l/min (minimum 25 l/min);
- Motor case drain (if fitted) maximum back pressure 10 bar.

NOTE: The 90PA does not require an electrical feed.



## 1.1 Hydraulic System

Capacity	Hydraulic System	5 litres
	Spool motor	630 cc <sup>3</sup> / rev
Pressure	System maximum operating	180 bar
	Constant tension	60-70 bar
Oil	Motor case drain (if fitted)	10 bar max back pressure
	Nominal flow	25 litres / min
	Minimum cleanliness (ISO4406)	19 / 16
	Motor brake volume	500 ml

Table 1-1: Hydraulic System Specifications

### 3. CONSTRUCTION

#### 3.1 General

This chapter describes the system as a whole and the key components of the system in order to give the Operator and Maintainer the correct knowledge of how the system operates and the appropriate terminology.

The main components of the 90PA kit, which will be described in this chapter, are the:

- 90PA;
- Spool Drive Assembly;
- Spool;
- Trackway® (C90);
- Flatrack;
- Interface Kits;
- Anchorage Kits.

#### 3.2 Assembly

The C90 Trackway® is transported, stored, deployed and recovered on Spools, around which the Trackway® can be coiled.

The 90PA is mounted on the Host Vehicle using the appropriate Interface Kit. The 90PA is controlled from and powered by the Host Vehicle.

The Host Vehicle can deploy and recover Trackway® using the 90PA which carries spools of Trackway®.

The 90PA's Quick Coupling Spool System allows multiple spools of Trackway® to be deployed and recovered.

When not in use the 90PA can be detached from the Host Vehicle and stored on the Flatrack.

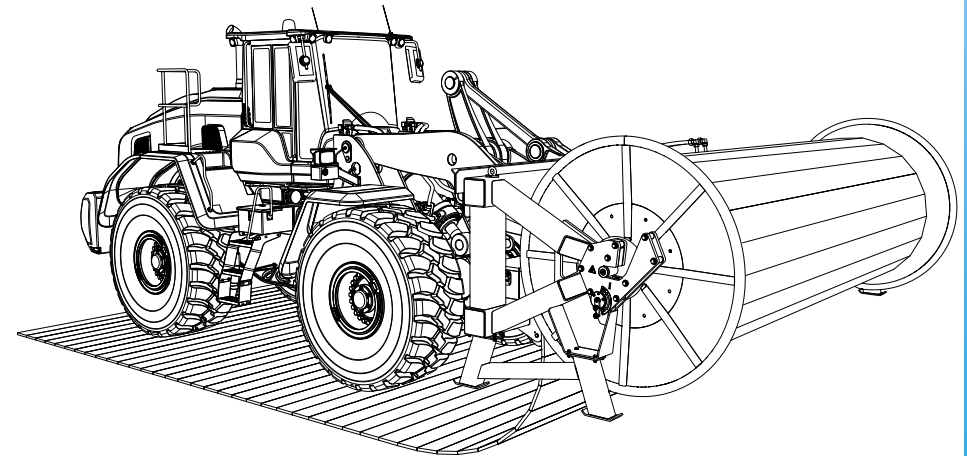


Fig. 3-1 90PA Deploying Trackway®

## 1.1 90PA

The 90PA is a simple, low maintenance and cost effective system for deploying and recovering C90 Trackway®.

The 90PA is mounted onto a suitable Host Vehicle (see Section 3.7 for Host Vehicle Requirements) using a dedicated Interface Kit.

The 90PA carries the Spool with the Host Vehicle providing hydraulic power and control. The 90PA does not require an electrical feed.

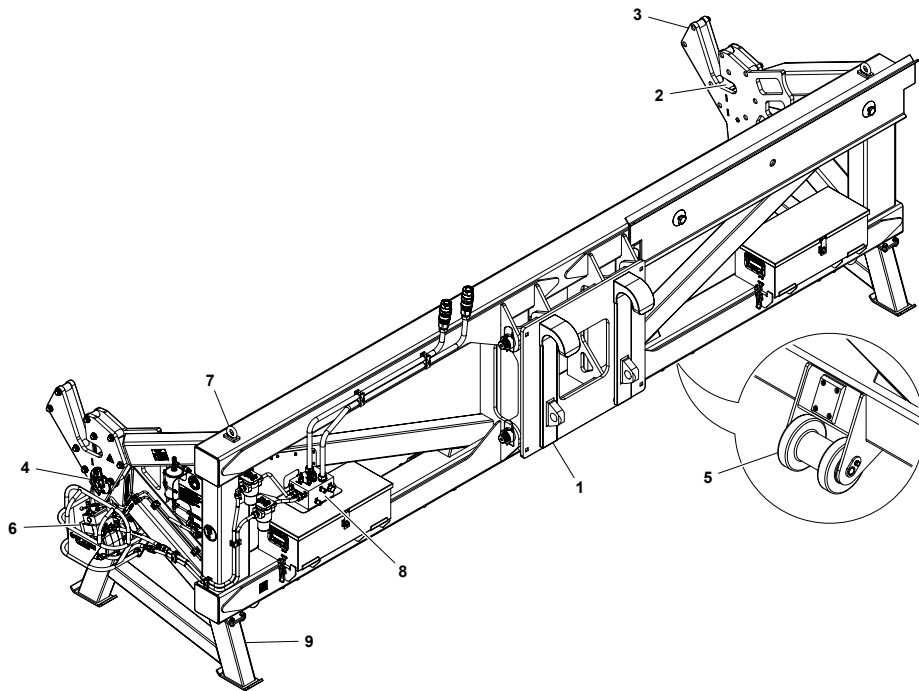
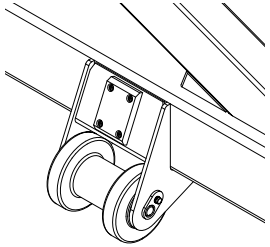
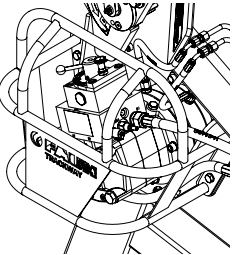
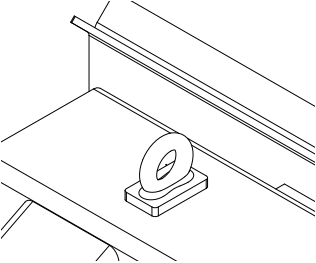
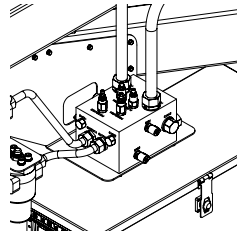
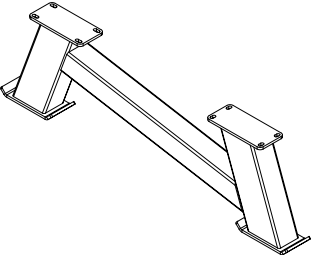


Fig. 1-1 The 90PA

#	Item	Description	
1	Interface Plate	Provides a connection point for the relevant Host Vehicle.	
2	Spool Pockets	A Spool Pocket on each Arm houses and locks the Spool Shafts when a Spool is loaded.	
3	Arm Horns	The two Arm Horns are used to manoeuvre the Spool during loading and unloading.	
4	Spool Lock Mechanism	Operated to lock and unlock the Spool in the Spool Pockets.	

#	Item	Description	
5	Roller	Rollers align the Trackway® and prevent it damaging the 90PA through contact.	
6	Spool Drive Assembly	Powers the Spool during deployment and recovery of Trackway®.	
7	Tie-down Point	Tie down points provided for securing the 90PA to the Flatrack.	

#	Item	Description	
8	Speed and Pressure Control Manifold	Enables functional movement of the Spool.	
9	Dispenser Stands	Enable the 90PA to be freestanding when not attached to the Host Vehicle (not normally removed from the machine).	

## 1.1 Spool Drive Assembly

The Spool Drive Assembly controls and powers the Spool during deployment and recovery of Trackway®.

The Host Vehicle provides power and control to the Spool Drive Assembly. In addition to the control from the Host Vehicle the Assistant uses the Mode Selector to switch the Assembly between operational modes.

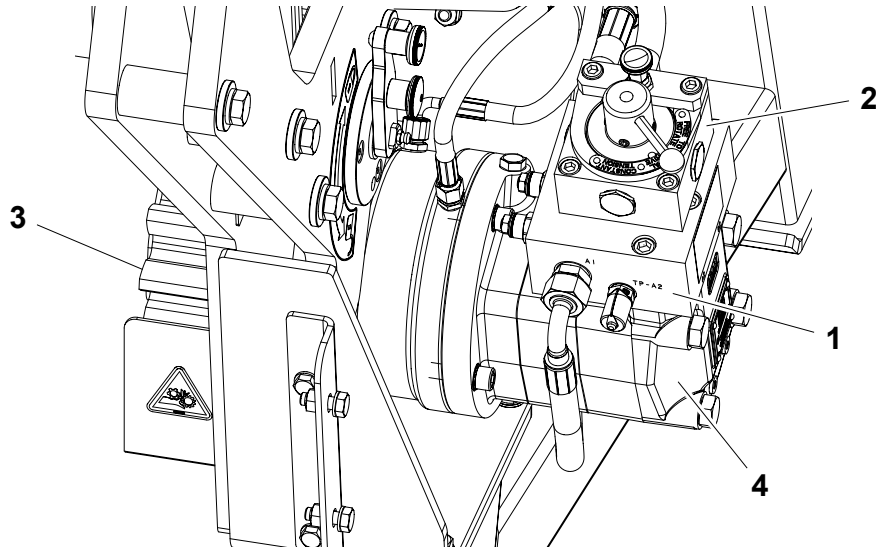


Fig. 1-1 Spool Drive Assembly

#	Item	Description	
1	Overcentre Valve Block with Constant Tension	Dual Overcentre Valves for load control plus Constant Tension Relief Valve.	
2	Mode Selector (Ball Valve)	Handle operated by the Assistant which positions the ball valve to switch to the required function of the Spool Drive Motor.	
3	Drive Gear	Meshes with the Spool Gear.	
4	Spool Drive Motor	Controls and Powers the Spool during Deployment and Recovery of Trackway®.	
5	Parking Brake	Prevents rotation of the spool during storage and transportation. Operated by hand lever.	

## 1.2 Spool

The Spool is a tubular frame with circular End Plates. Trackway® is coiled onto the Spool for storage and transit.

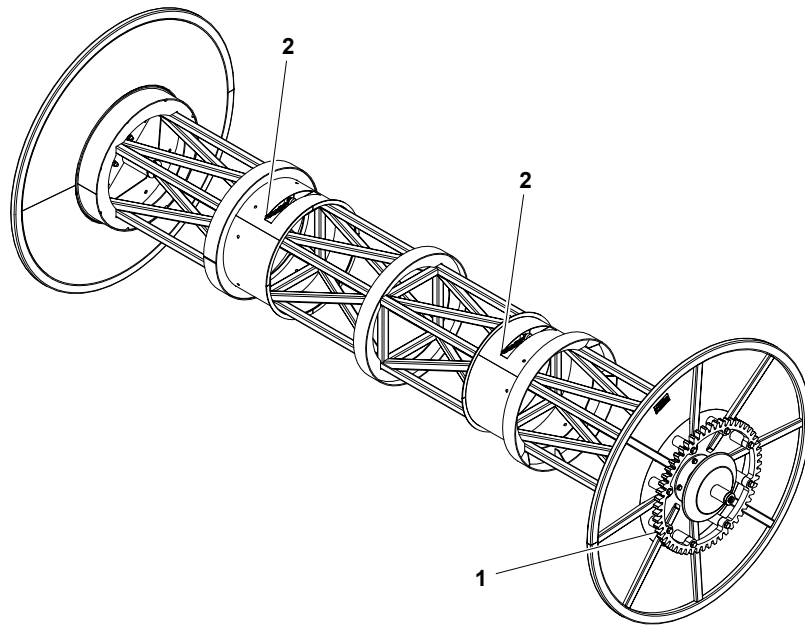
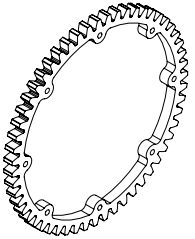
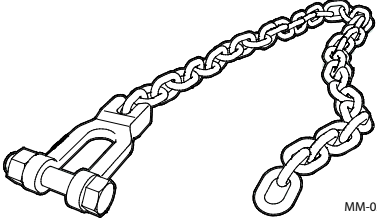


Fig. 1-2 Spool

#	Item	Description	
1	Spool Gear	Meshes with the Spool Drive Assembly to power the Spool.	
2	Spool Chains	Two Spool Chains, fixed at one end of the Spool and are used in the deployment and recovery of the Trackway®.	 MM-035

## 1.1 Trackway®

Trackway® consists of Panels connected together. The Panels are connected via a male and female flexible joint. The flexibility enables the Trackway® to be laid on undulating ground or coiled into a roll.

The Panels are locked together with Locking Pins that prevent lateral movement.

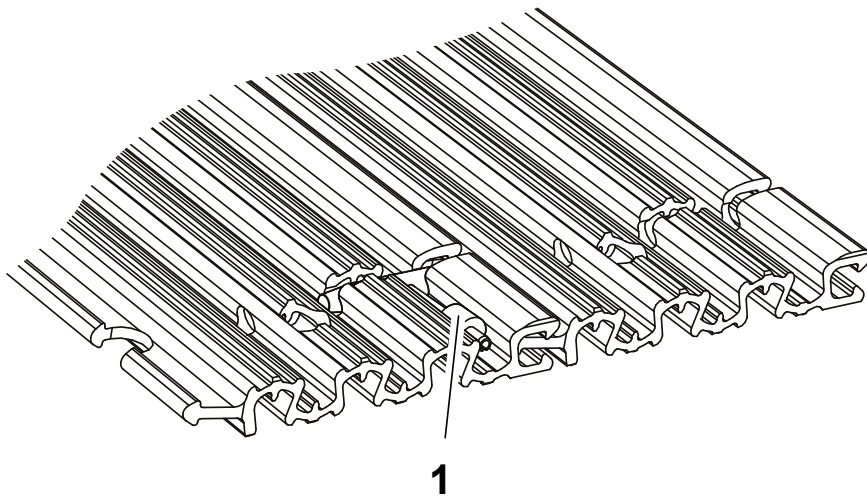
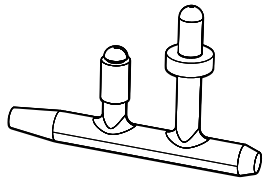
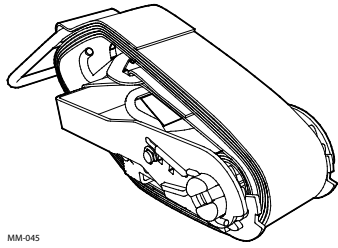
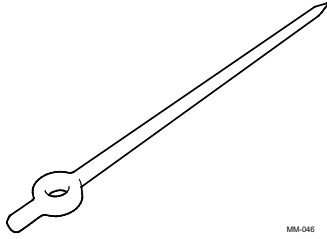
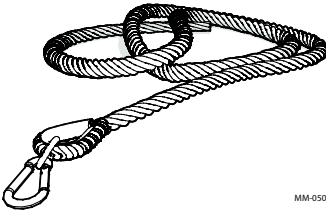


Fig. 1-1 Trackway®

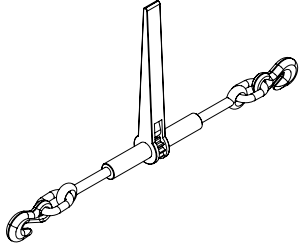
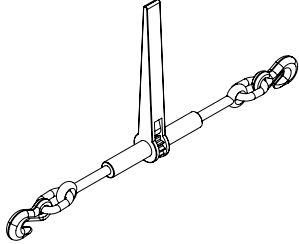
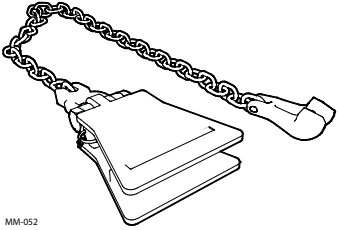
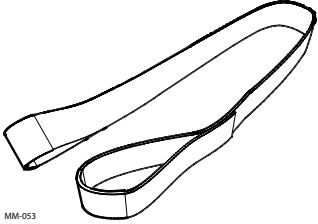
#	Item	Description	
1	Locking Pins.	Lock Trackway® Panels together to prevent Lateral movement.	

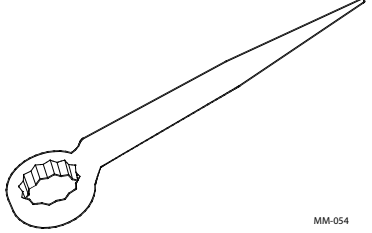
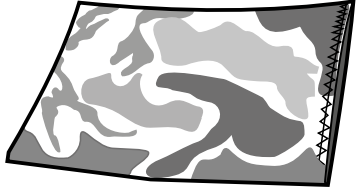
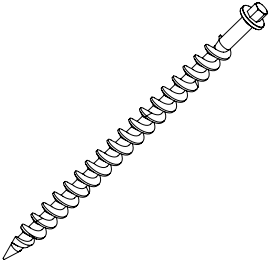
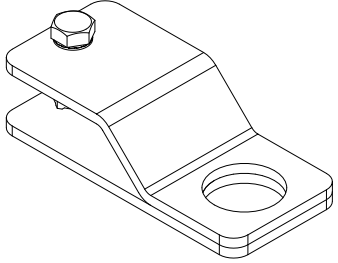
## 1.2 Accessories

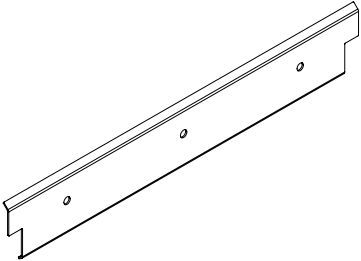


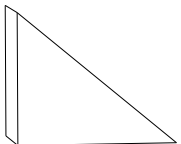
Accessories, which are kept in the Flatrack Storage Box, enable deployment, recovery, anchorage and basic maintenance.

Item	Description	Qty	
Transit / Holdfast Strap	Used to secure the roll of Trackway® when in transit and storage. Can also be used when anchoring Trackway®. Has a protective sleeve.	2	 MM-045
Ground Anchor Stake	Used to anchor the Trackway®.	12	 MM-046
Hand Line (Single Leg)	Used to pull out Panels when splitting the Trackway®.	2	 MM-050



Item	Description	Qty	
Load Binder and Chains (2m)	Used to secure the 90PA to the Shipping Frame.	2	
Load Binder and Chains (5m)	Used to secure the 90PA to the Shipping frame.	2	
End Adaptor	Aids in the recovery and the deployment of Trackway®. Two are positioned each end of the Trackway®.	4	 MM-052
2t Webbing Duplex (2m)	Aids lifting the Interface Plates.	2	 MM-053

Item	Description	Qty	
24mm Podger spanner	Useful when changing Interface Plates.	1	 MM-054
Spare Locking Pin Pouch	Contains 10x Locking Pins in a camouflage pouch.	1	 MM311 NZ
26" Aluminum Screw Anchor	Provides mechanical fastening between the Trackway and the ground, to hold the Trackway® in position.	26	
Side Anchor Kit	Interface between the Screw Anchor and the Trackway®.	20	

Item	Description	Qty	
C90 End Anchor Plate	Protects the end panels during ingress/egress and provides interface between Screw anchor and Trackway®.	2	
Transit/Holdfast Strap	Secures the Trackway® when in rolled condition and provides tension lashing as part of the anchorage assembly.	2	
Webbing Sling 3T	Used for lifting interface plates into position.	2	
Heavy Duty Wheel Chock	Prevents roll of Trackway® moving uncontrollably.	2	



## 3. OPERATION

### 3.1 General

This chapter documents how the 90PA should be operated.

It provides instruction on:

- Pre-Operation Inspection;
- Reconnaissance;
- 90PA Controls;
- Mounting and Dismounting the 90PA;
- Deployment;
- Loading and Unloading Spools;
- Recovery;
- Recovery – Optional following Hydraulic Failure;
- Deployment and Recovery in Water;
- Splitting Trackway®;
- Joining Trackway®;
- Anchoring Trackway®;

### 3.2 Pre-Operation Inspection

The Pre- and Post-Operation Checklist lists the checks to be conducted on the:

- 90PA;
- Spool;
- Trackway®;
- Accessories.

Checks should be conducted daily before operating the 90PA and again after operations are complete.

Please refer to the Pre- and Post-Operation Checklist in Section 6.4 – this checklist must be completed to ensure the system is functional before use.



**CAUTION:** Record all faults in the Pre- and Post-Operation Checklist and do not use the equipment if it does not pass the inspection.

## 1.1 Reconnaissance

### 1.1.1 General

Before deploying the Trackway®, ground reconnaissance is required to be carried out. The Operator shall survey the operating area for the 90PA and ensure that the area is suitable to lay the Trackway®.



**CAUTION:** During peacetime training / exercises the area commander must ensure that a suitably qualified and experienced Operator or Ground Guide is present to guide the Driver and perform ground recce.

Trackway® can be successfully deployed, used and recovered on most sites ranging from very soft marsh to brush covered ground. However, if the best alignment is not explored and if the site is not properly set out, the time taken to deploy and recover will increase.

An ideal route would be a straight line across firm, smooth, flat ground with plenty of good anchorage points. Since most deployment sites are far from this ideal the surveyor will need to select a route as free from obstruction as possible and with the best ground anchorage points.

The following sections document the following considerations the surveyor has to make before finally setting out the route:

- Softness of the Ground;
- Evenness of the Ground;
- Obstacles;
- Inclines;
- Non-Standard Trackway® Lengths;

The success, efficiency and time taken to deploy Trackway® is related to the thoroughness of the reconnaissance - especially over difficult terrain. The more carefully this task is undertaken, the faster the deployment will be and less damage to the Trackway® will be incurred.

### 1.1.2 Soft Ground

If the Trackway® needs to cross soft ground, then it should be deployed from a point on firm ground, laid across the soft area and continued until firm ground is reached again.

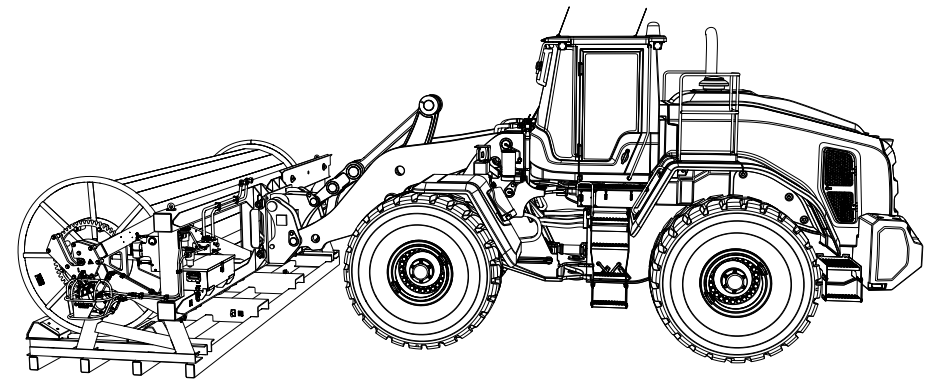


Fig. 1-1 Spanning Soft Ground

### 1.1.3 Uneven Ground

The route will need to be cleared if the Trackway® needs to cross uneven ground that exceeds the limits documented in Section 1.4.3.

Clearance requires a lot of effort and is time consuming.

### 1.1.1 Alignment Changes

Bends in the Trackway® route cause traffic flow to be slowed and therefore should be minimized.

Natural obstacles may require a change of alignment.

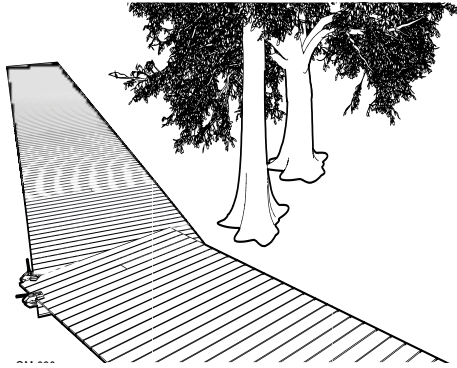


Fig. 1-1 Alignment Change to Avoid Natural Obstacle

### 1.1.2 Deploying Across Slopes

The route must be chosen such that the maximum inclines documented in Section 1.4.2 are not exceeded.

On a cross slope, the Trackway® will have a tendency to slip downhill (sideways) during deployment. This effect can be counteracted by positioning the Vehicle slightly up-slope before beginning the deployment.

Unless the Trackway® beds firmly into the ground it should be anchored on the uphill slope.

### 1.1.3 Non-Standard Trackway® Lengths

Where the length of a route is not the length of a standard section of Trackway® (say 40m), the Trackway® will need to be split or joined during deployment to create custom length sections.

### 1.1.4 Setting Out

Once the optimum route has been decided the area is marked out.

The left-hand side of the Trackway® run is staked out. Sighting Rods are used at the beginning, middle and end of the Trackway® run.

Using the 90PA and the Sighting Rods the Operator can align the Vehicle during deployment of the Trackway®.



OM-091

Fig. 1-2 Setting out the Route

## 1.1 Introduction to Controls

### 1.1.1 General

The 90PA is mainly controlled by the Vehicle Operator from the Host Vehicle. This includes:

- Positioning the 90PA
- Rotating the Spool

There is one control that is operated by the Assistant – the Mode Selector. The Mode Selector switches the Spool Drive between the following functions:

- Constant Tension
- Dual Function
- Emergency

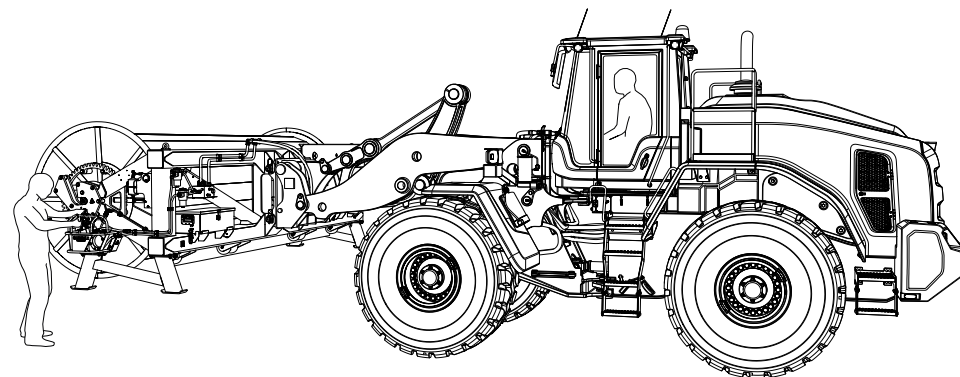


Fig. 1-3 90PA Controls

### 1.1.2 Host Vehicle Controls

Refer to the Host Vehicle's Operator Handbook for auxiliary control operation.

The operating 'sense' for the auxiliary control should be:

Rotation is based on looking onto the Spool drive gear.

- Moving the control towards the spool results in 'clockwise' rotation of the spool for deployment of the Trackway®
- Moving the control away from the spool results in 'anti-clockwise' rotation of the spool for recovery of the Trackway®.

The rotation of the spool can be changed by swapping round the Hydraulic Hose connections on to the host vehicle.

### 1.1.3 Mode Selector General

The Mode Selector, operated by the Assistant, switches the Spool Drive between the following functions:

- Constant Tension
- Dual Drive
- Emergency Mode

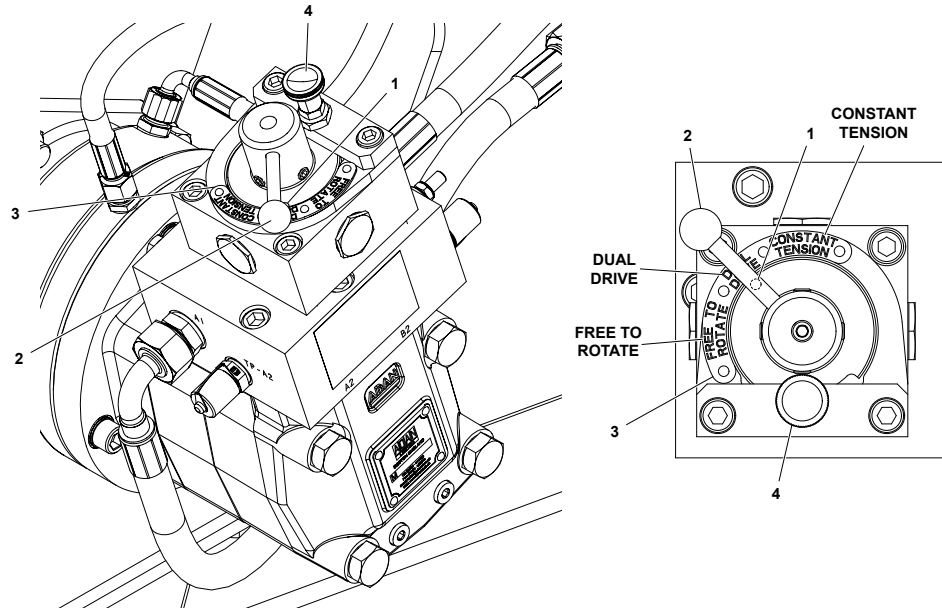


Fig. 1-1 Host Vehicle Auxiliary Control Operation

Components

1. Selection Dot
2. Handle
3. Labeled Dial
4. Safety Gate

Operation

To select the desired mode the Assistant uses the Handle to turn the Labeled Dial. The position on the Labeled Dial that lines up with the Selection Dot on the base is the selected mode.

In order to select FREEWHEEL MODE mode, the Assistant must lift the Safety Gate (4) to allow the Handle to turn to the FREEWHEEL MODE position.

Mode	Position	Usage	Details
Constant Tension	CONSTANT TENSION	Deployment	The Operator does not operate the auxiliary controls to deploy the Trackway®. The vehicle is simply driven forward to draw the track from the spool.
Dual Function	DUAL DRIVE	Recovery, Powered Deployment	Allows the Host Vehicle's auxiliary controls to power the rotation of the Spool in either direction.
Freewheel	FREEWHEEL MODE	Manual Recovery	The Spool is in 'free-wheeling' mode with NO control exerted on the Spool. This mode should only be selected when inserting a spool into the 90PA or redundancy deployment mode.



**WARNING:** When Freewheel mode is selected and the brake is released, the spool may rotate uncontrollably.



## 1.1 Mounting and Dismounting 90PA

### 1.1.1 Introduction

The 90PA is designed to be easily mounted and dismounted from the Host Vehicle so the Vehicle can be utilized for other tasks in addition to deploying and recovering Trackway®.

The Dispenser, when dismounted from the Host Vehicle, should always be stored on the Flatrack. The Dispenser is also mounted and dismounted from the Host Vehicle whilst on the Flatrack.

The 90PA can be provided with several Integration Kits to allow it to be mounted onto different Host Vehicles.

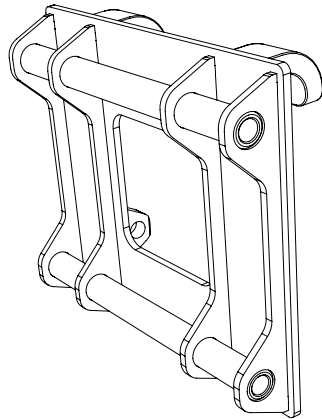


Fig. 1-2 Typical Interface Plates

Each Interface Kit contains a set of Hydraulic Hoses and an Interface Plate. The Interface Plate is bolted onto the Dispenser and should only be attached by a trained Operator or Maintainer.

Interface Plates, when not mounted on a Host Vehicle, are bolted to the Interface Mounting Points on the Flatrack. \*Depending on option.

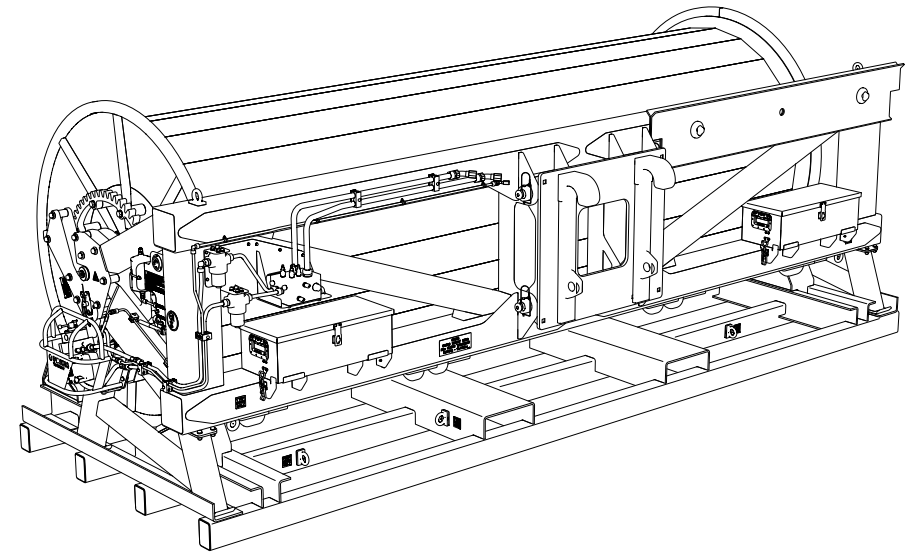


Fig. 1-3 Dismounted Dispenser on the Flatrack

### 1.1.1 Changing an Interface Plate

#### Equipment Required:

- Integration Plate
- 2t Webbing Duplex (2m)
- Toolkit
- 2T Shackles

The following procedure replaces an incompatible Interface Plate that is already attached to the 90PA with the correct Interface Plate for the Host Vehicle.

Whilst the compatible Interface Plate is still bolted to the Flatrack, attach the Webbing Duplex to the Host Vehicle and compatible Interface Plate, using Shackles if required. If Banksman is present, they command the task.



**WARNING:** Only use the provided straps or suitably rated similar items for lifting the interface plate.

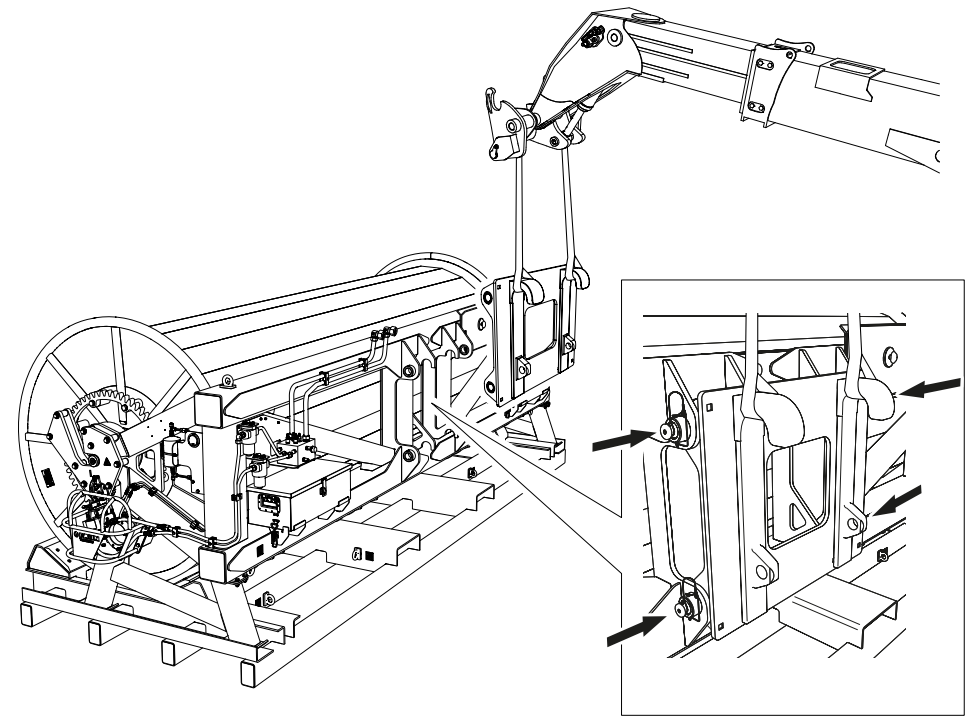


Fig. 1-1 Host Vehicle Attached

Unbolt the connected Interface Plate from the Flatrack.

Lift the Interface Plate from the Flatrack using the Host Vehicle. Place the Interface Plate on the ground in a safe location and disconnect from the Host Vehicle.

Fit the Webbing Duplex to the incompatible Interface Plate currently mounted on the 90PA.

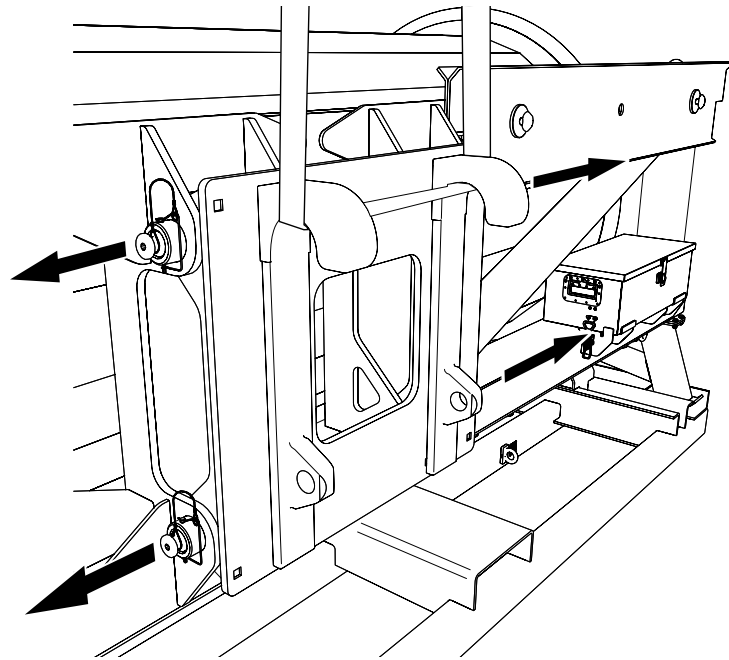


Fig. 1-2 Remove Incompatible Plate using Webbing Duplex

Remove the four pins (and release lynch pins) that connect the interface plate to the 90PA.

Using the Host Vehicle, position the incompatible Interface Plate in a safe stores area.

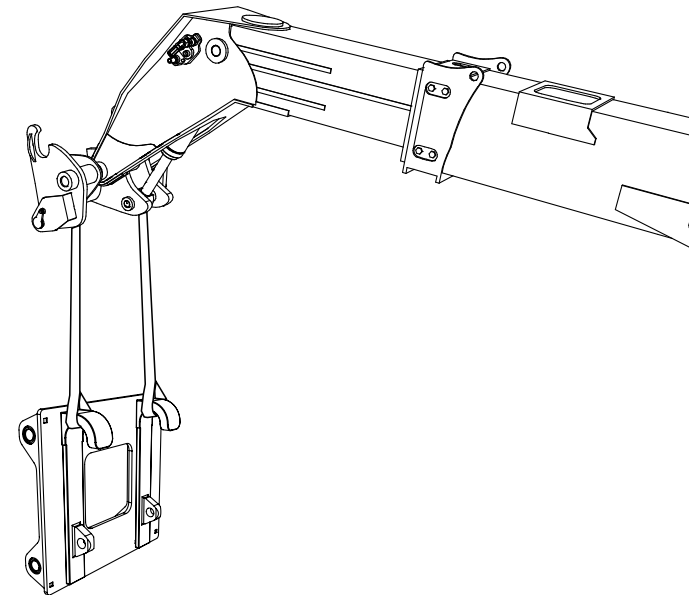


Fig. 1-3 Attach Compatible Plate using Webbing Duplex

Using the Host Vehicle, position the compatible Interface Plate so that it can be attached to the 90PA

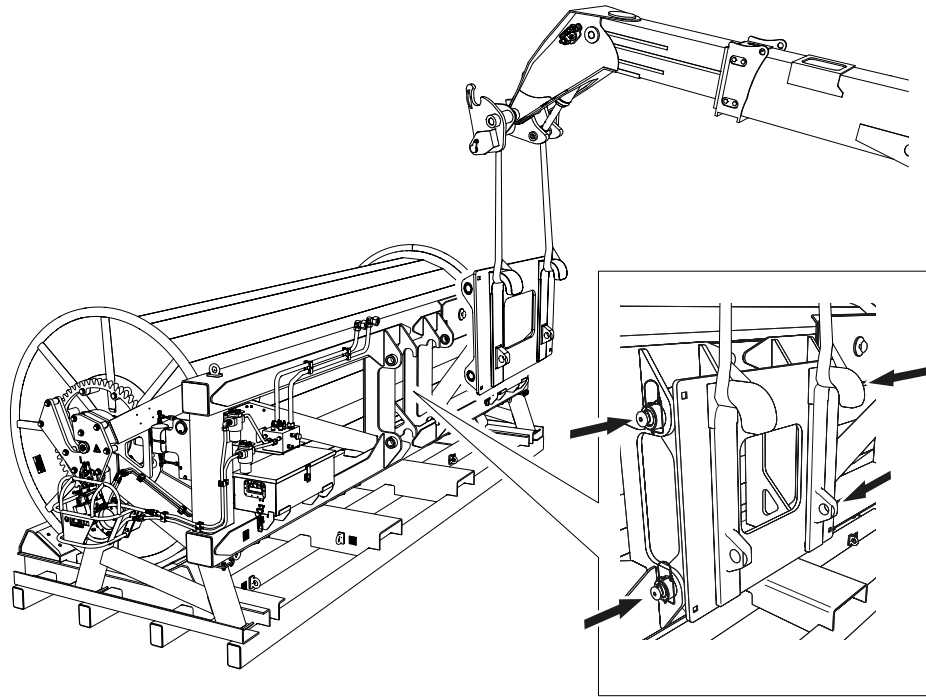


Fig. 1-1 Position Plate so it can be attached to the 90PA

Secure the Interface Plate to the 90PA with the four securing pins. Ensure lynch pins are also fitted.

Stow the Webbing Duplex and Shackles.



**WARNING:** Personnel should not work under the elevated Interface Plate.

### 1.1.1 Before Integration Checks

The following checks must be conducted before mounting the 90PA onto the Host Vehicle:

- Ensure the correct Interface Plate for the Host Vehicle is fitted and all securing bolts are tight.
- Ensure the Flatrack or 90PA is situated on flat and level ground with a suitable area around the system for the Host Vehicle to access it.
- Inspect the two motor connection hoses, protection sleeves and steel pipes to check they are in good condition and not damaged or leaking, replace or tighten as required.
- Check that the four Side Rollers are in place and freely rotate.
- Check the Trackway® Alignment Guide is fitted.

If a Spool is loaded into the 90PA:

- Check the Transit Straps securing the Trackway® are fitted, in good condition and are tight. If they are defective replace, tighten if loose.
- Check the two Spool Lock Levers are in the locked position and the Locking Bolts are trapping the Spool Shaft into place.
- Check that the Gear Guard is fitted and in good condition.

### 1.1.2 Mounting the Dispenser

**Equipment Required:**

- [Hydraulic Hoses from the Vehicle's Integration Kit](#)

Before mounting the Dispenser ensure that:

- The Host Vehicle meets the required specification (see Section 3.7).
- The correct Interface Plate has been fitted.
- The correct Hydraulic Hoses from the Interface Kit for the Vehicle have been identified.

- Before Integration Checks have been completed (Section 5.3.3).
- The ground around the Flattrack is flat and stable with a suitable area around the system for the Host Vehicle to access it.

Position the Vehicle so that the end of the Vehicle's quick hitch is aligned with the Interface Plate on the Dispenser.

Follow the Vehicle's connection procedures to attach the Dispenser via the Interface Plate.

Connect the Hydraulic Hoses to the Dispenser.

Follow the Vehicle's auxiliary connection procedure to connect the Hydraulic Hoses to the Vehicle.

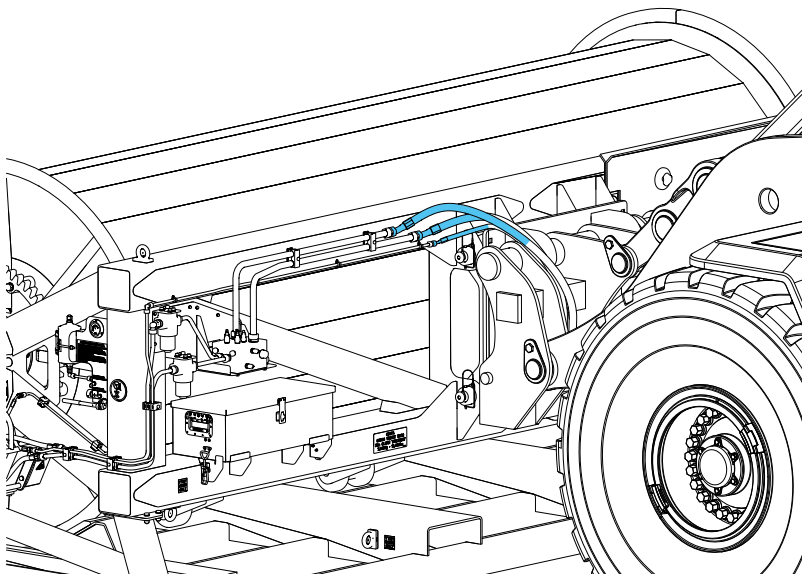


Fig. 1-2 Connect Hydraulic Hoses to the Dispenser

Using the Vehicle's auxiliary connection procedure should ensure that there is no pressure in the system while connecting.

Once the Tie Down Straps have been removed, lift the Dispenser so that the Spool is 100mm clear of the ground / Flattrack.

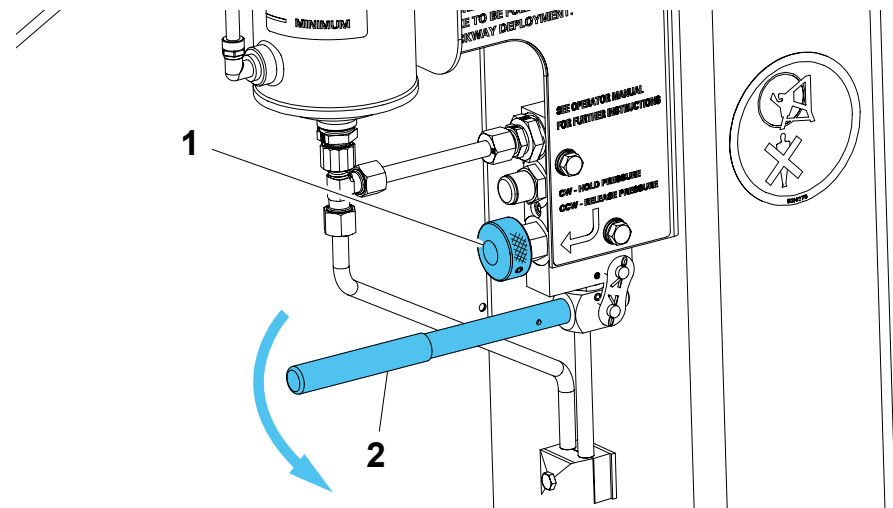


Fig. 1-3 Spool Park Brake hand valve and lever

Release the Spool park brake. Close the hand valve (1) by turning clock wise CW and then operate the lever (2) to pressurise the brake.

To apply the Spool park brake open the hand valve (1) by turning counter clock wise CCW.

With the Mode Selector set to Dual Function, check that the Spool rotates relative to the control movement of the Host Vehicle. If the direction of rotation is incorrect, swap the Hydraulic Hose connections from the Host Vehicle, to suit operator control.

NOTE: Before rotation of the spool, ensure the transit straps are securely fitted.

The Dispenser is ready to be lifted from the Flatrack.

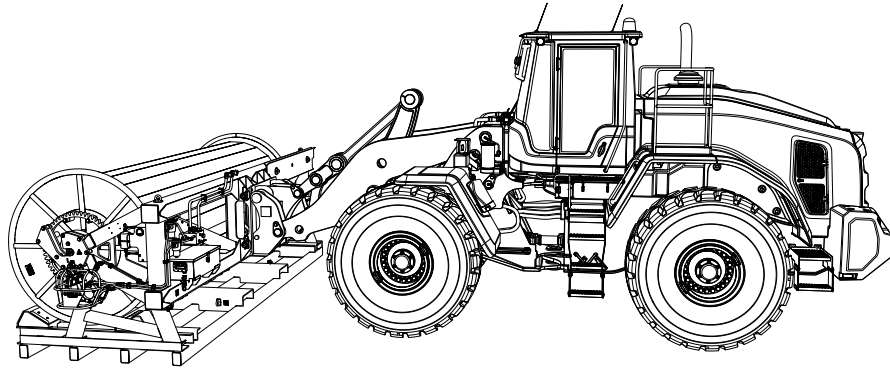


Fig. 1-1 Mounted Dispenser

### 1.1.1 Unloading the Dispenser from the Flatrack

#### Equipment Required:

- None

Once the Dispenser has been mounted onto the Host Vehicle, the Vehicle can be used to lift the Dispenser from the Flatrack.

Before unloading the Dispenser from the Flatrack ensure the following steps have been taken:

- If the Dispenser is loaded with a Spool, ensure that any Trackway® on the Spool is secured with Transit Straps with protective sleeves fitted.
- Remove the Tie Down Chains that secure the Dispenser to the Flatrack frame.

Using the Vehicle, lift the Dispenser from the Flatrack.

Stow the Tie Down Chains.

### 1.1.2 Loading the Dispenser onto the Flatrack

#### Equipment Required:

- Flatrack

Before loading the Dispenser onto the Flatrack ensure the following steps have been taken:

- If the Dispenser is loaded with a Spool, ensure that any Trackway® on the Spool is secured with Transit Straps
- Ensure the ground around the Flatrack is flat and stable with a suitable area around the system for the Host Vehicle to access it.

Rotate the Dispenser Arms to the horizontal position.

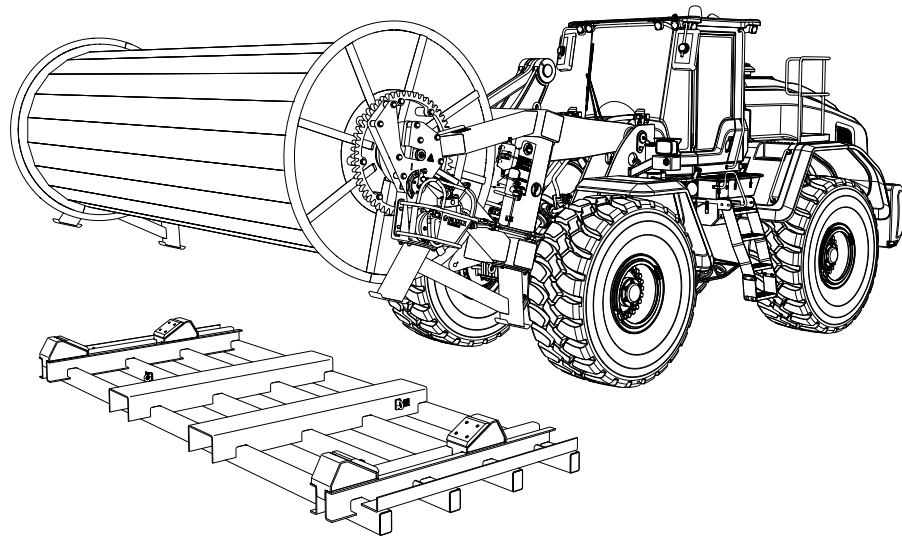


Fig. 1-2 Unloading the Dispenser

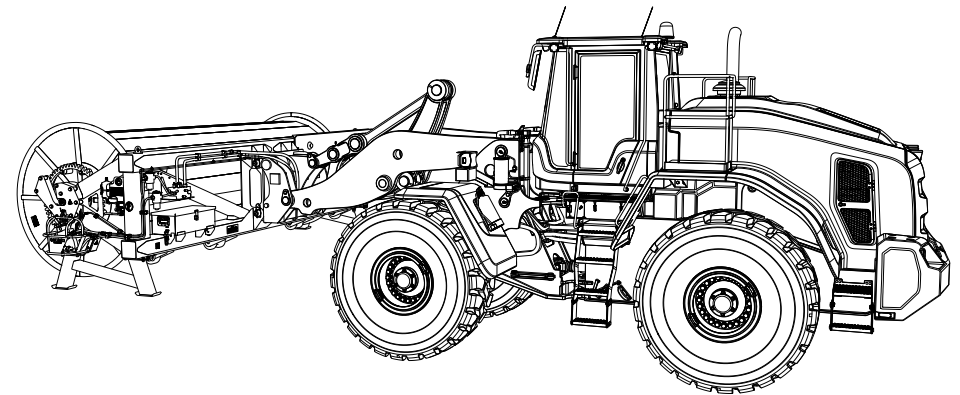


Fig. 1-3 Horizontal Dispenser Arms

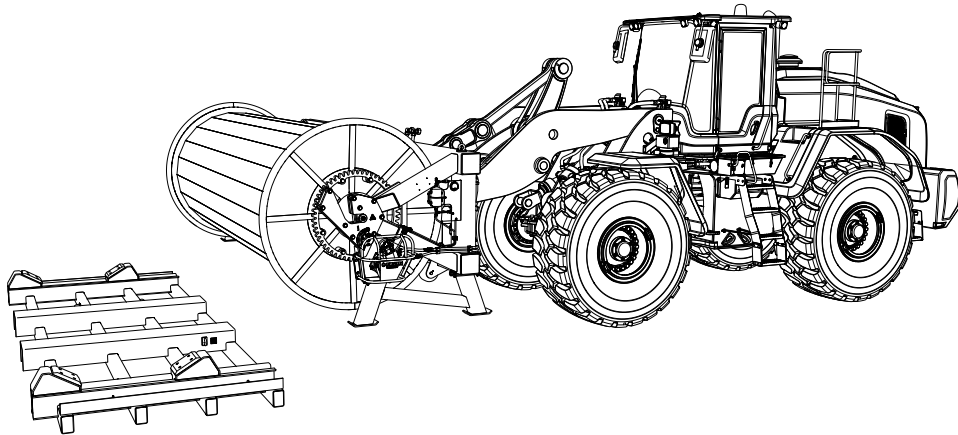


Fig. 1-1 Approach from the Location Stand Side

Follow the Vehicle's auxiliary disconnection procedure to disconnect the Hydraulic Hoses from the Vehicle.

Using the Vehicle's auxiliary disconnection procedure should ensure that there is no pressure in the system while disconnecting. Engine Off.

Disconnect the Hydraulic Hoses from the Dispenser and Host Vehicle and stow.

Align the 90PA with the shipping frame. The 'Spool seat' (yoke shaped pads) should be on the far side of the shipping frame, as you approach.

Drive forward until the Spool is 1m away from the Flatrack.

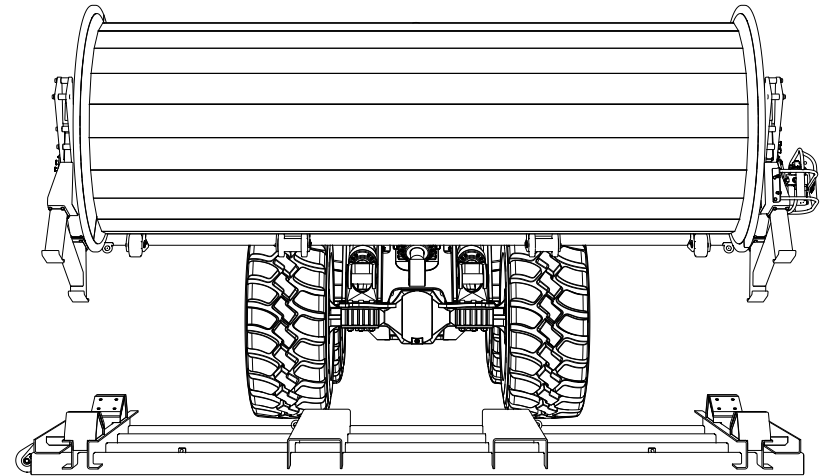


Fig. 1-2 Raise Spool to Clear Location Stands

Raise the Dispenser sufficiently for the Spool and the Dispenser Stands to clear the 90PA Stands.

With the Assistant guiding, drive forward so that the Dispenser's Flatrack Alignment Guides are either side of the left hand 90PA Stand.



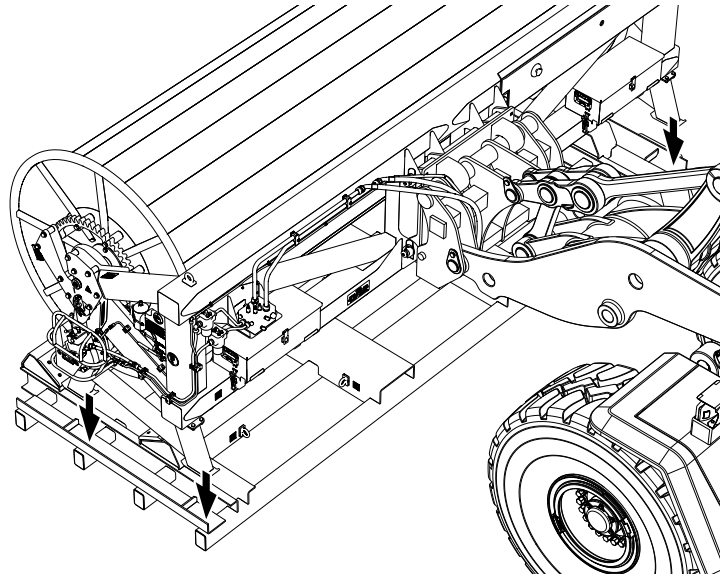


Fig. 1-3 Align Dispenser with 90PA Stands using Guides

With the assistant guiding, lower the 90PA onto the shipping frame, locating the feet on the 90PA stands, in the outer guide channels of the shipping frame. Ensure the 90PA is central on the shipping frame and stable inside the guide channels.

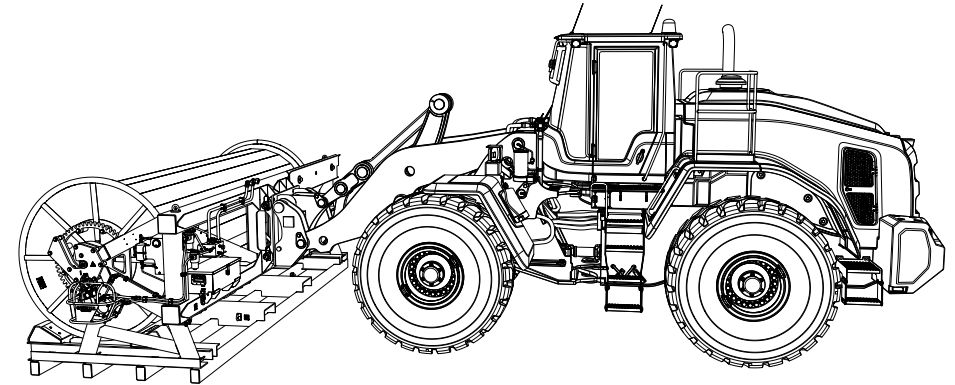


Fig. 1-4 Loaded Dispenser

The Dispenser is now ready to be dismantled from the Host Vehicle.

Before dismantling the Dispenser ensure that:

- The Dispenser is securely loaded on the Flatrack

Follow the Vehicle's disconnecting procedures to detach the Vehicle from the Interface Plate.

Secure the Dispenser to the Flatrack following the procedures in Section 5.3.7.

### 1.1.1 Securing the Dispenser to the Flatrack

#### Equipment Required:

- 2m Load Binder x 2
- 5m Load Binder x 2

The Dispenser is secured to the Flatrack using Load Binders and chains the 90PA Tie-down Points on the Flatrack.

Ends of the Ratchet Straps with Twisted Snap Hooks (Twisted Snap Hooks have blue catches) should always be used when securing to Tie-down Points labelled with blue identification bands.

Secure Dispenser to 90PA Stands using two 2m Load Binder and chains. Firmly secure the Dispenser to the 90PA Stands. This prevents the lateral movement.

Attach two 2m Load Binder and chains from the Tie-down Points located on the Dispenser running down diagonally to the Tie-down Points on the base of the Flatrack. Ensure that the ratchets are on the outside of the Interface Plate. Insert rubber padding to protect the Dispenser from rubbing against the ratchet.

If the Dispenser is not secured firmly to the 90PA Stands, the Dispenser may slide as the lateral ratchets are tightened.

### Secure Spool and Trackway®

Attach the two 5m Load Binder and chains to the Tie-down Points at the rear of the Flatrack. Pass the chains over the Spool (and the Trackway® if the Spool is loaded with Trackway®) and attach the other ends to the Tie-down Points at the base of the 90PA Stands.

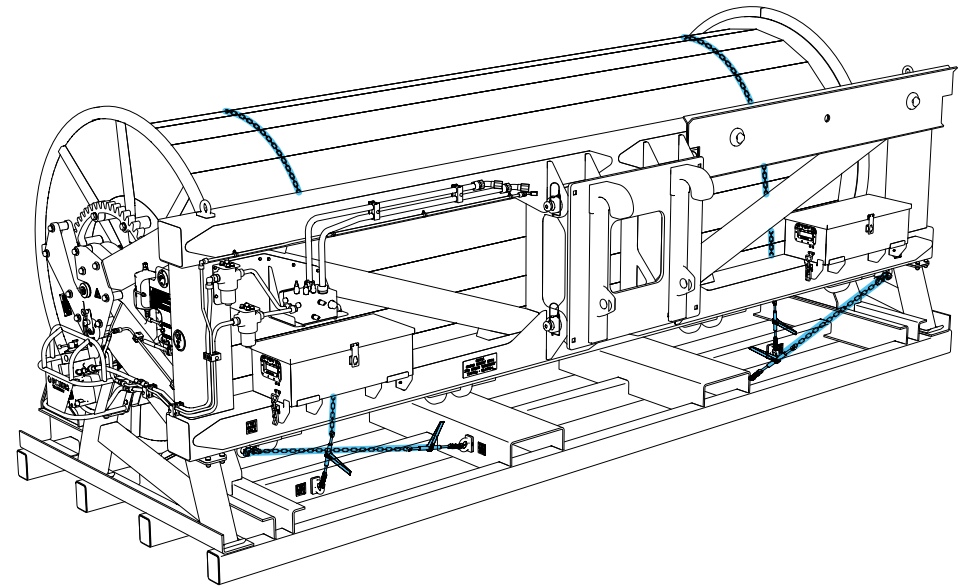


Fig. 1-1 Spool and Trackway® secured on the Flatrack (rear)

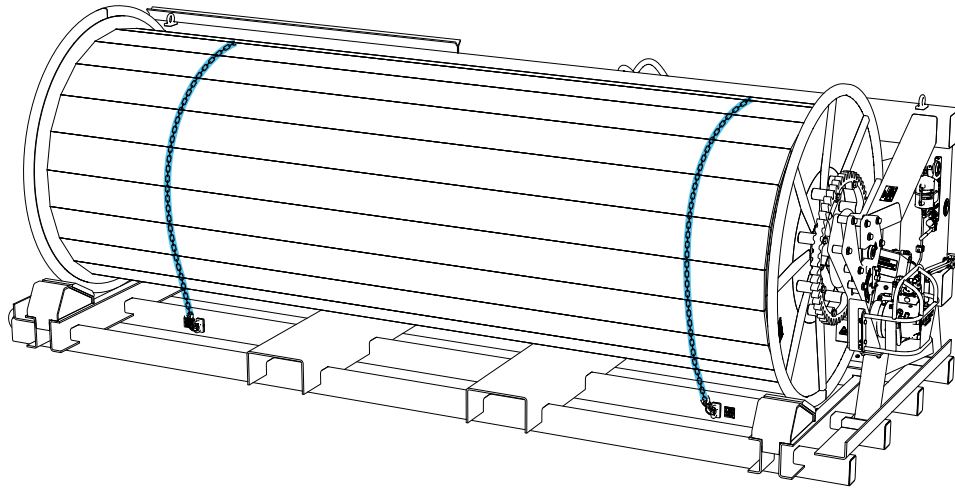


Fig. 1-2 Spool and Trackway® secured on the Flatrack (front)

## 1.1 Deployment

### Equipment Required:

- Hand Lines x 2

#### 1.1.1 General

This section details how the Trackway® can be deployed using the 90PA.

Before starting deployment operations ensure the following steps have been taken:

- Ground reconnaissance and setting out of the route.

Before deploying the Trackway® the following steps must be taken:

- Position the Vehicle as required
- Manually position Trackway® under the front wheels of the Host Vehicle

Once the Trackway® has been deployed the following steps must be taken before moving the Vehicle:

- Disconnect the Trackway® from the Spool
- Anchor the Trackway® as required
- If this is the last operation of the day then complete the Pre- and Post-Operation Checklist (Section 6.4).



**WARNING:** While the 90PA is being prepared, ground guides should ensure the work area is clear of unauthorized personnel.

### 1.1.1 Positioning the Vehicle

Position Vehicle so that the front wheels are where the Trackway® is intended to begin.

The Dispenser should be positioned so that the bottom of the Spool is about 400 mm above the ground and the gap between the Spool and the wheels of the Vehicle is between 1,500 mm and 2,000 mm.

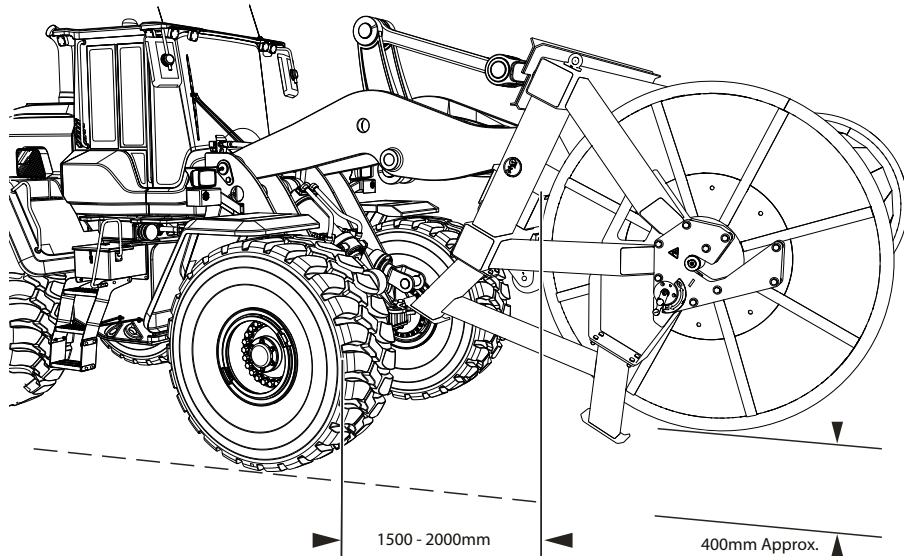


Fig. 1-1 Position the 90PA

### 1.1.2 Positioning Trackway® Under the Front Wheels

The Assistant selects Dual Function on the Mode Selector.

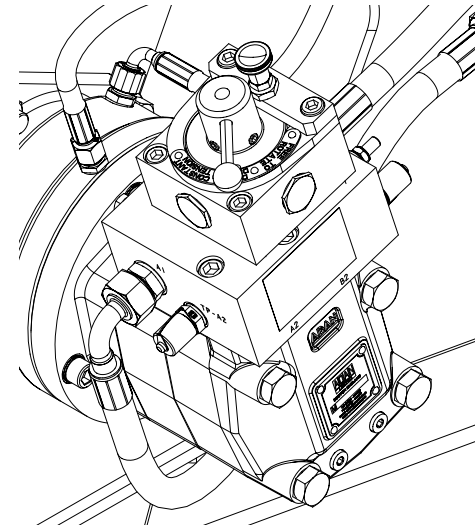


Fig. 1-2 Dual Function Selected

Ensuring the no-one is in the immediate area of the spool, close the motor brake hand valve and pump up the brake release lever, until light resistance is felt. The spool may rotate a little at this point.

Rotate the Spool until the end of the Trackway® is at the 3 o'clock position (nearest the Vehicle).

This is important to ensure the safe release of the Transit Straps.

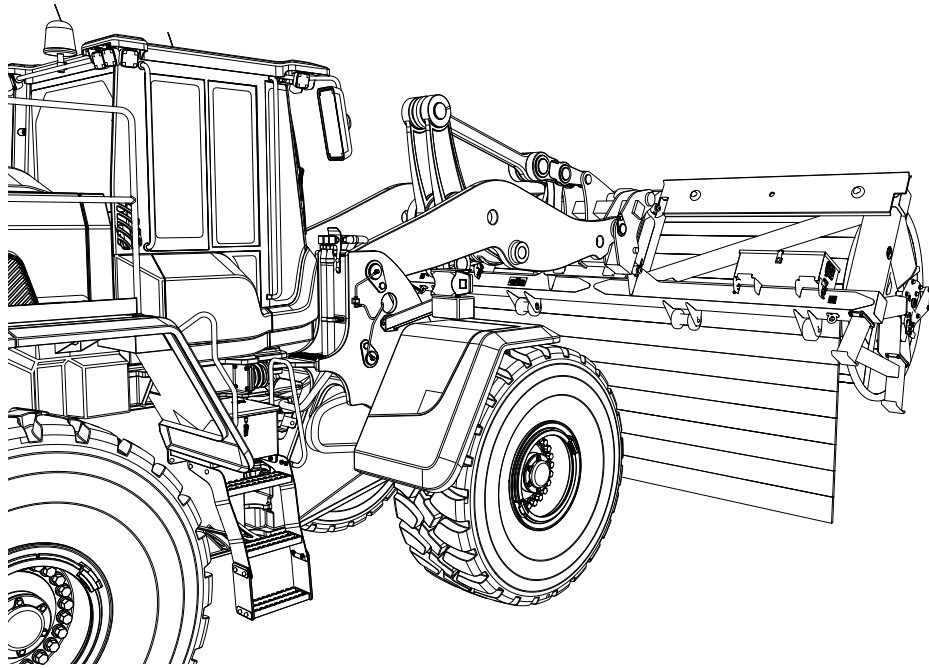


Fig. 1-3 End of the Trackway® at the Bottom

Working together, Vehicle Operator and Assistant release the Transit Straps by slackening the ratchet buckle. Remove, coil and stow the Transit Straps.

The Assistant attaches a handline to the first Panel using the rope's karabiner.

The Assistant, using one Hand Line, pulls one side of the Trackway® under the front wheel of the Vehicle while the Driver spools-out sufficient Trackway® to allow engagement of the first Panel under the wheel.

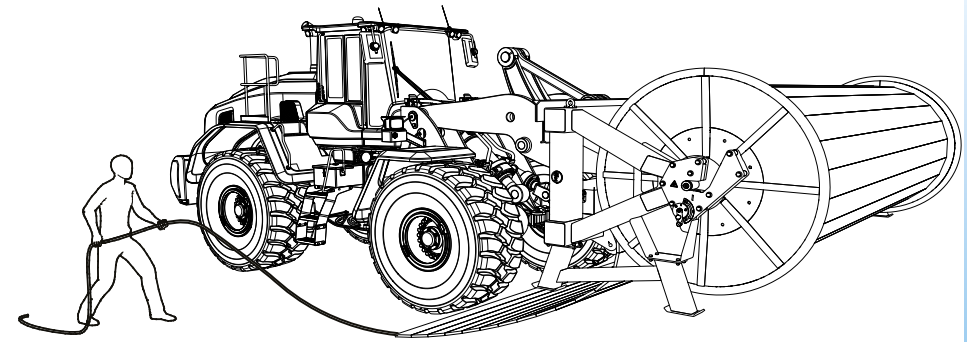


Fig. 1-4 Pull Trackway® Under Front Wheels

The Assistant, moving round the back of the Vehicle to reach the Hand Line at the other side, then pulls the other side of the Trackway® under the other front wheel.

The alignment of the first panel of Trackway® will determine the direction of deployment.

The Driver, spooling-out a small amount of Trackway®, should move the Vehicle forward onto the first Panel of Trackway® under the guidance of the Assistant.

### 1.1.3 Deploying Trackway®

Ensure there are no objects or people in the deployment area.

The Assistant should select Constant Tension on the Mode Selector so that the Trackway® can be drawn off the Spool without operating the Vehicle's spool-out controls.

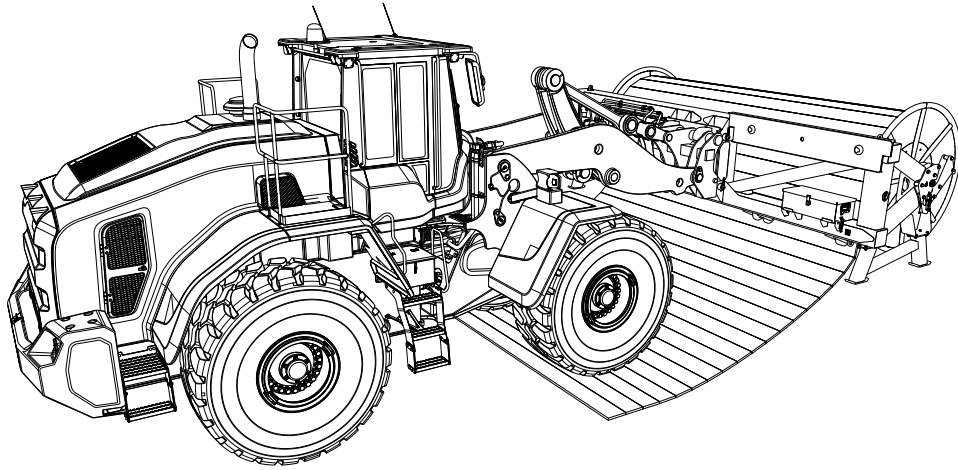


Fig. 1-1 Deploy Trackway®

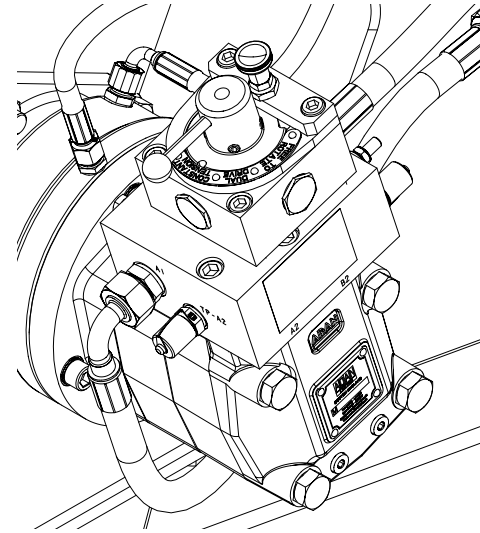


Fig. 1-2 Constant Tension Selected

Drive the Vehicle forward in a straight line, deploying the Trackway® by drawing it off the Spool.

Maintain a constant gap between the edge of the Trackway® and the Frame Rollers. Use the Sighting Rods positioned during Setting Out to keep the Vehicle aligned during deployment of the Trackway®.

Deployment should be gradual at first, until the Vehicle Operator is familiar with the operation.

Slow the deployment as the last wrap of Trackway® is visible on the Spool. Stop when the last Trackway® Panel is clear of the Spool at the 3 o'clock position.

With the Vehicle stationary and Constant Tension still selected, lower the end of the Trackway® to the ground using the Vehicle's controls.



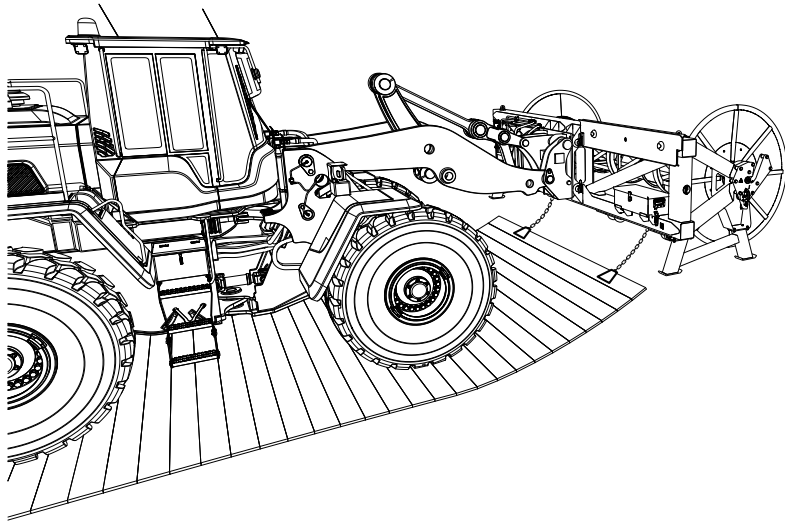


Fig. 1-3 Lower the Trackway® to the Ground with the Arm

The Assistant selects Dual Drive on the Mode Selector.

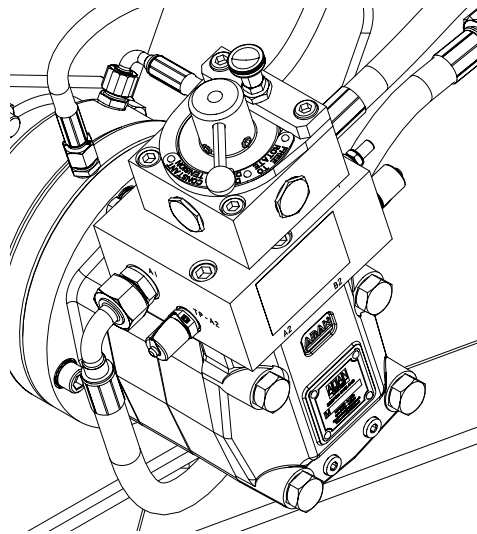


Fig. 1-4 Dual Function Selected



CAUTION: Ensure the Host Vehicle is stationary before disengaging Constant Tension.

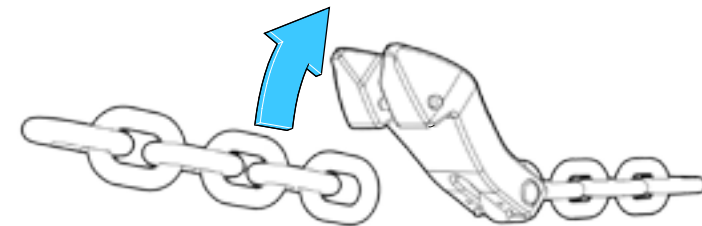
Spool-out sufficient length of Spool Chain so that the End Adapters are fully on the ground.

### 1.1.1 Disconnect Trackway® from Spool

Guided by the Assistant, reverse the Vehicle so that the Spool is no longer above the End Adapters. Spool-out additional Spool Chain if required.

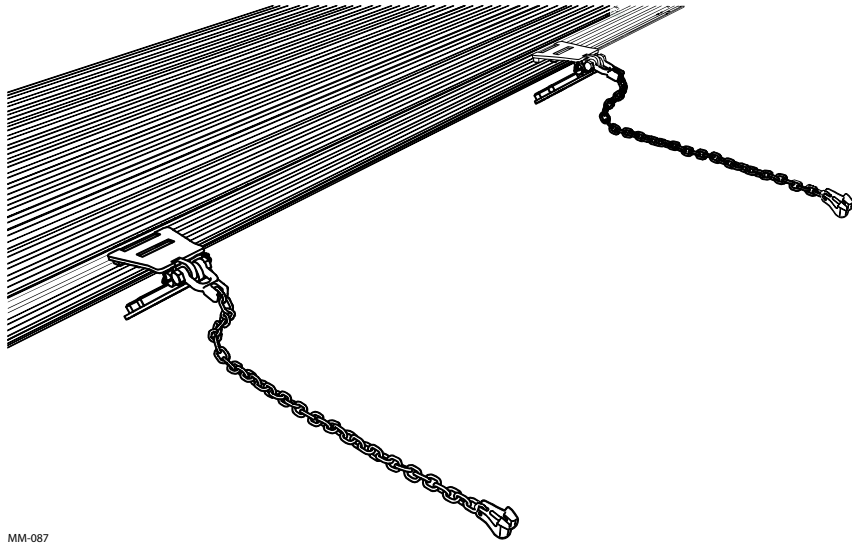
The Assistant should:

- Disconnect the Chain Clutch between the Spool Chains and End Adapters.
- Remove the End Adapters from the Trackway®.
- Stow the End Adapters.
- Release the hydraulic pressure from the spool park brake to prevent spool rotation.



MM-205

Fig. 1-5 Disconnect Chain Clutch



MM-087

Fig. 1-1 Remove End Adapters

### 1.1.1 Anchoring the Trackway®

With the Trackway® deployed, it should be securely anchored using the procedures as outlined in chapter 5.14.

### 1.1.2 Post-Operation Inspection

If this is the last operation of the day complete the Pre- and Post-Operation Checklist (see Section 6.4).

## 1.1 Loading and Unloading Spools

### 1.1.1 General

The 90PA can deploy and recover multiple Spools of Trackway®. This is achieved by loading / unloading Spools, full or empty, onto the 90PA.

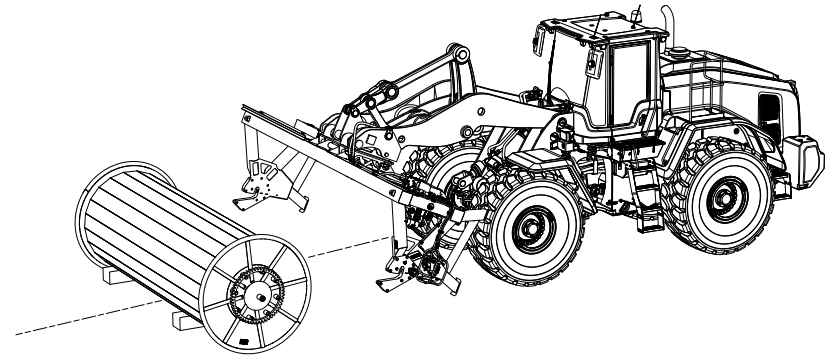


Fig. 1-2 Position Vehicle with Spool Gear on the Left

### 1.1.2 Loading Spools

#### Equipment Required:

- Nothing

Ensure the Spool is chocked to prevent movement when loading.



Position the Vehicle so that the Dispenser is aligned with the Spool with the Spool Gear on the left hand side.

Place the mode selector in 'Dual' mode and release the spool park brake.

If loading a full Spool, ensure that Spool contains no more than 25m of Trackway® and Transit Straps are securing the Trackway® to the Spool.

Rotate the Dispenser down so that the Arm Horns are approximately horizontal (dependent on the maximum crowding rotation of the Host Vehicle) and the tips of the Arm Horns are lower than the height of the Spool Shafts.

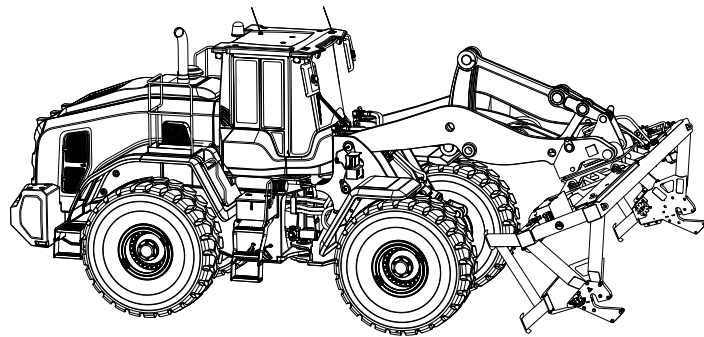


Fig. 1-3 Lower Arm Horns

The Assistant shall ensure that the Spool Locking Levers are in the unlocked position and the Locking Bolts are fully retracted.

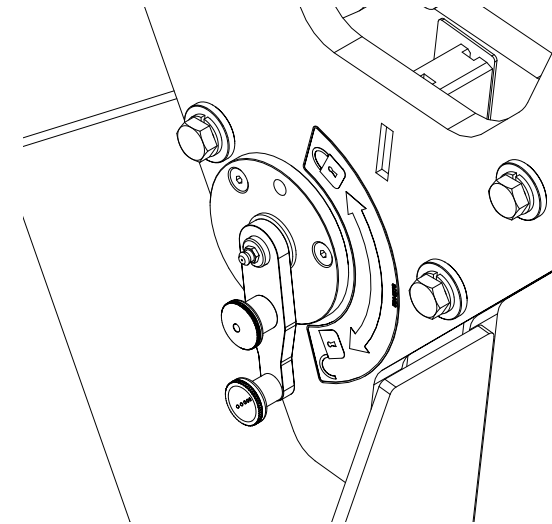


Fig. 1-4 Locking Levers Unlocked

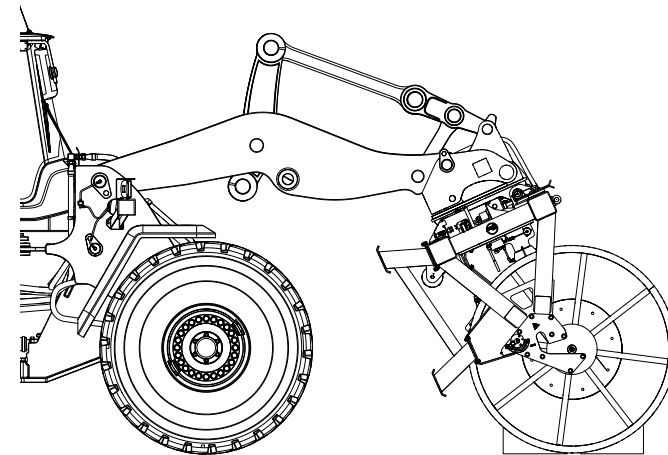


Fig. 1-5 Arm Horns Underneath the Spool Shafts

Drive the Vehicle forward so that the Arm Horns are just underneath the Spool Shafts. The Assistant will guide the alignment of the Spool and the Arm Horns using hand signals (see Section 2.5).

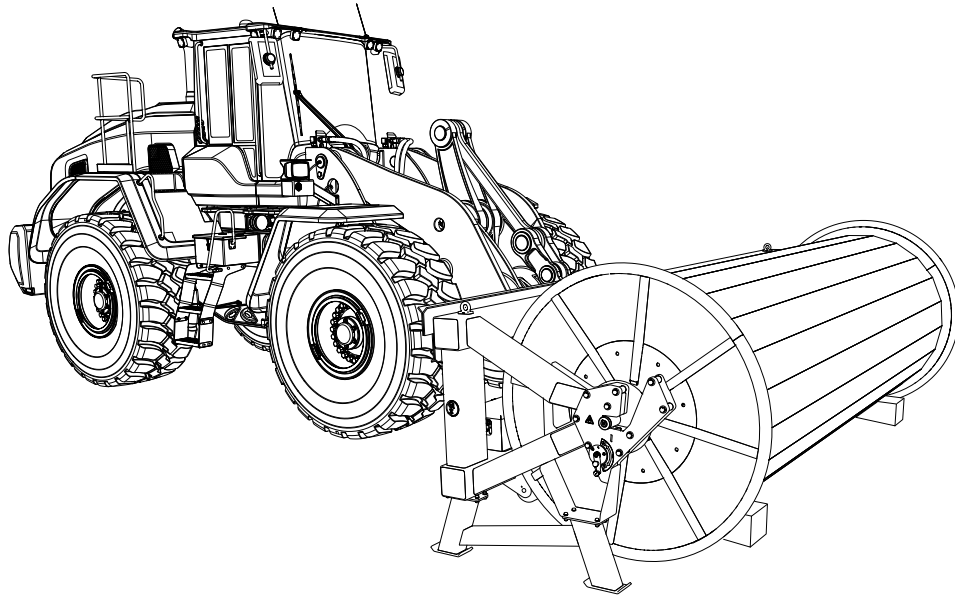


Fig. 1-1 Rotate Dispenser until Spool Shafts Engage with Pockets

Rotate the Dispenser Arms upwards by approximately 40° until the Spool Shafts engage with bottom of the Spool Pockets. Ensure that the gears have meshed.

The Assistant shall secure the Spool by moving both Spool Locking Levers on the Dispenser Arms into the locked position, visually checking that the Spool Locks have engaged with the locking catches and the Locking Bolts are over the top of the Spool Shafts.

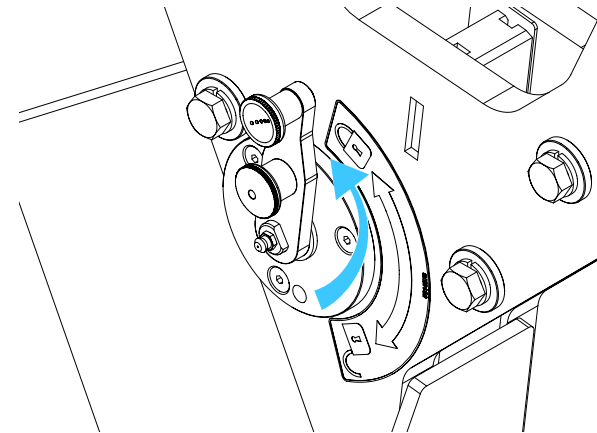


Fig. 1-2 Lock Spool using Locking Levers

With the Mode Selector in Dual Function mode, check that the Spool rotates in both directions under powered operation.

When complete, re-apply the spool park brake.

#### 1.1.1 Unloading Spools

##### Equipment Required:

- Chock x 4

Before considering unloading the Spool ensure the ground conditions are sufficiently level and firm to take the weight of the Host Vehicle and the Spool.

If unloading a full Spool, ensure that Spool contains no more than 25m of Trackway® and Transit Straps are securing the Trackway® to the Spool.

Release the spool park brake.

Rotate the Dispenser to the deployment position with the bottom of the Spool 300 mm above the ground.

The Assistant shall move both Spool Locking Levers on the Dispenser into the unlocked position to release the Spool, visually checking that the Spool Locks have fully disengaged.

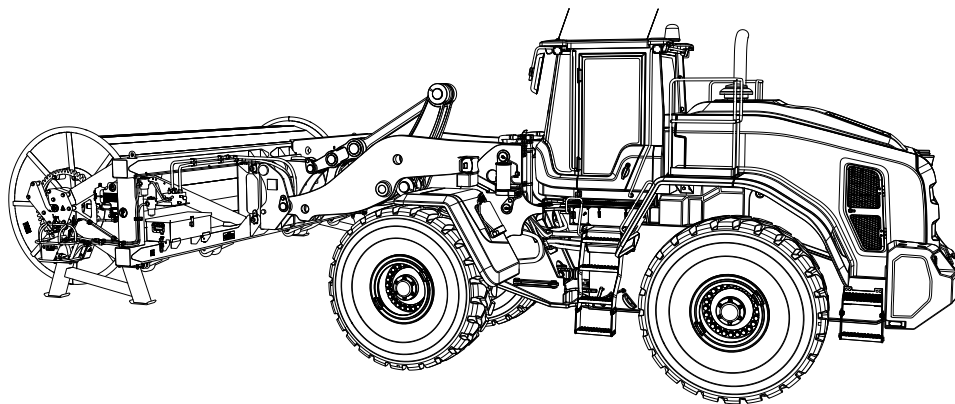


Fig. 1-3 Arm Horns Horizontal with the Spool Low to the Ground

Rotate the Dispenser Arms down until the Arm Horns are horizontal, lifting the Dispenser as required to prevent the Trackway® contacting the ground.

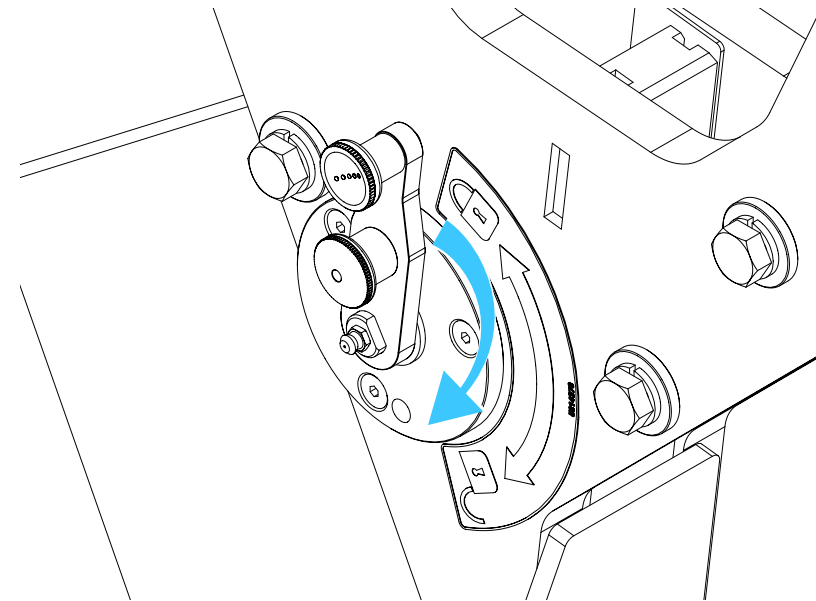


Fig. 1-4 Unlock Spool using Locking Levers

Under the guidance of the Assistant, lower the Spool to the ground, making sure that the ratchets on the Transit Straps do not make contact with the ground.

Once the full weight of the Spool is supported on the ground (the Spool Shafts are just out of the bottom of the Spool Pockets), the Assistant must chock both sides of the Spool to prevent rolling.

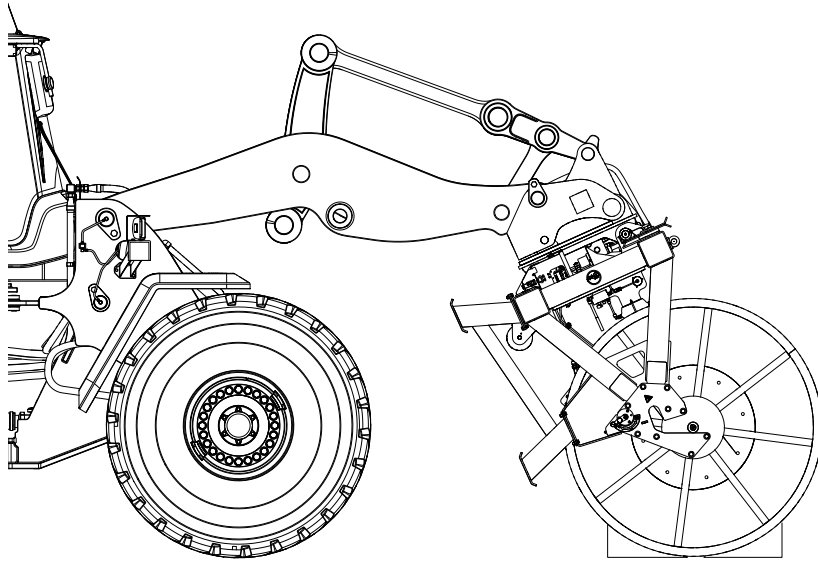


Fig. 1-1 Secure the Spool

Under the guidance of the Assistant, lower the Dispenser until the tips of the Arm Horns are below the Spool Shafts. Slowly reverse the Vehicle in a straight line clear of the chocked Spool.

Once the Arm Horns are disengaged from the Spool, the Dispenser should be rotated up to prevent contact with the ground.

## 1.1 Recovery

### Equipment Required:

- End Adapter x 2
- Transit Strap x 2

#### 1.1.1 General

This section details how the Trackway® can be recovered by the 90PA.

Before starting recovery operations ensure the following steps have been taken:

- Check the Trackway® Condition.

Before recovering the Trackway® the following steps must be taken:

- Position the Vehicle.
- Connect the Spool Chains.

Once the Trackway® has been recovered the following steps must be taken before moving the Vehicle:

- Secure the Trackway® for transit.
- If this is the last operation of the day then complete the Pre- and Post-Operation Checklist (Section 6.4).



WARNING: During recovery, ground guides should ensure the work area is clear of unauthorized personnel.

### 1.1.2 Checking the Trackway® Condition

Before recovery, while the Trackway® is no longer in use, check for damage to the Panels or debris that could obstruct recovery.

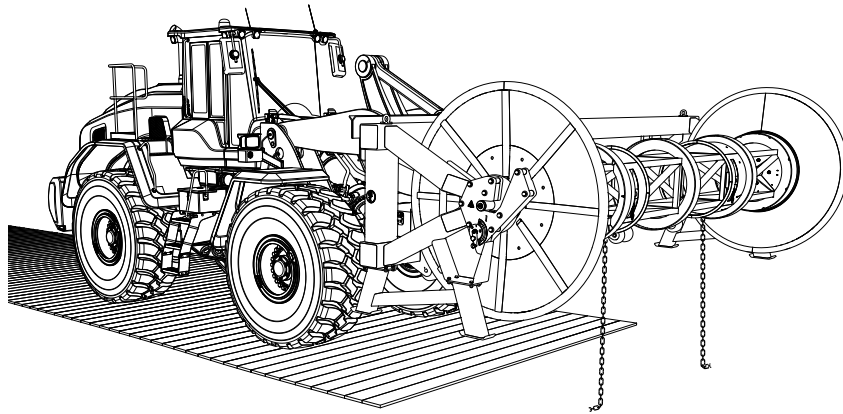


Fig. 5-47 Position the Vehicle on the Trackway®

### 1.1.3 Positioning the Vehicle

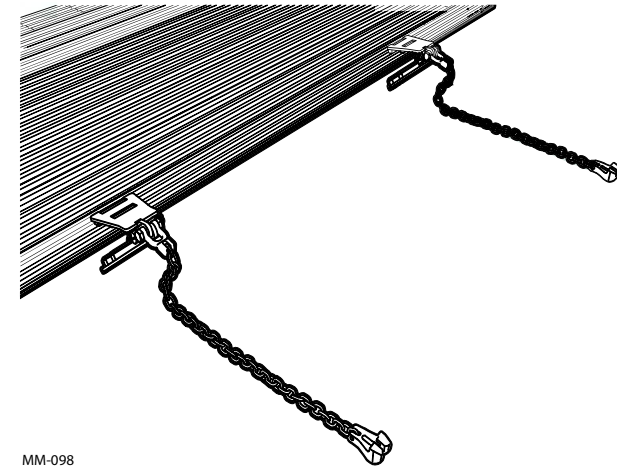
Position the Vehicle centrally on the Trackway® a few Panels from the end. Position the 90PA so it is between 0.5m and 1m above the ground so the Spool Chains will be within reach of the End Adapters.

### 1.1.4 Attaching the Spool Chains

If this is the first operation of the day then complete the Pre- and Post-Operation Checklist (see Section 6.4).

Release the spool park brake and select 'Dual' mode.

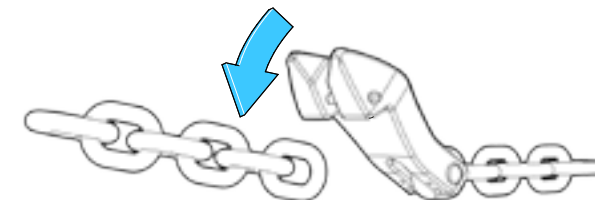
Rotate the Spool so that the Chains are at the 6 o'clock position.



MM-098

Fig. 5-48 Attach End Adapters

Attach the last link of the Spool Chain to the Chain Clutch on the End Adapter.



MM-204

Fig. 5-49 Connect Chain Clutches

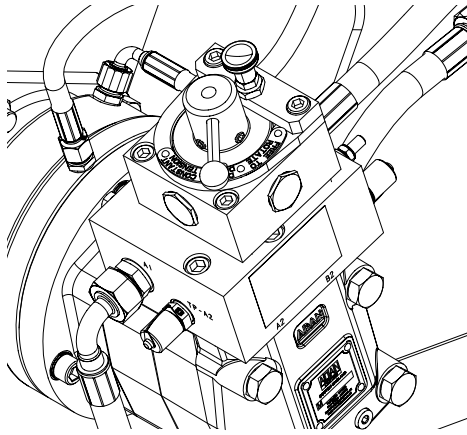


Fig. 5-50 Dual Function Selected

Spool-in the Spool until the Spool Chains are taut. Simultaneously reverse the Host Vehicle and spool-in the Trackway®. Check the edges are between the Guide Rollers.

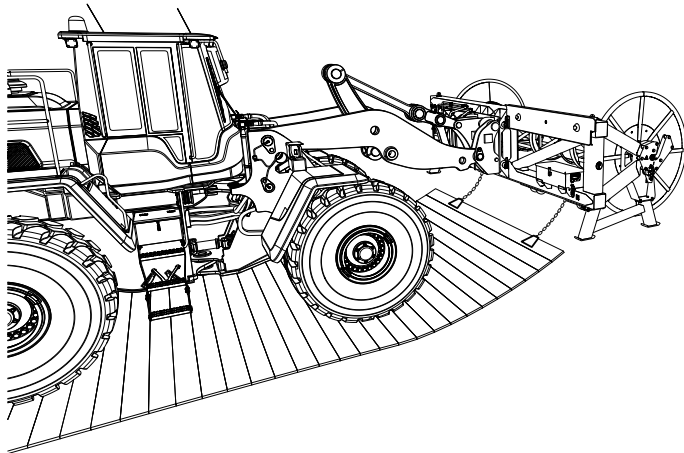


Fig. 5-51 Spool Chains Taut

### 1.1.1 Recovering the Trackway®

Ensure the Mode Selector is set to Dual Drive.

Simultaneously reverse the Vehicle at a low speed whilst spooling-in the Trackway®. Match the vehicle speed to the rate that the Trackway® is being recovered onto the Spool.

Aim to maintain a central position, so the Trackway® is guided between the spool end plates, with minimal collision.

The Assistant should use hand signals (Section 2.5) to assist with vehicle alignment.

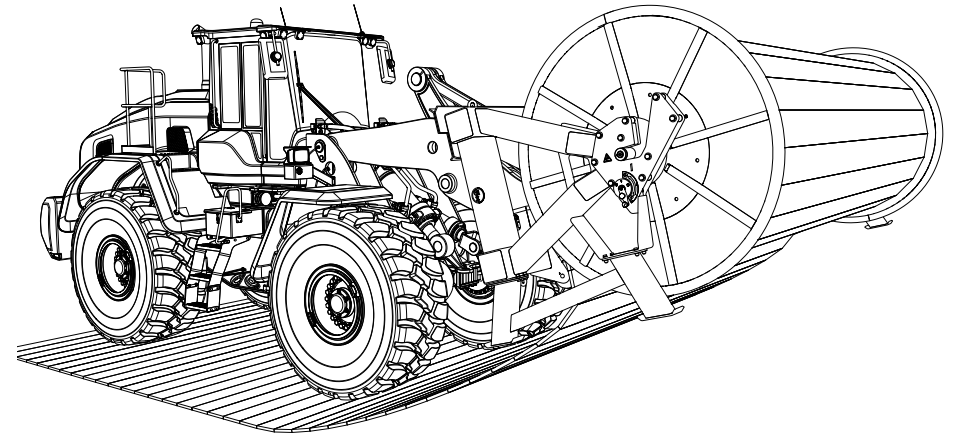


Fig. 5-52 Recovering Trackway®



Continue until the Trackway® is fully recovered onto the Spool and the end of the Trackway® is at the 3 o'clock position.

Release the hydraulic pressure from the spool park brake to lock the spool in position.

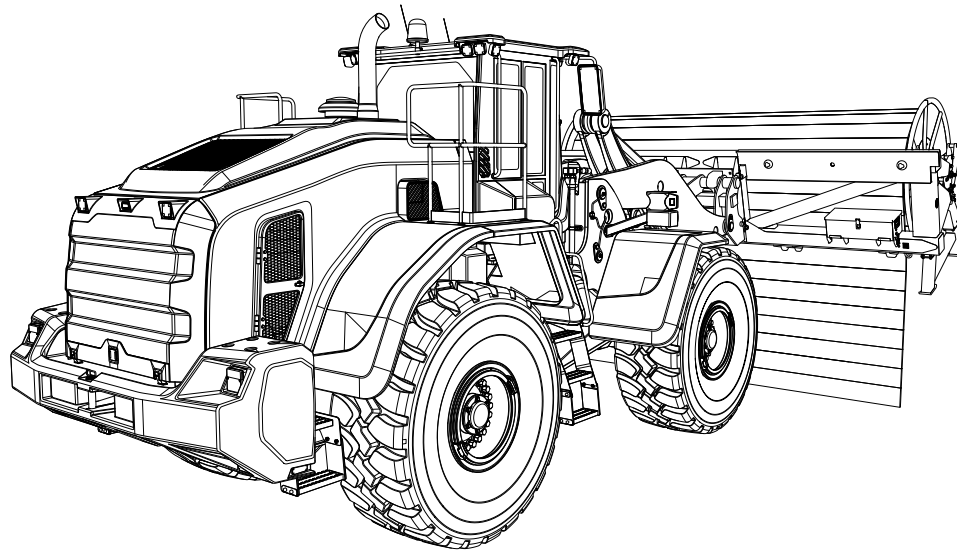


Fig. 5-53 Recovery Complete with Trackway® End at the 3 o'clock position

### 1.1.2 Securing the Trackway®

If fitted, remove and stow the End Adapters in the Storage Boxes.

Secure the Trackway® with two Transit Straps by throwing the D-loop end of each Strap over the Spool (from the front of the Vehicle) and securing with the ratchets horizontally in line

with the Spool Shafts opposite the Host Vehicle. The Transit Straps should be positioned approximately 1m in from the ends of the spool.

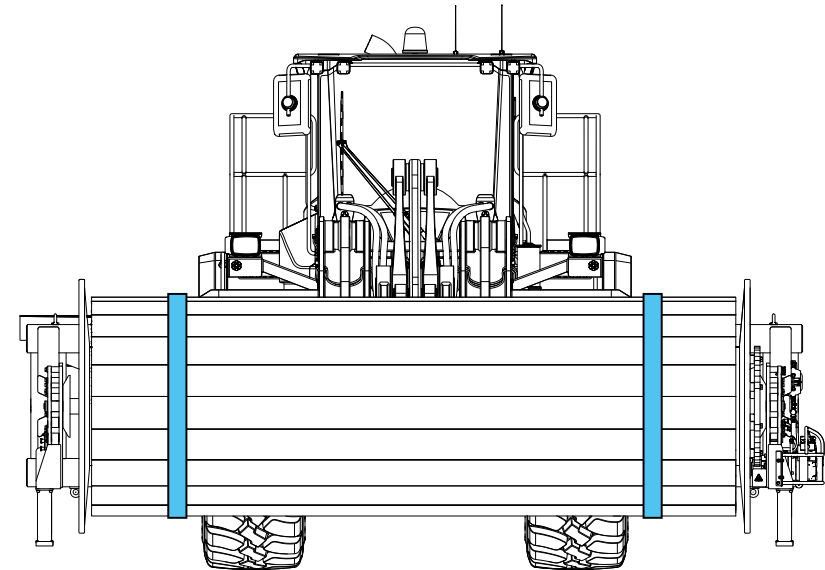


Fig. 5-54 Secure Trackway® with Transit Straps

If this is the last operation of the day then complete the Pre- and Post-Operation Checklist (see Section 6.4).

## 1.1 Post-Operation Inspection

The Pre- and Post-Operation Checklist lists the checks to be conducted on the:

- 90PA
- Spool
- Trackway®
- Accessories

Checks should be conducted on the 90PA after operations are complete.

Please refer to the Pre- and Post-Operation Checklist in Section 6.4 – this checklist must be completed to ensure the system is functional after use.



CAUTION: Record all faults in the Pre- and Post-Operation Checklist and do not use the equipment if it does not pass the inspection.

## 1.2 Deployment and Recovery in Water

### 1.2.1 General

When deploying and recovering in water, follow the procedures documented in Sections 5.7 and 5.9 combined with the following considerations.

The Dispenser should be positioned before the water at a suitable distance to ensure that the required length of Trackway® will be deployed in the water. The distance will depend on the length of Trackway® on the Dispenser and the length of Trackway® required in the water. It may be necessary to use longer or extended Spool Chains to facilitate disconnecting from the Dispenser.

The Driver of the Host Vehicle must ensure that the wading depth of the Vehicle is not exceeded and that the sub-surface ground is flat and stable before deployment.

### 1.2.2 Deployment in Water

Use the Optional 7m long spool chains. This will require the Host Vehicle to be positioned 7m ahead of where the Trackway® is intended to begin.

When setting out, set the start of the deployment approximately 20m from the water entry point.

### 1.2.3 Recovery in Water

Position the Host Vehicle centrally on the Trackway®, on level ground clear of the water. Connect the Spool Chains to the End Adapter chains and recover the Trackway® as per Section 5.9.



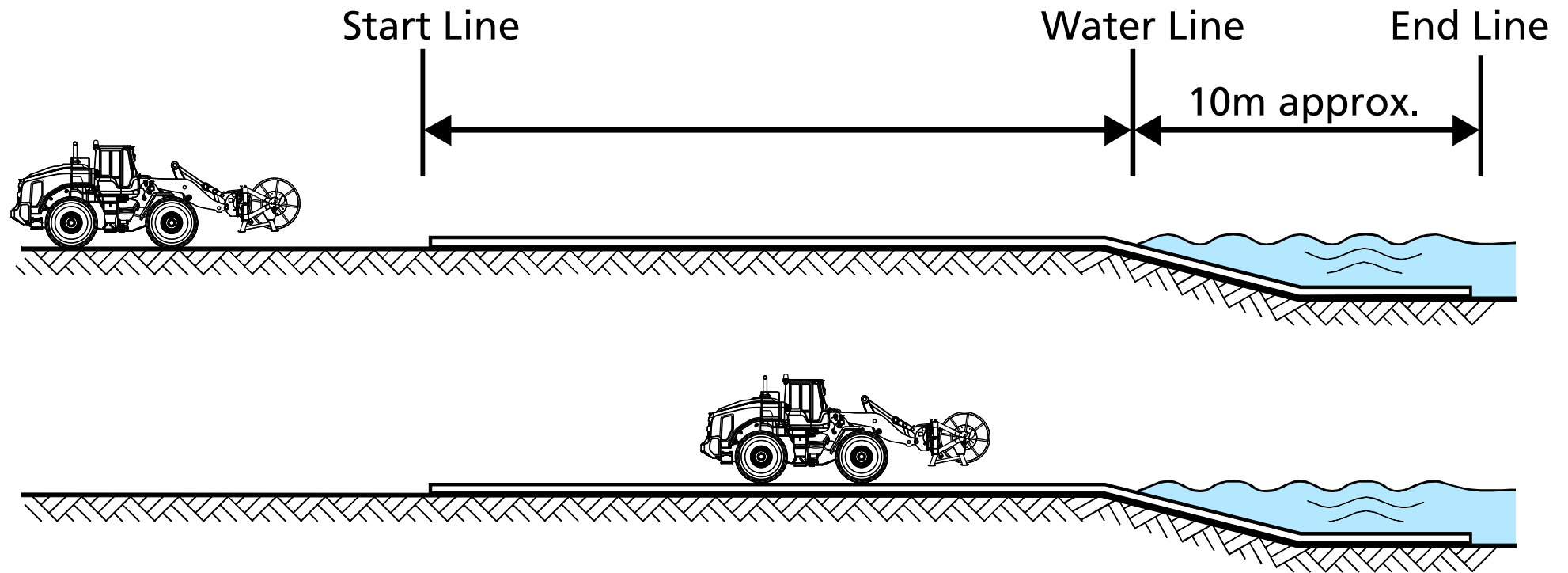


Fig. 5-62 Deployment and Recovery in Water

## 1.1 Splitting Trackway®

Operation to be carried out in dual mode only.

### Equipment Required:

- Hand Line

Trackway® can be split to:

- Facilitate manual recovery
- Create shorter runs
- Replace or repair damaged panels and sections

Trackway® can be split during deployment, recovery, or when all of the Trackway® is on the ground.

The Trackway® has Half Panels fitted approximately every 5m and it is at these points that the Trackway® should be split, although the Trackway® can be split using Full Panels.

It is recommended to split the Trackway® using Half Panels because less force is required to extract them and less clearance at the side of the Trackway® is required.

Identify the row of Half or Full Panels at the point where the split is to take place. Ensure that the identified row is on the ground at the front of the Dispenser.

If splitting at a row of Half Panels then make sure there is at least 2.0m clearance on each side of the Trackway®.

If splitting a row with a Full Panel then make sure there is at least 5m clearance on one side of the Trackway®.

When splitting / joining the Trackway®, the Spool should be placed on the ground and the park brake applied to eliminate 'Spool creep'. If this is not achievable, a maximum clearance of 400mm must not be exceeded.

Locate the Locking Pins at each end of the Panel(s) to be removed and the adjacent Trackway® Panel. Lift and slide these Locking Pins into the open position.

Attach the Hand Line to the outside edge of the Panel to be removed by clipping it through the hole. Ensure that the karabiner gate is closed.

Slowly pull the Panel out of the Trackway® until it is free and clear. If splitting at a row of Half Panels, repeat for the other Half Panel.

Recover the remaining Trackway® back onto the Spool and secure it following the recovery procedures in Section 5.9.

Stow the Hand Line in the Storage Boxes.

Personnel are NOT to work under elevated Trackway®.

## 1.2 Joining Trackway®

Operation to be carried out in dual mode only.

### Equipment Required:

- Spare Full Panel or pair of Half Panels (if spare Panels are unavailable remove Panel(s) from deployed Trackway®)
- Hand Line
- Tool Panel Handle
- Sledgehammer

### 1.2.1 General

Sections of Trackway® can be joined to create longer continuous lengths or to enable recovery of a section which has been previously split. Note that only male Panel ends can be joined to female ends and vice versa.

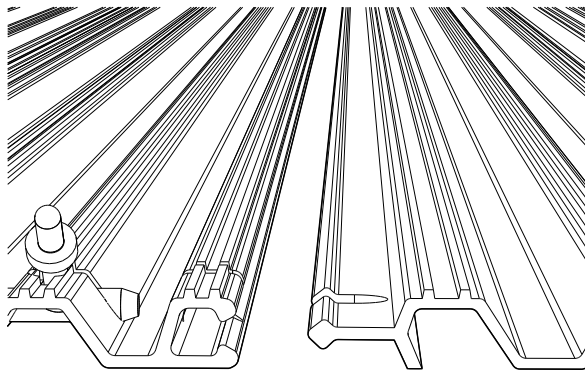


Fig. 5-63 Male and Female Panel Ends

Trackway® must be only deployed in a straight line. Where bends in the route are required, separate sections of Trackway® can be joined at an angle (see Section 5.13.5).

### 1.2.2 Positioning the Dispenser

Position the Dispenser on top of the deployed Trackway®, as near to the centreline as possible, with the Vehicle front wheels approximately 3m in front of the end to be joined.

Deploy the Trackway® from the Spool, following the deployment procedures outlined in Section 5.6, until it is touching the top of the Trackway® on the ground, with the edges of both Trackway® aligned.

When splitting / joining the Trackway®, the Spool park brake should be applied to eliminate 'Spool creep'. If this is not achievable, a maximum clearance of 400mm must not be exceeded.

Slowly drive the Vehicle forward so that the end of the Trackway® on the Dispenser lines up with and is parallel to the end of the Panel of the Trackway® on the ground, at a distance of approximately 200mm.

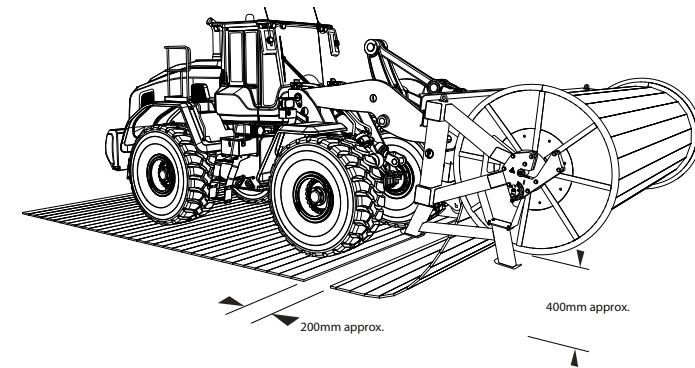
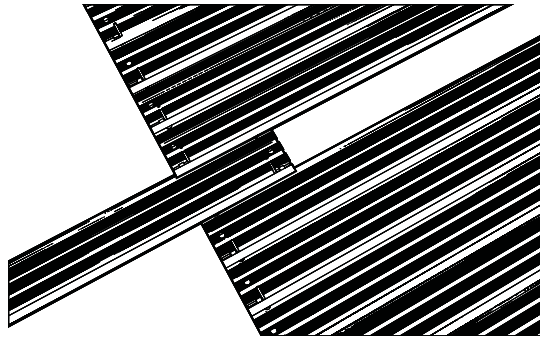


Fig. 5-64 Trackway® Aligned Ready for Joining

### 1.2.3 Inserting Half Panels

Slot a spare Half Panel approximately 300 mm into one side of the Trackway®, ensuring that the male and female joints connect on each side with the Trackway® Panel on the ground and the Trackway® Panel leading off the Dispenser.



OM-145

Fig. 5-65 Initially Insert Half Panels 300mm into Trackway®

Repeat with the other Half Panel on the other side of the Trackway®.

With the ends of the Trackway® segments to be joined properly aligned and connected, both Half Panels can be pushed in fully. The Sledgehammer may be used if this is too difficult to do by hand (use in conjunction with dunnage).

It may help to engage the centre Locking Pin of the first Half Panel inserted to make inserting the second Half Panel easier.

Slide the Locking Pins into the locked position at each end of the inserted Half Panels and the Panel adjacent to it.

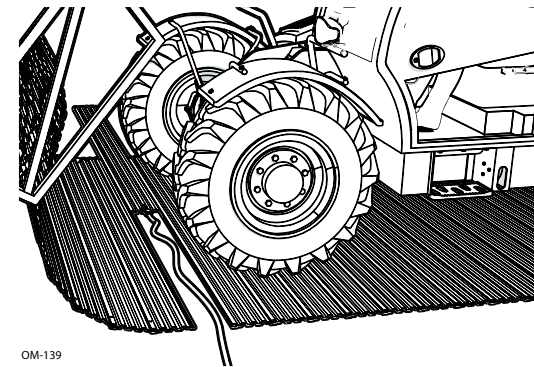
Stow any Accessories back in the Storage Boxes. Continue laying Trackway®.

### 1.1.1 Inserting a Full Panel

Insert one end of a spare Full Panel into the Trackway®, ensuring that the male and female joints connect on each side with the Trackway® Panel on the ground and the Trackway® Panel leading off the Dispenser. Assistance may be required to align both sections.

Attach the Hand Line to the inserted edge of the Panel being inserted by clipping it through the hole. Ensure that the karabiner gate is closed.

Using the Hand Line, pull the Full Panel all the way into the Trackway®.



OM-139

Fig. 5-66 Pulling the Panel into the Trackway®

Slide the Locking Pins into the locked position at each end of the inserted Panel and the Panel adjacent to it.

Stow any Accessories back in the Storage Boxes.

Continue laying Trackway®.

## 1.1 Anchorage

### 1.1.1 General

When deploying C90 Trackway® anchorages may be required, to prevent the C90 Trackway® moving.

On sloped ground, the C90 Trackway® Boat Ramp should be anchored to prevent it working downhill. Anchorages should be installed in pairs, one each side of the C90 Trackway® Boat Ramp, with one pair of anchorages at the top.

On level ground, short runs of C90 Trackway® Boat Ramp may not require anchorage - dependent on the strength of the ground.

Natural anchors such as firm trees, posts and large rocks may be used for anchorage.

### 1.1.2 Anchoring C90 Trackway®

#### 1.1.2.1 Option 1

##### Equipment Required:

- Ground Anchor Stakes;
- Sledge Hammer.

The C90 Trackway® can be directly staked through holes at the end of the panels.

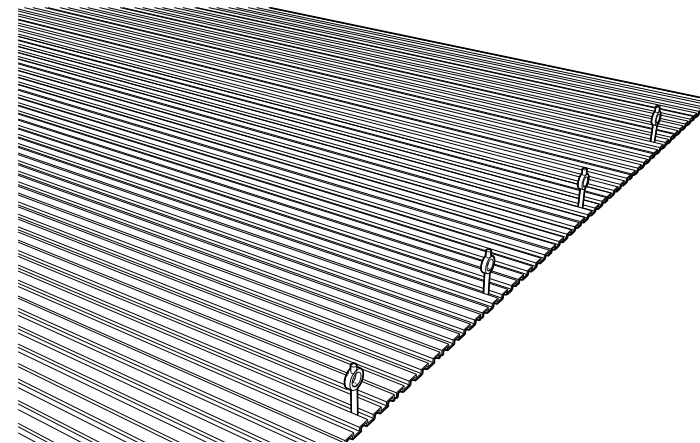


Fig. 1-1 C90 Trackway® with stakes every third panel on both sides. 4 stakes per side.

1.1.1.1 Option 2

Equipment Required:

- Leading Edge Anchor Plate;
  - i) Screw Anchor
  - ii) 25mm spanner or 25mm socket and ratchet (not supplied)
- Side Anchor Assembly
  - i) Screw Anchor
  - ii) Base Plate
  - iii) Top Plate
  - iv) M12 Hex Head Bolt with Locking Washer
  - v) 19mm spanner (not supplied)
  - vi) 25mm spanner (not supplied)

Leading Edge Anchor Plate:

Hook lip of Leading Edge Anchor Plate into groove of C90 Trackway® panel. Insert Screw Anchor through the Leading Edge Anchor Plate and tighten down using the 25mm spanner.

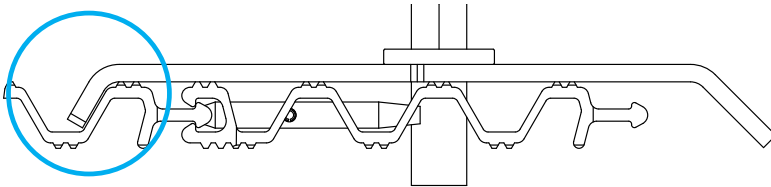


Fig. 1-1 Leading Edge Anchor Plate placed into groove of C90 Trackway®

The lip can be placed either side of the C90 Trackway® panel.

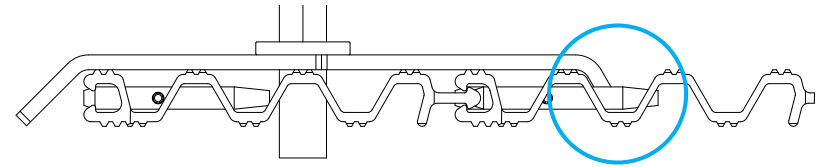


Fig. 1-2 Leading Edge Anchor Plate placed into groove of C90 Trackway®

Secure Leading Edge Anchor Plates and Side Edge Anchor Plates with Screw Anchors.

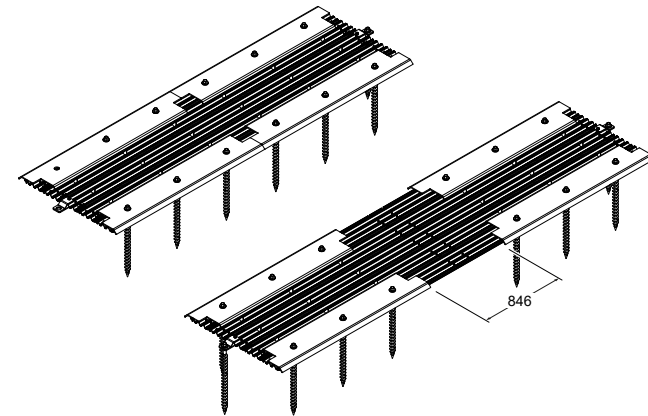


Fig. 1-1 Leading Edge Anchor Plate secured with Screw

### Side Anchor Assembly:

Place Base Plate under the C90 Trackway® panel, aligning the weld nut with the panel hole. Place the Top plate over the top of the C90 Trackway® panel, aligning the hole with the nut of the Base Plate.

Lock with the locking washer and M12 Hex Head Bolt and tighten using the 19mm spanner. Insert Screw Anchor into Side Anchor Assembly and tighten down using the 25mm spanner.

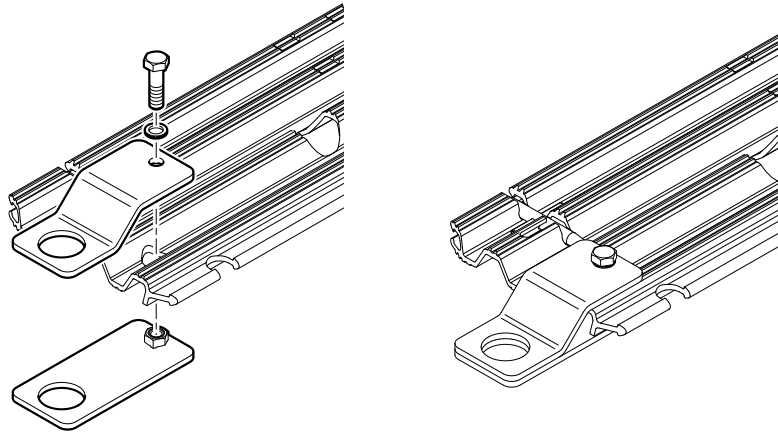


Fig. 1-1 Side Anchoring Assembly

## 3. MAINTENANCE

### 3.1 General

This chapter provides detailed maintenance procedures, to be performed by qualified maintenance personnel to prevent damage and ensure long-term serviceable use.

### 3.2 Preventative Maintenance

#### 3.2.1 General

This section details the preventative maintenance that should be undertaken to avoid or mitigate the consequences of 90PA failure.



CAUTION: Wear personal protective equipment (gloves, goggles, hard hat, protective footwear and ear protection) when undertaking preventative maintenance tasks.



CAUTION: Collect used and excess grease including cleaning cloths and dispose of according to local environmental regulations.



CAUTION: The 90PA should be at ground level for preventative maintenance tasks to be carried out.

#### 3.2.2 Preventative Maintenance Plan

The Preventative Maintenance Schedule shown in Section 6.3 consists of tasks allocated to:

- The Operator
- The Maintainer

When appropriate, use the supplied manufacturer handbooks as supporting literature.

Tasks are broken down generally as follows and are specified as either Operator or Maintainer tasks.

Cleaning: wipe down with a damp cloth or jet wash as appropriate to remove dirt and debris.

- Lubricating: apply the specified lubricant.
- Changing: remove the part and replace.
- Checking: visual inspection to see if the part is still present and functional.
- Adjusting: use of a tool to ensure the correct tightness.

#### 3.2.3 Preventative Maintenance Intervals

After operation: After each time the equipment is used.

Monthly: On a set date each month.

Annually: After 250 hrs or 12 months



### 3.2.4 Preventative Maintenance Checklists

The Pre- and Post-Operation Checklist is used by the Operator to assess the equipment before and after use and report any damage or defects for remedial action (see Section 6.4).

The Maintenance Checklist is used by the Maintainer to assess the equipment during monthly and annual checks and report any damage or defects for remedial action (see Section 6.5 in Maintainer Manual).

## 1.1 Preventative Maintenance Schedule

### 1.1.1 90PA

S/N	SYSTEM	LUBRICATION / PART CHANGE	CLASS	SPECIFICATION	QTY	Interval and Tasks			Carry out By
						After Operation	Monthly	Annually/250 hrs Operation	
1	Drive Gear	Lubricate	NLGI -2	NLGI -2, EP, Castrol Biotac EP2	As Req.	Clean & Grease	Clean & Grease	Clean & Grease	Operator
2	Spool Lock Bar Pivots	Lubricate	NLGI -2	NLGI -2, EP, Castrol Biotac EP2	As Req.	Clean & Grease	Clean & Grease	Clean & Grease	Operator
3	Spool Lock Bar Catches	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator
4	Quick Release Couplings	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator

### 1.1.2 Shipping Frame

S/N	SYSTEM	LUBRICATION / PART CHANGE	CLASS	SPECIFICATION	QTY	Interval and Tasks			Carry out By
						After Operation	Monthly	Annually/250 hrs Operation	
5	Storage Box Hinges, Latches & Gas Struts	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator

1.1.3 Spool

S/N	SYSTEM	LUBRICATION / PART CHANGE	CLASS	SPECIFICATION	QTY	Interval and Tasks			Carry out By
						After Operation	Monthly	Annually/250 hrs Operation	
6	SPOOL CHAINS	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator
7	SPOOL GEAR	Lubricate	NLGI -2	NLGI -2, EP, Lithium	As Req.	Clean & Grease	Clean & Grease	Clean & Grease	Operator

1.1.4 C90 Trackway®

S/N	SYSTEM	LUBRICATION / PART CHANGE	CLASS	SPECIFICATION	QTY	Interval and Tasks			Carry out By
						After Operation	Monthly	Annually/250 hrs Operation	
8	PANELS	-	-	-	-	Clean	Clean & Lubricate	Clean & Lubricate	Operator
9	LOCKING PINS	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator
10	HALF PANEL					Clean	Clean & Lubricate	Clean & Lubricate	Operator
11	JUNCTION CLAMP	Lubricate		WD40	As Req.	Clean & lubricate	Clean & lubricate	Clean & lubricate	Operator

1.1.1 Accessories

S/N	SYSTEM	LUBRICATION / PART CHANGE	CLASS	SPECIFICATION	QTY	Interval and Tasks			Carry out By
						After Operation	Monthly	Annually/250 hrs Operation	
12	Steel Shackle WII2 Ton	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator
13	Hand Line Karabiner	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator
14	Sighting Rods	-	-	-	-	Clean	Clean	Clean	Operator
15	Duplex Webbing WII 2t, 2m	-	-	-	-	Clean	Clean	Clean	Operator
16	Ratchet Straps	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator

1.1.2 Interface Kits

S/N	SYSTEM	LUBRICATION / PART CHANGE	CLASS	SPECIFICATION	QTY	Interval and Tasks			Carry out By
						After Operation	Monthly	Annually/250 hrs Operation	
17	Hydraulic Hose Quick Couplers	Lubricate	-	WD40	As Req.	Clean & Lubricate	Clean & Lubricate	Clean & Lubricate	Operator

## 1.1 Operator Pre and Post Operation Checklist

SERIAL NUMBER:	DATE:
This is to certify that I have inspected the equipment in accordance with the pre and post operation check-list.	
OPERATOR NAME AND RANK:	SIGNATURE:

SN	ITEM	INSPECTION POINT	PASS CRITERIA	PASS / FAIL	COMMENTS
1	SHIPPING FRAME	a. Check the frame.	i. No welding cracks or distortion.		
		b. Check the accessory box.	i. Can be opened and closed firmly. Can be locked.		
			ii. No damage to latches, hinges, seals, gas struts and doors.		
		c. Check tie down points x 18.	i. Not bent, missing or broken.		
2	90PA	d. Check frame.	i. No welding cracks or distortion.		
		a. Check the frame.	i. No welding cracks or distortion.		
		b. Check the sole plates x 4.	i. Not overly worn, missing or broken.		
		c. Check tie down points x 8.	i. Not bent, missing or broken.		
			i. Roller shafts and locating tabs/bolts are not damaged or missing.		
		ii. Able to rotate.			
		e. Check the quick release couplings.	i. No damage, no leakage and clean.		
		f. Check the hydraulic hoses, pipes and fittings.	i. No damage, no leakage.		
g. Check the lock assemblies are engaged.	i. Not loose, broken or missing, functional.				
h. Check the spool motor.	i. No damage, no leakage.				

SN	ITEM	INSPECTION POINT		PASS CRITERIA		PASS / FAIL	COMMENTS
2	Dispenser (Cont'd)	i.	Check the motor guard.	i.	Is present, not damaged.		
		j.	Check the Mode Selector.	i.	Not bent, missing or broken.		
		k.	Check the interface plate.	i.	Is the correct plate, is firmly attached.		
		l.	Check the spool bearing in the bottom of the spool pockets.	i.	Not worn, missing or broken.		
		m.	Check the drive pinion.	i.	Visual check to confirm not broken or missing gear teeth.		
		n.	Check Spool brake assembly.	i.	Not leaking or damaged.		
3	Spool	a.	Check the frame NB: Deploy the Trackway® first.	i.	Visual check to confirm no welding cracks or distortion.		
		b.	Check the spool shafts and the retaining bolts are tight.	i.	Visual check to confirm no damage.		
		c.	Check the spool deployment and recovery chains.	i.	Chain links are not bent, worn diameter limits or broken.		
		d.	Spool deployment and recovery chain lugs.	i.	Load lug is not bent, worn diameter limits or broken.		
		e.	Check sprocket teeth (31), gear and fastenings.	i.	Visual check to confirm not missing.		
4	Trackway®	a.	Check transit and holdfast straps, hooks and mechanism.	i.	Not torn, missing, bent, broken or inoperative.		
		b.	Check panels.	i.	Are operational, not badly worn, torn, twisted or bent.		
		c.	Locking Pins	i.	Are present, operational, not badly worn, torn, twisted or bent.		
5	Dispenser And Trackway® Accessories	a.	Hand line	i.	Is operational, not badly worn, twisted or bent.		
6		a.	Interface Plates with equipment.	i.	Is present, Plate is not badly split, worn or bent. Hoses are present, not split.		

### 3. TROUBLESHOOTING

#### 3.1 Hydraulic System Issues

Symptom/Fault	Possible Cause	Action	Level	
No powered Spool rotation	Auxiliary pump disengaged.	Ensure the PTO [power take off] on the Host Vehicle is engaged (if needed, refer to the vehicle manufacturer's manual for further information).	Operator	
	Incorrect function on the Mode Selector.	Set the Mode Selector to Dual Drive (powered operation in both directions).	Operator	
	Hydraulic hoses connected incorrectly.	Ensure the Hydraulic Hose quick release connectors are correctly fitted to the Host Vehicle and the 90PA (refer to the vehicle manufacturer's manual for further information).	Operator	
	Insufficient hydraulic oil in the Host Vehicle's hydraulic Tank.	Replenish the Host Vehicle's hydraulic tank with hydraulic oil.	Operator	
	No pressure or insufficient pressure in the system	Relief valve opening below setting.	Adjust the relief valve.	Maintainer
		Hydraulic motor is worn or has excessive external damage.	Repair or replace the unit.	Maintainer
		Hydraulic couplings are disconnected.	Connect the couplings.	Operator
Erratic operation of motor	Entrapped air causing fluctuating pump delivery.	Ensure that the oil in system is clear from bubbles and foam.	Maintainer	
	Inconsistent engine speed.	Check the PTO condition and engine speed.	Maintainer	
	Air pocket in system.	Remove air from system by bleeding.	Maintainer	

Symptom/Fault	Possible Cause	Action	Level
Speed of hydraulic movement	Engine RPM is too high/low.	Adjust the engine RPM.	Operator
	Pump delivery is too low.	Refer to the chassis manufacturer's manual.	Maintainer
	Incorrect speed adjustment.	Adjust speed.	Maintainer
Creeping or over movement	Spool brake oil level or condition.	Check oil/replace if necessary.	Maintainer
	Spool brake is worn/damaged.	Investigate brake condition/replace components worn or damaged components.	Maintainer
	Over-center valve is incorrectly adjusted.	Check and adjust valve.	Maintainer





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