

Metso

Nordtrack S2.11

Instruction Manual
Spare Parts Catalog

S/N 1900876

General Documents

1

Instructions

Incl. General safety instructions

2

Diesel Engine

3

Spare Parts Catalog

4

Diagrams

5



IMPORTANT INFORMATION ON THE COMPANY NAME CHANGE

On May 3, 2023 Metso Outotec's Annual General Meeting approved the Board of Directors' proposal to change the company name from Metso Outotec Corporation to **Metso Corporation**. The change of the parent company name Metso Corporation is effective starting May 4, 2023, but globally the change will be implemented in a phased manner.

The name change will affect both the documentation and appearance of the products. Within the documentation or branding of products manufactured by Metso, there might still be some references to the previous company names of "Metso Outotec", "Metso Minerals" or similar. All these references shall be considered as "Metso".

The names of the global Metso Outotec support centers listed in the product documentation will also be changed. Refer to the support centers' announcements for the correct company names and further information.

Due to the continuous product development, the manufacturer reserves the right to alter the technical specifications in the instruction manuals, spare part documentation, warranty documents, and any other technical documentation shipped with the machine.

In case of any issues, contact your local Metso support center for further information.



GLOBAL PRODUCT SUPPORT CENTERS

Metso Outotec Finland Oy (Finland, Tampere)

Metso Outotec Finland Oy
Lokomonkatu 3
FI-33900 Tampere, FINLAND
Tel +358 20 48 4142

Metso Outotec France SAS (France, Mâcon)

Metso Outotec France SAS
41, rue de la République, CS 61609
71009 Mâcon, FRANCE
Tel +33 (0)3 85 39 62 00

Metso Outotec India Private Limited (India, Alwar)

Metso Outotec India Private Limited
Metso Park (Production unit)
SP1-1 to SP1-13, South East Zone, MIA
Alwar (Rajasthan) - 301030, INDIA
Tel +91 144 5167500 / 2887500

TECHNICAL SUPPORT CENTERS BY THE REGION

Metso Outotec USA Inc. (USA, Waukesha)

Metso Outotec USA Inc.
20965 Crossroads Circle
53186 Waukesha
Wisconsin, USA
Tel +1 262 717 2500

Metso Outotec Brasil Indústria e Comércio Ltda. (Brazil, Sorocaba)

Metso Outotec Brasil Indústria e Comércio Ltda.
Av. Independência, 2500 - Iporanga
18087-101 Sorocaba
Sao Paulo, BRAZIL
Tel +55 15 2102 1300 (Portaria) +55 15 2102 1700 (Vendas)

Metso Outotec International Trade (Tianjin) Co., Ltd Beijing Branch (China, Beijing)

Metso Outotec International Trade (Tianjin) Co., Ltd Beijing Branch
Level 11, China Youth Plaza
19 North Road, East 3rd Ring Road, Chaoyang District, 100020 Beijing
100022 Beijing, CHINA
Tel +86 10 6566 6600

For other technical support locations visit <https://www.metso.com/contact>

For other information: Minerals.Info.CSR@mogroup.com

WARRANTY CERTIFICATE FOR NORDTRACK S2.11 S/N 1900876

Enclosed are the following documents that are necessary in order to activate the warranty of the above mentioned equipment:

- Commissioning and Warranty Registration (CWR)
- CWR Policy for New Equipment
- Standard Limited Warranty Conditions

Please complete the CWR document and follow the instructions outlined in the CWR Internal Policy for New Equipment.

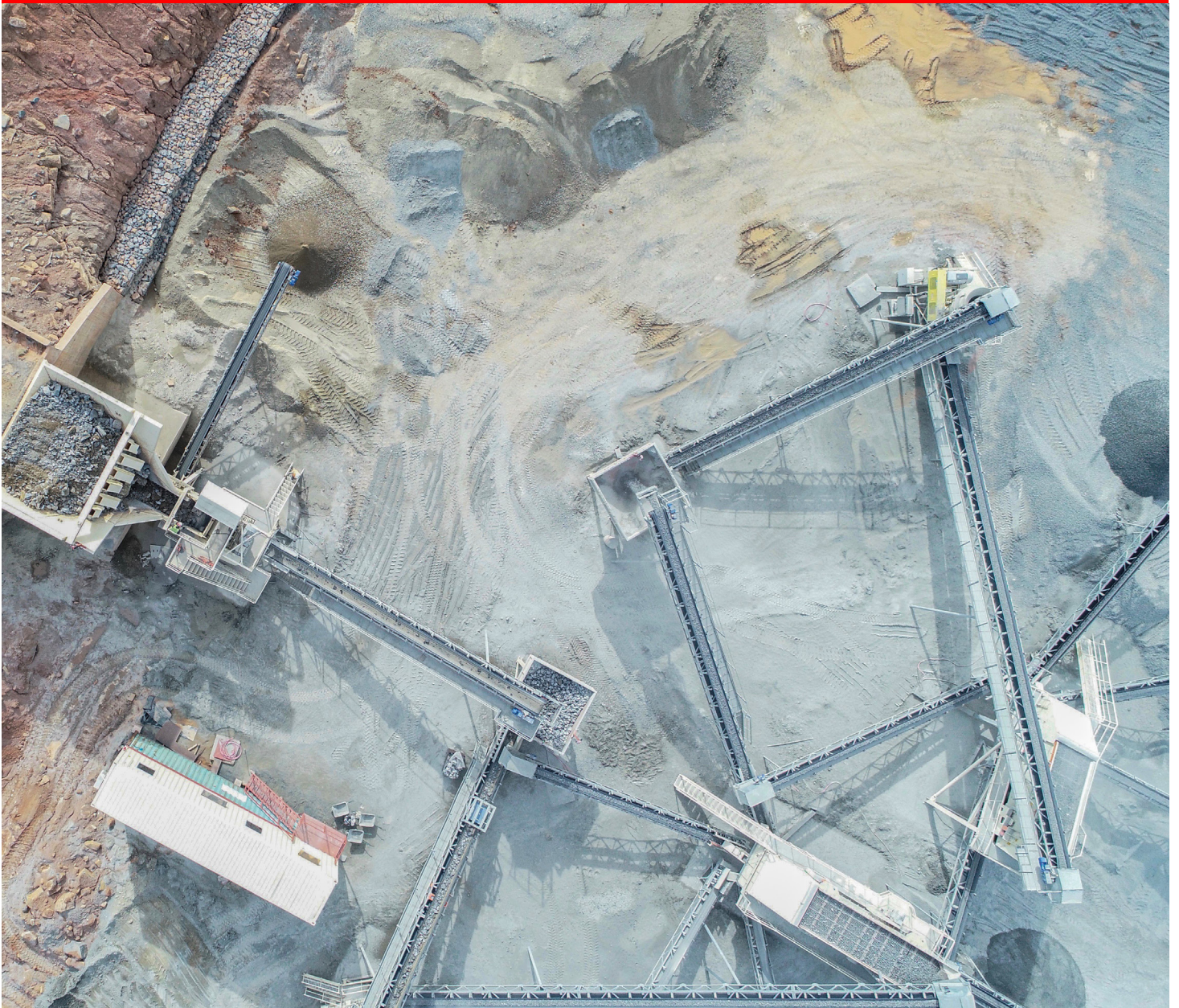
Metso

Commissioning & Warranty Registration (CWR)

Doc No. D100026783 Revision 0

Original instructions

INSTRUCTION MANUAL



This document is proprietary to Metso Corporation and its affiliated companies ("Metso"). This document is intended for the use of Metso's customers only for the purposes of the agreement under which the document is submitted and no ownership rights are hereby transferred. No part of the document shall be used, reproduced, translated, converted, adapted, stored in a retrieval system, communicated or transmitted by any means, for any commercial purpose, including without limitation, sale, resale, licence, rental or lease, without the prior express written consent of Metso.

Customer understands and accepts that the information in this document is subject to any change without notice. It is the customer's responsibility to determine whether there have been any such updates or amendments.

The document has been prepared to be used by professional and properly trained personnel, and the customer assumes full responsibility when using it. Despite the fact that every effort has been made to ensure that the information in this document is accurate Metso does not make any representations, warranties or guarantees, express or implied, as to the accuracy or completeness of the document. In case of any discrepancies between different language versions English version shall prevail. Metso shall not be liable in contract, tort or in any other manner whatsoever to any person for any loss, damage, injury, liability, cost or expense of any nature, including without limitation incidental, special, direct or consequential damages arising out of or in connection with the use of the document. Metso's liability for any errors in the document is limited to the documentary correction of errors.

Metso logo is a registered trademark of Metso Corporation.

Other product names mentioned in this document may be trademarks of their respective companies, and they are mentioned for identification purposes only.

Copyright © Metso 2023. All rights reserved.

Metso

Address: PO Box 1220
FI-00101, Helsinki, Finland

Telephone: +358 20 484 100

Internet: www.metso.com

Status:		Valid from product update:		Original size: A4	
Customer:			Project Phase:		Site No:
Project Name:			Customer Document ID:		
Replaced by:			Replaces:		Language: EN
Metso			Document Title: Instruction Manual Commissioning & Warranty Registration (CWR)		
Equipment No:		Item No:			

☒ Original instructions

☐ Translation of the original instructions

Language: EN

Contents

1

Introduction.....

4

2

Retrieving PIN.....

5

2.1

Retrieving the PIN from my.metso.com (for distributors).....

5

2.2

Retrieving the PIN from Salesforce (for internal users).....

6

3

Logging in.....

8

3.1

Logging in by using the QR code.....

8

3.2

Logging in by using Direct access.....

8

3.3

Logging in through my.metso.com.....

10

4

Filling the commissioning and warranty registration form.....

11

1

Introduction

The purpose of this manual is to instruct the user in filling out the commissioning and warranty registration form and making sure the unit works properly.

In case electrical registration is not available, send a scanned copy of the CWR form to metso.cwr@mogroup.com.



NOTE: This manual does not replace the instruction manual of the machine. Read the instruction manual before operating the machine.

Project ID:	Plant Code:	Plant Unit Code:	Document Type:	Running No:	Revision: 0	Metso Document ID: D100026783
-------------	-------------	------------------	----------------	-------------	----------------	----------------------------------

2

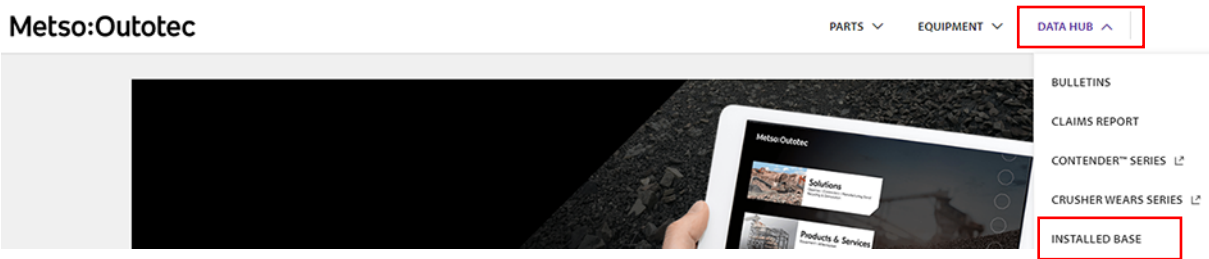
Retrieving PIN

Before you can access the CWR form, you need to retrieve the PIN code associated with the machine.
See [Retrieving the PIN from my.metso.com \(for distributors\)](#) or [Retrieving the PIN from Salesforce \(for internal users\)](#).

2.1

Retrieving the PIN from my.metso.com (for distributors)

1. In my.metso.com, click the **Data Hub** menu.
2. Click **Installed Base**.



3. Enter the machine serial number in the **Serial number** field.
4. Click **Search equipment**.

SEARCH CRITERIA

Serial number

Description

Product type

Type to select...

Operational status

End customer

Type to select...

Type to select...

SEARCH EQUIPMENT

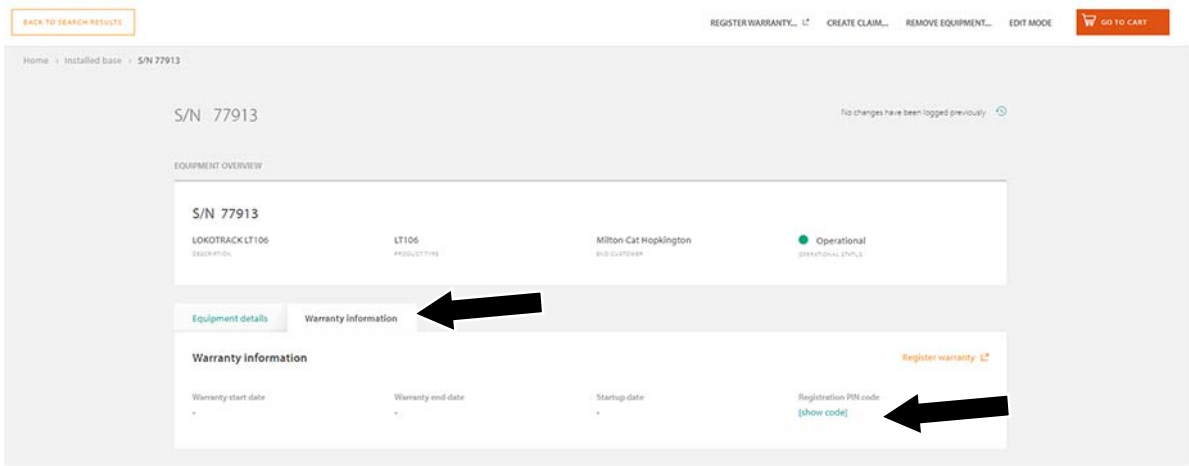
[clear search criteria]

Search results

1 - 20 of 191 equipment

O.S.	SERIAL NO	DESCRIPTION	PRODUCT TYPE	END CUSTOMER
	129626	BRITADOR HP200 - S/N 129626	HP200	George C Hall & Sons Inc

5. To select the correct machine from the search results, click the serial number.
The **Equipment overview** page is displayed.



6. On the **Equipment overview** page, in the **Warranty information** tab, click **Show code**.
The PIN code is displayed.



***NOTE:** You can proceed to the Commissioning and Warranty Registration from this view by clicking **Register Warranty**. See chapter [Logging in](#) for more instructions*

2.2 Retrieving the PIN from Salesforce (for internal users)

1. In Salesforce, click the **Equipment** tab.
2. Enter the serial number of the unit in the search bar.
3. Press **Enter**.
4. In the search results, find the **Equipment** section.
5. Select the correct unit.
The equipment information is displayed: see the following figure.

Project ID:	Plant Code:	Plant Unit Code:	Document Type:	Running No:	Revision: 0	Metso Document ID: D100026783
-------------	-------------	------------------	----------------	-------------	----------------	----------------------------------

Equipment

83458913

+ Follow

Edit

Account

Serial Number

79987

Change Indicator

Up-to-da...

Related

Details

Equipment Number ⓘ

83458913

Description

LOKOTRACK

Warranty Start Date

1.8.2018

Manufacturer

Metso

Start-up Date

1.8.2018

Construction Year ⓘ

2018

Parent Equipment

Serial Number

79987

Account

Warranty End Date

1.8.2019

Product Type

LOKOTRACK LT106

Product Line

Lokotricks

Product Group

CS_PO_LOKO_LT

EPF Plan Valid to Date

Operational Status Description

Ownership Status

End Customer

PIN

Equipment Category

Metso Minerals Equipment

6. You can find the PIN code in the equipment information.



NOTE: The PIN will be entered without the comma.

3 Logging in

There are three ways to access the CWR form:

- By reading the QR code (note that the QR code only applies to Metso LT and ST machinery) on the control center of the machine, see [Logging in by using the QR code](#).
- By going directly to <https://id.metso.com>, see [Logging in by using Direct access](#).
- Distributor users can access the CWR form through my.metso.com, see [Logging in through my.metso.com](#).

3.1 Logging in by using the QR code

1. Read the QR code located on the control center of the machine: see the following figure.



Figure 1. QR code location

2. Enter the PIN you have retrieved from Salesforce or my.metso.com.

3.2 Logging in by using Direct access

1. Go to <https://id.metso.com>.



NOTE: <https://id.metso.com> does not support Internet Explorer.

2. Enter the serial number.

- 3. Enter the material type (machine model, for example LT106).
- 4. Click **Confirm**.
- 5. Enter the PIN you have retrieved from Salesforce or my.metso.com.





[Scan the QR code](#)

or

Enter serial number

Enter material type

CONFIRM



Figure 2. Log in view (note that the QR code only applies to Metso LT and ST machinery)

Project ID:	Plant Code:	Plant Unit Code:	Document Type:	Running No:	Revision: 0	Metso Document ID: D100026783
-------------	-------------	------------------	----------------	-------------	----------------	----------------------------------



Serial number

76240

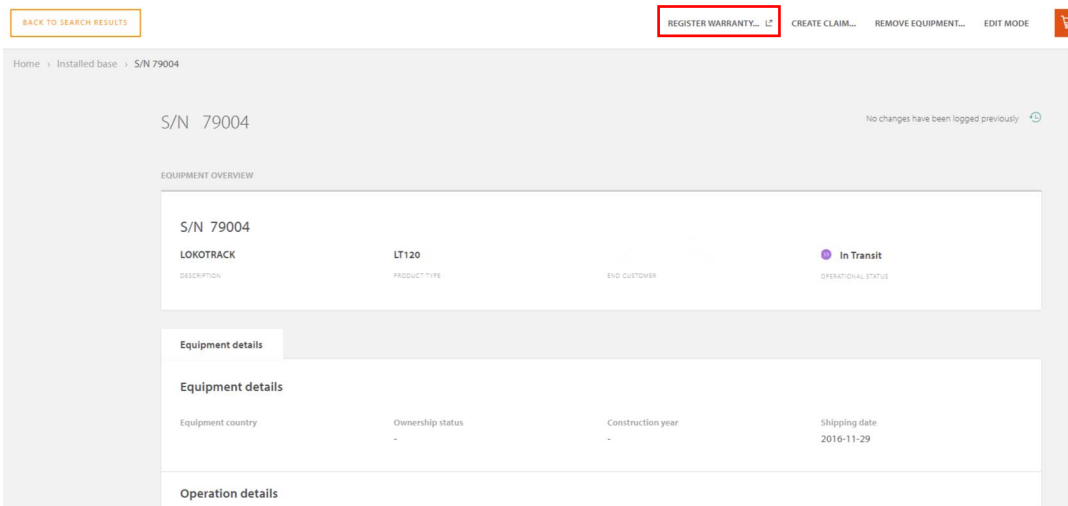
Enter PIN code



Figure 3. Enter PIN

3.3 Logging in through my.metso.com

1. On the **Equipment overview** page, click **Register warranty**: see the following picture.



The login view opens.

2. Enter the PIN you have retrieved from my.metso.com.

4

Filling the commissioning and warranty registration form



NOTE:

The warranty registration with the diesel engine manufacturer must be done before commissioning of the unit.



NOTE: *An incomplete commissioning form cannot be saved.*

1. After logging in, click **CWR & Commissioning**.
2. Fill in the applicable fields.



NOTE: *For some fields, answers are required. The required fields are marked with an asterisk (*).*

3. After each section, click **Next**.



NOTE: *If you want to return to a previous section of the form, click Previous.*

4. After you have filled in all the sections, click **Register warranty**.

Metso

Metso

PO Box 1220, FI-00101, Helsinki, Finland
Tel +358 20 484 100
www.metso.com

Copyright © Metso 2023. All rights reserved.

Metso:Outotec**Commissioning and
Warranty Registration****MM1439490**

PAGE 1/4

For Nordtrack S2.11

S/N: _____

*The information contained herein could be modified without prior notification by Metso Outotec***Metso Outotec warranty starts on the day of this commissioning and warranty registration has taken place****CUSTOMER INFORMATION**

Name: _____ Phone: _____

Customer representative: _____ Position: _____

E-mail: _____

Address: _____

City / State / Zip: _____

METSO OUTOTEC SSO OR DISTRIBUTOR INFORMATION

Metso Outotec sso or distributor: _____

Contact: _____ Phone: _____

E-mail: _____

MAIN INFORMATION

Date of appointment: ____/____/____

Application: ☐ Rock ☐ Gravel ☐ Recycling

Amb. temperature: _____ °C _____ °F

Setting: _____ mm / _____ inch

START UP	OK	Not OK
Inspection before starting the engine		
1. Check oil and water level in diesel engine	☐	☐
2. Check oil level in track gearboxes	☐	☐
3. Check oil level in hydraulic tank	☐	☐
4. Check V-belt tension-engine	☐	☐
After the engine start		
5. Check function of the process & options	☐	☐
6. Check manual valve functions	☐	☐
7. Check hydraulic oil max pressure and tank line	☐	☐
8. Check the safety and E-stop installations & operations	☐	☐
9. Check conveyor belt tracking-no load	☐	☐
After material feed		
10. Screen cloth tightening on screen unit	☐	☐
11. Conveyor belt tracking	☐	☐

Metso:Outotec	Commissioning and Warranty Registration	MM1439490
	For Nordtrack S2.11	PAGE 2/4
		S/N: _____
<i>The information contained herein could be modified without prior notification by Metso Outotec</i>		

Metso Outotec warranty starts on the day of this commissioning and warranty registration has taken place

TRAINING OF OPERATORS	OK	Not OK
Has the operator received any accredited competence training	☐	☐
1. Training of safety instructions	☐	☐
2. Operating with unit	☐	☐
3. Daily maintenance of the unit	☐	☐
4. Name / company of attending in training		
a. _____		
b. _____		
c. _____		
5. Train on and test radio remote controls	☐	☐

OTHER	OK	Not OK
1. Foldable main conveyor operation	☐	☐
2. Screen units operation	☐	☐
	☐	☐
	☐	☐
	☐	☐
	☐	☐
	☐	☐

U.S.A: All associated paperwork must be attached (I.E Delivery Acceptance Form, Crushing Member S/U, etc.).

	YES	NO
Warranty certificate received	☐	☐
Instruction manual received	☐	☐
Spare parts book received	☐	☐
Delivery date respected	☐	☐
Engine registration done *)	☐	☐
Diesel engine S/N		

*) www.cat.com (-> Engine warranty registration)

Metso:Outotec	Commissioning and Warranty Registration For Nordtrack S2.11	MM1439490 PAGE 3/4 S/N: _____
<i>The information contained herein could be modified without prior notification by Metso Outotec</i>		

Metso Outotec warranty starts on the day of this commissioning and warranty registration has taken place

Safety familiarisation of Metso Outotec supplied equipment	YES	NO
Pre start up visual inspection (all guards fitted and safe to use)	☐	☐
Location and use of Metso Outotec supplied emergency safety devices	☐	☐
Familiarisation of tracking controls	☐	☐
Familiarisation of Metso Outotec supplied operational controls	☐	☐
Familiarisation of general lock-out points	☐	☐

(NOTE: PLEASE REFER TO MANUAL FOR STORED ENERGY RISKS)

Has METSO OUTOTEC answered correctly to your expectations, in terms of product quality and sales process?	YES	NO
Pre-sales	☐	☐
Delivery	☐	☐
First impression (If NO, please write in the notes section)	☐	☐
Commissioning	☐	☐

Has METSO OUTOTEC answered correctly to your expectations, in terms of customer relations?	YES	NO
Attitude	☐	☐
Reactivity / Response time	☐	☐
Expertise	☐	☐
How likely would you recommend Metso Outotec to a friend or a colleague from 1-10, (1 = would not recommend, 10 = would recommend)		
What suggestions, if any, do you have for improving our future deliveries? If the answer is YES, please write down in the notes.	☐	☐
Do you want Metso Outotec to contact you for additional services? (spare parts, equipment protection services...)	☐	☐



METSO AGGREGATES EQUIPMENT, COMMISSIONING AND WARRANTY REGISTRATION (CWR) POLICY FOR NEW EQUIPMENT

The warranty is only valid after commissioning and warranty registration has been completed

1. POLICY. All new aggregates equipment must be commissioned in accordance to the guidelines provided in the equipment's CWR form. An electronic form must be followed and filled in during commissioning. Instructions for filling in the form will be provided with customer documentation.

2. WARRANTY ACTIVATION. The warranty for new equipment will begin immediately after the date of execution of the CWR form. The executed CWR form is the validation for equipment's warranty, and its conditions are as stated in "Standard Limited Warranty Conditions for Aggregates Equipment, Components, Parts and Services".

3. WARRANTY REGISTRATION. The executed CWR form must be registered electronically during the start-up and commissioning of the equipment. Electronic registration is to be done online using warranty registration functionality. Instructions for registering the warranty of the equipment are available in "Commissioning & Warranty Registration (CWR) Instruction Manual".

The electronic warranty registration must be done in English, and all relevant observations should be documented. In case electrical registration is not available, please send a scanned copy of the CWR form to metso.cwr@mogroup.com.

In case of any issues during the registration process, contact Metso warranty person immediately.

THESE ARE METSO STANDARD LIMITED WARRANTY CONDITIONS FOR NEW AGGREGATES EQUIPMENT, COMPONENTS, PARTS AND SERVICES

1. Warranty. Metso warrants new aggregates equipment, as well as components and spare parts thereto ("Goods"), supplied by Metso under the contract between Metso and its Purchaser ("**Contract**"), to be free from defects in materials and workmanship in accordance with this Warranty. Subject to Clause 4.2 of this Warranty, wear parts and consumables are not warranted. This Warranty covers (i) the Purchaser; or, in case of distribution sales channel sales, (ii) the first purchaser purchasing from authorized distributor; or, in case of contractor or rental company, (iii) the contractor or rental company who rents equipment to third parties; (all referred to as "**User**") and is not transferable without Metso's prior written consent.

Metso has the right to review the Goods at any time agreed with the User during the warranty period though at the latest by the expiry date of the warranty.

2. Duration. Metso warrants that the Goods shall be free from defects in material and workmanship attributable to Metso, provided that any defect must be claimed in writing within the defects liability period of, unless otherwise specified in the Contract, the earliest of (i) twelve months from the first industrial use, 2,000 operating hours or eighteen months from Delivery for equipment and (ii) six months from the first industrial use, 1,000 operating hours or twelve months from Delivery for components and spare and wear parts.

In case of equipment, the electronic Commissioning and Warranty Registration (CWR) Form shall be filled during the commissioning or within 7 days from the CWR Inspection. Subject to applicable mandatory law, this Warranty becomes effective only if Metso receives the properly filled CWR Form.

If the equipment, components or spare parts are used more intensely than specified by Metso or against good industry practice, above periods of time shall be reduced proportionally as determined by Metso in good faith.

3. Remedy. Metso shall, at its option, either repair the defect or replace the defective equipment, component or part under this Warranty. Repair work shall be carried out by Metso or its authorized representative at the place decided by Metso.

The User may have the right to carry out the warranty repair or replacement only subject to Metso's prior consent or in case of urgency where no consent and service from Metso is available within reasonable time. In such event, Metso shall reimburse reasonable actual out-of-pocket costs incurred to the User in the necessary repair or replacement of the defective equipment, component or spare part. Costs resulting from preparatory work, auxiliaries or plant environment shall not be reimbursed. No compensation shall be paid by Metso for overtime, Sunday or other holiday work or for any removal or installation costs.

Unless otherwise agreed, transport from site to Metso (or other repair shop or replacement source) and to site in connection with remedying of defects under this Warranty shall be at the risk and expense of the User. The defect in question shall be clearly marked on the part, component or equipment, which must be packed properly and in such a way that Metso can carry out a defect or fault analysis reliably.

4. Exclusions. This Warranty does not cover:

4.1 ordinary wear and tear or deterioration of the equipment, components or parts, normal maintenance and service (such as engine tune-ups, adjustments, settings and inspections), normal ageing, normal replacement items (such as service filters), or any damage resulting therefore;

4.2 wear parts and wear components such as hoses, belts, rubber tyres, blades, linings, discs, batteries, nozzles, oil, fuel, fluids, grease, coolants or other materials or parts, which are considered within the industry as wear parts or consumables, except where defects in materials or workmanship are found, in Metso's judgement, to cause premature breakage or wear;

4.3 components, parts and work, if repair or correction requires only minor effort such as changing of seals, tightening, adjustment or settings;

4.4 any modifications or work if carried out by an unauthorized repairer or without Metso's prior consent;

4.5 carelessness of the operators or service men, incorrect operation, maintenance, service or storage, overloading, or any use, action or omission against Metso's manuals or instructions;

4.6 Force Majeure events or any other circumstances beyond the reasonable control of Metso (such as fire, lightning, flooding, earthquake, landslide, vandalism, labour dispute, war, riot, governmental action, utility shortage or excessive voltage fluctuation), or acts or omissions of the User or a third party;

4.7 parts, other than those approved by Metso, which have been used in earlier repair or maintenance work or are otherwise not of sufficient quality and design;

4.8 defects or faults that have no significance to the operation of the equipment or plant, such as dents or surface scratches;

4.9 defects or faults caused by materials or parts provided or designs or specifications specified by or on behalf of the User; and

4.10 any indirect or consequential damage or loss whatsoever, such as loss of profit, loss of production, down-time, business interruption, loss of business opportunity, capital costs, cost of substitute use, claims by third parties or loss of use.

5. Reporting. The User shall notify Metso in writing of any defect as soon as it becomes apparent or damage occurs and in no event later than 14 days after this Warranty expires in accordance with Clause 2 above.

6. Title to Replaced Parts. Parts, components and equipment replaced under this Warranty shall become the property of Metso upon Metso's request.

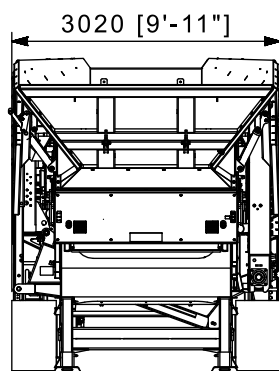
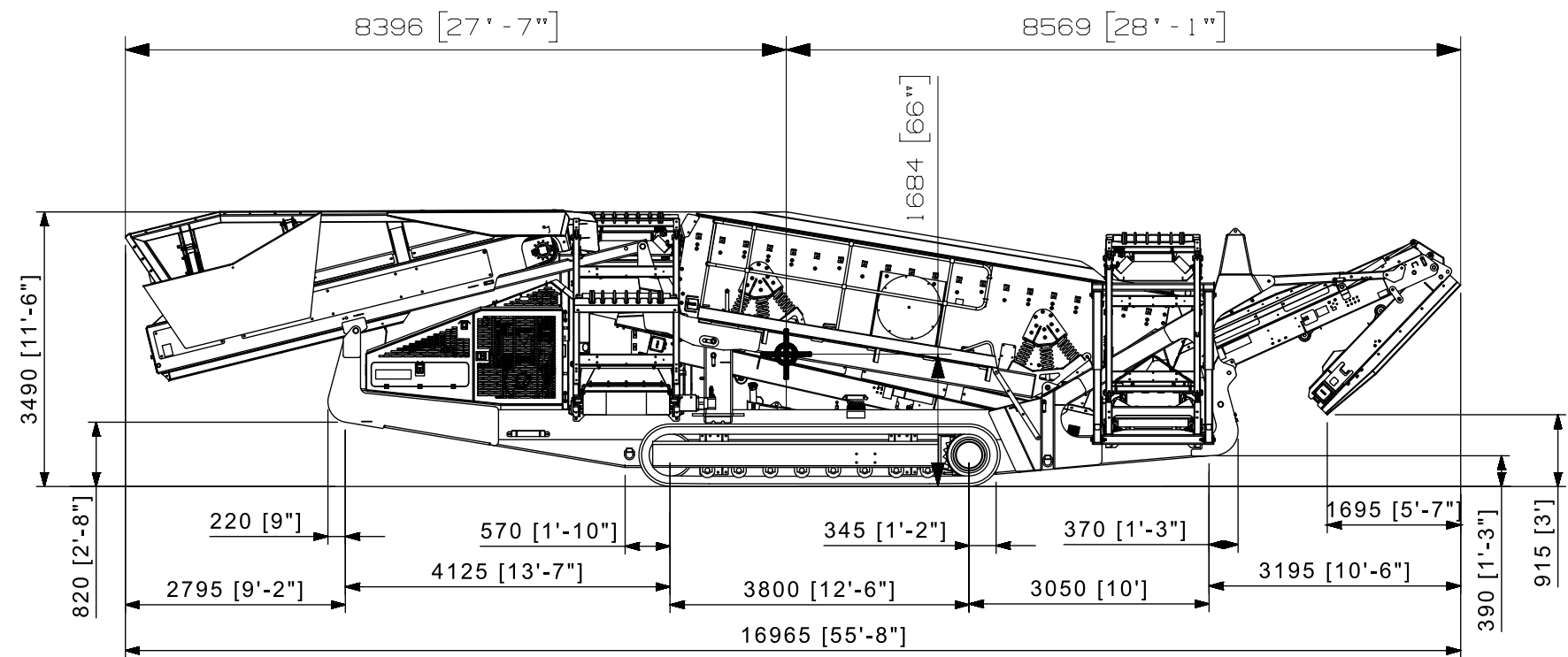
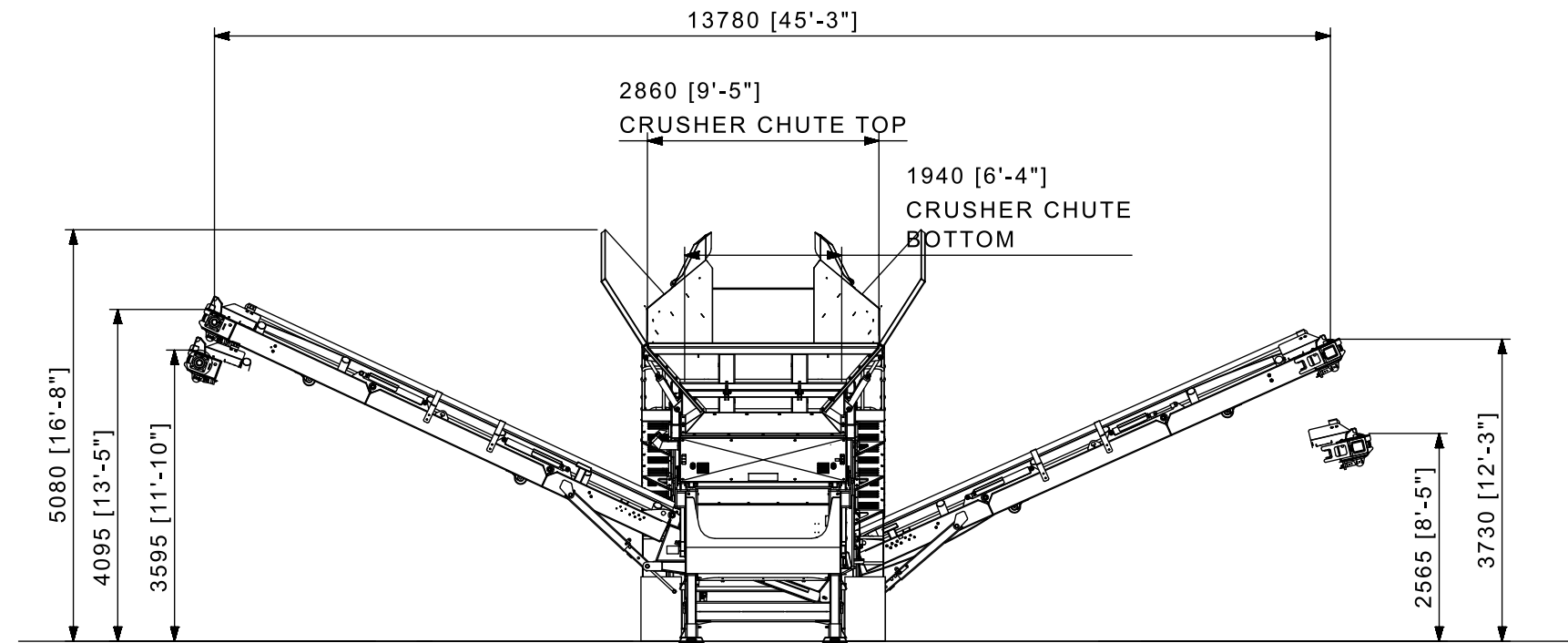
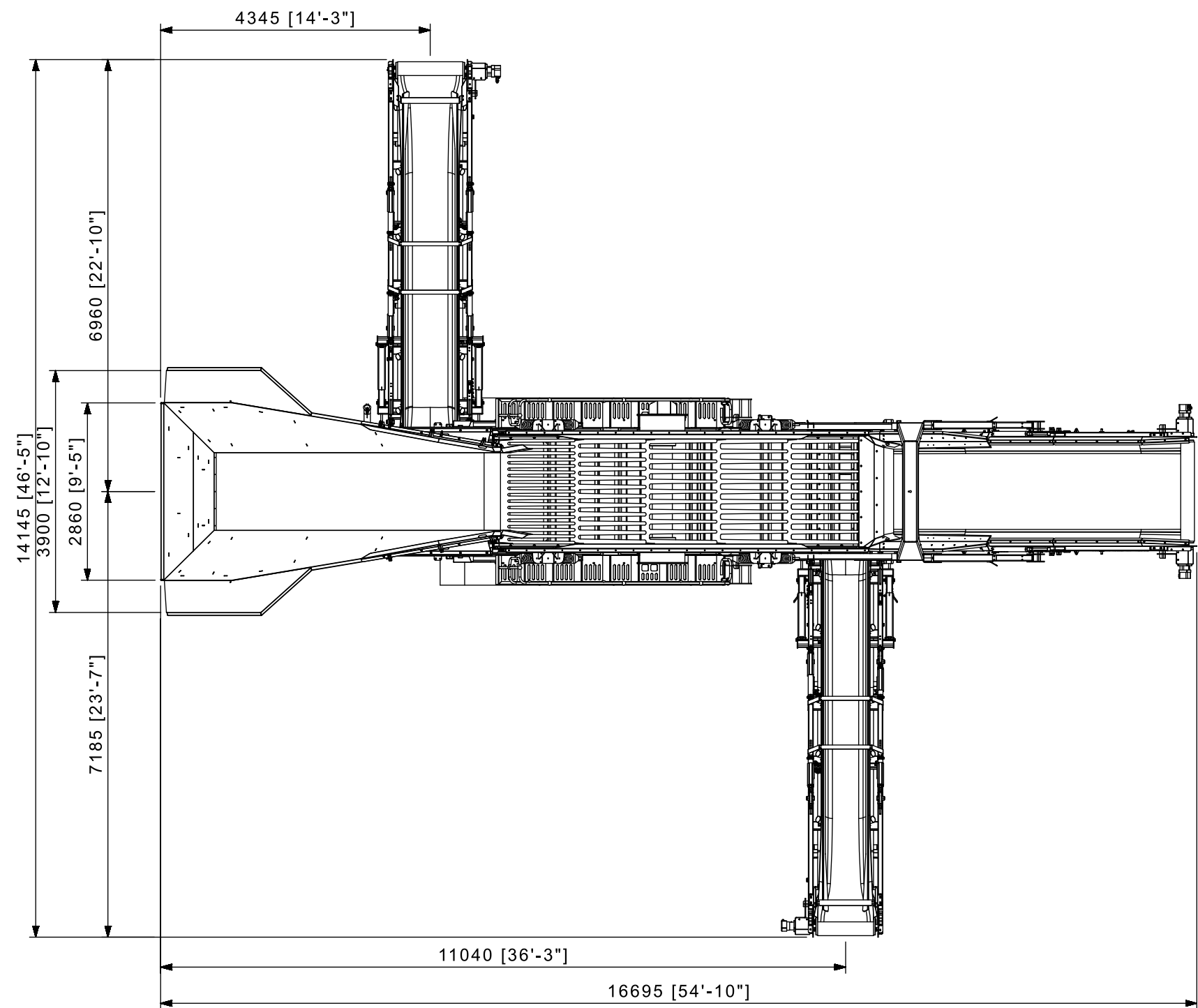
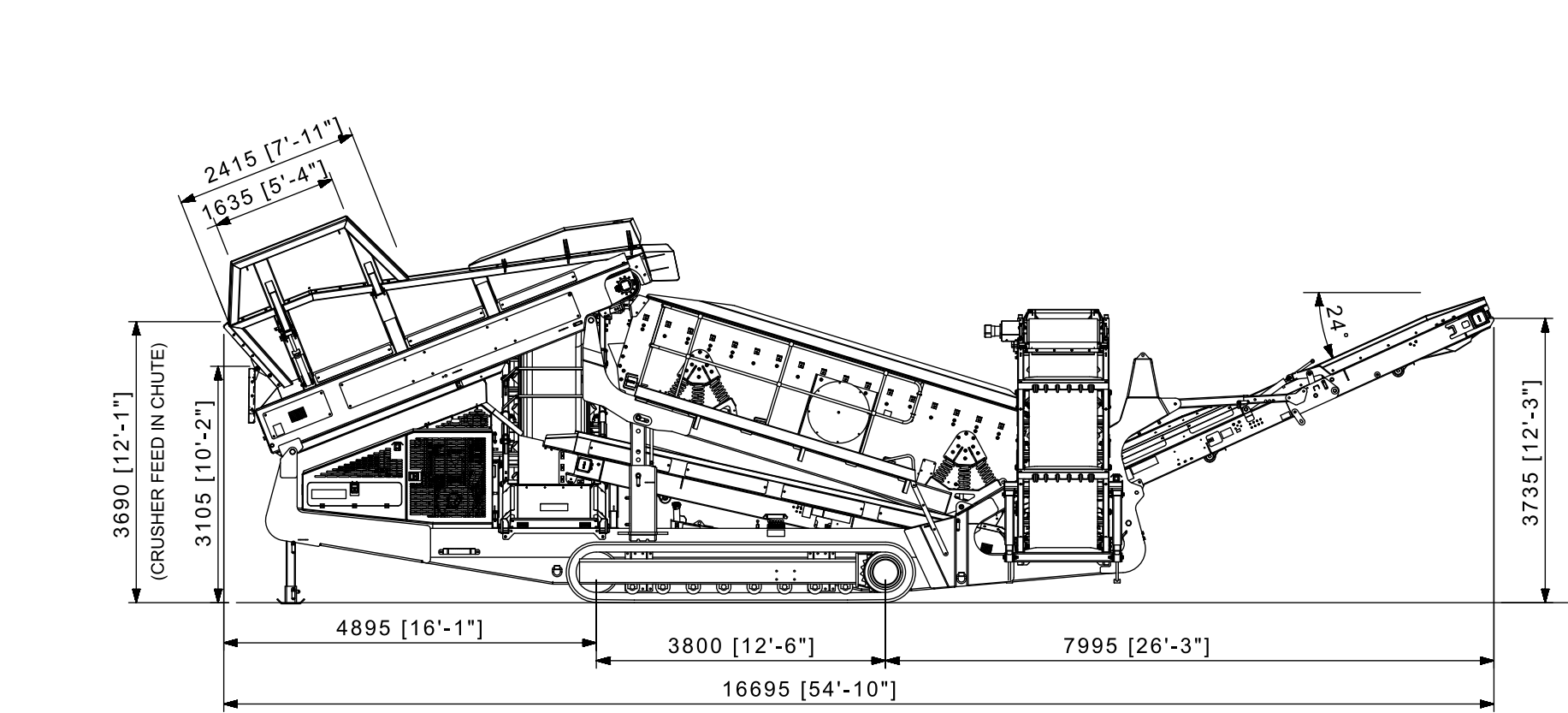
7. No Liability for Others' Work. Metso does not accept any liability for defects, faults or occurrences incurred as a result of any service, maintenance, repair or replacement carried out by others than Metso or its authorized representative.

8. Genuine Metso Parts Required. No claim will be considered and this Warranty will be null and void to the extent any defect, fault or occurrence has been caused as a result of the use of other than GENUINE METSO SPARE AND WEAR PARTS in the equipment or plant in question.

9. Services. Metso warrants that the services provided by Metso under the Contract shall be performed in a workmanlike manner. Unless otherwise agreed, no warranty of any kind is given by Metso as it comes to the outcome of the equipment, plant or system or other outcome of the services. Upon User's notification, Metso shall investigate the claimed defect in the services and shall, in its sole discretion, either carry out a defective part of the services again or reimburse the relevant portion of the price as User's entire and exclusive remedy.

10. Applicable Metso Companies and Products. This Warranty shall apply only to the Metso equipment, components, parts and services and Metso companies specified in the Contract.

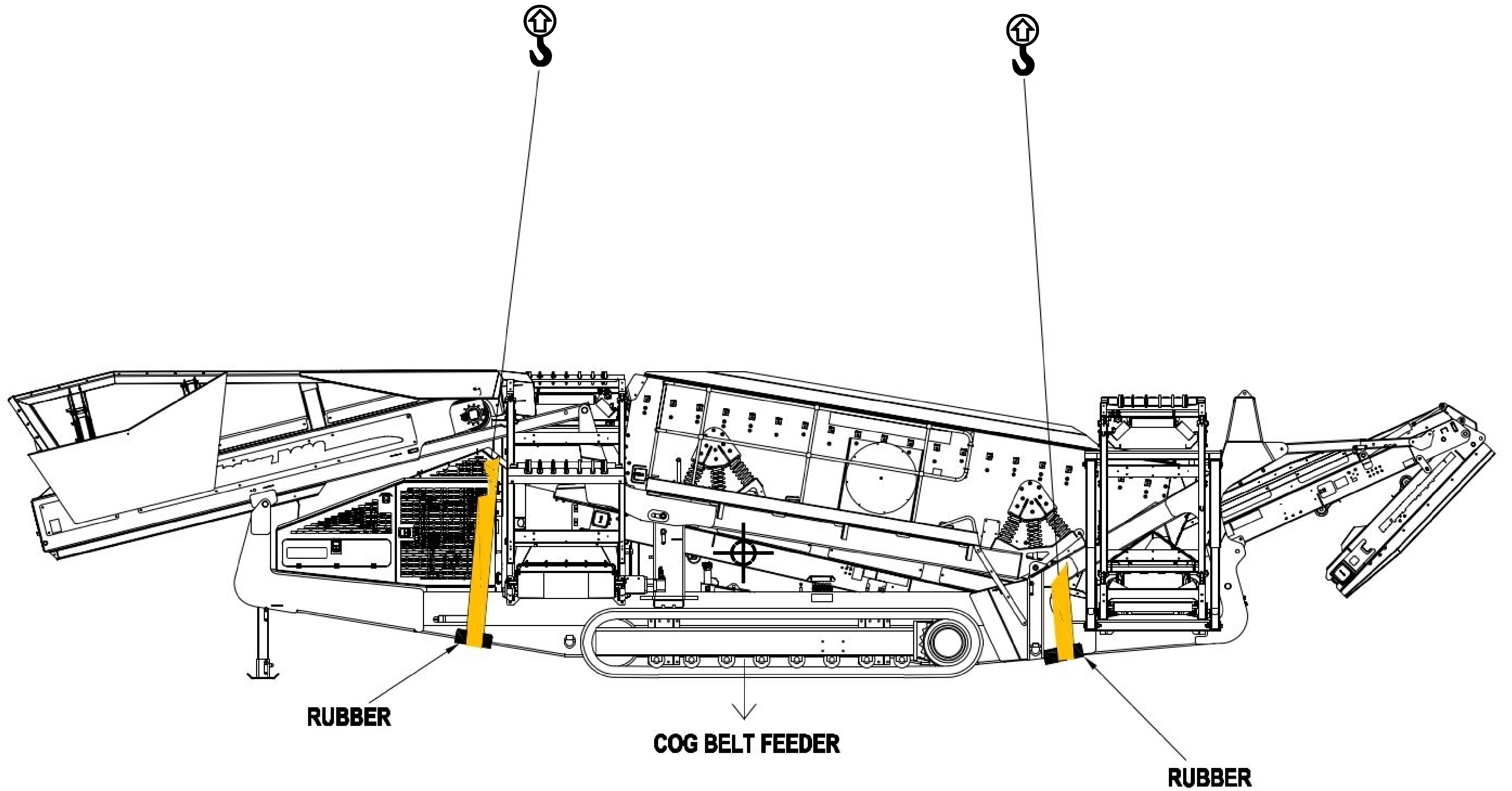
THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER LIABILITIES, WARRANTIES, CONDITIONS AND REMEDIES, WHICH ARE HEREBY EXCLUDED, DISCLAIMED AND WAIVED BY THE PARTIES WITH RESPECT TO METSO'S WARRANTY OBLIGATIONS FOR THE EQUIPMENT, COMPONENTS, PARTS AND SERVICES PROVIDED BY METSO.



TRANSPORT WEIGHT BELT FEEDER - 37220Kg
TRANSPORT WEIGHT APRON FEEDER - 39500Kg

1		-	Irehassilo	24-Feb-2020	
0		-	Ireturvaat	01-Nov-2019	50/0014/27392
REV	DESCRIPTION OF CHANGE	LOC	BY	DATE	ECN

ALL DIMENSIONS IN MM		STANDARDS AND INSTRUCTIONS FOR MANUFACTURING General tolerances N1147752, Welding specifications N11449040 and N11492104, Tightening torques N11492503, Surface treatment N11528257, N11529634 / N11530835 and N11530037				SURFACE FINISHING: -	
	WEIGHT (Kg) 37220	DRAWN BY: treturvaat	CHECKED BY: trehassilo	APPROVED BY: trejokirju		CUSTOMER:	
		DATE: 01-Nov-2019	DATE: 24-Feb-2020	DATE: 24-Feb-2020		LOCATION:	
 THIS INFORMATION IS CONFIDENTIAL AND PROPRIETARY TO METSO CORPORATION OR ITS SUBSIDIARIES (METSO) AND IS PROTECTED BY TRADE SECRET, COPYRIGHT AND/OR OTHER LAWS. IT MAY NOT BE ACCESS, COPIED OR DISCLOSED WITHOUT THE WRITTEN CONSENT OF METSO. ALL RIGHTS RESERVED.		PROJECT NO: EQUIPMENT NO:		MATERIAL NUMBER			
		DRAWING DESCRIPTION DIMENSIONAL DRAWING Nordtrack S2.11 transport/general arrangement		DRAWING NUMBER MM1414448			
		1	RESTRICTED	A2	1/2		



**APRON FEEDER MODEL
BELT FEEDER**

**39.5 TONNES
37.2 TONNES**

1		-	Irehassio	24-Feb-2020	
0		-	Irehassio	01-Nov-2019	50/0014/27392
REV	DESCRIPTION OF CHANGE	LOC	BY	DATE	ECN

ALL DIMENSIONS IN MM		STANDARDS AND INSTRUCTIONS FOR MANUFACTURING General tolerances N1147752, Welding specifications N11449040 and N11492104, Tightening torques N11492503, Surface treatment N11528257, N11529634 / N11530835 and N11530037			SURFACE FINISHING: -	
 1ST ANGLE PROJECTION	WEIGHT (Kg)	DRAWN BY: Irehassio	CHECKED BY: Irehassio	APPROVED BY: Irehassio	CUSTOMER:	
	37220	DATE: 01-Nov-2019	DATE: 24-Feb-2020	DATE: 24-Feb-2020	LOCATION:	
		PROJECT NO: EQUIPMENT NO:			MATERIAL NUMBER	
		DRAWING DESCRIPTION Nordtrack S2.11 transport/general arrangement			DRAWING NUMBER MM1414448	
THIS INFORMATION IS CONFIDENTIAL AND PROPRIETARY TO METSO CORPORATION OR ITS SUBSIDIARIES (METSO) AND IS PROTECTED BY TRADE SECRET, COPYRIGHT AND/OR OTHER LAWS. IT MAY NOT BE ACCESS, USED, COPIED OR DISCLOSED WITHOUT THE WRITTEN CONSENT OF METSO. ALL RIGHTS RESERVED.		REV	1	RESTRICTED	DWG SIZE A2	PAGE 2/2



Feedback on Technical Documentation

Please give feedback on our technical documentation.

Fill in the form below and send it to:

aggregates_technical_documentation@mogroup.com

From:	Name
	Company
	Address
	Country

Document type	Instruction Manual ☐ Spare Part Catalogue ☐ Other Document ☐
Page(s)	
Machine type	
Serial number	
Date	
Suggestions, comments, remarks, etc.	

Please, contact me: _____
e-mail address

Print Form

Submit by e-mail

Metso:Outotec

Nordtrack S2.11

D100013548-EN
Revision 2

Original instructions

Instruction Manual



Serial Number

Year of Construction

Dealer Stamp

Notes

Record of Revisions

Revision Number	Reason for Change	Date
0	Manual released.	15/11/2019
1	Tier 3/Tier 4F OLED Control Panel Removed Stage V DSE Control Panel Added	19/03/2021
1.1	Hydraulic Chrome Maintenance schedule updated Storage section added Return Line Filter maintenance updated	19/05/2021
2	OLED Tier 3 / Tier 4 Control Panel added Side Conveyor procedure updated Restricted Area During Operation section added Tipping Grid Option Removed	25/04/2022

Intentionally Left Blank

Table of Content

1	Introduction.....	1-2
1.1	Operations Manual Guide	1-2
(1)	Optional Equipment	1-2
1.2	Safety Information	1-3
(1)	Safety Warning Symbol	1-3
(2)	ANSI Hazard Classification System	1-3
(3)	California Proposition 65 Warnings	1-3
1.3	Machine Designated Use	1-4
1.4	Machine Storage	1-4
1.5	Declaration of Conformity.....	1-4
1.6	Copyright.....	1-4
2	Safety	2-2
2.1	Safety Symbol Classification	2-2
(1)	Safety Warning Symbol	2-2
(2)	ANSI Hazard Classification System	2-2
(3)	Description of Safety Symbols.....	2-3
2.2	Safety Signs on the Machine.....	2-8
2.3	Health and Safety Decal Locations	2-11
2.4	Personal Safety.....	2-13
(1)	Personal Protective Equipment	2-13
2.5	Work Area Safety	2-14
(1)	General Work Area Guidelines	2-14
(2)	Safety Warnings and Labels.....	2-14
(a)	Modifications	2-14
(3)	Transportation Safety	2-15
(4)	Operation Safety.....	2-16
(5)	Hydraulic and Pneumatic Safety	2-17
(6)	Electrical Safety	2-18
(7)	Maintenance Safety	2-19
(8)	Gas, Dust, Steam, Smoke	2-21
(9)	Hazardous Substances	2-21
(10)	Noise Levels	2-21
(11)	Magnetic Material Equipment	2-21
2.6	Restricted Area During Operation	2-22
2.7	Emergency Stop Locations	2-23
(1)	Emergency Stop Locations	2-23
3	Technical Data.....	3-2
3.1	General Information.....	3-2
(1)	Fines Product Side Conveyor	3-2
(2)	Mid Product Side Conveyor	3-2
(3)	Oversize Product Tail Conveyor	3-2
(4)	Transport Dimensions.....	3-2
(5)	Working Dimensions.....	3-2

Table of Content

3.2	General Layout.....	3-3
3.3	Machine Measurements	3-4
(1)	Elevation	3-4
3.4	Plan View	3-5
3.5	Noise levels (measured with machine idling)	3-6
4	Operational Procedures	4-4
4.1	Prior to Use	4-4
4.2	Prestart Inspection	4-4
4.3	Machine Location	4-4
4.4	Control Panel Overview.....	4-5
(1)	Universal Screener Panel (OLED Tier 3 / Tier 4 Control Panel).....	4-5
(2)	Panel Display	4-6
(3)	Panel Display Menu.....	4-7
(4)	Display Functions and Selection	4-8
(5)	Deutz After Treatment Screens (Option)	4-12
(6)	Control Panel Error Screen	4-13
(a)	Universal Control Panel Error List.....	4-13
(7)	DEF Purge (Optional)	4-16
(a)	Complete Power Down Sequence	4-16
(8)	Remote Control Informations.....	4-17
(9)	Feeder Radio Handset	4-18
(a)	Feeder Radio Handset Functions Overview	4-19
(10)	Feeder Radio Handset Coding (Option)	4-20
(11)	Control Panel Auxiliary Buttons	4-20
4.5	Starting the Engine	4-21
(1)	Setting Engine Speed (Non Fixed Speed Option)	4-22
(2)	Setting Engine Speed (Fixed Speed Option).....	4-22
4.6	Starting Electric Motors (Dual Power Option).....	4-23
4.7	Machine Tracking	4-25
(1)	Before moving the machine perform the following checks:	4-25
(2)	Remote Control.....	4-27
(3)	Switching Handset On and Off	4-27
(4)	Unlocking the Handset	4-27
(5)	Pairing Remote Control Handset to Machine	4-28
(6)	Tracking	4-29
4.8	Stage V DSE Control Panel Overview	4-31
(1)	Panel Lock	4-32
(2)	Key Switch	4-32
(3)	Buttons.....	4-33
(4)	Display Unit.....	4-34
(a)	LCD Panel.....	4-35
(b)	Multi- function Buttons	4-35
(c)	Navigation Buttons	4-35
(d)	LED	4-36
4.9	Screens Overview	4-37
(1)	Main Screen.....	4-37

(a) Meter	4-39
(b) Bar Chart.....	4-39
(c) Engine Hours	4-40
(2) Warning Symbols.....	4-40
(3) Tracking/Radio Screen	4-46
(a) Buttons on Tracking/Radio Screen	4-46
(b) Tracking/Radio Screen Elements.....	4-48
(4) Engine Information Screen 1	4-50
(a) Engine Information Screen 1 Buttons	4-50
(b) Engine Information Screen 1 Bar-Charts	4-51
(c) Fuel Usage.....	4-51
(d) Engine Hours	4-51
(5) Engine Information Screen 2 (DEF)	4-52
(a) Engine Information Screen 2 (DEF) Buttons.....	4-52
(b) Engine Information Screen 2 (DEF) Bar-Charts	4-53
(6) Engine Information Screen 2 (DPF)	4-54
(a) Engine Information Screen 2 (DPF) Buttons.....	4-54
(b) Engine Information Screen 2 (DPF) Bar-Charts	4-55
(c) Time Since Last Regeneration.....	4-55
(7) Machine Information Screen 1.....	4-56
(a) Machine Information Screen 1 Buttons.....	4-56
(b) Hydraulic Oil Status	4-57
(8) Machine Information Screen 2.....	4-58
(a) Machine Information Screen 2 Buttons.....	4-58
(9) Settings Screen	4-59
(a) Settings Screen Buttons	4-60
(b) Settings Screen Version Information.....	4-60
4.10 Controlling and Monitoring the Engine	4-61
(1) Starting the Engine	4-61
(2) Stopping the Engine	4-63
(3) Controlling Engine Speed.....	4-64
(a) Increasing Engine Speed.....	4-64
(b) Decreasing engine Speed.....	4-64
(4) Monitoring the Engine.....	4-65
(a) Engine Speed	4-65
(b) Engine Load.....	4-66
(c) Fuel Information	4-67
(d) Oil Pressure	4-69
(e) Coolant Information.....	4-69
(f) Air Intake Information.....	4-70
(g) Battery Information.....	4-71
(h) Other Engine Information.....	4-72
(5) Exhaust After treatment (Stage V Engines).....	4-73
(a) Diesel Exhaust Fluid (DEF).....	4-73
(b) Diesel Particulate Filter (DPF)	4-75
(c) Engine Protection for After treatment Failure.....	4-78

Table of Content

(d) Delayed Engine Shutdown (CAT 7.1 Stage V Engine)	4-79
4.11 Moving the Machine	4-80
(1) Tracking Handset Overview.....	4-80
(a) Establishing a Wired Handset Connection.....	4-81
(b) Establishing a Wireless Handset Connection	4-82
(2) Unlocking the Handset	4-85
(3) Using Handset to Control the Tracks	4-87
4.12 Operating the Machine	4-90
(1) Starting the Machine.....	4-90
(2) Stopping the Machine	4-90
(3) Operating the Feeder	4-91
4.13 Remote Handsets.....	4-95
(1) Tracking Handset Overview.....	4-95
(a) Handset Controls and LEDs	4-95
(b) Handset Connector	4-98
(c) Wired (Doglead) Mode.....	4-99
(d) Wireless (Radio) Mode	4-99
(2) Operational Handset Overview.....	4-100
(3) Handset Charging.....	4-102
(4) Activating/Deactivating the Track Handset	4-103
(a) Switching ON and Off.....	4-103
(b) Locking and Unlocking.....	4-103
(5) Operational Handset.....	4-106
4.14 Machine Error Codes	4-107
4.15 Hydraulic Control Valve Operation	4-110
4.16 Pictorial Decal Descriptions.....	4-111
(1) Machine Operations Decals	4-111
(2) Machine Information Decals	4-116
4.17 Machine Tracking	4-119
(1) Before moving the machine perform the following checks:	4-119
4.18 Machine Setup	4-121
(1) Unfolding the Left Hand Side Conveyor	4-121
(2) Unfolding the Right Hand Side Conveyor	4-125
(3) Unfolding the Tail Conveyor.....	4-127
(4) Raising the Screen Box	4-129
(5) Feeder Setup	4-131
(6) Feeder Support Legs	4-134
4.19 Machine Components Start-Up Procedure	4-135
4.20 Machine Shut Down Procedure.....	4-137
4.21 Machine Lockout and Tag Out Procedure	4-137
4.22 Emergency Stop Procedure	4-138
(1) Emergency Stop Locations	4-139
5 Transportation.....	5-2
5.1 Preparing Machine for Transport.....	5-3
(1) Slide The Feeder Into Transport Position	5-3
(2) Lowering Screenbox for Transport	5-5

(3)	Folding Tail Conveyor	5-6
(4)	Raising the Feeder Support Legs.....	5-8
(5)	Placing Feeder in Transport Position.....	5-9
(6)	Placing Left Hand Side Conveyor in Transport Position.....	5-10
(7)	Folding Right Hand Side Conveyor for Transport.....	5-15
6	Maintenance	6-3
6.1	Regular Servicing	6-3
6.2	Machine Storage	6-4
6.3	Fuel System	6-5
(1)	Check Fuel Level and Top up	6-5
(a)	Machines Without Optional Fuel Pump.....	6-5
(b)	Machines With Optional Fuel Pump.....	6-5
(c)	Machines With AdBlue Tanks.....	6-5
6.4	Unscheduled Maintenance.....	6-6
6.5	Tracks.....	6-6
6.6	Maintenance Schedules	6-7
(1)	Daily or 8 Hour Maintenance Schedule	6-7
(2)	Weekly or 50 Hour Maintenance Schedule	6-8
(3)	Monthly or 250 Hour Maintenance Schedule	6-9
(4)	500 Hour Maintenance Schedule	6-9
(5)	1000 Hour Maintenance	6-10
(6)	2500 Hour Maintenance Schedule	6-10
6.7	Engine Maintenance Schedules.....	6-11
(1)	CAT Engine Maintenance Schedules	6-11
(a)	When Required	6-11
(b)	Daily	6-11
(c)	Weekly	6-11
(d)	Every 50 Service Hours or Monthly	6-11
(e)	Every 250 Service Hours	6-12
(f)	Every 500 Service Hours	6-12
(g)	Every 500 Service Hours or 1 Year.....	6-12
(h)	Every 1000 Service Hours	6-12
(i)	Every 1500 Service Hours	6-12
(j)	Every 2000 Service Hours	6-13
(k)	Every 3000 Service Hours	6-13
(l)	Every 3000 Service Hours or 2 Years	6-13
(m)	Every 4000 Service Hours	6-13
(n)	Every 6000 Service Hours or 3 Years	6-13
(o)	Every 12000 Service Hours or 6 Years	6-13
6.8	Lubrication.....	6-14
6.9	Servicing Conveyors	6-16
(1)	Clean & Check the Conveyor Belts	6-16
(2)	Tensioning the Conveyor Belts	6-17
(3)	Conveyor Alignment	6-18
6.10	Apron Tensioning.....	6-19
6.11	Servicing the Tracks	6-20

Table of Content

6.12	Measuring Track Tension	6-21
6.13	Adjusting Track Tension	6-22
6.14	Gearbox Oil Level.....	6-23
(1)	Checking and Filling Gearbox Oil	6-23
(2)	Draining Gearbox Oil	6-24
6.15	Servicing DEF Tank Filters (Tier 4 / Stage V).....	6-25
(1)	DEF Fluid Filter	6-25
(2)	DEF Screen Filter	6-28
(3)	DEF Manifold Filter	6-29
6.16	Servicing the Hydraulic System.....	6-30
(1)	Changing Hydraulic Filters	6-30
(2)	Changing Hydraulic Oil	6-31
6.17	Changing Air Filter Elements.....	6-32
6.18	Replacing Screen Media	6-33
(1)	Replacing Top (and Middle) Deck Screens	6-33
(2)	Replacing Bottom Deck Screens.....	6-35
6.19	Checking the Screen Box Running Condition	6-37
(1)	Checking if Screen Box is in Tune.....	6-37
7	Troubleshooting.....	7-2
7.1	General Troubleshooting	7-2
7.2	Hydraulic Troubleshooting.....	7-5
7.3	Tracks Troubleshooting	7-6
7.4	Machine Error Codes	7-8
7.5	Cat Engine Fault Codes	7-11
	Glossary.....	A-2

Table of Content

1	Introduction.....	1-2
1.1	Operations Manual Guide	1-2
(1)	Optional Equipment	1-2
1.2	Safety Information	1-3
(1)	Safety Warning Symbol	1-3
(2)	ANSI Hazard Classification System	1-3
(3)	California Proposition 65 Warnings	1-3
1.3	Machine Designated Use	1-4
1.4	Machine Storage	1-4
1.5	Declaration of Conformity.....	1-4
1.6	Copyright.....	1-4

1 Introduction

1.1 Operations Manual Guide

This operations manual has been designed to help you properly and safely operate and maintain your new machine to ensure many years of safe, reliable and efficient service. Make sure that all owners and operators read and understand this manual fully to learn how to operate your machine. Failure to do so could result in personal injury or equipment damage. Consider this manual a permanent part of your machine. Keep it with the machine at all times.

Follow all applicable safety regulations and recommendations in this manual as appropriate to your machine and the situation/conditions prevailing at the time.

Federal, State, National and Local laws and safety regulations must be complied with at all times to prevent possible danger to person(s) or property from accidents or harmful exposure.

Where supplied as a basic machine only, (with or without optional extras, e.g. drive elements, etc.), the machine is intended for incorporation into a complete processing machine that is NOT designed and/or constructed by Metso Outotec. In these circumstances, or where supplied as a replacement machine, Metso Outotec will NOT be responsible for addressing environmental issues and/or health and safety protection measures for the machine installation as a whole and will bear NO responsibility for ensuring compliance with any regulations and/or statutory requirements that may apply unless specifically included in the Contract of Sale.

INFORMATION AND ADVICE

If you need any information or advice regarding your machine please contact:

Metso Outotec Lokomonkatu 3
P.O. Box 306
FI-33101
Tampere, Finland

Phone: +358 20 484 142

Fax: +358 20 484 143

Web: www.mogroup.com

(1) Optional Equipment

Some machines can include optional equipment and/or special features additional to the standard specification. These may affect the information given in this operations manual. Look in the appendix of this operations manual for any addendum which may relate to additional equipment or variations to the standard specification. Take note of any variations to the standard procedures and/or component specifications.

1.2 Safety Information

(1) Safety Warning Symbol



In conjunction with the text which follows it, this safety warning symbol is used as a “safety warning system” in these operating instructions. The safety warning symbol indicates a risk of personal injury. Follow all instructions which appear after this safety warning symbol in order to avoid injury or fatal accidents.

(2) ANSI Hazard Classification System

A multi-tier hazard classification system is used to alert you to potential personal injury hazards. Signal words used with the safety alert symbol indicate a specific level of severity of the potential hazard. Signal words used without the safety alert symbol relate to property damage and protection only. All are used as attention-getting devices throughout this manual as well as on ANSI type decals and labels fixed to the machine.



DANGER

This indicates a hazardous situation which, if not avoided, will result in death or serious injury. The safety alert symbol is shown with this danger classification.



WARNING

This indicates a hazardous situation which, if not avoided, could result in death or serious injury. The safety alert symbol is shown with this danger classification.



CAUTION

This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. The safety alert symbol is shown with this danger classification.

NOTICE

This indicates a message related to property damage. The safety alert symbol is not shown with this danger classification.

(3) California Proposition 65 Warnings

This product can expose you to chemicals including lead and lead compounds (as contained e.g. in batteries and related accessories), which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

1.3 Machine Designated Use

This machine is a portable, self-contained screening plant for screening materials into various sizes. Typical materials include rock, soil, gravel, sand, coal and landfill. If you need to crush any other material not listed please consult with the factory.

Metso Outotec cannot be held liable for any damages resulting from misuse.

1.4 Machine Storage

To protect your machine from rust corrosion during seasonal shutdown, shipment or for outdoor storage (winter or summer), please refer to: "6.2 Machine Storage" on page 6-4.

If you have further questions related to the storage or safety at work contact Metso Outotec.

1.5 Declaration of Conformity

This machine is in conformity with the provisions of the EC Machinery Directive 2006/42/EC together with appropriate EN Harmonised Standards and National BS Standards and Specifications.

1.6 Copyright

The copyright of this operations manual is reserved by Metso Outotec.

This operations manual contains information and technical drawings, which may not be copied, distributed, altered, stored on electronic media, revealed to others or used for the purpose of competition, either partially or in its entirety.

The right is reserved to alter any details contained in this manual without notice.

Copyright 2022

Metso Outotec

Lokomonkatu

P.O Box 306

FI-33101

Tampere, Finland

To order additional copies contact your local dealer.

Table of Content

2	Safety	2-2
2.1	Safety Symbol Classification	2-2
(1)	Safety Warning Symbol	2-2
(2)	ANSI Hazard Classification System	2-2
(3)	Description of Safety Symbols.....	2-3
2.2	Safety Signs on the Machine.....	2-8
2.3	Health and Safety Decal Locations	2-11
2.4	Personal Safety	2-13
(1)	Personal Protective Equipment	2-13
2.5	Work Area Safety	2-14
(1)	General Work Area Guidelines	2-14
(2)	Safety Warnings and Labels.....	2-14
(a)	Modifications	2-14
(3)	Transportation Safety	2-15
(4)	Operation Safety.....	2-16
(5)	Hydraulic and Pneumatic Safety	2-17
(6)	Electrical Safety	2-18
(7)	Maintenance Safety	2-19
(8)	Gas, Dust, Steam, Smoke	2-21
(9)	Hazardous Substances	2-21
(10)	Noise Levels	2-21
(11)	Magnetic Material Equipment	2-21
2.6	Restricted Area During Operation	2-22
2.7	Emergency Stop Locations	2-23
(1)	Emergency Stop Locations	2-23

2 Safety

Most accidents involving product operation, service and transportation are caused by failure to observe basic safety rules and precautions. Recognizing all possible safety hazards before acting can often prevent accidents. Any person(s) involved in the operation, maintenance or transportation of this machine must observe each situation for potential hazards. The Person(s) must also possess the required knowledge, skill and equipment required to perform these tasks appropriately. The warnings located on the machine and those in this publication are NOT inclusive. Metso Outotec strive to foresee all potential hazardous situations but cannot anticipate every possible situation that can prove potentially hazardous. For any function performed not recommended by Metso Outotec, you must satisfy yourself that it is safe for you and for others and the action must not compromise the safety or function of the product.

2.1 Safety Symbol Classification

The following signs and designations are used in the manual to designate instructions of particular importance.

(1) Safety Warning Symbol



The safety warning symbol indicates a risk of personal injury. Follow all instructions which appear after this safety warning symbol in order to avoid injury or fatal accidents.

(2) ANSI Hazard Classification System

A multi-tier hazard classification system is used to alert you to potential personal injury hazards. Signal words used with the safety alert symbol indicate a specific level of severity of the potential hazard. Signal words used without the safety alert symbol relate to property damage and protection only. All are used as attention-getting devices throughout this manual as well as on ANSI type decals and labels fixed to the machine.



DANGER

This indicates a hazardous situation which, if not avoided, will result in death or serious injury. The safety alert symbol is shown with this danger classification.



WARNING

This indicates a hazardous situation which, if not avoided, could result in death or serious injury. The safety alert symbol is shown with this danger classification.



CAUTION

This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. The safety alert symbol is shown with this danger classification.

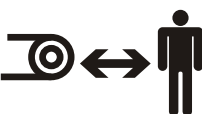
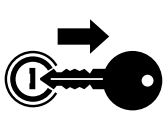
NOTICE

This indicates a message related to property damage. The safety alert symbol is not shown with this danger classification.

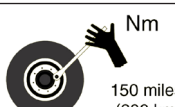
(3) Description of Safety Symbols

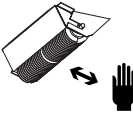
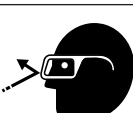
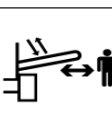
This machine is fitted with a number of safety warning decals to highlight potential risks. These warnings must be obeyed at all times. If one of the decals becomes detached or damaged it must be replaced. The safety decals use pictograms to indicate the relevant risk in line with ISO requirements and pictograms with text in line with ANSI requirements and will be equipped with same dependant on your region. A full list of explanations for each pictogram can be found in this section.

Table 2.1 - Description of Safety Symbols

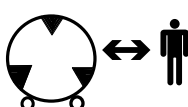
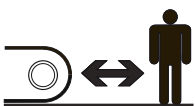
Symbol	Description
	Electrocution hazard Electrical shock/ electrocution from conveyor to power line contact.
	Stay sufficient distances from electrical power lines.
	Entanglement hazard Entanglement in belt drive or conveyor.
	Entanglement hazard Entanglement in belt drive.
	Stay clear of conveyor.
	Install covers and guards before operation.
	Turn machine off and remove the key.
	Lockout machine.
	Read and understand operations manual before using equipment.
	Injection hazard Skin injection from high pressure fluid.

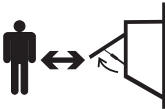
2 Safety

Symbol	Description
	Use safe methods to check for hydraulic leaks.
	Crush hazard Crushed foot from support leg.
	Stay clear of support legs and jacks.
	Falling material hazard Risk from falling or flying material.
	Stay clear of hopper during operation.
	Fall Hazard Falling from a height.
	Do not climb onto the machine.
	Use personnel lift to reach high places.
	Check tyre pressures prior to transport.
	Check wheel nut torque. Recheck wheel nut torque every 150 miles (200km).
	Connect and check braking system.
	Crush hazard Crushing of fingers or hand. Force applied in one direction.
	Keep hands clear of openings.

Symbol	Description
	Hand entanglement in pulley/ winch
	Keep hands clear of moving components
	Electrocution hazard Electric shock/ electrocution.
	Hearing hazard Risk of loss or degradation of hearing.
	Wear hearing personal protective equipment.
	Explosion hazard Risk of explosion during an operation or service procedure.
	Burn hazard Risk Of burns from corrosive material.
	Keep open flame away.
	Emergency Stop Press to engage, twist to reset.
	Flying Material Hazard Risk of being struck by flying objects
	Wear eye personal protective equipment
	Crush Hazard Crush risk from overhead impact.
	Stay clear of moving conveyors.

2 Safety

Symbol	Description
	Unauthorized persons prohibited.
	Flying Material Hazard risk of being struck by flying material.
	Do not stand on platform while machine is in operation
	Do not stand on machine while in operation.
	Inhalation Hazard Inhalation of poisonous/ toxic fumes or dust.
	Use dust suppression (water spray) or dust collection (filter) during operation of this equipment.
	Wear respiratory personal protective equipment.
	Cutting Hazard Contact with knives in trommel drum will result in death or serious injury.
	Stay clear of sharp knives in trommel drum.
	Crush Hazard Crush from track machine run over.
	Stay clear of track machine.
	Crush Hazard Crush from wheel machine run over.
	Stay clear of wheeled machine.

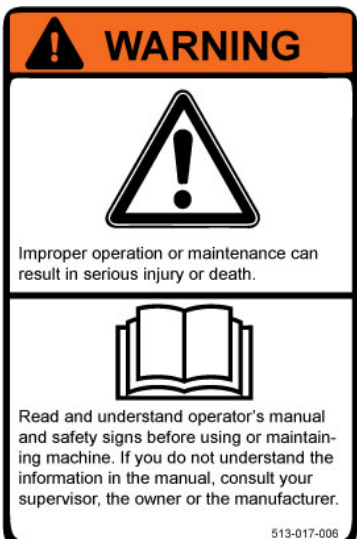
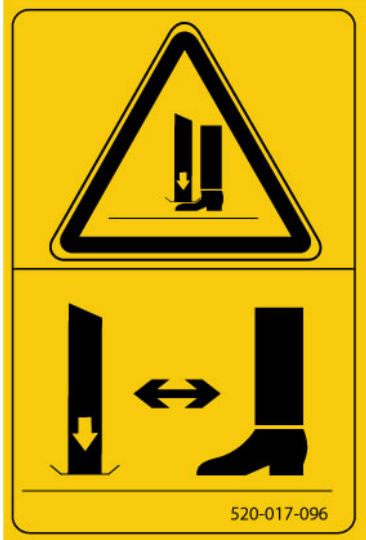
Symbol	Description
	Explosion Hazard Battery Explosion.
	Keep welding sparks away from the battery area.
	Burn Hazard Burn from hot surface or liquid
	Stay clear of hot surface or liquid.
	Impact Hazard Impact from spring loaded door.
	Stay clear of spring loaded door while opening.
	Safety Harness Safety harness is required when working above ground level.
	No access for people with active implanted cardiac devices
	Warning Magnetic Field

2.2 Safety Signs on the Machine

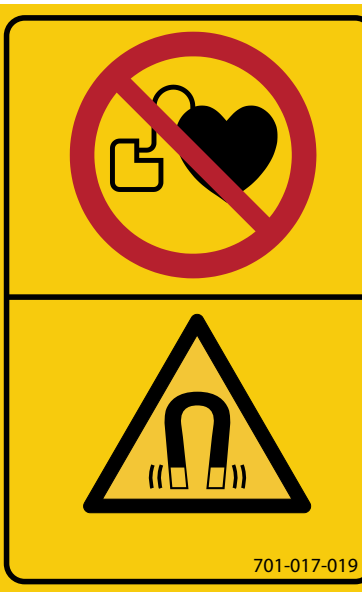
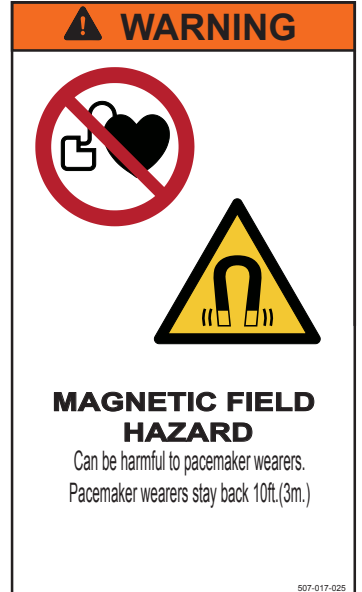
Table 2.2 lists the safety signs that are on this machine.

Table 2.2 - Safety Signs

Item		Sign	
		ISO	ANSI
1	Entanglement Hazard		
2	Emergency Stop		
3	Falling Material		

Item		Sign	
		ISO	ANSI
4	Do not Operate machinery without understanding how it operates		
5	Noise Hazard		
6	Crushing Hazard from extendible legs		

2 Safety

Item		Sign	
		ISO	ANSI
7	Burn Hazard from hot surface		
8	Safety harness is required when working above ground level		
9	(Optional) Magnetic Field Hazard, can be harmful to Pacemaker wearers stay back 3 meters (10ft)		

2.3 Health and Safety Decal Locations

See Illustrations below showing the Health and Safety Decal Locations all numbers Correspond with “Table 2.2 - Safety Signs”

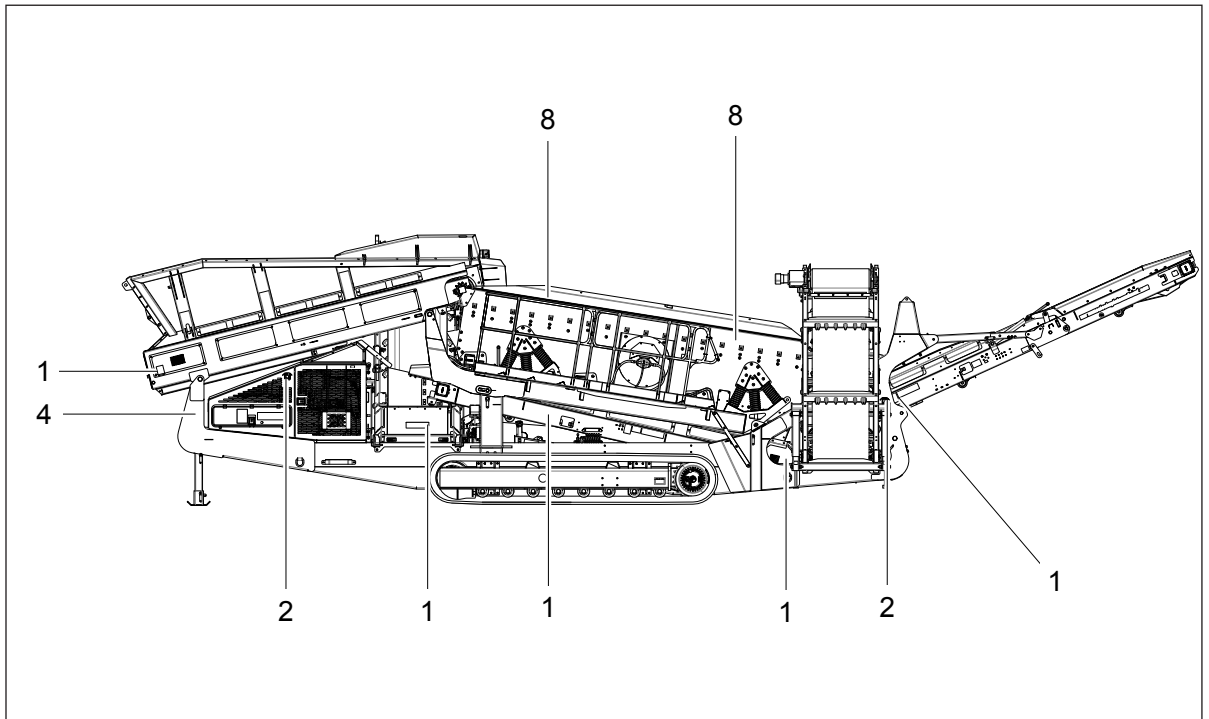


Figure 2.1 - RHS Health and Safety Decal Locations

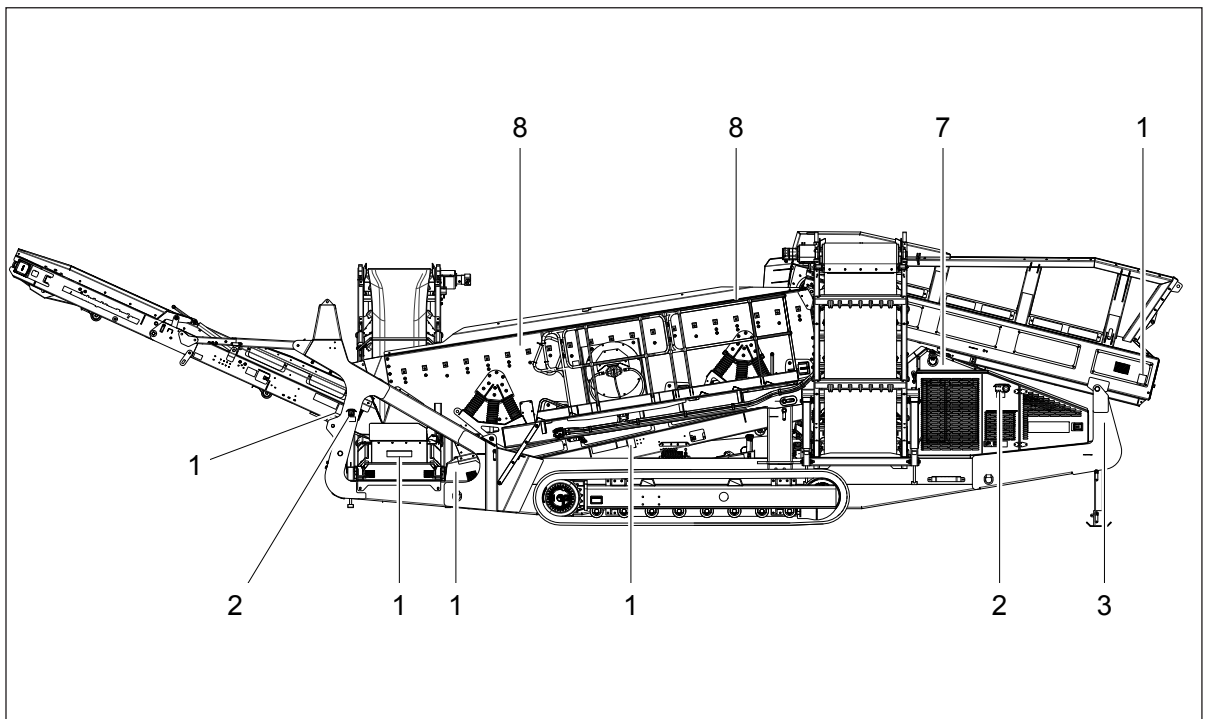


Figure 2.2 - LHS Health and Safety Decal Locations

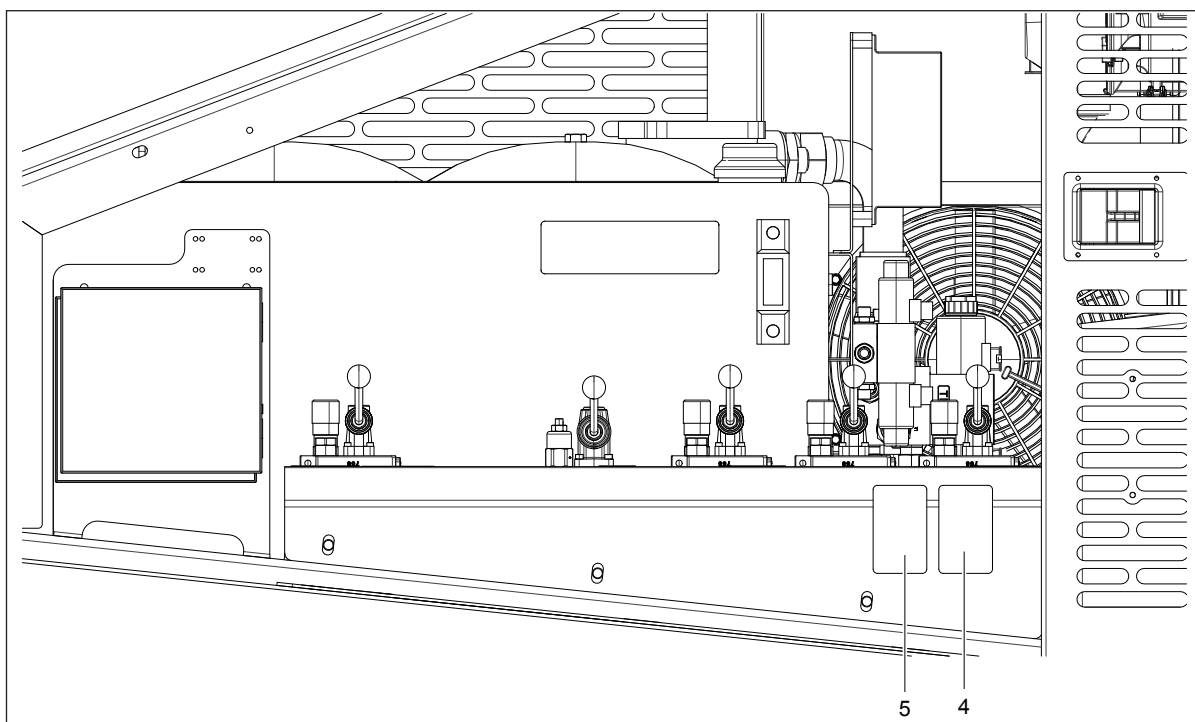


Figure 2.3 - Back Health and Safety Decal Locations

2.4 Personal Safety

Ascertain from the appropriate authority and observe all statutory and any other regulations that may apply to the planned location before operating the machine. Operators must be trained in the correct and safe use of all equipment.

Before operation the operator(s) must:

- Have received specific and adequate training in the task to be carried out.
- Have read and understood the operations manual and the Safety Signs in this manual and around the machine(s).
- Knows the location and function of controls and safety features such as emergency stop buttons and safety guards.
- Be aware of all moving parts of the machine.

Any work on and/or with the machine must be executed by trained, reliable and authorised personnel only. Statutory minimum age limits must be observed.

Work on the electrical system and equipment of the machine must be carried out only by a skilled electrician or by instructed persons under the supervision and guidance of a skilled electrician and in accordance with electrical engineering rules and regulations.

Work on the hydraulic system must be carried out only by personnel with special knowledge and experience of hydraulic equipment.

(1) Personal Protective Equipment

Where possible when working close to engines or machinery, only do so when they are stopped. If this is not practical, remember to keep tools, test equipment and all other parts of your body well away from the moving parts. Loose or baggy clothing can get caught in running machinery.

For reasons of safety, long hair must be tied back or otherwise secured, garments must be close fitting and no jewelry such as rings may be worn. Injury may result from being caught up in the machinery or from rings catching on moving parts.

Always wear correctly fitting (EN/ANSI approved) protective clothing.

Protective clothing includes: Hard Hat, Safety Glasses, Ear Protection, Dust Mask, Close fitting Overalls, Steel Toed Boots and a High Visibility Vest.

2.5 Work Area Safety

(1) General Work Area Guidelines

Operators must have received specific training in all operating and service tasks as required for the safe operation and service of the machine. Operators must know the location and correct operation of all controls and safety features such as remote stop buttons and isolator switches. Operators must be aware of all moving parts on the machine.

Only authorised and trained personnel involved in the machines operation or maintenance should be in the vicinity of the machine while it is running. All other personnel should be kept at a safe distance.

Keep the work area as neat and as clean as practical. Keep your equipment clean and free of dirt and grease so it can be checked for loose, cracked or broken parts. Replace defective parts as soon as they are discovered.

The guards provided are designed and manufactured to ensure so far as reasonably practicable that the machinery and plant on which they are fitted can be operated safely and without risk to health when properly used. However, it cannot be guaranteed that the guards provided will meet the requirements laid down by individual Inspectors and any additional guard and/or modification to guarding supplied, which may be required for any reason whatsoever, will be charged as an addition to the contract price.

Walkways should only be used when the machine is turned off, unless to perform specific maintenance procedures which require the machine to be operational. In this instance, only suitable trained and authorised personnel equipped with the correct PPE should be allowed access and the machine must be running empty and cleared of all material beforehand.

Always check that walkways and handrails are fully secured in place before using.

Do not smoke or allow smoking near flammable fuels or solvents. Use non flammable solvents for cleaning parts and equipment. Know where fire extinguishers and other fire suppression equipment are located and learn how to use them.

Always use hoisting equipment for heavy loads. Regularly check hooks, cables, shackles and chains for stretch and wear. Never overload hoists, cranes or other lifting devices.

Avoid electrical and static sparks and any open flame while handling, storing, moving or pouring fuels, electrolytes for batteries, hydraulic fluids or coolants.

(2) Safety Warnings and Labels

You can be injured if you do not obey the safety instructions as indicated on warning signs. Observe all safety instructions and warnings attached to the equipment.

Ensure that safety instructions and warnings attached to the equipment are always complete and perfectly legible. Keep warnings and instruction labels clean and up to date.

Replace unreadable or missing labels with new ones before operating the machinery. Make sure replacement parts include warning or instruction labels where necessary.

(a) Modifications

Never make any modifications, additions or conversions which might affect safety without the supplier's approval.

In the event of safety relevant modifications or changes in the behavior of the machinery during operation, stop the machine and lock out immediately and report the malfunction to the competent authority/ person.

(3) Transportation Safety

Before transporting the machine, observe the prescribed transport position, admissible speed and itinerary. Only use appropriate means of transport and lifting gear of adequate capacity. Know the overall height to avoid contacting overhead obstructions such as bridges, power lines etc.

The preparations to move equipment by an articulated lorry should be supervised by a minimum of two persons. Ensure persons transporting the machine adhere to all safety signs and procedures.

Before transportation on public roads, ensure the machine has been properly secured with no loose material left in or on the machine. Always observe the valid traffic regulations and, if necessary, ensure beforehand that the machine is in a condition compatible with these regulations.

Extreme caution is required when transporting machinery on site. Soft or uneven ground may cause accidents. On sloping terrain, always adapt your travelling speed to the relevant ground conditions. Never change to a lower gear on a slope. Always change gear before reaching a slope.

The machine is remote controlled and may start without notice. Stay clear of the machine. The machine must be loaded and transported only in accordance with the operating instructions. For manoeuvring the machine, observe the prescribed transport position, admissible speed and itinerary. Use only appropriate means of transport and lifting equipment and where applicable of adequate capacity. The re-commissioning procedure must be strictly in accordance with the operating instructions. Before travelling with the machine, check that the braking and any signalling and lighting systems are fully functional. Before setting the machine in motion always check that the accessories have been safely stowed away.

On wheel Bogie machines:

Ensure wheel nuts are torqued between 800 to 550 Nm (590 - 627 ft.lb) prior to transport.

Check your tires for:-

- correct pressure
- cuts or bulges
- nails or spikes
- uneven or excessive wear
- missing valve caps

Check your wheels for:-

- damaged rims
- missing or loose wheel nuts or bolts
- obvious misalignment

Have cuts or punctures repaired by authorised personnel before adding air. Beware that an over-inflated tire can explode and cause serious injury or death.

(4) Operation Safety

Before attempting to operate the machine, DO read, fully understand and observe the contents of this manual. Also any other relevant manual for other equipment incorporated in the machine, e.g. Engine manual. Study all safety signs on your machine.

It is emphasized that all safety aspects are checked before starting the machinery.

Make sure that you fully understand the operating procedures for the machine before attempting to start.

Take the necessary precautions to ensure that the machine is used only when in a safe and reliable state.

Operate the machine only for it's designed purpose and only if all guarding, protective and safety orientated devices, emergency shut-off equipment, sound proofing elements and exhausts, are in place and fully functional.

Before starting the engine ensure it is safe to do so. NEVER leave the machine unattended whilst it is in operation.

Before starting, walk completely around the machine. Make sure no one is under it, on it or close to it. Let other workers and bystanders know you are starting up and do not start until everyone is clear of the machine.

Before moving the machine, ensure that everyone is clear from the surrounding area and that the warning siren and beacon and the tracking umbilical Machine Stop button are operating correctly

Make certain enough ventilation is present to run engines safely. Do not start an engine in an enclosed space without properly vented exhaust. Exhaust fumes from gasoline or diesel engines can kill.

DO NOT allow a build up of solid material or dust in any part of the machine. In the event of material blockage, any malfunction or operational difficulty, stop the machine immediately and lockout. Have any defects rectified immediately.

Be alert and watch for pinch points, closing mechanisms, and falling parts when working on or around any machinery. Keep hands and tools clear. In-running nip points on moving machinery can cause serious injury or even death. Do not reach into unguarded machinery. Your arm could be pulled in and amputated. Switch off and lockout the machine before removing any safety devices or guarding.

Never work or stand beneath machinery or attachments as it is raised or lowered. Never work or stand beneath machinery as they are being loaded with and/or discharging material. During operation, do not climb onto, over or under moving conveyor belts and rollers. Always use ladders, steps and walkways when mounting and dismounting.

Hole alignment on mechanical supports must be checked and secured with pins provided and in accordance with safety signs.

Follow safe operating practices. Operate the machine controls smoothly. Avoid sudden stops, starts or changes in direction. Only use emergency stop buttons or emergency stop lines (if fitted) in emergency situations or during safety drills.

Never check the tension of 'V' belts, drive chains and conveyors when machine is running.

DO check frequently the stability of the machine. The chassis SHOULD NOT have undue vibration during operation.

After each day's operation, always run the machine dry; never leave material in the belt feeder on conveyor belts or screen box. Starting a machine with a full load will cause strain problems in your machine.

(5) Hydraulic and Pneumatic Safety

Only persons having special knowledge and experience in hydraulic and pneumatic systems may carry out work on hydraulic and pneumatic equipment. Never disable or alter any hydraulic circuit or component without consulting with Metso Outotec

Relieve all pressure in the hydraulic system by returning all controls to the neutral position. Turn off the machine and isolate power supply before any pipes, filter caps, filters or hydraulic fittings are disconnected or removed. Depressurize all system sections and pressure pipes (hydraulic system, compressed air system) to be removed in accordance with the specific instructions for the unit concerned before carrying out any repair work.

Check for leaks in tanks or tubing with flashlights or other proper equipment. Never use an open flame to check for leaks. Always use a piece of cardboard to check for leaks. Do not use your hand. Hydraulic fluid under pressure can penetrate the skin causing serious injury. If fluid is injected under the skin, it must be surgically removed or gangrene will result. Get medical help immediately if this occurs. Wear personal protective equipment including goggles and gloves.

Check all lines, hoses and screwed connections regularly for leaks and obvious damage. Splashed oil may cause injury and fire. Repair any damage immediately.

Hydraulic and compressed air lines must be laid and fitted properly. Ensure that no connections are interchanged. The fittings, lengths and quality of the hoses must comply with the technical requirements.

Always practice extreme cleanliness servicing hydraulic components.

Do not exceed safe limits. Never set a pressure relief valve to a pressure higher than that set at the factory.

For questions concerning accumulators, which are pressure-containment vessels, contact your Metso Outotec distributor. Malfunctioning valves or poor maintenance practices can result in build-up of extremely high hydraulic and/or pneumatic pressures inside the accumulator.

(6) Electrical Safety

The electrical mode of operation on the electric hydraulic machines operates at 380-415 Volts AC, 50/60Hz.

Work on the electrical system or equipment may only be carried out by a skilled and qualified electrician or by specially instructed personnel under the control and supervision of such an electrician and in accordance with applicable electrical engineering rules and regulations.

Use only original fuses with the specified current rating. Switch off the machine immediately if trouble occurs in the electrical system.

Machines with high voltage electrical equipment must be suitably earth bonded by a qualified electrician prior to activating the main isolator switch. If machine is electric-hydraulic or direct electric drive, the 'mains' electrical supply to the machine should always be isolated by unplugging/uncoupling the 'mains' power socket. It is recommended that an earth leakage safety switch be fitted in the supply line to the power point on site. Special care should be taken to ensure that earth wires are correctly connected.

When working with the machine, maintain a safe distance from overhead electric lines. If work is to be carried out close to overhead lines, the working equipment must be kept well away from them. Check out the prescribed safety distances.

If your machine comes into contact with a live wire:

- Warn others against approaching and touching the machine.
- Have the live wire de-energised.

If provided for in the regulations, the power supply to machines and parts of machines, on which inspection, maintenance and repair work is to be carried out, must be cut off. Before starting any work, check the de-energised parts for presence of power and ground or short circuit them in addition to insulating adjacent live parts and elements.

The electrical equipment of the machine is to be inspected and checked at regular intervals. Defects such as loose connections or scorched or otherwise damaged cables must be rectified immediately.

Necessary work on live parts and elements must be carried out only in the presence of a second person, who can cut off the power supply in the case of danger by actuating the emergency shut off or main power switch. Secure the working area with a red and white safety chain and a warning sign. Use insulated tools only.

Before starting work on high voltage assemblies and after cutting out the power supply, the feeder cable must be grounded and components such as capacitors short-circuited with a grounding rod.

Tracked machines are wired with negative earth. Always observe correct polarity.

Always disconnect battery leads before carrying out any maintenance to the electrical system or servicing the engine. Never short across the starter terminals of a battery as this can cause a fire and could also damage the electrical system. If welding is to be carried out on the machine, it is essential that the powerpack is isolated.

The battery contains sulfuric acid, an electrolyte which can cause severe burns and produce explosive gases. Wear personal protective equipment and avoid contact with the skin, eyes or clothing.

Diesel engine exhaust emissions contain products of combustion which may be harmful to your health. Always operate the machine in a well ventilated area and if operating in an enclosed area, vent the emissions outside. Do not touch any part of the engine or exhaust system. Allow the engine and exhaust to cool before performing any repair or maintenance.

Never fill the fuel tank with the engine running, while smoking or when near an open flame. Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately.

(7) Maintenance Safety

Understand the service procedures before doing work. Keep working area clean and dry. Never lubricate, clean, service or adjust machinery while it is moving. Keep hands, feet and clothing clear of power driven parts and in running nip-points. Disengage all power and operate controls to relieve pressure. Stop the engine, implement the lockout and tag out procedure and allow the machinery to cool before carrying out any maintenance.

Whenever maintenance or service is being carried out a minimum of two (2) persons should be present at all times. NEVER WORK ALONE.

Keep all parts in good condition. Ensure that all parts are properly installed. Fix damage immediately. Replace worn and broken parts. Remove any build up of grease, oil and debris.

Never attempt repairs or adjustments to the machine while it is running unless specified to do so.

Before carrying out any maintenance, relieve all hydraulic pressure by returning the controls to the neutral position and secure all hydraulically operated attachments with pins provided.

Disconnect the battery ground cable before making adjustments on electrical systems or welding on machinery. For the execution of maintenance work, tools and workshop equipment adapted to the task on hand are absolutely indispensable.

Remove only guards or covers that provide access. Wipe away any excess grease and oil. Never leave guards off or access doors open when unattended. Keep bystanders away if access doors are open.

When working beneath raised equipment, always use blocks, jack-stands or other rigid and stable supports. Make sure that any part of the machine raised for any reason is prevented from falling by securing in a safe reliable manner. Never work under unsupported equipment.

For carrying out overhead assembly work always use specially designed or otherwise safety-oriented ladders and working platforms. Always use any walkway/platforms provided or a safe and secure platform approved by the regional safety enforcing authority.

Performing work above ground level make sure to always use an approved (EN/ANSI) safety harness. Always use walkways and platforms provided or a safe secure platform approved by the machine operators management. Do not use any unauthorized or unsafe structures or platforms.

Return idler roller guards should be checked for wear/damage during routine maintenance. The gap between the guard and the idler roller should not exceed 6mm. The gap between the idler roller and the guard must be renewed. Contact your local Metso Outotec dealer to obtain an approved replacement.

Maintenance and Repairs During Operation; Disposal of Parts and Consumables

Observe the adjusting, maintenance and intervals set out in these operating instructions, except where:

- Warning, horn/light/gauge or indicator calls for immediate action.
- Adverse conditions necessitate more frequent servicing.

Observe information on the replacement of parts and equipment. These activities may be executed by skilled personnel only.

When the machine is completely shutdown for maintenance and repair work, it must be secured against inadvertent starting by:

- Switching off the engine and removing the ignition key or isolating the electrical supply as applicable.
- Implementing the lockout procedure.
- Attaching a warning sign(s) to the machinery in appropriate positions.

Carry out maintenance and repair work only if the machine is positioned on stable and level ground and has been secured against inadvertent movement and buckling.

Never allow unqualified or untrained personnel to attempt to remove or replace any part of the machine, or anyone to remove large or heavy components without adequate lifting equipment.

2 Safety

To avoid the risk of accidents, individual parts and large assemblies being moved for replacement purposes should be carefully attached to lifting tackle and secured. Use only suitable and technically adequate lifting gear. Never work or stand under suspended loads.

Keep away from the feed hoppers and stockpile conveyor discharge points, where there is risk of serious injury or death due to the loading and removal of material.

Falling from and/or onto Metso Outotec machines can cause injury or even death. Do not climb on the machine whilst it is in operation. Never use machine parts as a climbing aid.

Beware of moving haulage and loading equipment in the vicinity of the machine.

Always use an EN/ANSI approved safety harness when reaching any points above ground level. Keep all handles, steps, handrails, platforms, landing and ladders free from dirt, oil, snow and ice.

The fastening of loads and instructing of crane operators should be entrusted to experienced persons only. The marshaller giving the instructions must be within sight or sound of the operator.

After cleaning, examine all fuel, lubricant, and hydraulic fluid lines for leaks, loose connections, chafe marks and damage. Any defects found must be rectified without delay.

Any safety devices removed for setup, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work to ensure full working order.

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with Metso Outotec equipment includes such items as oil, fuel, coolant, filters and batteries, etc. Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain or into any water source. Ensure that all consumables and replaced parts are disposed of safely and with minimum environmental impact.

Always ensure that any safety fitment such as locking wedges, securing chains, bars or struts are utilized as indicated in these operating instructions.

Diesel fuel is highly flammable. Never remove the filler cap, or refuel, with the engine running. Never add gasoline or any other fuels mixed to diesel because of increased fire or explosion risks. Do not carry out maintenance on the fuel system near naked lights or sources of sparks, such as welding equipment or whilst smoking.

After maintenance, tighten all bolts, fittings and connections. Install all guards, covers and shields. Replace or repair any damaged ones. Refill and recharge pressure systems with recommended fluids. Start the engine and check for leaks. Operate all controls and make sure the machine is functioning properly. After testing, shut down, check the work you performed. Recheck all fluid levels before releasing machine for operation.

(8) Gas, Dust, Steam, Smoke

Death, serious injury or delayed lung disease may result from breathing dusts that are generated when certain hazardous materials are crushed, screened or conveyed with this equipment.

Always operate internal combustion engines and fuel operated heating systems only out of doors or in a well-ventilated area. Before starting the machine in enclosed areas, make sure that there is sufficient ventilation.

Observe the regulations in force at the respective site.

Dust found on the machine or produced during work on the machine should be removed by extraction, not blowing. Dust waste should be dampened, placed in a sealed container and marked, to ensure safe disposal.

When dusts are generated by the operation of this equipment, use approved respiratory protection, as required by Federal, State and Local safety and health regulations.

Carry out welding, flame cutting and grinding work on the machine only if this has been expressly authorised, as there may be a risk of explosion and fire.

Before carrying out welding, flame cutting and grinding operations, clean the machine and its surroundings from dust and other flammable substances and make sure the premises are adequately ventilated as there may be a risk of explosion.

Ensure operators wear a suitable face mask where exposed to possible harmful effects of air pollution of any kind.

(9) Hazardous Substances

Ensure that correct procedures are formulated to safely handle hazardous materials by correct identification, labelling, storage, use and disposal.

All hazardous materials must be handled strictly in accordance with the manufacturers instructions and all applicable regulations observed at all times. Store hazardous materials in restricted access areas and mark them clearly.

(10) Noise Levels

HEARING HAZARD EXCEEDS 90 dB (A)

May cause loss or degradation of hearing over a period of time.

Always ensure that operators are provided with ear defenders of approved pattern and that these are worn at all times when the machine is operating.

(11) Magnetic Material Equipment

Before handling this equipment personnel with pacemakers or implants should confirm that their implants are not affected by magnetism.

If in doubt do not approach within three metre radius of the magnet.

2.6 Restricted Area During Operation



DANGER

Risk of death or serious injury.

Do NOT climb on top of the machine when it is operating.

Use of service ladders is strictly prohibited while the machine is processing material.

Keep clear from belt conveyor and magnetic conveyor discharge areas.



WARNING

General Hazard - Immediately move away from the restricted area when you hear the audible warning signal.

Risk of Fire Hazard - Stay away from the exhaust pipe due to a regeneration of the diesel particulate filter. Do not place any flammable objects in front of the exhaust pipe. Exhaust gas temperature is normally 650°C but may exceed up to 900°C in a fault situation.

Risk of fire and/or burn hazard! Processed material such as plastic may ignite during the process.

Risk of impact injury! Before folding or unfolding the conveyor, make sure that there is no one near or on the conveyor.

Risk of injury. Only authorized personnel wearing personal protective equipment may enter the work site. For unauthorized personnel the minimum safety distance is 20 meters (66 feet).

Before starting the machine, make sure that the restricted area is clear of people.

The areas shown in the illustration below are restricted when the machine is in operation.

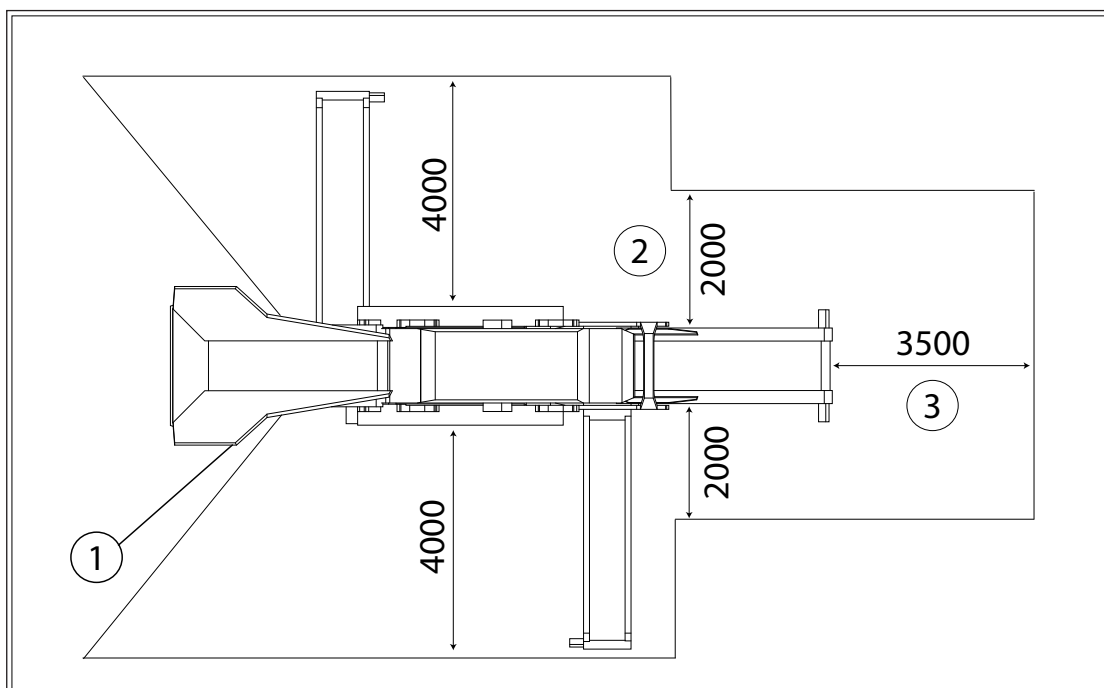


Figure 2.4 - Restriction Zone

Table 2.3 - Restriction Zone

Callout	Description
1	Operation / Control Panel
2	Magnetic Conveyor Discharge Area
3	Belt Conveyor Discharge Area

2.7 Emergency Stop Locations

Emergency stops are located at both the left and right hand side of the machine Ref: Figure 2.5 on page 2-23

(1) Emergency Stop Locations

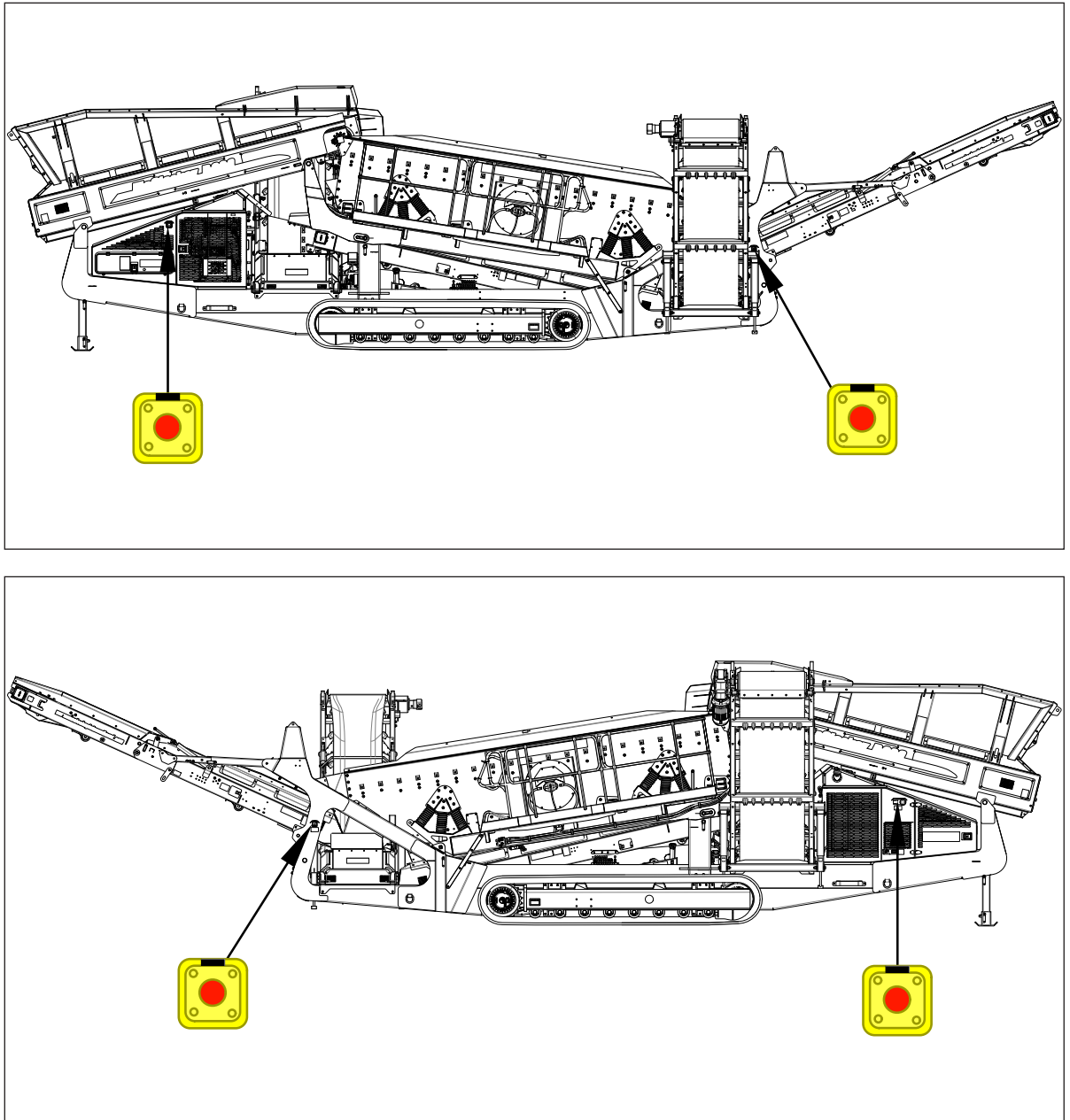


Figure 2.5 - Emergency Stop Locations

Intentionally Left Blank

Table of Content

3	Technical Data.....	3-2
3.1	General Information.....	3-2
(1)	Fines Product Side Conveyor.....	3-2
(2)	Mid Product Side Conveyor.....	3-2
(3)	Oversize Product Tail Conveyor	3-2
(4)	Transport Dimensions.....	3-2
(5)	Working Dimensions.....	3-2
3.2	General Layout.....	3-3
3.3	Machine Measurements	3-4
(1)	Elevation.....	3-4
3.4	Plan View	3-5
3.5	Noise levels (measured with machine idling)	3-6

3 Technical Data

3.1 General Information

Machine Mobile Screening Machine
Weight 37,220 kg (86 056 lbs)

(1) Fines Product Side Conveyor

Stockpile Height..... 4100 mm (13' - 5.3")
Belt Type..... 400/3 4+2
Belt Width 1050 mm / 42"

(2) Mid Product Side Conveyor

Stockpile Height..... 3600 mm (12')
Belt Type 400/3 4+2
Belt Width 900 mm / 36"

(3) Oversize Product Tail Conveyor

Stockpile Height..... 3830 mm (12' - 6")
Belt Type..... 500/3 5+1,5
Belt Width 1600 mm / 64"

(4) Transport Dimensions

Transport Height (Spill Plates Folded)..... 3500 mm (11' 5.8")
Transport Width 3000 mm (9' - 10")
Transport Length 16760 mm (54' - 11.7")

(5) Working Dimensions

Working Height 5080 mm (16' - 6.7")
Working Width 14150 mm (46' - 6')
Working Length 16490 mm (54' - 1")

3.2 General Layout

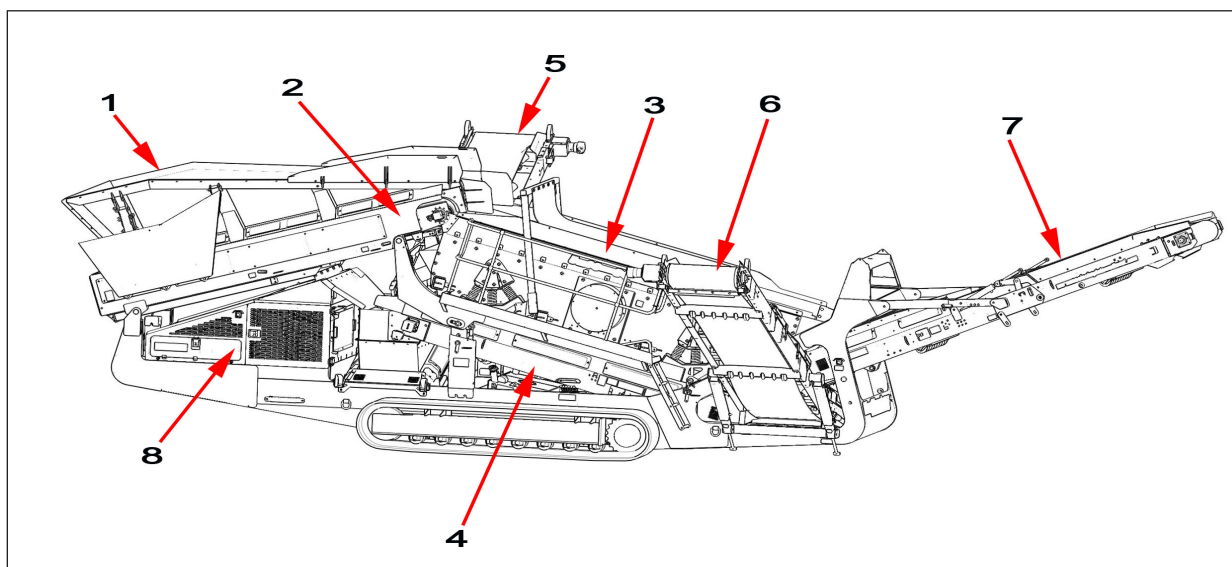


Figure 3.1 - General Layout

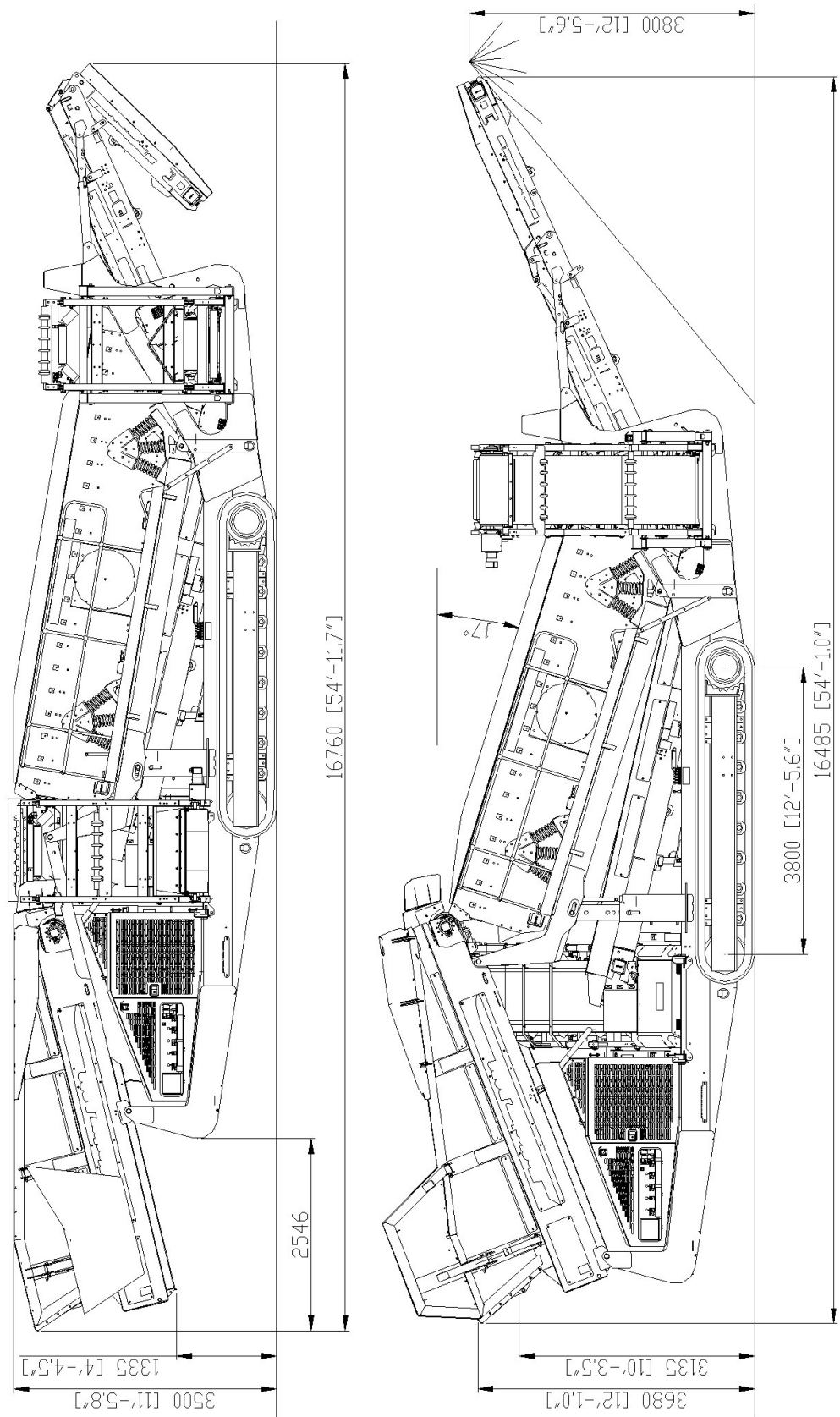
NOTICE

The left and right of the machine are assigned by standing at the hopper end of the machine and looking towards the tail conveyor.

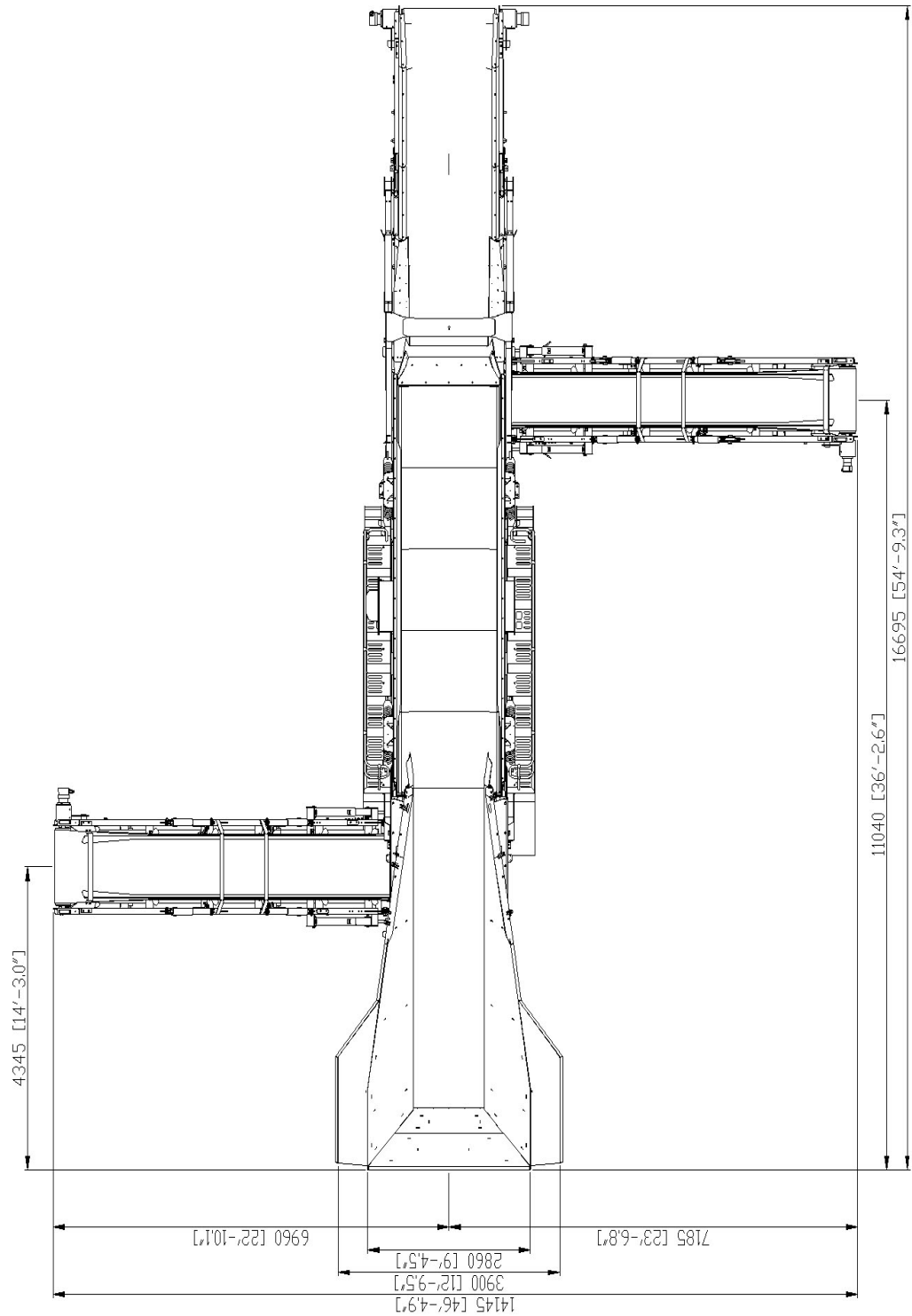
- 1 Hopper – Receives the feed material from loading shovel or excavator and directs this material onto the feeder.
- 2 Feeder – Consists heavy duty 4 ply belt. Acts as a reserve for raw material and controls the rate at which the material is fed to the screenbox.
- 3 Screenbox - This is the most important part of the machine. This will screen raw material into three products. Different grades of product can be produced depending on screen meshes fitted.
- 4 Collection Conveyor–A three-ply belt delivers material from under the screenbox to the fines side conveyor.
- 5 Left Hand (Fine-Product) Side Conveyor – A three-ply belt and carries the fine screened material from the screenbox to discharge stockpile.
- 6 Right Hand (Mid Product) Side Conveyor – A three-ply belt and carries the mid screened material from the screenbox to discharge stockpile.
- 7 Tail (Oversize Product) Conveyor –A three-ply belt and carries the oversize screened material from the screenbox to discharge stockpile.
- 8 Powerunit – Encloses the engine, hydraulic tank and machine operational controls

3.3 Machine Measurements

(1) Elevation



3.4 Plan View



3.5 Noise levels (measured with machine idling)

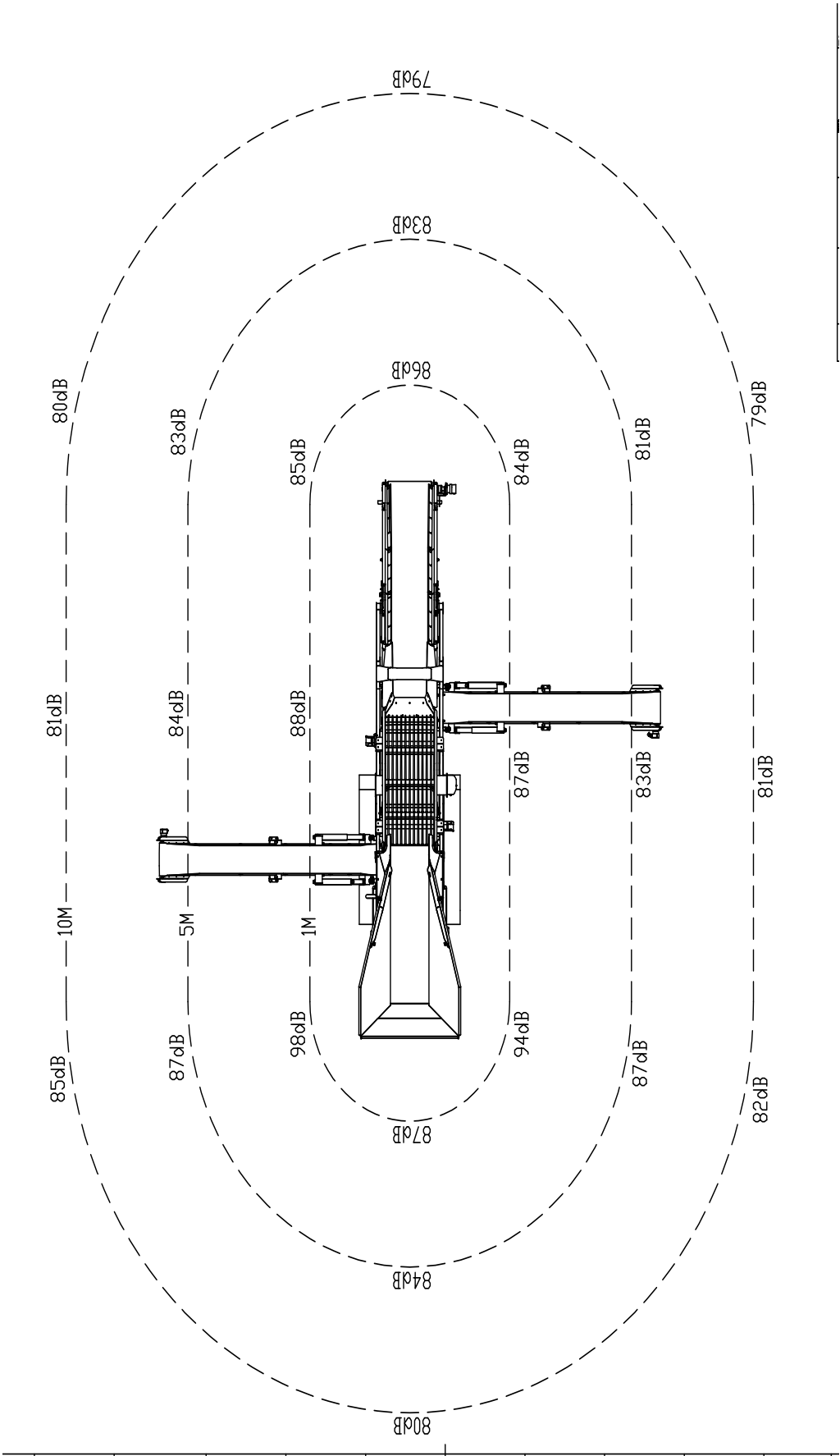


Table of Content

4	Operational Procedures	4-4
4.1	Prior to Use	4-4
4.2	Prestart Inspection	4-4
4.3	Machine Location	4-4
4.4	Control Panel Overview.....	4-5
(1)	Universal Screener Panel (OLED Tier 3 / Tier 4 Control Panel).....	4-5
(2)	Panel Display.....	4-6
(3)	Panel Display Menu.....	4-7
(4)	Display Functions and Selection	4-8
(5)	Deutz After Treatment Screens (Option)	4-12
(6)	Control Panel Error Screen	4-13
(a)	Universal Control Panel Error List.....	4-13
(7)	DEF Purge (Optional).....	4-16
(a)	Complete Power Down Sequence	4-16
(8)	Remote Control Informations.....	4-17
(9)	Feeder Radio Handset	4-18
(a)	Feeder Radio Handset Functions Overview	4-19
(10)	Feeder Radio Handset Coding (Option)	4-20
(11)	Control Panel Auxiliary Buttons	4-20
4.5	Starting the Engine	4-21
(1)	Setting Engine Speed (Non Fixed Speed Option)	4-22
(2)	Setting Engine Speed (Fixed Speed Option).....	4-22
4.6	Starting Electric Motors (Dual Power Option).....	4-23
4.7	Machine Tracking	4-25
(1)	Before moving the machine perform the following checks:	4-25
(2)	Remote Control.....	4-27
(3)	Switching Handset On and Off	4-27
(4)	Unlocking the Handset	4-27
(5)	Pairing Remote Control Handset to Machine	4-28
(6)	Tracking	4-29
4.8	Stage V DSE Control Panel Overview	4-31
(1)	Panel Lock.....	4-32
(2)	Key Switch	4-32
(3)	Buttons.....	4-33
(4)	Display Unit.....	4-34
(a)	LCD Panel.....	4-35
(b)	Multi- function Buttons	4-35
(c)	Navigation Buttons	4-35
(d)	LED	4-36
4.9	Screens Overview	4-37
(1)	Main Screen.....	4-37
(a)	Meter.....	4-39
(b)	Bar Chart.....	4-39
(c)	Engine Hours	4-40

4 Machine Operation

(2) Warning Symbols.....	4-40
(3) Tracking/Radio Screen	4-46
(a) Buttons on Tracking/Radio Screen	4-46
(b) Tracking/Radio Screen Elements.....	4-48
(4) Engine Information Screen 1	4-50
(a) Engine Information Screen 1 Buttons	4-50
(b) Engine Information Screen 1 Bar-Charts	4-51
(c) Fuel Usage.....	4-51
(d) Engine Hours	4-51
(5) Engine Information Screen 2 (DEF)	4-52
(a) Engine Information Screen 2 (DEF) Buttons.....	4-52
(b) Engine Information Screen 2 (DEF) Bar-Charts	4-53
(6) Engine Information Screen 2 (DPF)	4-54
(a) Engine Information Screen 2 (DPF) Buttons.....	4-54
(b) Engine Information Screen 2 (DPF) Bar-Charts	4-55
(c) Time Since Last Regeneration.....	4-55
(7) Machine Information Screen 1.....	4-56
(a) Machine Information Screen 1 Buttons.....	4-56
(b) Hydraulic Oil Status	4-57
(8) Machine Information Screen 2.....	4-58
(a) Machine Information Screen 2 Buttons.....	4-58
(9) Settings Screen	4-59
(a) Settings Screen Buttons	4-60
(b) Settings Screen Version Information.....	4-60
4.10 Controlling and Monitoring the Engine	4-61
(1) Starting the Engine	4-61
(2) Stopping the Engine	4-63
(3) Controlling Engine Speed.....	4-64
(a) Increasing Engine Speed.....	4-64
(b) Decreasing engine Speed.....	4-64
(4) Monitoring the Engine.....	4-65
(a) Engine Speed	4-65
(b) Engine Load.....	4-66
(c) Fuel Information	4-67
(d) Oil Pressure	4-69
(e) Coolant Information.....	4-69
(f) Air Intake Information.....	4-70
(g) Battery Information.....	4-71
(h) Other Engine Information.....	4-72
(5) Exhaust After treatment (Stage V Engines).....	4-73
(a) Diesel Exhaust Fluid (DEF).....	4-73
(b) Diesel Particulate Filter (DPF)	4-75
(c) Engine Protection for After treatment Failure.....	4-78
(d) Delayed Engine Shutdown (CAT 7.1 Stage V Engine)	4-79
4.11 Moving the Machine	4-80
(1) Tracking Handset Overview.....	4-80

(a) Establishing a Wired Handset Connection.....	4-81
(b) Establishing a Wireless Handset Connection	4-82
(2) Unlocking the Handset	4-85
(3) Using Handset to Control the Tracks.....	4-87
4.12 Operating the Machine	4-90
(1) Starting the Machine.....	4-90
(2) Stopping the Machine	4-90
(3) Operating the Feeder	4-91
4.13 Remote Handsets.....	4-95
(1) Tracking Handset Overview.....	4-95
(a) Handset Controls and LEDs	4-95
(b) Handset Connector	4-98
(c) Wired (Doglead) Mode	4-99
(d) Wireless (Radio) Mode	4-99
(2) Operational Handset Overview.....	4-100
(3) Handset Charging.....	4-102
(4) Activating/Deactivating the Track Handset	4-103
(a) Switching ON and Off.....	4-103
(b) Locking and Unlocking.....	4-103
(5) Operational Handset.....	4-106
4.14 Machine Error Codes	4-107
4.15 Hydraulic Control Valve Operation	4-110
4.16 Pictorial Decal Descriptions.....	4-111
(1) Machine Operations Decals	4-111
(2) Machine Information Decals	4-116
4.17 Machine Tracking	4-119
(1) Before moving the machine perform the following checks:	4-119
4.18 Machine Setup	4-121
(1) Unfolding the Left Hand Side Conveyor	4-121
(2) Unfolding the Right Hand Side Conveyor	4-125
(3) Unfolding the Tail Conveyor.....	4-127
(4) Raising the Screen Box	4-129
(5) Feeder Setup.....	4-131
(6) Feeder Support Legs.....	4-134
4.19 Machine Components Start-Up Procedure	4-135
4.20 Machine Shut Down Procedure.....	4-137
4.21 Machine Lockout and Tag Out Procedure	4-137
4.22 Emergency Stop Procedure	4-138
(1) Emergency Stop Locations	4-139

4 Operational Procedures

4.1 Prior to Use

Do not attempt to start the machine until you have received the correct training and have read and understood this manual fully. Make sure all precautions are taken so that the machine is operated in a safe and reliable manor. Follow all government laws, codes or bylaws regarding safety matters. Only operate the machine after you have satisfied yourself that all safety devices are in place and working correctly including but not limited to all guards, safety devices, emergency stop switches, safety decals, tank caps and exhaust elements. Always operate internal combustion engine equipped machines in properly ventilated areas. Make sure that all personnel are wearing the correct Personal Protective Equipment (PPE) in accordance with local legislation. Avoid wearing any loose fitting clothing which could become entangled in the machine or other equipment

4.2 Prestart Inspection



WARNING

Switch off, tag out and lock out machine before carrying out pre-operation checks or machine maintenance.

Wear personal protective equipment at all times.

Check bearings have been greased.

Before starting the machine thoroughly check for any damage and make sure the machine is in good mechanical condition.

Before starting the machine make sure that no personnel are on the machine or machine walkways.

Make sure all guards are in place and all safety devices are working correctly

Make sure all fluids and lubrication checks have been completed and that the machine has had all required service procedure carried out in line with the service schedules.

Make sure all hydraulic control levers are in the neutral (off) position

Do not start up the machine until the inspection is complete.

4.3 Machine Location

Prior to setting up the machine, consideration should be given to a suitable layout. Position the machine in a safe and level operating position, make sure both tracks are in full contact with the ground to minimise movement of the Machine. Regularly check the machine is level and stable.

Inspect the area around the machine for potential hazards such as overhead electric cables or other structures.

Pay attention to access from the loading area and to where material is to be deposited.

4.4 Control Panel Overview

(1) Universal Screener Panel (OLED Tier 3 / Tier 4 Control Panel)

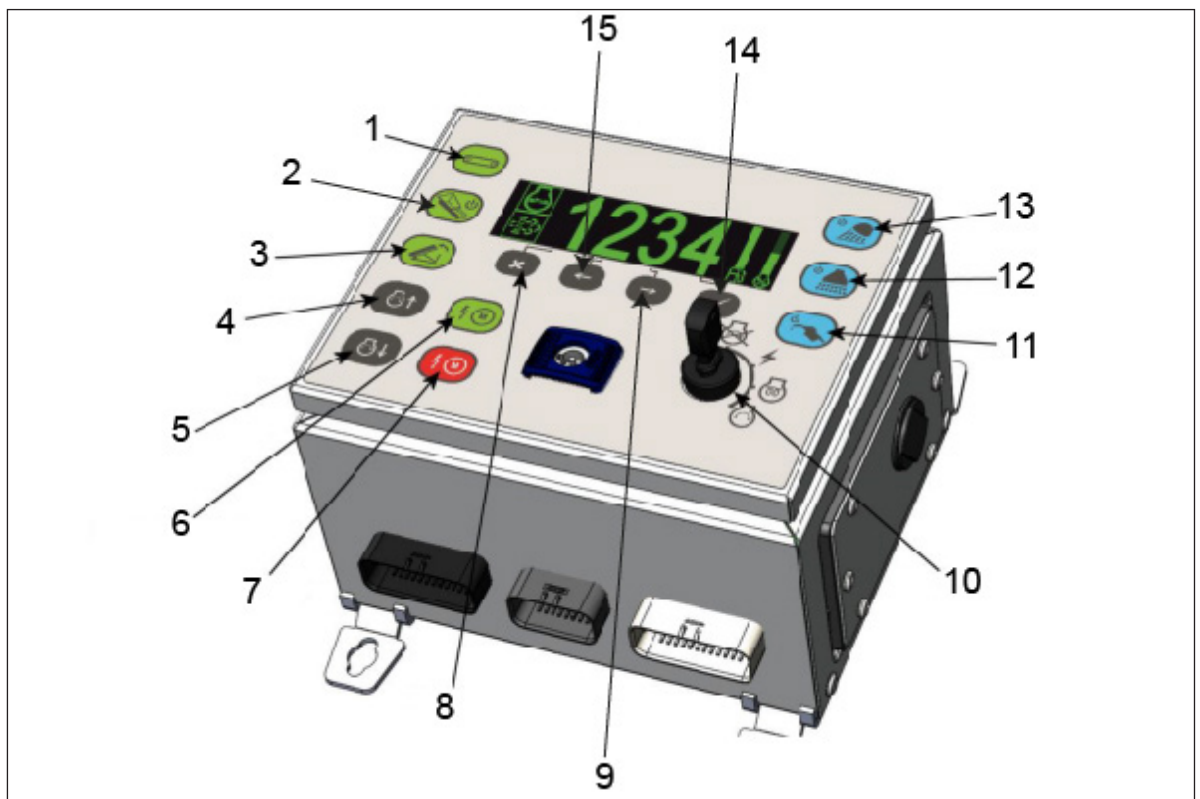


Figure 4.1 - Control Panel

- 1 Track Mode
- 2 Feeder Start/Stop
- 3 Unused
- 4 Engine Speed Increase
- 5 Engine Speed Decrease
- 6 Electric Motor Start (Option)
- 7 Electric Motor Stop (Option)
- 8 Menu Button Exit
- 9 Menu Button Scroll Right
- 10 Key Switch
- 11 Auxiliary Function Diesel Pump On/Off (Option)
- 12 Auxiliary Function Dust Pump On/Off (Option)
- 13 Auxiliary Function Panel Light On/Off (Option)
- 14 Menu Button Select
- 15 Menu Button Scroll Left

(2) Panel Display

1. The screen below appears when the machine is first switched on showing total number of engine run hours.



2. When the RPM is greater than zero, the screen below, showing engine rpm is displayed.



3. This screen will also show fuel level (all engine types) and the following depending on engine type:
 - DEF/Adblue Level for Tier 4 engines fitted with DEF after treatment
 - Active Regen status, Active / Disabled. For Tier 4 engines fitted with DPF after treatment
 - If engine has neither DEF or DPF then the final bargraph will show engine load

(3) Panel Display Menu

Using the left and right menu buttons (items 8 in Figure 4.1) will cycle through the available menu options on the LCD display, once the desired menu icon is highlighted in the green bar press the tick button to select it and display the details of the selected item, see Table 4.1.

Table 4.1 - Display Menu Icons

Menu Icon	Selected Icon Display	Description
		Engine hours
		Engine information:
		Fuel information
		Oil information
		Coolant information
		Unused
		Remote control information
		Multiple setting menus

(4) Display Functions and Selection

NOTICE

Some of the listed functions below are not available on certain engine types.

1. From the menu, select the battery symbol to view the Engine Information screen.



- Battery voltage
 - Engine load
 - Engine RPM
2. From the menu, select the Fuel symbol to view the Fuel Information screen.



- Fuel level
 - Fuel pressure
 - Fuel rate
 - Fuel temperature
3. From the menu, select the Oil symbol to view the Oil Information screen.

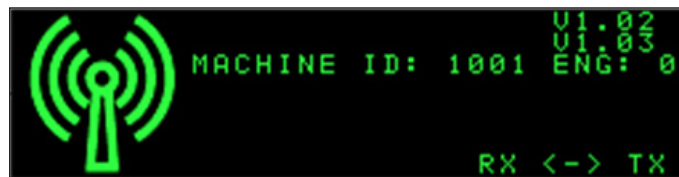


- Hydraulic oil level
 - Engine oil pressure
 - Engine oil temperature
4. From the menu, select the Coolant symbol to view the Coolant Information screen.



- Coolant level
- Coolant temperature
- Inlet pressure

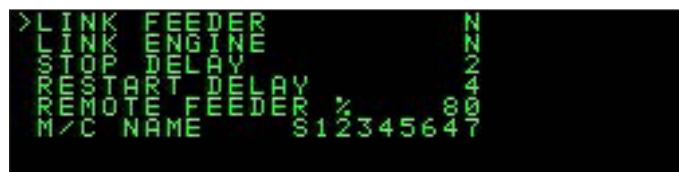
5. From the menu, select the Radio symbol to view the Remote Control Information screen.



- Machine ID
 - Software version
 - Radio data.
6. From the menu, select the Settings symbol to view the Settings menu.



- Link options
 - Link select
 - DEF
 - Regen / DPF
 - Set time / date
 - Set Webasto
 - Stop / Start
7. When Link Options is selected from the settings menu the following screen is displayed.



- Link feeder
 - Link engine
 - Stop delay
 - Restart delay
 - Remote feeder %
 - M/C name
8. When Link Feeder or Link Engine are selected the following screen is displayed.



9. When Link Select is selected from the settings menu the following screen is displayed.



10. When DEF is selected the DEF information screen is displayed. This only applies to those machines with Tier 4 engines that use DEF. This screen will also automatically appear in the event of a problem with the after treatment package.

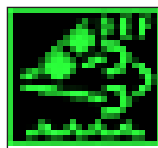


- Severity Code Displays the engine after-treatment selective catalytic reduction operator inducement level. Please refer to engine manual on how the inducement level affects engine performance.

Bargraphes display from left to right:

- DEF oC. Temperature of DPF unit.
- DEFoC. Temperature of diesel exhaust fluid.

The symbol below will appear when there is less than 20% of diesel exhaust fluid left in the tank.



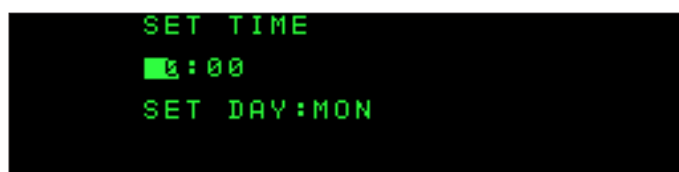
The symbol below is an emissions warning, the symbol is displayed and varies between warning, alarm and flashing alarm. Indicates SCR inducement level



11. When Regen / DPF is selected the following screen is displayed



12. When Set Time / Date is selected the following screen is displayed.



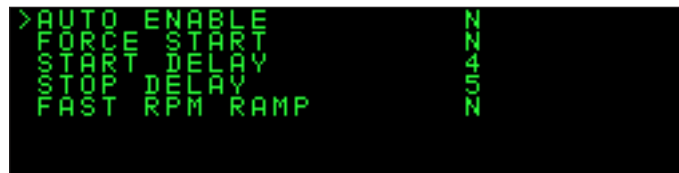
- Set time
- Set day

13. When Set Webasto is selected the following screen is displayed



- Start time
- Stop time

14. When Stop / Start is selected the following screen is displayed.



- AUTO ENABLE means that screener starts reading the proximity sensor on the hopper.
- When the sensor no longer sees metal, it means rocks are in the hopper and have pushed the feed door open. This triggers the panel, after a preset delay (START DELAY), to rev the engine up and start each hydraulic service in turn.
- Once there are no more rocks in the hopper, door closes, sensor sees metal and the machine shuts down each service in a preset delay (STOP DELAY). Goes back to engine idle.
- When FORCE START is enabled, it triggers the panel, after a preset delay (START DELAY), to rev the engine up and start each hydraulic service in turn.
- When FAST RPM RAMP is enabled, engine revs to the maximum in a short time.

(5) Deutz After Treatment Screens (Option)

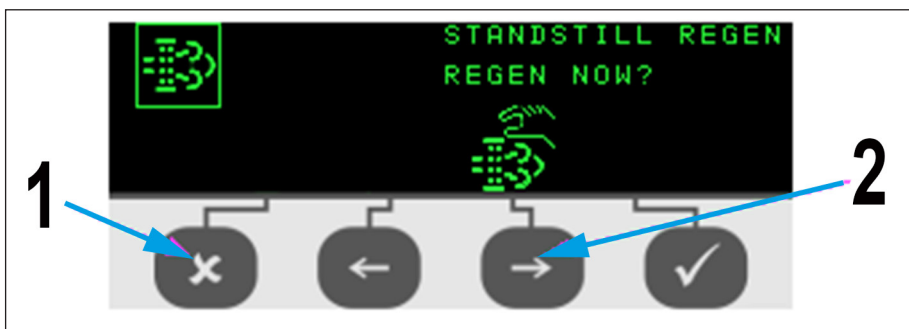
1. Normal engine running with low DEF level.



1. Low DEF icon.
2. Engine running, standstill regen required.



3. If standstill lamp is displayed when engine is next started then press button 1 to cancel or press button 2 to begin standstill regen.



4. If regen has been selected remaining time to completion is shown in minutes.



5. In the event of an SCR error the error screen automatically appears.



(6) Control Panel Error Screen

1. If an error is encountered, the screen below is displayed.



2. Errors are either generated by the engine or by the screener panel. All screener panel error start 800xxx.
3. English text translation of error is shown below the error number. There is no the facility for any other languages to be displayed.
4. Errors are not logged

(a) Universal Control Panel Error List

Table 4.2 - Panel Error Codes

Error Code	Error Text	Meaning	Notes
800100	MASTER MODULE CAN FAULT	The screener display is not receiving messages from the Screener Master Module	Check fuses inside panel
800101	ESTOP	ESTOP has been pressed	
800102	DOGLEAD STOP BUTTON	Stop button on doglead has been pressed or doglead has been unplugged	
800103	RADIO TRACK STOP BUTTON	Stop button request on radio track handset has been pressed	
800104	RADIO SMALL HANDSET STOP	Stop button request on radio small handset has been pressed	
800105	HYD TEMPERATURE WARNING	Hydraulic temperature has reached high enough temperature to generate warning (optional sensor)	
800106	HYD TEMPERATURE SHUTDOWN	Hydraulic temperature has reached high enough temperature to stop machine (optional sensor)	
800107	HYD OIL LEVEL LOW	Hydraulic oil level sensor has not seen any oil for >30seconds, machine shutdown	Check oil, check sensor and plug to sensor
800108	ULTRASONIC LEVEL	Optional ultrasonic sensor has been unplugged / come disconnected	
800109	CONV PRESSURE SENSOR	Optional pressure sensor has been unplugged / come disconnected	20s

4 Machine Operation

800110	PUMP PRESSURE SENSOR	Optional pressure sensor has been unplugged / come disconnected	
800116	IO MODULE NOT CONNECTED	The screener panel is not receiving messages from the io module (located by valves)	Check fuse F, check wiring to io module
800151	OIL COOLER FAULT	The hydraulic oil cooler is drawing excessive current, causing panel to shut it down	Check oil cooler fan, blow out dust from around cooler.
800154	ALTERNATOR NOT CHARGING	Alternator is not outputting high enough voltage to ensure batteries are being recharged	Warning only, Check Alternator fuse, drive belt
800199	DOWNSTREAM PAUSE	Screener is seeing an inhibit signal from a linked machine, preventing feeder running it's feeder	
800200	PULL CORD STOP	Pull cord stop has been activated.	
800201	COOLANT LEVEL LOW	Coolant level sensor has not seen any liquid for >20seconds, machine shutdown	Check coolant level, check sensor and plug
800202	BLOCKED AIR FILTER	Air filter needs changing / cleaning	Warning only
800203	REMOTE LINK STOP	The screener has received an engine stop request from a remote linked machine	
800204	DUAL POWER PANEL COMMS	The screener display is not receiving messages from the AC 3 phase panel controller	
800205	LOSS OF AC VOLTAGE	Check incoming AC / Fuses	
800206	MOTOR STARTER 1 ERROR	3 Phase Panel controller is not seeing a valid link to Motor1 starter	
800207	MOTOR 1 TRIPPED	Motor1 Starter has drawn too much AC current for too long, motor shut down	
800208	MOTOR STARTER 2 ERROR	3 Phase Panel controller is not seeing a valid link to Motor2 starter	
800209	MOTOR 2 TRIPPED	Motor2 Starter has drawn too much AC current for too long, motor shut down	
800210	ON AC ENGINE DISABLED	AC power detected, engine cranking is disabled	Unplug AC to allow engine to start
800211	ON AC TRACKING DISABLED	AC power detected, machine tracking is disabled	Unplug AC to allow machine to track

800212	ENGINE TEMPERATURE SHUTDOWN	Mechanical engines only, engine coolant temperature switch has closed, engine over heated	
800213	NO J1939 ENGINE DATA	Electronic engines only, Tedd Panel not communicating with engine ECU.	Check that relay K1 inside Tedd panel is energised.
800214	BLOCKED AIR FILTER	Air filter needs changing / cleaning, problem has persisted for 30minutes, engine has been shutdown	
800215	WATER IN FUEL	Water in fuel trap needs draining, problem has persisted for 30 minutes, engine has been shutdown	
800216	WIRELESS INTERLOCK REMOTE SHUTDOWN	Wireless interlock engine option is enabled but not seeing any remote machines, engine has been shutdown	Turn off setting LINK OPTIONS->LINK ENGINE set to N to disable
800217	ESTOP DUE LOW VOLTAGE	Normally triggered by low battery voltage, estop circuit has dropped below threshold voltage when cranking	Charge battery
800218	BLOCKED AIR FILTER J1939	Electronic engine has told Tedd panel that there is a problem with air filter.	
800219	BLOCKED AIR FITLER AUX IO	Electronic engine has told Tedd panel that there is a problem with air filter.	

(7) DEF Purge (Optional)

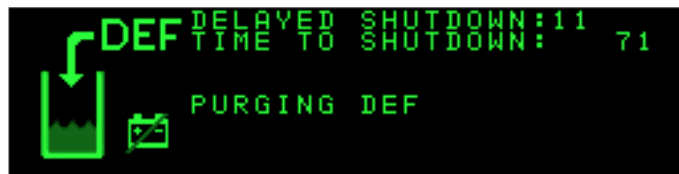
The Diesel Exhaust Fluid is purged from the engine shutdown to prevent engine damage due to DEF freezing.

This DEF Purge is carried out each time the engine is switched off, regardless of whether the engine has performed a DES shutdown or not.

The DEF Purge is carried out with a battery driven pump and whilst it is being carried out the following will be displayed on the screen.

Time shown for DEF purge to complete is shown in seconds.

Operator should not turn off battery isolator during this period or DEF purge will not complete and freezing damage could occur to engine.

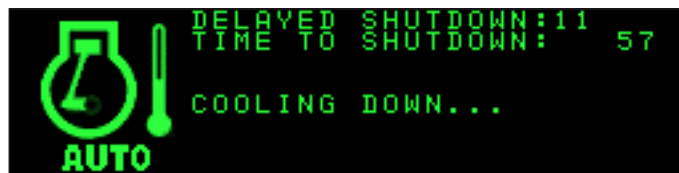


Once the DEF purge has completed the screener panel will switch off automatically.

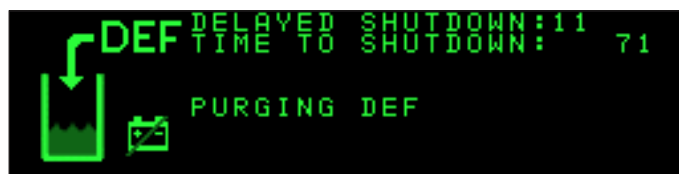
(a) Complete Power Down Sequence

Screener is running normally. DPF / exhaust reaches high temperatures

1. Operator turns off ignition switch on panel.
2. DES is active, engine drops to idle and runs for approx. 4 minutes.



3. Engine stops, DEF purge now starts. DEF battery driven pump runs for approx. 60 seconds.



4. DEF purge is now complete, panel will switch off.

(8) Remote Control Informations

1. From the menu, select the Radio symbol to view the Remote Control Information screen.

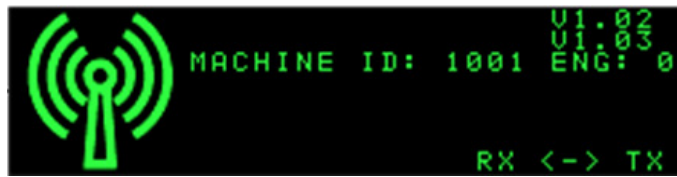


Figure 4.2 - Remote Control Information Screen

2. The information displayed on this screen includes:
 - Machine ID. This is used by the radio system to pair transmitters and receivers.
 - Software versions. Software versions for the display and master module.
 - Radio data. Information about the radio signal being received
3. Radio data information consists of:
 - Valid RX data - Data being received from a paired handset
 - Locked out - Data being received from an incorrect handset
 - No data - Not receiving any data.

(9) Feeder Radio Handset

Certain machines have the option of a radio controlled handset shown below.

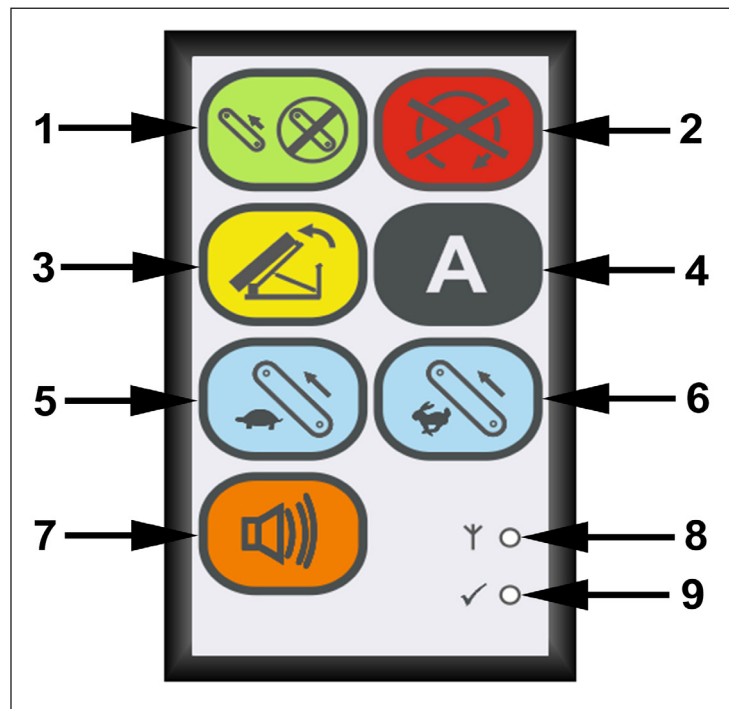


Figure 4.3 - Radio Handset

- 1 Feeder start/stop
- 2 Engine stop request
- 3 Unused
- 4 Button A
- 5 Feeder slow down
- 6 Feeder speed up
- 7 Horn
- 8 Transmitting LED
- 9 Coding LED

(a) Feeder Radio Handset Functions Overview

1. Feeder Stop/Start – Stops and starts the feeder.
2. Engine Stop Request – Transmits an engine stop request to the panel. If within range the machine will stop the engine immediately. Please note this is NOT an emergency stop and should not be relied upon as such.
3. Unused.
4. Unused.
5. Unused
6. Button A – No function
7. Feeder Slow Down – Slows down the feeder, where optional feeder speed control is fitted.
8. Feeder Speed Up – Speeds up the feeder, where optional feeder speed control is fitted.
9. Horn – Sounds the siren, can be used by excavator driver to signal attention.
10. Transmitting LED - Will light up green when a button is pressed and the transmitter is communicating with a paired receiver. Will light up red when a button is pressed but the transmitter is not communicating or intermittently if no buttons are being pressed.
11. Coding / Pairing LED – Used when pairing a spare handset to the machine.
12. Will light red when transmitter has not been paired to a receiver.
13. Will light orange whilst in pair / coding mode.
14. Will light green when transmitter has been successfully paired to receiver.

(10) Feeder Radio Handset Coding (Option)

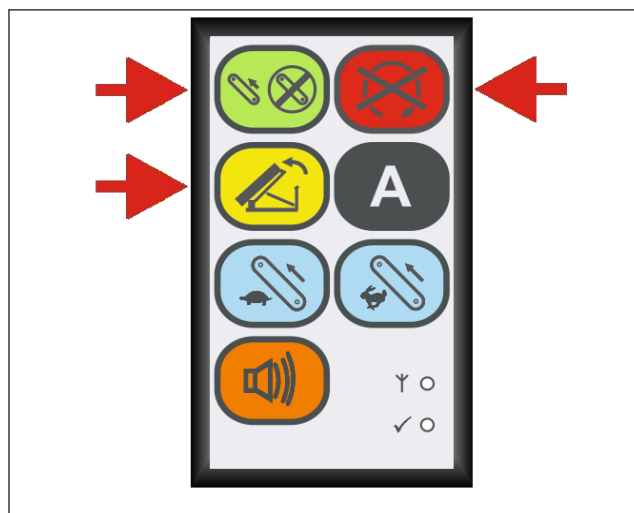
To pair a new handset to the panel the procedure is as follows.

1. Switch on the hand set using the push switch next to the handset charging point.
2. On the control panel select the radio symbol to view the remote control information screen.
3. Press the tick button below “RF Pair” and the “Teach Radio” countdown appears.



Figure 4.4 - Teach Radio Screen

4. During the countdown hold down the three buttons indicated below until the coding LED at the bottom of the handset starts to flash orange.
5. Upon completion of pairing, handset LED will change to green.



(11) Control Panel Auxiliary Buttons

1. The control panel is pre-fitted with 1 X 25Amp capable auxiliary output. This can be activated by pressing the Auxiliary A Button.
2. The control panel is also fitted with a low current Auxiliary B and C service. These are used with an external relay and fuse to add aftermarket control options e.g. work lights, diesel pump etc.

4.5 Starting the Engine

WARNING

Wear personal protective equipment at all times.

Make sure that no personnel are on the machine.

1. Observe all safety warnings
2. Check that control levers are in neutral position, and all emergency stops are released
3. Turn ignition key to the crank position, (3, Ref: Figure 4.5).

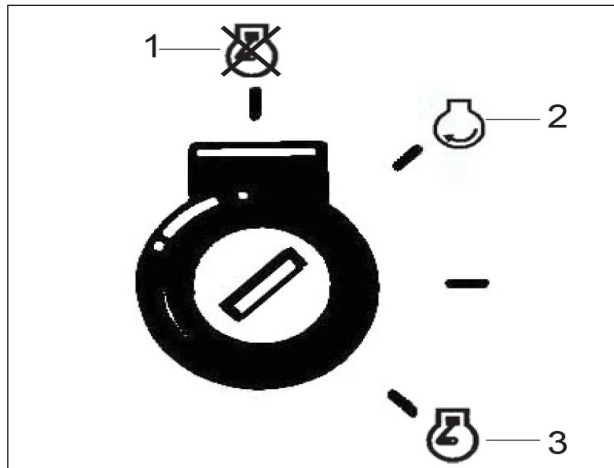


Figure 4.5 - Ignition Key Positions

4. The panel will display the machine start countdown timer and the siren will sound.



Figure 4.6 - Machine Start Countdown

5. Once the countdown timer reaches zero the engine will begin to crank.

(1) Setting Engine Speed (Non Fixed Speed Option)

1. The engine has 3 preset speed settings, Pressing the engine speed up button will increase the engine speed to the next level, likewise pressing the engine speed down button will decrease the engine speed to the next lower level.



Figure 4.7 - Engine Speed Up



Figure 4.8 - Engine Speed Down

(2) Setting Engine Speed (Fixed Speed Option)

1. For fixed speed engine options the engine has only one working speed setting. When the machine is switched on it will be at idle, pressing the engine speed up button will increase the engine speed to the machine working preset speed. Pressing the engine speed up button again will not increase the speed beyond the working speed.
2. From working speed pressing the engine speed down button will decrease the engine speed to idle. Once the engine speed has been decreased from working to idle it can not be increased again without turning the machine off.

4.6 Starting Electric Motors (Dual Power Option)

WARNING

To operate in electric mode, first make sure that a suitably sized supply cable is connected safely to the Dual power Control panel isolator Input side.

Ensure that this cable is suitably protected at the supply side with the appropriate protection and isolating device in strict accordance with local and international regulations.

Supply cable should only be installed by a qualified electrician.

The control panel can also be used in conjunction with dual power machines. On dual power machines the machine can either be powered via the onboard diesel engine, or by plugging into a 3 phase AC supply.

The AC supply is plugged into a secondary panel on the side of the machine. The main control panel is linked to this secondary AC panel in such a way to prevent both the diesel engine and AC supply being used at the same time.

All machine functions are done using the normal control panel. Switch power onto control panel using keyswitch as normal.

1. Turn ignition key to first position.
2. Once AC power has been detected by the secondary panel the main display main display control panel will change, see Figure 4.9.

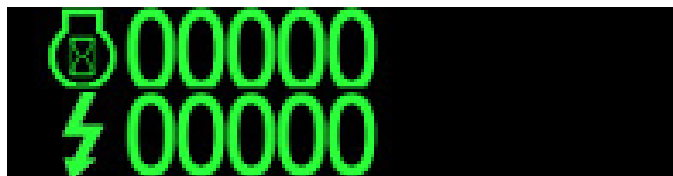


Figure 4.9 - Dual Power Hours

3. This show the machines total hours run, diesel engine hours on the top line and electric motor hours on the bottom line.
4. If AC power has been detected, any attempt to crank the engine or engage tracking mode will be overridden. Error codes will be displayed showing the reason why engine has been disabled as well as tracking mode. If AC power is not detected, all machine functions behave as normal.
5. If AC power is present and operator wishes to run machine using AC power, press the green motor start button, see Figure 4.10.

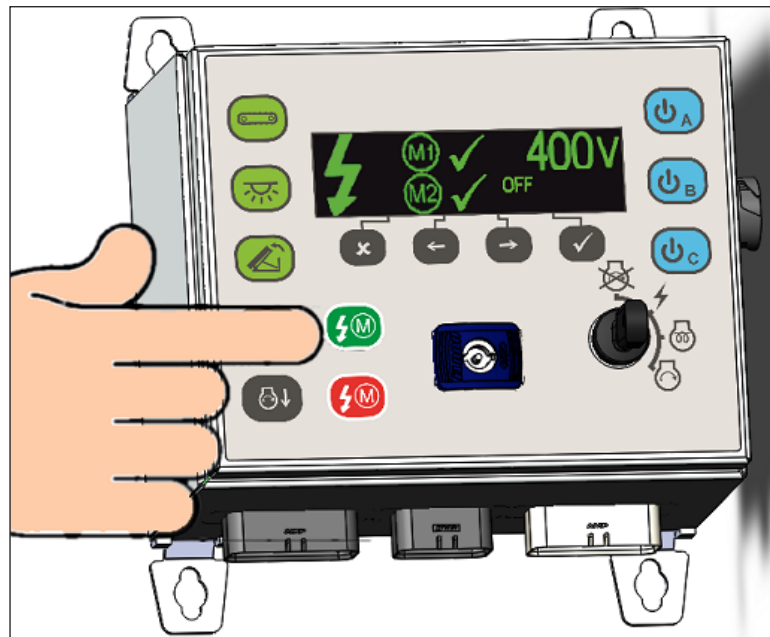


Figure 4.10 - Electric Motor Start

6. The screen will change to the information shown in



Figure 4.11 - Dual Power Information

7. Motor 1 and Motor 2 Status are displayed as tick / warning. Motor status is defined as correct current being drawn by motor from AC panel motor starter. Incoming AC voltage is also displayed.
8. Siren will sound and screen will count down prestart warning.
9. Once delay has reached zero, the 2 motors will ramp up to operating speed.

If there is a fault with either motor once the motors are running, both motors will be disabled and an error message will appear, see Table 4.2 on page 4-13.

Please note on brand new machines, the hydraulic pumps can take larger than normal currents when starting up. This is due to mechanical friction of new pumps. This may cause an over current trip out. Once the pumps have been run in, this problem should alleviate.

- If over current trip out occurs, restart motors.
- If the motors are started and stopped excessively in a short time period, for example 5 times in 30 minutes, then the AC panel will prevent further restarts for a short period. This is to allow motors and starters time to cool down.

Whilst running on AC power, a 12V DC supply prevents the lead-acid battery discharging. This 12V DC supply is located within the AC panel.

All normal machine functions are carried out in the same way as when running on diesel engine.

4.7 Machine Tracking

DANGER

DO NOT stand on any of the platforms or ladders of the machine whilst it is being moved

When manoeuvring the machine make sure you stand well clear of the machine but are in a position to have all-round vision to see any obstacles or dangers that may lie in your path.

WARNING

Machines with optional fixed speed engines are equipped with a hydraulic speed control lever. Do not attempt to track the machine on to a transport trailer with the hydraulic speed control lever in the Up (Fast) position.

Always perform maintenance on a level and solid surface.

NOTICE

Make sure that the tracks are free from obstructions and built up material before manoeuvring the machine.

The left and right of the machine are assigned by standing at the hopper end of the machine and looking towards the main conveyor.

For machines with optional fixed speed engines an additional hydraulic valve is fitted to control the speed of the tracks.

(1) Before moving the machine perform the following checks:

- Check for loose bolts and nuts on lower rollers, sprockets and track shoes.
- Check all tracks links and make sure master pins are correctly located and tight.
- Check for oil leaks from the lower rollers and front idlers.
- Check for oil leak from the track drive gearbox and motor.
- Check track tension is 5mm and 15mm.
- Check for general damage and wear to all components.

If any issues are found make sure corrective action is taken before attempting to move the machine.

When traveling up a gradient, the tracks should be driven forward (i.e. idlers first, drive sprocket to the rear). When traveling down a gradient, tracks should be driven sprocket first Ref: Figure 4.12.

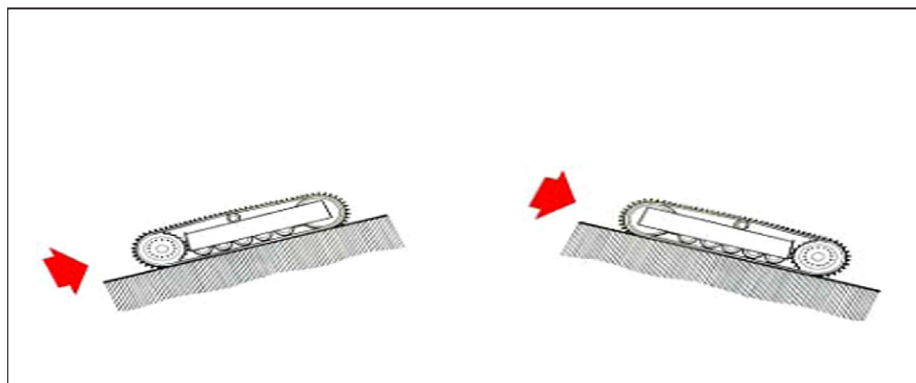


Figure 4.12 - Gradient Direction

4 Machine Operation

ALWAYS:-

- Park the machine on flat, level ground. If it is necessary to park the machine on a gradient, the tracks should be solidly blocked.
- Ensure the terrain the machine is working on is firm enough to adequately support the machine.
- Ensure the machine is tracked at least 10m in either direction on a daily basis, to minimize risk of track chain seizure.
- Ensure the track systems are free from debris before moving the machine.
- Ensure the tracks are not frozen to the ground before moving the machine.

NEVER:-

- Attempt to track the machine if there is any build up of material around the tracks and drive sprockets.
- Attempt to track the machine if the tracks are frozen to the ground.
- Push or tow the machine when unable to free itself.

(2) Remote Control**NOTICE**

The Tedd tracking handset can be used as either a wired umbilical handset or a wireless handset. When the handset is connected via the wired connection it will charge the handset. When not connected via the wired connection the handset can be used once it is paired to the machines wireless signal.

CAUTION

The stop button (1) on the remote control cannot be referred to as an emergency stop. Should an emergency arise and the radio remote is not in connect with the machine, pressing the stop button will not stop the machine.

Should an emergency arise press an emergency stop on the machine itself.

(3) Switching Handset On and Off

1. To switch on / off, hold down green button for 3 seconds. Both LEDs will flash orange before powering on / off.
2. If left unused the handset will enter sleep mode, reactivate by pressing either the green or red button.

(4) Unlocking the Handset

The handset has an in built safety feature which prevents tracking the machine unintentionally. To unlock the handset follow these steps:

1. Press green button, lock LED will flash green.
2. Push Left Track Forward and release
3. Push Left Track Reverse and release
4. Push Right Track Forward and release
5. Push Right Track Reverse and release
6. Lock LED will now be lit steady green.



Figure 4.13 - Handset Unlock

(5) Pairing Remote Control Handset to Machine

1. Go to radio page on panel and press TX->RX button.
2. Now hold down both track reverse big toggles and the red button for 5 seconds.
3. RF LED should flash orange till handset is paired with receiver.
4. Once paired RF LED shows green when paired correctly.

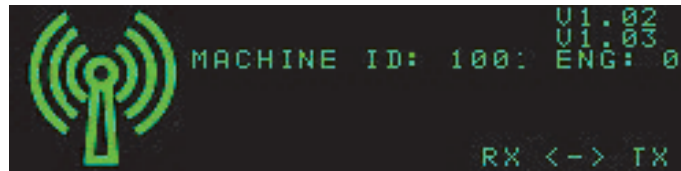


Figure 4.14 - Handset Coding Screen



Figure 4.15 - Handset Coding

(6) Tracking

1. For optional fixed speed machines move the track speed control lever to the down (slow) position when loading machine to transport trailer, see Figure 4.16.

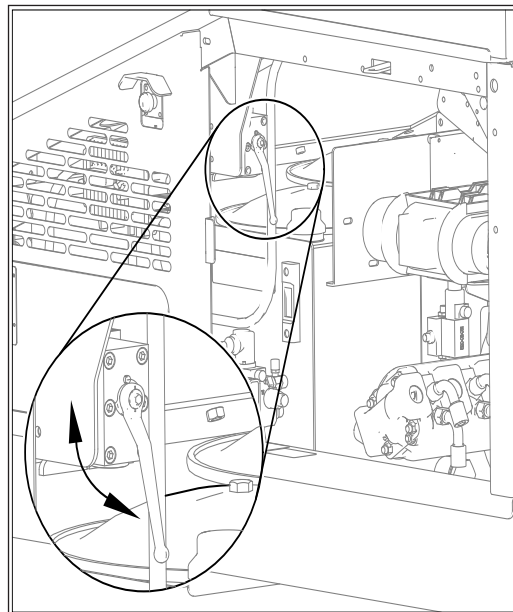


Figure 4.16 - Fixed Speed Track Control

2. Connect the handset cable to the hopper end of the machine (if using in wired mode).
3. Make sure all machine levers are in the neutral (off) position.
4. Start the engine.
5. Push the track button on the control panel and the track countdown timer will be displayed



Figure 4.17 - Track Control Screen

6. Once the timer has reached zero tracking mode will be enabled and the screen below will be displayed.



Figure 4.18 - Track Signal Screen

7. The arrows on the above screen represent a tracking signal being received from the handset. The aerial symbol will appear if this signal is being received by a radio handset, it will not appear if the wired connection is being used.
8. Push track control levers down to activate track hydraulic circuits

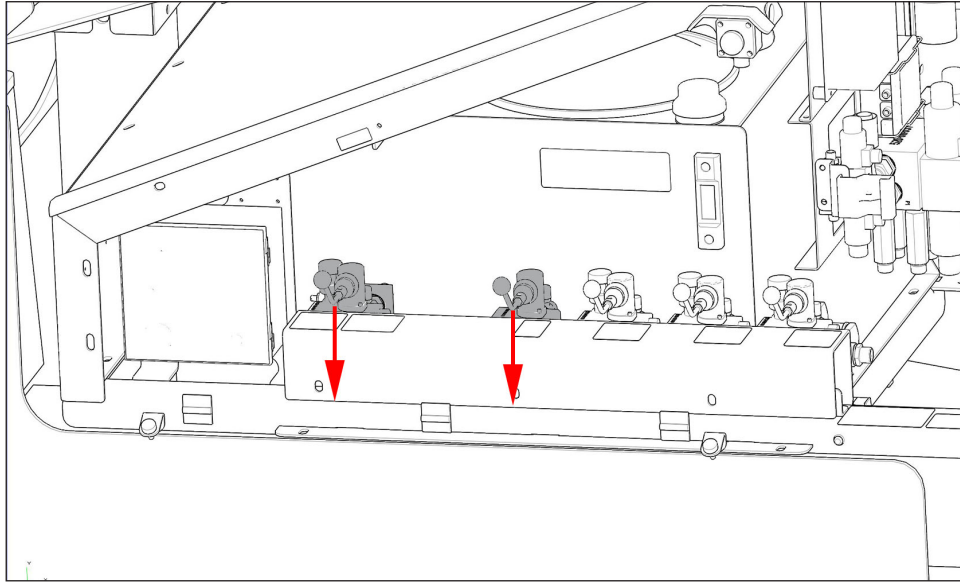


Figure 4.19 - Track Levers

4.8 Stage V DSE Control Panel Overview

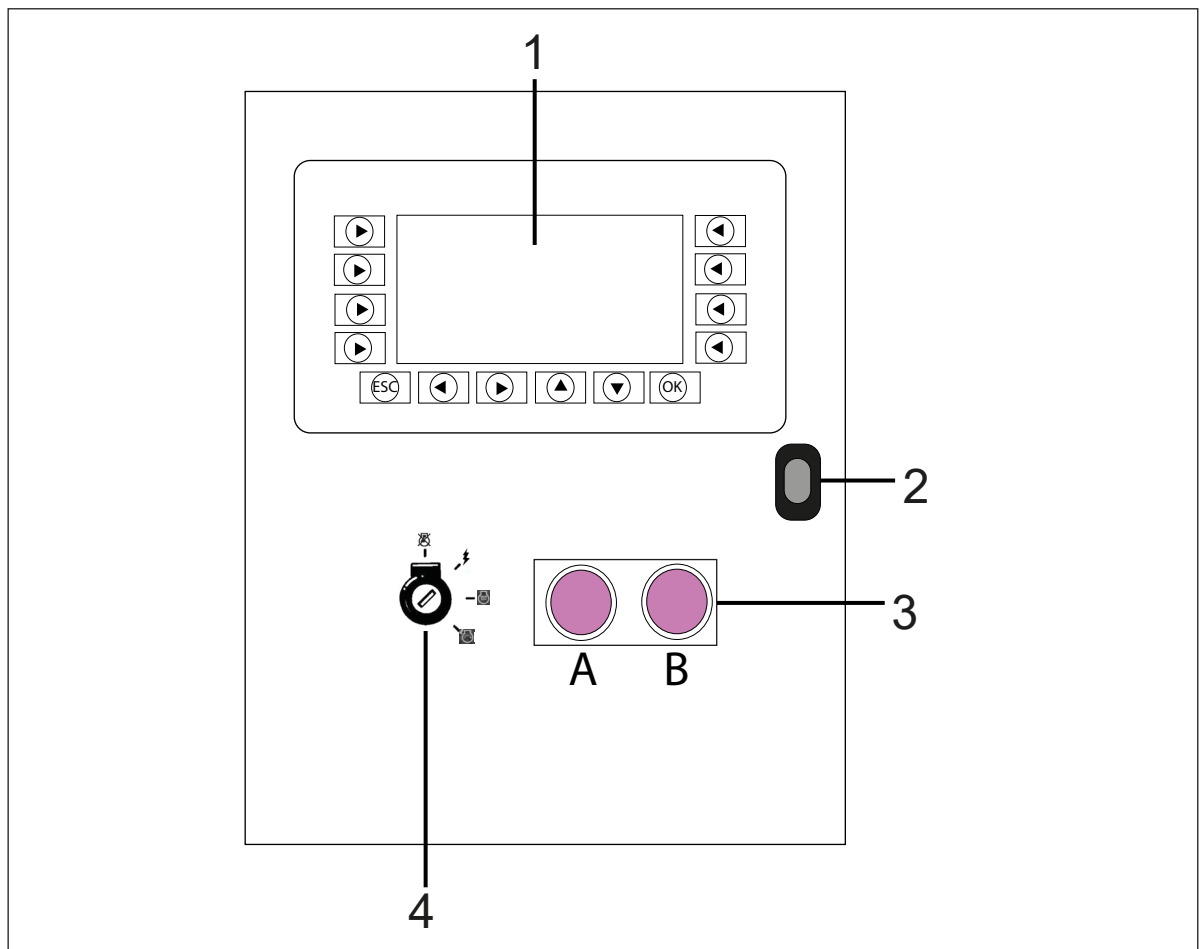


Figure 4.20 - Panel Overview

- 1 Display Unit - used to control and monitor the machine.
- 2 Panel Lock used - to lock and unlock the cover of the control panel.
- 3 Buttons used - to start the conveyor (A) and feeder (B).
- 4 Key Switch - used to start and stop the engine.

4 Machine Operation

(1) Panel Lock

The Panel Lock allows the hinged cover of the control panel to be locked and unlocked.

The cover must be closed and locked when the machine is operating.

A key (supplied) is required to lock and unlock the panel cover.

(2) Key Switch

The Key Switch is used in starting and stopping the engine. It requires a key (supplied) to be inserted and has four positions:

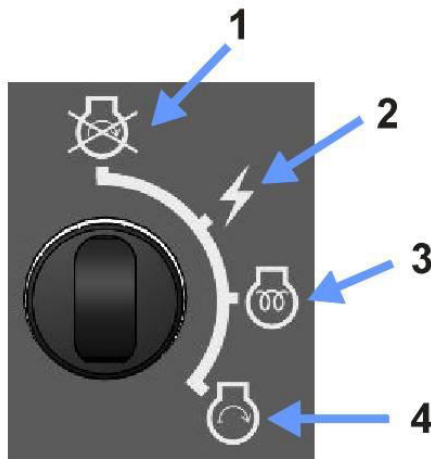


Figure 4.21 - Key Switch

- 1 Off.
- 2 Power-only.
- 3 Heat.
- 4 Crank.

NOTICE

In starting the engine, the Key Switch must be moved in stages. It should be moved from one position to the next position only when the machine is ready.

(3) Buttons

There are two large buttons on the control panel, labelled A and B.

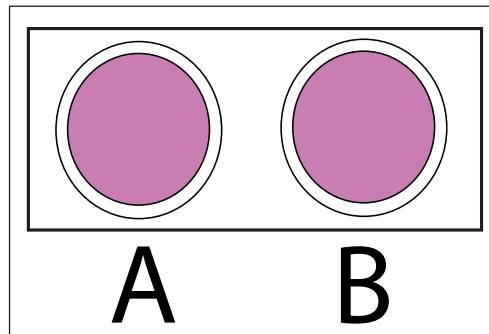


Figure 4.22 - Panel Buttons A and B

Each button can have one of the following functions, which is user-configurable:

- Tracking Mode Enable/Disable
- Feeder Start/Stop
- Feeder Slow
- Feeder Fast
- Work lights On/Off

A button illuminates when the conveyor/feeder is in operation.

(4) Display Unit

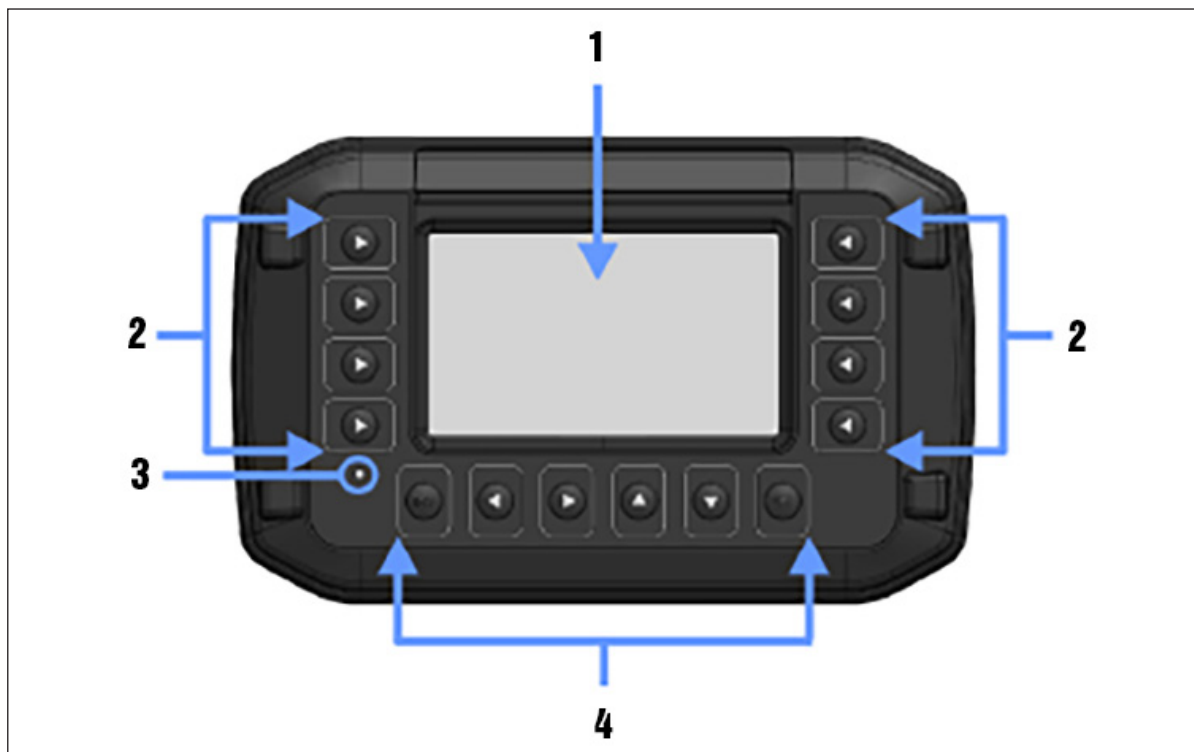


Figure 4.23 - Display Unit

The Display Unit features:

- 1 LCD panel.
- 2 8 multi-function buttons (left and right of panel) relating to on-screen functions.
- 3 1 LED Light.
- 4 6 navigation buttons (under panel).

(a) LCD Panel

The colour LCD panel is used to display various screens for machine control and monitoring. On some screens, icons are displayed down the left and right sides, where an icon indicates the functionality of the adjacent (multi-function) button.

(b) Multi- function Buttons

There are eight multi-function buttons, four down each side of the LCD panel. For convenience in this manual, these buttons are referenced using the numbers 1 to 8, as indicated below.



Figure 4.24 - Multi-function Buttons

The functionality of a button depends on the screen being displayed and is indicated by the adjacent on-screen icon. Not all of the buttons are used by all the screens.

(c) Navigation Buttons

There are six navigation buttons under the LCD panel, which are shown and described in the table below.



Figure 4.25 - Navigation Buttons

Table 4.3 - Navigation Buttons

Button	Description	Function
	ESC	Escape/Home: Press to return to the Main screen.

4 Machine Operation

Button	Description	Function
	Left-arrow	Previous Screen: Press to return to the previous screen.
	Right-arrow	Next Screen: Press to move to the next screen.
	Up-arrow	Move Up: Press to move up an on-screen list.
	Down-arrow	Move Down: Press to move down an on-screen list.
	OK	Select/Confirm: Press to select or confirm an on-screen item.

(d) LED

There is a LED in the bottom-left of the Display Unit (under button 4). During machine operation, you may see the LED in the following colours and states.

Table 4.4 - LED Colours and States

Colour	State	Description
Green	Flashing	Unit is running the control system application (normal operation)
Amber	Static	Unit is booting up or has stopped due to software issue
Red	Static	Fatal hardware fault

4.9 Screens Overview

The screens that may be displayed on the LCD panel of the Display Unit are outlined below. More information on these screens is provided elsewhere in this manual.

Once the Display Unit has been powered, the Boot screen is displayed.

(1) Main Screen

The Main screen automatically appears following boot-up of the Display Unit.



Figure 4.26 - Panel Main Screen

The Main screen is used for:

- Monitoring and controlling the engine
- Accessing other screens
- Controlling the Feeder

Note: You can always return to the Main screen by pressing the Escape button on the Display Unit

Most other screens can be accessed from the Main screen by pressing the button alongside the relevant on-screen icon. These screens are listed below.

Table 4.5 - Main Screen Icon breakdown

Button	Icon	Function	Function	Icon	Button
1		Access the Tracking/Radio screen	Engine Speed Up: Increase the engine speed		5
2		Access the Engine Information screens	Engine Speed Down: Decrease the engine		6
3		Access the Machine Information 1 screen	Access the Machine Information 2 screen		7

4 Machine Operation

Button	Icon	Function	Function	Icon	Button
4		Start/stop Feeder When the feeder is moving, the button icon turns green (pressing again will stop/pause the feeder).	Access the Settings screen		8

Two of the bottom buttons of the Main screen are used on a screener with an engine fitted with an exhaust after treatment unit. They relate to Diesel Particulate Filter (DPF) regeneration, as follows:

Table 4.6 - Diesel Particulate Filter (DPF) regeneration

Icon		
Button		
Function	Manual DPF regeneration. When active, the button icon turns yellow.	Inhibit DPF regeneration. When active, the button icon turns yellow.

The two DPF button icons are not always displayed on the Main screen:

- If more than two warning symbols are displayed across the bottom of the screen, the DPF button icons will not be displayed (to make space for warning symbols)
- On a screener without DPF engine after treatment, the two DPF button icons are absent from the Main screen

(a) Meter

The central meter of the Main screen displays two quantities.



Figure 4.27 - Meter

- The top part of the meter shows engine speed in two ways;
 - On an analogue scale as RPMx100
 - In figures as RPM
- The bottom part of the meter shows engine load as a percentage.

(b) Bar Chart

Two bar-charts are displayed on the Main screen, as follows:

Bar-chart	Description	Description	Bar-chart (DEF or DPF)	
	Fuel Level (%)	DEF Level (%) Level of Diesel Exhaust Fluid (DEF) in tank, if fitted. OR DPF Soot Level (%) Level of soot in Diesel Particulate Filter (DPF), if fitted.		

NOTICE

For screeners with engines without the Diesel Exhaust Fluid (DEF) or Diesel Particulate Filter (DPF) feature, the right bar-chart is not displayed on the Main screen..

(c) Engine Hours

The total running hours of the engine are shown to the lower-right of the meter on the Main screen.



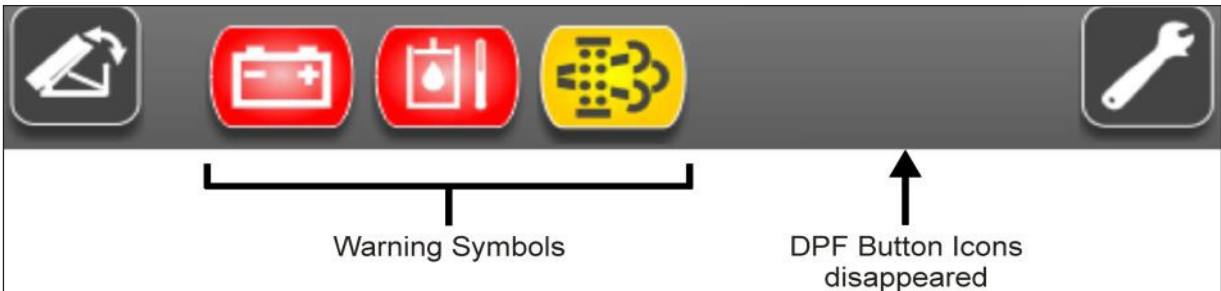
Figure 4.28 - Engine Hours

(2) Warning Symbols

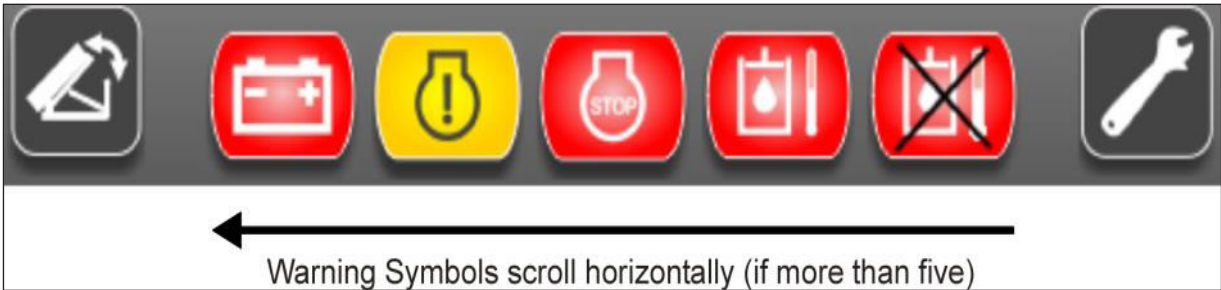
One or more warning symbols can be displayed across the bottom of the Main screen.



The symbols are added from left to right. If more than two warnings are displayed, the DPF button icons (if present) on the right disappear to make space for the warning symbols.



Up to five warning symbols can be displayed at any one time. If more than five warnings need to be displayed, the symbols are all displayed by means of an automatic horizontal scrolling mechanism.



The possible warning symbols and their meanings are listed in Tables below.

Table 4.7 - Engine Warning Symbols

Symbol	Meaning
Engine Warning Symbols	
	Engine Preheat: The engine is preheating before cranking. Wait for this warning to disappear before cranking the engine.
	Engine Alert: There is an engine problem (but not severe enough to automatically stop the engine).
	Engine Speed Low: The engine speed is too low (< 1750 rpm) to track the machine (on a fixed-speed engine).
	Engine Stop: The engine is stopping due to an issue of high severity.
	Delayed Engine Shutdown: The engine is going to automatically shut down after a delay.
	Oil Pressure Low: The engine oil pressure is too low.
	Coolant Level Low: The level of engine coolant (water) is too low and should be replenished.
	Coolant Temperature High: The temperature of the engine coolant (water) is too high.
	Blocked Air Filter: The engine's air filter is blocked and should be unblocked.

Table 4.8 - Hydraulic Warning symbols

Symbol	Meaning
Hydraulic Warning Symbols	
	Hydraulic Oil Level Low: The level of hydraulic oil is too low and should be replenished.
	Hydraulic Oil Temperature High: The temperature of the hydraulic oil is too high.
	Hydraulic Oil Level Bypassed: The hydraulic oil level sensor has been bypassed and no oil level warnings will be issued.
	Hydraulic Oil Temperature Bypassed: The hydraulic oil temperature sensor has been bypassed and no oil temperature warnings will be issued.

Table 4.9 - Feeder Warning Symbols

Symbol	Meaning
Feeder Warning Symbols	
	Feeder Off: The feeder has been switched off at the Control Panel.
	Feeder Stopped from Handset: The feeder has been stopped from the wireless (radio) handset.
	Feeder Stopped via Wireless Interlock: The feeder has been stopped due to an event on a remote machine in a wireless interlock system.
	Feeder Stopped via Wired Interlock: The feeder has been stopped due to an event on a remote machine in a wired interlock system
	Feeder Stopped due to Empty Hopper: The feeder has been stopped under auto-control because the feed-hopper is empty.
	Feeder Stopped due to Low Engine Speed: The feeder has been stopped under auto-control because the engine speed is too low.
	Feeder Stopped due to High Hydraulic Pressure: The feeder has been stopped under auto-control because the hydraulic oil pressure is too high on one or more services.
	Feeder Stopped due to Low Fuel: The feeder has been stopped under auto-control because the fuel level is low.

Table 4.10 - Exhaust After treatment Warnings (Tier 4 Engines Only)

Symbol	Meaning
Exhaust After treatment Warnings (Tier 4 Engines Only)	
	After treatment Fault: There is a problem with the engine's exhaust after treatment unit.
	DEF Level Low: The level of Diesel Exhaust Fluid (DEF) is low and should be replenished.
	DPF Regeneration Needed: The Diesel Particulate Filter (DPF) needs to be 'regenerated' (Tier 4F engines only).
	DPF Regeneration Active: A DPF regeneration is underway (Tier 4F engines only). Beware of high-temperature exhaust fumes during this process.
	Manual DPF Regeneration Active: A DPF regeneration has been activated manually on the Control Panel (Tier 4F engines only). Beware of high-temperature exhaust fumes during this process.
	DPF Regenerations Inhibited: Automatic DPF regenerations have been inhibited from the Control Panel (Tier 4F engines only).

Table 4.11 - Other Warning Symbols

Symbols	Meaning
Other Warnings	
	Battery Not Charging: The battery is not charging - the alternator should be checked.
	Wait before Disconnecting Battery: Do not isolate the battery until this warning has disappeared
	Water in Fuel: Water has been detected in the fuel.
	Fuel Level Bypassed: The fuel level sensor has been bypassed and the engine or feeder will no longer be automatically stopped due to low fuel. This bypass feature is an option on certain machines.

(3) Tracking/Radio Screen

The Tracking/Radio screen is accessed from the Main screen by pressing button 1 (top-left):see “Figure 4.26 - Panel Main Screen” on page 4-37.

The Tracking/Radio screen is shown below;



Figure 4.29 - Tracking/Radio Screen

This screen provides an interface for:

- Controlling tracking speed
- Enabling/disabling radio communication with a wireless handset
- Pairing a wireless handset with the machine's radio transceiver

NOTICE

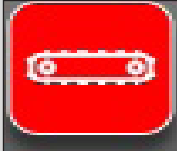
On accessing the Tracking/Radio screen, Tracking Mode is enabled on the machine. There is, however, a pre-tracking delay of 8 seconds before the tracks are enabled, during which a warning siren will sound.

(a) Buttons on Tracking/Radio Screen

The left/right buttons of the Tracking/Radio screen are used as follows.

Table 4.12 - Buttons on Tracking/Radio Screen

Button	Icon	Function	Function	Icon	Button
1		Not Used	Enable/disable radio link with wireless handset. Icon turns grey with a red cross when disabled (pressing again will enable).		5

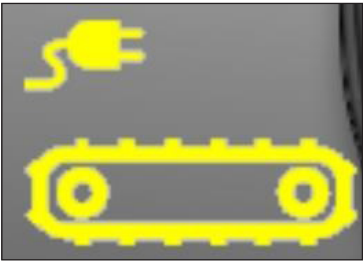
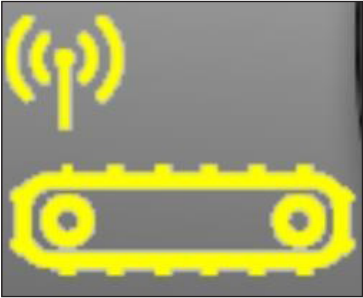
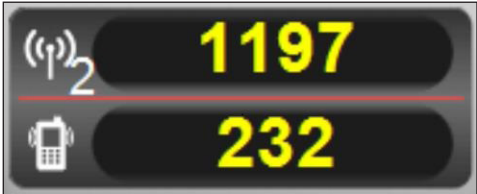
Button	Icon	Function	Function	Icon	Button
2		Not Used	Increase tracking speed. For variable-speed engines, hold down button to continuously increase speed.		6
3		Not Used	Decrease tracking speed. For variable-speed engines, hold down button to continuously decrease speed.		7
4		Exit Tracking Mode. Disables Tracking Mode and returns to the Main screen.	Exit Tracking Mode. Disables Tracking Mode and returns to the Main screen.		8

(b) Tracking/Radio Screen Elements

The Tracking/Radio screen has the following elements.

Table 4.13 - Tracking/Radio Screen Elements

Element	Description
	Tracking Handset An image of the Tracking Handset is displayed on which arrows are superimposed to provide guidance for handset unlocking and pairing.
	Operational Handset An image of the Operational Handset is displayed on which arrows are superimposed to provide guidance for handset pairing.
	Tracking Handset Locked When the Tracking Handset is locked, a closed (red) padlock is displayed at the bottom of the screen.
	Tracking Handset Unlocked When the Tracking Handset is unlocked, an open (green) padlock is displayed in the top-left of the screen.

Element	Description
	Wired Connection of Tracking Handset If the Tracking Handset is connected to the machine via the dog lead cable, this symbol appears.
	Wireless Connection of Tracking Handset If the Tracking Handset is connected to the machine via a paired radio link, this symbol appears.
	Radio Codes A pair of radio codes for the machine's radio receiver (1197 here) and the radio handset currently in use (232 here) is displayed at the top of the screen.

(4) Engine Information Screen 1

- The Engine Information 1 screen is accessed from the Main screen by pressing button 2 (second-down on the left).see “Figure 4.26 - Panel Main Screen” on page 4-37.

The Engine Information 1 screen is shown below;



Figure 4.30 - Engine Information Screen 1

This screen provides an interface for:

- Monitoring various engine-related parameters via bar-charts
- Monitoring daily fuel usage (not shown above)
- Monitoring total number of engine hours
- Accessing the Engine Information 2 screen (if available).

(a) Engine Information Screen 1 Buttons

The left/right buttons of the Engine Information 1 screen are used as follows.

Button	Icon	Function	Function	Icon	Button
1		Not Used	Not Used.		5
2		Not Used	Not Used		6
3		Not Used	Not Used		7
4		Access Engine Information 2 screen.	Access Engine Information 2 screen.		8

(b) Engine Information Screen 1 Bar-Charts

Bar-charts are displayed on the Engine Information 1 to indicate the states of various engine-related parameters, as follows:

					
Fuel Rate (l/hr)	Oil Pressure (kPa)	Coolant Temperature (°C)	Battery Voltage (V)	Air Inlet Pressure (kPa)	Engine Speed (Rpm)

The values of these parameters are illustrated in the bar-charts and shown in figures.

(c) Fuel Usage

The Engine Information screen features a box containing the fuel usage of the engine per day, in liters, over the last seven days, as illustrated below;



Figure 4.31 - Fuel Usage

(d) Engine Hours

The Engine Information 1 screen shows the total engine running hours so far.

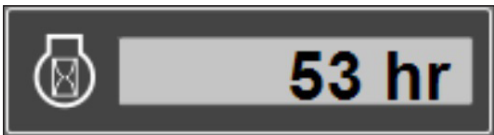


Figure 4.32 - Engine hours

(5) Engine Information Screen 2 (DEF)

If the engine is fitted with an engine after treatment system featuring Diesel Exhaust Fluid (DEF), the Engine Information 2 screen is dedicated to monitoring the DEF. The screen is accessed from the Engine Information 1 screen using button 4 or 8.

The Engine Information 2 screen (DEF) is shown below.



Figure 4.33 - Engine Information Screen 2 (DEF)

This screen provides an interface for;

- Monitoring the DEF temperature, concentration and level

The elements of the Engine Information 2 screen are described below.

(a) Engine Information Screen 2 (DEF) Buttons

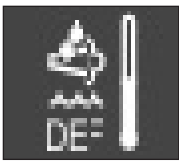
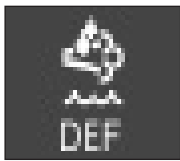
The left/right buttons of the Engine Information 2 screen (DEF) Screen are used as follows.

Button	Icon	Function	Function	Icon	Button
1		Not Used	Not Used.		5
2		Not Used	Not Used		6
3		Not Used	Not Used		7
4		Access Engine Information 1 screen.	Not Used		8

(b) Engine Information Screen 2 (DEF) Bar-Charts

Bar-charts are displayed on the Engine Information 2 (DEF) to indicate the DEF status, as follows;

Table 4.14 - Engine Information Screen 2 (DEF) Bar-Chart

		
DEF Temperature °C or °F)	DEF Concentration * (%)	DEF Level (%)

* If information available from the engine

(6)
Engine Information Screen 2 (DPF)

If the engine is fitted with an engine after treatment system featuring a Diesel Particulate Filter (DPF), the Engine Information 2 screen is dedicated to monitoring the DPF. The screen is accessed from the Engine Information 1 screen “Figure 4.26 - Panel Main Screen” on page 4-37 using button 4 or 8.

The Engine Information 2 screen (DPF) is shown below.

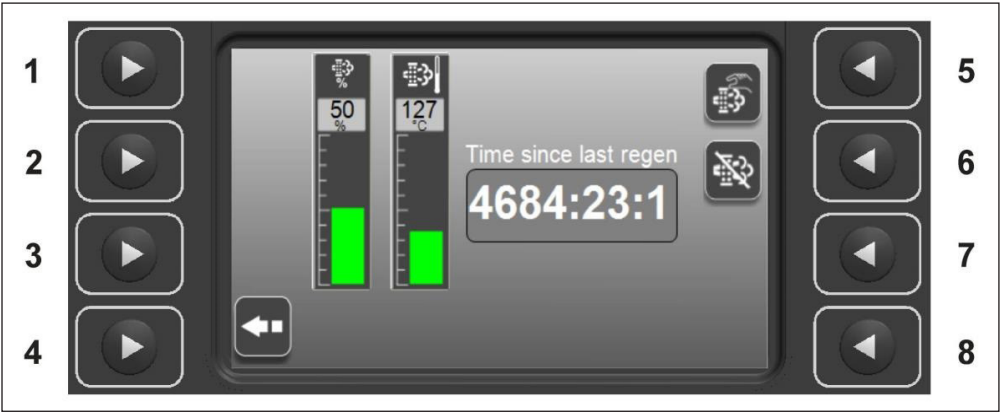


Figure 4.34 - Engine Information Screen 2 (DPF)

This screen provides an interface for;

- Monitoring the DPF
- Manually controlling DPF regeneration
- Inhibiting automatic DPF regenerations

The elements of the Engine Information 2 screen are described below.

(a)
Engine Information Screen 2 (DPF) Buttons

The left/right buttons of the Engine Information 2 screen (DPF) are used as follows;

Button	Icon	Function	Function	Icon	Button
1		Not Used	Manual DPF regen: Initiates a manual DFP regeneration. When active, the button icon turns green.		5
2		Not Used	Inhibit DPF regens: Inhibits automatic DPF regenerations. When active, the button icon turns green.		6
3		Not Used	Not Used		7
4		Return to Engine Information 1 screen.	Not Used		8

(b) Engine Information Screen 2 (DPF) Bar-Charts

Table 4.15 - Engine Information Screen 2 (DPF) Bar-Chart

Bar-Chart	Description	Description	Bar-chart
	DPF Soot Level (%) This is the level of soot in the DPF used on Tier 4F engines. When the soot level exceeds 80%, DPF regeneration is needed.	Exhaust Temperature This temperature is expressed in units of °C or °F.	

(c) Time Since Last Regeneration

The time elapsed since the last DPF regeneration (automatic or manual) is shown in a box on the Engine Information 2 screen. This time is expressed in minutes, seconds and tenths of seconds. It is continually updated and is reset to zero on a DPF regeneration.



Figure 4.35 - Time Since Last Regeneration

4 Machine Operation

(7) Machine Information Screen 1

The screen is accessed from the Main screen “Figure 4.26 - Panel Main Screen” on page 4-37 by pressing button 3 (third-down on the left).

The Machine Information 1 screen is shown below;

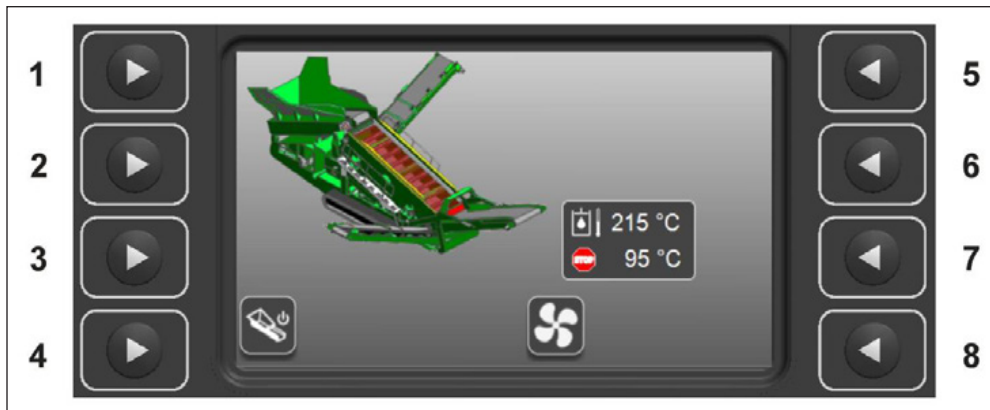


Figure 4.36 - Machine Information Screen 1

The Machine Information screen 1 provides an interface for:

- Monitoring the machine's hydraulic oil temperature (option on certain machines)
- Starting/stopping the hydraulic oil cooling system
- Starting / Stopping the feeder (and engine)

The elements of the Machine Information 1 screen are described below;

(a) Machine Information Screen 1 Buttons

The left/right buttons of the Machine Information 1 screen are used as follows:

Button	Icon	Function	Function	Icon	Button
1		Not Used	Not Used		5
2		Not Used	Not Used		6
3		Not Used	Not Used		7
4		Start/stop feeder. Icon turns grey when feeder is stopped (pressing again will start feeder).	Not Used		8

In addition, the up-arrow button below the LCD panel is used to control the hydraulic oil cooling system, as follows.

Icon	
Button	
Function	Start/Stop hydraulic oil cooling fan. Icon turns grey when fan is stopped (pressing again will start fan).

(b) Hydraulic Oil Status

The Machine Information 1 screen features a box containing status information about the hydraulic oil.

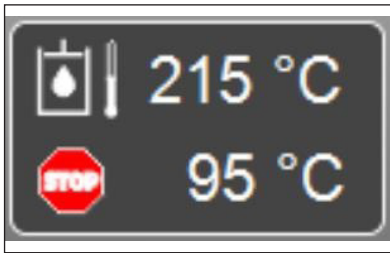


Figure 4.37 - Hydraulic Oil Status

The figures are interpreted as follows;

Icon	Figure
	Current hydraulic oil temperature (°C)
	Hydraulic oil temperature (°C) at which feeder will be automatically stopped

(8) Machine Information Screen 2

The screen is accessed from the Main screen “Figure 4.26 - Panel Main Screen” on page 4-37 by pressing button 7 (third-down on the right).

The Machine Information 2 screen is shown below;



Figure 4.38 - Machine Information Screen 2

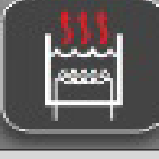
The Machine Information 2 screen provides an interface for;

- Controlling machine lamps (panel and work lights)
- Controlling machine pumps (diesel and dust)
- Accessing the Error Log and Webasto Heater screens

The elements of the Machine Information 2 screen are described below;

(a) Machine Information Screen 2 Buttons

The left/right buttons of the Machine Information 2 screen are used as follows::

Button	Icon	Function	Function	Icon	Button
1		Switch on/off panel light. Icon turns grey when light is off (pressing again will switch on light).	Switch on/off diesel pump. Icon turns grey when pump is off (pressing again will switch on pump).		5
2		Switch on/off work lights. Icon turns grey when lights are off (pressing again will switch on lights).	Switch on/off dust pump. Icon turns grey when pump is off (pressing again will switch on pump).		6
3		Not Used	Access the Webasto Heater screen.		7
4		Not Used .	Access the Error Log screen		8

(9) Settings Screen

The Settings screen is accessed from the Main screen “Figure 4.26 - Panel Main Screen” on page 4-37 by pressing button 8 (bottom-right).

The Settings screen is shown below;



Figure 4.39 - Settings Screen

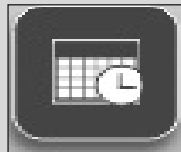
This screen provides an interface to access the following screens;

- Wireless Interlock screen
- Options screen
- Timers screen
- Feeder Speed Settings screen
- Display Settings screen
- Factory Settings screen
- Error Log screen

4 Machine Operation

(a) Settings Screen Buttons

The left/right buttons of the Settings screen are used as follows:

Button	Icon	Function	Function	Icon	Button
1		Access the Wireless Interlock screen.	Access the Display Settings screen.		5
2		Access the Options screen.	Access the Factory Settings screen .		6
3		Access the Timers screen.	Not Used.		7
4		Access the Feeder Speed Settings screen.	Access the Error Log screen.		8

(b) Settings Screen Version Information

The version numbers of the following are shown on the Settings screen;

- Screener
- Display Unit software
- Master Module software
- IO Module software

4.10 Controlling and Monitoring the Engine

(1) Starting the Engine

To start the engine;

1. Check that:
 - All control levers on the machine are in the neutral position
 - All E-stops (emergency stops) are released
 - All engine fluids and other machine fluids are above their minimum levels
2. Make sure that nobody is within 15 metres (50 feet) of the machine.
3. Insert the key into the Key Switch on the Control Panel.
4. Turn the key clockwise to the Power-only position see Figure 4.40 Item 2.

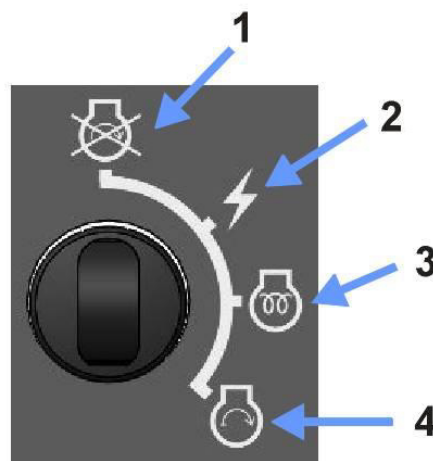


Figure 4.40 - Power Only Position

5. Wait until the display shows the Main screen.

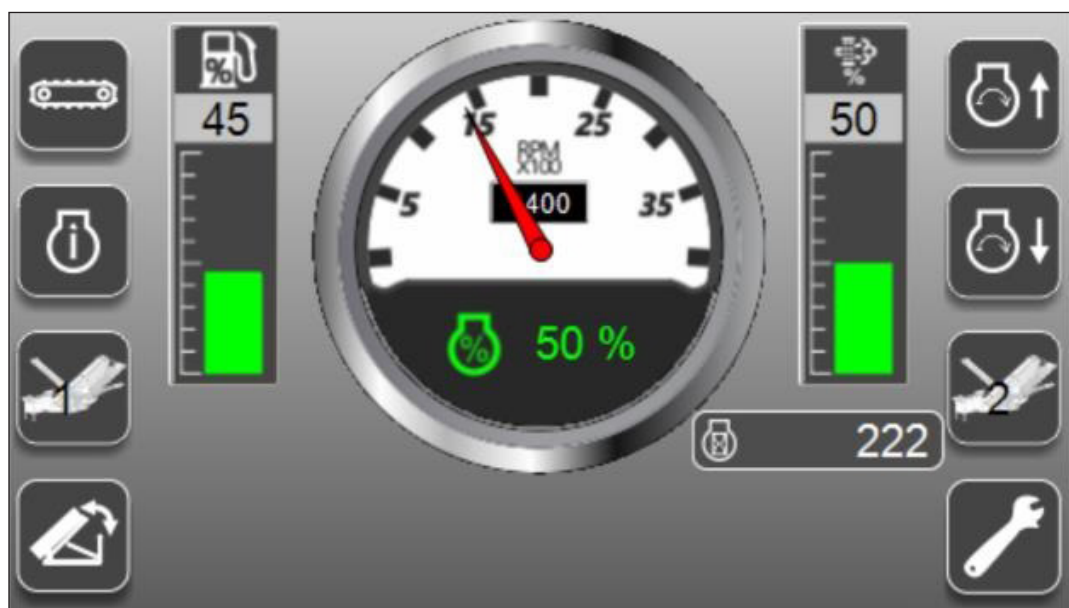


Figure 4.41 - Engine Controls on Main screen

4 Machine Operation

6. Turn the key further clockwise to the Heat position item 3 Figure 4.42.

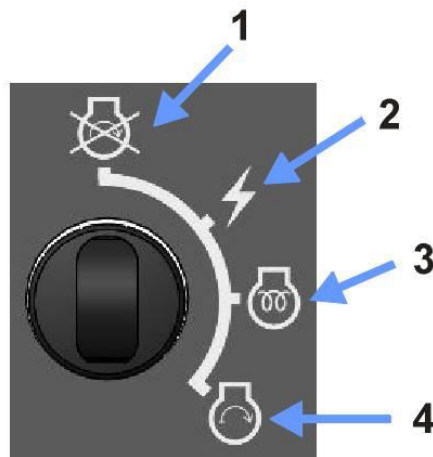


Figure 4.42 - Heat Position

The engine will now be pre-heated and the Engine Pre-heat symbol will be displayed on the Main screen see Figure 4.43.

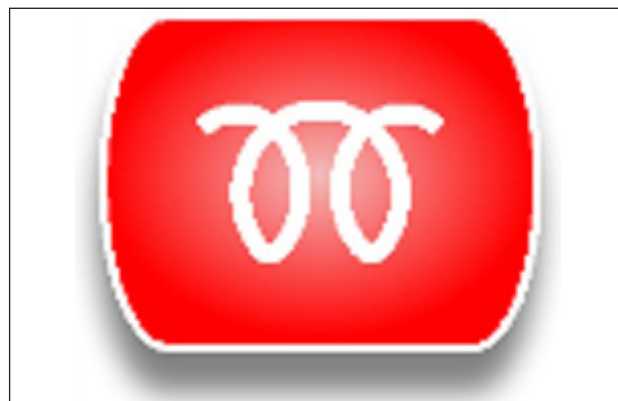


Figure 4.43 - Preheat Symbol

7. Hold the key in the Heat position and wait for the Engine Pre-heat symbol to disappear before proceeding. This will take several seconds.
8. Turn the key further clockwise to the Crank position item 4 Figure 4.44 and hold it in this position until the engine starts. A time-delay of 7 seconds will be implemented before the engine is started. During this time, the machine's siren will sound to indicate that the engine is going to start.

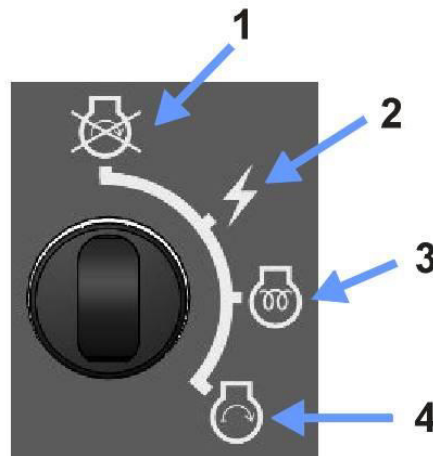


Figure 4.44 - Crank Position

9. As soon as the engine starts, release the Key Switch. The meter on the Main screen will now show the current engine speed in rpm, which will be the idle speed.
10. Before increasing the engine speed and operating the machine, run the engine at the idle speed for 5 minutes to allow the running temperature to be reached. This will prolong the engine life.

(2) Stopping the Engine

If the engine is running in the idle state and no components of the machine are operating (tracks, feeder, screenbox, conveyor) then you can shut down the engine by turning the Key Switch on the Control Panel anti-clockwise to the Off position.

Otherwise, you must stop the machine components and engine in a particular order;

1. Make sure the feed hopper, screenbox and conveyor belts are clear of material.
2. Stop the components of the machine in the following order:
 - Feeder (using its mechanical lever)
 - Conveyors (using their mechanical levers)
3. Reduce the engine speed to the idle state either by pressing the Engine Speed Down button of the Main screen or using the manual throttle until the lowest speed is reached.
4. Allow the engine to run at the idle speed for 5 minutes before shutting off (by turning the Key Switch anti-clockwise to the Off position). This will allow the engine to cool and will prolong the engine life.

NOTICE

CAT Stage V engines have features to protect themselves from damage during engine shutdown. This may result in a delay before the engine is switched off.

(3) Controlling Engine Speed

The engine speed can be changed using two buttons on the Main screen, as described in the sub-sections below.

The machine may be fitted with a variable-speed engine or a fixed-speed engine. The latter has three speed set-points, as follows;

- Idle speed
- 900 rpm
- 1800 rpm

Access to the top speed of 1800 rpm is restricted in that it can only be reached once during every engine session. Therefore, if the engine is run at 1800 rpm and then its speed is reduced, the speed cannot be increased again to 1800 rpm without first stopping and restarting the engine.

(a) Increasing Engine Speed

1. To increase the engine speed, go to the Main screen “Figure 4.26 - Panel Main Screen” on page 4-37 and press the Engine Speed Up button (5):
 - For a fixed-speed engine, pressing this button will increase the speed to the next set-point (if not already on the highest)
 - For a variable-speed engine, you must hold down this button to continuously increase the speed.

(b) Decreasing engine Speed

To decrease the engine speed, go to the Main screen “Figure 4.26 - Panel Main Screen” on page 4-37 and press the Engine Speed Down button (6):

- For a fixed-speed engine, pressing this button will decrease the speed to the next set-point (if not already on the lowest)
- For a variable-speed engine, you must hold down this button to continuously decrease the speed

(4) Monitoring the Engine

The engine can be monitored via two screens on the Display Unit:

- Main screen (described in “Figure 4.26 - Panel Main Screen” on page 4-37)
- Engine Information 1 screen (described in Figure 4.30 on page 4-50).

NOTICE

The exhaust after treatment unit of a Stage V engine can be monitored via the Engine Information 2 screen Figure 4.34 on page 4-54.

The sub-sections below detail where to find information about various engine properties (speed, load, hours, fuel, oil, coolant, air intake and battery, amongst others).

(a) Engine Speed

The engine speed, in rpm, can be monitored via both the Main screen and Engine Information 1 screen.

On the Main screen, the engine speed is indicated on the central meter.



Figure 4.45 - Engine Speed Indicator

The speed is shown in the top (white) part of the meter in two forms;

- On an analogue scale as RPMx100
- In figures as RPM

In addition, when the engine speed is too low (< 1750 rpm) on a fixed-speed engine to track the machine, the following warning is shown on the Main screen;



4 Machine Operation

On the Engine Information 1 screen, the engine speed is shown in the form of a bar-chart, where it is also indicated in figures in units of rpm.

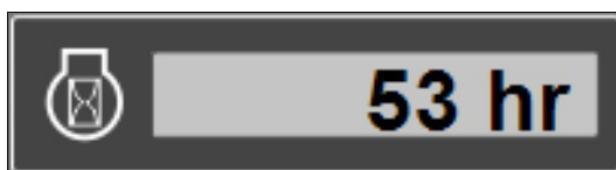


(b) Engine Load

The engine load can be monitored via the central meter of the Main screen. It is shown as a percentage in the bottom (black) part of the meter.



The total hours of engine use so far (since new) are shown on both the Main screen and Engine Information 1 screen in similar boxes, as illustrated below;



(c) Fuel Information

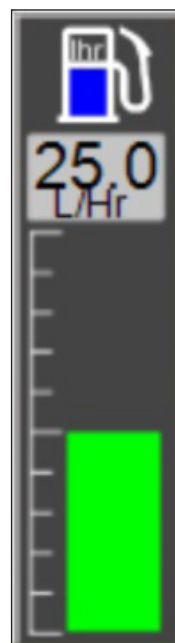
The fuel status can be monitored in terms of level, consumption rate and daily usage, as described below. A 'Water in Fuel' warning can also be issued.

(i) Fuel Level

The current fuel level is shown on the Main screen in the form of a bar-chart, where it is also indicated as a percentage of a full fuel-tank.

**(ii) Fuel Rate**

The current rate of fuel consumption is shown on the Engine Information 1 screen in the form of a bar-chart, where it is also indicated in figures in units of L./hr.



4 Machine Operation

(iii) Fuel Usage

A record of the daily fuel usage, in liters, over the last seven days is shown on the Engine Information 1 screen in a summary box.



(iv) Water in Fuel

If water is detected in the fuel, the following warning is shown on the Main screen.



If this problem persists for 30 minutes without being rectified, a 'Water in Fuel' error screen will be displayed and the engine will be automatically shut down.

(d) Oil Pressure

The engine oil pressure can be monitored via the Main screen and Engine Information 1 screen. The current oil pressure is shown on the Engine Information 1 screen in the form of a bar-chart, where it is also indicated in figures in units of kPa.



If the oil pressure falls too low, the following warning is shown on the Main screen.

**(e) Coolant Information**

The engine coolant (water) can be monitored in terms of level and temperature, as described below.

(i) Coolant Level

If the coolant level falls too low, the following warning is shown on the Main screen.



If the problem persists without being rectified, a 'Coolant Level Low' error screen will be displayed. If the coolant level sensor does not detect any liquid for more than 20 seconds, the engine will be automatically shut down.

(ii) Coolant Temperature

The current coolant temperature is shown on the Engine Information 1 screen in the form of a bar-chart, where it is also indicated in figures in units of °C or °F.



If the coolant temperature rises too high, the following warning is shown on the Main screen.



If the problem persists without being rectified, an 'Engine Temperature Shutdown' error screen may be displayed and the engine will be automatically shut down.

(f) Air Intake Information

The engine's air intake can be monitored via the Main screen and Engine Information 1 screen. On the Engine Information 1 screen, the air intake pressure is shown in the form of a bar-chart, where it is also indicated in figures in units of kPa.



On the Main screen, the following warning is shown when the engine's air filter is blocked.



If the problem persists for 30 minutes without being rectified, a 'Blocked Air Filter' error screen will be displayed and the engine will be automatically shut down.

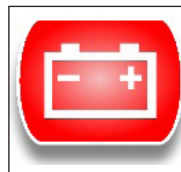
(g) Battery Information

The battery status can be monitored via the Main screen and Engine Information 1 screen.

On the Engine Information 1 screen, the current battery voltage is shown in the form of a bar-chart, where it is also indicated in figures in units of V.



On the Main screen, the following warning is shown when the battery is not charging (the alternator should be checked)



The following warning is shown to instruct you to wait before isolating the battery (the warning disappears when it is safe to isolate the battery)



(h) Other Engine Information

Other engine-related warnings may be displayed on the Main screen, as follows;

Engine Preheat

When the engine is being heated before cranking, the following warning is displayed;



The engine should not be cranked until the above warning has disappeared.

(i) Engine Alert

When there is a non-urgent engine issue, the following warning is displayed;



(ii) Engine Stop

When the engine is stopping due to an issue of high severity, the following warning is displayed.



(iii) Delayed Engine Shutdown

When the engine is going to automatically shut down after a delay, the following warning is displayed;



(5) Exhaust After treatment (Stage V Engines)

Tier 4 engines are fitted with an exhaust after treatment unit to clean the emissions from the engine. Two after treatment features may be available;

- Diesel Exhaust Fluid (DEF).
- Diesel Particulate Filter (DPF).

NOTICE

The CAT 7.1 Stage V engine also has a Delayed Engine Shutdown (DES) feature to protect the engine system components from damage during a shutdown with a high exhaust temperature.

Exhaust after treatment information is provided on two screens;

- Main screen, detailed in “(4) Engine Information Screen 1” on page 4-50
- Engine Information screen 2, “(5) Engine Information Screen 2 (DEF)” on page 4-52 and “(6) Engine Information Screen 2 (DPF)” on page 4-54.

If there is a high-severity problem with the exhaust after treatment unit, the ‘After treatment Fault’ warning is displayed on the Main screen.



(a) Diesel Exhaust Fluid (DEF)

A Tier 4 engine may be fitted with an after treatment unit which injects Diesel Exhaust Fluid (DEF) into the exhaust system to convert Nitrous Oxide into Nitrogen and Water. It is important to maintain the DEF level of the machine in order to support this exhaust after treatment feature. When the DEF feature is fitted, the Engine Information 2 screen is dedicated to DEF monitoring “(5) Engine Information Screen 2 (DEF)” on page 4-52.

(i) DEF Level

If the DEF level falls below 20%, the DEF should be replenished at the earliest opportunity. In this case, a ‘DEF Level Low’ warning is displayed on the Main screen as a prompt to do this.



In the event of the DEF level falling further, the ‘After treatment Fault’ warning will be displayed on the Main screen (see above) on the level reaching 13.5% and an engine derate will be initiated on the level reaching 7.5%. If the level falls below 3%, the engine will be automatically shut down.

(ii) DEF Level Warnings

Table 4.16 - DEF Level Warnings

4 Machine Operation

DEF Level	Warning (Main Screen)			Comments
20%				DEF should be replenished as soon as possible.
13.5%				DEF must be replenished as a matter of urgency
7.5%				Engine derate is initiated
3%				Engine is automatically shut down

(iii) DEF Purge

On CAT Stage V engines, the DEF is purged from the engine during shutdown to prevent engine damage due to the DEF freezing. The DEF Purge is performed each time the engine is switched off, regardless of whether a Delayed Engine Shutdown has been performed.

The DEF Purge is carried out using a battery-driven pump and during this phase, the battery isolator on the machine must not be engaged, otherwise the DEF Purge will not complete and freezing damage may occur in the engine. While the DEF Purge is being carried out, the following warning is displayed on the Main screen to indicate to wait before isolating the battery;



Once the above warning has disappeared, you can switch off the Control Panel and isolate the battery.

NOTICE

On the CAT 4.4 Tier 4F / Stage IV engine, the above warning on the Control Panel is not used. Instead, you should wait for the LED next to the battery isolator on the machine to extinguish before isolating the battery.

(b) Diesel Particulate Filter (DPF)

A Stage V engine may be fitted with a Diesel Particulate Filter (DPF) to catch particles of soot in the exhaust gases. This filter is monitored and managed via the Main screen and the Engine Information 2 screen – if the DPF is fitted, the latter screen is dedicated to the DPF.

If the DPF becomes blocked, it will need to be 'regenerated' – DPF regeneration is the process of clearing the filter of soot deposits and is done by raising the engine exhaust temperature to 450°C. During a DPF regeneration, the following symbol is displayed on the Main screen to warn of extremely high exhaust temperatures;



A DPF regeneration can be performed automatically or manually, as described below. The conditions that must be satisfied for a DPF regeneration to be initiated are also described.

(i) Automatic DPF Regeneration

Periodic DPF regeneration may be initiated automatically by the engine. An automatic DPF regeneration can be performed only when the soot loading of the filter is between 30% and 116%, along with other satisfied conditions.

Automatic DPF regeneration is enabled by default but can be inhibited (disabled) using a button on the Main screen or Engine Information 2 screen labelled with the following icon;



- On the Main screen, this is the down-arrow button below the LCD panel, but the icon is not displayed if the screen-space is needed for warning symbols
- On the Engine Information 2 screen, this is button 6 to the right of the LCD panel

When automatic DPF regeneration is inhibited, the following warning symbol is displayed on the Main screen.

**NOTICE**

Inhibiting automatic DPF regeneration is not normally advised, unless there are safety concerns by having this feature enabled. If it is inhibited, DPF regeneration must still to be performed manually.

(ii) Manual DPF

If an automatic DPF regeneration is not effective or automatic regeneration has been inhibited for some reason then a manual regeneration must be carried out by the operator. A manual DPF regeneration can be performed only when the soot loading of the filter is between 15% and 105%, along with other satisfied conditions.

A manual DPF regeneration should be performed when the soot level is seen to rise above 80%. The following warning symbol is displayed on the Main screen when this happens;



Bar-charts to allow the monitoring of soot level are also displayed on the Main screen and Engine Information 2 screen.

To implement a manual DPF regeneration;

1. Press either of the following buttons, both indicated by the icon;



- Up-arrow button below the LCD panel on the Main screen (note that the icon is not displayed if the screen-space is needed for warning symbols)
 - Button 5 to the right of LCD panel on the Engine Information 2 screen
2. The following symbol is displayed on the Main screen to warn that a manual DPF regeneration is active – wait for this warning to disappear, indicating that the manual DPF regeneration has completed.



(iii) DPF Soot Loading Warnings and Actions

If the DPF soot loading is allowed to increase without any attention (for example, automatic DPF regenerations are inhibited and no manual DPF regeneration is initiated), the engine will eventually automatically derate and then shut down. The key soot levels, warning indicators and associated actions are summarised in the table below;

Table 4.17 - Key Soot Levels

Soot Level	Warning (Main Screen)			Comments
80%				A DPF regeneration is required as soon as possible .
100%				Engine derate is initiated
140%				Engine is automatically shut down

(iv) Conditions for DPF regeneration

A DPF regeneration will not activate unless the following conditions are satisfied:

- 1 Soot loading of filter is within a certain range:
 - Between 30% and 116% for automatic regeneration
 - Between 15% and 105% for manual regeneration
- 2 More than 10 minutes have passed since the last regeneration attempt (this condition applies only to automatic regenerations, as a manual regeneration is regarded as a necessary operator intervention).
- 3 DPF Inlet Temperature > 50°C/122°F
- 4 Coolant temperature is sufficiently high;
 - > 40°C/104°F if ambient temperature > 0°C/32°F
 - > 60°C/140°F if ambient temperature < 0°C/32°F
- 5 For CAT engines;
 - No CAT regeneration system diagnostics are active
 - CAT regeneration system nozzle heater is not active

(c) Engine Protection for After treatment Failure

If the engine after treatment system (featuring DEF and/or DPF) fails for some reason, the engine will take action to protect itself. This failure may result from either of the following situations;

- DEF level falls below a fixed threshold
- DPF soot loading rises above a fixed threshold

The first protective step is to initiate an engine derate. If the after treatment issue is not subsequently corrected and the situation deteriorates, an engine shutdown may then be initiated. These two phases, engine derate and shutdown, are described below.

(i) Phase 1: Engine Derate

An 'engine derate' reduces the operating capacity of the engine. It may be initiated when either of the following engine after treatment conditions occurs:

- DEF level falls below 7.5%
- DPF soot loading rises above 100%

Once an engine derate has been started, the machine will continue to operate but an engine shutdown may eventually be initiated.

(ii) Phase 2: Engine Shutdown

An engine shutdown is generally preceded by an engine derate (see Phase 1 above). A shutdown is initiated when either of the following engine after treatment conditions occurs:

- DEF level falls below 3%
- DPF soot loading rises above 140%

Once it has been shut down, the engine will not restart until the after treatment issue has been resolved.

(d) Delayed Engine Shutdown (CAT 7.1 Stage V Engine)

The Delayed Engine Shutdown (DES) feature is provided on the CAT 7.1 Stage V engine to protect the engine system components from damage during a shutdown with a high exhaust temperature.

If the engine is switched off (using the Key Switch on the Control Panel) and the Diesel Particulate Filter (DPF) outlet has reached a high temperature, the Engine Control Unit (ECU) will keep the engine running in the idle state for a fixed period of time after the Key Switch has been moved to the Off position. This allows the exhaust temperature to drop to a safe level before the engine is automatically switched off.

During this time, the Main screen is displayed on the LCD panel and the following warning symbol appears;

**NOTICE**

DES can be over-ridden by pressing an E-stop on the machine. However, frequently over-riding the DES in this manner is not recommended, as the over-ride is logged by the ECU and this information may be used to refuse a CAT warranty.

Following a DES, a DEF Purge will be performed, as described in Section “(a) Diesel Exhaust Fluid (DEF)” on page 4-73.

4.11 Moving the Machine

(1) Tracking Handset Overview

The machine can be moved on its tracks, which can be controlled from the Tracking Handset, shown below.

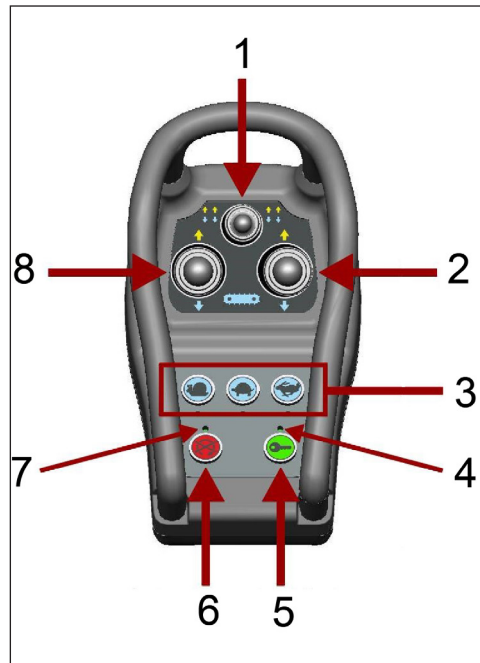


Figure 4.46 - Tracking Handset Overview

Below is the breakdown of corresponding number with Figure 4.46:

- 1 Both Tracks Forward/Reverse.
- 2 Right Track Forward/Reverse.
- 3 Tracking Speed; Slow/Intermediate/Fast.
- 4 Lock LED; Green flashing: Locked, Green Steady: unlocked and Red Flashing: Charging.
- 5 Lock/Unlock.
- 6 Engine stop request.
- 7 RF LED; Green: Paired and Red: Unpaired/Out of Range.
- 8 Left Track Forward/Reverse.

(a) Establishing a Wired Handset Connection

To establish a wired connection between the Tracking Handset and machine or to charge the handset for wireless use:

1. Connect the doglead cable item (1) Figure 4.47 to the socket on the base of the handset Item 2 and the other end of the cable to the socket on the machine Item 3.

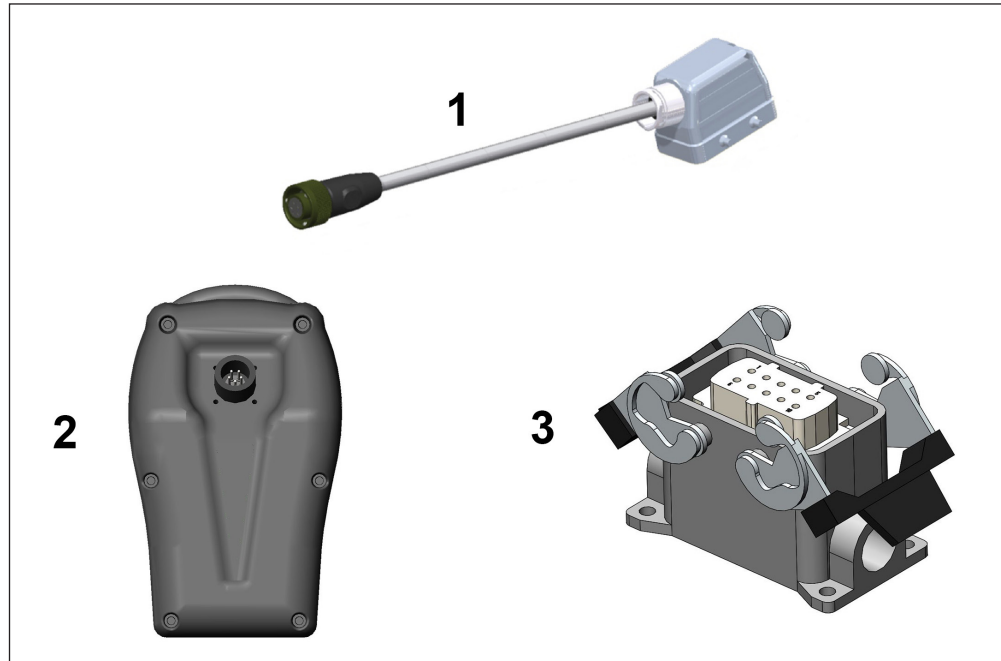


Figure 4.47 - Wired Handset Connection Items

2. Start the engine of the machine.
3. You can now unlock the handset for wired use, as described in “Unlocking the Handset” on page 4-85. Alternatively, you can leave the handset to charge for wireless use – the Lock LED on the handset flashes red during charging and is extinguished when the handset is fully charged.

(b) Establishing a Wireless Handset Connection

Before the handset can be used in wireless (radio) mode, it must be charged through either a wired (dog lead) connection with the machine “Establishing a Wired Handset Connection” or the separate handset charger provided with the machine.

The first time that the handset is used in wireless mode, the radio transceiver on the handset must be paired with the radio transceiver on the machine, as follows:

1. Ensure that there is power to the Control Panel on the machine – that is, the Key Switch is at least in the Power-only position.
2. Ensure that the handset is not connected to the machine via the doglead cable.
3. Ensure that the handset is switched-on. If the Lock LED is not illuminated, press the green Lock button (key symbol) until the LED flashes red.
4. From the Main screen of the Display Unit (see “Figure 4.26 - Panel Main Screen” on page 4-37), access the Tracking/Radio screen by pressing button 1:



The Tracking/Radio screen is now displayed (note that a siren will also sound):



Figure 4.48 - Tracking/Radio Screen

5. Ensure that the machine's radio receiver is enabled - if the icon for the Radio Enable/Disable button (5) is as shown below (disabled), press the button.



Once the radio is enabled, the button icon will turn green.



6. On the Tracking/Radio screen, initiate radio pairing by pressing the Radio Pairing button (8):



The Radio Pairing button icon turns green and the time-limited radio pairing interval commences, during which you must complete the next step.



The button icon will turn back to grey when the radio pairing interval expires.

As an alternative to the above, you can simply press the blue button on the radio transceiver unit on the machine.

7. During the displayed countdown, perform the following actions on the handset:
8. Pull down both the left and right track control levers (blue direction see “Figure 4.49 - Pairing Handset for Wireless” on page 4-83) and hold them down.
9. Now also hold down the red button for at least 5 seconds. The RF LED (beside the red arrow see Figure 4.49) will now flash orange.



Figure 4.49 - Pairing Handset for Wireless

10. Wait for the RF LED to stop flashing and illuminate constantly in green, then release the button and levers.

Once the pairing has successfully completed, a radio tracking icon will be shown on the left of the Tracking/Radio screen and a radio code for the handset will be shown in the box at the top of the screen.



Figure 4.50 - Tracking/Radio Screen tracking Activated

11. You can now unlock the handset for tracking, as described in “(2) Unlocking the Handset” on page 4-85

(2) Unlocking the Handset

Before the handset can be used to control the tracks, it must be unlocked as described below.

NOTICE

If the handset is to be used in wireless (radio) mode, the internal battery must have charge. The battery can be charged via a wired (doglead) connection with the machine or independently via the supplied handset charger

1. Ensure that there is power to the Control Panel on the machine – that is, the Key Switch is at least in the Power-only position see “Figure 4.5 - Ignition Key Positions” on page 4-21.
2. If on-screen indications of unlocking are required, ensure that the Tracking/Radio screen is shown on the Display Unit. While the handset is locked, a closed (red) padlock is shown at the bottom of the screen. The following example screen is for a wired (doglead) connection.



Figure 4.51 - Wired Doglead Screen

3. Start the unlocking sequence on the Tracking Handset by pressing the green Lock button (key symbol). If the handset was off, you will need to hold down this button for at least 3 seconds until the Lock LED above the button starts to flash red. You must now complete the rest of the unlocking sequence within 40 seconds (otherwise the handset will automatically switch off).
4. An image of the handset is then shown on the display, which will guide you through the actions of the next step.

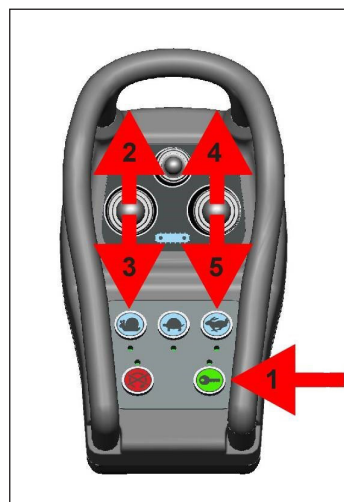


Figure 4.52 - Sequence to Unlock Handset

4 Machine Operation

Below describes the function of handset Arrows from “Figure 4.52 - Sequence to Unlock Handset” on page 4-85:

5. Arrow 1 to start sequence Lock/Unlock Handset hold until lock LED flashed green;
6. Arrow 2 Left control: Move up.
7. Arrow 3 Left control: Move down.
8. Arrow 4 Right control: Move up.
9. Arrow 5 Right control: Move down.

The above movements must be made in quick succession for the handset to successfully unlock.

10. Wait for the handset to unlock, which is indicated as follows:

- On the handset, the Lock LED will stop flashing and be constantly illuminated in green
- On the Tracking/Radio screen, the closed (red) padlock will disappear and an open (green) padlock will appear in the top-left of the screen



Figure 4.53 - Hand set Unlocked

11. You can now use the handset to control the tracks.

NOTICE

The handset will automatically lock itself if it detects no activity for 300 seconds (5 minutes). In this case, it must be unlocked again. Also, if it is left in the locked state for 50 seconds, the handset will automatically switch off.

(3) Using Handset to Control the Tracks

It is assumed that the handset is ready for tracking control – that is, either of the following applies;

- For wired use, the doglead cable is connected between the handset and machine
- For wireless use, the handset has been charged, the radio transceivers have been paired and the doglead cable is not connected

WARNING

If you need to urgently stop the machine at any point during the tracking operation, press the red button on the handset. This will request the engine to stop but is not an E-stop and should not be relied upon as one.

To control the Tracks;

1. Ensure that the engine is running, or start it as described in “(1) Starting the Engine” on page 4-61.
2. Ensure that the Tracking Handset is unlocked. This is indicated by the Lock LED on the handset being constantly illuminated in green. If necessary, unlock the handset.
3. Ensure that the Tracking/Radio screen is shown on the Display Unit. The following example screen is for a wireless (radio) connection.

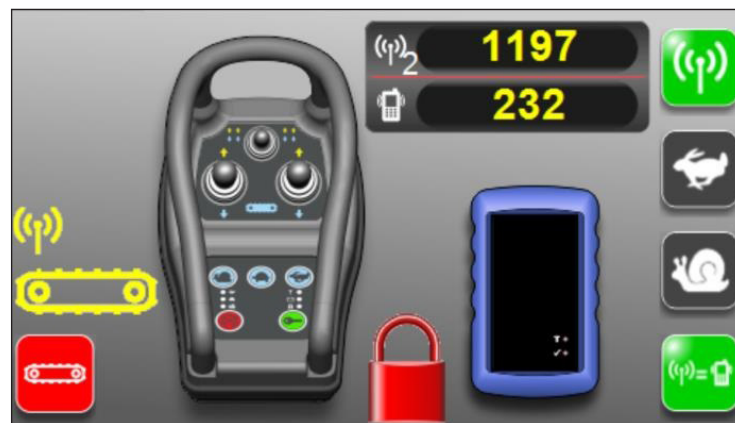


Figure 4.54 - Tracking Screen Activated

NOTICE

When the above screen is accessed, the machine enters Tracking Mode but there is an 8-second pre-tracking delay before the tracks are enabled. During this time, a siren sounds on the machine. If any of the track-control levers is moved on the Tracking Handset during this time, the countdown will restart from 7 seconds.

4. Wait for the siren to stop and then control the tracks as follows. Use the three tracking levers on the handset to operate the left and right tracks. A lever must be held in position to maintain tracking – when it is released, tracking stops. The two tracking directions are colour-coded, yellow and blue.

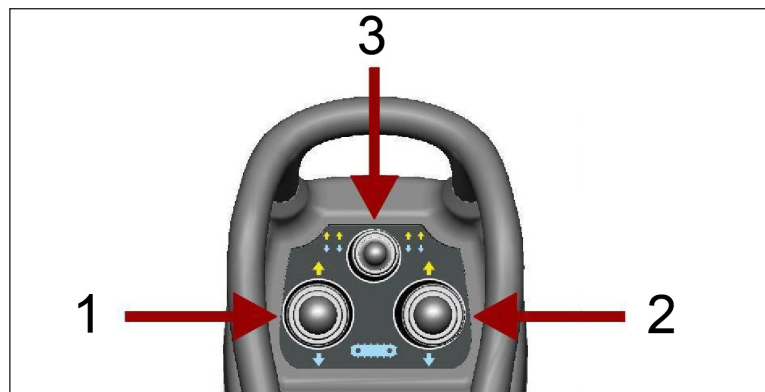


Figure 4.55 - Tracking Levers on Handset

- 1 Left Track Forward/Reverse.
- 2 Right Track Forward/Reverse.
- 3 Both Tracks Forward/Reverse.
5. You may control the tracking speed from the Tracking/Radio screen or the Tracking Handset.

Tracking/Radio screen:

The Hare and Snail buttons are used to increase (Hare) and decrease (Snail) the engine speed and tracking speed as follows:

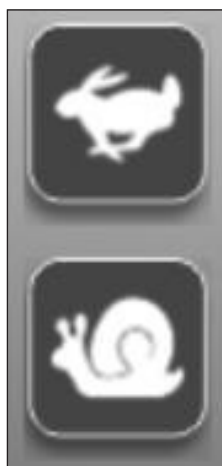


Figure 4.56 - Hare and Snail Symbols

- For a variable-speed engine, the button must be held down to continuously change the engine speed and therefore tracking speed
- For a fixed speed engine, pressing the button will change to the tracking speed corresponding to the next engine speed set-point see “(3) Controlling Engine Speed” on page 4-64.

Tracking Handset:

The Hare, Tortoise and Snail buttons are used as follows:

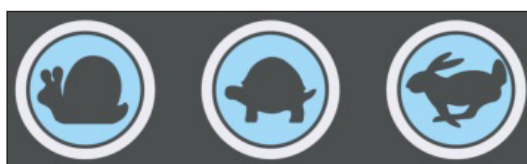


Figure 4.57 - Hare, Tortoise and Snail

For a variable-speed engine, the buttons are used to reach engine speed set-points and the corresponding tracking speeds:

- Snail: Idle engine speed, slow tracking speed
- Tortoise: 1400 Rpm engine speed, intermediate tracking speed
- Hare: 1800 Rpm engine speed, fast tracking speed

For a fixed-speed engine, the Snail and Hare buttons are used as above, but the Tortoise button is not used.

6. To exit Tracking Mode:

- On the Tracking/Radio screen, press the Tracking Mode Exit button (4), which will return you to the Main screen.
- Press the green Lock button (key symbol) on the handset to lock the handset (the Lock LED will flash red). The handset will automatically switch off after 50 seconds in the locked state.

7. Finally, switch off the engine by turning the Key Switch on the control panel anti-clockwise to the Off (12 'o'clock) position. You should ideally run the engine at the idle speed for 5 minutes before shutting off, as this will allow the engine to cool and will prolong the engine life.

4.12 Operating the Machine

On the screener, raw material is passed via a feeder to the screenbox, where it is sorted in terms of size, and is then passed out of the machine via conveyors.

The feeder can be controlled from the Control Panel on the machine and from the remote Operational Handset.

(1) Starting the Machine

Operation of the machine is started as follows:

1. Start the engine.
2. Wait for the engine to warm up before continuing (a warm-up time of at least 5 minutes is advised), then rev up the engine to the required operational speed.
3. Enable the conveyor(s) by releasing the relevant mechanical lever(s) on the machine. The conveyor(s) will automatically start.
4. Start the Screenbox by putting the Lever in the Drive position.
5. Enable the feeder by releasing its mechanical lever on the machine.
6. Start the feeder by pressing the appropriate button on the Control Panel of the machine or on the Operational Handset.

(2) Stopping the Machine

If you need to stop and shut down a fully operational machine, you must stop the machine components in a particular order, as follows:

1. Make sure the feed hopper (if fitted), feeder, screenbox and conveyor belts are clear of material.
2. Stop the feeder using its mechanical lever.
3. Stop the conveyors using their mechanical levers.
4. Reduce the engine speed to the idle state and leave the engine running for at least 5 minutes (to prolong engine life), then shut it down by turning the Key Switch on the control panel anti-clockwise to the Off (12 'o'clock) position.

(3) Operating the Feeder

The Control Panel and Operational Handset provide the facility to control the feeder – it can be started/stopped and its speed can be increased/decreased.

Feeder Start / Stop

The feeder can be started and stopped either from the Control Panel on the machine or remotely from the Operational Handset.

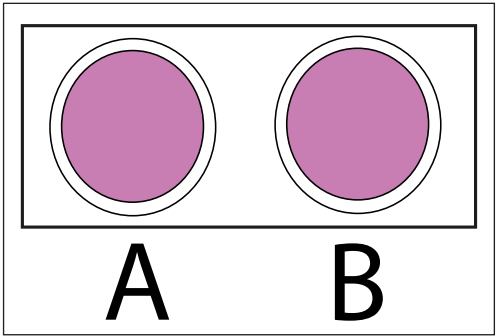
From Control Panel

The feeder can be started and stopped from the Control Panel in the following ways:

- From Main screen: Button 4 of the Main screen can be used to start/stop the feeder. The button icon is green when the feeder is running and grey when it is not, as shown below.

	Feeder Running - Pressing Button will stop the feeder.
	Feeder Not Running - Pressing Button will start the feeder.

- Button 4 of the Machine Information 1 screen can be used to start/stop the feeder. The button icon is green when the feeder is running and grey when it is not, as shown above.
- Button A or B: The large buttons labelled A and B on the Control Panel can be user-configured, with one possible option being Feeder Start/Stop. Therefore, either of these buttons can be configured and used to start and stop the feeder.



4 Machine Operation

If the feeder is stopped at the Control Panel, the following warning symbol is displayed on the Main screen .



From Operational Handset

The feeder can be started and stopped using the Feeder Start/Stop button on the Operational Handset. This button is located at the top-left of the handset.



Pressing the button once starts the feeder and pressing again stops the feeder.

If feeder is stopped over the radio from the Operational Handset, the following warning symbol is displayed on the Main screen.



Feeder Speed

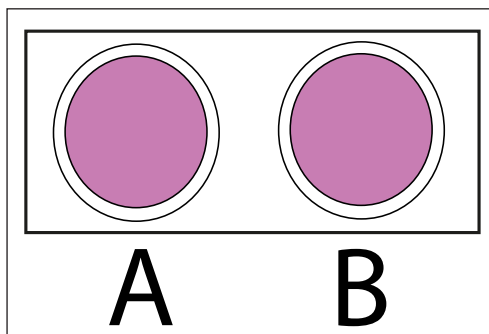
Once the feeder has been started, its speed can be controlled either from the Control Panel on the machine or remotely from the Operational Handset.

From Control Panel

The large buttons labelled A and B on the Control Panel can be user-configured, with two of the possible options being:

- Feeder Fast (Speed Up)
- Feeder Slow (Slow Down)

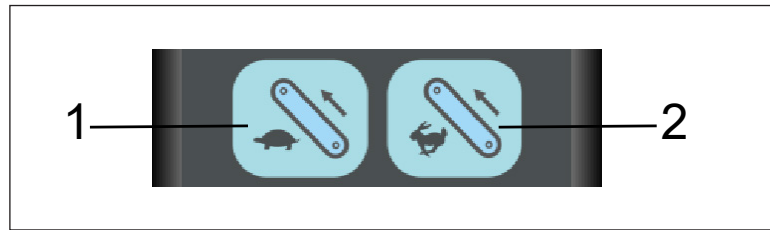
Therefore, one of these buttons could be configured as Feeder Fast and the other button as Feeder Slow, allowing the speed to be increased and decreased.



For these options, these buttons have a momentary action and are only effective when held down.

From Operational Handset

Once the feeder has been started, its speed can be controlled using the following two buttons on the Operational Handset.



Therefore:

- The tortoise button slows down the feeder (Item 1)
- The hare button speeds up the feeder (Item 2)

For these options, these buttons have a momentary action and are only effective when held down.

Automatic Feeder Control

The feeder can be stopped under automatic control due to various conditions detected by sensors on the machine. When one of these conditions occurs, a warning symbol is displayed on the Main screen. The automatic feeder-stop conditions and their warning symbols are described below.

Feeder Stopped via Wireless Interlock

The feeder has been stopped because of an event on a remote (linked) machine in a wireless interlock system. This may be due to a Linked Feeder Stop or a Linked Engine Stop.



Feeder Stopped via Wired Interlock

The feeder has been stopped because of an event on a remote (linked) machine in a wired interlock system.



Feeder Stopped due to Empty Hopper

The feeder has been stopped because the feed-hopper is empty.



4 Machine Operation

Feeder Stopped due to Low Engine Speed

The feeder has been stopped because the engine speed is too low.



Feeder Stopped due to High Hydraulic Pressure

The feeder has been stopped because the hydraulic oil pressure is too high on one or more services.



Feeder Stopped due to Low Fuel

The feeder has been stopped because the fuel level is too low.



4.13 Remote Handsets

Two remote handsets are supplied with the machine;

- Tracking Handset.
- Operational Handset.

Note: Before a remote handset is used for the first time in wireless (radio) mode, it must be paired with the radio receiver on the machine.

(1) Tracking Handset Overview

The Tracking Handset is used only for controlling the tracks when moving the machine. It can be used in wired (doglead) or wireless (radio) mode.

(a) Handset Controls and LEDs

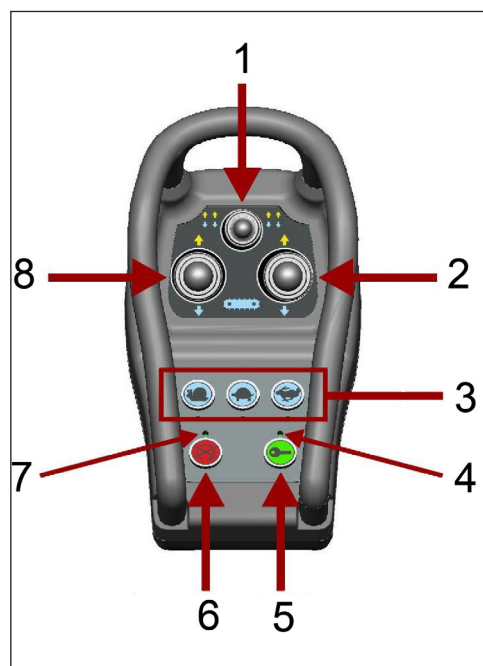


Figure 4.58 - Tracking Handset Overview

Below is the breakdown of corresponding number with Figure 4.79:

- 1 Both Tracks Forward/Reverse.
- 2 Right Track Forward/Reverse.
- 3 Tracking Speed; Slow/Intermediate/Fast.
- 4 Lock LED; Green flashing: Locked, Green Steady: unlocked and Red Flashing: Charging.
- 5 Lock/Unlock.
- 6 Engine stop request.
- 7 RF LED; Green: Paired and Red: Unpaired/Out of Range.
- 8 Left Track Forward/Reverse.
- 9 The handset controls are described in the table below;

4 Machine Operation

(i) Controls

Table 4.18 - Tracking Handset Controls

Control Function	Type	Description
Both tracks forward/reverse	Lever*	Controls both tracks together: • Push forward to rotate tracks in forward direction • Pull back to rotate tracks in reverse direction
Left track forward/reverse	Lever*	Controls only the left track: • Push forward to rotate track in forward direction • Pull back to rotate track in reverse direction Also used in unlocking and pairing the handset.
Right track forward/reverse	Lever*	Controls only the right track: • Push forward to rotate track in forward direction • Pull back to rotate track in reverse direction Also used in unlocking and pairing the handset.
Tracking speed (3 speeds):		
Snail (symbol)	Button	Press to select slow tracking speed (engine speed idle)
Tortoise (symbol)	Button	Press to select intermediate tracking speed (engine speed 1400 rpm – unused on fixed-speed engines)
Hare (symbol)	Button	Press to select fast tracking speed (engine speed 1800 rpm)
Engine stop request	Button	Press to request an immediate engine stop
Lock/unlock	Button	Used to lock and unlock the handset; • When off, hold down to power-on • When locked, use to unlock • When unlocked, press to lock

* Momentary action levers – need to be held in position to perform requested action

(ii) LEDs

The handset also features a number of LEDs.

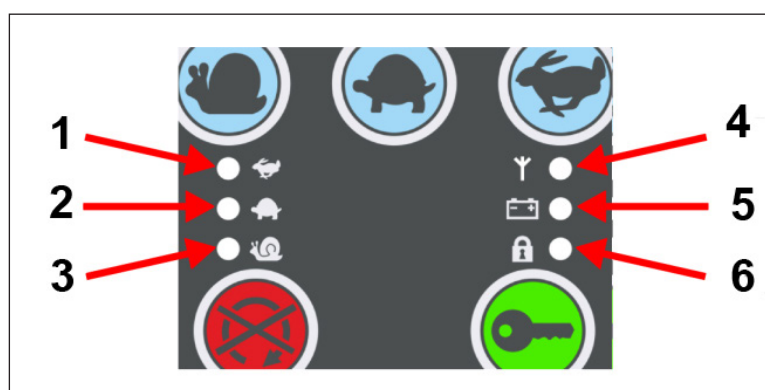


Figure 4.59 - LEDs

- 1 Fast Speed
- 2 Intermediate Speed
- 3 Slow Speed
- 4 RF LED
- 5 Battery LED
- 6 Lock LED

- The left column of LEDs relates to the tracking speed (fast/intermediate/slow), as indicated above. Only one of these LEDs is illuminated at any one time.
- The right column of LEDs provides status information, as detailed in the table below.

Table 4.19 - Tracking Handset LEDs

LED	Colour	Appearance	Description
RF LED	Green	Steady	Handset paired with machine for radio control
	Orange	Flashing	Handset in the process of pairing
	Red	Steady	Handset not paired with or out-of-range of machine for radio control
Battery LED	Green	Flashing	Handset battery is charging
	Green	Steady	Handset battery is charged
	Orange	Steady	Handset battery is low on charge
	Red	Steady	Handset battery needs charging
Lock LED	Red	Steady	Handset is locked
	Green	Flashing	Handset is in unlocking phase
	Green	Steady	Handset is unlocked (can be used)

(b) Handset Connector

A 5-pin male connector is located on the base of the Tracking Handset. This cable socket serves two purposes;

- Accepts the doglead cable for a wired link to the machine (see Section (c) on page 4-49).
- Accepts a connection to the DC battery charger (see Section (3) on page 4-49).



Figure 4.60 - Socket on Base of Tracking Handset

(c) Wired (Doglead) Mode

The Tracking Handset can be used in wired mode, employing a 'doglead' cable to connect the handset to the machine. The cable and the sockets to which it connects (on the base of the handset and on the machine) are shown below.

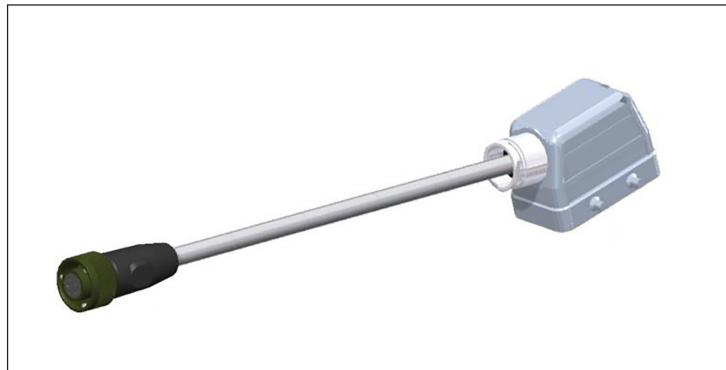


Figure 4.61 - Dog Lead Cable

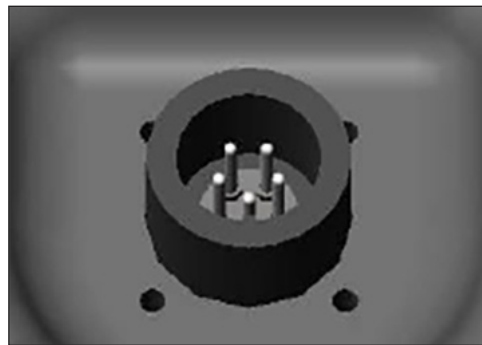


Figure 4.62 - Cable Sockets on Handset

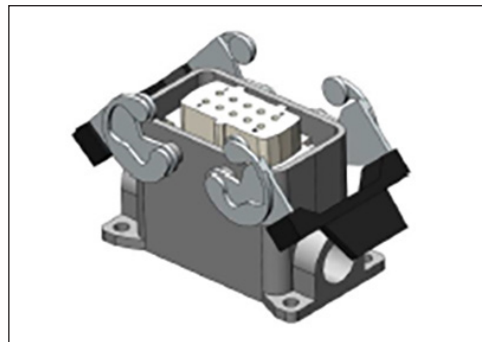


Figure 4.63 - Cable Sockets on Machine

For instructions on setting up a wired connection between the Tracking Handset and machine, refer to Figure 4.17 on page 4-50.

(d) Wireless (Radio) Mode

The Tracking Handset can be used in wireless mode via a radio link to the machine. To use the handset in this mode;

- The internal battery of the Tracking Handset must first be charged, as indicated in Section (3) on page 4-50.
- The radio transceiver on the handset must be paired with the transceiver on the machine, as described in Section (3) on page 4-50.

(2) Operational Handset Overview

The Operational Handset is mainly used to control the feeder.



Figure 4.64 - Radio Handset

The handset has a keypad, an On/Off button and a socket for battery charging. It communicates with the machine via a wireless (radio) link only.

Note: The handset incorporates a lithium-ion rechargeable battery which must be charged using the supplied charger, as indicated in Section (3) on page 4-51.

The keypad controls and LEDs of the Operational Handset are depicted below Figure 4.85;

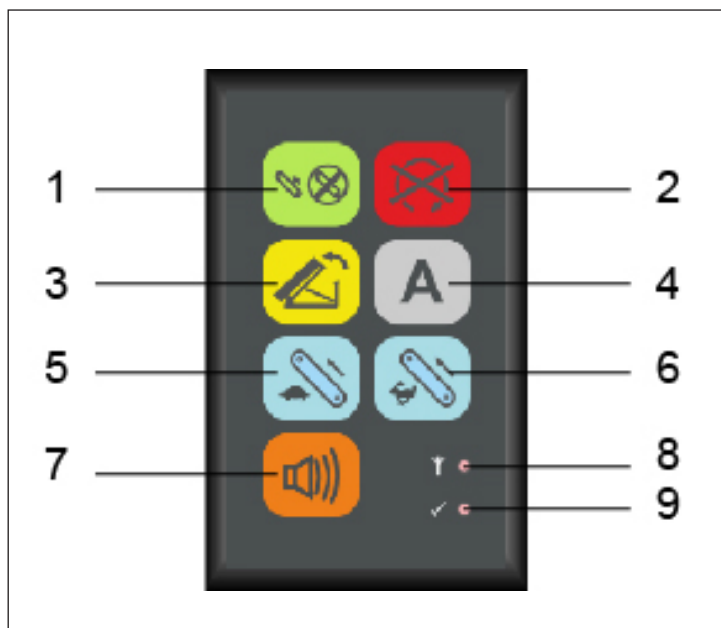


Figure 4.65 - Operational Handset Controls and LEDs

- 1 Feeder Start/Stop
- 2 Engine Stop Request
- 3 Unused
- 4 Button A
- 5 Feeder Slow-Down
- 6 Feeder Speed-Up
- 7 Siren
- 8 Transmitting LED
- 9 Information LED

The keypad buttons are described in the table below.

Table 4.20 - Operational Handset Controls

Control Function	Icon	Description
Feeder Start/Stop		Press to start the feeder, press again to stop the feeder
Feeder Slow-down		Press to slow-down the running feeder
Feeder Speed-Up		Press to speed-up the running feeder
Unused		Unused
Engine Stop Request		Press to transmit an engine stop request to the control panel (if within radio range, the machine will stop the engine immediately) Important: This is NOT an emergency stop and must not be relied upon as such.
Siren		Press to sound the siren on the machine (siren will sound only while the button is held down).

NOTICE

Important: The Operational Handset also has an On/Off latching push-button. When not using the handset for a long period of time, it should be switched off to preserve battery life. The handset must be switched on during battery charging.

The handset LEDs are described in the table below;

Table 4.21 - Handset LED's

LED	Description
Transmit LED	Flashes continuously when a button is pressed or intermittently if no buttons are being pressed
Information LED	Flashes during battery charging (see Section (3) on page 4-53)

(3) Handset Charging

The internal batteries of the handsets can be charged as follows:

- The Tracking Handset can be charged from the machine via the doglead cable or from a DC source via the supplied charger (which uses the same socket on the handset as the doglead cable. The Lock LED on the handset flashes red during charging and is extinguished when charging is complete.

The charger is shown below. .

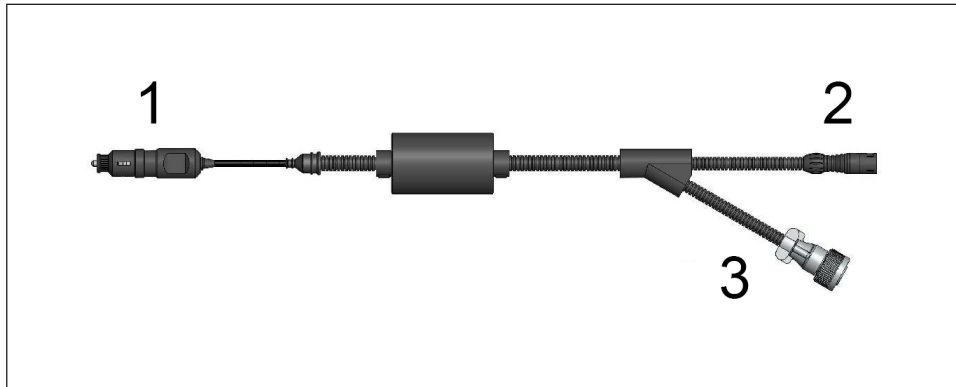


Figure 4.66 - Handset Charger

- 1 DC Source Connector
- 2 Feeder Handset Connector
- 3 Tracking Handset Connector

The source of charge must be a 12V DC supply, such as a cigarette lighter socket on the dashboard of a vehicle.

(4) Activating/Deactivating the Track Handset

To use the Tracking Handset, it must have a power supply (from the doglead cable or internal battery) and be switched on. The handset defaults to a low-power locked state and must be unlocked before use.

(a) Switching ON and Off

If the handset is not powered, none of its LEDs will be illuminated.

1. To switch on the handset, hold down the green (key) button for at least three seconds until the LED above the button flashes in green. Note the following:
 - The LEDs above the red and green buttons both briefly flash in red before the handset switches on.
 - If the LEDs fail to illuminate, this may be because the handset has no power supply – that is, the doglead cable is not connected or the internal battery of the handset has no charge.
2. To switch off the handset, hold down the green (key) button for at least three seconds until its green LED is extinguished. The LEDs above the red and green buttons both briefly flash in red before the handset switches off.

NOTICE

Note: After switching on the Tracking Handset using the green button, there is a 12-second window to start the handset unlocking sequence, otherwise the handset will default to the locked state. For information on unlocking the handset, refer to Section (b) on page 4-54.

(b) Locking and Unlocking

The handset is able to enter a low-power locked state which serves two purposes;

- Prevents controls that are inadvertently moved during idle periods from transmitting commands to the machine.
- Helps to conserve the charge in the handset's internal battery when operating in wireless mode.
- When in the locked state, the handset is powered (as described in Section (a) on page 4-54) but none of its LEDs are illuminated and the tracking levers have no effect. The handset must be unlocked before it can be used to control the tracks.

Unlocking Handset

1. The handset is unlocked by following an unlocking sequence which is indicated in the diagram below and fully described in Section (2) on page 4-54.

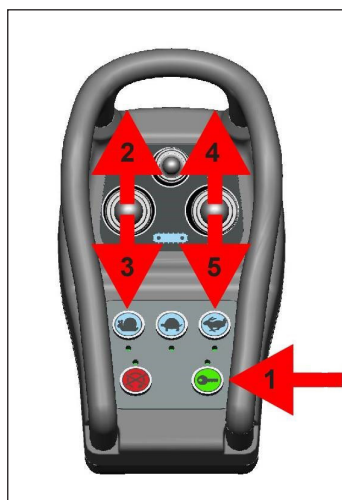


Figure 4.67 - Sequence to Unlock Handset

4 Machine Operation

2. After pressing the green (key) button Arrow 1, you have 12 seconds to continue the unlocking sequence, otherwise the handset reverts to the locked state. During this time, the LED above the button flashes in green and turns solid green once the handset is unlocked.

Locking Handset

3. The locked state can be entered manually or automatically.
4. The handset will automatically enter the locked state after a period of inactivity in the unlocked state – if no control is moved within a period of 300 seconds (5 minutes), the handset will lock.

Once in the locked state, the LED above the green (key) button will be extinguished.

Before the handset can be used in wireless (radio) mode, it must be charged through either a wired (dog lead) connection with the machine “(b) Establishing a Wireless Handset Connection” on page 4-82 or the separate handset charger provided with the machine.

The first time that the handset is used in wireless mode, the radio transceiver on the handset must be paired with the radio transceiver on the machine, as follows:

5. Ensure that there is power to the Control Panel on the machine – that is, the Key Switch is at least in the Power-only position.
6. Ensure that the handset is not connected to the machine via the doglead cable.
7. Ensure that the handset is switched-on. If the Lock LED is not illuminated, press the green Lock button (key symbol) until the LED flashes red.
8. From the Main screen of the Display Unit (see “(1) Main Screen” on page 4-37), access the Tracking/Radio screen by pressing button 1:



The Tracking/Radio screen is now displayed (note that a siren will also sound):



Figure 4.68 - Tracking/Radio Screen

9. Ensure that the machine's radio receiver is enabled - if the icon for the Radio Enable/Disable button (5) is as shown below (disabled), press the button.



Once the radio is enabled, the button icon will turn green.



10. On the Tracking/Radio screen, initiate radio pairing by pressing the Radio Pairing button (8):



The Radio Pairing button icon turns green and the time-limited radio pairing interval commences, during which you must complete the next step.



The button icon will turn back to grey when the radio pairing interval expires.

As an alternative to the above, you can simply press the blue button on the radio transceiver unit on the machine.

11. During the displayed countdown, perform the following actions on the handset:
12. Pull down both the left and right track control levers (blue direction) and hold them down.
13. Now also hold down the red button for at least 5 seconds. The RF LED (beside the red arrow) will now flash orange.



Figure 4.69 - Pairing Handset for Wireless

4 Machine Operation

14. Wait for the RF LED to stop flashing and illuminate constantly in green, then release the button and levers.

Once the pairing has successfully completed, a radio tracking icon will be shown on the left of the Tracking/Radio screen and a radio code for the handset will be shown in the box at the top of the screen.



Figure 4.70 - Tracking/Radio Screen tracking Activated

You can now unlock the handset for tracking, as described in “(2) Unlocking the Handset” on page 4-85

(5) Operational Handset

1. Hold down the following three buttons together until the Information LED starts to flash;

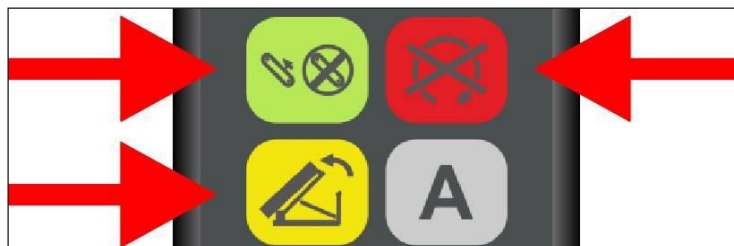


Figure 4.71 - Operational Handset Pairing

- Feeder Start/Stop
 - Grip Tip Cycle
 - Engine Stop Request
2. Exit the Tracking/Radio screen (and Tracking Mode) by pressing button 4 “(3) Tracking/Radio Screen” on page 4-46.

4.14 Machine Error Codes

Table 4.22 - Panel Error Codes

Error Code	Error Text	Meaning	Notes
800100	MASTER MODULE CAN FAULT	The screener display is not receiving messages from the Screener Master Module	Check fuses inside panel
800101	ESTOP	ESTOP has been pressed	
800102	DOGLEAD STOP BUTTON	Stop button on doglead has been pressed or doglead has been unplugged	
800103	RADIO TRACK STOP BUTTON	Stop button request on radio track handset has been pressed	
800104	RADIO SMALL HANDSET STOP	Stop button request on radio small handset has been pressed	
800105	HYD TEMPERATURE WARNING	Hydraulic temperature has reached high enough temperature to generate warning (optional sensor)	
800106	HYD TEMPERATURE SHUTDOWN	Hydraulic temperature has reached high enough temperature to stop machine (optional sensor)	
800107	HYD OIL LEVEL LOW	Hydraulic oil level sensor has not seen any oil for >30seconds, machine shutdown	Check oil, check sensor and plug to sensor
800108	ULTRASONIC LEVEL	Optional ultrasonic sensor has been unplugged / come disconnected	
800109	CONV PRESSURE SENSOR	Optional pressure sensor has been unplugged / come disconnected	20s
800110	PUMP PRESSURE SENSOR	Optional pressure sensor has been unplugged / come disconnected	
800116	IO MODULE NOT CONNECTED	The screener panel is not receiving messages from the io module (located by valves)	Check fuse F, check wiring to io module
800151	OIL COOLER FAULT	The hydraulic oil cooler is drawing excessive current, causing panel to shut it down	Check oil cooler fan, blow out dust from around cooler.
800154	ALTERNATOR NOT CHARGING	Alternator is not outputting high enough voltage to ensure batteries are being recharged	Warning only, Check Alternator fuse, drive belt
800199	DOWNSTREAM PAUSE	Screener is seeing an inhibit signal from a linked machine, preventing feeder running it's feeder	

4 Machine Operation

800200	PULL CORD STOP	Pull cord stop has been activated.	
800201	COOLANT LEVEL LOW	Coolant level sensor has not seen any liquid for >20seconds, machine shutdown	Check coolant level, check sensor and plug
800202	BLOCKED AIR FILTER	Air filter needs changing / cleaning	Warning only
800203	REMOTE LINK STOP	The screener has received an engine stop request from a remote linked machine	
800204	DUAL POWER PANEL COMMS	The screener display is not receiving messages from the AC 3 phase panel controller	
800205	LOSS OF AC VOLTAGE	Check incoming AC / Fuses	
800206	MOTOR STARTER 1 ERROR	3 Phase Panel controller is not seeing a valid link to Motor 1 starter	
800207	MOTOR 1 TRIPPED	Motor 1 Starter has drawn too much AC current for too long, motor shut down	
800208	MOTOR STARTER 2 ERROR	3 Phase Panel controller is not seeing a valid link to Motor 2 starter	
800209	MOTOR 2 TRIPPED	Motor 2 Starter has drawn too much AC current for too long, motor shut down	
800210	ON AC ENGINE DISABLED	AC power detected, engine cranking is disabled	Unplug AC to allow engine to start
800211	ON AC TRACKING DISABLED	AC power detected, machine tracking is disabled	Unplug AC to allow machine to track
800212	ENGINE TEMPERATURE SHUTDOWN	Mechanical engines only, engine coolant temperature switch has closed, engine over heated	
800213	NO J1939 ENGINE DATA	Electronic engines only, Tedd Panel not communicating with engine ECU.	Check that relay K1 inside Tedd panel is energised.
800214	BLOCKED AIR FILTER	Air filter needs changing / cleaning, problem has persisted for 30 minutes, engine has been shutdown	
800215	WATER IN FUEL	Water in fuel trap needs draining, problem has persisted for 30 minutes, engine has been shutdown	

800216	WIRELESS INTERLOCK REMOTE SHUTDOWN	Wireless interlock engine option is enabled but not seeing any remote machines, engine has been shutdown	Turn off setting LINK OPTIONS->LINK ENGINE set to N to disable
800217	ESTOP DUE LOW VOLTAGE	Normally triggered by low battery voltage, estop circuit has dropped below threshold voltage when cranking	Charge battery
800218	BLOCKED AIR FILTER J1939	Electronic engine has told Tedd panel that there is a problem with air filter.	
800219	BLOCKED AIR FITLER AUX IO	Electronic engine has told Tedd panel that there is a problem with air filter.	
800221	LOW FUEL LEVEL FUEL	The level of fuel is low. Warning only	
800223	LOW FUEL LEVEL SHUTDOWN	The level of fuel is low and engine shutdown has been initiated	

4.15 Hydraulic Control Valve Operation

All hydraulic control valves operate using levers and each is labelled with their function. Some control valves on the machine are equipped with a flow control dial. These dials control the output flow from the valve which will in turn speed up or slow down (clockwise turn will reduce speed, anti-clockwise will increase speed) the respective component they control Ref Figure 4.72

The neutral (off) position for hydraulic control valves is when the lever is in the centre position.

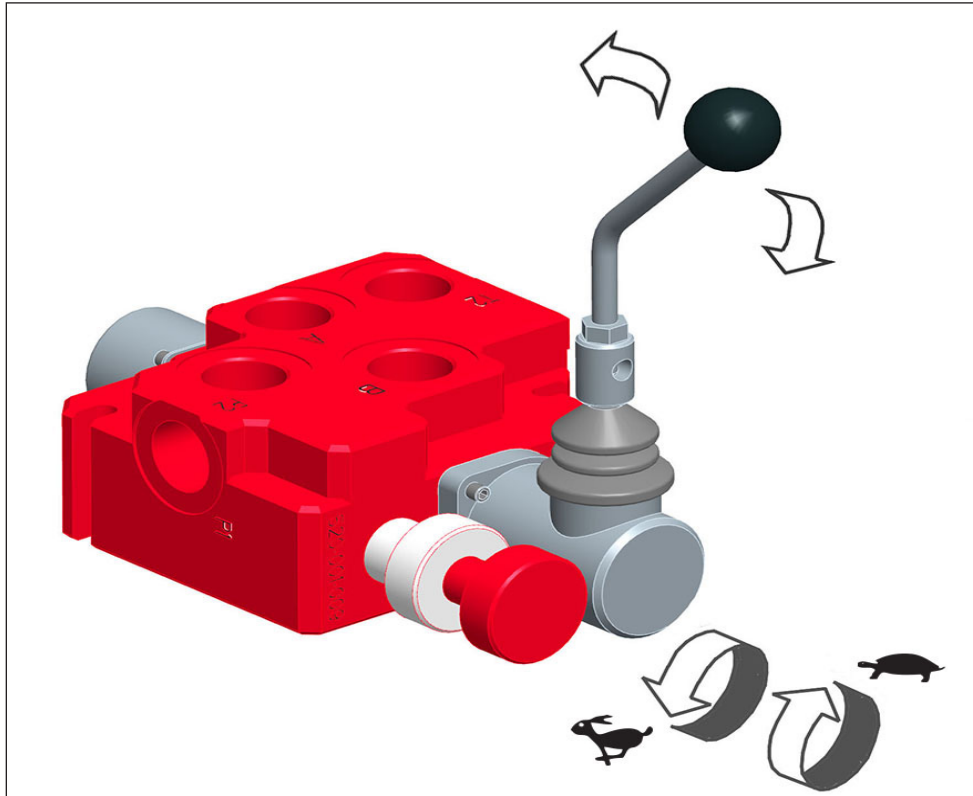


Figure 4.72 - Control Valve

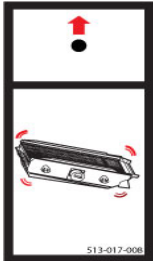
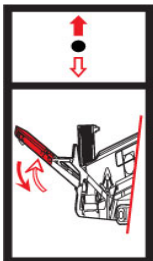
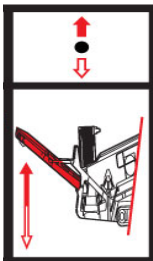
4.16 Pictorial Decal Descriptions

Pictorial decals have been placed on the machine to ensure that the machine is correctly operated and maintained. Operations decals describe the operations of levers on the machine. Information decals give details about how to correctly operate and maintain the machine.

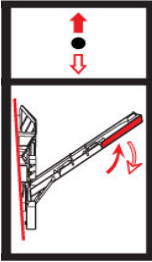
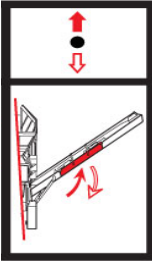
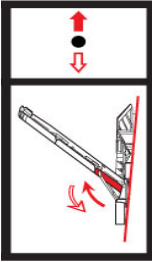
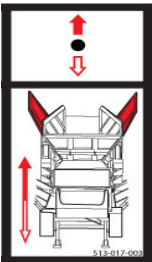
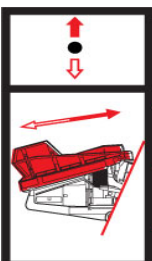
(1) Machine Operations Decals

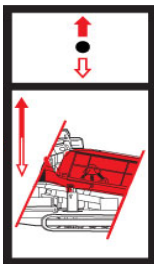
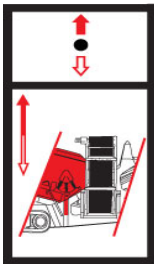
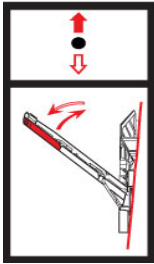
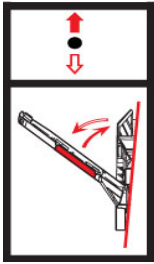
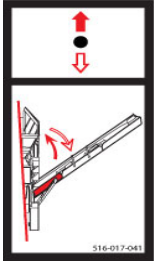
Each operation decal is placed on the machine beside the corresponding lever or control. The following tables give short explanations of each operation decal used on the machine. The operations of the levers or controls will remain the same. The up arrow in the decals indicates moving the lever forward or up. The circle in the decals indicates the neutral position. The down arrow in the decals indicates moving the lever back or down. The pictorial decals contain an image of a component or of the machine with a shaded component. This indicates the part of the machine and the operation that the lever controls.

Table 4.23 - Pictorial Decals

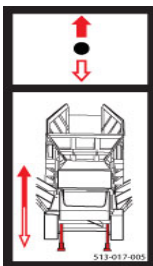
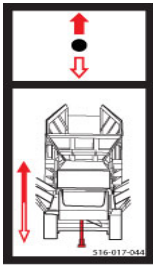
Decal	Description	Explanation	
	Screen Box	↑	Engage screen box
		●	Off position
	Tail Conveyor	↑	Fold tail conveyor
		●	Neutral
		↓	Unfold tail conveyor
	Tail Conveyor	↑	Raise tail conveyor
		●	Neutral
		↓	Lower tail conveyor

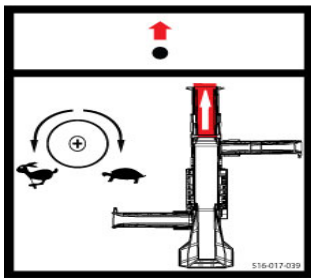
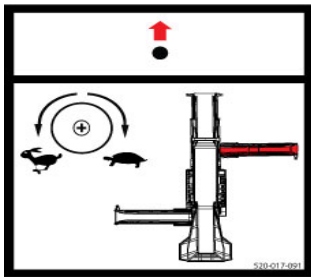
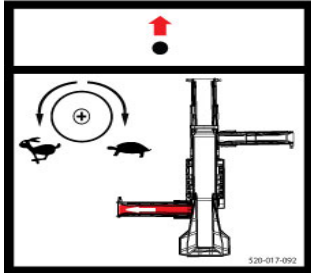
4 Machine Operation

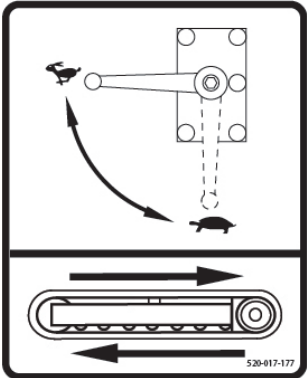
	Right Hand Side Conveyor	↑	Fold right hand side conveyor top section
		●	Neutral
		↓	Unfold right hand side conveyor top section
	Right Hand Side Conveyor	↑	Fold right hand side conveyor middle section
		●	Neutral
		↓	Unfold right hand side conveyor middle section
	Left Hand Side Conveyor	↑	Fold left hand side conveyor bottom section
		●	Neutral
		↓	Unfold left hand side conveyor bottom section
	Hopper Extension Plates	↑	Raise hopper extension plates
		●	Neutral
		↓	Lower hopper extension plates
	Feeder	↑	Slide feeder towards screenbox
		●	Neutral
		↓	Slide feeder away from screen box

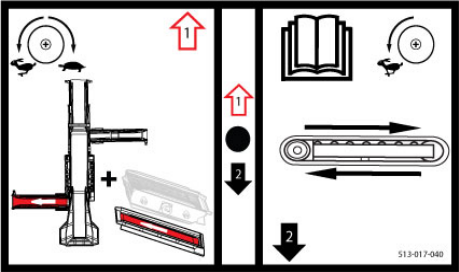
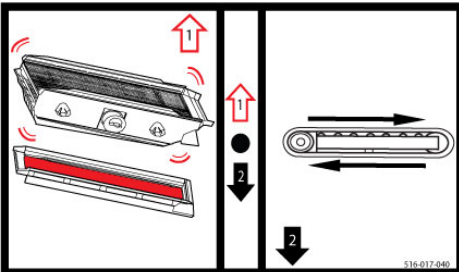
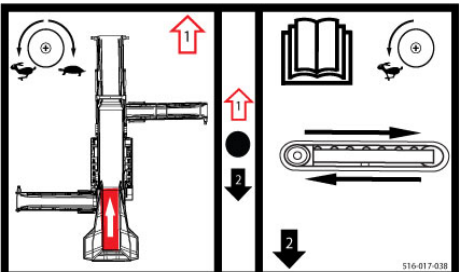
	Screen Box	↑	Raise screenbox upper end
		●	Neutral
		↓	Lower screenbox upper end
	Screen Box	↑	Raise screenbox lower end
		●	Neutral
		↓	Lower screen box lower end
	Left Hand Side Conveyor	↑	Fold left hand side conveyor top section
		●	Neutral
		↓	Unfold left hand side conveyor top section
	Left Hand Side Conveyor	↑	Fold left hand side conveyor middle section
		●	Neutral
		↓	Unfold left hand side conveyor middle section
	Right Hand Side Conveyor	↑	Fold right hand side conveyor bottom section
		●	Neutral
		↓	Unfold right hand side conveyor bottom section

4 Machine Operation

	Support Legs	↑	Raise support legs
		●	Neutral
		↓	Lower support legs
	Support Leg	↑	Raise support legs
		●	Neutral
		↓	Lower support legs

Decal	Description	Explanation	
	Tail Conveyor	↑	Engage tail conveyor plus speed control for conveyor
		●	Off position
	Right Hand Side Conveyor	↑	Engage right hand side conveyor plus speed control for conveyor
		●	Off position
	Left Hand Side Conveyor	↑	Engage left hand side conveyor plus speed control for conveyor
		●	Off position

	Track Speed Control	↑	Enable fast track speed for moving machine across ground
		↓	Enable slow track speed to load machine to transport trailer.

Decal	Explanation	
	↑ 1	Engage collection conveyor and left hand side conveyor plus speed control for conveyors
	●	Off position
	↓ 2	Engage tracks (Make sure speed control is set to max speed before engaging tracks)
	↑ 1	Engage screen box and collection conveyor
	●	Off position
	↓ 2	Engage tracks
	↑ 1	Engage feeder conveyor plus speed control
	●	Off position
	↓ 2	Engage tracks (Make sure speed control is set to max speed before engaging tracks)

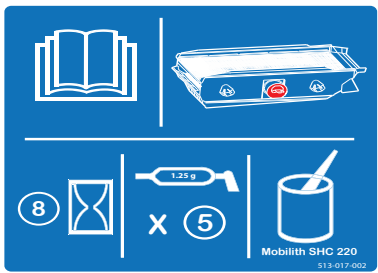
(2) Machine Information Decals

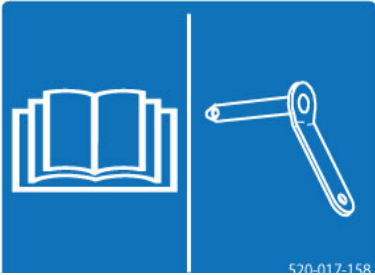
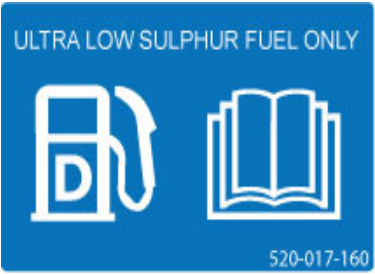
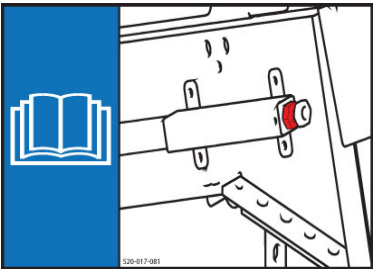
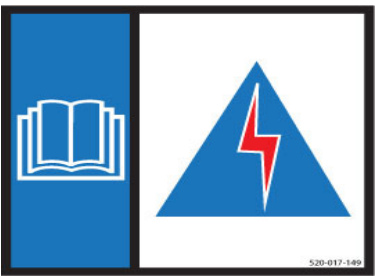
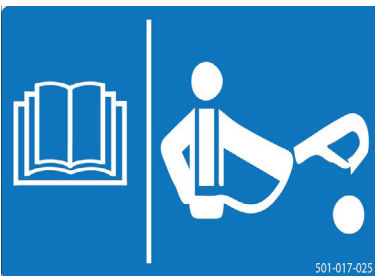
NOTICE

The decals shown below are for illustration only and the actual decal fitted to the machine should be referred to for the correct information.

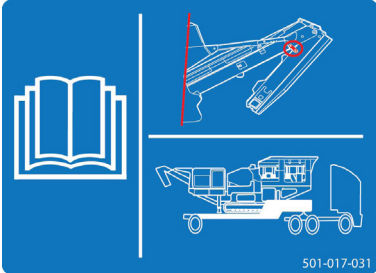
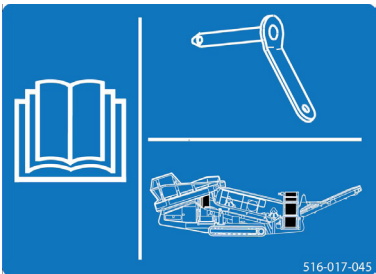
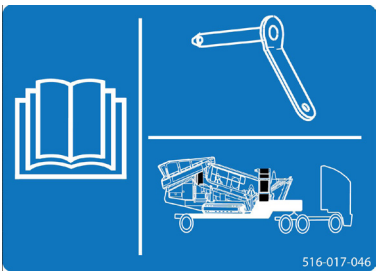
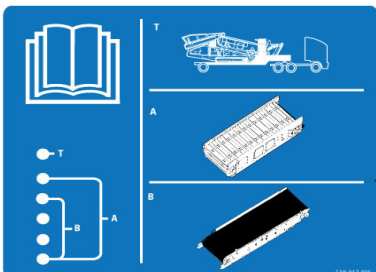
All details are also covered in the corresponding sections of the operations manual which should be read and understood fully before performing any operation with the machine.

Table 4.24 - Machine Information Decals

Decal	Explanation
 The decal is blue with white text and icons. It features a fuel pump icon at the top. Below it, a tank level icon shows a wavy line. To the right of the tank level icon, the text reads: 485 L, 107 Gal UK, 128 Gal US. At the bottom right, the part number 513-017-010 is visible.	Fuel tank capacity
 The decal is blue with white text and icons. It features a hydraulic pump icon and an open book icon at the top. Below them, a tank level icon shows a wavy line and a checkmark icon. To the right of the tank level icon, the text reads: 800 L, 176 Gal UK, 211 Gal US. At the bottom right, the part number 513-017-009 is visible.	Hydraulic oil tank capacity
 The decal is blue with white text and icons. It features an open book icon and a grease gun icon at the top. Below them, a grease gun icon is shown with a 1.25g label. To the right of the grease gun icon, the text reads: 5. Below the grease gun icon, the text reads: Mobilith SHC 220. At the bottom right, the part number 513-017-002 is visible.	Screen box greasing schedule. This decal shows that the screen box requires 5 grease gun pumps delivering 1.25 grams of Mobilith SHC220 grease per pump every 8 hours
 The decal is blue with white text and icons. It features an open book icon and a grease gun icon at the top. Below them, a grease gun icon is shown with a 1.25g label. To the right of the grease gun icon, the text reads: 2. Below the grease gun icon, the text reads: EP 2. At the bottom right, the part number 513-017-002 is visible.	This decal shows that 2, 1.25 gram grease gun pumps of general purpose grease is required every 40 hours

	Make sure that safety pins are removed and replaced as necessary
	Make sure that ultra low sulphur fuel only is used
	Make sure that ultra low sulphur fuel only is used
	Make sure the locking bolt on the belt adjuster is slackened before adjustment and re-tightened after adjustment
	Battery isolator location
	Safety harness securing point

4 Machine Operation

 501-017-031	Make sure that the tail conveyor transport stays are fitted before transporting the machine
 516-017-045	Pinning position while machine is in working configuration.
 516-017-046	Pinning position when machine is in transport configuration
 516-017-047	Feeder pinning positions: T - Transport position A - 5 Working positions which can be used when apron feeder is fitted B - 4 Working positions which can be used when belt feeder is fitted

4.17 Machine Tracking

DANGER

DO NOT stand on any of the platforms or ladders of the machine whilst it is being moved

When manoeuvring the machine make sure you stand well clear of the machine but are in a position to have all-round vision to see any obstacles or dangers that may lie in your path.

WARNING

Machines with optional fixed speed engines are equipped with a hydraulic speed control lever. Do not attempt to track the machine on to a transport trailer with the hydraulic speed control lever in the Up (Fast) position.

Always perform maintenance on a level and solid surface.

NOTICE

Make sure that the tracks are free from obstructions and built up material before manoeuvring the machine.

The left and right of the machine are assigned by standing at the hopper end of the machine and looking towards the main conveyor.

For machines with optional fixed speed engines an additional hydraulic valve is fitted to control the speed of the tracks.

(1) Before moving the machine perform the following checks:

- Check for loose bolts and nuts on lower rollers, sprockets and track shoes.
- Check all tracks links and make sure master pins are correctly located and tight.
- Check for oil leaks from the lower rollers and front idlers.
- Check for oil leak from the track drive gearbox and motor.
- Check track tension is 5mm and 15mm.
- Check for general damage and wear to all components.

If any issues are found make sure corrective action is taken before attempting to move the machine.

When traveling up a gradient, the tracks should be driven forward (i.e. idlers first, drive sprocket to the rear). When traveling down a gradient, tracks should be driven sprocket first Ref: Figure 4.73.

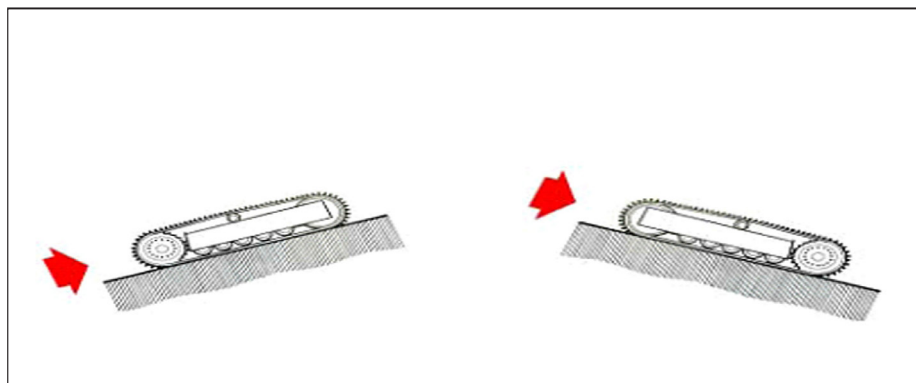


Figure 4.73 - Gradient Direction

4 Machine Operation

ALWAYS:-

- Park the machine on flat, level ground. If it is necessary to park the machine on a gradient, the tracks should be solidly blocked.
- Ensure the terrain the machine is working on is firm enough to adequately support the machine.
- Ensure the machine is tracked at least 10m in either direction on a daily basis, to minimize risk of track chain seizure.
- Ensure the track systems are free from debris before moving the machine.
- Ensure the tracks are not frozen to the ground before moving the machine.

NEVER:-

- Attempt to track the machine if there is any build up of material around the tracks and drive sprockets.
- Attempt to track the machine if the tracks are frozen to the ground.
- Push or tow the machine when unable to free itself.

4.18 Machine Setup

WARNING

Make sure all personnel are clear from the machine.

When starting the machine always make sure all control levers are in the neutral (off) position.

Always observe all safety warnings.

Wear personal protective equipment.

(1) Unfolding the Left Hand Side Conveyor

WARNING

When working above ground level make sure to use a suitable working platform.

NOTICE

All control levers must be in the neutral (non-operational) position.

Take care not to nip the conveyor belt between moving parts.

It is recommended that this procedure is carried out by two people, as access to both sides of the machine is required.

1. Make sure all personnel are clear from the machine.
2. Remove transport stays securing the head section in transport position.

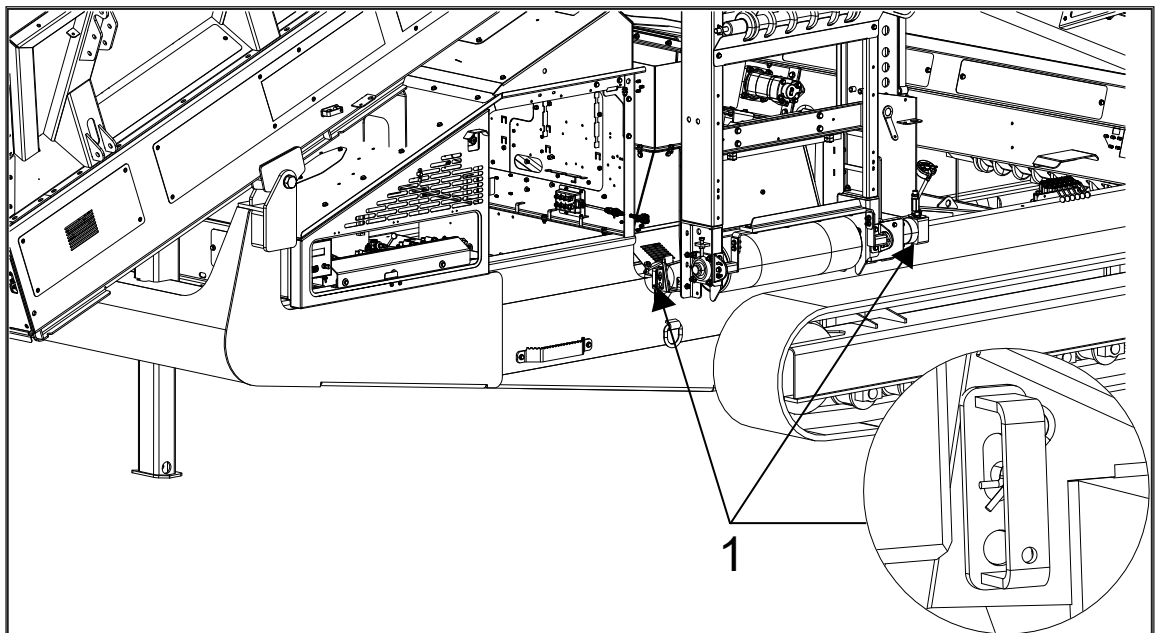


Figure 4.74 - Remove pin securing head section

3. The valve bank controlling the head and mid sections of this conveyor is located on the RHS of the machine (Item 4, Reference: Figure 4.75).

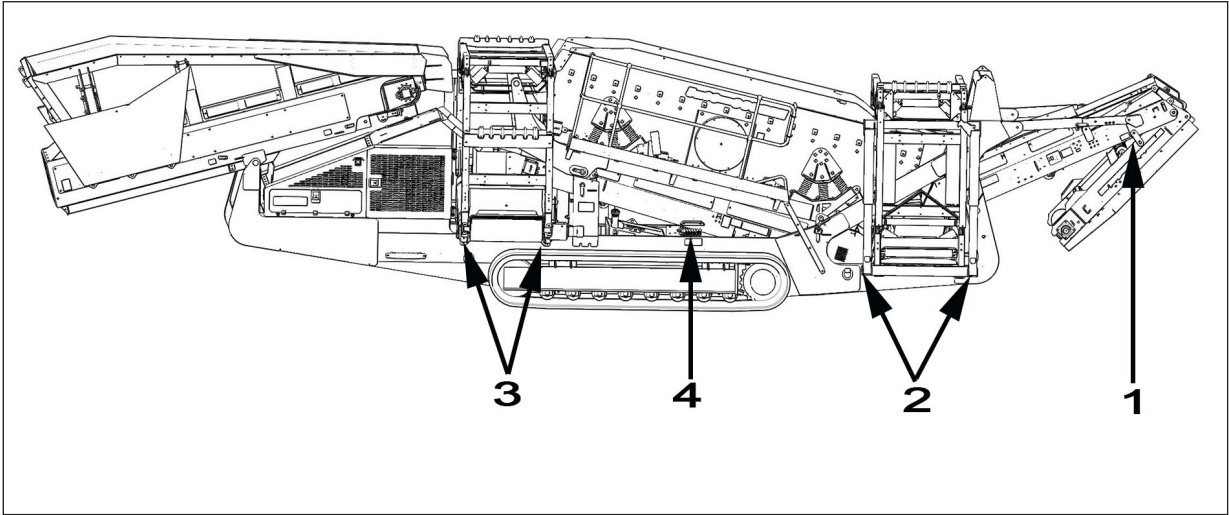


Figure 4.75 - Side Conveyor Setup

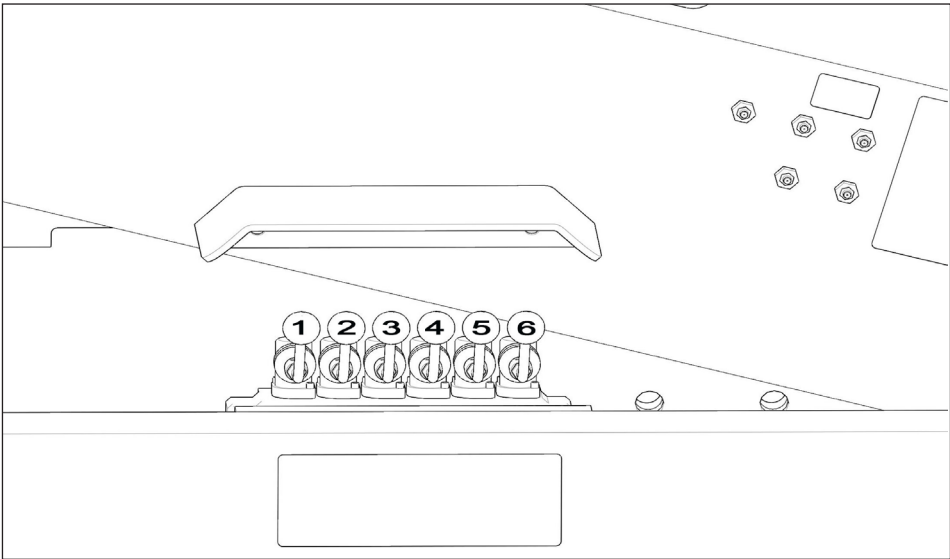


Figure 4.76 - Control Valve Bank RHS

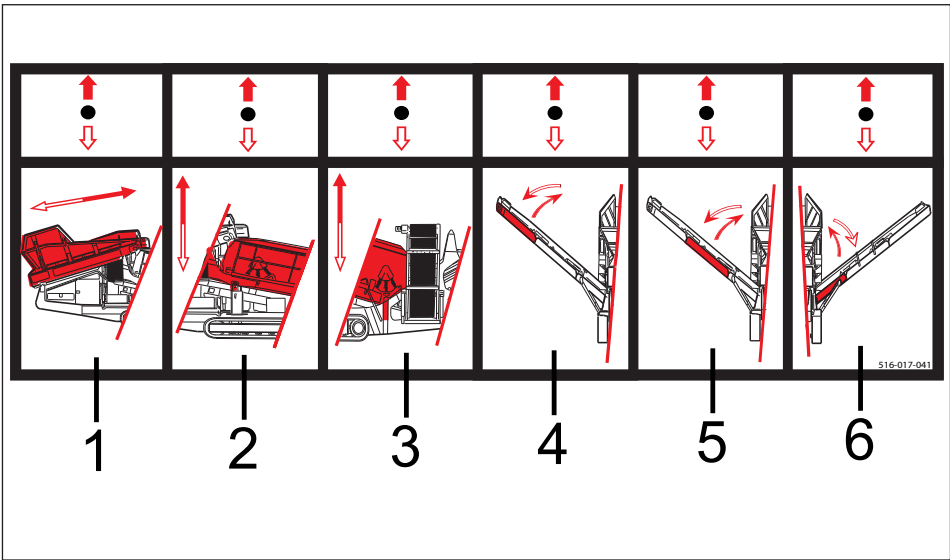


Figure 4.77 - RHS Control Bank Decal

4. Fold out the head section using lever 4 (Figure 4.77) slightly to make sure there is slack on the belt.
5. Unfold the mid-section until it is almost vertical using lever 5 (Figure 4.77).
6. To fold out the bottom section of this conveyor you need to walk around to the opposite side of the machine (Left Hand Side of the machine).
7. Remove the pins securing the bottom section of the conveyor (Reference: Figure 4.78)

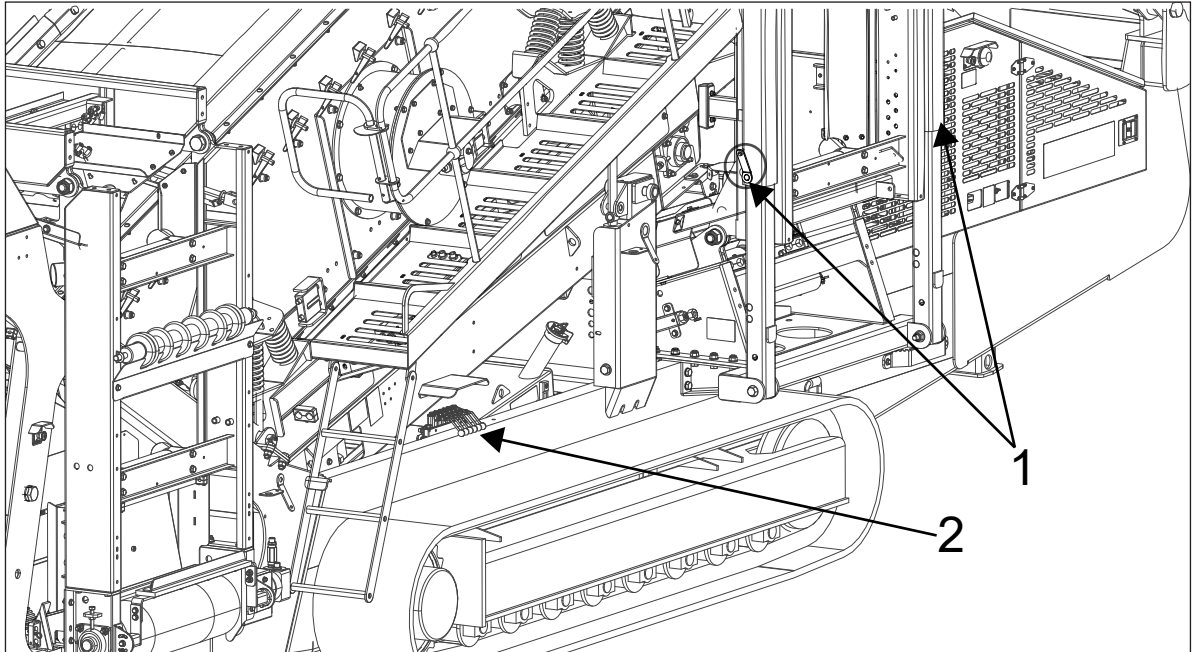


Figure 4.78 - Side Conveyor Pins

8. Locate the valve bank on the LHS of the machine (Item 2, Reference: Figure 4.79).
9. Use Lever 4 (Reference: Figure 4.80) to fold out the bottom section of the conveyor.

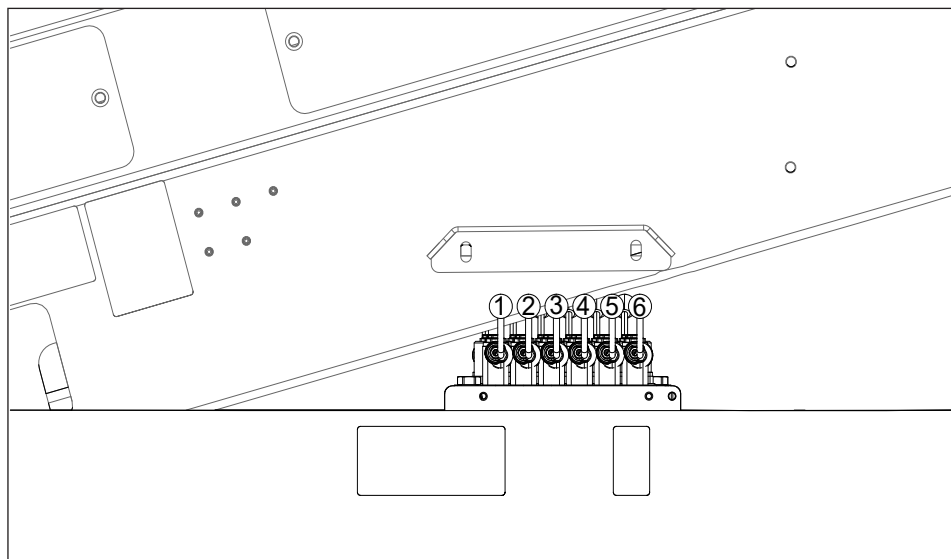


Figure 4.79 - Control Valve Bank LHS

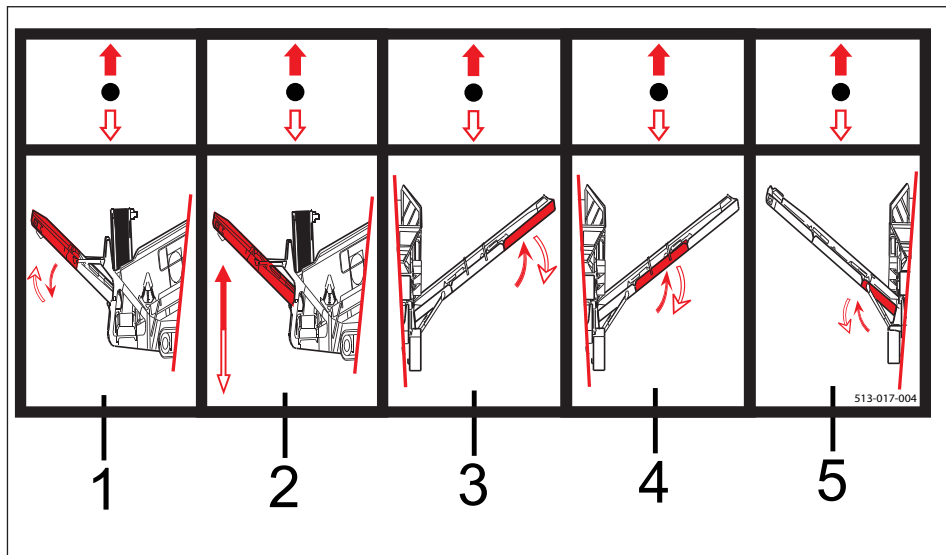


Figure 4.80 - LHS Control Bank Decal

NOTICE

Hydraulic control lever 6 in is an option fitted to machines with hopper extension plates. If hopper extensions are not fitted to the machine this lever will be missing.

10. Go to the Right Hand Side of the machine and finish unfolding the head section of the conveyor (Lever 4, Reference: Figure 4.77).
11. Refit pins to secure in place.

(2) Unfolding the Right Hand Side Conveyor**⚠ WARNING**

When working above ground level make sure to use a suitable working platform.

NOTICE

All control levers must be in the neutral (non-operational) position.

Take care not to nip the conveyor belt between moving parts.

It is recommended that this procedure is carried out by two people, as access to both sides of the machine is required.

1. Make sure all personnel are clear from the machine.
2. Remove the securing pins (Item 1, Reference: Figure 4.81) from the head section of the conveyor.

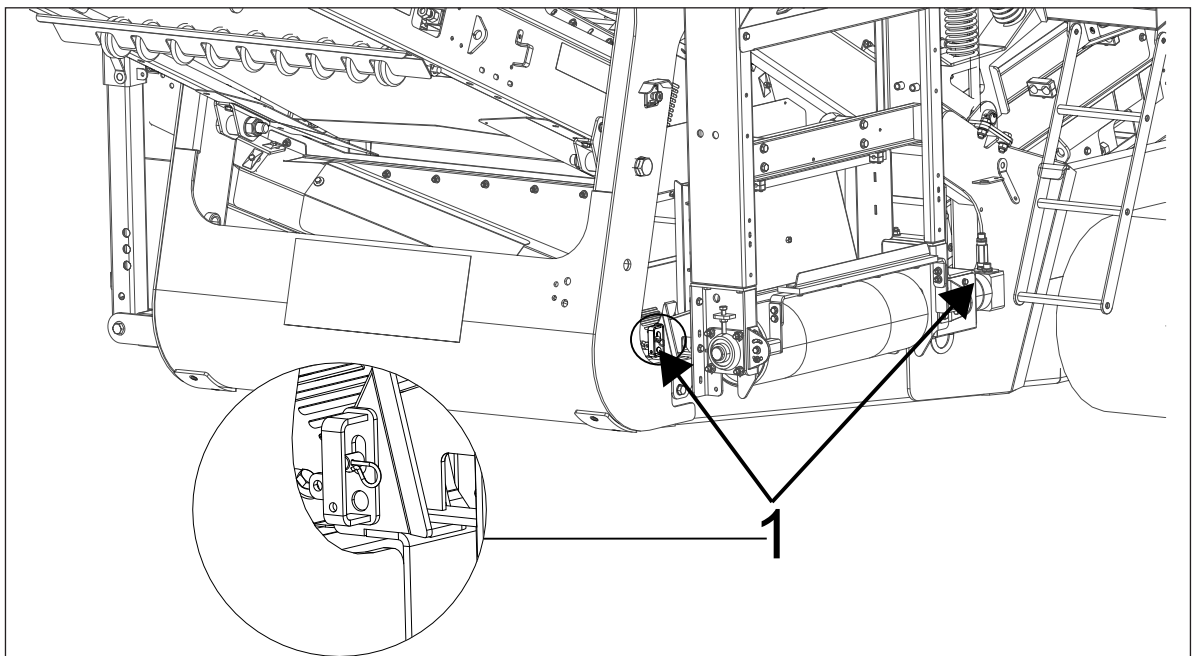


Figure 4.81 - Head Section Securing Pins

3. Locate the control bank on the LHS of the machine.

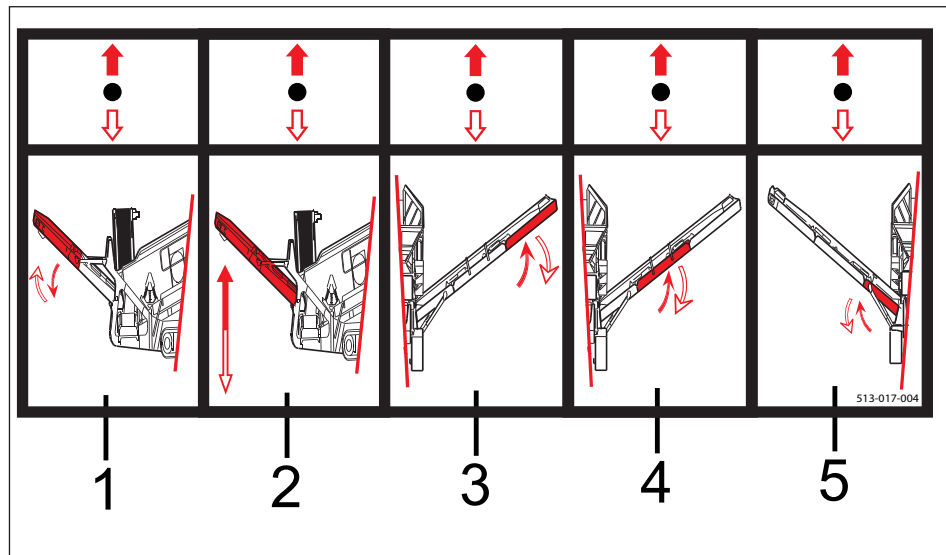


Figure 4.82 - Left Hand Side Control Bank Decal

4. Unfold the right hand side conveyor head section slightly using lever 3, to make sure there is slack on the belt (Figure 4.82).
5. Unfold the mid-section until it is almost vertical using lever 4 (Figure 4.82).
6. To fold out the bottom section of this conveyor you need to walk around to the opposite side of the machine and locate the RHS control bank.

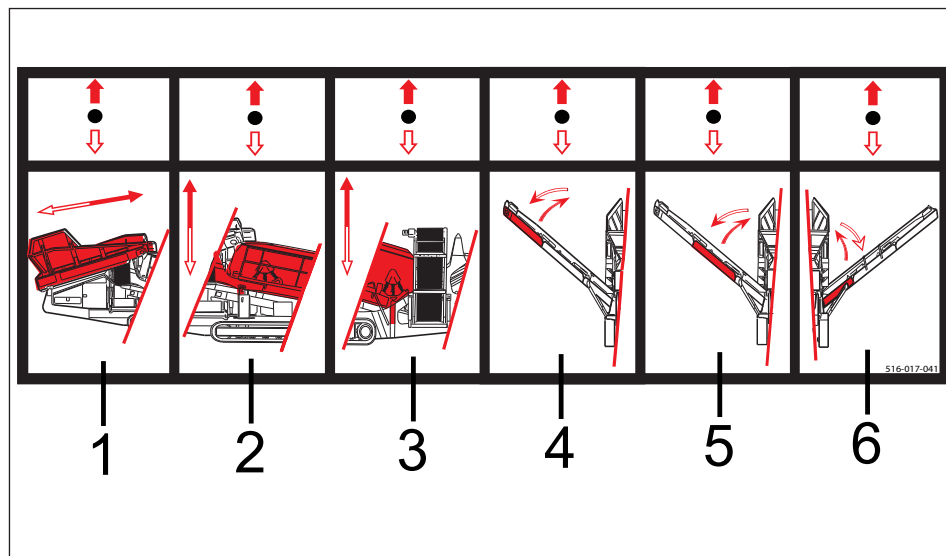


Figure 4.83 - Right Hand Side Control Bank Decal

7. Remove the pins securing the bottom section of the conveyor.
8. Use lever 6 to unfold the bottom section (Figure 4.83).
9. Go to the opposite side of the machine and locate the LHS control bank, finish unfolding the head section using lever 3 (Figure 4.82).
10. Refit pins to secure in place.

(3) Unfolding the Tail Conveyor**WARNING**

When working above ground level make sure to use a suitable working platform.

NOTICE

All control levers must be in the neutral (non-operational) position.

Take care not to nip the conveyor belt between moving parts.

1. Start engine
2. Run engine at idle speed.
3. Remove transport stays from tail conveyor (1) see Figure 4.84.

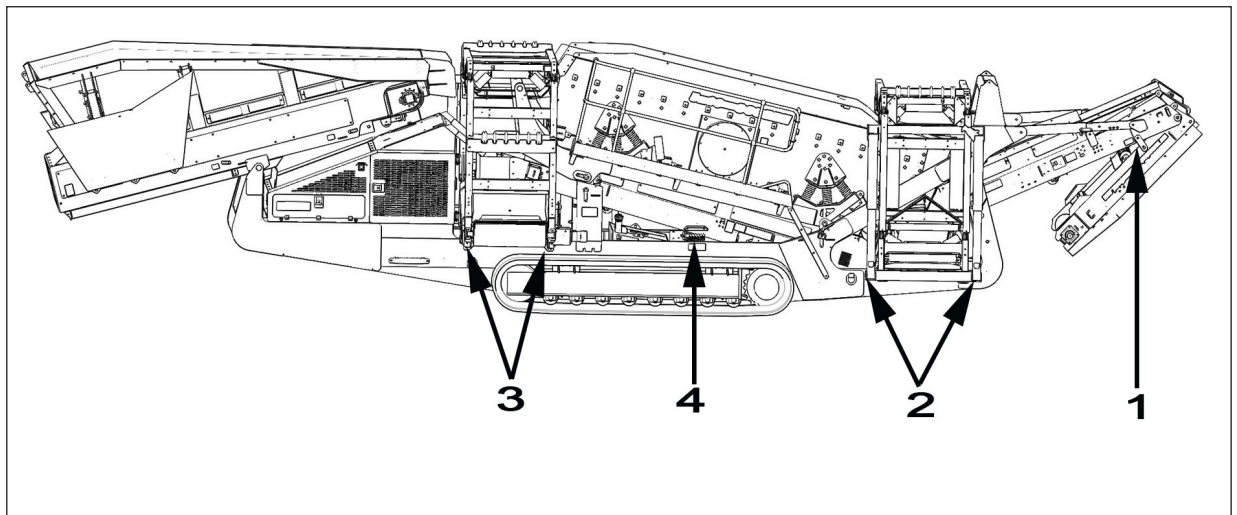


Figure 4.84 - Side and Tail Conveyor Setup

4. Tail Conveyor: Push lever (1) in Figure 4.85 to unfold the tail conveyor (ensure transport stays are removed before unfolding). Fit pins to both side of the tail conveyor, see item (2) Figure 4.86
5. Use Lever (2) in Figure 4.85 to position the tail conveyor at the desired angle and fit pins to both support legs, see item (1) Figure 4.86

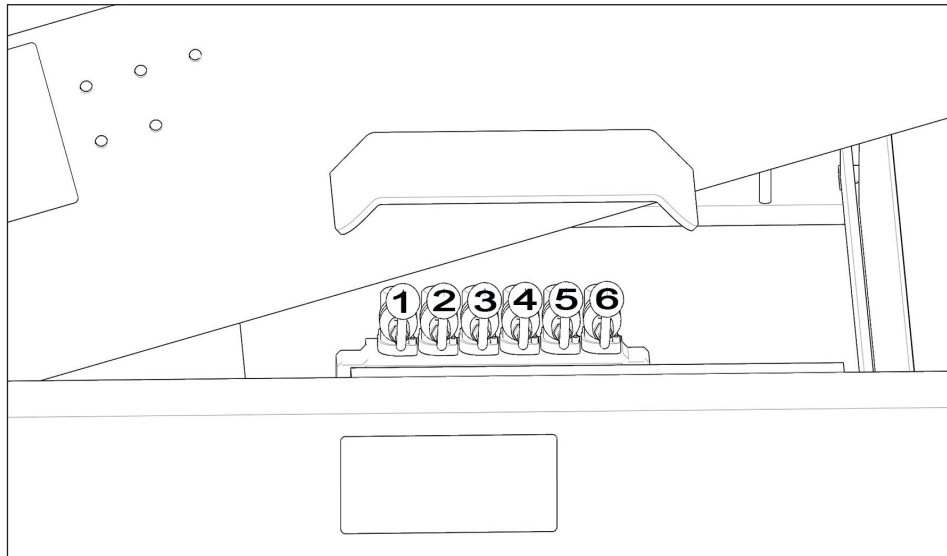


Figure 4.85 - Left Hand Side Hydraulic Levers

NOTICE

Hydraulic control lever 6 in Figure 4.85 is an option fitted to machines with hopper extension plates. If hopper extensions are not fitted to the machine this lever will be missing.

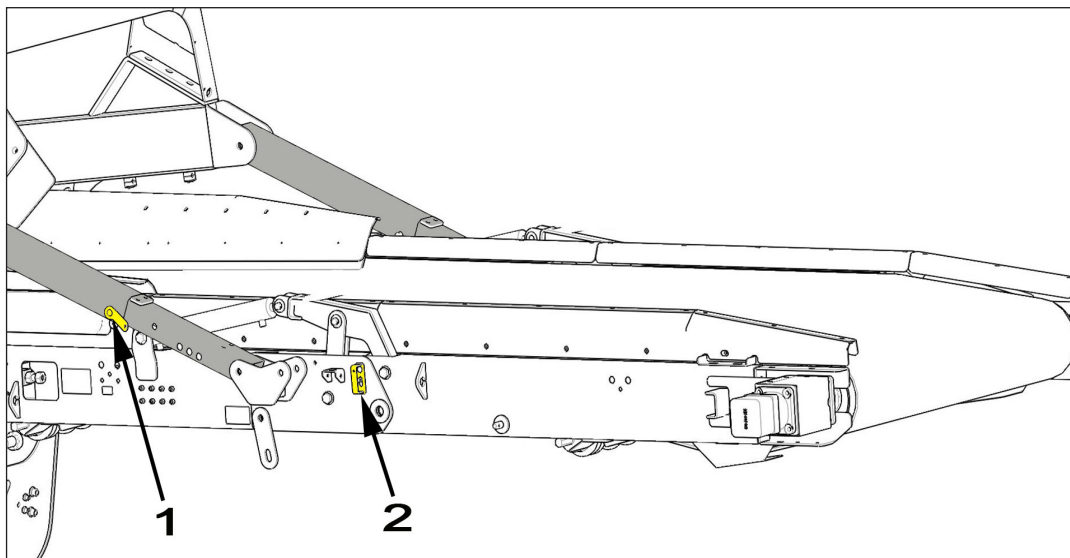


Figure 4.86 - Tail Conveyor Pins

(4) Raising the Screen Box

1. Raise the screen box using lever (2) Figure 4.87 and release the weight on the pin, (Item 1 Figure 4.88).

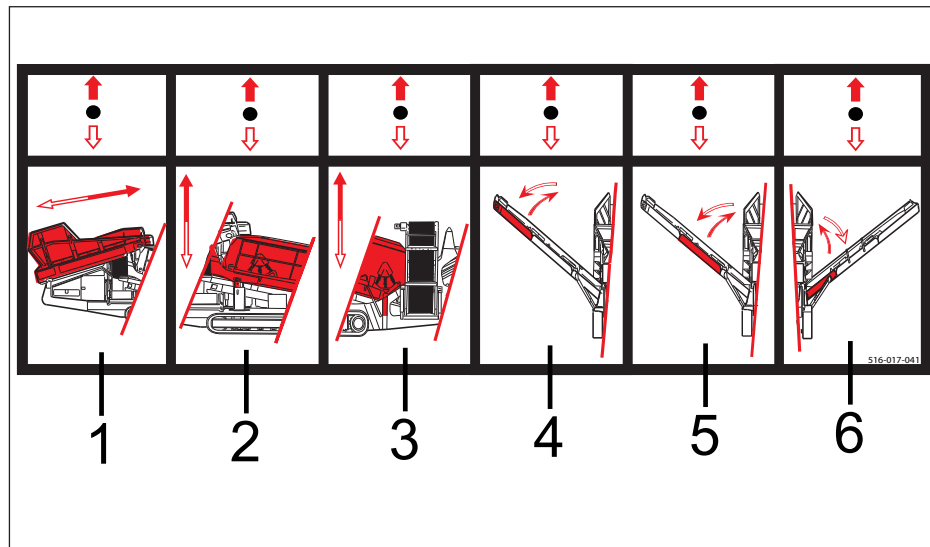


Figure 4.87 - Right Hand Side Control Bank Decal

2. Remove the pin and raise the screen to the appropriate hole. Replace the pin and lower the screen box to ensure the pins are carrying the load of the screen box.
3. There are 5 pinning holes explained in Figure 4.88 and Table 4.25

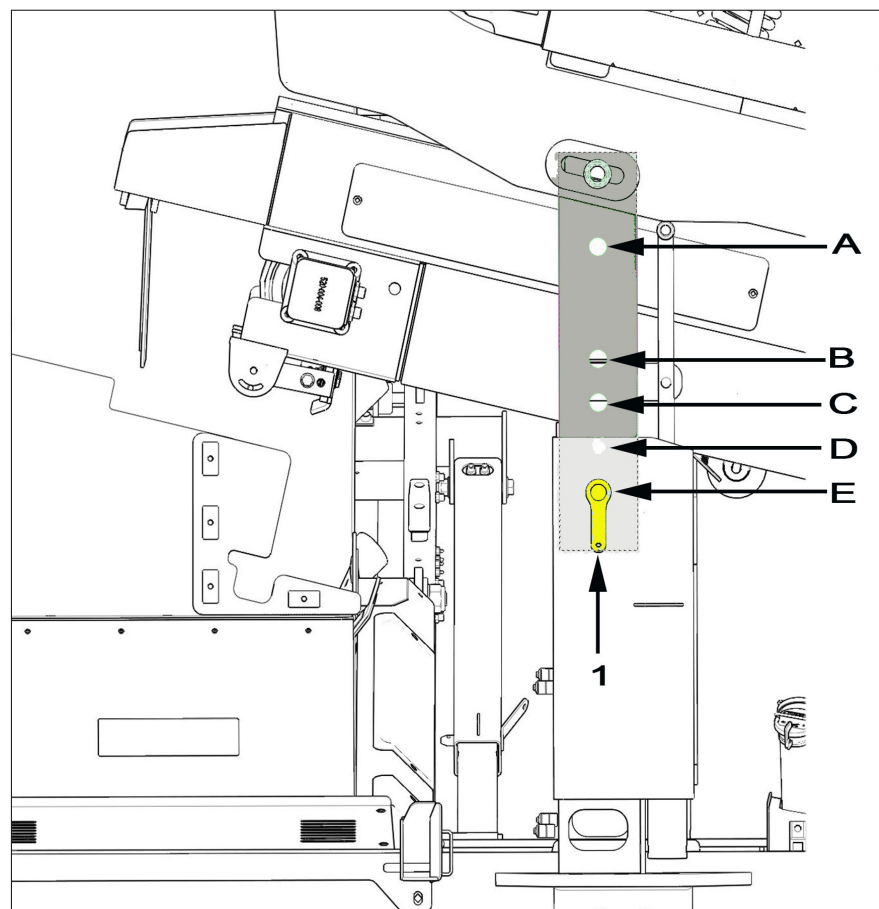


Figure 4.88 - Screen Box Pin Positions

Table 4.25 - Screen Box Pin Positions

Position A	Transport
Position B	13°
Position C	14.3°
Position D	15.7°
Position E	17°

(5) Feeder Setup**WARNING**

When working above ground level make sure to use a suitable working platform.

NOTICE

Screen box must be raised before Feeder is slide forward.

1. To Slide feeder conveyor forward for operation first remove locating pin (1) from its transport position Figure 4.90.
2. Slide the feeder conveyor forward using lever (1) Figure 4.90.

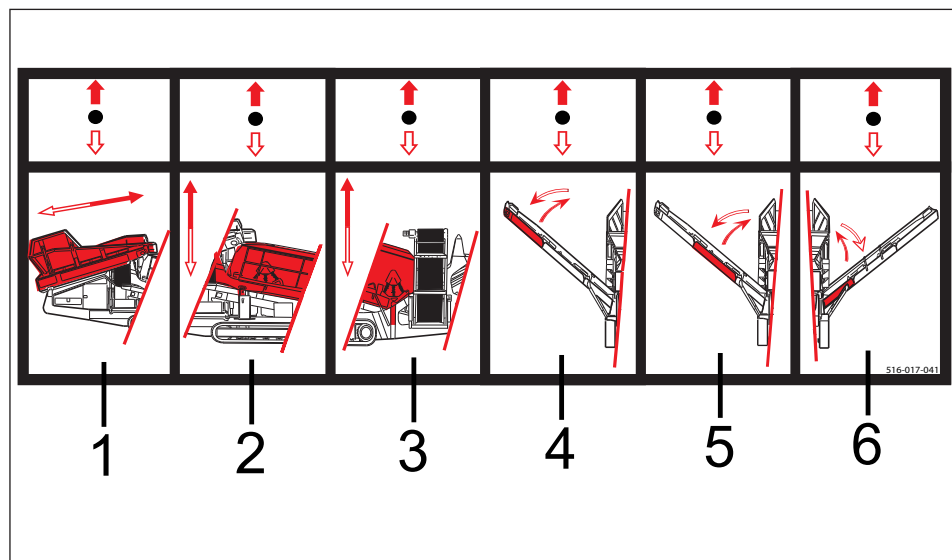


Figure 4.89 - Right Hand Side Control Bank Decal

3. When conveyor is fully forward fit locating pin (1) Figure 4.90 to prevent Feed Conveyor creeping back over time.
4. Rotate both wingplates into working position as shown in Figure 4.92 Items (1).
5. Install 4 M16x50 bolts and washers each side to lock in position

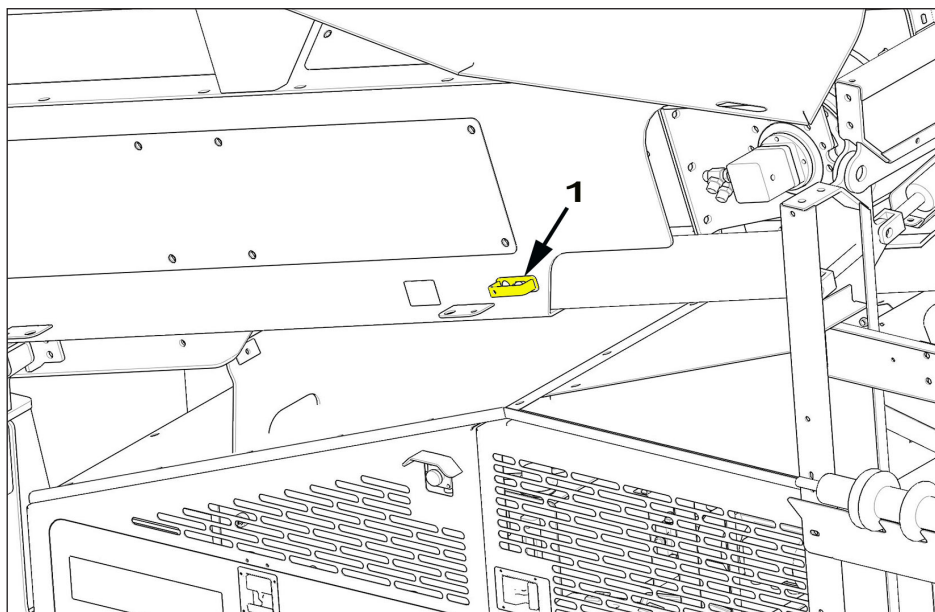


Figure 4.90 - Feed Conveyor Transport Position

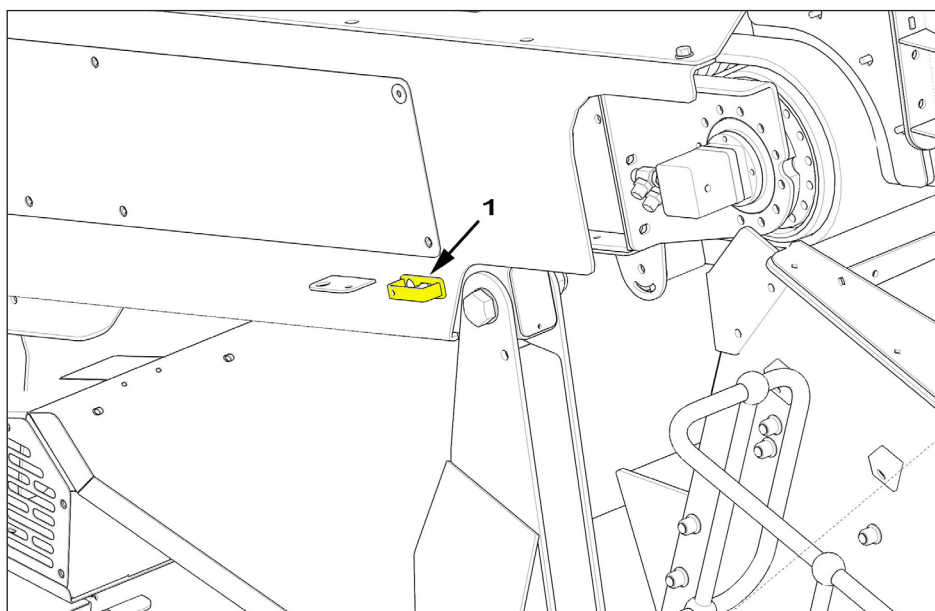


Figure 4.91 - Feed Conveyor Working Positions

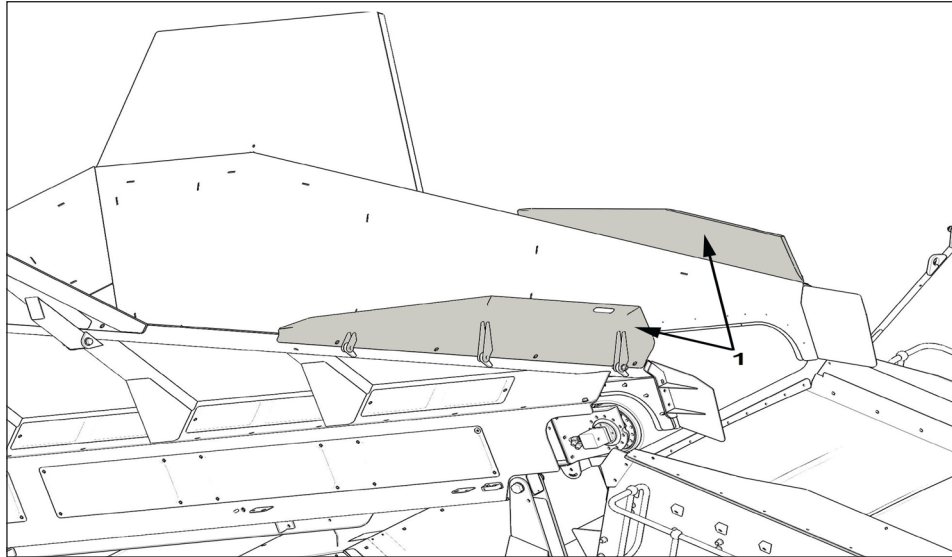


Figure 4.92 - Feeder Conveyor Wing Plates

6. If the machine is fitted with the option of feeder extension plates these should now be placed in their working position, the control lever can be found on the left hand side of the machine under the screenbox, Ref: Figure 4.93 lever (6)
7. Operate the hydraulic control lever to unfold the feeder extension plates.
8. Install 6 M16x50 bolts and washers each side to lock in position

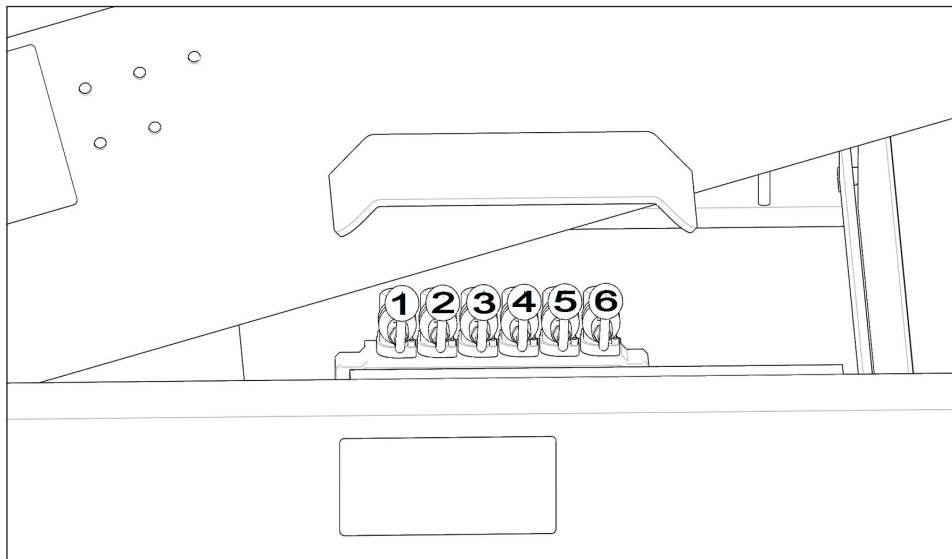


Figure 4.93 - Feeder Extension Hydraulic Lever

(6) Feeder Support Legs

CAUTION

Crush hazard from lowering support legs. Stand clear of support legs when lowering.

1. Remove the feeder support leg shoes from their transport location (1) Ref: Figure 4.95 and place on level ground under the support legs.
2. Lower the support legs into the feet (4) Ref: Figure 4.95 using lever (7) Ref: Figure 4.94 and fit pins (2 & 3) Ref: Figure 4.95.

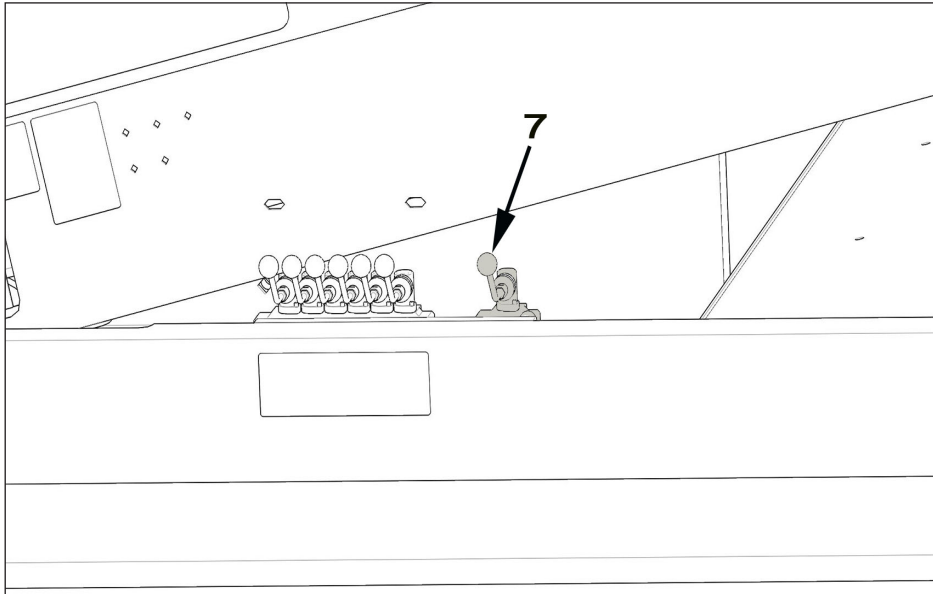


Figure 4.94 - Feeder Support Leg Lever.

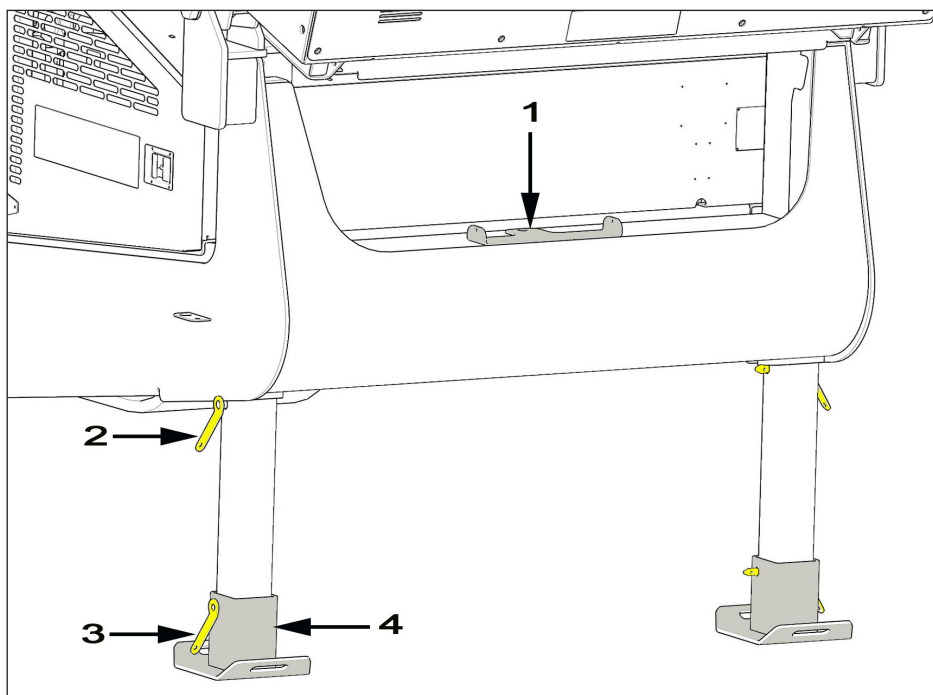


Figure 4.95 - Feeder Support Legs

4.19 Machine Components Start-Up Procedure

WARNING

Wear personal protective equipment.

Make sure no personnel are on the machine or machine walkways.

NOTICE

Before starting the machine components make sure you check that all fluid and grease checks have been completed in line with the service schedules contained in Maintenance section of this manual.

Make sure all control levers are in the neutral (off) position and the throttle is set to idle.

1. Make sure all prestart check have been completed.
2. Make sure the electrical isolator switch is turned on Ref: item 1 Figure 4.96

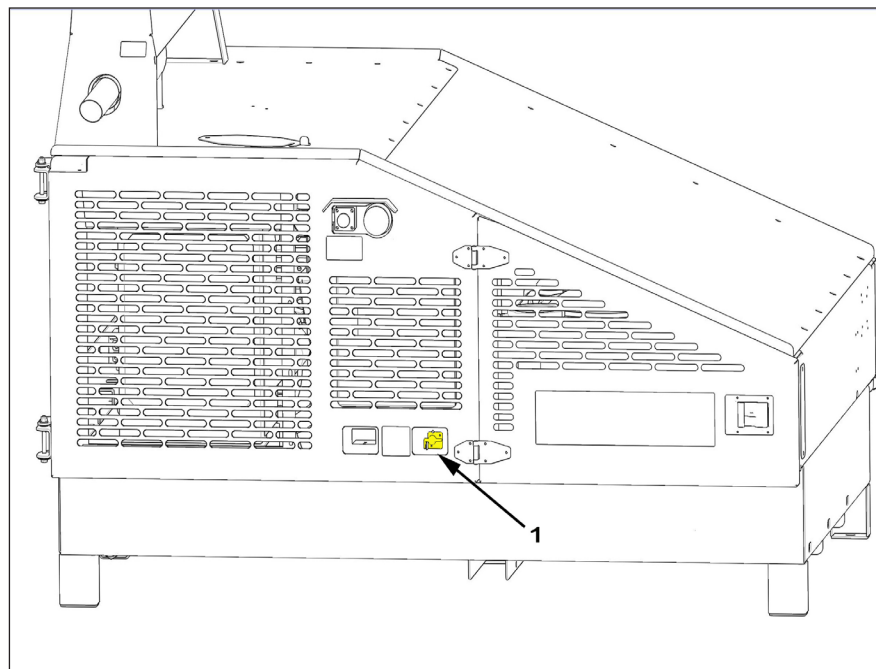


Figure 4.96 - Isolator Switch

3. Turn on the engine.
4. Increase the throttle speed.
5. Start the machine components using the hydraulic levers in the power unit in the following order:-
 - Left hand side conveyor.
 - Right hand side conveyor.
 - Tail Conveyor.
 - Screen box and collection conveyor.
 - Feeder.

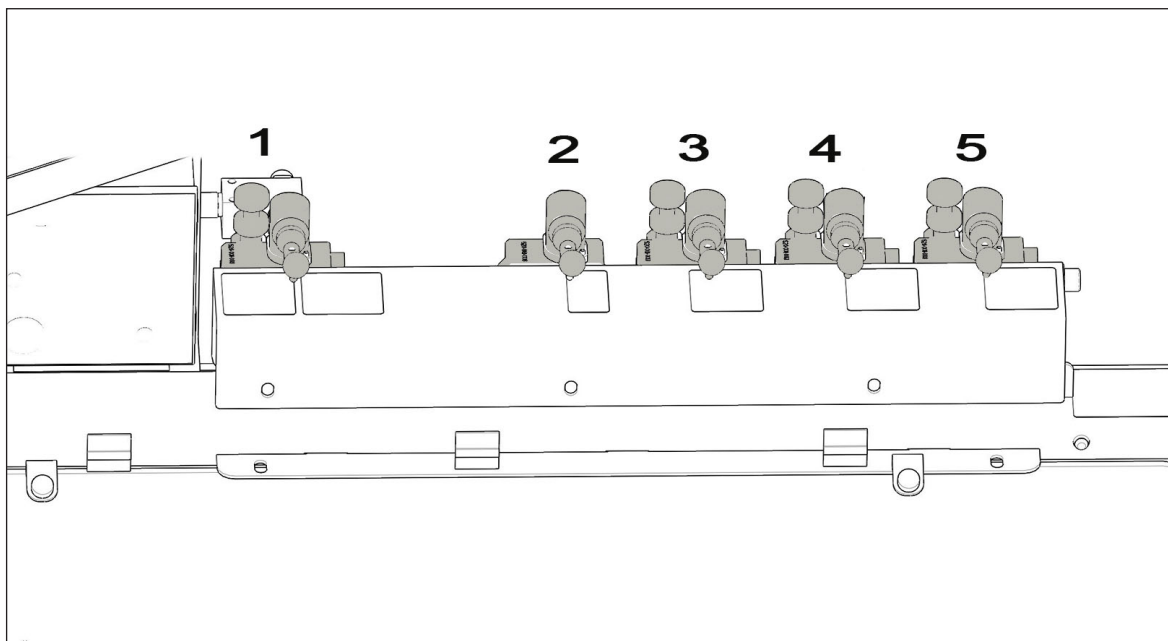


Figure 4.97 - Control Levers

Valves 1, 3, 4 and 5 Figure 4.97 have a flow control valve incorporated into the control valve body. If the material flow to the screen is too high the oversize and/or mid size product may be contaminated with finer material. Adjust flow control on valve to maximise screen efficiency.

4.20 Machine Shut Down Procedure



DANGER

Diesel fuel is highly flammable and is an explosion/burns hazard. NEVER remove the filler cap or refuel, with the engine running.

DO NOT smoke while refilling or carrying out maintenance on the fuel system.

NOTICE

Do not use the emergency stop buttons to switch the machine off under normal conditions. The emergency stop should only be used in emergencies, use of the emergency stop button interrupts the correct shutdown process and continued unnecessary use may result in damage to the machine.

1. Make sure that all material has been run off the machine and the screen box is empty.
2. Stop the machine components in the following order
 - Feeder.
 - Screen box and collection conveyor.
 - Tail conveyor.
 - Right hand side conveyor.
 - Left hand side conveyor.
3. Throttle down the machine and allow engine to run at idle for 5 minutes, this is necessary to allow all the components and the engine to complete their shutdown phase and avoid damage.
4. Turn ignition key to the off position and remove key.
5. Check fuel level and top up if required to avoid build up of condensation in fuel tank.
6. Secure machine.

4.21 Machine Lockout and Tag Out Procedure

This procedure is designed to prevent injuries caused by the unexpected start-up or movement of a machine. These procedures are to be followed every time a machine is to be cleaned, maintained, adjusted or repaired.

1. Turn off the machine following the “4.20 Machine Shut Down Procedure” on page 4-137.
2. After 20 seconds, rotate the isolator switch from the “ON” position to the “OFF” position, Ref: Figure 4.96.
3. Fit the lock out padlock on the main power isolator and keep the key with you.
4. Release stored energy from the system, such as hydraulic fluid under pressure, so that the machine is in a zero energy state.
5. Place a tag on the lock that identifies you as well as the date and time you locked it out
6. Check that the machine can not be started to ensure the lookout is complete.

4.22 Emergency Stop Procedure

In an emergency situation stop the machine by pressing the closest emergency stop button located on the machine. The stop button on the remote radio control or umbilical control, if fitted, is not an emergency stop but can be used to stop the machine. If the stop button on the remote is activated also activate an emergency stop on the machine when safe to do so.

1. Press any emergency stop button located on the machine to stop the engine and machine, Ref: Figure 4.98
2. Turn the ignition key to the off position as soon as possible, if safe to do so.
3. Remove the ignition key.
4. Set the isolator switch to the off position.
5. When safe, release the emergency stop button(s) by pulling or twisting

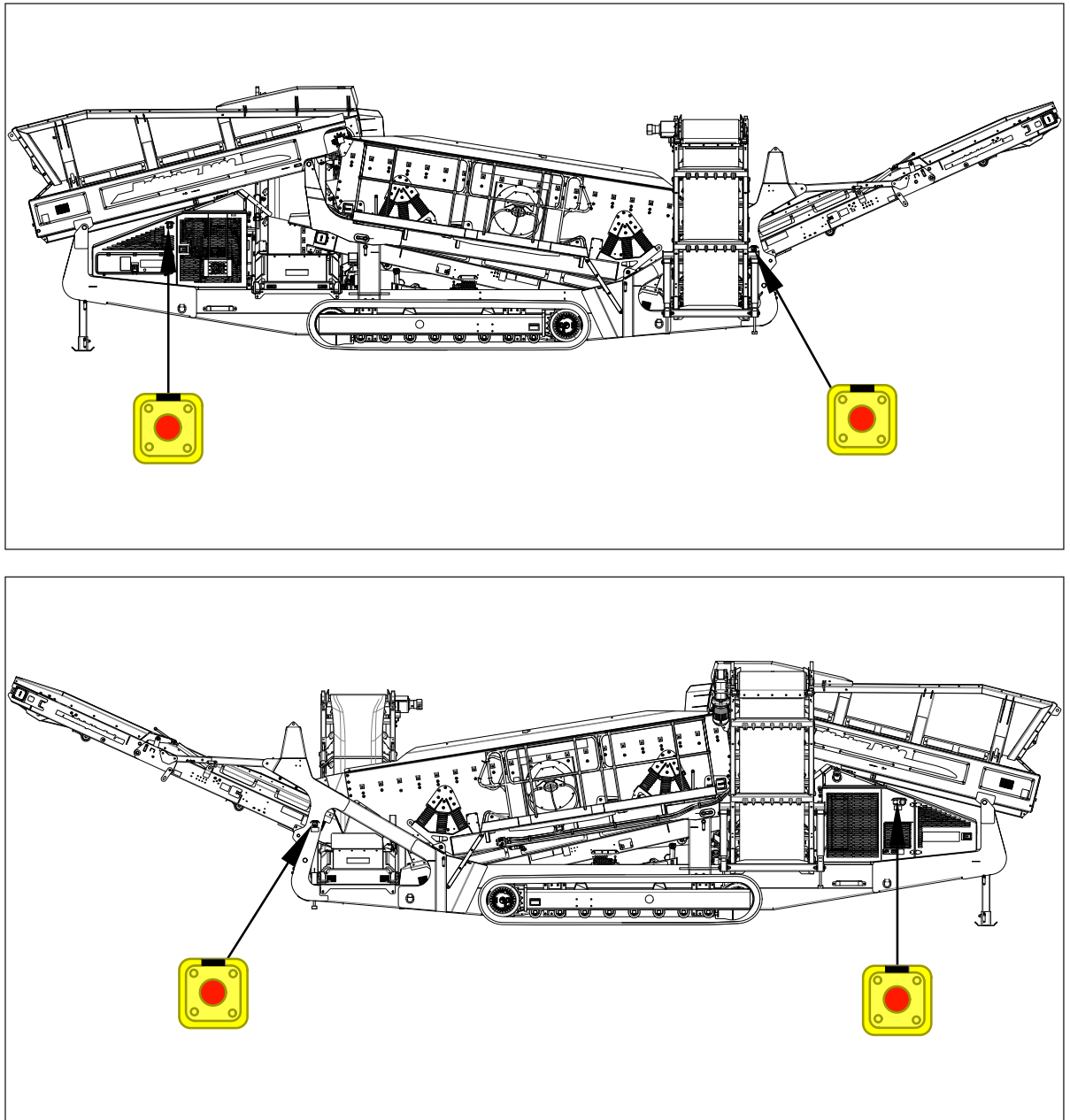
(1) Emergency Stop Locations

Figure 4.98 - Emergency Stop Locations

Intentionally Left Blank

Table of Content

5	Transportation.....	5-2
5.1	Preparing Machine for Transport.....	5-3
(1)	Slide The Feeder Into Transport Position	5-3
(2)	Lowering Screenbox for Transport	5-5
(3)	Folding Tail Conveyor	5-6
(4)	Raising the Feeder Support Legs.....	5-8
(5)	Placing Feeder in Transport Position.....	5-9
(6)	Placing Left Hand Side Conveyor in Transport Position	5-10
(7)	Folding Right Hand Side Conveyor for Transport.....	5-15

5 Transportation



DANGER

Do not move the machine without all transportation fitments securely in place and safety pins in position.



WARNING

Wear personal protective equipment.



CAUTION

Prior to transportation always check the machine for loose or damaged components. Make sure all loose items are carefully stowed and secured if these are to be transported on the machine.

Check that the travelling dimensions and weight of the machine will be within the regulation limits.

NOTICE

Make sure that all of material has been run off the conveyors and the screen box and hopper are both empty and that the machine has been properly shut down.

Clear the area of all personnel & obstructions before folding the conveyors.

Before transporting the machine, observe the prescribed transport position, admissible speed and itinerary. Only use appropriate means of transport and lifting gear of adequate capacity. Know the overall height to avoid contacting overhead obstructions such as bridges, power lines etc.

The preparations to move equipment by an articulated lorry should be supervised by a minimum of two persons. Ensure persons transporting the machine adhere to all safety signs and procedures.

Before transportation on public roads, ensure the machine has been properly secured with no loose material left in or on the machine. Always observe the valid traffic regulations and, if necessary, ensure beforehand that the machine is in a condition compatible with these regulations.

The machine must be loaded and transported only in accordance with the operating instructions. For manoeuvring the machine, observe the prescribed transport position, admissible speed and itinerary. Use only appropriate means of transport and lifting equipment and where applicable of adequate capacity. Before travelling with the machine, check that the braking and any signalling and lighting systems are fully functional.

5.1 Preparing Machine for Transport

(1) Slide The Feeder Into Transport Position

WARNING

When working above ground level make sure to use a suitable working platform.

NOTICE

Feeder must be slide down to transport position before screenbox is lowered.

1. To Slide feeder conveyor backward for transport first remove Locating Pin (1) Figure 5.1.
2. Slide the feeder conveyor backward using lever (1) Figure 5.2.
3. When conveyor is fully back refit Locating Pin (1) Figure 5.3.

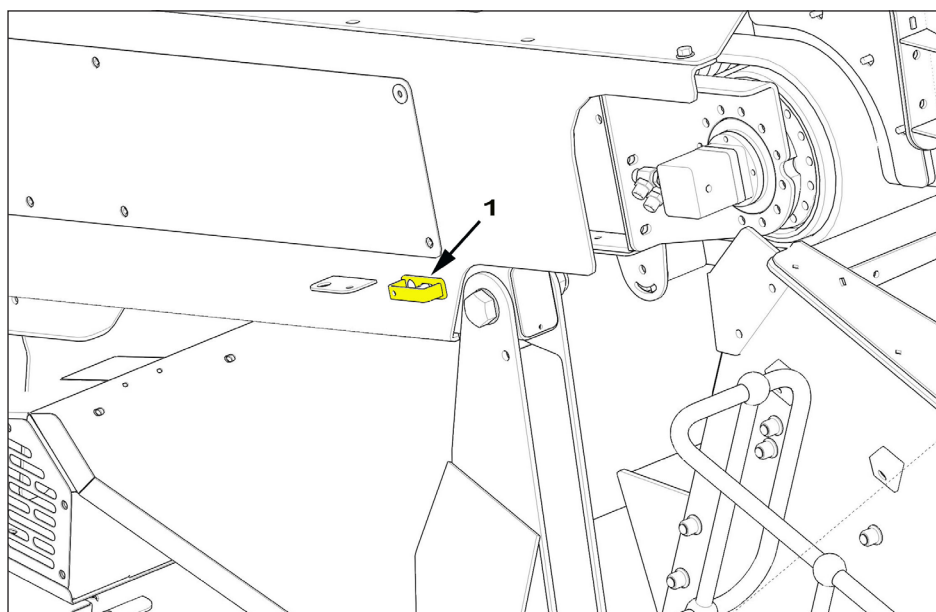


Figure 5.1 - Feeder Working Position

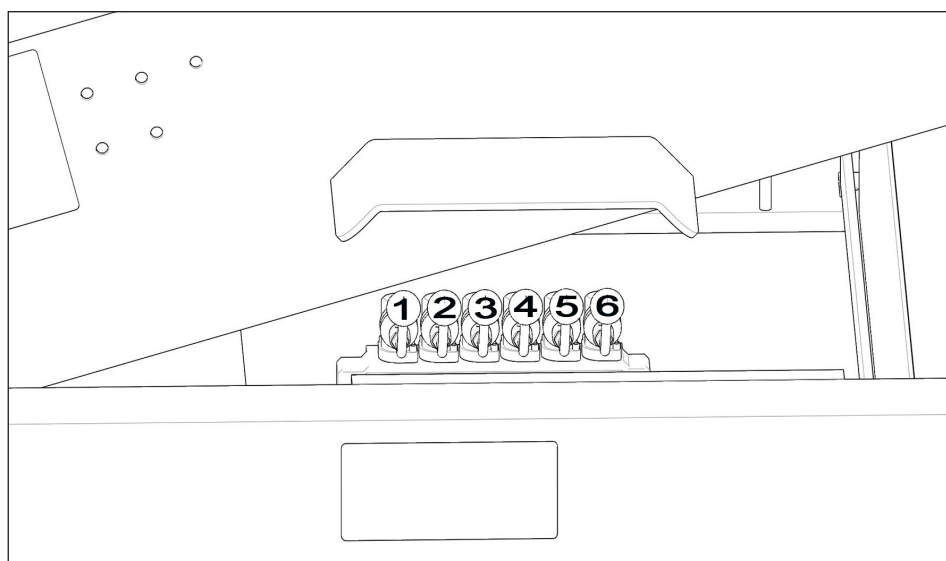


Figure 5.2 - Control Levers

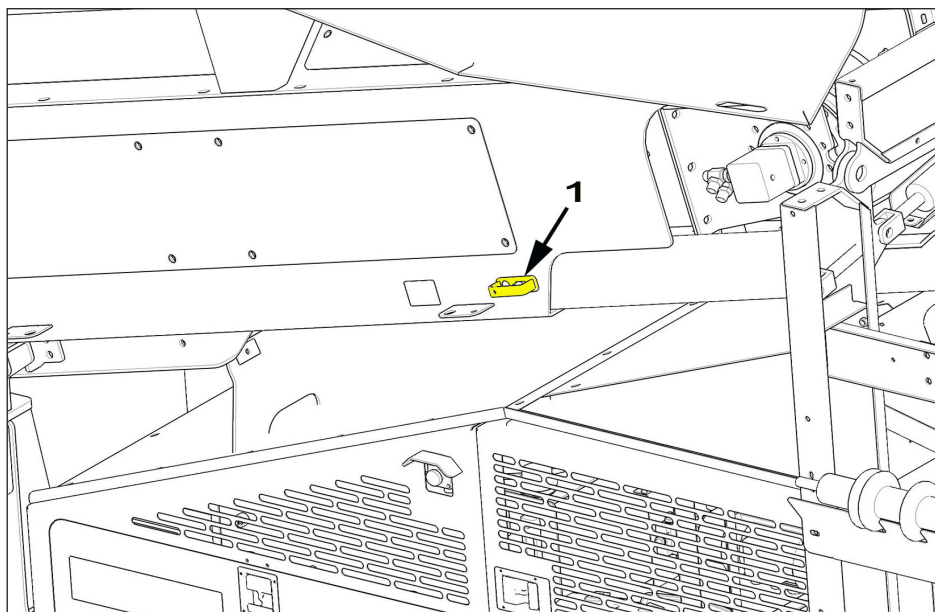


Figure 5.3 - Feeder Transport Position

(2) Lowering Screenbox for Transport

1. Raise the screen box using lever (2) Figure 5.4 and release the weight on the pin, (Item 1 Figure 5.5).

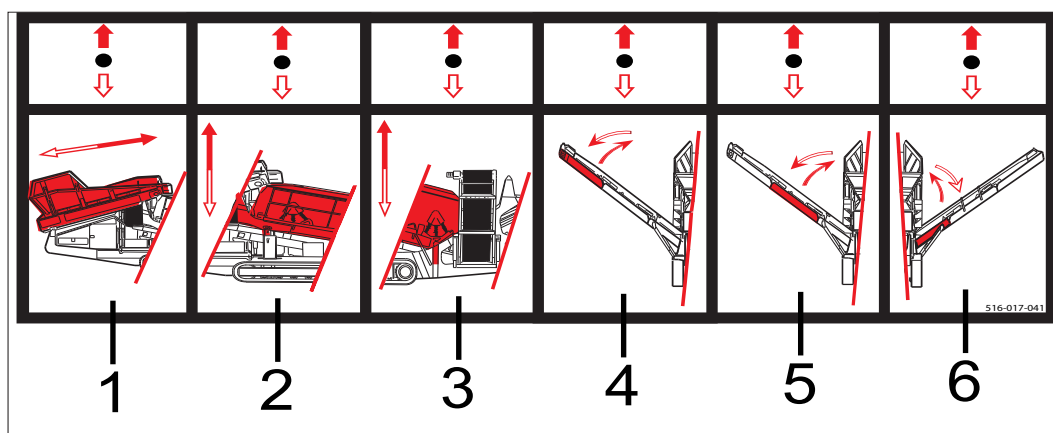


Figure 5.4 - RHS Control Bank Decal

2. Remove the pin and lower the screen to the transport hole (E). Replace the pin.

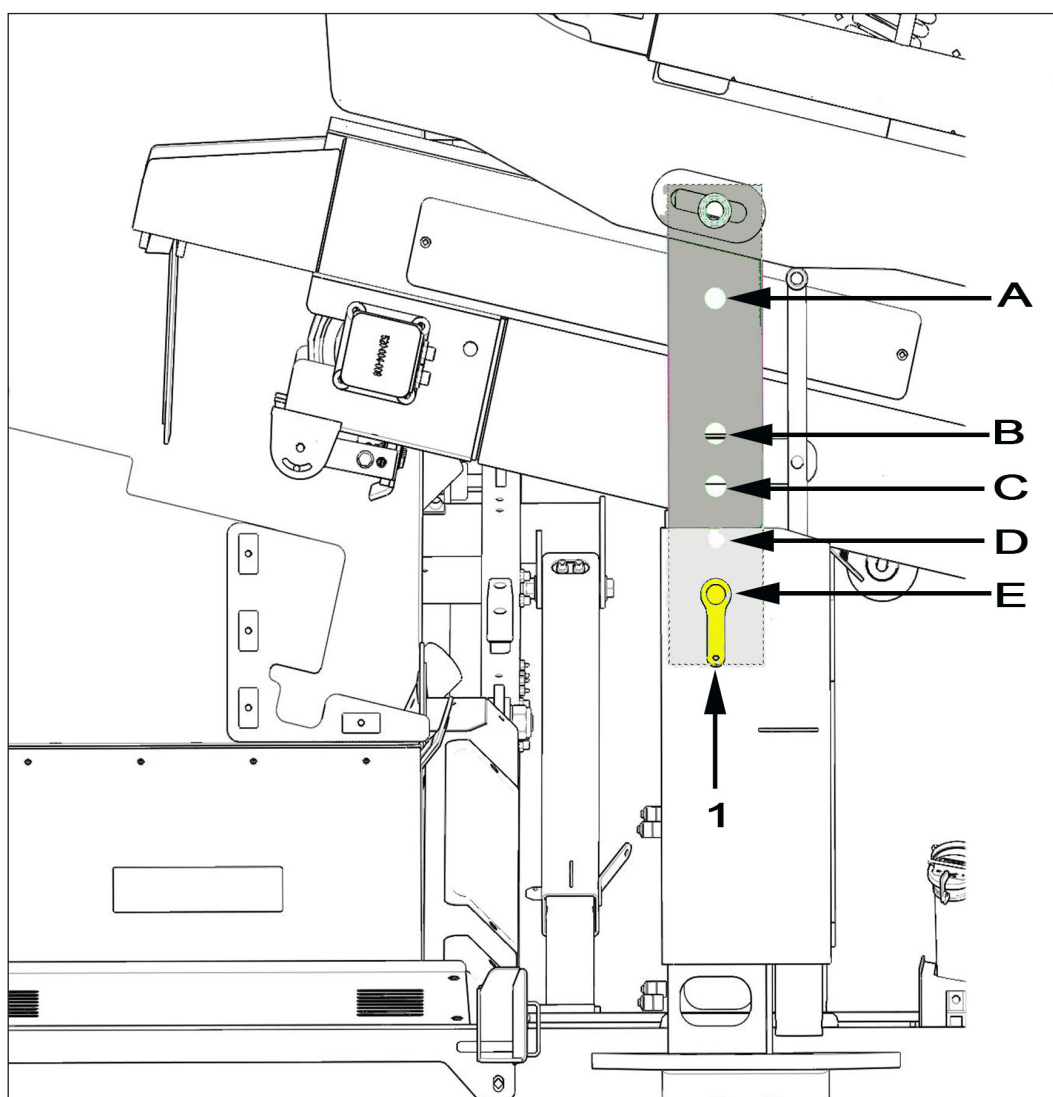


Figure 5.5 - Screenbox Transport Position

(3) Folding Tail Conveyor

1. Remove pins (1) and (2) from either side of the tail conveyor Figure 5.7.
2. Use lever (2) in Figure 5.6 to place the tail conveyor in the transport position.
3. Use Lever (1) in Figure 5.6 to fold the tail conveyor.
4. Refit pins (1) when tail conveyor is at correct transport height, see Figure 5.8.
5. Fit transport stays to tail both side of tail conveyor (2) Figure 5.8.

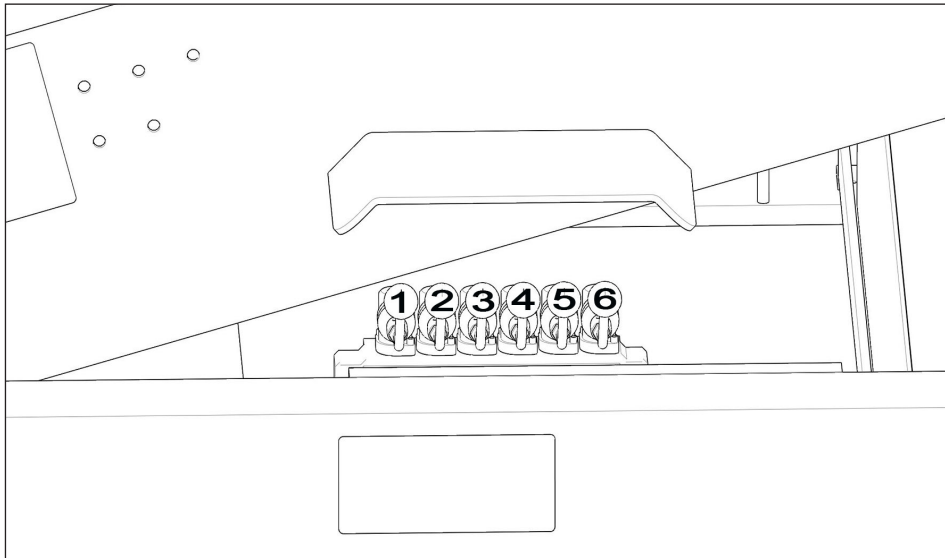


Figure 5.6 - Left Hand Side Conveyor Levers

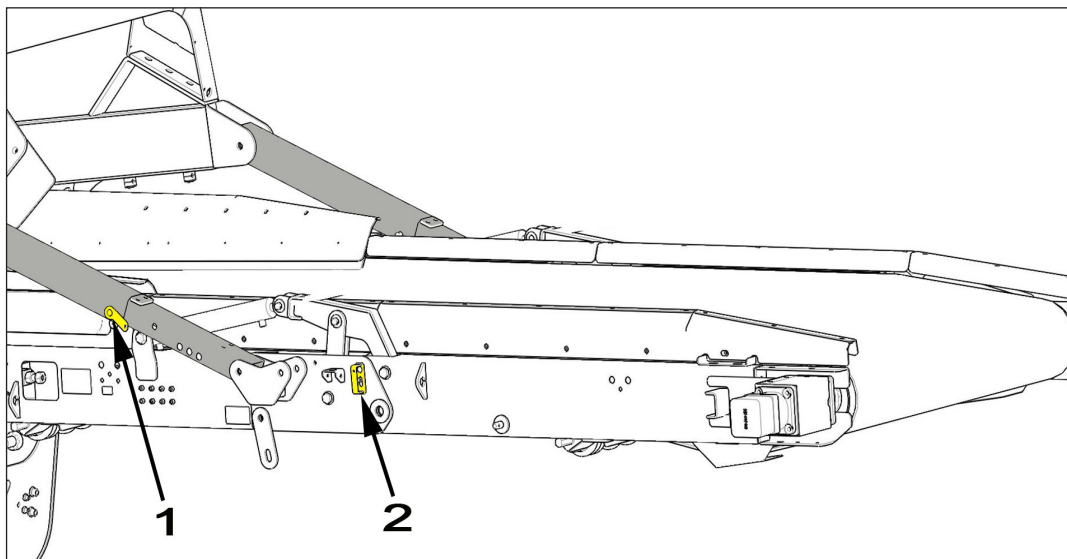


Figure 5.7 - Tail Conveyor Pins Working Position

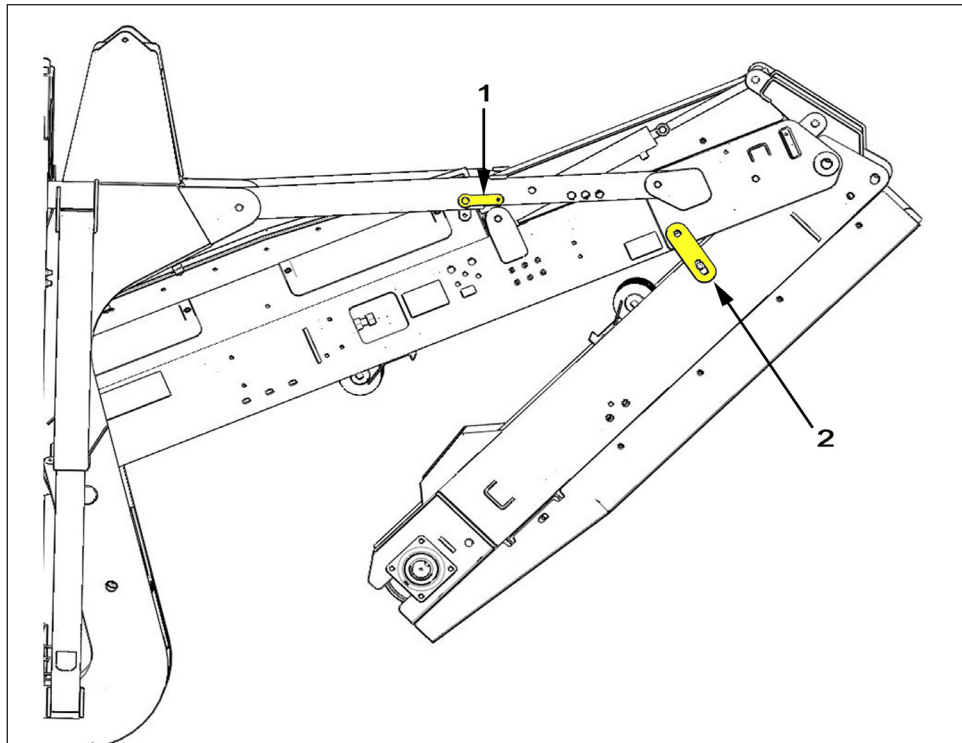


Figure 5.8 - Tail Conveyor Pins Transport Position

(4) Raising the Feeder Support Legs

CAUTION

Crush hazard from support legs. Stand clear of support legs when raising .

1. Remove the feeder support leg shoes pins (3) and leg pins (2) Ref: Figure 5.10.
2. Raise the support legs lever (7) Ref: Figure 5.9.
3. Place the support leg shoes in their transport position (1) Figure 5.10.

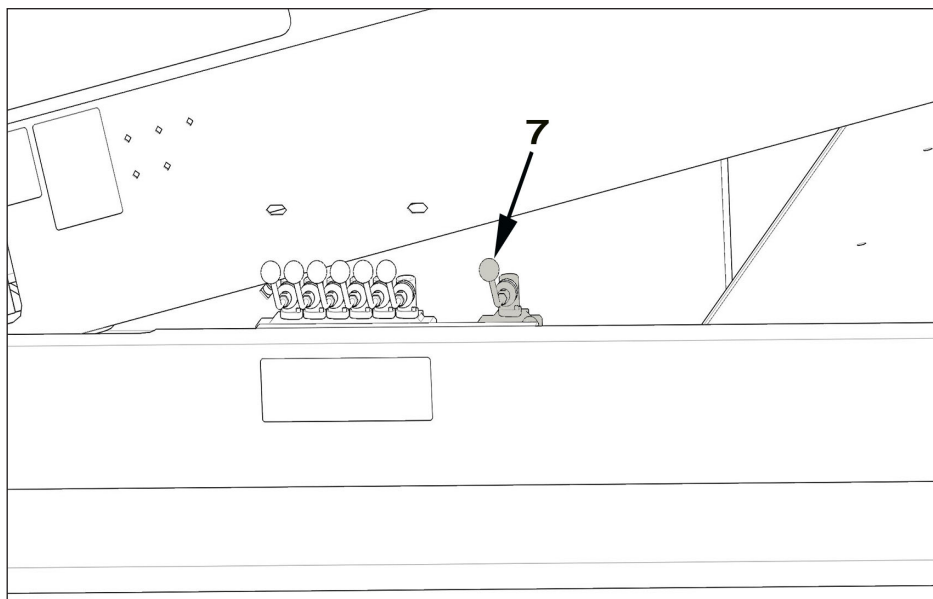


Figure 5.9 - Feeder Support Leg Lever.

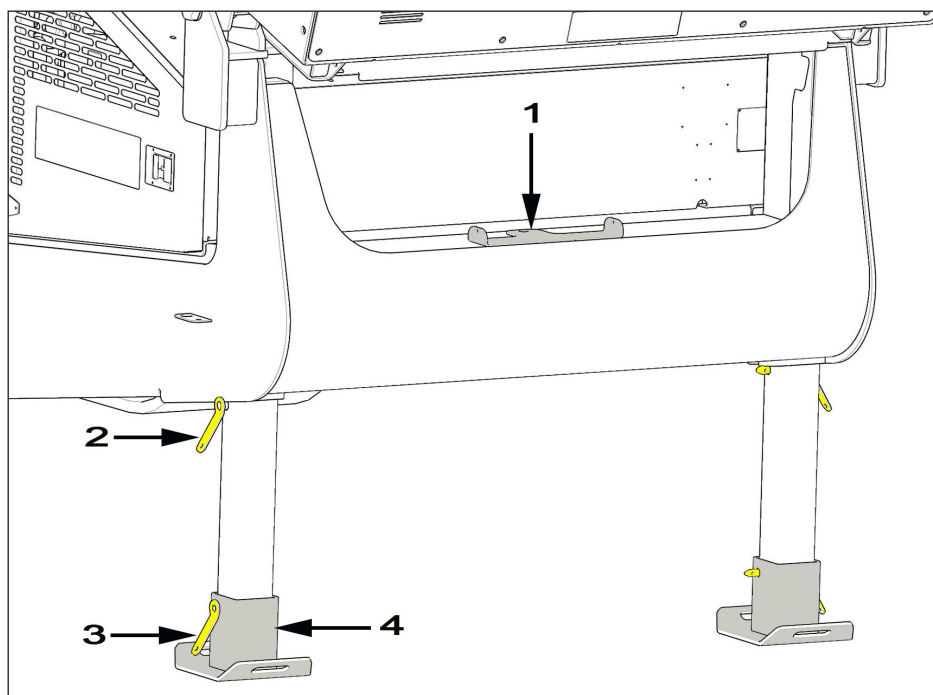


Figure 5.10 - Feeder Support Legs

(5) Placing Feeder in Transport Position**! WARNING**

When working above ground level make sure to use a suitable working platform.

1. Feeder should have been slide down to transport position before screenbox was lowered.
2. Remove the M16x50 bolts securing the wing plates in position Figure 5.11.
3. Rotate both wing plates into transport position.

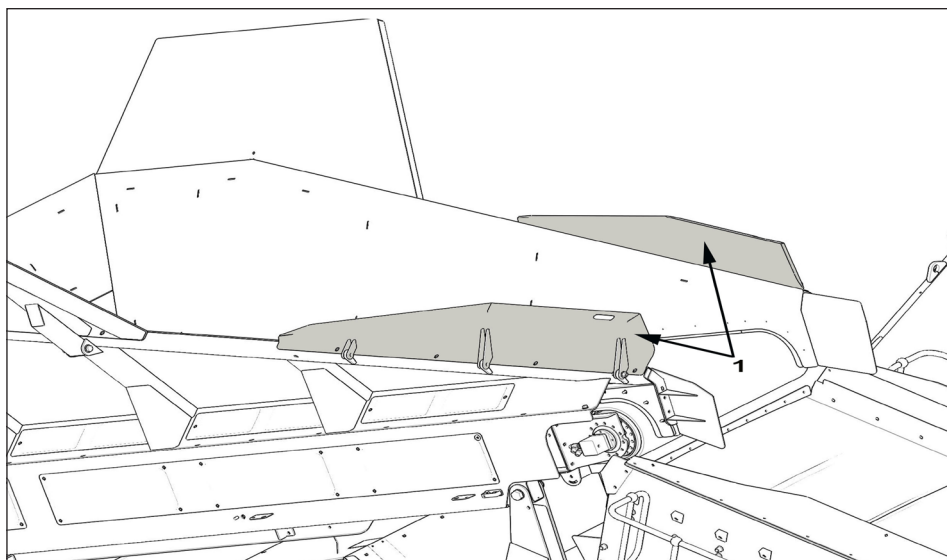


Figure 5.11 - Feeder Wing Plates

4. If the machine is fitted with the option of feeder extension plates these should now be placed in their transport position, the control lever can be found on the left hand side of the machine under the screenbox, Ref: Figure 5.12 lever (6)
5. Remove the M16x50 bolts securing the feeder extension plates.
6. Operate the hydraulic control lever to fold the feeder extension plates.

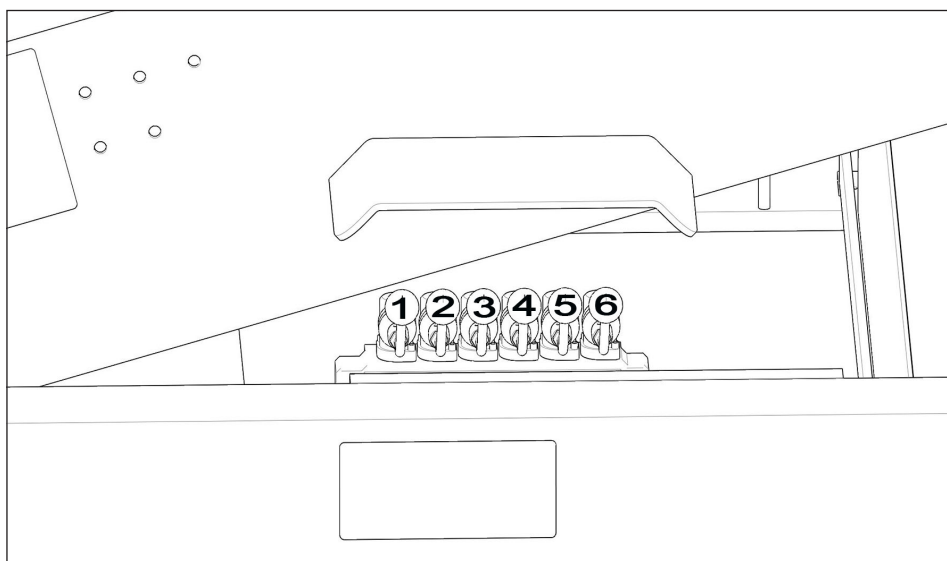


Figure 5.12 - Control Levers

(6) Placing Left Hand Side Conveyor in Transport Position

WARNING

Make sure all personnel are clear from the machine.

When starting the machine always make sure all control levers are in the neutral (off) position.

Always observe all safety warnings.

Wear personal protective equipment.

NOTICE

All control levers must be in the neutral (non-operational) position.

Take care not to nip the conveyor belt between moving parts.

It is recommended that this procedure is carried out by two people, as access to both sides of the machine is required.

1. Make sure all personnel are clear from the machine.
2. Remove the pins securing the conveyor in place (Item 1, Reference: Figure 5.13).

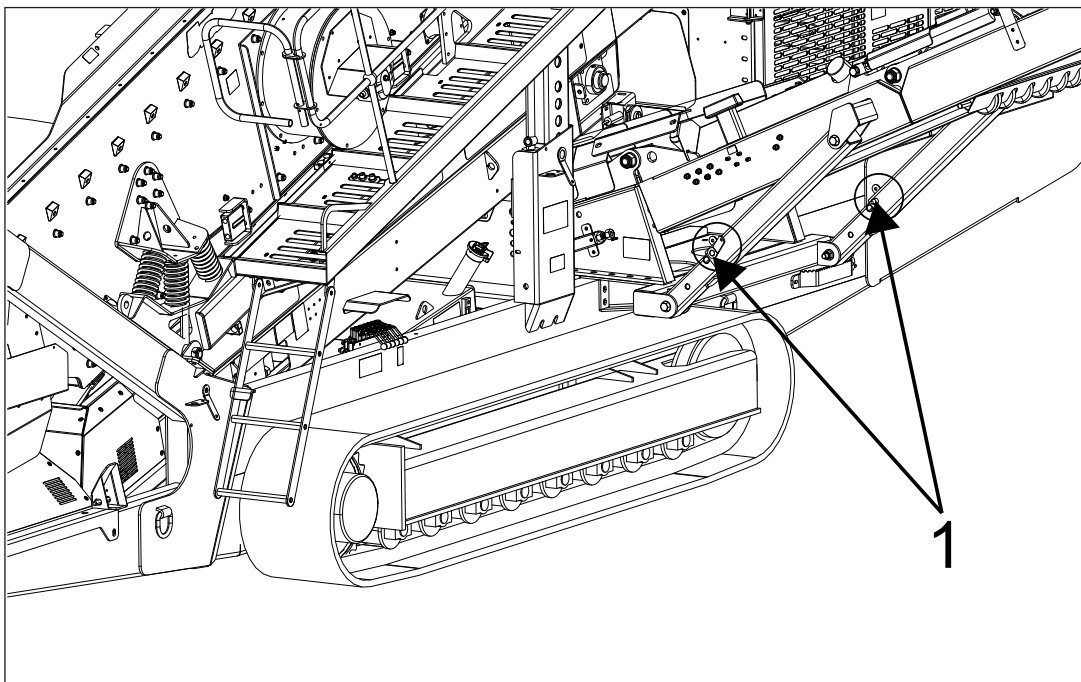


Figure 5.13 - Remove Securing Pins

3. Locate the RHS control bank.

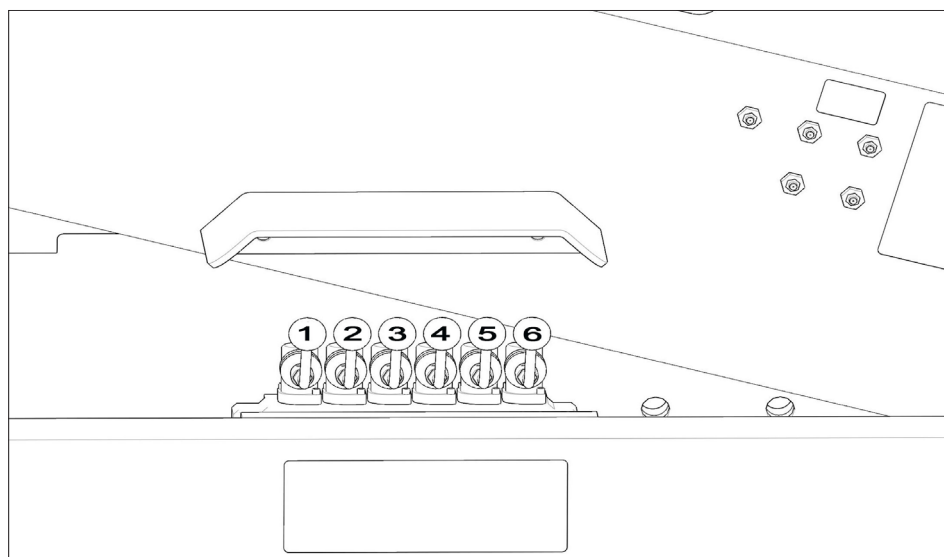


Figure 5.14 - RHS Control Bank

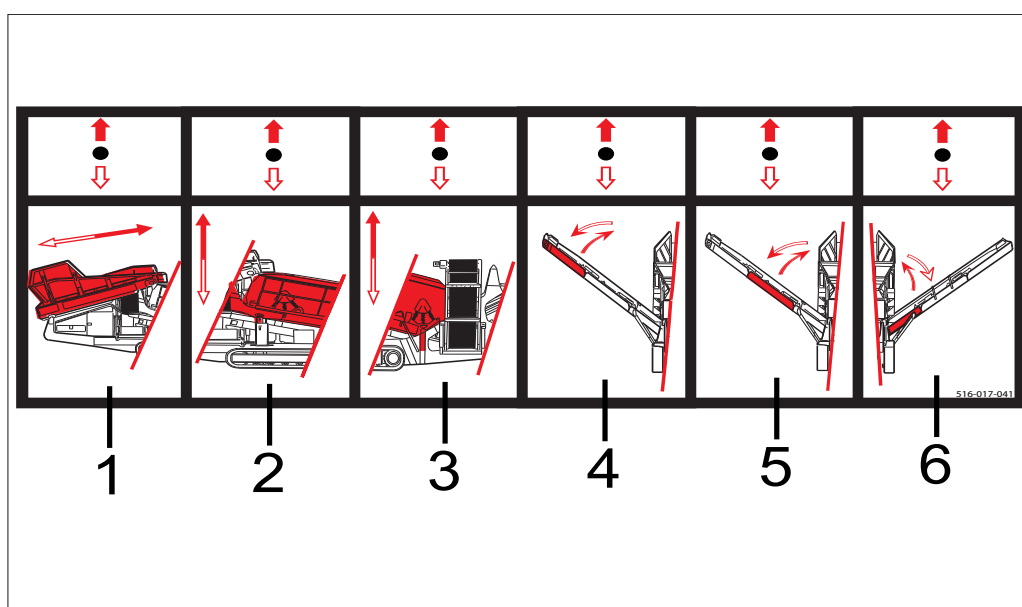


Figure 5.15 - RHS Control Bank Decal

4. Using lever 4 (Reference: Figure 5.15), fold the head section approximately 30% to give some slack on the belt.

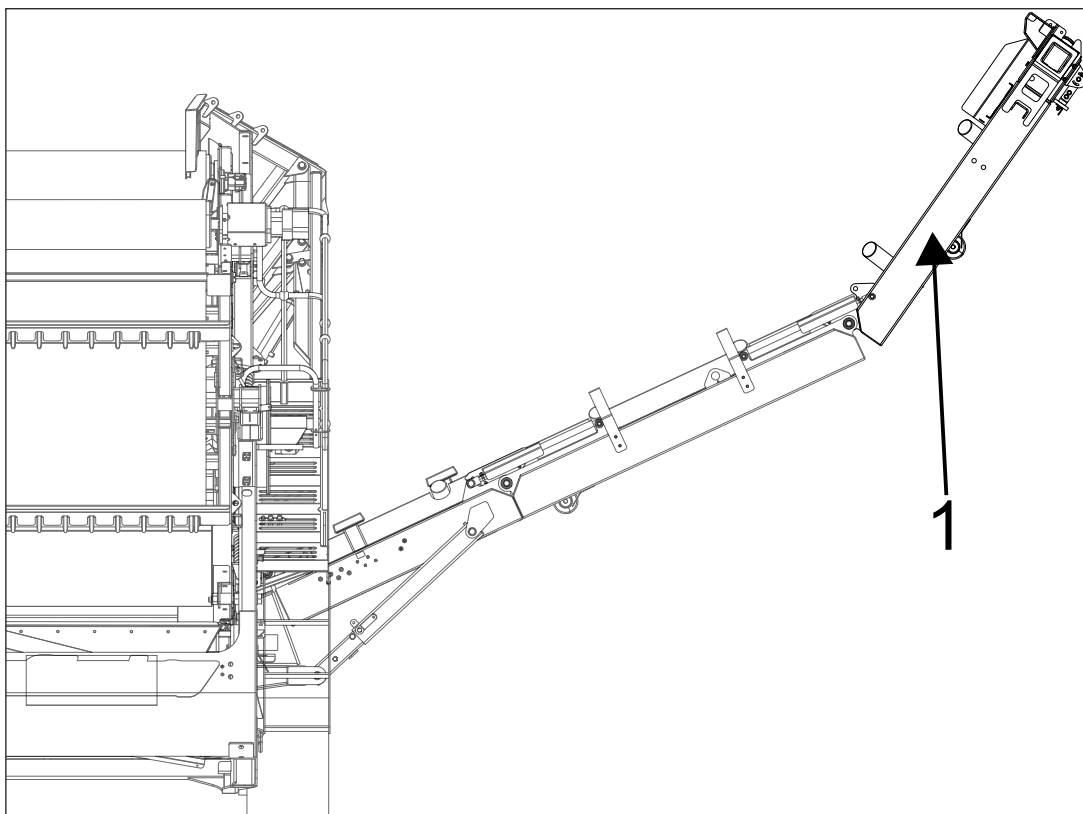


Figure 5.16 - Fold Head Section 30%

5. Locate the LHS control bank.
6. Use Lever 5, (Reference: Figure 5.18) to fold the bottom section of the conveyor until it is vertical.

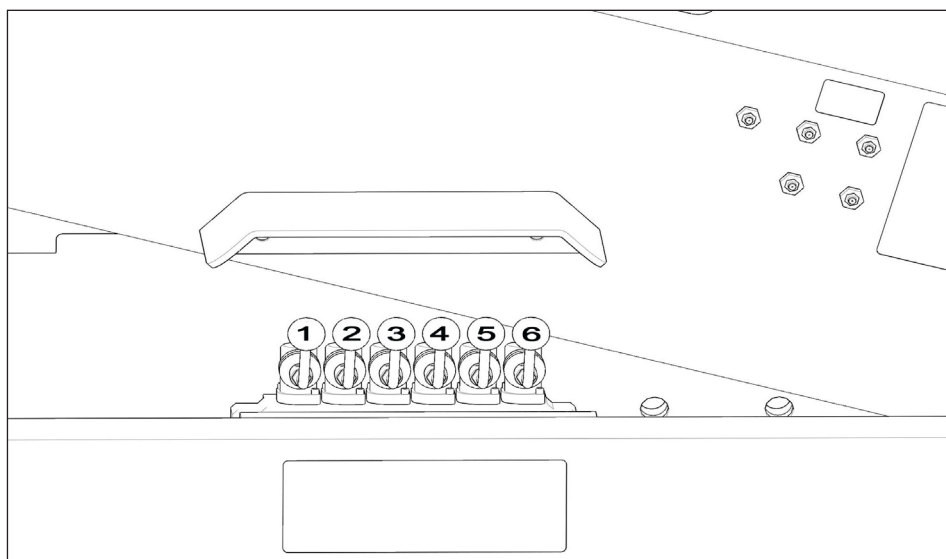


Figure 5.17 - Fold Bottom Section

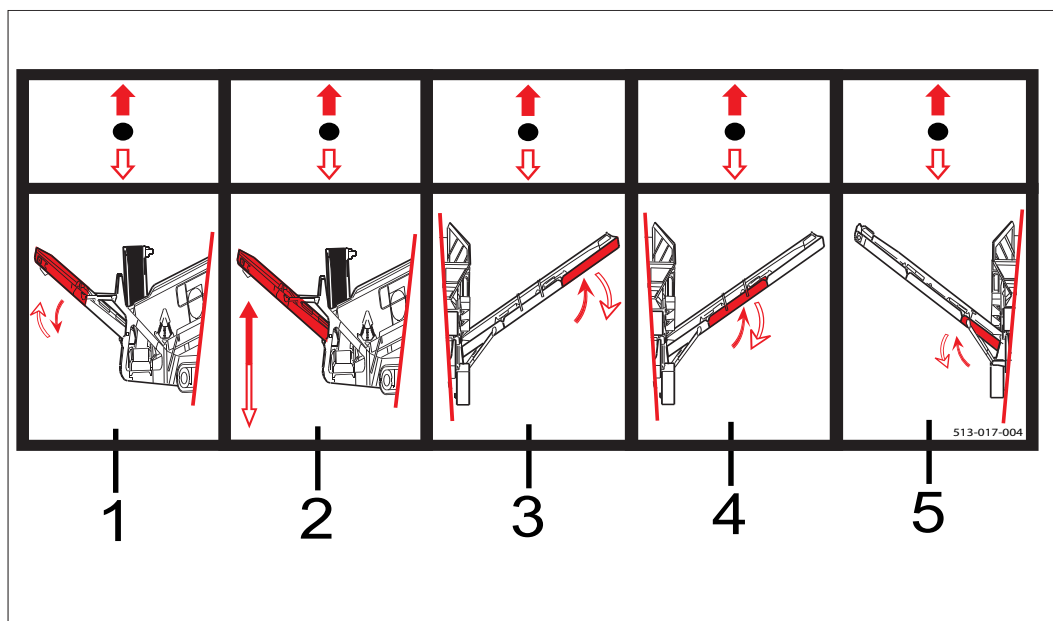


Figure 5.18 - LHS Control Bank Decal

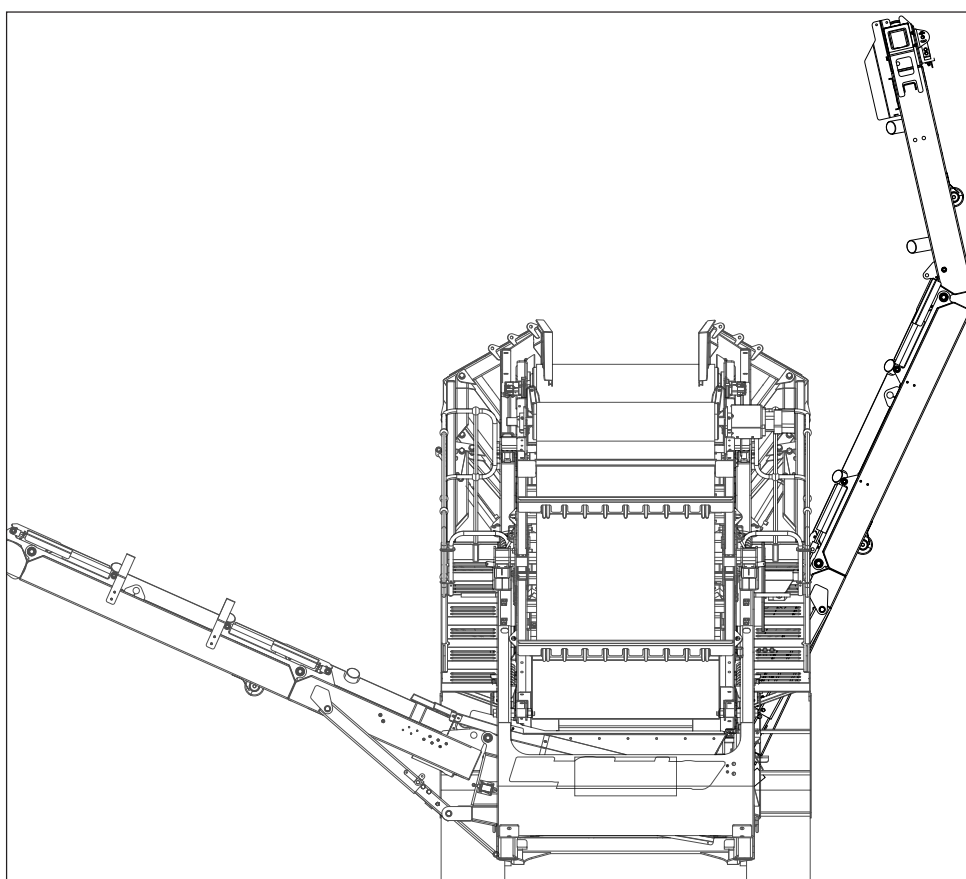


Figure 5.19 - Bottom Section Vertical

7. Locate the control bank of the RHS of the machine.
8. Fold the mid-section of the conveyor over the top of the machine using lever 5 (Reference: Figure 5.15).
9. Fold the remainder of the head section into transport position (Item 1, Reference: Figure 5.18).

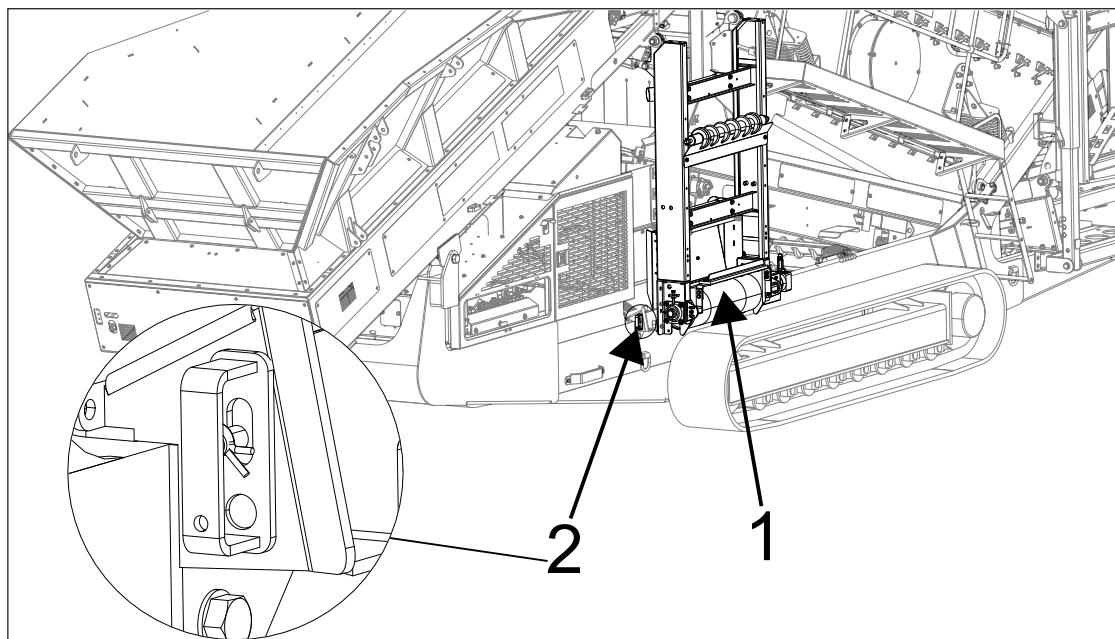


Figure 5.20 - Side Conveyor in transport position

10. Refit the pins to secure the conveyor for transport (Item 2, Reference: Figure 5.20).
11. Tie up side conveyor belts as required with straps provided. Ensure the conveyor belts are not touching any moving parts.

(7) Folding Right Hand Side Conveyor for Transport**WARNING**

Make sure all personnel are clear from the machine.

When starting the machine always make sure all control levers are in the neutral (off) position.

Always observe all safety warnings.

Wear personal protective equipment.

NOTICE

All control levers must be in the neutral (non-operational) position.

Take care not to nip the conveyor belt between moving parts.

It is recommended that this procedure is carried out by two people, as access to both sides of the machine is required.

1. Make sure all personnel are clear from the machine.
2. Remove pins securing the conveyor in place.

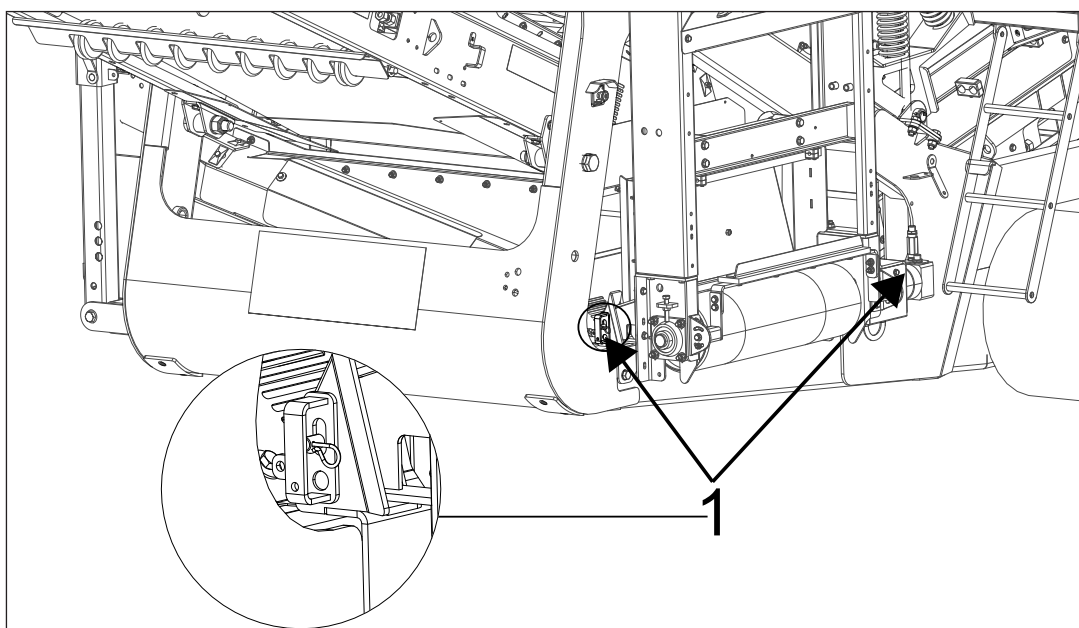


Figure 5.21 - Remove Securing Pins

3. Locate the LHS control bank.

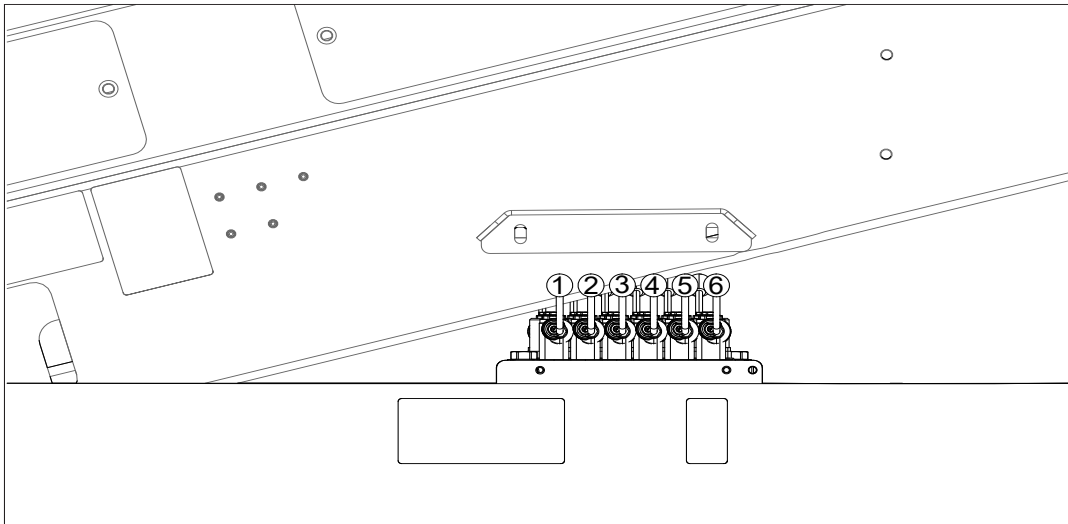


Figure 5.22 - LHS Control Bank

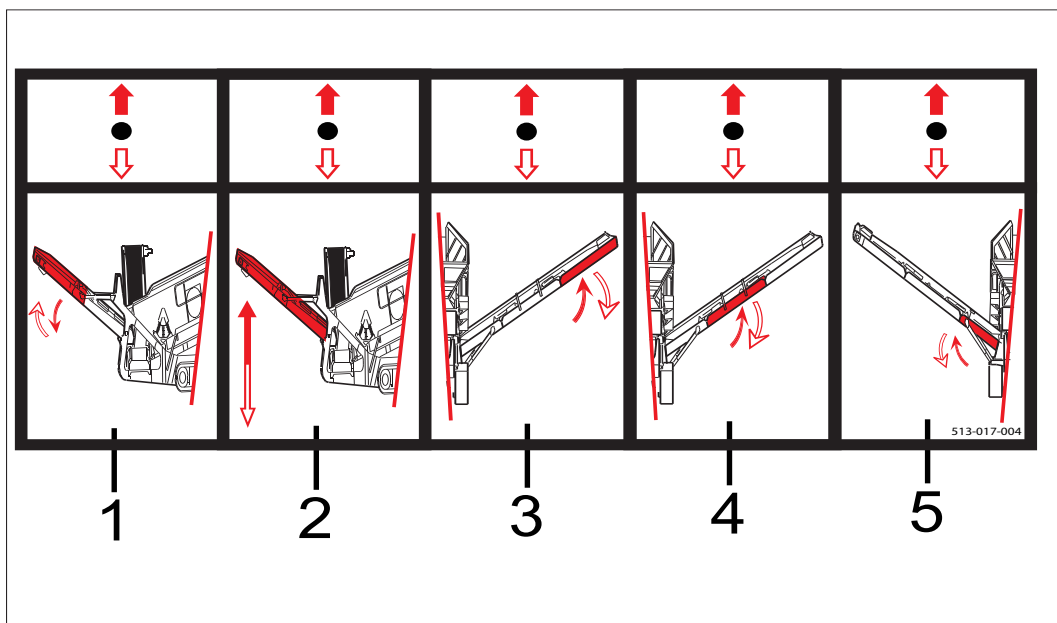


Figure 5.23 - LHS Control Bank Decal

4. Use lever 3 (Reference: Figure 5.23) to fold in the head section approximately 30% to give some slack on the belt.
5. Go to the other side of the machine (RHS) and locate the RHS control bank (Reference: Figure 5.25).

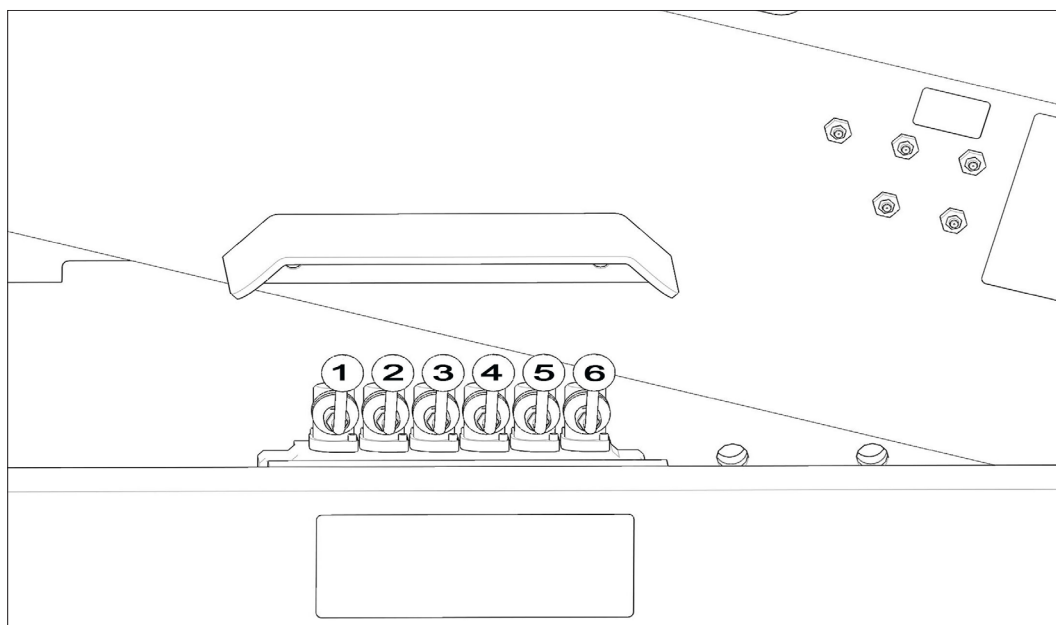


Figure 5.24 - RHS Control Bank

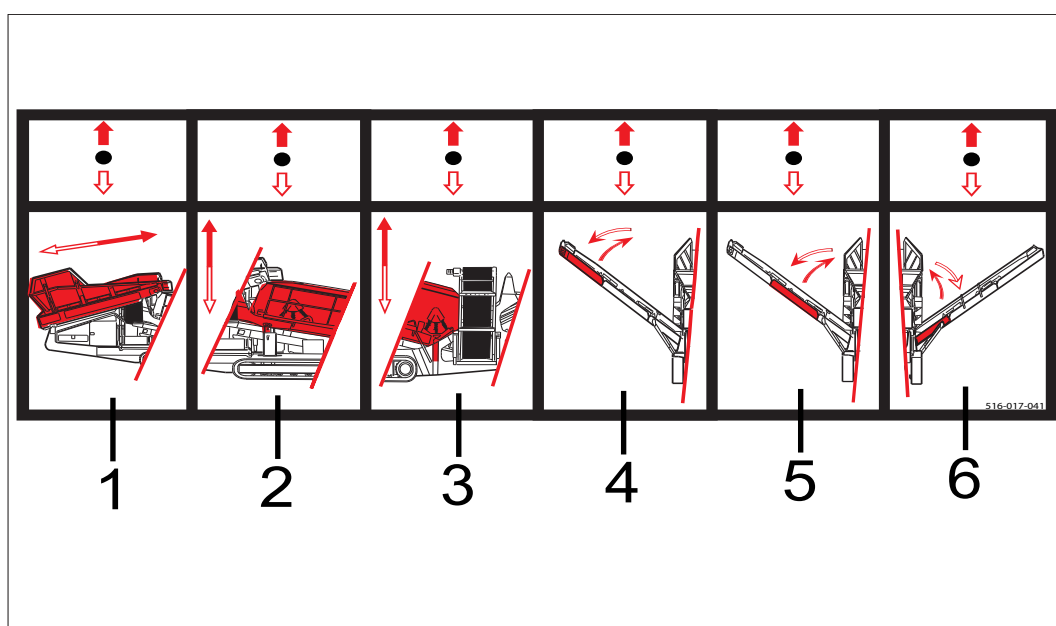


Figure 5.25 - RHS Control Bank Decal

6. Use lever 6 (Reference: Figure 5.25) to fold the bottom section of the conveyor until it is vertical.
7. Return to the LHS of the machine and use lever 4 (Figure 5.23) to fold the mid-section over the top of the machine.
8. Fold the remainder of the head section into position using lever 3 (Figure 5.23).
9. Secure pins in transport position.

Intentionally Left Blank

Table of Content

6	Maintenance	6-3
6.1	Regular Servicing	6-3
6.2	Machine Storage	6-4
6.3	Fuel System	6-5
(1)	Check Fuel Level and Top up	6-5
(a)	Machines Without Optional Fuel Pump	6-5
(b)	Machines With Optional Fuel Pump	6-5
(c)	Machines With AdBlue Tanks	6-5
6.4	Unscheduled Maintenance	6-6
6.5	Tracks	6-6
6.6	Maintenance Schedules	6-7
(1)	Daily or 8 Hour Maintenance Schedule	6-7
(2)	Weekly or 50 Hour Maintenance Schedule	6-8
(3)	Monthly or 250 Hour Maintenance Schedule	6-9
(4)	500 Hour Maintenance Schedule	6-9
(5)	1000 Hour Maintenance	6-10
(6)	2500 Hour Maintenance Schedule	6-10
6.7	Engine Maintenance Schedules	6-11
(1)	CAT Engine Maintenance Schedules	6-11
(a)	When Required	6-11
(b)	Daily	6-11
(c)	Weekly	6-11
(d)	Every 50 Service Hours or Monthly	6-11
(e)	Every 250 Service Hours	6-12
(f)	Every 500 Service Hours	6-12
(g)	Every 500 Service Hours or 1 Year	6-12
(h)	Every 1000 Service Hours	6-12
(i)	Every 1500 Service Hours	6-12
(j)	Every 2000 Service Hours	6-13
(k)	Every 3000 Service Hours	6-13
(l)	Every 3000 Service Hours or 2 Years	6-13
(m)	Every 4000 Service Hours	6-13
(n)	Every 6000 Service Hours or 3 Years	6-13
(o)	Every 12000 Service Hours or 6 Years	6-13
6.8	Lubrication	6-14
6.9	Servicing Conveyors	6-16
(1)	Clean & Check the Conveyor Belts	6-16
(2)	Tensioning the Conveyor Belts	6-17
(3)	Conveyor Alignment	6-18
6.10	Apron Tensioning	6-19
6.11	Servicing the Tracks	6-20
6.12	Measuring Track Tension	6-21
6.13	Adjusting Track Tension	6-22
6.14	Gearbox Oil Level	6-23

6 Maintenance

(1) Checking and Filling Gearbox Oil	6-23
(2) Draining Gearbox Oil	6-24
6.15 Servicing DEF Tank Filters (Tier 4 / Stage V)	6-25
(1) DEF Fluid Filter	6-25
(2) DEF Screen Filter	6-28
(3) DEF Manifold Filter	6-29
6.16 Servicing the Hydraulic System	6-30
(1) Changing Hydraulic Filters	6-30
(2) Changing Hydraulic Oil	6-31
6.17 Changing Air Filter Elements	6-32
6.18 Replacing Screen Media	6-33
(1) Replacing Top (and Middle) Deck Screens	6-33
(2) Replacing Bottom Deck Screens	6-35
6.19 Checking the Screen Box Running Condition	6-37
(1) Checking if Screen Box is in Tune	6-37

6 Maintenance

Refer to Chapter 2 Safety for relevant safety information before attempting to carry out any maintenance on the machine.



WARNING

Before undertaking any maintenance, repairs work on the machine, switch off the machine and implement the lockout and tag out procedure.

NOTICE

Ensure that only qualified and trained personnel operate and maintain this equipment.

Always keep control panels closed to avoid water ingress and dust contamination.

Regularly check the control system and connections for any damage.

6.1 Regular Servicing

It is important that a strict routine of regular servicing is undertaken from the start of operation of the machine.

Regular checks on fluids and the lubrication of the machine, in accordance with the schedule, is essential.

In addition to the lubrication points, the lubrication schedule lists the regular attention required to the machine hydraulic system.

The engine oil and coolant also require checking regularly.

6.2 Machine Storage

NOTICE

Improper storage of the machine may lead to warranty expiration.

To protect the machine from rust corrosion during seasonal shutdown, shipment or outdoor storage (winter or summer) and to avoid deterioration to parts that are stored for a long time, the following protective measures have to be taken.

- At least once each month while the machine is in storage or during the seasonal shutdowns the machine should be operated for at least 5 minutes to make sure the bearings remain properly greased.
- Store the machine and any removed components on a firm support so that it does not touch the ground. The machine has to be placed on appropriate foundation, to protect against ground humidity.
- To avoid rust forming, the machine should be stored in closed dry areas protected from the weather.
- If the machine is stored outside, the machine must be covered with a canvas, which is opened on the floor, to allow the flowing up of eventual perspiration water.
- Protect the machine surface with an anti-corrosion product.
- Cover all the parts with protective sheeting against the weather and UV rays.
- The bearings must be stored inside their original packaging on suitable supports.
- Rubber gaskets must be protected against heat and oxidation in a cool, dry place.
- Periodically check the stored parts to ensure the protective coating is not damaged.
- Before removing the part or machine from storage, remove the anti-corrosion product using a suitable solvent, check the parts are not damaged to avoid operating problems or damage to the machine.
- The electric units of the machine have to be stored in closed and dry rooms. The storage place can't have any vibrations, since otherwise there is a risk of chatter marks formation (brinelling) on the contact surfaces of the rolling-contact bearing.
- For electric motors storage additional instructions given by the motor supplier might exist.
- The above procedure is necessary, as moisture condensation will cause corrosion where the bearing rollers contact the inner and outer rings. This corrosion will destroy the highly finished surfaces of the rollers and rings at this point. When the machine is started and operating under load, bearings not properly greased will soon become rough, causing premature bearing failure.

6.3 Fuel System

(1) Check Fuel Level and Top up

DANGER

Diesel fuel is highly flammable and is an explosion/burns hazard.

NEVER remove the filler cap or refuel, with the engine running.

DO NOT smoke while refilling or carrying out maintenance on the fuel system.

DO NOT carry out maintenance on the fuel system near naked flames or sources of sparks, such as welding equipment.

DO NOT leave the machine unattended during the refuelling process

NOTICE

Ultra low sulphur diesel must be used in machines with CAT Tier 4 engines.

Preferably re-fuel at the end of each day, where possible, to reduce overnight water condensation within the tank.

(a) Machines Without Optional Fuel Pump

1. Observe all safety warnings.
2. Check the fuel level gauge / indicator.
3. Clean the area around the filler cap.
4. Remove the filler cap and top up fuel level as required.
5. Replace the filler cap.

(b) Machines With Optional Fuel Pump

1. Observe all safety warnings.
2. Check the fuel level gauge / indicator.
3. Clean the area around the filler cap.
4. Remove the filler cap.
5. Place refueling hose in fuel container and start refuelling pump.
6. Replace the filler cap when refuelling is completed.

(c) Machines With AdBlue Tanks

NOTICE

It is recommended to use AdBlue - DIN70070 diesel exhaust fluid (DEF), if using a different supplier ensure that the def complies with this standard.

If flushing or cleaning associated AdBlue parts do not use diesel or any other cleaning fluids. Use only clean water or AdBlue to carry out the procedure.

Do not use fuel pump to fill AdBlue tank. Diesel and AdBlue must not be mixed.

1. Observe all safety warnings.
2. Check the fuel level gauge / indicator.
3. Clean the area around the filler cap.
4. Remove the filler cap and top up fuel level as required.
5. Replace the filler cap.

6.4 Unscheduled Maintenance



WARNING

Wear personal protective equipment.

Switch off machine and implement the lock out and tag out procedure.

NOTICE

We recommend that air cleaner elements are replaced and not reused .

Air Cleaner Elements

The life span on air cleaner elements is dependant on the environment the machine is used in and as such a maintenance schedule can not be implemented for their replacement. This machine is equipped with an air filter restriction indicator which will illuminate at the control panel highlighting the need for maintenance, Ref: Control Panel Overview in chapter 4.

6.5 Tracks

The maintenance schedule for the tracks will depend greatly on the amount of travel a machine is expected to do in its day to day operation and for that reason is not included in the following hourly schedules. Before any attempt is made to move this machine refer to the Tracks Maintenance section of this manual.

6.6 Maintenance Schedules

(1) Daily or 8 Hour Maintenance Schedule

ITEM	OPERATION	REMARKS
Defects	Attend to any defects reported by the operator.	
Screen Bearings	The screen box requires 5 grease gun pumps delivering 1.25 grams of Mobilith SHC220 grease per pump every 8 hours	Mobilith SHC 220
Electrical System	Examine all visible cables and connections.	
Hydraulic Power Unit	a) Check oil level and replenish b) Visually inspect for leaks, damaged hoses and fittings. Replace defective items. c) Visually inspect filter indicators.	
Conveyor Belt	a) Visually inspect for cuts, rips and tears. Report to maintenance manager if necessary. b) Check alignment, adjust as necessary. c) Check tension, adjust as necessary.	
Guards	a) Make sure all guards are securely fitted. b) Report defective guards to maintenance manager. c) Replace defective guards.	
Fasteners	Visually inspect for loose bolts and cap screws, tighten if necessary.	
Track Maintenance	Refer to track section	
Fuel Level	a) Check fuel level and replenish. b) Visually inspect for leaks, damaged hoses and fittings and replace as necessary.	
Engine oil level	Check oil level and replenish	
Hoses	Visually inspect for leaks, damaged hoses and fittings and replace as necessary.	
Seals	Visually inspect for damaged seals	
Engine air filter	Check air breather restriction indicator at control panel and replace filters if necessary.	
Screen Mesh tension	Make sure mesh is tensioned correctly	
Hydraulic oil filters	Check indicator and change if necessary.	

6 Maintenance

(2) Weekly or 50 Hour Maintenance Schedule

ITEM	OPERATION	REMARKS
Carry out daily or 8 hour maintenance schedule	Make sure all work in the daily or 8 hours schedule is carried out	
Feeder Gearbox	Change feeder gearbox oil	After first 50 hour service then every 2500 hours or annually Shell Omala 150 or equivalent
Return line hydraulic filters	Change	After first 50 hour service then every 500 hours or annually or when indicator turns for green to red
Diesel prefilter	Drain Prefilter	
Belt cleaners	Check / adjust / replace	
Skirting rubbers	Check / adjust / replace	
Bearings	Grease.	Refer to Section 6.6
Screen mesh	Check condition of screen mesh	
Rubber cushions	Check condition of rubber cushions	

(3) Monthly or 250 Hour Maintenance Schedule

ITEM	OPERATION	REMARKS
Carry out daily or 8 hour and weekly or 50 hour maintenance schedules		
Bearings	a) Inspect for loose bolts and tighten if necessary. b) Inspect for loose fit on shaft and any damage, replace if necessary	
Engine air intake pipe	Check engine air intake pipe for signs of wear or damage. Replace if necessary.	
Hydraulic Ram Chrome	All Hydraulic Rams with chrome exposed to the elements must be greased to protect against corrosion. Hydraulic Rams must be greased during machine assembly, transportation and storage.	Use Tectyl 506 Multi purpose
Track	Refer to track section	

*Refer to Greasing schedule for quantities.

(4) 500 Hour Maintenance Schedule

ITEM	OPERATION	REMARKS
FIRST		
Carry out daily or 8 hour maintenance schedule		
Carry out weekly or 50 hour maintenance schedule		
Carry out 250 hour maintenance schedule		
Engine	Change engine oil and oil filter Change fuel filter	

6 Maintenance

(5) 1000 Hour Maintenance

ITEM	OPERATION	REMARKS
Carry out daily or 8 hour maintenance schedule		
Carry out weekly or 50 hour maintenance schedule		
Carry out 250 hour maintenance schedule		
Carry out 500 hour maintenance schedule		

(6) 2500 Hour Maintenance Schedule

ITEM	OPERATION	REMARKS
FIRST		
Carry out daily or 8 hour maintenance schedule		
Carry out weekly or 50 hour maintenance schedule		
Carry out 250 hour maintenance schedule		
Carry out 500 hour maintenance schedule		
Carry out 1000 hour maintenance schedule		
Hydraulic oil	a) Analyse oil sample, check for condition and contamination b) Change oil if necessary.	
Feeder Gearbox	Change feeder gearbox oil	Shell Omala 150 or equivalent

6.7 Engine Maintenance Schedules

For further engine maintenance information, refer to the engine manufacturer's operation manual supplied.

(1) CAT Engine Maintenance Schedules

(a) When Required

Object	Job	Remarks	Sign
Battery	Replace		
Battery or battery cable	Disconnect		
Engine	Clean		
Engine air cleaner element (Dual element)	Clean/replace		
Engine air cleaner element (single element)	Inspect/Replace		
Engine air cleaner element (single element)	Replace		
Fuel System	Prime		
Severe service application	Check		

(b) Daily

Object	Job	Remarks	Sign
Coolant system coolant level	Check		
Engine air cleaner service indicator	Inspect		
Engine air pre-cleaner	Check/Clean		
Engine oil level	Check		
Fuel system primary filter / water separator	Drain		
Walk around inspection			

(c) Weekly

Object	Job	Remarks	Sign
Hoses and clamps	Inspect/Replace		

(d) Every 50 Service Hours or Monthly

Object	Job	Remarks	Sign
Fuel tank water and sediment	Drain		

6 Maintenance

(e) Every 250 Service Hours

Object	Job	Remarks	Sign
Coolant system coolant sample (Level 1)	Obtain		
Engine oil sample	Obtain		
Engine oil and filter change	Change*		

* Due to the severe environment that most crushers and screens operate in the engine oil and filter change should be every 250 hours of service. However if oil sampling and analysis is carried out it is possible to increase the engine oil and filter change to every 500 hours of service.

(f) Every 500 Service Hours

Object	Job	Remarks	Sign
Belt	Inspect		
Engine oil and filter	Change		
Fan clearance	Check		

(g) Every 500 Service Hours or 1 Year

Object	Job	Remarks	Sign
Battery electrolyte Level	Check		
Cooling System Supplemental Coolant Additive (SCA)	Test/Add		
Engine air cleaner element (Dual Element)	Clean/Replace		
Engine air cleaner element (Single Element)	Inspect/Replace		
Engine air cleaner element (Single Element)	Replace		
Fuel system primary filter (water separator) element	Replace		
Fuel system secondary filter	Replace		
Radiator	Clean		

(h) Every 1000 Service Hours

Object	Job	Remarks	Sign
Water pump	Inspect		

(i) Every 1500 Service Hours

Object	Job	Remarks	Sign
Engine crankcase breather element	Replace		

(j) Every 2000 Service Hours

Object	Job	Remarks	Sign
After cooler Core	Inspect		
Engine Mounts	Inspect		
Starting Motor	Inspect		
Turbocharger	Inspect		

(k) Every 3000 Service Hours

Object	Job	Remarks	Sign
Alternator	Inspect		
Alternator and Fan Belts	Replace		
Belt Tensioner	Inspect		
Radiator Pressure Cap	Clean/Replace		

(l) Every 3000 Service Hours or 2 Years

Object	Job	Remarks	Sign
Cooling system coolant (DEAC)	Change		

(m) Every 4000 Service Hours

Object	Job	Remarks	Sign
After cooler core	Clean/Test		

(n) Every 6000 Service Hours or 3 Years

Object	Job	Remarks	Sign
Cooling System Coolant Extender (ELC)	Add		

(o) Every 12000 Service Hours or 6 Years

Object	Job	Remarks	Sign
Cooling System Coolant (ELC)	Change		

6.8 Lubrication

 **WARNING**

Wear personal protective equipment.

Switch off machine and implement the lock out and tag out procedure.

NOTICE

Do not mix grease types as this can result in the blend having a lower specification than the individual greases.

Regular lubrication of this machine in accordance with the maintenance schedules is essential..

NOTICE

All Hydraulic Rams with chrome exposed to the elements must be greased to protect against corrosion.

Hydraulic Rams must be greased during machine assembly, transportation and storage.

Hydraulic Rams must be inspected every 4 weeks for grease requirements.

NOTICE

When changing or topping up hydraulic oil or changing filter elements. The utmost cleanliness must be observed at all times, as impurities in the oil will destroy the system.

If the performance of the machine has decreased i.e. conveyors have slowed down, switch off machine immediately, check hydraulic system before restarting

Recommended Lubricants and Fluids

- Screen Box BearingsMobilith SHC 220
- Belt Feeder Gearbox Shell Omala 150
- Conveyor Bearings EP2 Grease
- Engine Oil..... 15W/40 Engine oil
- Track Gearbox OilRenogear SG320
- Hydraulic Oil ISO VG 46
- General Grease EP2
- Hydraulic Ram Chrome Maintenance Tectyl 506 Multi purpose

Cold Weather Operation (Ambient Temp -4°C (40°F))

- Engine Oil..... 10W/30 Engine Oil
- Recommended Hydraulic Oil By Temperature Ranges

NOTICE

Viscosity range between 25 and 36cSt ensures maximum hydraulic efficiency and lowest fuel consumption.

Typical ambient temperature range is based on average machine loading.

Hydraulic oil grade	Hydraulic system temperature @ maximum optimum viscosity of 36cS	Hydraulic system temperature @ minimum optimum viscosity of 25cSt	Typical ambient temperature range
ISO VG 22	28°C (82.4°F)	36°C (96.8°F)	-20 to +10°C (-4 to 50°F)
ISO VG 32	37°C (98.6°F)	46°C (114.8°F)	-10 to +20°C (14 to 68°F)
ISO VG 46	46°C (114.8°F)	55°C (131°F)	0 to +30°C (32 to 86°F)
ISO VG 68	54°C (129.2°F)	65°C (149°F)	+15 to +40°C (59 to 104°F)
ISO VG 100	63°C (145.4°F)	73°C (163.4°F)	+25 to +50°C (77 to 122°F)

- Shell Recommended Lubricant Typical Characteristics

Shell Omala Grade:	68	100	150	220	320	460
Viscosity Grade (ISO 3448)	68	100	150	220	320	460
Kinematic Viscosity @ 40°C cST (IP 71)	68	100	150	220	320	460
Kinematic Viscosity @ 100°C cST (IP 71)	8.7	11.4	15.0	19.4	25.0	31.8
Viscosity Index (IP 226)	95	95	95	95	95	95

- Mobilith SHC Typical Characteristics

6.9 Servicing Conveyors

(1) Clean & Check the Conveyor Belts



WARNING

Wear personal protective equipment.

Switch off machine and implement the lock out and tag out procedure.

When working above ground level make sure to use a suitable working platform.



CAUTION

Do not unfasten or remove any guard while the machine is running or start the machine while a guard is unfastened or removed.

If any damage to the belt is found, do not operate the machine until it is repaired or replaced.

1. Observe all safety warnings.
2. Stop the machine, Ref: Machine Shut Down Procedure in chapter 4
3. Implement the lockout and tag out procedure
4. Open the guard doors where necessary.
5. Clean the conveyor belts using a high pressure hose.
6. Check the belts for cuts, tears, rips or any other physical damage.

(2) Tensioning the Conveyor Belts



DANGER

Do not attempt to adjust the belt whilst the machine is running. There is an entanglement hazard and risk of trapping parts of the body.



WARNING

Wear personal protective equipment.

When working above ground level make sure to use a suitable working platform.

NOTICE

Do not over tension the belt as this will damage the drum bearings.

1. Observe all safety warnings.
2. Start machine and run conveyor.
3. Observe conveyor belt from a safe distance to check for belt slippage.
4. If belt slippage is present switch off machine and lock out and tag out.
5. Tighten the conveyor belt by adjusting both belt adjusters evenly one turn at a time. Slacken bolt 2 then adjust using bolt 1. Retighten bolt 2 after adjustment Ref: Figure 6.1
6. Start machine, run conveyor and check if slippage is still present.
7. If slippage is still present then switch off, lock out and tag out and repeat steps 1-6 until slippage is no longer present.

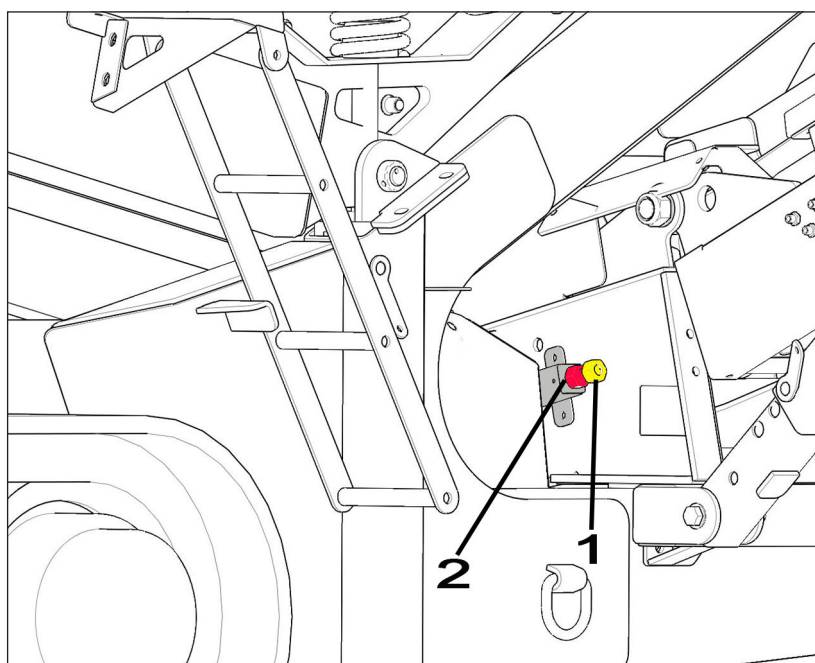


Figure 6.1 - Conveyor Belt Tensioner

(3) Conveyor Alignment



DANGER

Do not attempt to adjust the belt whilst the machine is running. There is an entanglement hazard and risk of trapping parts of the body.



WARNING

Wear personal protective equipment.

When working above ground level make sure to use a suitable working platform.

NOTICE

Do not over tension the belt as this will damage the drum bearings.

1. Observe all safety warnings.
2. Start machine and run conveyor.
3. Observe the conveyor from a safe distance and determine to which side the conveyor is tracking off.
4. If belt is tracking off switch off machine and lock out and tag out.
5. Tighten the conveyor belt by adjusting belt adjuster evenly one turn at a time. Slacken bolt 2 then adjust using bolt 1 Ref: Figure 6.1. Retighten bolt 2 after adjustment
6. If the conveyor is tracking off to the right side, operate the right side adjuster one turn at a time until the belt tracks correctly.
7. If the conveyor is tracking off to the left side, operate the left side adjuster one turn at a time until the belt tracks correctly.
8. Start machine, run conveyor and check if belt is still tracking off.
9. If belt is still tracking off then switch off, lock out and tag out and repeat steps 1-7 until tracking correctly.

6.10 Apron Tensioning

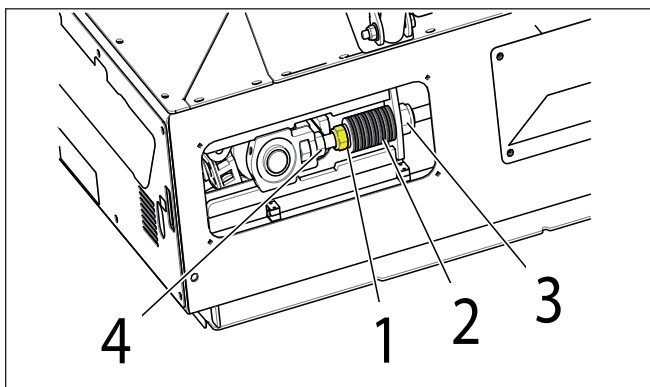


Figure 6.2 - Apron Conveyor Tensioning

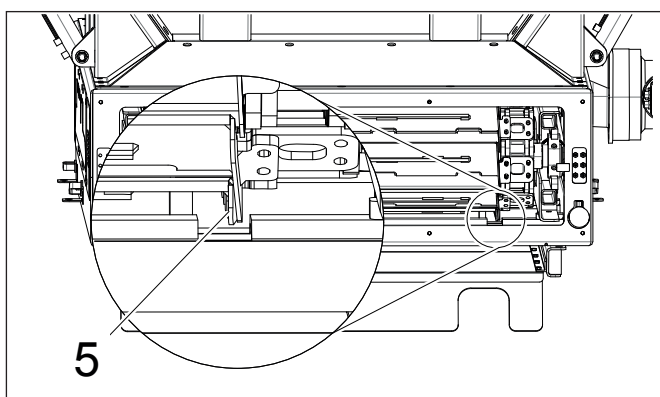


Figure 6.3 - Apron Conveyor shoe alignment

DANGER

Do not attempt to adjust the Apron whilst the machine is running. There is an entanglement hazard and risk of trapping parts of the body.

WARNING

Wear personal protective equipment.

When working above ground level make sure to use a suitable working platform.

1. Observe all safety warnings.
2. Start machine and run conveyor.
3. If the Apron shoe is close to or touching cross member Item 5 Figure 6.3 Tensioning is required.
4. If the Apron requires tensioning, switch off machine and lock out and tag out.
5. Tighten the apron conveyor by turning the Bolt highlighted in Yellow (Clockwise to tighten) or (Anti-Clock wise to loosen) See Figure 6.2 item 1. Ensure nut 4 does not rotate.
6. Adjust RH + LH until 10-15mm clearance between apron shoe and cross member see Figure 6.3.
7. Start the machine. To ensure the apron conveyor is running smoothly, there should be a smooth back and forth movement of the bearing on the bearing slide. The disc springs item 2 Figure 6.2 allow for this movement. If the disc springs are not allowing movement, loosen by adjusting nut 3 see Figure 6.2. If tension cannot be maintained replace the disc washers.

6.11 Servicing the Tracks

NOTICE

Keeping the tracks correctly adjusted will increase the service life of the tracks and drive components.

Frequently check for loose bolts, oil leaks, master pins are correctly located and tight, general wear and damage, correct track tension, etc. To ensure safe working and long life.

Always check the tracks prior to manoeuvring the machine

It is essential that the tracks are correctly tensioned at all times. Check track tension regularly.

Moving the machine with incorrectly tensioned tracks can cause severe damage to the undercarriage components and may invalidate the warranty.

6.12 Measuring Track Tension

WARNING

Wear personal protective equipment.

Do not push or tow the machine.

NOTICE

Prior to attempting any manoeuvring of the machine, the tracks must be free of obstructions, including crushed material and fines.

It is important that the track is not tensioned too tightly as this places excessive loads on the gearbox grease cylinder and idler bearings. It will also lead to accelerated wear and premature failure.

1. Observe all Safety Warnings.
2. Position the machine on solid and level ground and drive 2 metres (2 yards) minimum in a forward direction, track idler roller leading.
3. Shut down the machine.
4. Implement the lockout and tag out procedure.
5. One track at a time, measure the sag on the top part of the track on the longest section of unsupported track by placing a 'straight edge' long enough to reach from the drive sprocket to the nearest skid plate.
6. Measure the maximum amount of track sag from the high point of the track to the bottom of the 'straight edge', Ref: Figure 6.4.
7. Correctly adjusted, the sag should be Between 5mm - 15mm.

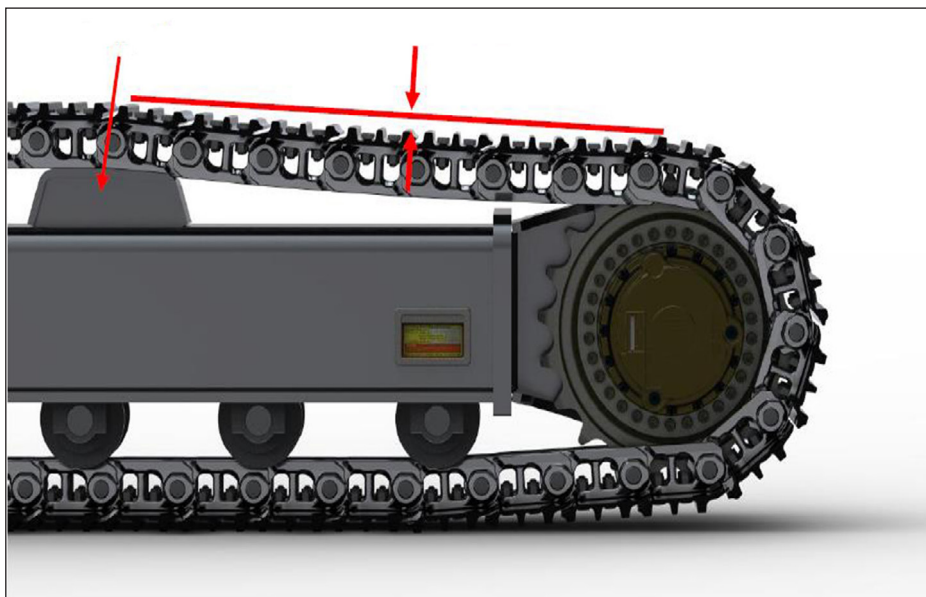


Figure 6.4 - Measuring Track Tension

6.13 Adjusting Track Tension



DANGER

Grease coming out of the relief valve under pressure can penetrate the body and any maintenance should only be attempted by fully trained personnel.



WARNING

Wear personal protective equipment.

Switch off machine and implement the lockout and tag out procedure.

1. Observe all Safety Warnings.
2. Shut down the machine, Ref: Machine Shut Down Procedure in chapter 4.
3. Implement the lockout and tag out procedure.
4. Locate the access aperture on the side of the track frame and remove the cover, where fitted, to reveal the relief valve inside.

To Release Track Tension

5. Loosen the relief valve by turning counter clockwise using gradual increments until the grease begins to be expelled. Care must be taken not to loosen the relief valve too quickly because the grease inside is under high pressure Ref: Figure 6.5.
6. When the correct track tension has been measured, turn the relief valve clockwise to tighten and then clean away all trace of expelled grease.
7. If the track fails to slacken after the grease fitting has been loosened, do not attempt to remove the tracks or disassemble the track Tensioner, or remove the grease fitting. It is possible that running the tracks with the grease fitting loosened may help to expel the grease.

To Increase Track Tension

8. Connect the grease gun to the grease fitting and add grease until the track tension is within the specified dimension, see 'Measuring Track Tension' and refer to lubricant and fluid specifications.

Re-check Tension

9. Operate the machine in track mode and drive the machine 50 metres (50 yards) forwards and 50 metres (50 yards) backwards, check track tension and repeat the above steps if it is within the specified dimension, see 'Measuring Track Tension'.
10. If room for manoeuvring the machine is restricted, drive the machine forwards and backwards several times over a shorter distance.

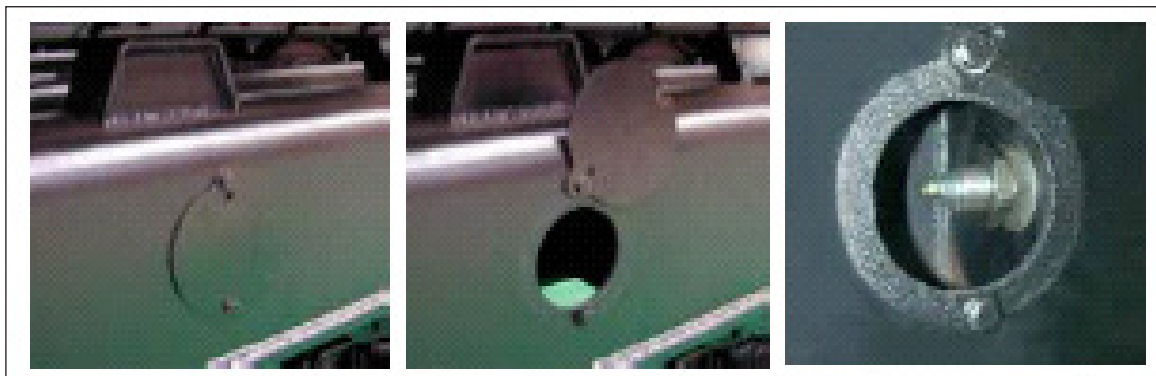


Figure 6.5 - Track Tensioner

6.14 Gearbox Oil Level

(1) Checking and Filling Gearbox Oil

NOTICE

Cleanliness is essential when checking, filling or replacing oil in the gearbox. Gearbox operating life will be dramatically shortened if the oil becomes contaminated. Only use new clean oil in clean containers and fillers.

The gearbox should hold approximately 5 litres of oil, which should be filtered through a 10 micron filter before entering the gearbox.

1. Move the machine to a level surface and bring the oil drain holes to the position shown in Figure 6.6.
2. Ensure machine is switched off, locked out and tagged out. Remove ignition key, carry it with you.
3. Thoroughly clean around both plugs removing all potential contaminants.
4. Remove both plugs.
5. Fill the oil through the upper hole (item 1) until it runs out through the lower hole (item 2), Ref: Figure 6.6.
6. Wait a few moments until any trapped air has escaped and then re-check the level.
7. Add more oil if necessary.

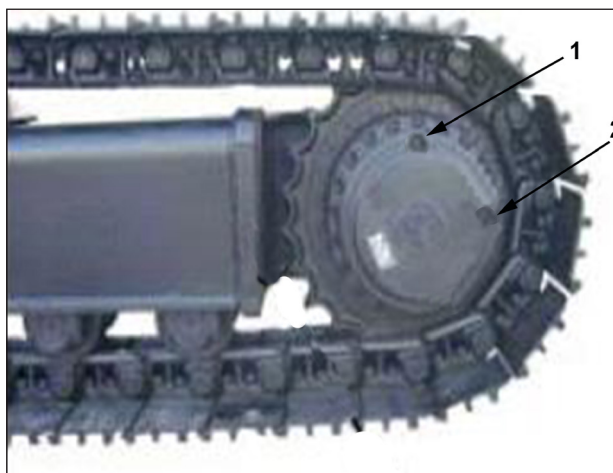


Figure 6.6 - Gearbox Oil Level Fill Position

(2) Draining Gearbox Oil

1. Move the machine to a level surface and bring the oil fill (1) and oil drain holes (2) to the position shown in Figure 6.7.

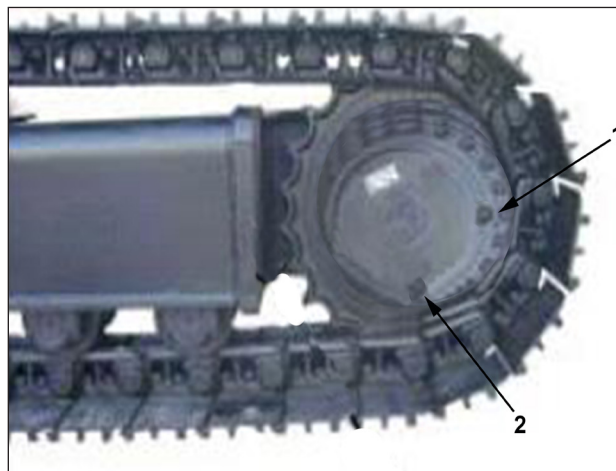


Figure 6.7 - Draining Gearbox Oil

2. Ensure machine is switched off, locked out and tagged out. Remove ignition key, carry it with you.
3. Thoroughly clean around both plugs removing all potential contaminants.
4. Remove both plugs and allow the oil to drain. The oil will drain quickly if it is hot, however care should be taken to avoid burns to the operator.
5. Move the machine to bring the plugs to the fill position shown in Figure 6.6.
6. Re-fill the oil.

6.15 Servicing DEF Tank Filters (Tier 4 / Stage V)

DANGER

Do not attempt any maintenance on the DEF system unless the machine has been shut down, locked out and tagged out.

WARNING

Wear personal protective equipment.

NOTICE

When working on the DEF system the utmost cleanliness must be observed at all times.

(1) DEF Fluid Filter

NOTICE

Wait until the pump unit has stopped running as it usually performs automatic Emptying of the AdBlue/DEF hoses..

1. Disconnect the battery negative terminal, see item 1 Figure 6.8.

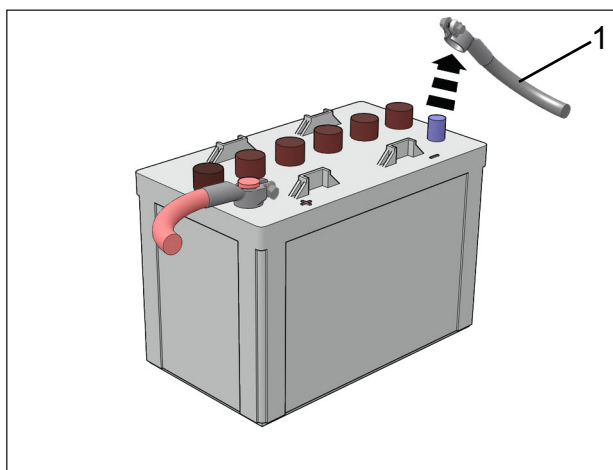


Figure 6.8 - Removing Battery Negative Terminal

2. Remove all Guards and Covers surrounding the DEF tank see item 1 Figure 6.9.
3. Access to the DEF Fluid Filter under the machine chassis item 2 Figure 6.9.

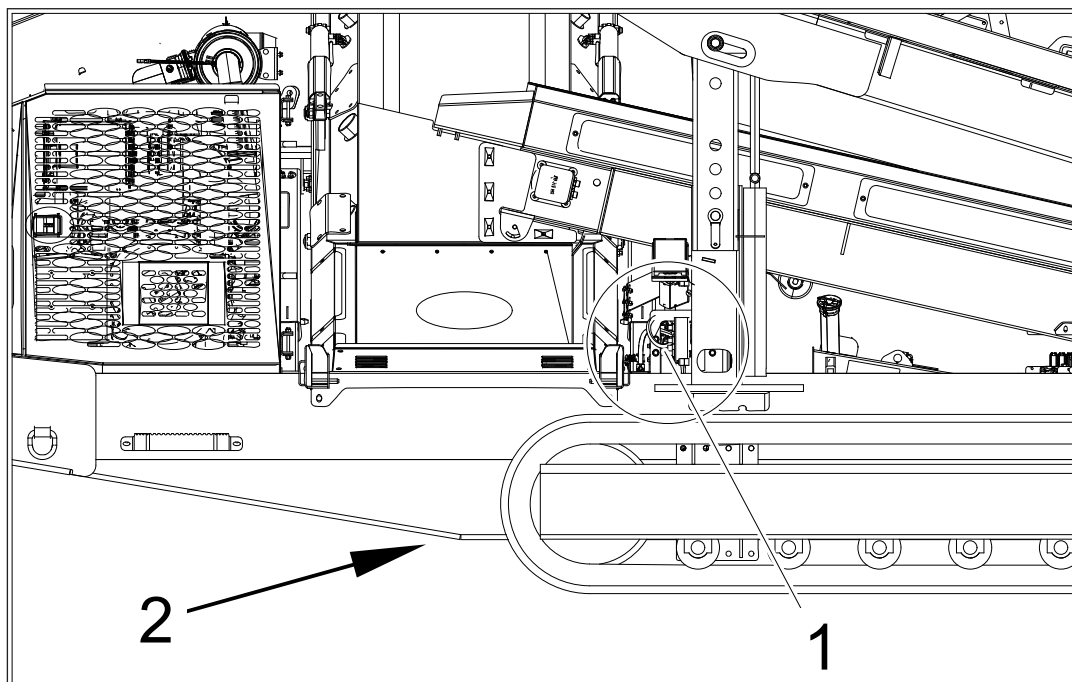


Figure 6.9 - Location of DEF Tank and how to access.

4. Place a collection vessel under the filter cover.

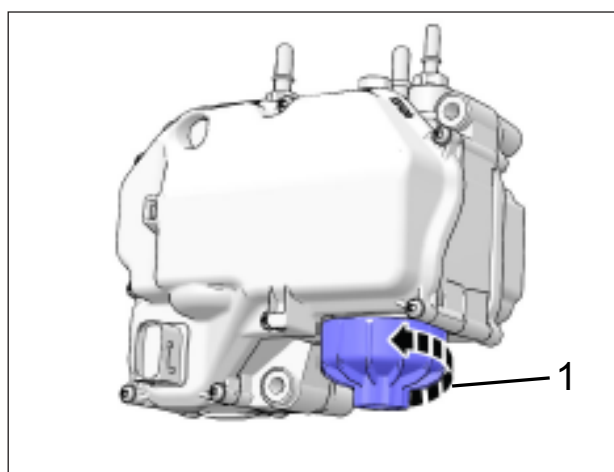


Figure 6.10 - Undo Filter cover.

5. Undo the filter cover see item 1 Figure 6.10.

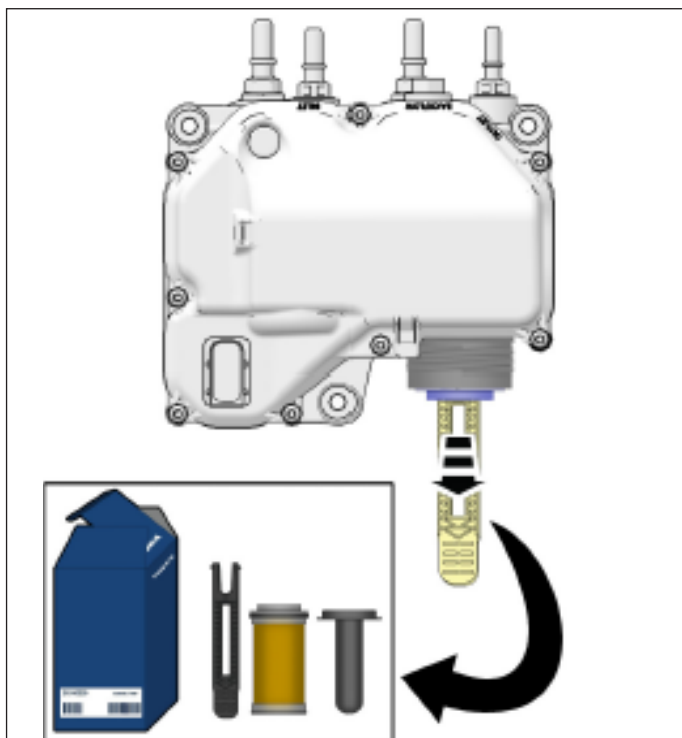


Figure 6.11 - Pull Out Filter.

6. Use the puller (supplied with the filter kit) to pull out the filter by first pressing it into the filter hole until it clicks.
7. Pull out the filter.
8. Install the new filter see item 1 Figure 6.12. Install the rubber gasket see item 2 Figure 6.12. Screw on the filter cover see Item 3 Figure 6.12.

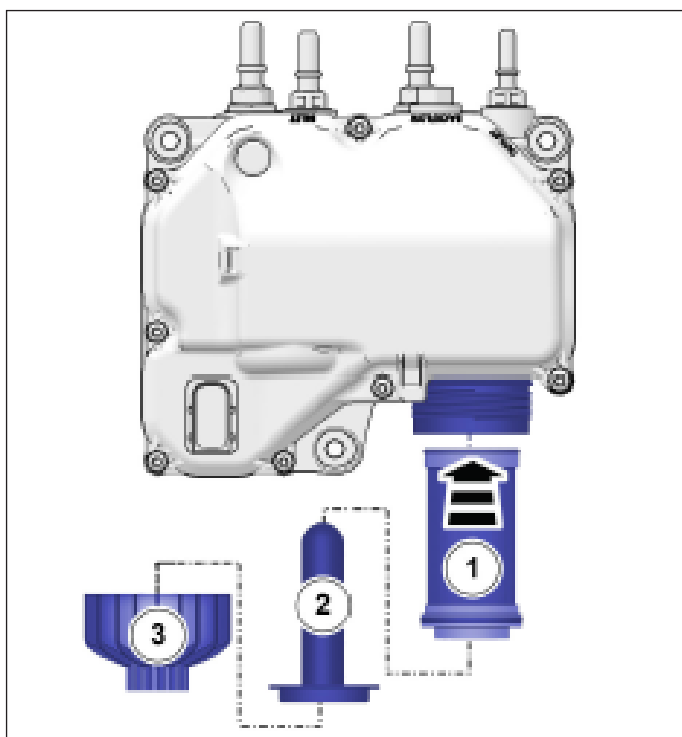


Figure 6.12 - Replacing DEF Pump Filter

6 Maintenance

9. Tighten the cover, Tightening torque: 20 (+5) Nm (14.8 +3.68 lbf. ft).
10. Reconnect the battery negative terminal, see item 1 Figure 6.8.
11. . Start the engine. Check for leaks; check function.
12. Delete any fault codes.

(2) DEF Screen Filter

1. Make sure that the area around the cap on the DEF tank is clean.
2. Remove DEF tank cap.
3. Remove the DEF screen filter from the filler neck, item 1 Figure 6.13.
4. If the filter is undamaged it can be cleaned in clean water and dried using compressed air then refitted.
5. If the filter is damaged it must be replaced with a new filter.

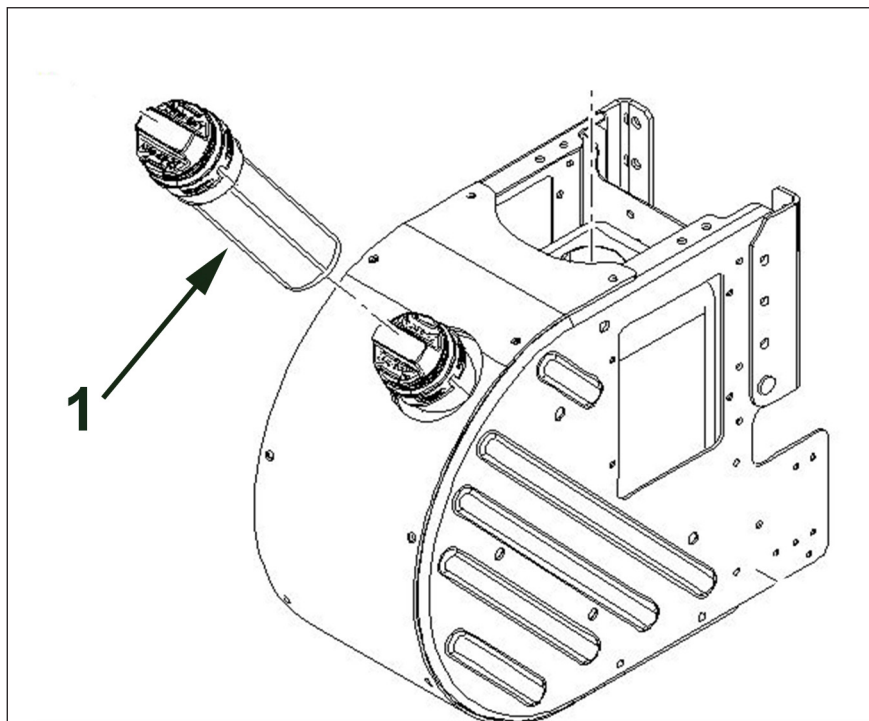


Figure 6.13 - Filter Screen

(3) DEF Manifold Filter

1. Remove the DEF heater manifold assembly, item 2 Figure 6.14 from the DEF tank.
2. Remove and replace the DEF heater manifold filter, item 1 Figure 6.14
3. Replace the DEF heater manifold assembly.

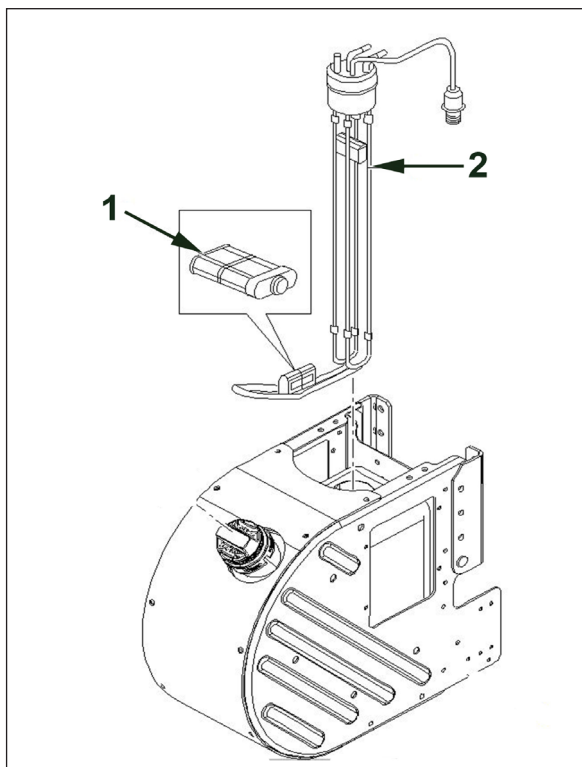


Figure 6.14 - DEF Manifold Filter

6.16 Servicing the Hydraulic System

DANGER

Never carry out any maintenance work without ensuring the hydraulic system is locked out and depressurised. In the event of any problems these should only be dealt with by suitably experienced and qualified engineers.

WARNING

Wear personal protective equipment.

Switch off machine and implement the lockout and tag out procedure.

(1) Changing Hydraulic Filters

1. Observe all Safety Warnings.
2. Shut down the machine, Ref: Machine Shut Down Procedure in chapter 4.
3. Implement the lockout and tag out procedure.
4. Take off filter cap by removing 4 bolts (item 1) Figure 6.15, making sure all times that dirt is prevented from entering the tank.
5. Remove Hydraulic filter element from inside the filter housing (item 2).
6. Replace filter element with new one.
7. The complete filter housing does not have to be removed as shown only the cap and lid.

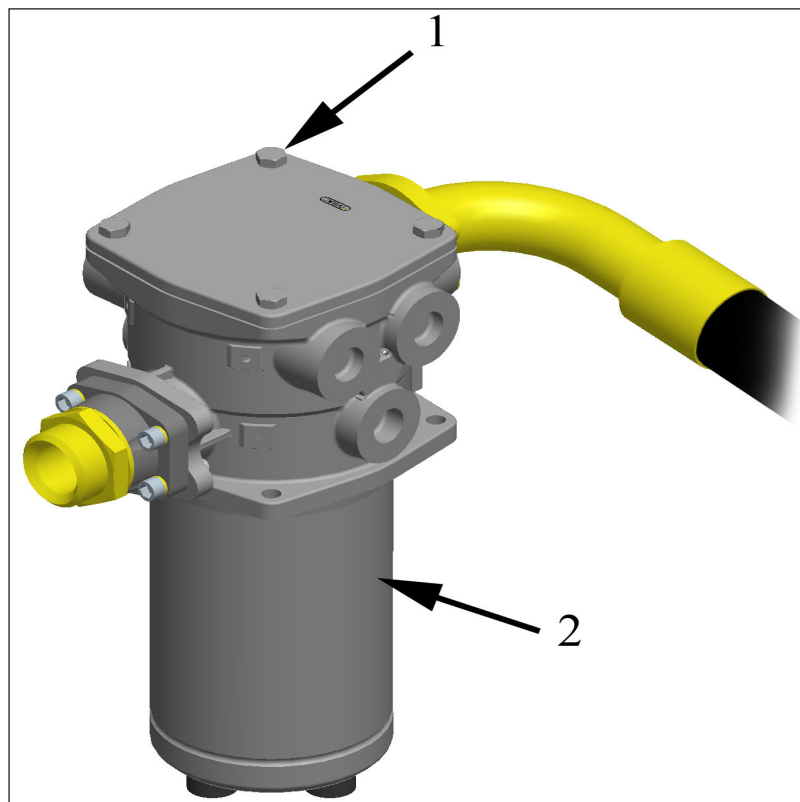


Figure 6.15 - Hydraulic Filter Housing

(2) Changing Hydraulic Oil

1. Drain hydraulic oil through bung on bottom of hydraulic tank.
2. Remove existing return line filters and dispose of.
3. Fill until oil reaches full level on tank gauge through the filler port (item 5) Figure 6.16, making sure all times that dirt is prevented from entering the tank.

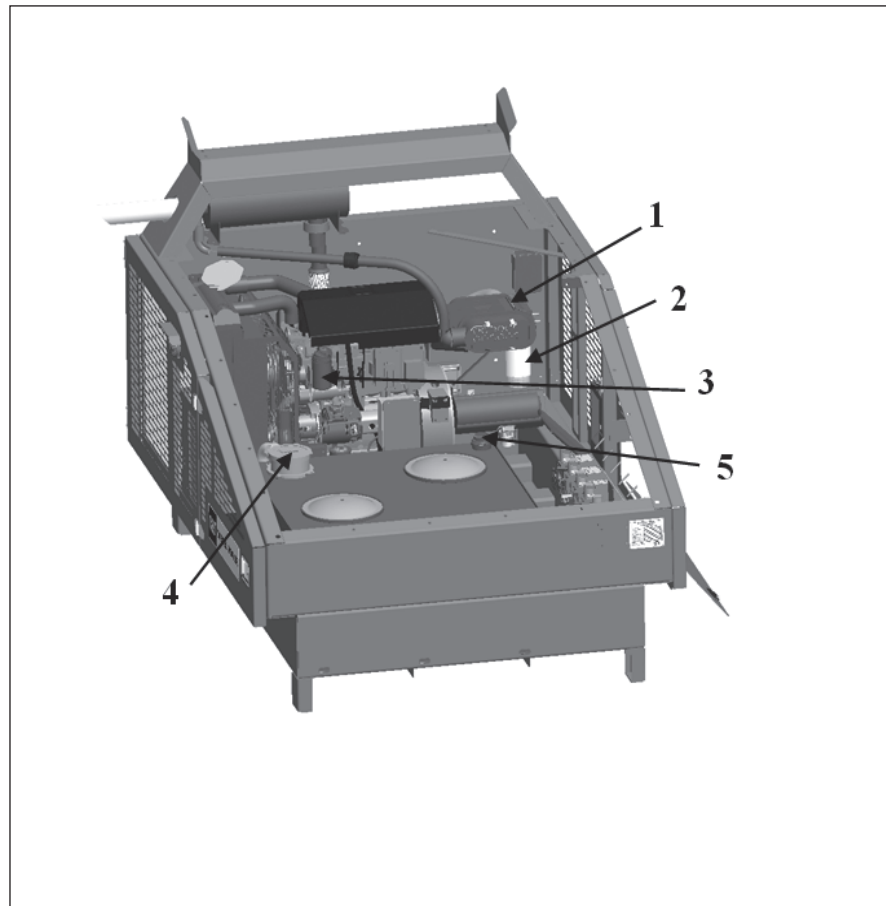


Figure 6.16 - Power Unit

- 1 Air Filter.
- 2 Primary Fuel Filter/Water Separator.
- 3 Fuel Filter.
- 4 Hydraulic Return Filter.
- 5 Oil Filler Cap.

6.17 Changing Air Filter Elements

1. Observe all safety warnings.
2. Ensure machine is switched off, locked out and tagged out.
3. Release the 4 tension clips holding the air filter housing cover in place.
4. Remove cover. (Item 4), Ref: Figure 6.17.
5. Carefully remove outer filter element (Item 5) and inner filter (Item 3).
6. Discard the elements and replace with new items
7. Refit filter housing cover.
8. Reset the air filter button (item 2).

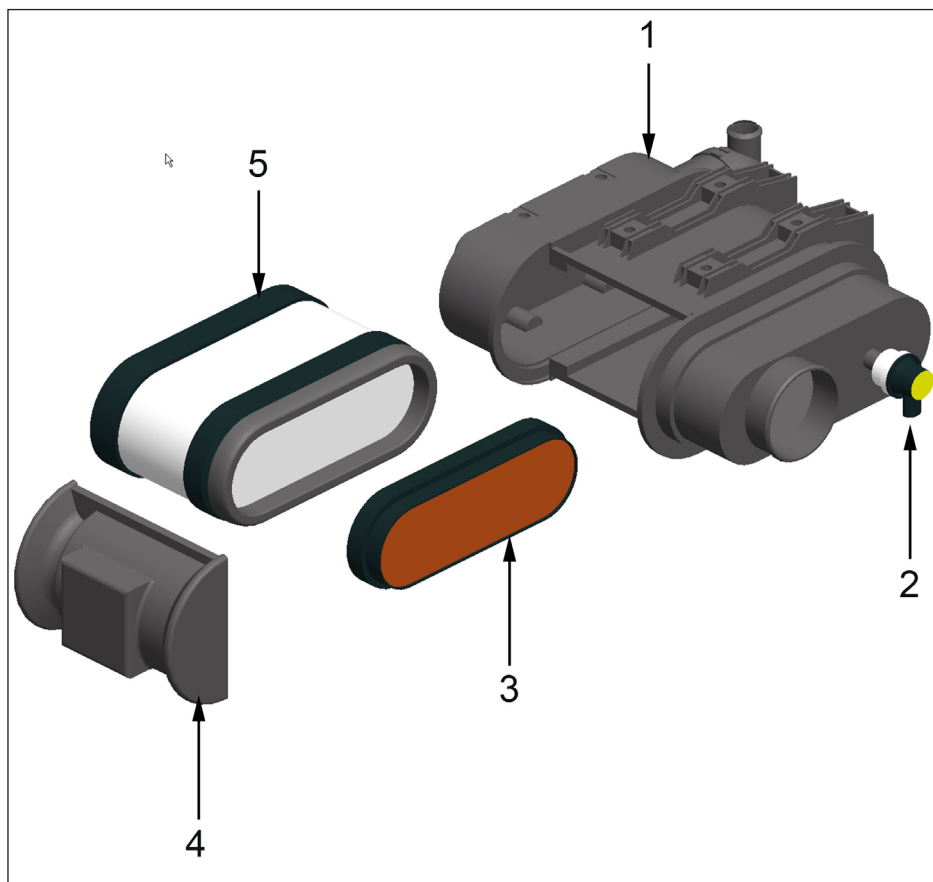


Figure 6.17 - Engine Air Filter

- 1 Air Filter Housing.
- 2 Air Filter Reset Button.
- 3 Inner Element.
- 4 Air Filter Housing Cover.
- 5 Outer Element.

6.18 Replacing Screen Media



DANGER

Make sure to use suitable lifting equipment.

This task should not be attempted unless there are a minimum of two persons.



WARNING

Wear personal protective equipment.

When working above ground level make sure to use a suitable working platform.

(1) Replacing Top (and Middle) Deck Screens

Each mesh is held in place by a clamp on either side. This is in turn held in place by a wedge tensioning system. To release the clamp.

1. Observe all safety warnings.
2. Ensure machine is switched off, locked out and tagged out.
3. Remove retaining split pin (item 1) Figure 6.18.
4. Tap wedge (item 2) lightly with a suitable hammer.
5. Remove wedge, pin (item 3), Washer (item 4) and spacer (item 5).
6. Repeat the above until the mesh is released.
7. Remove the mesh and replace it with the new mesh.
8. Replace the clamps and wedge system.
9. Once the wedge system is re-assembled tension the mesh by driving the wedge (2) through the pin using a hammer. Drive each wedge in the same amount to, achieve even pressure on the clamp plate.
10. The meshes must not vibrate separate from the screen box when this is achieved the meshes are tensioned correctly.

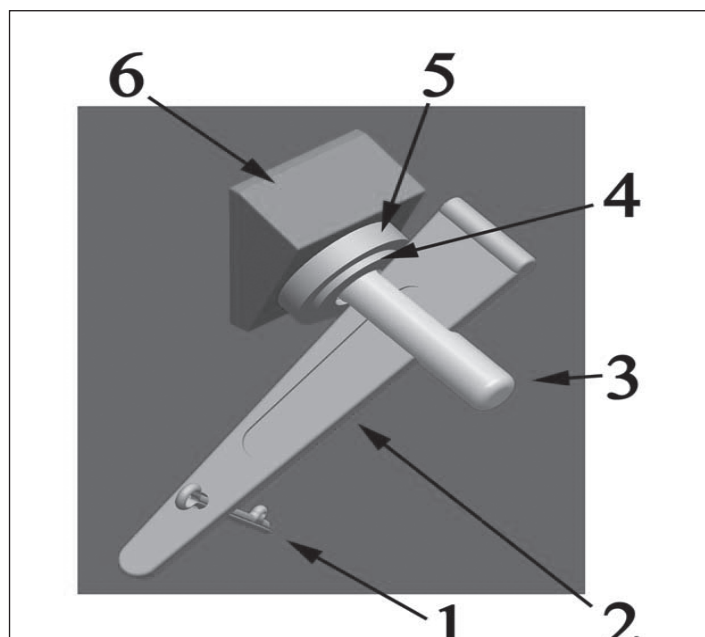


Figure 6.18 - Screen Tension Wedges

(2) Replacing Bottom Deck Screens

Bottom deck meshes are held in place by tension bars (3). Tension in the mesh is achieved through tension block (2) and tension bolts (3). Lock out machine.

1. Observe all safety warnings. .
2. Ensure machine is switched off, locked out and tagged out.
3. Loosen off tension bolts completely (item 1) Figure 6.19.
4. Push tension bar toward the discharge side of the screen box.
5. Unhook screening media from around the tension bar.
6. Remove screening media.
7. Fit screening media ensuring each end hook, is seated correctly Ref: Figure 6.20.
8. During tensioning these hooks must be constantly checked to ensure they are seated correctly.
9. Start tensioning the tension bolts top and bottom and side to side alternatively to keep the tension bar relatively level in the slot.
10. Do not over tension the screening media, Ref: Figure 6.21.

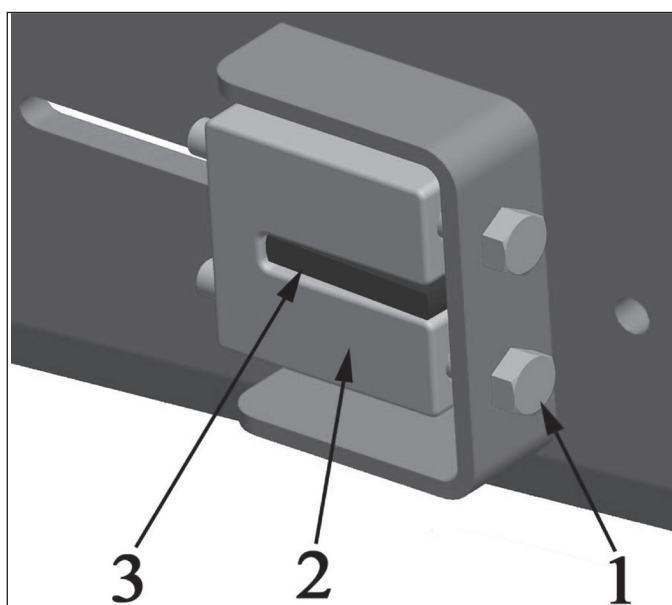


Figure 6.19 - Bottom Deck Tensioner

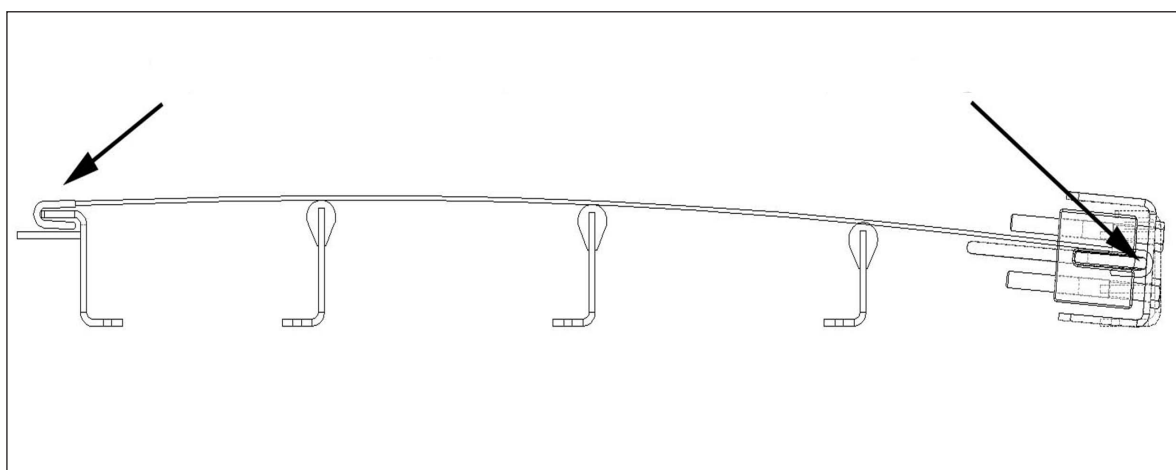


Figure 6.20 - Screen Mesh Hooks

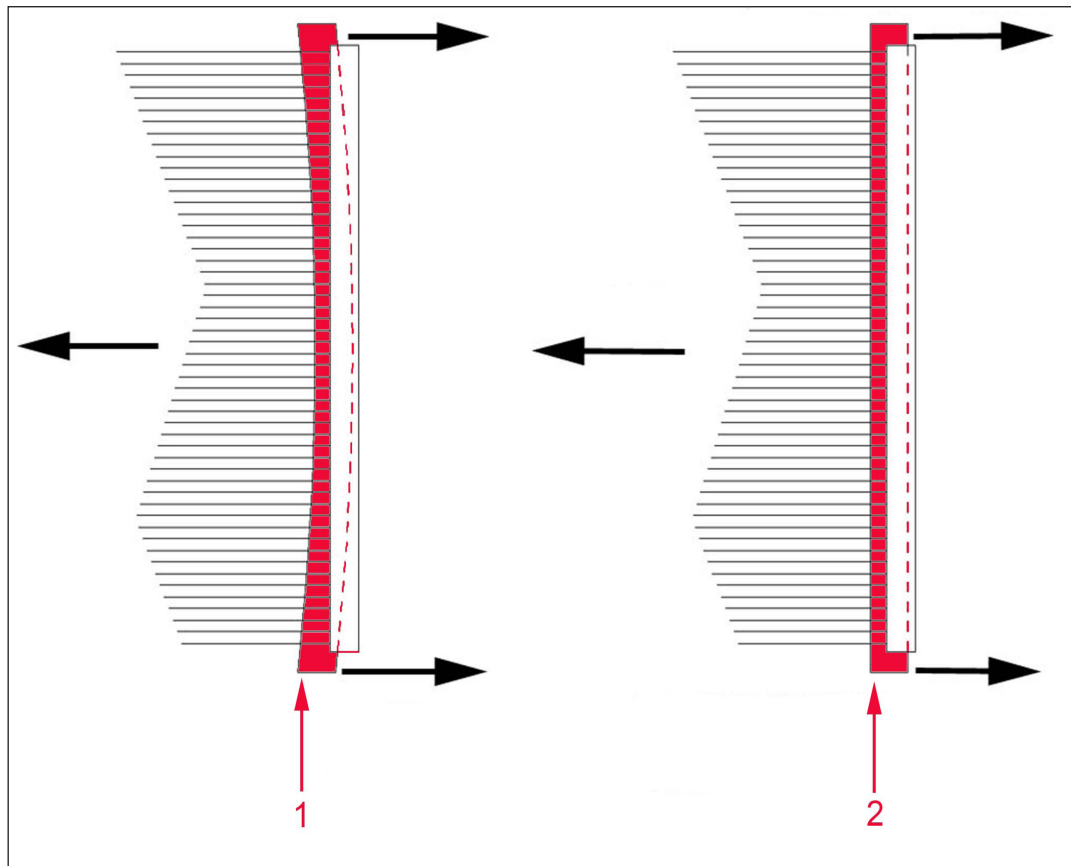


Figure 6.21 - Screen Mesh Tension

11. A mesh or speed harp will have the correct tension when the pre-bend in the tension bar is straightened (position 2) Figure 6.21. If the mesh or speed harp is tensioned beyond this point the screening media will be stretched and rendered unusable.
12. When fitting speed harp wire spacers they will fit snugly on top of the screen cushion rubbers as shown in Figure 6.22.

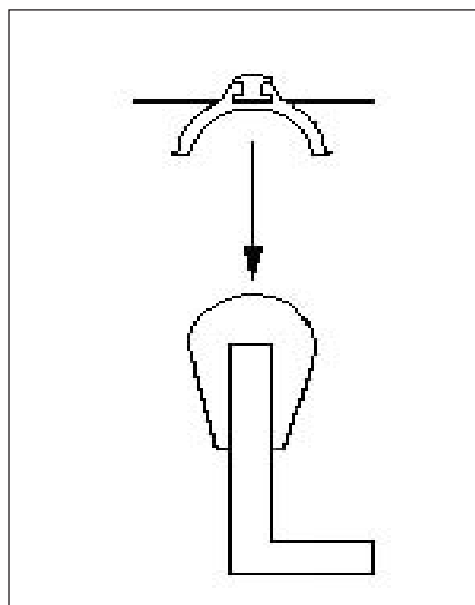


Figure 6.22 - Cushion Rubbers

6.19 Checking the Screen Box Running Condition

Checking the screen is in tune.

To prevent damage to the screen box, bearings or meshes the box must be running at the correct speed and amplitude. The box must also be running in a circular motion.

The screening action of the screen box is achieved by rotating the screen shaft which has an in-built out of balance weight. The size of the circular motion achieved by the out of balance weight is controlled by adding or subtracting out of balance weights.

These weights are called flywheel weights. These weights are attached to the end of the screen shaft. If the out of balance flywheel weight is not in line with the out of balance screen shaft weight the box will run out of tune.

An unbalanced or out of tune box will create enormous stress in the screen box and will cause premature failure.

Screen Speed = 950 to 970 rpm

Screen Throw = 9mm to 10mm

(1) Checking if Screen Box is in Tune



DANGER

This task should not be attempted unless there are a minimum of two persons, second person should be able to shut down machine in the event of an emergency.

This process is conducted while the machine is running, extreme caution should be used at all times.



WARNING

Wear personal protective equipment.

1. Attach to each corner of the screen box with a stroke card.
2. Run the screen box.
3. If the box is correctly balanced the dot on each corner will trace a slight ellipse see Figure 6.23.
4. If the box is out of tune, 2 or more of the corners will trace a pronounced ellipse see Figure 6.23.
5. If any of the ellipses even a slight elliptical shape are pointing in different directions the screen is running out of balance.

Causes for the fault condition shown in Figure 6.23.

- 1. Over speed.
- 2. Too much weight on the flywheel.
- 3. Flywheels misaligned.

If your screen box is showing any of the above faults contact your local dealer immediately.

The speed of the screen box can only be changed by an authorised dealer. Tampering with the screen box speed, by someone other than an authorised dealer will invalidate warranty.

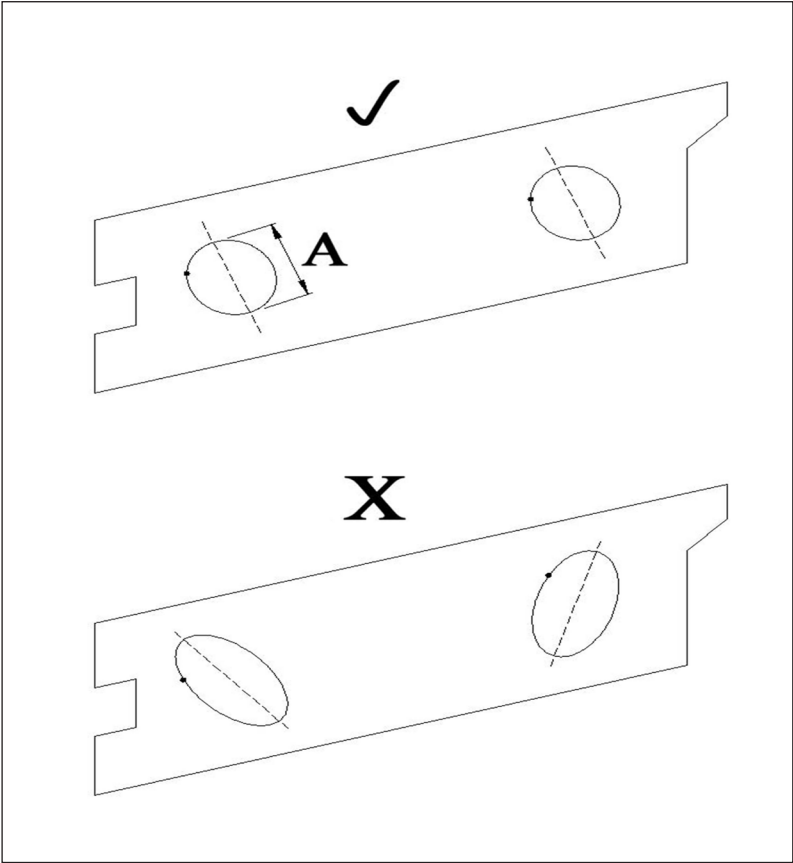


Figure 6.23 - Screen Tuning

Table of Content

7	Troubleshooting.....	7-2
7.1	General Troubleshooting	7-2
7.2	Hydraulic Troubleshooting	7-5
7.3	Tracks Troubleshooting	7-6
7.4	Machine Error Codes	7-8
7.5	Cat Engine Fault Codes	7-11

7 Troubleshooting

If any problem arises that is not listed, or if a problem persists after carrying out the recommended checks, contact the your Local Dealer or the after sales service department for further assistance.

Refer to Chapter 2 Safety and Chapter 6 Maintenance for relevant information and safety warnings before attempting to carry out any maintenance on the machine.



WARNING

Before undertaking any maintenance, repairs work on the machine, switch off the machine and implement the lockout and tagout procedure.

NOTICE

Ensure that only qualified and trained personnel operate and maintain this equipment.

Always keep control panels closed to avoid water ingress and dust contamination.

Regularly check the control system and connections for any damage.

7.1 General Troubleshooting

Fault	Cause	Corrective Measure
Drive drum turns but belt does not move	Too much load on belt	Reduce load on belt
	Incorrectly tensioned belt	Tension belt
	Worn belt	Replace belt
Belt completely stopped	Material jam	Remove material jam
	Taperlock is not tight or broken	Tighten or replace taperlock
Belts are tracking off	Machine is not level	Make sure machine is on level ground
	Belts are not aligned	Align belts
	Belts are not being fed evenly, material is tending to be fed to one side of conveyor	Ensure conveyor is fed more evenly
Material collects under belt	Skirting rubbers not adjusted	Adjust skirting rubbers
Rumbling noise from bearing	Bearing lacking lubricant	Follow greasing procedure
	Incorrectly aligned bearing	Align bearing
	Bearing is damaged	Replace bearing
Screeching noise when conveyor is running	Conveyor belt wedged or rubbing against fixed parts	Clear obstruction, adjust and align conveyor belt
	Belt scraper too tightly placed against belt	Re-adjust belt scraper

Machine components running slowly	Obstruction (e.g stone, material build up etc)	Clear obstruction
	Check general condition of machine (e.g oil leaks, excessive heat, hose blockages etc)	Correct problem if possible
	Low engine speed	Correct engine speed
	Low hydraulic oil level.	Top up hydraulic oil level
	Return line filter blockage	Replace return line filter
	Pre-pump filter blockage	Replace suction strainer
	Machine is overloaded	Check mesh size calculations, alter screen angle
	Incorrect control valve relief valve pressure settings	Check and correct relief pressure setting
	Incorrect Pressure relief block pressure settings	Check and correct relief pressure setting
	Pump cavitation, suction line is collapsed	Low oil level
	Flow at pump is not as expected	Check flow after pump, after control valve and after motor. These values should be the same
Machine will not jack to working position	Machine is not level	Place machine on level ground
	Securing pins not removed	Remove securing pins
	Blockage along hose	Remove blockage, replace hose if necessary
	Incorrect control valve relief pressure	Correct control valve relief pressure
Excessively noisy pump	Blockage at pre-pump filter	Replace suction strainer
	Misalignment between drive source and pump	Correctly align drive source to pump
	Incorrect hydraulic oil	Drain hydraulic and replace with correct hydraulic oil
	Obstruction at inlet pipe	Remove obstruction
Screen Starts Slow	Drive belt slipping	Tighten belt; replace worn belt or sheave
Spillage	Stroke angle too steep	Set it to run at a more shallow angle
	Screen speed too fast	Set it to run slower
	Stroke is too long	Reduce stroke length, if possible
	Worn screen rubbers or curtain	Replace screen rubbers or curtain

7 Troubleshooting

Decks overflowing	Screen is overloaded	Check plug weight Placement - Increase RPM, but stay within stroke speed
Material moves across screen too fast	Rpm too high	Decrease rpm but stay within stroke-speed range
	Stroke angle too flat	Increase stroke angle
Material moves across screen too slowly	Rpm too low	Increase rpm but stay within stroke speed range
	Stroke angle too steep	Decrease stroke angle
Decks blinded with clay	Wire cloth wire too heavy	Use smaller-gauge wire
Excessive vibration	Loose or misaligned weights	Check counterweight bolts; check number and position of plug weights
	Broken shaft	Replace shaft
	Impulse shafts improperly timed	Check improperly timing
Water in wheel-case oil	Condensation in case	Check for oil-breather clearance or plugging, water entering breather
	Leaking wheel-case bolt	Re-torque bolt

7.2 Hydraulic Troubleshooting

Fault	Cause	Corrective Measure
No response from any hydraulic system	Low oil level	Top up hydraulic oil level
	Return line element is clogged (Check blockage indicator)	Replace return line element
	Damaged suction line	Replace suction line pipe
	Pressure relief valve stuck in open position	Replace valve
Machine operating slowly. No external oil leaks	Low oil level	Top up hydraulic oil level
	Incorrect hydraulic oil	Drain tank and replace hydraulic oil
	Worn or damaged pump	Replace pump
	Worn or damaged drive motor	Replace motor
	Loose or damaged taperlocks	Replace taperlock
	Feeder kickout engaging at low pressure	Reset feeder kickout pressure
	Engine performance	Consult engine manual
Excessive noise from hydraulic pump	Damaged pump	Replace pump
	Low oil level causing cavitation	Top up oil level
	Misaligned drive source (engine or motor) to pump	Align pump correctly
	Damage to suction pipe	Replace pipe
	Incorrect hydraulic oil (fluid viscosity too high)	Drain tank and replace hydraulic oil

7.3 Tracks Troubleshooting

Fault	Cause	Corrective Measure
One Track not operating or operating slower than the other.	Different size of motors fitted to tracks.	Check that the same size of motors have been fitted to both tracks
	Brake jammed.	Check if the brake is releasing. Fit a pressure clock to the brake hose. A pressure of at least 285 PSI / 20 bar is required to release the brakes.
	Incorrect pressure going to the brake hose caused by a problem with the motion control block possibly contamination. If a load control valve should jam due to oil-entrained debris then the likelihood is that it will not open and will not allow the motor to turn in one direction. This will cause the machine to 'crab' in one direction. Swapping the valves over from one Track to the other will usually transfer the problem to the opposite direction.	Try removing the valves and cleaning them thoroughly taking care not to damage the external cavity seals. Also check the ports in the block for dirt etc. If this does not work replace the valves with new ones. Always cross reference the part numbers on the new valves with the old valve, before fitting. It is critical that the correct Valves are fitted. Valves should never be dismantled as no internal seals or parts are available.
	Brake pressure regulator valve jammed due to debris will stop the motor turning on one side.	Swap the pressure regulator from the opposite block to see if the problem is in the brake valve. If the valves continue to jam then the oil in the hydraulic system is not being filtered to the required level of cleanliness.
	Motor fault.	Swap over the motors on the two tracks. If the fault is in the motor, replace with a new motor.
	Faulty brake.	Remove the motor and look into the gearbox for heat discoloration and/or fragments of brake disc. If the fault is in the brakes the complete gearbox will have to be replaced.

Excessive oil leaking around drive assembly.	Seal damaged between Motion control block and motor.	Remove motion control block and replace seals.
	Seal damaged between motor and gearbox.	Remove motor and replace seal.
	Seal damage may be caused by excessive oil temperatures.	Check oil operating temperature and environmental conditions.
Track will not stay tensioned	Grease escaping.	Check that the track adjuster Grease valve is tight, has a properly fitted seal and that there is no grease leaking past it.
		Check around the tensioning Cylinder for escaping grease. This will indicate that the seals are damaged in the tensioning cylinder. Replace with a new cylinder immediately.
Track group running off Sprocket and/or Idler.	Track group too loose.	Check track tension.
	Excessive misalignment.	Check alignment of Sprocket, Idler and track rollers.
	Excessive component wear.	Check wear limits,
	Twisted track frame.	Check track frame.
Track roller leaking oil	Damaged or worn seals.	Replace with a new Track Roller.

7.4 Machine Error Codes

Table 7.1 - Panel Error Codes

Error Code	Error Text	Meaning	Notes
800100	MASTER MODULE CAN FAULT	The screener display is not receiving messages from the Screener Master Module	Check fuses inside panel
800101	ESTOP	ESTOP has been pressed	
800102	DOGLEAD STOP BUTTON	Stop button on doglead has been pressed or doglead has been unplugged	
800103	RADIO TRACK STOP BUTTON	Stop button request on radio track handset has been pressed	
800104	RADIO SMALL HANDSET STOP	Stop button request on radio small handset has been pressed	
800105	HYD TEMPERATURE WARNING	Hydraulic temperature has reached high enough temperature to generate warning (optional sensor)	
800106	HYD TEMPERATURE SHUTDOWN	Hydraulic temperature has reached high enough temperature to stop machine (optional sensor)	
800107	HYD OIL LEVEL LOW	Hydraulic oil level sensor has not seen any oil for >30seconds, machine shutdown	Check oil, check sensor and plug to sensor
800108	ULTRASONIC LEVEL	Optional ultrasonic sensor has been unplugged / come disconnected	
800109	CONV PRESSURE SENSOR	Optional pressure sensor has been unplugged / come disconnected	20s
800110	PUMP PRESSURE SENSOR	Optional pressure sensor has been unplugged / come disconnected	
800116	IO MODULE NOT CONNECTED	The screener panel is not receiving messages from the io module (located by valves)	Check fuse F, check wiring to io module
800151	OIL COOLER FAULT	The hydraulic oil cooler is drawing excessive current, causing panel to shut it down	Check oil cooler fan, blow out dust from around cooler.
800154	ALTERNATOR NOT CHARGING	Alternator is not outputting high enough voltage to ensure batteries are being recharged	Warning only, Check Alternator fuse, drive belt
800199	DOWNSTREAM PAUSE	Screener is seeing an inhibit signal from a linked machine, preventing feeder running it's feeder	

800200	PULL CORD STOP	Pull cord stop has been activated.	
800201	COOLANT LEVEL LOW	Coolant level sensor has not seen any liquid for >20seconds, machine shutdown	Check coolant level, check sensor and plug
800202	BLOCKED AIR FILTER	Air filter needs changing / cleaning	Warning only
800203	REMOTE LINK STOP	The screener has received an engine stop request from a remote linked machine	
800204	DUAL POWER PANEL COMMS	The screener display is not receiving messages from the AC 3 phase panel controller	
800205	LOSS OF AC VOLTAGE	Check incoming AC / Fuses	
800206	MOTOR STARTER 1 ERROR	3 Phase Panel controller is not seeing a valid link to Motor 1 starter	
800207	MOTOR 1 TRIPPED	Motor 1 Starter has drawn too much AC current for too long, motor shut down	
800208	MOTOR STARTER 2 ERROR	3 Phase Panel controller is not seeing a valid link to Motor 2 starter	
800209	MOTOR 2 TRIPPED	Motor 2 Starter has drawn too much AC current for too long, motor shut down	
800210	ON AC ENGINE DISABLED	AC power detected, engine cranking is disabled	Unplug AC to allow engine to start
800211	ON AC TRACKING DISABLED	AC power detected, machine tracking is disabled	Unplug AC to allow machine to track
800212	ENGINE TEMPERATURE SHUTDOWN	Mechanical engines only, engine coolant temperature switch has closed, engine over heated	
800213	NO J1939 ENGINE DATA	Electronic engines only, Tedd Panel not communicating with engine ECU.	Check that relay K1 inside Tedd panel is energised.
800214	BLOCKED AIR FILTER	Air filter needs changing / cleaning, problem has persisted for 30 minutes, engine has been shutdown	
800215	WATER IN FUEL	Water in fuel trap needs draining, problem has persisted for 30 minutes, engine has been shutdown	

7 Troubleshooting

800216	WIRELESS INTERLOCK REMOTE SHUTDOWN	Wireless interlock engine option is enabled but not seeing any remote machines, engine has been shutdown	Turn off setting LINK OPTIONS->LINK ENGINE set to N to disable
800217	ESTOP DUE LOW VOLTAGE	Normally triggered by low battery voltage, estop circuit has dropped below threshold voltage when cranking	Charge battery
800218	BLOCKED AIR FILTER J1939	Electronic engine has told Tedd panel that there is a problem with air filter.	
800219	BLOCKED AIR FITLER AUX IO	Electronic engine has told Tedd panel that there is a problem with air filter.	
800221	LOW FUEL LEVEL FUEL	The level of fuel is low. Warning only	
800223	LOW FUEL LEVEL SHUTDOWN	The level of fuel is low and engine shutdown has been initiated	

7.5 Cat Engine Fault Codes

J1939 Code	Description	Refer to Procedure
27-3	Engine Exhaust Gas Recirculation Valve Position Sensor : Voltage Above Normal	Valve Position Sensor - Test
27-4	Engine Exhaust Gas Recirculation Valve Position Sensor : Voltage Below Normal	Valve Position Sensor - Test
29-2	Accelerator Pedal Position 2 : Erratic, Intermittent, or Incorrect (Engines equipped with a throttle switch)	Throttle Switch Circuit - Test
29-2	Accelerator Pedal Position 2 : Erratic, Intermittent or Incorrect (Engines equipped with an analog throttle)	Analog Throttle Position Sensor Circuit - Test
29-3	Accelerator Pedal Position 2 : Voltage Above Normal (Engines equipped with an analog throttle)	Analog Throttle Position Sensor Circuit - Test
29-3	Accelerator Pedal Position 2 : Voltage Above Normal (Engines equipped with a digital throttle)	Digital Throttle Position Sensor Circuit - Test
29-4	Accelerator Pedal Position 2 : Voltage Below Normal (Engines equipped with an analog throttle)	Analog Throttle Position Sensor Circuit - Test
29-4	Accelerator Pedal Position 2 : Voltage Below Normal (Engines equipped with a digital throttle)	Digital Throttle Position Sensor Circuit - Test
29-8	Accelerator Pedal Position 2 : Abnormal Frequency, Pulse Width or Period	Digital Throttle Position Sensor Circuit - Test
51-3	Engine Throttle Position : Voltage Above Normal	Valve Position Sensor - Test
51-4	Engine Throttle Position : Voltage Below Normal	Valve Position Sensor - Test
91-2	Accelerator Pedal Position 1 : Erratic, Intermittent, or Incorrect (Engines equipped with a throttle switch)	Throttle Switch Circuit - Test
91-2	Accelerator Pedal Position 1 : Erratic, Intermittent or Incorrect (Engines equipped with an analog throttle)	Analog Throttle Position Sensor Circuit - Test
91-3	Accelerator Pedal Position 1 : Voltage Above Normal (Engines equipped with an analog throttle)	Analog Throttle Position Sensor Circuit - Test
91-3	Accelerator Pedal Position 1 : Voltage Above Normal (Engines equipped with a digital throttle)	Digital Throttle Position Sensor Circuit - Test

7 Troubleshooting

91-4	Accelerator Pedal Position 1 : Voltage Below Normal (Engines equipped with an analog throttle)	Analog Throttle Position Sensor Circuit - Test
97-4	Accelerator Pedal Position 1 : Voltage Below Normal (Engines equipped with a digital throttle)	Digital Throttle Position Sensor Circuit - Test
97-8	Accelerator Pedal Position 1 : Abnormal Frequency, Pulse Width or Period	Digital Throttle Position Sensor Circuit - Test
97-3	Water In Fuel Indicator : Voltage Above Normal	Water in Fuel Sensor - Test
97-15	Water In Fuel Indicator : High - least severe (1)	Fuel Contains Water
97-16	Water In Fuel Indicator : High - moderate severity (2)	Fuel Contains Water
100-1	Engine Oil Pressure : Low - most severe (3)	Oil Pressure Is Low
100-3	Engine Oil Pressure : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
100-4	Engine Oil Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
100-17	Engine Oil Pressure : Low - least severe (1)	Oil Pressure Is Low
100-21	Engine Oil Pressure : Data Drifted Low	5 Volt Sensor Supply Circuit - Test
102-16	Engine Intake Manifold #1 Pressure : High - moderate severity (2)	Intake Manifold Air Pressure Is High
102-18	Engine Intake Manifold #1 Pressure : Low - moderate severity (2)	Intake Manifold Air Pressure Is Low
105-3	Engine Intake Manifold #1 Temperature : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
105-4	Engine Intake Manifold #1 Temperature : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
105-15	Engine Intake Manifold #1 Temperature : High - least severe (1)	Intake Manifold Air Temperature Is High
105-16	Engine Intake Manifold #1 Temperature : High - moderate severity (2)	Intake Manifold Air Temperature Is High
107-15	Engine Air Filter 1 Differential Pressure : High - least severe (1)	Inlet Air Is Restricted
108-3	Barometric Pressure : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
108-4	Barometric Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
108-13	Barometric Pressure : Calibration Required	Sensor Calibration Required - Test

108-21	Barometric Pressure : Data Drifted Low	5 Volt Sensor Supply Circuit - Test
110-0	Engine Coolant Temperature : High - most severe (3)	Coolant Temperature Is High
110-3	Engine Coolant Temperature : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
110-4	Engine Coolant Temperature : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
110-15	Engine Coolant Temperature : High - least severe (1)	Coolant Temperature Is High
110-16	Engine Coolant Temperature : High - moderate severity (2)	Coolant Temperature Is High
111-1	Engine Coolant Level : Low - most severe (3)	Coolant Level Is Low
157-3	Engine Injector Metering Rail #1 Pressure : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
157-4	Engine Injector Metering Rail #1 Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
157-16	Engine Injector Metering Rail #1 Pressure : High - moderate severity (2)	Fuel Rail Pressure Problem
157-18	Engine Injector Metering Rail #1 Pressure : Low - moderate severity (2)	Fuel Rail Pressure Problem
158-2	Keyswitch Battery Potential : Erratic, Intermittent or Incorrect	Ignition Keyswitch Circuit and Battery Supply Circuit - Test
168-2	Battery Potential / Power Input 1 : Erratic, Intermittent or Incorrect	Ignition Keyswitch Circuit and Battery Supply Circuit - Test
168-3	Battery Potential / Power Input 1 : Voltage Above Normal	Ignition Keyswitch Circuit and Battery Supply Circuit - Test
168-4	Battery Potential / Power Input 1 : Voltage Below Normal	Ignition Keyswitch Circuit and Battery Supply Circuit - Test
172-3	Engine Air Inlet Temperature : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
172-4	Engine Air Inlet Temperature : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
174-3	Engine Fuel Temperature 1 : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
174-4	Engine Fuel Temperature 1 : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
174-15	Engine Fuel Temperature 1 : High - least severe (1)	Fuel Temperature Is High
174-16	Engine Fuel Temperature 1 : High - moderate severity (2)	Fuel Temperature Is High
190-8	Engine Speed : Abnormal Frequency, Pulse Width or Period	Engine Speed/Timing Sensor Circuit - Test

7 Troubleshooting

190-15	Engine Speed : High - least severe (1)	Engine Overspeeds
411-3	Engine Exhaust Gas Recirculation Differential Pressure Sensor : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
411-4	Engine Exhaust Gas Recirculation Differential Pressure Sensor : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
411-13	Engine Exhaust Gas Recirculation Differential Pressure Sensor : Calibration Required	Sensor Calibration Required - Test
412-3	Engine Exhaust Gas Recirculation Temperature : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
412-4	Engine Exhaust Gas Recirculation Temperature : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)
412-15	Engine Exhaust Gas Recirculation Temperature : High - least severe (1)	NRS Exhaust Gas Temperature Is High
412-16	Engine Exhaust Gas Recirculation Temperature : High - moderate severity (2)	NRS Exhaust Gas Temperature Is High
558-2	Accelerator Pedal 1 Low Idle Switch : Erratic, Intermittent or Incorrect	Idle Validation Switch Circuit - Test
626-5	Engine Start Enable Device 1 : Current Below Normal	Ether Starting Aid - Test
626-6	Engine Start Enable Device 1 : Current Above Normal	Ether Starting Aid - Test
630-2	Calibration Memory : Erratic, Intermittent or Incorrect	Flash Programming
631-2	Calibration Module : Erratic, Intermittent or Incorrect	ECM Memory - Test
637-11	Engine Timing Sensor : Other Failure Mode	Engine Speed/Timing Sensor Circuit - Test
651-2	Engine Injector Cylinder #01 : Data Incorrect	Injector Data Incorrect- Test
651-5	Engine Injector Cylinder #01 : Current Below Normal	Injector Solenoid Circuit - Test
651-6	Engine Injector Cylinder #01 : Current Above Normal	Injector Solenoid Circuit - Test
652-2	Engine Injector Cylinder #02 : Data Incorrect	Injector Data Incorrect- Test
652-5	Engine Injector Cylinder #02 : Current Below Normal	Injector Solenoid Circuit - Test
562-6	Engine Injector Cylinder #02 : Current Above Normal	Injector Solenoid Circuit - Test
563-2	Engine Injector Cylinder #03 : Data Incorrect	Injector Data Incorrect- Test
653-5	Engine Injector Cylinder #03 : Current Below Normal	Injector Solenoid Circuit - Test

653-6	Engine Injector Cylinder #03 : Current Above Normal	Injector Solenoid Circuit - Test
654-2	Engine Injector Cylinder #04 : Data Incorrect	Injector Data Incorrect- Test
654-5	Engine Injector Cylinder #04 : Current Below Normal	Injector Solenoid Circuit - Test
654-6	Engine Injector Cylinder #04 : Current Above Normal	Injector Solenoid Circuit - Test
655-2	Engine Injector Cylinder #05 : Data Incorrect	Injector Data Incorrect- Test
655-5	Engine Injector Cylinder #05 : Current Below Normal	Injector Solenoid Circuit - Test
655-6	Engine Injector Cylinder #05 : Current Above Normal	Injector Solenoid Circuit - Test
656-2	Engine Injector Cylinder #06 : Data Incorrect	Injector Data Incorrect- Test
656-5	Engine Injector Cylinder #06 : Current Below Normal	Injector Solenoid Circuit - Test
656-6	Engine Injector Cylinder #06 : Current Above Normal	Injector Solenoid Circuit - Test
676-6	Engine Glow Plug Relay : Current Above Normal	Starting Aid (Glow Plug) Relay Circuit - Test
678-3	ECU 8 Volts DC Supply : Voltage Above Normal	Digital Throttle Position Sensor Circuit - Test
678-4	ECU 8 Volts DC Supply : Voltage Below Normal	Digital Throttle Position Sensor Circuit - Test
723-8	Engine Speed Sensor #2 : Abnormal Frequency, Pulse Width or Period	Engine Speed/Timing Sensor Circuit - Test
1075-5	Engine Electric Lift Pump for Engine Fuel Supply : Current Below Normal	Fuel Pump Relay Circuit - Test
1075-6	Engine Electric Lift Pump for Engine Fuel Supply : Current Above Normal	Fuel Pump Relay Circuit - Test
1076-5	Engine Fuel Injection Pump Fuel Control Valve : Current Below Normal	Solenoid Valve - Test
1076-6	Engine Fuel Injection Pump Fuel Control Valve : Current Above Normal	Solenoid Valve - Test
1188-5	Engine Turbocharger 1 Wastegate Drive : Current Below Normal	Solenoid Valve - Test
1188-6	Engine Turbocharger 1 Wastegate Drive : Current Above Normal	Solenoid Valve - Test
1196-9	Anti-theft Component Status States : Abnormal Update Rate	Data Link Circuit - Test
1239-0	Engine Fuel Leakage 1: High - most severe (3)	Fuel Rail Pressure Problem

7 Troubleshooting

2659-7	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate : Not Responding	NRS Mass Flow Rate Problem
2791-5	Engine Exhaust Gas Recirculation (EGR) Valve Control : Current Below Normal	Motorized Valve - Test
2791-6	Engine Exhaust Gas Recirculation (EGR) Valve Control : Current Above Normal	Motorized Valve - Test
2791-7	Engine Exhaust Gas Recirculation (EGR) Valve Control : Not Responding Properly	Motorized Valve - Test
2882-2	Engine Alternate Rating Select : Erratic, Intermittent, or Incorrect	Mode Selection Circuit - Test
2970-2	Accelerator Pedal 2 Low Idle Switch : Erratic, Intermittent, or Incorrect	Idle Validation Switch Circuit - Test
3241-3	Exhaust Gas Temperature 1 : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Active Sensors)
678-3	ECU 8 Volts DC Supply : Voltage Above Normal	Digital Throttle Position Sensor Circuit - Test
678-4	ECU 8 Volts DC Supply : Voltage Below Normal	Digital Throttle Position Sensor Circuit - Test
723-8	Engine Speed Sensor #2 : Abnormal Frequency, Pulse Width or Period	Engine Speed/Timing Sensor Circuit - Test
1075-5	Engine Electric Lift Pump for Engine Fuel Supply : Current Below Normal	Fuel Pump Relay Circuit - Test
1075-6	Engine Electric Lift Pump for Engine Fuel Supply : Current Above Normal	Fuel Pump Relay Circuit - Test
1076-5	Engine Fuel Injection Pump Fuel Control Valve : Current Below Normal	Solenoid Valve - Test
1076-6	Engine Fuel Injection Pump Fuel Control Valve : Current Above Normal	Solenoid Valve - Test
1188-5	Engine Turbocharger 1 Wastegate Drive : Current Below Normal	Solenoid Valve - Test
1188-6	Engine Turbocharger 1 Wastegate Drive : Current Above Normal	Solenoid Valve - Test
1196-9	Anti-theft Component Status States : Abnormal Update Rate	Data Link Circuit - Test
1239-0	Engine Fuel Leakage 1: High - most severe (3)	Fuel Rail Pressure Problem
2659-7	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate : Not Responding	NRS Mass Flow Rate Problem
2791-5	Engine Exhaust Gas Recirculation (EGR) Valve Control : Current Below Normal	Motorized Valve - Test

2791-6	Engine Exhaust Gas Recirculation (EGR) Valve Control : Current Above Normal	Motorized Valve - Test
2791-7	Engine Exhaust Gas Recirculation (EGR) Valve Control : Not Responding Properly	Motorized Valve - Test
2882-2	Engine Alternate Rating Select : Erratic, Intermittent, or Incorrect	Mode Selection Circuit - Test
2970-2	Accelerator Pedal 2 Low Idle Switch : Erratic, Intermittent, or Incorrect	Idle Validation Switch Circuit - Test
3241-3	Exhaust Gas Temperature 1 : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Active Sensors)
3241-4	Exhaust Gas Temperature 1 : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Active Sensors)
3242-3	Particulate Trap Intake Gas Temperature : Voltage Above Normal	Engine Temperature Sensor Open or Short Circuit - Test (Active Sensors)
3242-4	Particulate Trap Intake Gas Temperature : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Active Sensors)
3242-15	Particulate Trap Intake Gas Temperature : High - least severe (1)	Diesel Particulate Filter Temperature Is High
3242-16	Particulate Trap Intake Gas Temperature : High - moderate severity (2)	Diesel Particulate Filter Temperature Is High
3242-18	Particulate Trap Intake Gas Temperature : Low - moderate severity (2)	Diesel Particulate Filter Temperature Is Low
3251-3	Particulate Trap Differential Pressure : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
3251-4	Particulate Trap Differential Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
3251-13	Particulate Trap Differential Pressure : Calibration Required	Sensor Calibration Required - Test
3358-3	Engine Exhaust Gas Recirculation Inlet Pressure : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
3358-4	Engine Exhaust Gas Recirculation Inlet Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
3358-13	Engine Exhaust Gas Recirculation Inlet Pressure : Calibration Required	Sensor Calibration Required - Test
3358-21	Engine Exhaust Gas Recirculation Inlet Pressure : Data Drifted Low	5 Volt Sensor Supply Circuit - Test
3464-5	Engine Throttle Actuator 1 Control Command : Current Below Normal	Motorized Valve - Test
3464-6	Engine Throttle Actuator 1 Control Command : Current Above Normal	Motorized Valve - Test

7 Troubleshooting

3464-7	Engine Throttle Actuator 1 Control Command : Not Responding Properly	Motorized Valve - Test
3473-31	Aftertreatment #1 Failed to Ignite	Diesel Particulate Filter Collects Excessive Soot or ARD Failed to Ignite
3474-14	Aftertreatment #1 Loss of Combustion : Special Instruction	ARD Loss of Combustion
3474-31	Aftertreatment #1 Loss of Combustion	Diesel Particulate Filter Collects Excessive Soot or ARD Loss of Combustion
3479-5	Aftertreatment #1 Fuel Pressure Control : Current Below Normal	Solenoid Valve - Test
3479-6	Aftertreatment #1 Fuel Pressure Control : Current Above Normal	Solenoid Valve - Test
3480-3	Aftertreatment #1 Fuel Pressure #1 : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
3480-4	Aftertreatment #1 Fuel Pressure #1 : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
3480-15	Aftertreatment #1 Fuel Pressure #1 : High - least severe (1)	ARD Pilot Fuel Pressure Is High
3480-16	Aftertreatment #1 Fuel Pressure #1 : High - moderate severity (2)	ARD Pilot Fuel Pressure Is High
3480-17	Aftertreatment #1 Fuel Pressure #1 : Low - least severe (1)	ARD Pilot Fuel Pressure Is Low
3480-18	Aftertreatment #1 Fuel Pressure #1 : Low - moderate severity (2)	ARD Pilot Fuel Pressure Is Low
3483-11	Aftertreatment #1 Regeneration Status : Other Failure Mode	Diesel Particulate Filter Requires Initial Regeneration
3484-5	Aftertreatment #1 Ignition : Current Below Normal	ARD Ignition - Test
3484-6	Aftertreatment #1 Ignition : Current Above Normal	ARD Ignition - Test
3487-5	Aftertreatment #1 Air Pressure Control : Current Below Normal	Motorized Valve - Test
3487-6	Aftertreatment #1 Air Pressure Control : Current Above Normal	Motorized Valve - Test
3487-7	Aftertreatment #1 Air Pressure Control : Not Responding Properly	Motorized Valve - Test
3488-3	Aftertreatment #1 Air Pressure Actuator Position : Voltage Above Normal	Valve Position Sensor - Test
3488-4	Aftertreatment #1 Air Pressure Actuator Position : Voltage Below Normal	Valve Position Sensor - Test
3509-3	Sensor Supply Voltage 1 : Voltage Above Normal	5 Volt Sensor Supply Circuit - Test

3509-4	Sensor Supply Voltage 1 : Voltage Below Normal	5 Volt Sensor Supply Circuit - Test
3510-3	Sensor Supply Voltage 2 : Voltage Above Normal	5 Volt Sensor Supply Circuit - Test
3510-4	Sensor Supply Voltage 2 : Voltage Below Normal	5 Volt Sensor Supply Circuit - Test
3556-7	Aftertreatment Fuel Injector #1 : Not Responding Properly	ARD Nozzle - Test
3563-3	Engine Intake Manifold #1 Absolute Pressure : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
3563-4	Engine Intake Manifold #1 Absolute Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
3563-13	Engine Intake Manifold #1 Absolute Pressure : Calibration Required	Sensor Calibration Required - Test
3563-21	Engine Intake Manifold #1 Absolute Pressure : Data Drifted Low	5 Volt Sensor Supply Circuit - Test
3609-3	Diesel Particulate Filter Intake Pressure 1 : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
3609-4	Diesel Particulate Filter Intake Pressure 1 : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
3609-13	Diesel Particulate Filter Intake Pressure 1 : Calibration Required	Sensor Calibration Required - Test
3609-15	Diesel Particulate Filter Intake Pressure 1 : High Least Severe	Diesel Particulate Filter Has High Inlet Pressure
3609-17	Diesel Particulate Filter Intake Pressure 1 : Low Least Severe	Diesel Particulate Filter Has Low Inlet Pressure
3609-18	Diesel Particulate Filter Intake Pressure 1 : Low Moderate Severity	Diesel Particulate Filter Has Low Inlet Pressure
3609-21	Diesel Particulate Filter Intake Pressure 1 : Data Drifted Low	5 Volt Sensor Supply Circuit - Test
3703-31	Particulate Trap Active Regeneration Inhibited Due to Inhibit Switch	Diesel Particulate Filter Collects Excessive Soot or ARD Is Disabled
3711-31	Particulate Trap Active Regeneration Inhibited Due to Low Exhaust Gas Temperature	Diesel Particulate Filter Collects Excessive Soot or ARD Temperature Is Low
3714-31	Particulate Trap Active Regeneration Inhibited Due to Temporary System Lockout	Diesel Particulate Filter Collects Excessive Soot
3715-31	Particulate Trap Active Regeneration Inhibited Due to Permanent System Lockout	Diesel Particulate Filter Collects Excessive Soot
3719-0	Particulate Trap #1 Soot Load Percent : High - most severe (3)	Diesel Particulate Filter Collects Excessive Soot
3719-16	Particulate Trap #1 Soot Load Percent : High - moderate severity (2)	Diesel Particulate Filter Collects Excessive Soot

7 Troubleshooting

3720-15	Particulate Trap #1 Ash Load Percent : High - least severe (1)	Diesel Particulate Filter Has High Ash Load
3720-16	Particulate Trap #1 Ash Load Percent : High - moderate severity (2)	Diesel Particulate Filter Has High Ash Load
3750-31	Diesel Particulate Filter 1 Conditions Not Met for Active Regeneration	Diesel Particulate Filter Collects Excessive Soot or ARD Is Disabled
3837-3	Aftertreatment 1 Secondary Air Pressure : Voltage Above Normal	Engine Pressure Sensor Open or Short Circuit - Test
3837-4	Aftertreatment 1 Secondary Air Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short Circuit - Test
3837-13	Aftertreatment 1 Secondary Air Pressure : Calibration Required	Sensor Calibration Required - Test
3837-17	Aftertreatment 1 Secondary Air Pressure : Low - least severe	ARD Combustion Supply Air Pressure Is Low
3837-21	Aftertreatment 1 Secondary Air Pressure : Data Drifted Low	5 Volt Sensor Supply Circuit - Test
4265-5	Aftertreatment #1 Transformer Secondary Output : Current Below Normal	ARD Ignition - Test
4265-6	Aftertreatment #1 Transformer Secondary Output : Current Above Normal	ARD Ignition - Test
4301-5	Aftertreatment #1 Fuel Injector #1 Heater Control : Current Below Normal	ARD Nozzle Heater - Test
4301-6	Aftertreatment #1 Fuel Injector #1 Heater Control : Current Above Normal	ARD Nozzle Heater - Test
4783-2	DPF #1 Mean Soot Signal : Erratic, Intermittent, or Incorrect	Soot Sensor - Test
4783-3	DPF #1 Mean Soot Signal : Voltage Above Normal	Soot Sensor - Test
4783-4	DPF #1 Mean Soot Signal : Voltage Below Normal	Soot Sensor - Test
4783-9	DPF #1 Mean Soot Signal : Abnormal Update Rate	Soot Sensor - Test
4783-12	DPF #1 Mean Soot Signal : Failure	Soot Sensor - Test
4783-13	DPF #1 Mean Soot Signal : Out of Calibration	Soot Sensor - Test
4783-21	DPF #1 Mean Soot Signal : Data Drifted Low	Soot Sensor - Test
5423-5	Aftertreatment Regeneration Device Fuel Pump Relay : Current Below Normal	ARD Fuel Supply - Test

5423-6	Aftertreatment Regeneration Device Fuel Pump Relay : Current Above Normal	ARD Fuel Supply - Test
5571-0	High Pressure Common Rail Fuel Pressure Relief Valve : High - most severe (3)	Fuel Rail Pressure Problem
5576-2	Aftertreatment #1 Identification Number Module : Erratic, Intermittent, or Incorrect	Diesel Particulate Filter Identification Signal - Test
5576-8	Aftertreatment #1 Identification Number Module : Abnormal Frequency, Pulse Width, or Period	Diesel Particulate Filter Identification Signal - Test
5576-14	Aftertreatment #1 Identification Number Module : Special Instruction	Diesel Particulate Filter Identification Signal - Test

Intentionally Left Blank

Table of Content

Glossary	A-2
----------------	-----

Glossary

Anti Rock Stay

A strap which is used to stabilise the screen unit whilst in transport.

Antiloosen Fastener

A type of fastener used to secure some doors.

Assemblies

Individual sections of the platform made up of different components parts.

Auxiliary Control Valve

A bank of hydraulic valves which carry out various movement functions throughout the platform.

Belt Scraper

A device fixed or flexible mounted across the width of a belt of a conveyor for removing adherent material.

Bogie

Undercarriage on chassis to which axles are bolted.

Centre Roller

A roller, which supports the loaded belt.

Collection Conveyor

A conveyor used to transfer the fines material from underneath the drum onto the incline conveyor.

Control Panel

A panel that is situated in the power unit which is used to start the engine and view the various warning lights.

Controller

An electromechanical device or assembly of devices for starting, stopping, accelerating, or decelerating a drive, or serving, to govern in some predetermined manner the power delivered to the drive.

Conveyor

A horizontal, inclined, or vertical device for moving or transporting bulk material, packages, or objects, in a path determined by the design of the device, and having points of adding and discharge, fixed or selective.

Conveyor belt

A belt used to carry materials and transmit the power required to move the load being conveyed.

Conveyor, extendable

A conveyor that may be lengthened or shortened to suit operating needs.

Conveyor roller

A series of rollers over which objects are moved by the application of power to all or some of the rollers.

Conveyor, mobile

Conveyor supported on a mobile self propelled structure. These conveyors normally handle bulk material.

Conveyor, portable

A transportable conveyor which is not self propelled, usually having supports that provide mobility

Control Valve

A hydraulic valve, which carries out a movement function on the machine.

Depressurized

To release the pressure from a vessel i.e. a tire, hydraulic system.

Discharge Area

The area where material is dumped from the machine.

Dolly Axle

An axle that can be fitted to king pin, used for towing purpose.

Drive

An assembly of the necessary structural, mechanical, and electrical parts provide the motive power to change direction.

Drive Drum

The drum that drives the conveyor belt sometimes called the head drum.

Non Drive Drum

The drum that is non-driven in the conveyor belt sometimes called the tail drum.

Drum Lagging

Rubber glued around the drive drum to grip the conveyor belt.

Feed Conveyor

Conveyor used to move the material from the hopper to the main conveyor.

Feedboot

An extended metal surround located at the bottom of the main, tail & side conveyors.

Feeder Unit

Conveyor which feeds the material onto the incline conveyor at an even rate.

Filler Cap

A cap used to seal a tank and is removed in order to fill the tank.

Fines Material

Material that is screened through the lower screen deck and is discharged on to the tail conveyor.

Four Bank

A bank of hydraulic control valves used to control functions of the machine.

Glossary

Flywheel

A half moon shaped counter weight, which is mounted on the screen unit shaft for the purpose of counter acting the weight of the eccentric of the screen shaft.

Gate

A device or structure by means of which the flow of material may be stopped or regulated; also a section of a machine equipped with a hinge mechanism for movable service often called a hinge section.

Grid Aperture

The spacing between the grid bars (typically 100mm) which determines the material size that enters the feed hopper.

Grid Bar

Bars used on the grid spaced out with equal spacing. Used to roughly screen material.

Grating

A coarse screen made of parallel and crossed bars used to prevent passage of oversized material.

Guard

A covering, barricade, grating, fence, or other form of barrier used to prevent inadvertent physical contact with operating components such as gears, sprockets, chains, and belts.

Hopper

A box having a funnel shaped bottom, or a bottom reduced in size, narrowed, or necked to receive material and direct it to a conveyor, feeder, or chute.

Hydraulic Components

A part used in the hydraulic system of the machine i.e. valve, motor etc.

Jacking legs

Hydraulic adjustable legs which raise or lower the back of the machine for the purpose of coupling to the tractor unit.

King Pin

Coupling used for towing by the tractor unit.

Landing Leg

A support leg which lowers from the machine and is used to stabilise it whilst in the working position.

LHS

Left Hand Side, used with reference to the side conveyors.

Lockout

Procedure to be carried out to ensure the machine is safe for maintenance or repairs.

Machine Stop

A stop arising from a sudden and unexpected need, and not as a part of the normal operation.

Main Conveyor

Conveyor used to move the material from the hopper to the screen unit.

Nip Point

A point at which a machine element moving in line meets a rotating element in such a manner that it is possible to nip, pinch, squeeze, or entrap a person or objects coming into contact with one or two of the members.

Optimum Speed

The best or most favorable speed to run a conveyor for example.

Oversize material

Material that is larger than the mesh size and runs off the top screen deck.

Platform

A working space for persons, elevated above the surrounding floor or ground for the operation of machinery and equipment.

Power unit

An inclosed unit situated under the main conveyor which houses the component parts which together drive the machine.

Prevent

When used in a context such as prevent access or prevent physical contact, means to impede or block; when used in a context such as prevent injury, means to reduce the chances of, but does not imply that an injury cannot occur.

P.S.I

Pounds per square inch. Unit of Pressure. Conversion 1 Bar = 14.5 P.S.I

Rated speed

The speed, as established by the manufacture or a qualified person, at which safe and satisfactory service can be expected.

Recommissioning / Commissioning

To prepare the machine for use.

Reject Grid

An arrangement of equally spaced grid bars which is used to separate the large stones before the material enters the feed hopper.

Remote control

Any system of controls in which the actuator is situated in a remote location.

Retract

Withdraw or fold up conveyor.

Return Roller

A roller, which is used to support the belt on the underside of the conveyor.

RHS

Right Hand Side, used with reference to the side conveyors.

Safety device

A mechanism or an arrangement placed in use for the specific purposes of preventing an unsafe condition, preventing the continuation of an unsafe condition, warning of an unsafe condition, or limiting or eliminating the unsafe effects of a possible condition.

Scraper

A device fixed or flexibly mounted across the width of a belt of a conveyor for removing adherent material.

Screen Drum

Drum which mesh is fitted onto rotates during operation to screen material (Trommel).

Screen Unit

Vibratory unit used to separate by size raw materials.

Should

As used in the context of a provision of this manual, indicates a recommendation, the advisability of which depends on the facts in a particular situation.

Shredder Safety Stay

Metal strap which restrains the shredder unit whilst in the raised position.

Shredder Unit

Swinging flail type unit which is located at the discharge end of the feed conveyor and is used to break down material.

Side Conveyor

Conveyor used to collect the material from the screen unit and move it to the discharge area at 90 degrees to the main machine.

Side Roller

Roller used to create arc on the belt to reduce spillage.

Sound Baffles

Plates used to blank out noise from the power unit.

Spillage

Material that spills over the edge of a conveyor etc.

Spill guard

A stationary device of sufficient strength and capacity to catch, retain, and contain any reasonably foreseeable spillage from a conveyor passing overhead.

Spreader Plate

Swinging plate located at the discharge end of the main conveyor and is used to spread the material evenly on the screen unit.

Sprocket

A toothed wheel arranged to fit into the links of a chain.

Strut

Rigid support used to hold an assembly in place.

Swivel Conveyor

Conveyor used to discharge fines material. Swivel through 180° to increase stockpiling capacity.

Tail Conveyor

Conveyor used to collect the fines material from the screen unit and move it to the discharge area.

Take-up

The assembly of the necessary structural and mechanical parts that provides the means to adjust the length of belts, cables, chains, etc. to compensate for stretch, shrinkage, and wear.

Telescopic Head Section

A section of a conveyor which extends out telescopically into transport position.

Tow pin

A movable or fixed member, used to engage a push or pull.

Tracks

The beams, shapes, or formed section on which trolleys, rollers, shoes, or wheels roll or slide while propelled.

Transport Bracket

A bracket used to hold an assembly in place whilst in transport.

Transport Position

The position of the machine when conveyors are folded.

Variable Speed Flow Control

A device which is used to hydraulically vary the speed of the conveyor belt.

Viewing Apertures

Opening holes to view the conveyor belt.

Vulcanized Belt

A conveyor belt that has been joined using a special treatment.

Wheel Nut Torque

A measure of pressure applied to tighten a nut.

Metso:Outotec

Metso Outotec

PO Box 1220, FI-00101, Helsinki, Finland
Tel +358 20 484 100
www.mogroup.com

Copyright © Metso Outotec 2022. All rights reserved.

