H6203R

OPERATIONS MANUAL

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1 Introduction

1.1 Notes to the Operations Manual

This operations manual contains important information on how to operate the machine safely and correctly. Read this manual carefully 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. Included with this manual is a disc which contains the original language version of this manual which is English.

There is a separate engine manufacturer's manual which should also be read and understood prior to any operation or maintenance of the machine.

The following procedure bar indicates the start of a procedure. Any safety warnings related to the procedure will be highlighted before the procedure.

PROCEDURE

Any results from a step in the procedure will be indicated in italic below that step. The end of a procedure is indicated with a line under the last step or the last image in a procedure.

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 Terex. In these circumstances, or where supplied as a replacement machine, Terex 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:

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11001 Electron Drive

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Telephone: 001 (502) 736 5200

(1) Units

Within this operations Manual figures shown within brackets ( ) after the Metric unit of measure are approximate conversions from the actual metric measurement of the item concerned to the imperial measurement.

(2) Optional Equipment

Terex machines can include optional equipment and/or special features additional to the standard specification. These may affect the information given in this operations manual. Refer to Chapter 4 of the operations manual for extra equipment or variations that can be applicable to the standard specification. Take note of any variations to the standard procedures and/or component specifications.

1.2 Safety Information

(1) Safety Alert Symbol



The safety alert symbol is used on safety signs and throughout this manual to alert you to potential personal injury hazards. Obey all messages that follow this symbol to avoid injury or death.

Conduct thorough risk assessments and mitigate identified risks in accordance to the assessment. For more information related to machine safety, please refer to the safety section of the manual (Chapter 2).

(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.

All hazards associated with each procedure will be listed before each procedure as described above.

(3) California Proposition 65 Warnings

This equipment contains and/or emits chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Lead and lead compounds, gasoline, diesel engine exhaust, and used engine oil are chemicals known to the State of California to cause cancer.

Lead and carbon monoxide are chemicals known to the state of California to cause birth defects.

Lead is a chemical known to the State of California to cause reproductive harm.

1.3 Intended Use

This product and its approved attachments are designed to be used in Material Processing crushing and screening applications. Compliance with the operating instructions, the performance of maintenance work as specified and adherence to maintenance intervals are all aspects of proper use. Use of this product in any other way is prohibited and contrary to its intended use.

1.4 Prohibited Use

Operating the machine outside of its recommended range of applications or for any use which it is not intended, will result in a loss of any guarantee. The manufacturer or supplier cannot be held liable for any damage or injury resulting from such misuse.

Use of this product in any way other than its intended use is prohibited. The manufacturer will not be liable for any damage resulting from such use.

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.

A Declaration of Conformity certificate is applicable to each machine. Refer to Appendix A for an example of a Declaration of Conformity certificate. The original copy of the certificate is sent out with the machine.

1.6 Warranty

Refer to Appendix B for an example of the warranty. It is important that it is read and fully understood.

1.7 Copyright

The copyright of this operations manual is reserved by Powerscreen.

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.

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To order additional copies contact your local Terex dealer.

1.8 Bulletin Distribution and Compliance

Safety of product users is of paramount importance to Terex. Various bulletins are used by Terex to communicate important safety and product information to dealers and machine owners. The information contained in bulletins is tied to specific machines using the machine model and serial numbers. Disribution of bulletins is based on the most current owner on record along with their associated dealer, so it is important to register your machine and keep your contact information up to date. To provide for the safety of personnel and the reliable continued operation of your machine, be sure to comply with actions indicated in all safety and product notices.

1.9 Contacting the Manufacturer

At times it may be necessary to contact the manufacturer of this machine. When you do, be ready to supply the model number and PIN number of your machine, along with your name and contact information. At minimum, the manufacturer should be contacted for any of the following reasons:

- Accident reporting
- Questions regarding product applications and safety
- Standards and regulations compliance information
- Questions regarding product modifications
- Current owner updates, such as changes in machine ownership or changes in your contact information (See Transfer of Machine Ownership).

Please contact:

Terex Powerscreen

200 Coalisland Road

Dungannon, Co. Tyrone

BT71 4DR

Telephone: +44 (0) 28 8774 0701

E mail: aftersales@powerscreen.com

1.10 Transfer of Machine Ownership and Contacting manufacturers

If you are not the original owner of this machine, provide the model number and PIN number of your machine. Also include your name and the date of the transfer of ownership. It ensures that you are the owner on record for this machine, allowing you to receive any applicable notices and advisories in a timely manner.

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2 Safety

This safety section covers a wide variety of hazardous situations, (but not necessarily limited to those described), which may or may not apply to any specific machine installation. They are given for general guidance only to assist the operator in setting up and maintaining an appropriate regime for the protection of health and safety. Where the machine is supplied for incorporation into plant/equipment designed, supplied and located by others, Terex cannot be aware of particular hazards that may be present or might occur and therefore accept no liability for addressing or resolving these issues.

2.1 General Safety

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

(1) Safety Alert Symbol



The safety alert symbol is used on safety signs and throughout this manual to alert you to potential personal injury hazards. Obey all messages that follow this symbol to avoid injury or death.

Conduct thorough risk assessments and mitigate identified risks in accordance to the assessment.

(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

(3) Property Damage Messages

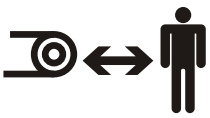
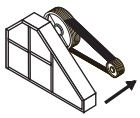
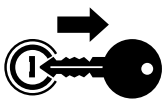
The signal word NOTICE, shown without the safety alert symbol, is used throughout this manual and on machine labels to address specific practices, or draw attention to supplemental information that is not related to personal injury.

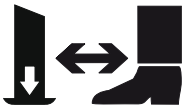
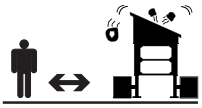
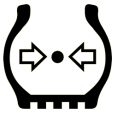
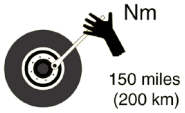
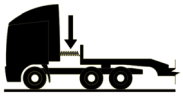
NOTICE

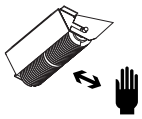
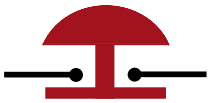
This indicates information considered important, but not hazard related. This is a message related to property damage. The safety alert symbol is not shown with this danger classification.

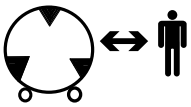
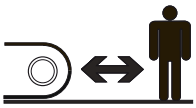
(4) Description of Safety Symbols

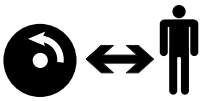
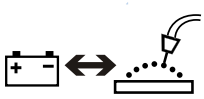
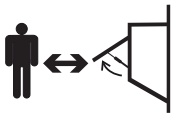
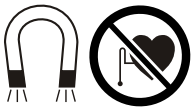
Table 2.1 - Description of Safety Symbols

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** Arm 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.

Symbol	Description
	**Injection hazard** Skin injection from high pressure fluid.
	Use cardboard or wood to check for leaks.
	**Crush hazard** Crushed foot from support leg.
	Stay clear of support legs and jacks.
	**Falling material hazard** Struck 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.

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

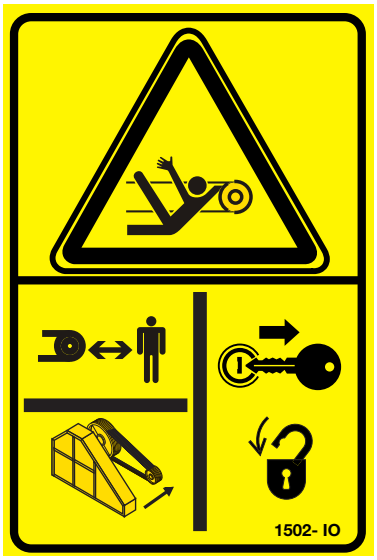
Symbol	Description
	Stay clear of moving conveyors.
	Unauthorized persons prohibited.
	**Flying Material Hazard** Struck by flying material.
	Do not stand on platform while machine is in operation
	Do not stand on machine while in operation.
	**Inhalation Hazard** Inhalation of poisonous/ toxic fumes 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.

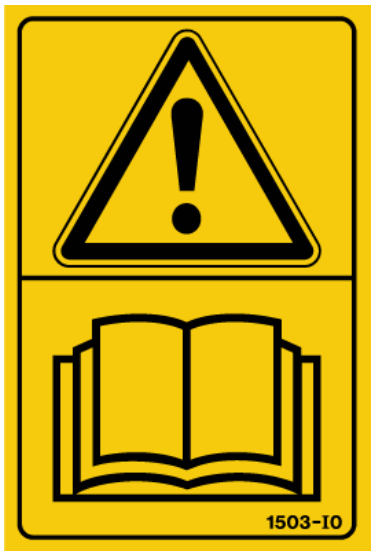
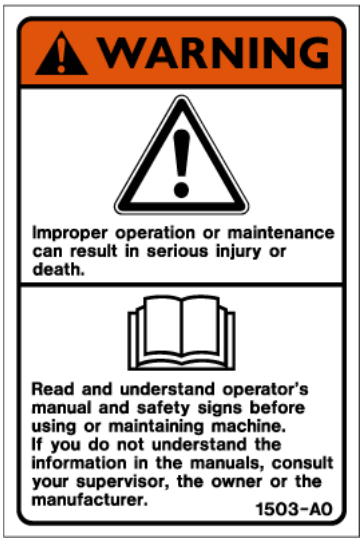
Symbol	Description
	Stay clear of wheeled machine.
	**Explosion Hazard** Battery Explosion.
	Keep welding sparks away from the battery area.
	**Burn Hazard** Burn from hot surface or liquid
	Stay clear of hot surface or liquid.
	**Impact Hazard** Impact from spring loaded door.
	Stay clear of spring loaded door while opening.
	**Magnetic Hazard** Magnetic fields can disturb pacemaker operation if within 3 metres of the magnet and result in serious injury or death to pacemaker wearer.

2.2 Positions of Safety Signs on the Machine

Table 2.2 lists the safety signs that are on this machine. Figure 2.1 shows the positions of the safety signs on the machine.

Table 2.2 - Safety Signs

Item	Sign	
	ISO	ANSI
1502		
1507		

Item	Sign	
	ISO	ANSI
1512		
1513		
1503		

Item	Sign	
	ISO	ANSI
1514		
1508		
1518		

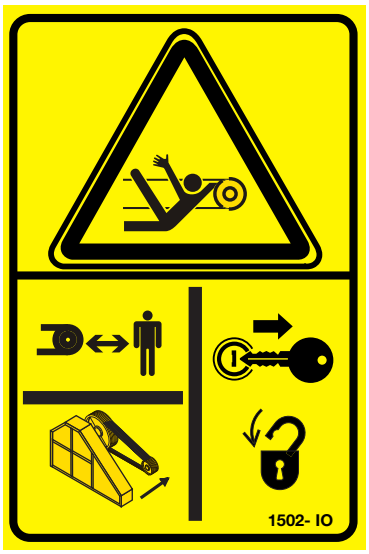
Item	Sign	
	ISO	ANSI
1502		
1507		

Figure 2.1 shows the positions of these safety signs on the machine.

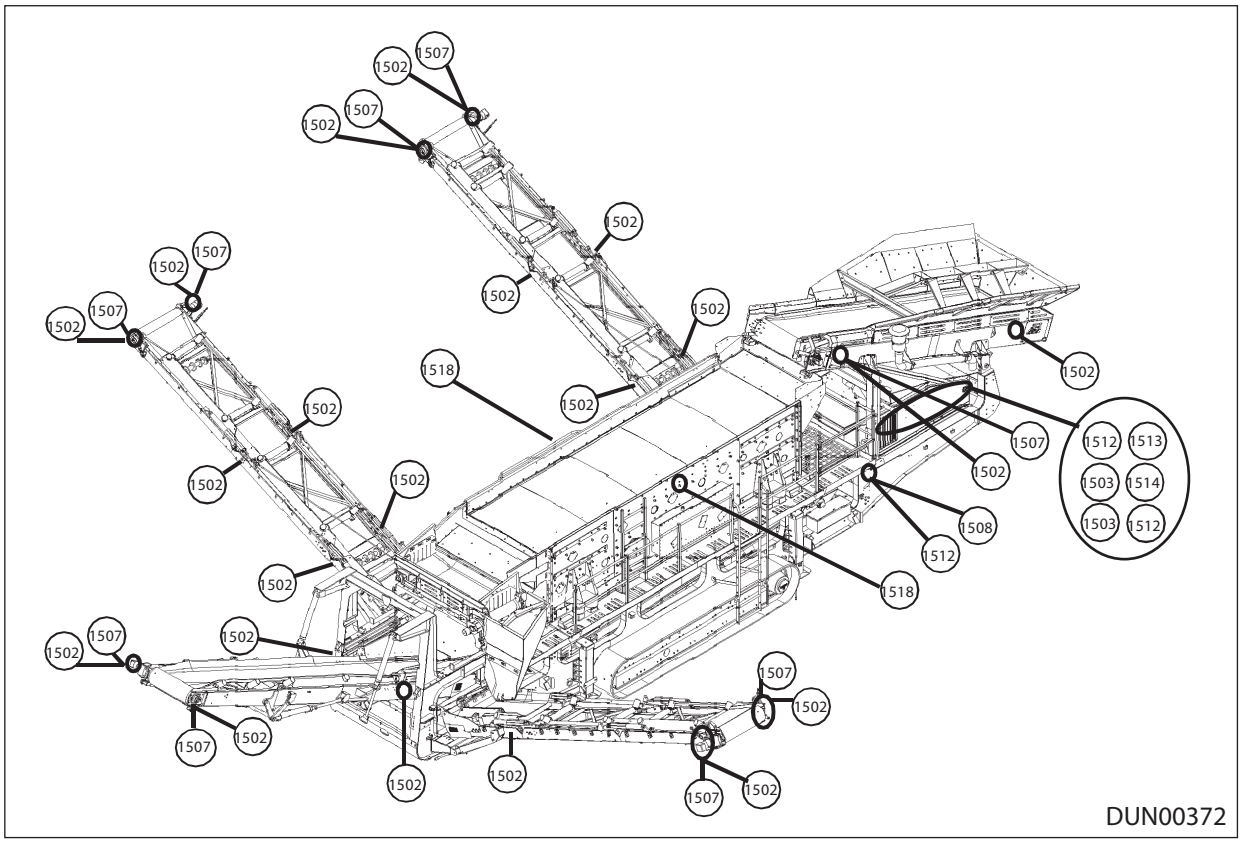
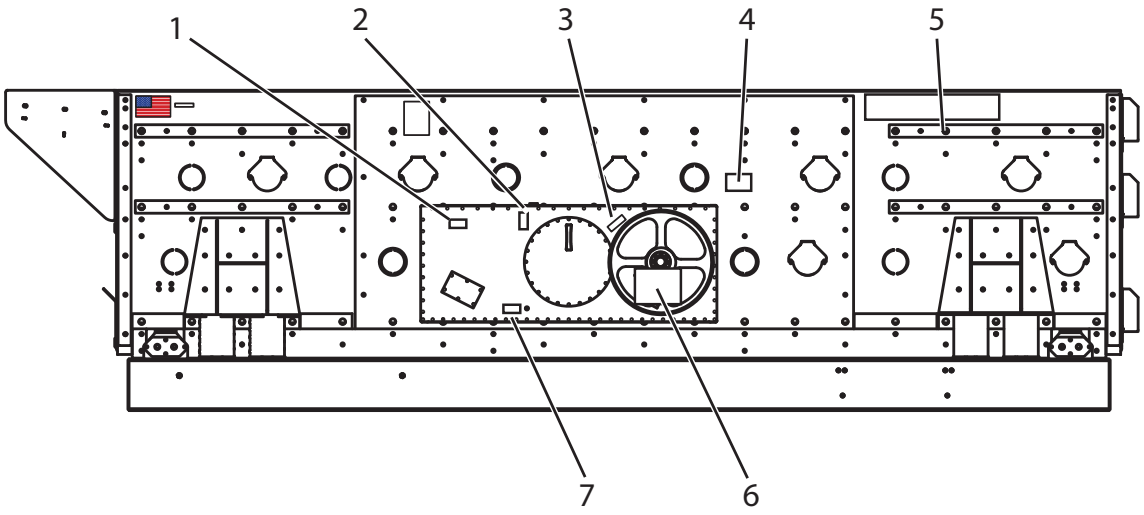


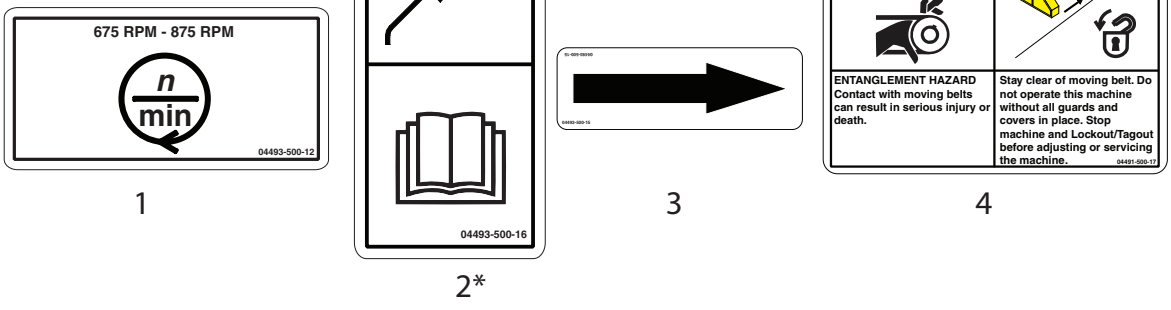
Figure 2.1 - H6203R Safety Sign Positions

Figure 2.1 shows the positions of the warning labels on the H6203R, these are in the same positions on the Chassis and on the conveyors on the H6203 and H6203 Light Duty.

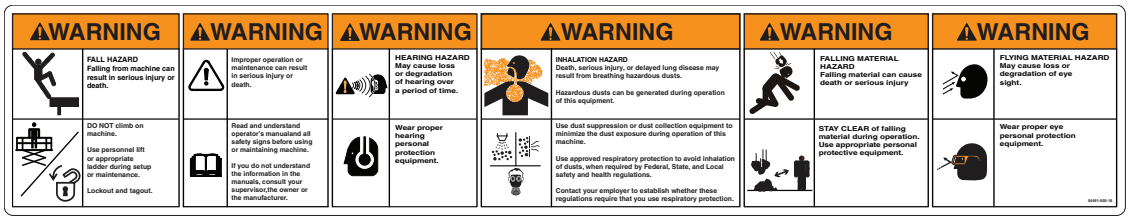
(1) Safety Signs on the Screenbox

(a) ANSI Safety Sign Location





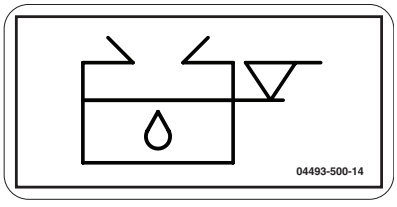
1 2* 3 4



5*



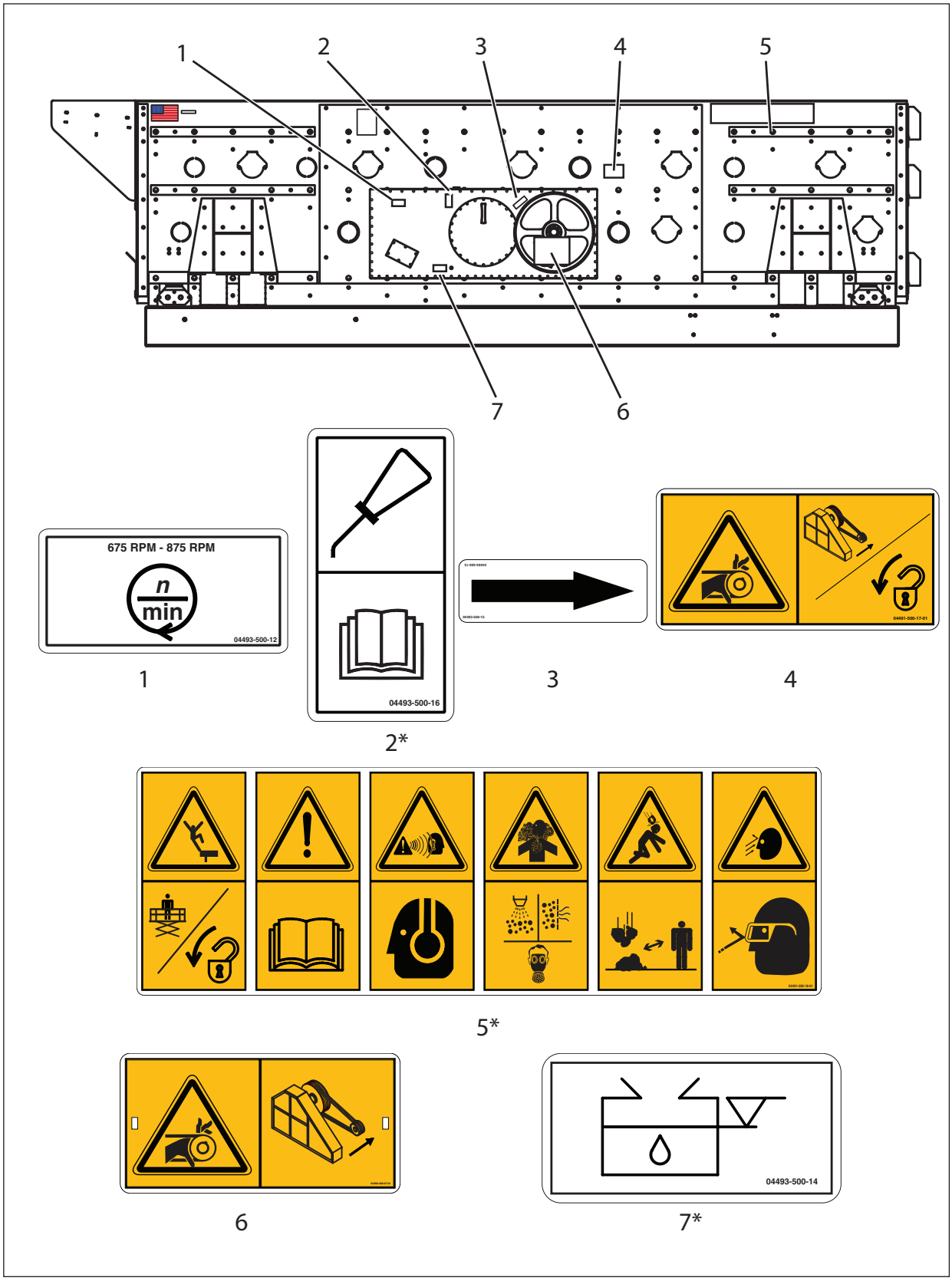
6



7*

Where there is a (*) present it indicates this sign is found on both sides of the machine

(b) ISO Safety Sign Location



Where there is a (*) present it indicates this sign is found on both sides of the machine

2.3 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.

2.4 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.

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 wheeled machine:

Ensure wheel nuts are torqued between 500 to 550 ft.lb (69 to 76 kg.m) 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 beltfeeder on conveyor belts or screenbox. 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 Terex Powerscreen.

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 Terex Powerscreen 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 sulphuric 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.

When working at height make sure you take all necessary precautions in line with local regulations and use approved PPE, safety harnesses and work platforms. If you are not aware of working at height requirements speak to your manager before starting any work. Keep all handles, steps, handrails, platforms, landing and ladders free from dirt, oil, snow and ice.

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 Terex 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.

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 Terex 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.

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 Terex 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.

2.5 Emergency Stop Locations

Emergency stops are located at both the left hand side and right hand side of the machine, Ref: Figure 2.2.

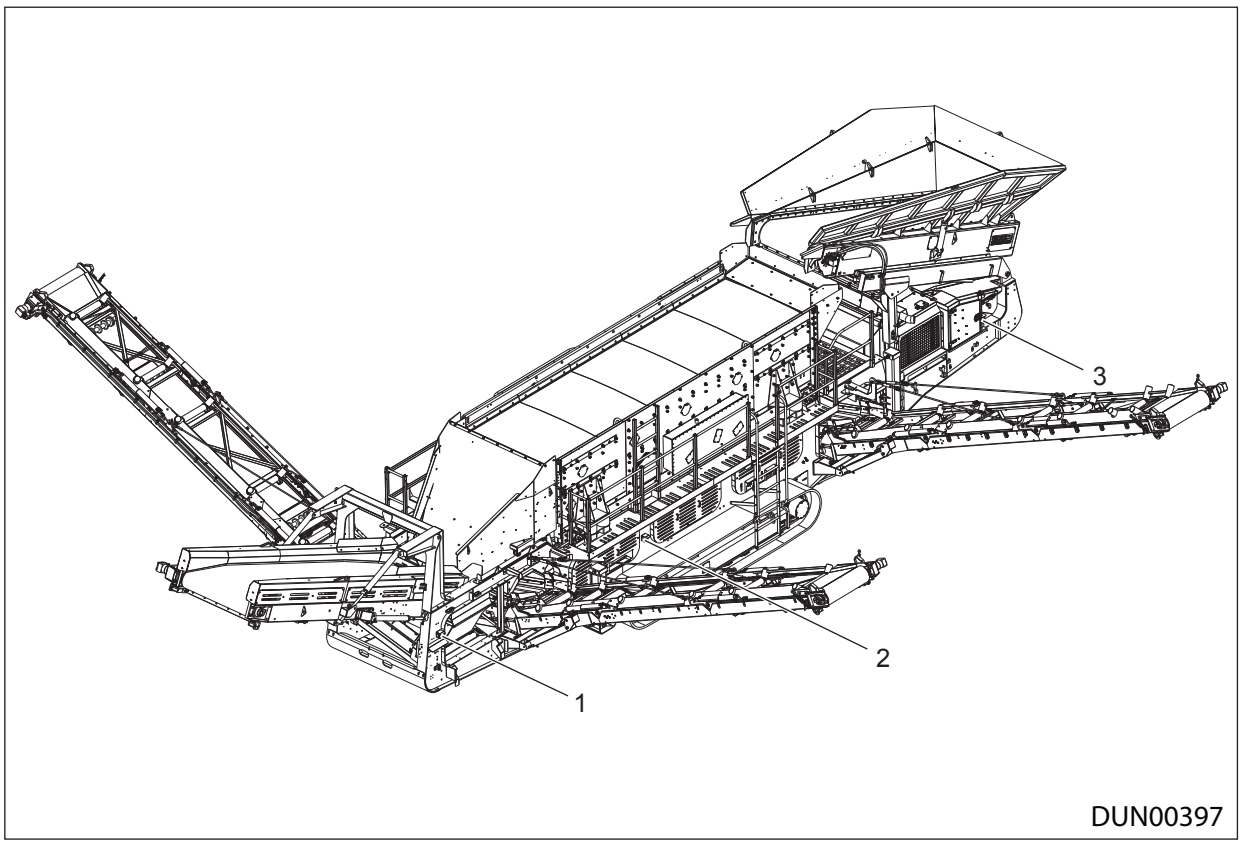


Figure 2.2 - Emergency Stop Locations LHS and RHS

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3 Technical Data

3.1 General Information

Machine	Mobile screening machine
Type	H6203

(1) Machine Weights (Approximate)

Total weight (Belt Feeder)	Approx 46, 700 kg*
Total weight (Apron Feeder)	Approx 49, 500 kg*

* The ‘Total weight’ refers to the weight of machine in standard conf guration only. Any optional extras added will have a considerable inf uence on the overall plant weight.

3.2 Machine Component Specifications

(1) Feeder Unit

(a) Feed Hopper

Opening size	5.23 m x 2.70 m (17’ x 8’10“)
Capacity	4.33 cu m (5.67 cu yds)
Feed in height	Range from 2.8 m (9’-1.8”) to 3.75 m (12‘-3.0“)

(b) Feeder Conveyor

Belt width	1300 mm (51”)

(2) Screen Unit

(a) Screenbox

Width	1.93 m (6’4”)
Length	6.1 m (20’)
Weight	8000 kg Approx
Oval stroke adjustable	Maximum 19 mm (3/4’)
Oval stroke angle adjustable	From 30 - 60 degrees
Screen shaft speed	970 rpm ±10 rpm

(3) Mid-Oversize Conveyor

Belt width	900 mm (36”)
Stockpile Height	4.3 m (14’- 2”)
Degree of incline: Variable Working Angle	10-25° (max.)

(4) Oversize Conveyor

Belt width	900 mm (36”)
Stockpile Height	4.35 m (14’ 4”)

(5) Fines Conveyor

Belt width	900 mm (36”)
Stockpile Height	4.3 m (14’- 2”)

(6) Collection Conveyor

Belt width	1500 mm (60”)

(7) Mid-Fines Conveyor

Belt width	900 mm (36”) Mid product 900 mm (36”)
Stockpile Height	4.35 m (14’- 4”)

(8) Power Unit

(a) Engine

Engine speed	2200 rpm

Refer to engine operation manual supplied with machine for more information.

(i) Tier 3 Engine

Standard
DEUTZ BF6M2012C diesel engine developing 130 kw (174 Hp) @ 2200 RPM

Option
Cat 3056E - ATACC diesel engine developing 129 kw (173 Hp) @ 2200 RPM

(ii) Tier 4 Engine

CAT C7.1 Tier 4i - 6 cylinder diesel engine developing 151kW (202.5 Hp) @ 2200 RPM

(iii) Motors and Pumps

Flywheel pump 1	63/63/33/33
PTO pump 1	5029/5029
Feeder Motors	OMSS80 (80 cc/rev) 2 OFF
Collection Conveyor Motor	OMT500 (500 cc/rev)
Tail Conveyor Motor	OMT500 (500 cc/rev)
Side Conveyor Motors	OMT500 (500 cc/rev)
Screen Motor	A2F90

(iv) Tank Capacities

Hydraulic tank	787 L (173 Gal)
Diesel tank	597 L (131 Gal)

(c) Battery

Type	12 Volt, negative earth - 2 OFF
Cranking Power	810 amps SAE

(9) Chassis-(Beam Plate Design)

(a) Tracks

For track torques, see adjustment data, “Maintenance“ section.

Tractive effort	16, 523 daN
Gradability percentage	50.5%
Gearbox ratio	1:153
Hydraulic motor	Rexroth 90 cc/rev
Approximate speed	0.95 Km/hr (0.59 Mph)
Flow rate	112.22 pm (24.7 gpm)

(10) Hydraulics

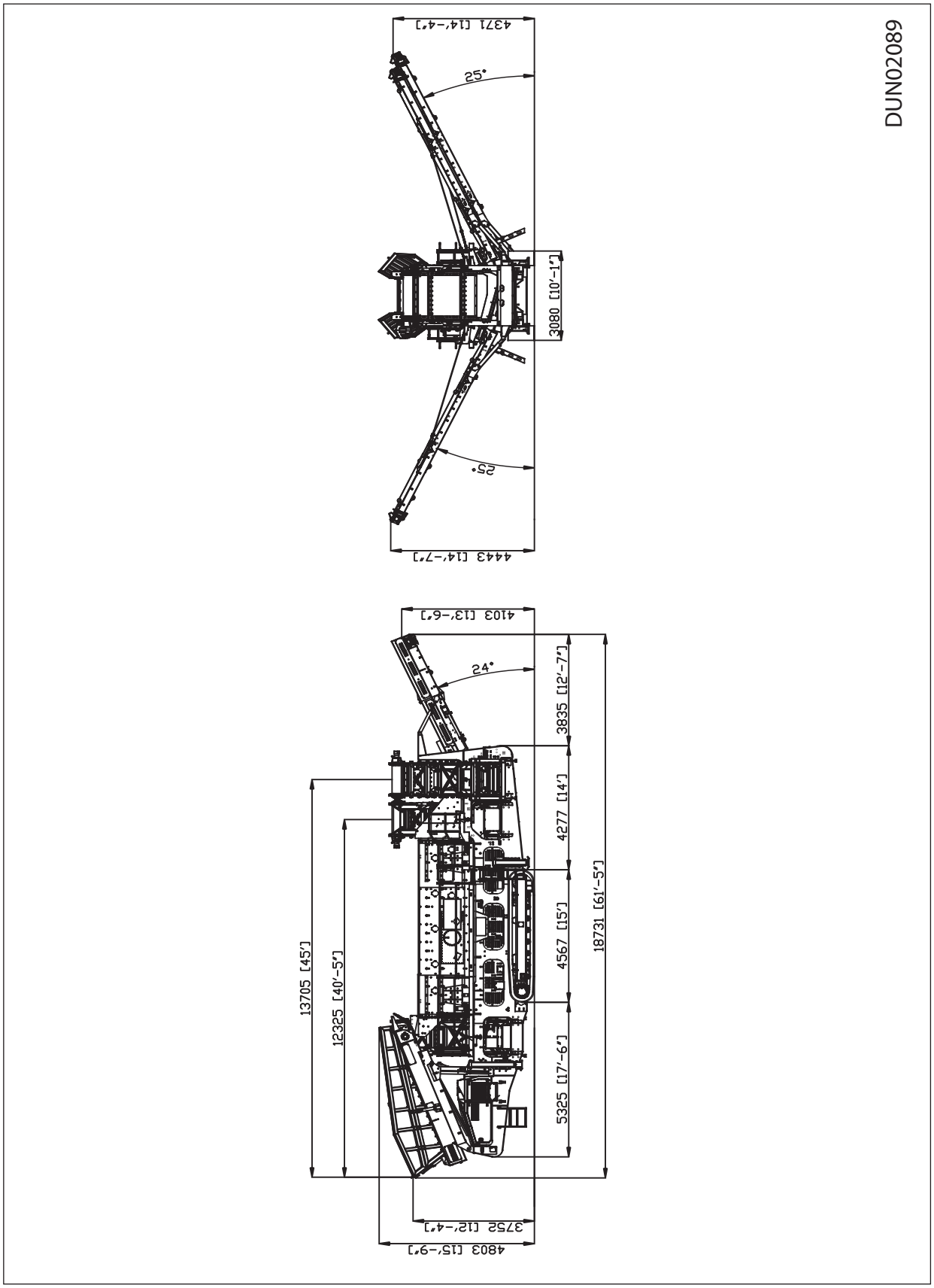
Hydraulic system pressure	210 bar (3000 psi)

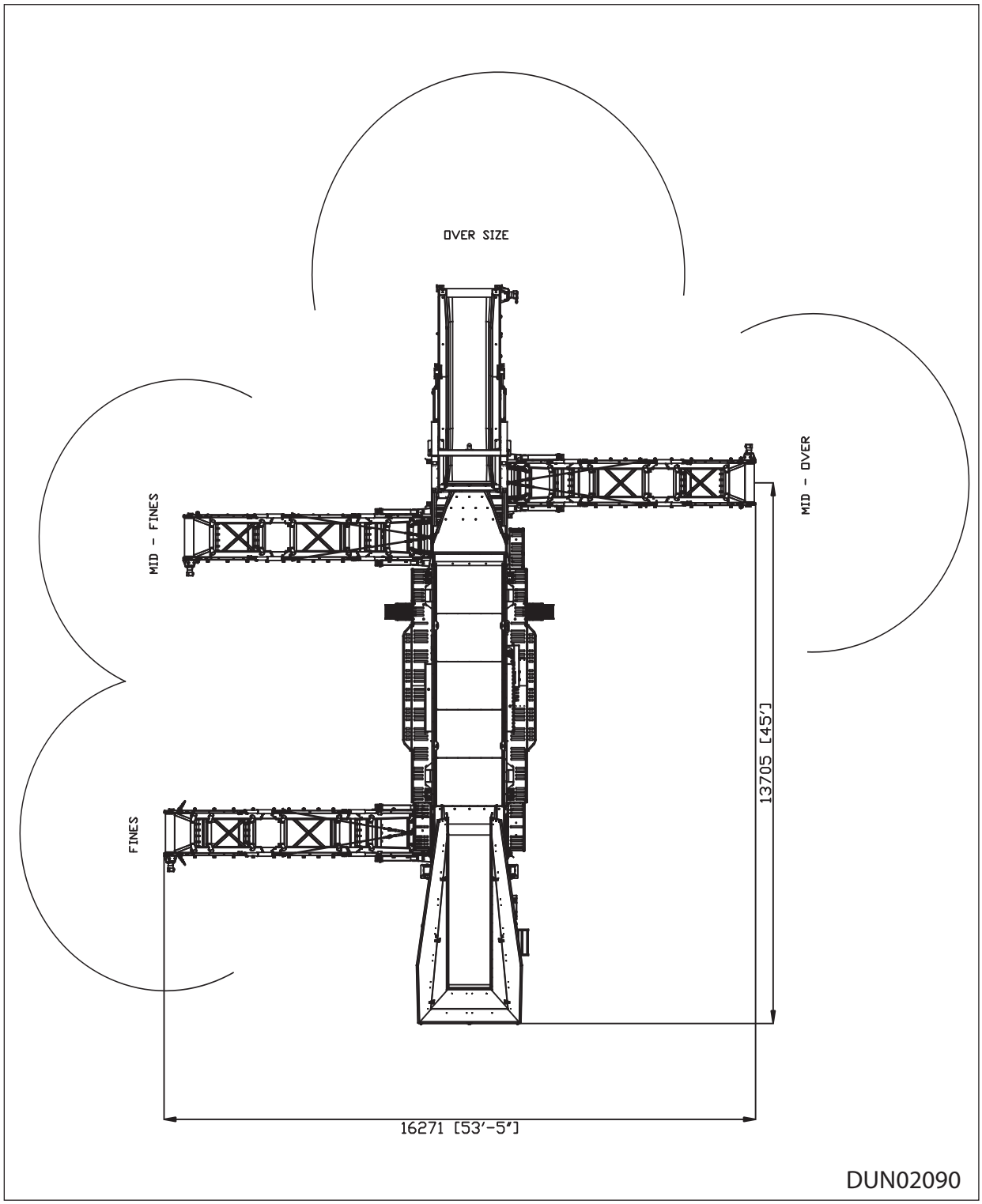
(a) Hydraulic Hoses Pressure Ratings

Type	Diameter	Working pressure	Test pressure	Burst pressure
2 SN-K “Semperpac 1” DIN 20022 Part 3	1” 3/4”	3500 psi	7395 psi	14210 psi
R1 AT DIN 20022 Part 3	3/16”	3570 psi	8700 psi	14500 psi
	1/4”	3210 psi	7830 psi	13050 psi
	5/16”	3070 psi	7395 psi	12325 psi
	3/8”	2570 psi	6307 psi	10440 psi
	1/2”	2295 psi	5582 psi	9280 psi
	5/8”	1855 psi	4567 psi	7540 psi
	3/4”	1500 psi	3697 psi	6090 psi
	1”	1255 psi	3045 psi	5075 psi
	1 1/4”	900 psi	2175 psi	3625 psi
	1 1/2”	715 psi	1740 psi	2900 psi
	2”	570 psi	1392 psi	2320 psi
R2 AT DIN 20022 Part 4	3/16”	5930 psi	14355 psi	23925 psi
	1/4”	5710 psi	13920 psi	23200 psi
	5/16”	5000 psi	12180 psi	20300 psi
	3/8”	4710 psi	11527 psi	19140 psi
	1/2”	3930 psi	9570 psi	15950 psi
	5/8”	3570 psi	8700 psi	14500 psi
	3/4”	3070 psi	7395 psi	12325 psi
	1”	2355 psi	5655 psi	9425 psi
	1 1/4”	1785 psi	4350 psi	7250 psi
	1 1/2”	1285 psi	3190 psi	5220 psi
	2”	1140 psi	2827 psi	4640 psi

3.3 Machine Drawings

(1) Working Dimensions




OVER SIZE
MID - FINES
MID - OVER
FINES
13705 [45']
16271 [53'-5"]
DUN02090

(2) Transport Dimensions

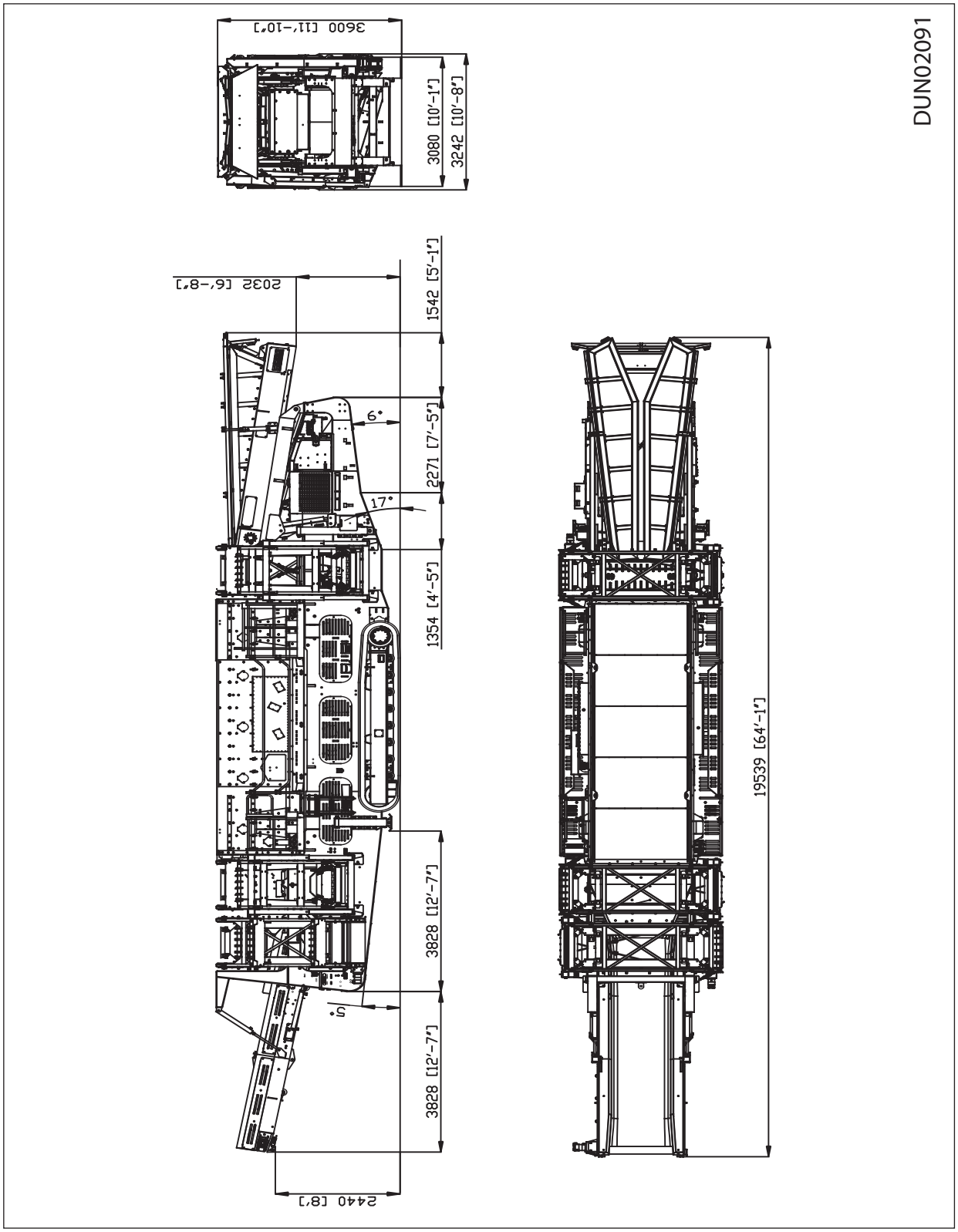


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4 Machine Description

4.1 General Information

(1) Identification Plate

The machine identification plate gives important information about the machine, Ref: Figure 4.1.



Figure 4.1 - Identification Plate

1 Machine model

2 Year manufactured

3 Machine mass

4 Serial number

The machine identification plate is located on the outside of the powerunit, Ref: Figure 4.2.

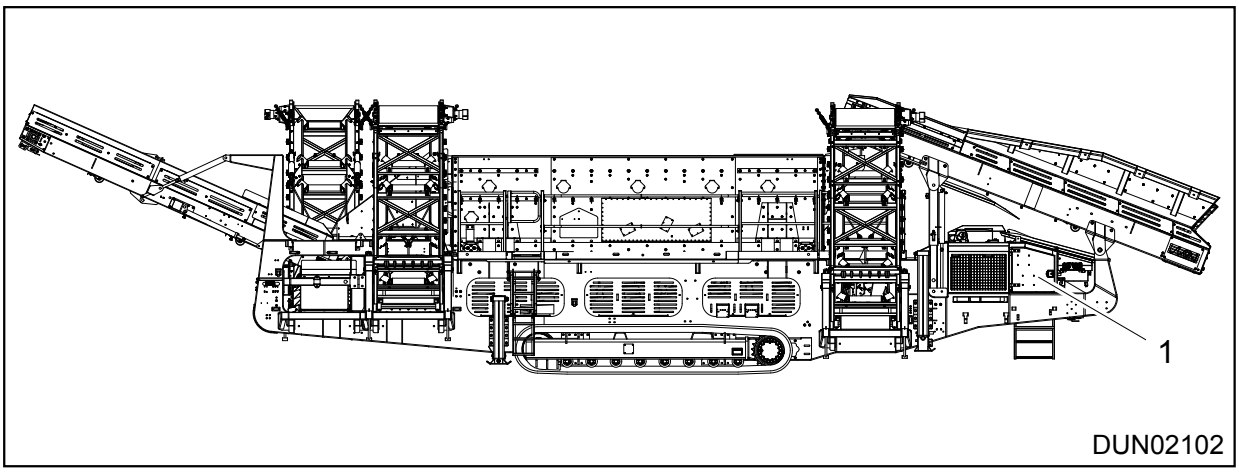
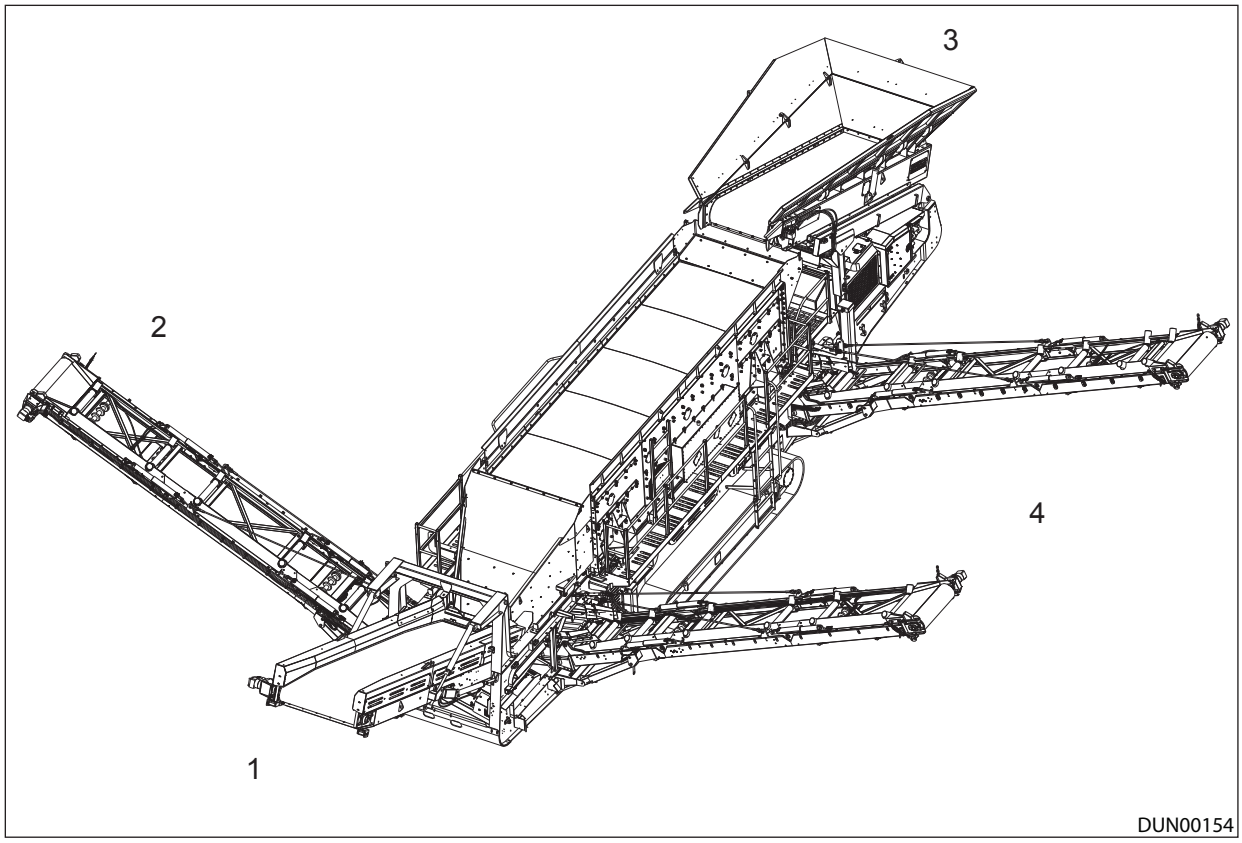
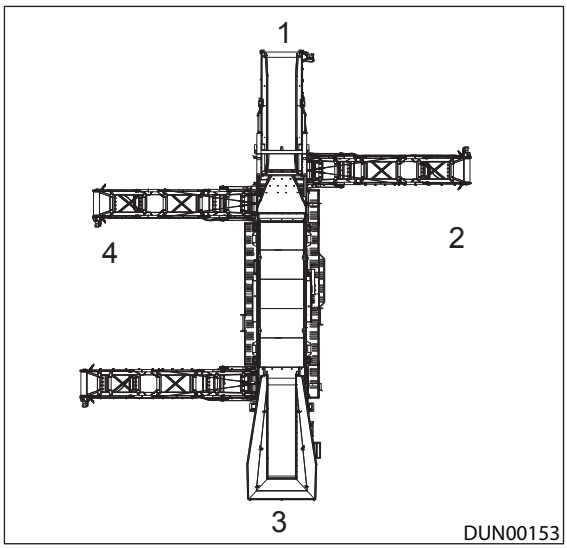


Figure 4.2 - Location of Machine Identification Plate

(2) Machine References

When using this handbook, at all times the right and the left hand references are viewed from the rear end of the machine. The feeder is situated at the rear of the machine.





1 Front

2 Right

3 Rear

4 Left

(3) Telematics

If a telematics system is included with the Equipment, the telematics system is administered by a third party and collects a range of operational data about the Equipment including, but not limited to, usage, performance and reliability. Buyer consents to Seller's obtaining such data for warranty, product improvement and customer support purposes. Buyer understands that the Equipment warranty is conditioned on the proper operation of the telematics system and Buyer shall not disable, tamper or interfere with the telematics system.

To access telematics system information visit our website:

http://powerscreen.com/en/pulse/

4.2 Nomenclature and Technical Data

Refer to Figure 4.3 to identify the main components of the machine and the term with which they are referred to in this manual.

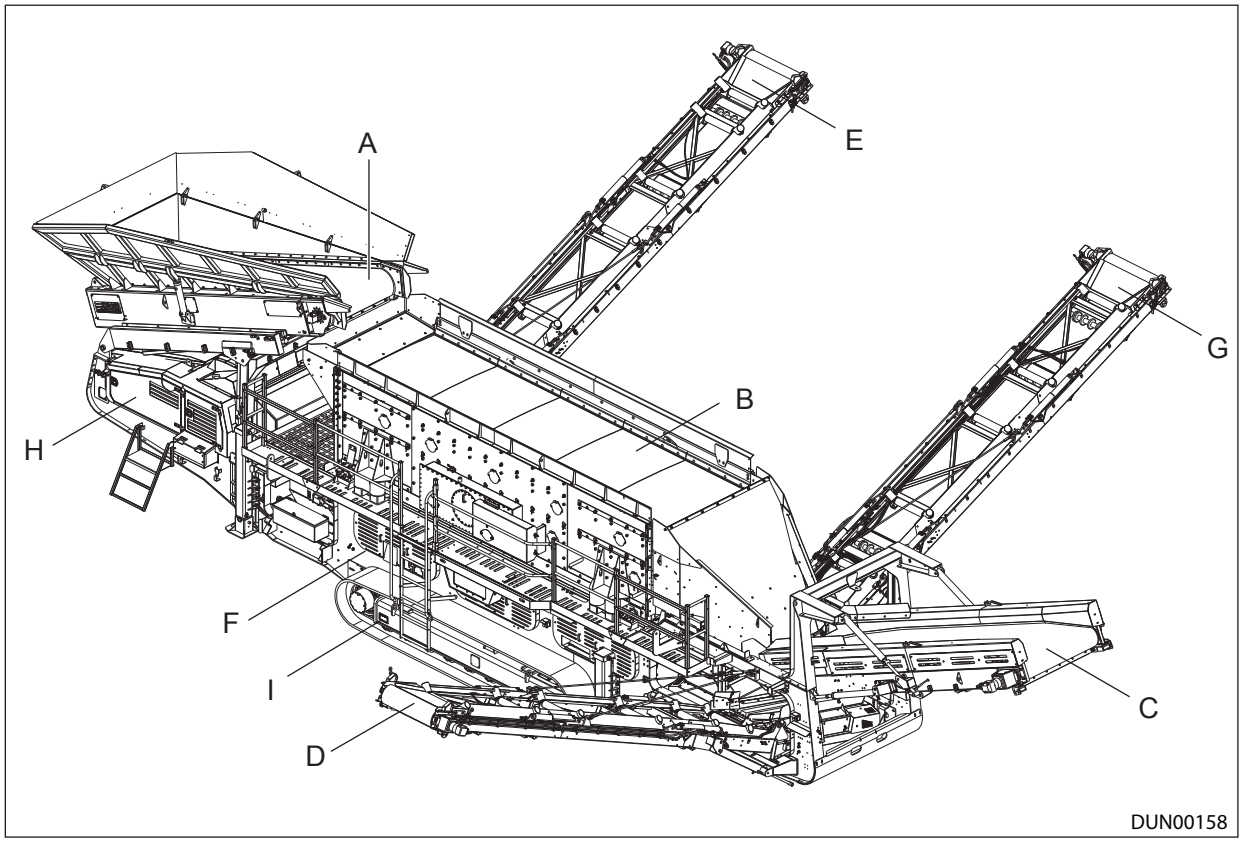


Figure 4.3 - Machine Components

ID	Construction Unit	Components
A	Feeder unit	Feeder/Hopper
B	Screen unit	Screen box/Mesh deck
C	Tail conveyor	
D	Mid oversize side conveyor	
E	Fines side conveyor	
F	Collection conveyor	
G	Mid - fines side conveyor	
H	Powerunit/Engine	
I	Chassis/Tracks	

4.3 Construction Units

(1) Heavy Duty Belt Feeder Unit (A)

The feeder unit consists of 2 main components:

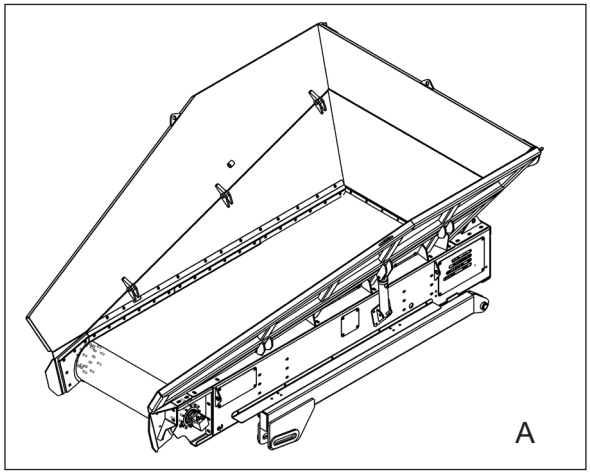


Figure 4.4 - Feeder Unit

A1 Feed Hopper

The capacity is 8.2 cu.m (10.72 cu.yds,) with clamping arrangement for rubber skirts and is manufactured from hardox steel plate.

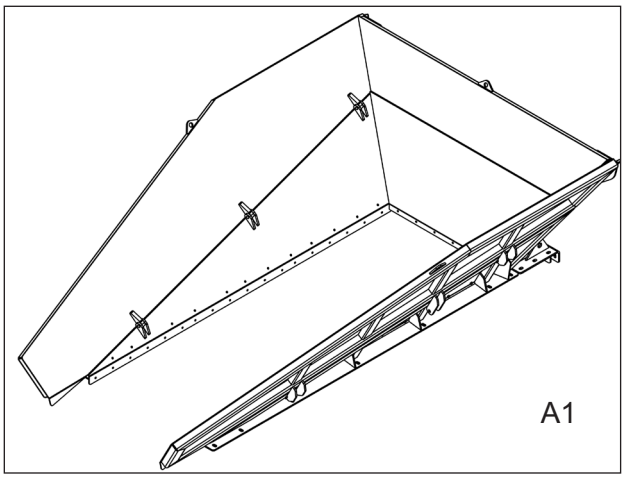


Figure 4.5 - Feed Hopper

A2 Feeder Conveyor

The wide belt allows steep hopper sides to minimise material build-up.

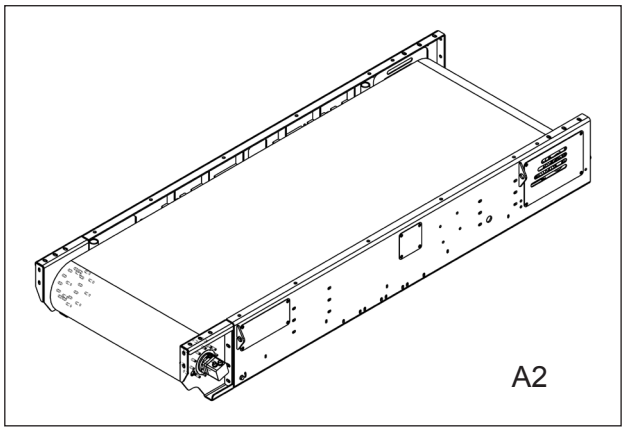


Figure 4.6 - Feeder Conveyor

(2) Apron Feeder Unit (A)

The apron feeder unit consists of 2 main components:

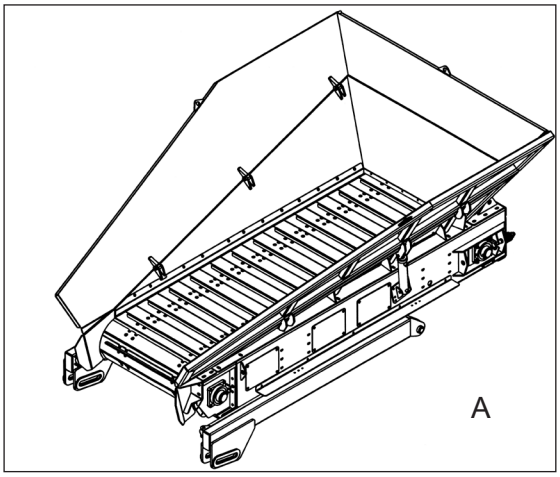


Figure 4.7 - Apron Feeder Unit

A1 Feed Hopper

The capacity is 8.2 cu.m (10.72 cu.yds,) with clamping arrangement for rubber skirts and is manufactured from hardox steel plate.

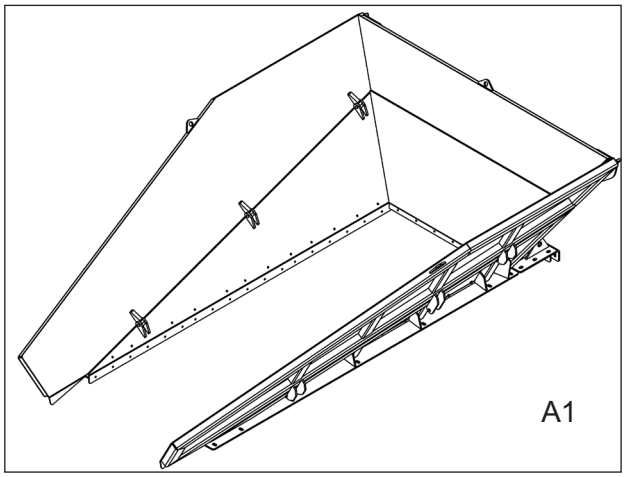


Figure 4.8 - Apron Feed Hopper

A2 Feeder Conveyor

The wide belt allows steep hopper sides to minimise material build-up.

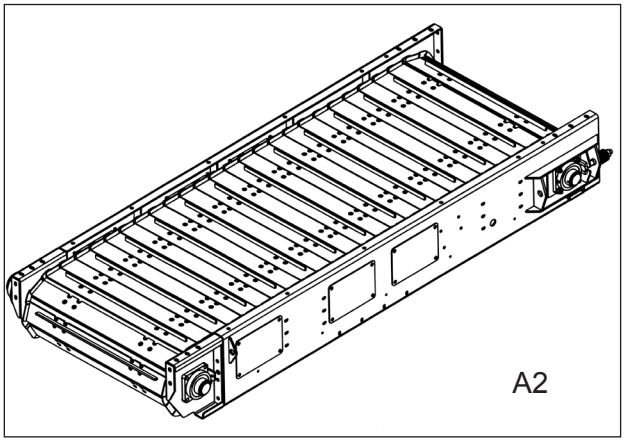


Figure 4.9 - Apron Feeder Conveyor

(3) Light Duty Feeder Unit (A)

The feeder unit consists of 2 main components:

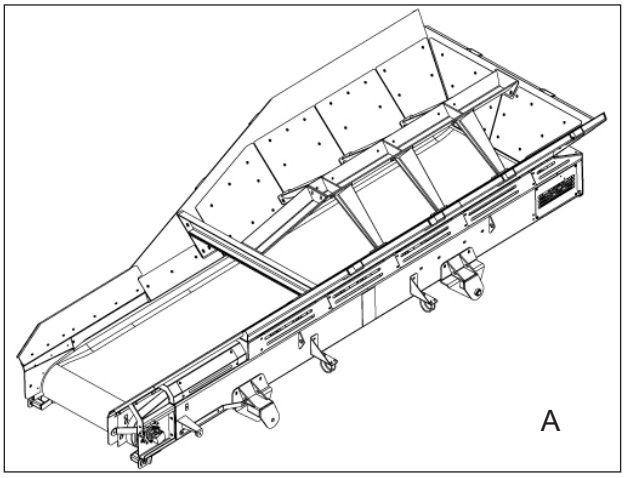


Figure 4.10 - Light Duty Feeder Unit

A1 Feed Hopper

The capacity is 4.33 cu.m (5.67 cu.yds,) with clamping arrangement for rubber skirts and is manufactured from hardox steel plate.

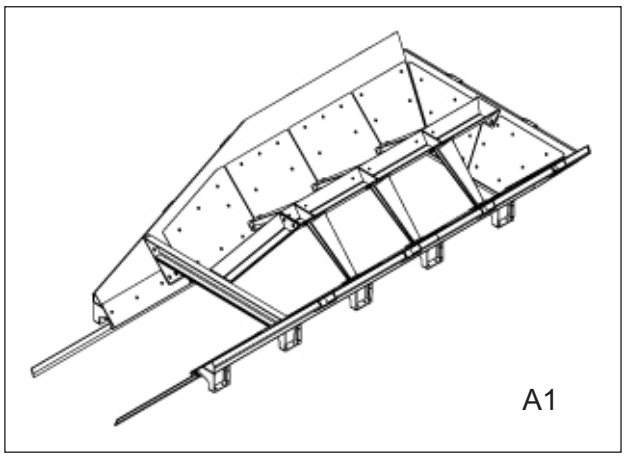


Figure 4.11 - Light Duty Feed Hopper

A2 Feeder Conveyor

The wide belt allows steep hopper sides to minimise material build-up.

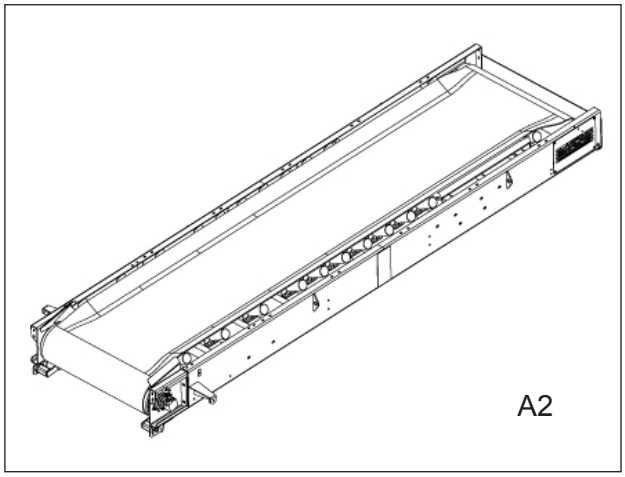


Figure 4.12 - Light Duty Feeder Conveyor

Belt tension adjustments are made outside of the guard doors.

Conveyor Belt Assembly

Conveyor belt assembly on all machines consists of :

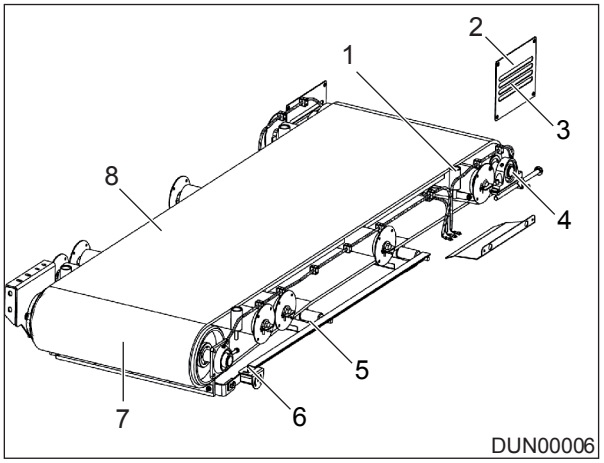


Figure 4.13 - Conveyor Belt Assembly

1 Guide rollers
2 Guarding
3 Viewing apertures
4 Tail drum
5 Impact rollers
6 Drive drum and motor
7 Belt scrapers
8 Conveyor belting

(4) Screen Unit (B)

The screen unit is attached at the end of the feed conveyor where it screens raw material into different sizes.

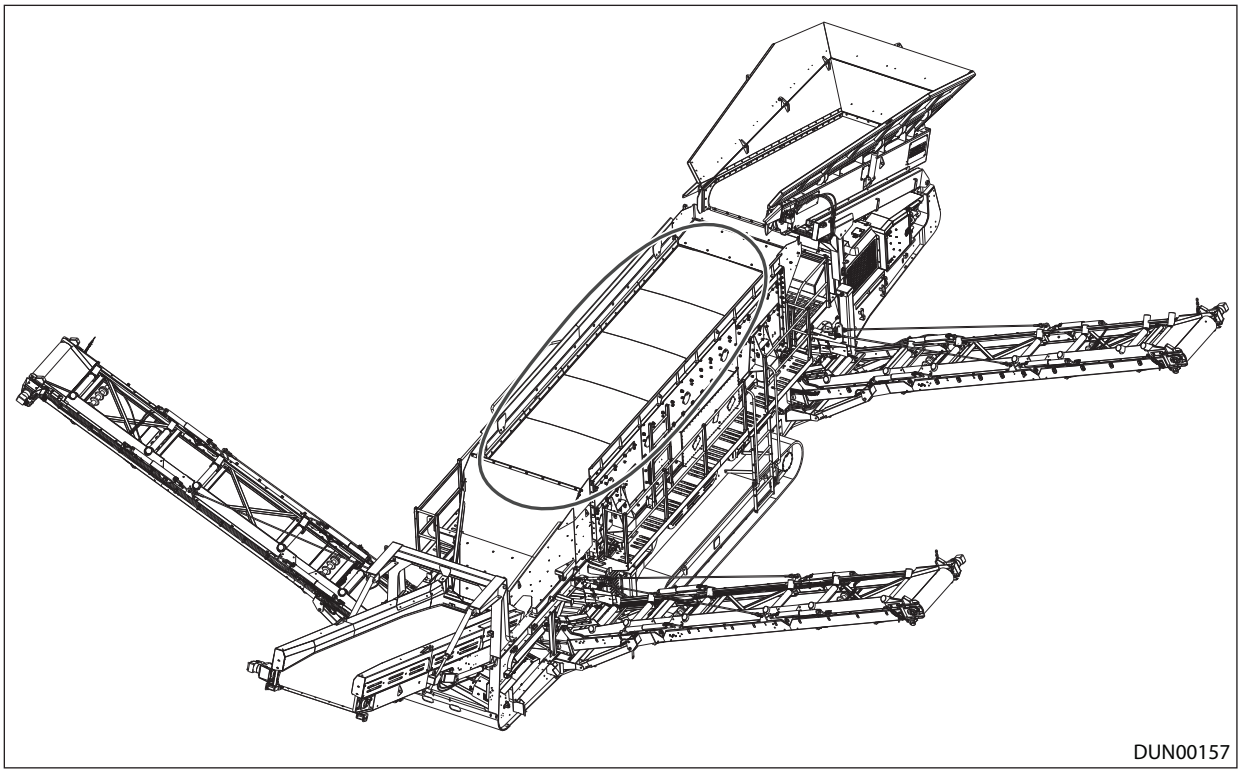


Figure 4.14 - Screen Unit

(a) Available Meshes and Suitable Applications

The machine offers a full range of woven mesh options for both top and bottom decks.

Alternatively the machine is available with punch plate decks, with either circular, hexagonal or square openings. Hexagonal openings are recommended for smaller apertures giving maximum open area and circular for larger apertures giving the punch plate the required strength. 5 mm punched plate can be fitted to the bottom deck.

The maximum punch plate opening on the top deck is 150 mm.

(5) Power Unit (H)

The power unit (H) is attached at the chassis (I) of the machine, under the feeder conveyor (A). The power unit is completely enclosed, sound suppressed and lockable.

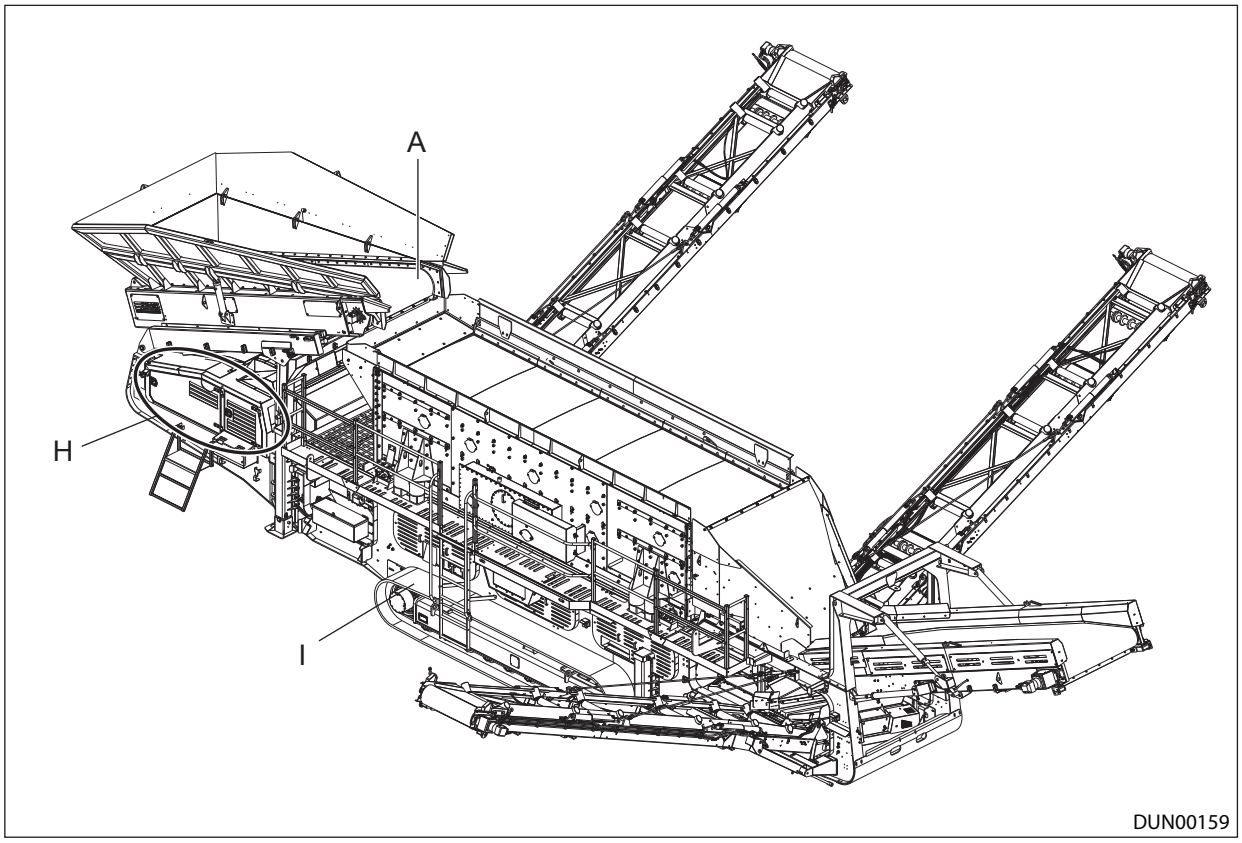


Figure 4.15 - Power Unit

The H6203 has SEVEN control units.

The control panel (H1), control valve unit (H2) and hand throttle (H3, if fitted) are situated at the power unit on the right hand side of the machine, Ref: Figure 4.16 and Figure 4.17 (The power unit will vary depending on the type of machine). The hand throttle is used to increase and decrease the engine speed. To increase the power, pull the hand throttle towards the operator. To decrease the power, push the hand throttle away from the operator.

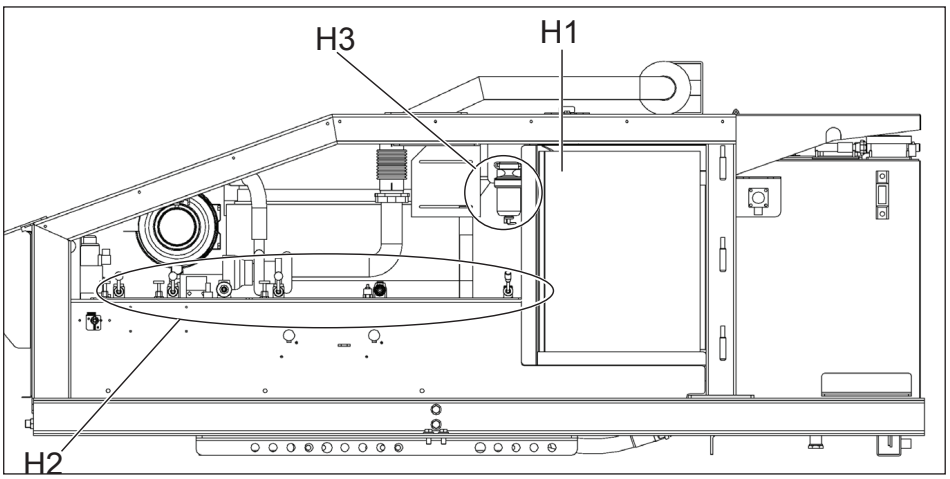


Figure 4.16 - Tier 3 Power Unit

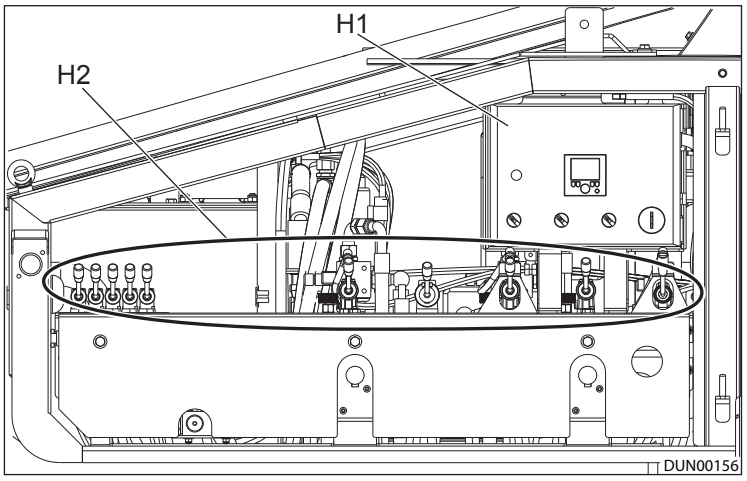


Figure 4.17 - Tier 4 Control Panel

The control valves (H4, H5 and H7) are situated on the left hand side of the machine.

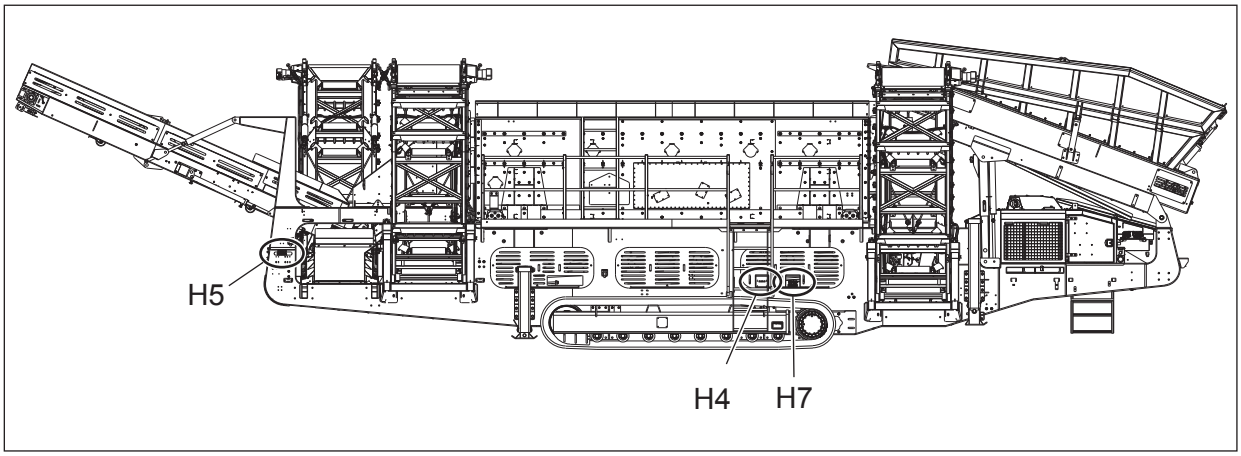


Figure 4.18 - LHS Side Control Valve Units

The control valve (H6) is situated on the right hand side of the machine.

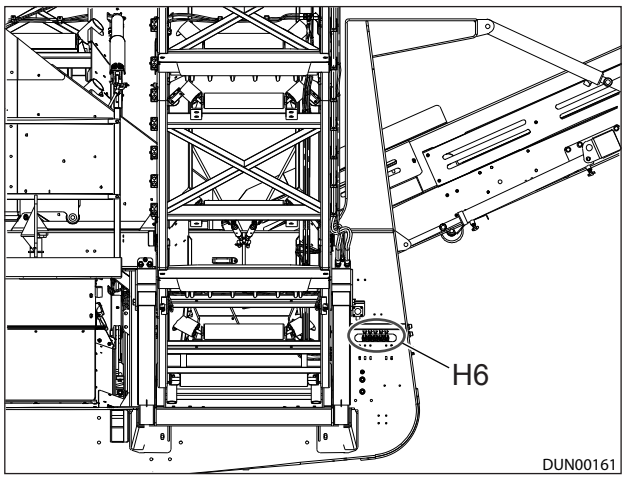


Figure 4.19 - Mid-Oversize Control Valve Unit (H6)

The radio control (H8) and remote control (H9) are independent control units. They control the movement of the tracks.

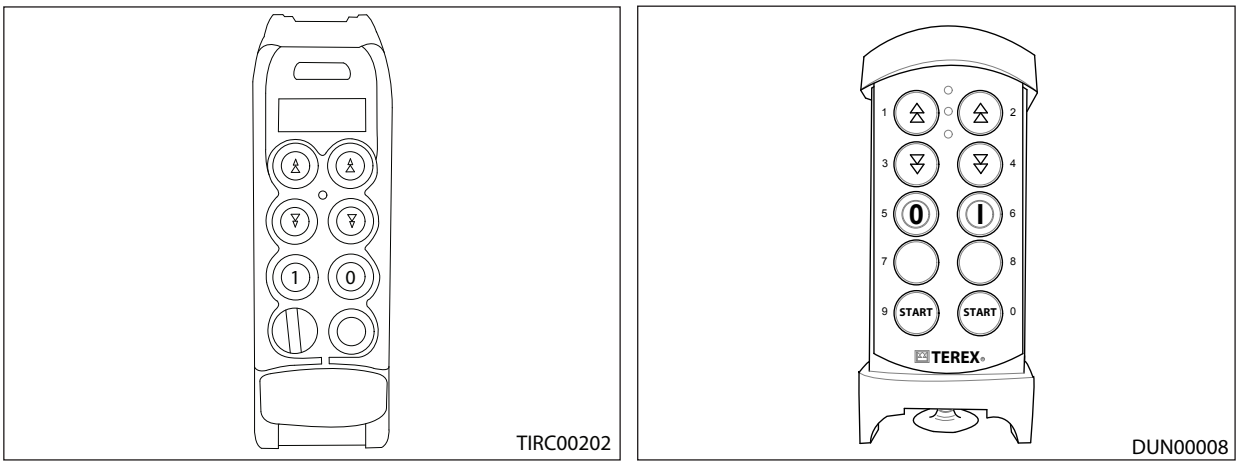


Figure 4.20 - Radio Control Units (H8)

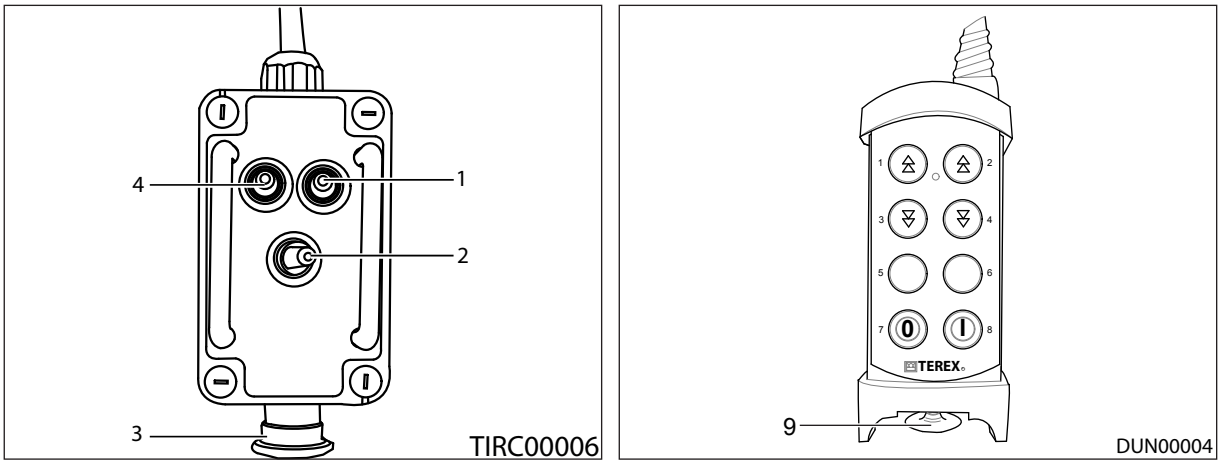


Figure 4.21 - Remote Control Units (H9)

4.4 Control and Display Elements

(1) MCU300 Control Panel

The main hydraulic control panel, fitted at ground level, has all the controls centrally located. This allows the operator to quickly and easily optimize production preventing unnecessary downtime. There is a display screen (item 1) on the control panel which indicates the current state of the machine, Ref: Figure 4.22.

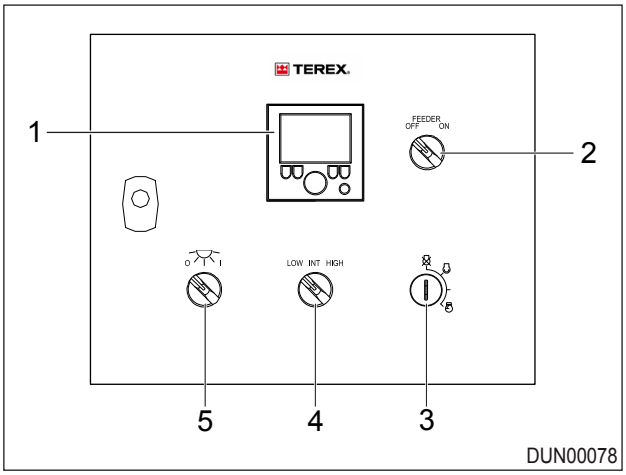


Figure 4.22 - Control Panel

1 MCU300 Control panel display screen

2 Feeder ON / OFF switch

3 Ignition switch

4 Engine speed switch

5 Powerunit light

When the ignition switch is turned to the ON position the Home Screen (Wait To Start) is displayed on the control panel display screen, this screen will only stay on for a few seconds until the engine warms up, Reference: Figure 4.23.

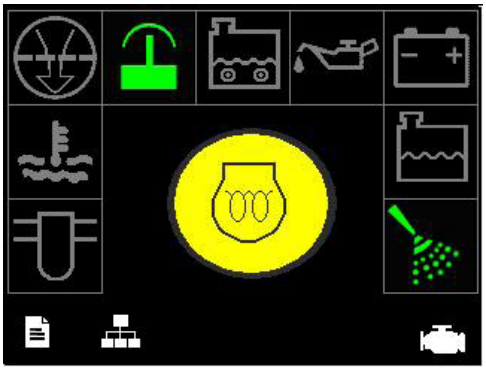


Figure 4.23 - Home Screen (Wait To Start)

When the engine is warmed up the Home Screen is displayed on the control panel display screen.

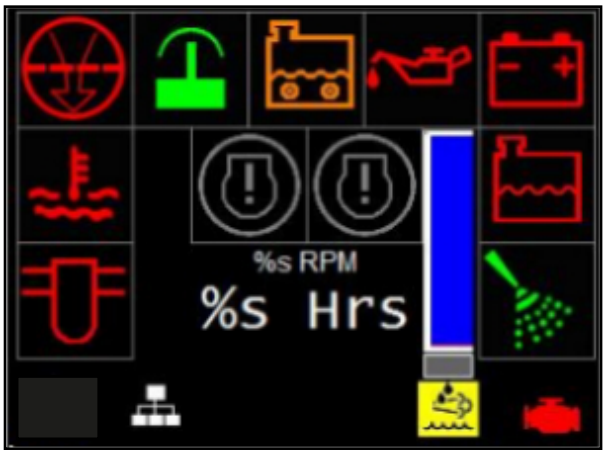


Figure 4.24 - Home Screen (No faults)

The total engine run hours are displayed in the centre of the home screen (Item 12, Figure 4.25).

Refer to Section 7.4 for more information on the operation of the MCU300 Control Panel.

If there are active faults these will be displayed on the home screen, Reference: Figure 4.25. An indicator light on the control panel display screen will illuminate when a machine fault occurs. The light or lights which illuminate will depend on the fault, Reference: Table 4.1.

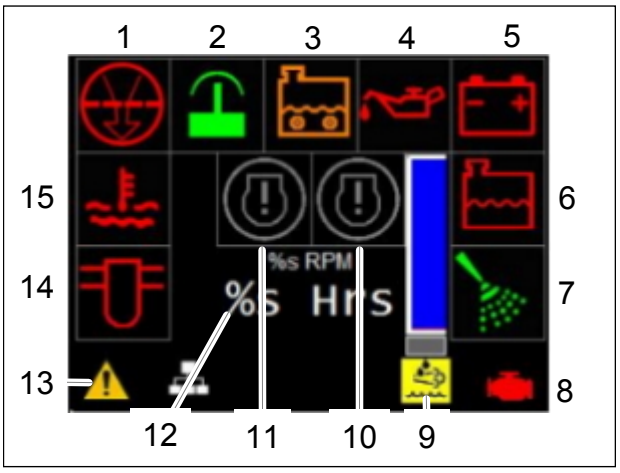


Figure 4.25 - Home Screen (Faults)

Table 4.1 - Display Screen Fault Codes

ID	Name	Description
1	**AIR FILTER RESTRICTION LAMP**	RED – Air Filter Blocked AMBER – Blockage Removed (Machine key off/on needed to reset fault) SPN – 107
2	**EMERGENCY STOP LAMP**	RED (Flashing) – ESTOP Activated AMBER – ESTOP Healthy (Machine key off/on needed to reset fault) GREEN – ESTOP Healthy

ID	Name	Description
3	**HYDRAULIC OIL LEVEL LOW LAMP**	RED – Hydraulic oil level low AMBER – Level Healthy (Machine key off/on needed to reset fault)
4	**OIL PRESSURE LAMP**	RED – Engine Oil Pressure High SPN – 100
5	**BATTERY LAMP**	RED – Battery voltage low (Alternator not Charging)
6	**COOLANT LEVEL LAMP**	RED – Engine Coolant level low SPN – 111
7	**FUEL SOLENOID LAMP**	GREEN – Fuel Solenoid Engaged
8	**ENGINE INFORMATION**	Click to access the engine information screen If flashing red then a DM1 code is present
9	**UREA LEVEL**	Monitors the Adblue level in the tank. When the engine senses a low level the yellow symbol will flash and the bar at the bottom of the level will flash red. SPN – 5245
10	**ENGINE SHUTDOWN LAMP**	RED – The shutdown lamp is used to warn the operator of the presence of critical active Engine Diagnostic Codes that necessitate the engine to possibly derate and shutdown. There are 2 levels, solid and flashing, flashing indicates a more severe fault. FLASHING: SPN – 3039 SOLID: SPN – 623
11	**ENGINE WARNING LAMP**	AMBER – The warning/diagnostic lamp is used to warn the operator of the presence of an active Engine Diagnostic Code. There are 2 levels, solid and flashing, flashing indicates a more severe fault. FLASHING: SPN – 3038, 3040 & 3041 SOLID: SPN - 624 & 987
12	**ENGINE HOURS**	Monitors the engine total hours of operation SPN – 247
13	**ACTIVE ALARM**	Symbol will flash when there is an active alarm, Machine key on/off will be required to clear the symbol once fault has been fixed.
14	**FUEL CONTAMINATION LAMP**	RED – Engine Fuel Filter has detected contamination (Water/Dirt) SPN – 97
15	**ENGINE TEMPERATURE LAMP**	RED – Engine temperature High SPN – 110

* The SPN number indicates the fault code.

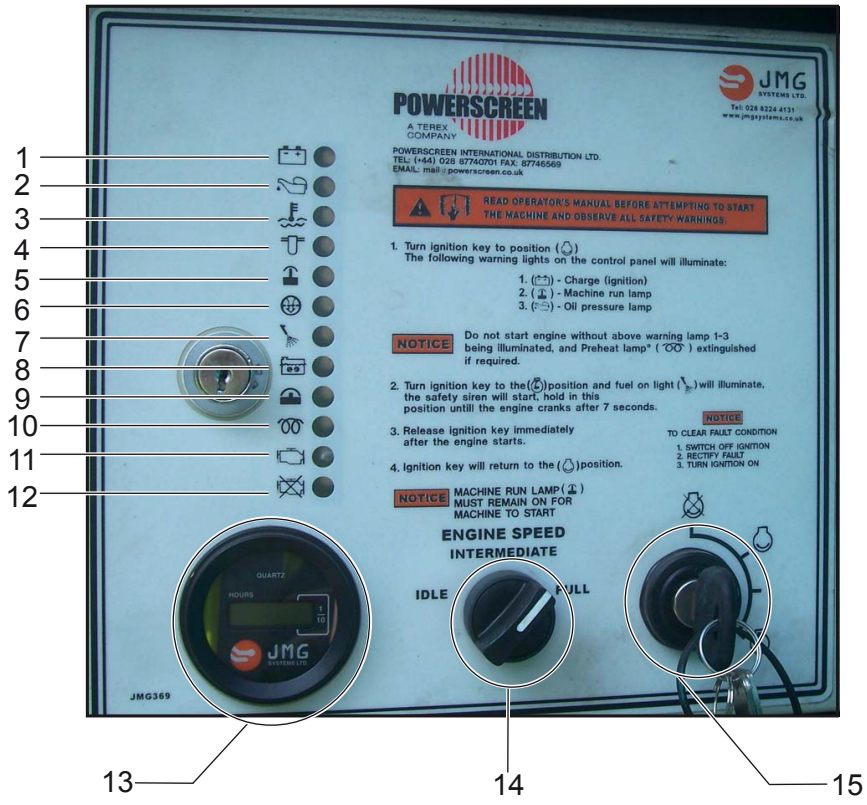
The control panel also displays an engine fault screen (Figure 4.26) if there is a problem with the engine.

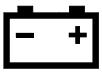


Figure 4.26 - Engine Fault Screen

Refer to the table in Section 10.10 for a list of the engine fault codes. Refer to the engine manufacturer's manual or your local dealer for more information.

(2) Control Panel



ID	Symbol	Name	Description
1		Battery Charging warning light	This light should illuminate when the key switch is turned to the ON position. As soon as the engine starts it should go out. If it fails to illuminate when the key is turned on, or if it illuminates when the engine is running, it indicates that there is a fault in the charging circuit. Stop the engine and have the circuit checked.
2		Oil Pressure Warning Light	This light should illuminate when the key switch is turned to the ON position. As soon as the engine starts it should go out. If a fault occurs in the oil pressure system the engine will shutdown after 2 seconds.
3		Coolant Temperature Warning Light	This light will only illuminate if a problem occurs in the coolant system, such as low water level. The engine will shut down 5 seconds after the fault has been detected.
4		Fuel contamination light	This light illuminates if a problem occurs in the fuel system, such as water contamination. The engine will shut down 1 second after the fault has been detected.
5		Engine Run Light	This light will only illuminate when the key is turned to the ON position and will remain on at all times. If it goes out then an E-Stop has been pressed and the engine will shut down immediately.

ID	Symbol	Name	Description
6		Air Breather Restriction Warning Light	This light should illuminate if a problem occurs in the air breather system. After 30 minutes the engine will shut down. The light will remain on until the fault has been repaired.
7		Fuel On Light	This light should illuminate when the engine starts and will remain on at all times. It will go out when the engine has been shut down.
8		Hydraulic Oil Level Warning Light (not shown)	This light will only illuminate if the hydraulic oil level is low. The engine will shut down 5 seconds after the fault has been detected.
9		E-Stop Activated Light	This light will only illuminate when an E-Stop has been pressed. This will immediately shut down the engine. If the light is flashing after shut down, this indicates that the manual tracking umbilical E-Stop has been pressed. If the light remains on constantly then another E-Stop has been pressed.
10		Engine Pre-Heater Indicator Light	This light only illuminates when the pre-heat button is operated during start up.
11		CAT Warning Light	This light will only illuminate when the Caterpillar engine or Caterpillar component has developed a problem. This can result in an engine shut down. In the event of a fault causing this light to illuminate you should contact your local Caterpillar dealer for further information.
12		CAT ECU Warning Light	This light will only illuminate when the Caterpillar engine control unit detects a problem. This can result in an engine shut down. In the event of a fault causing this light to illuminate you should contact your local Caterpillar dealer for further information.
13		Hour Clock	This will record the number of hours that the engine has been running.
14		Throttle Control/ Two-speed tracking	This is used to control the engine throttle by selecting one of the 3 speeds. On constant speed machines there is no throttle switch, instead it is a two-speed tracking switch.
15		Key Start Switch	This is used to start the engine when required.

(a) Engine Pre-Heat

If an engine pre-heat sequence was installed to the control panel during manufacture, it will be either automatic or manual.

If it is automatic then the pre-heat light will illuminate when the key is turned to the start position (Item 3), Ref: Figure 4.27. The engine will crank automatically once the pre-heat operation has been completed and the light will go out.

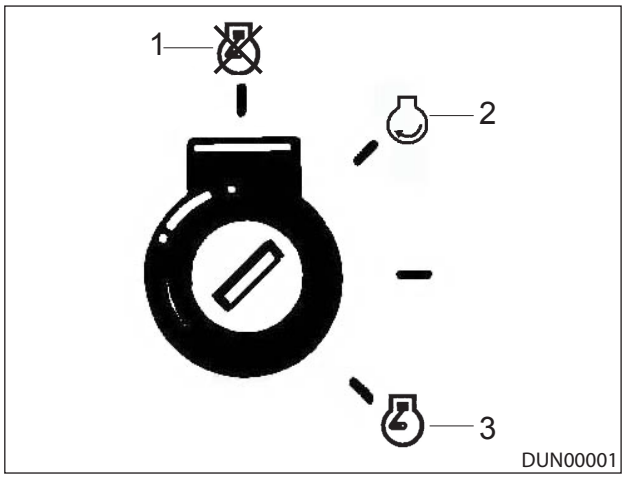


Figure 4.27 - Ignition Key Positions

If manual pre-heat has been fitted then the light will illuminate when the key is turned to the pre-heat position. The engine can be manually preheated by holding in the preheat button (Item 1) on the side of the control panel, Ref: Figure 4.28. The light will extinguish after the preheat operation has been completed and the key can be turned to the start position to crank the engine.

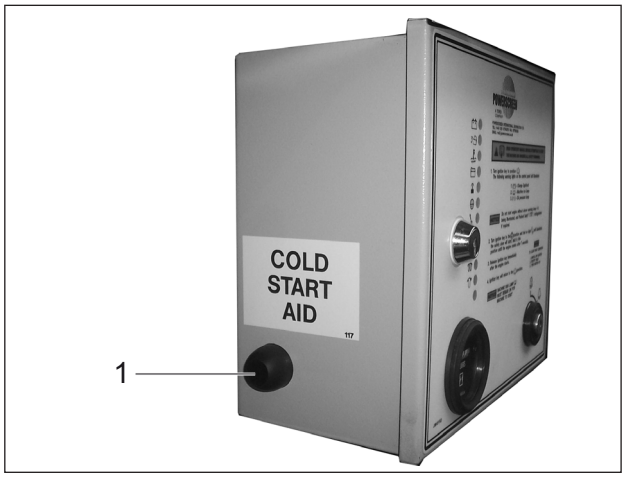


Figure 4.28 - Engine Pre Heat Button

(3) Tracking Controls

Figure 4.29 below shows the Manual Tracking Umbilical Layout.

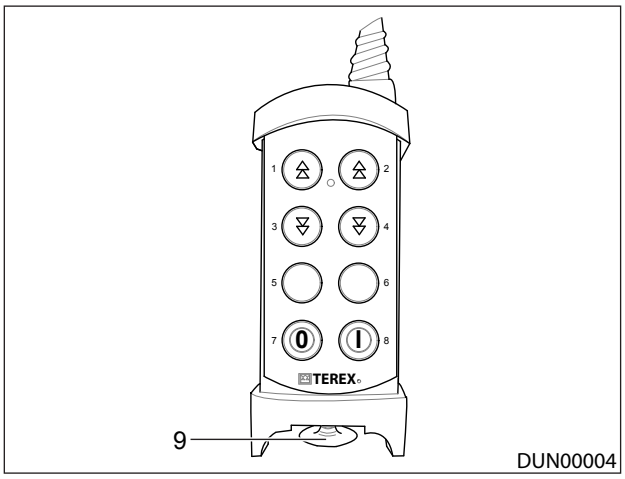


Figure 4.29 - Tracking Umbilical Layout

Table 4.2 below gives a description of each button on the Umbilical shown above

Table 4.2 - Tracking Umbilical Layout

ID	Description
1	Left Track Forward
2	Right Track Forward
3	Left Track Reverse
4	Right Track Reverse
5	Unused
6	Unused
7	Stop Tracks
8	Start Tracks
9	Machine Stop

(4) Radio Tracking System

The radio control unit consists of a receiver and a hand held, battery powered radio control unit. It is only fitted to track machines as an optional extra.

Figure 4.30 below shows the Radio Tracking Transmitter Layout.

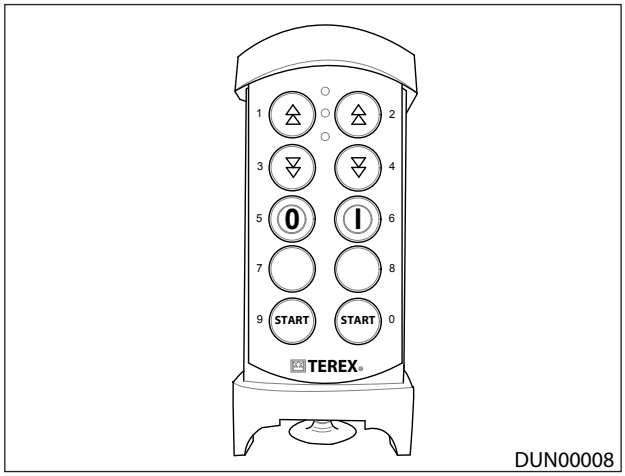


Figure 4.30 - Radio Tracking Transmitter Layout

Table 4.3 below gives a description of each button on the radio tracking unit shown above

Table 4.3 - Radio Tracking System Layout

ID	Description
1	Left Track Forward
2	Right Track Forward
3	Left Track Reverse
4	Right Track Reverse
5	Stop Tracks
6	Start Tracks
7	Unused
8	Unused
9	Radio Start Button 1
0	Radio Start Button 2

(5) Teleradio Radio Remote Tracking Kit

Figure 4.31 below shows the Teleradio Radio Remote Tracking transmitter layout.

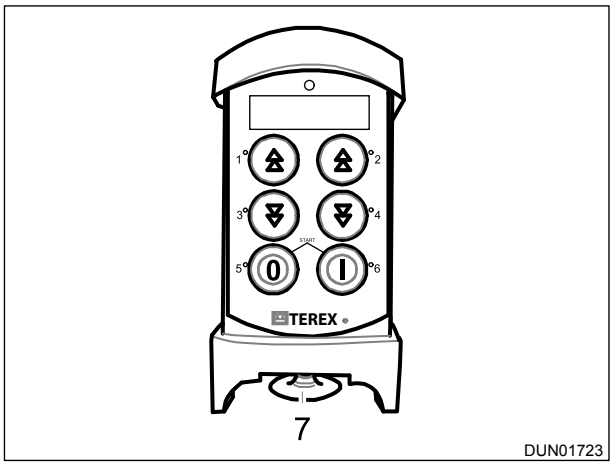


Figure 4.31 - Radio Remote Tracking Layout.

Table 4.4 below gives a description of each button on the Radio Remote Tracking transmitter shown above.

Table 4.4 - Radio Remote Tracking

ID	Description
1	Left Track Forward
2	Right Track Forward
3	Left Track Reverse
4	Right Track Reverse
5	Stop Tracks
6	Start Tracks
7	Machine Stop

(6) Tier 4 Dual Power

(a) Control Panel Component Identification

Figure 4.32 below shows the dual power control panel as used on mobile machines. Control panels may vary.

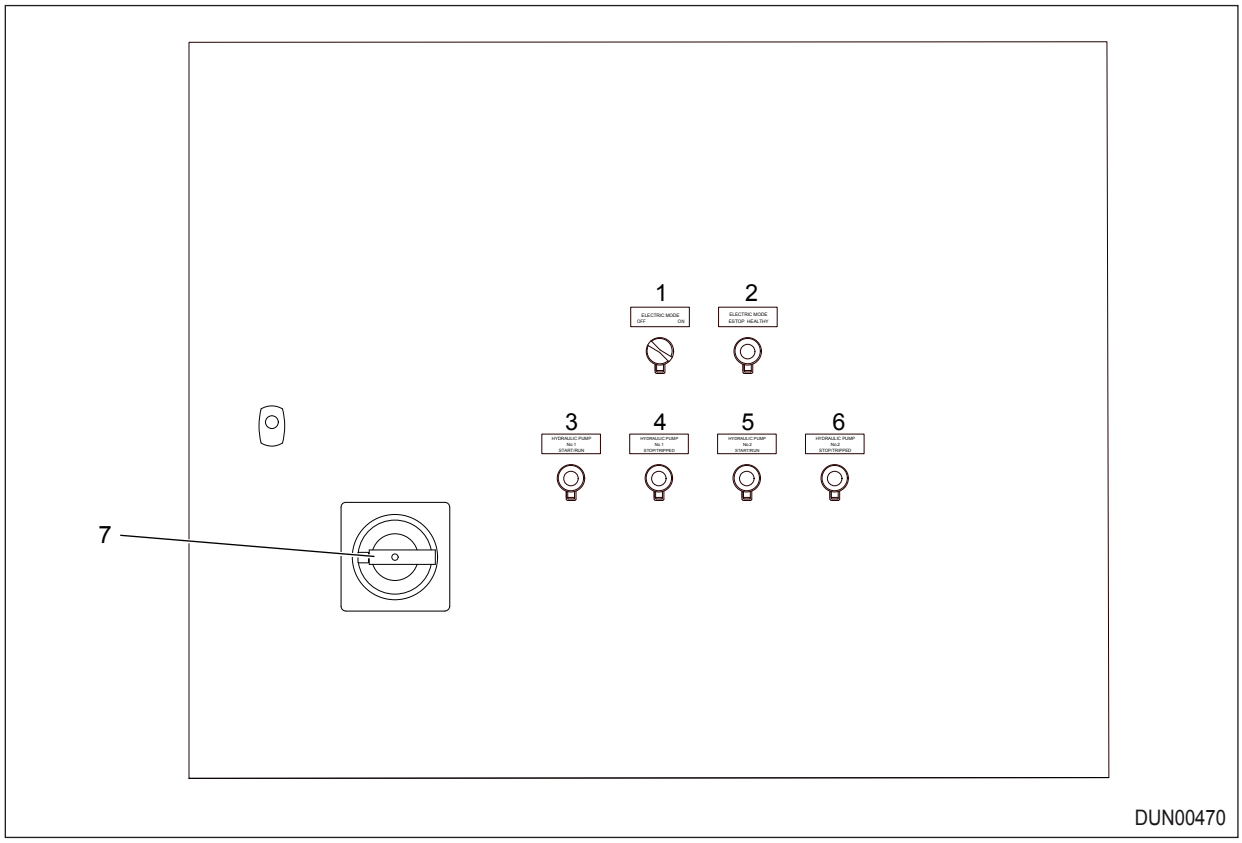


Figure 4.32 - Tier 4 Dual Power Control Panel

Table 4.5 below gives the description of the various switches and lamps on the tier 4 dual power control panel door.

Table 4.5 - Tier 4 Dual Power Control Panel Door Component Identification

ID	Description
1	Electric mode ON/OFF switch
2	Electric mode E-stop healthy
3	Hydraulic pump No. 1 Running
4	Hydraulic pump No. 1 Tripped
5	Hydraulic pump No. 2 Running
6	Hydraulic pump No. 2 Tripped
7	Main Isolator Switch

(7) Tier 3 Dual Power

(a) Control Panel Component Identification

Figure 4.33 below shows the Powerscreen control panel as used on the Powerscreen H6203 Dual Power machines.

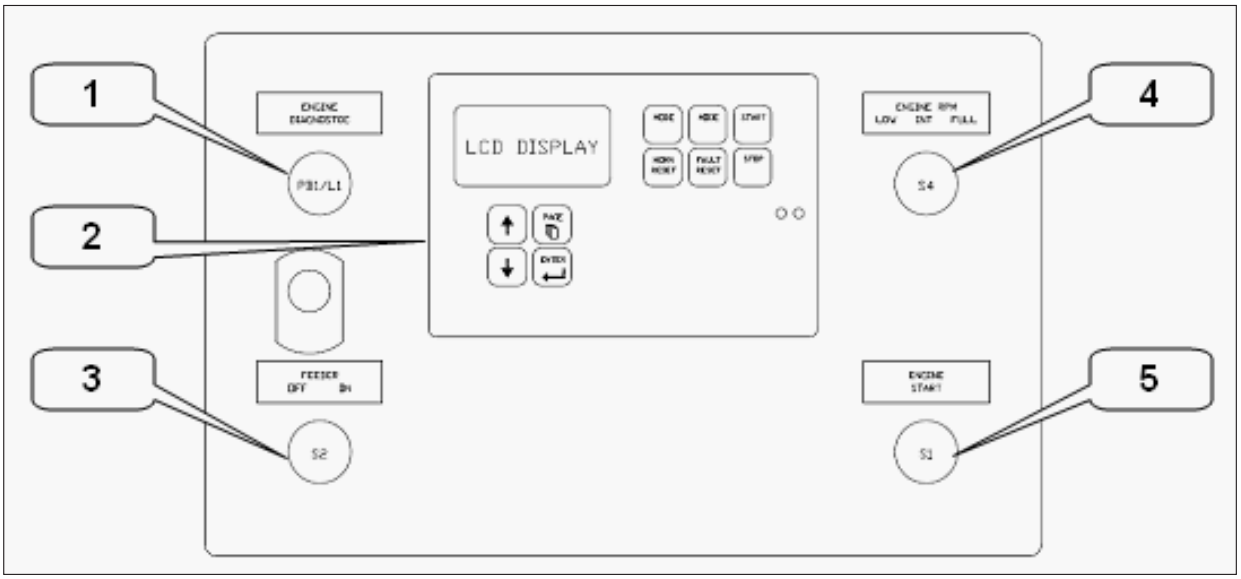


Figure 4.33 - H6203 All Ranges Control Panel

Table 4.6 gives the description of the various switches and lamps on the dual power control panel door.

Table 4.6 - Description of the Switches and Lamps on the Dual Power Control Panel Door

ID	Description	Function
1	Engine Diagnostic Button/Lamp	Display Engine Fault Flash Code
2	MCU200 Controller	Engine Control
3	Feeder Start/Stop Switch	Enable/Disable Feeder
4	Engine Speed Selection Switch	Select Engine Speed–3 Set points
5	Ignition Switch	Switch On Panel/Crank Engine

(b) Control Panel Internal Component Identification

Figure 4.34 shows the internal component layout in the H6203 Dual power control panel.

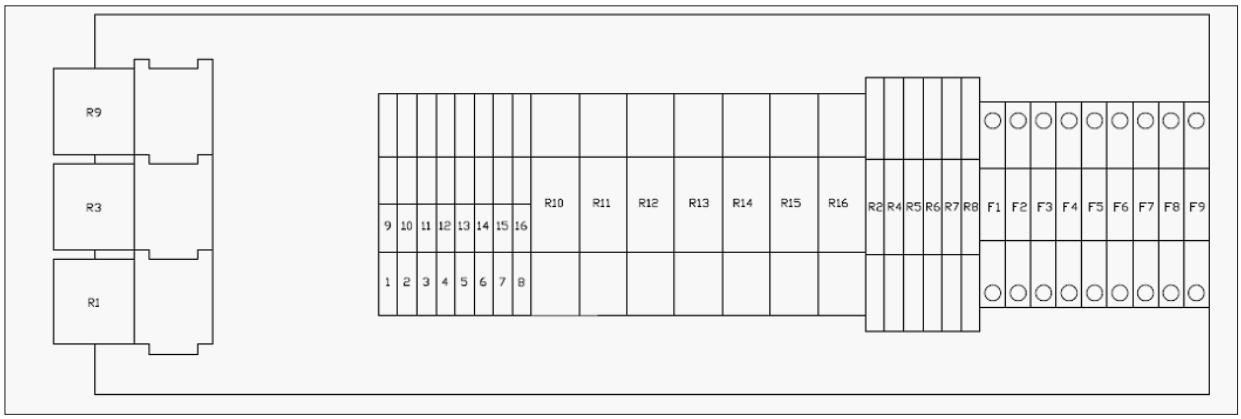


Figure 4.34 - H6203 Dual Power Control Panel Internal Component Layout

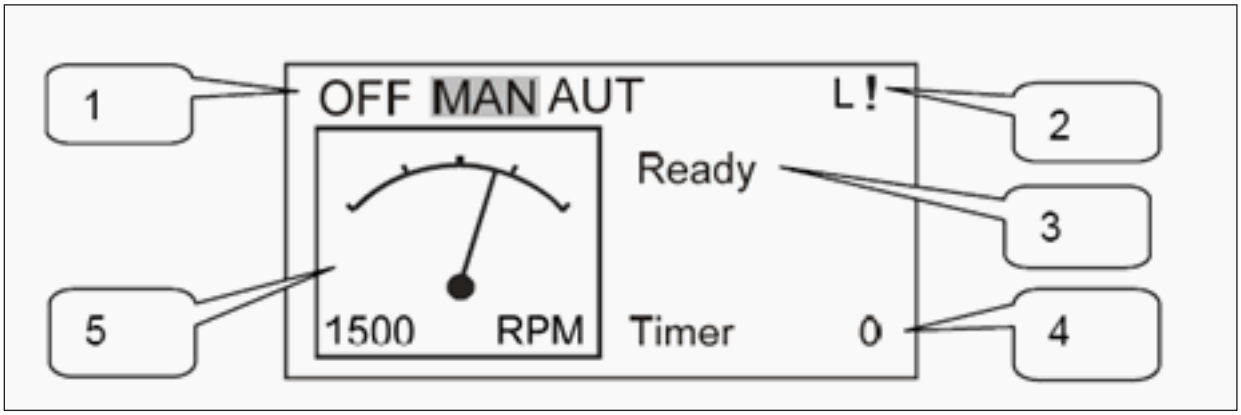
Table 4.7 gives the description of the internal components used on the dual power control panel.

Table 4.7 - Description of the Internal Components Used in the H6203 Range Control Panel

ID	Description
1	Track Umbilical Terminal No.1
2	Track Umbilical Terminal No.2
3	Track Umbilical Terminal No.3
4	Track Umbilical Terminal No.4
5	Track Umbilical Terminal No.5
6	Track Umbilical Terminal No.6
7	Track Umbilical Terminal No.7
8	Track Umbilical Terminal No.8
9	Track Umbilical Terminal No.9
10	Track Umbilical Terminal No.10
11	Track Umbilical Terminal No.11
12	Track Umbilical Terminal No.12
13	Track Umbilical Terminal No.13
14	Track Umbilical Terminal No.14
15	Track Umbilical Terminal No.15
16	Track Umbilical Terminal No.16
17	Remote feeder start / stop supply to receiver Terminal No.17
18	Remote feeder start / stop return from receiver Terminal No.18
R1	Starter Relay
R2	ECU Ignition Relay
R3	Cooling Fans Relay
R4	Siren / Beacon Relay
R5	Tracks Enabled Relay
R6	E Stop Relay
R7	Key Start Relay
R8	Feeder Relay
R9	Deutz Engine Main Relay
R10	Left Track Forward Relay
R11	Right Track Forward Relay
R12	Left Track Reverse Relay
R13	Right Track Reverse Relay
R14	Fast Track Relay
R15	Radio Latch Relay
R16	Aux Conveyor Relay
F1	Control Circuit Fuse
F2	Sensor Supply Fuse
F3	Tracks Fuse
F4	Starter Fuse
F5	ECU Ignition Fuse
F6	ECU Power Fuse
F7	Siren / Beacon / Feeder Fuse
F8	Cooling Fan 1 Fuse
F9	Cooling Fan 2 Fuse
F10	ECU Power Fuse

(c) Measurement Screens

Main Measurement Screen / Home Screen



Number	Description
1	Operation Mode of Engine
2	Indication: L=Access Lock,! = Active Alarm
3	Status of Control System
4	Timer – events counting time (Prestart, Crank Pause etc)
5	Engine RPM

Analogue Inputs Screen

This screen shows the status of the analogue inputs, where used

- Oil Pressure Bar graph with Protection (Shutdown) Limits shown
- Water Temperature Bar graph with Protection (Shutdown) Limits shown
- Fuel Level Bar graph with Protection (Shutdown) Limits shown
- Battery Voltage Bar graph with Protection (Shutdown) Limits shown

NOTICE

Depending on application, some or all of the above may be unavailable

All binary inputs and outputs are Negative Switching. Therefore a 0VDC input is interpreted as ON and the outputs switch 0VDC out

Binary Inputs Screen

This screen shows the status of the Binary Inputs as a ‘1’ for ON or a ‘0’ for OFF

- Emergency Stop
- Pressure Setpoint 1
- Pressure Setpoint 2
- Start Feeder
- Tracks Request
- Remote Start (Ignition Crank)

Binary Outputs Screen

This screen shows the status of the Binary Outputs as a ‘1’ for ON or a ‘0’ for OFF

- Starter Solenoid
- Fuel Solenoid / ECU On
- Cooling Fans
- Siren / Beacon
- Tracks
- ECU Ready

ECU State Screen

This screen gives the status of the ECU when used with electronic engines

- ECU Yellow Lamp
- ECU Red Lamp
- ECU Wait to Start

Statistics Screen

This screen gives an overview of the key statistics as follows:

- Run Hours — Total Engine Run Hours
- Number of Starts — Total Start Attempts
- E Stop — Total Emergency Stop Events
- Shutdown — Total Engine Shutdown Stops (excluding E-Stops)
- Next Service Time — Hours remaining until Next Service is due

ECU Alarm List

Diagnostic messages are read from the ECU and displayed in this second alarm list The J1939 standards of SPN (Suspect Parameter Number), OC (Occurrence Count) and FMI (Failure Mode Identifier) are shown together with a text description if available

The following image shows typical ECU alarms being displayed on this second alarm list. As you scroll down through the list, the additional information for that alarm (SPN, OC and FMI) are displayed at the bottom of the page

If no test description is available, the SPN will be given in decimal and Hex.

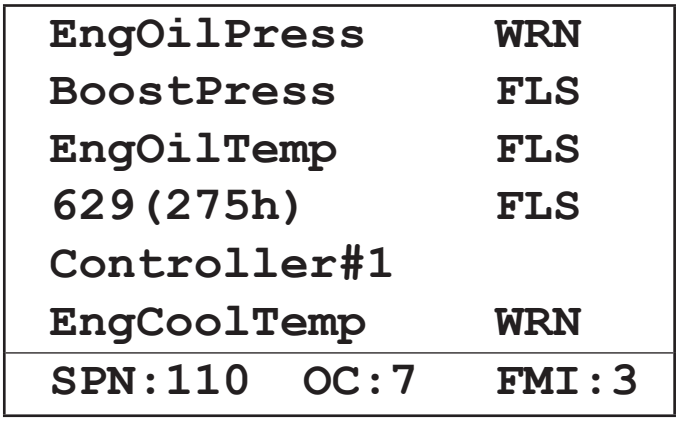


Figure 4.35 - ECU Alarm List Screen

Standard Alarm List

This screen as detailed earlier displays active or inactive alarms. This screen will de displayed automatically when any new alarm appears, but only from the Main Measure (Home) screen

(d) Alarm Management

There are two types of Alarm displayed:

- Warning
- Shutdown

Warning (WRN)

When a Warning Alarm is activated, the engine will not shutdown but the Alarm LED will be Red and the fault will be displayed on the screen. This type of alarm is noncritical

Shutdown (SD)

When a Shutdown alarm is activated, the Fuel Solenoid, Starter and Prestart outputs are opened immediately causing the engine to shut down.

List of Possible Alarms

Event Specification	Alarm Type	Description
Overspeed	SD	Engine RPM is greater than ***Overspeed setpoint***
Underspeed	SD	Engine RPM is lower than ***Underspeed setpoint***
EmergencyStop	SD	Emergency Stop Input is Open
LowCoolantLvl	SD	Low Coolant Level input is closed for 3 seconds or more
LowHydOilLvl	SD	Low Hydraulic Oil Input is closed for 3 seconds or more
AirFilterRest	SD	Airfilter Restriction Input is closed for 30 minutes or more
FuelContam	SD	Fuel Contamination Input is closed for 3 seconds or more
Sd OilPressure	SD	Oil Pressure Input is closed for 3 seconds or more when engine is running
Sd EngineTemp engine is running	SD	Engine Temperature Input is closed for 3 seconds or more when engine is running
PickupFault	SD	No RPM Reading from Magnetic Pickup or Alternator W+ terminal
StopFail	SD	Engine Failed to Stop
WrnServiceTime	WRN	Engine Run Hours reach the value in the ***NextServTime*** setpoint
ChrgAlternFail	WRN	Failure of Alternator to charge the battery
Wrn ECU Alarm	WRN	ECU Alarm List has an active fault
Low BackupBatt	WRN	Real time Clock internal battery is low
Ubatt	WRN	Battery Voltage is outside limits set in ***Batt Overvolt*** and ***Batt Undervolt*** setpoints
Start Failed	SD	Engine Failed to start
Battery Flat	WRN	Controller shutdown due to low battery voltage

Powerscreen MCU200 States

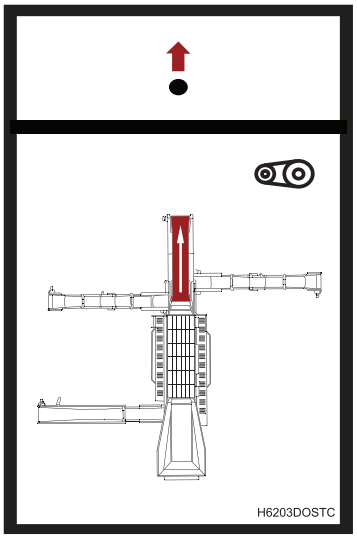
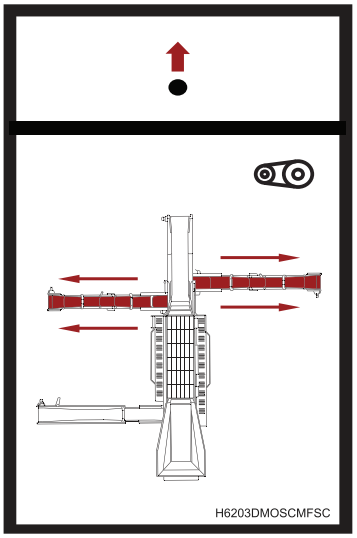
State	Description
Init	Auto Test During Power-Up
Not Ready	Engine Not Ready to start
Prestart	Prestart sequence in process
Cranking	Engine is Cranking
Pause	Pause between start attempts
Starting	Starting Speed is reached
Running	Engine is running at nominal speed
Stop	Engine is stopped
Shutdown	Shut Down alarm is activated
Ready	Engine is ready to run
Cooling	Engine is cooling before stop

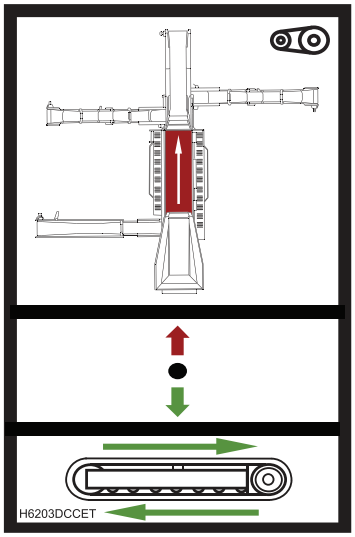
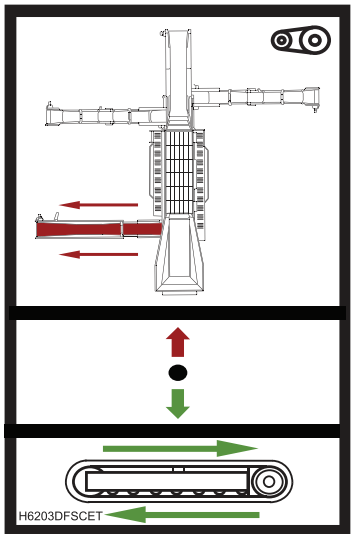
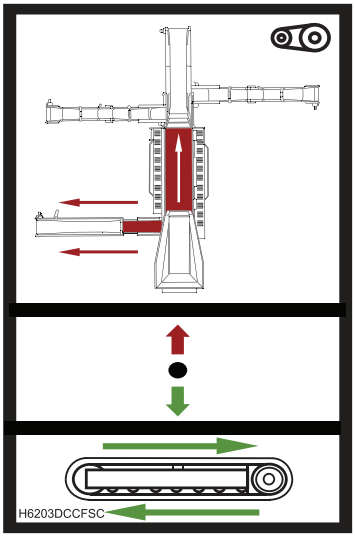
4.5 Pictorial Decal Descriptions

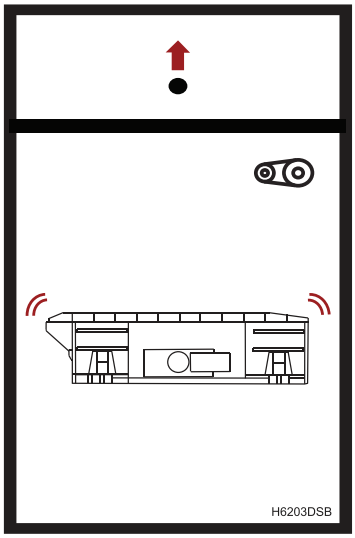
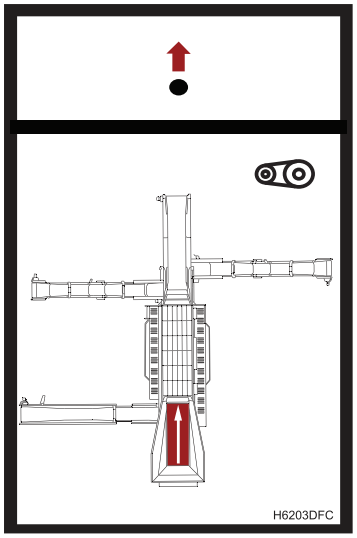
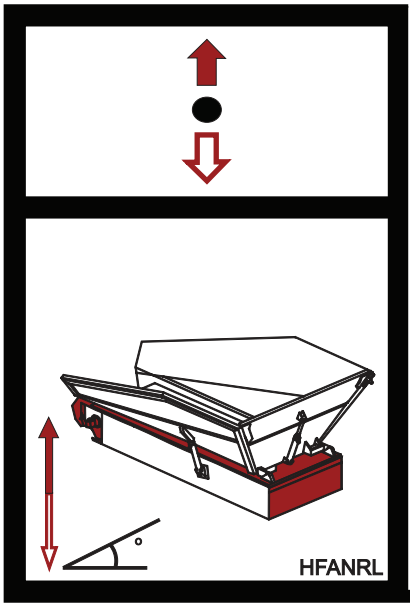
Pictorial decals have been placed on the machine to ensure that the machine is correctly operated and maintained. Operations decals describe the operations of levers on the machine. Information decals give details about how to correctly operate and maintain the machine.

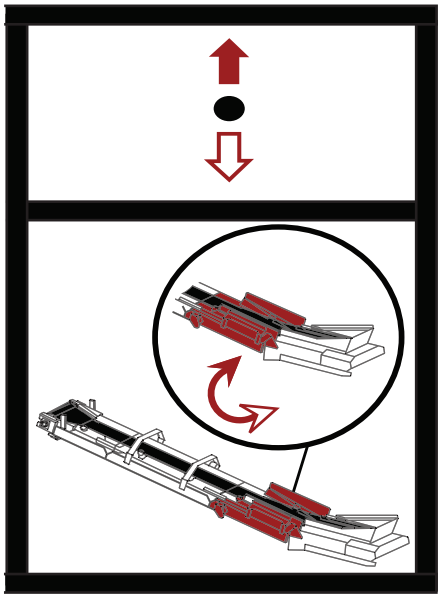
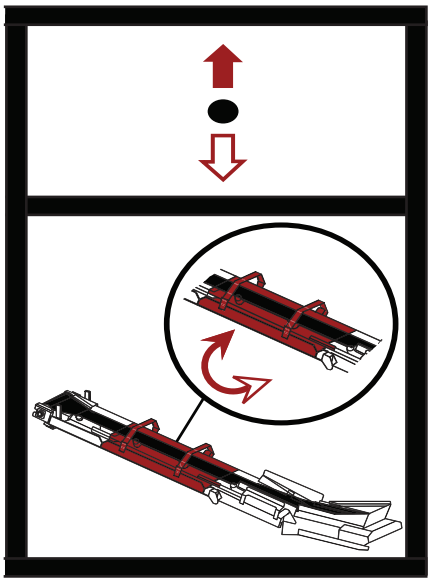
(1) Machine Operations Decals

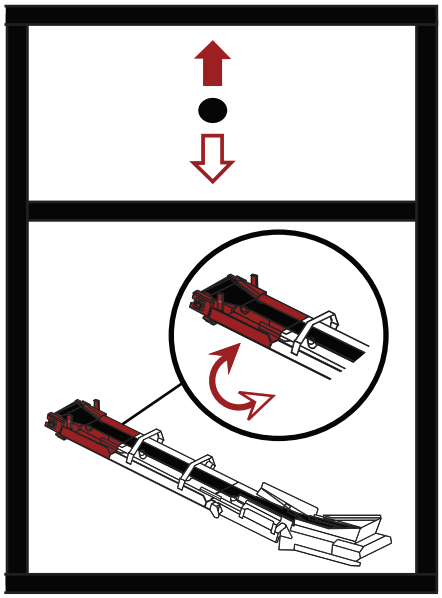
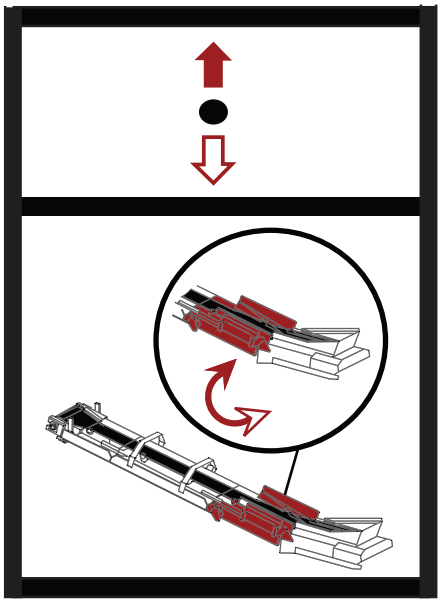
Each operation decal is placed on the machine beside the corresponding lever or control. The following tables give short explanations of each operation decal used on the machine. The up arrow in the decals indicates moving the lever forward or up. The circle in the decals indicates the neutral position. The down arrow in the decals indicates moving the lever back or down. The new 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.

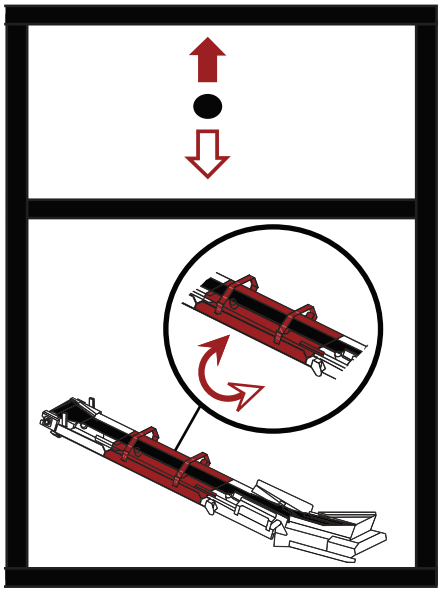
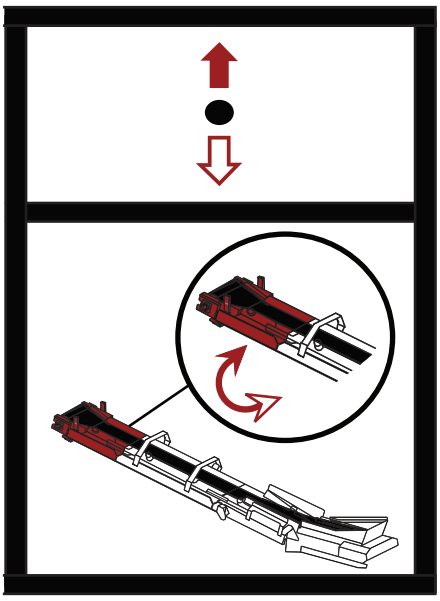
Decal	Explanation	
	⬆	Drive tail conveyor
	●	Hold
	⬆	Drive mid fines side and mid oversize side conveyors
	●	Hold

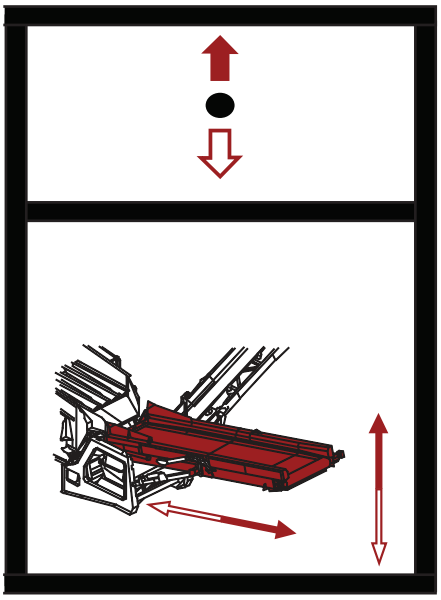
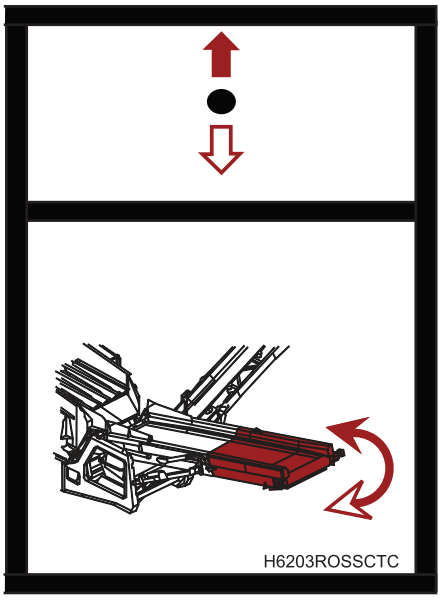
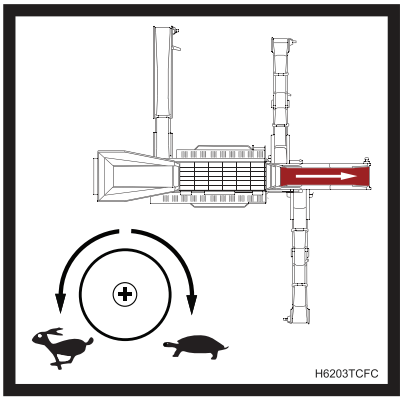
Decal	Explanation	
	↑	Drive collection conveyor
	●	Hold
	↓	Engage tracks
	↑	Drive fines side conveyor
	●	Hold
	↓	Engage tracks
	↑	Drive collection conveyor and fines side conveyor
	●	Hold
	↓	Engage tracks

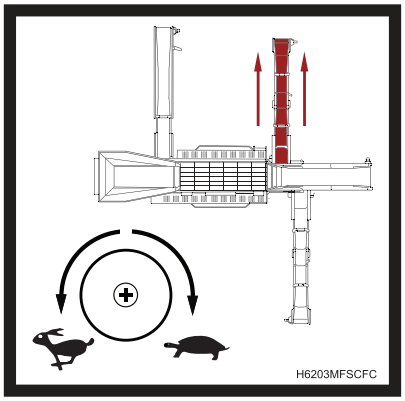
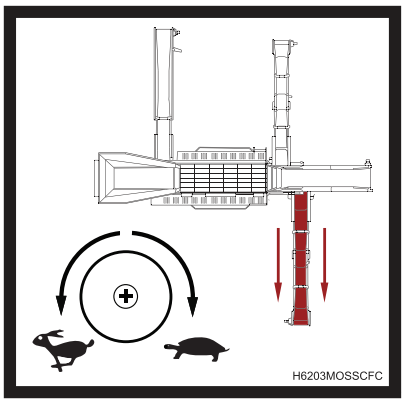
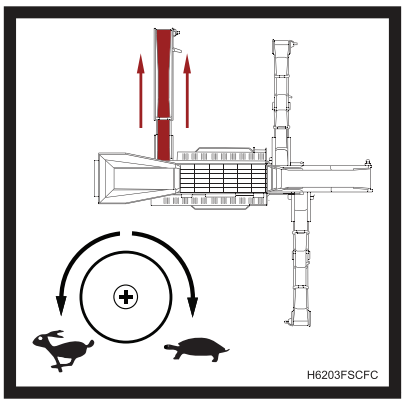
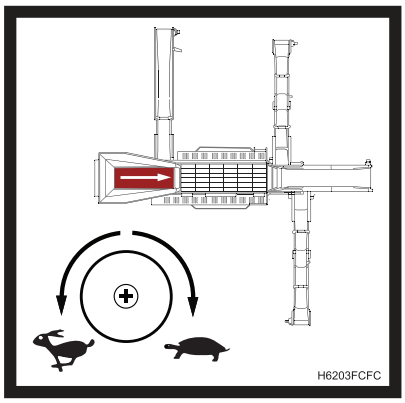
Decal	Explanation	
	⬆	Drive screenbox
	●	Hold
	⬆	Drive feeder
	●	Hold
	⬆	Raise feeder angle
	●	Hold
	⇩	Lower feeder angle

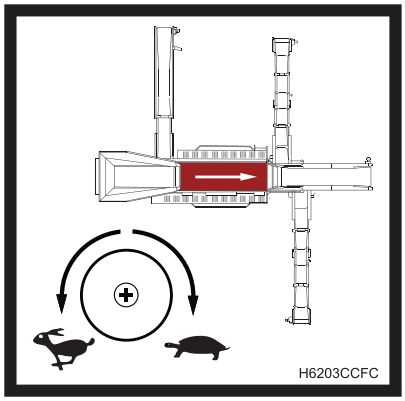
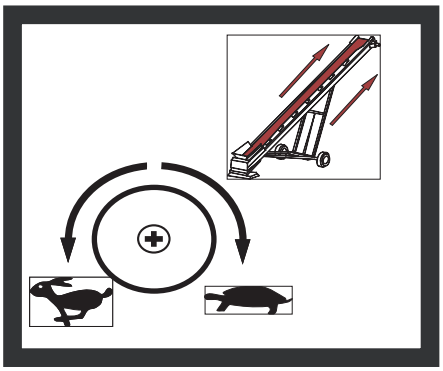
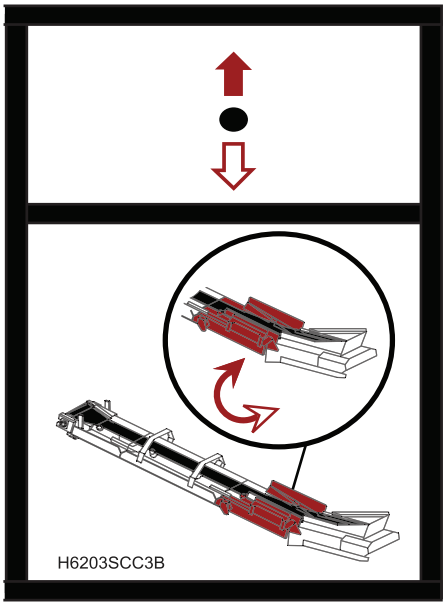
Decal	Explanation	
	⬆	Raise mid fines conveyor angle
	●	Hold
	⇩	Lower mid fines conveyor angle
	⬆	Fold in mid fines conveyor middle section
	●	Hold
	⇩	Fold out mid fines conveyor middle section

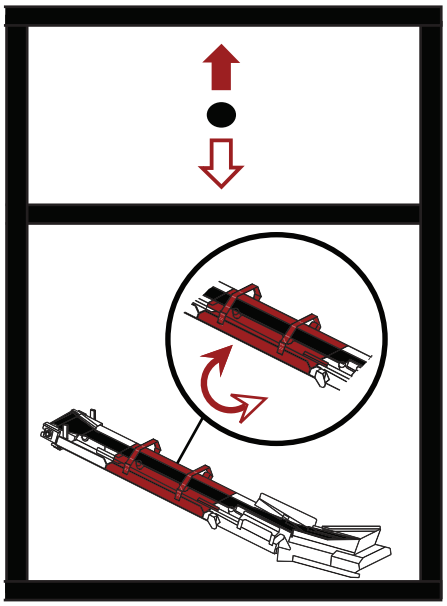
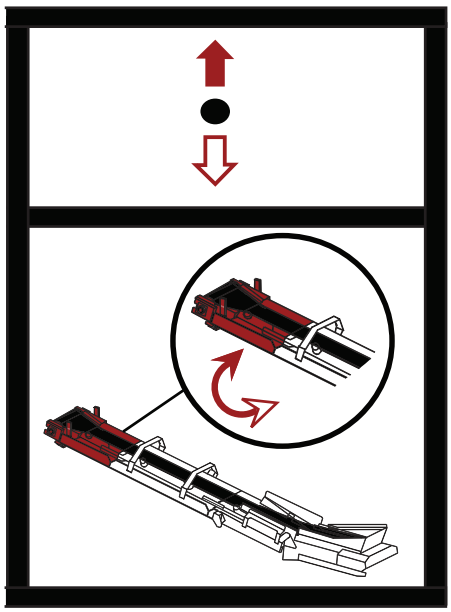
Decal	Explanation	
	⬆	Fold in mid fines conveyor end section-
	●	Hold
	⇩	Fold out mid fines conveyor end section
	⬆	Raise oversize side conveyor angle
	●	Hold
	⇩	Lower oversize side conveyor angle

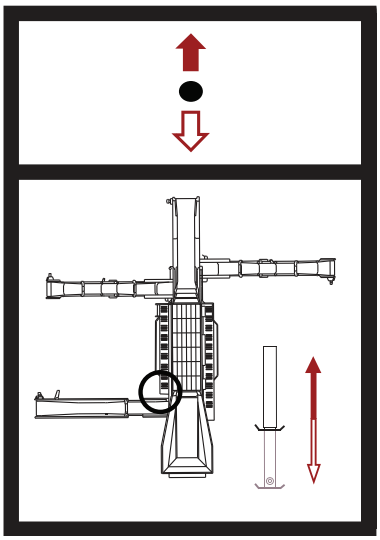
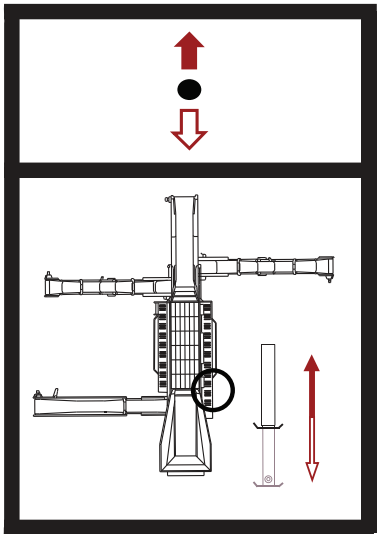
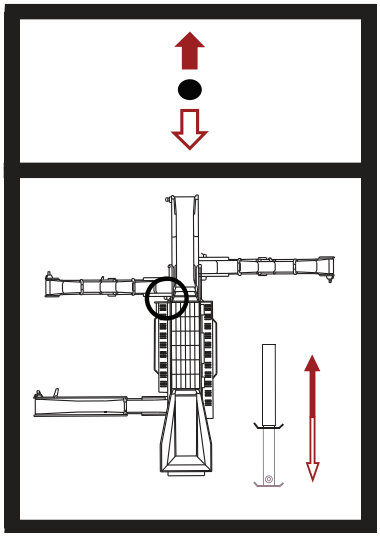
Decal	Explanation	
	⇧	Fold in oversize side conveyor middle section
	●	Hold
	⇩	Fold out oversize side conveyor middle section
	⇧	Fold in oversize side conveyor end section
	●	Hold
	⇩	Fold out oversize side conveyor end section

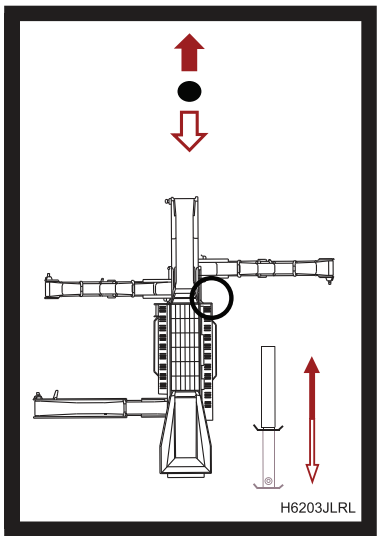
Decal	Explanation	
	⇧	Raise tail conveyor
	●	Hold
	⇩	Lower tail conveyor
	⇧	Fold tail conveyor head section
	●	Hold
	⇩	Unfold tail conveyor head section
	Turn the flow control valve clockwise to decrease the tail conveyor speed.	
	Turn the flow control valve anti-clockwise to increase the tail conveyor speed.	

Decal	Explanation
	Turn the flow control valve clockwise to decrease the mid-fines side conveyor speed.
	Turn the flow control valve anti-clockwise to increase mid-fines side conveyor speed.
	Turn the flow control valve clockwise to decrease the oversize conveyor speed.
	Turn the flow control valve anti-clockwise to increase the oversize conveyor speed.
	Turn the flow control valve clockwise to decrease the fines side conveyor speed.
	Turn the flow control valve anti-clockwise to increase the fines side conveyor speed.
	Turn the flow control valve clockwise to decrease the feeder conveyor speed.
	Turn the flow control valve anti-clockwise to increase the feeder conveyor speed.

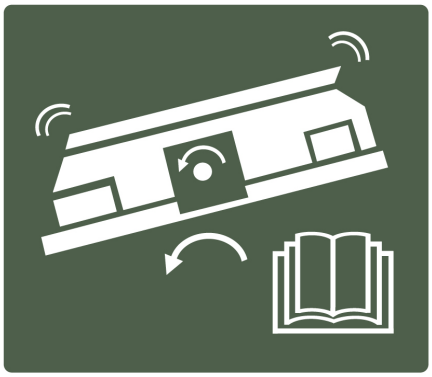
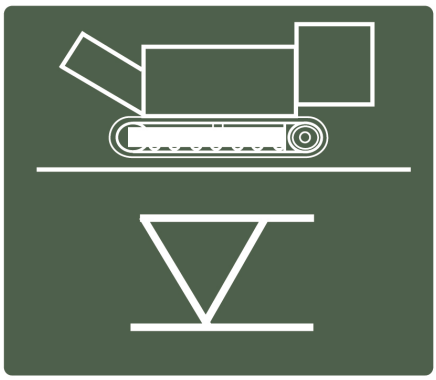
<table>
<tr><th>Decal</th><th colspan="2">Explanation</th></tr>
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</td><td colspan="2">Turn the flow control valve clockwise to decrease the collection conveyor speed.</td></tr>
<tr><td colspan="2">Turn the flow control valve anti-clockwise to increase the collection conveyor speed.</td></tr>
<tr><td rowspan="2">  </td><td colspan="2">Turn the flow control valve clockwise to decrease auxiliary (extra coupling) conveyor speed.</td></tr>
<tr><td colspan="2">Turn the flow control valve anti-clockwise to increase auxiliary (extra coupling) conveyor speed.</td></tr>
<tr><td rowspan="3"> 
</td><td>⬆</td><td>Raise Side conveyor angle</td></tr>
<tr><td>●</td><td>Hold</td></tr>
<tr><td>⇩</td><td>Lower Side conveyor angle</td></tr>
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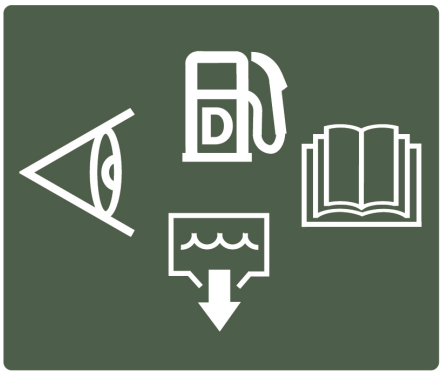
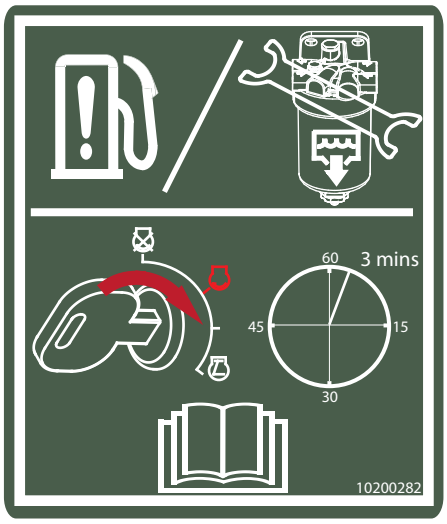
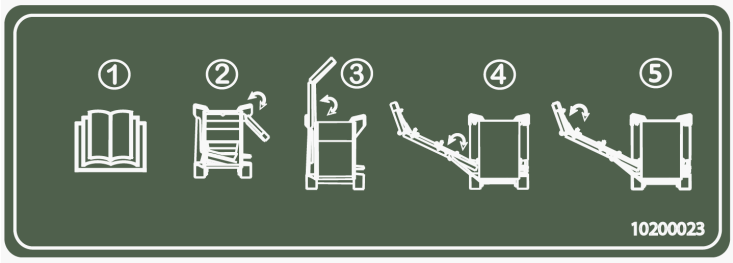
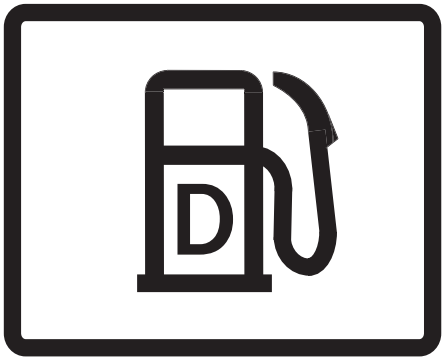
Decal	Explanation	
	⇧	Fold in Side conveyor middle section
	●	Hold
	⇩	Fold out conveyor middle section
	⇧	Fold in side conveyor end section
	●	Hold
	⇩	Fold out side conveyor end section

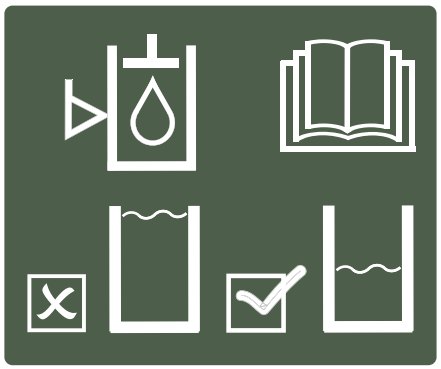
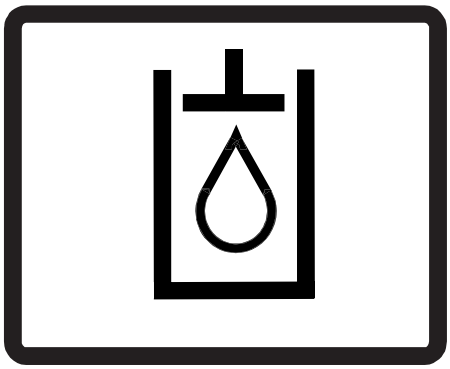
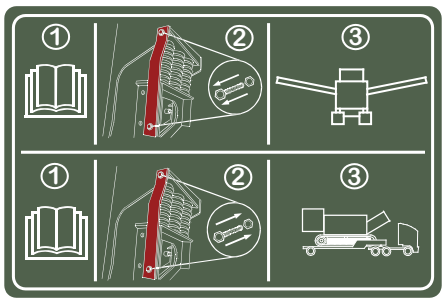
Decal	Explanation	
	⇧	Raise back jacking legs-left hand side
	●	Hold
	⇩	Lower back jacking legs-left hand side
	⇧	Raise back jacking legs-right hand side
	●	Hold
	⇩	Lower back jacking legs-right hand side
	⇧	Raise front jacking legs left hand side
	●	Hold
	⇩	Lower front jacking legs left hand side

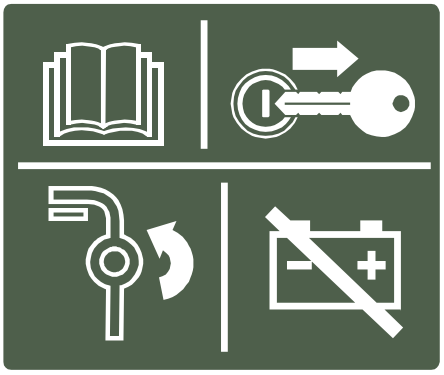
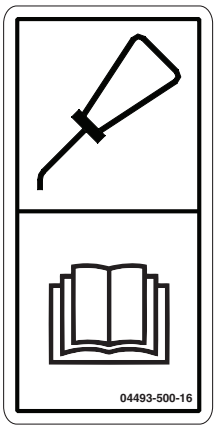
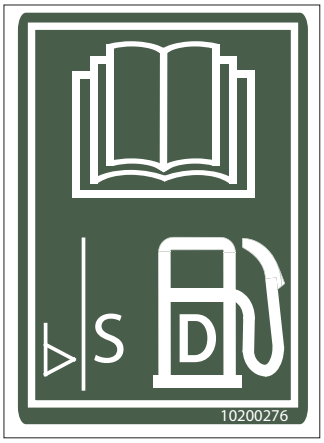
Decal	Explanation	
	⬆	Raise front jacking legs right hand side
	●	Hold
	⇩	Lower front jacking legs right hand side

Information Decals

Decal	Explanation
	Screenbox Speed
	IMPORTANT Machine must be Level at all times

Decal	Explanation
	IMPORTANT Check and drain diesel/watertrap daily
	If the fuel supply is interrupted (e.g. fuel level low, water trap maintenance or burst hose) the engine should be primed for 3 minutes before startup by turning the ignition key to the on position as shown.
	IMPORTANT Conveyor Unfolding 1. Read Operations Manuals 2. Fold Out Head Section Fully 3. Fold Middle Lower Section Fully 4. Fold Lower Section Fully 5. Fold Out Head Section Fully
	Diesel oil

Decal	Explanation
	Hydraulic oil capacity
	Hydraulic oil
	Engine oil only
	IMPORTANT Screen anti-rock stays must be removed before operating machine

Decal	Explanation
	Battery isolator switch
	Oil lubrication is required for the operation of this equipment. Refer to manuals for instructions.
	Use ultra low sulfur fuel only. (Tier 4 engines)

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Table of Content

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5 Transportation

5.1 Prior to Transportation

⚠ CAUTION

Prior to transportation always check the machine for loose or damaged components. Ensure 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.

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 wheeled machine:

Ensure wheel nuts are torqued between 500 to 550 ft.lb (69 to 76 kg.m) prior to transport. Recheck the wheel nut torque every 150 miles (200km).

Connect and check the braking system.

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.

5.2 Removing Machine from the Low Loading Trailer (Track Machine)

A tracked machine will normally be secured to a low loader trailer. If the machine has been manufactured to connect to special rear bogie, refer to the special instructions to separate the machine from its bogie.

⚠ WARNING

Wear personal protective equipment.

Ensure all personnel are clear from the machine.

NOTICE

Removing the fastenings securing the machine and any loose items from a trailer is the responsibility of the haulage contractor.

Refer to Chapter 4, for complete specification on radio/remote control units before attempting the following procedures.

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

The screen and tail conveyor must be raised to allow adequate ground clearance for the tail conveyor when the machine is being loaded or unloaded.

Care must be taken not to raise the screen too far or the conveyor will bend the walkway.

Ensure that tail conveyor does not impact on screen box or walkway when raising.

(1) Radio Control

PROCEDURE

1. Observe all safety warnings.
2. Prepare the low loading trailer, for removing the machine on tracks.
3. Make sure suitable ramps are positioned at the end of the trailer to unload the machine.
4. Start the engine, Ref: Chapter 7.
5. Move the track levers down, to activate the tracks.
6. To start remote tracking disconnect the manual handset from the machine and press any button on the transmitter.

   » After the 7 second delay has elapsed the track directional switches become active.
7. Operate the track buttons on the radio tracking control unit to move the machine off the low loading trailer, Ref: Figure 5.1.

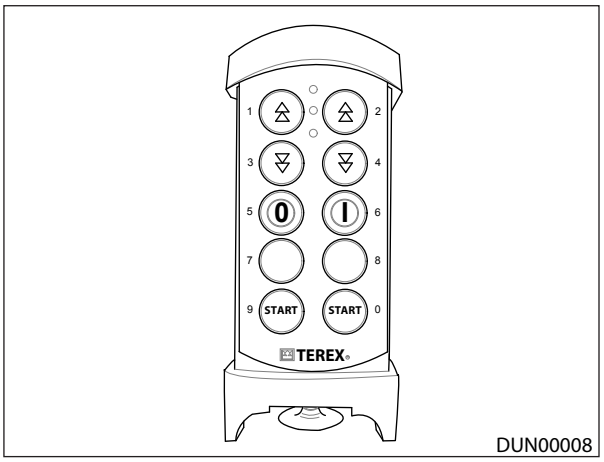


Figure 5.1 - Radio Tracking Control Unit

8. Press the forward or backward buttons (items 1 to 4), on the corresponding hand-set, to move the machine in the desired direction.
9. Unload the machine slowly off the trailer into a safe position or machine operating position,
10. Move the machine into the required position on the work site.
11. Switch off the machine

(2) Remote Control

NOTICE

Ensure all personnel are clear from the machine.

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

PROCEDURE

1. Observe all safety warnings.
2. Prepare the low loading trailer, for removing the machine on tracks.
3. Make sure suitable ramps are positioned at the end of the trailer to unload the machine.
4. Remove the dummy plug and insert the remote control unit into it‘s socket (S) at the rear of the machine, Ref: Figure 5.2.

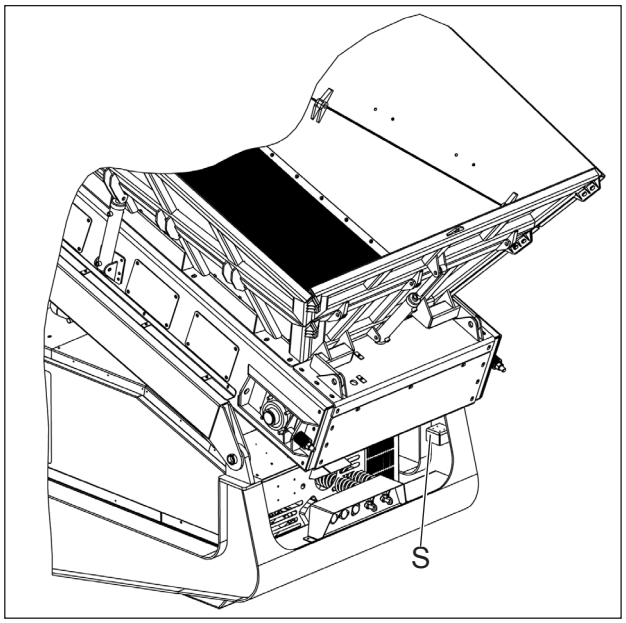


Figure 5.2 - Remote Control Socket

5. On some earlier powerscreen machines a switch was fitted to the track junction box. This switch was used to select between manual and remote tracking.
6. Move the track levers down, to activate the tracks.
7. Start the engine, Ref: Chapter 7.
8. Operate the track buttons on the remote control unit to move the machine off the low loading trailer, Ref: Figure 5.3.

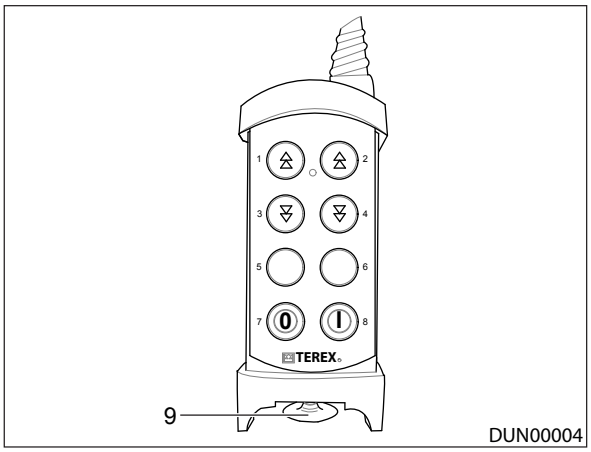


Figure 5.3 - Remote Tracking Control Unit

9. Press the forward or backward buttons, on the corresponding handset, to move the machine in the desired direction.
10. Unload the machine slowly off the trailer into a safe position or machine operating position,
11. Move the machine into the required position on the work site.
12. Switch off the machine.

(3) Teleradio Remote Control

Carry out steps 1 to 9 of the radio control procedure, Reference: Section 5.2(1). The remote will show an E-Stop fault if the machine and remote are not turned on in the correct order.

PROCEDURE

1. Remove the dummy plug (item 1) and insert the remote control unit plug into it‘s socket at the rear of the machine, Reference: Figure 5.4.

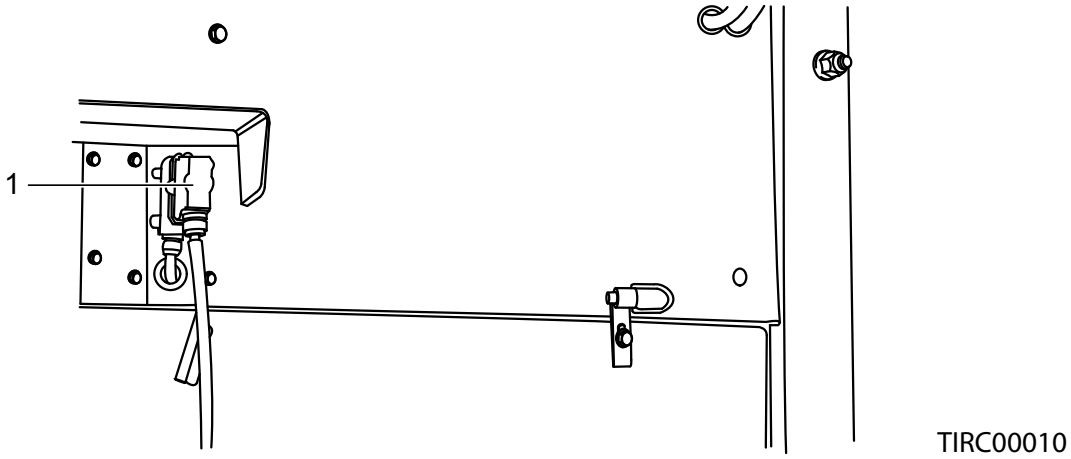


Figure 5.4 - Remote Control Unit Connection

2. Turn the transmitter on using the switch on the back.
3. Release the machine stop button (button 7) at the bottom of the transmitter, Reference: Figure 5.5.
4. Hold buttons 5 and 6 until the transmitter beeps indicating the log-in process has begun, Reference: Figure 5.5.

   » The machine siren will sound and there will be a 7 second delay before the tracks can be operated.

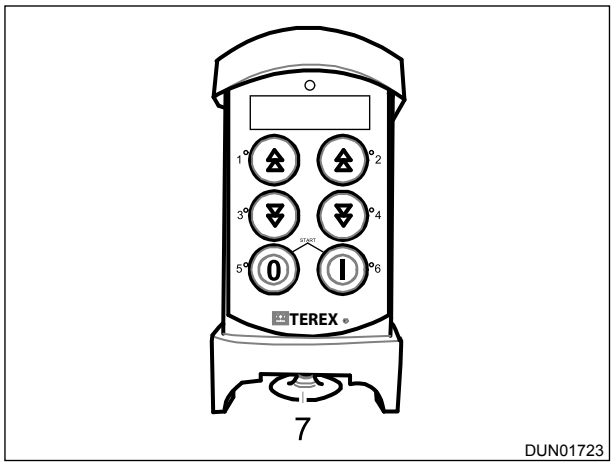


Figure 5.5 - Teleradio Remote Tracking Transmitter

5. Use buttons 1, 2, 3 and 4 to operate the tracks.
6. Unload the machine slowly off the trailer into a safe position or machine operating position.
7. Move the machine into the required position on the work site.
8. Press button 5 to disable the tracks. Press button 7 to switch off the machine, Reference: Figure 5.5.

5.3 Transportation of Tracked Machine

⚠ WARNING

Falling hazard.

Wear personal protective equipment.

Hearing hazard.

Entanglement hazard.

PROCEDURE

1. Observe all safety warnings.
2. Remove all loose materials such as rocks from the machine.
3. Put the machine into the transport position.
4. The machine should be loaded onto the low loader, with the conveyors and hopper in their folded positions.

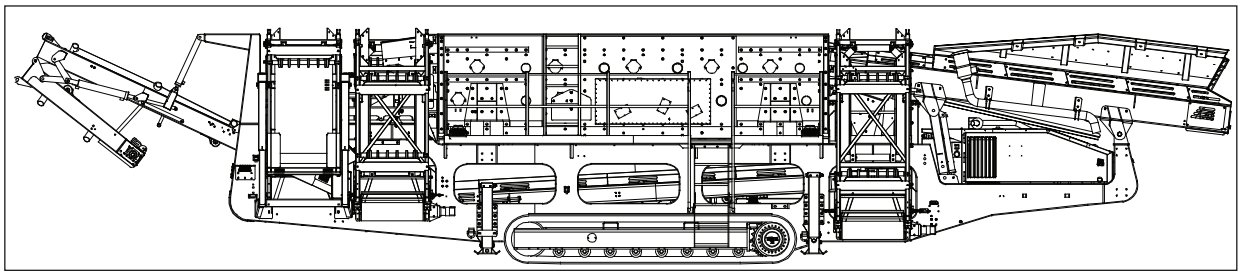


Figure 5.6 - Machine in Transportation Position

5.4 Transportation of Wheeled Machine (Roll-in Bogie Option)

⚠ WARNING

Falling hazard.

Wear personal protective equipment.

Hearing hazard.

Entanglement hazard.

PROCEDURE

1. Observe all safety warnings.
2. Remove all loose materials such as rocks from the machine.
3. Put the machine into the transport position.
4. Attach lights to the front of the machine.
5. Connect and check the lights.
6. Check tire pressure and wheel nut torques, (Refer Chapter 9).
7. Connect and check the braking system.
8. Re-check wheel nut torque every 150 miles (200 km).

5.5 Putting the Machine in the Transport Position

Prior to towing the machine on the highway, the machine must be put in to the transport position.

⚠ WARNING

Wear personal protective equipment.

Falling hazard.

Hearing hazard.

Crush hazard.

Automatic startup.

NOTICE

The machine must be put into the transport position in the correct order.

PROCEDURE

1. Observe all safety warnings.
2. Start the engine. (Refer to Chapter 7)
3. Prepare the walkways.
4. Prepare the screenbox for transport.
5. Prepare the FINES side conveyor for transport.
6. Prepare the MID-FINES side conveyor for transport.
7. Prepare the OVERSIZE side conveyor for transport.
8. Prepare the TAIL/MID OVERSIZE conveyor for transport.

(1) Folding Oversize and Mid Fines Side Conveyor for Transport

⚠ WARNING

Falling hazard.

Wear personal protective equipment.

Entanglement hazard.

PROCEDURE

1. Observe all safety warnings.
2. Ensure machine is switched off, locked and tagged out.
3. Remove all loose materials such as rocks from the machine.
4. Remove oversize side conveyor chute (Items marked 2), Ref: Figure 5.7.

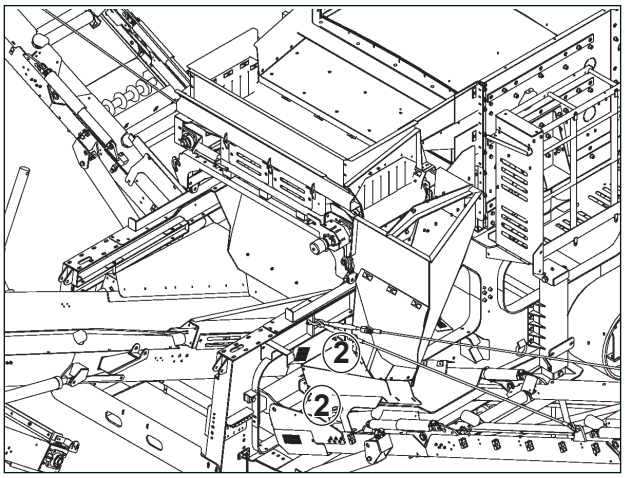


Figure 5.7 - Oversize Side Conveyor Chute

5. Remove the feedboot extension (Item marked 3), Ref: Figure 5.8.

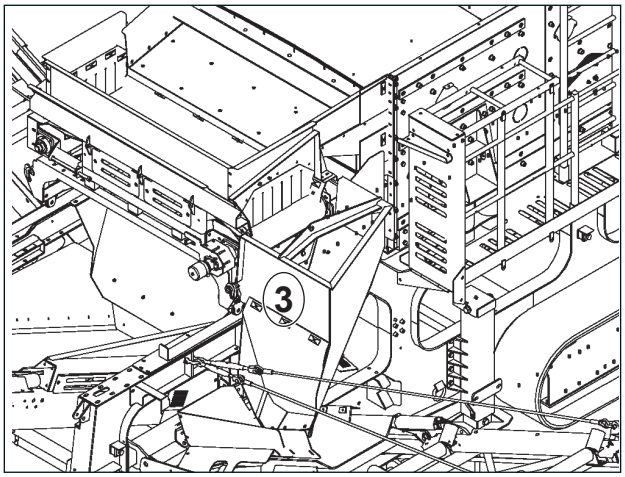


Figure 5.8 - Feedboot Extensions

6. Pack any loose parts with machine.
7. Fold in the side conveyors.

(2) Fold Mid-Fines Side Conveyor for Transport (H5)(D)

⚠ WARNING

Wear personal protective equipment.

Falling hazard.

Hearing hazard.

Crush hazard.

Automatic startup.

NOTICE

Side conveyor hydraulic cylinders MUST be pressurised before folding is attempted.

Raise each section by 5 degrees, then lower to charge system. Repeat process 3 times prior to folding conveyor.

B4, B5 and B6 are optional chute door control valves not as standard.

PROCEDURE

1. Observe all safety warnings.
2. Detach the side conveyor skirting (V) from the conveyor by removing washers and bolts (U).

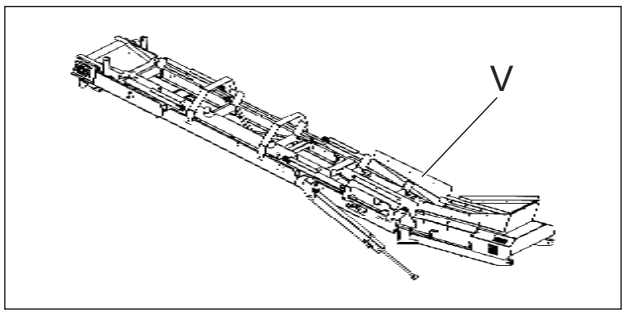


Figure 5.9 - Side Conveyor Skirting

3. Start the engine.

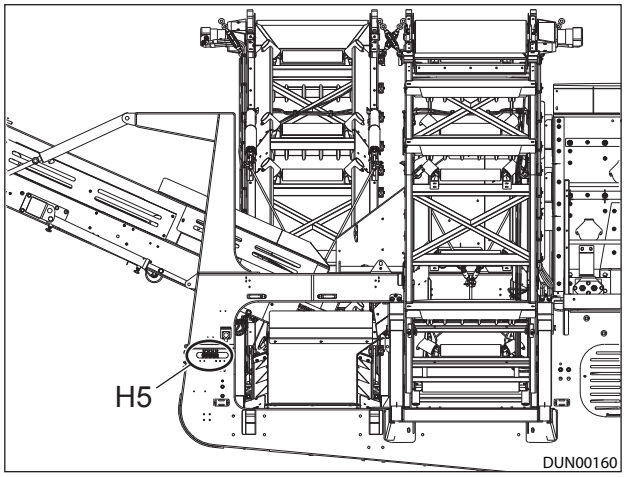
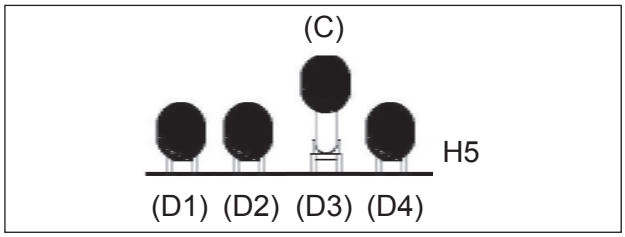
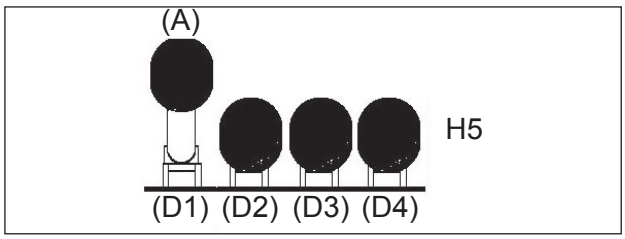


Figure 5.10 - Position of Control Levers

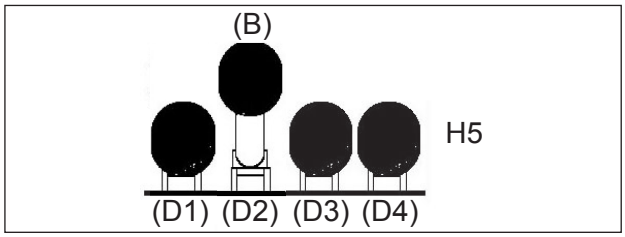
4. Remove the working pins 1 off LHS/RHS.
5. Move up the side conveyor. Raise lever to raise the side conveyor head section into 45 degrees position (H5 - Lever D3 - Position C).



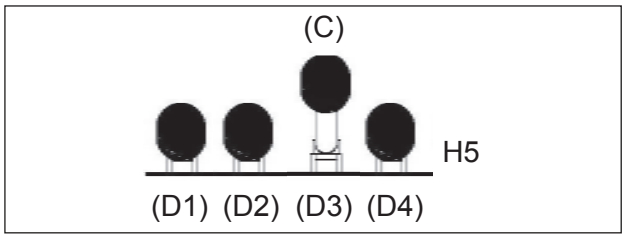
6. Move up the side conveyor lower section. Raise lever to raise the side conveyor lower section in a vertical position (H5 - Lever D1 - Position A).



7. Move up the side conveyor middle section. Raise lever to raise the side conveyor middle section in a 90 degree position (H5 - Lever D2 - Position B).



8. Move up the side conveyor. Raise lever to raise the side conveyor head section into the rest position (H5 - Lever D3 - Position C).



(3) Fold Oversize Side Conveyor for Transport

The OVERSIZE side and tail conveyor control valve unit (H6) is situated on the LEFT hand side, at the front of the machine.

⚠ DANGER

Lock-out machine.

⚠ WARNING

Wear personal protective equipment.

⚠ CAUTION

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

NOTICE

Side conveyor hydraulic cylinders MUST be pressurised before folding is attempted.

Raise each section by 5 degrees, then lower to charge system. Repeat process 3 times prior to folding conveyor.

PROCEDURE

1. Observe all safety warnings.
2. Switch off the machine and implement the lockout and tagout procedure.
3. Detach the side conveyor skirting (V) from the conveyor, Ref: Figure 5.11.

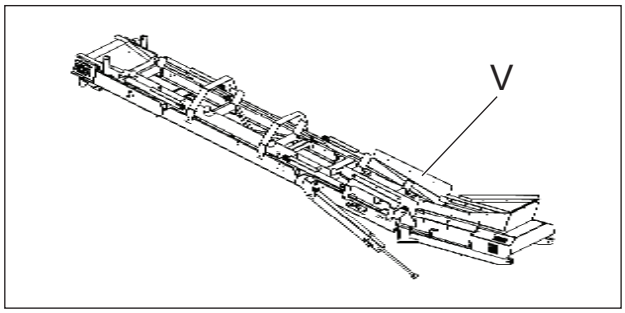


Figure 5.11 - Side Conveyor Skirting

4. Start the engine.
5. Remove the working position pins 1 off LH/RH.
6. Move up the head section of the OVERSIZE side conveyor. Raise lever to raise the MID - OVERSIZE side conveyor‘s head section into a 45 degree position (H6- LEVER G3 - POSITION E), Ref: Figure 5.12.

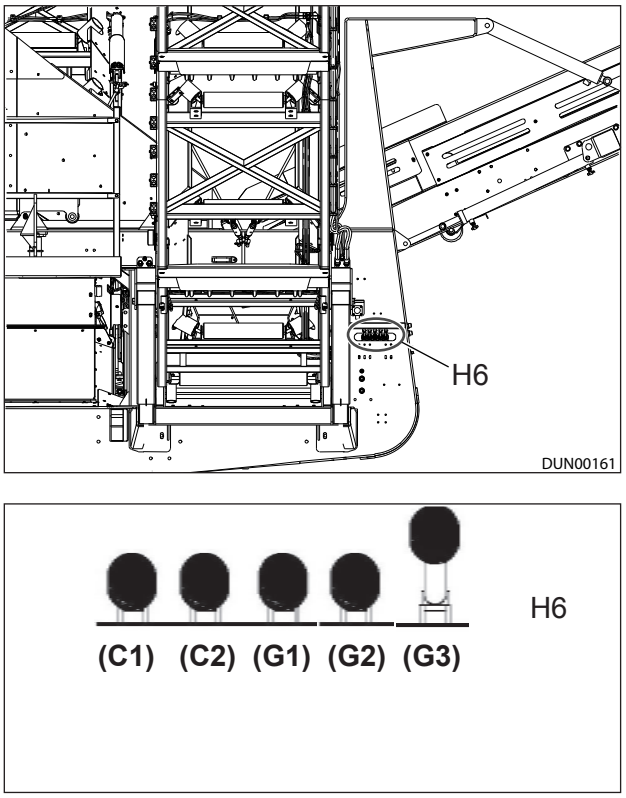
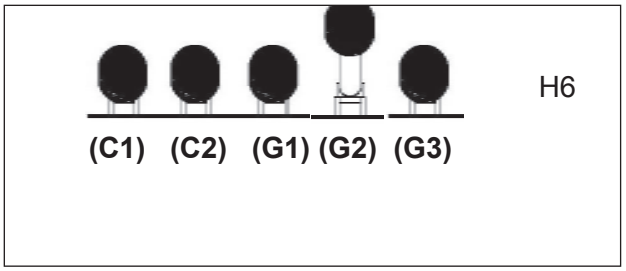
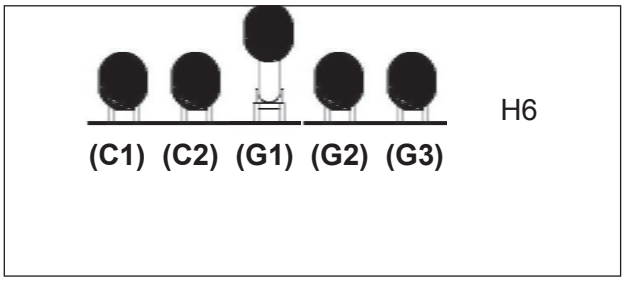


Figure 5.12 - Control Levers H6

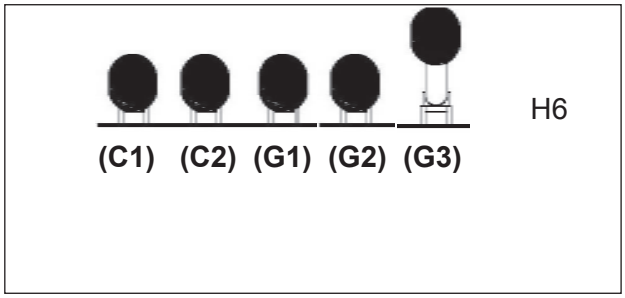
7. Move up the OVERSIZE side conveyor‘s lower section. Raise lever to raise the OVERSIZE side conveyor‘s middle section into a vertical position (H6 - LEVER G2 - POSITION D).



8. Move up the OVERSIZE side conveyor lower section. Raise lever to raise the OVERSIZE side conveyor lower section into vertical position (H6 - LEVER G1 - POSITION C).



9. Move up the OVERSIZE side conveyor middle section. Raise lever to raise OVERSIZE side conveyor middle section into a 90 degrees position (H6 - LEVER G2 - POSITION D).
10. Move side conveyor head section. Raise lever to lower the side conveyor head section into resting position. (H6- LEVER C3 - POSITION C)



11. Insert transport pins and R-Clips into positions. Tighten adjusters.

(4) Fold Fines-Side Conveyor for Transport

The Fines Side Conveyor control valve unit (H4) is situated at the RIGHT hand side, at the rear of the machine, Ref: Figure 5.13.

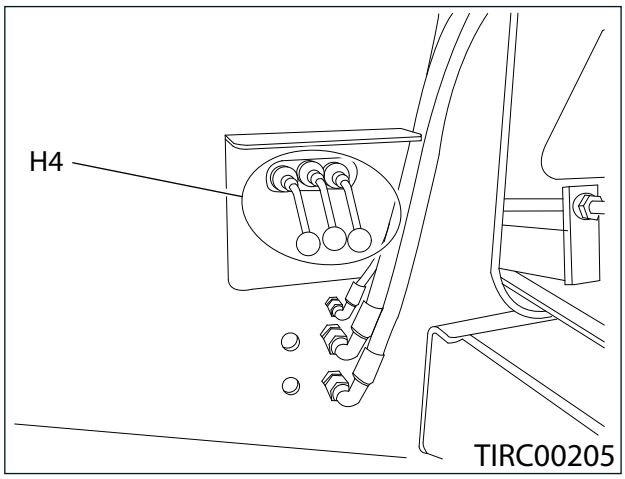


Figure 5.13 - Fines Side Conveyor control valve unit (H4)

⚠ CAUTION

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

NOTICE

Side conveyor hydraulic cylinders MUST be pressurised before folding is attempted.

Raise each section by 5 degrees, then lower to charge system. Repeat process 3 times prior to folding conveyor.

PROCEDURE

1. Observe all safety warnings.
2. Detach the side conveyor skirting (V) from the conveyor by removing washers and bolts (U), Ref: Figure 5.14.

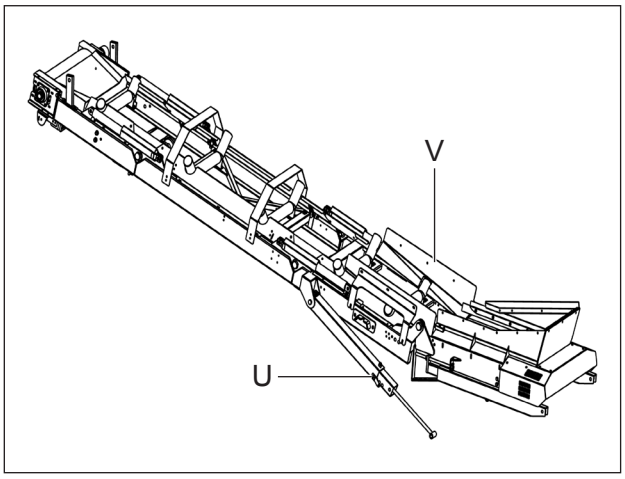
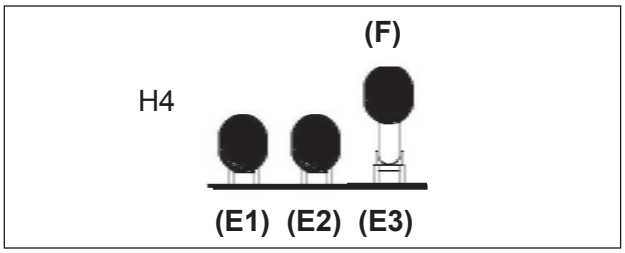
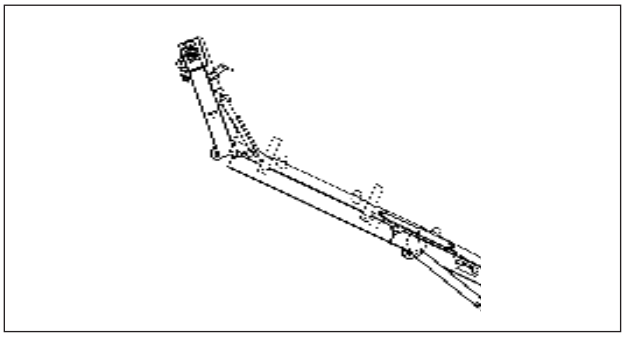


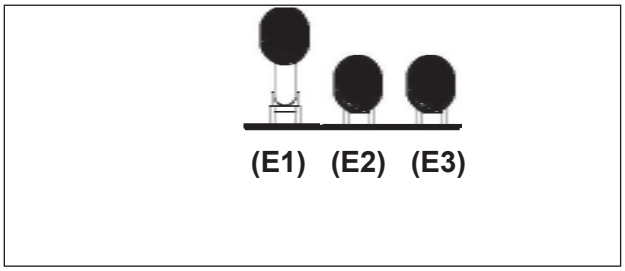
Figure 5.14 - Side Conveyor Skirting

3. Start the engine.
4. Remove the working pins 1 off LHS/RHS.
5. Move up the side conveyor head section. Raise lever to raise the side conveyor head section into a 45 degree position (H4 - LEVER E1 - POSITION F).





6. Move up side conveyor lower section. Raise lever to raise side conveyor lower section into a vertical position (H4-LEVER E3- POSITION D).



7. Move side conveyor middle section. Raise lever to raise side conveyor middle section into a 90 degree position (H4 - LEVER E2 - POSITION E), Ref: Figure 5.15.

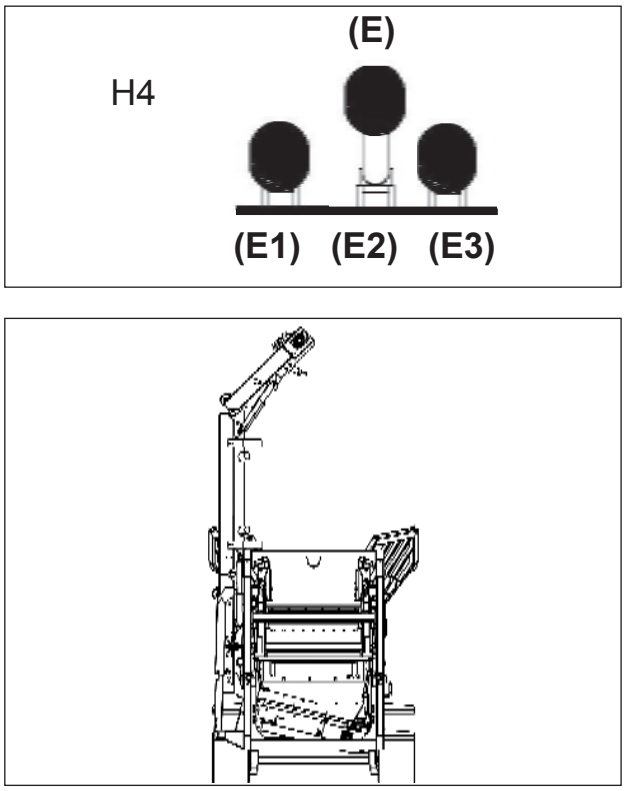
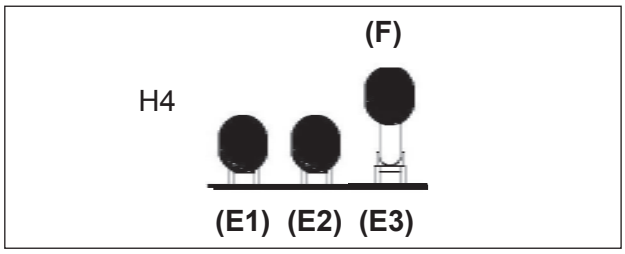


Figure 5.15 - Side Conveyor Middle Section in 90 Degree Position

8. Move side conveyor head section. Raise lever to raise side conveyor head section into rest position (H4 - LEVER E1 - POSITION F).



9. Insert transport pins (A and B) and R Clips (U), Ref: Figure 5.16.

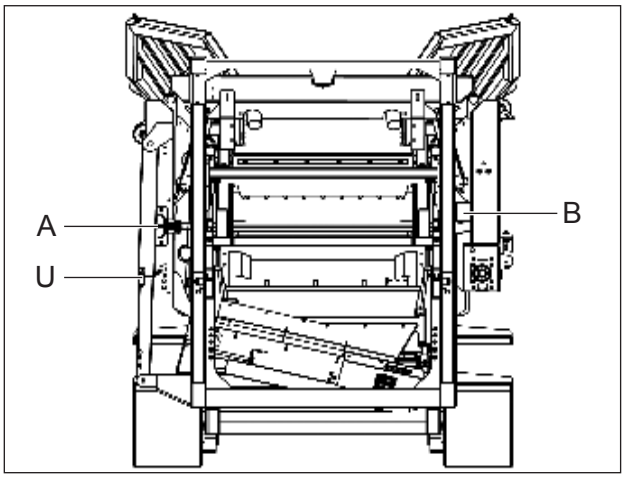


Figure 5.16 - Transport Pins

(5) Fold Hydraulic Aux Conveyor for Transport (Optional)

⚠ WARNING

Wear personal protective equipment.

⚠ CAUTION

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

PROCEDURE

1. Observe all safety warnings.
2. Ensure landing leg on Hydraulic Folding Aux Conveyor is deployed (item 1) before affixing inner support leg pin (item 2) to prevent the conveyor closing onto the chassis side (Ref: Figure 5.17).

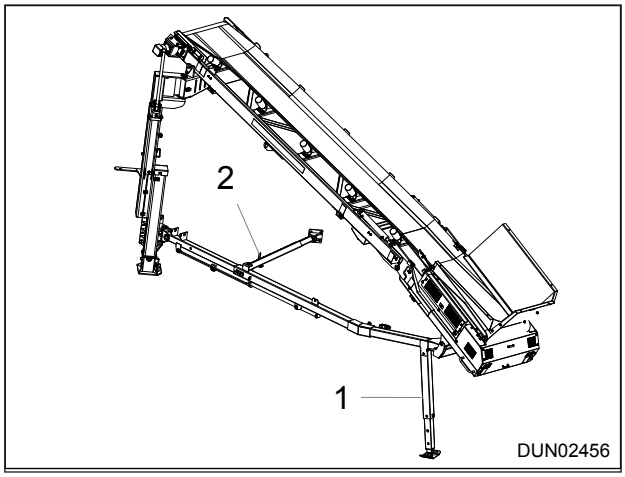


Figure 5.17 - Transport Pins

(6) Fold Tail Conveyor for Transport

⚠ WARNING

Lockout the machine.

Wear personal protective equipment.

⚠ CAUTION

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

PROCEDURE

1. Observe all safety warnings.
2. Ensure tail conveyor slide pins are in position (SP), Ref: Figure 5.18.

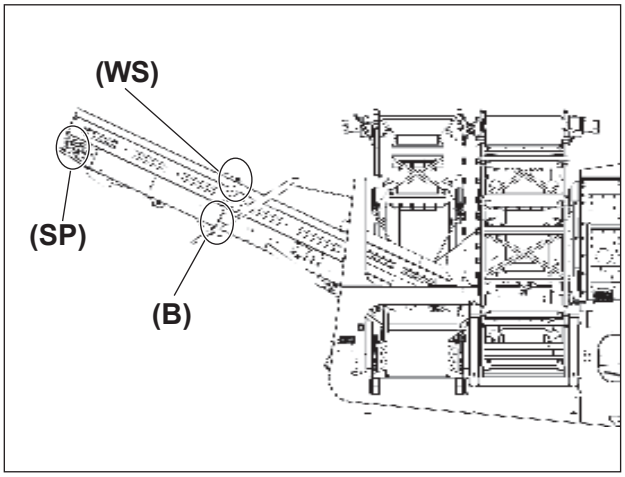


Figure 5.18 - Tail Conveyor in Working Position

3. Support conveyor head section with the aid of proper lifting equipment.
4. Remove bolts (B) and working stays (WS), Ref: Figure 5.18.
5. Lower conveyor head section until transport stay lines up with lower and upper section.
6. Fix transport stays (TS) to conveyor Ref: Figure 5.19.

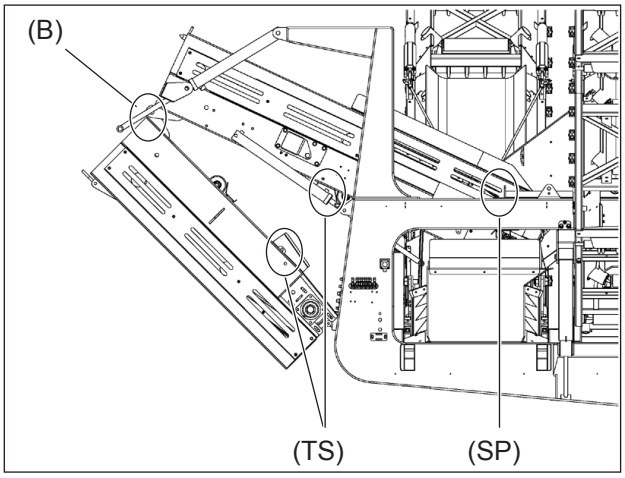


Figure 5.19 - Tail Conveyor in Folded Position

(7) Preparing the Walkways for Transport

⚠ WARNING

Falling hazard. Use a suitable platform when working at a height.

Use suitable lifting equipment.

Wear personal protective equipment.

Switch off the machine and implement the lockout procedure.

NOTICE

Walkways may differ depending on what machine spec has been ordered.

PROCEDURE

1. Observe all safety warnings.

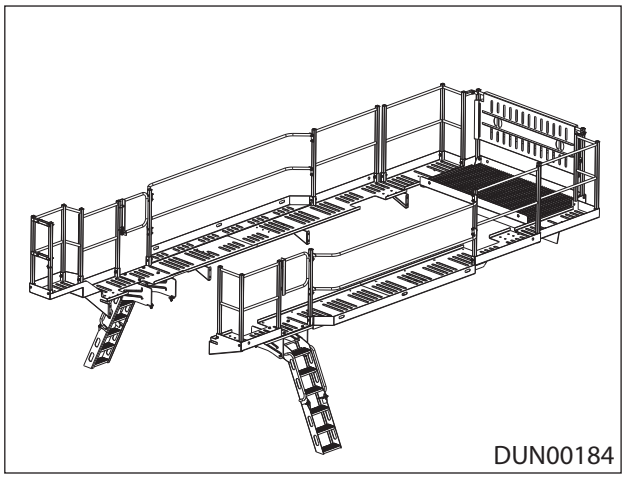


Figure 5.20 - Walkway in the Working Position

2. Remove the bolts and brackets (item 1) from either side of the rear handrail, Ref: Figure 5.21.

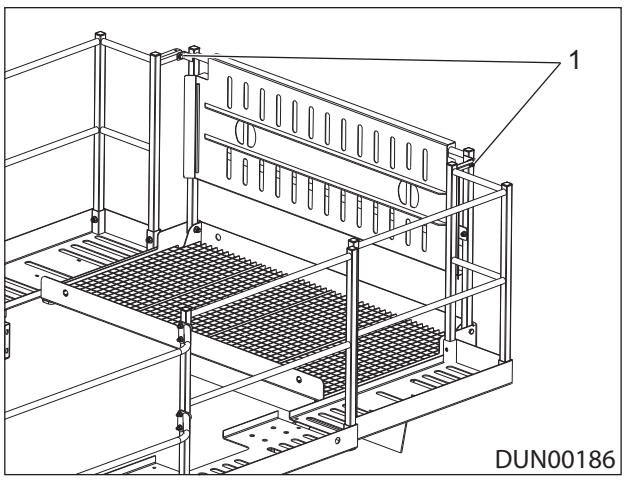


Figure 5.21 - Rear Handrail Brackets

3. Rotate the rear hand rail down to the transport position, Ref: Figure 5.22.

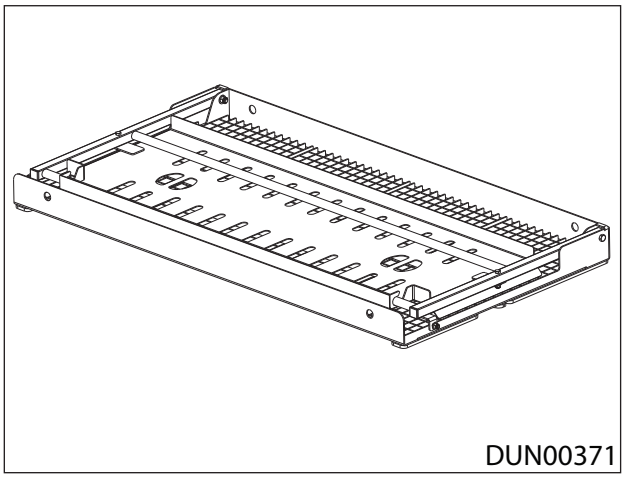


Figure 5.22 - Rear Handrail Folded into Transport Position

4. Rotate the bottom section of the walkway (item 1) on both sides of the machine into the transport position, Ref: Figure 5.23.

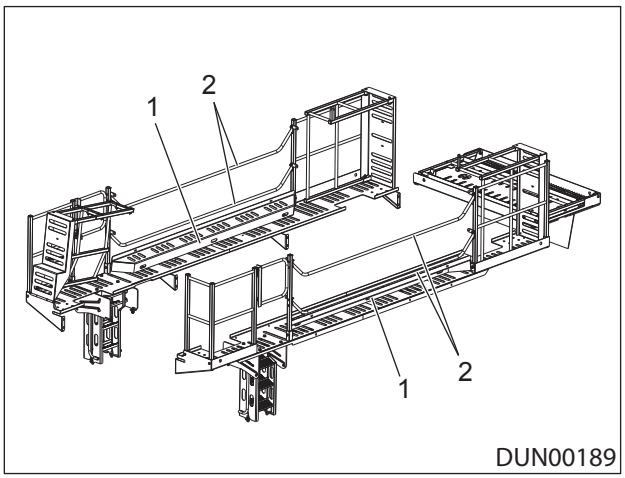


Figure 5.23 - Walkway in the Transport Position

5. Remove the nuts and bolts from each end of the handrails (item 2), Ref: Figure 5.23.
6. Rotate the upper and lower handrails (item 2) on both sides of the machine into the transport position, Ref: Figure 5.23.
7. Replace and tighten the nuts and bolts in each end of the handrails (item 2) to secure them in the transport position, Ref: Figure 5.23.
8. Rotate the handrail sections (item 1) on both sides of the machine up into the position shown for transport, Ref: Figure 5.24.

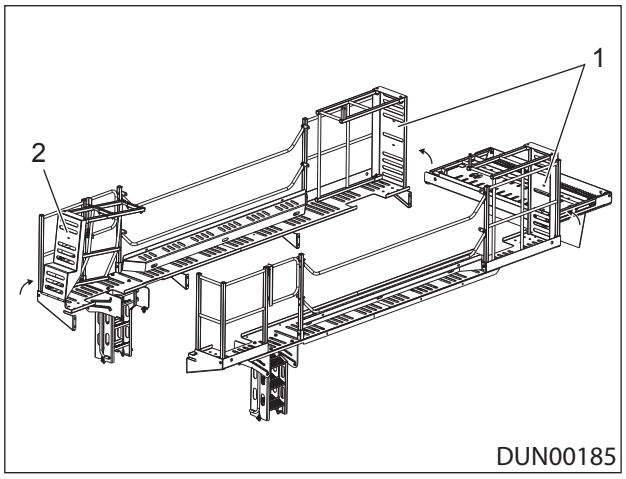


Figure 5.24 - Walkway in the Transport Position

9. Rotate the handrail section (item 2) up into the position shown for transport, Ref: Figure 5.24.
10. Rotate the bottom section of the walkway access steps up, Ref: Figure 5.25.
11. Slide the folded walkway access steps back along the cutout in the mounting plate into the transport position, Ref: Figure 5.25.

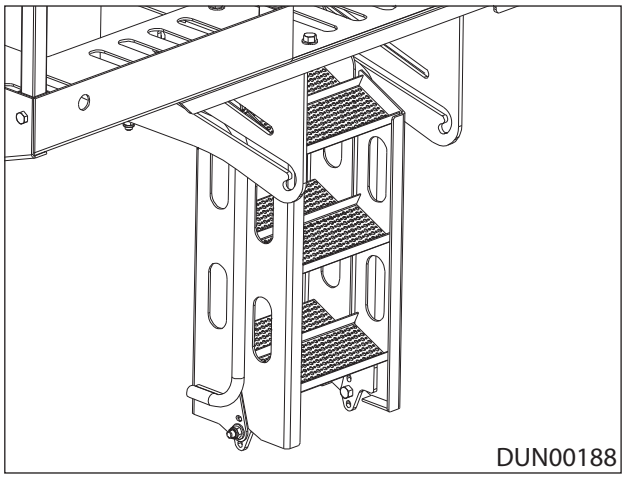


Figure 5.25 - Walkway Access Steps Folded

5.6 Loading the Machine to the Low Loading Trailer (Track Machine)

⚠ CAUTION

Vehicle control hazard.

Wear personal protective equipment.

Electrocution hazard.

Read the operations manual.

Entanglement hazard.

NOTICE

Prior to towing the machine on the highway, the machine must be put in towing position.

PROCEDURE

1. Before loading, the plant must be prepared for transportation, refer to putting the machine into the transport position. The machine should be loaded onto the low loader as shown, with the conveyors and hopper in their folded position.

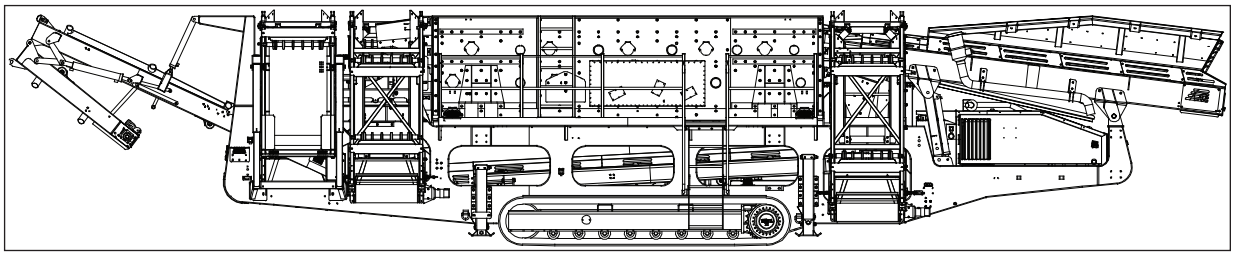


Figure 5.26 - Machine Folded for Transport

2. Check that the travelling dimensions and weight, when loaded, will be within the regulation limits, refer to plant specification and information.
3. Make sure suitable ramps are positioned at the end of the trailer to load the plant.
4. Ensure all loose items are carefully stowed and secured if these are to be transported on the plant.
5. Check that any loose items transported with the machine will not cause a hazard while loading.
6. Ensuring that the engine/motors are running at idle load the plant slowly on the trailer, manoeuvring the plant with the tracks, using the umbilical control or the remote radio control, if fitted, see moving the plant.
7. Stop the machine.

(1) Ready for Transport

⚠ WARNING

Do not transport this machine without it being properly secured on to the lowloader.

Before transporting this machine you must read and understand the Safety section in this manual.

NOTICE

Before tracking the machine ensure the engine speed is idle.

The machine should now be ready for transport.

Secure machine with Chain shackles to the Lowloader.

Use securing eyes (Item 1) fitted on the machine undercarriage on either side, Ref: Figure 5.27.

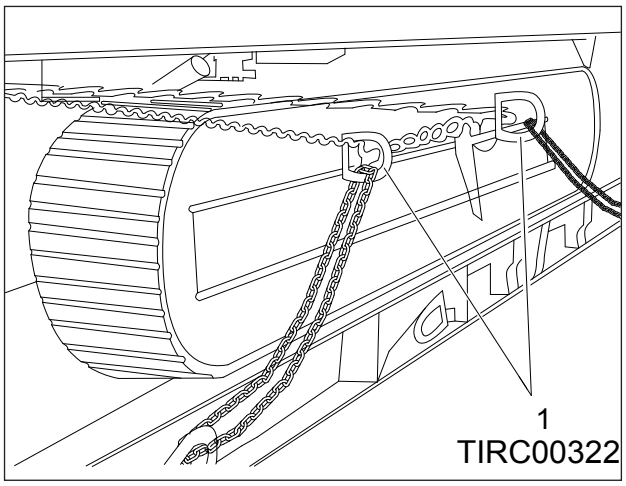


Figure 5.27 - Tracks Secured on Lowloader

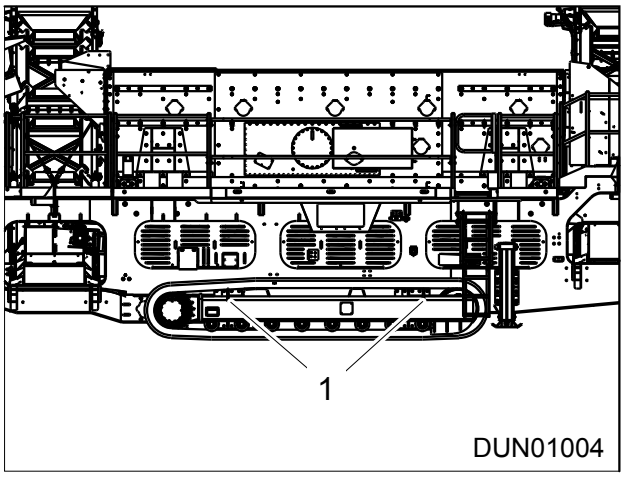


Figure 5.28 - Tie down points underneath

The machine can also be secured in place using the tie down points on the side of the machine, ref item 1, Figure 5.28. These points are located in the same place on both sides of the machine.

(2) Prior to Haulage

PROCEDURE

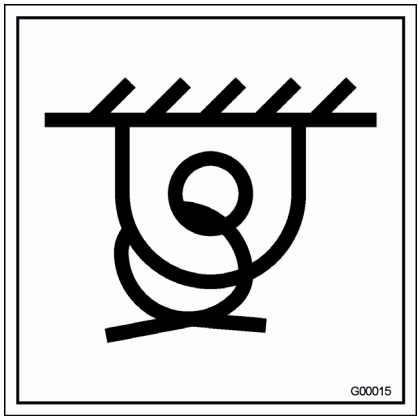
1. Check for loose parts or debris on the machine.
2. Ensure all pins are secured with ‘R’ pins and Split pins.
3. Raise the support legs fully.
4. Ensure persons transporting the machine adhere to all safety signs and procedures.

5.7 Transport Tie Down Points

NOTICE

When transporting the machine, it is the responsibility of the haulage contractor to safely secure it to the transporter.

This machine is fitted with transport tie down brackets, the brackets are indicated on the machine by a safety symbol. Under NO circumstances should these be ever used as a lifting point for the machine.



OMA00588

Figure 5.29 - Tie Down Points Symbol

The tie down points are located on both sides of the machine.

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6 Initial Setup and Adjustments

NOTICE

Terex recommends that the assembly and installation work of the machine be carried out by the Terex customer service department. The manufacturer/supplier will not be liable for damage caused by improper assembly or installation.

The environment in which the machine will operate contains inherent health and safety risks, which the operator must take steps to avoid.

Dangers from overhead conveyor discharges, overspill material, vehicle movements, etc., as well as other site related hazards must be anticipated.

Avoid these by carrying out risk assessments before the machine is put into operation to ensure appropriate exclusion zone measures are put in place and site personnel safety awareness training has been undertaken.

6.1 Initial Inspection

When the machine is delivered, thoroughly check for any damage that might have occurred during transport. Do not set up the unit until the inspection is complete. Complete any delivery and start-up forms that were supplied with the equipment. Take note of any damage found, and photos if possible, and have the driver initial your description of any problem(s).

Check all loose parts, small-parts boxes, and tools against the packing list to ensure all items shipped are present. Check in and around the machine for any items that may have been shipped inside the machine

6.2 Machine Location Considerations

Prior to setting up the machine, consideration should be given to a suitable layout to prevent oversize material or metal from entering the machine. In order to prevent damage of the screen unit no material above the size recommended should be fed into the machine.

Position the machine in a safe, level, operating position making sure both tracks are in full contact with the ground to minimise movement of the machine. Regularly check the machine is level and stable.

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

Ensure the area under the tail drum of the product conveyor is free of large stones etc. which may cause damage to the belt

For dusty conditions some account should be taken of the prevailing wind direction to minimize the possibility of dust entering the air intake.

When setting up the machine, ensure that enough space is available around the machine to enable easy set up, servicing and repair work.

Machinery arranged before and after this machine will have to be placed on the site accordingly.

6.3 Measures Before Set Up

NOTICE

We recommend that the assembly/ installation work of the machine be carried out by the Powerscreen customer service department. The manufacturer/supplier will not be liable for damage caused by improper assembly/ installation.

PROCEDURE

1. Ensure all guards are fully secured in correct/closed position.
2. Remove all loose items from the belt by untying\ the securing ropes.
3. Put control valve levers in neutral (non-operational) position.
4. The machine must be placed on solid ground capable of carrying the machine‘s weight.
5. Before detaching the machine from the prime mover, it is important that the chosen site is level. Level the work site foundation with the loading shovel.
6. Level the machine with a precision spirit level.
7. Do not position the machine above ground level, e.g. on blocks etc

6.4 Measures After Long Term Standstill

NOTICE

Prior to putting into operation perform daily (10 hour) maintenance schedule.

Check tracks before transporting or moving the machine.

6.5 Initial Setup

(1) Opening Out the FINES Side Conveyor

⚠ DANGER

Lock-out machine.

⚠ WARNING

Wear personal protective equipment.

Falling hazard.

NOTICE

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

Ensure punnit ball valves are open before staring the engine.

The Fines Side Conveyor control valve unit (H4) is situated at the RHS, at the rear of the machine.

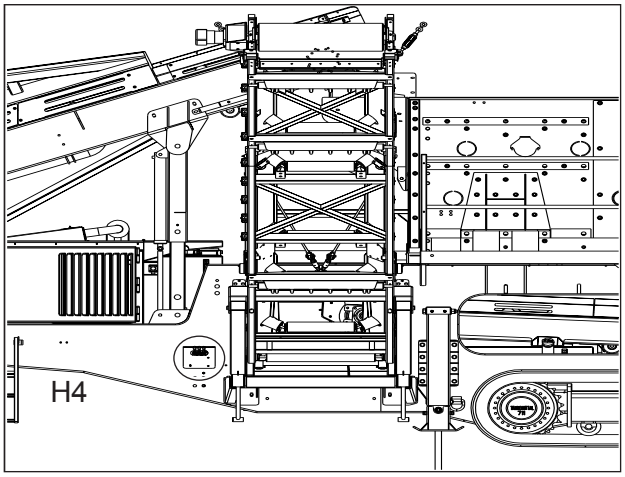


Figure 6.1 - Fines Side Conveyor Control Valve Unit

Side conveyor hydraulic cylinders MUST be pressurised before folding is attempted. Raise each section by 5 degrees, then lower to charge system. Repeat process 3 times prior to folding conveyor.

PROCEDURE

1. Observe all safety warnings.
2. Start the engine.(Refer section 7.3).
3. Remove all transport pins (P) and transport stays from the fines side conveyor, Ref: Figure 6.2 and Figure 6.3.

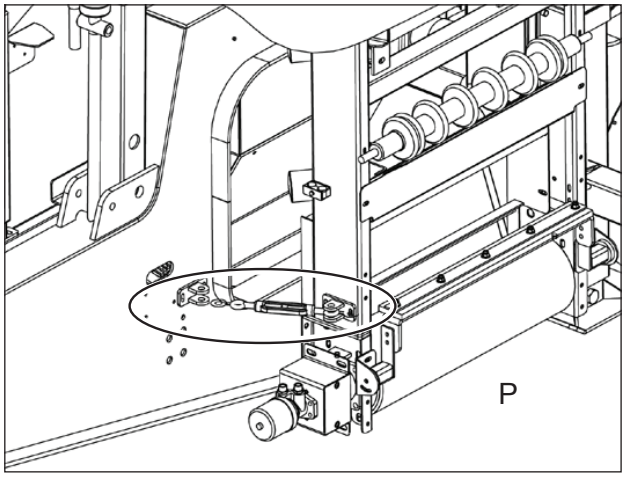


Figure 6.2 - Transport Pins

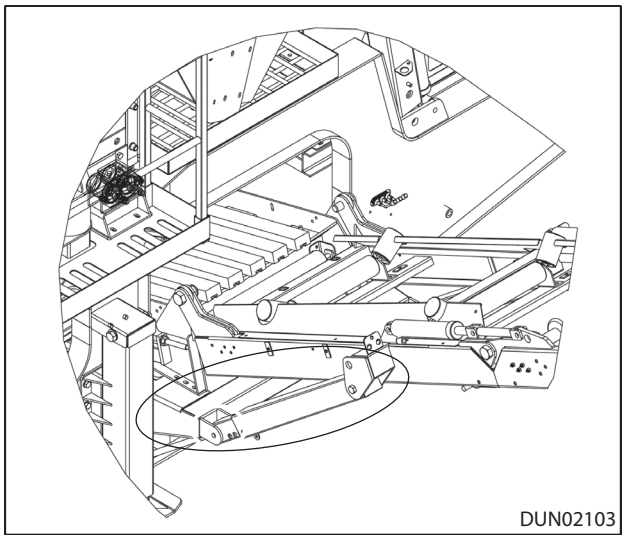
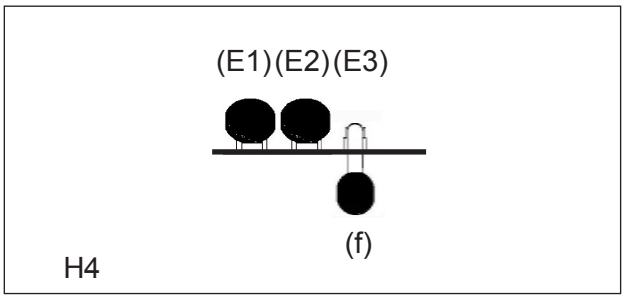
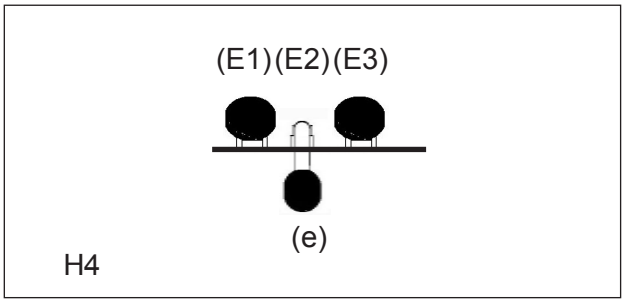


Figure 6.3 - Transport Pins

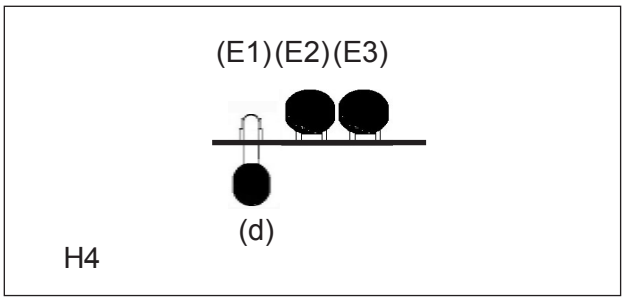
4. Move the FINES side conveyor head section. Lower lever to open out the FINES side conveyor head section into 45 degrees position. (H4-Lever E3-Position f)



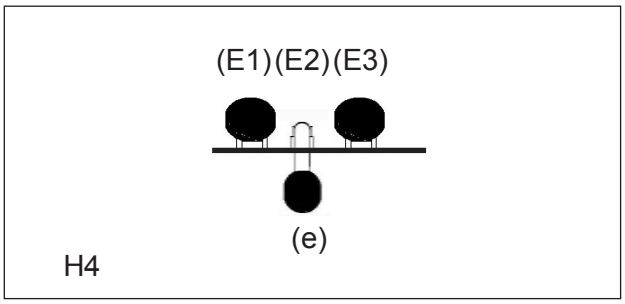
5. Move the FINES side conveyor middle section. Lower lever to open out the FINES side conveyor middle section into 45 degrees position . (H4-Lever E2-e)



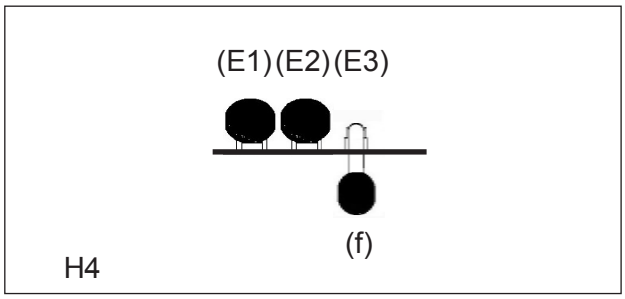
6. Move the FINES side conveyor lower lever to lower the FINES side conveyor to the required angle. (H4-Lever E1-d).



7. Move the FINES side conveyor middle section. Lower lever (H4 - Lever E2 - Position e) to open out the FINES side conveyor middle section.



8. Move the FINES side conveyor head section, lower the lever to open out the FINES side conveyor head section fully into position (H4-Lever E1-f).



9. Insert the working position pins (U) 1 off LH/RH, Ref: Figure 6.4.

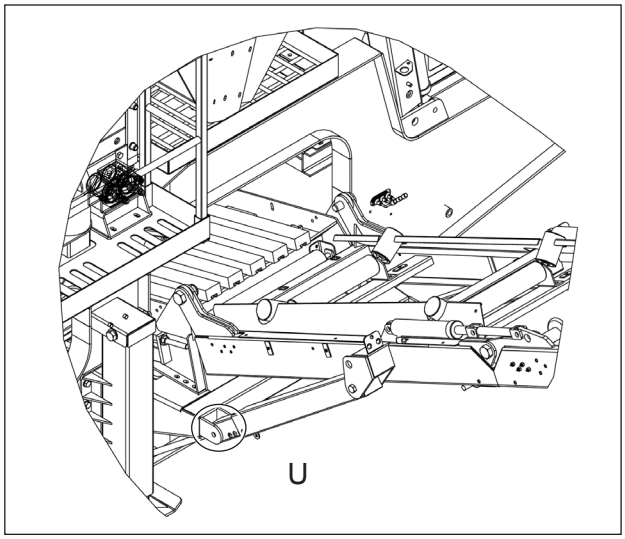


Figure 6.4 - Working Position Pins

10. Fix side conveyor skirting to lower section of conveyor (V), Ref: Figure 6.5.

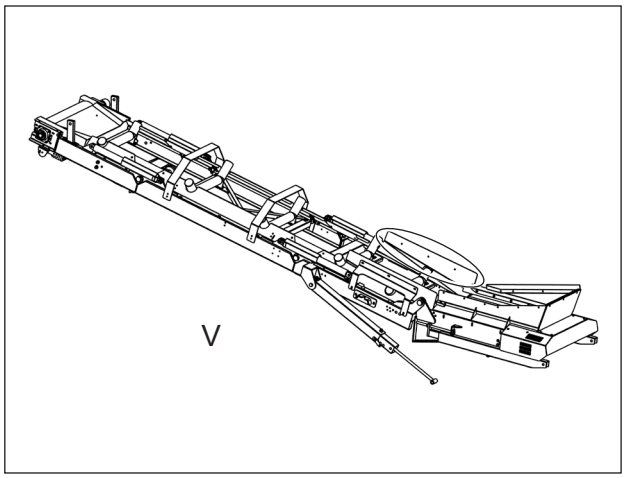


Figure 6.5 - Lower Section of Conveyor

(2) Opening Out the MID FINES Side Conveyor (H5)(D)

⚠ DANGER

Lock-out machine.

⚠ WARNING

Wear personal protective equipment.

Falling hazard.

⚠ CAUTION

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

NOTICE

Side conveyor hydraulic cylinders MUST be pressurised before folding is attempted.

Raise each section by 5 degrees, then lower to charge system. Repeat process 3 times prior to folding conveyor.

PROCEDURE

1. Observe all safety warnings.
2. Start the engine. Refer Chapter 7.
3. Remove all transport pins and transport stays from the side conveyor.

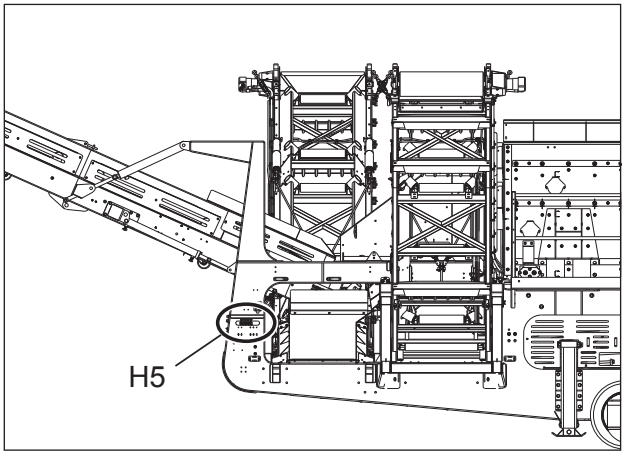
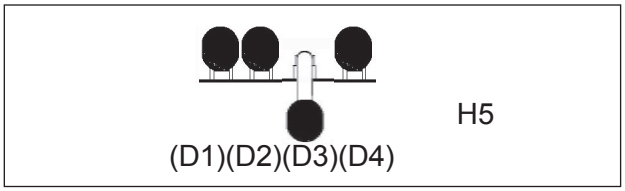
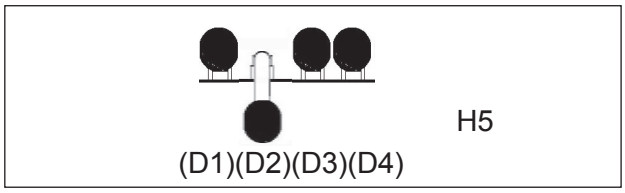


Figure 6.6 - Mid Fines Side Conveyor Control Valve Unit

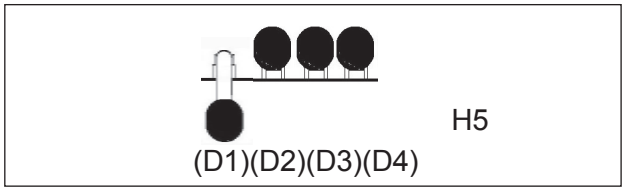
4. Move the MID-FINES side conveyor head section. Lower lever to open out the side conveyor head section into 45 degrees position. (H5 - Lever D1 - position c)



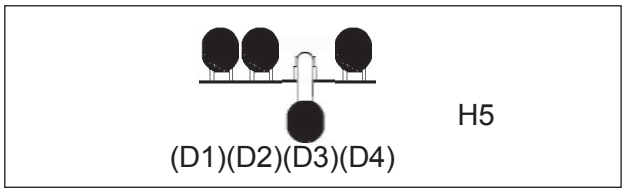
5. Move the MID-FINES side conveyor middle section. Lower lever to open out the side conveyor middle section into 45 degree position. (H5 - Lever D2 - position b)



6. Move the side conveyor lower lever to obtain required angle. (H5 - Lever D3 - position a)



7. Move the MID-FINES side conveyor head section, lower the lever to open out the side conveyor head section fully into position. (H5 - D1 - c).



8. Insert the working position pins 1 off LH/RH.
9. Fix the side conveyor skirting to the lower section of the conveyor (V), Ref: Figure 6.7.

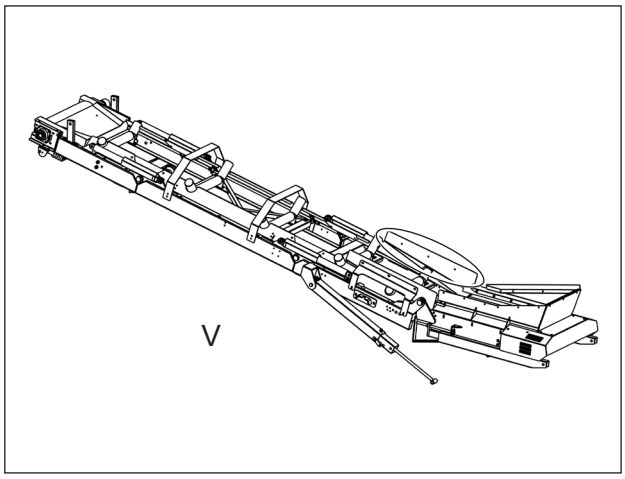


Figure 6.7 - Lower Section of Conveyor

(3) Opening Out the OVERSIZE Conveyor

⚠ DANGER

Lock-out machine.

⚠ WARNING

Wear personal protective equipment.

Falling hazard.

⚠ CAUTION

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

NOTICE

Side conveyor hydraulic cylinders MUST be pressurised before folding is attempted.

Raise each section by 5 degrees, then lower to charge system. Repeat process 3 times prior to folding conveyor.

PROCEDURE

1. Observe all safety warnings.

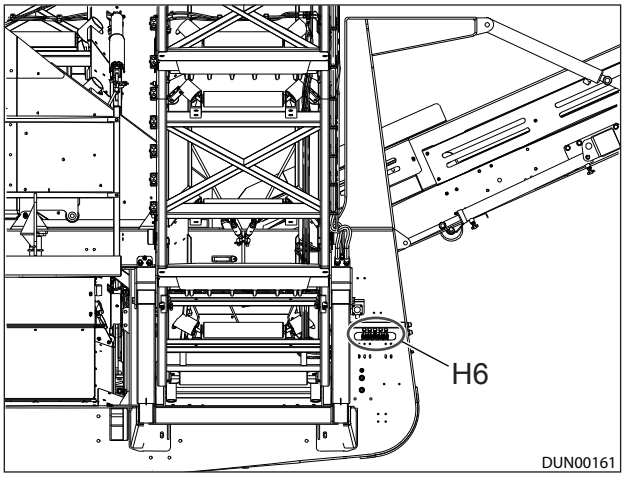
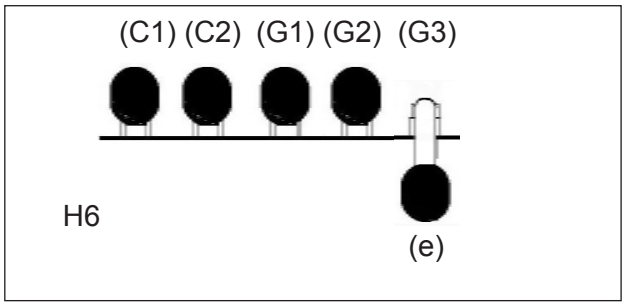
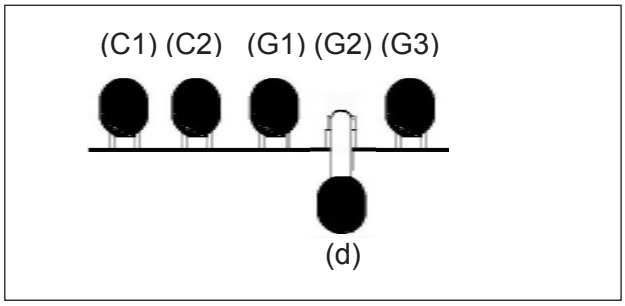


Figure 6.8 - Oversize Conveyor Control Valve Unit

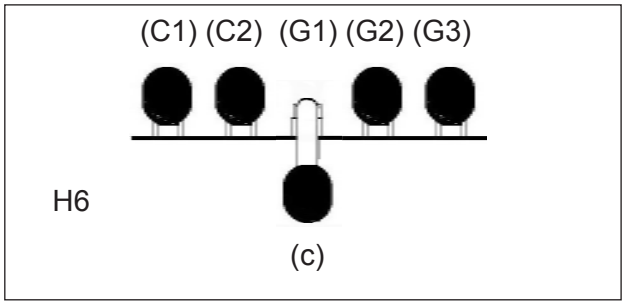
2. Start the engine. Refer Section 7.3.
3. Remove all transport pins and transport stays from the side conveyor.
4. Move the OVERSIZE side conveyor head section. Lower lever to open out the side conveyor head section into 45 degrees position. (H6 - Lever G3 -position e)



5. Move the OVERSIZE side conveyor middle section. Lower lever to open out the side conveyor middle section into vertical position. (H6 - Lever G2 - position d)



6. Move the OVERSIZE side conveyor first section, lower the lever to open out the side conveyor first section fully into position. (H6 - Lever G1 - position c).



7. Insert the working position pins 1 off LH/RH.
8. Fix the OVERSIZE side conveyor skirting to the lower section of the conveyor (V), Ref: Figure 6.9.

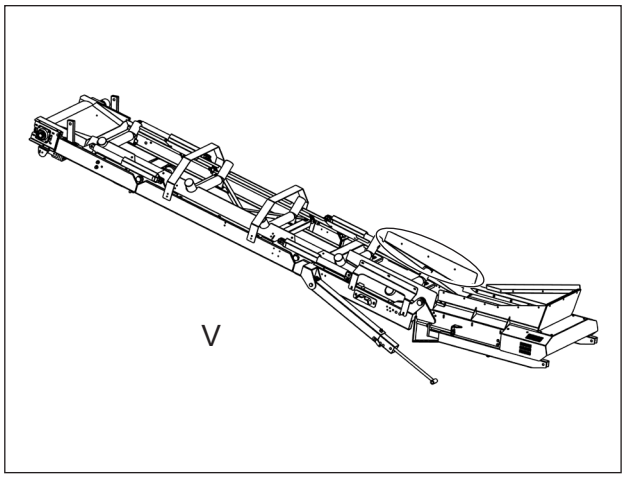


Figure 6.9 - Lower Section of Conveyor

(4) Opening Out Hydraulic Aux Conveyor (Optional)

⚠ WARNING

Wear personal protective equipment.

⚠ CAUTION

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

PROCEDURE

1. Observe all safety warnings.
2. Ensure landing leg on Hydraulic Folding Aux Conveyor is deployed (item 1) before affixing inner support leg pin (item 2) to prevent the conveyor closing onto the chassis side (Ref: Figure 6.10).

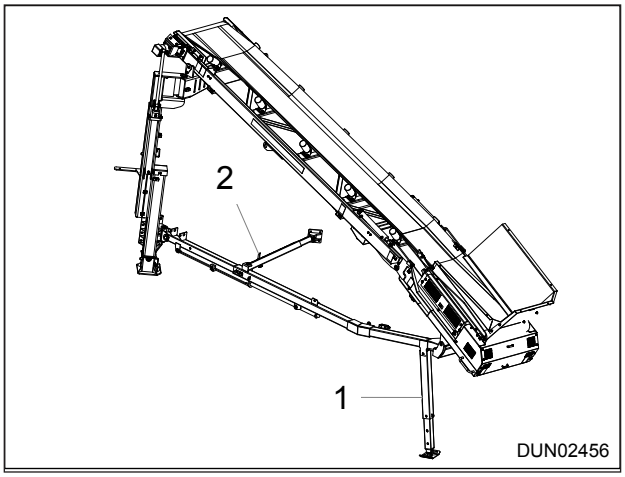


Figure 6.10 - Transport Pins

(5) Preparing the Walkways

⚠ WARNING

Falling hazard. Use a suitable platform when working at a height.

Use suitable lifting equipment.

Wear personal protective equipment.

Switch off the machine and implement the lockout procedure.

NOTICE

Walkways may differ depending on what machine spec has been ordered.

PROCEDURE

1. Slide the folded walkway access steps forward along the cutout in the mounting plate (item 2) into the working position, Ref: Figure 6.11.
2. Rotate the bottom section of the walkway access steps (item 1) down into the working position, Ref: Figure 6.11.

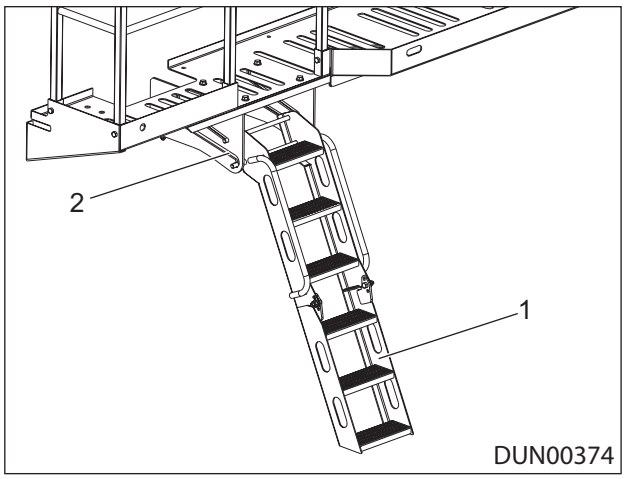


Figure 6.11 - Walkway Access Steps in the Working Position

3. Rotate the handrail section (item 2) down into the working position, Ref: Figure 6.12.

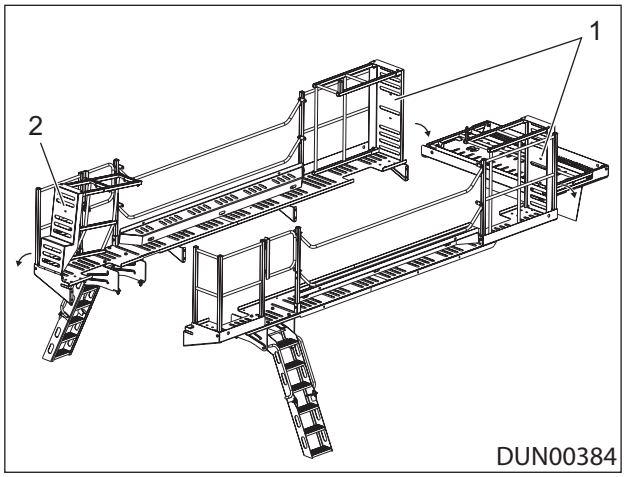


Figure 6.12 - Walkway Handrail Sections in the Transport Position

4. Rotate the handrail sections (item 1) on both sides of the machine down into the working position, Ref: Figure 6.12.
5. Remove the nuts and bolts from each end of the handrails (item 3), Ref: Figure 6.13.
6. Rotate the upper and lower handrails (item 2) on both sides of the machine into the working position, Ref: Figure 6.13.
7. Replace and tighten the nuts and bolts in each end of the handrails (item 3) to secure them in the working position, Ref: Figure 6.13.

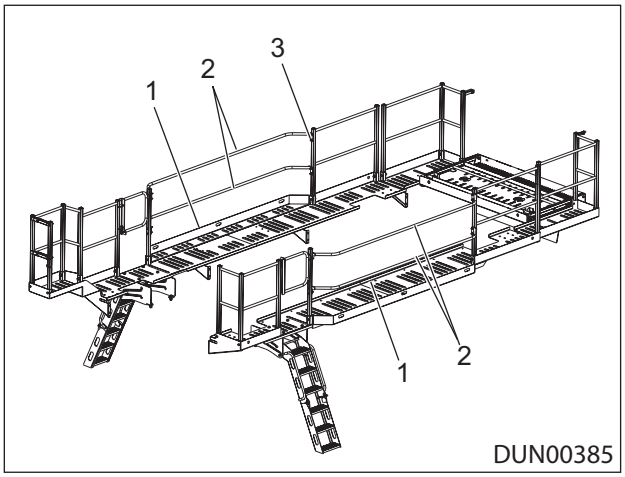


Figure 6.13 - Walkway Handrails in the Working Positions

8. Rotate the bottom section of the walkway (item 1) on both sides of the machine into the working position, Ref: Figure 6.13.
9. Rotate the rear hand rail down up into the working position, Ref: Figure 6.14.
10. Insert the bolts and brackets (item 1) on either side of the rear handrail to secure in the working position, Ref: Figure 6.14.

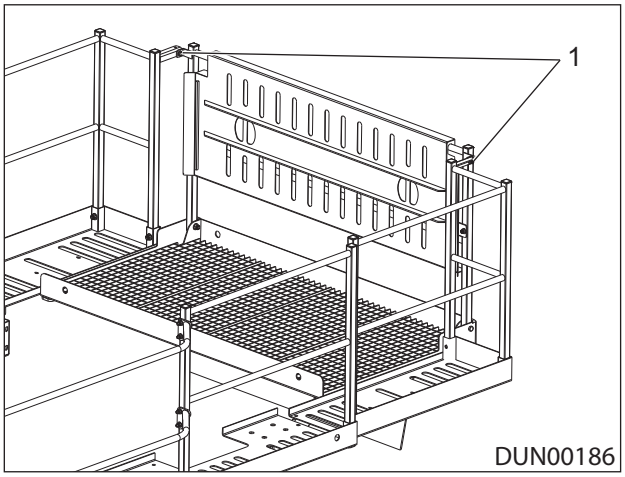


Figure 6.14 - Rear Handrail in the Working Position

(6) Opening Out the Tail Conveyor

⚠ DANGER

Lock-out machine.

⚠ WARNING

Wear personal protective equipment.

Falling hazard.

⚠ CAUTION

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

The combined oversize side and tail conveyor control valve unit (H6) is situated on the left hand side, at the front of the machine, Ref: Figure 6.15.

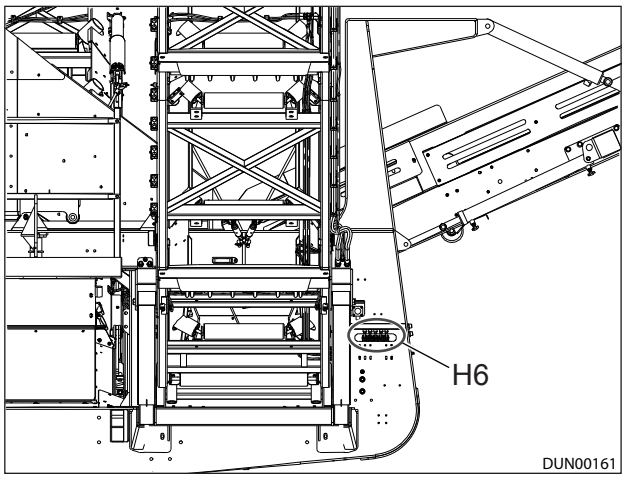


Figure 6.15 - Tail Conveyor Control Valve Unit

PROCEDURE

1. Observe all safety warnings.
2. Stop the machine and implement the LOCKOUT procedure.
3. With the aid of proper lifting equipment lift conveyor at position (1), Ref: Figure 6.16. Raise until the conveyor is in the working position.

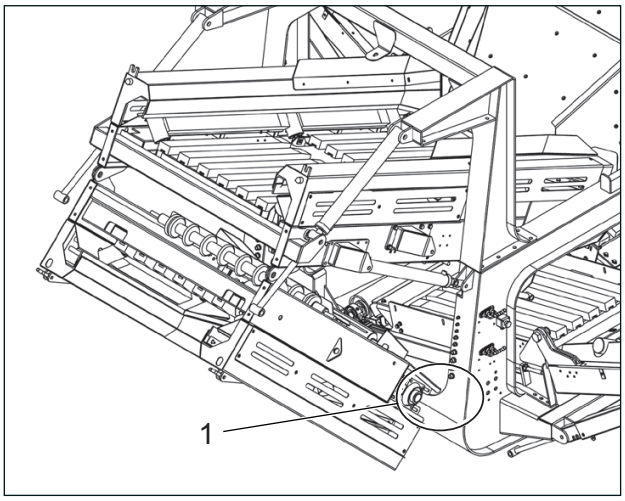


Figure 6.16 - Conveyor Lift Position

4. Fix adjusters (items 1 and 2) and bolt into position as shown, Ref: Figure 6.17.

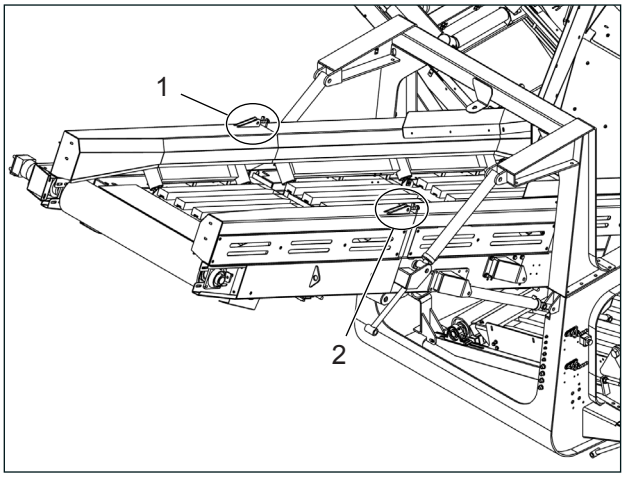
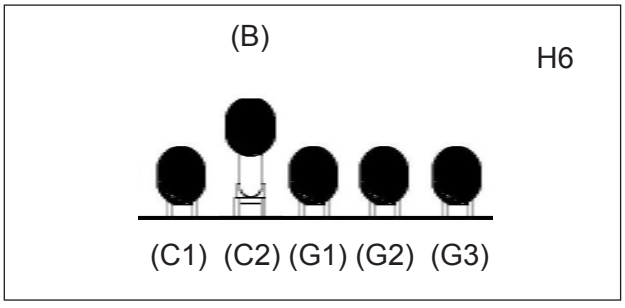


Figure 6.17 - Tail conveyor in the Working Position

5. Start the engine (Refer section 7.3).
6. Move up the tail conveyor lever until the conveyor is at the required angle (H6 - Lever C2 - position B).



(7) Screenbox Preparation

⚠ DANGER

Switch off the machine and implement the lockout and tagout procedure.

⚠ WARNING

Wear personal protective equipment.

Falling hazard. Use a suitable platform and lifting equipment when working at a height.

⚠ CAUTION

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

PROCEDURE

1. Use setup arms to fit drop box (item 1) into the working position, Ref: Figure 6.18.
2. Bolt up drop box (item 1) in the working position, Ref: Figure 6.18.

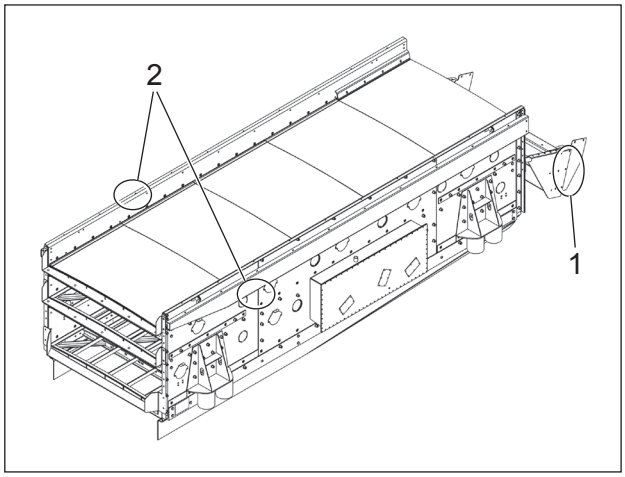


Figure 6.18 - Drop Box and Deflector Plate

3. Remove setup arms after drop box is securely fitted.
4. Slide the deflector plates (item 2) into the working position, Ref: Figure 6.18.

6.6 Horizontal Hopper Set-up (Option)

(1) Folding Up the Hopper Sides

⚠ WARNING

Falling material hazard. Ensure there is no water or material lying on hopper sides when in transport position.

NOTICE

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

Side conveyors need to be unfolded before putting hopper into operation position.

PROCEDURE

1. Observe all safety warnings.
2. Operate lever 1 (Ref. Figure 6.19), to fold the rear door of the hopper (Item 1; Ref. Figure 6.20), into its working position.

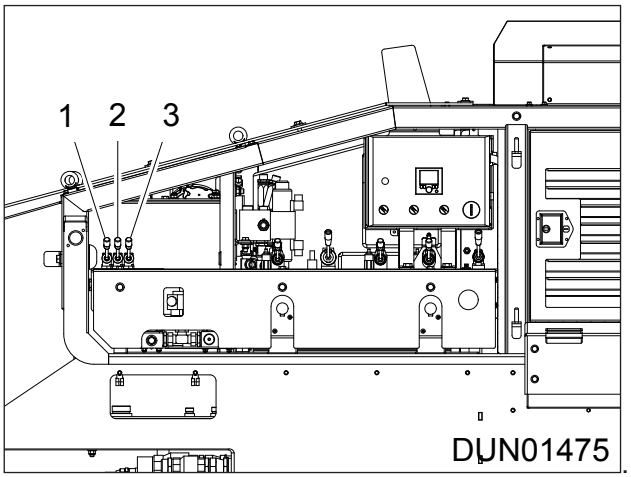


Figure 6.19 - Control Levers

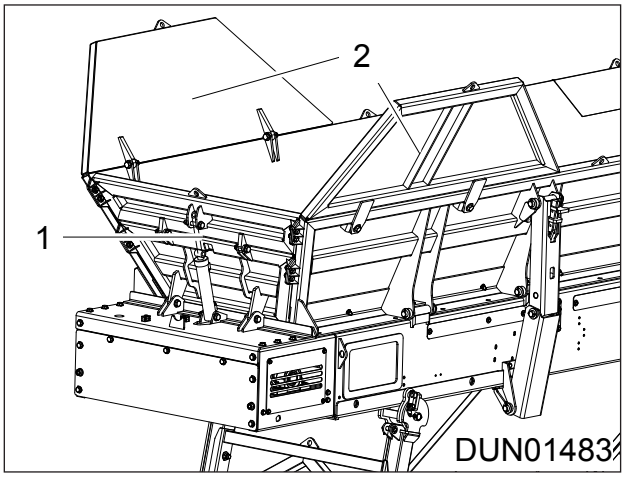


Figure 6.20 - Hopper Doors Raised

3. Operate lever (Item 1; Ref. Figure 6.19) and lever (Item 1; Ref. Figure 6.19) to fold the sides of the hopper up to the working postion (Item 2; Ref. Figure 6.20).

4. Insert the hopper wedges (Item 1; Ref. Figure 6.21) to secure the hopper sides in place.

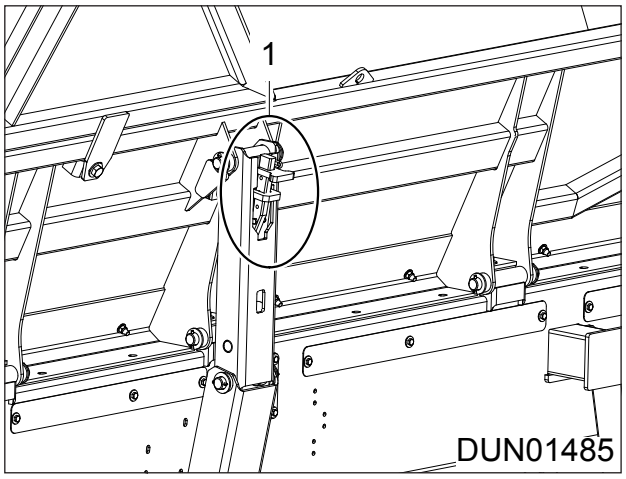


Figure 6.21 - Hopper Wedges

5. Secure the hopper sides to the rear hopper door by inserting the 4 bolts on either side (Item 1; Ref. Figure 6.22).

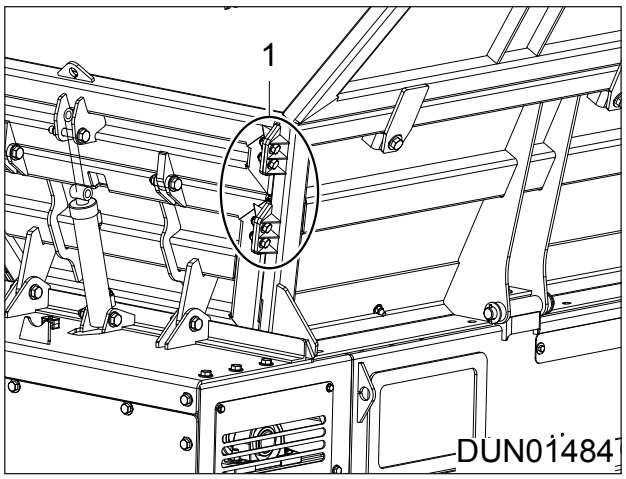


Figure 6.22 - Securing Bolts

(2) Rasing to Angled Working Position

⚠ WARNING

Falling material hazard. Ensure there is no water or material lying on hopper sides when in transport position.

NOTICE

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

Side conveyors need to be unfolded before putting hopper into operation position.

Raise hopper levers NOT TO BE OPERATED while LH side conveyor is in transport mode.

Hopper and screenbox are not underconnected on WARRIOR 2400.

PROCEDURE

1. Observe all safety warnings.

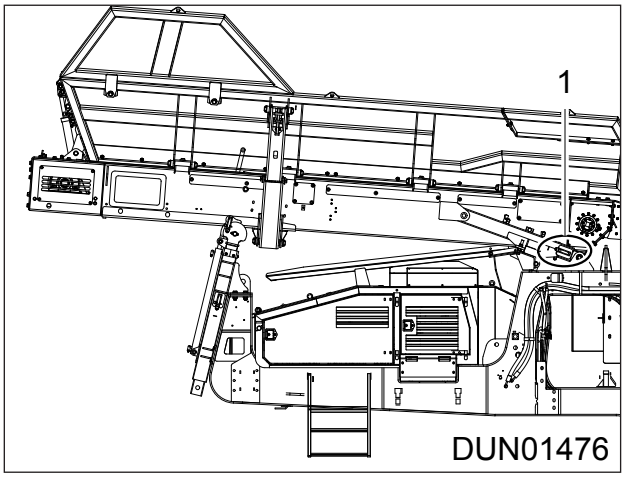


Figure 6.23 - Hopper in Transport Position

2. Remove pin (Item 1; Ref, Figure 6.23).

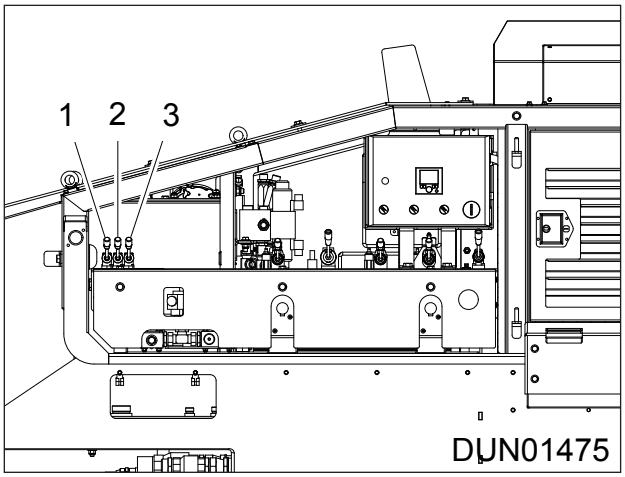


Figure 6.24 - Control Levers

3. Operate lever 3 (Ref. Figure 6.24) to raise the front strut (Item 1; Ref. Figure 6.25) to the second pinning location and re-insert the pin (Item 2; Ref. Figure 6.25)

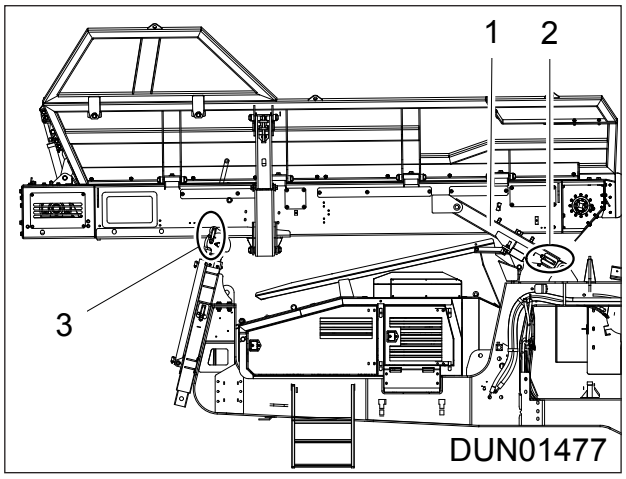


Figure 6.25 - Second Pinning Location - Front Strut

4. Remove pin (Item 3; Ref. Figure 6.25).
5. Operate lever 3 (Ref. Figure 6.24) to raise the hopper to its angled working position.

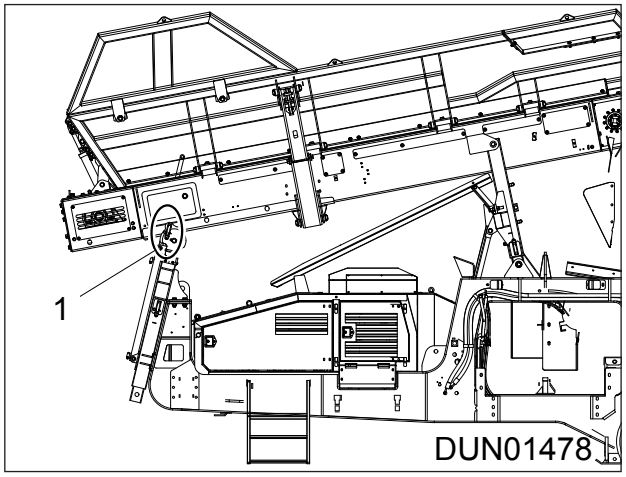


Figure 6.26 - Hopper Angled Working Position

6. Insert pin (Item 1; Ref. Figure 6.26) to secure the hopper in this position.

(3) Rasing to Horizontal Working Position

⚠ WARNING

Falling material hazard. Ensure there is no water or material lying on hopper sides when in transport position.

NOTICE

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

The Hopper Must be in the angled working position before carrying out this procedure.

PROCEDURE

1. Observe all safety warnings.
2. Remove pin (Item 1; Ref. Figure 6.27).

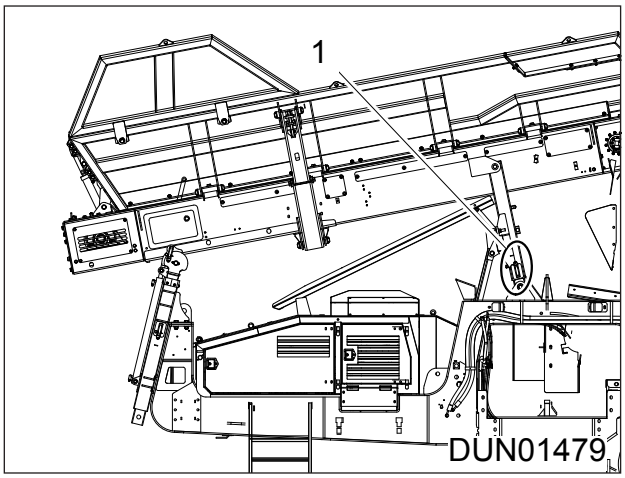


Figure 6.27 - Front Strut Pin

3. Operate lever 3 (Ref. Figure 6.28) to raise the front strut to the third pinning location (Item 1; Ref. Figure 6.29).

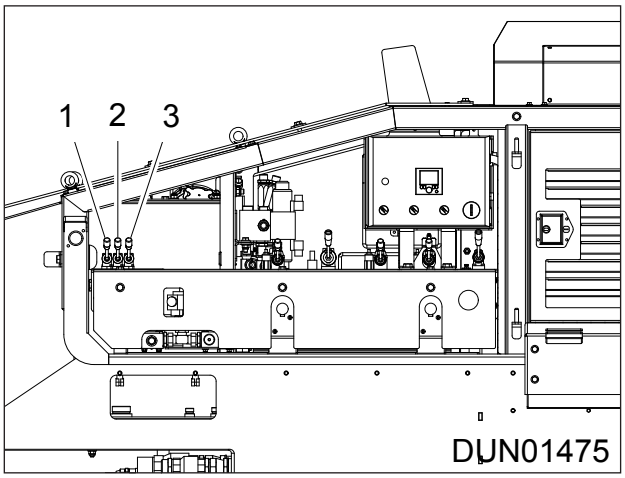


Figure 6.28 - Control Levers

4. Remove pins (Items 2 and 3; Ref. Figure 6.29).

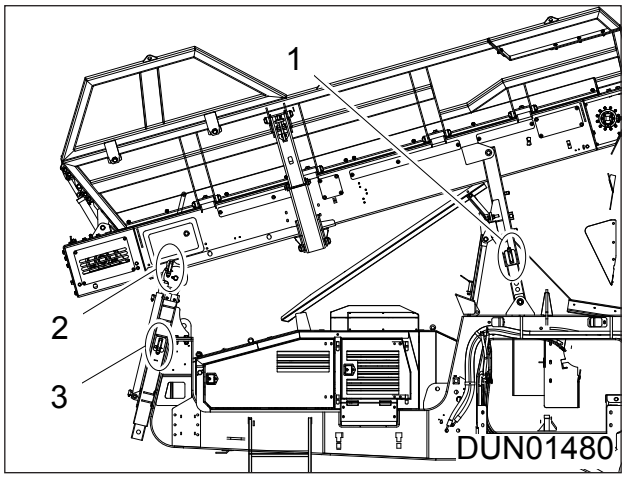


Figure 6.29 - Raising to Horizontal

5. Operate lever 2 (Ref. Figure 6.28) to raise the rear strut (Item 2; Ref. Figure 6.30) to the horizontal position.
6. Insert pins (Items 1, 3 and 4; Ref. Figure 6.30) to secure the hopper in the Horizontal Working position.

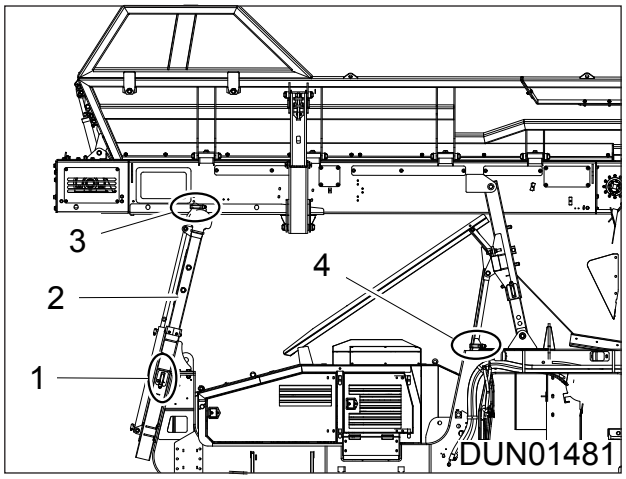


Figure 6.30 - Hopper in Horizontal Working Position

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7 Standard Operating Procedures

7.1 Pre Operating Checks

⚠ DANGER

DO not stand on the maintenance platform whilst the screen and feeder are operating.

⚠ WARNING

The machine may only be operated if the safety instructions provided in this manual have been observed and the described procedures have been performed.

Wear personal protective equipment. Always wear a EN/ANSI approved hard hat and footwear with adequate toe protection when working in the vicinity of the machine and on the work site.

Keep away from the conveyor belts, where there is risk of serious injury or death due to rejected processed material and danger from other heavy machinery working in the area, unless you are a fully-trained operator engaged in collecting processed material.

Fall hazard.

Switch off, tag out and lock out machine before carrying out pre-operating checks.

NOTICE

In the event the machine malfunctions for any reason, stop the machine and lock out immediately. Report the malfunction to the competent authority in charge. DO NOT continue to operate the machine UNTIL the malfunction is corrected!

AVOID frequent starting and stopping of the machine unnecessarily as it WILL cause damage to the machine.

PROCEDURE

1. Ensure the machine is placed on solid level ground capable of carrying the machine‘s weight. Regularly check the stability of the plant. The chassis should not bounce during operation.
2. Ensure there is adequate space around the machine for operation, material stockpiles, maintenance and vehicular movement.
3. Ensure all guards are fully secured in correct/closed position.
4. Check that all safety equipment, alarms and interlocks are operative.
5. Operate the machine only if all protective and safety devices, such as removable safety devices, emergency shut-off equipment, sound-proofing elements and exhausts are in place, fully functional and properly maintained.
6. Remove all loose items from the belt by untying the securing ropes.
7. Ensure all control valve levers are in the neutral (non-operational) position.
8. Check the engine oil level and the fuel level and replenish if necessary.
9. Check the hydraulic oil level and replenish if necessary.
10. Ensure the material being feed into the feeder or screen unit is below the size limitations recommended by the manufacturer. Do not allow build up of material at feed points.
11. DO NOT allow the engine RPM to run at a speed not suited for the application. Check the wear parts to ensure speed is suitable for the application and feed rate not excessive.
12. Check setup of the screen unit and adjust as necessary to the required settings.
13. Observe all safety instructions and ensure the correct protective clothing and equipment are used by operators.
14. All sound baffles must be closed during operation.
15. Check the oil cooler fan and radiator for any build up of dust/dirt. Check regularly that the oil cooler fan is running correctly and that dust/dirt has not built up in the fan and radiator unit (overheating can occur if dust/dirt is allowed to build up). Blow out dust/dirt if necessary.

7.2 Initial Startup Checks

NOTICE

Checks on the machine are crucial during the first week of operation.

These checks must be carried out before operating the machine.

This section should be read and understood prior to starting the machine. If there are any doubts, consult your local Powerscreen dealer or Powerscreen Technical Support department.

PROCEDURE

1. Refer to engine manufacturer's manual for initial start up of the engine.
2. Run the machine empty for a short period of time and check for abnormal noises, vibration or excessive heat from the shaft bearings.
3. Each day during the initial days of operation check the tension of the conveyor belts.
4. Frequently check the overall stability of the machine, re-position if necessary.
5. Check the machine is level, re-position if necessary.
6. Frequently check the hydraulic oil level in the tank.
7. Frequently check all oil levels.
8. Ensure that the tension of the screen mesh(es) is satisfactory.
9. Frequently check the flow of material over the screen mesh(es) to confirm satisfactory separation is taking place.
10. Make sure that the screen mesh apertures are free of 'pegged' material and that they remain in good condition.
11. Check the vibrating unit bearing temperatures using a contact thermometer on the end covers; record the temperature for future reference and fault diagnosis. (Maximum acceptable temperature is 80 ºC [176°F] .)
12. Ensure that all components of the machine are operating before any material is introduced to the machine.

7.3 MCU300 Machine Operation

(1) Starting the Engine

NOTICE

Do not start the engine if any red warning lights or fault symbols are shown on the display screen. A fault symbol indicates that there is a fault relevant to that indicator which must be fixed before starting the engine.

(a) No Faults on the Display Screen

PROCEDURE

1. Switch the engine speed switch (item 4) to low, Ref: Figure 7.1.

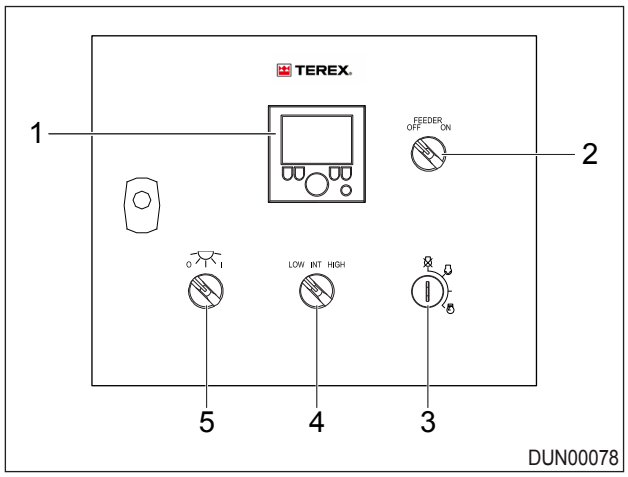


Figure 7.1 - Control Panel

2. Turn the ignition key on the control panel to the “ON” position, Ref: Figure 7.2 (item 2).

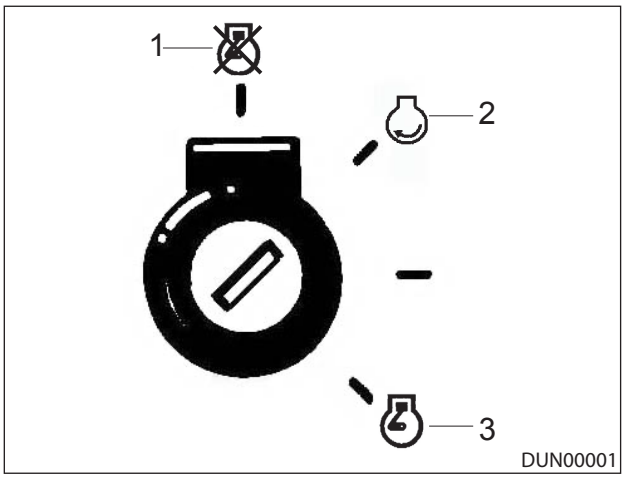


Figure 7.2 - Ignition Key Positions

» *The home screen will be displayed on the control panel display screen, Ref: Figure 7.3. The indicator lamps in the centre of the screen will illuminate and extinguish after two seconds if there are no faults present. If the indicator lamps do not extinguish, refer to section 7.4(3) for more information. The e-stop healthy and fuel on symbols only should light up green. Do not start the engine if any other lights are illuminated red or if there are any other faults shown on the display screen.*

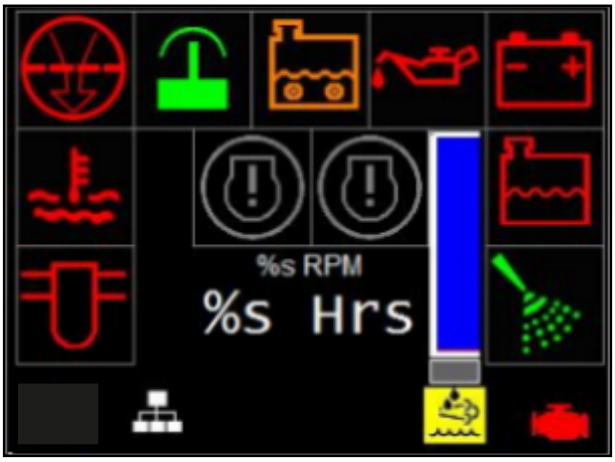


Figure 7.3 - Home Screen (No Faults)

» *On Tier 4 machines the wait to start lamp is illuminated briefly on the home screen, Ref: Figure 7.4. The engine can be started after this lamp goes out.*

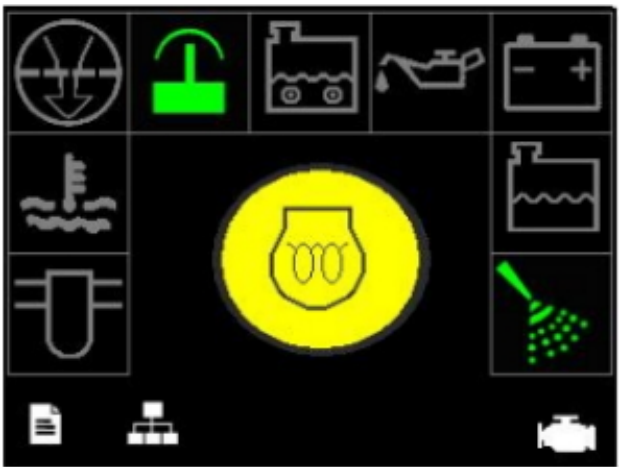


Figure 7.4 - Home Screen (Wait to Start)

3. Turn the ignition key to the crank position, Ref: Figure 7.2 (Item 3).

» *The engine will crank and start after the warning siren has sounded for approximately 7 seconds.*

» To view engine information, press the button under the engine symbol (item 4), Ref: Figure 7.5.

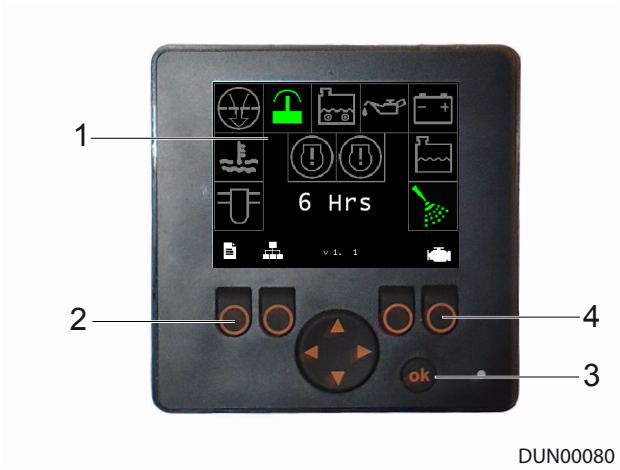


Figure 7.5 - Control Panel Display

» *The engine information screen is displayed, Ref: Figure 7.6. Refer to Table 7.1 for a description of each of the symbols.*

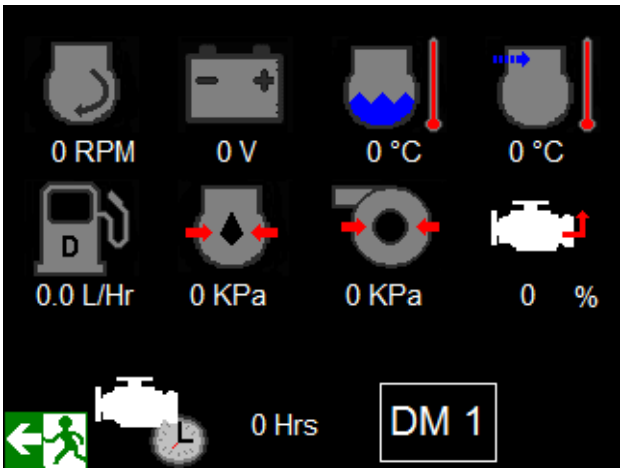
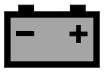
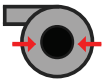


Figure 7.6 - Engine Information Screen

Table 7.1 - Engine Information Screen Symbols

Symbol	Description
	Engine speed
	Battery voltage
	Coolant temperature
	Air intake temperature
	Fuel rate
	Engine oil pressure
	Engine boost (or turbo) pressure
	Engine load
	Engine run hours

When a DM 1 code is present the DM 1 symbol will flash red. Pressing the button will take you to the Active Fault page

4. To return to the main menu home screen any time press the button under the exit symbol (item 2), Ref: Figure 7.5.

(b) Active Fault on the Display screen

A fault symbol will be illuminated red on the home screen when a fault occurs. The symbols shown will depend on the fault.

NOTICE

Do not start the engine if any red warning lights or fault symbols are shown on the display screen. A fault symbol indicates that there is a fault relevant to that indicator which must be fixed before starting the engine.

PROCEDURE

1. Switch the engine speed switch (item 4) to low, Ref: Figure 7.1.
2. Turn the ignition key to the “ON” position, Figure 7.2 (item 2).

   » *The main menu is displayed on the control panel screen. A fault symbol around the outer edge of the home screen is highlighted red and a yellow safety warning symbol is displayed in the bottom left hand corner of the screen indicating that there is a fault, Ref: Figure 7.7.*



Figure 7.7 - Home Screen (Active Fault)

3. Press the button under the warning symbol to view the alarm history, Figure 7.8 (item 2).

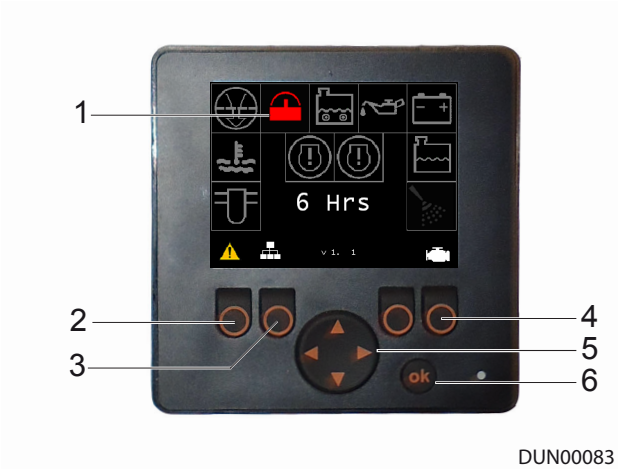


Figure 7.8 - Control Panel Display

» *A screen showing the alarm symbol and corresponding fault code is displayed, Ref: Figure 7.9. The engine run hours at which the fault occurred is also displayed. Active alarms will have the yellow warning symbol displayed beside the fault symbol. If a fault symbol is shown without the yellow warning symbol, this indicates that the alarm has occurred but it is now inactive.*



Figure 7.9 - Fault Screen

4. The last 12 faults are stored in the control panel. Press the right direction button (item 5) on the panel to scroll through the active faults, Ref: Figure 7.8.
5. To return to the main menu home screen any time press the button under the exit symbol (item 2), Ref: Figure 7.8
6. Determine the cause of the fault(s) and ensure that the problem(s) has been fixed before continuing. Refer to Table 7.2 for fault code descriptions. If the engine fault screen is shown (Figure 7.10) there is a problem with the engine. Refer to the table in Section 10.10 for a list of the engine fault codes. Refer to the engine manufacturer's manual or your local dealer for more information.



Figure 7.10 - Engine Fault Screen

7. Press the button (item 2) on the control panel to return to the home screen, Ref: Figure 7.8 .

» *The home screen will be displayed with the fault symbol shown orange indicating that the fault is cleared, Ref: Figure 7.11.*

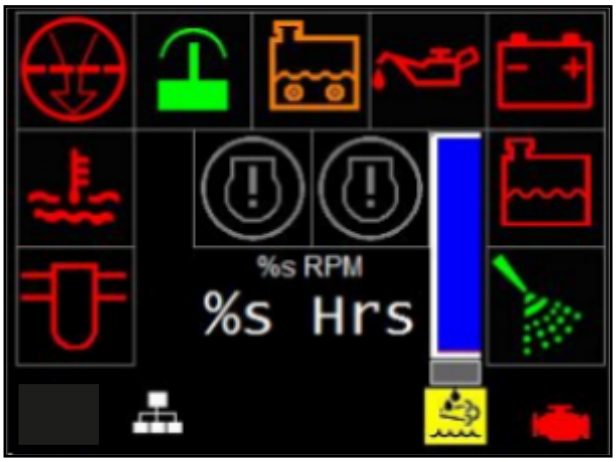


Figure 7.11 - Home Screen (Fault Cleared)

8. If there is a communication loss fault (FC010), the communication loss fault icon will be displayed in the centre of the home screen , Ref: Figure 7.12.



Figure 7.12 - Home Screen (Communication Fault)

9. Press the button (item 3) on the panel to view the machine inputs and outputs, Ref: Figure 7.8.

» *The controller status screen showing the input and output connections will be displayed, Ref: Figure 7.13. If there is a communications fault, all of the icons will be shown in grey.*



Figure 7.13 - Controller Status Screen

10. If any of the inputs or outputs are illuminated green, there is healthy communication between the PLC and the display screen. If any of the inputs are grey, the input to the controller is not active. If any of the outputs are grey, the output to the controller is not active. Ensure that all connections are correct.

» Refer to tables below for descriptions of each of the inputs and outputs shown on the controller status screen.

Table 7.2 - Inputs

Item	Description
I0	IGN ON
I1	TRACK REQUEST
I2	FEED CONVEYOR PRESSURE
I3	LOW SPEED
I4	INTER SPEED
I5	HIGH SPEED
I6	CONVEYOR 1 START REQ
I7	FEED CONVEYOR SWITCH
I8	AIR FILTER RESTRICTION
I9	START ENGINE
I10	MACHINE STOP
IN11	HYD OIL LEVEL

Table 7.3 - Outputs

Item	Description
O0	ENGINE CRANK
O1	FUEL SYSTEM
O2	HYD OIL FAN
O3	SIREN/BEACON
O4	TRACKS ENABLE
O5	DELAYED ENGINE SHUTDOWN
O6	SPARE
O7	SPARE
O8	SPARE
O9	SPARE
O11	CONVEYOR 1 RUN
O11	FEEDER CONVEYOR RUN

Table 7.4 - Expansion Node Inputs

Item	Description
I1	CONVEYOR 2 START REQ
I3	CONVEYOR 2 START REQ
I5	SPARE
I7	SPARE

Table 7.5 - Expansion Node Outputs

Item	Description
O2	CONVEYOR 2 RUN
O4	CONVEYOR 3 RUN
O6	SPARE
O8	SPARE

11. Press the button (item 2) on the control panel to return to the home screen, Ref: Figure 7.8 .
12. Turn the ignition key to the crank position, Ref: Figure 7.2 (item 3).

» The engine will crank and start after the warning beeper has sounded for approximately 7 seconds.

(c) CAT Fault Indicator Lamps

The fault indicator lamps in the centre of the home screen will flash when powering up the CAT ECU on switch on but will switch off again if there are no faults.

If either or both of the indicator lamps are illuminated or flashing while the engine is running, there is a fault with the engine system which must be dealt with immediately, Reference: Figure 7.14 and Figure 7.15. Refer to Table 7.6 to determine the fault indicated by the lamps.

NOTICE

All faults must be identified and resolved as soon as possible.

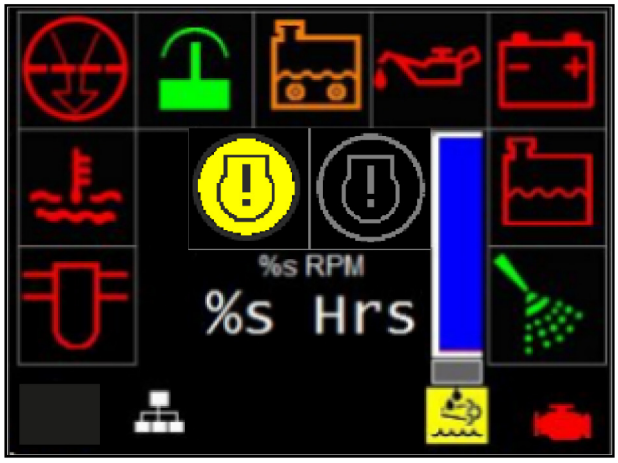


Figure 7.14 - Warning Lamp (Alert Lamp)

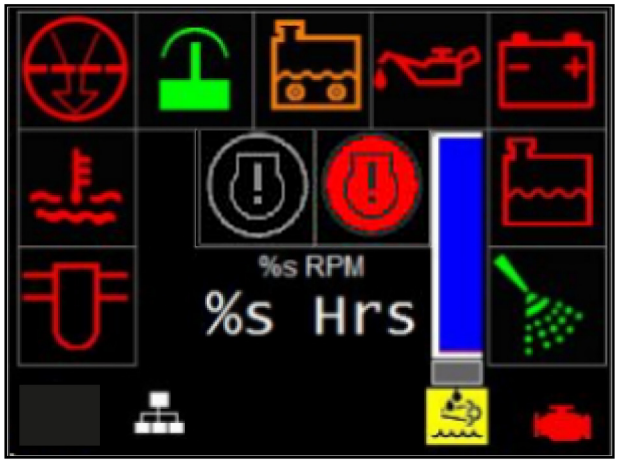


Figure 7.15 - Shutdown Lamp (Action Lamp)

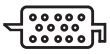
Table 7.6 - Indicator Lamps Logic

Warning Lamp	Shutdown Lamp	Lamp State	Description	Engine State
On	On	Bulb Check	When the ignition is turned on the EMS shall illuminate each bulb for 2 seconds and extinguish them afterwards.	Key on but engine has yet to be cranked.
Off	Off	No faults present	With both lamps off whilst engine is running then there are no currently active warnings diagnostic's or events.	Engine is running with no detected faults.
On	Off	Active diagnostic	Should the warning lamp illuminate during engine running this indicates that an Active diagnostic (Electrical fault) is present.	Engine is running normally but has one or more faults with the engine management system.
On	Flash	Derate (invoked by active diagnostic)	Should the warning lamp illuminate and the shutdown lamp flash during engine running this indicates that an Active diagnostic (Electrical fault) is present. The diagnostic is sufficiently serious to invoke engine derate.	Engine is running but has one or more Active diagnostic events that have initiated engine derate.
Flash	Off	Warning (warning only)	Should the warning lamp flash during engine running this indicates that one or more of the engine protection strategy warning values have been exceeded but not to a level that will invoke Derate or Shutdown.	Engine is running normally but has one or more monitored engine parameters outside of the acceptable range.
Flash	Flash	Derate (warning and derate)	Should both the Warning lamp and Shutdown lamp flash during engine running this indicates that one, or more, of the engine protection strategy values have been exceeded beyond the level required to invoke engine Derate.	Engine is running but one or more of the monitored engine parameters has gone beyond that of warning only and has now exceeded those set for engine derate.
On	On	Engine shutdown	Should both the Warning lamp and Shutdown lamp illuminate during engine running this indicates that either: 1. One or more of the engine protection strategy shutdown values has been exceeded. 2. A serious Active diagnostic has been detected. Shortly after (time duration to be agreed) engine will shutdown.	Engine is either shutdown or shutdown is imminent, one or more monitored engine parameters have gone beyond that of warning or derate and have now exceeded those set for engine shutdown. Or a serious Active diagnostic has been detected

(d) CAT 7.1 Tier 4 Diesel Particulate Filter Regeneration

This diesel particulate filter (DPF) removes pollutants from exhaust gases. When particulates build up in the DPF, the regeneration device raises the temperature of the exhaust gases in order to regenerate the DPF and prevent it from becoming blocked. This is an automatic process and the corresponding symbols will be illuminated on the home screen when they are active, refer to Table 7.4 for descriptions of each of the symbols. Refer to the engine manufacturer's operations manual for more information.

Table 7.7 - Diesel Particulate Filter Regeneration Symbols

Symbol	Description
	Diesel particulate filter (DPF) regeneration
	Diesel particulate filter regeneration disabled
	High exhaust system temperature (HEST)
	Percentage soot load in the diesel particulate filter

PROCEDURE

1. When the particulates build up in the DPF and the temperature of the exhaust gases are raised, the high exhaust system temperature symbol is illuminated orange on the home screen, Ref: Figure 7.16.

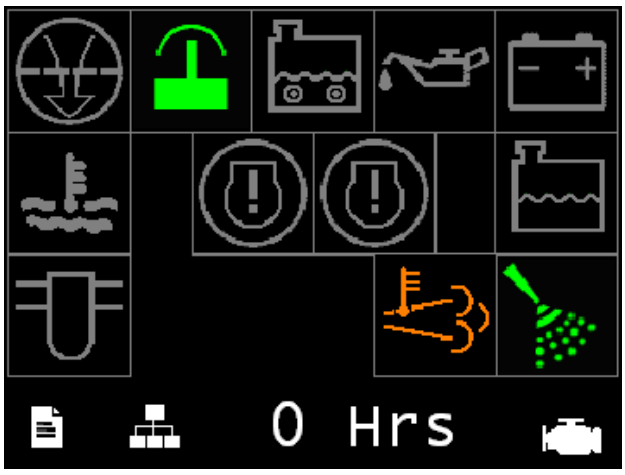


Figure 7.16 - High Exhaust System Temperature (HEST)

2. When the diesel particulate filter regeneration is active, the DPF regeneration symbol will be illuminated orange on the home screen, Ref: Figure 7.17.

   » *The duration of the regeneration will depend on the soot load in the diesel particulate filter.*

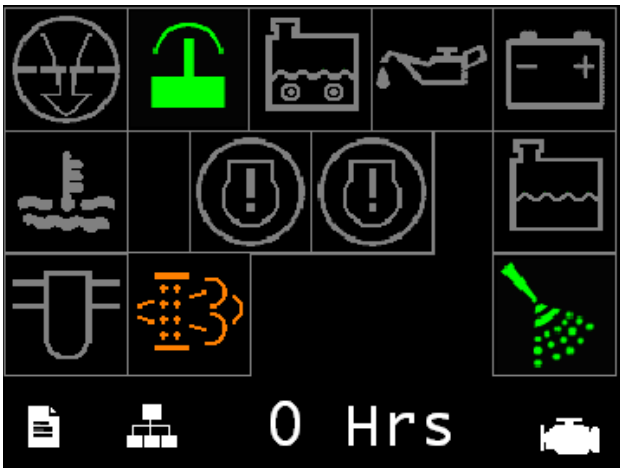


Figure 7.17 - Diesel Particulate Filter (DPF) Lamp

3. If the diesel particulate filter regeneration has been disabled, the DPF disabled symbol will be illuminated orange on the home screen, Ref: Figure 7.18.

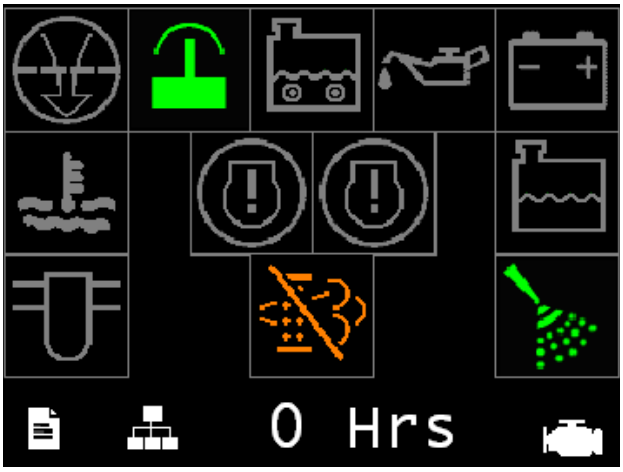


Figure 7.18 - DPF Regeneration Disabled

4. To view the diesel particulate filter information screen press the button (item 2), Ref: Figure 7.19.

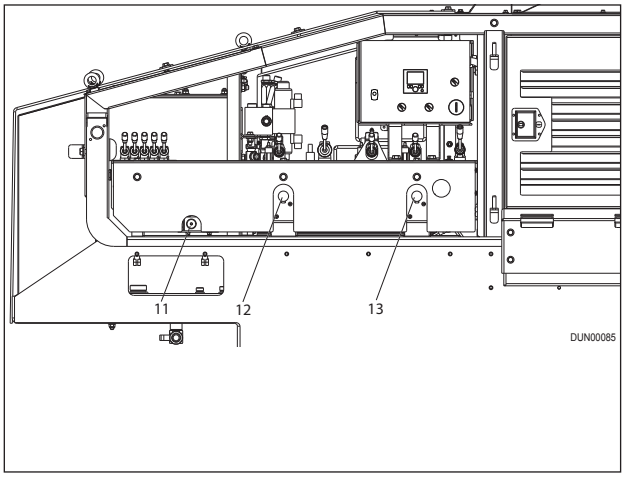


Figure 7.19 - Control Panel Display

5. The diesel particulate filter information screen shows the percentage soot load in the DPF, Ref: Figure 7.20.

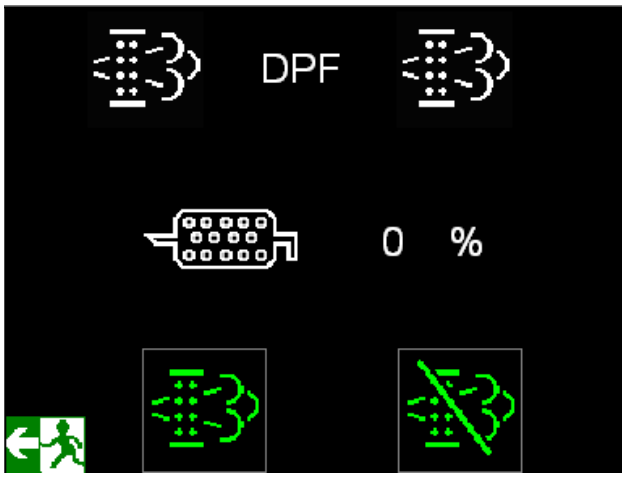


Figure 7.20 - Diesel Particulate Filter Information Screen

6. To force a DPF regeneration, press the button under the DPF regeneration symbol (item 3), Ref: Figure 7.19
7. To disable the DPF regeneration press the button under the DPF disable symbol (item 4), Ref: Figure 7.19
8. Press the button under the exit symbol (item 2) to return to the home screen.

7.4 Tracking

NOTICE

When the Radio Control is ENABLED and the Radio Stop button on the Radio Handset is ACTIVE. Pressing the Radio Stop button at this stage will shut down the machine.

Once the radio control is DISABLED the radio stop button on the radio handset is INACTIVE. Pressing the radio stop button at this stage will have no effect.

The machine can be tracked using either the umbilical remote tracking unit or the radio tracking unit.

(1) Manual Tracking with the Umbilical Handset

PROCEDURE

1. Ensure engine is running and all conveyors, feeder etc are OFF.
2. Press the Tracks Start button on the umbilical remote (item 8), Ref: Figure 7.21.
   - » *The Led Indicator will illuminate RED. The Siren and Beacon will activate and continue to do so until the Tracks Stop button (item 7) is pressed.*

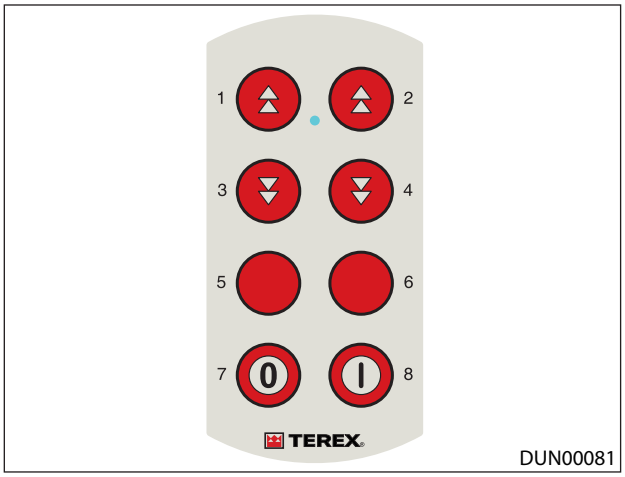


Figure 7.21 - Tracking Umbilical Layout

3. After a period of 10 seconds the LED Indicator will illuminate GREEN.
4. At this stage pressing the various Track direction buttons (items 1 to 4) will engage the respective track solenoid.
5. To stop the Tracking function, simply press the Tracks Stop button on the Umbilical (item 7) in Figure 7.21.

(2) Radio Tracking with the Radio Tracking Unit

PROCEDURE

1. Ensure engine is running and all conveyors, feeder etc are OFF.
2. Press and hold both Radio Start buttons on the Radio Handset (items 9 & 0) in Figure 7.22, for 3 seconds.

   » All three LED Indicators will flash.

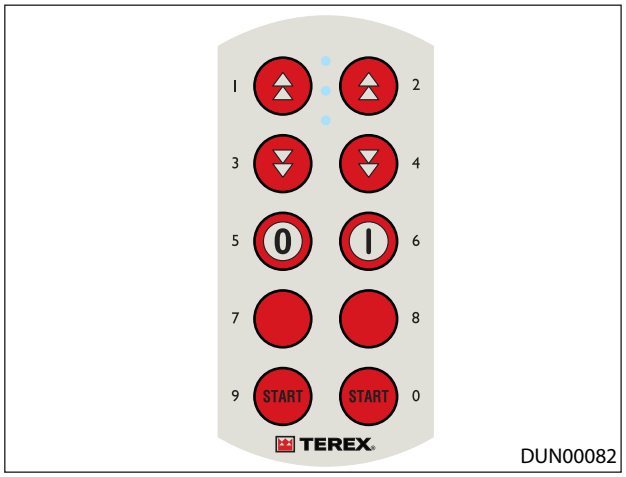


Figure 7.22 - Radio Tracking Transmitter Layout

3. Release the Start buttons.

   » The Top LED Indicator will illuminate GREEN and the other two LEDs will be OFF.

4. Press the Tracks Start button on the Radio Handset (items 6) in Figure 7.22.
5. At this stage pressing the various Track direction buttons (items 1 to 4) will engage the respective track solenoid.
6. To stop the Tracking function, simply press the Tracks Stop button on the Umbilical (item 5) in Figure 7.22.
7. If you have finished with the tracking function, the radio control unit can be disabled by pressing the radio stop button at the base of the radio handset.

(3) Radio Tracking with the Teleradio Remote Control

PROCEDURE

1. Ensure engine is running and all conveyors, feeder etc are OFF.
2. Remove the dummy plug (item 1) and insert the remote control unit plug into it‘s socket at the rear of the machine, Reference: Figure 7.23.

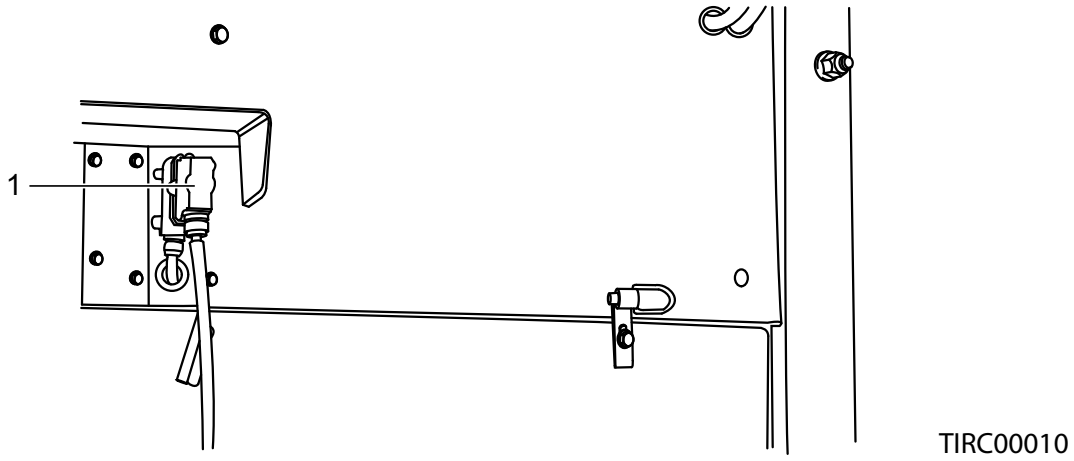


Figure 7.23 - Remote Control Unit Connection

3. Turn the transmitter on using the switch on the back and release the machine stop button (button 7) at the bottom of the transmitter, Reference: Figure 7.24.
4. Hold buttons 5 and 6 until the transmitter beeps indicating the log-in process has begun, Reference: Figure 7.24.

» The machine siren will sound and there will be a 7 second delay before the tracks can be operated.

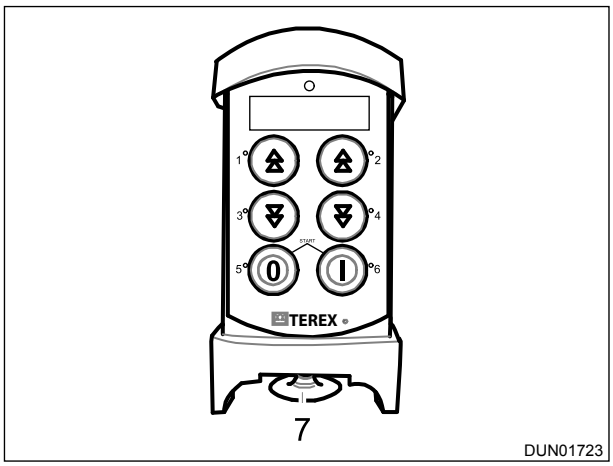


Figure 7.24 - Teleradio Remote Tracking Transmitter

5. Use buttons 1, 2, 3 and 4 to operate the tracks..
6. Move the machine into the required position on the work site.
7. Press button 5 to disable the tracks. Press button 7 to switch off the machine, Reference: Figure 7.24.
8. If you have finished with the tracking function, the radio control unit can be disabled by pressing the radio stop button at the base of the radio handset.

(4) Fast Tracking

Some machines are fitted with two-speed tracking systems.

To engage fast tracking on the machine, four levers in the power unit must be pulled down before tracking, (items 1-4, Reference: Figure 7.25).

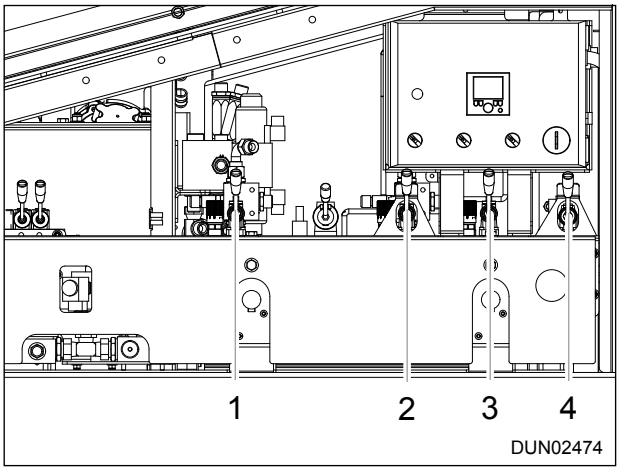


Figure 7.25 - Teleradio Remote Tracking Transmitter

Both the Umbilical Handset and the Radio Handset have two-step push buttons on the Track Directions. The first level is the Normal Track speed. The second press level is the Fast Track Speed.

You cannot slow the machine with Fast Tracks – only both forward or both reverse tracks will engage the fast track function.

7.5 Tier 3 Dual Power Machine Operation

(1) MCU200 Control Panel

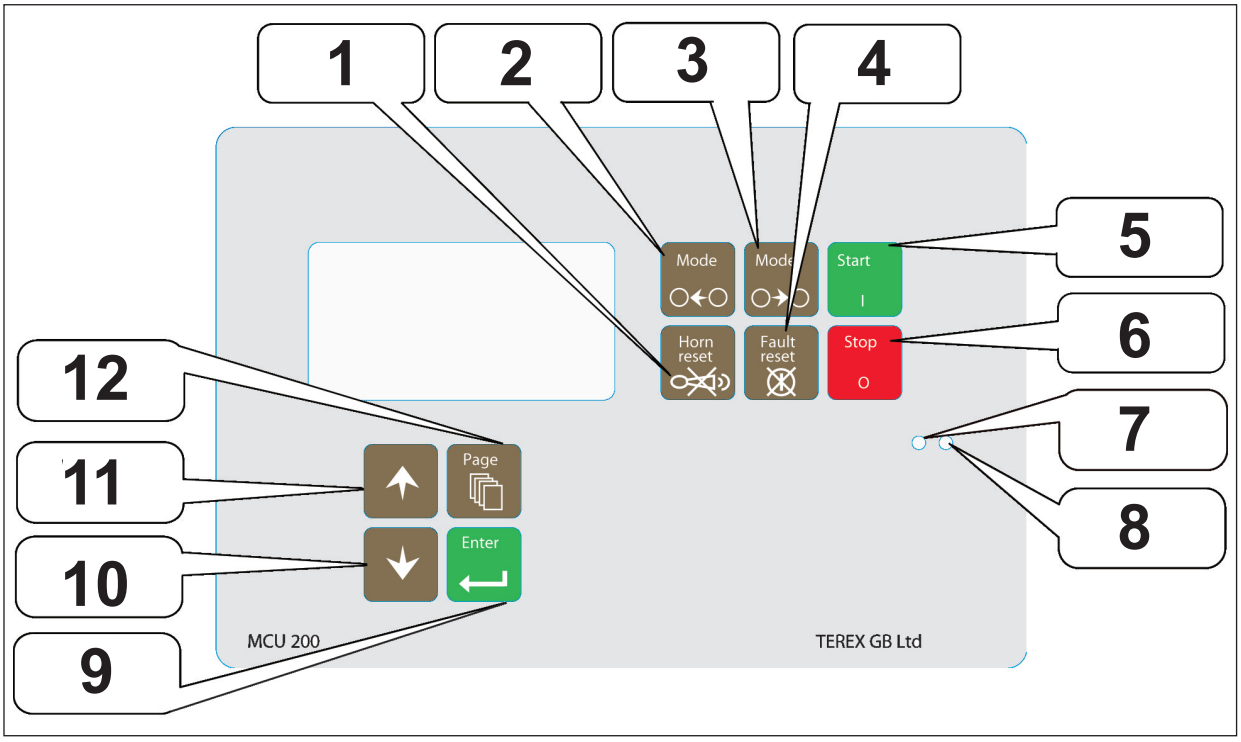


Figure 7.26 - Powerscreen MCU200 Operator Interface

Table 7.8 - Powerscreen MCU200 Function Key and Display LED Description

Number	Description
1	Unused
2	Mode Select - Backward Cyclic Selection of OFF-MAN-AUT
3	Mode Select - Forward Cyclic Selection of OFF-MAN-AUT
4	Fault Reset – Acknowledges Faults and Alarms
5	Start – Begins Start Sequence
6	Stop – Stops Engine
7	Green LED – Engine Running
8	Red LED – Fault Present
9	Enter – Confirm Setpoint value
10	Down select Button – Setpoint adjust / Screen Select etc
11	Up select Button – Setpoint adjust / Screen Select etc
12	Page – Cyclic Selection of Display Mode

(a) Display

There are three Display Menus available:

1. Measurement
2. Adjustment
3. History

PROCEDURE

1. Scroll between the three Display Menus using the PAGE button

(b) Mode

There are three Engine Modes available:

OFF

MAN (Manual)

AUT (Auto)

You must enter minimum Level 2 Password to change modes. MCU200 must be in MAN mode to function.

PROCEDURE

1. Use the MODE buttons to select between the three modes.

(c) Viewing Measured Data

PROCEDURE

1. Press the PAGE button repeatedly until the Measurement Display is active.
2. Then use the UP and DOWN buttons to select the screen with the requested data.
3. Press ENTER to enter that page.

(d) View and Edit Setpoints

Setpoints marked with '*' are password protected.

PROCEDURE

1. Press the PAGE button repeatedly until the Adjustment Display is active.
2. Use the UP and DOWN buttons to select the requested Setpoint Group.
3. Press ENTER to confirm.
4. Use the UP and DOWN buttons to select the requested Setpoint.
5. Press ENTER to edit.
6. Use the UP and DOWN buttons to modify the requested Setpoint. Pressing and holding the UP or DOWN keys will cause the value to ramp up or ramp down.
7. Press ENTER to confirm or PAGE to escape without saving change.

(e) Changing the Display Contrast

PROCEDURE

1. Press ENTER and UP or DOWN at the same time to change the display contrast.

(f) Changing Display Language

PROCEDURE

1. Hold ENTER and then press PAGE to go to Software Version Screen.
2. Press PAGE to enter Language Selection Screen.
3. Use the UP / DOWN buttons to select required language.
4. Press ENTER to confirm language selection.

(g) Viewing Active Alarms

The Active Alarm Screen is the last screen in the Measurement Menu.

The Active Alarm List will be displayed each time a new alarm is activated.

Alarms have four states as shown below:

Description	
*Wm Water temp	Active not accepted alarm
Wm water temp	Active accepted alarm
*Wm Water temp	Inactive not accepted alarm
	Inactive accepted alarm

PROCEDURE

1. Select Measurement Menu.
2. Press UP to view Active Alarms.
3. Press FAULT RESET to accept all alarms.

   » *Non-active alarms will clear from the screen.*

(h) ECU Alarm List

There is a second Alarm List that deals with only those alarms sent over CanBus via J1939 protocol from electronic engine ECUs.

This Alarm List is one screen above the Main Active Alarm List.

If an ECU alarm is received, it will be indicated by an exclamation mark (!) on the Main Screen and by ECU FAULT on the standard alarm list.

(i) Chart Guide to Menus and Pushbutton Operation

Figure 7.2 below shows the navigation procedure through the various screens in the MCU200.

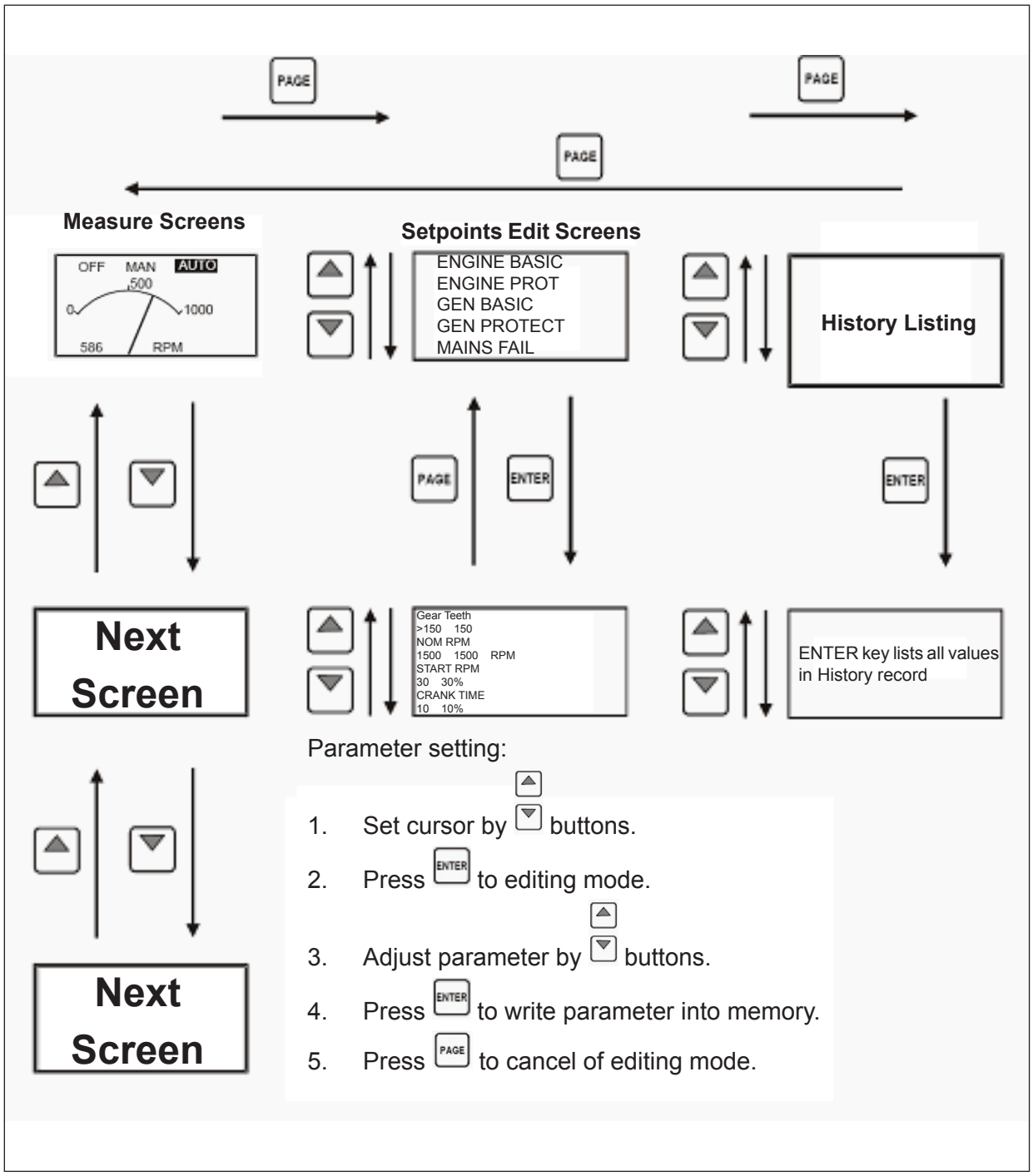


Figure 7.27 - MCU200 Navigation Procedure

(j) Start – Stop Sequence

The order in which the MCU200 controller starts and stops the engine is given below to enable operators to have a better understanding of the control logic which will aid in any service issues.

The Start-up routine can be interrupted at any time by pressing the STOP button.

PROCEDURE

1. Ensure System is in Ready State as indicated on the Home Page.
2. Press Start button or turn Keyswitch to Crank position.
   - » *Siren & Beacon will switch ON. Fuel Solenoid will switch ON. After 10 seconds, Siren and Beacon will switch OFF.*
   - » *Starter Solenoid will switch ON. Starter Solenoid will stay on for the duration of the MaxCrankTime as set in the setpoints menu or until the engine RPM is greater than the Start RPM as set in the setpoints menu.*
   - » *Once the RPM is greater than the Start RPM, the control system will enter the Running State.*
   - » *If the engine RPM does not exceed the Start RPM within the MaxCrankTime, the system will pause for three seconds then repeat the process.*
   - » *This Start process will repeat three times after which if the Running state is not achieved the system will shutdown and a Start Fail fault will be displayed.*
3. To restart the sequence, press Fault Reset button and then the Start Button (or Ignition Switch to crank position).
4. To stop the engine at any time, press the Stop button.
   - » *If a Stop Delay time is enabled this will begin to count down and be displayed on the Home page. Once this time has elapsed the Fuel Solenoid will disengage and the engine will stop.*
5. If the Stop button is pressed a second time during the Stop Delay, the engine will stop immediately.
6. If no Stop Delay has been enabled, pressing the Stop button once will disengage the Fuel Solenoid and stop the engine.

(k) History File

The MCU200 stores a record of each important event into a history file. The file holds 117 events. Once this count is reached, the older events are overwritten.

Historical Event Structure

Abbreviation	Historical Value
Num	Number of Historical Event
Reason	Event Specification
Date	Date of Historical Event in format DD/MM/YY
Time	Time of Historical Event in format HH:MM:SS
RPM	Engine Speed
Ubat	Battery Voltage
OilP	Oil Pressure (if used)
EngT	Engine Temperature (If used)
FLvl	Fuel Level (If used)
AIM1	Unused
AIM2	Unused
AIM3	Unused
AIM4	Unused
BIN	State of Binary inputs (1=Closed, 0=Open)
BIM	State of Additional Binary Inputs (1=Closed, 0=Open)
BOUT	State of Binary Outputs (1=Closed, 0=Open)
BOM	State of Additional Binary Outputs (1=Closed, 0=Open)
FC	ECU Alarm Failure Code
FMI	ECU Alarm Failure Mode Identifier

Viewing History

PROCEDURE

1. Press the PAGE button repeatedly to access the History Page.
2. Press UP or DOWN to select required Historical Entry.
3. Press ENTER to scroll to the Right and view various measured data at that Log Time.
4. Use the PAGE button to get back to the Measurement Screen.

(2) .Diesel Mode Operation

PROCEDURE

1. Ensure the battery is connected and the battery isolator switch is in the ON position
2. Switch the Ignition Switch to the ON position
   - » *The Powerscreen MCU200 controller will power up and the screen will illuminate.*
3. If there are any un-cleared or active faults, the Display will show ‘Not Ready’.
4. Press the Fault Reset Button on the MCU200 to clear any inactive faults.
5. Ensure the MCU200 is in MAN mode
6. Once the MCU200 displays ‘Ready’ it is clear to begin the Start Procedure.

The engine can be started by two methods:

(a) Using the Start Pushbutton

PROCEDURE

1. To start the engine using the Start Pushbutton simply press the Start Button when ready to start the engine
   - » *This will cause the Siren and Beacon to operate for ten seconds*
   - » *After 10 seconds, the starter solenoid will energise for five seconds and the engine will try to start*
   - » *If the engine has not started within the five seconds the starter solenoid will disengage and there will be a pause of three seconds.*
   - » *After the three second pause, the Siren and Beacon will operate for ten seconds*
   - » *After 10 seconds, the starter solenoid will energise again for five seconds and the engine will try to start..*
2. If the engine has not started within the five seconds the starter solenoid will disengage and there will be a pause of three seconds.
3. This process will be repeated three times in total after which if the engine has not started the MCU200 will display ‘StartFail’ alarm
4. Once the MCU200 reads a speed level from the engine the engine starter solenoid will disengage and the MCU200 will display ‘Running’
5. The engine speed will be displayed on the MCU200 visually as an analogue gauge and the RPM value displayed beside it as shown in Figure 7.2.

(b) Using the Ignition Switch

PROCEDURE

1. Start the engine using the Ignition Switch simply turn the Ignition to the ‘Crank’ position and release. The start sequence will be the same as detailed above
2. The Start / Stop sequence is given in more detail in Section 7.3.1 (j) of this manual.

7.6 Tier 4 Dual Power Machine Operation

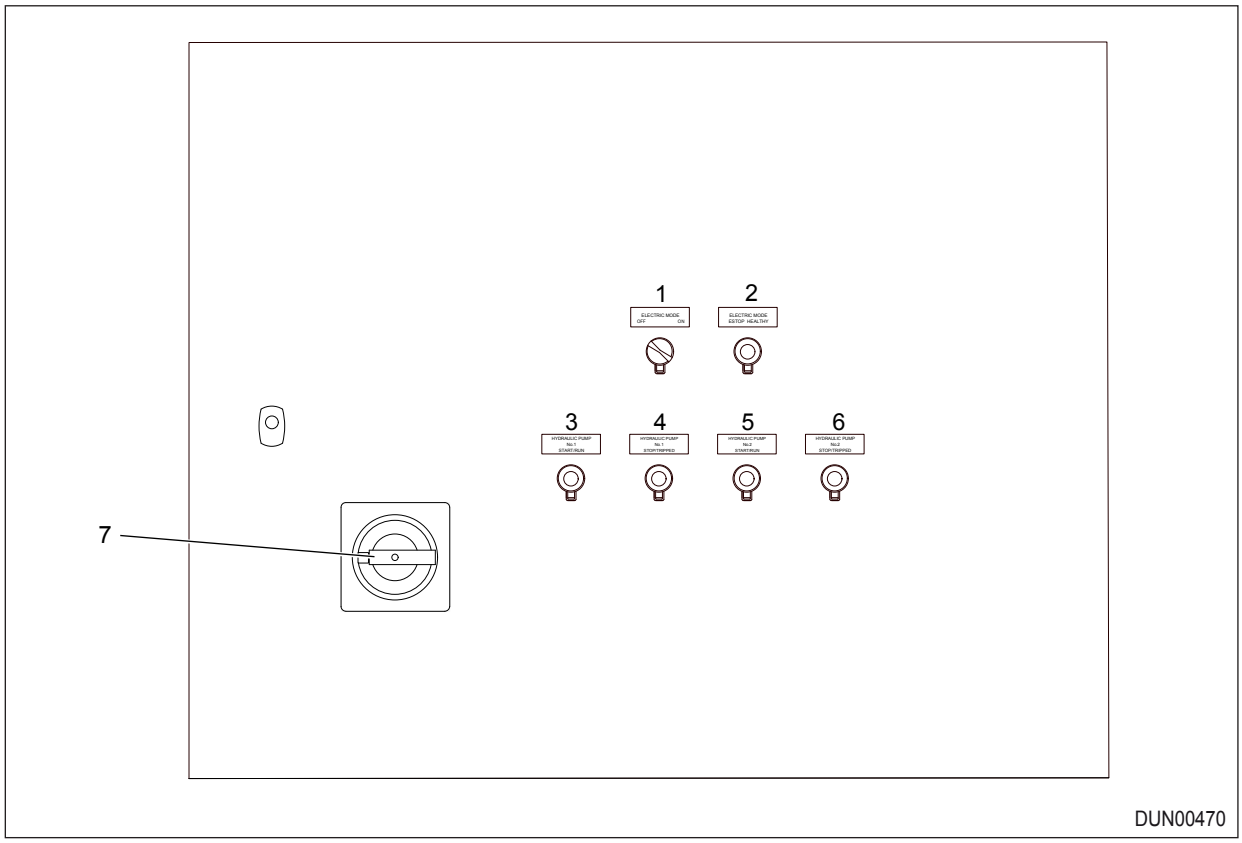


Figure 7.28 - Tier 4 Dual Power Control Panel

Refer to Section 4.4 (2) for identification of control panel components.

(1) Diesel Mode Operation

PROCEDURE

1. Ensure the Electric mode switch (item 1) is OFF, Ref: Figure 7.28.
2. Switch the isolator switch (Item 7) on the control panel to on.
3. To operate the machine in diesel mode refer to Section 7.3 MCU300 Machine Operation.

(2) Electric Mode Operation

In Electric Mode the Operator can run the machine in either MANUAL (Test) Mode or AUTO Mode

PROCEDURE

1. To allow the machine to operate in Electric mode, ensure the electric mode switch (item 1) is ON, Ref: Figure 7.29.
2. Switch the isolator switch (Item 7) on the control panel to on, Ref: Figure 7.29.

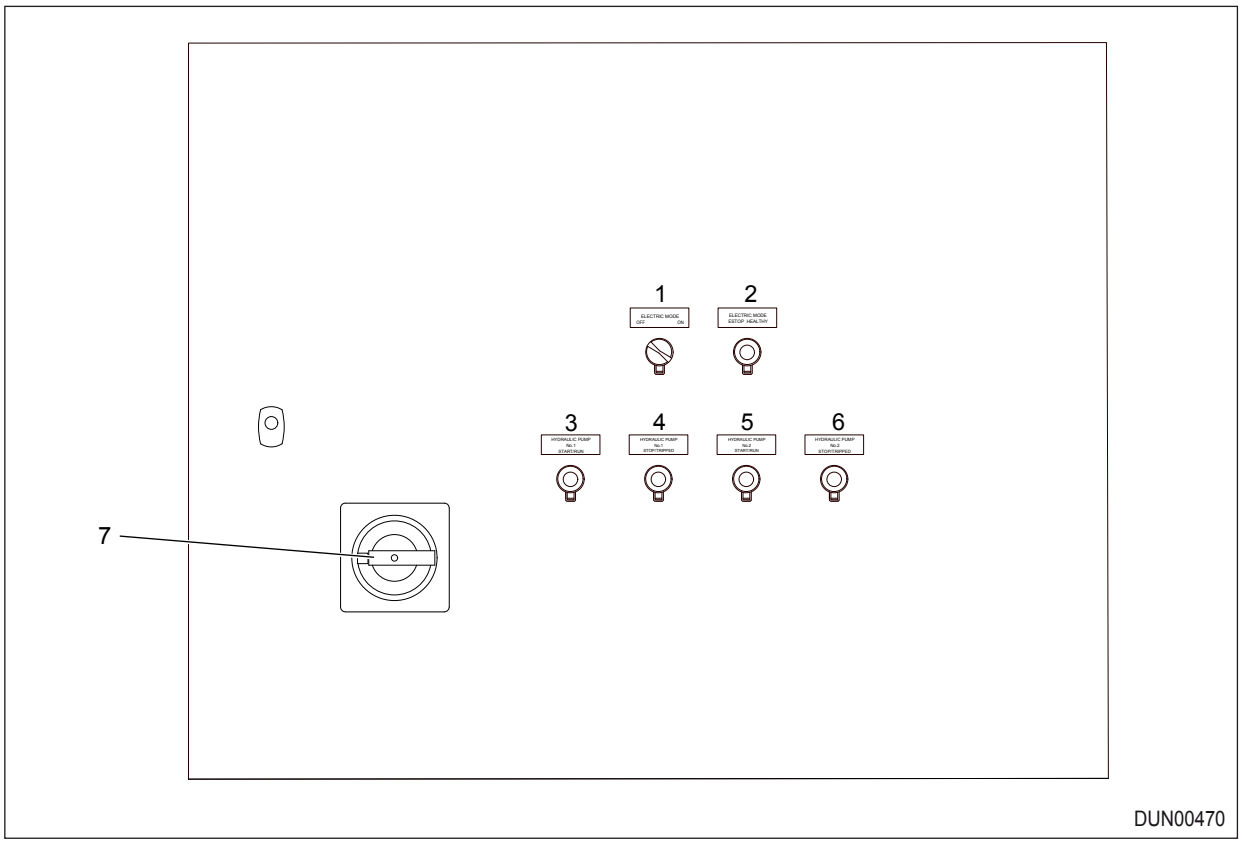


Figure 7.29 - Tier 4 Dual Power Control Panel

3. Turn the ignition key on the control panel to the “ON” position, Figure 7.30 (item 2).

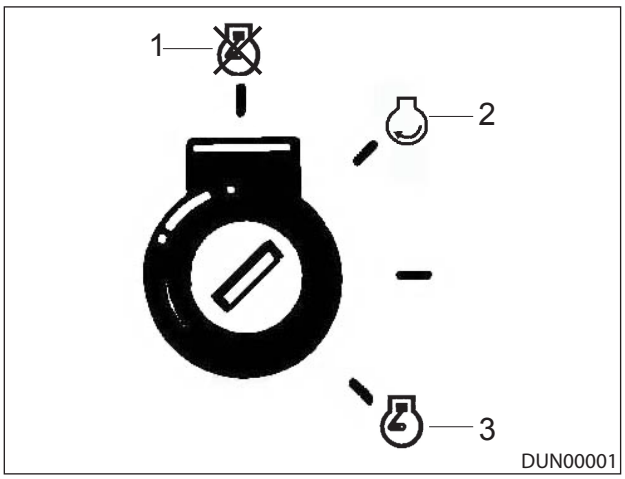


Figure 7.30 - Ignition Key Positions

» *If all Emergency Stops on machine are OK then "Electric Mode Estop Healthy" Lamp (item 2) should illuminate*, Ref: Figure 7.29.

» *The electric mode home screen will be displayed on the control panel, Ref: Figure 7.31.*

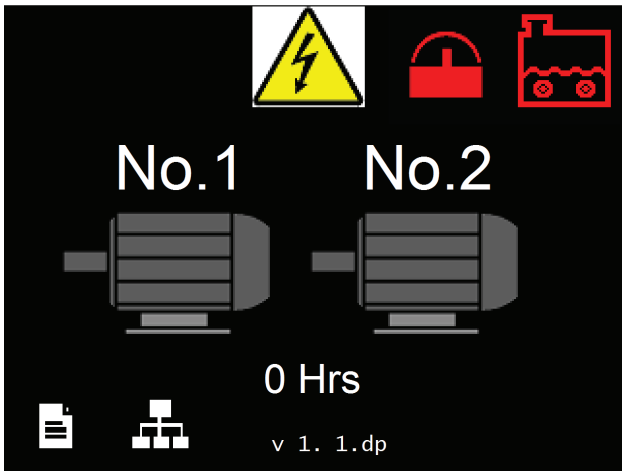


Figure 7.31 - Electric Mode Home Screen

4. Turn the ignition key to the crank position, Ref: Figure 7.30 (Item 3).

» *Motor No.1 starts to flash green, when fully running will change to steady green*, Ref: Figure 7.32.

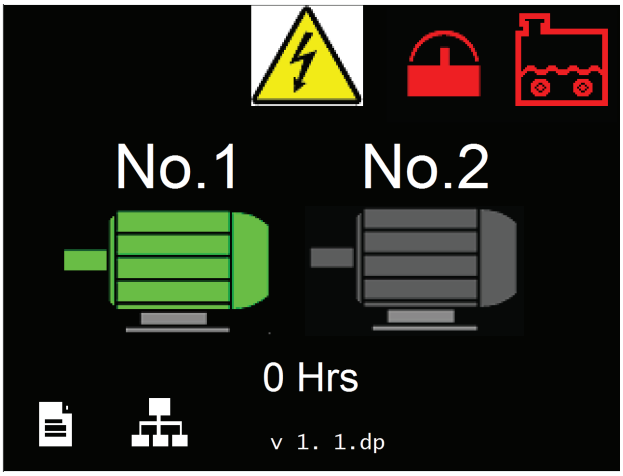


Figure 7.32 - Motor 1 Running

» *Then motor No.2 starts to flash green, when fully running will change to steady green, Figure 7.33.*

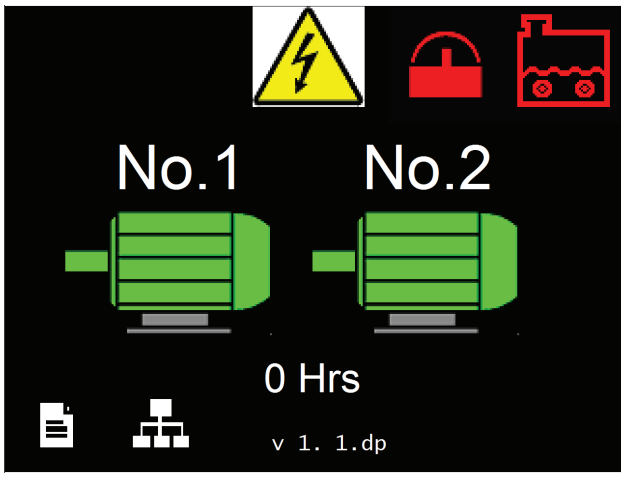


Figure 7.33 - Motor 1 and 2 Running

5. If a motor goes to Fault condition the motor symbol will change to red, Ref: Figure 7.34.

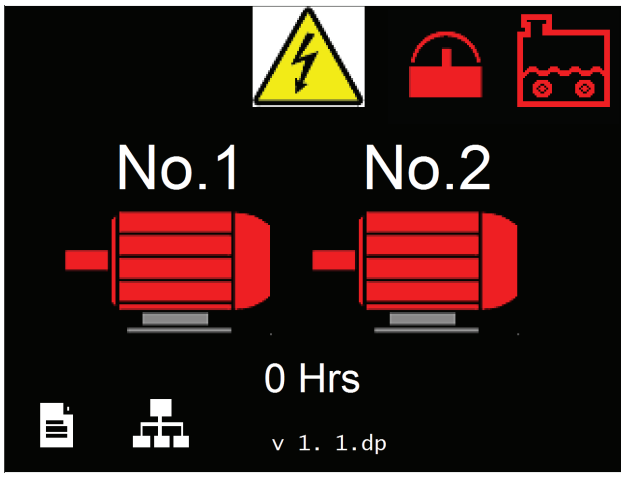


Figure 7.34 - Motor 1 and 2 Fault

6. Switch off the machine and ensure the problem is fixed before restarting

7.7 Normal Operation

(1) Putting into Operation

Refer to Section 4.5 for pictorial decal descriptions.

NOTICE

The machine must be put into operation in the correct order.

Ensure that there is mesh in the screenbox in all decks when the machine is operational. Should only one of the decks be needed, then an oversize mesh should be fitted to retain the structure of the screenbox, as well as to minimise wear.

Check that all conveyor belts are running in alignment. If an adjustment is necessary refer to conveyor service sections.

PROCEDURE

1. Observe all safety warnings.
2. Start the engine and gradually increase speed to maximum (2200 RPM).
3. Move up the tail conveyor lever to start and drive the tail conveyor.
4. Move up RH FINES side conveyor to drive RH FINES side conveyor.
5. Move up collection lever to start and drive the collection conveyor.
6. Move LH side conveyor lever to start and drive the LH conveyor
7. Move up screenbox lever to start and drive the screenbox.
8. Start the feeder conveyor at the control panel. Refer section 7.5.2 for remote control feeder option.
9. Set the Mid Size, Tail conveyor speeds on the variable speed controls relative to material.
10. Turn the control knob of the variable speed flow control valve to level 2.
11. Fill up the feed hopper. To obtain optimal feeder speed, turn the control knob of the variable speed flow control valve, counter clockwise to increase the feeder speed, clockwise to decrease the feeder speed.
12. Re-check that all conveyor belts are running in alignment. If an adjustment is necessary refer to conveyor maintenance sections.
13. Check that screenbox is running and is capable of screening.
14. Re-fill feed hopper.
15. To obtain optimal feeder speed, turn the control knob of the variable speed flow control valve counter clockwise to increase the feeder speed, clockwise to decrease the feeder speed.
16. The machine is now adjusted for continuous operation.

(2) Feeder Remote Control (Optional)

Some machines are fitted with a Radio Controlled Feeder.

⚠ CAUTION

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

A raised part of the machine can fall, causing serious injuries or death.

Always fit a safety support stay if any part of the machine must not be raised for any reason whilst in operation.

Never work under unsupported equipment.

NOTICE

When starting and stopping the engine please ensure the Feeder ON / OFF Switch is in the off position.

PROCEDURE

1. To start the feeder turn the Feeder ON / OFF switch (item 2) on the control panel to the on position, Ref: Figure 7.35.

   » *The feeder should start.*

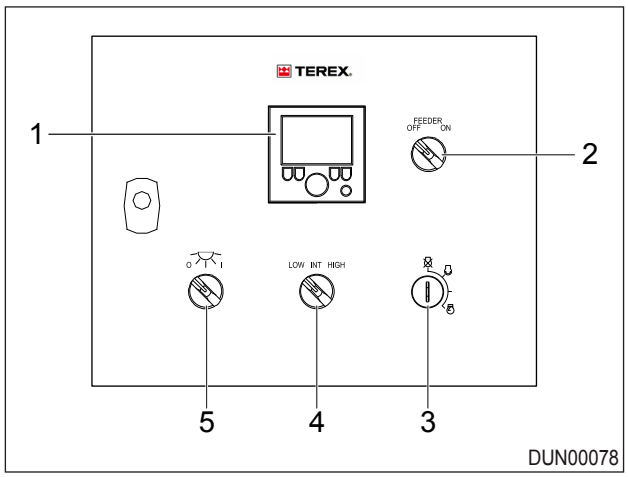


Figure 7.35 - Control Panel

2. Press and hold the On / Off button (item 1) for 2 seconds to turn the transmitter ON, Ref: Figure 7.36.

   » *Once successfully switched on the Status LED (item 3) will illuminate RED. Ref: Figure 7.36.*

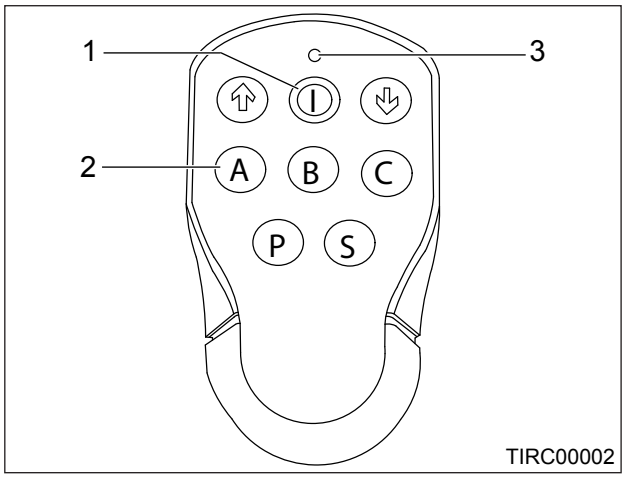


Figure 7.36 - RTG Transmitter

3. To turn the feeder off using the remote, press button A (item 2) on the radio transmitter, Ref: Figure 7.36.
4. To restart the feeder press button A (item 2) on the radio transmitter, Ref: Figure 7.36.
5. If no button is pressed for two minutes or if the On/Off button is pressed and held for two seconds again, the transmitter will switch OFF to save the battery life.
6. To start the feeder ensure the Feeder Start / Stop Switch on the panel door is in the ‘on’ position, then to stop the feeder simply press the A button on the RTG transmitter as shown in Figure 7.36, to restart the feeder repress button A.
7. If the transmitter is not used the feeder will run continually until the Feeder Start / Stop Switch on the panel door is turned to the OFF position.
8. If the machine is stopped while the feeder has been turned off using the transmitter, on power up of the control panel, the receiver resets to allow the feeder to start on the Feeder On/Off Switch.

(a) Programming a Transmitter to an Existing Receiver

NOTICE

If there was another transmitter already programmed to the receiver, it will automatically be erased once a new transmitter is programmed. Only one Transmitter can operate the Receiver.

PROCEDURE

1. Ensure that the machine is safe to work on and the engine has been stopped.
2. Open the cover of the RTG Receiver by removing the four screws in the lid, Ref: Figure 7.37.

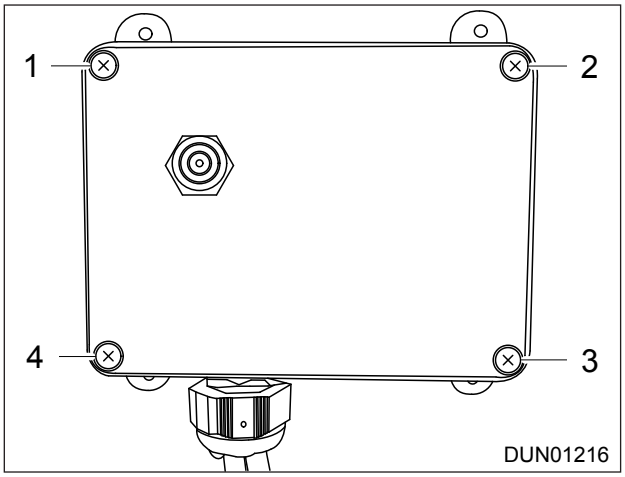


Figure 7.37 - RTG Receiver

3. Carefully let the lid hang below the main box as the antenna is attached to the lid, exposing the Printed Circuit Board as shown in Figure 7.38.
4. Switch on the Transmitter to be programmed, by pressing the On/Off switch.
5. Press and hold the Transmitter Program Button on the RTG Receiver Printed Circuit Board as shown in Figure 7.38, for two seconds.
   - » *The Transmitter Program LED will illuminate Red.*
6. Press any button on the Transmitter to be programmed (NOT the On/Off button).
   - » *The Transmitter Program LED will flash.*
7. Press the UP or DOWN button on the Transmitter – the respective Relay will activate on the Receiver printed Circuit Board – this will be indicated by the respective Relay LED illuminated RED.
8. Replace the receiver cover and the process is complete.

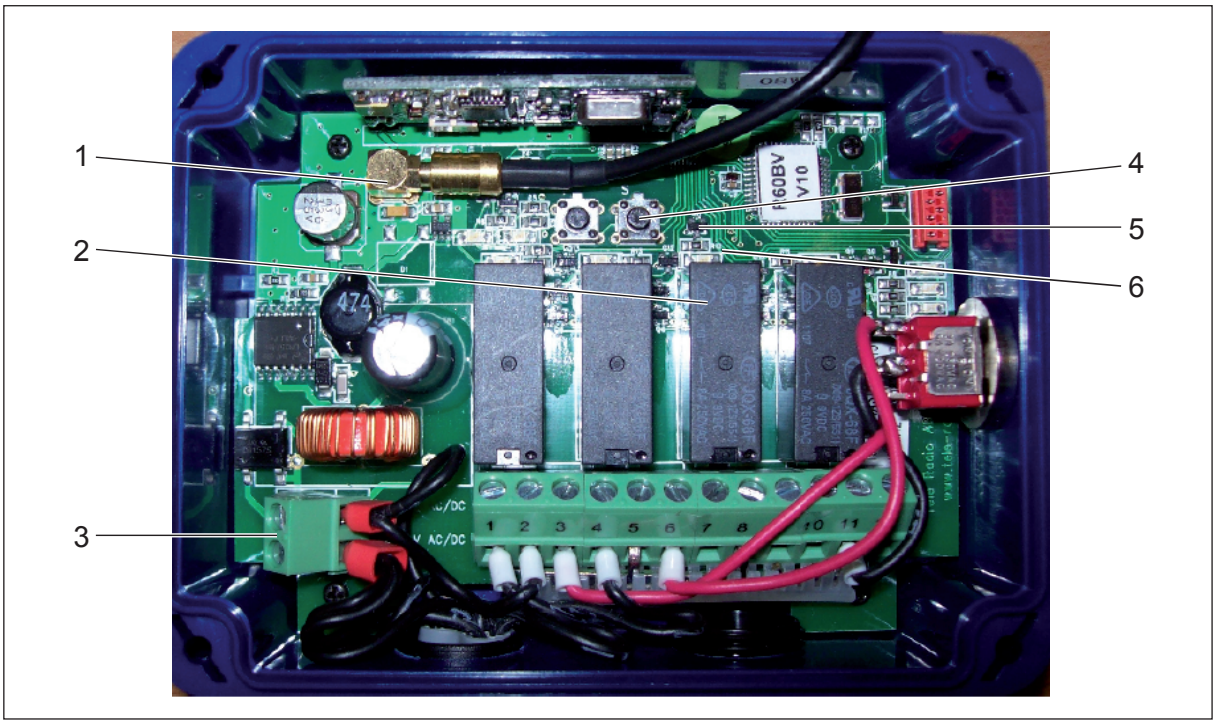


Figure 7.38 - Transmitter Printed Circuit Board

1 Antenna
2 Feeder On/Off relay
3 Power supply connections
4 Transmitter program button
5 Transmitter program LED
6 Relay LED

7.8 Manoeuvring

(1) Manoeuvring General

DANGER

DO NOT stand on any of the platforms or ladders of the plant whilst it is being manoeuvred using the remote control handset.

When manoeuvring your machine to its operating position make sure you stand well clear of the plant but are in a position to have all-round vision to see any obstacles, dangers that may lie ahead e.g personnel,overhead cables, ditches, unsafe roadways etc.

WARNING

Prior to attempting any manoeuvring of the plant the tracks must be free of obstructions, including screened material and fines. Do not push or tow the Plant. Failure to observe this warning could result in danger to persons and damage to the plant which may invalidate warranty.

- Before manoeuvring the plant, ensure the feed hopper and screen are empty, and that all materials have run off the conveyors. STOP the feeder, screenunit and product conveyors.
- The safety warning horn/siren sounds continuously whilst the plant is being manoeuvred.
- Make sure that you do not manoeuvre the plant on a gradient steeper than 30 degrees (moving fore or aft), damage may occur to the engine and/or plant.
- Avoid manoeuvring the plant over extremely uneven ground or damage may occur. Due to the limited ground clearance, avoid running over isolated objects between the tracks.
- Initial start up in cold weather may result in a tendency to steer to the right whilst tracking fast forward due to the hydraulic oil being cold. Run the plant for approx. 10 minutes with the conveyor and feeder running prior to manoeuvring the plant.

(2) Undercarriage

Warrior machinery can be moved one of two different ways depending on the type of machine,

1 Bogie

2 Tracks

Each type of undercarriage must be properly maintained to ensure a safe, effective working environment. Track machines are designed for ease of movement around the site and should not be used on public roads. Haulage equipment, such as a low loader or a roll in bogie, should be used for this purpose. Non track machines should be transported using the appropriate haulage equipment.

(3) Manual Tracking Information

⚠ WARNING

Only a fully qualified and competent electrician must connect the electrical supply to this machine.

The electrical supply to this machine must be carried out in strict accordance with all relevant local and international electrical safety regulations.

The electrical supply to this machine must have adequate protection for safe disconnection in the event of either over-current, short circuit or earth leakage faults.

The electrical supply to this machine must be fully tested and inspected by a qualified electrician in strict accordance with all relevant local and international electrical regulations.

This machine must not, under any circumstances, be operated or tracked unless it is absolutely safe to do so.

As the Electrical Hydraulic machine must be connected to a three phase 415VAC 50Hz electrical supply to power the electrical motors that control the hydraulic track pumps, absolute care must be taken when tracking this machine.

The operator must ensure that strict attention is paid to all relevant health and safety regulations and guidelines when operating and tracking this machine.

The electrical supply to this machine must be connected via the supplied industrial ‘spring release’ plug with safety tension cord properly attached to facilitate safe disconnection should the cable come under strain. No other connection method to this machine is acceptable.

When tracking the machine, it must be ensured that the supply cable to the machine is behind the direction of travel or away from the tracks and the path of travel at all times.

(4) Tracking the Machine

⚠ DANGER

DO NOT stand on any of the platforms or ladders of the machine whilst it is being manoeuvred. Stand well clear of the machine but be in a position to have all-round vision to see any obstacles or dangers that may lie ahead e.g personnel, overhead cables, ditches, unsafe roadways etc.

NOTICE

- Before tracking the machine on site ensure that all material has been processed through it and that no material is left on any belts, in the hopper or the screenbox.
- For large tracking manoeuvres or when loading the machine onto a low loader it is necessary to fold in the side conveyors. Never track the machine over long distances with the conveyors in the working position.
- The rear support legs must be raised to the transport position before tracking.
- Stop the machine for 30 minutes after tracking it continously for 30 minutes, to allow the components to cool down. Never track the machine constantly for more than 30 minutes without providing adequate rest.
- When travelling up a gradient, the tracks should be driven forward (i.e. idlers first, drive sprocket to the rear). When travelling down a gradient, tracks should be driven sprocket first, Ref: Figure 7.39. **Do not manoeuvre the machine on a gradient steeper than 30 degrees.**

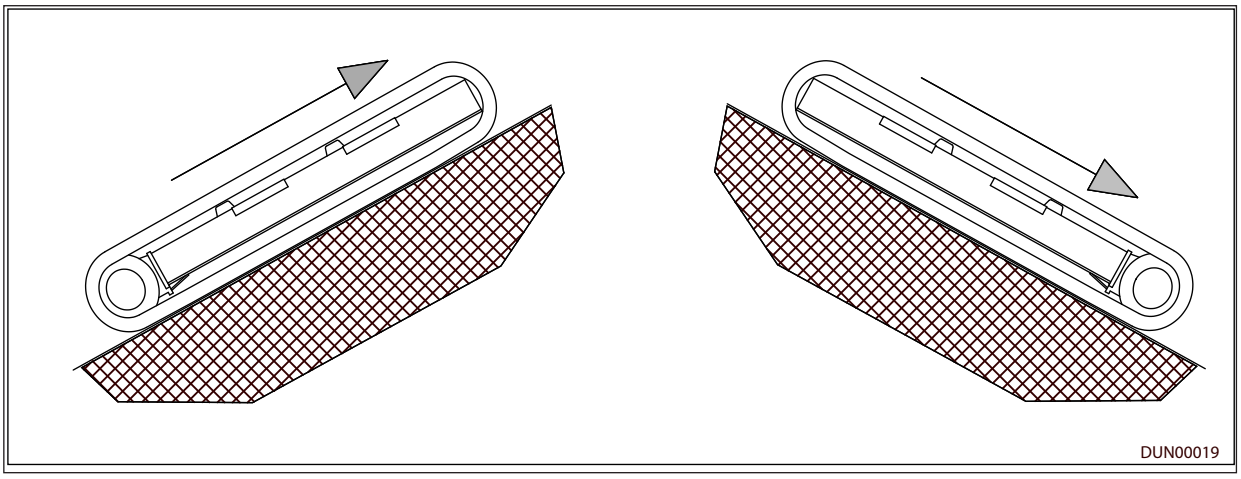


Figure 7.39 - Tracking Uphill and Downhill

- Avoid manoeuvring the machine over extremely uneven ground. Ensure the terrain that the machine is working on is firm enough to adequately support the machine.
- 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.
- Never attempt to track the machine if there is any build up of material around the tracks and drive sprockets or if the tracks are frozen to the ground.
- Move all of the control levers to the neutral positions to stop all machine parts prior to manoeuvring

(5) Manual Tracking Umbilical

NOTICE

To operate the machine via the umbilical firstly retrieve the remote control unit. Attach the remote control unit cable to the socket (S) situated behind the rear right hand upright, Ref: Figure 7.40.

One option available on the tracked Machine is the radio controlled tracking, as with all other standard track machines a umbilical is also fitted, these models are fitted with an automatic changeover, thus no changeover switch will be fitted.

In this case the start up procedure is the same as for a machine which is not fitted with a radio tracking option. That is to simply connect umbilical, start engine position appropriate levers and than press the tracks on/off button on the umbilical to initiate tracking after the 7 second delay finishes.

The umbilical is only used to operate the tracks. It performs no other operation. The remote control consists of a direct lead and a handset.

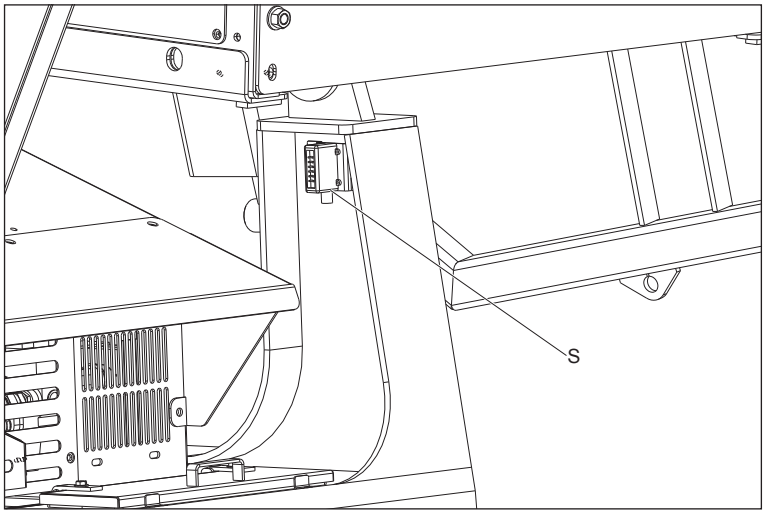


Figure 7.40 - Manual Tracking Umbilical Socket

7.9 Machine Shutdown

(1) Stopping the Machine

NOTICE

When shutting down the machine or carrying out maintenance or adjustment the following procedure must be followed.

Turning all machine components at once causes a pressure spike in the hydraulic circuit and a voltage spike in the electrical circuit both of which are detrimental to the machine. A slight pause between disengaging each component can prevent this spike taking place.

The machine must be running empty of material before the feeder, screenbox and conveyors are stopped in the correct sequence.

PROCEDURE

1. Disengage each machine component (e.g conveyors etc) using the correct control levers.
2. Turn off the machine components in the following order.
   1 Feeder
   2 Screen
   3 Collection conveyor
   4 Fines conveyor
   5 Mid size conveyor
   6 Tail conveyor
3. Gradually decrease engine speed to minimum using throttle.
4. Switch off engine and remove ignition key. Carry the key with you.
5. Engage an emergency stop on the machine.
6. If carrying out maintenance on the machine implement the lockout and tagout procedure, Ref: Chapter 8.

(2) Switching Off the Machine

NOTICE

For normal closing down of the machine, DO NOT use the emergency stop buttons [or, if fitted, radio remote control stop buttons] or by switching off the engine ignition to close down the machine. Always follow the correct preparation sequence.

The feeder, screenbox and conveyors must be emptied and stopped in the correct sequence before the machine is shut down.

PROCEDURE

1. Observe all safety warnings.
2. Follow instructions to prepare to finish screening or finish manoeuvring in moving the plant.
3. Set the engine at its slowest speed.
4. Let the engine idle with no load for 3 to 5 minutes.
5. Turn the ignition key to the off position to stop the engine and remove the key.
6. If the radio remote control, if fitted, has been in use, switch it off by pressing the stop button.

(3) CAT 7.1 Tier 4 Final Shut Down

⚠ WARNING

Do not hit the emergency stop during this process unless completely necessary.

The battery isolator should not be used to close down the control panel during this period.

NOTICE

The system DEF must be purged of DEF fluid on engine shutdown to protect the system components from damage due to DEF freezing. For this reason it is important that electrical power is maintained to the engine ECM and aftertreatment system after the ignition has been turned off. It is therefore important that the machine battery isolator is not turned off until the system purge has been completed and the battery disconnect light is off (Item 1, Figure 7.43). There is a maximum purge time of 20 minutes. *The engine ECU records every time the engine is isolated before the wait to disconnect light has gone out.*

In order to flush all the excess Adblue out of the engine and prevent it from freezing while the engine is not running the engine will be held on by the engines ECM.

This symbol will appear on the home screen while the Delayed Engine Shutdown is taking place, Ref: Figure 7.41.

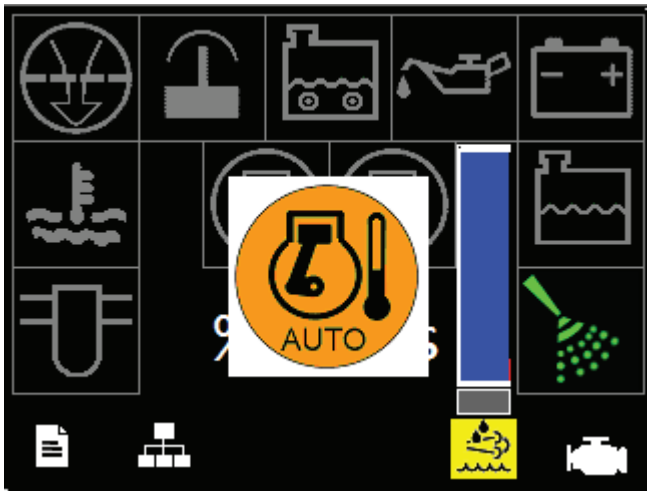


Figure 7.41 - Delayed Engine Shutdown

Repeatedly stopping the engine during cool down could damage the engine.

The engine ECU records every time the engine is turn off during cool down.

The CAT C7.1 T4F requires a shutdown procedure, once the DES has finished the machine must not be isolated until the symbol below no longer appears on the home page, Ref: Figure 7.42.

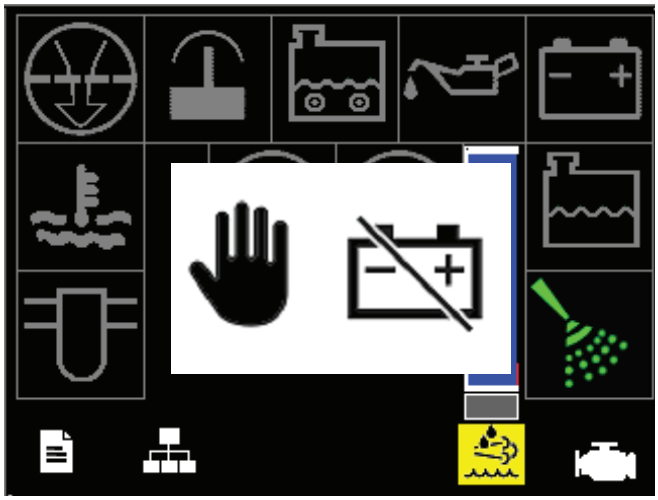


Figure 7.42 - Wait to Disconnect

PROCEDURE

1. Observe all safety warnings.
2. Disengage the machine components in the correct order.
3. Set the engine at its slowest speed.
4. Let the engine idle with no load for 3 to 5 minutes.
5. Turn the ignition key to the off position and remove the key. Carry the key with you.
6. Engage an emergency stop on the machine.
7. Before carrying out maintenance on the machine ensure the battery disconnect light is off, Reference: Figure 7.43.

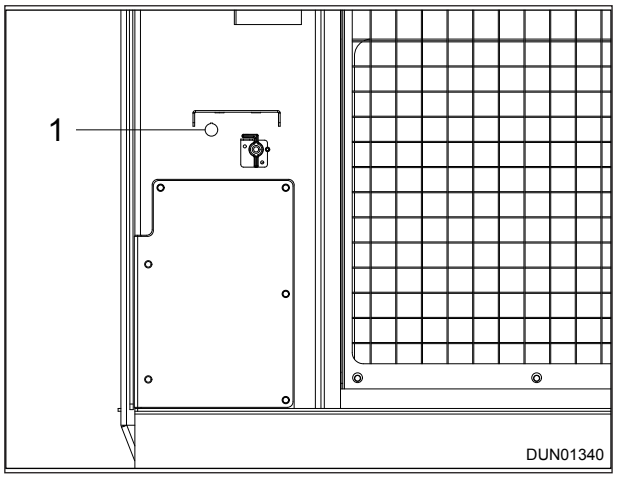


Figure 7.43 - Battery Wait to Disconnect Light



Figure 7.44 - Battery wait to Disconnect Decal

» *When battery disconnect light is ON do not isolate battery. When battery disconnect light is OFF battery can be isolated.*

8. Implement the lockout and tagout procedure, Reference: Chapter 8.

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8.3 Restarting after Emergency Stop 8-6

8.4 Testing Emergency Stops 8-6

8 Emergency Operating Procedures

8.1 Lockout and Tagout

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. When used as intended, Lockout also protects personnel from energy stored in devices such as springs, accumulators, batteries, hydraulic systems, etc.

Where the lock out and tagout symbols (Ref: Chapter 2 Safety) appear on a safety sign it indicates that the machine must be switched off and locked out before any work is carried out.

⚠ WARNING

Never give your key to anyone else and where more than one person is working on the equipment they must fit their lock also

(1) Before Carrying out any Work on the Machine

NOTICE

Depending on the type of machine, there may still be several kinds of energy remaining after the power is turned off. The written lock-out procedure should have a complete list of all these secondary energy sources. Secondary energy sources may be hydraulic (fluid under pressure), pneumatic (air under pressure), kinetic (force of moving parts) and/ or potential (force contained in weights that have been raised).

PROCEDURE

1. Turn off the engine at the starter panel and remove key.
2. Lock the panel and put the key in a safe place.
3. After 20 seconds, rotate the isolator switch from the “ON” position (Item 1) to the “OFF” position (Item 2), Ref: Figure 8.1.

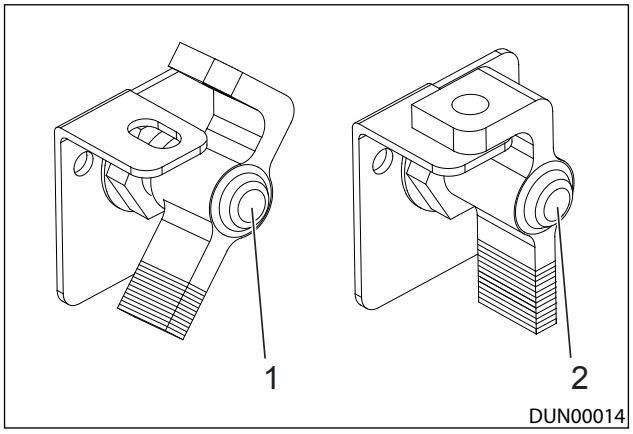


Figure 8.1 - Isolator Switch

4. Fit the lock out hasp (Item 3) and unique padlock (Item 2) on the main power isolator and keep the key to make sure no one can remove your lock and turn the power back on, Ref: Figure 8.2.
5. Place a Tag (Item 1) on the lock that identifies you (by your name, picture or number) as well as the date and time you locked it out Ref: Figure 8.2.

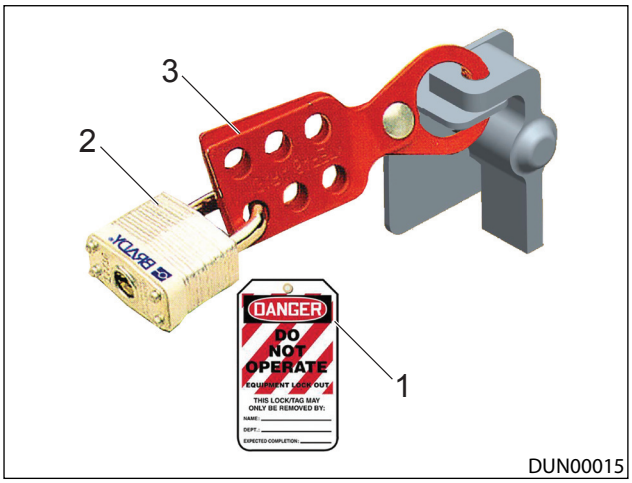


Figure 8.2 - Isolator Switch Off, Locked and Tagged

6. Release stored energy from the system, such as hydraulic fluid under pressure, so that the machine is in a zero energy state.
7. Try to start or activate the machine to make sure that the power is off. (Don't forget to push the stop button again, afterward.)

(2) After Carrying out any Work on the Machine

PROCEDURE

1. Secure the work area by replacing guards and shields, removing blocks, picking up tools and inspecting the work area.
2. Take your lock and tag off the main power Isolator.
3. If there are no other locks on, turn the main Isolator switch to the ON position (item 1), Ref: Figure 8.1.
4. Unlock the operator's control panel.
5. Warn others before starting the machine.
6. Start the machine and proceed with your work.

8.2 Emergency Stop

In an emergency situation only stop the machine by pressing an emergency stop button on the machine.

⚠ WARNING

The stop button on the remote radio control, if fitted, is NOT an emergency stop as it may not be operative at all times.

When an emergency stop has been initiated, the ignition switch stays on. Do not attempt to restart the engine until it is safe to do so.

PROCEDURE

1. Press any emergency stop to stop the engine and machine, Ref: Figure 8.3.
   » The safety alarm will sound until it is acknowledged and cancelled.
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 too the off position.
5. When safe, release the emergency stop button(s) by pulling or twisting.

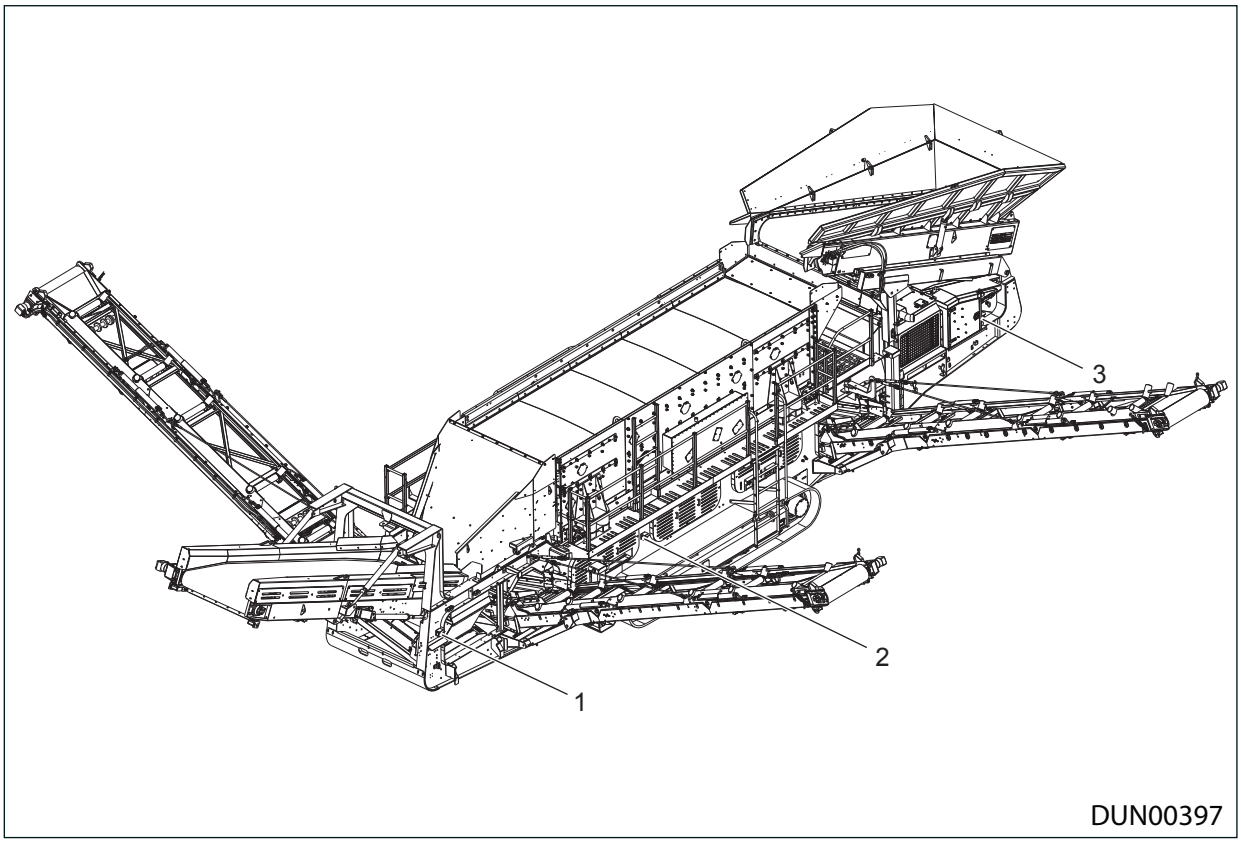


Figure 8.3 - Emergency Stop Locations LHS and RHS

8.3 Restarting after Emergency Stop

⚠ WARNING

Ensure that the problem has been solved and all personnel are clear of the machine. Before restarting, ensure that all guards are correctly fitted and fully functional. Do not restart until it is safe to do so.

NOTICE

The machine must not be restarted if there is any material in and/or on the machine Ensure there is no material in and/or on the machine before restarting.

PROCEDURE

1. Release the emergency stop button(s) by pulling or twisting.
2. Restart the machine, Ref: Chapter 7.

8.4 Testing Emergency Stops

PROCEDURE

1. Start the engine.
2. Push in an emergency stop button.
   » The engine will stop, the safety alarm will sound and alarm messages are shown on the display screen.
3. Acknowledge the alarm.
4. Re-set the emergency stop by pulling or twisting, depending on the type fitted.
5. Turn the ignition key to the 'Off' position.
6. Turn ignition key to the first position again.
7. Wait for the pre-start warning to complete.
8. Turn ignition key to start the engine again.
9. Repeat the procedure for all other emergency stops.

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9 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 or retooling work on the machine, switch off the machine and implement the lockout and tagout procedure.

Maintenance procedures in the maintenance section of this operations manual are intended to be carried out by trained operators. You must satisfy yourself that you have received the correct training before attempting any procedure in the maintenance section, if you have any doubts do not attempt any procedure and speak to your manager. More complex machine maintenance that is not covered in the maintenance section of the operations manual must only be carried out by fully trained service personnel who have taken part in specific maintenance training provided by us or our approved dealer, please contact your local dealer for further details

9.1 Regular Servicing

NOTICE

To deliver the specified quantity of grease to shaft bearings, ascertain the amount the grease gun will deliver with each ‘pump’. Do not guess or assume an amount ! Check the greasing equipment used regularly. To prevent contamination of the grease, wipe the grease nipples clean before applying the grease gun.

It is bad practice to mix greases. The blend can have a lower specification than the individual greases and can lead to premature bearing failure. USE ONE BRAND ONLY.

It is the operators responsibility to ensure that all bearings are greased with the correct quantity and type of grease at the correct intervals specified.

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.

When power or steam cleaning the machine be aware of the risk of damaging components i.e., electrical components , bearings. Water ingress or heat may penetrate or damage seals leading to premature failure.

9.2 Fuel System

(1) Check the Fuel Level and Topup

⚠ DANGER

NEVER leave your product unattended whilst it is in operation.

Diesel fuel is highly flammable and is an explosion/burns hazard. NEVER remove the filler cap or refuel, with the engine running. NEVER add gasoline, petrol or any other fuel mixes to diesel because of increased fire or explosion risks.

Wear personal protective equipment.

DO NOT smoke while refilling or carrying out maintenance on the fuel system.

DO NOT carry out maintenance on the fuel system near naked lights or sources of sparks, such as welding equipment.

NOTICE

Ultra low sulfur diesel must be used in machines with CAT Tier 4 engines.

The use of fuel additives is not recommended. Additives may not be compatible with the fuel.

Do not fill the tank to overflow or full capacity. Monitor the gauge on the side of the tank

Allow room for expansion and wipe up spilt fuel immediately, otherwise paintwork may be damaged.

PROCEDURE

1. Observe all safety warnings.

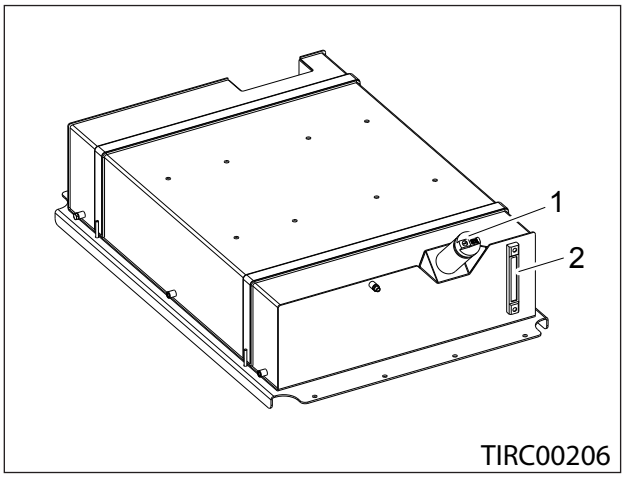


Figure 9.1 - Fuel Tank

2. Check the level indicator (item 2), Ref: Figure 9.1.
3. Clean the area around the filler cap.
4. Remove the filler cap (item 1), Ref: Figure 9.1.
5. Fill the tank with the specified diesel fuel. Refer to the engine manufacturers operation manual.
6. Fill the tank at the end of each day, where possible, to reduce overnight condensation within the tank.
7. Replace the filler cap (item 1), Ref: Figure 9.1.

9.3 Non Scheduled Maintenance

⚠ WARNING

Wear personal protective equipment.

Switch off the machine and implement the lockout procedure.

(1) 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.

(2) Control Systems

Ensure that only qualified and trained personnel operate and maintain this equipment.

Always keep control panels closed to avoid water ingress and dust contamination and keep keys in secure locations.

Regularly check the control system and connections for any damage.

Never adjust any components or settings without authorisation from Powerscreen.

9.4 Maintenance Schedules

(1) Daily Maintenance (10 Hour) Schedule

(a) General Maintenance

	Maintenance Task	Notes	Signature
Check for material build up	Check/Remove		
Check all safety guards are in place	Check/Replace		
Check for loose parts, missing nuts and bolts	Tighten/Replace		
Check hydraulic hoses, rams and pumps for leaks (when tightening fittings use a torque wrench and follow the torque setting on the following page)	Tighten/Replace		
Check hydraulic oil level in site gauge	Check/Top up		
Check diesel level in fuel tank	Check/Refill		

(b) Conveyor Maintenance

	Maintenance Task	Notes	Signature
Check conveyor belts for rips and tears	Check/Repair		
Check belt tension	Check/Tension		
Check belt alignment	Check/Align		
Check all rollers are free moving and free from obstruction	Check/Free		

(c) Screen Maintenance

	Maintenance Task	Notes	Signature
Check mesh securing bolts are tight	Check/Tighten		
Check meshes for wear and damage	Check/Change		
Check discharge lips securing bolts are tight	Check/Tighten		
Check wear plates securing bolts are tight	Check/Tighten		
Check oil levels in gear & impulses case	Check/Top-up		
Check dirt build-up on breather cap	Check/Clean		
Check condition of feedbox & discharge lip	Check/Replace		
Check poly modules for holes or excessive wear	Check/Replace		
Check springs are vertical	Check/Replace		
Check drive assembly belt for stretching & cracking	Check/Replace		
Check guards are in good condition	Check/Replace		

(d) Engine Maintenance (See Engine operators manual for more details)

	Maintenance Task	Notes	Signature
Check engine oil level	Check/Top up		
Check water coolant level	Check/Top up		

(e) Track Maintenance

	Maintenance Task	Notes	Signature
Check tension of tracks	Check/Tension		
Check tracks for oil leakage	Check/Repair		

(2) Weekly Maintenance (50 Hour) Schedule

(a) General Maintenance

	Maintenance Task	Notes	Signature
Grease all bearings (see greasing schedule)	Grease		
Drain the watertrap	Drain		
After first 50 hours replace return filters	Replace		

(b) Conveyor Maintenance

	Maintenance Task	Notes	Signature
Check tension of belt scrapers	Check/Adjust/ Replace		
Check tension of belt skirting rubbers - no spillage	Check/Adjust/ Replace		
Check for obstruction to drums	Check/Remove Obstruction		

(c) Engine Maintenance (See Engine operators manual for more details)

	Maintenance Task	Notes	Signature
After first 50 hours carry out full engine service	Service		
Air filter pre cleaner	Clean up		
Battery acid level	Check/Top up		

(d) Screen Maintenance

	Maintenance Task	Notes	Signature
Check screen is level crosswise & centre.	Check/Adjust		
Check springs are vertical	Check/Replace		
Check dirt build-up around breather cap	Check/Remove		
Check all securing bolts are tight	Check/Tighten		
Check drive belt tension	Check/Tighten		

When tightening hydraulic fitting always use a torque wrench, as overtightening of fittings can break internal seals. Please follow the torque settings in the table below.

Screen Torque Settings

Thread Size	Bolt Location	Torque lb-ft	Torque Nm
3/4”	case bolts** (3/4”-16 UNF)	225	305
1/2”	discharge-lip bolts	55	75
5/8”		110	149
1/2”	feed-box mounting bolts	55	75
5/8”		110	149
3/4”	spindle bolts***	320	434

Machine Torque Settings

Thread Size	Torque lb-ft	Torque kg-m	Torque Nm
1/4"	15	2.07	20.3
3/8"	18	2.49	24.4
1/2"	40	5.50	53.9
3/4"	60	8.30	81.3
1"	85	11.75	115.2
1¼"	110	15.20	149.0
1½"	130	17.98	176.2

* All torque values are ‘Lube’ for lubricated bolts.

** Case-bolt heads are tack welded inside case. Newer screen designs use permanent O-Ring sealed Huck Bolts that do not require tightening.

*** Spindle bolts are SAE grade 8.

(3) Monthly Maintenance (250 Hour) Schedule

(a) General Maintenance

Check	Maintenance Task	Notes	Signature
Drain the watertrap	Drain		

(b) Engine Maintenance (See Engine operators manual for more details)

Check	Maintenance Task	Notes	Signature
Air filter elements	Check/Replace		

(c) Track Maintenance

	Maintenance Task	Notes	Signature
After first 250 hours change gearbox oil in tracks	Change		

(d) Beltfeeder Maintenance

	Maintenance Task	Notes	Signature
After first 250 hours change gearbox oil in feeder	Change		

(e) Screen Maintenance

	Maintenance Task	Notes	Signature
Check oil levels in gear and impulse case	** Analysis and change if required **		

If contaminant levels exceed any of those listed in the table below, change oil in cases and find source of contamination.

Contaminant	Acceptable Range parts per million (ppm)
Iron	125 - 150
Chrome	25 - 30
Aluminum	45 - 50
Copper	100 - 125
Silicon	25 - 30
Water	0

** Your local oil supplier will be able to analysis your hydraulic oil. **

(4) 2 Monthly Maintenance (500 Hour) Schedule

(a) Engine Maintenance (See Engine operators manual for more details)

	Maintenance Task	Notes	Signature
Change engine oil	Drain and Refill		
Change oil filter and fuel filter	Remove and Replace		
Change air filter safety element	Remove and Replace		

(b) General Maintenance

	Maintenance Task	Notes	Signature
Adjust V Belt tension	Check/Adjust		
Change hydraulic return filters	Remove/Replace		

(c) Screen Maintenance

	Maintenance Task	Notes	Signature
Change screenbox gearbox oil	Drain & Refill		

(5) 4 Monthly Maintenance (1000 Hour) Schedule

(a) General Maintenance

Change	Maintenance Task	Notes	Signature
Hydraulic oil	Analyse oil and change if required **		
Suction filters	Remove & Replace		

**Your local oil supplier will be able to analysis your hydraulic oil.

(6) 8 Monthly Maintenance (2000 Hour) Schedule

(a) Track Maintenance

	Maintenance Task	Notes	Signature
Change the gearbox oil in the tracks	Change		

(b) Engine Maintenance (See Engine operators manual for more details)

	Maintenance Task	Notes	Signature
Change engine coolant	Drain & refill		
Alternator and starter motor	Check		

(c) Beltfeeder Maintenance

	Maintenance Task	Notes	Signature
Change the Gearbox oil in the Beltfeeder	Change		

(7) Engine Maintenance Schedules

For further engine maintenance information, refer to the engine manufacturer‘s operation manual supplied.

(8) CAT 7.1 T4F 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		
Driven equipment	Check		
Engine air cleaner service indicator	Inspect		
Engine air precleaner	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		
Battery electrolyte Level	Check		

(e) Every 250 Service Hours

Object	Job	Remarks	Sign
Engine oil sample	Obtain		
Engine oil and filter	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
Cooling system coolant sample (Level 1)	Obtain		
Engine oil and filter	Change		
Fan clearance	Check		

(g) Every 500 Service Hours or 1 Year

Object	Job	Remarks	Sign
Cooling System Supplemental Coolant Additive (SCA)	Test/Add		
Engine air cleaner element (Dual Element)	Inspect/Clean/ Replace		
Engine air cleaner element (Single Element)	Inspect/Replace		
Engine Oil and Filter	Replace		
Fuel Filter (In-Line)	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
Belt Tensioner	Check		
Belt	Inspect		
Water pump	Inspect		

(i) Every 1500 Service Hours

Object	Job	Remarks	Sign
Engine crankcase breather element	Replace		
Pump main filter	Replace		
Tank header filter	Replace		

(j) Every 2000 Service Hours

Object	Job	Remarks	Sign
Aftercooler Core	Inspect		
Engine Mounts	Inspect		
Starting Motor	Inspect		
Turbocharger	Inspect		
Hydraulic Oil	Change		

(k) Every Year

Object	Job	Remarks	Sign
Cooling system coolant sample (level 2)	Obtain		

(l) Every 3000 Service Hours

Object	Job	Remarks	Sign
Alternator	Inspect		
Alternator and Fan Belts	Replace		

(m) Every 3000 Service Hours or 2 Years

Object	Job	Remarks	Sign
Cooling system coolant (DEAC)	Change		
Cooling system water temperature regulator	Replace		

(n) Every 4000 Service Hours

Object	Job	Remarks	Sign
Aftercooler core	Clean/Test		

(o) Every 4500 Service Hours

Object	Job	Remarks	Sign
ARD spark plug	Clean/Inspect/ Replace		

(p) Every 5000 Service Hours

Object	Job	Remarks	Sign
Diesel particulate filter	Clean		
DEF Tank			
Diesel Exhaust Fluid Filter	Clean/Replace		
Injector (Diesel Exhaust Fluid)	Replace		

(q) Every 6000 Service Hours or 3 Years

Object	Job	Remarks	Sign
Coolant Extender (ELC)	Add		

(r) Every 12000 Service Hours or 6 Years

Object	Job	Remarks	Sign
Coolant (ELC)	Change		

(9) CAT 6.6 T3 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		
Driven equipment	Check		
Engine air cleaner service indicator	Inspect		
Engine air precleaner	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		
Alternator and Fan Belts	Inspect		

(d) Every 50 Service Hours or Weekly

Object	Job	Remarks	Sign
Fuel tank water and sediment	Drain		
Battery electrolyte Level	Check		

(e) Every 250 Service Hours

Object	Job	Remarks	Sign
Engine oil sample	Obtain		
Engine oil and filter	Change		
Cooling system coolant sample (Level 1)	Obtain		

* 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) Initial 500 Service Hours

Object	Job	Remarks	Sign
Engine Valve Lash	Inspect/Adjust		

(g) Every 500 Service Hours

Object	Job	Remarks	Sign
Fan clearance	Check		

(h) Every 500 Service Hours or 1 Year

Object	Job	Remarks	Sign
Cooling System Supplemental Coolant Additive (SCA)	Test/Add		
Crankcase Breather (Canister)	Replace		
Engine air cleaner element (Dual Element)	IClean/Replace		
Engine air cleaner element (Single Element)	Inspect/Replace		
Engine Oil and Filter	Replace		
Fuel system primary filter (water separator) element	Replace		
Fuel system secondary filter	Replace		
Radiator	Clean		

(i) Every 1000 Service Hours

Object	Job	Remarks	Sign
Engine Valve Lash	Inspect/Adjust		
Water pump	Inspect		

(j) Every 2000 Service Hours

Object	Job	Remarks	Sign
Aftercooler Core	Inspect		
Engine Mounts	Inspect		
Starting Motor	Inspect		
Turbocharger	Inspect		
Belt Tensioner	Inspect		
Hydraulic Oil	Change		

(k) Every 2000 Service Hours or 1 Year

Object	Job	Remarks	Sign
Alternator	Inspect		

(l) Every Year

Object	Job	Remarks	Sign
Cooling system coolant sample (level 2)	Obtain		

(m) Every 3000 Service Hours

Object	Job	Remarks	Sign
Alternator and Fan Belts	Replace		

(n) Every 3000 Service Hours or 2 Years

Object	Job	Remarks	Sign
Cooling system coolant (DEAC)	Change		
Cooling system water temperature regulator	Replace		

(o) Every 4000 Service Hours

Object	Job	Remarks	Sign
Aftercooler core	Clean/Test		

(p) Every 6000 Service Hours or 3 Years

Object	Job	Remarks	Sign
Coolant Extender (ELC)	Add		

(q) Every 12000 Service Hours or 6 Years

Object	Job	Remarks	Sign
Coolant (ELC)	Change		

9.5 Lubrication

(1) Lubricants and Fluids

NOTICE

Always use lubricants and fluids that meet the above international specifications.

The Shell grades are for reference only.

Component	International Spec	Sample
Engine Oil (C6.6)	CAT ECF-1-a , API CH-4/CI-4	CAT DEO (SAE 15W-40)
Engine Oil (C7.1)	CAT ECF-3 , API CJ-4 , AECA E9	Cat DEO-ULS (SAE 15W-40)
Coolant (C6.6/C7.1)	CAT EC-1, ASTM D4985 or ASTM D6210	CAT Extended Life Coolant (ELC) or CAT Diesel Engine Antifreeze (DEAC)
Hydraulics Oil	ISO 46	Shell Tellus 46
Anti freeze	BS6580	Shell Safe Anti-Freeze (Ethylene Glycol Based)
	ASTM D3306-74	Shell Save Premium Anti Freeze
General Grease	DIN 51826, EP2	Shell Retinax EP
Screen Bearing Oil	Industrial Oil 220	Shell Morlina S2 B 220 (4° to 35°) or Shell Morlina S2 B 150 (-18° to 18°)
Feeder Gearbox (RMB O95D series) (Beltfeeder)	SAE 80W/90	Shell Spirax S2 G 80W-90
Track Final Drive	SAE 80W/90, ISO 4406 (20/18/18)	Shell Spirax S2 G 80W-90

(2) Capacities - Fluid

Engine coolant - C6.6/C7.1	21/24.25 ltr
Engine oil - C6.6/C7.1	17.4/17.9 ltr
Hydraulic tank	780 ltr
Fuel tank	597 ltr
Feeder Gearbox (Belt)	1.3 ltr

(3) Greasing Schedule (LHS and RHS)

(Please note: 20 Grams = approx. 13 grease gun strokes. Each grease gun will put out a differing amount. Check greasing equipment before use)

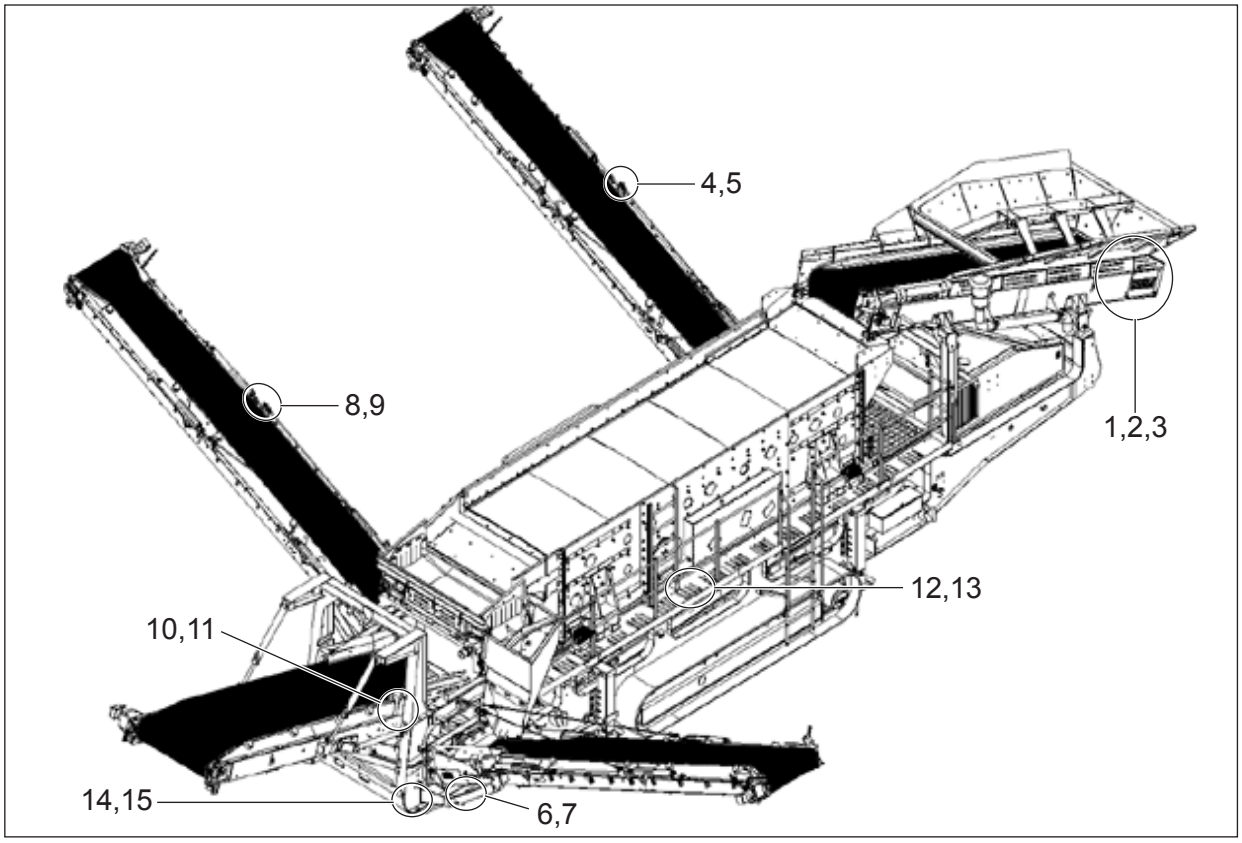


Figure 9.2 - H6203R Lubrication Points

Area	Description	Frequency	Grease Gun Strokes
1	Feeder Conveyor Tail Drum Bearings LH/RH	100 HRS	2
2	Apron Feeder Tail Drum Bearings LH/RH	100 HRS	2
3	Apron Feeder Drive Drum Bearings LH/RH	100 HRS	2
4	Fines Conveyor Tail Drum Bearing LH/RH	100 HRS	2
5	Fines Conveyor Drive Drum Bearing LH/RH	100 HRS	2
6	Oversize Tail Drum Bearings LH/RH	100 HRS	2
7	Oversize Drive Drum Bearings LH/RH	100 HRS	2
8	Mid-Fines Tail Drum Bearings LH/RH	100 HRS	2
9	Mid-Fines Drive Drum Bearings (LH/RH)	100 HRS	2
10	Tail Conveyor Tail Drum Bearings (LH/RH)	100 HRS	2
11	Tail Conveyor Drive Drum Bearings (LH/RH)	100 HRS	2
12	Collection Conveyor Tail Drum Bearings (LH/RH)	100 HRS	2
13	Collection Conveyor Drive Drum Bearings (LH/RH)	100 HRS	2
14	Transfer Conveyor Tail (LH/RH)	100 HRS	2
15	Transfer Conveyor Drive (LH/RH)	100 HRS	2

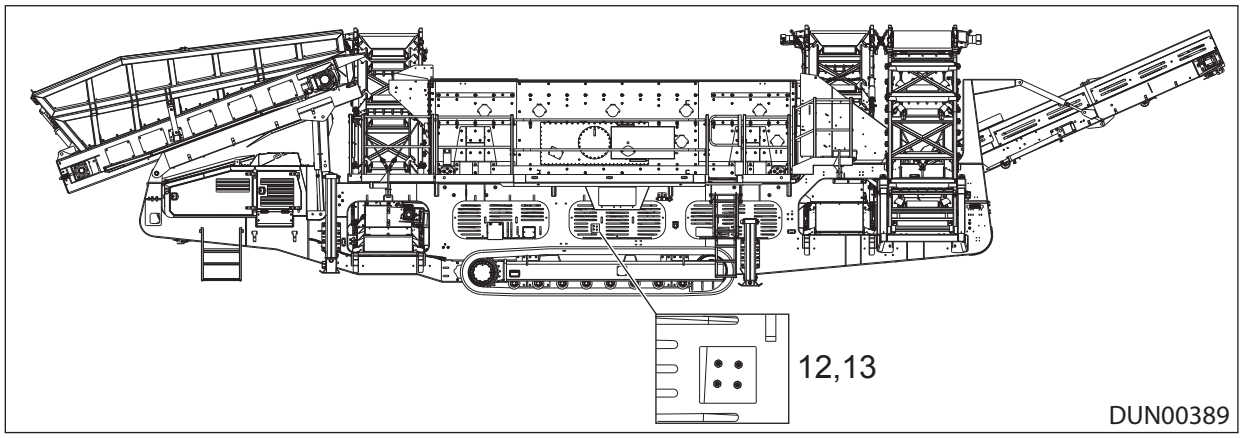


Figure 9.3 - Collection Conveyor Grease Points

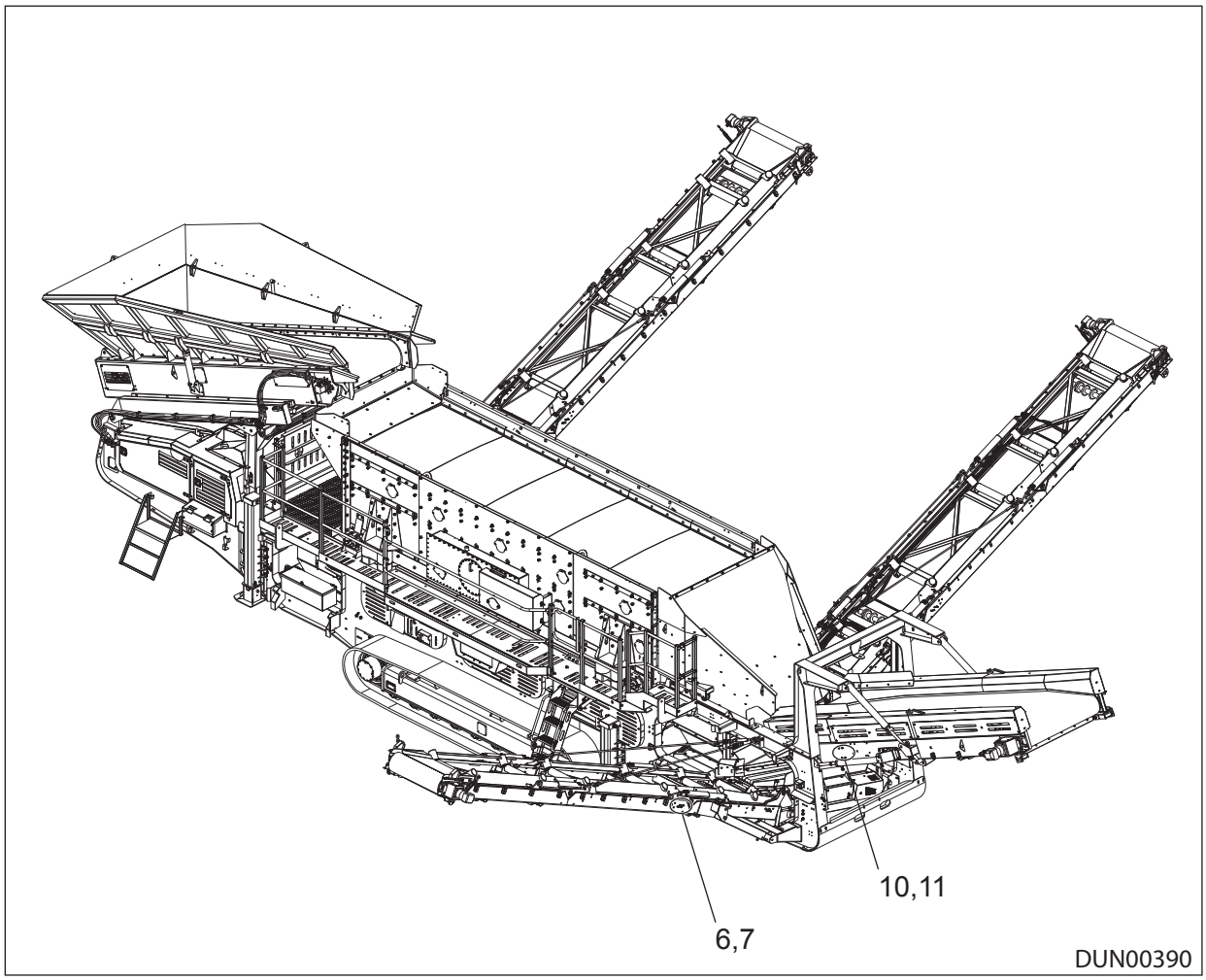


Figure 9.4 - Grease Points Oversize and Tail Conveyor

(4) Recommended Lubricants for Screenbox

	Ambient Temperature 40 to 95° F (4 to 35° C)	Ambient Temperature 0 to 65° F (-18 to 18° C)
AMOCO	Industrial Oil 220	Industrial Oil 150
CHEVRON	AW Machine Oil 220	AW Machine Oil 150
EXXON	Teresstic 220	Teresstic 150
MOBIL	DTE Oil BB	DTE Oil Extra Heavy
SHELL	Morlina S2 B 220	Morlina S2 B 150
TEXACO	Regal R & O 220	Regal R & O 150

If ambient temperature exceeds 95° F (35°C) then ISO grade 320 should be used.

Flushing Oil : Use iso viscosity grade 46 lubricant.

The gearbox on each side requires approximately 10 liters (2 US gallons).

The level bung on the side should be removed and when the oil stops flowing out this is the correct amount of oil. Do not overfill as this can cause overheating.

9.6 Servicing the Conveyors

(1) General Servicing for All Conveyors

All conveyor belts and drum lagging on Powerscreen machines are made to the highest standards and are tough and durable. However these are consumable items and will need to be replaced through normal wear and tear.

Spliced belts are less effective than vulcanized and have an increased tendency to slip. Also a belt which has been adjusted to its maximum must be replaced with a new belt.

Worn lagging must also be replaced.

The correct procedure for changing a belt/lagging is to contact your local POWERSCREEN dealer who will either carry out the work himself or get it carried out by personnel trained in this field

To ensure optimum performance and safety, the conveyor(s) must be:

1 Cleaned on a daily basis or more frequently depending on the application. (For details contact your local POWERSCREEN dealer).

2 Checked for cuts, tears, rips or any other physical damage.

3 Tensioned properly.

4 Kept in alignment.

So long as the described maintenance procedures have been properly observed, your machine should not experience belt slippage. Slippage occurs when the drum turns and the belt does not move. Slippage can occur for a number of reasons including:

- Incorrectly tensioned belts.
- Worn belts.
- Ineffective lagging.
- Too much load on the belt.
- Rollers cannot rotate freely.

(a) Clean & Check the Conveyor Belts

⚠ DANGER

Entanglement hazard.

⚠ WARNING

Wear personal protective equipment. Ensure that eyes are protected by wearing safety glasses.

Falling material hazard.

Hearing hazard.

Falling hazard.

⚠ 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 entirely by your local POWERSCREEN dealer.

PROCEDURE

1. Observe all safety warnings.
2. Stop the engine and implement the lockout and tagout procedure.
3. Open the guard doors where necessary.
4. Clean the conveyor belts using a high pressure hose. Ensure that eyes are protected by wearing safety glasses.
5. Check the belts for cuts, tears, rips or any other physical damage.

(b) Tensioning the Conveyor Belts

⚠ DANGER

Under no circumstances should any adjustment be made on 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.

Nip point hazard.

Entanglement Hazard.

Fall hazard.

Switch off the machine and implement the lockout and tagout procedure.

NOTICE

The COLLECTION and FINES side conveyor operate together.

The TAIL and MID-FINES side conveyors operate together.

Do not over tension the belt as this will damage the drum bearings.

The belt will normally have to be tensioned a number of times during the belt's lifetime due to the natural stretching of the belt.

It is very important that the conveyor belt is tensioned evenly and to the correct level, not too tight and not too loose. A loose belt can cause slippage, resulting in reduced throughput. An over-tight belt can damage drum bearings, resulting in increased downtime.

Correct tension is obtained when no slippage occurs during normal use.

PROCEDURE

1. Observe all safety warnings.
2. For the main conveyor open hopper access doors if necessary.
3. Start the machine, Ref: Chapter 7.
4. Start the conveyor to be tensioned (Ref: Section 7.7).
5. Adjust the flow control valve to run the conveyor at the desired speed.
6. Tighten the belt by adjusting both belt adjusters (item 1) LHS and RHS evenly, 2 turns at a time until slippage stops, Ref: Figure 9.5 to Figure 9.10.
7. Stop the conveyor.

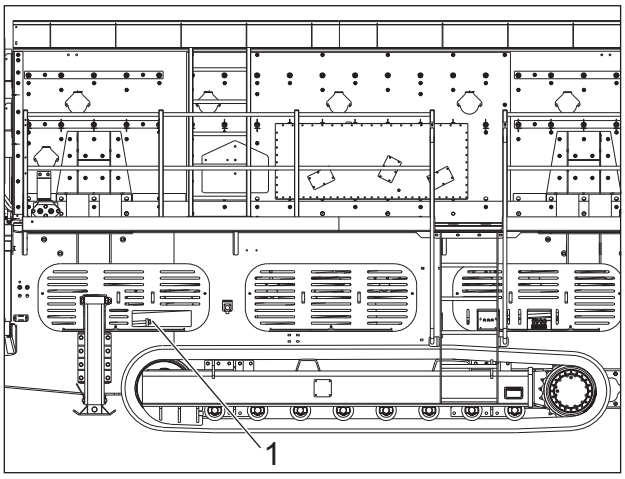


Figure 9.5 - Collection Conveyor Belt Adjuster

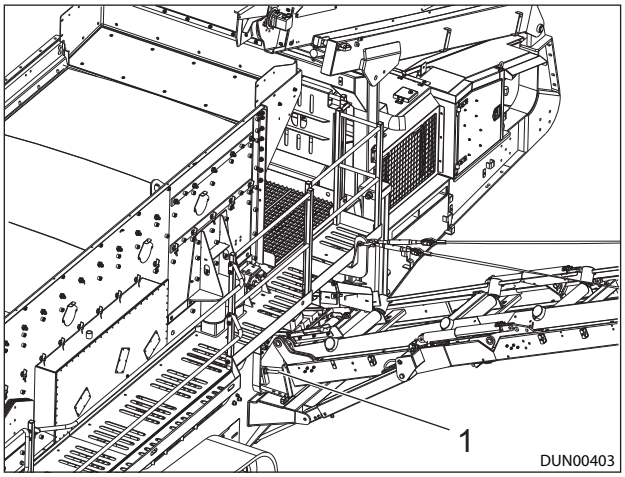


Figure 9.6 - Fines Side Conveyor Adjuster

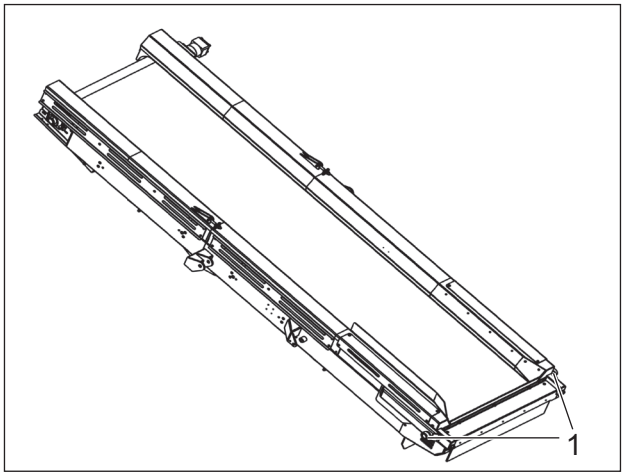


Figure 9.7 - Tail Conveyor Adjusters

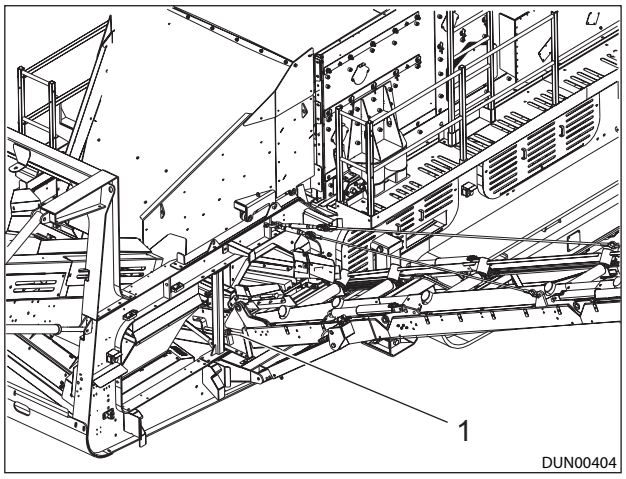


Figure 9.8 - Mid Fines Side Conveyor Adjuster

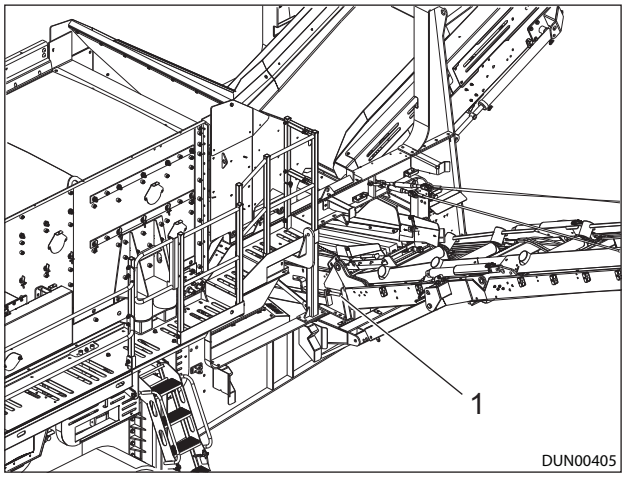


Figure 9.9 - Mid Overs Side Conveyor Belt Adjuster

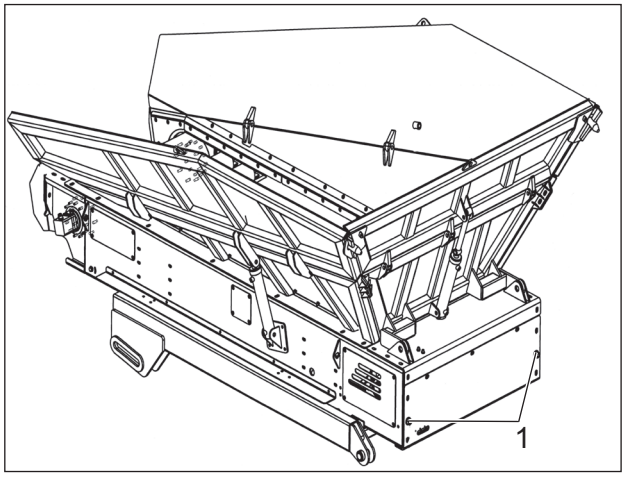


Figure 9.10 - Feeder Conveyor Belt Adjusters

(c) Conveyor Alignment

For safe, proper and efficient operation of the machine, it is important that conveyor belts are properly aligned. The belt alignment can be checked without removing any guard by looking through the viewing apertures. The conveyor belts are aligned by adjusting the drum adjusters, Ref: Figure 9.5 to Figure 9.10.

Reasons for the conveyor belts not running in alignment:

1 Machine not perfectly levelled.

2 Faulty belt tension.

3 Faulty position of the drums.

⚠ DANGER

Nip point hazard

Entanglement hazard.

⚠ WARNING

Wear personal protective equipment.

Falling material hazard.

Fall hazard.

Switch off the machine and implement the lockout and tagout procedure.

⚠ CAUTION

Do not unfasten or remove any guard while the machine is running or start the machine while a guard is unfastened or removed.

NOTICE

The COLLECTION and FINES side conveyor operate together.

Do not over tension the belt as this will damage the drum bearings.

PROCEDURE

1. Observe all safety warnings.
2. For the main conveyor open hopper access doors if necessary.
3. Start the conveyor to be aligned (Ref: Section 7.7).
4. Turn the control knob of the variable speed control valve COUNTER CLOCKWISE to run the conveyor at maximum speed, Ref: Figure 9.11.
5. Observe the conveyor through the viewing apertures and determine to which side the conveyor is tracking off.
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. Stop the conveyor.

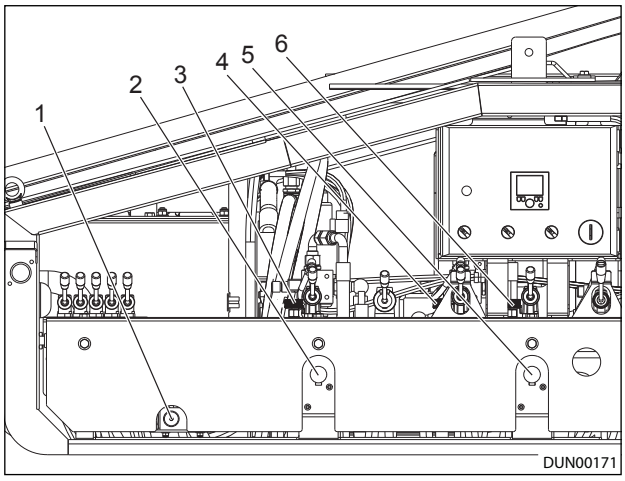


Figure 9.11 - Variable Speed Flow Control Valves

1 Feeder conveyor
2 Mid-Fines conveyor
3 Collection conveyor
4 Fines conveyor
5 Mid Overs conveyor
6 Tail conveyor

(2) Servicing the Collection Conveyor

(a) Collection Conveyor Belt Scraper Adjustment

Tensioning the Primary Scraper

PROCEDURE

1. Secure nut (A) & turn adjuster bolt (B) clockwise.
2. The secondary scraper is tensioned by nut (C) applying a downward force on the secondary scraper frame

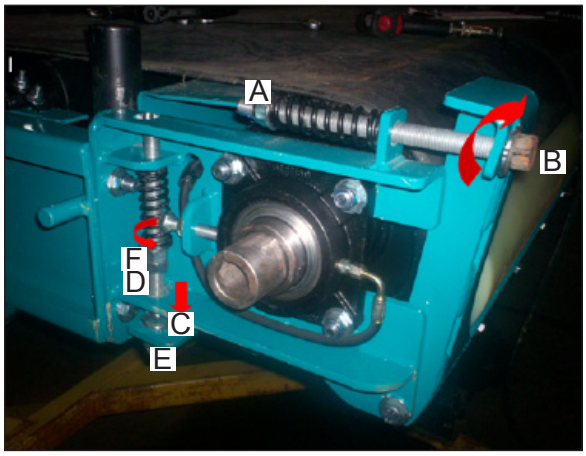


Figure 9.12 - Collection Conveyor Scraper Adjustment

Tensioning the Secondary Scraper

NOTICE

Always ensure sufficient clearance is kept between nuts (c) and (e) to allow secondary scraper frame to pivot

PROCEDURE

1. Replace locking nut (D), secure adjuster bolt (E) and turn the tension nut (F) anti-clockwise. Re-tighten the locking nut (D). Refer figure 9.12.
2. Tension and track the collection conveyor belt.

9.7 Servicing the Tracks

⚠ WARNING

Wear personal protective equipment.

Switch off the machine and implement the lockout and tagout procedure.

NOTICE

Frequently check all nuts and bolts on the tracks.

(1) Machine Tracks

NOTICE

To maximise the life of the track, keep it movable and avoid damage, the machine should be moved at least every week, by a distance exceeding four times the track length. It should also be parked on level ground overnight and during periods to of non-usage. This is particularly important when working in adverse conditions.

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.

PROCEDURE

1. Keeping the track correctly adjusted will increase the service life of the track and drive components.
2. 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.
3. Always check the tracks prior to manoeuvring the machine.

(2) Measuring Track Tension

⚠ WARNING

Prior to attempting any manoeuvring of the machine, the tracks must be free of obstructions, including crushed material and fines. Do not push or tow the machine. Failure to observe this warning could result in injury to persons and damage to the machine which may invalidate warranty.

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.

PROCEDURE

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 tagout 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 9.13.

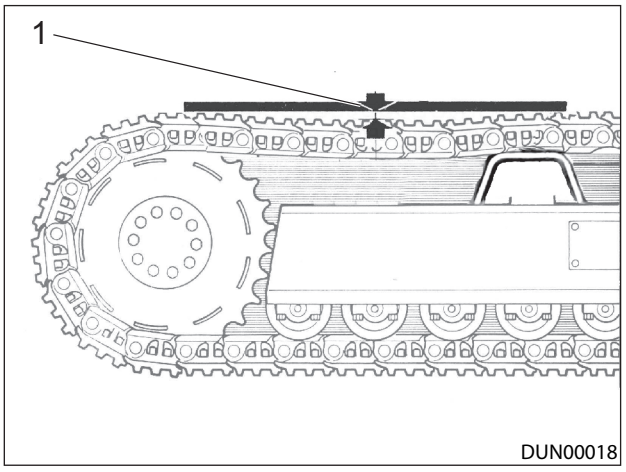


Figure 9.13 - Measuring Track Tension

7. Correctly adjusted, the sag should be within the limits set by the supplier as shown in Table 9.1.

Table 9.1 - Track Tension Limits

Identification	Sag Value
Strickland	5 mm - 15 mm

8. Depending upon the need to either slacken or tension the track, proceed as follows.

(3) Adjusting Track Tension

⚠ DANGER

Grease coming out of the relief valve under pressure can penetrate the body causing injury or death; DO NOT watch the relief valve to see if grease is escaping but instead watch the track adjustment cylinder to verify that the track is being loosened.

⚠ WARNING

Fall hazard. Wear personal protective equipment.

Switch off the machine and implement the lockout and tagout procedure.

NOTICE

Do not set track tension too tight.

PROCEDURE

1. Observe all Safety Warnings.
2. Shut down the machine, (Refer to Chapter 7, “Standard Operating Procedures”).
3. Implement the lockout and tagout procedure, Ref: Chapter 8.
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 [After measurement]:-

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.
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 [After measurement]:-

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.

(4) Gearbox Oil Level

(a) Checking and Filling Gearbox Oil

⚠ WARNING

Burn hazard from hot fluid.

Dispose of oil safely and in an environmentally friendly manner.

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.

PROCEDURE

1. Move the machine to a level surface and bring the oil drain holes to the position shown in Figure 9.14.
2. Ensure the 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 9.14.
6. Wait a few moments until any trapped air has escaped and then re-check the level.
7. Add more oil if necessary.
8. Replace both plugs.

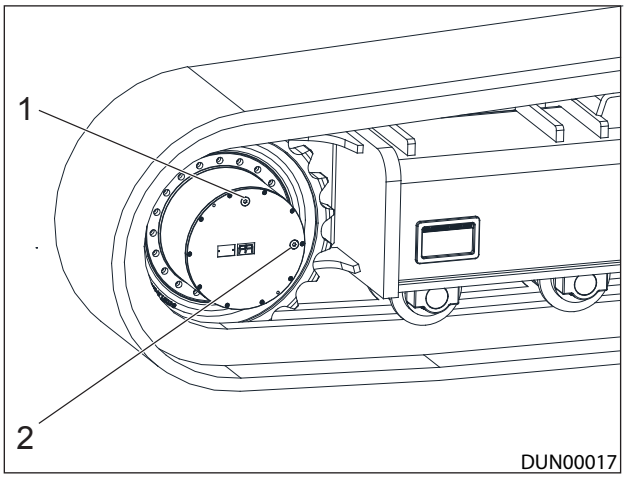


Figure 9.14 - Gearbox Oil Level Fill Position

(b) Draining Gearbox Oil

⚠ WARNING

Burn hazard from hot fluid.

Dispose of oil safely and in an environmentally friendly manner.

PROCEDURE

1. Move the machine to a level surface and bring the oil fill and oil drain holes to the position shown in Figure 9.15.
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 9.13. Do not move the machine any further until the gearbox oil has been replaced.
6. Re fill the oil as per the procedure in 9.11(4)(a).

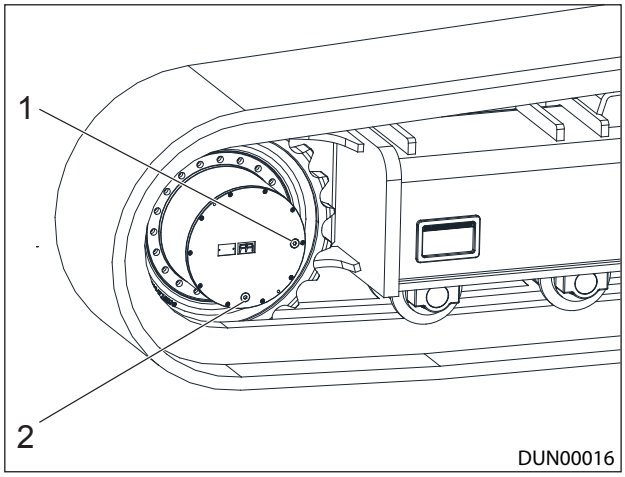


Figure 9.15 - Draining Gearbox Oil

(5) Cleaning the Tracks

PROCEDURE

1. Observe all safety warnings.
2. On a daily basis the tracks should be hosed down to dislodge any build up of material on the tracks.

9.8 Servicing the Electrical System

⚠ WARNING

Switch off the machine immediately if malfunctions occur in the electrical system.

Before beginning work on any of the machine‘s electrical components, any power supplied to the machine (whether the battery or a power line) must be cut-off by disconnecting or de-energizing.

Before starting any work, check the machine and the electrical parts to be worked on for the presence of power. Ground or short-circuit the parts to be worked on to prevent the possibility of an electrocution hazard.

Insulate any live parts which cannot be de-energized to prevent the possibility of an electrocution hazard.

Always use insulated tools when working on the electrical systems.

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 components must be rectified immediately.

Work on the electrical system and equipment of the machine must be carried out 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.

(1) Check the Battery

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Always disconnect battery leads before carrying out any maintenance to the electrical system. The battery contains sulphuric acid, electrolyte which can cause severe burns and produce explosive gasses. Avoid contact with the skin, eyes or clothing.

NOTICE

In cold weather, distilled water should only be added immediately before starting the engine, to prevent it freezing.

PROCEDURE

1. Observe all safety warnings.
2. Ensure that all electrical connections are clean and tight and coat the terminals with petroleum jelly to protect them from corrosion.
3. Remove the battery filler plugs and check that the electrolyte level is between 6 and 9 mm (0.25 - 0.37 ins) above the tops of the separators.
4. If necessary, fill up with distilled water.
5. Where batteries have trough fillers, add distilled water to the filling trough until the trough just begins to fill with water.

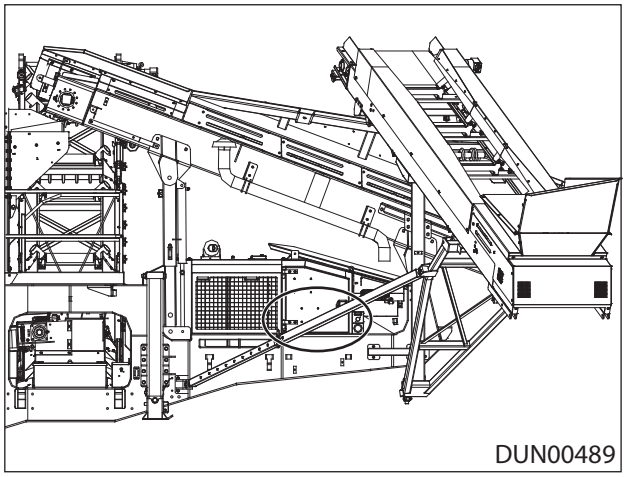


Figure 9.16 - Battery

(2) Battery Removal

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Always disconnect battery leads before carrying out any maintenance to the electrical system. The battery contains sulphuric acid, electrolyte which can cause severe burns and produce explosive gasses. Avoid contact with the skin, eyes or clothing

PROCEDURE

1. Observe all safety warnings.
2. Ensure all electrical circuits are switched off.
3. Loosen bolts from the battery retaining frame.
4. Remove the battery retaining frame.
5. Disconnect the ground (-) lead from the battery.
6. Disconnect the positive (+) lead from the battery.
7. Lift the battery from the machine.

(3) Battery Installing

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

NOTICE

When installing the battery the positive (+) lead must be connected first.

These machines are wired negative ground. Always observe correct polarity.

PROCEDURE

1. Observe all safety warnings.
2. Ensure all electrical circuits are switched off.
3. Lift the battery onto the machine.
4. Connect the positive (+) lead.
5. Connect the ground (-) lead.
6. Fit the battery retaining frame.
7. Tighten bolts on the battery retaining frame.

9.9 Servicing the Hydraulic System

(1) Hydraulic System

⚠ DANGER

Fluid injection hazard.

⚠ WARNING

Lock-out machine.

Wear personal protective equipment.

NOTICE

The air vents in the cap must be kept open to allow the hydraulic system to “breathe.” Always use the correct grade of oil, otherwise overheating will occur. (Refer this Section, “lubricants and fluids.”)

If the hydraulic system requires filling up on a regular basis, all hydraulic parts and hoses should be inspected for leaks. Any repairs should be made prior to continued operation of the machine.

ALWAYS practice extreme cleanliness when servicing.

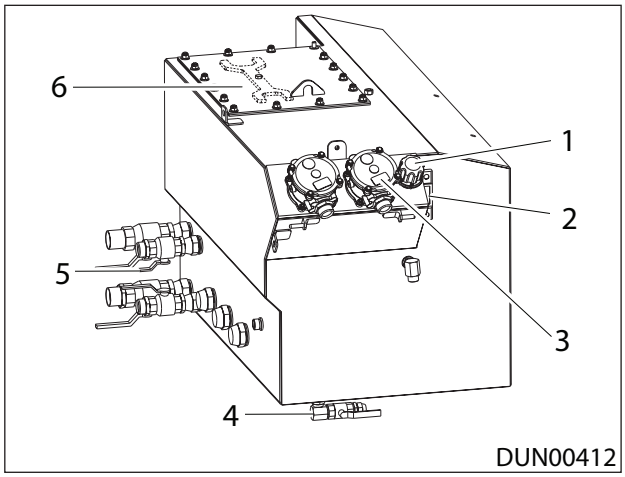


Figure 9.17 - Hydraulic Tank

1 Filler cap
2 Level indicator
3 Return line filter
4 Drain plug
5 Suction pipes
6 Cover plate

(2) Hydraulic Oil

(a) Check Hydraulic Oil Level

⚠ DANGER

Fluid injection hazard.

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

PROCEDURE

1. Observe all safety warnings.
2. Machine must be on level ground.
3. Always have the hydraulic oil at normal operating temperature.
4. Always have all cylinders retracted (where possible).
5. Check the level indicator (item 2), Ref: Figure 9.18. The oil level must be between the red and black marks on the gauge.

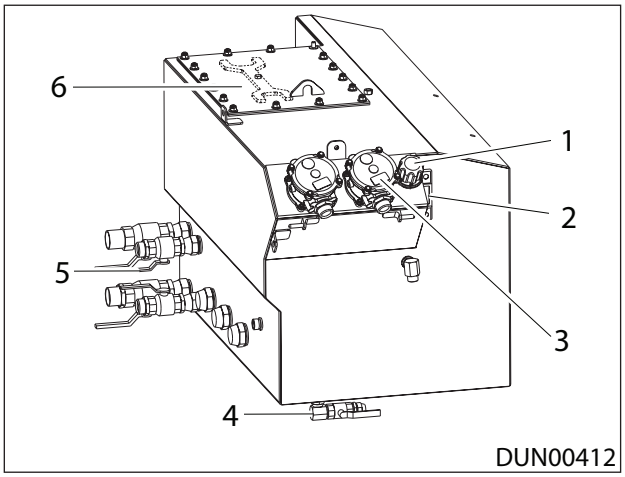


Figure 9.18 - Hydraulic Tank

(b) Adding Hydraulic Fluid

⚠ DANGER

Fluid injection hazard.

⚠ WARNING

Lock-out machine.

Wear personal protective equipment.

NOTICE

Never overfill the hydraulic tank as this will cause leakage from the filler cap.

PROCEDURE

1. Observe all safety warnings.
2. Machine must be on level ground.
3. Always have all cylinders retracted (where possible).
4. Implement lock-out procedure.
5. Clean the area around the filler cap (item 1).
6. Open the filler cap (item 1).
7. Fill the tank to midway between red and black marks on the level indicator. (Correct grade of hydraulic oil see this Section, “lubricants and fluids.”)

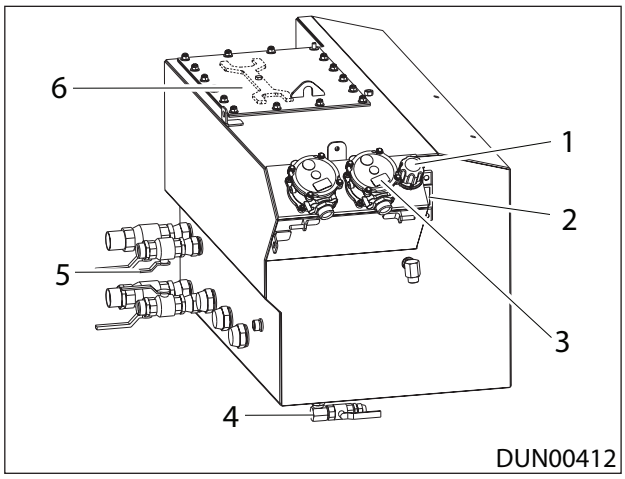


Figure 9.19 - Hydraulic Tank

(c) Change Hydraulic Oil

⚠ DANGER

Fluid injection hazard.

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

NOTICE

ALWAYS practice extreme cleanliness when servicing.

Before removing the drain plug (D)

- Release any pressure in the hydraulic tank by slowly unscrewing the filler cap (C).
- Ensure a suitable container is placed on the ground to catch the full capacity of oil in the tank.
- Remember to stand on one side to avoid oil which will spill from the drain hole.

Change the suction elements when an oil change is being carried out.

PROCEDURE

1. Observe all safety warnings.
2. Always have the hydraulic oil at normal operating temperature.
3. Always have all cylinders retracted (where possible).
4. Drain the tank by removing the drain plug (item 4).

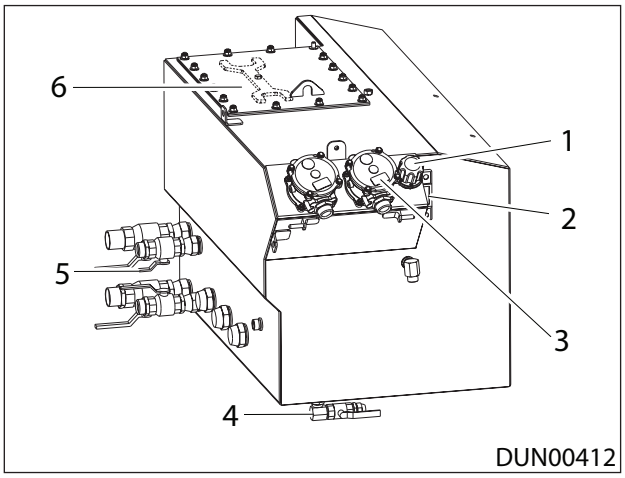


Figure 9.20 - Hydraulic Tank

5. Remove the cover plate (item 6). Discard the gasket.
6. Remove the suction filters by unscrewing them from the suction pipes (item 5).
7. Flush out the tank with clean hydraulic oil taking extreme care to remove all dirt and foreign matter.
8. Fit new suction filters to the suction pipes.
9. Re-fit cover plate to the tank using a new gasket and refit drain plug (item 4).

10. Change the return line filter element (refer this Section).
11. Refill the tank with clean hydraulic oil to midway between the red and black marks on level indicator. (Correct grade of hydraulic oil see this Section, “lubricants and fluids”).
12. Run the engine to circulate the oil. Operate the hydraulic controls to purge any air from the system.
13. Stop the engine and fill up the system as required.

(3) Return Line Filter

(a) Check Return Line Filter

DANGER

Fluid injection hazard.

WARNING

Lock-out machine.

Wear personal protective equipment.

NOTICE

Red indicates no filtration.

Always change the filter element immediately when the indicator shows red.

PROCEDURE

1. Observe all safety warnings.
2. Always have the engine running at maximum speed.
3. Always have all hydraulic equipment working.
4. Always have the hydraulic oil at normal operating temperature.
5. Check the return line filter blockage indicator (A), Ref: Figure 9.21.

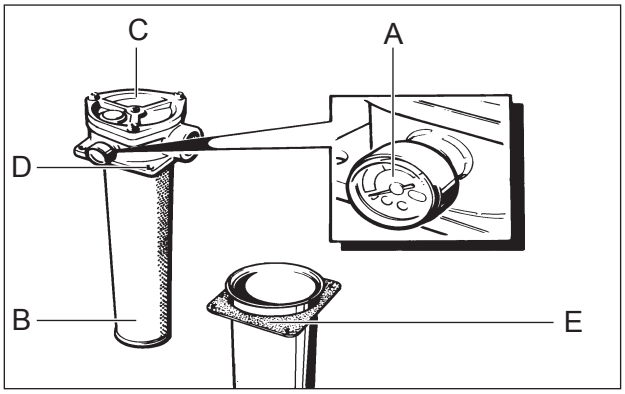


Figure 9.21 - Return Line Filter

6. Change the filter element immediately when the green sector of the blockage indicator goes to red.

(b) Change Return Line Filter

⚠ DANGER

Fluid injection hazard.

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

PROCEDURE

1. Observe all safety warnings
2. Release any pressure in the hydraulic tanks by slowly unscrewing the filler cap.
3. Clean the outside of the filter housing (C), Ref: Figure 9.22.
4. Remove the filter by unscrewing the retaining bolts (D), Ref: Figure 9.22.
5. Lift out the old element (B) and discard it safely, Ref: Figure 9.22.
6. Wash out the filter cap and dry with an air hose. DO NOT USE A RAG.
7. Re-fit new filter ensuring seal ring (E) is in good condition and correctly positioned, Ref: Figure 9.22.
8. Tighten cap securely.

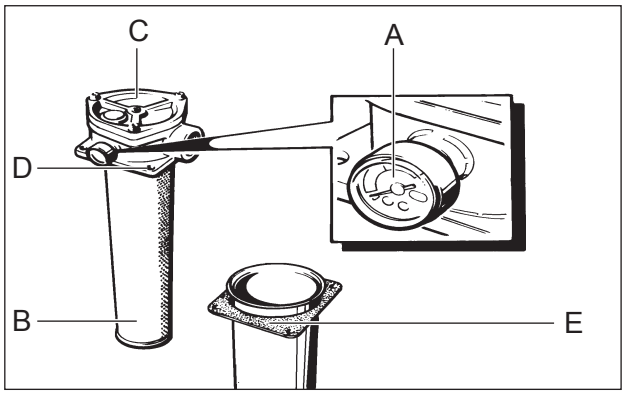


Figure 9.22 - Return Line Filter

9.10 CAT 7.1 T4F Engine Maintenance

(1) Changing Engine Filters & Oil

(See the engine Operators Manual for more detailed information regarding the Engine)

⚠ CAUTION

Hot surfaces. Beware of burns from hot oil.

(a) Checking Engine Oil

PROCEDURE

1. Turn off the engine. Open the engine inspection doors (Item 1, Ref: Figure 9.23).

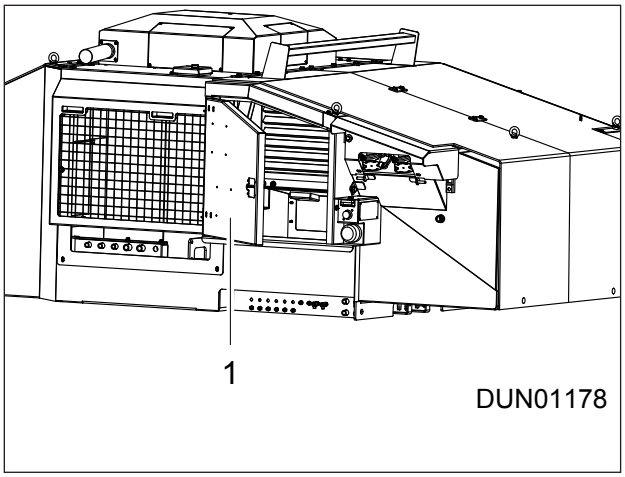


Figure 9.23 - Engine Inspection Door

2. Remove dipstick (Item 1, Ref: Figure 9.24) from the engine and clean. Re-insert the dipstick fully.

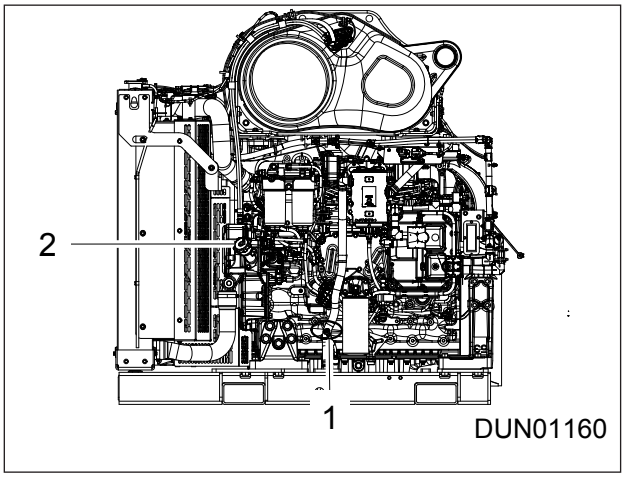


Figure 9.24 - Engine Oil Filler Cap & Dipstick

3. Remove the dipstick again and observe that the oil level is between the minimum and maximum levels. If the level is below the minimum mark oil has to be added through the filler cap (Item 2, Ref: Figure 9.24) .
4. It is important the oil level is not above the maximum level. If this happens some oil must be removed.

(b) Changing Engine Oil & Filter

PROCEDURE

1. Operate the engine to ensure the oil is warm, this enables the oil to flow more easily, also when the oil is cool waste particles settle on the bottom of the oil pan and will not drain off.
2. Stop the engine and open the filler cap (Item 2, Ref: Figure 9.25).
3. Remove the drain plug located underneath the engine and drain the oil to an external container large enough to hold all the oil.

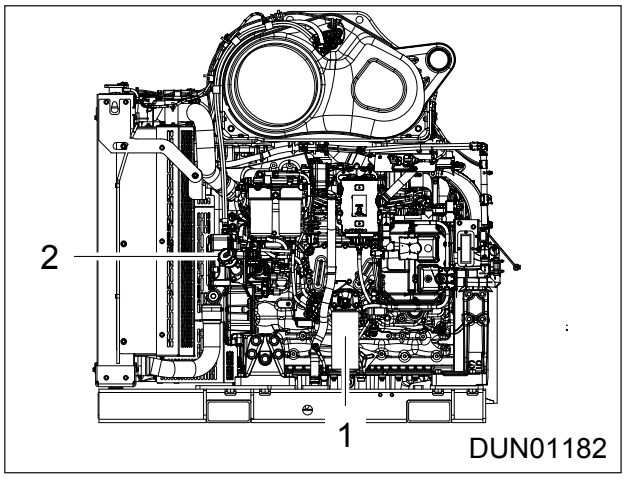


Figure 9.25 - Engine Oil Filter

4. When all the oil has drained off replace the drain plug.
5. Loosen the Filter (Item 1, Ref: Figure 9.25) and dispose off properly. Replace the new filter and hand tighten.
6. Refill the engine with oil and dip the engine.

(2) Changing Fuel Filters

(a) Draining the Fuel Filter Water Trap

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Diesel fuel is highly flammable.

Do not smoke or carry out maintenance on the fuel system near open flame or sources of sparks, such as welding equipment, etc.

PROCEDURE

1. Observe all safety warnings.
2. Turn off the engine. Open the engine inspection doors (Item 1, Ref: Figure 9.26).
3. Unscrew the drain bung (Item 1, Ref; Figure 9.27) at the bottom of the water trap (item 2, Ref; Figure 9.26) and allow the water to drain out into a suitable container.

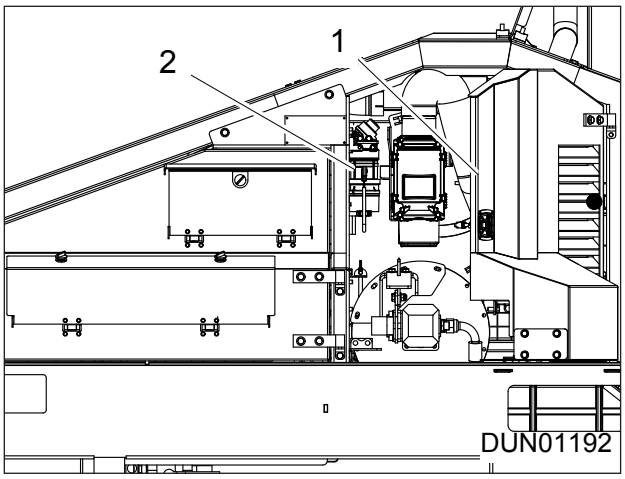


Figure 9.26 - Engine Fuel Filters

4. Tighten the drain plug when pure diesel starts to come out.
5. Clean up any spilt diesel.

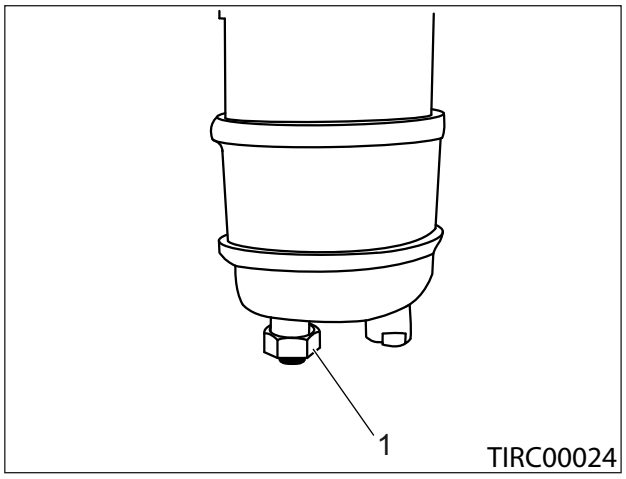


Figure 9.27 - Water Trap

(b) Changing Watertrap Filter

To change the watertrap filter element (Item 2, Ref: Figure 9.26) follow the procedure outlined.

PROCEDURE

1. Stop the machine and turn the fuel supply off.
2. Remove the bleed.
3. Remove the filter& watertrap bowl.
4. Remove the watertrap bowl from the filter element.
5. Oil the watertrap bowl.
6. Attach new element to watertrap bowl.
7. Oil top of filter element.
8. Attach the filter element.
9. Prime the fuel system to fill the element and watertrap, and to remove air from the system. (Refer to section 9.14 for more information on how to do this)
10. Replace the bleed.

(c) Changing the Fuel Filters

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Diesel fuel is highly flammable.

Do not smoke or carry out maintenance on the fuel system near open flame or sources of sparks, such as welding equipment, etc.

NOTICE

Fill up the new fuel filter with diesel. This will make the restart of the machine easier.

PROCEDURE

1. Observe all safety warnings.
2. Unscrew the fuel filter (Item 1, Ref; Figure 9.28)

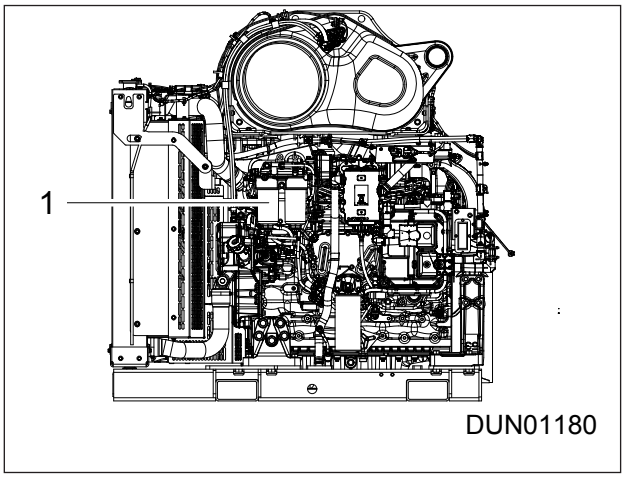


Figure 9.28 - Engine Fuel Filters

3. Fill the new filters with diesel and fit into position.
4. Tighten the new fuel filter and o-ring.

(3) Servicing The DEF (Diesel Exhaust Fluid) System (CAT 7.1 T4F)

⚠ WARNING

Wear personal protective equipment.

Switch off the machine and implement the lockout and tagout procedure.

Hot Surface Hazard

Beware of hot DEF and surfaces.

DEF is corrosive and therefore must be stored in tanks constructed of approved materials. (Refer to engine manual for more details)

NOTICE

It is recommended that filter elements are not cleaned or reused but replaced with new items.

Do not run the engine with the filter elements removed

Do not use agricultural grade urea solutions. Do not use any fluids that do not meet ISO 22241-1 requirements in SCR emissions reduction systems. Use of these Fluids can result in numerous problems including damage to SCR equipment and a reduction in NOx conversion efficiency.

(a) DEF Tank Location

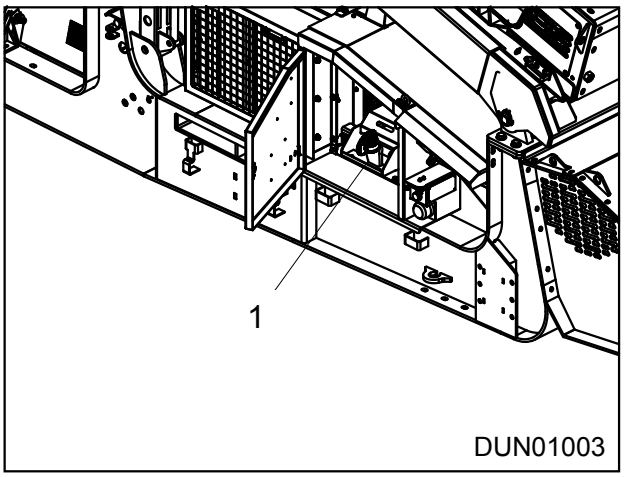


Figure 9.29 - Location of the DEF tank (item 1)

(b) DEF System Parts location

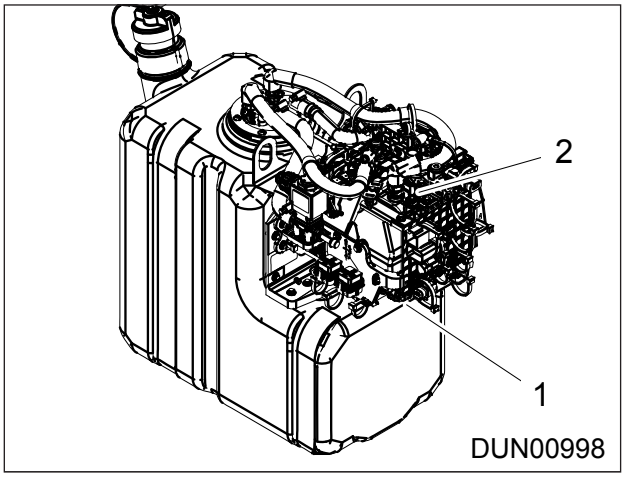


Figure 9.30 - Parts location

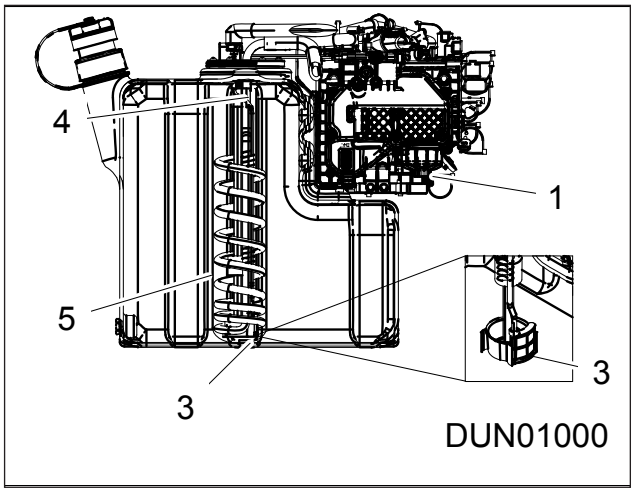


Figure 9.31 - Parts location

1. Pump Main Filter (ref. item 1), Figure 9.30 & 9.31.
2. Inlet Fitting (ref item 2), Figure 9.30.
3. Header Screen (ref item 3), Figure 9.31.
4. Scok Header Attachment (ref item 4), Figure 9.31.
5. Sock (ref item 5), Figure 9.31.

(c) Changing the Pump Main Filter

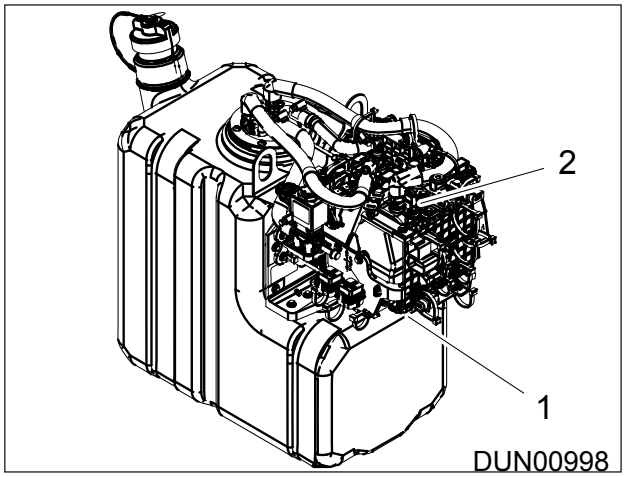


Figure 9.32 - Pump Main Filter Location - Item 1

1. Ensure that the area around the main filter is clean and free from dirt. A 27mm Bi-Hex socket is needed to remove the filter cap (Item 3): Ref Figure 9.33.

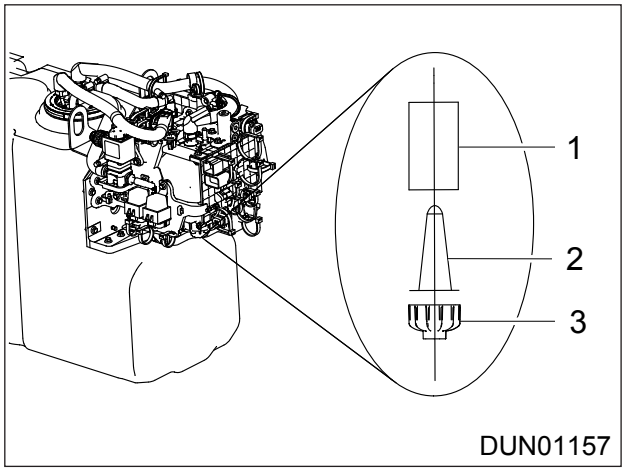


Figure 9.33 - Pump Main Filter Parts

2. Remove the expansion device (Item 2). Use the tool supplied with the new filter element in order to remove the expansion device.
3. Remove filter element (Item 1), from the main body.
4. Install new filter element (Item 1), into the main body.
5. Install the expansion device (Item 2), into the filter element.
6. Install filter cap (Item 3), and tighten the cap to 20 Nm (15 lb ft).

9.11 CAT 6.6 T3 Engine Maintenance

(1) Changing Engine Filters & Oil

(See the engine Operators Manual for more detailed information regarding the Engine)

⚠ CAUTION

Hot surfaces. Beware of burns from hot oil.

(a) Checking Engine Oil

PROCEDURE

1. Turn off the engine. Open the engine inspection doors (Item 1, Ref: Figure 9.34).

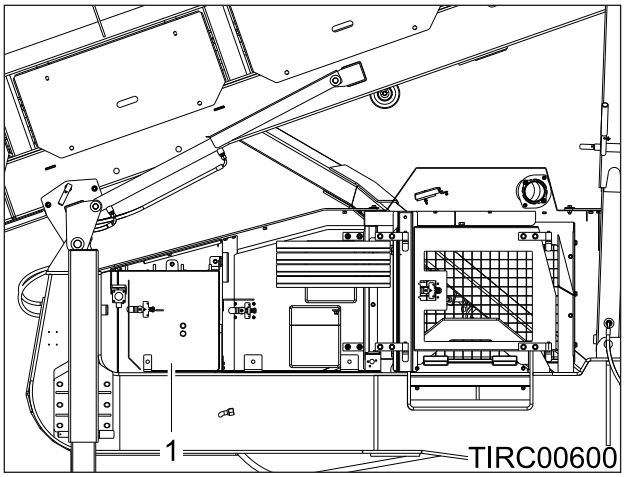


Figure 9.34 - Engine Inspection Door

2. Remove dipstick (Item 1, Ref: Figure 9.35) from the engine and clean. Re-insert the dipstick fully.

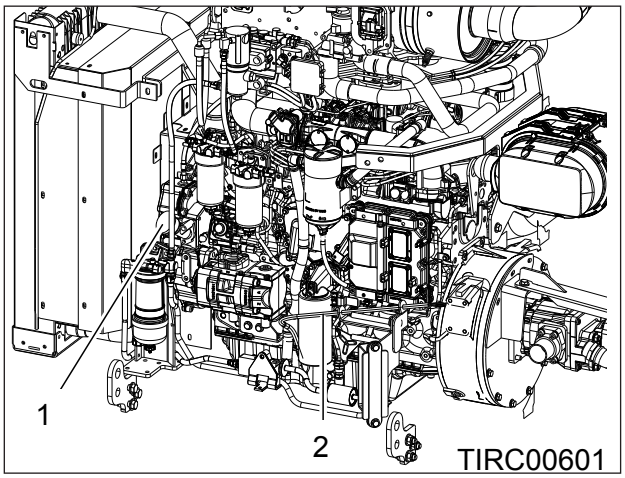


Figure 9.35 - Engine Oil Filler Cap & Dipstick

3. Remove the dipstick again and observe that the oil level is between the minimum and maximum levels. If the level is below the minimum mark oil has to be added through the filler cap (Item 2, Ref: Figure 9.35) .
4. It is important the oil level is not above the maximum level. If this happens some oil must be removed.

(b) Changing Engine Oil & Filter

PROCEDURE

1. Operate the engine to ensure the oil is warm, this enables the oil to flow more easily, also when the oil is cool waste particles settle on the bottom of the oil pan and will not drain off.
2. Stop the engine and open the filler cap (Item 2, Ref: Figure 9.36).
3. Remove the drain plug located underneath the engine and drain the oil to an external container large enough to hold all the oil.

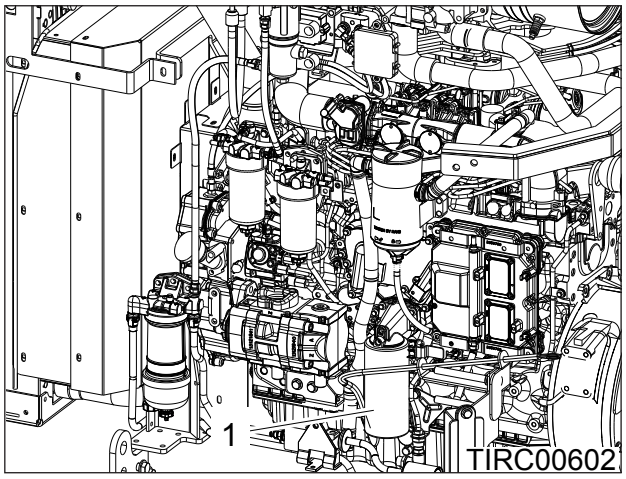


Figure 9.36 - Engine Oil Filter

4. When all the oil has drained off replace the drain plug.
5. Loosen the Filter (Item 1, Ref: Figure 9.36) and dispose off properly. Replace the new filter and hand tighten.
6. Refill the engine with oil and dip the engine.

(2) Changing Fuel Filters

(a) Draining the Fuel Filter Water Trap

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Diesel fuel is highly flammable..

Do not smoke or carry out maintenance on the fuel system near open flame or sources of sparks, such as welding equipment, etc.

PROCEDURE

1. Observe all safety warnings.
2. Unscrew the drain bung (Item 1, Ref; Figure 9.38) at the bottom of the water trap (item 4, Ref; Figure 9.37) and allow the water to drain out into a suitable container.

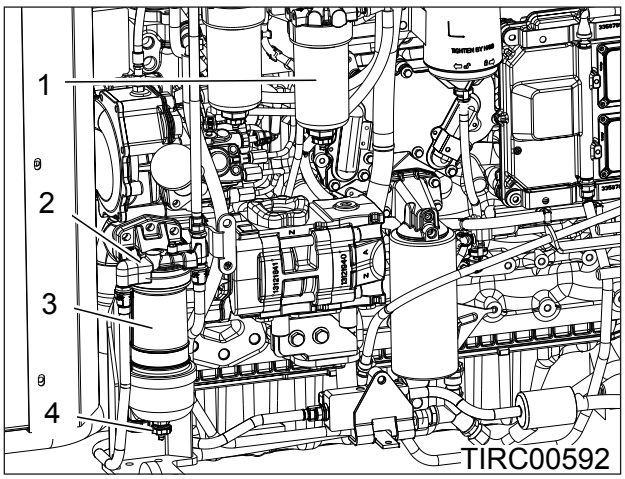


Figure 9.37 - Engine Oil Filters

3. Tighten the drain plug when pure diesel starts to come out.
4. Clean up any spilt diesel.

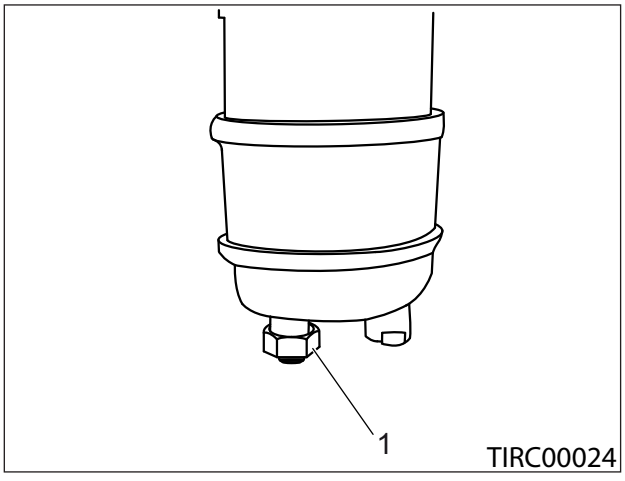


Figure 9.38 - Water Trap

(b) Changing Watertrap Filter

To change the watertrap filter element (Item 4, Ref: Figure 9.37) follow the procedure outlined.

PROCEDURE

1. Stop the machine.
2. Remove the bleed.
3. Remove the filter& watertrap bowl.
4. Remove the watertrap bowl from the filter element.
5. Oil the watertrap bowl.
6. Attach new element to watertrap bowl.
7. Oil top of filter element.
8. Attach the filter element.
9. Prime the fuel system to fill the element and watertrap, and to remove air from the system. (Refer to section 9.14 for more information on how to do this)
10. Replace the bleed.

(c) Changing the Fuel Filter

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Diesel fuel is highly flammable.

Do not smoke or carry out maintenance on the fuel system near open flame or sources of sparks, such as welding equipment, etc.

NOTICE

Fill up the new fuel filter with diesel. This will make the restart of the machine easier.

PROCEDURE

1. Observe all safety warnings.
2. Unscrew the fuel filter (Item 1, Ref; Figure 9.37)
3. Fill the new filters with diesel and fit into position.
4. Tighten the new fuel filter and o-ring.

9.12 Changing the Air Cleaner Elements

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

NOTICE

Always obey the air cleaner restriction indicator immediately if the control panel light illuminates. (Never attempt to clean and reuse an element.)

During normal service, the outer element (2) will require replacing only when the restriction indicator is illuminated.

Do not run the engine with the dust cover (2) removed as this will result in dust ingression and subsequent engine failure.

If the outer element has not been changed for 500 operating hours, a leak in the induction system must be suspected. Check that the air cleaner casing and hoses to the engine are not damaged. Check that all hose connections are airtight.

(1) Check Both Air Cleaner Elements

NOTICE

It is recommended that air cleaner elements are not cleaned or reused but replaced with new items.

Do not run the engine with the cover or filter elements removed.

PROCEDURE

1. Observe all safety warnings.
2. Ensure machine is switched off, locked out and tagged out. Remove the ignition key and carry it with you.
3. Release the tension clips (Item 4), Ref: Figure 9.39.
4. Remove the outer cover (Item 5), Ref: Figure 9.39.
5. Carefully remove outer filter (Item 3) and inner filter (Item 2).

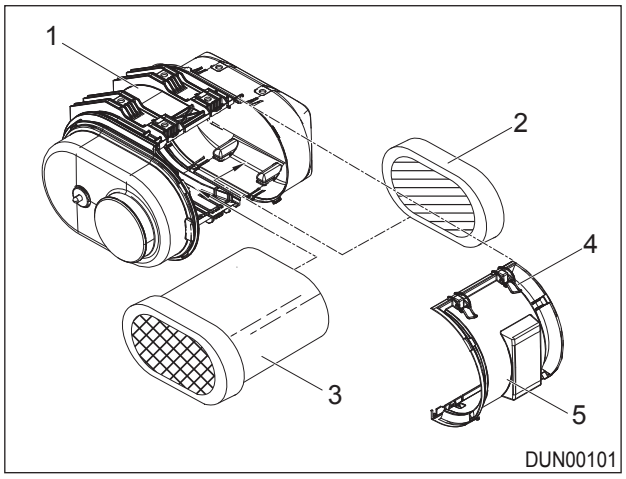


Figure 9.39 - CAT Engine Air Filter

6. Discard the elements if they are distorted or the bonded gaskets are loose.
7. Hold each element up to the light to check for damage to the paper. The elements should be discarded if pin pricks of light can be seen or if there are areas of paper that appear thin.
8. Clean the inside of the air cleaner casing using a damp, lint free cloth, paying particular attention to the element seals.
9. Refit new or existing elements as required.
10. Replace the outer cover (item 5) and fasten the tension clips (item 4), Ref: Figure 9.39.

(a) Changing the Air Cleaner Elements

NOTICE

Do not run the engine with the cover or filter elements removed.

PROCEDURE

1. Observe all safety warnings.
2. Ensure machine is switched off, locked out and tagged out. Remove the ignition key and carry it with you.
3. Release the tension clips (item 4) at the side of the cover (item 5), Ref: Figure 9.40.
4. Remove the cover (item 5).
5. Carefully remove the outer filter (item 3), minimizing the amount of dust spilled.
6. Remove the inner element (item 2).

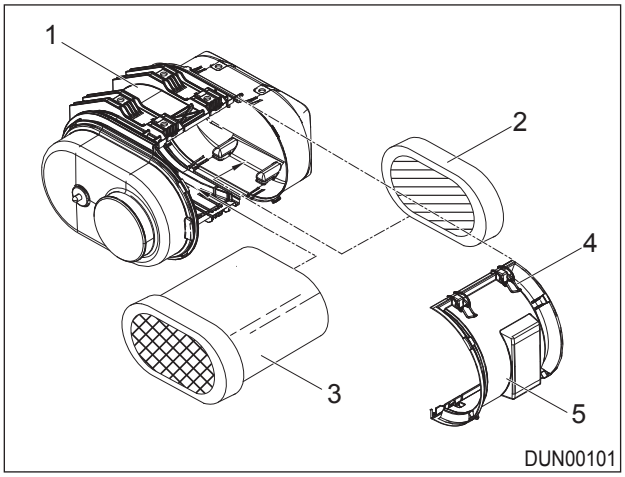


Figure 9.40 - CAT Engine Air Filter

7. Clean the inside of the air cleaner casing using a damp, lint free cloth.
8. Fit a new inner filter element (item 2), Ref: Figure 9.40.
9. Fit a new outer filter element (item 3), Ref: Figure 9.40.
10. Replace the outer cover (item 5) and fasten the tension clips (item 4), Ref: Figure 9.40

9.13 Priming the Fuel System

(1) Electic Fuel Pump Priming

⚠ WARNING

Wear personal protective equipment

Diesel fuel is highly flammable.

Do not smoke or carry out maintenance on the fuel system near open flame or sources of sparks, such as welding equipment, etc.

NOTICE

Do not crank the engine continuously for more than 30 seconds. Allow the starting motor to cool for two minutes before cranking again.

If air enters the system, the air must be purged from the fuel system befofre the engine can be started.

Do not loosen the high pressure fuel line in order to purge air from the fuel system. This procedure is not required.

After the engine has stopped, you must wait for 60 seconds in order to allow to allow the fuel pressure to be purged from the high pressure fuel lines before any service or repair is performed on the engine or fuel lines.

PROCEDURE

1. Ensure the fuel system is in working order and that the fuel supply is switched on.
2. Turn the ignition key to the ‘ON’ position (Item 2, Ref. Figure 9.41).

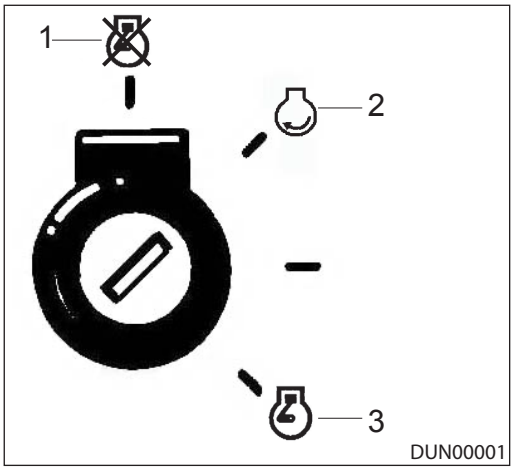


Figure 9.41 - Key Positions

3. This allows the electric priming pump to operate. Operate the electric priming pump.The ECM will stop the pump after 2 minutes.
4. Turn the ignition key to the ‘OFF’ position (Item 1’ Ref. Figure 9.41). The fuel system should now be primed and the engine should be able to start.
5. Turn the ignition key to the crank position (Item 3, Ref. Figure 9.41)

» The engine will crank and start after the warning siren has sounded for approximately 7 seconds.

6. After the engine has started, operate it at low idle for a minimum of 5 minutes, immediately after the air has been removed from the fuel system. This will help ensure that the fuel system is free of air.
7. Ensure that the fuel system is free of leaks.

(2) Manual Fuel Pump Priming

⚠ WARNING

Wear personal protective equipment

Diesel fuel is highly flammable.

Do not smoke or carry out maintenance on the fuel system near open flame or sources of sparks, such as welding equipment, etc.

NOTICE

Do not crank the engine continuously for more than 30 seconds. Allow the starting motor to cool for two minutes before cranking again.

If air enters the system, the air must be purged from the fuel system befofre the engine can be started.

Do not loosen the high pressure fuel line in order to purge air from the fuel system. This procedure is not required.

After the engine has stopped, you must wait for 60 seconds in order to allow to allow the fuel pressure to be purged from the high pressure fuel lines before any service or repair is performed on the engine or fuel lines.

PROCEDURE

1. Ensure the fuel system is in working order and that the fuel supply is switched on.

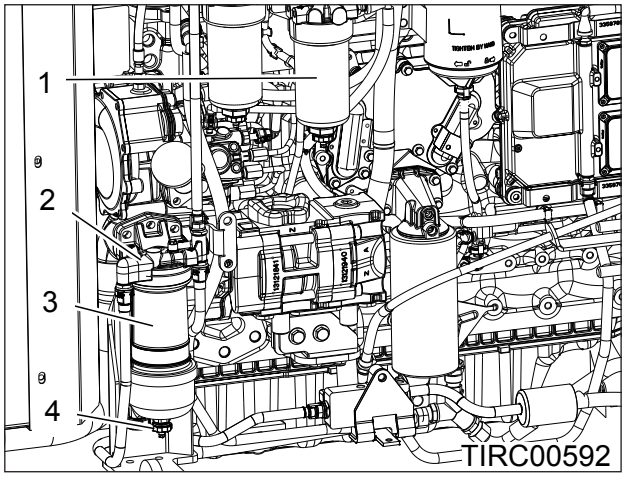


Figure 9.42 - Fuel Priming Pump

2. Operate the fuel priming pump (Item 2, Ref. Figure 9.41). Count the number of operations of the priming pump. After 100 depressions of the priming pump, stop.
3. The fuel system should now be primed and the engine should be able to start.
4. Turn the ignition key to the crank position (Item 3, Ref. Figure 9.42)

   » *The engine will crank and start after the warning siren has sounded for approximately 7 seconds.*
5. After the engine has started, operate it at low idle for a minimum of 5 minutes, immediately after the air has been removed from the fuel system. This will help ensure that the fuel system is free of air.
6. Ensure that the fuel system is free of leaks.

9.14 Screen Unit Maintenance

(1) Periodic maintenance

⚠ WARNING

Always lock out the power source before cleaning, adjusting or performing maintenance or repairs. Make it impossible for anyone to start the machine while others work in it or on it. Failure to do so may result in severe personal injury or death.

To ensure efficient operation and minimize critical failures of your screen, have a qualified person inspect, lubricate, make adjustments and repairs at regular intervals. Generally inspect for any missing or damaged parts. Repair or replace any damaged guards. Replace any missing or damaged safety signs. Keep operator safety in mind at all times. Following inspection and maintenance, make sure all tools and scrap material have been removed from the area before operation.

Ensure that there is mesh in the screenbox in all decks when the machine is operational. Should only one of the decks be needed, then an oversize mesh should be fitted to retain the structure of the screenbox, as well as to minimise wear.

(2) Daily Maintenance

⚠ WARNING

Switch off the machine and implement the lockout and tagout procedure.

NOTICE

Do not allow breather caps to plug. Clean filter regularly. Running screen with plugged breathers risks damage to driveshaft seal, case covers and bearings.

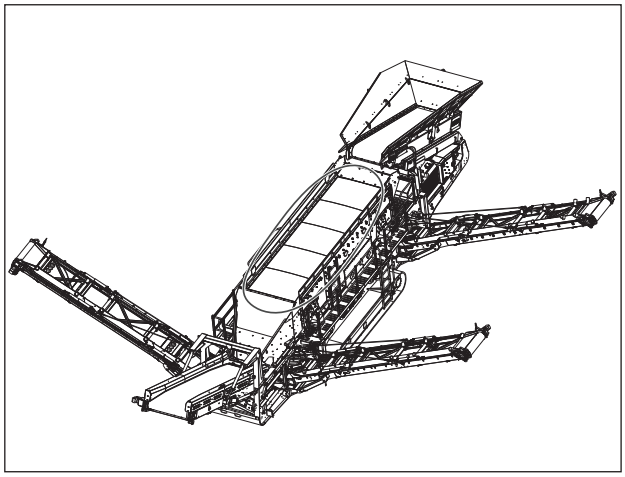


Figure 9.43 - Screen Unit

Before starting the screen each day, check the following items;

PROCEDURE

1. Check the oil level in gear and impulse cases. Unscrew the oil level plugs in the case covers to see that oil reaches the holes.
2. Check the breather cap on both impulse and gear case covers. Keep dirt build-up away from breather caps.
3. Check the condition of the discharge lip wear plates. Note excessive wear in your equipment. Log and replace worn parts as soon as possible.
4. Check screen media for holes or excessive wear.
5. Keep wire cloth taut between screen side plates. Tighten new wire cloth as needed after one or two days of operation.
6. Make sure springs are vertical. If not, remove any rock or dust build-up.
7. Inspect the drive assembly for signs of drive-belt stretching or cracking. Note excessive wear in your log book and if required replace belt as soon as possible.
8. Make sure all guards are in place and in good condition.

Note 4 & 5 for mesh deck only

(3) Weekly Maintenance

NOTICE

For proper operation, centre screen box as follows:

- Measure clearance between snubber housing and snubber plates on screen box at each of four snubber locations.
- Clearance measurements at each of the snubbers should come within 6 mm of being identical. Where difference is greater, adjust snubbers to bring it within spec.
- Loosen jam nut on each snubber adjusting bolt. Turn bolts in or out, as needed, to centre screen basket between snubbers.

Purpose of final tightening is to force snubbers firmly against snubber plates. As you perform final tightening, be sure the screen box isn't pulled off-centre

On a weekly basis it is required to perform the following tasks:

PROCEDURE

1. Make sure screen box is level crossways and cantered in base frame. Adjust snubbers as necessary. If snubber adjusting screws are turned all the way in and adjustment is no longer possible, install new snubber rubbers.
2. Make sure springs are vertical. If not, remove any rock or dust build-up.
3. Clean breather cap and area around it. Do not allow dirt or abrasives to enter oil-fill port.
4. Check tag line's rubber tension band for damage, and tag-line and belt-tension balance. (Rubber spring models only).
5. Perform an overall visual inspection of all joints for loose hardware. If any loose hardware is found, torque to the proper specifications listed in **Appendix E**.
6. If any washers need replaced, be sure to use heat-treated washers for all bolts in and around cases and in slotted holes on discharge lips and feed boxes.
7. Use locknuts with nylon inserts on all bolts on the vibrating screen, except where nuts are welded.
8. Inject grease into oil-seal barrier ring once each week, or as required based on operating conditions.
9. With hand-operated grease gun, pump about five shots of grease into grease fitting on oil-seal barrier ring. Use grade 2, high temperature, lithium-base grease. Wipe extruded grease from oil seal housing.
10. Application of new grease forces old grease, along with dust and moisture, out through the labyrinth seal. As a result, the seal has a clean, protective grease barrier that is renewed each week.

(4) Lubrication

⚠ WARNING

Injection hazard from high pressure fluid. Wear personal protective equipment.

Switch off the machine and implement the lockout and tagout procedure.

NOTICE

Ensure the oil fill openings are thoroughly cleaned before oil is added. Do not fill above oil-level holes on case covers. Too much oil causes heat buildup and does not improve lubrication. Too much heat can cause early breakdown of oil, and bearing failure.

Never mix different brands of oil.

Regular oil changes and professional oil sample analyses are among the most important maintenance practices for your vibrating screen.

Change oil in both cases if you have any of the following conditions:

1 Oil is dirty

2 Machine operated 500 hours since last oil change

3 Oil sample shows high contaminant levels

Powerscreen recommends a professional oil-sample analysis after every 500 hours of operation. If contaminant levels exceed any of those listed in Table 9.2, change oil in cases and find source of contamination. Refer to Section 9.4 for recommended lubricants.

Table 9.2 - Contaminant Levels

Contaminant	Acceptable Range (ppm)
Iron	125-150
Chrome	25-30
Aluminium	45-50
Copper	100-125
Silicon	25-30
Water	0

To change the oil, follow the procedure below for both sides of the screen.:

PROCEDURE

1. Remove oil-level plugs (item 1) from case cover, Ref: Figure 9.29.
2. Remove the magnetic drain plug (item 2) from bottom of each case and drain used oil into containers for recycling, Ref: Figure 9.44. Magnetic plugs help prevent damage to gears and bearings by attracting metal particles in oil. Look carefully at the plugs to see if metal particles are present.

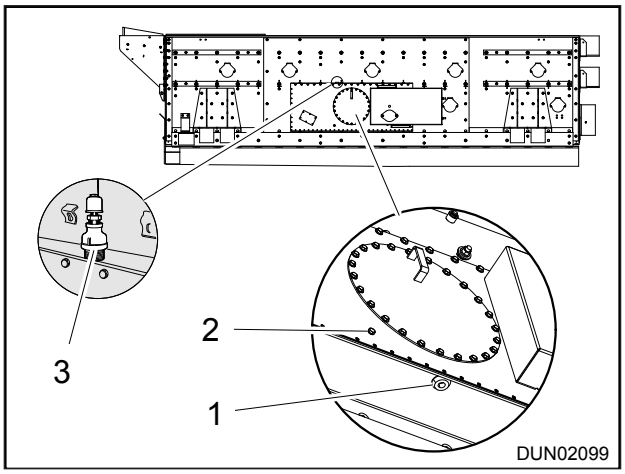


Figure 9.44 - Oil Reservoir

3. When oil has drained completely, clean drain plugs and reinstall them in bottoms of cases.
4. Clean area around breather caps (item 3), Ref: Figure 9.29. Be sure fill openings are thoroughly cleaned before oil is added. Use only clean containers and tools. Do not allow dust, dirt or abrasives to enter case.
5. Remove breather/ filler cap from oil-fill port.
6. Add the recommended oil at fill ports (Refer to Section 9.4 Lubrication). Use only high-quality oil and never mix different brands of oil. Fill the cases up to the oil-level holes. Stop when oil reaches holes. Do not add oil with oil level plugs installed. Doing so may cause you to underfill or overfill.
7. Clean and replace oil-level plugs and breather caps on both cases. Tighten plugs and caps securely. Check for leaks.

(a) Drive shaft grease

Grease the drive shaft oil seal once each month (item 3). Using a hand-operated grease gun, pump two shots of grease into grease fitting (item 1) on the oil-seal barrier ring. Use grade 2, high temperature, lithium-base grease (EP-2). Wipe extruded grease from oil-seal housing,

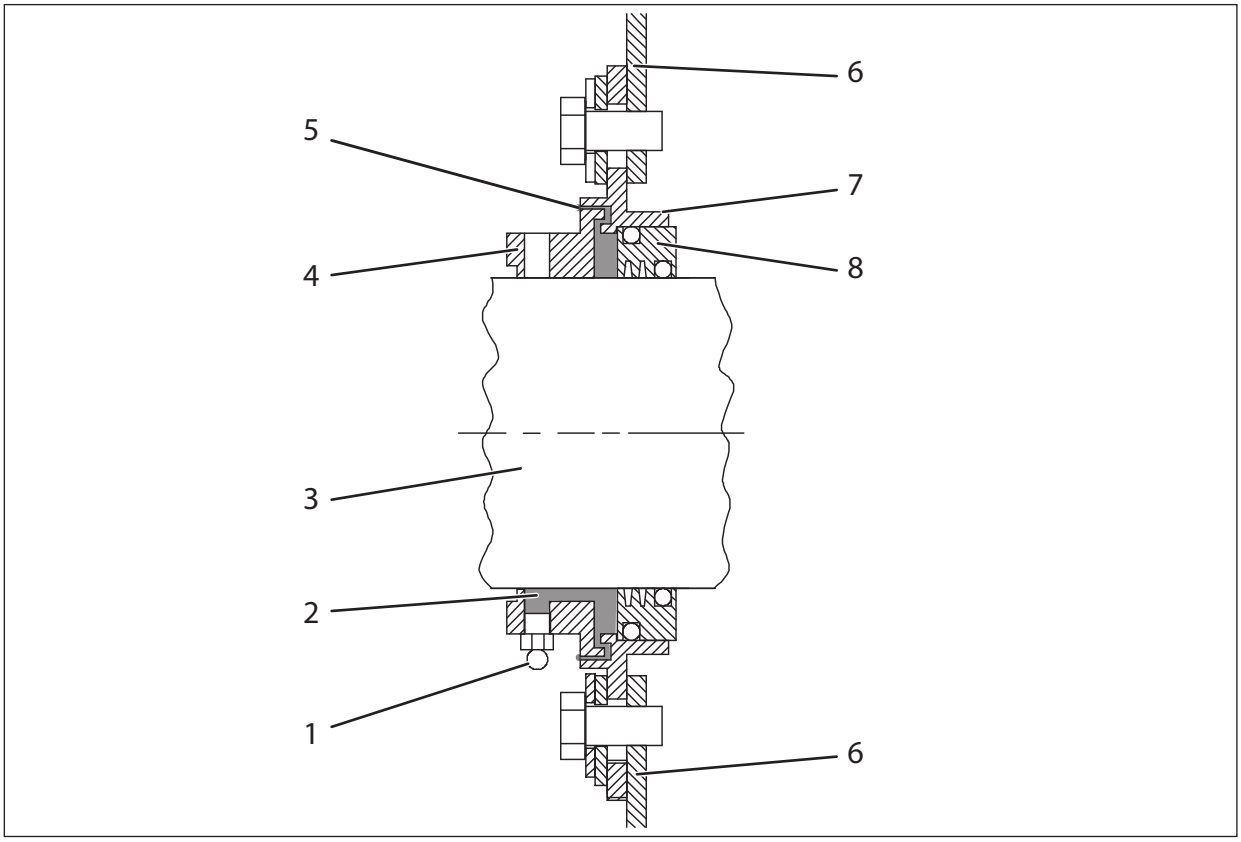


Figure 9.45 - Drive Shaft Oil Seal Cross Section

1 Grease fitting (located at 6 O'Clock position)

2 Grease

3 Drive shaft (gear side of shaft 1)

4 Barrier ring

5 Extruded grease

6 Gear case cover

7 Oil seal housing

8 Oil seal cartridge

(5) Bearing Temperature

Because shafts are subject to continual stress, it is important to check bearing temperatures periodically.

Because heat from bearings transfers to the oil, you can get a rough idea of average bearing operating temperature by monitoring oil temperature. Place a magnetic-type thermometer on case cover below level of oil-fill plug. During normal operation, temperature of case covers will average 50° to 80°C (130° to 180°F).

If oil temperature reaches 90°C (200°F) or higher, bearings are overheating. Find cause and correct problem before serious damage occurs.

The most common cause of overheating is excessive lubricating oil. This often occurs when the screen is new or immediately after changing lubricant. Make sure oil level is correct. Other causes of overheating include;

1 Wrong type or grade of oil. Always use recommended lubricant.

2 Screen is operated faster than recommended speed. Make sure you have correct number of plug weights for your screen size and application.

3 Screen Box is not level. Keep screen level crosswise at all times during operation.

Overheating may be a sign that the bearings are beginning to fail. Inspect the bearings for wear.

(6) Maintenance for stored screen

If your screen is in storage, rock the shafts every 15 days by turning driven sheave. Turning shafts ensures a protective film of oil is distributed on bearing rollers.

During long periods of storage, protect equipment against corrosion damage to internal parts.

• Place plastic bags or balloons over breather caps to prevent moist air being drawn into gear cases. Water in the air may condense on bearings, gears and other internal parts, causing corrosion damage. TEREX does not recommend using pipe plugs to seal cases as when the equipment is removed from storage, it is too easy to forget to remove the plugs before starting the screen.

• Apply medium grease to surface of shaft seal to prevent water from freezing the seal to the shaft.

• If the screen is moved for storage, install red shipping brackets before moving the equipment.

(7) Screen Tuning

(a) Aspects of Stroke Adjustment

The stroke of a Powerscreen screenbox has three aspects. All three are adjustable;

1 Stroke length (amplitude)

2 Stroke speed (frequency)

3 Stroke angle (timing)

All are important for getting maximum value from your screening operation. Proper adjustment for screening conditions you may encounter helps you get the highest output from your equipment.

Generally, coarse material requires a longer, more horizontal stroke and slower speed. For separating fines, a shorter, more vertical stroke and higher speed are more efficient.

Figure 9.47 and Tables 9.3 and 9.4 are guides to determine optimum settings for your operating conditions. Your actual measured stroke may vary slightly from the standard due to differences in screen size, type of material or other factors related to your equipment setup and environment.

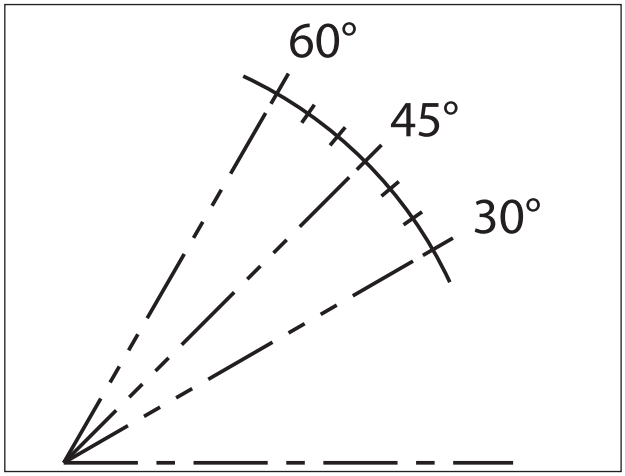


Figure 9.46 - Available Stroke Angles

Figure 9.47 shows the available stroke angles, adjustable in 5° increments.

Table 9.3 - Screen settings

Settings	Length	Speed	Angle
Scalping	Full	Slow	35° to 45°
Medium size material	Medium	Medium	40° to 50°
Medium size material (Maximum efficiency bottom deck)	Medium	Medium	45° to 55°
Fine screening	Short	Fast	45° to 60°

Table 9.4 - Stroke Adjustment Guidelines

Material	Stroke			
	Length		Speed	Angle (degrees)
	Oval	Weights		
Coarse	Max 18mm	● ● ●	740 Slow	35 to 45
Medium	Med 16mm	● ○ ●	785 Med	40 to 45
Fine	Short 14 mm	○ ● ○	830 Fast	45 to 55
Extra Fine	Short 14 mm	○ ○ ○	876 Fast	45 to 55

The stroke gauge shipped with the machine helps you identify stroke length and angle when your screen is operating, Ref: Figure 9.48. A stroke gauge is a flexible magnetic sheet you can attach to the side plate of your screen. The gauge has a series of circles, varying in diameter from 5 to 22 mm (3/16 to 7/8 in), with which to determine stroke length. Straight lines on the gauge identify stroke angle.

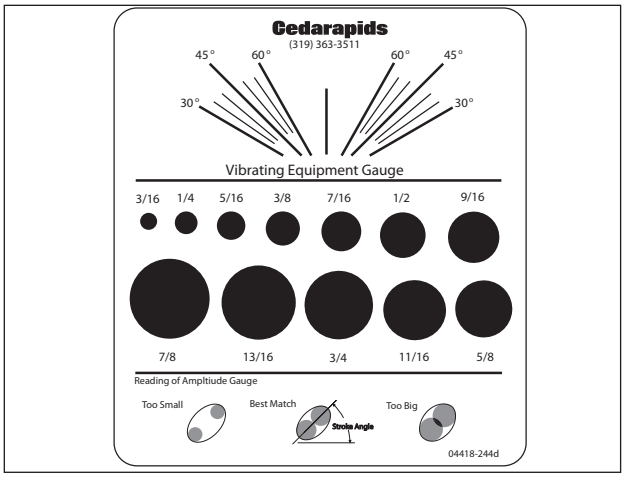


Figure 9.47 - Stroke Gauge

You can move the magnetic sheet anywhere on the screen's side plates to measure screen action at that location. Under normal operating conditions, the gauge reads the same from one side of the screen to the other but may vary from feed end to discharge end. Readings may also vary due to size of screen, amount of material being screened or other conditions.

(b) Determining the stroke length

The term “stroke length” refers to the maximum distance any point on the screen’s side plate moves during operation. As the screen vibrates, each point follows an oval-shaped path. The length of that oval is the stroke length.

One way to determine stroke length is to make a dot on one side plate and use a ruler to measure the long axis of the oval orbit the dot follows during operation, Ref: Figure 9.49.

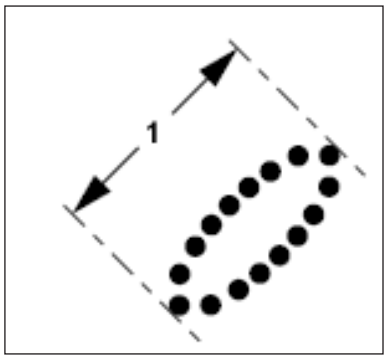


Figure 9.48 - Stroke Length

An easier and more accurate method is to “read” circles on the stroke gauge. Screen motion causes each circle on the gauge to look like two circles blurred together.

Circles best representing actual length of your screen’s stroke appear to touch at their inner edges (Figure 9.50, oval A). Ignore ovals where circles appear separated (measurement too small, Oval B) or overlapping (measurement too big, oval C). After identifying the best match, note the location of the circle on the stroke gauge and read the dimension for that circle. Dimensions on the gauge are in inches.

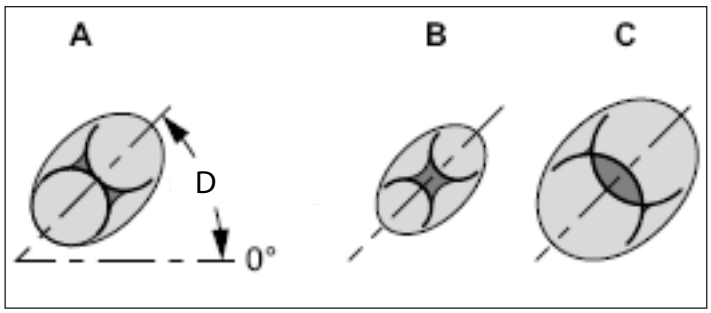


Figure 9.49 - Touching Circles Indicate Stroke Length

A Best match - edges of circles touching

B Measurement too small

C Measurement too big - circles overlapping

D Stroke Angle

(c) Determining the stroke angle

An imaginary line drawn through the oval at its greatest length indicates direction of stroke. The angle formed by that line and the horizontal plane is the stroke angle of your screen (item D), Ref: Figure 9.50. The lines on the upper part of the stroke gauge show possible stroke angles. During operation, the sharpest line on the gauge matches the screen’s stroke angle. Other lines blur more as they deviate from the true angle.

(d) Adjusting the Stroke Length

⚠ WARNING

Always lock out power source before cleaning, adjusting, performing maintenance or repairs. Make it impossible for anyone to start the machine while others work in it or on it. Failure to do so may result in severe personal injury or death.

NOTICE

It is not necessary to remove case cover to change stroke length. The right hand weight disc in Figure 9.51 is in as shipped configuration with two plugs installed. The centre disc has all weights included for illustrative purposes. For coarse screening or scalping use maximum stroke length of about 18 mm by installing all three plug weights in each weight disc. For screening finer material, use smaller stroke length of down to 14 mm by removing plugs from discs.

To access any weight disc on the drive side of the screen, it is necessary to first remove the belt guard. Do not remove belt or driven sheave.

Never attempt to operate the screen without a proper weight arrangement. Never operate screen when plug-weight arrangements on gear and impulse sides are not identical. Weight changes on one side of screen must be matched on opposite side to maintain operational equilibrium. Operating screen with unbalanced plug-weight arrangement may void warranty.

Stroke length is controlled by the imbalance of six weight discs relative to the weight of the screen box plus any material in it. Thus alteration of shaft speed will not alter stroke length. Stroke length can only be changed by changing the degree of imbalance.

The vibrating mechanism in the machine has three removable plug weights (plugs) for each of six weight discs. The purpose of the plugs is to vary length (amplitude) of stroke according to needs of your operation.

Powerscreen Screens usually ship with two plugs installed in each weight disc. Others are crated and strapped to the screen for transport. Figure 9.51 shows gear & weight-disc assemblies with case cover removed.

Weights are added for a longer stroke: For coarse screening or scalping, generally use the maximum stroke length of about 19 mm (3/4 in). Install three plug weights in each weight disc.

Weights are removed for a shorter stroke: For screening fines, generally use the minimum stroke length of about 16mm (5/8”). Remove all plugs from each weight disc.

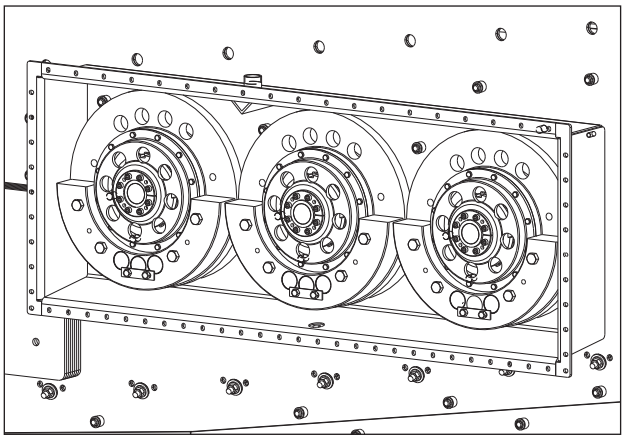


Figure 9.50 - Gear and Weight Disc Assemblies

PROCEDURE

1. Remove the belt guard. Do not remove the belt or driven sheave.
2. Remove the timing cover to access gear-side centre weight disc, Ref: Figure 9.52.

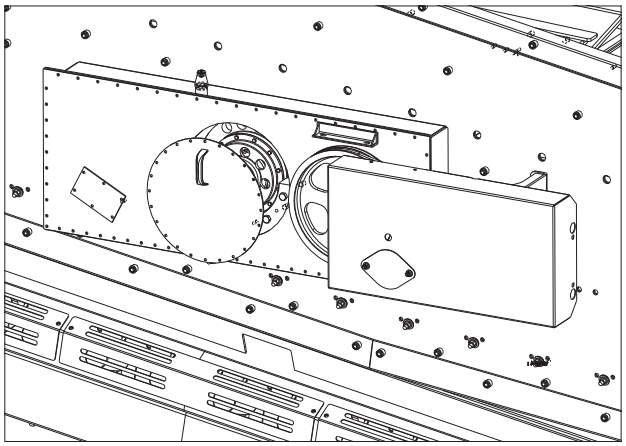


Figure 9.51 - Timing Cover Removed

3. Remove inspection plates on remaining two gear-side and three impulse-side weight discs, Ref: Figure 9.53.

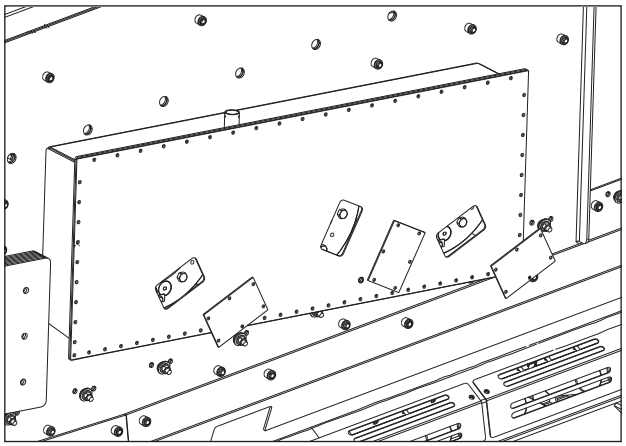


Figure 9.52 - Inspection Plates Removed

4. On any weight disc, remove one of two cap screws that hold the plug-retaining strap. Loosen the other cap screw, but leave it in place to keep retaining strap from falling down behind case cover, Ref: Figure 9.54.

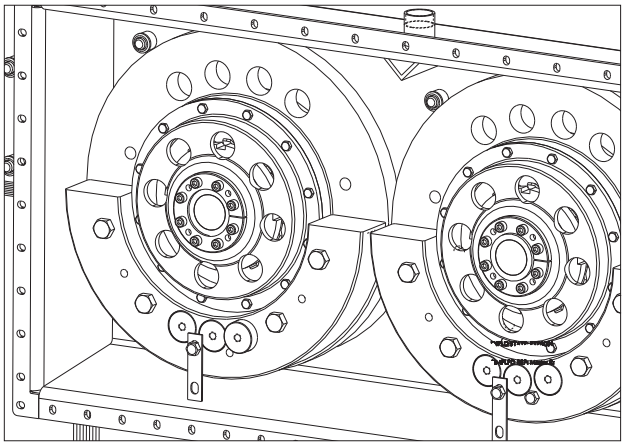


Figure 9.53 - Retaining Straps Loosened

5. Remove or insert plug weights as needed. Configuration must be the same on all discs, gearside and impulse-side. For easy handling of plugs, use cap screw from retaining strap as finger knob.
6. Reposition plug-retaining straps and secure with cap screws. Use thread-locking compound on cap-screw threads. When all discs are adjusted and plug weights secured, replace timing cover and inspection plates after applying silicone sealer around casecover bolt holes and in an unbroken bead between holes.
7. Replace the belt guard

(e) Stroke Speed

NOTICE

The load on bearings increases dramatically at speeds higher than that necessary for efficient operation. To extend bearing life, operate at the lowest shaft speed that efficiently screens your material.

Do not start or stop the screen slowly! Always start and stop your screen quickly. Start-up time of 4 to 10 seconds is best.

Stroke speed (also called screen speed or stroke frequency) is the easiest stroke adjustment to make and may significantly increase screening efficiency. Powerscreen fits each screen with an adjustable speed flow control valve. To increase the speed turn the control dial in the anti-clockwise direction and to decrease the speed turn in the clockwise direction.

Speed control allows you to operate at optimum screening efficiency and lowest operating cost.

Centrifugal forces cause greater bearing load at higher speeds. Bearing life varies inversely with the cube of load. This means that relatively small increases in rpm can greatly reduce bearing life, increasing your operating cost.

A screen's shaft, locking assembly and/or gears can be damaged if screen comes to operating speed slowly. Possible causes of slow starts are weak motor, worn drive belt, worn sheaves, oil too thick or worn belt-tensioner.

Under most conditions, fine material screens more effectively with a faster, shorter stroke. Coarse, heavy material screens better with a slower, longer stroke, Ref: Table 9.4.

(f) Stroke Angle

⚠ WARNING

Always lock out power source before cleaning, adjusting, performing maintenance or repairs. Make it impossible for anyone to start the machine while others work in it or on it. Failure to do so may result in severe personal injury or death.

Keep hands away from gears as you remove key bolt. Gear assembly will sometimes swing down into neutral position when key bolt is removed. Failure to heed this warning could result in crushed fingers, hands, or other severe personal injury.

If weight disc has not swung free yet, it will when struck with a hammer.

NOTICE

It is possible to set a screen too flat, causing limited material movement and decrease in conveying velocity.

It is not necessary to remove belt guard before adjusting stroke angle.

Powerscreen ships a timing wrench with each new flat screen. You can also buy timing wrenches from Powerscreen distributors.

Before welding, attach grounding clamp to weight disc next to key bolt. This prevents arcing through bearings or gear teeth. When welding lock washer to key bolt, protect gears from weld spatter.

Do not neglect to bend key-bolt lock washer tab as shown. If key-bolt lock is not used, serious damage to screen could result and warranty may be void.

Powerscreen normally ships screens with stroke angle set at 45°, acceptable for most applications. Stroke angle is adjustable from 30° to 60° in 5° increments, determined by notches on inner edge of centre drive gear.

Adjusting stroke-angle timing changes the rate of material flow across decks. Table 9.4 provides a guideline for setting the stroke based on material size. A larger, more vertical angle moves material across screen more slowly and is usually best for separating fines. A more horizontal angle moves material faster by thrusting it farther forward with each stroke. Flatter angles are better for screening coarse material.

With screen timed between 45° and 60°, material is not conveyed as rapidly as when screen is timed between 30° and 45°. Flatter, less vertical angles decrease bed depth and reduce possibility of material travelling the length of the deck without falling through the wire cloth.

The best stroke angle for your equipment is based on several factors;

1) Weight of the material

2) Moisture content

3) Clay content

4) Amount of natural fines

5) the way material shatters (friability)

6) thickness of the bed of material on deck

Priorities for specific jobs influence choice of stroke angle, too. For example, if volume of material across the screen is more important than efficiency of screening action, a 35° stroke angle can increase flow across the screen. If more efficient screening action is desired and volume is less critical, a more vertical stroke of 50° can be used.

Figure 9.55 shows the vibrating mechanism from gear side of screen. The case cover is removed for clarity and each shaft is numbered. The other side of the screen (the impulse side), looks similar except it has no gears. Shaft No. 1 is always the drive shaft and is at discharge end of screen.

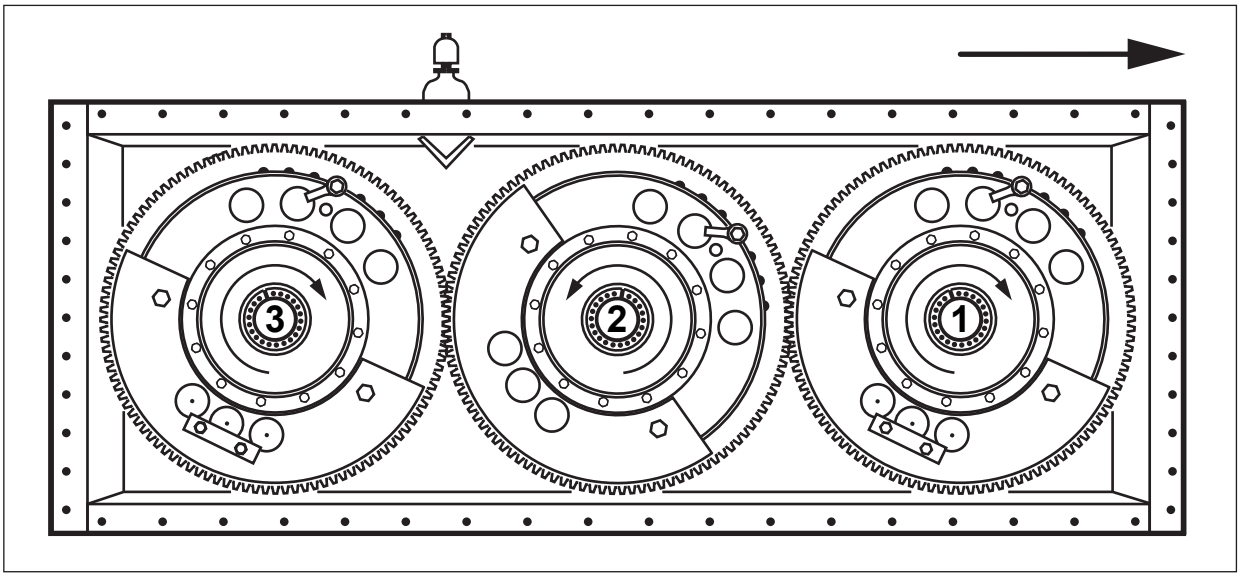


Figure 9.54 - Gear-side Vibrating Mechanism

The direction of the arrow in Figure 9.55 indicates the direction of material flow across the screen.

Power is applied to the shaft 1 through the driven sheave, which turns clockwise as viewed from gear side of right-hand drive screen. The No.1 gear pulls Nos. 2 and 3. All turn at the same speed. Because No. 1 and No. 2 gears mesh, No. 2 turns counter to No. 1, while No. 2 drives No. 3 in same direction as No. 1.

The point of rotation at which all weights align determines stroke angle. Twice every revolution, weights on all six discs are in phase. When in phase, momentum of all six weights add together as indicated in Figure 9.57, positions A and C. The combined momentum hurls the screen basket back and forth on the long axis of the oval motion or stroke.

When shaft 2 turn 90° past the A and C positions, weights are as shown in Figure 9.57, positions B or D and are out of phase with shafts 1 and 3 .” When weights are out of phase, the momentum of weights on shaft 2 is subtracted from momentum of weights on shafts 1 and 3 and the resulting action causes the short axis portion of the oval stroke as shown in Figure 9.56. The arrow indicates the direction of feed to discharge.

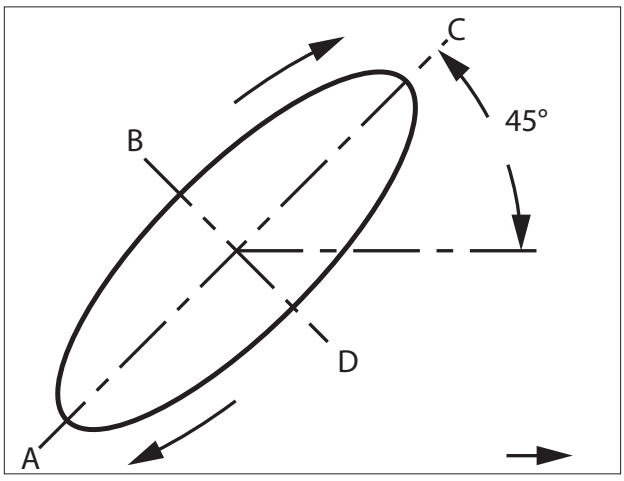


Figure 9.55 - Screen Basket Travel Diagram

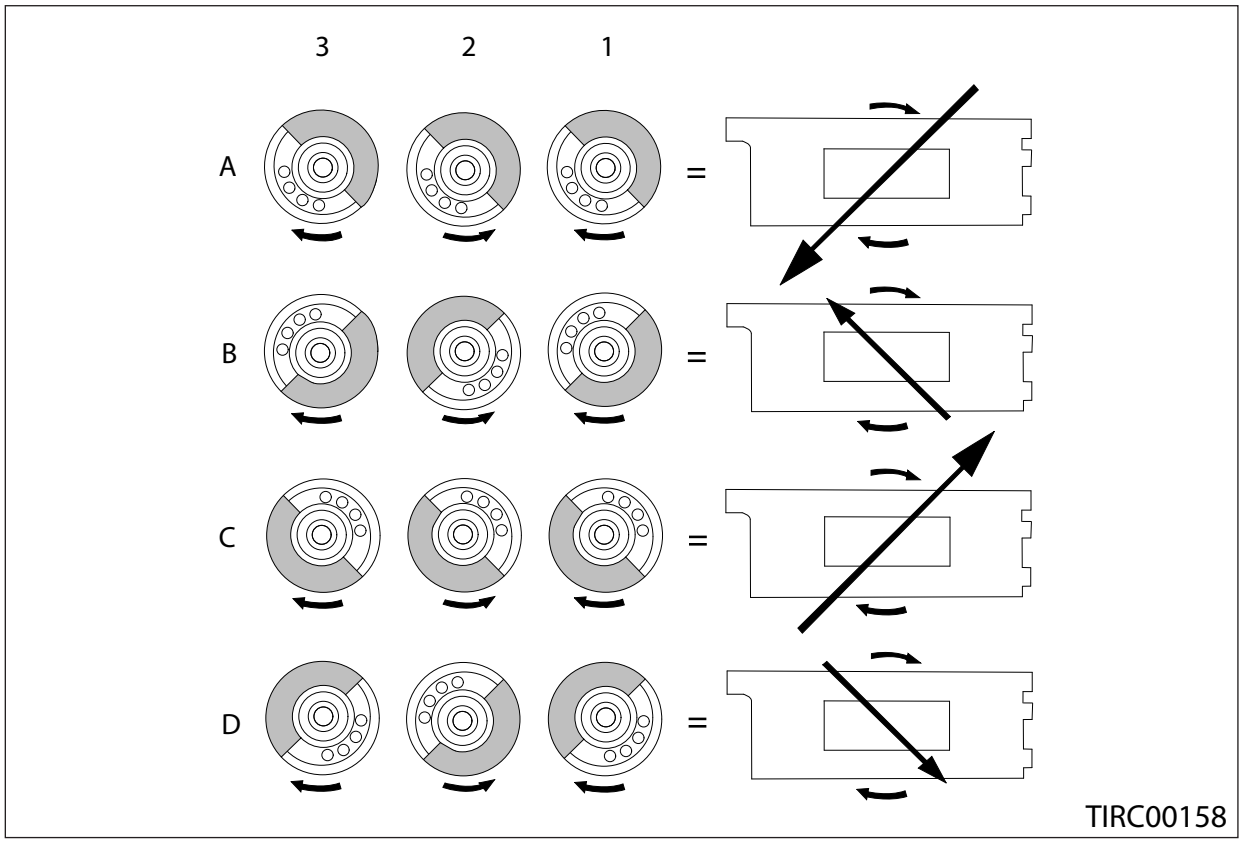


Figure 9.56 - Shaft and Weight Rotation = Resulting Basket Motion

- Position A - Starting position in cycle*
  - All 6 weight discs in phase.
  - Weights on all shafts add together.
- Position B - Shafts turned 90°
  - No.2 out of phase with No.1 & No.3.
  - Weights on shaft No.2 subtract from total of No.1 & No.3.
- Position C - Shafts turned 180°
  - All 6 discs in phase again.
  - Weights on all shafts add together.
- Position D - Shafts turned 270°
  - No.2 out of phase with No.1 & No.3.
  - Weights on shaft No.2 subtract from total of No.1 & No.3.

* During operating cycle. The weights are not in this upward position before start-up.

A key bolt locks stroke-angle adjustment on centre weight disc. The bolt holds the disc at a specific notch on inner edge of gear.

A key-bolt lock washer prevents key bolt from working loose during screen operation. The lock washer is welded to the key bolt. Then tab end of lock washer is bent into a hole on the gear, ensuring that key bolt never loosens.

Notches in centre gear are used to time weights and thereby change stroke-angle adjustment. Figure 9.58 shows key bolt in 45° timing notch.

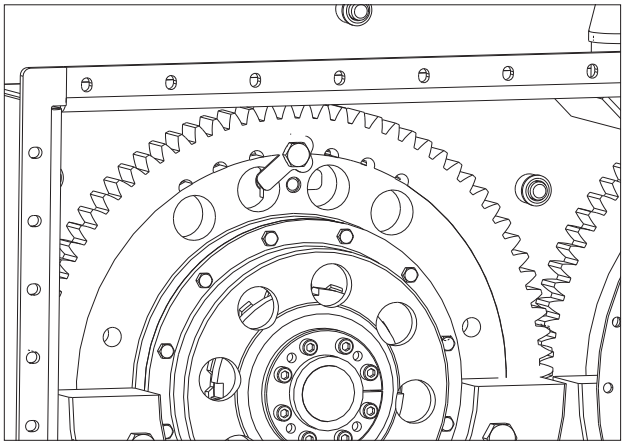


Figure 9.57 - Key Bolt in 45° Timing Notch

(g) Adjusting stroke angle

DANGER

Keep hands away from gears as you remove key bolt. Gear assembly can unexpectedly swing down into neutral position when key bolt is removed or at any time during the remaining procedure. Failure to heed this warning could result in crushed fingers, hands, or other severe personal injury.

WARNING

Always lock out the power source before cleaning, adjusting, performing maintenance or repairs. Make it impossible for anyone to start the machine while others are in or on it. Failure to do so may result in severe personal injury or death.

NOTICE

For simplicity, these figures show only a right-hand drive configuration. Layouts for left-hand drive are mirror images of those shown. On a screen with left-hand drive, the timing disc is rotated counter-clockwise to set stroke.

The key-bolt retaining clip is reusable, but will fatigue and break if bent too many times. When the retaining clip is to be reused, check it carefully for cracks. A cracked clip may fail during operation, causing equipment damage.

Stroke angle is changed by adjusting the timing of the center gear weight disc on the drive side of the screen. A notch in the weight disc is aligned with an indexed notch in the center gear. Once set, a key bolt locks in the center weight disc to keep it from changing during operation. A key-bolt retaining clip prevents the key bolt from working loose during operation. The retaining clip has ears that are secured against the key bolt. The tab end of the retaining clip is bent into a hole on the weight disc, ensuring that key bolt never loosens.

PROCEDURE

1. Lock out power source.
2. Remove timing cover, Ref: Figure 9.59.

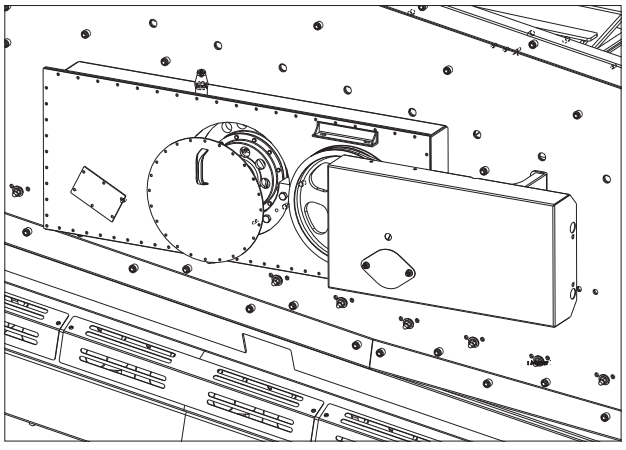


Figure 9.58 - Remove Timing Cover

3. Pry up tab on key-bolt lock washer, Ref: Figure 9.60.

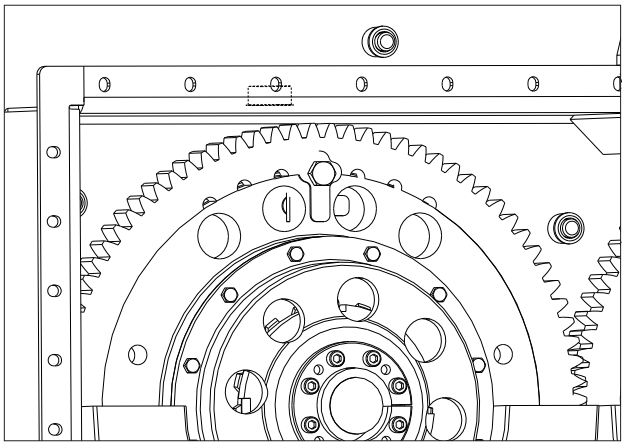


Figure 9.59 - Key Bolt Lock Washer

4. Loosen key bolt. Keep hands away from gears. Carefully remove key bolt, Ref: Figure 9.61.

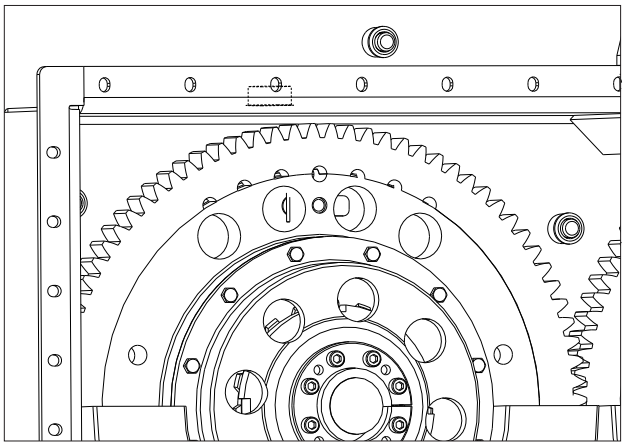


Figure 9.60 - Remove Key Bolt

5. Keep hands clear. Loosen counterweight bolts to allow weight disc to slide freely around gear, Ref: Figure 9.62.

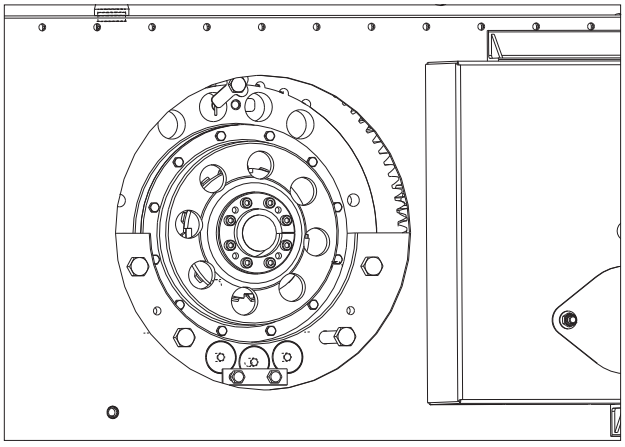


Figure 9.61 - Loosen Counterweight Bolts

6. Occasionally gear & weight-disc assembly freezes up and does not swing down to rest position unaided. If that occurs, tap counterweight bolt with hammer to separate counterweight sections.

7. When disc swings free of gear and comes to rest, remove two counterweight bolts and use them to bolt timing wrench to disc. Install the timing wrench so the handle points toward the feed end of screen, Ref: Figure 9.63.

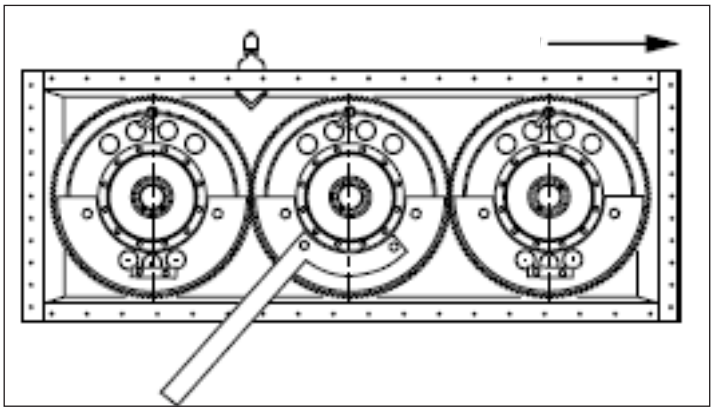


Figure 9.62 - Bolt Timing Wrench to Center Disc

8. Have a co-worker help with this step. Use the timing wrench to turn the centre weight up toward feed end of screen. Align the notch in the weight disc with notch in gear that matches timing angle you want, Ref: Figure 9.64. Each notch represents a 5° change in stroke angle. Install key-bolt lock washer and key bolt. Turning centre weight clockwise 1/4-turn (90°) aligns notches for a 45° stroke angle. For a steeper stroke angle, turn centre weight less than 90°.

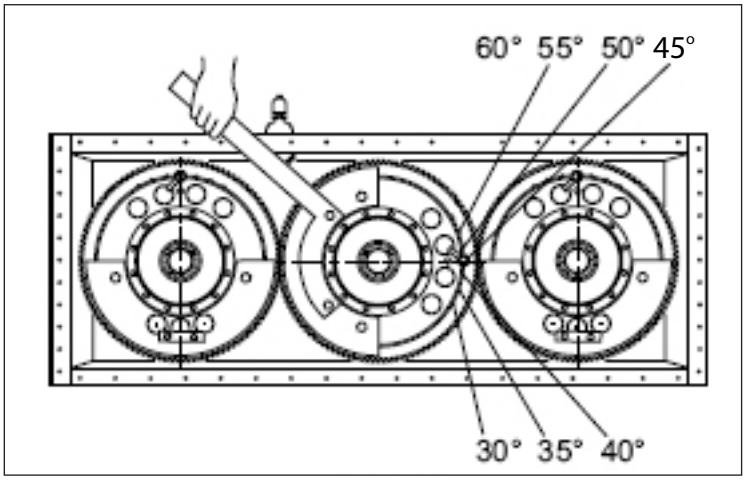


Figure 9.63 - Timing Notch Identification

9. Stroke angle is the angle at which an imaginary line through centre of shaft end and the centre plug hole intersects the horizontal plane. For a flatter stroke angle, turn centre weight more than 90°. Figure 9.64 shows the relative gear position with timing set at 30°, 45° and 60° stroke angles, respectively. The arrows in the figure indicate the direction of material flow.

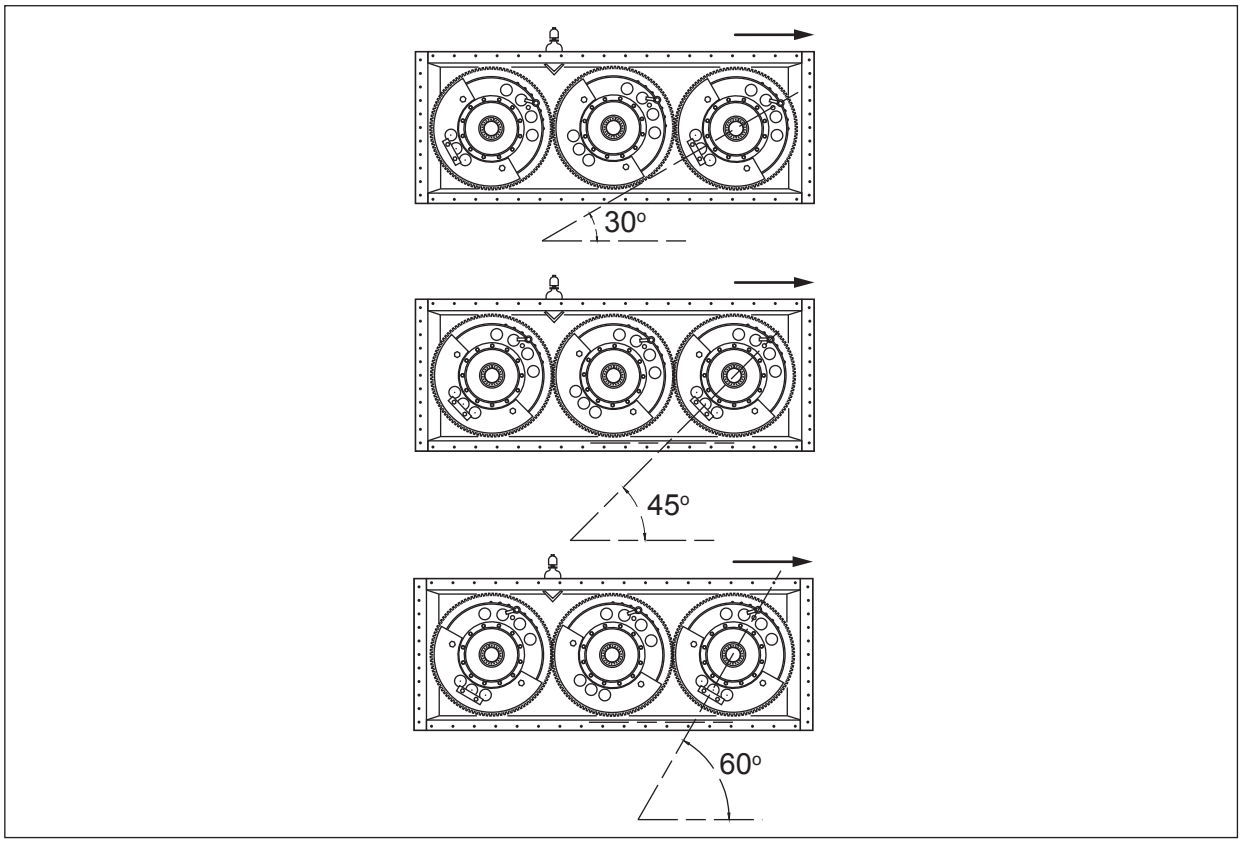


Figure 9.64 - Relative Positions of Weight Discs

10. Two people are required to perform this step. When you have aligned the slots in the weight disc and gear at the desired position, install retaining clip and key bolt. Position the extended tab of the retaining clip so it extends over a blank hole in weight disc. Torque the key bolt to proper specification.
11. Release timing wrench. The gears will rotate to a static position.
12. Remove timing wrench. Put a general-purpose retaining compound, such as Loctite #243 or equivalent, on the two counterweight bolts, then thread them into place and tighten them.
13. Remove the remaining two loosened counterweight bolts. Coat threads with Loctite as above and re-install into the weight.
14. Torque all counterweight bolts to the proper specification.
15. Bend down tab of the retaining clip, locking it into the hole in weight disc. Check tab carefully for cracks or weakening. Replace if suspect.
16. Apply silicone sealer around timing port as an oil seal.
17. Replace timing cover (Figure 9.59). Replace drive belt and belt guard if they were removed.

(8) Checking Screen Drive Belt Tension

⚠ WARNING

Wear personal protective equipment.

Nip hazard.

Fall Hazard.

Switch off the machine and implement the lockout and tagout procedure.

NOTICE

The recommended amount of slack in the belt is 9mm.

PROCEDURE

1. Observe all safety warnings.
2. Ensure machine is switched off, locked out and tagged out, Remove the ignition key and carry it with you.

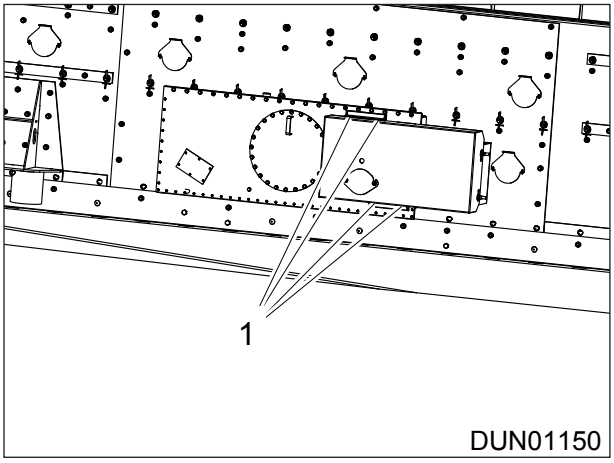


Figure 9.65 - Screen box flywheel cover bolts.

3. Undo the bolts (Item 1, Ref: Figure 9.66) securing the drive side of the screen box flywheel cover and remove it to get acess to the drive belt. There are 4 bolts to be removed.
4. Check the tension of the belt by pushing down on it in the center and measuring the deflection (Item A, Ref figure 9.67).

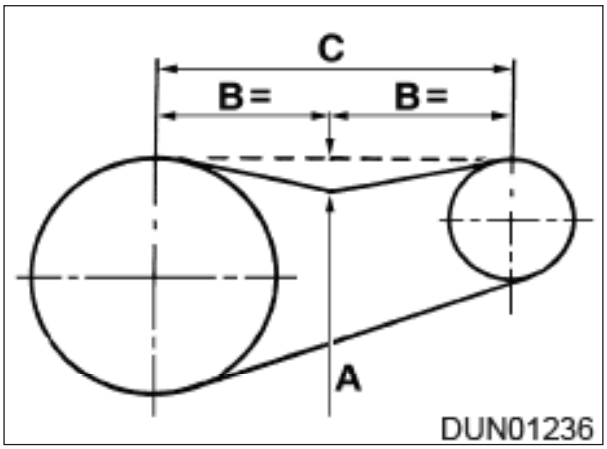


Figure 9.66 - Measuring belt tension

5. Depending on the value of the deflection measurement, the belt may need tensioned. See Section 9.15 (9).

(9) Tensioning the Screen Drive Belt

⚠ WARNING

Wear personal protective equipment.

Nip hazard.

Fall Hazard.

Switch off the machine and implement the lockout and tagout procedure.

NOTICE

Do not over tension the belt as this will damage the belt and the belt tensioner.

The recommended amount of slack in the belt is 9mm.

PROCEDURE

1. Observe all safety warnings.
2. Ensure machine is switched off, locked out and tagged out. Remove the ignition key and carry it with you.
3. Undo the bolts (Item 1, Ref: Figure 9.66) securing the drive side of the screen box flywheel cover and remove it to get access to the drive belt. There are 14 bolts to be removed.
4. Loosen bolts (Items 1, Ref: Figure 9.68) so the pulley mounting plate can slide along the motor mounting plate.
5. Tighten the nuts on the V belt adjuster (Item 2, Ref: Figure 9.68) until the required tension is reached in the V belts (Item 3, Ref: Figure 9.68). The correct tension is approximately 9mm of slack.

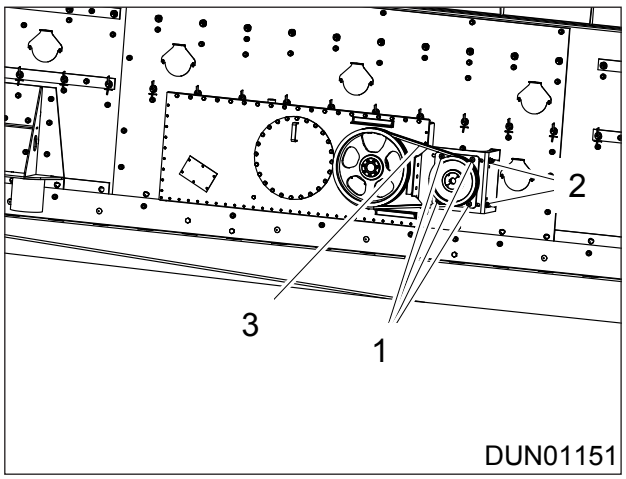


Figure 9.67 - Screen Box Drive Belt Tensioner

6. Tighten bolts (Items 1, Ref: Figure 9.68) so the pulley mounting plate is fixed and secured.
7. Replace the cover and bolt in position using the bolts (Items 1, Ref: Figure 9.66).

9.15 Wire cloth replacement

A Terex flat screen is designed so that wire-cloth panels, or media, can be easily maintained or replaced. The number of panels required depends on the length of the screen. In addition to being easier to handle, service life of shorter panels is greater than that of a one-piece panel designs. A multiple-panel installation provides more wear areas. You can turn panels to evenly distribute wear, or exchange them from one end of the screen to the other. For example, feed-end panels can be switched with discharge-end panels.

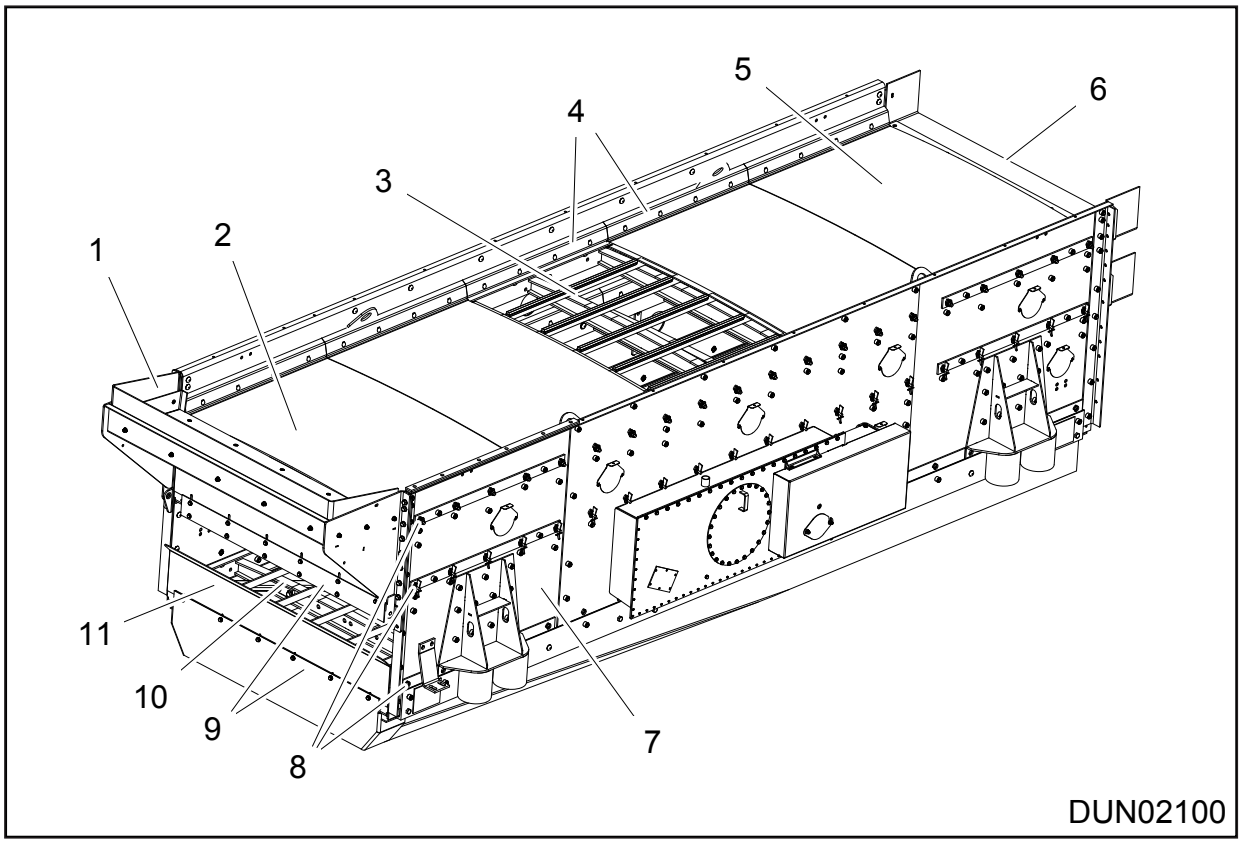


Figure 9.68 - Flat screen deck components

1 Feed box.

2 Feed end wire cloth panel (cutaway to show deck frame).

3 Single-crown deck frame.

4 Draw plates.

5 Discharge end wire cloth.

6 Discharge end.

7 Side plates.

8 Draw/wedge bolts.

9 Tailgate straps.

10 Bottom deck wire cloth.

11 Tailgate.

NOTICE

Use caution when applying heat to the screen. Excess heat can distort the deck.

Acceptable loading is generally defined as bed depth at discharge end of from one to four times the size of squares in wire cloth.

On standard single-crowned or optional divided decks, draw plates and bolts along outer edges of the deck hold wire-cloth panels in place. A choice of carriage bolts or wedge bolts are available to tightly secure the draw plates. In addition, end-tensioned bottom decks are optional on some models. Panels are available in various widths and lengths for any selection of side-tensioned, divided (split) deck side-tensioned, and end-tensioned mounting styles.

As a general rule, use the smallest-gauge wire cloth that is practical for your operating conditions. Small-gauge wire provides:

- Maximum screening efficiency
- Minimum blinding effect of sticky materials

Although wear life of small-gauge wire is shorter, small wire usually produces greater profits because the value of increased production outweighs costs of changing wire cloth more often.

Table 9.5 shows two wire-cloth applications. Square openings in both screens are same size, but screen with smaller wire (#12) has 7.4 % more openings in the surface area – same as having a 7.4 % bigger screen.

Table 9.5 - Wire diameter example

Wire cloth sizes		Wire diameter		Open screen area %
mm	in	mm	in	
6.4	1/4	#10	0.135	42.2
6.4	1/4	#12	0.105	49.6

Another advantage of smaller wire is that it offers less surface for clay to stick to. Small wire reduces tendency of clay to bridge openings in wire cloth. Wire cloth is said to “blind” when material flowing down the deck cannot pass through openings in wire cloth. Blinding occurs when material sticks to wire or wedge-shaped particles lodge in holes. In environments where clay buildup is a problem, smaller-gauge wire may be a good choice. In some applications, applying heat may relieve clay buildup.

- Do not repair wire cloth with solid plate or rubber belting. Doing so reduces both screening area and screening efficiency.
- Install rubber channels and periodically check their condition. Rubber channels cushion wire cloth and so reduce wear caused by pounding as product passes over and through cloth. This is particularly important on the feed end of the screen.
- Keep draw plates tight to maintain wire-cloth tension. Loose cloth will oscillate, causing unsatisfactory screening action and shorter cloth life.
- Avoid dropping material directly onto wire cloth. If possible, send material into feed box in same direction as material flow across screen.
- Do not scalp and finish on the same screen. Though common practice, it is inefficient because it limits both operations. Initial feed of large rocks, especially flats, covers many openings in the wire. Crushed fines can ride piggyback on larger rocks and not fall through. This creates an unnecessary recirculating load, decreasing efficiencies of both screening and crushing operations. It is always best to scalp on one screen and finish on another.

- Do not overload screen. When you reach a maximum effective load condition, any additional load drastically reduces effectiveness and production capability.

(1) Wire cloth support

Decks that support wire cloth in the screen basket are usually crowned so that the center of the cloth is higher than the edges. This feature creates a more even spread of material over the entire screening area and makes it possible to draw the wire cloth tight against the deck.

(2) Subscreen support

When using wire cloth with a small-diameter clear square opening, always use a subscreen cloth to lend additional support. Wire-cloth sizes that require subscreen support vary, depending upon size and configuration of your screen. Use only flat-top wire cloth as a subscreen, and be sure to install it flat-side up. Do not use woven wire as subscreen cloth because high spots on woven wire wear holes in wire cloth.

(3) Wire cloth types and sizes

There are several types of wire cloth available in a variety of sizes. The most common styles are clear square and mesh, slotted opening and end tension.

- Clear square and mesh- Most commonly used cloth type in the industry, Ref: Figure 9.70.

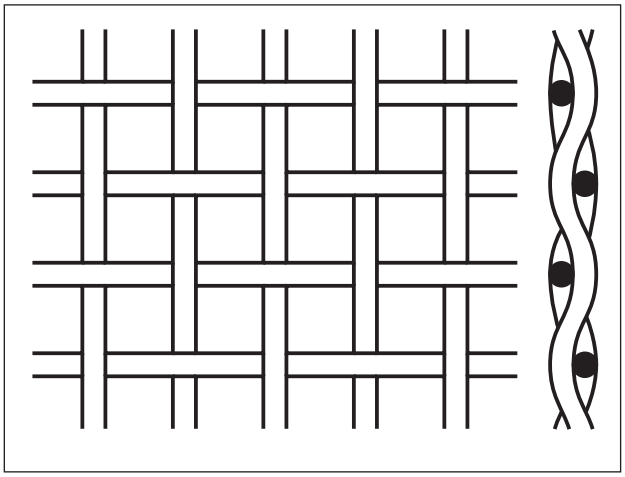


Figure 9.69 - Clear square and mesh

- Flat top square - Used as a subscreen cloth to support a finer wire cloth. It helps the finer cloth maintain its rigidity and reduces wire fatigue. Flat top cloth is not recommended as a sizing cloth.
- Slotted opening (Figure 9.71) - Primarily used as a special application wire cloth. It can be effective in reducing blinding when feed material is sticky. It also has a larger open area of the cloth that enables the screen deck to accept more feed material. Longer slots aid in the removal of flat and elongated material.

For 1 inch slots or less use single cross wire as shown in the top image in Figure 9.71. For slots greater than 1 inch use a cluster of triple cross wires as shown in the bottom image in Figure 9.71.

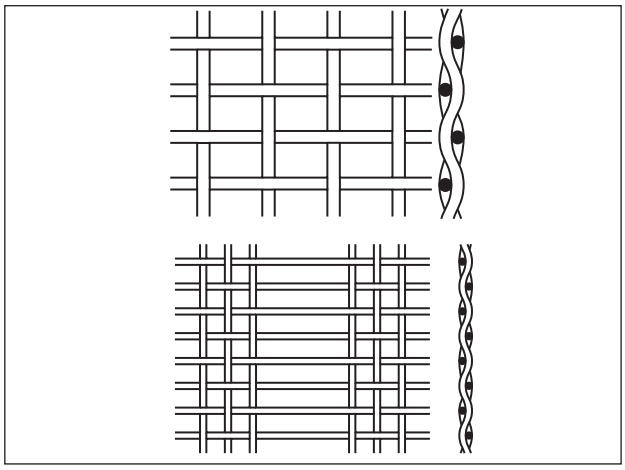


Figure 9.70 - Slotted opening

- End tension (Figure 9.72) - This wire is tensioned end to end instead of side to side. Generally available in 6 inch or 12 inch long slots.

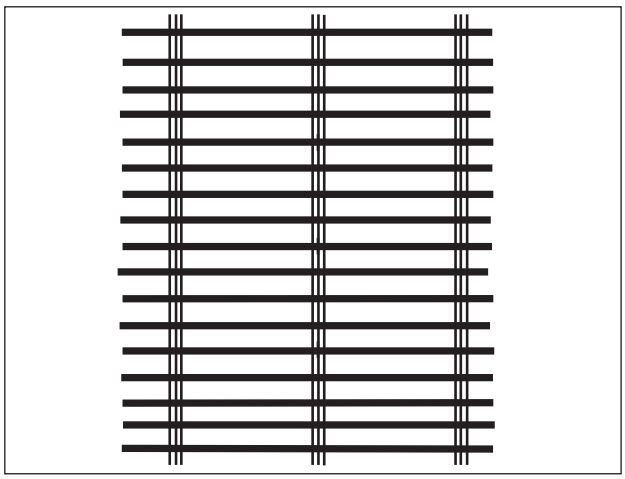


Figure 9.71 - End tension

Refer to Figure 9.73 and Table 9.6 for available wire cloth panels. Use Table 9.6 to aid in selection of screen wire diameters suitable for your application. It is best to consult your Terex dealer concerning your specific application needs.

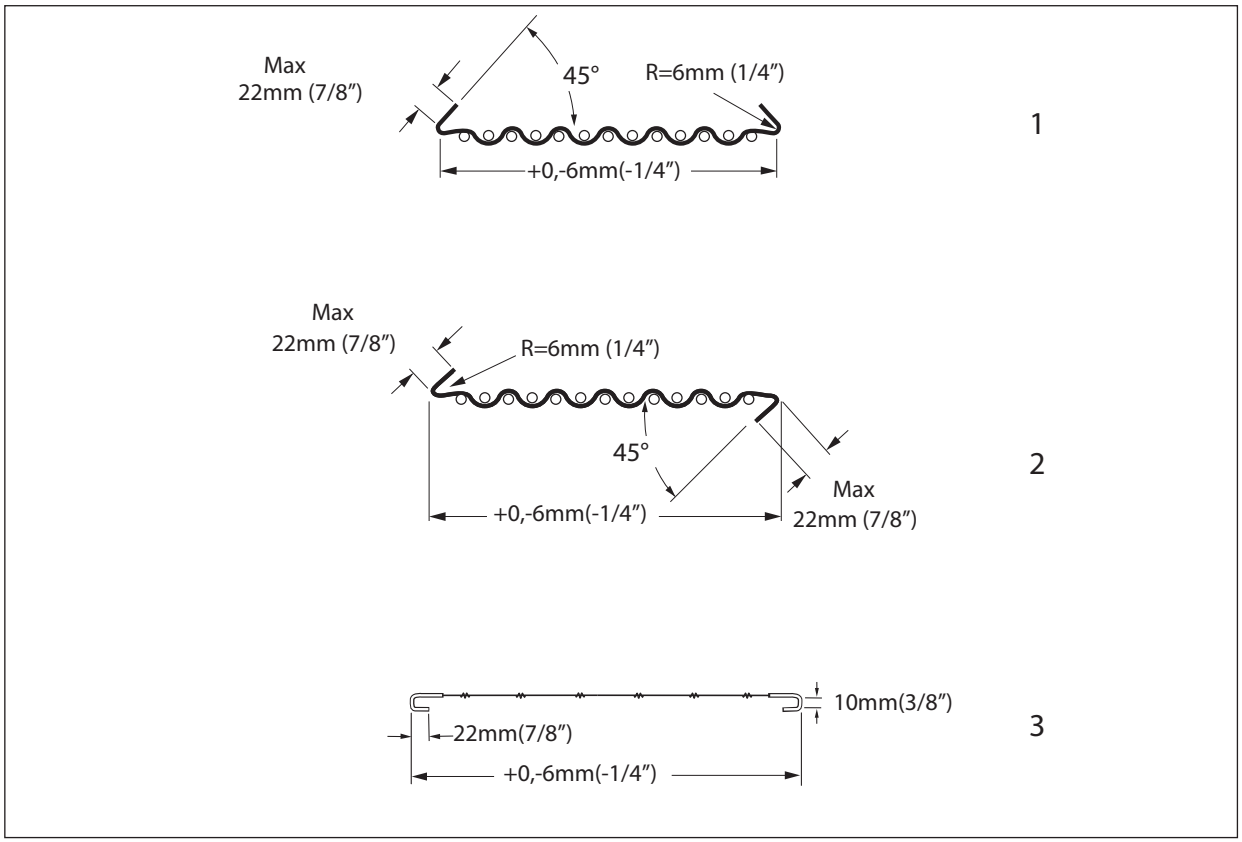


Figure 9.72 - Wire cloth panel sizes

In Figure 9.73 image 1 is a single-crown deck, image 2 is a Divided deck and image 3 is an end tensioned deck.

Table 9.6 - Wire cloth panel sizes

Model	Style	Dimensions Inches (mm)		Hook*
		Inside Hook	Along Hook	
TSH 412	Side Tension	48.00 (1219)	72.00 (1829)	45
	End tension	71.63 (1819)	48.00 (1219)	Square**
TSH 414	Side Tension	48.00 (1219)	84.00 (2134)	45
	End tension	83.63 (2124)	48.00 (1219)	Square**
TSH 514	Side Tension	60.00 (1524)	84.00 (2134)	45
	Split Side Tension	28.88 (734)	84.00 (2134)	45R
	End Tension	83.63 (2124)	20.00 (508)	Square**
TSH 516	Side Tension	60.00 (1524)	48.00 (1219)	45
	Split Side Tension	28.88 (734)	48.00 (1219)	45R
	End Tension	95.63 (2429)	20.00 (508)	Square**
TSH 616	Side Tension	74.50 (1892)	48.00 (1219)	45
	Split Side Tension	36.13 (918)	48.00 (1219)	45R
	End Tension	95.63 (2429)	25.00 (635)	Square**
TSH/TSS 620	Side Tension (4'panel)***	74.50 (1892)	48.00 (1219)	45
	Side Tension (5'panel)***	74.50 (1892)	60.00 (1524)	45
	Divided Deck (4'panel)***	36.13 (918)	48.00 (1219)	45R
	Divided Deck (5'panel)***	36.13 (918)	60.00 (1524)	45R
	End tension	119.63 (3039)	25.00 (635)	Square**
TSH/TSS 720	Side Tension (4'panel)***	86.50 (2197)	48.00 (1219)	45
	Side Tension (5'panel)***	86.50 (2197)	60.00 (1524)	45
	Divided Deck (4'panel)***	42.13 (1070)	48.00 (1219)	45R
	Divided Deck (5'panel)***	42.13 (1070)	60.00 (1524)	45R
	End tension	119.63 (3039)	29.00 (737)	Square**
TSH 820	Side Tension	98.50 (2502)	48.00 (1219)	45
	Split Side Tension	48.00 (1219)	48.00 (1219)	45R
	End Tension	119.63 (3039)	33.00 (838)	Square**

* 45 Hook is angled 45 degrees. Hook length is limited to 22 mm (7/8") from inside bend. 45R Hook is same dimensions as above except one hook is reverse bend (one up, one down). Square Hook is formed 180 degrees, able to fit over 10mm (3/8") edge or clamp. Maximum allowable height of hooks above top surface of wire cloth is 29mm (1-1/8-inch). Higher hooks will interfere with installation of draw hooks.

** Interior cross wire clusters are normally spaced 305mm (12"), end spaces to be equal both ends.

*** Standard side tension and divided deck panel is 48"; 60" is optional .

Table 9.7 - Screen wire diameters versus square clear openings

Table of recommended screen wire diameters for square clear openings and percentages of open area-Mineral aggregate production									
Square clear openings	Light Wire			Standard Wire			Heavy Wire		
	Size	Thickness	% Open area	Size	Thickness	% Open area	Size	Thickness	% Open area
1/8”	#18	.047”	52.8	#15	.072”	40.3	#13	.092”	33.2
3/16”	#16	.063”	56.0	#14	.080”	49.1	#13	.092”	45.1
1/4”	#14	.080”	57.4	#12	.105”	49.6	#9	.148”	39.4
5/16”	#14	.080”	63.4	#12	.105”	56.0	#9	.148”	46.0
3/8”	#13	.092”	64.5	#11	.120”	57.4	#6	.192”	43.8
7/16”	#12	.105”	65.0	#10	.135”	58.4	#6	.192”	48.3
1/2”	#12	.105”	68.3	#9	.148”	59.5	#6	.192”	52.2
5/8”	#9	.148”	65.4	#7	.177”	60.7	#4	.225”	45.0
3/4”	#8	.162”	67.6	#6	.192”	63.4	#3	.244”	56.3
7/8”	#8	.162”	71.2	#6	.192”	67.2	#3	.244”	60.5
1”	#8	.162”	74.0	#5	.207”	68.6	5/16	.3125”	58.0
1-1/8”	#5	.207”	71.3	#3	.244”	66.9	5/16	.3125”	61.2
1/1/4”	#4	.225”	71.8	5/16	.3125”	64.0	3/8	.375”	59.2
1-3/8”	#3	.244”	71.6	5/16	.3125”	66.4	3/8	.375”	61.7
1-1/2”	#3	.244”	73.4	5/16	.3125”	68.5	3/8	.375”	64.0
1-3/4”	#3	.244”	76.6	5/16	.3125”	71.9	3/8	.375”	67.8
2”	5/16	.3125”	74.8	3/8	.375”	70.9	1/2	.500”	64.0
2-1/4”	5/16	.3125”	77.1	3/8	.375”	73.4	1/2	.500”	69.4
2-1/2”	5/16	.3125”	79.0	3/8	.375”	75.6	1/2	.500”	69.4
2-3/4”	5/16	.3125”	80.6	3/8	.375”	77.4	1/2	.500”	71.6
3”	3/8	.375”	79.0	1/2	.500”	73.5	5/8	.625”	68.5

(4) Wire cloth replacement on single crowned decks

(a) Removal

PROCEDURE

1. Remove screen tailgates, as needed.
2. Remove all draw bolts and draw plates. On the top deck, lift wire cloth out from top. On middle and bottom decks, pull cloth out from either end of screen, Ref: Figure 9.74.

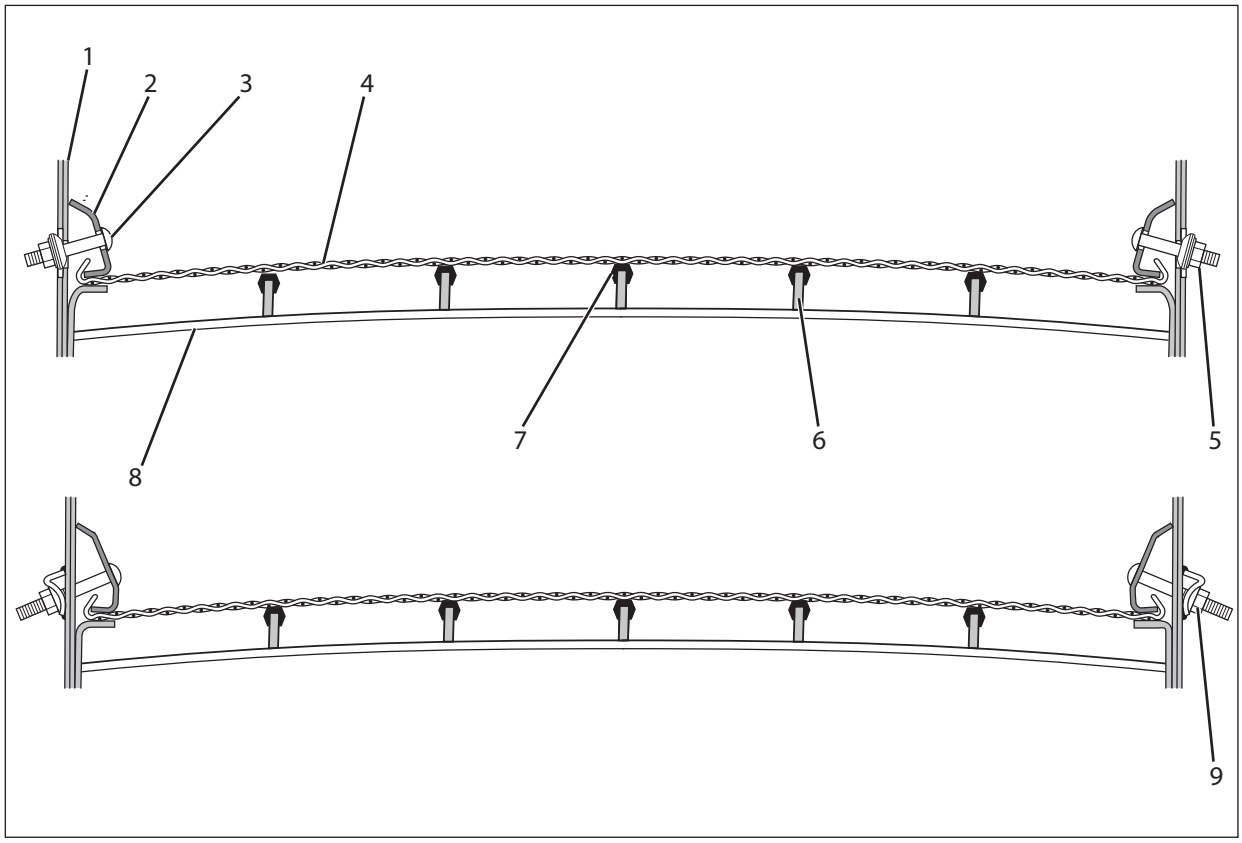


Figure 9.73 - Cross sectional view of a typical screen deck

1 Screen side plate

2 Draw plate

3 Draw bolt

4 Wire cloth

5 Spherical washer

6 Rail

7 Rubber channel

8 Deck cross-beam

9 Aligning washer

The spherical washer design (top image in Figure 9.74) is the design used in the current production of screens. The side plate washer design (bottom image in Figure 9.74) is used in older models

(b) Installation

NOTICE

Do not over tighten draw bolts. Too much torque on draw bolts can damage wire cloth, draw plates or bolts.

Do not allow wedges to “bottom out” in slots or come in contact with screen basket side plate. Add or remove heat-treated flat washers as necessary to adjust wedge position in the bolt.

Be sure that wire cloth is tight and flat against screen deck. Loose cloth has a shortened life span and gives unsatisfactory performance.

PROCEDURE

1. When installing wire cloths refer to Figure 9.74 and Figure 9.75.
2. Make sure all rubber channels are in position and in good condition. Replacing worn channels helps preserve wire cloth and screen decks.
3. Center subscreen cloth (if used) on screen deck. Subscreen support is only needed if small-mesh wire cloth with a clear square opening of 3 mm (1/8 in) or less is used.
4. Center wire cloth on screen deck.
5. Position draw plates and bolts (carriage bolt or wedge bolt). Be sure ends of draw plates do not catch on adjacent plates. Overlapping causes plates to pull down unevenly as bolts are tightened. Be sure each draw plate seats into bottom of wire-cloth hooks at both ends of the draw plate. Tapping downward on top edge of each draw plate helps set wire cloth in position.
6. Tighten draw bolts evenly. With one person working on each side of screen basket, tighten first pair of draw bolts directly across from each other. Continue to tighten pairs of bolts evenly down full length of deck.
7. Torque carriage type draw bolts to 60–80 ft-lb (81–108 Nm) depending on wire gauge. Fine-gauge wire requires less torque and heavy-gauge wire requires more. OR Tighten wedge type draw bolts by securing the wedge in the bolt:
8. Tap the wedge through the slotted bolt to tension the screen wire.
9. Position wedge bolts so that wider side of slots face upward. If necessary, because of clearance, position slots horizontally, with wide sides toward feed end of the screen.
10. Slide an aligning washer/ spherical washer over each bolt. Install one or more heat-treated flat washers over each bolt. Insert wedges into slot in bolt.
11. With a person on each side of the screen, start at one end and begin tapping wedges down. Work together so screen wire pulls evenly toward both sides of screen basket. Keep wire cloth centered in screen basket as you work. Wedges are tight when the wedges ‘ring’ and the hammer wants to bounce off the wedge.
12. Install a 4mm (5/32”) cotter pin in the hole in each wedge. Spread pins just enough to prevent them from shaking out during operation.
13. Repeat tightening procedure along the length of the screen cloth to ensure tight fit. If wire cloth bows upward away from center of deck frame, hammer cloth down. To help prevent bowing, be sure to tighten wire cloth evenly.
14. Install tailgates. After screen has run for 3 to 4 hours, re torque draw bolts. If using the wedge type draw bolts, check after the first hour of operation.

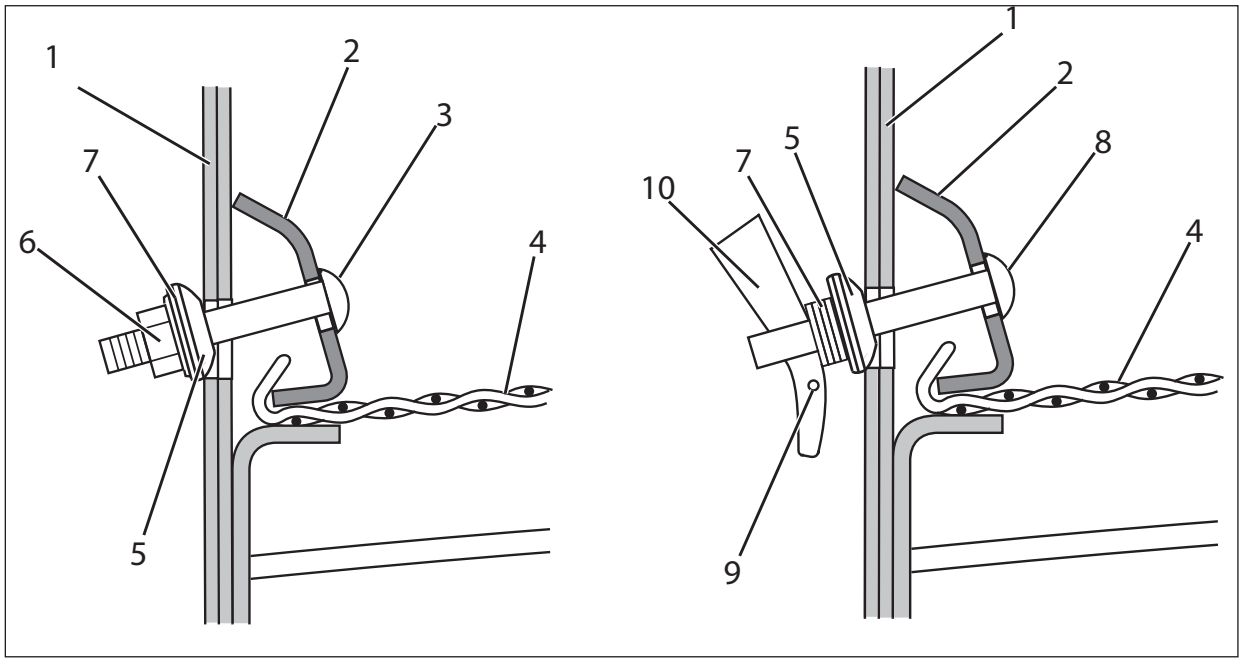


Figure 9.74 - Screen cloth side retaining hardware

1 Screen deck
2 Draw plate
3 Draw bolt (carriage)
4 Screen cloth
5 Spherical washer
6 Nut
7 Heat treated washer
8 Draw bolt (wedge)
9 Cotter pin
10 Wedge

(5) Wire Cloth Replacement on Divided Decks

(a) Removal

NOTICE

Top and bottom decks use T-bolts to secure hold down straps. If nuts are jammed, they can be released from the channel by giving bolts a quarter turn.

A divided deck is divided lengthwise by a channel and uses two separate wire-cloth panels, each of them one half of the screen deck width. Hooks on divided-deck wire-cloth panels turn down to attach to the channel. The channels are covered by a hold-down strap to secure the screen cloth in place (Figure 9.76).

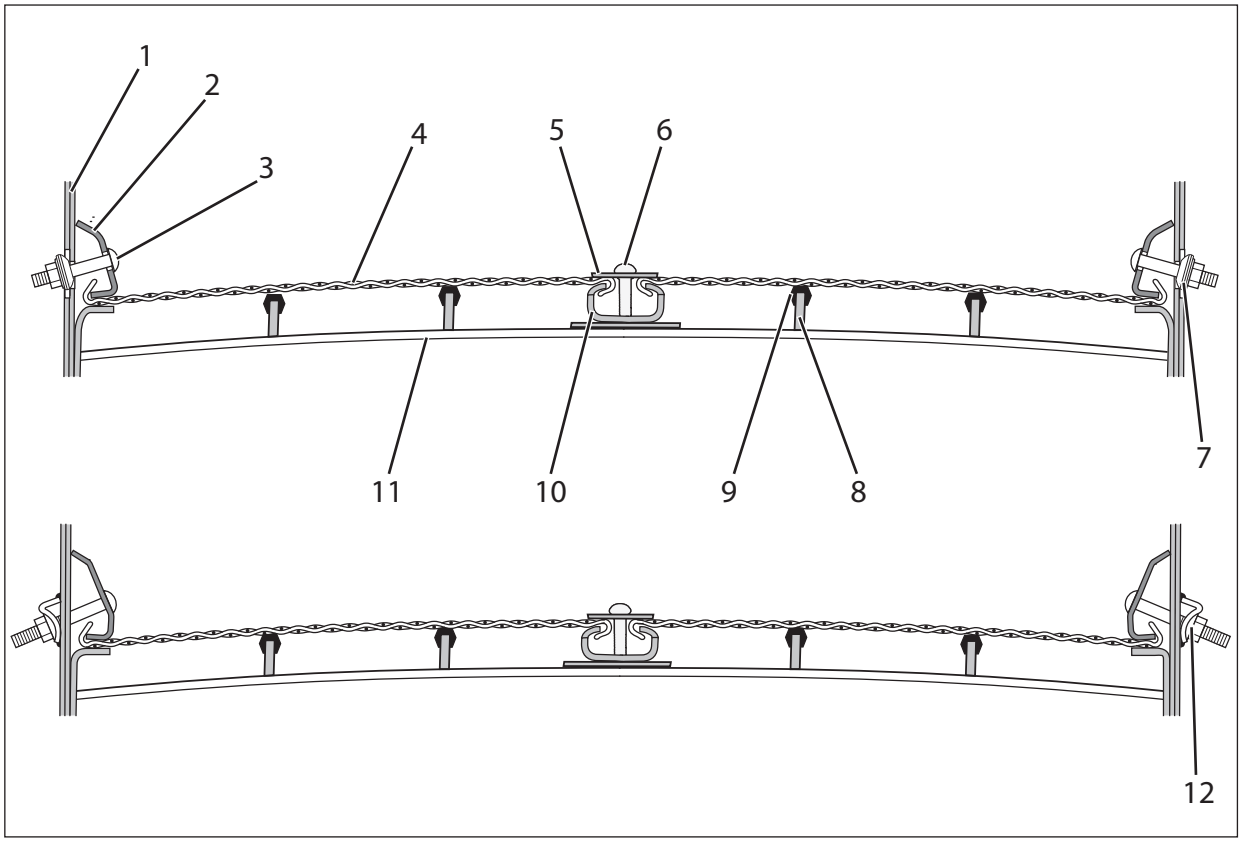


Figure 9.75 - Cross Sectional View of a Divided Deck Screen

1 Screen side plate
2 Draw plate
3 Draw bolt
4 Wire cloth
5 Hold down strap
6 Bolt
7 Aligning washer
8 Rail
9 Rubber channel
10 Center channel
11 Deck cross-beam
12 Spherical washer

The spherical washer design (top image in Figure 9.75) is the design used in the current production of screens. The side plate washer design (bottom image in Figure 9.75) is used in older models.

PROCEDURE

1. Remove screen tailgates, as needed.
2. Remove all draw bolts and draw plates.
3. Remove all bolts (middle deck) or nut and washers (top and bottom decks) and remove the center hold down strap.
4. On the top deck, lift the wire cloth out from top. On middle and bottom decks, pull cloth out from either end of screen.

(b) Installation

NOTICE

Do not over tighten draw bolts. Too much torque on draw bolts can damage wire cloth, draw plates or bolts.

Do not allow wedges to “bottom out” in slots or come in contact with screen basket side plate. Add or remove heat-treated flat washers as necessary to adjust wedge position in the bolt.

PROCEDURE

1. Make sure all rubber channels are in position and in good condition. Replacing worn channels helps preserve wire cloth and screen decks.
2. Center subscreen cloth (if used) on screen deck. Subscreen support is only needed if small-mesh wire cloth with a clear square opening of 3 mm (1/8 in) or less is used.
3. Hook wire-cloth panels into the center channel.
4. Replace hold down straps and tighten bolts.
5. Position draw plates and bolts (carriage bolt or wedge bolt). Be sure ends of draw plates do not catch on adjacent plates. Overlapping causes plates to pull down unevenly as bolts are tightened. Be sure each draw plate seats into bottom of wire-cloth hooks at both ends of the draw plate. Tapping downward on top edge of each draw plate helps set wire cloth in position.
6. Tighten draw bolts evenly. With one person working on each side of screen basket, tighten first pair of draw bolts directly across from each other. Continue to tighten pairs of bolts evenly down full length of deck.
7. Torque carriage type draw bolts to 81–108 Nm (60–80 ft-lb), depending on wire gauge. Fine-gauge wire requires less torque and heavy-gauge wire more. OR Tighten wedge type draw bolts by securing the wedge in the bolt:
8. Tap the wedge through the slotted bolt to tension the screen wire.
9. Position wedge bolts so that wider side of slots face upward. If necessary, because of clearance, position slots horizontally, with wide sides toward feed end of the screen.
10. Slide an aligning washer/ spherical washer over each bolt. Install one or more heat-treated flat washers over each bolt. Insert wedges into slot in bolt.
11. With a person on each side of the screen, start at one end and begin tapping wedges down. Work together so screen wire pulls evenly toward both sides of screen basket. Keep wire cloth centered in screen basket as you work. Wedges are tight when the wedges ‘ring’ and the hammer wants to bounce off the wedge.
12. Install a 4mm (5/32”) cotter pin in the hole in each wedge. Spread pins just enough to prevent them from shaking out during operation.
13. Repeat tightening procedure along the length of the screen cloth to ensure tight fit. If wire cloth bows upward away from center of deck frame, hammer cloth down. To help prevent bowing, be sure to tighten wire cloth evenly.
14. Recheck tightness of hold down bolts.
15. Install tailgates. After screen has run for 3 to 4 hours, re torque draw bolts. If using the wedge type draw bolts, check after the first hour of operation.

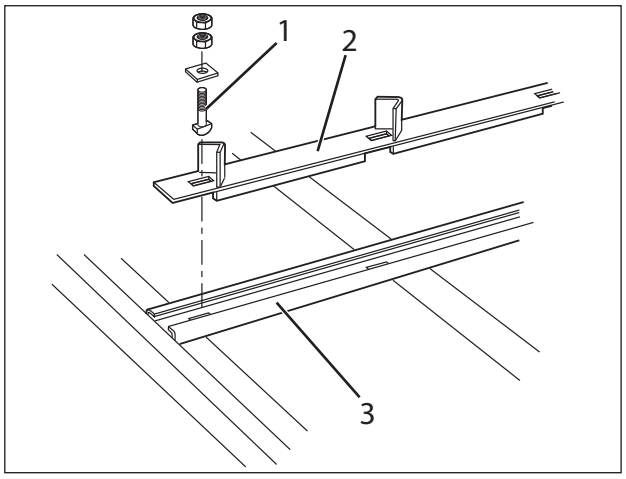


Figure 9.76 - Divided Deck Hold-down Strap - Top/ Bottom Decks

1 T-bolt with nuts and washer.

2 Hold-down strap for top and bottom decks

3 Divided-deck center channel

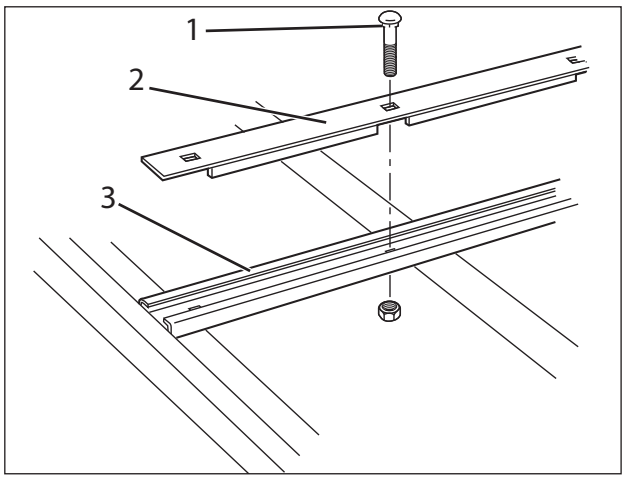


Figure 9.77 - Divided Deck Hold-down Strap - Middle Deck

1 Carriage bolt

2 Hold-down strap for the middle deck

3 Divided-deck center channel

9.16 Chassis Maintenance

NOTICE

Check that all bolts and pins are in place and secure.

Check that all guards are fully secured in the closed position.

(1) Wheels

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Explosive separation of tire

PROCEDURE

1. Check wheel nuts before every journey.
2. Check wheel nuts every 150 miles.
3. After a wheel change, nuts should be checked several times a day until they maintain their correct setting. (For wheel nut tightening torques, refer to this Section, “adjustment data.”)

(2) Tires

⚠ WARNING

Lock-out machine.

Wear personal protective equipment

Explosive separation of tire

Explosive separation of a tire and rim parts can cause serious injury or death.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

Always maintain the correct tire pressure. Do not inflate the tiers above the recommended pressure (See this Section, “Pressures. “) When inflating tiers, use a clip-on chuck and extension hose long enough to allow you to stand to one side and not in front or over the tire assembly. Use a safety cage if available.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Never weld or heat a wheel and tire assembly. The heat can cause an increase in tire pressure resulting in a tire explosion. Welding can also structurally weaken or deform the wheel

PROCEDURE

1. Check tiers for damage and deterioration before every journey.
2. Check tire pressures before every journey.
3. The tire pressures must be checked when the tiers are cold.

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10 Troubleshooting

NOTICE

The information included in this document is intended for experienced personnel familiar with this type of equipment. Only trained and competent personnel should perform the work outlined in this document.

Operation and maintenance of the machine must be done in accordance with the instructions in the operation manual for the machine.

The diagnostic codes may alert the operator to conditions that may damage the machines components. Never ignore a Machine fault if one occurs. Always investigate thoroughly or if in doubt contact your Terex supplier.

10.1 General Troubleshooting

Fault	Cause	Correct Measure
Machine Stops	Fuel	Top up as necessary
	Coolant level	Top up as necessary
	High coolant temperature	Clean Radiator / check fan operation
	Hydraulic oil level	Top up as necessary
	High Hydraulic oil temperature	Clean oil cooler / Replace
	Emergency stop depressed	Check all Emergency stops

10.2 Conveyors Troubleshooting

Fault	Cause	Correct 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
	Worn drum lagging	Replace drum lagging
	Rollers cannot rotate freely	Clean/check/replace rollers
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	Ensure 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 the conveyor	Ensure conveyor is fed more evenly
Material collects under belt	Conveyor belt is loose	Tighten or replace as necessary
	Conveyor belt misaligned	Align conveyor belt
	Skirting rubbers not adjusted	Adjust skirting rubbers

Fault	Cause	Correct Measure
Feeder conveyor is not moving	Feeder kickout circuit has been activated	Allow material in drum to be processed before re-engaging control
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

10.3 Screen Troubleshooting

Fault	Cause	Correct Measure
Screen Starts Slow (if applicable)	Drive belt slipping	Tighten belt; replace worn belt
	In cold weather, wheel case oil may be too heavy	Check
	Motor may be weak	Consult licensed electrician
Screen Spillage	Screen angle too steep	Set it to run at a more shallow angle
	Screen speed too fast	Set it to run slower
	Worn screen rubbers or curtain	Replace screen rubbers or curtain
	Stroke is too long	Reduce stroke length, if possible
Screen decks overflowing	Screen is overloaded	Decrease feed of material
Rock Moves Down One Side of screen	Screen not laterally (side-to-side) level	Level screen
	Feed is introduced to one side of the screen only	Check in feed conveyor
Rock moves across screen too fast	Screen angle too steep	Decrease Screen angle
	Rpm too high	Decrease rpm but stay within stroke-speed range
	Screen base is not level	Level screen
Rock moves across screen too slow	Screen angle too shallow	Increase Screen angle
	Rpm too low	Increase rpm but stay within stroke-speed range

Fault	Cause	Correct Measure
Excessive vibration	Loose or misaligned weights	Check counterweight bolts
	Build up of material	Remove build up and ensure build up is regularly removed
	Anti-rock stays have not been removed	Remove anti rock stays
	Meshes are not secure	Ensure all meshes, punchplate, etc are secure
	Machine and Screenbox are not level	Ensure machine and screenbox are level
	coil springs, fatigued, sagging springs bottoming out	Replace springs
	Screen shaft is not at correct speed	Correct screen shaft speed
	Bearing failure (excessive heat,excessive grease, lack of oil, or excessive movement)	Replace Bearing
	Excessive feed overloading	Co-ordinate feed loading with tuning of screenbox, adjust screen angle
Screen ‘‘dead’’ on feed end	Screen is overloaded	Reduce feed.
		Check springs on feed end
		Check plug weight placement, Increase rpm, but stay within strke speed range
Deck Blinds over with clay	Wire cloth too heavy	Use smaller guage wire
	insufficient water spray	Spray more water, if possible
	Feed material has too much clay content	Clean feed material before screening
		Install a balldeck
Dirty oil spot near gear case	Leaky gearcase bolt or impulse case bolt	Retighten to 305Nm(225lb)
Product out of specification	hole in wire cloth	Replace wire cloth
	Incorrect wire cloth	Replace wire cloth
Water in the gear case	Condensation in the case	Check oil breather clearance or plugging, water entering from breather
	Leaking Wheel case bolt(in wet screening applications)	Retighten to 305Nm(225lb)

10.4 Components Troubleshooting

Fault	Cause	Correct Measure
Machine components running slowly	Obstruction (e.g stone, material build up etc	Clear obstruction
	Check general condition of machine (eg oil leaks, excessive heat, hose blockages etc)	Correct problem if possible
	Low engine speed	Correct engine speed
	Engine performance	Consult engine manual
	Low hydraulic oil level.	Top up hydraulic oil level
	Return line filter blockage	Replace return line filter
	Pre pump filter blockage	Replace suction strainer
	Loose or damaged drive couplings	Tighten/replace drive couplings
	Machine is overloaded	Check setting parameters
	Worn or damaged drive motor	Replace motor
	Worn or damaged pump	Replace pump
	Incorrect relief pressure settings	Check and correct relief pressure settings
	Pump cavitation, suction line is collapsed	Check oil level and gate valve is open fully (if applicable)
	Flow at pump is not as expected	Check flow after pump, after control valve and after motor. These values should be the same
Components do not start	Faulty switch	Check for power
		Replace switch
	PVG solenoid	Check for power
		Replace solenoid
	wiring connection (loose)	carry out visual inspection
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

10.5 Hydraulic Troubleshooting

Fault	Cause	Correct Measure
Excessively noisy pump	Low oil level causing cavitation	Top up oil level
	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 oil and replace with correct oil
	Hydraulic oil tank breather clogged	Disassemble and clean
	Pressure relief valve stuck in open position	Disassemble, clean or replace the spring nozzle
	Contiminated hydraulic oil	Drain tank and replace hydraulic oil
	Damaged pump	Replace pump
	Obstruction at inlet pipe	Remove obstruction
Low or erratic pressure	Contaminants in hydraulic oil	Drain tank and replace hydraulic oil
	Worn or sticking relief valve	Replace relief valve
	Dirt or chip holding valve partially open	Clean around valve. Replace valve
	Control valve relief pressure set too low	Set relief pressure to correct level
Irregular motion of the cylinder	Air mixed in the cylinder	Check the piping, hose and coupling. After checking and repair, remove air
	Filters blocked	Replace
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
	Air mixed from the suction	retighten couplings and replace the piping as necessary
	Blockage at pre pump filter	Remove and clean
	Pressure relief valve stuck in open position	Contact Terex
The pump does not start	Rotating direction error	Check the rotating direction and reconnect
	Low oil level	Top up oil level
	Pump seized	Check that the pump shaft rotates, fit replacement if faulty

Fault	Cause	Correct Measure
Machine operating slowly. No external oil leaks	Low oil level	Top up hydraulic oil level
	Incorrect hydraulic oil	Drain tank and replace hydraulic oil
	Engine performance	Consult engine manual
	Loose or damaged taperlocks	Tighten / replace taperlock
	Worn or damaged drive motor	Replace motor
	Worn or damaged pump	Replace pump
Oil in system becomes excessively hot	Pump running continously under pressure	Check for symptons of pressure build up

10.6 Production Troubleshooting

Fault	Cause	Correct Measure
Low Product Output	Not enough raw material delivered to machine	Increase feed rate.
	Not enough hauling equipment for finished product	Increase removal rate.
	Incorrect machine parameter settings	Change parameter settings
	Incorrect or worn liners	Replace liners
	Incorrect mesh fitted	Replace mesh
Product out of specification	Incorrect or worn liners	Replace liners
	Incorrect mesh fitted	Replace mesh
	Incorrect machine parameter settings	Change parameter settings

10.7 Tracks Troubleshooting

Fault	Cause	Correct Measure
One track not operating or operating slower than the other	Parameter settings	Check parameter setting within the PLC screen and adjust if necessary (independly)
	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
	Different sizes of motors fitted to tracks	Check that the same size of motors have been fitted to both tracks
	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 Host 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 discolouration and/ or fragments of brake disc. If the fault is in the brakes the complete gearbox will have to be replaced.
	Faulty brake piston seals	Remove the motor. If there is hydraulic oil in the gearbox entrance then the seals are damaged. While it may be possible to replace these seals on-site we strongly recommended that a replacement gearbox is fitted and an overhaul of the damaged gearbox be carried out off-site.

Fault	Cause	Correct Measure
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

10.8 Electrical Troubleshooting

Fault	Cause	Correct Measure
Control panel lights up but engine does not start	Faulty ignition switch	Replace ignition switch
	Low engine oil level (warning light should be on)	Top up oil level
	Low engine coolant level (warning light should be on)	Top up coolant level
	Emergency stop bottons depressed	Check all emergency stop buttons
	Faulty starter motor relay	Replace starter motor relay
	Faulty starter motor	Replace starter motor
Control panel does not light up	Low battery voltage	Top up electrolyte level
		Charge up battery
	Fuse blown	Replace fuse
	Isolator on	turn off isolator
	Faulty ignition switch terminals	Correct connections/replace
	Damaged battery	Replace battery
Battery goes flat while engine is running	Low battery voltage	Top up electrolyte level
		Charge up battery
	Faulty Alternator	Replace alternator
	loose fanbelt	Adjust tension
	Blown fuse	Replace fuse
Battery goes flat while engine is running	Faulty starter motor relay	Replace starter motor relay
	Faulty starter motor	Replace starter motor
Track radio remote control does not work	Remote control is out of range	Move remote control to within 100 m of the machine
	Batteries are dead	Charge or replace batteries
	Control bank levers are not in the correct position	Place control levers in the correct position
	Remote control not programmed to receiver box	Program receiver box
Tracks do not operate	Control bank levers are not in the correct position	Control bank levers are not in the correct position
	Fuse blown	Replace fuse
Components do not start	Faulty switch	Check for power
		Replace switch
	PVG solenoid	Check for power
		Replace solenoid
	wiring connection (loose)	Carry out visual inspection
7 second delay warning siren does not operate	Blown fuse	Replace fuse
	Siren has been damaged	Replace siren

Fault	Cause	Correct Measure
Tipping grid remote control does not work	Remote control is out of range	Move remote control to within 100m of the machine
	Batteries are dead	Replace batteries
	Tipping grid cycle not set	Set program
	Remote control not programmed to receiver box	Program receiver box

10.9 Engine Troubleshhoting

Fault	Cause	Correct Measure
Engine non-start or difficult to start	Not declutched	Check
	Battery defective or discharged	Check
	Incorrect valve clearance	Check
	Diagnostic code	Check the display for fault code and refer to engine manual for instructions
	ECM module	Check for battery voltage to ECM
	Starting aids	Check that cold start system is operating correctly
	Emergency stop switches	Check that all emergency stops are depressed and functioning correctly
	Starter motor	Remove the starter and visually inspect the drive pinion and flywheel for damage
		Check battery voltage to starter motor and solenoid, test the operation of both , replace as necessary
	Engine speed	Check and clean speed sensor electrical connections
		Check speed sensor for proper installation
	Fuel injector	Check injector electrical connection and clean as necessary
		Check for injector line leakage/ have the engine manufacturer repair as necessary
	Fuel supply	Check the fuel level, do not rely on the fuel gauge only, add fuel as necessary
		Check the fuel lines for restrictions, collapsed and pinched lines, repair / have the engine manufacturer replace as necessary
		Check fuel in the tank for contamination
		Check condition of fuel filters, replace as necessary

Fault	Cause	Correct Measure
Engine starts, but runs irregularly or fails	Fuel injection line leaks	Check / repair as necessary
	Fuel injector defective	Check / have the engine manufacturer Replace as necessary
	Air in the fuel system	Check / Replace
	Fuel filter / fuel pre- cleaner soiled	Check
	Fuel quality not as per operation manual	Check / Clean
Engine becomes excessively hot	Oil level too low	Top up
	Oil level too high	Check
	Air cleaner clogged / turbocharger	Check / Replace
	Air cleaner service switch / indicator defective	Check
	Charge airline leaking	Check / have the engine manufacturer replace
	Coolant pump defective	Check / Clean
	Coolant heat exchanger soiled	Check / Clean
	Cooling air temperature rise / heating short circuits	Check
	Ventilation line blocked (coolant heat exchanger)	Have the engine manufacturer check
	Fuel injector defective	Check / have the engine manufacturer replace as necessary
	Oil filter defective	Check
	Coolant deficiency	Check / Clean
Engine does not run on all cylinders	Electrical connections	Check electrical connection to engine ECM
	Fuel injection line leaks	Check / have the engine manufacturer repair as necessary
	Fuel injector defective	Check / have the engine manufacturer replace as necessary
	Air in the fuel system	Check / Replace
	Air inlet	Check for air inlet restriction, clean/ replace filters as necessary
	Fuel filter / fuel pre- cleaner soiled	Check

Fault	Cause	Correct Measure
Engine output is deficient	Engine shut off lever still in stop position	Check
	Oil level too high	Check
	Air cleaner clogged / turbocharger	Check / Replace
	Air cleaner service switch / indicator defective	Check
	CPD defective (connection line leaks)	Have the engine manufacturer check
	Charge airline leaking	Check / have engine manufacturer replace as necessary
	Intercooler soiled	Check / Clean
	Cooling air temperature rise / heating short circuits	Have the engine manufacturer check
	Incorrect valve clearance	Have the engine manufacturer check
	Fuel injection line leaks	Check / have the engine manufacturer repair as necessary
	Fuel injector defective	Check / have the engine manufacturer repair as necessary
	Air in the fuel system	Check / Replace
	Fuel filter / fuel pre- cleaner soiled	Check
	Fuel quality not as per operation manual	Check / Clean
Engine oil pressure is non-existent or very low	Oil level too low	Top up
	Excessive engine wear	Have the engine manufacturer check for excessive crankcase blow by at the engine breather
	Incorrect engine lube	Check / Replace
Engine oil consumption is excessive	Oil level too high	Check
	Excessive engine wear	Have the engine manufacturer check for excessive crankcase blow by at the engine breather
	Turbo charger seal	Check the turbo for oil leaks, have the engine manufacturer repair as necessary
	Oil leaks	Check the engine for oil leaks, have the engine manufacturer repair as necessary

Fault	Cause	Correct Measure
Engine smoke blue	Oil level too high	Check
	Excessive engine wear	Have the engine manufacturer check for excessive crankcase blow by at the engine breather
Engine smoke white	Below starting limit temperature	Check
	Incorrect valve clearance	Have the engine manufacturer check
	Starting aids	Have the engine manufacturer check that cold start system is operating correctly
	Fuel injectors defective	Check / have the engine manufacturer repair as necessary
	Fuel quality not as per operation manual	Check / Clean
Engine smoke black	Air cleaner clogged / turbocharger	Check / Replace
	Air cleaner service switch / indicator defective	Check
	CPD defective (connection line leaks)	Have the engine manufacturer check
	Charge airline leaking	Have the engine manufacturer check / Replace
	Incorrect valve clearance	Have the engine manufacturer check
	Fuel Injector defective	Check / have the engine manufacturer repair as necessary

Fault	Cause	Correct Measure
Alternator charging problem	Alternator drive belts	Check the condition of the drive belts, if worn or damaged replace the belts
		Check the tension of the drive belts, adjust the tension if necessary
	Charging circuit	Check the battery cables, wiring and connections in the charging circuit. Clean and tighten all connections. Replace faulty parts
	Regulator	Have the engine manufacturer verify the regulator is operating correctly, replace if necessary
	Alternator	Have the engine manufacturer verify the alternator is operating correctly, repair or replace if necessary
Coolant in engine oil	Engine oil cooler core	Check for leaks in the oil cooler core, if a leak is found the engine manufacturer replace as necessary. Drain the engine oil and replace with clean oil and oil filter
	Cylinder head gasket	Have the engine manufacturer remove cylinder head and replace head gasket
	Cylinder liner	Have the engine manufacturer with the cylinder head removed check the cylinder liner for cracks, replace as necessary
	Cylinder head	Have the engine manufacturer check for cracks in the cylinder head, if necessary repair or replace the cylinder head
	Cylinder block	Have the engine manufacturer check for cracks in the cylinder block, if necessary repair or replace the cylinder head
ECM will not communicate with other systems or displays	Electrical connections	Check and clean electrical connections

Fault	Cause	Correct Measure
Engine cranks but will not start	Diagnostic code	Check the display for fault code and refer to engine manual for instructions
	ECM module	Check for battery voltage to ECM
	Starting aids	Have the engine manufacturer check that cold start system is operating correctly
	Emergency stop switches	Check that all emergency stops are depressed and functioning correctly
	Starter motor	Have the engine manufacturer remove the starter and visually inspect the drive pinion and flywheel for damage
		Check battery voltage to starter motor and solenoid, test the operation of both , replace as necessary
	Engine speed	Check and clean speed sensor electrical connections
		Have the engine manufacturer check sensor for proper installation
	Fuel injector	Check injector electrical connection and clean as necessary
	Fuel supply	Check the fuel level, do not rely on the fuel gauge only, add fuel as necessary
		Check the fuel lines for restrictions, collapsed and pinched lines, have the engine manufacturer repair and replace as necessary
		Check fuel in the tank for contamination
		Check condition of fuel filters, replace as necessary

Fault	Cause	Correct Measure
Engine oil in cooling system	Engine oil cooler core	Check for leaks in the oil cooler core, if a leak is found have the engine manufacturer replace as necessary. Drain the engine oil and replace with clean oil and oil filter
	Cylinder head gasket	Have the engine manufacturer remove cylinder head and replace head gasket
Intermittent engine shutdown	Emergency stop switches	Check that all emergency stops are depressed and functioning correctly
	Electrical connections	Check and clean electrical connections between the engine ECM system display
	Circuit breakers	Check the status of circuit breakers
	Fuel supply	Check the fuel level, do not rely on the fuel gauge only, add fuel as necessary
		Check the fuel lines for restrictions, collapsed and pinched lines, have the engine manufacturer repair and replace as necessary
		Check fuel in the tank for contamination
		Check condition of fuel filters, replace as necessary
	Diagnostic code	Check the display for fault code and refer to engine manual for instructions

10.10 Engine Fault Codes

If there is an engine fault the engine fault screen will be shown on the display (Figure 10.1) when the alarm button (Item 2, Figure 10.2) is pressed.



Figure 10.1 - Engine Fault Screen

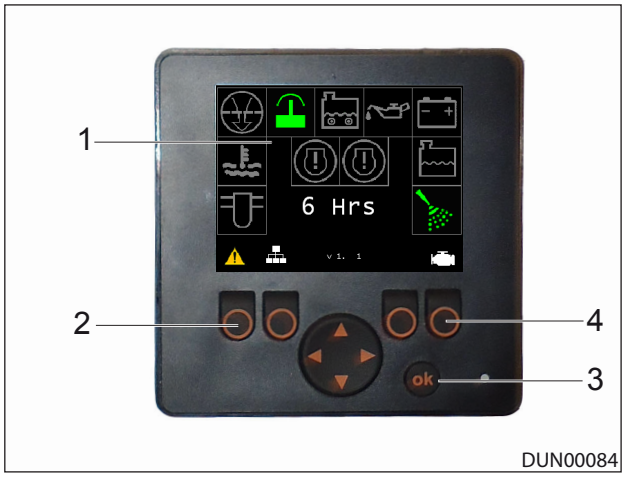


Figure 10.2 - Control Panel Display

The engine fault screen displays the following information:

- The SPN number identifies the specific component which has a fault.
- The number of hours specifies the engine run hours when the fault occurred.
- The FMI number indicates the type of failure that is associated with the component.
- The OC number specifies how many times that particular fault has occurred.

Table 10.1 gives a list of the fault codes and descriptions of the faults corresponding to the combination of codes from the engine fault screen. Table 10.1 can be used to determine what the active fault is.

Example:

Table 10.1 gives a list of the engine fault codes along with a description of the fault.

The J1939 code is made up of two numbers separated by a dash. The first number is the SPN number. The second number is the FMI number.

The engine fault screen in Figure 10.1 is shown on the display screen. The SPN number is 172 and the FMI number is 4. The corresponding numbers in Table 10.1 indicate that the engine coolant level is low.

Extract from table:

J1939 Code	Description	Refer to Procedure
172-4	Engine Air Inlet Temperature : Voltage Below Normal	Engine Temperature Sensor Open or Short Circuit - Test (Passive Sensors)

The engine fault screen also shows that this fault has occurred twice and the last time it occurred was when the engine run hours was 6 hours. The yellow warning symbol at the right hand side of the screen indicates that the fault is currently active.

Table 10.1 - Engine Fault Codes and Descriptions

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
91-4	Accelerator Pedal Position 1 : Voltage Below Normal (Engines equipped with an analog throttle)	Analog Throttle Position Sensor Circuit - Test
91-4	Accelerator Pedal Position 1 : Voltage Below Normal (Engines equipped with a digital throttle)	Digital Throttle Position Sensor Circuit - Test
91-8	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

J1939 Code	Description	Refer to Procedure
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

J1939 Code	Description	Refer to Procedure
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
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

J1939 Code	Description	Refer to Procedure
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
652-6	Engine Injector Cylinder #02 : Current Above Normal	Injector Solenoid Circuit - Test
653-2	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

J1939 Code	Description	Refer to Procedure
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
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)

J1939 Code	Description	Refer to Procedure
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
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

J1939 Code	Description	Refer to Procedure
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
3563-4	Engine Intake Manifold #1 Absolute Pressure : Voltage Below Normal	Engine Pressure Sensor Open or Short

J1939 Code	Description	Refer to Procedure
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
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 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
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

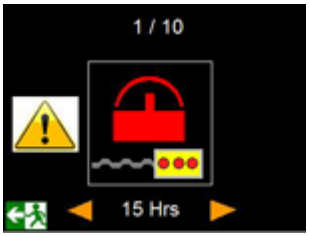
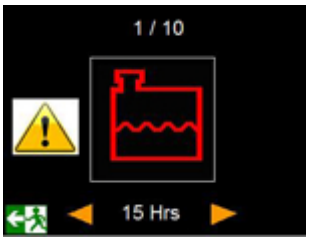
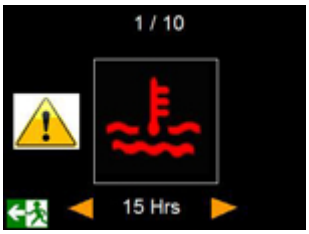
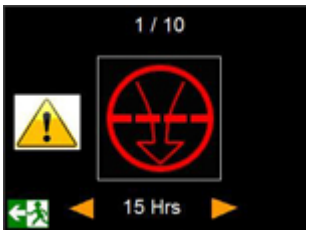
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3837-21	Aftertreatment 1 Secondary Air Pressure : Data Drifted Low	5 Volt Sensor Supply Circuit - Test
4265-5	Aftertreatment #1 Transformer Secondary Output : Current Below Normal	ARD Ignition - Test
4265-6	Aftertreatment #1 Transformer Secondary Output : 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

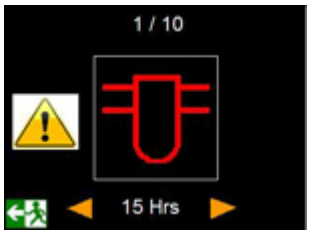
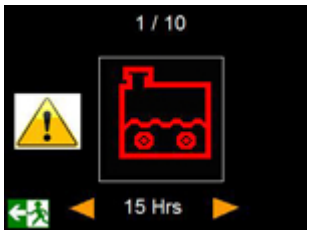
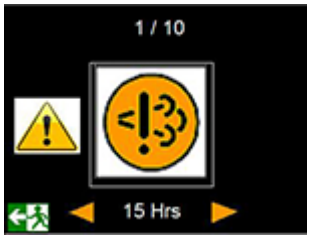
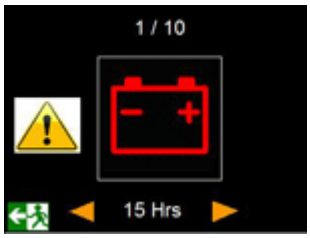
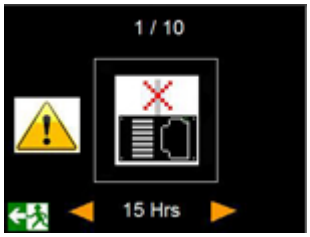
10.11 Machine Fault Codes and Descriptions

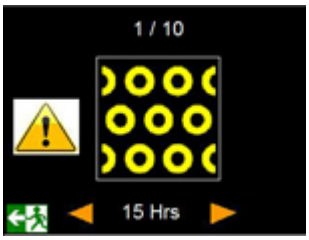
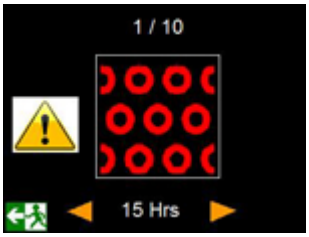
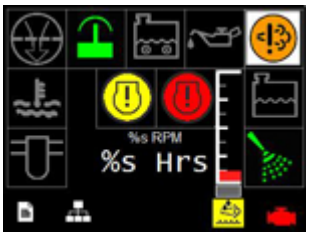
NOTICE

The fault codes may alert the operator to conditions that may damage the machines components. Never ignore a Machine fault if one occurs. Always investigate thoroughly or if in doubt contact your Terex plant supplier.

Table 10.2 - Machine Fault Codes

Fault	Description	Graphic
1	Emergency Stop Activated Emergency Stop on the machine has been activated at ?? Hrs Run Machine will Shutdown	
2	Machine Stop Activated Machine Stop on the doglead has been activated at ?? Hrs Run Machine will Shutdown	
3	Coolant Level Low - SPN 111 Coolant Level is low, activated at ?? Hrs Run. Machine will Shutdown	
4	Engine Temperature - SPN 110 Engine temperature is above normal, activated at ?? Hrs Run. Warning only	
5	Air Filter Restriction - SPN 107 Air Filter for Engine has become blocked activated at ?? Hrs Run. Machine will show this Alarm for 30 Minutes after which the machine will Shutdown	

Fault	Description	Graphic
6	Fuel Contamination - SPN 97 The water trap is full, activated at ?? Hrs Run. Machine will Shutdown	
7	Hydraulic Oil Level Low Hydraulic Oil Level is low, activated at ?? Hrs Run. Machine will Shutdown	
8	Oil Pressure - SPN 100 Engine oil pressure low, recorded at ?? Hrs Run. Engine will not start	
9	After treatment Fault - SPN 5246 & 3038 The After treatment is not functioning, recorded at ?? Hrs Run. The engine will de-rate This warning will also appear on the Home screen when present	
10	Battery Voltage Battery voltage has fallen below the required level, Alarm recorded at ?? Hrs Run. Also an indication that the engines alternator has stopped charging.	
11	Comms Fault MCU Controller has lost CAN Communication with the MCU Display Screen, Alarm recorded at ?? Hrs Run. Engine will not start	

Fault	Description	Graphic
12	DPF Warning - SPN 3719-16 DPF soot level has reached 100%, activated at ?? Hrs Run. Engine regen is required	
13	DPF Critical Warning - SPN 3719-31 DPF soot level has reached 116%, activated at ?? Hrs Run. Engine regen is required, engine will shut down after 30 seconds	
14	Emissions System Malfunction - SPN 3038 The engine will de-rate. If the engine is run in this mode the engine will go into harbour mode.	

11 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, live roller
A series of rollers over which objects are moved by the application of power to all or some of the rollers. The power transmitting medium is usually belting or chain.

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.

Conveyor, screw
A conveyor screw revolving in a suitably shaped stationary trough or casing fitted hangers, trough ends, and other auxiliary accessories.

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.

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.

Hydraulic Screen Tension

The assistance of hydraulic rams when tensioning the screen meshes.

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
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 unladened 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 seamlessly using a special treatment.

Wheel Nut Torque

A measure of pressure applied to tighten a nut.

Table of Content

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Appendix A EC Declaration of Conformity
Appendix B Warranty
Appendix C Schematics
Appendix D Torque Specifications

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Appendix A EC Declaration of Conformity

This machine is in conformity with the provisions of the EC Machinery Directive 06/42/EC together with appropriate EN Harmonised Standards and National BS Standards and Specifications.

A Declaration of Incorporation certificate is applicable to each machine. The original copy of the certificate is sent out with the machine.

The following page shows an example of a Declaration of Incorporation certificate and the information which should be included in it.

Each item of information on the example is numbered and the list of explanations below refer to the corresponding numbered items on the example.

1 Full name and address of the manufacturer of the machine.

2 The name of the person authorised to compile the technical file.

3 The address of the person authorised to compile the technical file.

4 The function of the machine.

5 The model or type of the machine.

6 Serial number or pin number of the machine.

7 Commercial name of the machine.

8 Manufacturers declaration of conformity to the Machinery Directive 2006/42/EC.

9 Manufacturers declaration of conformity to the EMC Directive 2004/108/EC.

10 The place where the machine was issued from.

11 The date on which the machine was issued.

12 Identification of the person empowered to sign on behalf of the manufacturer.

Example

TEREX CORPORATION

Original EC Declaration of Conformity

2006/42/EC 'Machinery Directive'

Manufacturer: Terex GB Limited (1)
200 Coalisland Road
Dungannon
BT71 4DR
United Kingdom

Name of person authorised to compile the Technical File: Michael O'Neill (2)
Address of person authorised to compile the Technical file: Terex GB Ltd (address as above) (3)

Machine Function: Mobile Screener (4)

Model / Type: (5)

Serial / PIN number: (6)

Commercial Name: (7)

Terex GB Limited hereby declare that the above piece of industrial equipment has been designed and manufactured to comply with the relevant provisions of the Machinery Directive 2006/42/EC. (8)

Terex GB Limited hereby declare that the above of industrial equipment has been designed and manufactured to comply with the EMC Directive 2004/108/EC. (9)

Place of issue: Dungannon, United Kingdom. (10)
Date of issue: AUGUST 2011 (11)

Empowered signatory: (12)

EXAMPLE

Appendix B Warranty

The following pages show warranty information.

To register the warranty of this machine please visit: http://www.powerscreenwarranty.com.

Depending on the engine fitted to your machine you must also register the engine of your product via:

Catapillilar

http://www.cat.com/cda/layout?m=37532&x=7&id=3836261

Scania

http://www.scania.co.uk/engines/service/start-up-report/index.aspx

Telematics

If a telematics system is included with the Equipment, the telematics system is administered by a third party and collects a range of operational data about the Equipment including, but not limited to, usage, performance and reliability. Buyer consents to Seller's obtaining such data for warranty, product improvement and customer support purposes. Buyer understands that the Equipment warranty is conditioned on the proper operation of the telematics system and Buyer shall not disable, tamper or interfere with the telematics system.

To access telematics system information visit our website:

http://powerscreen.com/en/pulse/

NON USA SALES ONLY

LIMITED PRODUCT WARRANTY (NON USA)

Terex GB Ltd. (hereafter referred as "Seller") warrants its new Equipment, to be free of defects in material or workmanship for a period of (i) 12 months from the date the Equipment is first placed into service, whether such Equipment is sold, rented or leased or (ii) 2,000 hours of use, whichever first occurs, provided that in no event shall this warranty extend beyond a period of 24 months from the date of shipment from the factory; provided that (1) the Buyer or the end-user sends Seller written notice of the defect within sixty (60) days of its discovery and establishes to the Seller's satisfaction that: (i) the Equipment has been maintained and operated within the limits of rated and normal usage, and that there have been no alterations to it; and (ii) the defect did not result in any manner from the intentional or negligent action or inaction by Buyer or the end-user or any of their respective agents or employees or any person using it and (2) a new machine registration certificate or the commissioning documents have been completed, signed and delivered to Seller within thirty (30) days of the equipment's "in-service" date. If requested by Seller, Buyer must return the defective equipment to Seller's manufacturing facility, or other location designated by Seller, for inspection, and if Buyer cannot establish that conditions (1) (i) and (1) (ii) above have been met, then this warranty shall not cover the alleged defect.

Subject to the Buyer establishing that conditions (1)(i) and 1(ii) above have been met, Seller warrants all Critical Components (as defined herein) to be free, under normal use and service, of any defects in manufacture or materials for a period of: (1) twenty four (24) months from the date of commissioning, (2) 4000 hours of use, or (3) Thirty Six (36) months the date of shipment from the factory, whichever occurs first. For the purposes of this warranty, Critical Components shall mean:

- Cone machines :- Main frame, Upper frame Countershaft and Housing, Drive pulley Drive Pinion and Gear, Eccentric, Wedge Ring (Excluding Pads)
- Jaw Machines: - Mainframe including Cross Beam, Eccentric Shaft, Jaw Stock, Toggle Beam, Flywheels.
- Impactor Machines: - Rotor, Main shaft, Crusher Body and Drive Pulley.
- Screen Boxes; - Screen Box Welded Assembly, Screen Box Sub frame, Main Shaft.

Seller's obligation and liability under this warranty is expressly limited to, at Seller's sole option, repairing or replacing, with new or remanufactured parts or components, any part, which appears to Seller upon inspection to have been defective in material or workmanship. Such parts shall be provided at no cost to the owner. If requested by Seller, components or parts for which a warranty claim is made shall be returned to Seller at a location designated by Seller. All components and parts replaced under this limited product warranty become the property of Seller.

This warranty shall be null and void if parts (including wear parts) other than genuine OEM Seller parts are used in the equipment.

Accessories, assemblies and components included in the Seller equipment, which are not manufactured by Seller, are subject to the warranty of their respective manufacturers. Normal maintenance, adjustments, or maintenance/wear parts, including without limitation, friction plates, glass, clutch, proper tightening of bolts, nuts and brake linings pipe fittings, adding or replacing of fluids, filters, wire rope, belts, screening media, rubber skirting, chute linings and paint, are not covered by this warranty and are the sole maintenance responsibility of Buyer.

Seller makes no other warranty, express or implied, and makes no warranty of merchantability or fitness for any particular purpose.

No employee or representative is authorised to modify this warranty unless such modification is made in writing and signed by an authorized officer of Seller.

Seller's obligation under this warranty shall not include duty, taxes, environmental fees, including without limitation, disposal or handling of tires, batteries, petrochemical items, or any other charges whatsoever, or any liability for direct, indirect, incidental, or consequential damages.

Improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, accident, sabotage or alteration or repair of the equipment by persons not authorized by Seller shall render this warranty null and void. Seller reserves the right to inspect the installation of the product and review maintenance procedures to determine if the failure was due to improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, or alteration or repair of the equipment by persons not authorized by Seller.

Parts Warranty:
Seller warrants the parts ordered from the Seller's parts department to be free of defect in material or workmanship for either (1) a period of 12 months after date of shipment from the factory or (2) 2000 hrs of use or (3) the balance of the remaining new equipment warranty, whichever occurs first. With respect to parts ordered from the Seller's parts department for Equipment that is no longer covered under this limited product warranty due to lapse of time or usage in excess of 4,000 hours of Critical Components, Seller warrants such parts to be free of defect in material or workmanship for a period of either 12 months after date of shipment from the factory or 2000 hrs of use, whichever occurs first.

Telematics.
If a telematics system is included with the Equipment, the telematics system is administered by a third party ("Teleservices Provider) and collects a range of operational data about the Equipment including, but not limited to, usage, performance and reliability. Buyer consents to Seller's obtaining such data from the Teleservices Provider for warranty, product improvement and customer support purposes. Buyer understands that the Equipment warranty is conditioned on the proper operation of the telematics system and Buyer shall not disable, tamper or interfere with the telematics system.

NO TRANSFERABILITY OF WARRANTY:
This warranty is limited to the original purchaser or original end-user if sold to a distributor, and is not assignable or otherwise transferable without the written agreement of Seller. Please contact your local distributor for additional details if needed.

ITEMS NOT COVERED BY SELLER WARRANTY

The following items are **NOT** covered under the Seller Warranty (the following list is not exhaustive):

1. Items sold by any individual, corporation, partnership or any other organization or legal entity that is not an authorized Seller distributor.
2. Components which are not manufactured by Seller are not covered by Seller's warranty. Such components are covered only by the warranty that is provided by the manufacturer of such components. Such components may include, but are not limited to, chassis, engines, air compressors, batteries, tires, customer supplied products.
3. Replacement of assemblies: Seller has the option to repair or replace any defective part or assembly. It is Seller's policy to refuse claims for the replacement of a complete assembly that is field repairable by the replacement or repair of defective part(s) within the assembly.
4. Normal Operational Maintenance Services and Wear Parts: Maintenance services and wear parts are excluded from warranty claims. Maintenance services and wear parts not covered include, but are not limited to, such items as: seals, gaskets, hoses, friction plates, glass, clutch and brake linings, filters, wire rope, exterior coatings, proper tightening of bolts, nuts and fittings, adding or replacing of fluids, filter, breathers, belts, nozzles, adjustments of any kind, services supplies such as hand cleaners, towels and lubricants, inspections, diagnostic time, travel time.
5. Transportation cost and/ or damage: Any damage caused by carrier handling is a transportation claim and should be filed immediately with the respective carrier.
6. Deterioration: Repairs, work required or parts exposed as the result of age, storage, weathering, lack of use, demonstration use, or use for transportation of corrosive chemicals.
7. Secondary Failures: Should the owner or operator continue to operate a machine after it has been noted that a failure has occurred, Seller will not be responsible under the warranty for resultant damage to other parts due to that continued operation.
8. Workmanship of Others: Seller does not accept responsibility for improper installation or labor costs or costs of any kind from personnel other than authorized Seller distributor personnel.
9. Stop and Go Warranty: Seller does not recognize "Stop and Go" warranties.
10. Incidental or Consequential Damage: SELLER SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, LOSS OF PRODUCTION, INCREASED OVERHEAD, LOSS OF BUSINESS OPPORTUNITY, DELAYS IN PRODUCTION, COSTS OF REPLACEMENT COMPONENTS AND INCREASED COSTS OF OPERATION THAT MAY ARISE FROM THE BREACH OF THIS WARRANTY. Customer's sole remedy shall be limited to (at Seller's sole option) repair or replacement of the defective part.

THIS WARRANTY IS EXPRESSLY IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS AND CONDITIONS, EXPRESS OR IMPLIED AND ALL OTHER STATUTORY, CONTRACTUAL, TORTIOUS AND COMMON LAW OBLIGATIONS OR LIABILITY ON SELLER'S PART ARE HEREBY EXPRESSLY EXCLUDED TO THE MAXIMUM EXTENT PERMITTED BY LAW. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY CONTAINED HEREIN.

Seller neither assumes nor authorizes any other person to assume for Seller any other liability in connection with the sale of Seller's Equipment. This warranty shall not apply to any of Seller's Equipment or any part thereof which has been subject to misuse, alteration, abuse, negligence, accident, acts of God or sabotage. No action by any party shall operate to extend or revive this limited warranty without the prior written consent of Seller. In the event that any provision of this warranty is held unenforceable for any reason, the remaining provisions shall remain in full force and effect.

IN THE EVENT OF ANY BREACH OF THE WARRANTY BY SELLER, SELLER'S LIABILITY SHALL BE LIMITED EXCLUSIVELY TO THE REMEDIES (AT SELLER'S SOLE OPTION) OF REPAIR OR REPLACEMENT OF ANY DEFECTIVE EQUIPMENT COVERED BY THE WARRANTY. IN NO EVENT SHALL SELLER, OR ANY SUBSIDIARY OR DIVISION THEREOF BE LIABLE FOR ANY: (A) LOST PROFITS AND/OR BUSINESS INTERRUPTION (WHETHER DIRECT OR INDIRECT); AND (B) INDIRECT, INCIDENTAL, CONSEQUENTIAL (WHETHER DIRECT OR INDIRECT) OR OTHER DAMAGES OR LOSSES OF ANY KIND, RESULTING FROM ANY BREACH OF WARRANTY, REPRESENTATION OR CONDITION, EXPRESS OR IMPLIED, OR ANY OTHER TERMS OF THIS WARRANTY, OR ANY BREACH OF ANY DUTY OR OBLIGATION IMPOSED BY STATUTE, CONTRACT, TORT OR COMMON LAW OR OTHERWISE (WHETHER OR NOT CAUSED BY THE NEGLIGENCE OF THE SELLER, ITS EMPLOYEES, AGENTS OR OTHERWISE), INCLUDING, WITHOUT LIMITATION, LOSS OF USE, LOST PROFITS OR REVENUES, LABOUR OR EMPLOYMENT COSTS, LOSS OF USE OF OTHER EQUIPMENT, DOWNTIME OR HIRE CHARGES, THIRD PARTY REPAIRS, IMPROPER PERFORMANCE OR WORK, LOSS OF SERVICE OF PERSONNEL, LOSS OF CONTRACT OR OPPORTUNITY AND PENALTIES OF ANY KIND, OR FAILURE OF EQUIPMENT TO COMPLY WITH ANY APPLICABLE LAWS. THE SELLER'S LIABILITY TO THE BUYER SHALL NOT IN ANY EVENT EXCEED THE PURCHASE PRICE OF THE EQUIPMENT, PROVIDED THAT NOTHING CONTAINED IN THIS LIMITED PRODUCT WARRANTY SHALL OPERATE TO EXCLUDE THE SELLER'S LIABILITY FOR DEATH OR PERSONAL INJURY.

USA SALES ONLY

LIMITED PRODUCT WARRANTY (USA)

Terex GB Ltd. and Terex USA, LLC (hereafter referred to collectively as "Seller") warrants its new Equipment, to be free of defects in material or workmanship for a period of (i) 12 months from the date the Equipment is first placed into service, whether such Equipment is sold, rented or leased or (ii) 2,000 hours of use, whichever first occurs, provided that in no event shall this warranty extend beyond a period of 24 months from the date of shipment from the factory; provided that (1) the Buyer or the end-user sends Seller written notice of the defect within sixty (60) days of its discovery and establishes to the Seller's satisfaction that: (i) the Equipment has been maintained and operated within the limits of rated and normal usage, and that there have been no alterations to it; and (ii) the defect did not result in any manner from the intentional or negligent action or inaction by Buyer or the end-user or any of their respective agents or employees or any person using it and (2) a new machine registration certificate or the commissioning documents have been completed, signed and delivered to Seller within thirty (30) days of the equipment's "in-service" date. If requested by Seller, Buyer must return the defective equipment to Seller's manufacturing facility, or other location designated by Seller, for inspection, and if Buyer cannot establish that conditions (1) (i) and (1) (ii) above have been met, then this warranty shall not cover the alleged defect.

Subject to the Buyer establishing that conditions (1)(i) and 1(ii) above have been met, Seller warrants all Critical Components (as defined herein) to be free, under normal use and service, of any defects in manufacture or materials for a period of: (1) twenty four (24) months from the date of commissioning, (2) 4000 hours of use, or (3) Thirty Six (36) months the date of shipment from the factory, whichever occurs first. For the purposes of this warranty, Critical Components shall mean

- Cone machines :- Main frame, Upper frame Countershaft and Housing, Drive pulley Drive Pinion and Gear, Eccentric, Wedge Ring (Excluding Pads)
- Jaw Machines: - Mainframe including Cross Beam, Eccentric Shaft, Jaw Stock, Toggle Beam, Flywheels.
- Impactor Machines: - Rotor, Main shaft, Crusher Body and Drive Pulley.
- Screen Boxes; - Screen Box Welded Assembly, Screen Box Sub frame, Main Shaft.

Seller's obligation and liability under this warranty is expressly limited to, at Seller's sole option, repairing or replacing, with new or remanufactured parts or components, any part, which appears to Seller upon inspection to have been defective in material or workmanship. Such parts shall be provided at no cost to the owner. If requested by Seller, components or parts for which a warranty claim is made shall be returned to Seller at a location designated by Seller. All components and parts replaced under this limited product warranty become the property of Seller.

This warranty shall be null and void if parts (including wear parts) other than genuine OEM Seller parts are used in the Equipment.

Accessories, assemblies and components included in the Equipment, which are not manufactured by Seller, are subject to the warranty of their respective manufacturers. Normal maintenance, adjustments, or maintenance/wear parts, including without limitation friction plates, glass, clutch and brake linings, filters, wire rope and paint, are not covered by this warranty and are the sole maintenance responsibility of Buyer.

Seller makes no other warranty, express or implied, and makes no warranty of merchantability or fitness for any particular purpose.

No employee or representative is authorised to modify this warranty unless such modification is made in writing and signed by an authorized officer of Seller.

Seller's obligation under this warranty shall not include duty, taxes, environmental fees, including without limitation, disposal or handling of tires, batteries, petrochemical items, or any other charges whatsoever, or any liability for direct, indirect, incidental, or consequential damages.

Improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, accident, sabotage or alteration or repair of the equipment by persons not authorized by Seller shall render this warranty null and void. Seller reserves the right to inspect the installation of the product and review maintenance procedures to determine if the failure was due to improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, or alteration or repair of the equipment by persons not authorized by Seller.

Parts Warranty:
Seller warrants the parts ordered from the Seller's parts department to be free of defect in material or workmanship for either (1) a period of 12 months after date of shipment from the factory or (2) 2000 hrs of use or (3) the balance of the remaining new equipment warranty, whichever occurs first. With respect to parts ordered from the Seller's parts department for Equipment that is no longer covered under this limited product warranty due to lapse of time or usage in excess of 4,000 hours of Critical Components, Seller warrants such parts to be free of defect in material or workmanship for a period of either 12 months after date of shipment from the factory or 2000 hrs of use, whichever occurs first.

Telematics.
If a telematics system is included with the Equipment, the telematics system is administered by a third party ("Teleservices Provider) and collects a range of operational data about the Equipment including, but not limited to, usage, performance and reliability. Buyer consents to Seller's obtaining such data from the Teleservices Provider for warranty, product improvement and customer support purposes. Buyer understands that the Equipment warranty is conditioned on the proper operation of the telematics system and Buyer shall not disable, tamper or interfere with the telematics system.

NO TRANSFERABILITY OF WARRANTY:
This warranty is limited to the original purchaser or original end-user if sold to a distributor, and is not assignable or otherwise transferable without the written agreement of Seller. Please contact your local distributor for additional details if needed.

ITEMS NOT COVERED BY SELLER WARRANTY

The following items are **NOT** covered under the Seller Warranty (the following list is not exhaustive):

1. Items sold by any individual, corporation, partnership or any other organization or legal entity that is not an authorized Seller distributor.
2. Components which are not manufactured by Seller are not covered by Seller's warranty. Such components are covered only by the warranty that is provided by the manufacturer of such components. Such components may include, but are not limited to, chassis, engines, air compressors, batteries, tires, customer supplied products.
3. Replacement of assemblies: Seller has the option to repair or replace any defective part or assembly. It is Seller's policy to refuse claims for the replacement of a complete assembly that is field repairable by the replacement or repair of defective part(s) within the assembly.
4. Normal Operational Maintenance Services and Wear Parts: Maintenance services and wear parts are excluded from warranty claims. Maintenance services and wear parts not covered include, but are not limited to, such items as: seals, gaskets, hoses, friction plates, glass, clutch and brake linings, filters, wire rope, exterior coatings, proper tightening of bolts, nuts and fittings, adding or replacing of fluids, filter, breathers, belts, nozzles, adjustments of any kind, services supplies such as hand cleaners, towels and lubricants, inspections, diagnostic time, travel time.
5. Transportation cost and/ or damage: Any damage caused by carrier handling is a transportation claim and should be filed immediately with the respective carrier.
6. Deterioration: Repairs, work required or parts exposed as the result of age, storage, weathering, lack of use, demonstration use, or use for transportation of corrosive chemicals.
7. Secondary Failures: Should the owner or operator continue to operate a machine after it has been noted that a failure has occurred, Seller will not be responsible under the warranty for resultant damage to other parts due to that continued operation.
8. Workmanship of Others: Seller does not accept responsibility for improper installation or labor costs or costs of any kind from personnel other than authorized Seller distributor personnel.
9. Stop and Go Warranty: Seller does not recognize "Stop and Go" warranties.
10. INCIDENTAL OR CONSEQUENTIAL DAMAGE: SELLER SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, LOSS OF PRODUCTION, INCREASED OVERHEAD, LOSS OF BUSINESS OPPORTUNITY, DELAYS IN PRODUCTION, COSTS OF REPLACEMENT COMPONENTS AND INCREASED COSTS OF OPERATION THAT MAY ARISE FROM THE BREACH OF THIS WARRANTY. CUSTOMER'S SOLE REMEDY SHALL BE LIMITED TO (AT SELLER'S SOLE OPTION) REPAIR OR REPLACEMENT OF THE DEFECTIVE PART.

THIS WARRANTY IS EXPRESSLY IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED (INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) AND ALL OTHER OBLIGATIONS OR LIABILITY ON SELLER'S PART. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY CONTAINED HEREIN.

Seller neither assumes nor authorizes any other person to assume for Seller any other liability in connection with the sale of Seller's equipment. This warranty shall not apply to any of Seller's equipment or any part thereof which has been subject to misuse, alteration, abuse, negligence, accident, acts of God or sabotage. No action by any party shall operate to extend or revive this limited warranty without the prior written consent of Seller. In the event that any provision of this warranty is held unenforceable for any reason, the remaining provisions shall remain in full force and effect.

IN THE EVENT OF ANY BREACH OF THE WARRANTY BY SELLER, SELLER'S LIABILITY SHALL BE LIMITED EXCLUSIVELY TO THE REMEDIES (AT SELLER'S SOLE OPTION) OF REPAIR OR REPLACEMENT OF ANY DEFECTIVE EQUIPMENT COVERED BY THE WARRANTY. IN NO EVENT SHALL SELLER, OR ANY AFFILIATE, SUBSIDIARY OR DIVISION THEREOF BE LIABLE FOR ANY A) LOST PROFITS AND/OR BUSINESS INTERRUPTION (WHETHER DIRECT OR INDIRECT); AND (B) INDIRECT, INCIDENTAL, CONSEQUENTIAL (WHETHER DIRECT OR INDIRECT) OR OTHER DAMAGES OR LOSSES OF ANY KIND, RESULTING FROM A BREACH OF WARRANTY INCLUDING, WITHOUT LIMITATION, LABOR COSTS, LOSS OF USE OF OTHER EQUIPMENT, THIRD PARTY REPAIRS, LOST PROFITS, LOST TIME, TOWING OR HAULING OF EQUIPMENT, RENTAL COSTS, PERSONAL INJURY, EMOTIONAL OR MENTAL DISTRESS, IMPROPER PERFORMANCE OR WORK, PENALTIES OF ANY KIND, LOSS OF SERVICE OF PERSONNEL, OR FAILURE OF EQUIPMENT TO COMPLY WITH ANY FEDERAL, STATE OR LOCAL LAWS.

LIMITED PRODUCT WARRANTY

Terex GB Ltd. and Terex USA, LLC (hereafter referred to collectively as "Seller") warrants its new Equipment, to be free of defects in material or workmanship for a period of (i) 12 months from the date the Equipment is first placed into service, whether such Equipment is sold, rented or leased or (ii) 2,000 hours of use, whichever first occurs, provided that in no event shall this warranty extend beyond a period of 24 months from the date of shipment from the factory; provided that (1) the Buyer or the end-user sends Seller written notice of the defect within sixty (60) days of its discovery and establishes to the Seller's satisfaction that: (i) the Equipment has been maintained and operated within the limits of rated and normal usage, and that there have been no alterations to it; and (ii) the defect did not result in any manner from the intentional or negligent action or inaction by Buyer or the end-user or any of their respective agents or employees or any person using it and (2) a new machine registration certificate or the commissioning documents have been completed, signed and delivered to Seller within thirty (30) days of the equipment's "in-service" date. If requested by Seller, Buyer must return the defective equipment to Seller's manufacturing facility, or other location designated by Seller, for inspection, and if Buyer cannot establish that conditions (1) (i) and (1) (ii) above have been met, then this warranty shall not cover the alleged defect.

Subject to the Buyer establishing that conditions (1)(i) and 1(ii) above have been met, Seller warrants all Critical Components (as defined herein) to be free, under normal use and service, of any defects in manufacture or materials for a period of: (1) twenty four (24) months from the date of commissioning, (2) 4000 hours of use, or (3) Thirty Six (36) months the date of shipment from the factory, whichever occurs first. For the purposes of this warranty, Critical Components shall mean:

- Cone machines :- Main frame, Upper frame Countershaft and Housing, Drive pulley Drive Pinion and Gear, Eccentric, Wedge Ring (Excluding Pads)
- M Series Jaw Machines :- Mainframe including Cross Beam, Eccentric Shaft, Jaw Stock, Toggle Beam, Flywheels Main Adjustment Cylinders on HA & HR Machines Only
- Impactor Machines (vertical and horizontal shaft):- Rotor, Main shaft, Crusher Body and Drive Pulley
- Screen Boxes;- Screen Box Welded Assembly, Screen Box Sub frame, Main Shaft

Seller's obligation and liability under this warranty is expressly limited to, at Seller's sole option, repairing or replacing, with new or remanufactured parts or components, any part, which appears to Seller upon inspection to have been defective in material or workmanship. Such parts shall be provided at no cost to the owner. If requested by Seller, components or parts for which a warranty claim is made shall be returned to Seller at a location designated by Seller. All components and parts replaced under this limited product warranty become the property of Seller.

This warranty shall be null and void if parts (including wear parts) other than genuine OEM Seller parts are used in the equipment.

Accessories, assemblies and components included in the Seller equipment, which are not manufactured by Seller, are subject to the warranty of their respective manufacturers. Normal maintenance, adjustments, or maintenance/wear parts, including without limitation, friction plates, glass, clutch, proper tightening of bolts, nuts and brake linings pipe fittings, adding or replacing of fluids, filters, wire rope, belts, screening media, rubber skirting, chute linings and paint, are not covered by this warranty and are the sole maintenance responsibility of Buyer.

Seller makes no other warranty, express or implied, and makes no warranty of merchantability or fitness for any particular purpose.

No employee or representative is authorized to modify this warranty unless such modification is made in writing and signed by an authorized officer of Seller.

Seller's obligation under this warranty shall not include duty, taxes, environmental fees, including without limitation, disposal or handling of tires, batteries, petrochemical items, or any other charges whatsoever, or any liability for direct, indirect, incidental, or consequential damages.

Improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, accident, sabotage or alteration or repair of the equipment by persons not authorized by Seller shall render this warranty null and void. Seller reserves the right to inspect the installation of the product and review maintenance procedures to determine if the failure was due to improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, or alteration or repair of the equipment by persons not authorized by Seller.

Parts Warranty: Seller warrants the parts ordered from the Seller's parts department to be free of defect in material or workmanship for either (1) a period of 12 months after date of shipment from the factory or (2) 2000 hrs of use or (3) the balance of the remaining new equipment warranty, whichever occurs first. With respect to parts ordered from the Seller's parts department for Equipment that is no longer covered under this limited product warranty due to lapse of time or usage in excess of 4,000 hours of Critical Components, Seller warrants such parts to be free of defect in material or workmanship for a period of either 12 months after date of shipment from the factory or 2000 hrs of use, whichever occurs first.

Telematics. If a telematics system is included with the Equipment, the telematics system is administered by a third party ("Teleservices Provider) and collects a range of operational data about the Equipment including, but not limited to, usage, performance and reliability. Buyer consents to Seller's obtaining such data from the Teleservices Provider for warranty, product improvement and customer support purposes. Buyer understands that the Equipment warranty is conditioned on the proper operation of the telematics system and Buyer shall not disable, tamper or interfere with the telematics system.

NO TRANSFERABILITY OF WARRANTY: This warranty is limited to the original purchaser or original end-user if sold to a distributor, and is not assignable or otherwise transferable without the written agreement of Seller. Please contact your local distributor for additional details if needed.

ITEMS NOT COVERED BY SELLER WARRANTY

The following items are NOT covered under the Seller Warranty (the following list is not exhaustive):

1. Items sold by any individual, corporation, partnership or any other organization or legal entity that is not an authorized Seller distributor.
2. Components which are not manufactured by Seller are not covered by Seller's warranty. Such components are covered only by the warranty that is provided by the manufacturer of such components. Such components may include, but are not limited to, chassis, air compressors, batteries, tires engines, engine components, and customer supplied products.
3. Replacement of assemblies: Seller has the option to repair or replace any defective part or assembly. It is Seller's policy to refuse claims for the replacement of a complete assembly that is field repairable by the replacement or repair of defective part(s) within the assembly.
4. Normal Operational Maintenance Services and Wear Parts: Maintenance services and wear parts are excluded from warranty claims. Maintenance services and wear parts not covered include, but are not limited to, such items as: seals, gaskets, hoses, friction plates, glass, clutch and brake linings, filters, wire rope, exterior coatings, proper tightening of bolts, nuts and pipe fittings, adding or replacing of fluids, filters, belts, screening media, rubber skirting, chute linings and paint, services supplies such as hand cleaners, towels and lubricants, and inspections, diagnostic time and travel time.
5. Transportation cost and/ or damage: Any damage caused by carrier handling is a transportation claim and should be filed immediately with the respective carrier.
6. Deterioration: Repairs, work required or parts exposed as the result of age, storage, weathering, lack of use, demonstration use, or use for transportation of corrosive chemicals.
7. Secondary Failures: Should the owner or operator continue to operate a machine after it has been noted that a failure has occurred, Seller will not be responsible under the warranty for resultant damage to other parts due to that continued operation.
8. Workmanship of Others: Seller does not accept responsibility for improper installation or labor costs or costs of any kind from personnel other than authorized Seller distributor personnel.
9. Stop and Go Warranty: Seller does not recognize "Stop and Go" warranties.
10. **INCIDENTAL OR CONSEQUENTIAL DAMAGE: SELLER SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, LOSS OF PRODUCTION, INCREASED OVERHEAD, LOSS OF BUSINESS OPPORTUNITY, DELAYS IN PRODUCTION, COSTS OF REPLACEMENT COMPONENTS AND INCREASED COSTS OF OPERATION THAT MAY ARISE FROM THE BREACH OF THIS WARRANTY. CUSTOMER'S SOLE REMEDY SHALL BE LIMITED TO (AT SELLER'S SOLE OPTION) REPAIR OR REPLACEMENT OF THE DEFECTIVE PART.**

THIS WARRANTY IS EXPRESSLY IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED (INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) AND ALL OTHER OBLIGATIONS OR LIABILITY ON SELLER'S PART. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY CONTAINED HEREIN. Seller neither assumes nor authorizes any other person to assume for Seller any other liability in connection with the sale of Seller's equipment. This warranty shall not apply to any of Seller's equipment or any part thereof which has been subject to misuse, alteration, abuse, negligence, accident, acts of God or sabotage. No action by any party shall operate to extend or revive this limited warranty without the prior written consent of Seller. In the event that any provision of this warranty is held unenforceable for any reason, the remaining provisions shall remain in full force and effect.

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1 September 2015

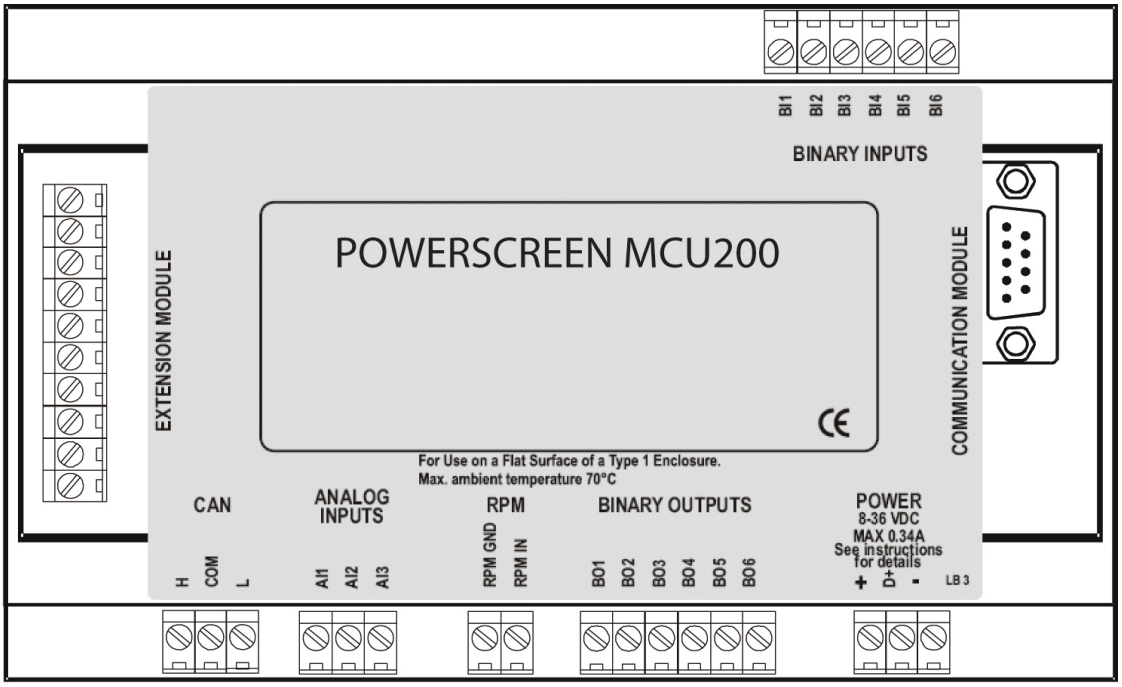
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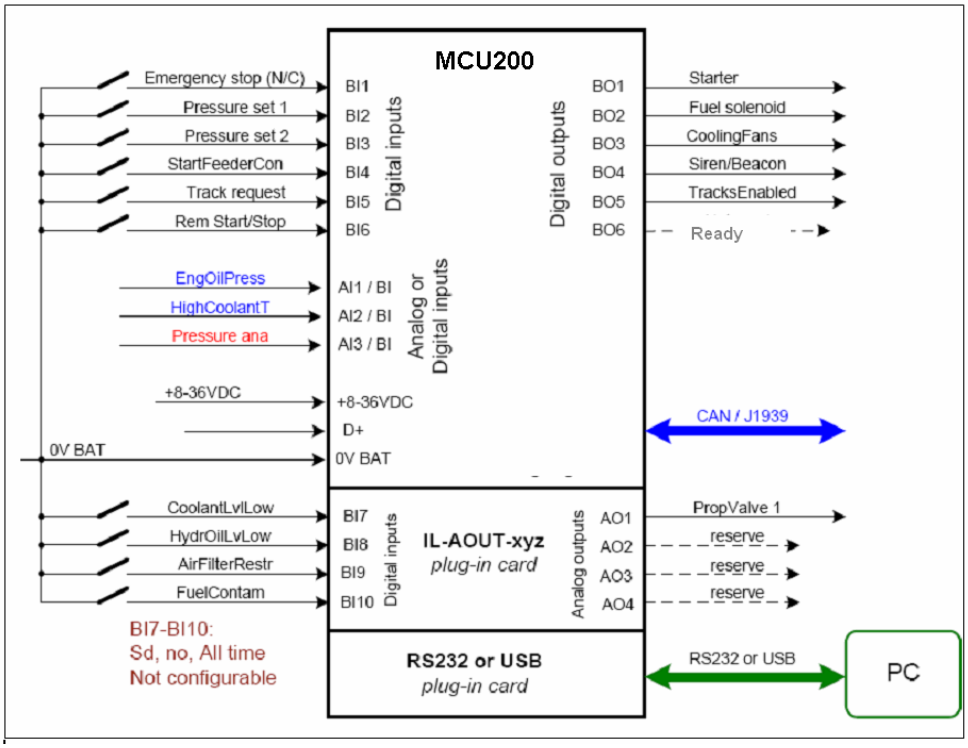
Appendix C Schematics

(1) Powerscreen MCU200 Rear Connections



(2) Basic Wiring of Powerscreen MCU200

See appropriate schematics for more detailed drawings.



(3) Tier 3 Schematics

(See the following pages.)

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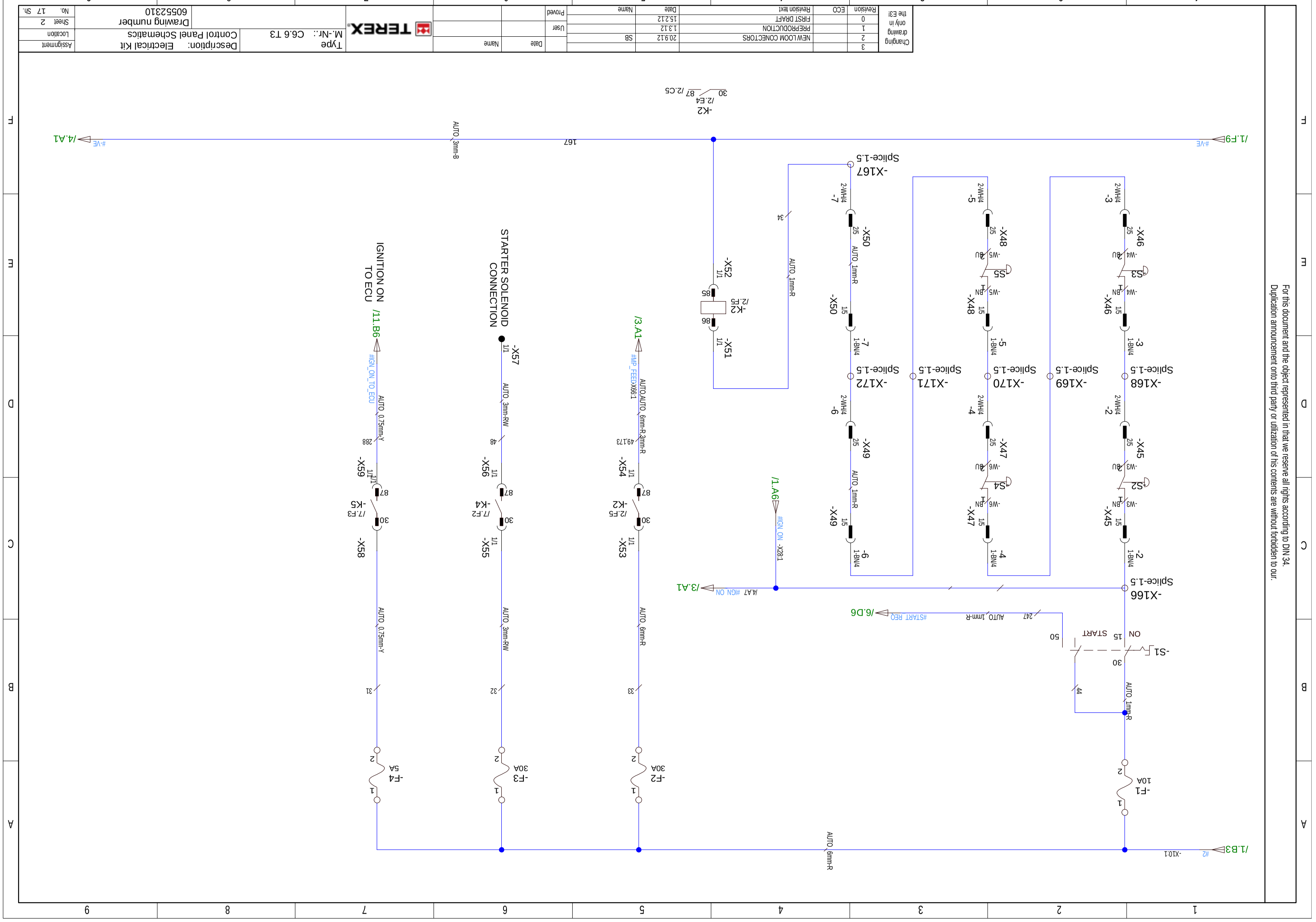
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ECO	2	NEW LOOM CONECTORS	SB	20.9.12	
Revision text	1	PREPRODUCTION		1.3.12	
	0	FIRST DRAFT		15.2.12	
			Name	Date	

Proved	User	Date
		Name

TEREX

Type	
M.-Nr.:	C6.6 T3
Description:	Electrical Kit
	MAIN BATTERY CONNECTIONS
Drawing number	60552310

Assignment	
Location	
Sheet No.	1 17 Sh.


Changing drawing only in the E3!
Revision
ECO
Revision text
Date
Name
0
15.2.12
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NEW LOOM CONECTORS
3
PREPRODUCTION
FIRST DRAFT
Drawn
User
Date
Name
TEREX
Type
M.-Nr.: C6.6 T3
Description: Electrical Kit
Control Panel Schematics
Drawing number
60552310
Sheet 2
No. 17 Sh.
Assignment
Location
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-K5
-F1
-F2
-F3
-F4
/1.F9
/4.A1
/1.B3
/1.A6
/3.A1
/6.D6
/11.B6
/3.A1
/3.A1
/7.F3
/7.F2
/2.F5
/2.C5
/2.E4
/2.F6
#-VE
#IGN ON
#START REQ
#IGN_ON_TO_ECU
#NP_FEED
-X28:1
-X10:1
AUTO_1mm-R
AUTO_3mm-R
AUTO_6mm-R
AUTO_3mm-RW
AUTO_0,75mm-Y
AUTO_1mm-R
AUTO_6mm-R
IGNITION ON TO ECU
STARTER SOLENOID CONNECTION
-FA1
10A
-FA2
30A
-FA3
30A
-FA4
5A
-K2
-K4
-K5
-S1
-S2
-S3
-S4
-S5
-X45
-X46
-X47
-X48
-X49
-X50
-X51
-X52
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-X54
-X55
-X56
-X57
-X58
-X65
-X66
-X167
-X168
-X169
-X170
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-X172
Splice-1.5
2-WH/4
1-BN/4
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Changing drawing only in the E3!										
	3						Date	Name	Type M.-Nr.: C6.6 T3	Description: Electrical Kit Control Panel Schematics
	2		NEW LOOM CONECTORS	20.9.12	SB					Assignment
	1		PREPRODUCTION	1.3.12		User				Location
	0		FIRST DRAFT	15.2.12						Drawing number 60552310
	Revision	ECO	Revision text	Date	Name	Proved				Sheet 3
										No. 17 Sh.

TEREX

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/3.A9 #IGN ON -S8:1, /3.A1, -X28:1
/2.F9 #-VE
/3.A9 #MP FEED

-P1
CR0451
CAN_L 5
CAN_H 4
GND 3
8...32 V DC 2
N.C 1

AUTO_1mm-S
AUTO_1mm-Y
AUTO_1mm-B
AUTO_1mm-R

-A1
CR0403

ifm
CR0403

A
/5.E2 2 IN0 ESTOP HEALTHY
/8.A1 3 IN1 TRACK REQUEST
/5.E3 6 IN2 FEEDER PRESSURE KICKOUT
/5.E5 7 IN3 LOW SPEED
1 VBBs
4 GND
5 GND
8 VBBs

B
/5.E6 2 IN4 INTER SPEED
/5.E7 3 IN5 HIGH SPEED
/5.E9 6 IN6 CONV1 ST REQ
/6.E2 7 IN7 FEEDER START/STOP
1 VBBs
4 GND
5 GND
8 VBBs

C
/6.E5 2 IN8 AIR FILTER RESTRICT
/6.E6 3 IN9 ENG START REQ
/8.A8 6 IN10 MACHINE STOP
/6.E9 7 IN11 HOL
1 VBBs
4 GND
5 GND
8 VBBs

D
/7.A1 1 OUT0 ENG CRANK
/7.A2 3 OUT1 FUEL SYSTEM
/7.A3 5 OUT2 HYD OIL FANS
/7.A6 7 OUT3 SIREN/BEACON
2 GND
4 GND
6 GND
8 GND

E
/8.A2 1 OUT4 TRACKS ENABLE
/9.A1 3 OUT5 SPARE
/9.A2 5 OUT6 SPARE
/9.A3 7 OUT7 SPARE
2 GND
4 GND
6 GND
8 GND

F
/9.A4 1 OUT8 SPARE
/9.A6 3 OUT9 SPARE
/9.A7 5 OUT10 CONV 1 RUN
/9.A8 7 OUT11 FEEDER RUN
2 GND
4 GND
6 GND
8 GND

N
VBBs 1
GND 2
CAN2_H 3
CAN2_L 4
1/1 -X61 AUTO_1mm-R
1/1 -X62 AUTO_1mm-B
1/1 -X63 AUTO_0.75mm-GY
1/1 -X64 AUTO_0.75mm-U

-R2 120 Ω 1 W
#CAN2_L
#CAN2_H
/11.C6
/11.C6

P/N1
VBBs 1
VBB1 2
VBB2 3
GND 4
CAN1_H 5
CAN1_L 6
1/1 -X65 AUTO_1mm-R
1/1 -X66 AUTO_3mm-R
1/1 -X67 AUTO_3mm-R
1/1 -X68 AUTO_1mm-B
1/1 -X69 AUTO,AUTO_1mm-Y,1mm-Y
1/1 -X70 AUTO,AUTO_1mm-S,1mm-S

55 58 49 167 46

-X71
EXPANSION NODE SOCKET
1/5 AUTO_1mm-R
2/5 AUTO,AUTO_3mm-R,1mm-R
3/5 AUTO_1mm-B
4/5 AUTO,AUTO_1mm-Y,1mm-Y
5/5 AUTO,AUTO_1mm-S,1mm-S

#GN ON /5.A1
#-VE /7.F1
#MP FEED /5.D1

-R1 120 Ω 1 W

4/5 -X72
5/5 -X72
PROGRAMMING SOCKET

Revision		Name	Date
3			
2	NEW LOOM CONECTORS	SB	20.9.12
1	PREPRODUCTION		1.3.12
0	FIRST DRAFT		15.2.12
ECO	Revision text	Date	Name

Changing drawing only in the E3!

Proved | User | Date | Name

TEREX

Type
M.-Nr.: C6.6 T3

Description: Electrical Kit
Control Panel Schematics

Drawing number
60552310

Assignment
Location
Sheet 4
No. 17 Sh.

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/4.A7 #IGN_ON
/3.E9 #-VE_SPLICE
#IGN_ON /6.A1
#-VE_SPLICE /6.D7

-X78 31/31
-X79 31/31
-X78 13/31
-X79 13/31
AUTO_1mm-R

-B2
PK8731
-X82 1/5
-X82 3/5
-X82 4/5
AUTO_FLR4Y-A_1mm-B,1.0-BK
AUTO_1mm-NO

-B3
PK8731
-X83 1/5
-X83 3/5
-X83 4/5

-B1
IFS208
CONVEYOR START
DELAY SENSOR
-X77 1/5
-X77 3/5
-X77 4/5
-X79 23/31 AUTO_1mm-BW
23/31 -X78

-S9
1 1 1
2 2 2
66
67
246
70

/4.A7 #MP_FEED X71:2 46
AUTO,AUTO_1mm-R,1mm-R
1/1 -X73
2
IN0
ESTOP HEALTHY
Input
/4.E4 -A1

AUTO_1mm-SB
14/31 -X79
14/31 -X78
AUTO_1mm-SB
1/1 -X74
6
IN2
FEEDER PRESSURE KICKOUT
Input
/4.E4 -A1

1/1 -X75
7
IN3
LOW SPEED
Input
/4.E4 -A1

1/1 -X76
2
IN4
INTER SPEED
Input
/4.E5 -A1

1/1 -X80
3
IN5
HIGH SPEED
Input
/4.E5 -A1

1/1 -X81
6
IN6
CONV1 ST REQ
Input
/4.E5 -A1

Changing drawing only in the E3!							Date	Name		Type	Description: Electrical Kit	Assignment
	3									M.-Nr.: C6.6 T3	Control Panel Schematics	Location
	2		NEW LOOM CONECTORS	20.9.12	SB							
	1		PREPRODUCTION	1.3.12		User			TEREX		Drawing number 60552310	Sheet 5
	0		FIRST DRAFT	15.2.12								
	Revision	ECO	Revision text	Date	Name	Proved						No. 17 Sh.

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/5.A9 #IGN_ON

#IGN_ON /8.B7

-X154
Splice-2.5

10k Ω 1 W
-R3

-D1
1
2

AUTO_1mm-RS
1/1
-X151

-X85 1/2
-X86 1/2
#IGN_ON

AFR SWITCH
(BY OTHERS)

#28
-X86 2/2
-X85 2/2
192
AUTO_1mm-BR
1/1
-X87

/2.C3
#START_REQ
247
AUTO_1mm-R
1/1
-X88

AUTO_1mm-R
-X78 24/31
-X79 24/31
AUTO_1mm-GR

HYD OIL LEVEL
SENSOR
188
3/4
3
2/4
2
186
1/4
1
-X91
-B4
320428

/5.B9 #-VE_SPLICE
#-VE_SPLICE /7.E6

AUTO_1mm-NW
25/31 -X79
25/31 -X78
AUTO_1mm-NW
1/1
-X90

-S10
1
2
251
1/1
-X84
7

IN7
FEEDER START/STOP
Input

/4.E5
-A1

IN8
AIR FILTER RESTRICT
Input

/4.E6
-A1

IN9
ENG START REQ
Input

/4.E6
-A1

IN11
HOL
Input

/4.E6
-A1

ALTERNATOR
D+

Revision	ECO	Revision text	Date	Name
3				
2		NEW LOOM CONECTORS	20.9.12	SB
1		PREPRODUCTION	1.3.12	
0		FIRST DRAFT	15.2.12	

Changing drawing only in the E3!

	Date	Name
User		
Proved		

TEREX

Type
M.-Nr.: C6.6 T3

Description: Electrical Kit
Control Panel Schematics

Drawing number
60552310

Assignment
Location
Sheet 6
No. 17 Sh.

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-A1 /4.E6 — Output: ENG CRANK — OUT0 — 1 — -X92 1/1 — ;73 — -X93 1/1 — 86 — -K4 /7.F2 — 85 — -X94 1/1 — AUTO,AUTO_1mm-B,1mm-B — /4.A7 #-VE

-A1 /4.E7 — Output: FUEL SYSTEM — OUT1 — 3 — -X95 1/1 — ;74 — -X96 1/1 — 86 — -K5 /7.F3 — 85 — -X97 1/1 — AUTO,AUTO_1mm-B,1mm-B

-A1 /4.E7 — Output: HYD OIL FANS — OUT2 — 5 — -X98 1/1 — AUTO_1mm-GW — OIL COOLING FANS TEMP STAT — 1/4 -X99 — 2/4 -X99 — 4/4 -X99 — AUTO_1mm-WP — -X100 1/1 — 86 — -K6 /7.F4 — 85 — -X101 1/1 — AUTO,AUTO_1mm-B,1mm-B — AUTO_1mm-B — /8.F1 #-VE

-A1 /4.E7 — Output: SIREN/BEACON — OUT3 — 7 — -X102 1/1 — 77,310 — 11/31 -X78 — 11/31 -X79 — AUTO_1mm-UY — -X105 1/2 — -X106 1/2 — -W2,BN — -X153 1/2 — -X152 1/2 — -W3 BN — -X103 1/2 — -X104 1/2 — -W1,BN — 1 — -H2 — 2 — -W1,BU — -X104 2/2 — -X103 2/2 — -X152 2/2 — -X153 2/2 — /6.D9 #-VE SPLICE — AUTO_1mm-B

-H3 — 1 — 2 — -W2,BU — -X106 2/2 — -X105 2/2

-K4 /7.D1 30 87 /2.C6

-K5 /7.D3 30 87 /2.C7

-K6 /7.D4 30 87 /1.B7

Changing drawing only in the E3!	Revision	ECO	Revision text	Date	Name
	3				
	2		NEW LOOM CONECTORS	20.9.12	SB
	1		PREPRODUCTION	1.3.12	
	0		FIRST DRAFT	15.2.12	

	Date	Name
User		
Proved		

TEREX

Type M.-Nr.: C6.6 T3

Description: Electrical Kit Control Panel Schematics

Drawing number 60552310

Assignment

Location

Sheet 7

No. 17 Sh.

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/7.F5 #+VE

/3.C2 #+VE TRACKS

TRACKS ON SW

LTF

LTR

RTF

RTR

FAST

RADIO TRACK STOP LINK

MACHINE REMOTE STOP

TRACKING UMBILICAL

-X79 2/31 AUTO 1mm-B 2/16 -X78 2/31 -X108

-X108 10/16 AUTO 0.75mm-RU -X78 10/31 AUTO 0.75mm-RU -X107 1/1 3 -X79 10/31

-X108 4/16 AUTO 1mm-R -X78 4/31 -X79 4/31

62

-K7 /8.F3 A2 A1 0.75mm-UO AUTO -X79 5/31 AUTO 0.75mm-UO 5/16 -X78 5/31 -X108

-X108 3/16 AUTO 0.75mm-RW -X78 3/31 AUTO 0.75mm-RW -X109 1/1 1 -X79 3/31

-K7 /8.F3 14 12 24 22 11/10.C3 21/10.C6

-K8 /8.F4 A2 A1 0.75mm-UY AUTO -X79 8/31 AUTO 0.75mm-UY 8/16 -X108 8/31 -X78

-K8 /8.F4 14 12 24 22 11/10.C3 21/10.C8

-K9 /8.F5 A2 A1 0.75mm-NS AUTO -X79 6/31 AUTO 0.75mm-NS 6/16 -X108 6/31 -X78

-K9 /8.F5 14 12 24 22 11/10.C4 21/10.D6

-K10 /8.F6 A2 A1 0.75mm-NY AUTO -X79 9/31 AUTO 0.75mm-NY 9/16 -X108 9/31 -X78

-K10 /8.F6 14 12 24 22 11/10.C5 21/10.D8

-K11 /8.F7 A2 A1 0.75mm-GY AUTO -X79 1/31 AUTO 0.75mm-GY 1/16 -X108 1/31 -X78

-K11 /8.F7 14 12 24 22 11/10.B6 21

-X79 15/31 AUTO 0.75mm-BP 15/16 -X108 15/31 -X78

AUTO 1mm-B

-X79 7/31 AUTO 0.75mm-BY 7/16 -X108 7/31 -X78

-X108 16/16 AUTO 0.75mm-GY -X78 16/31 -X79 16/31

-X108 12/16 AUTO 0.75mm-WR -X78 12/31 AUTO 0.75mm-WR -X110 1/1 6 -X79 12/31

-X164:1 #IGN ON

AUTO 3mm-R

/10.A1

#+VE TRACKS

/6.A9 #IGN ON

AUTO,AUTO 1mm-R,1mm-R

/9.F1 #+VE

/9.D8

-A1 /4.E4 Input TRACK REQUEST IN1

-A1 /4.E7 Output TRACKS ENABLE OUT4

-A1 /4.E6 Input MACHINE STOP IN10

Revision	ECO	Revision text	Date	Name
3				
2		NEW LOOM CONECTORS	20.9.12	SB
1		PREPRODUCTION	1.3.12	
0		FIRST DRAFT	15.2.12	

Changing drawing only in the E3!

Proved | User | Date | Name

TEREX

Type
M.-Nr.: C6.6 T3

Description: Electrical Kit
Control Panel Schematics

Drawing number
60552310

Assignment
Location
Sheet 8
No. 17 Sh.

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Changing drawing only in the E3!	Revision	ECO	Revision text	Date	Name
	3				
	2		NEW LOOM CONECTORS	20.9.12	SB
	1		PREPRODUCTION	1.3.12	
	0		FIRST DRAFT	15.2.12	

	Date	Name
User		
Proved		

TEREX

Type M.-Nr.: C6.6 T3	Description: Electrical Kit Control Panel Schematics	Assignment
	Drawing number 60552310	Location
		Sheet 9
		No. 17 Sh.

/10.F1 #-VE

/8.F9 #-VE

-X78 29/31
-X79 29/31
-X114 2/4
-X112 2/4

AUTO_1mm-B

-X114 1/4
-X112 1/4

REMOTE FEEDER START/STOP (FUTURE)

-X164 2/4
-X164 1/4 /8.B9 #IGN ON
-X164 4/4 -X165 4/4
-X164 3/4 -X165 3/4

AUTO_1mm-GB
AUTO_1mm-GB
AUTO_1mm-GB
AUTO_1mm-GB
AUTO_1mm-GN

-X79 28/31
-X78 28/31
AUTO_1mm-R
289
-X113 1/1

-X79 30/31
-X78 30/31
AUTO_1mm-R
82
-X111 1/1

-A1 /4.E9	-A1 /4.E9	-A1 /4.E8	-A1 /4.E8	-A1 /4.E8	-A1 /4.E8	-A1 /4.E8
7	5	3	1	7	5	3
Output	Output	Output	Output	Output	Output	Output
FEEDER RUN	CONV 1 RUN	SPARE	SPARE	SPARE	SPARE	SPARE
OUT11	OUT10	OUT9	OUT8	OUT7	OUT6	OUT5

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Changing drawing only in the E3!	Revision	ECO	Revision text	Date	Name
	3				
	2		NEW LOOM CONECTORS	20.9.12	SB
	1		PREPRODUCTION	1.3.12	
	0		FIRST DRAFT	15.2.12	

	Date	Name
User		
Proved		

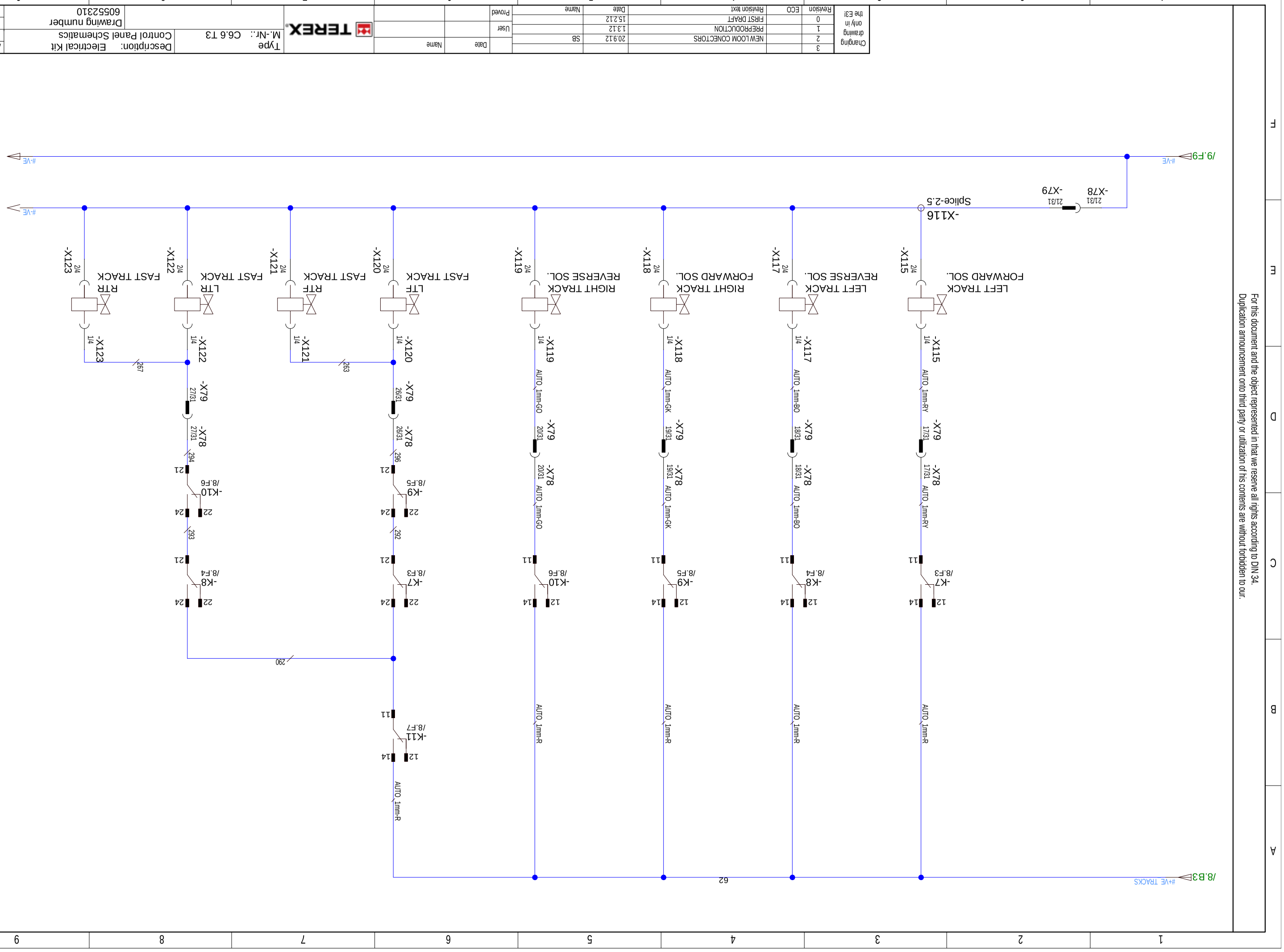
TEREX

Type M.-Nr.: C6.6 T3

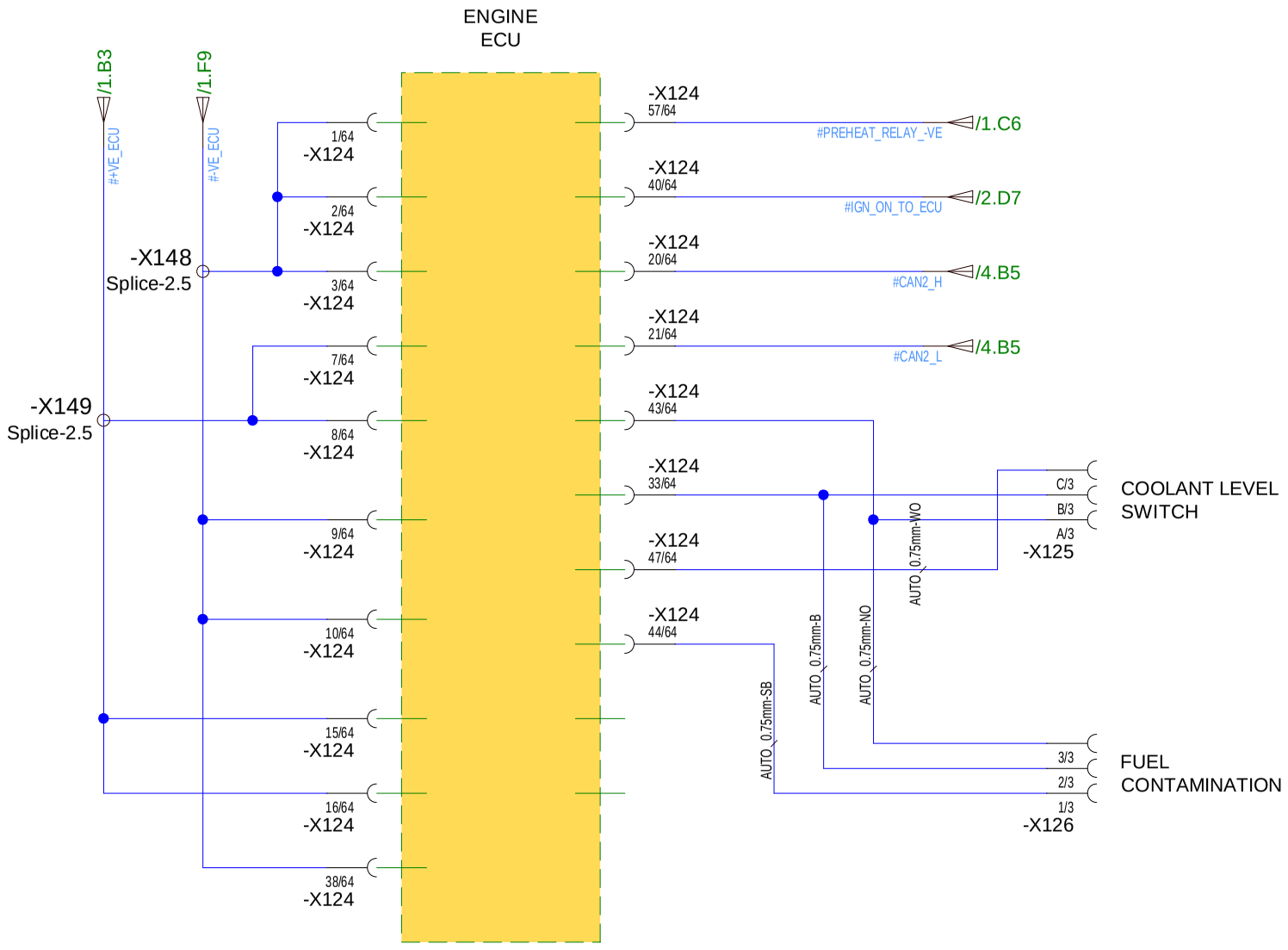
Description: Electrical Kit
Control Panel Schematics

Drawing number 60552310

Assignment
Location
Sheet 10
No. 17 Sh.



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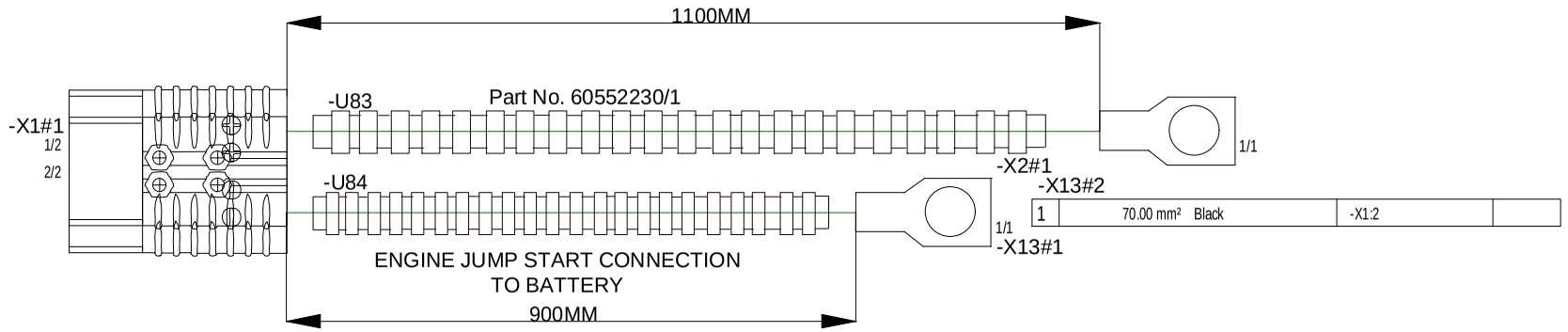


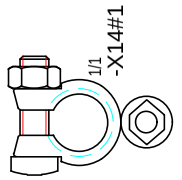
Changing drawing only in the E3!							Date	Name	Type M.-Nr.: C6.6 T3	Description: Electrical Kit Control Panel Schematics	Assignment
	3										Location
	2		NEW LOOM CONECTORS	20.9.12	SB						Sheet 11
	1		PREPRODUCTION	1.3.12		User				Drawing number 60552310	
	0		FIRST DRAFT	15.2.12							No. 17 Sh.
	Revision	ECO	Revision text	Date	Name	Proved					

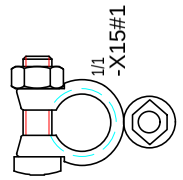
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-X1#2

1	70.00 mm² Red	-X2:1	
2	70.00 mm² Black	-X13:1	

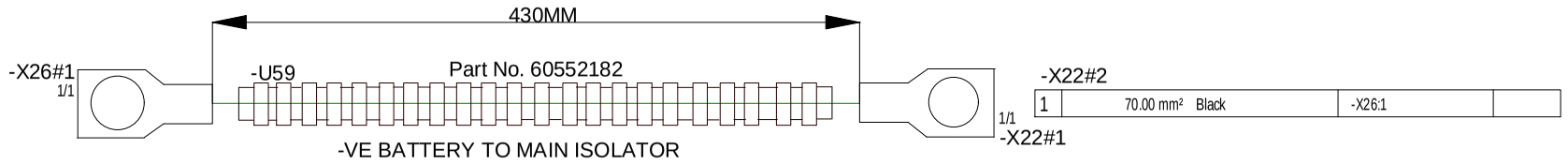






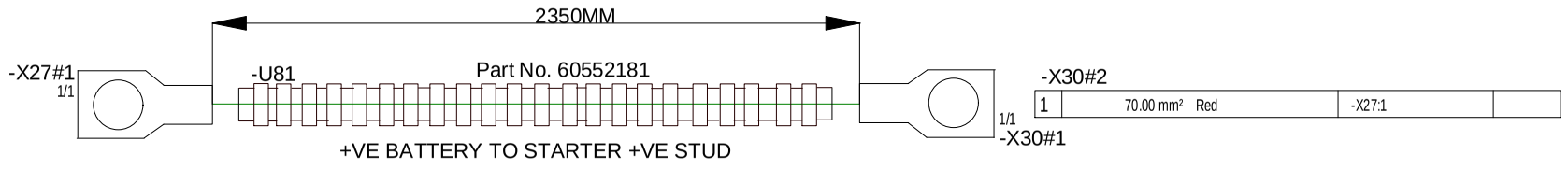
-X26#2

1	70.00 mm² Black	-X22:1	



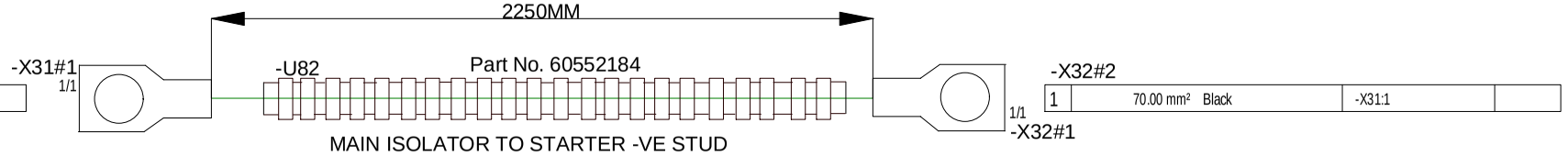
-X27#2

1	70.00 mm² Red	-X30:1	



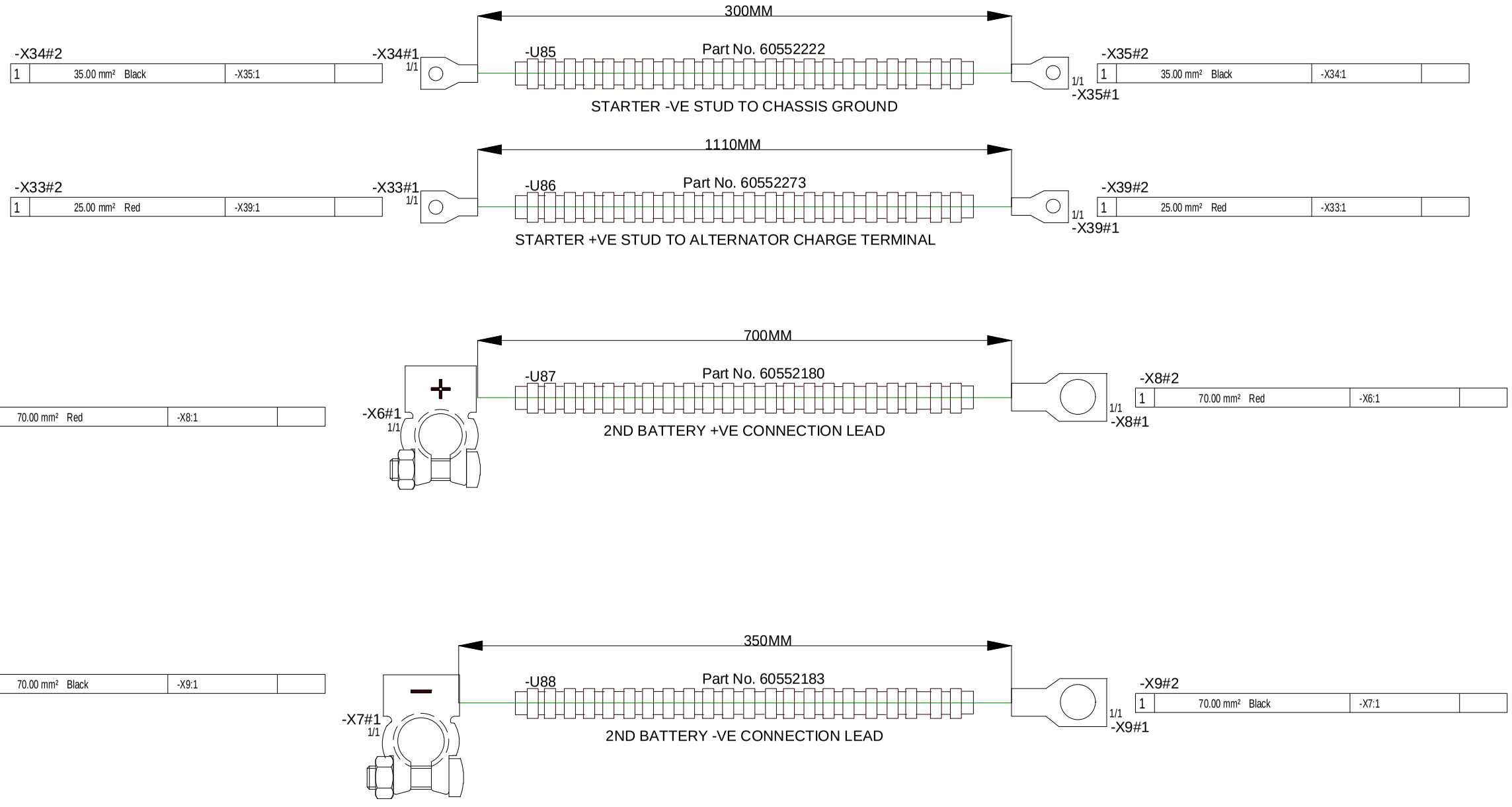
-X31#2

1	70.00 mm² Black	-X32:1	



Changing drawing only in the E3!										
	3						Date	Name	TEREX	Type M.-Nr.: C6.6 T3
	2		NEW LOOM CONECTORS	20.9.12	SB					Description: Electrical Kit Battery Leads
	1		PREPRODUCTION	1.3.12		User				Assignment
	0		FIRST DRAFT	15.2.12						Location
	Revision	ECO	Revision text	Date	Name	Proved				Drawing number 60552310
										Sheet 12
										No. 17 Sh.

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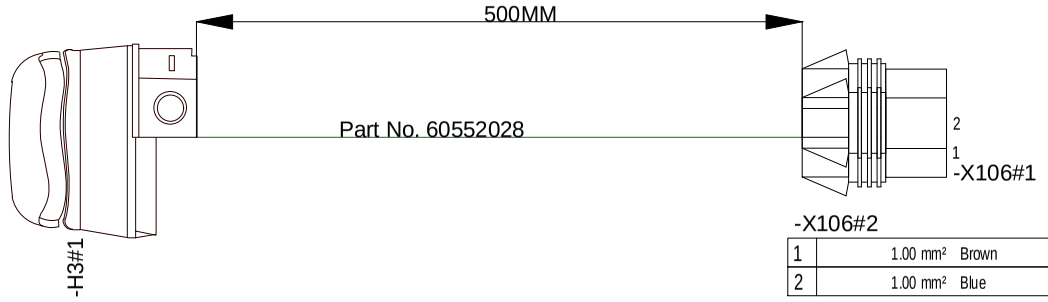
Changing drawing only in the E3!										
	3						Date	Name	TEREX	Type M.-Nr.: C6.6 T3
	2		NEW LOOM CONECTORS	20.9.12	SB					Description: Electrical Kit Battery Leads
	1		PREPRODUCTION	1.3.12		User				Assignment
	0			15.2.12						Location
	Revision	ECO	Revision text	Date	Name	Proved				Drawing number 60552310
										Sheet 13
										No. 17 Sh.


-X79#2
-X78#2
-X11#2
-X12#2
-X13#2
-X14#2
-X15#2
-X16#2
-X17#2
-X18#2
-X19#2
-X20#2
-X21#2
-X22#2
-X23#2
-X24#2
-X25#2
-X26#2
-X27#2
-X28#2
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-X41#2
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-X48#2
-X49#2
-X50#2

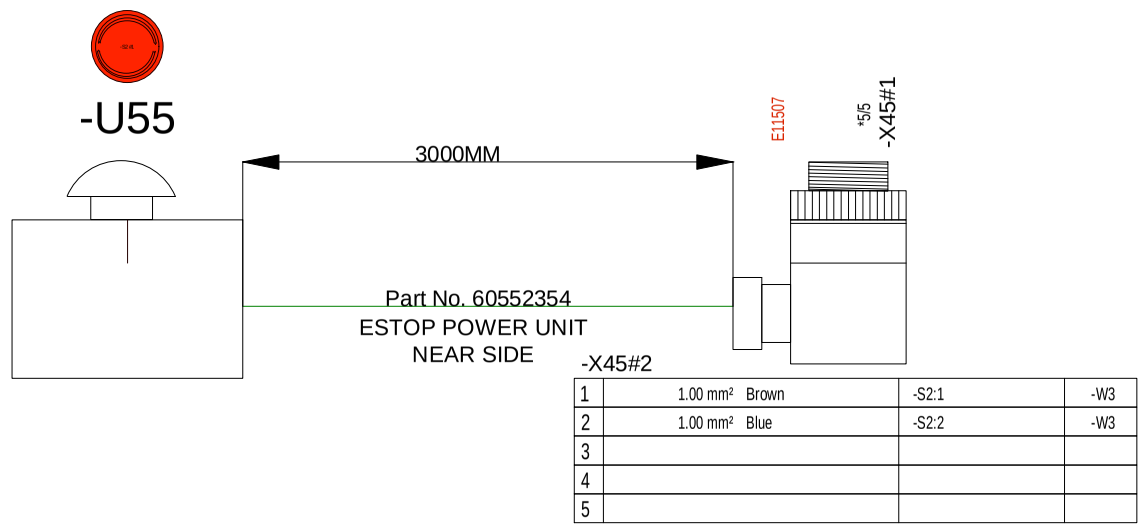
Cavity	P1	P2	P3	P4	P5	P6	P7	P8
Housing	-X12#2	-X13#2	-X14#2	-X15#2	-X16#2	-X17#2	-X18#2	-X19#2
Housing Colour	BK	BK	BK	BK	BK	BK	BK	BK
Cavity Colour	BK	BK	BK	BK	BK	BK	BK	BK
Cavity Seal	Red	Red	Red	Red	Red	Red	Red	Red
Cavity Seal Colour	RD	RD	RD	RD	RD	RD	RD	RD
Cavity Colour	GN01	GN02	GN03	GN04	GN05	GN06	GN07	GN08
Cavity Size	0.5 mm²	0.5 mm²	0.5 mm²	0.5 mm²	0.5 mm²	0.5 mm²	0.5 mm²	0.5 mm²
Cavity Qty	1	1	1	1	1	1	1	1
Cavity Part	1-1452641-1	1-1452641-1	1-1452641-1	1-1452641-1	1-1452641-1	1-1452641-1	1-1452641-1	1-1452641-1

Cavity	P1	P2
Housing Qty	1	1
Housing Colour	BK	BK
Cavity Colour	GN01	GN02
Cavity Seal	Red	Red
Cavity Seal Colour	RD	RD
Cavity Size	0.5 mm²	0.5 mm²
Cavity Part

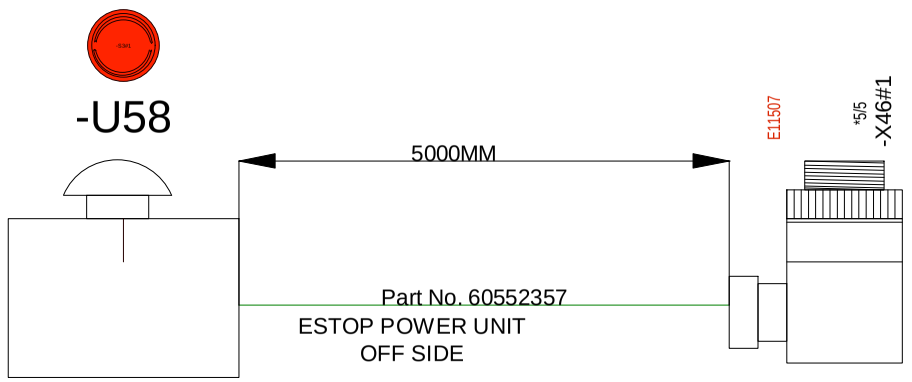
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1	1.00 mm² Brown	-H3:1	-W2
2	1.00 mm² Blue	-H3:2	-W2



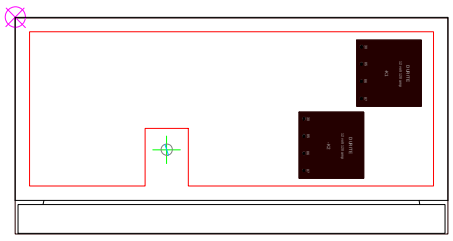
1	1.00 mm² Brown	-S2:1	-W3
2	1.00 mm² Blue	-S2:2	-W3
3			
4			
5			

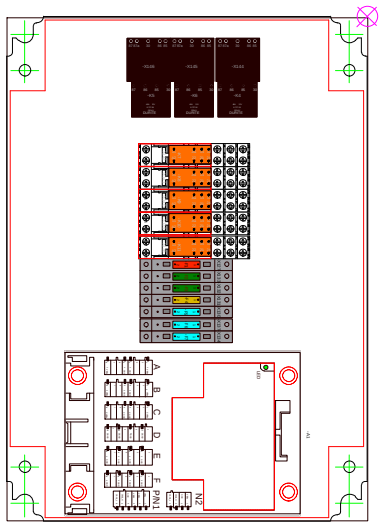


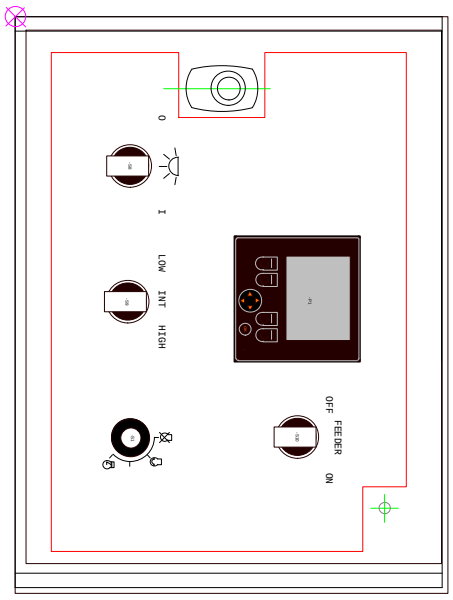
1	1.00 mm² Brown	-S3:1	-W4
2	1.00 mm² Blue	-S3:2	-W4
3			
4			
5			

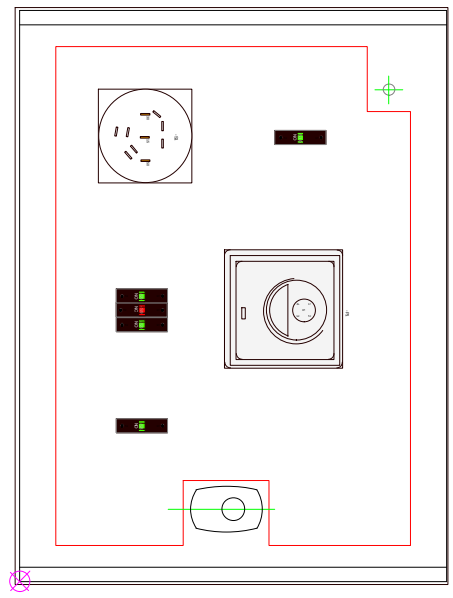
Changing drawing only in the E3!										
	3						Date	Name	TEREX	Type M.-Nr.: C6.6 T3
	2		NEW LOOM CONECTORS	20.9.12	SB					Description: Electrical Kit Chassis Cables
	1		PREPRODUCTION	1.3.12		User				Assignment
	0		FIRST DRAFT	15.2.12						Location
	Revision	ECO	Revision text	Date	Name	Proved				Drawing number 60552310
										Sheet 16
										No. 17 Sh.

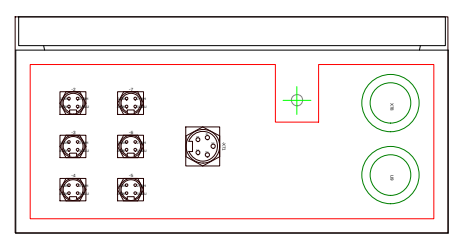
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Changing drawing only in the E3!

Revision	ECO				
3					
2		NEW LOOM CONECTORS	20.9.12	SB	
1		PREPRODUCTION	1.3.12		
0		FIRST DRAFT	15.2.12		
Revision	ECO	Revision text	Date	Name	

	Date	Name
User		
Proved		

TEREX

Type		Description: Electrical Kit	Assignment
M.-Nr.:	C6.6 T3	BACKPLATE LAYOUT	Location
		Drawing number	Sheet 18
		60552310	No. 17 Sh.

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-K1

CR2033

Device filter location changed

5050143225

Node-ID=

Channel 7		Channel 8	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

Channel 5 FOLDING SENSOR No.3		Channel 6 FOLDING SOLENOID No.3	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

Channel 3 FOLDING SENSOR No.2		Channel 4 FOLDING SOLENOID No.2	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

Channel 1 CONVEYOR No.2 DELAY SENSOR		Channel 2 CONVEYOR No.2 RUN SOLENOID	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

/1.C3 /1.C4

1	GNDs	GNDs 1
2	+VBBc	+VBBc 2
3	CAN_GND	CAN_GND 3
4	CAN_H	CAN_H 4
5	CAN_L	CAN_L 5

CAN_H	CAN_L	GNDs	GNDo	+VBBo	+VBBs	+VBBc
1	2	3	4	5	6	7

-W116 3 4 -W116 G/Y -W116 2 1

-1 1/5 2/5 3/5 4/5 5/5

-B3 IFS208

-X212 1/5 3/5 4/5

-W111 1 -W111 2 -W111 3

-X213 1/5 3/5 4/5

CH1 1 2 3 4 5

L+ | IN (Analog) | L- | IN (Dig)/OUTPUT | Shell

/1.D1 -K1 Channel 1 CONVEYOR No.2 DELAY SENSOR

5050143225

-X218 1/4 2/4 3/4 PE/4

-W114 2 -W114 1

-X219 3/5 4/5

CH2 1 2 3 4 5

L+ | IN (Analog) | L- | IN (Dig)/OUTPUT | Shell

/1.D2 -K1 Channel 2 CONVEYOR No.2 RUN SOLENOID

5050143225

Changing drawing only in the E3!							Date	Name
	3							
	2							
	1		NODE PWR CONNECTION CHANGED	23.3.12	CD	User		
	0		FIRSTDRAFT	3.1.12	CD			
	Revision	ECO	Revision text	Date	Name	Proved		

TEREX

Type C7.1 T4 PU
M.-Nr.:

Description: Electrical Kit
H6203 EXPANSION NODE KIT

Drawing number

Assignment
Location
Sheet 1
No. 2 Sh.

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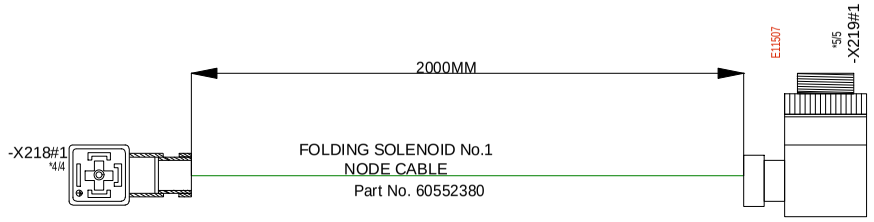
NODE SETTINGS:		
S1	S2	S3
3	0	2



NOTE:
REMOVE JUMPER LINK
BETWEEN TERMINALS
5,6&7

-1#2

1	1.50 mm² Black	-K1:6	-W116
2	1.50 mm² Black	-K1:5	-W116
3	1.50 mm² Green-Yellow	-K1:4	-W116
4	1.50 mm² Black	-K1:1	-W116
5	1.50 mm² Black	-K1:2	-W116

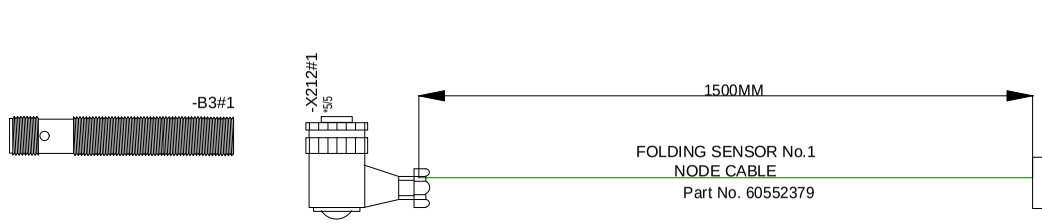


-X218#2

1	1.00 mm² Black	-X219:4	-W114
2	1.00 mm² Black	-X219:3	-W114
3			
PE			

-X219#2

1			
2			
3	1.00 mm² Black	-X218:2	-W114
4	1.00 mm² Black	-X218:1	-W114
5			



-X212#2

1	1.00 mm² Black	-X213:1	-W111
2			
3	1.00 mm² Black	-X213:3	-W111
4	1.00 mm² Black	-X213:4	-W111
5			

-X213#2

1	1.00 mm² Black	-X212:1	-W111
2			
3	1.00 mm² Black	-X212:3	-W111
4	1.00 mm² Black	-X212:4	-W111
5			

Changing drawing only in the E3!	3							Date	Name
	2								
	1		NODE PWR CONNECTION CHANGED	4.0.1.0	CD		User		
	0		FIRSTDRAFT	3.1.1.2	CD		Proved		
	Revision	ECO	Revision text	Date	Name				

TEREX

Type C7.1 T4 ESS
M.-Nr.:

Description: Electrical Kit
H6203 EXPANSION NODE KIT

Drawing number

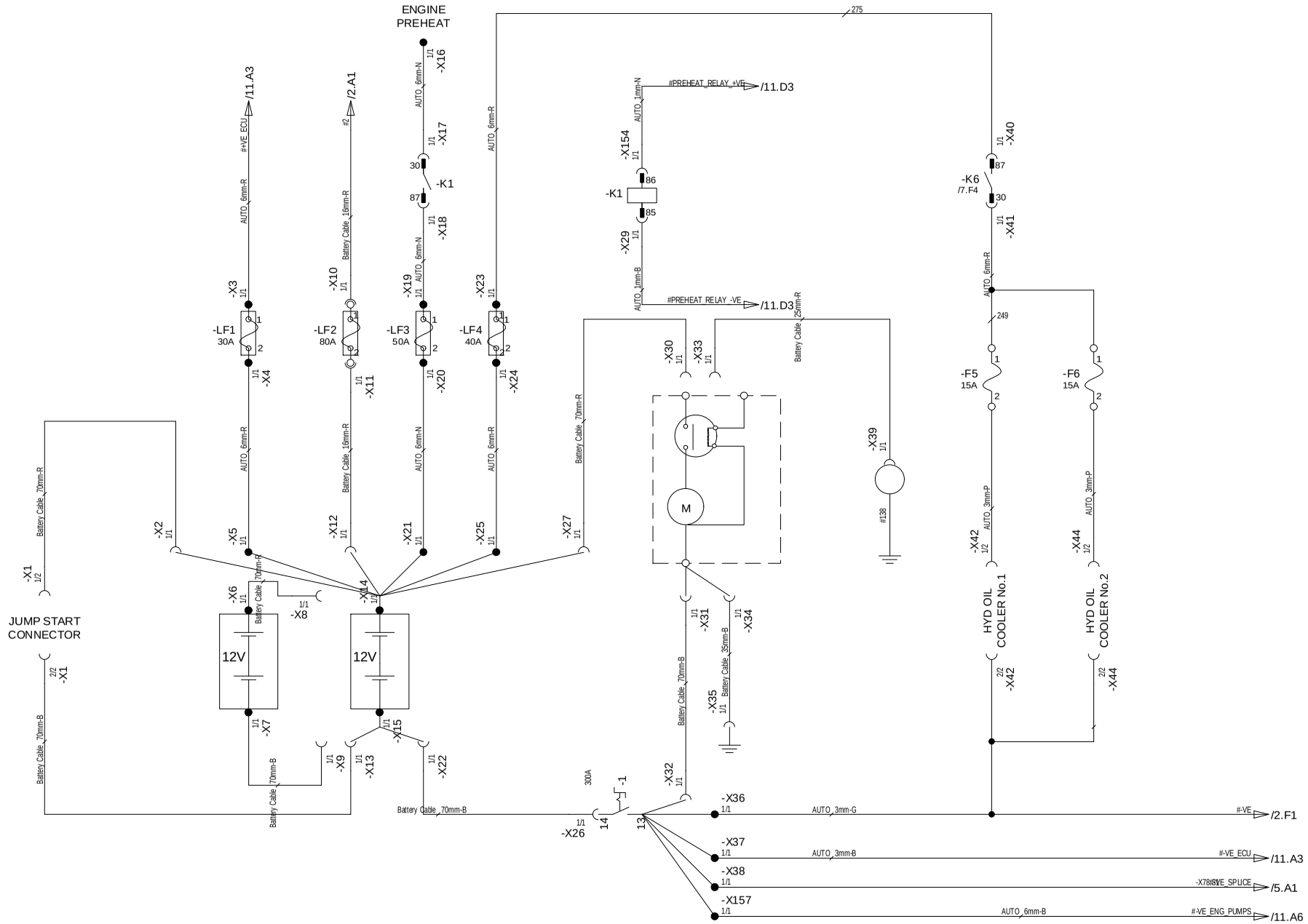
Assignment
Location
Sheet 2
No. 2 Sh.

(4) Tier 4 Schematics

(See the following pages.)

Intentionally Left Blank

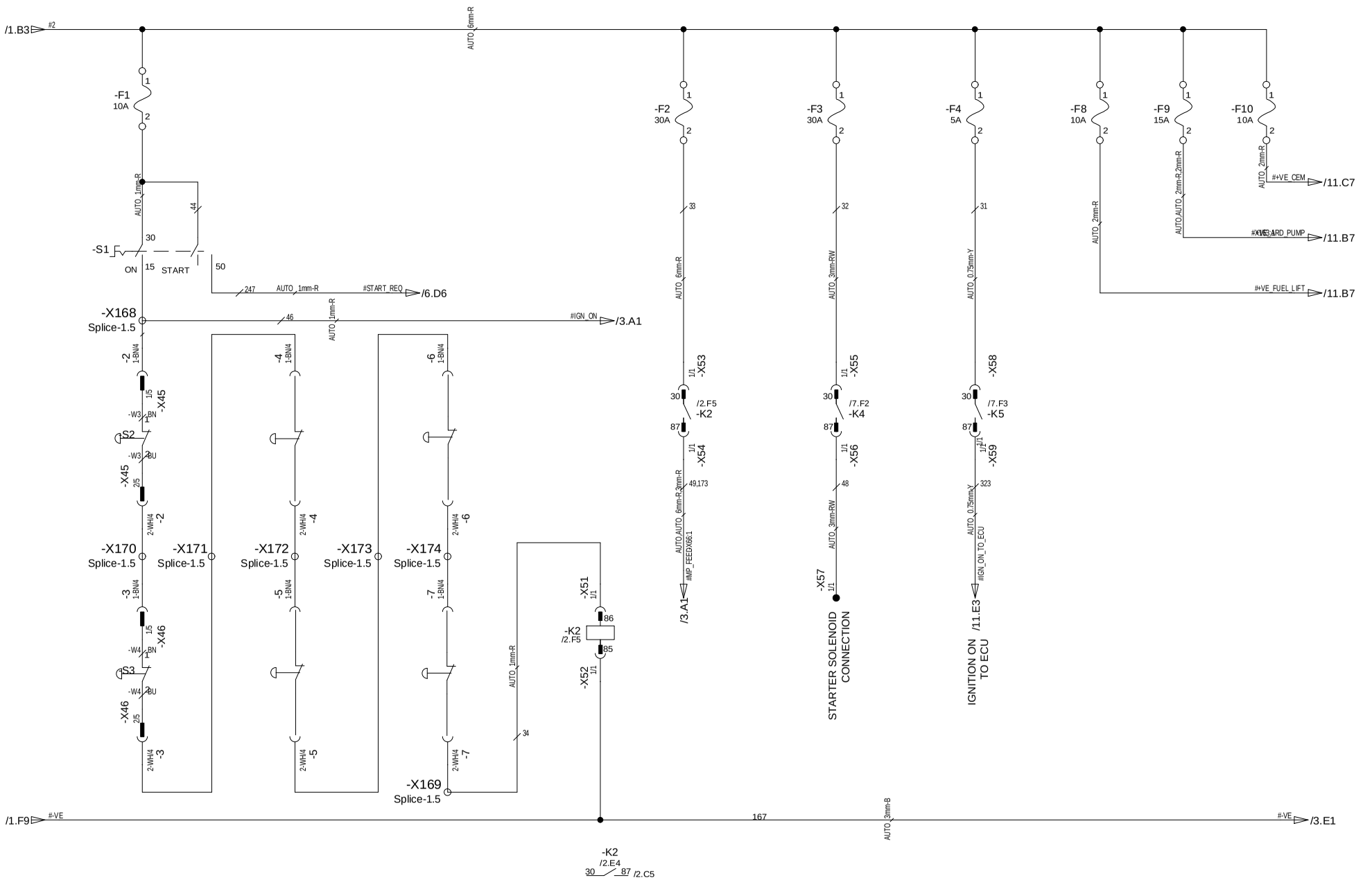
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Changing drawing only in the E3!							Date	Name
	7							
	6							
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User		
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB			
	Revision	ECO	Revision text	Date	Name	Proved		

TEREX

Type	Description: Electrical Kit	Assignment
M.-Nr.: CAT C7.1 T4	MAIN BATTERY CONNECTIONS	Location
	Drawing number 60552342	Sheet 1
		No. 17 Sh.

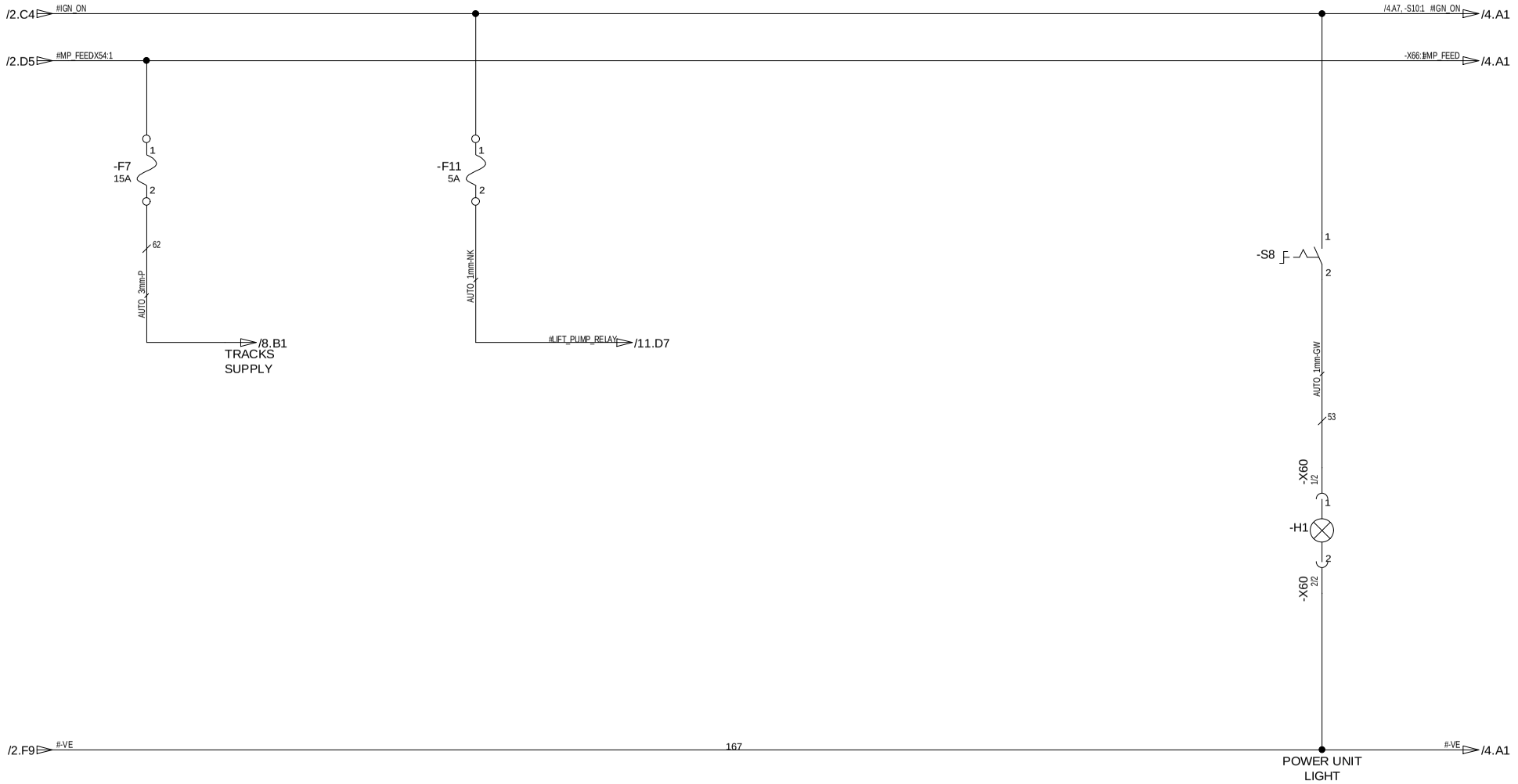


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Changing drawing only in the E3!							Date	Name
	7							
	6							
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User		
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB			
	Revision	ECO	Revision text	Date	Name	Proved		

TEREX

Type	Description: Electrical Kit	Assignment
M.-Nr.: CAT C7.1 T4	Control Panel Schematics	Location
	Drawing number 60552342	Sheet 2
		No. 17 Sh.

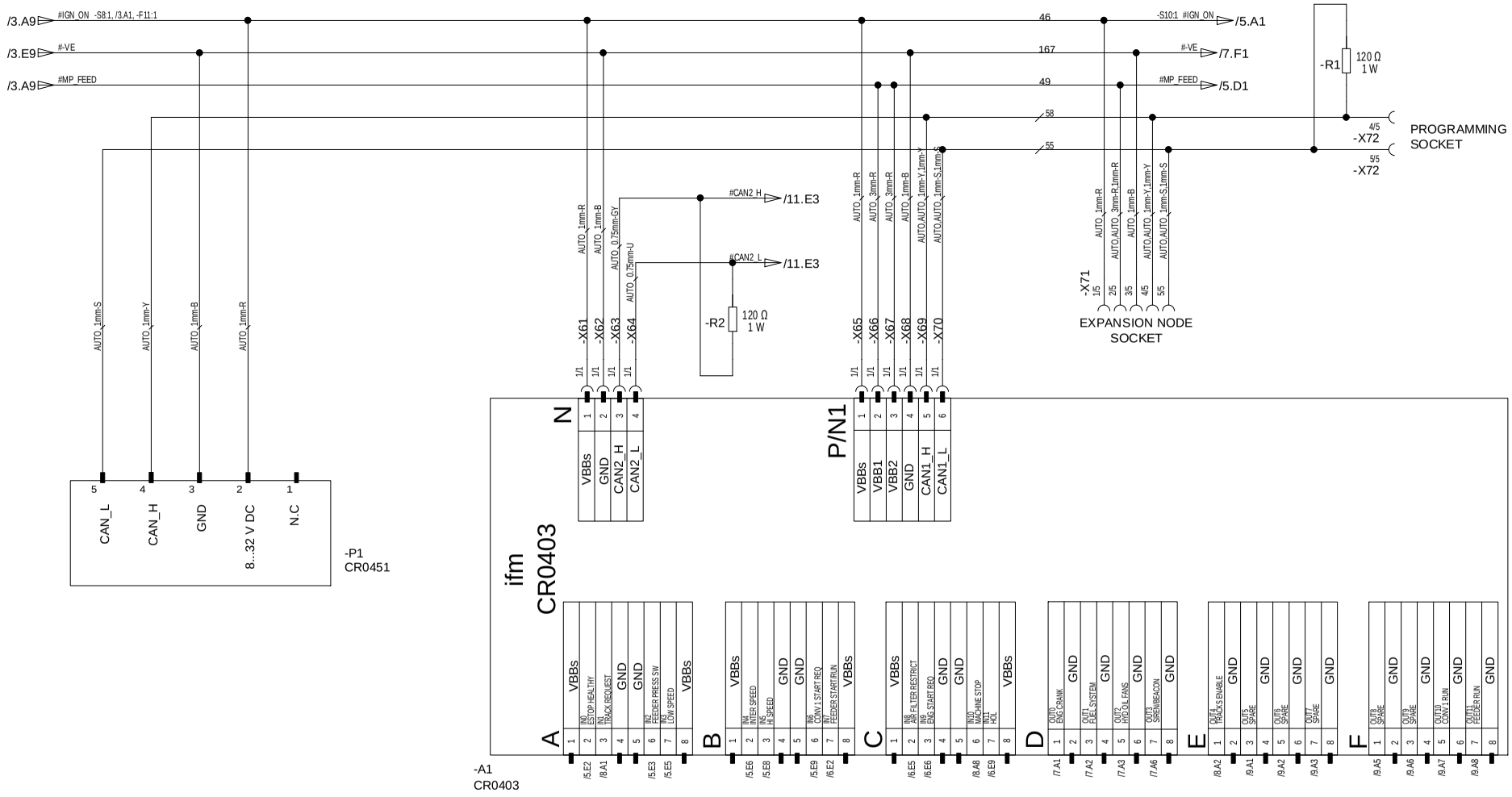


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Changing drawing only in the E3!							Date	Name
	7							
	6							
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User		
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB			
	Revision	ECO	Revision text	Date	Name	Proved		

TEREX

Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Control Panel Schematics	Assignment	
		Location	
	Drawing number 60552342	Sheet 3	
		No. 17 Sh.	

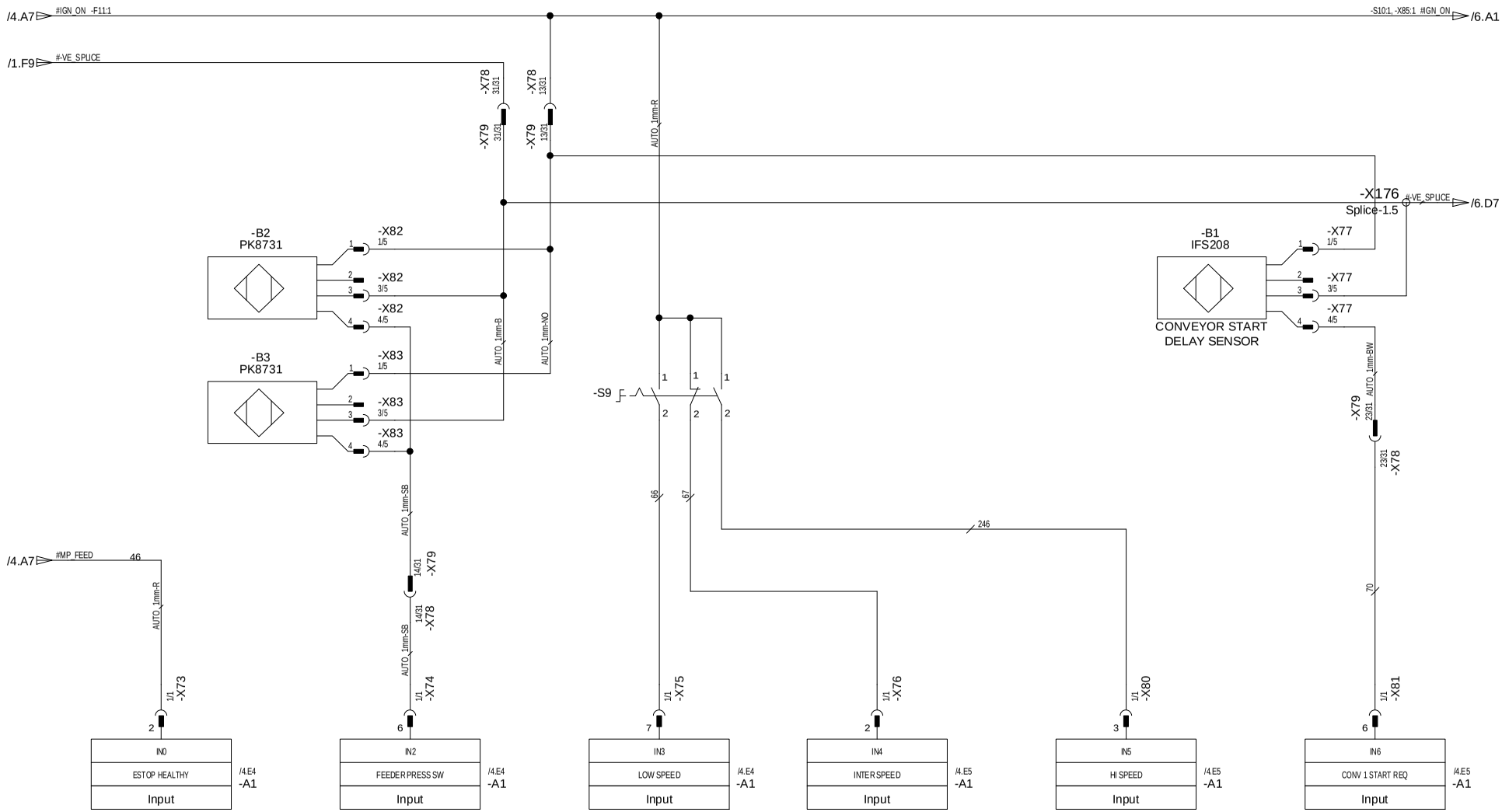


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Changing drawing only in the E3!						Date	Name
	7						
	6						
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User	
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB	Proved	
	Revision	ECO	Revision text	Date	Name		

TEREX

Type	Description: Electrical Kit	Assignment
M.-Nr.: CAT C7.1 T4	Control Panel Schematics	Location
	Drawing number 60552342	Sheet 4
		No. 17 Sh.



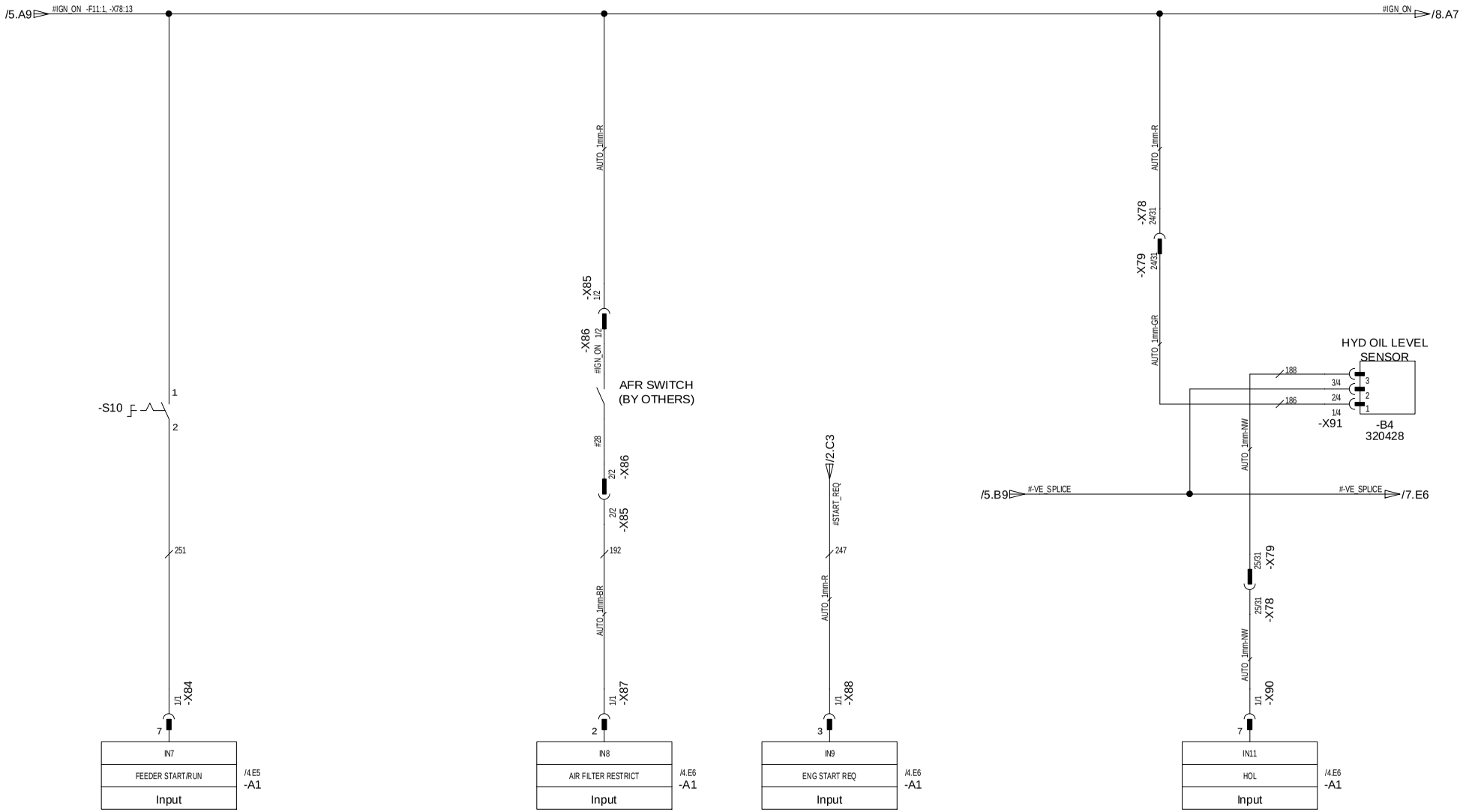
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Changing drawing only in the E3!							Date	Name
	7							
	6							
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User		
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB	Proved		
	Revision	ECO	Revision text	Date	Name			

TEREX

Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Control Panel Schematics	Assignment	
		Location	
	Drawing number 60552342	Sheet 5	
		No. 17 Sh.	

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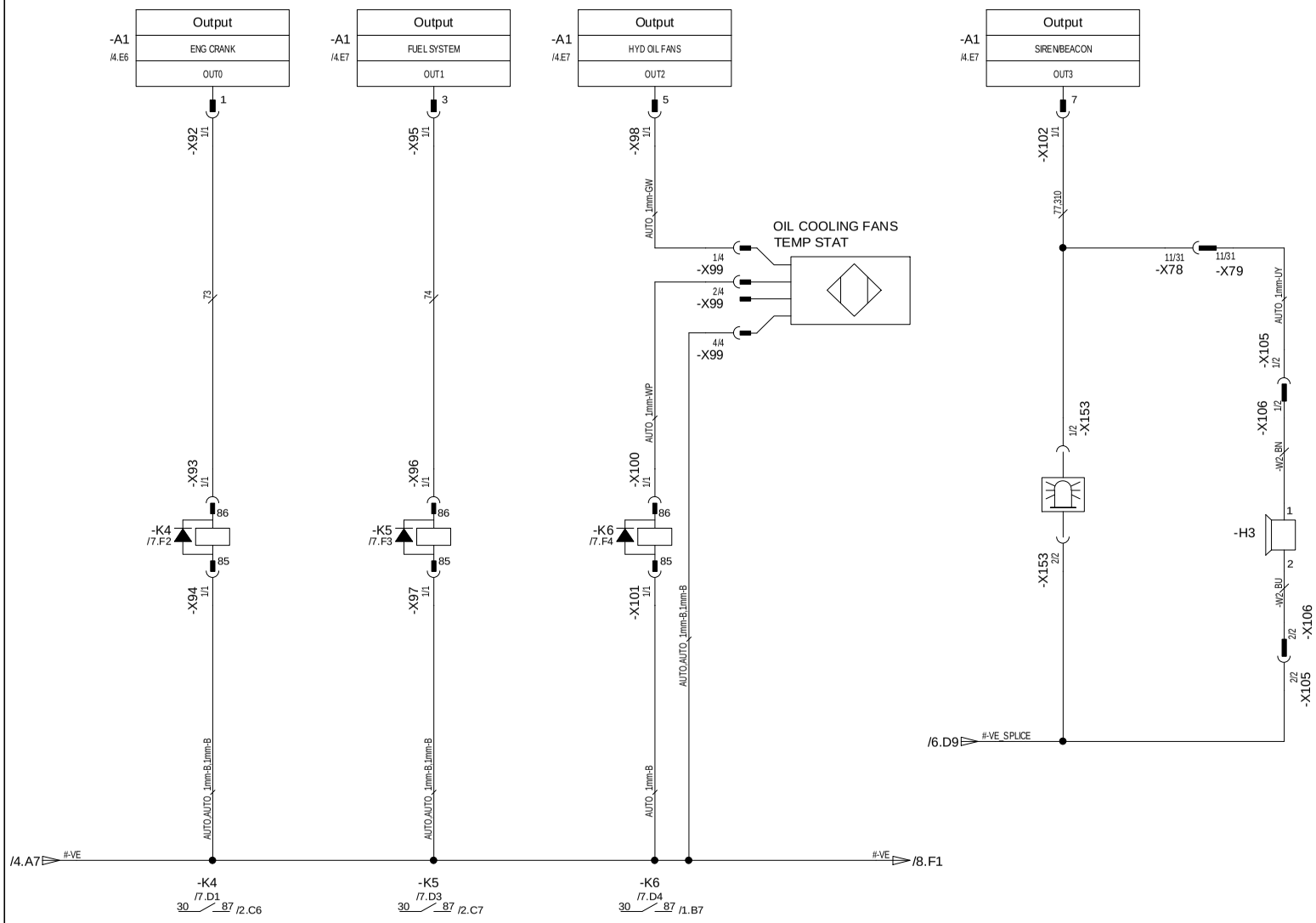


Changing drawing only in the E3!							Date	Name
	7							
	6							
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User		
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB			
	Revision	ECO	Revision text	Date	Name	Proved		

TEREX

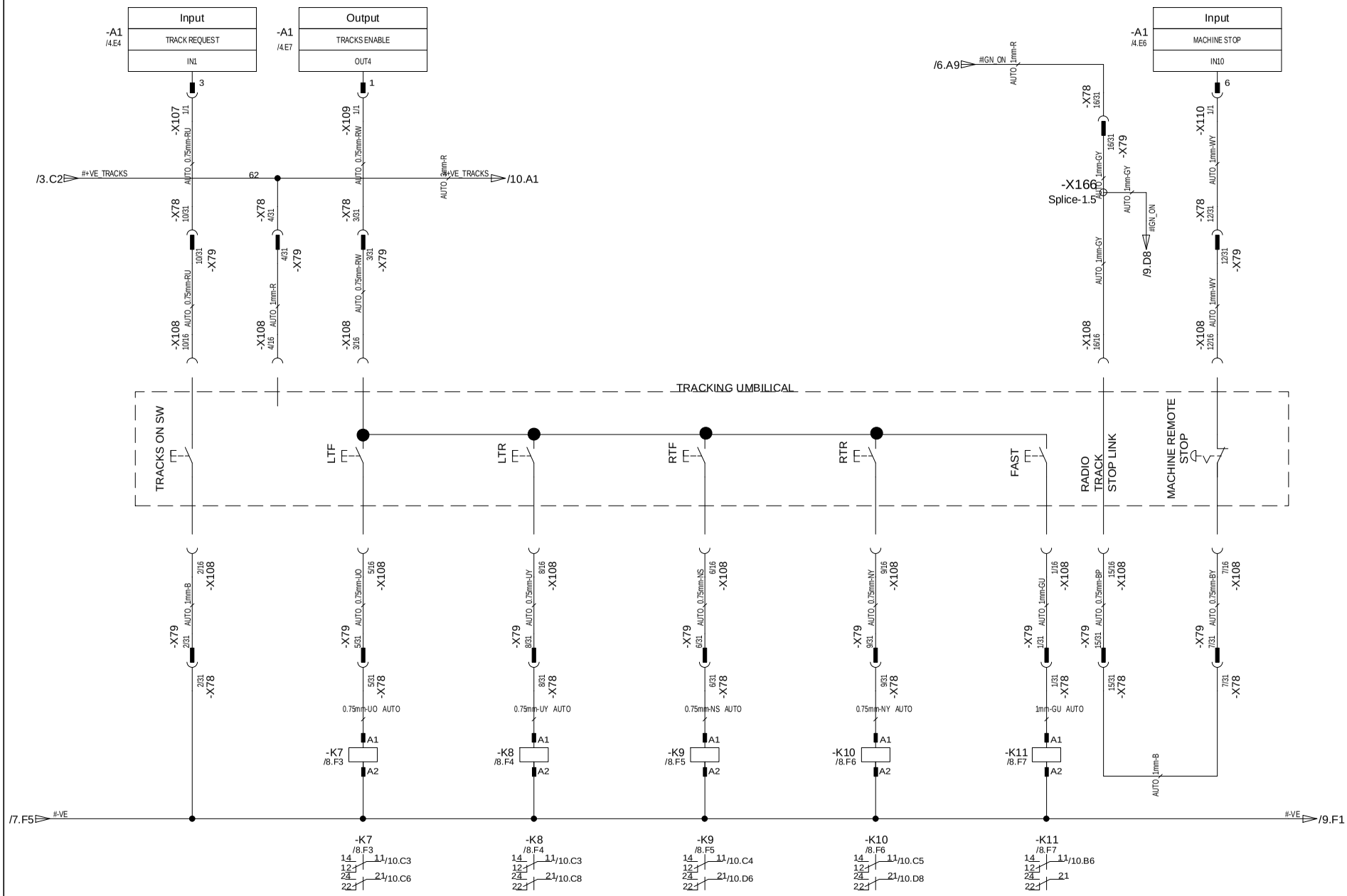
Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Control Panel Schematics	Assignment Location	
	Drawing number 60552342	Sheet 6 No. 17 Sh.	

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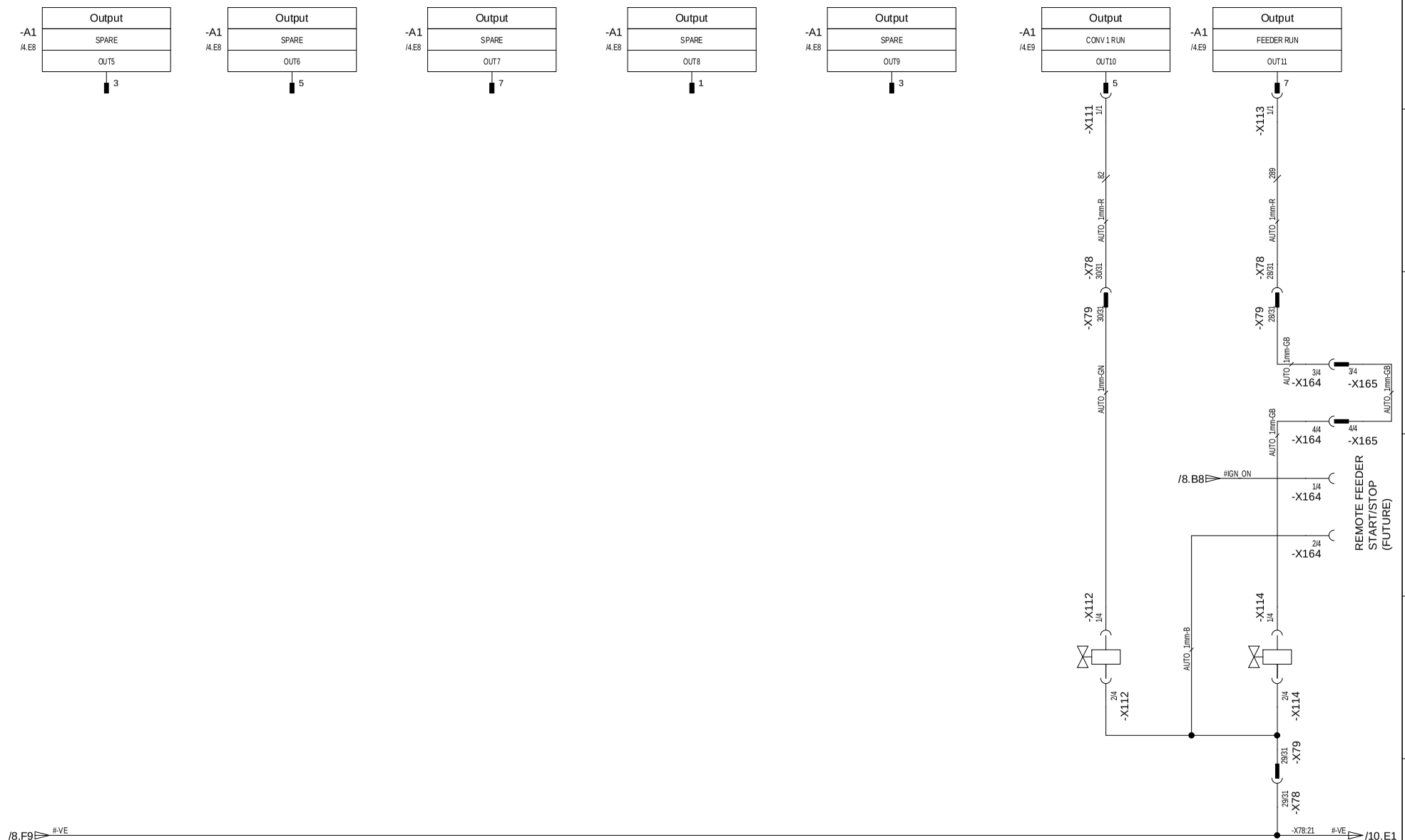
Changing drawing only in the E3!							Date	Name	TEREX	Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Control Panel Schematics	Assignment
	7											Location
	6										Drawing number 60552342	Sheet 7
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User						No. 17 Sh.
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB	Proved						
	Revision	ECO	Revision text	Date	Name							

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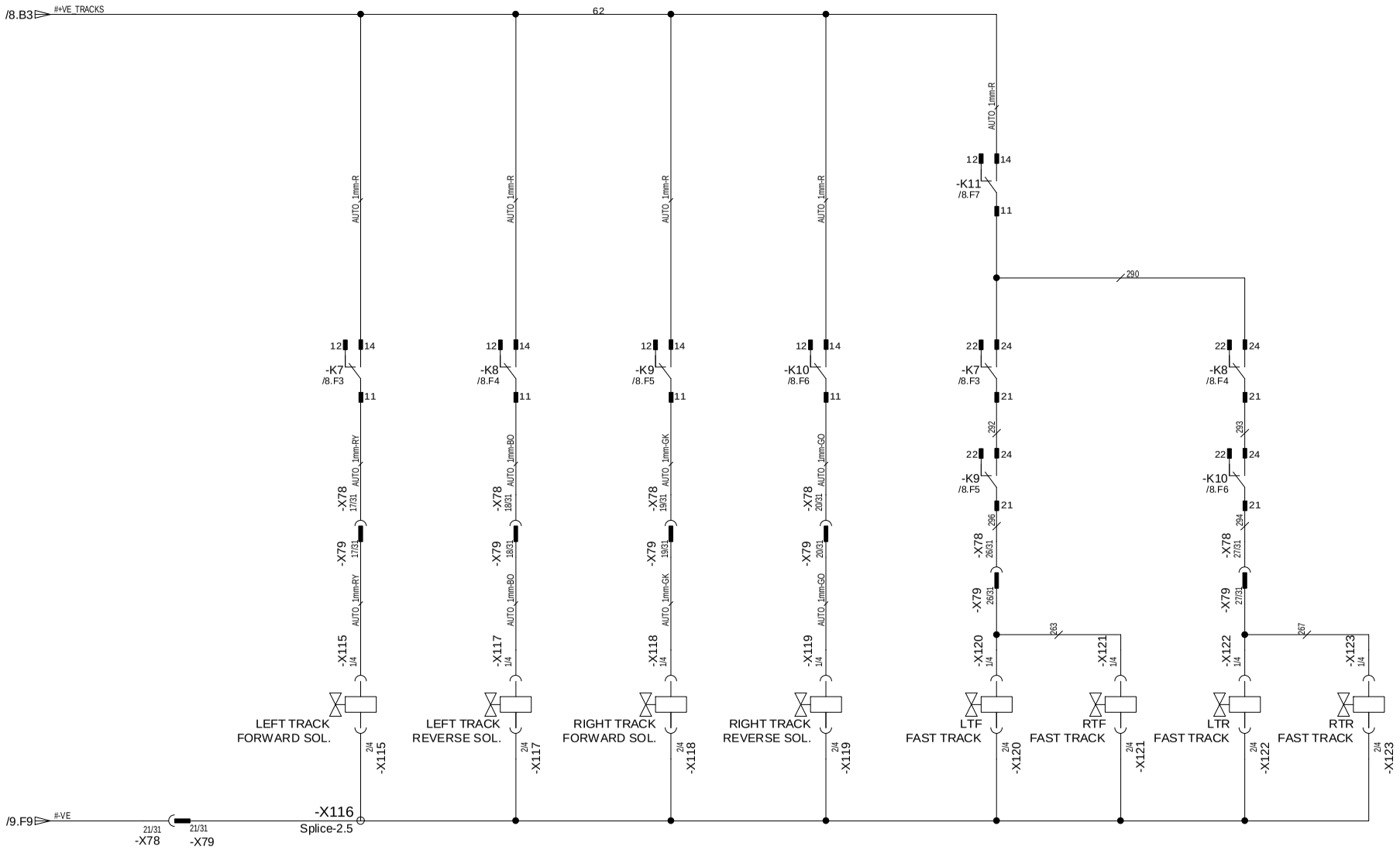
Changing drawing only in the E3!							Date	Name	TEREX	Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Control Panel Schematics	Assignment
	7											Location
	6											
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User					Drawing number 60552342	Sheet 8
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB	Proved						No. 17 Sh.
	Revision	ECO	Revision text	Date	Name							

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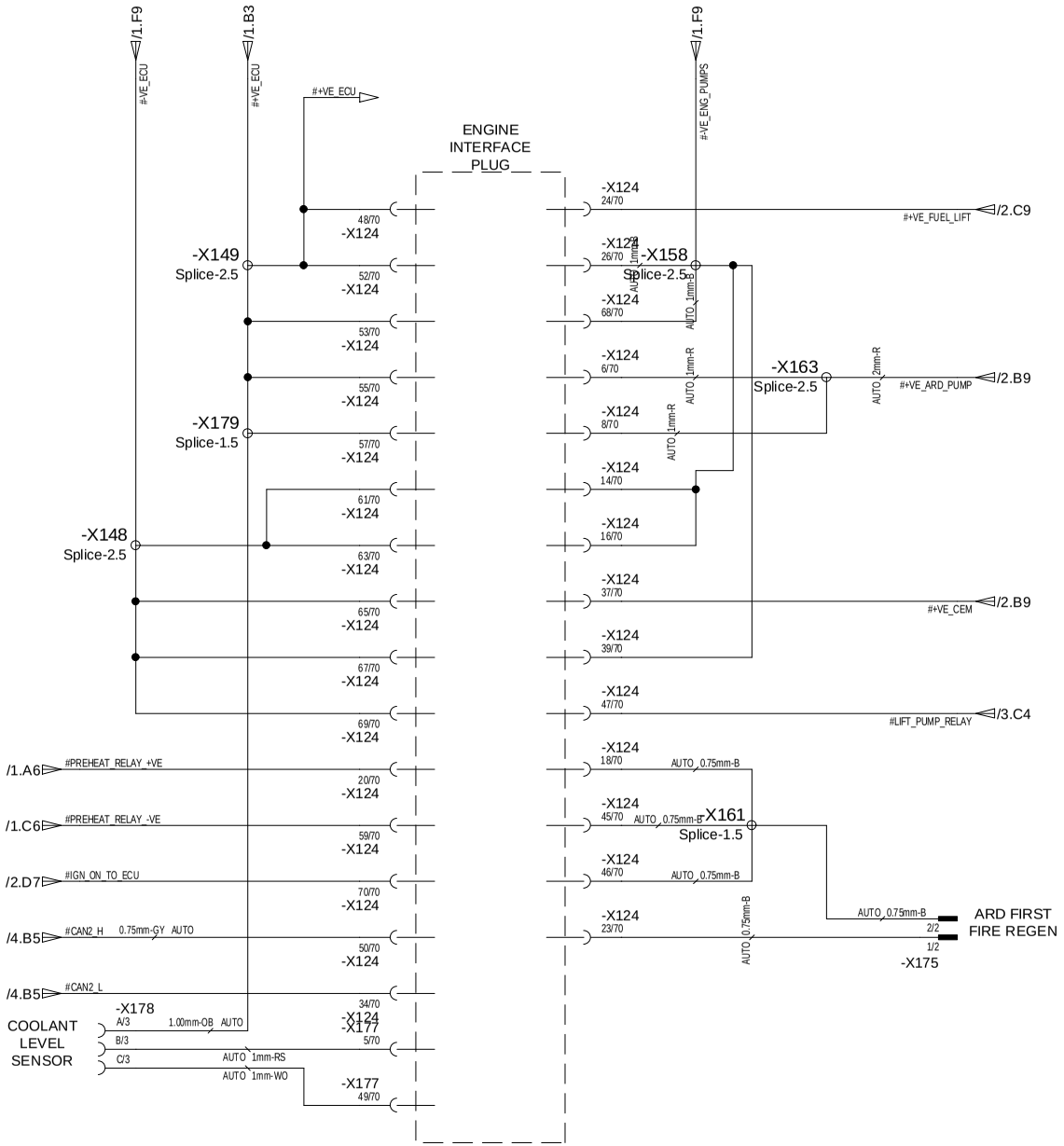


Changing drawing only in the E3!							Date	Name		Type	Description: Electrical Kit	Assignment
	7									M.-Nr.: CAT C7.1 T4	Control Panel Schematics	Location
	6											
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User			TEREX		Drawing number 60552342	Sheet 9
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB							No. 17 Sh.
	Revision	ECO	Revision text	Date	Name	Proved						

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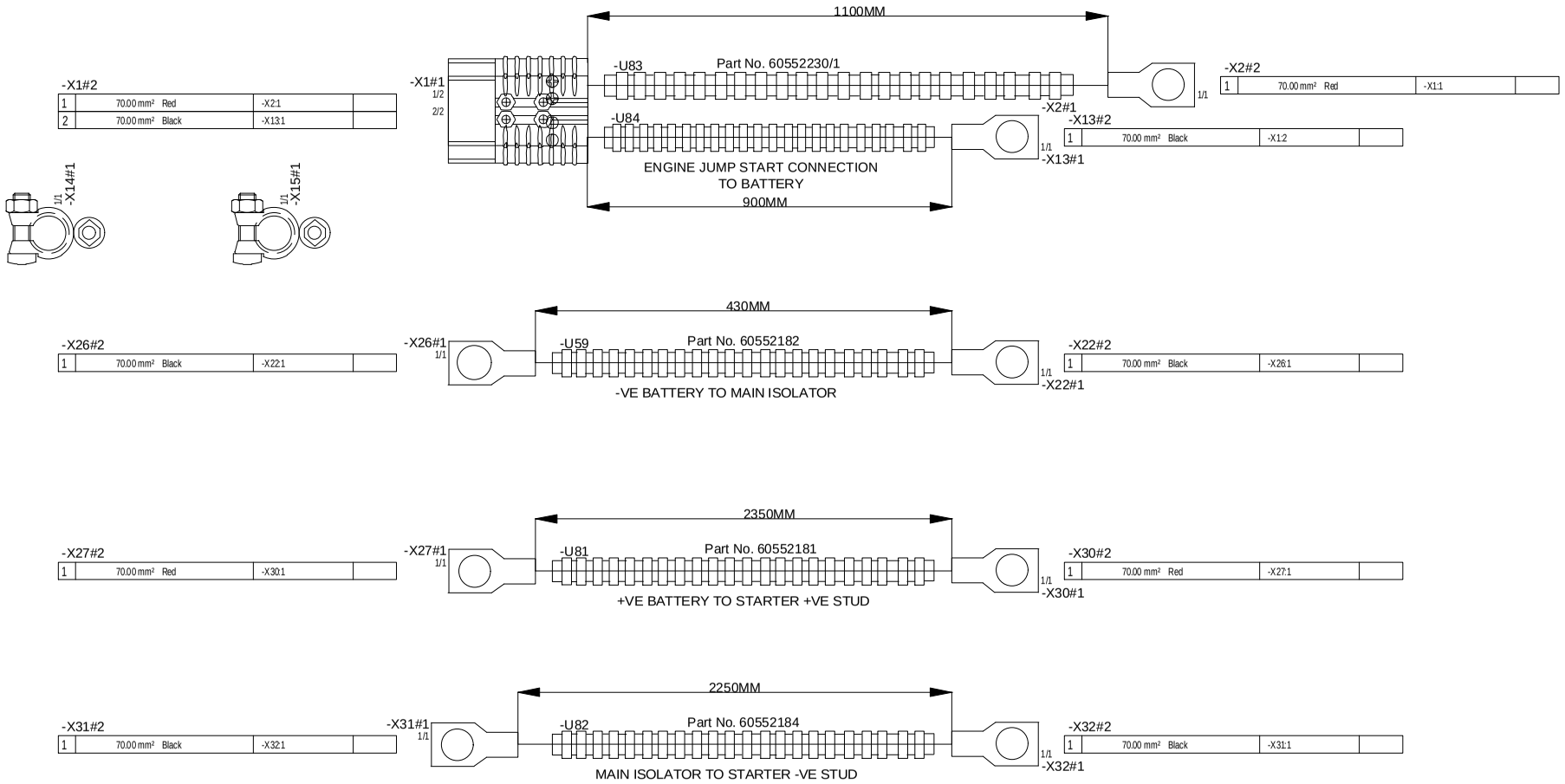


Changing drawing only in the E3!							Date	Name	TEREX	Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Control Panel Schematics	Assignment
	7											Location
	6										Drawing number 60552342	Sheet 10
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User						No. 17 Sh.
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB	Proved						
	Revision	ECO	Revision text	Date	Name							



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Changing drawing only in the E3!							Date	Name		Type	Description: Electrical Kit	Assignment
	7								TEREX	M.-Nr.: CAT C7.1 T4	Control Panel Schematics	Location
	6											Sheet 11
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User					Drawing number 60552342	No. 17 Sh.
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB							
	Revision	ECO	Revision text	Date	Name	Proved						



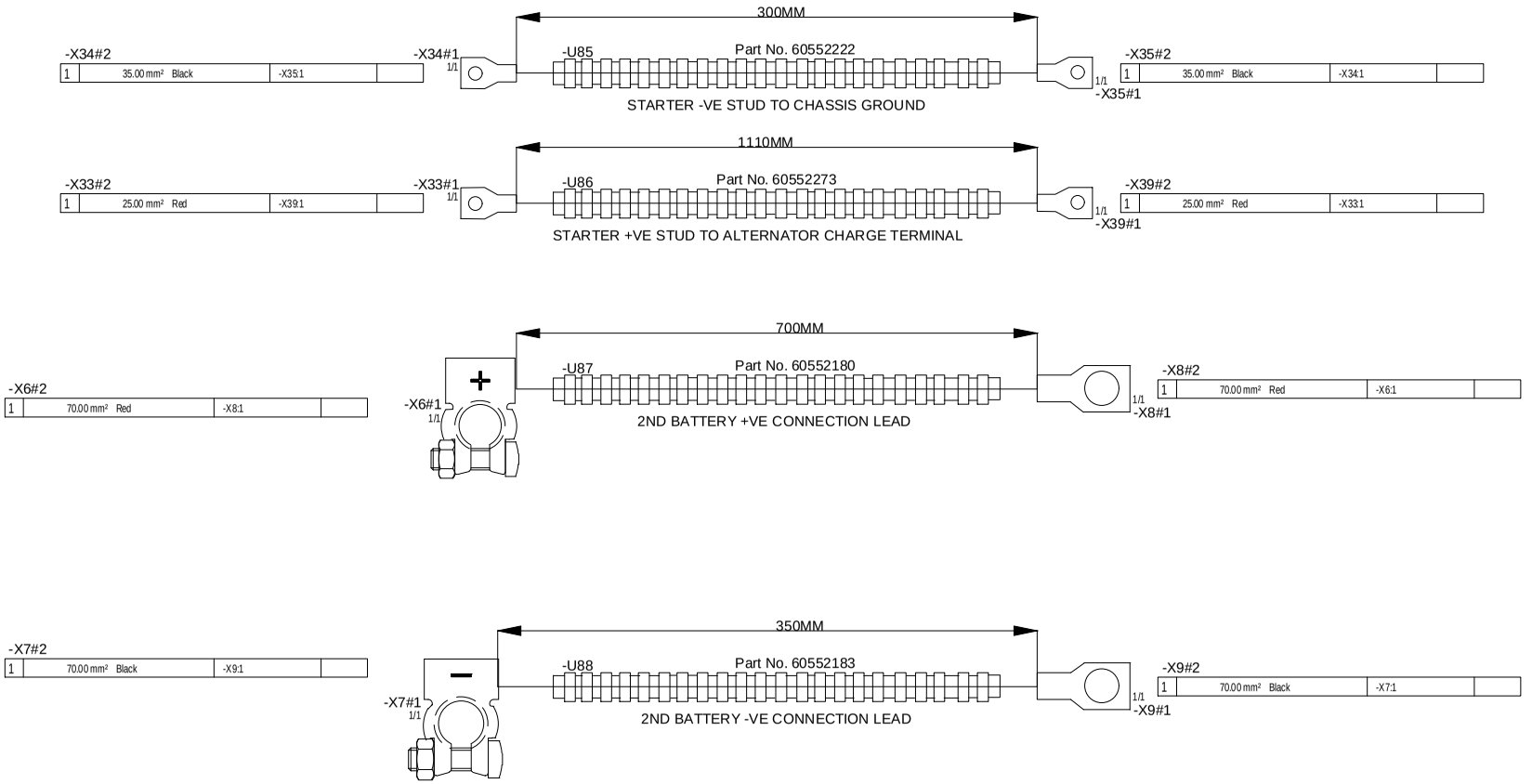
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Changing drawing only in the E3!							Date	Name
	7							
	6							
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User		
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB	Proved		
	Revision	ECO	Revision text	Date	Name			

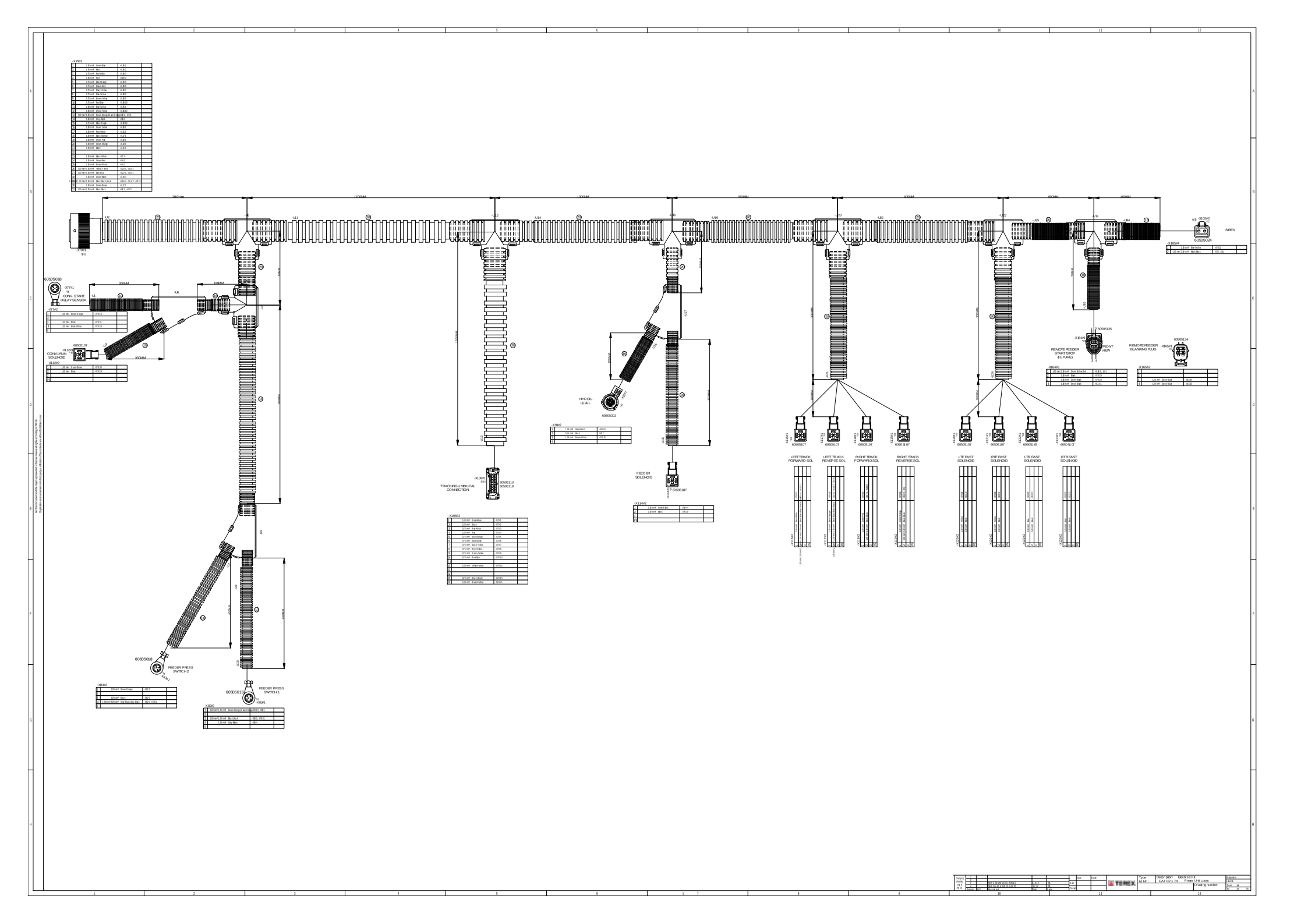
TEREX

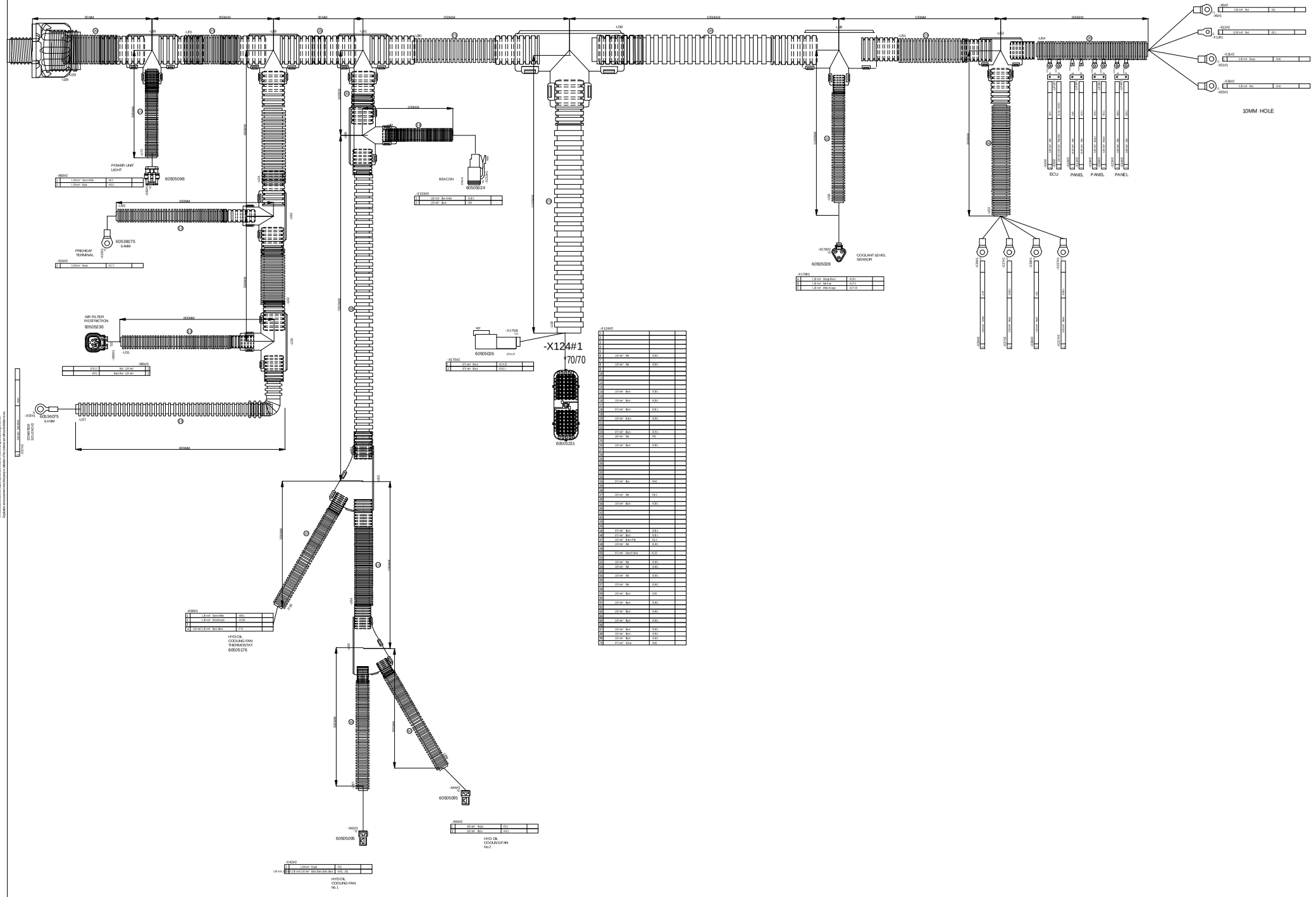
Type	Description: Electrical Kit	Assignment
M.-Nr.: CAT C7.1 T4	Battery Leads	Location
	Drawing number 60552342	Sheet 12
		No. 17 Sh.

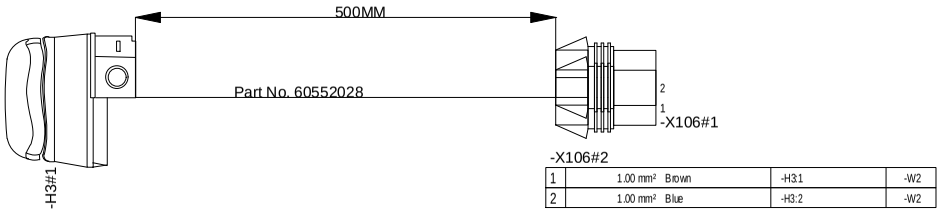
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Changing drawing only in the E3!							Date	Name	TEREX	Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Battery Leads	Assignment
	7											Location
	6											Sheet 13
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User					Drawing number 60552342	
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB							No. 17 Sh.
	Revision	ECO	Revision text	Date	Name	Proved						

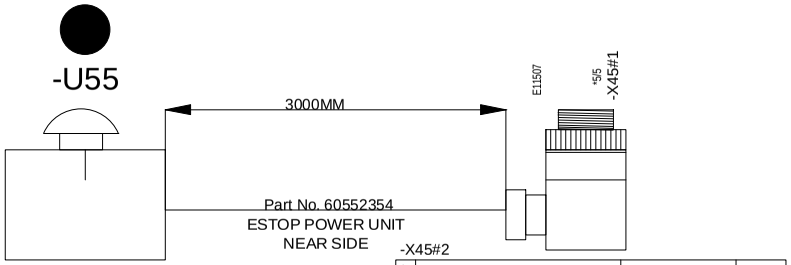

-X79/2
-U0
-U1
-U2
-U14
-U18
-U19
-U20
-U22
-U23
-U5
-U9
-U4
-X105/3
SIREN
60505034
-X105/4
-X79/1
CONV. START RELAY SENSOR
60505018
-X112/1
CONV.I.RUN SOLENOID
60505107
-X112/2
-X39/2
HYD OIL LEVEL
60505202
-X108/1
TRACKING UMBILICAL CONNECTION
60505113
60505116
-X114/2
FEEDER SOLENOID
60505107
-X83/2
REEDER PRESS SWITCH2
60505018
REEDER PRESS SWITCH 1
-X83/1
-X82/2
-X105/1
-X105/2
-X104/1
-X104/2
REMOTE FEEDER START/STOP (FUTURE)
REMOTE FEEDER BLANKING PLUG
60505135
60505134
-X1354
-X1355
-X1356
-X1357
LEFT TRACK FORWARD SOL
LEFT TRACK REVERSE SOL
RIGHT TRACK FORWARD SOL
RIGHT TRACK REVERSE SOL
LTF FAST SOLENOID
RTF FAST SOLENOID
LTR FAST SOLENOID
RTR FAST SOLENOID
60505107
60505107.07
350mm
300mm
1700MM
1000MM
550MM
400MM
800MM
2500MM
1500MM
3000MM
4000MM
Type
Description
Electrical Kit
CAT C7.1 T4
Power Unit Loom
Drawing number
Assembly drawing
Sheet
of
Rev


10MM HOLE
ECU
PANEL
PANEL
PANEL
POWER UNIT
LIGHT
60505098
BEACON
60505024
PREHEAT
TERMINAL
60539075
6.4MM
AIR FILTER
RESTRICTION
60505236
60636075
6.4MM
STARTER
SOLENOID
-X124#1
170/70
60505231
60505026
COOLANT LEVEL
SEN45R
60505028
HYD OIL
COOLING FAN
THERMOSTAT
60505176
HYD OIL
COOLING FAN
No 2
60505095
HYD OIL
COOLING FAN
No 1
60505095
-X124#2
-X124#1
-X17#1
-X17#2
-X17#3
-X17#4
-X17#5
-X17#6
-X17#7
-X17#8
-X17#9
-X17#10
-X17#11
-X17#12
-X17#13
-X17#14
-X17#15
-X17#16
-X17#17
-X17#18
-X17#19
-X17#20
-X17#21
-X17#22
-X17#23
-X17#24
-X17#25
-X17#26
-X17#27
-X17#28
-X17#29
-X17#30
-X17#31
-X17#32
-X17#33
-X17#34
-X17#35
-X17#36
-X17#37
-X17#38
-X17#39
-X17#40



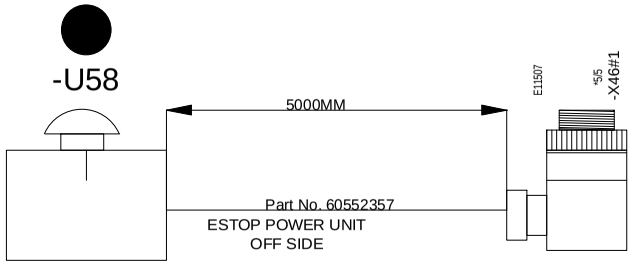
-X106#2

1	1.00 mm² Brown	-H3:1	-W2
2	1.00 mm² Blue	-H3:2	-W2



-X45#2

1	1.00 mm² Brown	-S2:1	-W3
2	1.00 mm² Blue	-S2:2	-W3
3			
4			
5			



-X46#2

1	1.00 mm² Brown	-S3:1	-W4
2	1.00 mm² Blue	-S3:2	-W4
3			
4			
5			

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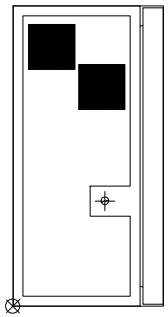
Changing drawing only in the E3!					
	7				
	6				
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB
	Revision	ECO	Revision text	Date	Name

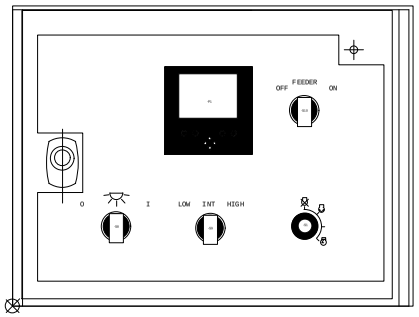
	Date	Name
User		
Proved		

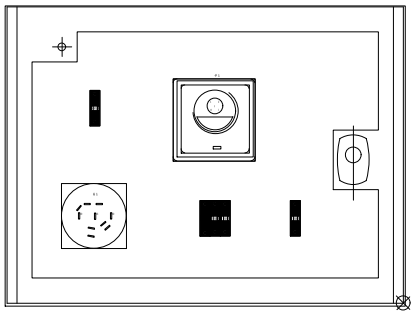
TEREX

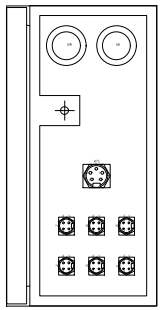
Type M.-Nr.: CAT C7.1 T4	Description: Electrical Kit Chassis Cables		Assignment
			Location
		Drawing number 60552342	Sheet 16
			No. 17 Sh.

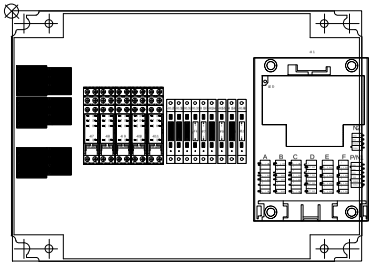
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Changing drawing only in the E3!							Date	Name		Type	Description: Electrical Kit	Assignment
	7								TEREX	M.-Nr.: CAT C7.1 T4	BACKPLATE LAYOUT	Location
	6											
	5		NEW COOLANT LEVEL WIRING	11.9.12	SB	User					Drawing number 60552342	Sheet 17
	4		NEW PLUGS & WIRE COLOURS	6.7.12	SB							
	Revision	ECO	Revision text	Date	Name	Proved						No. 17 Sh.

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-K1

CR2033

Device filter location changed

5050143225

Node-ID=

Channel 7		Channel 8	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

Channel 5 FOLDING SENSOR No.3		Channel 6 FOLDING SOLENOID No.3	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

Channel 3 FOLDING SENSOR No.2		Channel 4 FOLDING SOLENOID No.2	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

Channel 1 CONVEYOR No.2 DELAY SENSOR		Channel 2 CONVEYOR No.2 RUN SOLENOID	
1	L+	L+	1
2	IN ◢	IN ◢	2
3	L-	L-	3
4	IN ⎍	OUT	4
5	Shell	Shell	5

/1.C3 /1.C4

1	GNDs	GNDs 1
2	+VBBc	+VBBc 2
3	CAN_GND	CAN_GND 3
4	CAN_H	CAN_H 4
5	CAN_L	CAN_L 5

CAN_H	CAN_L	GNDs	GNDo	+VBBo	+VBBs	+VBBc
1	2	3	4	5	6	7

-W116 3 4 -W116 G/Y -W116 2 1

-1 1/5 2/5 3/5 4/5 5/5

-B3 IFS208

-X212 1/5 3/5 4/5

-W111 1 -W111 2 -W111 3

-X213 1/5 3/5 4/5

CH1 1 2 3 4 5

L+ | IN (Analog) | L- | IN (Dig)/OUTPUT | Shell

/1.D1 -K1 Channel 1 CONVEYOR No.2 DELAY SENSOR

5050143225

-X218 1/4 2/4 3/4 PE/4

-W114 2 -W114 1

-X219 3/5 4/5

CH2 1 2 3 4 5

L+ | IN (Analog) | L- | IN (Dig)/OUTPUT | Shell

/1.D2 -K1 Channel 2 CONVEYOR No.2 RUN SOLENOID

5050143225

Changing drawing only in the E3!							Date	Name
	3							
	2							
	1		NODE PWR CONNECTION CHANGED	23.3.12	CD	User		
	0		FIRSTDRAFT	3.1.12	CD			
	Revision	ECO	Revision text	Date	Name	Proved		

TEREX

Type C7.1 T4 PU
M.-Nr.:

Description: Electrical Kit
H6203 EXPANSION NODE KIT

Drawing number

Assignment
Location
Sheet 1
No. 2 Sh.

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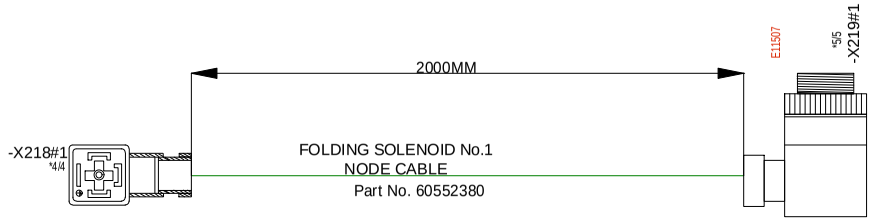
NODE SETTINGS:		
S1	S2	S3
3	0	2



NOTE:
REMOVE JUMPER LINK
BETWEEN TERMINALS
5,6&7

-1#2

1	1.50 mm² Black	-K1:6	-W116
2	1.50 mm² Black	-K1:5	-W116
3	1.50 mm² Green-Yellow	-K1:4	-W116
4	1.50 mm² Black	-K1:1	-W116
5	1.50 mm² Black	-K1:2	-W116

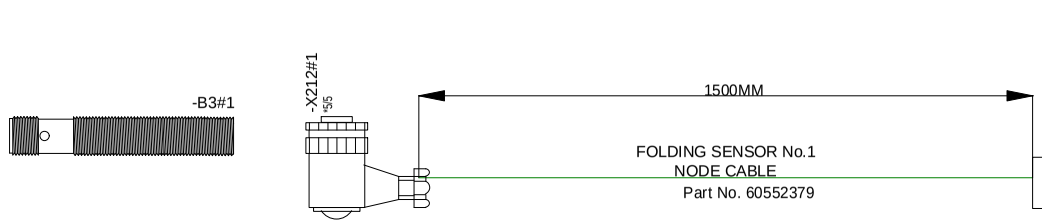


-X218#2

1	1.00 mm² Black	-X219:4	-W114
2	1.00 mm² Black	-X219:3	-W114
3			
PE			

-X219#2

1			
2			
3	1.00 mm² Black	-X218:2	-W114
4	1.00 mm² Black	-X218:1	-W114
5			



-X212#2

1	1.00 mm² Black	-X213:1	-W111
2			
3	1.00 mm² Black	-X213:3	-W111
4	1.00 mm² Black	-X213:4	-W111
5			

-X213#2

1	1.00 mm² Black	-X212:1	-W111
2			
3	1.00 mm² Black	-X212:3	-W111
4	1.00 mm² Black	-X212:4	-W111
5			

Changing drawing only in the E3!	3							Date	Name
	2								
	1		NODE PWR CONNECTION CHANGED	4.0.1.0	CD		User		
	0		FIRSTDRAFT	3.1.1.2	CD		Proved		
	Revision	ECO	Revision text	Date	Name				

TEREX

Type C7.1 T4 ESS
M.-Nr.:

Description: Electrical Kit
H6203 EXPANSION NODE KIT

Drawing number

Assignment
Location
Sheet 2
No. 2 Sh.

(5) Tier 4 Dual Power Schematics

(See the following pages.)

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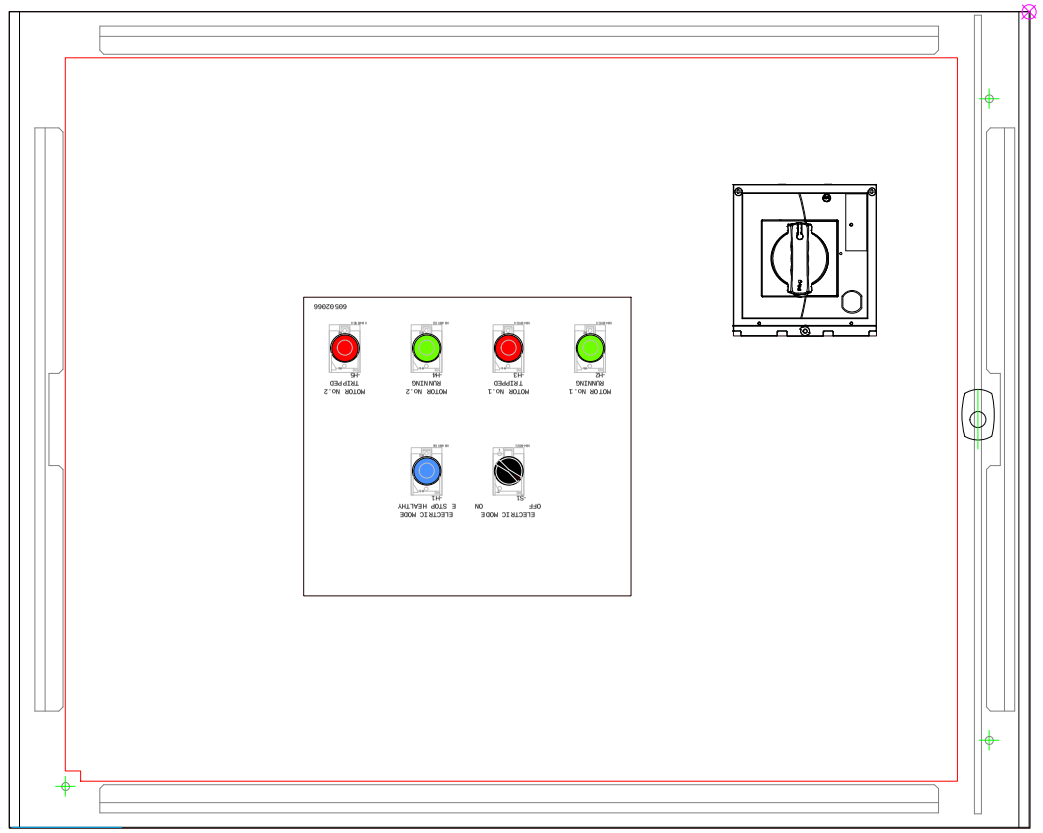
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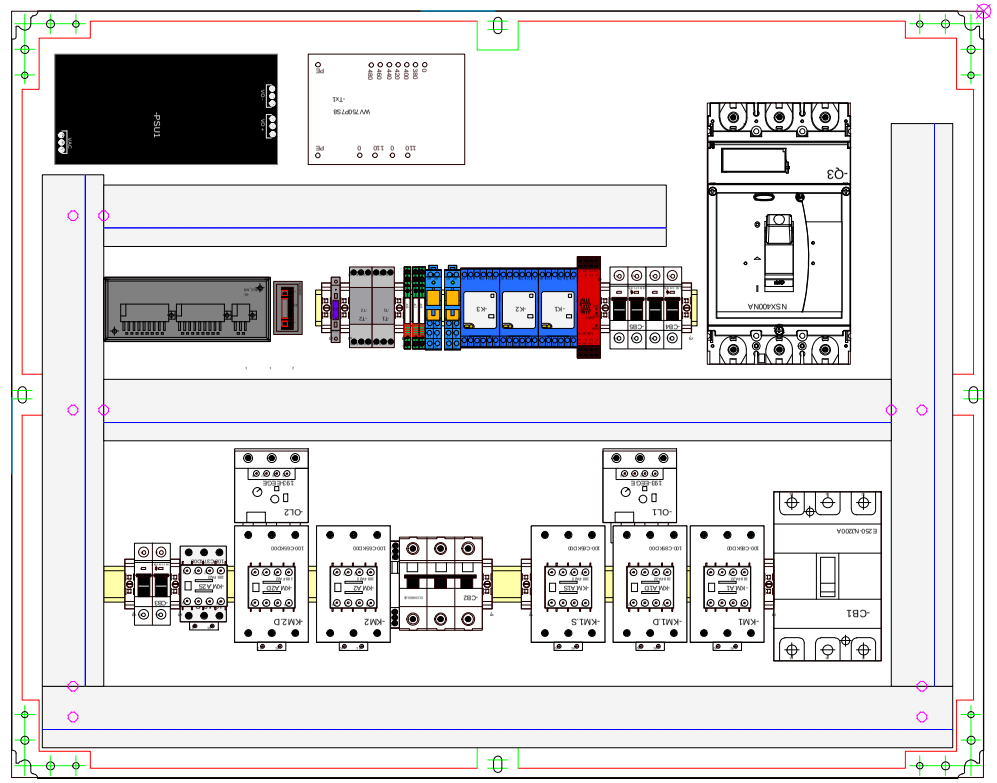
Changing drawing only in the E3!						
	Revision	ECO	Revision text	Date	Name	
3						
2						
1			PRSTDRAFT	23.5.12	CD	
0						

	Date	Name		Proved
			User	

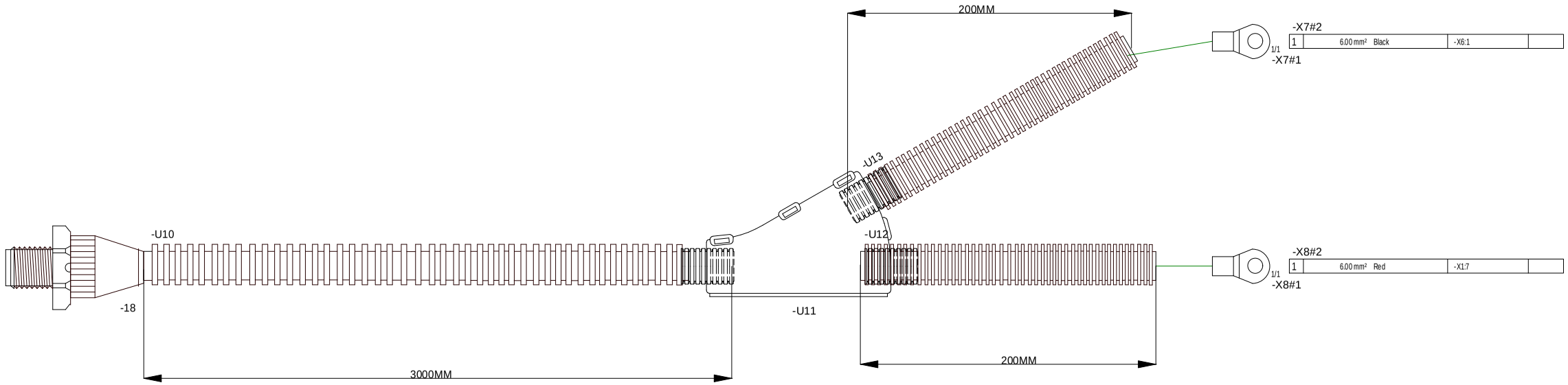
TEREX

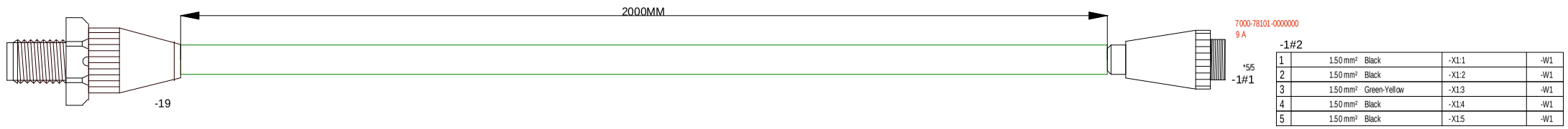
Type M.-Nr.:	Description: T4 DUAL POWER AC PANEL (37KW+37KW)		Drawing number 60552415.0
Assignment			
Location			
Sheet 1			
No. 8			Sh.




-Q3
-Q61
-KA1 D
-KA2 D
-KA2
-KA1 S
-KA1 D
-KA1

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1	1.50 mm² Black	-X1:1	-W1
2	1.50 mm² Black	-X1:2	-W1
3	1.50 mm² Green-Yellow	-X1:3	-W1
4	1.50 mm² Black	-X1:4	-W1
5	1.50 mm² Black	-X1:5	-W1

Changing drawing only in the E3!	3						Date	Name	TEREX
	2					User			Type M.-Nr.:
	1					Proved			Description: T4 DUAL POWER AC PANEL (37KW+37KW)
	0								Drawing number 60552415.0
	Revision	ECO	Revision text	Date	Name				Sheet 2 No. 8 Sh.

Assignment
Location

AC Control Panel Internal Wiring Colour Code Guide	
Mains L1 (230/415VAC)	Brown (or Black flagged Brown or L1 at Terminal)
Mains L2 (230/415VAC)	Black (or Black flagged L2 at Terminal)
Mains L3 (230/415VAC)	Grey (or Black flagged Grey or L3 at Terminal)
Mains Neutral (230/415VAC)	Blue
Protective Conductor	Green/Yellow
110VAC	Yellow
24VDC	Grey
12VDC	Green
Analogue (0-10V, 4-20mA)	Orange
CAN H (CANBus)	Pink — Twisted
CAN L (CANBus)	White — Twisted
Volt Free Contacts to Field	Violet (Purple)

HYD. PUMP No.1
MOTOR
75kW 400V/50Hz
138AflC

HYD. PUMP No.2
MOTOR
55kW 400V/50Hz
105AflC

-Q3
NSX400NA
/5.B11

-CB1
E250-NJ200A
Set at ?? Amps
000348
/6.F6
/6.C2
-CB.A1.1
-CB.A1

-KM1
100-C85KD00
/6.I1
-KM.A1
100-FA22

-KM1.D
100-C85KD00
/6.I3
-KM.A1D
100-FA22

-KM1.S
100-C65KD00
/6.I4
-KM.A1S
100-FA22

-KM2
100-C65KD00
/7.I2
-KM.A2
100-FA22

-KM2.D
100-C65KD00
/7.I4
-KM.A2D
100-FA22

-KM2.S
100-C37KD00
/7.I4
-KM.A2S
100-FA22

-CB2
C120HD3125
125A
26929
-CB.A2

-OL1
193-EEGE
set to 63A

-OL2
193-EEGE
set to 63A

-CB31
/4.A1
-CB32
/4.A1
-CB33
/4.A1

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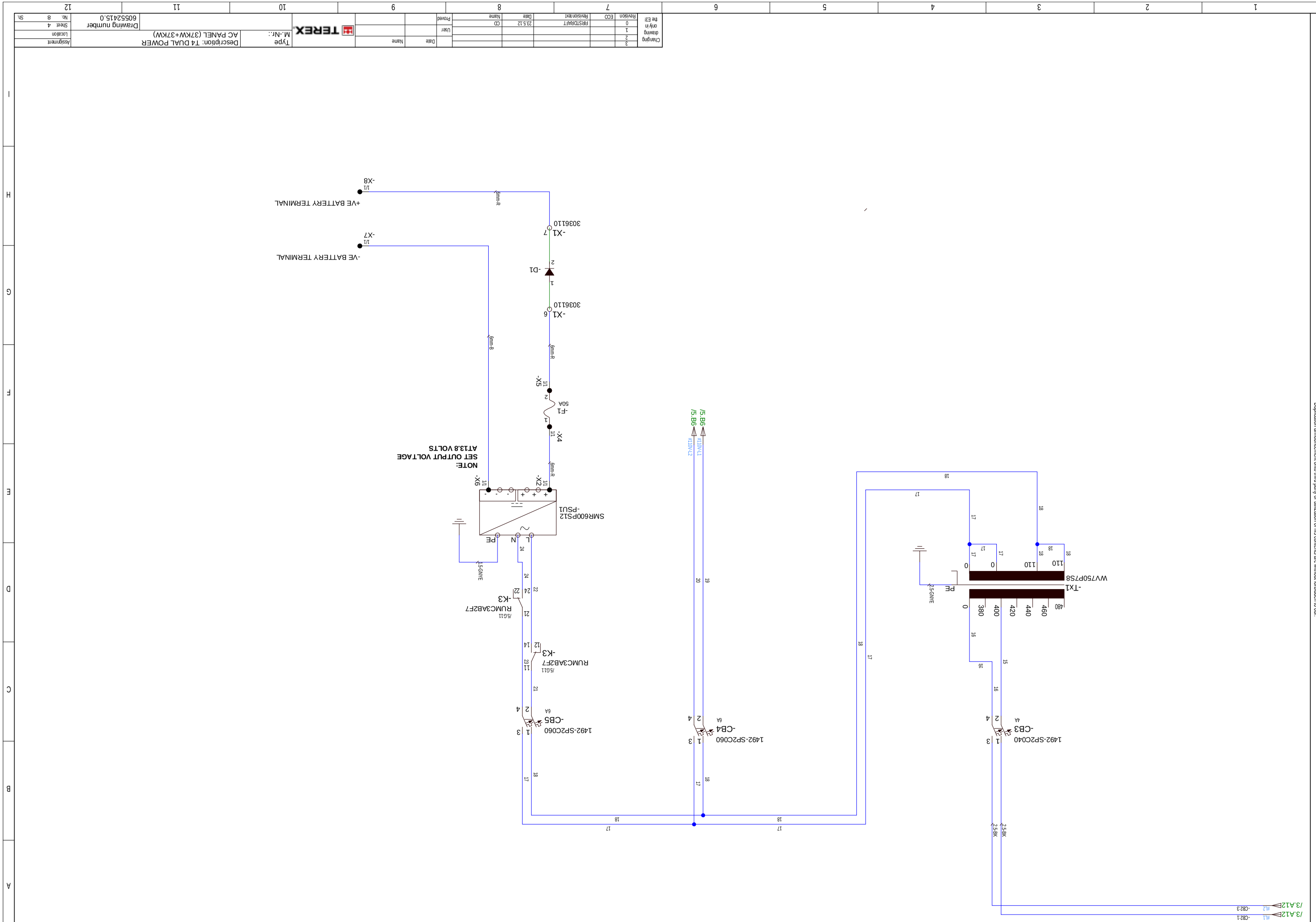
Changing drawing only in the E3!	Rev. Given	ECO	Revision text	Date	Name
3					
2					
1			FRSTDRAFT	23.5.12	CD
0					

Proved			
User			
	Date	Name	

TEREX

Type M.-Nr.:	Description: T4 DUAL POWER		Drawing number
	AC PANEL (37KW+37KW)		60552415.0

Assignment		Sh.
Location		
Sheet	3	
No.	8	



Changing drawing only in the E3!	Revision	ECO	Revision text	Date	Name
	3				
	2		PRSTDRAFT	23.5.12	CD
	1				
	0				

			Date	Name	
			User		
			Proved		

TEREX

Type M.-Nr.:	AC PANEL (37KW+37KW)
Description: T4 DUAL POWER	
Drawing number	60552415.0
Assignment	
Location	
Sheet 4	
No. 8	Sh.

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-A1
/6.B9
purchaser
5050143211

ifm
CR2012

X1
Digital-Eingänge

IN1 HYD PUMP No.1 RUNNING	1	/6.B9
+UB	2	
IN2 HYD PUMP No.1 TRIPPED	3	/6.B10
+UB	4	
IN3 HYD PUMP No.2 RUNNING	5	/7.B8
+UB	6	
IN4 HYD PUMP No.2 TRIPPED	7	/7.B9
+UB	8	
+UB	9	
+UB	10	
IN5	11	
IN6	12	
GND	13	
GND	14	
IN7 / OUT7 HYD PUMP No.1 RUN OP	15	/6.B12
GND	16	
IN8 / OUT8 HYD PUMP No.2 RUN OP	17	/7.B11
GND	18	

X2
Digital-Eingänge

IN9 ELECTRIC MODE SELECTED	1	/8.A3
+UB	2	
IN10 AC PANEL ESTOP HEALTHY	3	/8.A5
+UB	4	
IN11	5	
+UB	6	
IN12	7	
+UB	8	
+UB	9	
+UB	10	
IN13	11	
IN14	12	
GND	13	
GND	14	
IN 15 / OUT 15 AC PANEL SIREN	15	/8.A7
GND	16	
IN 16 / OUT 16	17	
GND	18	

S1 = 3 (BAUDRATE 250kb/s)
S2 = 2 (NODE ID 3)

Betriebsspannung
X3 CAN-Bus

-AX1:1	1	+UB
-AX1:2	2	GND
-AX1:3	3	+UB
-AX1:4	4	GND
-AX1:5	5	CAN_L
-AX1:6	6	CAN_H

6/6

-F2
3A

-R1
120 Ohm
Resistor_120_MP

-S1
XB4-BD21
ELECTRIC MODE SELECTED
/8.C2

-K1
RUMC3AB2JD
/5.G5
RUMC3AB2JD

-K2
RUMC3AB2JD
/5.G6
RUMC3AB2JD

-X1
3031364
GNYE
-W1:SH1

-K1
/5.F5
/5.A7
/5.A8
RUMC3AB2JD

-K2
/5.F6
/5.B7
/5.B8
RUMC3AB2JD

/5.G5 RUMC3AB2JD -K1
/5.H5 RUMC3AB2JD -K1
/5.G6 RUMC3AB2JD -K2
/5.H6 RUMC3AB2JD -K2

/4.E6 #110V-L1 -CB4:2
/4.E6 #110V-L2 -CB4:4

-ESR1
AB-MSR127TP
S11 S52 S21 S22 A1 13 23 33 41
S34 S12 A2 14 24 34 42

-KM.A2S 100-FA22 /3.E12
-KM.A1 100-FA22 /3.E5
-KM.A1S 100-FA22 /3.E8
-KM.A1D 100-FA22 /3.E6
-KM.A2 100-FA22 /3.E9
-KM.A2D 100-FA22 /3.E11

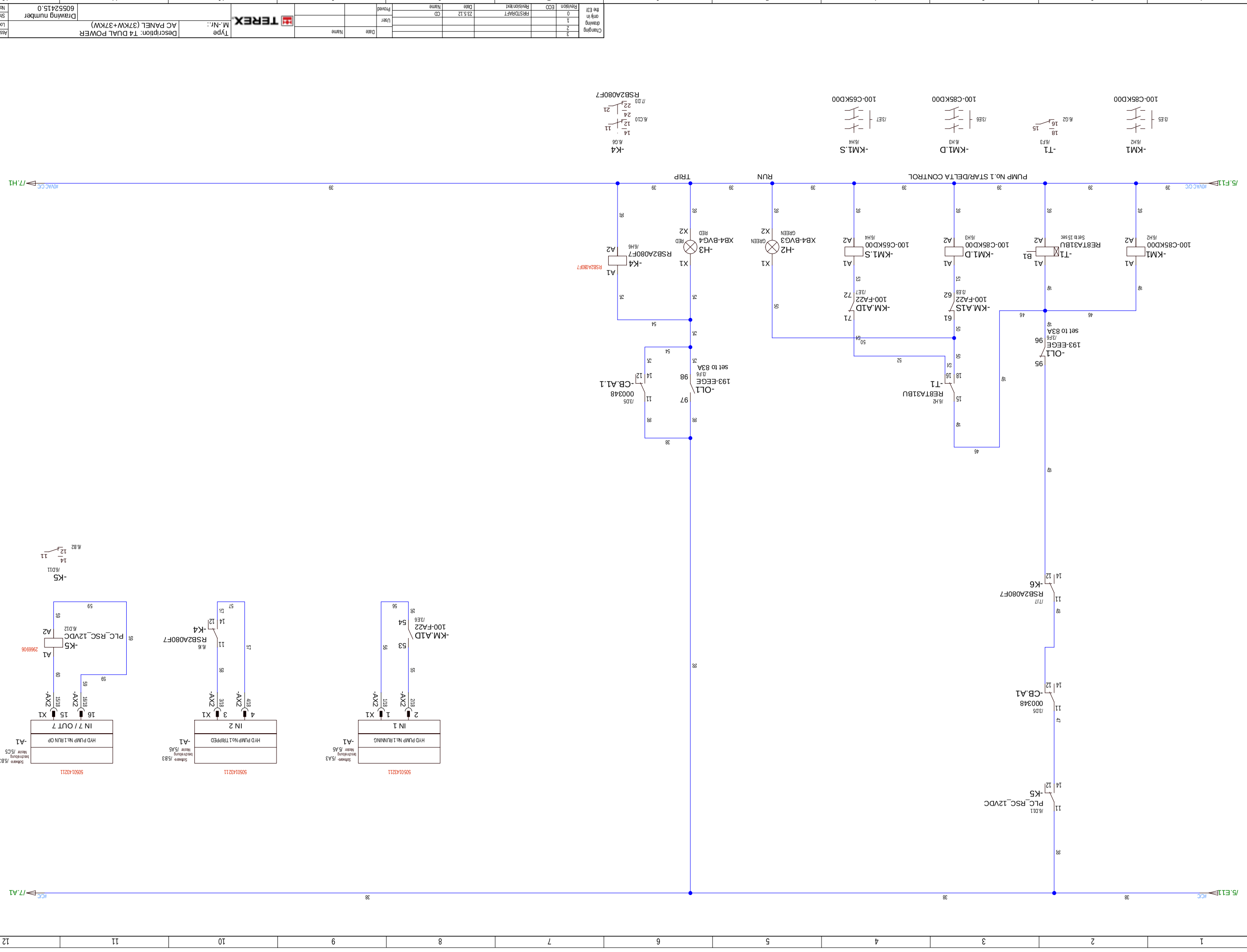
-H1
XB4-BVG6
BLUE

-K3
RUMC3AB2F7
/5.G11

#CJC /6.A1
#0VAC CJC /6.H1

-K3
/5.F11
/4.C8
/4.D8
/8.C4
RUMC3AB2F7

Changing drawing only in the E3!	3							Date	Name	TEREX	Type M.-Nr.:	Description: T4 DUAL POWER AC PANEL (37KW+37KW)		Assignment
	2													Location
	1						User						Drawing number 60552415.0	Sheet 5
	0		FIRSTDRAFT	23.5.12	CD		Proved							No. 8 Sh.
	Revision	ECO	Revision text	Date	Name									



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Changing drawing only in the E3!	Revision	ECO	Revision text	Date	Name
3					
2					
1			PRSTDRAFT	23.5.12	CD
0					

	Date	Name
Proved		
User		

TEREX

Assignment	Type	Description: T4 DUAL POWER	Drawing number
Location	M.-Nr.:	AC PANEL (37KW+37KW)	
Sheet 6			6055241S.0
No. 8			Sh.

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/6.A12 #C/C

38 38 38

38 11 /7.D10 PLC_RSC_12VDC -K7 14 12

62 62 11 /3.D9 26929 -CB.A2 14 12

63 21 /6.I6 RSB2A080F7 -K4 24 22

64 61

61 15 /7.H3 RE8TA31BU -T2 18 16 67

67 65 67

95 -OL2 193-EEGE /3.F11 set to 63A 96

61 61 61 -KM.A2S 100-FA22 /3.E12 62

71 -KM.A2D 100-FA22 /3.E11 72

38 38 38 97 -OL2 193-EEGE /3.F11 set to 63A 98

21 /3.D9 26929 -CB.A2 24 22

69 69 69 69 69

-KM2 100-C65KD00 /7.H2 A1 A2

-T2 RE8TA31BU Set to 15 sec A1 B1 A2

-KM2.D 100-C65KD00 /7.H4 A1 A2

-KM2.S 100-C37KD00 /7.H5 A1 A2

-H4 XB4-BVG3 GREEN X1 X2

-H5 XB4-BVG4 RED X1 X2

-K6 RSB2A080F7 /7.H7 A1 A2 RSB2A080F7

/6.H12 #DVAC.C/C

39 39 39 39 39 39 39 39

PUMP No.2 STAR/DELTA CONTROL RUN TRIP

-KM2 /7.H2 /3.E9 100-C65KD00

-T2 /7.F4 /7.G3 18 16 15

-KM2.D /7.H4 /3.E10 100-C65KD00

-KM2.S /7.H5 /3.E12 100-C37KD00

-K6 /7.G7 /6.D2 /7.C9 14 12 11 24 22 21 RSB2A080F7

5050143211 Software-beschreibung Master /5.B3 /5.B5

HYD PUMP No.2 RUNNING -A1 IN 3 6 5 X1 6/18 -AX2 5/18 -AX2

-KM.A2D 100-FA22 /3.E11 53 54 71 71

5050143211 Software-beschreibung Master /5.B3 /5.B5

HYD PUMP No.2 TRIPPED -A1 IN 4 8 7 X1 8/18 -AX2 7/18 -AX2

72 73 21 /7.I7 RSB2A080F7 -K6 24 22 72 72

5050143211 Software-beschreibung Master /5.B3 /5.C5

HYD PUMP No.2 RUN OP -A1 IN 8 / OUT 8 18 17 X1 18/18 -AX2 17/18 -AX2

74 74 74 75 A1 -K7 PLC_RSC_12VDC /7.D11 A2 2966906 74 74 74

-K7 /7.C10 14 12 11 /7.B3

Changing drawing only in the E3!	3							Date	Name	TEREX	Type M.-Nr.:	Description: T4 DUAL POWER AC PANEL (37KW+37KW)	Assignment
	2						User						Location
	1											Drawing number 60552415.0	Sheet 7
	0		FIRSTDRAFT	23.5.12	CD		Proved						No. 8 Sh.
	Revision	ECO	Revision text	Date	Name								

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5050143211

Software-beschreibung Master /5.B3 /5.C5

ELECTRIC MODE SELECETED

-A1

IN 9

2 1 X2

2\18 -AX3 1\18 -AX3

76 77

.4 -S1 ZBE101 /5.F4 .3

77 77

5050143211

Software-beschreibung Master /5.B3 /5.C5

AC PANEL ESTOP HEALTHY

-A1

IN 10

4 3

79 78

31 /5.H11 RUMC3AB2F7 -K3

34 32

78 78

5050143211

Software-beschreibung Master /5.B3 /5.D5

AC PANEL SIREN

-A1

IN 15 / OUT 15

16 15 X2

16\18 -AX3 15\18 -AX3

80 81

80

A1 2966906

-K8 PLC_RSC_12VDC /8.C7 A2

80 80

80

-K8 /8.C7

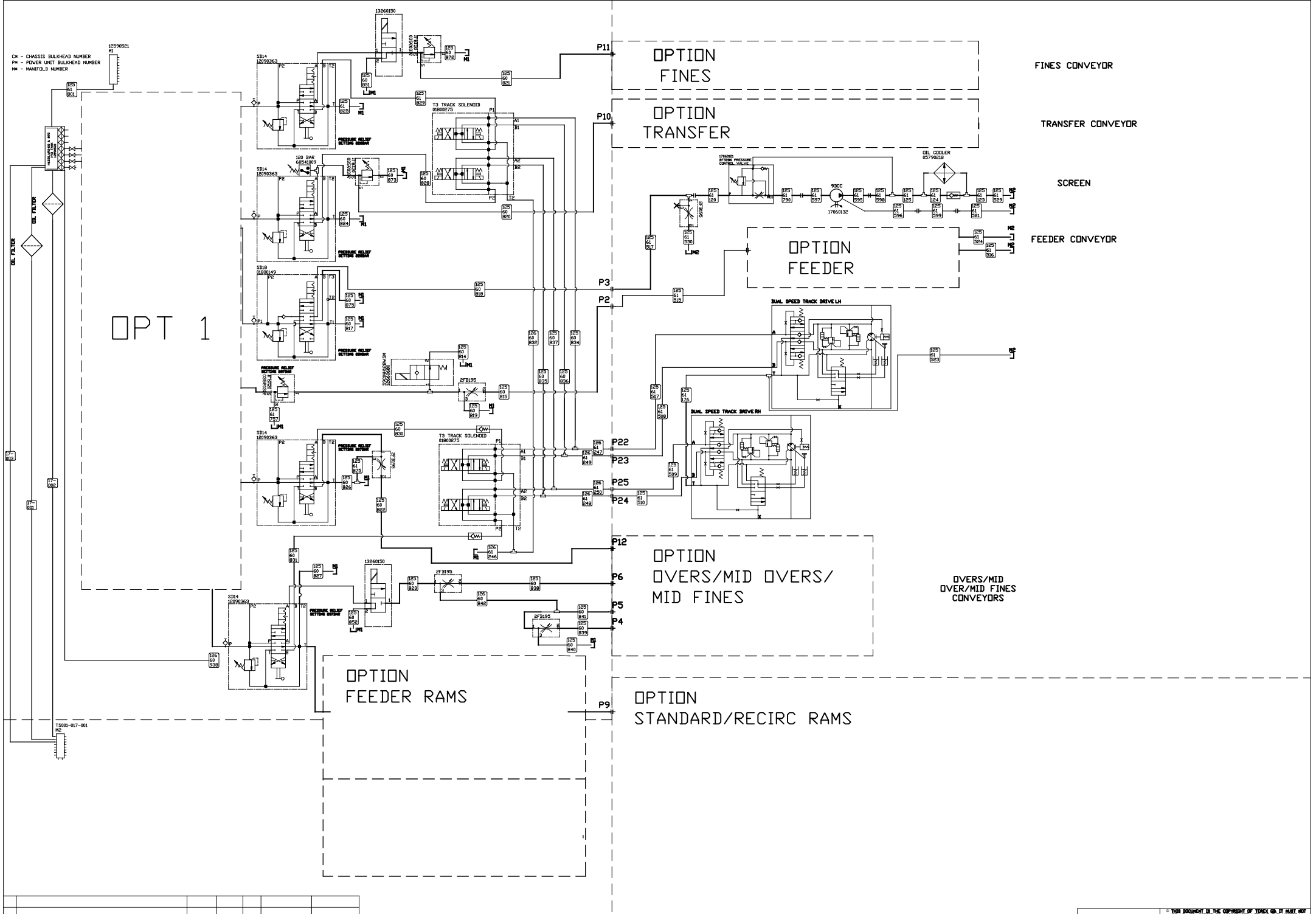
14 12 11

Changing drawing only in the E3!	3							Date	Name	TEREX	Type M.-Nr.:	Description: T4 DUAL POWER AC PANEL (37KW+37KW)		Assignment
	2													Location
	1						User						Drawing number 60552415.0	Sheet 8
	0		FIRSTDRAFT	23.5.12	CD		Proved							No. 8 Sh.
	Revision	ECO	Revision text	Date	Name									

(6) Hydraulic Schematics

(See the following pages.)

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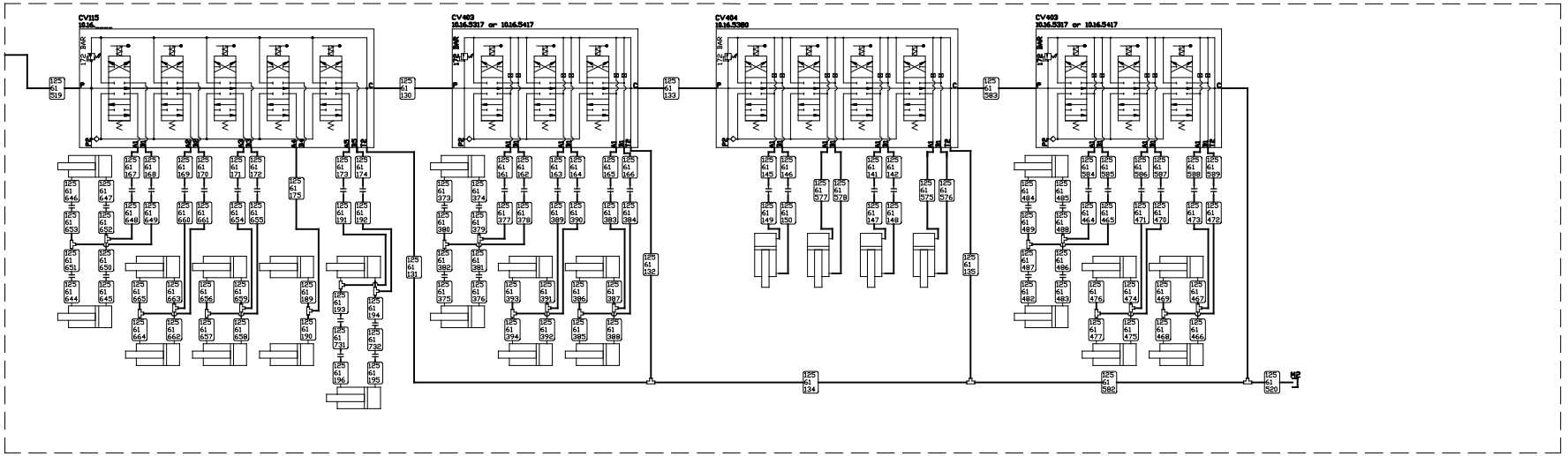
REV	CHANGE DETAILS	BY	DATE	ECO	FROM	TO
0	ORIGINAL ISSUE	MURPHY G	16/04/12	12862		
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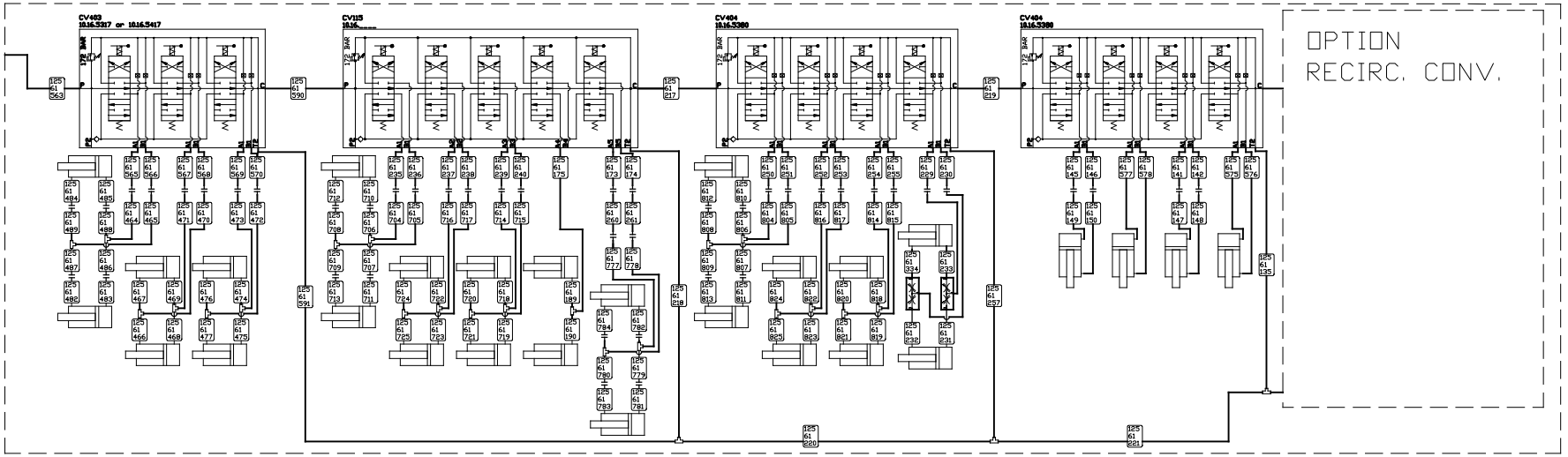
TEREX Materials Processing

DRAWN BY	APPROVED BY	DESCRIPTION			
MCKERNAN R	FANNING C	H6203 HYDRAULIC CIRCUIT			
HOSES ALL PRECEEDED WITH 12560 UNLESS OTHEREWISE STATED	FORMAT A3	SHEET 1 of 3	PULSE ID NS-1134	REVISION 0	

FEEDER OPTIONS
STANDARD

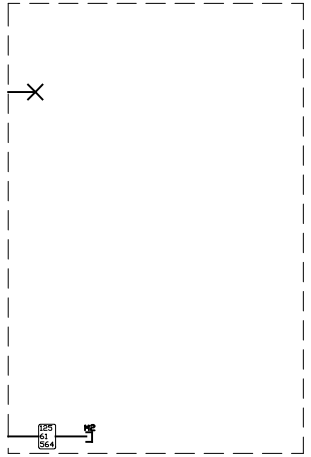


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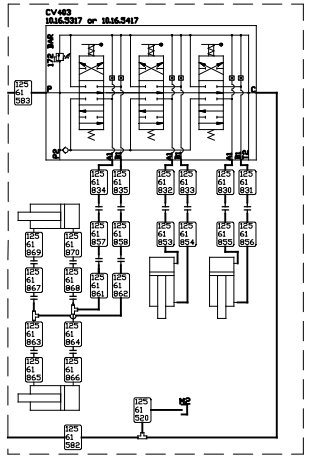


OPTION
RECIRC. CONV.

RECIRC. CONV. OPTIONS
STANDARD



FULLY HYDRAULIC



REV	DESCRIPTION	BY	DATE	ECO	FROM	TO
0	ORIGINAL ISSUE	MURPHY G	16/04/12	12862		
					SERIAL NUMBER	

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TEREX
Materials Processing

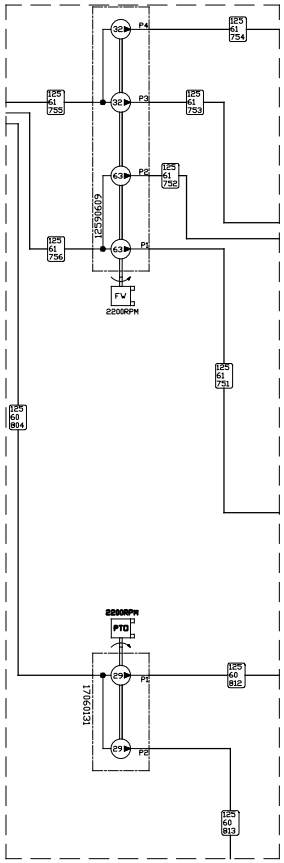
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H6203 HYDRAULIC CIRCUIT

DRAWN BY	APPROVED BY
MCKERNAN R	FANNING C

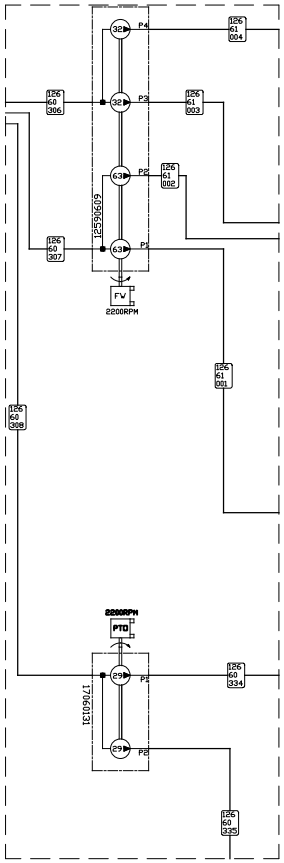
HOSES ALL PRECEEDED WITH 12560 UNLESS OTHEREWISE STATED	FORMAT	SHEET	PULSE ID	REVISION
	A3	3 of 3	NS-1134	0

C# - CHASSIS BULKHEAD NUMBER
P# - POWER UNIT BULKHEAD NUMBER
M# - MANIFOLD NUMBER

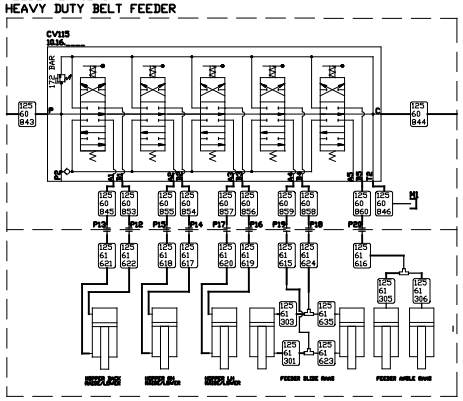
OPTION 1 OPTIONS
TIER 4 ENGINE



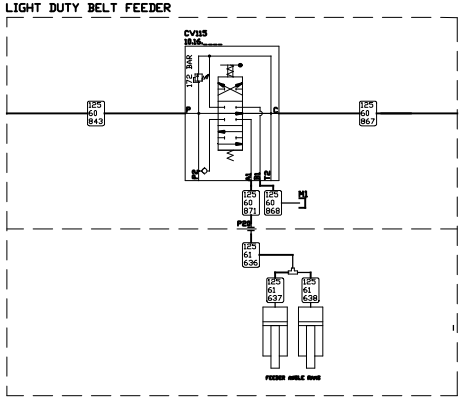
TIER 3 ENGINE



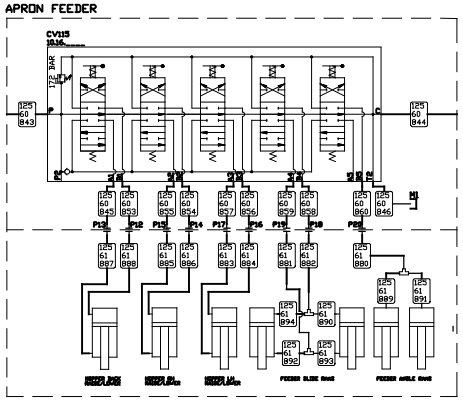
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HEAVY DUTY BELT FEEDER



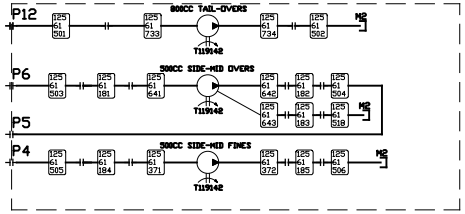
LIGHT DUTY BELT FEEDER



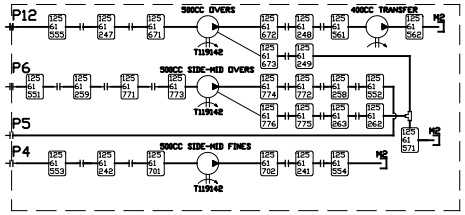
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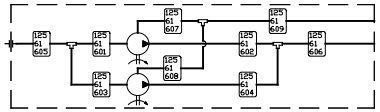
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STANDARD



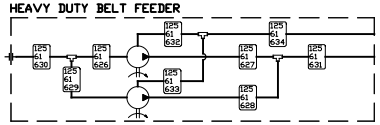
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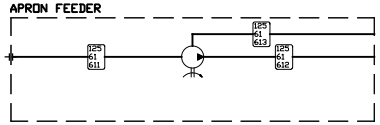
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LIGHT DUTY BELT FEEDER



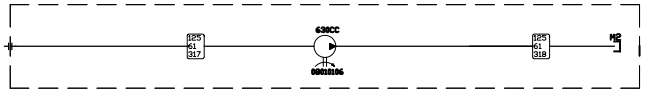
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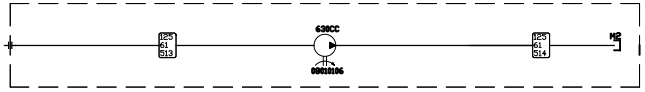
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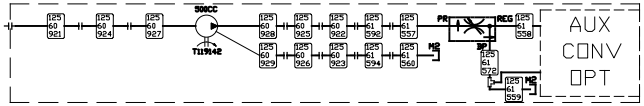
OPTION TRANSFER OPTIONS
TRANSFER STANDARD



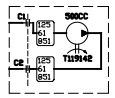
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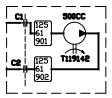
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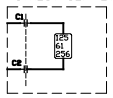
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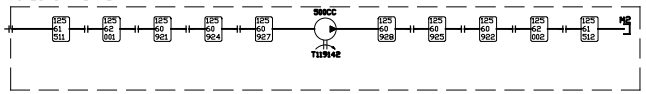
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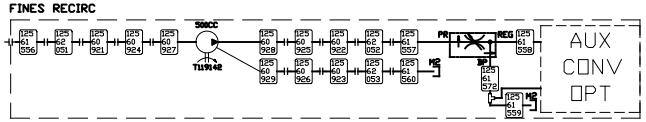
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OPTION FINES OPTIONS
FINES STANDARD



FINES RECIRC



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0	ORIGINAL ISSUE	MURPHY G	16/04/12	12862		
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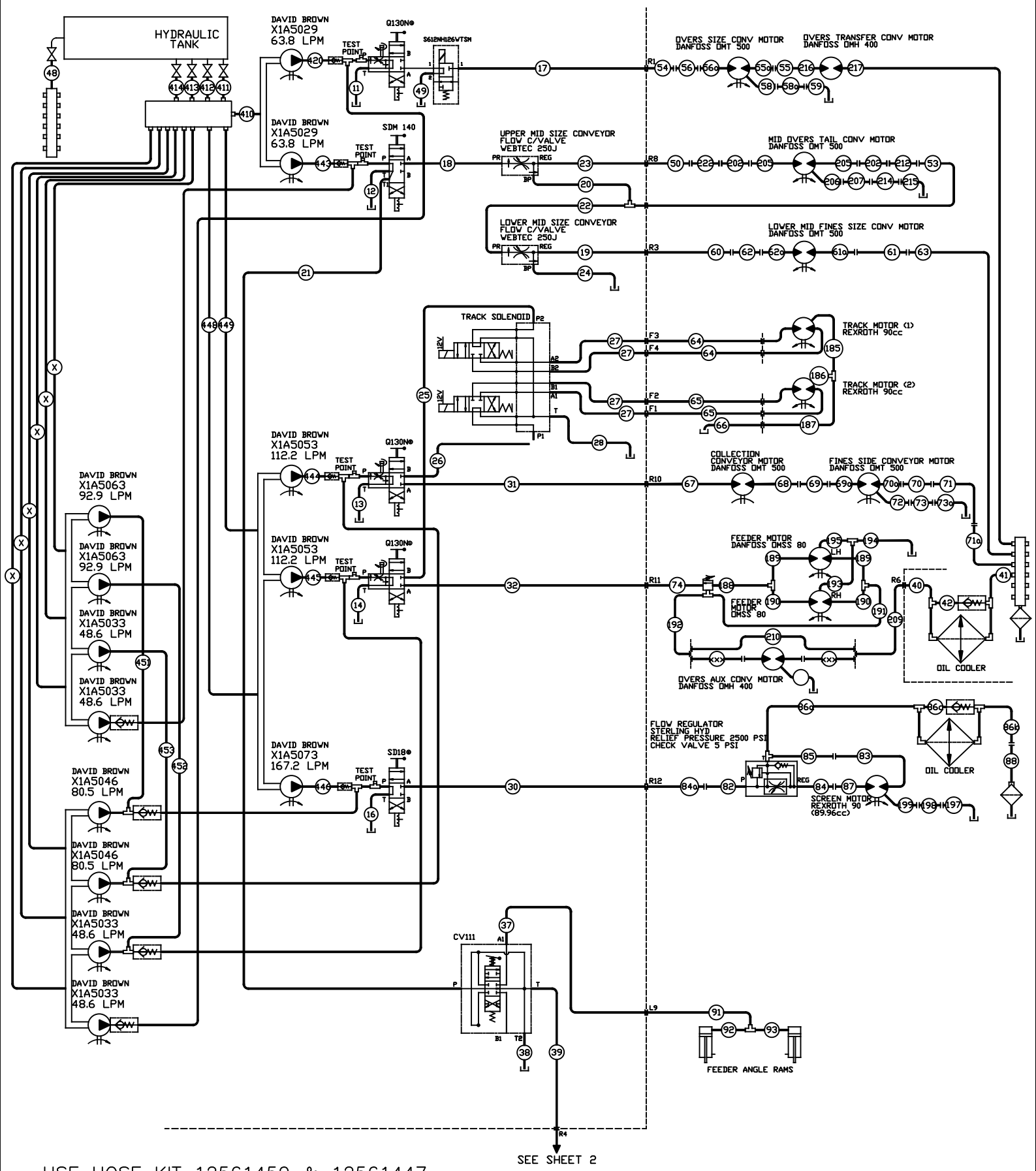
TEREX Materials Processing

DESCRIPTION: H6203 HYDRAULIC CIRCUIT

DRAWN BY	APPROVED BY	FORMAT	SHEET	PULSE ID	REVISION
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HOSES ALL PRECEEDED WITH 12560 UNLESS OTHEREWISE STATED

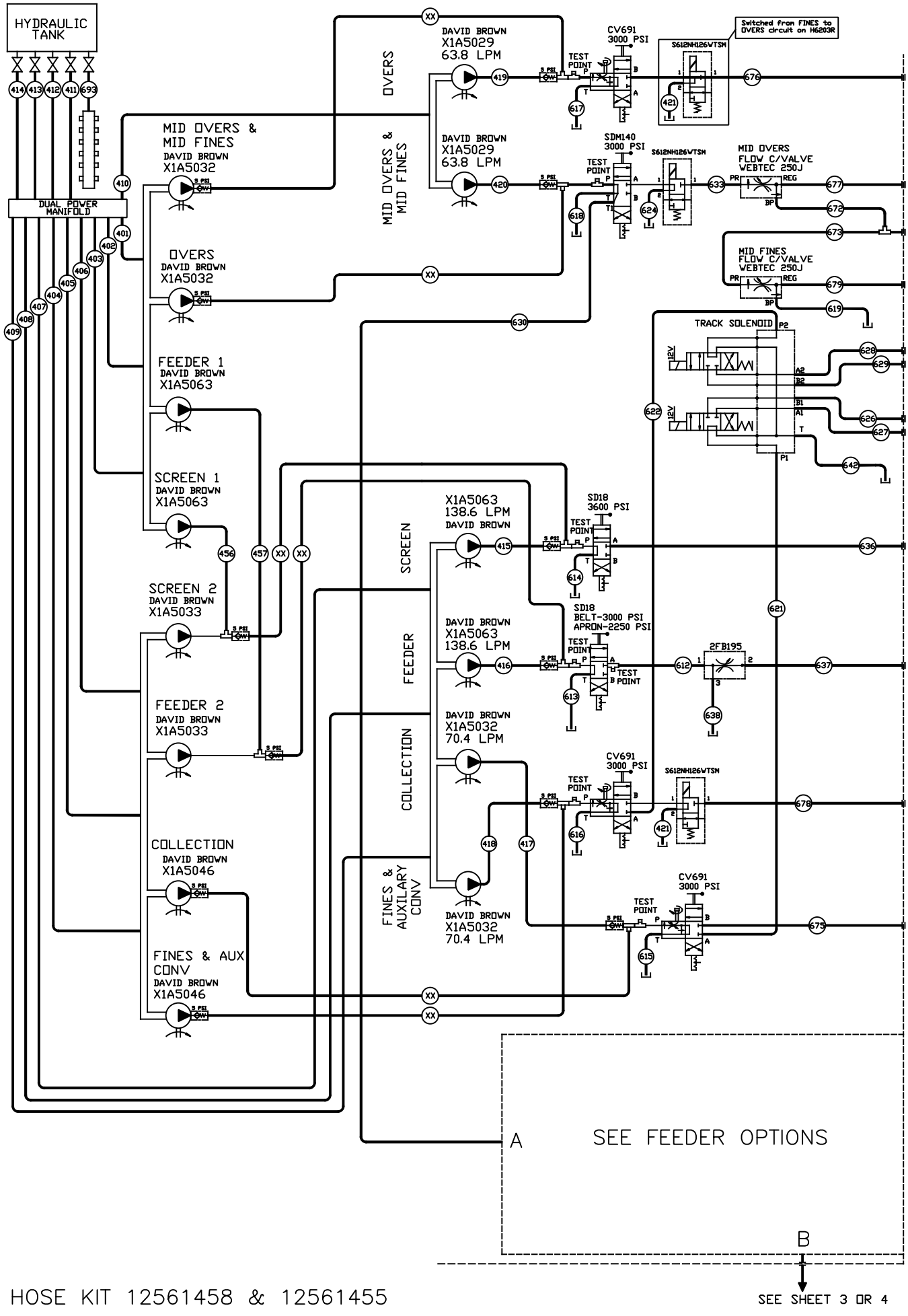
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USE HOSE KIT 12561450 & 12561447

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		SHEET 1 OF 2	BOOKS

SCALE REF.	DRN. BY	DATE	CHD. BY	DATE	
N.T.S.	OHAGAND	07/12/2011			POWERSCREEN INTERNATIONAL DISTRIBUTION LIMITED



REV	CHANGE DETAILS	BY	DATE	ECO

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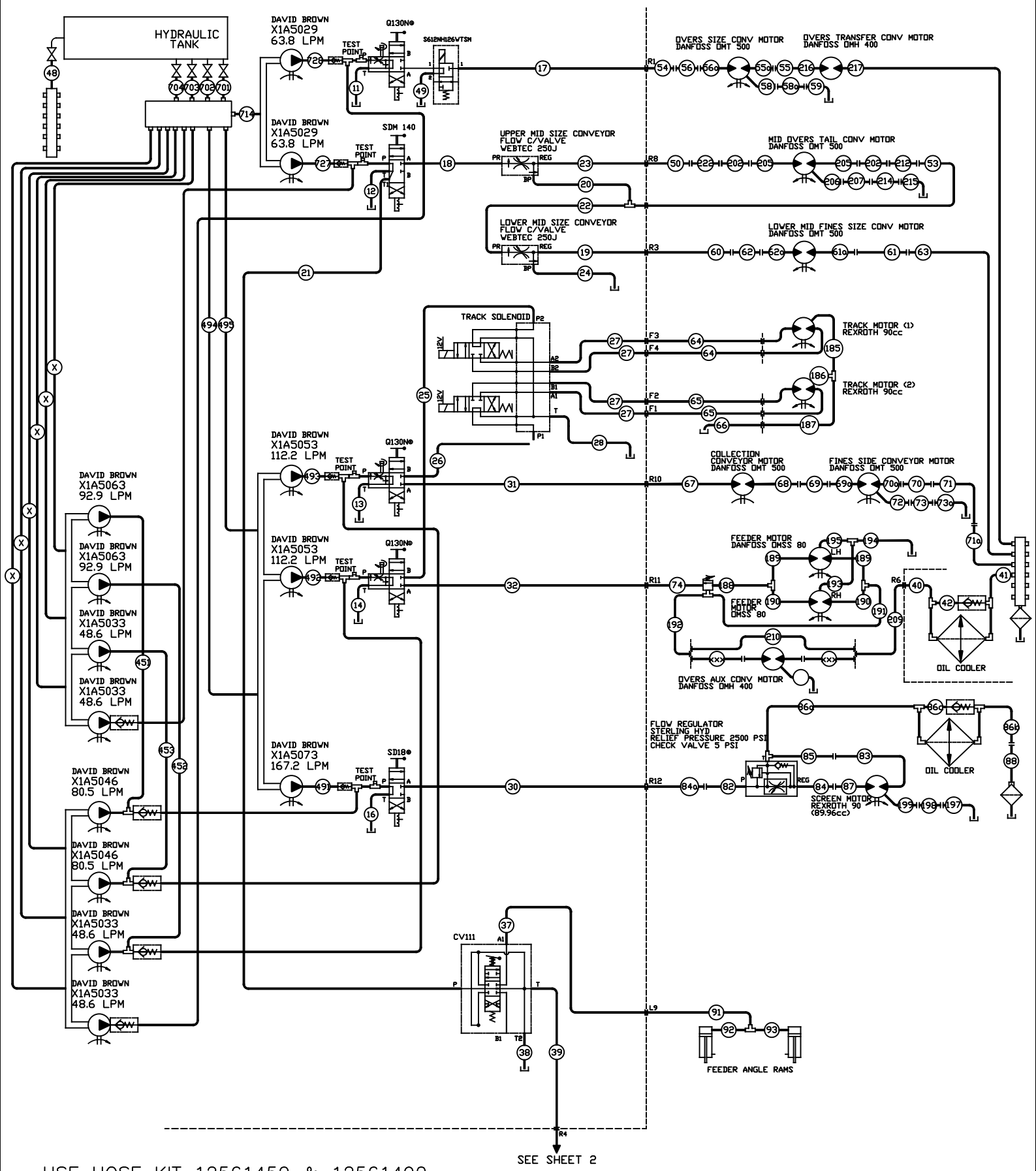
ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED

DESCRIPTION
H6203 & H6203R POWERUNIT
NSO - CAT 6.6 DUAL POWER

DRAWN BY	APPROVED BY
OHAGAND	WATTERSP

DATE	SCALE	FORMAT	SHEET	PART NO.	REVISION
08/02/12	N.T.S	A3	1 of 1	N/A	0

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED | DO NOT SCALE DRAWING



USE HOSE KIT 12561450 & 12561490

MACHINE TYPE	TITLE	DRAWING NUMBER	CAD DRAWING REF.
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		SHEET 1 OF 2	BOOKS

SCALE REF.	DRN. BY	DATE	CHD. BY	DATE
N.T.S.	OHAGAND	08/02/2012		

POWERSCREEN INTERNATIONAL DISTRIBUTION LIMITED

Appendix D Torque Specifications

(1) Standard TSS and TSH Models Outline and Dimensions

NOTICE

Dimensions are guidelines only - For installation, use only engineering installation drawings.

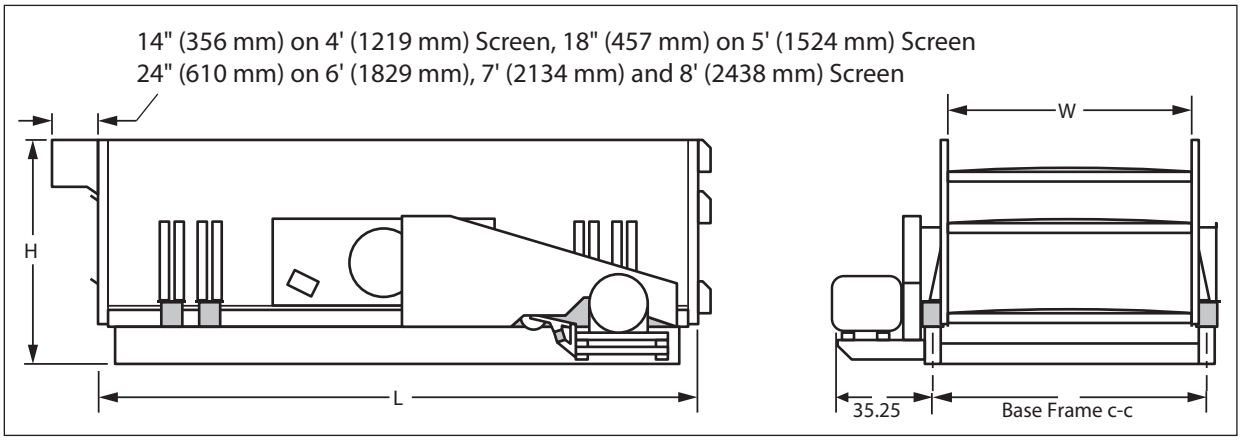


Table D.1 - Standard TSS and TSH outline and dimensions

Screen size	1200 rpm hp (KW)	Basket weight lbs (kg)**	Dimensions in inches (mm) for standard coil springs *Subtract 1.25" (32mm) for optional rubber springs			
			H*	L	W	Base frame c-c
TSH 4122-24	20 (15)	8700 (3946)	51-1/4 (1302)	144 (3658)	49-1/2 (1257)	59 (1499)
TSH 4123-24	20 (15)	10500 (4763)	62-5/8 (1591)	144 (3658)	49-1/2 (1257)	59 (1499)
TSH 4142-24	20 (15)	9800 (4445)	51-3/4 (1314)	168 (4267)	49-1/2 (1257)	59 (1499)
TSH 4143-24	20 (15)	11600 (5262)	67-3/4 (1721)	168 (4267)	49-1/2 (1257)	59 (1499)
TSH 5142-24	25 (19)	10800 (4899)	52-5/8 (1337)	168 (4267)	61-1/2 (1532)	71 (1803)
TSH 5143-24	25 (19)	13000 (5897)	67-3/4 (1721)	168 (4267)	61-1/2 (1532)	71 (1803)
TSH 5143-26	25 (19)	14000 (6350)	71 (1803)	168 (4267)	61-1/2 (1532)	71 (1803)
TSH 5162-24	25 (19)	11600 (5262)	54-5/8 (1387)	192 (4877)	61-1/2 (1532)	71 (1803)
TSH 5162-26	25 (19)	12500 (5670)	56-5/8 (1438)	192 (4877)	61-1/2 (1532)	71 (1803)
TSH 5163-26	30 (22)	15300 (6940)	73-1/4 (1861)	192 (4877)	61-1/2 (1532)	71 (1803)
TSH 6162-32	30 (22)	15100 (6849)	57-1/2 (1461)	192 (4877)	76 (1930)	87 (2210)
TSH 6163-32	40 (30)	19100 (8664)	73-7/8 (1877)	192 (4877)	76 (1930)	87 (2210)
TSH 6202-32	40 (30)	18260 (8283)	59-7/8 (1521)	240 (6096)	76 (1930)	87 (2210)
TSH 6203-32	40 (30)	21860 (9916)	76-1/2 (1943)	240 (6096)	76 (1930)	87 (2210)
TSH 7202-32	50 (37)	22125 (10036)	62-3/8 (1584)	240 (6096)	88 (2235)	99 (2515)
TSH 7203-38	50 (37)	26450 (11998)	82 (2083)	240 (6096)	88 (2235)	99 (2515)
TSH 8202-38	50 (37)	22900 (10387)	62-3/8 (1584)	240 (6096)	100 (2540)	111 (2819)
TSH 8203-38	50 (37)	28390 (12878)	81-7/8 (2080)	240 (6096)	100 (2540)	111 (2819)
TSS 6202-32	40 (30)	18500 (8391)	68-7/8 (1750)	240 (6096)	76 (1930)	87 (2210)
TSS 6203-32	40 (30)	22170 (10060)	84 (2134)	240 (6096)	76 (1930)	87 (2210)
TSS 7202-38	50 (37)	20780 (9426)	74-3/8 (1889)	240 (6096)	88 (2235)	99 (2515)
TSS 7203-38	50 (37)	24280 (11010)	92-3/8 (2346)	240 (6096)	88 (2235)	99 (2515)

*TSS screens have 2.7° sloped basket

**Basket weights include base frame, motor mount, belt guard, motor and wire screen cloth

(2) Torque specifications

NOTICE

Maximum torque values listed are based on 75% of the specified minimum proof strength of bolt steel in order to provide a safety factor. Hardened washers should always be used regardless of whether standard nuts or lock nuts are employed. The term “lube” applies to cadmium plating and/or application of thread lubricants.

Refer to Table C.4 for specific torque requirements of hardware used on this equipment. Standard torque values for Grades 2, 5 and 8 nuts and bolts are listed in Table C-2. Metric torque values for Class 8.8, 10.9 and 12.9 nuts and bolts are listed in Table C-3.

Table D.1 - Special torque requirements

Size (in)	Bolt location	Torque value* N-m	Torque value* (ft-lb)
3/4	Case bolts**(3/4”-16NF)	305	225
1/2 5/8	Discharge lip bolts	75 149	55 110
1/2	Feed box mounting bolts	75 149	55 110
5/8			
3/4	Spindle bolts***	434	320

* All torque values are “Lube” for lubricated bolts

** Case-bolt heads are tack welded inside case

*** Spindle bolts are SAE grade 8

Table D.2 - Special torque requirements

Wire cloth gauge	Draw bolt torque Nm	Draw bolt torque ft-ib
Average wire	81-108	60-80
Fine gauge wire	Less than 81	Less than 60
Heavy gauge wire	Greater than 108	Greater than 80

Table D.3 - Torque values for metric hardware

		Property class=8.8				Property class=10.9				Property class=12.9			
Dia	Pitch	Dry		Lube		Dry		Lube		Dry		Lube	
(mm)	(mm)	ft-ibs	N-m	ft-ibs	N-m	ft-ibs	N-m	ft-ibs	N-m	ft-ibs	N-m	ft-ibs	N-m
10	1.5	37	50	29	39	53	72	41	56	62	84	48	65
10	1.25	39	53	30	41	56	76	43	58	66	89	51	69
12	1.75	65	88	50	68	93	126	71	96	109	148	83	113
12	1.25	71	96	55	75	101	137	78	106	119	161	91	123
14	2	104	141	80	108	148	201	114	155	173	235	133	180
14	1.5	112	152	86	117	160	217	123	167	187	254	144	195
16	2	161	218	124	168	230	312	177	240	269	365	207	280
16	1.5	172	233	132	179	246	334	189	256	287	389	221	300
18	2.50	230	312	177	240	318	431	245	332	372	504	286	388
18	1.5	258	350	199	270	357	484	275	348	418	567	321	435
20	2.5	325	441	250	339	450	610	346	469	525	712	404	548
20	1.5	360	488	277	376	499	677	384	521	583	791	448	607
22	2.5	443	601	341	462	613	831	471	639	716	971	551	747
22	1.5	486	659	374	507	673	913	518	702	786	1066	605	820
24	3	562	762	432	586	777	1054	598	811	908	1231	698	946
24	2	612	830	471	639	847	1149	652	884	990	1342	762	1033
27	3	823	1116	633	858	1139	1544	876	1188	1331	1805	1024	1389
27	2	889	1205	683	926	1229	1667	945	1281	1436	1947	1105	1498
30	3.5	1117	1514	859	1165	1541	2089	1185	1607	1810	2454	1392	1887
30	2	1236	1676	951	1289	1705	2312	1312	1778	2004	2717	1541	2089
33	3.5	1520	2061	1169	1585	2096	2842	1613	2187	2463	3339	1895	2569
33	2	1667	2260	1282	1738	2299	3117	1768	2397	2701	3662	2078	2817
36	4	1952	2647	1501	2035	2692	3650	2071	2808	3163	4288	2433	3299
36	3	2067	2802	1590	2156	2850	3864	2193	2973	3349	4540	2576	3493
39	4	2526	3425	1943	2634	3484	4724	2680	3634	4094	5551	3149	4269
39	3	2666	3615	2051	2781	3677	4985	2828	3834	4320	5857	3323	4505

Table D.4 - Torque values for isometric hardware

		S.A.E Grade 2 			S.A.E Grade 5 			S.A.E Grade 8 		
		Torque (ft-ibs)		Clamp load (lbs)	Torque (ft-ibs)		Clamp loads (lbs)	Torque (ft-ibs)		Clamp loads (lbs)
Dia (inches)	Pitch (thread/ in)	Dry	Lube		Dry	Lube		Dry	Lube	
1/4	20	5	4	1310	8	6	2020	12	9	2860
1/4	28	6	5	1500	10	7	2320	14	11	3270
5/16	18	11	9	2160	17	13	3340	25	19	4710
5/16	24	12	10	2390	19	15	3690	27	21	5220
3/8	16	20	15	3190	31	24	4940	44	34	6970
3/8	24	23	17	3620	35	27	5590	49	38	7900
7/16	14	32	25	4380	49	38	6770	70	54	9560
7/16	20	36	27	4890	55	42	7560	78	60	10680
1/2	13	49	38	5850	75	58	9040	106	82	12770
1/2	20	55	42	6590	85	65	10190	120	92	14390
9/16	12	70	54	7500	109	84	11600	150	115	16380
9/16	18	79	60	8370	121	93	12940	170	130	18270
5/8	11	97	75	9320	150	115	14400	210	160	20340
5/8	18	110	85	10560	170	130	16320	240	180	23040
3/4	10	170	130	13770	265	200	21290	375	285	30060
3/4	16	190	145	15380	295	225	23770	415	320	33570
7/8	9	165	125	11430	425	330	29450	605	465	41580
7/8	14	180	140	12590	470	360	32440	665	510	45810
1	8	245	190	14990	640	495	38630	905	695	54540
1	14	270	210	16400	700	540	42260	990	765	59670
1-1/8	7	350	270	18880	790	610	42340	1285	990	68670
1-1/8	12	395	305	21180	890	685	47500	1440	1110	77040
1-1/4	7	495	380	23980	1120	860	53770	1815	1395	87210
1-1/4	12	550	425	26550	1240	950	59550	2010	1545	96570
1-3/8	6	655	500	28580	1465	1130	64100	2380	1830	103950
1-3/8	12	745	570	32540	1670	1285	72980	2710	2085	118350
1-1/2	6	865	665	34770	1945	1495	77970	3160	2430	126450
1-1/2	12	975	750	39120	2190	1685	87740	3555	2735	142290
1-3/4	5	1370	1055	47020	2285	1755	78370	4985	3835	170990
2	4.5	2060	1585	61870	3435	2640	103120	7500	5765	225000
2-1/4	4.5	3015	2320	80430	5025	3865	134060	10960	8435	292500
2-1/2	4	4125	3170	99000	6875	5285	165000	15000	11530	360000
2-3/4	4	5590	4300	122010	9320	7165	203360	17790	13680	388230
3	4	7385	5680	147750	12310	9470	246260	23500	18080	470130

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