I-C13 Impactor

Operating and Maintenance Manual



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Introduction

This document has been prepared to ensure the equipment constructed by Extec Screens & Crushers Ltd is installed, put into use and operated efficiently and safely.

Read the manual carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or damage to the equipment.

It is recommended that this manual is thoroughly understood before operating the equipment.

Operation of the plant contrary to the instructions contained in this manual or modification to the machine without prior agreement with Extec Screens & Crushers Ltd will invalidate any undertakings given by the manufacturer in regard to this machine.

Whilst every effort has been made to ensure the accuracy of information contained within this manual, Extec Screens & Crushers Ltd can assume no responsibility for any errors, omissions or their consequences. As operating conditions vary considerably, all performance data is indicative only for plant operated in accordance with the conditions set out in this manual.

Please contact Extec Screens & Crushers Ltd regarding any part of this manual that requires further clarification.

A copy of this manual must be kept at the operational site for easy reference.

Extec Screens & Crushers Ltd reserve the right to change the content of this manual without prior notice.

The information contained within this manual should be considered to be commercially confidential and should not be released to any third party without prior consent from Extec Screens & Crushers Ltd.

Certificate of Conformity

Supply of Machinery Safety Regulations - Machinery Directive 98/37/EC

Serial No:

Engine Serial No:

Production Manager:

Date of build:

Issued Declaration of Conformity on next page.

DECLARATION OF CONFORMITY

98/37/EC Machinery
89/336/EEC EMC

Name of manufacturer or supplier
Extec Screens & Crushers Ltd

Full postal address including country of origin
Hearthcote Road, Swadlincote, Derbyshire, England, DE11 9DU

Description of product
Impactor

Name, type or model, batch
Impactor
In built diesel
22278/D515

Extec Screens & Crushers Ltd
Swadlincote, Derbyshire, DE11 9DU

Standards used, including number, title, issue date and other relative documents
EN292-1, EN292-2, EN349, EN418, EN954-1, EN1050

Place of issue
Extec Screens & Crushers Ltd

Originating certification by
Laidler Associates, Belasis Business Centre, Coxwold way, Billingham, Teesside, TS23 4EA
Certificate number 22278/D515

Declaration

I declare that the above information in relation to the supply / manufacture of this product, is in conformity with the stated standards and other related documents following the provisions of the above Directives and their amendments.

Signature _____ Date

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ENGINE SCHEMATIC IMPACTOR DEUTZ TED6300sht11 26/04/04
IMPACTOR RECEIVER AND LOOM TED6300sht12 26/04/04
IMPACTOR SOLENOID CONTROL PANEL TED6300sht13 26/04/04
IMPACTOR ENGINE PANEL ELECTRONIC TED6300sht14 26/04/04
IMPACTOR AUX LOOMS TED6300sht15 26/04/04
CRUSHER JAW CONTROL REV1
LAMP DIAGNOSTICS . . . . . REV 1

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CATERPILLAR C-13 Operation and Maintenance Manual SEBU7901 May 2004
C13 Industrial Engine Parts Manual CD . . . . . SERP4130-06 April 2005
ERIEZ MAGNET MODELS CP & OP INSTRUCTIONS . . . . . IM-108GB-(F.01)

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Exxon Unirex N 3 Grease. . . . . .570317-00 UNIREX N 3
Shell Albida Grease EP2 . . . . . ACIYK GB/eng/C 19/03/2005
Shell Rimula Super 15W-40 . . . . . ACK9D GB/eng/C 26/11/2003
Shell Naturelle Fluid HF-M 46 . . . . . ACKXR GB/eng/C 09/06/2004
Shell Tellus Oil 46 . . . . . ACKQ6 GB/eng/C 29/04/2004
Shell Omala 220 Gear Oil. . . . . ACH75 GB/eng/C 29/01/2003
Shell Safe Anti Freeze . . . . . L84042 Revision 23 08 2004
Shell Agricultural Gas Oil . . . . . F32002 Revision 02 10 2002
Exol Ethena EP90 Gear Oil . . . . . 2nd October 2002

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Return Conveyor (2) . . . . . 1125 kg
Chassis Frame (1) . . . . . 1125 kg
Screen Sub Assy (3,4,5,6) . . . . . 3668 kg
A15930000 Support Arm (7) . . . . . 150 kg

Section 1 Safety Instructions

1.1 Notes

a. Read this manual and familiarise yourself with any associated documentation.

b. Ensure that a copy of this manual is available for any persons installing, using, maintaining or repairing this equipment.

c. Training should be provided to ensure safe working practices. Initial commissioning and starting must only be undertaken by a competent person who has read and fully understands the information provided in the manual pack.

d. To avoid the risk of electric shock always isolate this equipment from the supply prior to carrying out any maintenance adjustment or removing any guards or covers.

e. Always follow the procedures outlined in the operating and maintenance instruction.

f. If in doubt ask. Do not take personal risk.

g. This equipment is manufactured in accordance with the Machinery Directive 98/37/EC[1]. The customer should ensure that this equipment is in conformance with local and national legislation if used outside of the EU.

h. Only trained personal should be allowed to install, set, operate, maintain, and decommission this equipment.

1.2 Alarms and Warnings

a. All electrical control boxes are labelled. Ensure these labels remain in place.

b. Any residual risks are identified within this manual with the equipment marked where appropriate. Ensure these warnings are maintained.

1. Directive 98/37/EC of 22.06.98 (OJ n° L 207 of 23.07.98, p.1)

1.3 Warnings marked on the machine

The following labels are posted on the machine for your safety. Please observe all warnings.

- You can be injured if you do not obey the safety instructions as indicated on warning stickers.
- Observe all safety instructions and warnings attached to the plant.
- Ensure that safety instructions and warnings attached to the plant are always complete and perfectly legible.
- Keep warning and instruction labels clean.
- Replace unreadable or missing labels with new ones before operating the plant. See “Stickers - English” on page 174. for part numbers.
- Make sure replacement parts include warning or instruction labels where necessary.

1.3.1 Personnel Safety Warnings










WARNING
EXCEEDS 90 dB (A)
May cause loss or degradation of hearing over long periods of time.
Proper hearing protection must be worn.


DANGER
ENTANGLEMENT HAZARD
Rotating Parts
DO NOT ENTER while rotor is turning
Death or serious injury will result
SWITCH OFF, LOCKOUT AND TAGOUT machine before inspection or maintenance


DANGER
ENTANGLEMENT HAZARD
Do not reach into unguarded machine you can be pulled in.
Risk of serious injury will result.
Keep all guards in place.
SWITCH OFF, LOCKOUT AND TAGOUT machine before opening or removing guards


DANGER
IMPACT HAZARD
Do not allow spring loaded door to be opened unrestrained.
Risk of injury


WARNING
LOCKOUT PROCEDURE
When carrying out maintenance or adjustment to the plant the following procedure must be followed.
1. Switch off engine
2. Remove the ignition key
3. Keep the ignition key on person during lockout
4. Place appropriate maintenance warning signs (ie. TAG OUT)
5. NEVER work alone


IMPORTANT
STOP AND LOCKOUT PLANT BEFORE MAINTENANCE


DANGER
STRONG MAGNETIC HAZARD
STAY CLEAR OF MAGNET
Strong magnetic field produced by magnet will have serious adverse effect on heart pacemakers, which could result in death.


ATTENTION
Read and understand operator's manual and all safety signs before using or maintaining machine.
If you do not understand the information in the manuals consult your supervisor, the owner, or manufacturer.


DANGER
SKIN INJECTION HAZARD
Use a piece of cardboard to check for hydraulic hose leaks.
DO NOT USE YOUR HAND
If fluid is injected under the skin seek medical help immediately


DANGER
CRUSHING HAZARD
Do not place hands or feet under jacking legs. Risk of serious injury.
KEEP HANDS AND FEET CLEAR before lowering or raising jacking legs.


DANGER
FALLING HAZARD
Falling from and/or onto a machine can cause serious injury or even death.
DO NOT climb onto the machine whilst in operation.
ALWAYS use walkways/platforms provided or a safe and secure platform approved by the local regional safety enforcing authority.
ALWAYS use an E.N./A.N.S. approved safety harness when reaching any points 7ft (2m) or more above ground level.
DE No. 5004FH02


DANGER
ENTANGLEMENT HAZARD
In-running nip points can cause serious injury or death.
DO NOT reach into an unguarded machine. Your arm could be pulled in and amputated.
SWITCH OFF, LOCKOUT AND TAGOUT machine before opening or removing guards.
DE No. 5007ENT02


DANGER
SKIN INJECTION HAZARD
Hydraulic fluid under pressure can penetrate the skin causing serious injury.
ALWAYS relieve the pressure from the hydraulic system before carrying out any kind of maintenance or adjustment.
ALWAYS use a piece of cardboard to check for leaks. DO NOT use your hand.
If fluid is injected under the skin you must seek medical help immediately.
DE No. 5012INJ02


ATTENTION
LOOSE OR BAGGY CLOTHING CAN GET CAUGHT IN RUNNING MACHINERY.
ALWAYS wear correctly fitting (E.N./A.NS.I approved) personal protective equipment.
Personal Protective Equipment includes Hard Hat, Safety Glasses, Hearing Protection, Dust Mask, Close Fitting Overalls, Safety Boots, Industrial Gloves and High Visibility Vest.
DE No. 5014CLO

1.3.2 Machine Safety Warnings

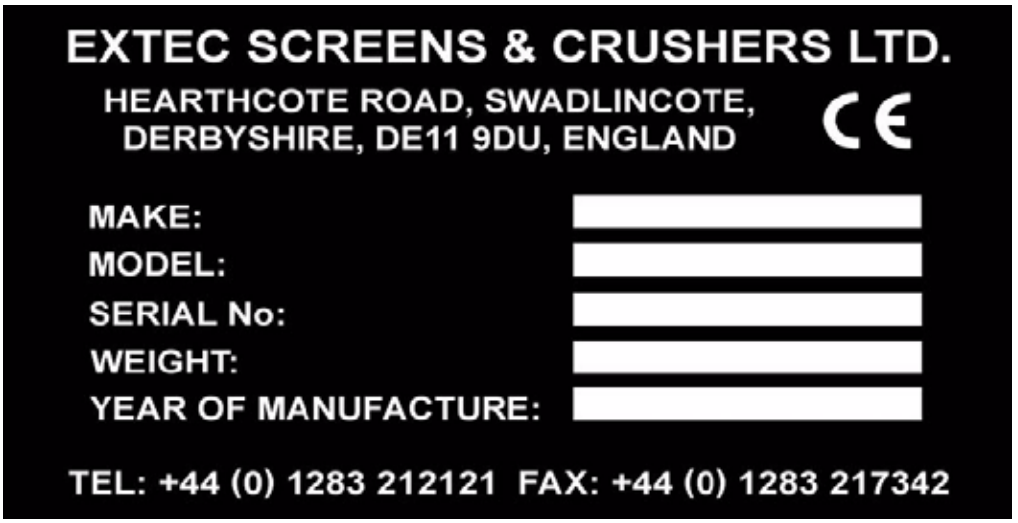








1.3.3 Machine Legend Plate



1.4 Component Safety Features

a. Do not use this equipment with guards removed or incorrectly fastened.

b. Do not use this equipment with safety devices maladjusted or removed.

1.5 Features for Operator Safety

a. Safety features associated with this equipment have been assessed in accordance with BS EN 954-1 to Category 3.

b. The Emergency Stop circuit is a 24 V DC series circuit and hard wired to remove power from the ECU Engine management system and stop the engine. A residual hazard has been identified in as much as the hydraulic circuit incorporates an accumulator fitted to protect the system. When the Safety Circuit is activated this will takes approximately five seconds to de-energize.

c. The detailed Safety Circuit diagram can be found within the drawing pack as an appendix to this manual.

d. Safety Components - Emergency Stop Buttons, Ensure all Guards are bolted down.

e. Steps handrails, tread plates and fixed guards are provided where personnel are required to climb on the machine.

f. If for any reason other areas need to be accessed the risk associated with the activity must be assessed and appropriate control measures implemented.

1.6 Environmental Safety

It is essential that the service intervals detailed in the maintenance procedures are followed to ensure that engine emissions are kept to a minimum.

1.6.1 Consumable Materials

- Diesel spillages must be dealt with immediately.
- Only use the lubricating oils recommended in the maintenance schedule.
- Observe the COSHH information contained in the appendix to this manual.
- Local & National regulations must be observed when disposing of waste.
- Improperly disposing of waste can threaten the environment and ecology and is illegal.
- Potentially harmful waste used on this equipment includes such items as oil, fuel, coolant, filters and batteries, etc. Details can be found in the appendix to this manual.
- Use leak proof 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.

1.6.2 Machine Disposal

- This machine must only be disposed of at a specialist machine breaker.

1.7 Personal Protective Equipment (PPE)

a. Loose or baggy clothing can get caught in running machinery.

b. 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.

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

d. Always wear correctly fitting (CE approved) personal protective equipment.

Recommended Personal Protective Equipment includes:

- Hard Hat
- Safety Glasses/ Goggles
- Hearing Protection
- Dust Mask
- Close fitting Overalls
- Safety Boots
- Industrial Gloves
- High Visibility Vest or Jacket.

1.8 Measured Noise Level

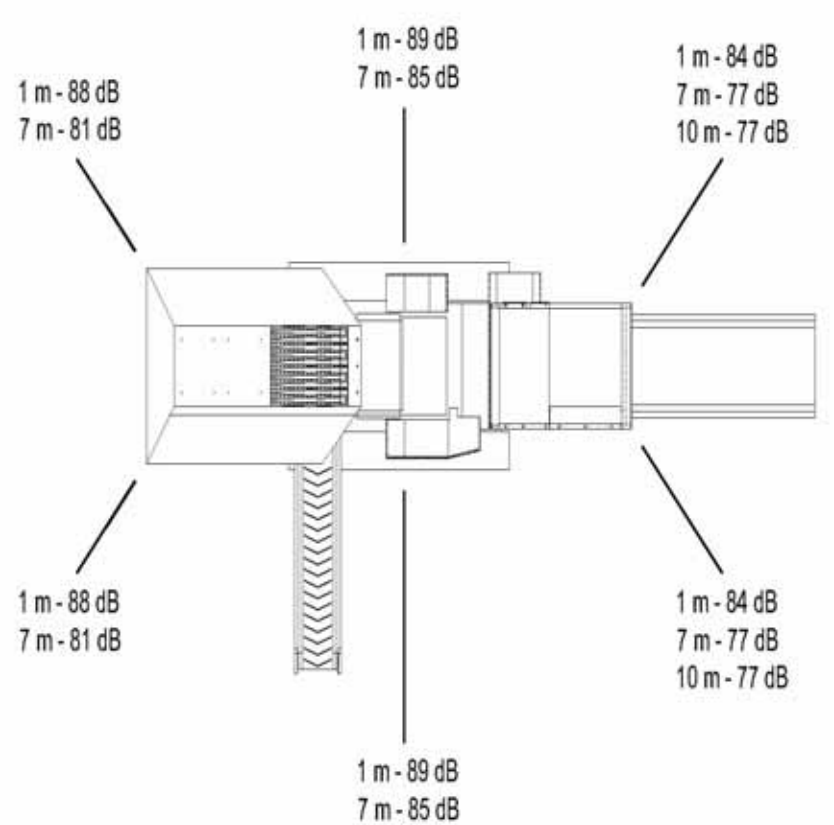


Figure 1-1: Measured Noise Level

The above diagram indicates the measured noise levels at a measured distance. i.e. 7 m - 85 dB indicates that at 7 meters the sound measured was 85 decibels. The readings were measured using a Castle GA101/701 meter with a calibration date of 05/06/04 and with all systems running situated on the factory assembly line.

The product and local conditions will affect the noise levels.

Ear protection is compulsory within 10 meters of the machine when the engine and all other parts of the machine are running.

1.9 Vibration Levels

There are no circumstances where an operator needs to be on or touching this equipment when it is running.

1.10 Organisational Safety Measures

- Understand the service procedure before doing work. Keep 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 lockout procedures. Allow the machinery to cool.

- 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.
- Disconnect battery ground cable before making adjustments on electrical systems or welding on plant.
- During maintenance only use the correct tool for the job.
- Never make any modifications, additions or conversions which might affect safety without the manufacturer's approval.
- In the event of safety relevant modifications or changes in the behaviour of the plant during operation, stop the plant and lock out immediately and report the malfunction to the competent authority/ person.

1.11 Personnel Qualification, Requirements and Responsibilities

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

b. Work on electrical system and equipment of the plant 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.

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

1.12 Safety Advice Regarding Specific Operational Phases

1.12.1 Standard Operation

- Take the necessary precautions to ensure that the plant is used only when in a safe and reliable state.
- Operate the plant 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 all place and fully functional.
- Ensure that any local barriers erected to stop unauthorized entry to this equipment are in place.
- Before starting the engine ensure it is safe to do so.

1.12.2 Blockage or Malfunction

In the event of material blockage, any malfunction or operational difficulty, stop the plant immediately and lockout. Have any defects rectified immediately.

1.12.3 Unguarded Areas

- 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 plant before removing any safety devices or guarding.
- Limit access to the machine and its surrounds by erecting barrier guards to reduce the risk of residual mechanical hazards, falling lifted loads and ejected materials.

1.13 Special Work

Such as Plant Maintenance and Repairs during Operation; Disposal of Parts and Consumables

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

a. Warning, horn/ light/ gauge or indicator calls for immediate action.

b. Adverse conditions necessitate more frequent servicing.

c. Always read instructions supplied with replacement of parts and equipment. Ensure only properly trained personnel undertake these tasks.

1.13.1 Isolation



When undertaking maintenance and repair work, the plant must be first made safe.

- Switch off the engine using the ignition key. Switch off at isolation point and remove the ignition key.
- Implement lockout procedures.
- Attaching a warning sign(s) to the plant in appropriate positions.

1.13.2 Maintenance Site Conditions

Prior to starting any maintenance work ensure the machine is positioned on stable and level ground and has been secured against inadvertent movement and buckling.

1.13.3 Replacement & Removal of Components

- Always observe handling instructions itemised in this manual, the Original Equipment Manufacturer’s manuals or the spare parts suppliers' instructions.

- Never allow untrained staff to attempt to remove or replace any part of the plant.
- The removal of large or heavy components without adequate lifting equipment is prohibited.
- 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 supplied or approved by Extec Screens & Crushers Ltd.
- Never work or stand under suspended loads.
- Keep away from the feeder hopper and product conveyor discharge, where there is risk of serious injury or death due to the loading and removal of material.
- Limit access to the machine and its surrounds by erecting barrier guards to reduce the risk of residual mechanical hazards, falling lifted loads and ejected materials.

1.13.4 Climbing, Falling

- Falling from and/ or onto this plant could cause injury or even death.
- Never climb on the plant whilst it is in operation.
- Never use plant parts as a climbing aid.
- Always keep the area around the plant clear of debris and trip hazards.
- Beware of moving haulage and loading equipment in the vicinity of the plant.
- For carrying out overhead assembly work always use specially designed or otherwise safety-oriented ladders and working platforms.
- Only use any walkway/ platforms provided on the machine or on an approved safe and secure platform.
- Only use CE certified safety harness when reaching any points 2 m or more above the ground level.
- Keep all handles, steps, handrails, platforms, landing and ladders free from dirt, oil, snow and ice.

1.13.5 Safety Consideration during Advanced Maintenance



Prior to undertaking all but normal planned maintenance activities it is essential that a method statement regarding safe working practices for the job in hand is produced.

- Restrict access to the maintenance to essential staff only. Where appropriate erect barrier guards and post warnings.

- The fastening of loads and instructing of crane operators should be entrusted to qualified persons only.
- The marshal providing instructions must be within sight or sound of the operator with an all round view of the operation.
- Always ensure that any safety fitment such as locking wedges, securing chains, bars or struts are utilised as indicated in these operating instructions.
- Particularly make sure that any part of the plant raised for any reason is prevented from falling by securing in a safe reliable manner.
- Never work under unsupported equipment.
- Never work alone.

1.13.6 Safety Considerations during Cleaning

- This equipment must be isolated prior to cleaning.
- Do not direct power washers near or into control boxes and devices.
- 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.

1.13.7 Removal of Safety Devices and Guards

- All safety devices (control devices or guards) temporarily removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work prior to operation.
- Never operate the machine with safety devices or guards removed or unsecured.
- Always report any defects regarding guards, safety devices or control devices.

1.13.8 Surrounding Structures

- This equipment must only be operated in a position away from buildings, permanent structures or high ground to eliminate the risk of persons falling onto the equipment or its surrounds.
- Any temporary structures erected around the machine must be removed prior to operating this equipment.

1.13.9 Safety when Refuelling

- Only refuel with diesel from approved storage and supply equipment.
- Diesel fuel is 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 and damage to the engine.
- Do not carry out maintenance on the fuel system near naked lights or sources of sparks, such as welding equipment or whilst smoking.
- To avoid spillages use drip trays.
- Immediately clear up spilt fuel and dispose of correctly to minimise any environmental impact.

1.14 Specific Hazards

1.14.1 Electrical Energy

External Considerations and Hazards

When working with the plant, maintain a safe distance from overhead electric lines. If overhead cables are in the vicinity a risk assessment must be completed prior to operating this equipment.

If your plant comes into contact with a live wire;

- Vacate the area,
- Warn others against approaching and touching the plant,
- Report the incident and have the live wire de-energized.

Machine - Electrical

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.

The power supply to the plants, on which inspection, maintenance and repair work is to be carried out must be isolated 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 plant is to be inspected and checked at regular intervals. Defects such as loose connections or scorched or otherwise damaged cables must be rectified immediately.

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

This plant is wired on a negative earth. Always observe correct polarity.

Battery

- Always disconnect battery leads before carrying out any maintenance to the electrical system.
- Recharge the battery in a well ventilated area.
- The battery contains sulphuric acid, an electrolyte which can cause severe burns and produce explosive gases.
- Avoid contact with the skin, eyes or clothing.
- No smoking when maintaining the battery.
- Wear appropriate PPE.

1.14.2 Gas, Dust, Steam, Smoke and Noise

Always operate internal combustion engines out of doors or in a well ventilated area.

If plant is operated for maintenance purposes in an enclosed area, ensure that there is sufficient ventilation or provide forced ventilation.

Observe the regulations in force at the respective site.

Dust found on the plant or produced during work on the plant must not be removed by blowing with compressed air.

Dust waste must only be handled by authorised persons dampened, placed in a sealed container and marked to ensure safe disposal.

1.14.3 Welding or Naked Flames

Welding, flame cutting and grinding work on the plant must only be carried out 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 plant and its surroundings from dust and other inflammable substances and make sure the premises are adequately ventilated (as there may be a risk of explosion). The battery must be isolated.

Avoid all naked flames in the vicinity of this equipment.

1.14.4 Hydraulic Equipment

Work on hydraulic equipment must be carried out by persons having special knowledge and experience of hydraulic systems.

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

Always relieve pressure from the hydraulic system before carrying out any kind of maintenance or adjustment.

Depressurise 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.

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.

Only fit replacement components of a type recommended by the manufacturer.

Always practice extreme cleanliness when servicing hydraulic components.

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.

Always use a piece of cardboard to check for leaks. Do not use your hand.

1.14.5 Hazardous Substances

Ensure that correct procedures are formulated to safely handle hazardous materials by correct identification, labelling, storage, use and disposal, all strictly in accordance with the manufacturer’s instructions and that all applicable regulations are observed at all times.

A full list of Substances Hazardous to Health associated with this equipment can be found in the appendix of this document.

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Section 2 Transportation

2.1 Transport

This machine must only be transported between sites on a suitable low loader or by utilising the optional bogie/ fifth wheel where available.

The machine must be tracked onto and off the trailer. See “Tracking Procedure” on page 33.

Note: This equipment must never be tracked on gradients that are more than: 10 degrees Port to Starboard or 20 degrees Front to Back. The machine must always be on flat, solid ground when operating in its normal mode.

A bogie and fifth wheel is available as an optional extra. The fifth wheel fits at the rear (feeder hopper door) end of the machine and attaches directly to the back of a tractor. The bogie fits at the front of the machine underneath the main conveyor. This is installed by lowering all four jack legs to lift the machine off the ground allowing the bogie to be rolled into position. When in position the machine is lowered until all four brackets align and locks the bogie into position. If this option is chosen full instructions may be found in the applicable section.

2.2 Loading

Ensure the loading/ unloading site is clear of non essential personnel. Barrier the area and post warning signs where site conditions warrant this.

Loading/ unloading must only be carried out on firm flat ground.

The operator must be fully trained in the operation of this equipment.

When tracking, the operator must be in a position to have an all round view of the operation. A banks man or marshal should assist where this is not possible.

The total weight of this machine is 41 tonnes.

2.3 Machine Transportation Dimension

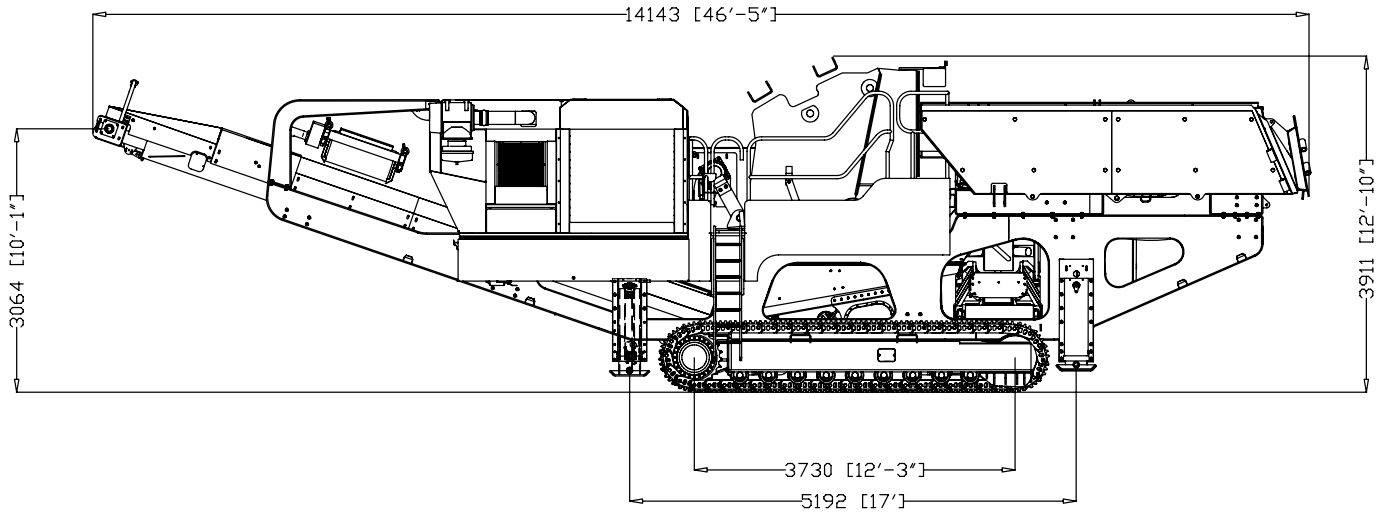


Figure 2-1: I-C13 Impactor Transport Dimensions

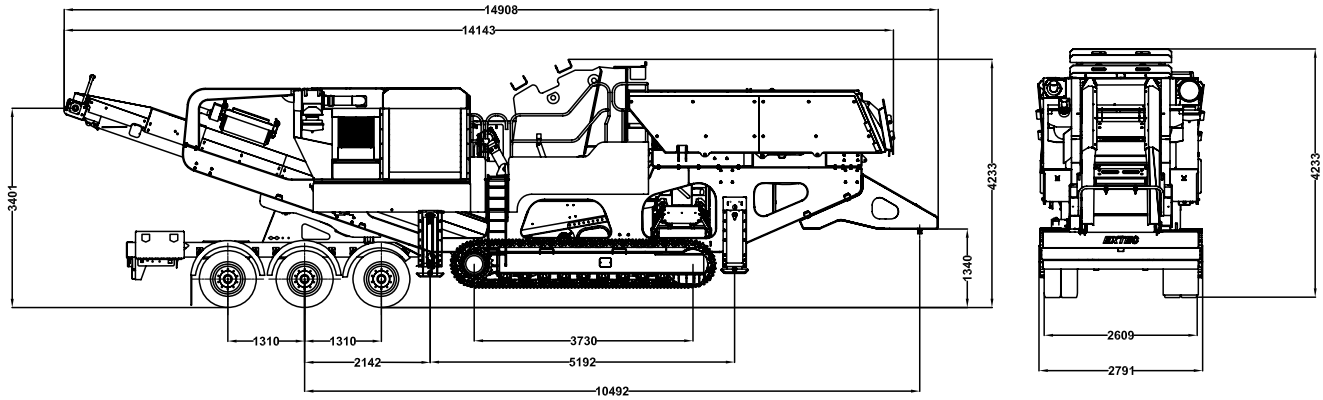


Figure 2-2: I-C13 Impactor Transport Dimensions Including Bogie and Swan Neck

Ensure the exhaust stack and spray bar are folded down and the apron adjuster caps are removed for transportation.

Before transporting this machinery all measurements of the machine should be checked to ensure they are within the legal transport dimensions.

Section 3 Description and Technical Information

3.1 Application & Limitations

The I-C13 Impactor has been designed and constructed to reduce minerals such as stone to a predetermined size. The I-C13 Impactor must not be used for any other purpose without first contacting Extec Screens & Crushers Ltd technical department.

The I-C13 Impactor must not be operated until the instructions supplied with the machine are read and fully understood.

3.2 Description

The I-C13 Impactor is a self contained tracked machine built to withstand the rigours and conditions of operating in quarries and within the construction industry.

The I-C13 Impactor utilises a diesel engine to provide the power to the hydraulic power pack and to generate electricity for the electrical systems of the machine.

The tracks, feeders, impactor box, conveyors and all other working parts of the machine are hydraulically driven.

Where possible all of the moving parts of this machine are guarded, where not, warnings are provided. The Safety Section of this manual must be read and fully understood. Any residual organisational, personal and environmental issues must be fully addressed as detailed in the safety section.

This equipment has been manufactured and assessed to be in accordance with the Machinery Directive 98/37/EC.

3.3 Operation Description

Section 2 and 4 of this manual provides details of Transport, Commissioning and Operation. This must be read and fully understood before operating this equipment.

Material is loaded normally by excavator into the hopper where the vibratory feeder transfers the material towards the impactor box.

The material passes over the grizzly bars where smaller material will fall through the bars where it is transferred either to the main conveyor or directed onto the side conveyor.

The larger material that has stayed on the grizzly bars is fed into the impactor box where it is crushed between the wear plates and falls onto the main conveyor.

The material is transferred up and along the main conveyor passing underneath the magnet. At this point any reinforcing bar mixed in with the material will be removed.

The material continues along the main conveyor where it is unloaded to a pile or to waiting transport.

3.4 Key Features of the I-C13 Impactor

- Diesel hydraulic power via Caterpillar C-13 Industrial C 440 bhp engine providing hydraulic transmission without clutches.
- Impactor box by Krupp Hazemag SA - the definitive box.
- Large vibratory feeder with grizzly and discharge conveyor for fines. The hydraulic system automatically coordinates the flow of material from the vibrating feeder to the impactor.
- Speed of the impactor can be varied between 500 - 765 rpm thereby varying the product size.
- Unique fast track system ensures the clean flow of reinforcing bar when concrete is crushed.
- Large gap between the discharge point of crusher and discharge conveyor eliminates blockages and facilitates cleaning.
- Vibrating tray receives the material from the crusher, absorbs the shock load and distributes the material onto the discharge conveyor.
- Complete machine rises on its hydraulic legs to facilitate cleaning and servicing of tracks and to provides a stable base.
- Machine is self propelled by remote control.
- Access platform.
- Optional bogie system eliminating the need for low loader transport.

3.5 Common Applications

- Granite
- Slate
- Bricks
- Limestone
- Recycling/ Demolition
- Rebar

- Asphalt

This list is by no means exhaustive. Please contact Extec Screens & Crushers Ltd for further details of performance figures and advice on your material.

3.6 Machine Layout Indicating Main Components

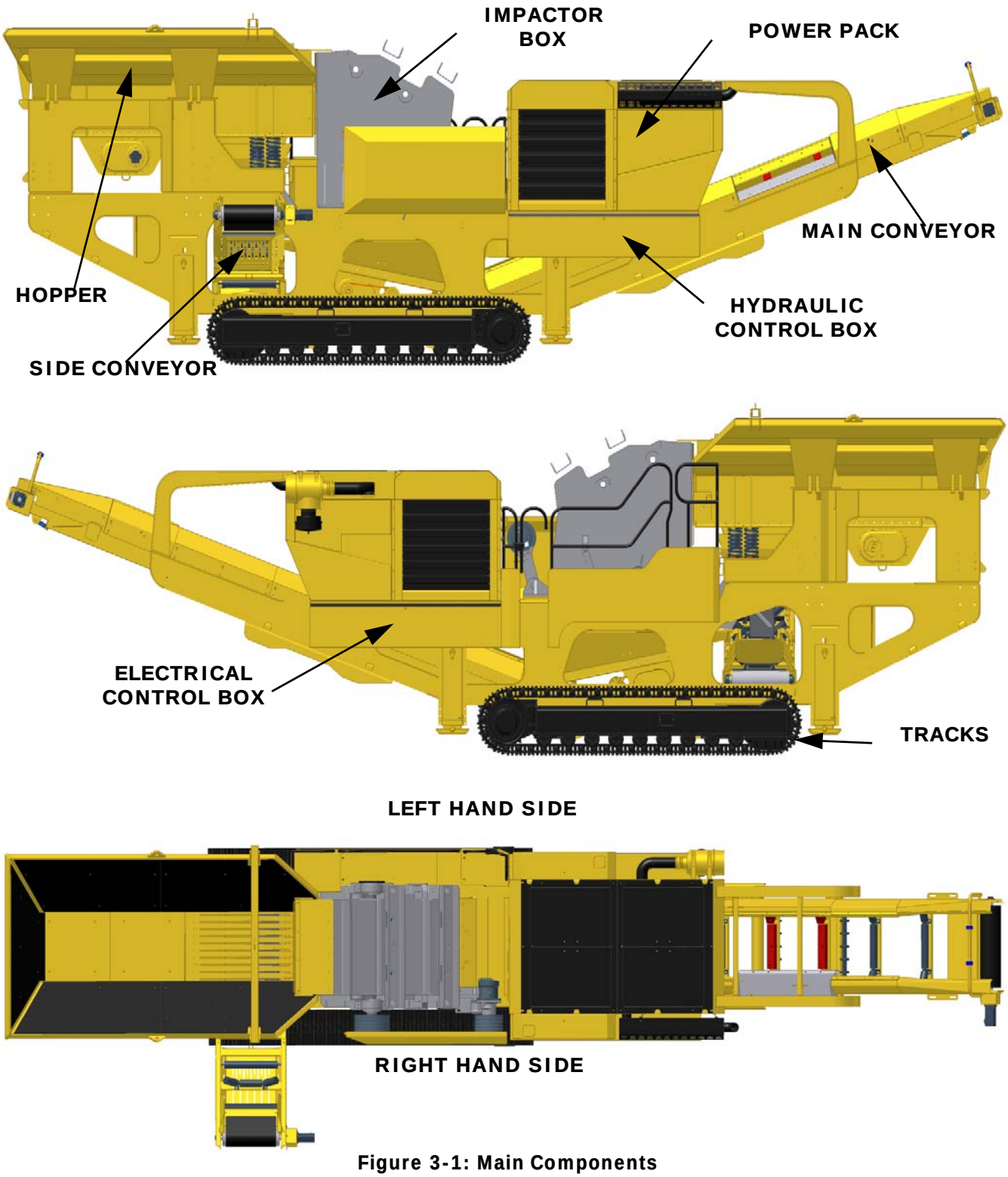


Figure 3-1: Main Components

3.7 Emergency Stop Positions

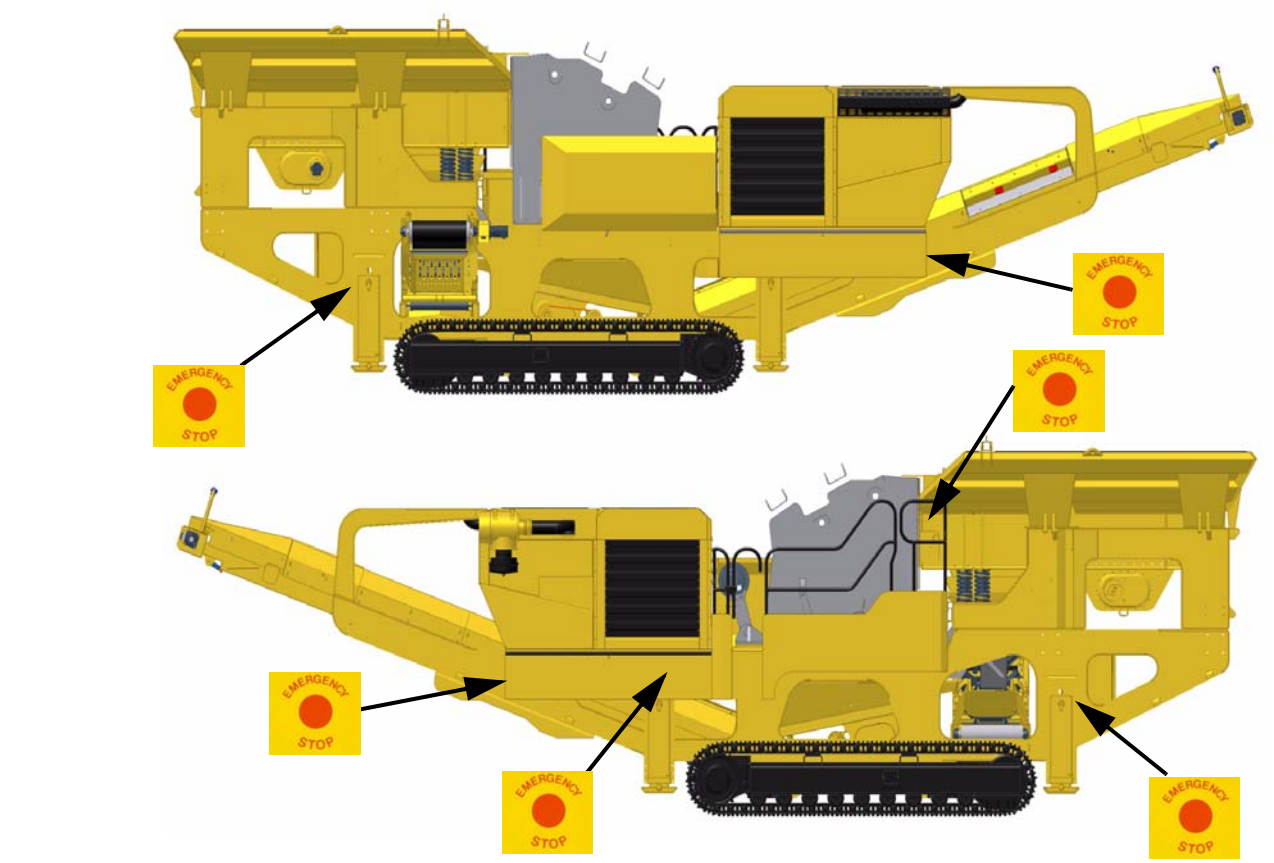


Figure 3-2: Emergency Stop Positions

3.8 Data

Crusher

Feed Opening	1290 x 950 mm
Crusher Speed	500 - 765 rpm
Drive	Hydraulic

Feeder

Hopper Width	2751 mm
Feeder Width	1100 mm
Feeder Length	4000 mm
Hopper Capacity	5.3 cubic meters

Conveyors

Side Conveyor	650 x 3100 mm

Main Conveyor	1000 x 10000 mm
Main Conveyor Speed	123 rpm

Dimensions

Transport Length	14143 mm
Transport Width	2756 mm
Transport Height	3911 mm
Working Length	14017 mm
Working Width	4107 mm
Working Height	4023 mm
Weight	44 000 kg

Engine Details

Engine	Caterpillar C-13 Industrial C 440 bhp
Engine Maximum Power	328 kW (440 bhp) @ 1900 rpm
Fuel Tank Capacity	475 litres
Hydraulic Tank Capacity	1400 litres

Fuel Consumption Guide

100% Full load, continuous	83.6 litres/ hour
70% load	58.5 litres/ hour

Section 4 Commissioning and Operation

4.1 Pre-Start Instructions

Before starting this machine it is important that the instructions below are followed:

1. Ensure that this manual is read and understood.
2. Do not attempt to start this machine until you are aware of all aspects of its operation.
3. Remove any temporary sealing and transport straps.
4. Check that the machine is in good mechanical condition and that there is no component damage or loss.
5. Ensure that all bolts and fixings are tight and that all guards are in place with all safety devices operating correctly. Never start this equipment without guards and safety devices operating correctly.
6. Ensure that crusher chamber feeder and conveyor belts are free of material.
7. Remove all tools and equipment from the operational area.
8. Ensure all personnel are well clear of the machine, drives, tracks and auxiliary equipment.
9. Ensure that the pre-start checks outlined in the engine manufacturer's instruction manual are complied with.
10. Check the oil levels in the engine and vibrating feeder.
11. Check that all drums and rollers turn freely. This must be done by hand. (Never attempt to touch the drums or rollers whilst the machine is running.)
12. Ensure that the skirting rubbers and scrapers are in good condition and working properly.

4.2 Main Control Devices

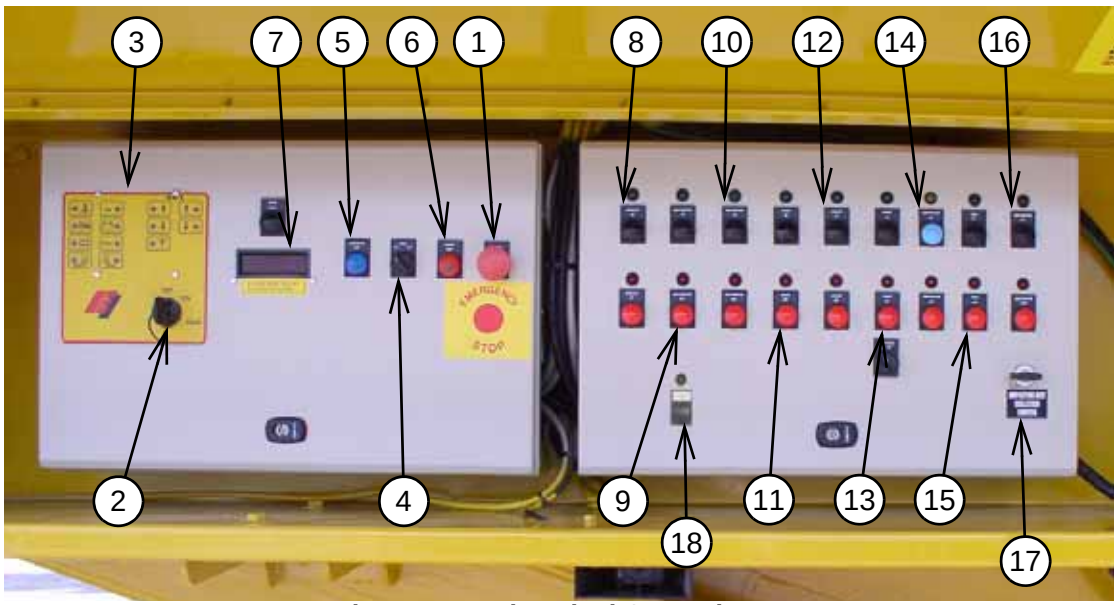


Figure 4-1: Electrical Control Box

1. Emergency Stop
2. Ignition Key (ON/OFF)
3. Engine Warning Lights
4. Engine Speed Control
5. Diagnostic Lamp
6. Warning Lamp
7. Engine rpm Meter
8. Interlock (ON/OFF)
9. Main Conveyor (ON/OFF)
10. Side Conveyor (ON/OFF)
11. Magnet (ON/OFF)
12. Crusher (ON/OFF)
13. Feeder (ON/OFF)
14. Feeder Pan (ON/OFF)
15. Tracks (ON/OFF)
16. Spare
17. Impactor Box Isolation Switch
18. Recirculation Conveyor (ON/OFF) (Where fitted)



Figure 4-2: Remote Control

- Start Feeder
- Stop Feeder
- No Action
- Remote Stop Engine
- No Action
- No Action
- Sound Track Alarm whilst held

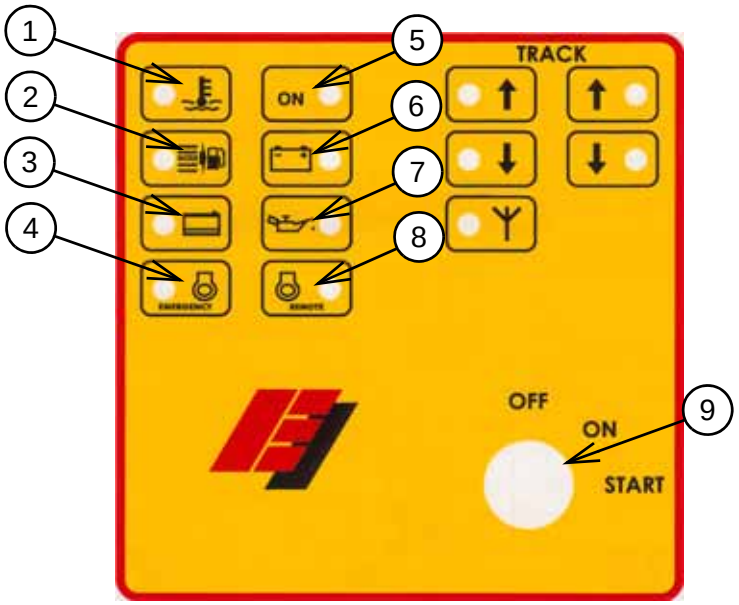


Figure 4-3: Engine Warning Lights

1. Water Temperature
2. Water and Fuel Sensor
3. Low Water Level
4. Emergency Stop Light
5. Engine On Light
6. Battery Light
7. Oil Light
8. Remote Control Emergency Stop
9. Ignition Switch Position

The I-C13 Impactor is equipped with a safety shutdown control panel. With this type of system, built-in switches set to factory preset limits, operate such that if during operation, either the oil pressure or engine temperature reaches its preset limit, the system will experience a safety shutdown and turn the engine off.

If a safety shutdown occurs, the condition causing the engine to shut down must be corrected before any attempt is made to restart it.

4.3 Starting Procedure



Figure 4-4: Starting procedure

1. Turn on at main isolation switch (1) positioned in the hydraulic control box next to the battery.
2. Set the speed control (2) to the No.1 position.
3. Turn the key (3) clockwise to the “ON” position. All lights will flash for several seconds.
4. Turn the key to the 'Start' position and hold until the engine starts.
5. Release key. Key will return to “ON” position.
6. Engine is now running at idling speed.

COLD START: When starting the machine in temperatures of 0°C or below, run all systems at engine speed No.1 for 15 minutes to allow the hydraulic oil to reach working temperature. ***DO NOT*** feed material into machine during this time. When this is done stop all systems, turn engine speed switch to No.2 and restart all systems. ***DO NOT*** turn engine speed switch from position 1 to 2 while any systems are running. ***DO NOT*** operate systems contrary to these instructions.

Note: The machine ***MUST*** be level in both longitudinal and traverse planes and set up on firm level ground before being operated. Failure to comply with this or any other instructions in this manual may cause damage to the machine and may invalidate any warranty.

4.4 Stopping the Machine

To stop the machine, it is ***ESSENTIAL*** that the following steps be followed in order to prevent damage to the machine:

1. Stop feeding material into hopper.
2. Wait for all material to fully discharge from feeder, impactor and conveyor belts.
3. Shut down systems in following order using the "stop" buttons in electrical control box:
   a. Feeder

b. Impactor
c. Main conveyor
d. Magnet
e. Side conveyor
f. Recirculation conveyor (Where fitted)

4. Wait for each system to come to a complete stop.
5. Turn engine speed switch to position No.1 and allow engine to idle briefly.
6. Stop engine by turning ignition key to 'OFF' position.

4.5 Stopping Machine in an Emergency

THE MACHINE CAN BE STOPPED IN AN EMERGENCY BY PRESSING THE EMERGENCY STOP BUTTONS LOCATED ON THE ELECTRICAL CONTROL PANEL AND ALONG EACH SIDE OF THE MACHINE OR BY TURNING THE IGNITION KEY OR ISOLATION SWITCH DIRECTLY TO 'OFF' POSITION.

ENSURE THAT ALL PERSONNEL IN THE VICINITY OF THE MACHINE ARE FULLY AWARE OF THE LOCATION OF THE EMERGENCY STOPS.

4.5.1 Emergency Stop Locations



1: Emergency stop and ignition switch in control box



2: Emergency stop on L/H jacking leg



3: Emergency stop on R/H jacking leg



4: Emergency stop on hydraulic control box



5: Emergency stop on electrical control box

Note: ***Emergency Stop*** switches should only be used in an emergency situation and not for normal stopping. Frequent use will cause damage to the hydraulic components.

Note: ***Emergency Stop*** switches must be reset before the machine can be restarted.

4.6 Removing Tractor Unit and Bogie - (Where fitted)





1: Remove jacking leg retention screws.

Note: Before attempting to lower the jacking legs ALL of the leg transportation retaining screws MUST be removed.



2: Front jacking legs lever.



3: Lower front jacking legs to raise fifth wheel neck by approximately 100 mm.



4: Remove tractor unit air brakes & lighting connections then unhitch from machine.



5: Unlock bogie from machine (4 positions).



6: Rear jacking legs lever.



7: Lower rear jacking legs to raise machine clear of the bogie locking mechanism.



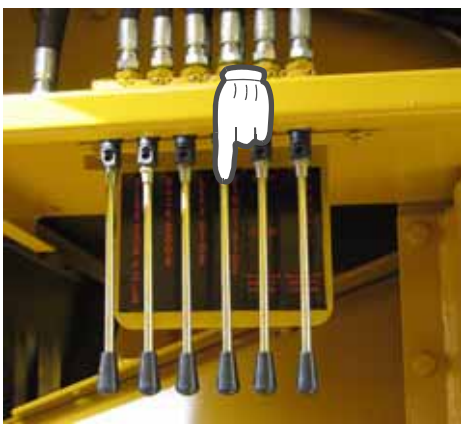
8: Remove bogie air brakes & lighting connections then tow away from machine.



9: Retract both front and rear jacking legs so that weight of machine is taken on tracks.



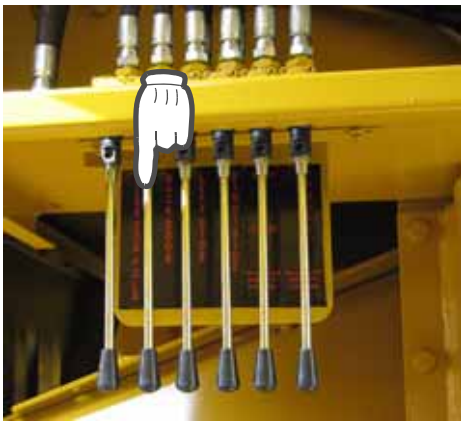
10: Raise left hand hopper side.



11: Raise right hand hopper side.



12: Hopper back door being raised.



13: Raise hopper back door.



14: Hopper back door being raised.



15: Hopper sides fully raised.





16: Remove connection panel & umbilical cord completely from machine.

Fitting the bogie and attaching the tractor for transportation is a reversed procedure to that describe above.

IMPORTANT: Before transporting with the bogie fitted ensure that the jacking legs are fully retracted and the leg transportation retaining screw have been refitted and tightened to prevent the legs from dropping.

4.7 Tracking Procedure

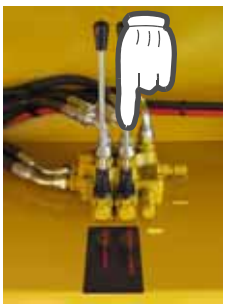
The operator must be fully trained in the operation of this equipment. When tracking, the operator must be in a position to have an all round view of the operation. A banks man or marshal should assist where this is not possible.
Ensure the site is clear of non essential personnel. Erect barriers around the area and post warning signs where site conditions warrant this.
Loading/ unloading must only be carried out on firm flat ground.

Note: This equipment must never be tracked on gradients that are more than: 10 degrees Port to Starboard or 20 degrees Front to Back. The machine must always be on flat, solid ground when operating in its normal mode.

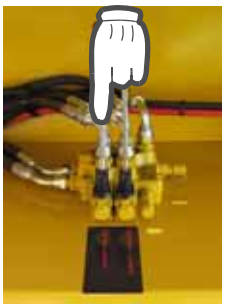
When engine is running at speed No.1, the machine can be moved to desired position on site by following the procedures in the order listed below:



17: Press button "INTERLOCK ON".

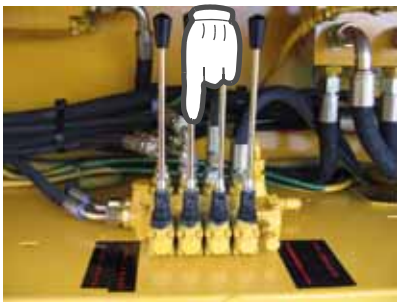


18: Activate levers to raise front jacking legs.

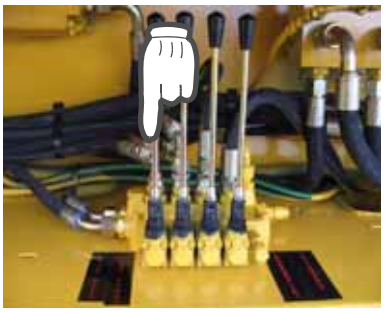


19: Activate levers to raise rear jacking legs.

Where a recirculation conveyor is fitted, the jacking leg levers are located in the hydraulic control cabinet.



20: Activate levers to raise front jacking legs.



21: Activate levers to raise rear jacking legs.



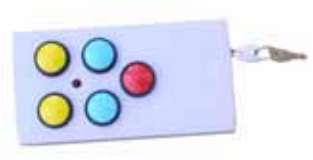
22: Jacking legs fully raised



23: Press button "TRACKS ON".

After following instructions on the previous page, use either the Remote Handset or Hard Wire Drive to move machine to desired position.

Note: The Remote Handset must be fully recharged at regular intervals. Use the correct instructions for your type of controller.



1: Remote Handset

OR



2: Plug in Hard Wire Umbilical Socket



3: Hard Wire Handset

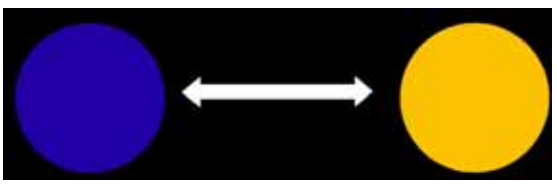
WARNING: Under NO circumstances try to move the machine when engine speed is set at position No.2 or when ANY personnel are standing on the machine.

For safety reasons, it is essential to check all around machine for obstacles or personnel which may be endangered by moving the machine.

When moving machine, ensure that it is only moved over firm ground suitable for carrying the weight of the machine. Prior to operating the machine, it is *ESSENTIAL* that both tracks are in contact with firm level ground to avoid excessive vibration or rocking of the machine. *DO NOT MOVE THE MACHINE ACROSS EXCESSIVELY SLOPING GROUND.*

NOTE:

1. When operating the White Remote Handset, the yellow buttons are for forward movement and the blue ones for reverse. (These correspond to direction indicator stickers on the machine.)
2. When operating the Hard Wire Handset, the yellow buttons are for forward movement and the blue ones for reverse. (These correspond to direction indicator stickers on the machine.)



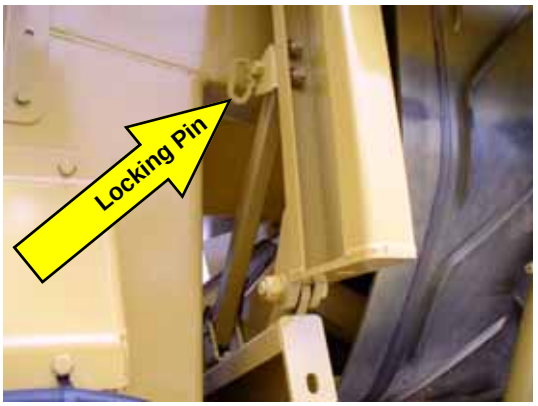
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When the machine is moved to its desired operating position, prepare the I-C13 Impactor for operation by following the procedures laid out in the following pages.

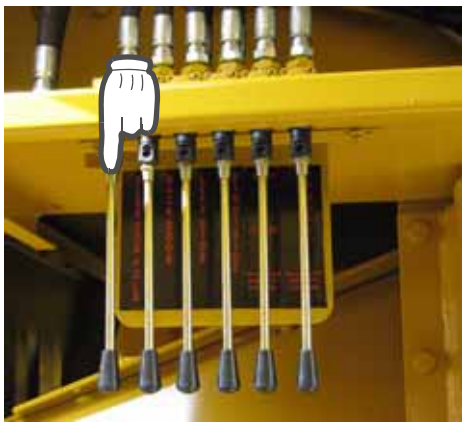
4.8 Preparing the I-C13 Impactor for Operation



1: Press button "Interlock On".



2: Remove side conveyor locking pin.



3: Activate lever marked SIDE CON FOLD to lower side conveyor.



4: Side conveyor in working position.

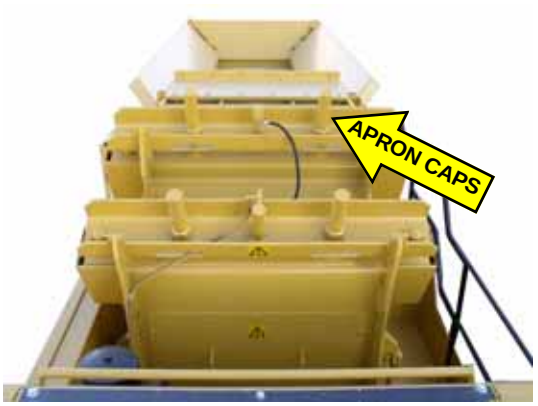


5: Raise main conveyor spray bar to working position.



6: Fix main conveyor spray bar in working position and secure.





1: Replace apron adjuster caps removed & stored during transport.



2: Unfold ladder, ensuring its locked into position.



3: Lift rail into position and lock with pin.

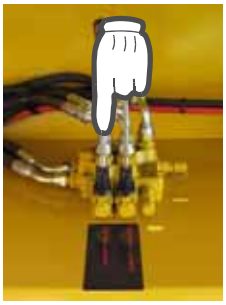


4: Lift up rotating gate section.

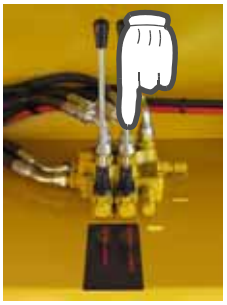


5: Rotate & lower the gate into position. Repeat the procedure on other side of machine.

Note: While operator is using the platforms the safety gates MUST be closed.



6: Lower rear jack legs by operating levers.

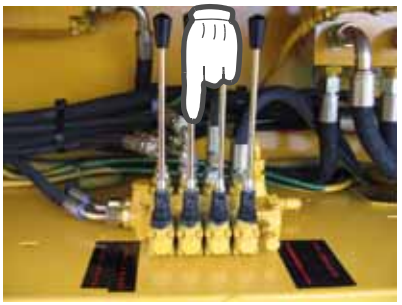


7: Lower front jack legs by operating levers.

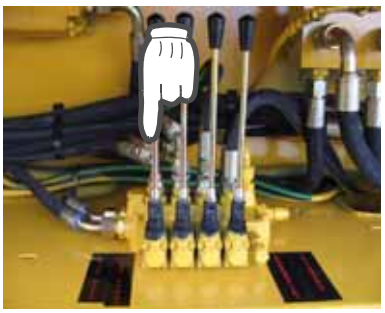


8: Fit pins & R-clips to jack legs (8 off).

Where a recirculation conveyor is fitted, the jacking leg levers are located in the hydraulic control cabinet.



9: Lower rear jack legs by operating levers.



10: Lower front jack legs by operating levers.

WARNING:

a. ***Ensure the machine is on a level surface before operating the jack leg levers.***

b. ***Lift the machine uniformly.***

4.8.1 Installation of the Recirculation Unit (Where fitted)

The recirculation unit is provided separately

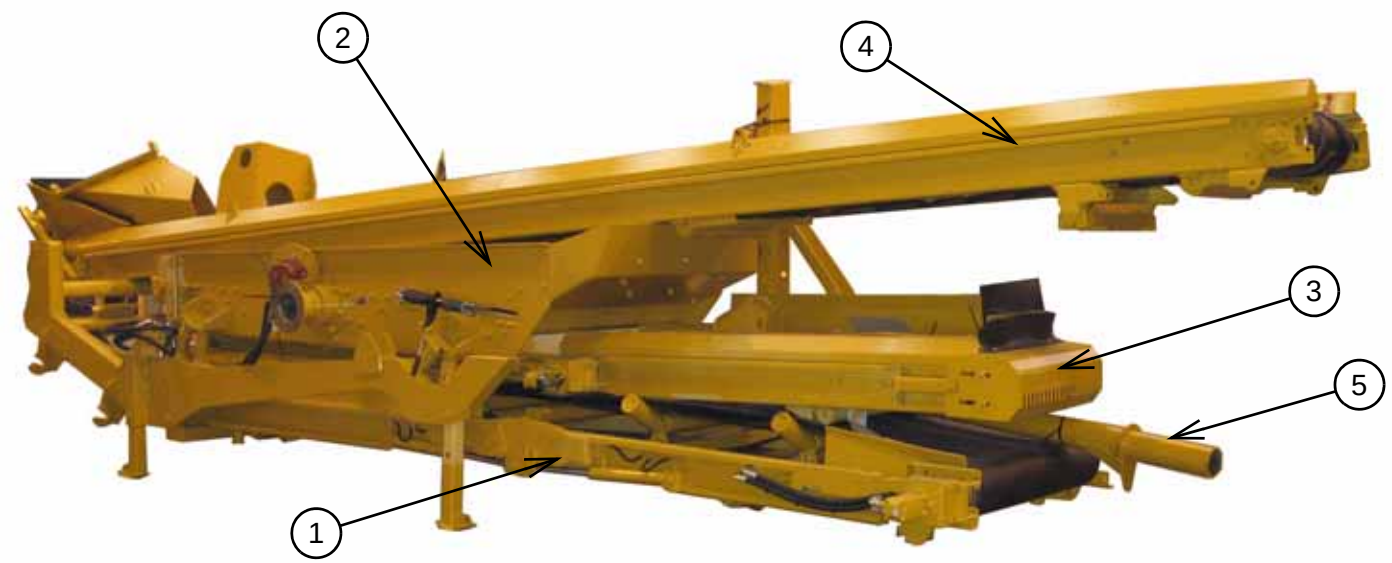


Figure 4-5: The Recirculation Unit

1. Main Conveyor
2. Screener Box
3. Side Conveyor
4. Recirculation Conveyor
5. Support Bracket

WARNING: The machine **MUST** be switched off and isolated with the ignition keys removed **BEFORE** making any adjustments.

DO NOT stand on any part of the engine whilst operating or carrying out any installation on the machine.

All adjustments must **ONLY** be carried out by trained personnel. All adjustments to modify hydraulic system must **ONLY** be carried out by trained Extec service engineers

ONLY use appropriate lifting equipment to separate the different parts of the recirculation unit.



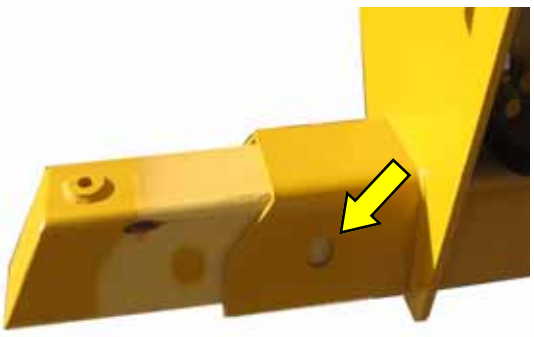
1: Install the side conveyor on the slides



2: Install the hydraulic ram, the bolt and tighten the nut



3: Remove the lock pins

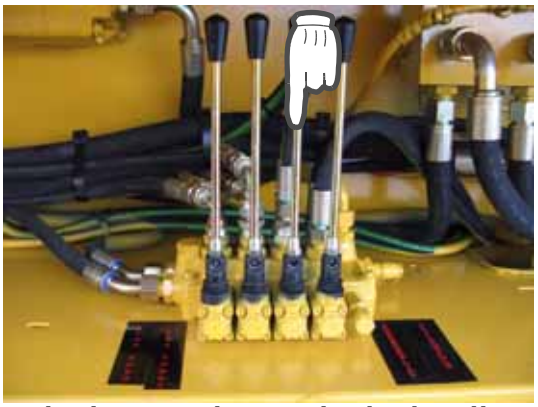


4: Extend the support and install the pin





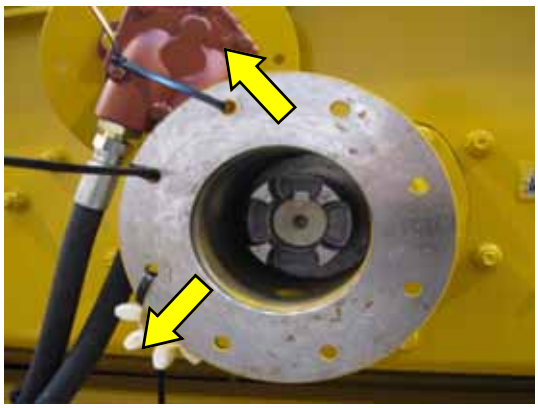
5: Install the main conveyor in position on the crusher



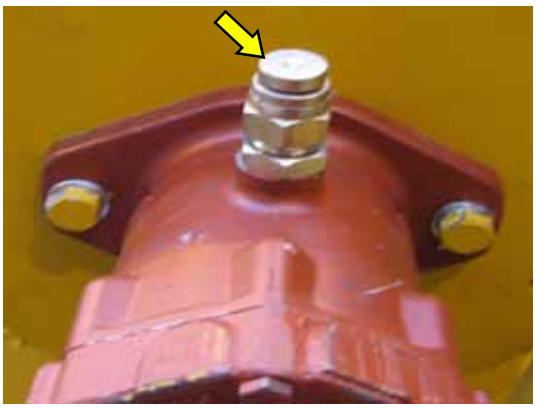
6: Use the lever to lower the hydraulic arms



7: Install the hydraulic arms on the supports



8: Attach the spacer bush and the motor



9: Install the hydraulic hose HH10158



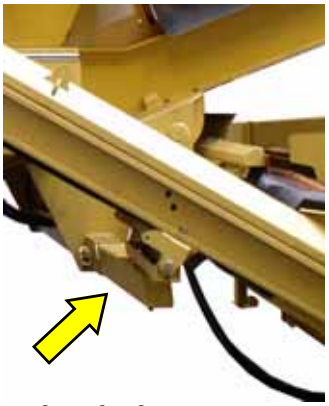
10: Install the hydraulic hoses to the side conveyor motor



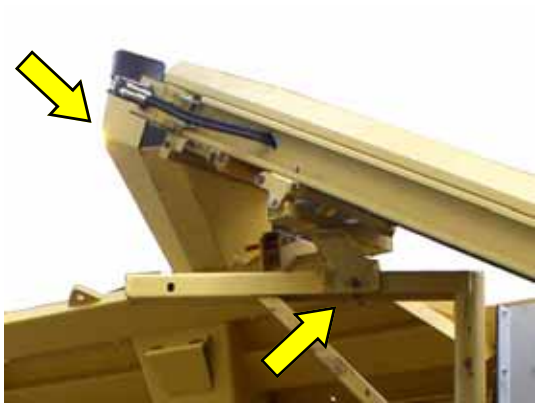
11: Install the hydraulic hoses from their match marks



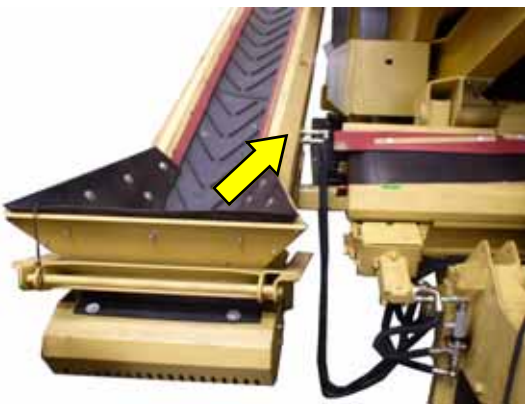
12: Install the support bracket box and attach the support bracket



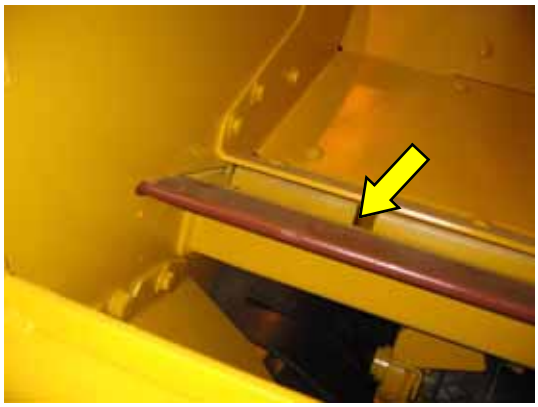
13: Put the recirculation conveyor in position and attach the lower end to the support beam

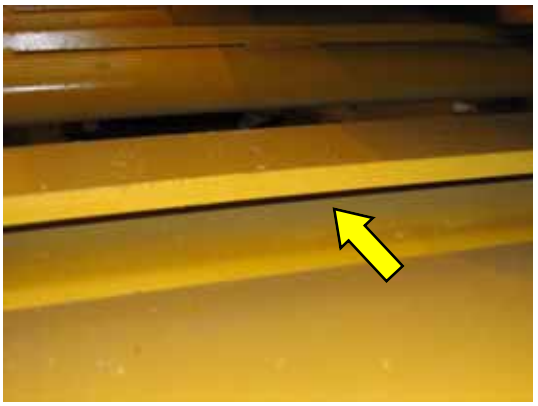


14: Attach the feeder and the support bracket



15: Connect the hydraulic hoses to the recirculation conveyor





16: Install the screen mesh



17: Tighten the screen mesh with the handle

To attach the recirculation conveyor perpendicular to the impactor do the steps that follow

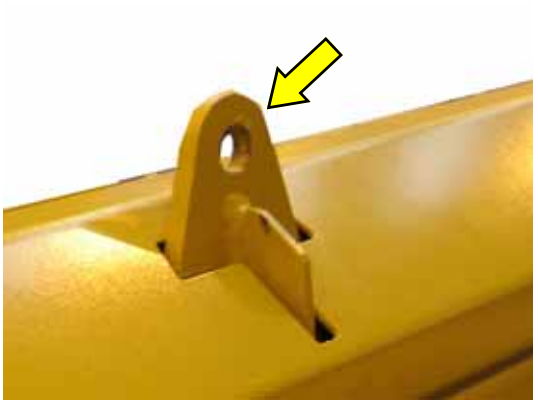




18: Put the recirculation conveyor in position

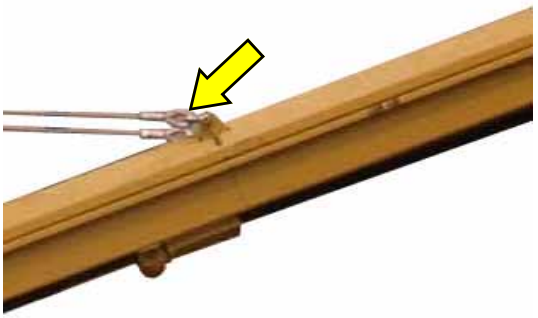


19: Attachment points of the chassis



20: Attachment points of the recirculation conveyor





21: Attach the two support cables to the impactor chassis and the recirculation conveyor

4.8.2 Operation of the Recirculation Unit

Make sure that the Impactor is started “Starting Procedure” on page 28.



1: Use the lever to adjust the height of the recirculation unit



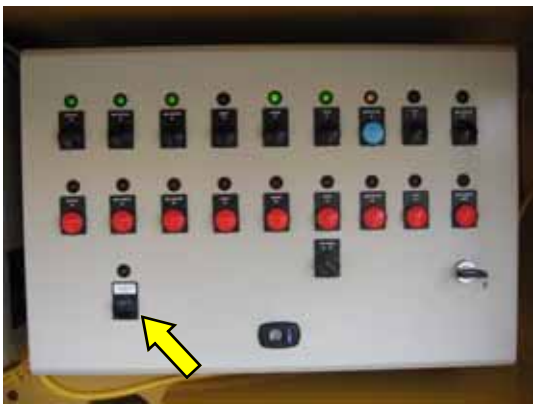
2: The recirculation unit adjusted



3: Use the lever to move the side conveyor



4: The side conveyor adjusted



5: Turn on the recirculation conveyors

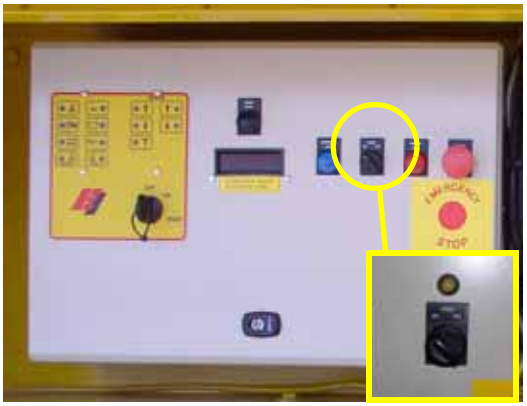
4.9 Operating The Machine

4.9.1 Operating Starting Sequence

When the machine is set up as described in the previous pages, it is now ready to be operated. To operate machine, turn engine speed to No.2 position and then start systems in the following sequence:

1. Side conveyor
2. Magnet
3. Main conveyor
4. Feeder pan
5. Impactor
6. Feeder

DO NOT START THESE SYSTEMS IF THEY ARE FULL OF MATERIAL. CLEAR ANY MATERIAL AWAY BEFORE STARTING.



1: Turn engine speed switch to position No.2.

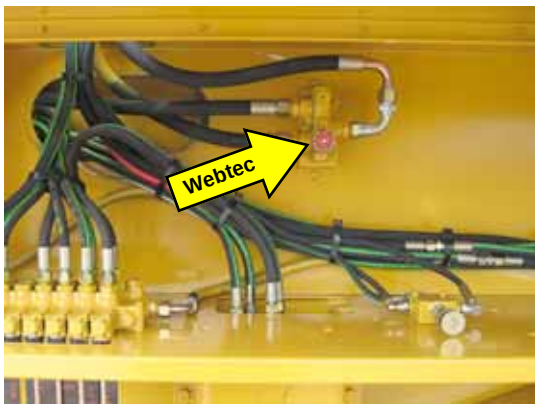


2: Start systems as per above sequence.

Prior to loading material into the machine, ensure that the machine is not vibrating or rocking excessively. Stabilise with jacking legs if required, or relocate machine to more suitable ground.

4.9.2 Loading Material Into Machine

1. Feeder *MUST* be running *PRIOR* to feed material being placed upon it. *DO NOT* start feeder if it is full of material.
2. Material which is larger than 80% of feeder discharge chute should not be presented to the feeder. *STOP MACHINE* and remove any large pieces of material with the appropriate equipment. *DO NOT* use excavators to force any material into feeder as any damage occurred from this action will invalidate any Extec Screens & Crushers Ltd warrantees.
3. Material should be fed carefully, (not dropped onto feeder) from about 300 mm above feeder. Ensure that feeder is evenly loaded over its entire length - excluding grizzly. This is to help with screening fines material and to maximise production.
4. It is recommended that an excavator is used to load material into hopper. *DO NOT OVER FILL HOPPER.*
5. For maximum output and minimum wear, it is recommended that the crusher chamber is fed consistently with the supply of material being steady and constant. STOP/ START OPERATION OF THE FEEDER SHOULD BE AVOIDED.



1: Adjusting feeder speed using Webtec control.



2: Starting / Stopping feeder speed using remote control.

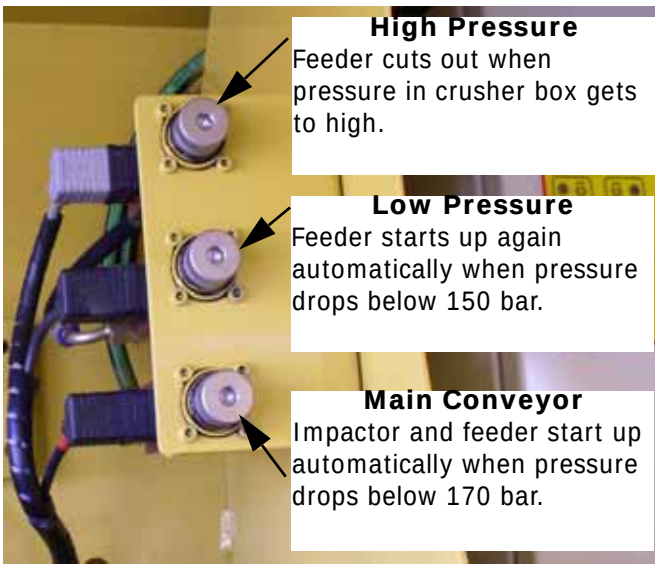
When the machine is set up as described in the previous pages, it is now ready to be used to crush the desired material. ***DO NOT START CRUSHING UNTIL YOU HAVE READ AND FULLY UNDERSTOOD THIS MANUAL.***

4.9.3 Feeder Cut-out

The I-C13 Impactor is fitted with a pressure sensing device that will cut out the operation of the feeder when the pressure in the crusher chamber exceeds specified limits.

This reduces the chances of the crusher becoming choked with material, as the machine will have more time to deal with what is in the crusher chamber.

Once the pressure in the crusher chamber drops to within specified limits, the feeder will automatically restart to give an uninterrupted crushing process. This system reduces the chances of having to manually clear the



crusher chamber and reduces the amount of down time.



Figure 4-6: Feeder cut out switch - on.



Figure 4-7: Feeder cut out switch - off.

4.10 Impactor Box Pressure Adjustment

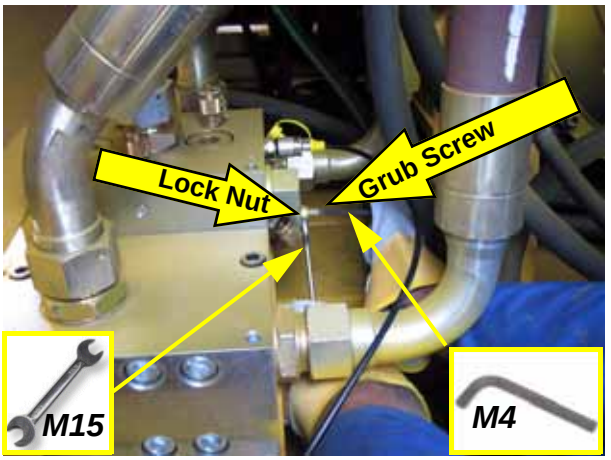
SAFETY NOTICE

The following procedures are carried out with the machine running so extra care ***MUST*** be taken to ensure the safety of ***ANY*** personnel on or in the vicinity of the machine.

4.10.1 Start Up Pressure



1: Start Up Pressure



2: Adjusting Pressure

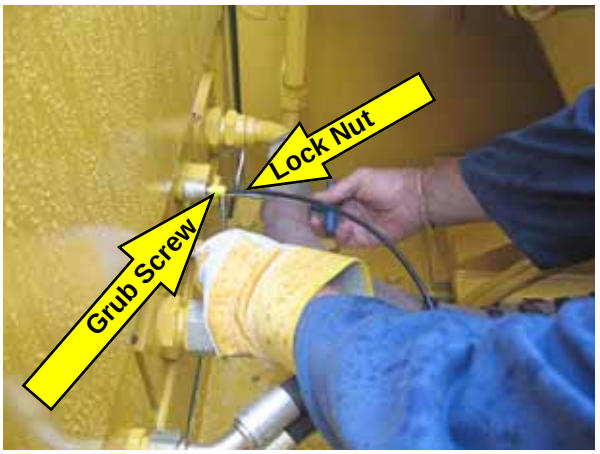
1. Attach pressure gauge to pressure point as shown.
2. Start crusher on speed on No.2 then stop impactor. The pressure gauge should read 250 bar. If required, adjust the pressure using following procedure.
3. Unscrew lock nut on relief valve grub screw. To reduce the pressure, turn the screw anti-clockwise. To increase pressure, turn the screw clockwise. Turn screw about ¼ of a turn.
4. Repeat procedures 2 & 3 checking the pressure each time.
5. When the pressure reads 250 bar lock the screw in position with the attached lock nut.

Note: The rotor will run for at least 20 seconds after stopping the box to allow for smooth braking.

4.10.2 Brake Pressure



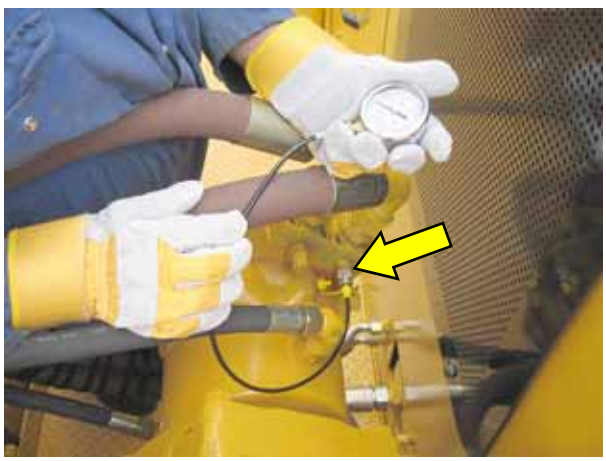
3: Brake Pressure



4: Adjusting Pressure

1. Attach pressure gauge to pressure point as shown.
2. Start impactor box at full speed on No.2 (800 rpm) then stop impactor box. The pressure gauge should read 150 bar. If required, adjust the pressure using following procedure.
3. Unscrew lock nut on relief valve grub screw. To reduce the pressure, turn the screw anti-clockwise. To increase pressure turn the screw clockwise. Turn screw about ¼ of a turn.
4. Repeat procedures 2 & 3 checking the pressure each time.
5. When the pressure reads 150 bar lock the screw in position with the attached lock nut.

Note: The rotor will run for at least 20 seconds after stopping the box to allow for smooth braking.



5: Running Pressure. For information only.



6: Return Pressure. For information only.

Section 5 Machine Maintenance

5.1 Introduction

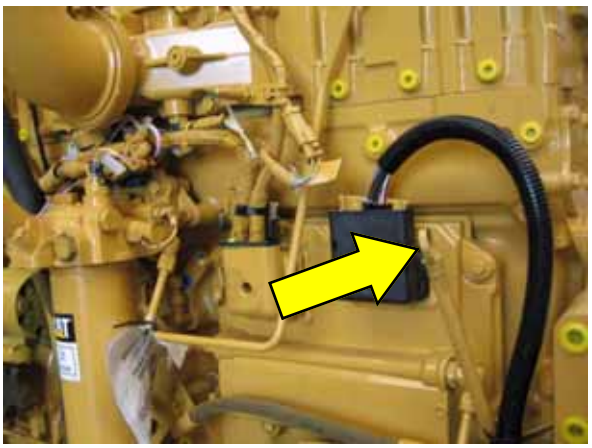
Maintenance is essential for safety and to ensure the best possible performance from your I-C13 Impactor by reducing the chances of breakdowns.

WARNING: The machine **MUST** be switched off and isolated with the ignition keys removed **BEFORE** making any adjustments.

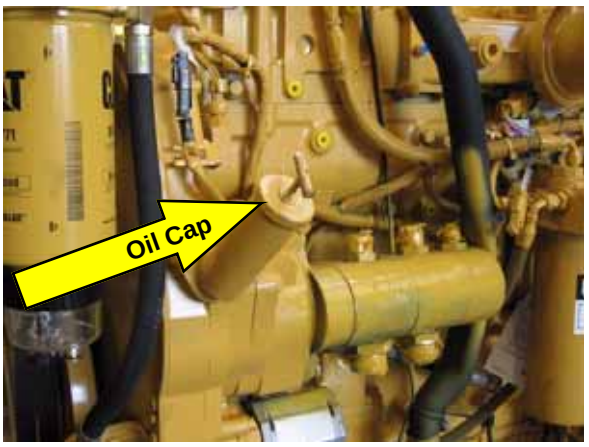
DO NOT stand on any part of the engine whilst operating or carrying out any maintenance on the machine.

All adjustments must **ONLY** be carried out by trained personnel. All adjustments to modify hydraulic system must **ONLY** be carried out by trained Extec service engineers.

5.2 Daily Maintenance Schedule



1: Check engine oil level.

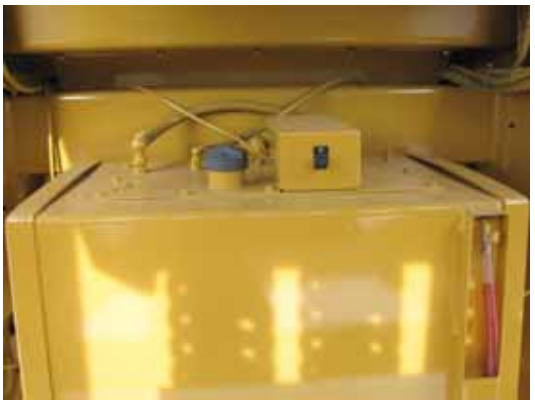


2: Refill if necessary.

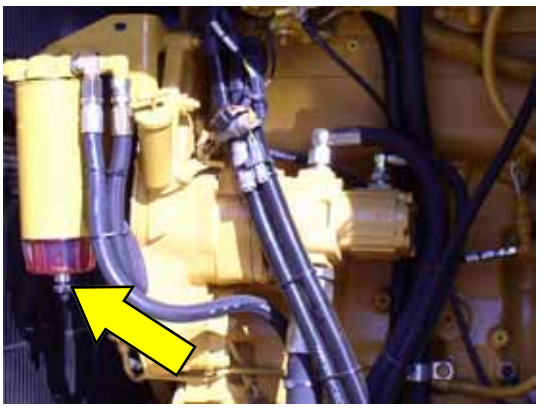
(Refer to the engine manufacturer's handbook for engine oil specification.)



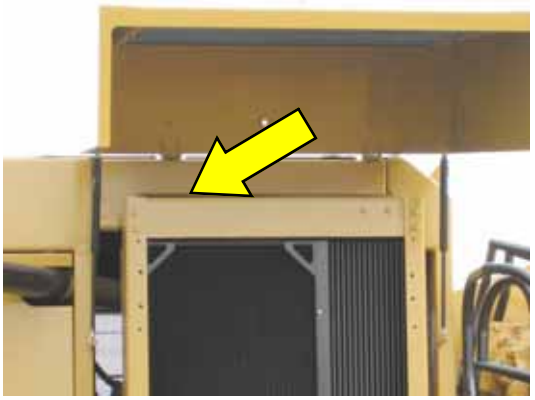
3: Check fuel level.



4: Refill diesel tank using the diesel pump and fuel suction pipe. Alternatively refill manually after cleaning around the cap opening.



5: Bleed diesel water trap.



6: Check radiator water level & refill if necessary.
Use a 50/50 mixture of anti freeze and water.



7: If fitted remove pieces of metal on magnet conveyor that may cause jamming around rotating parts.

5.2.1 Air Cleaner Servicing

Check the service indicators on the air cleaner. Regardless of condition of service indicator, remove the primary air cleaner from air cleaner as shown below and clean using compressed air. Never clean the secondary air cleaner. After 3 primary air cleaner replacements, replace the secondary air cleaner.

Note: Service indicators are for showing when the air filter needs to be replaced or cleaned. Test the service indicator as laid out in the engine manufacturer's handbook.



1: Check the service indicator daily.



2: Unclip the cover and remove.



3: Remove and clean the primary air cleaner. The primary air cleaner can be used up to six times if properly maintained. Replace at least once a year.



4: Only remove and replace secondary air cleaner after three services.

When the engine is operating in environments that are dusty or dirty, air cleaner elements may require more frequent replacement.



5: Cover the turbocharger air inlet in order to keep dirt out. Clean the inside of the air cleaner cover and body with a clean, dry cloth.



6: Replace air cleaners and cover after cleaning. Reset the air cleaner service indicator.

For detailed cleaning instructions, refer to the instructions in the engine manufacturer's handbook.

Filter Maintenance List

Part Number	Description	QTY
1. EN1350	AIR PRIMARY FILTER	1
2. EN1349	AIR SECONDARY FILTER	1
3. EN1008	INDICATOR-AIR FILTER CHANGE	1

5.3 Weekly Maintenance Schedule

Maintenance is essential for safety and to ensure the best possible performance from your I-C13 Impactor by reducing the chances of breakdowns.

WARNING: The machine **MUST** be switched off and isolated with the ignition keys removed **BEFORE** making any adjustments.

DO NOT stand on any part of the engine whilst operating or carrying out any maintenance on the machine.

All adjustments must **ONLY** be carried out by trained personnel.

STOP MACHINE, ISOLATE AND REMOVE IGNITION KEY BEFORE CARRYING OUT ANY MAINTENANCE ON THIS MACHINE.

1. Check the condition of conveyor belts, rollers and other moving parts.
2. Clear any obstructions from the grizzly bars and impactor chamber.
3. Check all bolts and panels are in place and secure.
4. Clear any build up of dust from the oil cooler and radiator using compressed air.
5. Check blow bars for wear, and turn around or replace if necessary.
6. Check condition of service indicators on hydraulic filters, water trap and air breather. Replace if necessary.
7. Examine liner plates inside crusher chamber for wear. Replace if necessary.
8. Check emergency stops are working correctly.
9. Check feeder oil level and grease bearings. See “Greasing Bearings” on page 55.
10. If fitted check condition of support chains on the magnet conveyor.
11. Inspect and adjust all belt scrapers and sealing rubbers if necessary.

5.3.1 Checking Feeder Oil Level



1: Remove oil level plug. If oil trickles out, there is enough oil in feeder - if not, oil level needs to be topped up.



2: Remove oil filler plug. Refill using Shell Omala 220 Gear Oil until oil comes out of level hole.

Note: Always check both sides.



3: Repeat for the main conveyor feeder pan.

5.3.2 Checking/ Changing Hydraulic Tank Air Breather



1: Raise cover plate and examine service indicator.

If the service indicator is green, it is time to replace the tank air breather. Simply remove air breather and replace with new one.

Note: If optional oil cooler is fitted, then it must be in the raised position & cover plate removed to access the air breather.

5.3.3 Greasing Bearings

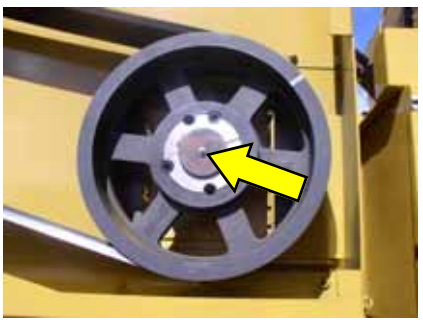
Extec Screens & Crushers Ltd use SKF sealed-for-life bearings that reduce grease consumption, lower life cycle cost, lower recycling costs and reduce pressure on the environment. The results are dramatically increased up-time for the machines and the consequent reduction in maintenance costs. Only apply grease where otherwise indicated.

WARNING: NEVER USE GREASE CONTAINING MOLYBDENUM. DOING SO MAY CAUSE DAMAGE TO MACHINE PARTS AND WILL INVALIDATE ANY WARRANTY.

Using suitable equipment, the following bearings must be greased every week. See following pictograms for details of grease points.



1: Torque Arm motor bearings



2: Torque Arm shaft bearings

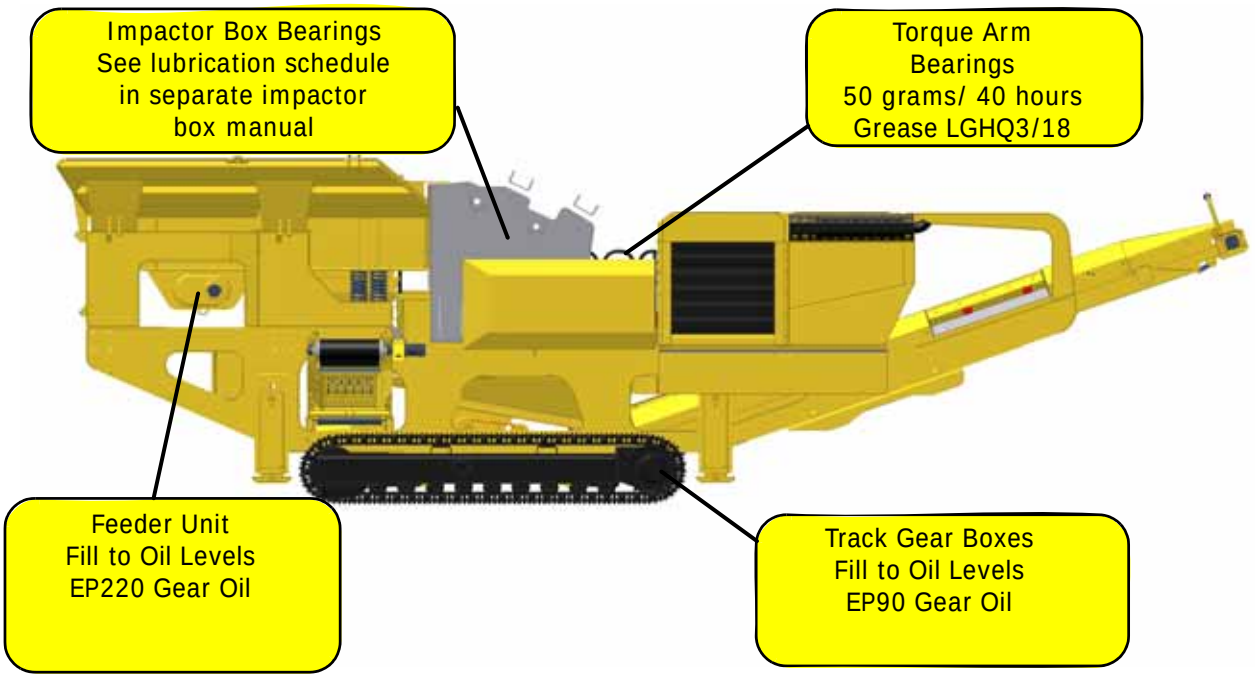
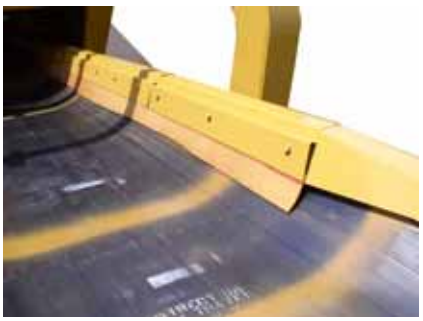


Figure 5-1: Grease Points

5.3.4 Inspecting/ Adjusting Belt Sealing Rubbers



1: Sealing rubber in correct position & condition



2: Adjust as required.



3: Refit clamp fixing screws.

5.3.5 Adjusting Belt Scraper



Figure 5-2: Adjusting Belt Scraper

If required, adjust head drum scraper by loosening bolts in Rosta springs, adjusting scraper and re-tightening bolts.

Both sides should be adjusted simultaneously.

5.3.6 Hydraulic Filter

Check service indicators on hydraulic filters when the machine is running. **CHECKING CONDITION OF FILTER INDICATORS IS THE ONLY CHECK TO BE MADE WHEN MACHINE IS RUNNING. STOP MACHINE BEFORE REPLACING ELEMENTS.**



1: Lift up cover & inspect service indicator.



2: Replace elements if service indicator is red.



3: Replace cap, ensuring O-ring is in place.

Note: If optional oil cooler is fitted, please refer to next page for maintenance instructions for hydraulic filters.

4: Close and secure cover plate.

5.3.7 Changing Hydraulic Water Trap



1: Replacing hydraulic water trap.

Note: When the water trap is taken off, oil will spill out. Use a suitable container to catch any waste oil - expect between 3 and 5 litres. Replace water trap as shown.

CLEAN UP ANY OIL SPILLS AFTER PERFORMING THESE OPERATIONS.

5.4 250 Hour Maintenance Schedule

Every 250 hours, the following maintenance must be carried out to ensure the best performance and least possible amount of downtime from your machine.

1. Follow maintenance instructions laid out in the engine manufacturer's handbook.
2. Change the hydraulic water trap ***regardless*** of condition of service indicator.
3. Change the hydraulic tank air breather ***regardless*** of condition of service indicator.
4. Flush hydraulic system and change the hydraulic filters ***regardless*** of condition of service indicator. To flush hydraulic system, proceed as follows:
    a. Ensure all material has passed through the crusher and off the conveyor belts.
    b. Stop the machine and replace the hydraulic filters with 3 micron flushing filters (EN1405).
    c. Fit new 10 micron water trap.
    d. Check condition of hydraulic tank air breather. If the service indicator is red, change it. Otherwise clean all dust from the base of the filter.
    e. Run all systems for 4 hours with engine speed set to No.1 position. ***(DO NOT FEED MATERIAL INTO THE MACHINE DURING THIS OPERATION.)***
    f. Stop machine and replace flushing filters with new 25 micron hydraulic filters.
5. Check for leaks on hydraulic pipes.
6. Inspect condition of conveyor belts and tracking.
7. Inspect condition of all drums and rollers.

8. Check drive belts for wear, swelling, softening and tension. Replace if necessary.

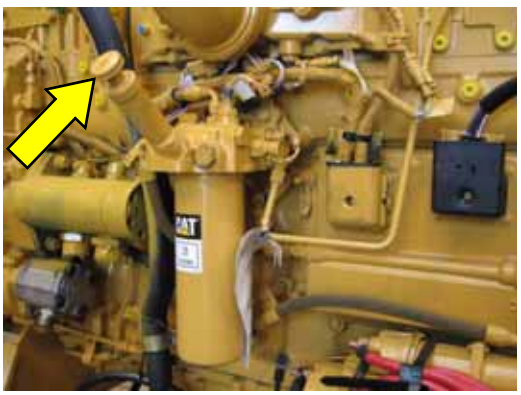
Note: Tension should remain constant during the belts working life and should not be re-tensioned.

9. Clean out sediment bowl on fuel pre-filter.

Note: When sediment bowl is cleaned out, the fuel system will have to be re-primed. Proceed as follows:



1: Open air purge screw for the fuel filter by three full turns. Do not remove the air purge screw.



2: Unscrew hand primer and pump up and down until a steady flow of fuel comes out of filters. (No bubbles must be coming through fuel line.) Re-secure hand primer after use. Close and tighten air purge screw.

5.5 1000 Hour Maintenance Schedule

Every 1000 hours, the following maintenance must be carried out:

1. Repeat 250 hour maintenance schedule.
2. Change oil in vibrating feeder.
3. Change diesel filters.
4. Change oil in tracks.

5.5.1 Changing Oil in Tracks

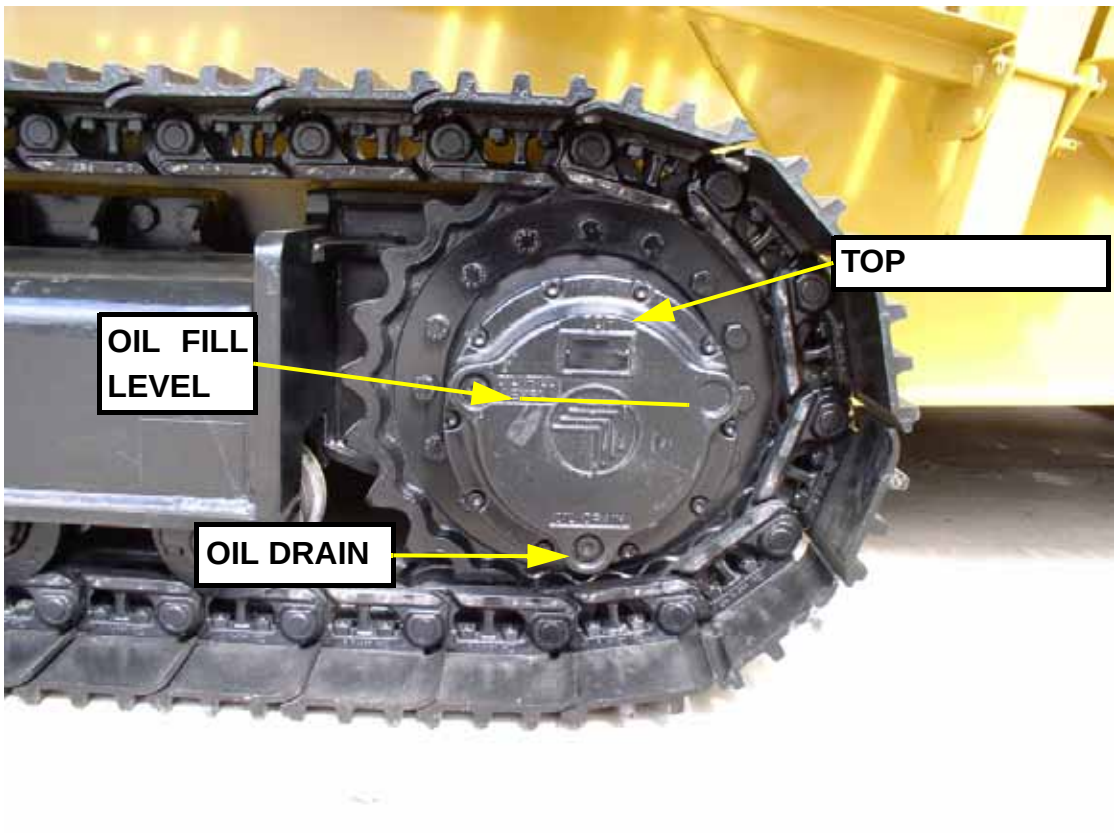
To drain oil from the track gearbox, drive the machine until the oil drain plug is at the bottom of the gearbox. Remove both plugs and the oil will drain out. Use a suitable container to collect waste oil. Replace drain plug.

Disposing of waste oil must be done in a manner that complies with current environmental legislation.

To refill track gearbox with oil, drive the machine until the gearbox is in the correct position. See below.

Note: This will only be 1/3 turn of the track gearbox.

DO NOT drive machine any further until oil has been replaced in tracks. Remove the oil level plug as shown in the photographs below. Fill with oil into the oil level plug until it starts to come out of the plug hole. Replace oil level plug ***BEFORE*** driving the machine. Each track gearbox will have to be maintained separately.



1: Track gearbox in correct position to refill with oil.



2: Remove oil level plug.

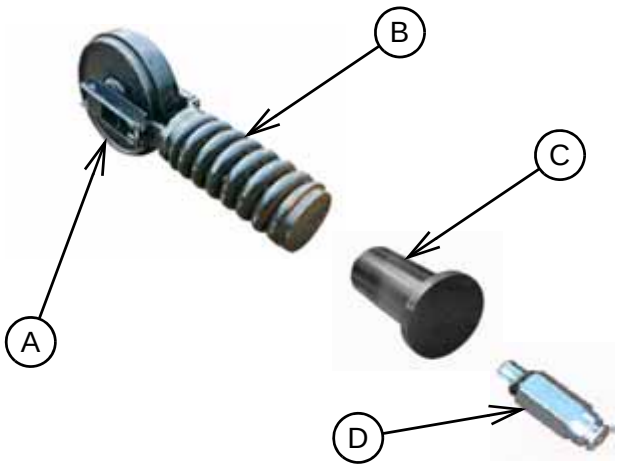
When changing oil in the tracks, use Exol Ethena EP90 Gear Oil.

5.6 Track Adjustments

WARNING!
Grease under pressure can cause serious injury. Never unscrew a track adjuster valve by more than a ½ turn, when the track is under tension.

5.6.1 Track Adjustment

After maintenance or over time the track will become slack and will have to be adjusted. The adjustment of the tracks operates through a tensioning cylinder (C). When the cylinder is filled with grease it extends and pushes the spring tension unit (B), and the idler (A), forward. The grease is filled through the track adjuster grease valve (D).



1: Track Adjustment

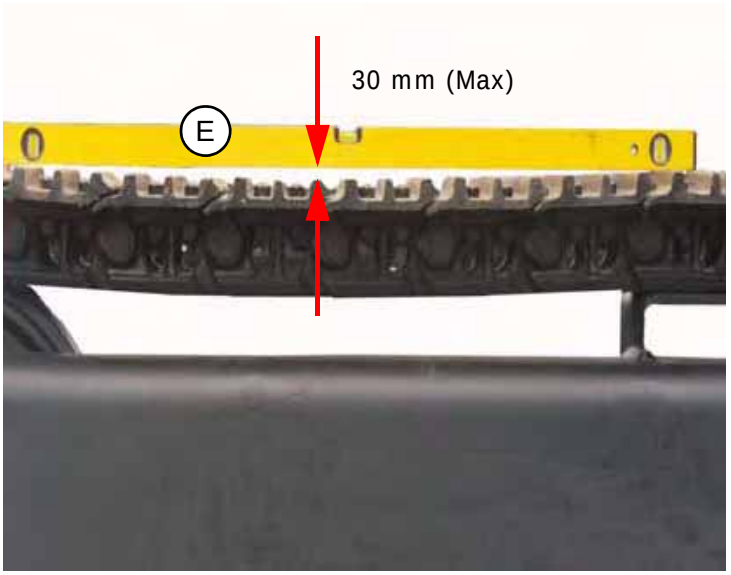
5.6.2 Track Adjustment Settings

In order to establish if the track requires tensioning, move the Host machine a few metres forwards and backwards on level ground. This allows the tracks to adopt their natural degree of tension.

Note: Do not slew the machine.

Using a straight edge and a measuring tape, measure the droop of the track group as shown at (E). For this particular track set, the droop should not exceed 30 mm.

Note: It is also important that the track is not tensioned too tightly as this places excessive loads on the gearbox and idler bearings. It will also lead to accelerated wear and premature failures.



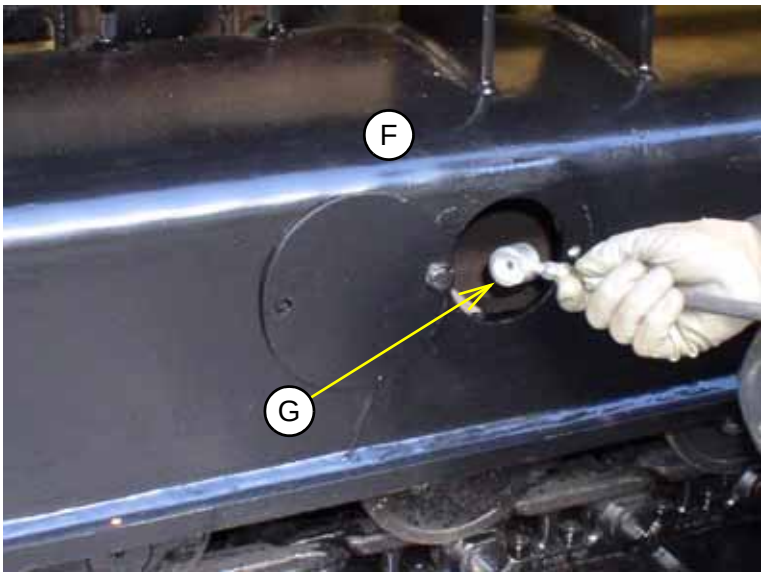
2: Track Adjustment Settings

5.6.3 Increasing The Track Tension

To increase the tension of the track:

1. Remove the inspection cover on the side of the track frame as shown at (F).
2. Ensure that the track adjuster valve (H), is tight.
3. Attach the special grease gun connector (G), to a grease gun and fit it onto the track adjuster valve (H).
4. Pump grease into the valve until the droop of the track is correct.
5. Move the Host machine backwards and forwards a few times more and then re-check the droop. Add more grease if required.
6. Check for any escaping grease around the tensioning unit and finally close the inspection cover when finished.

Important: Ensure that the correct grease is used.

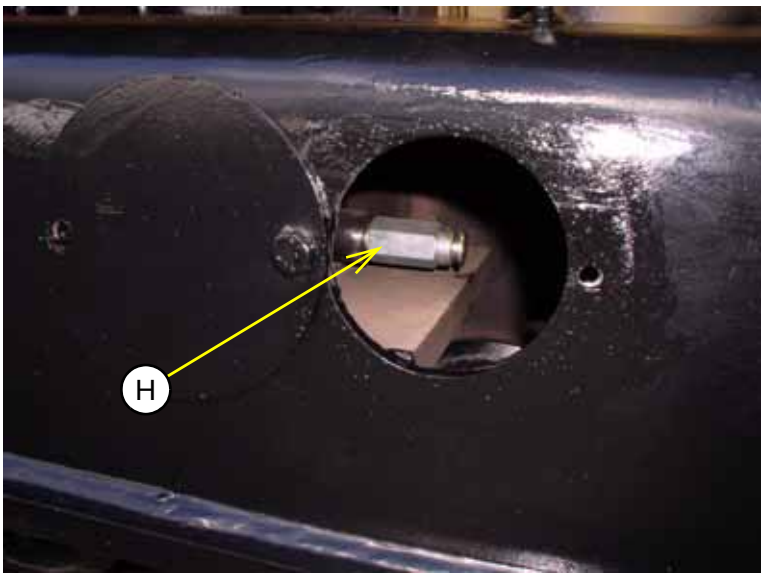


3: Increasing The Track Tension

5.6.4 Releasing The Track Tension

To the release the tension on the tracks:

1. Remove the inspection cover on the side of the track frame as shown at (F).
2. Loosen the track adjuster valve (H), by turning it one half turn anticlockwise.
3. Grease should now escape slowly from the track tensioning cylinder and the track should slacken.
4. If the track fails to loosen, apply a little pressure to the idler end of the track to push the idler group in.
5. Replace the inspection cover when completed.



4: Releasing The Track Tension

5.7 Magnetic Conveyor

WARNING: The machine MUST be switched off and ignition key removed BEFORE making any adjustments.

Follow maintenance instructions laid out in the magnet manufacturer's handbook. See "ERIEZ MAGNET MODELS CP & OP INSTRUCTIONS IM-108GB-(F.01)" on page 199.

5.8 Oils And Fluids

Lub / Oil and Grease Points	Temperature	Viscosity	Manufacturers Equivalent Specifications
Anti Freeze			Shell Safe Anti Freeze Concentrate
Diesel			Shell Agricultural Gas Oil
Engine Oil			Shell Diesel Engine Oil Rimula Ultra 10W-40
	Cold Weather		Shell Diesel Engine Oil Rimula 5W-30
Engine Oil - Alternative			See Manufacturer's Handbook
Feeder Gearbox			Shell Omala 220 Gear Oil
Hydraulic System		ISO VG 32	Shell Tellus Arctic 32
		ISO VG 46	Shell Tellus 46
		ISO VG 68	Shell Tellus Oil 68
		ISO VG 100	Shell Tellus Oil 100
	Environmentally friendly		Shell Naturelle HF-E 46
General Lubrication Points			Shell Albida EP2
	Arctic		Shell Aeroshell 33
Tracks			Exol Ethena EP90 Gear Oil
Tracks - Alternative			Shell SPIRAX GSX75W-80

A full list of Substances Hazardous to Health associated with this equipment can be found in the appendix of this document.

Section 6 Trouble Shooting Guide

Below is a list of some of the common problems that might occur on your machine. If these problems arise, carry out the checks listed.

PROBLEM	*SOLUTION*
Engine losing power or hard to start.	*Check air filter isn't blocked.* *Check diesel filter and sediment bowl.*
Engine won't start or keeps shutting off.	*Check that emergency stops are not pushed in.* *Check water level in radiator.* *Check fuel level.* *Check that the batteries are charged and that the terminals are tight.* *Check oil pressure, temperature, battery and over-speed warning lights on electrical control panel.*
Crusher won't start.	*Check that "Crusher" button is "ON" in electrical box.* *Check fuel level.* *Check hydraulic oil level in tank.* *Check that there are no hydraulic pipes leaking.* *Check flywheel belt tension.* *Check engine speed switch is at No.2 position.* *Clean air filter, diesel filter & diesel sediment bowl.* *Check control pressure. See "Checking Hydraulic Pressure" on page 67.*
Feeder not working.	*Check Webtec is fully open.* *Check pressure on at 4 station manifold using 0 - 250 bar pressure gauge. See "Checking 5 Station Manifold Pressure" on page 67.*
Machine "Rocking" excessively.	*Check flywheel alignment.* *Check ground conditions are firm and level.* *Check tracks are not slack. If they are see 5.6.3 Increasing The Track Tension on page 62.*

PROBLEM	SOLUTION
Machine not tracking.	*Check oil level in the hydraulic tank.* *Check that Interlock and Track buttons are on.* *Check remote handset is fully charged. Plug in Hard Wire Drive and try to move machine.* *Check that all levers are in their central position and check if the crusher operates. If Crusher operates and levers are central but the machine still won't track, this may indicate an electrical problem. Contact Extec Screens & Crushers Ltd immediately.*
Main, Side or Magnet Conveyor belts jammed.	*Check belt tension.* *Ensure that there is no build-up of material underneath machine.* *Clean under machine as shown in following photographs as required.*



1: Using jacking legs, lift the machine off ground.



2: Ensure that locking pins and R-clips are fitted BEFORE cleaning below the machine.

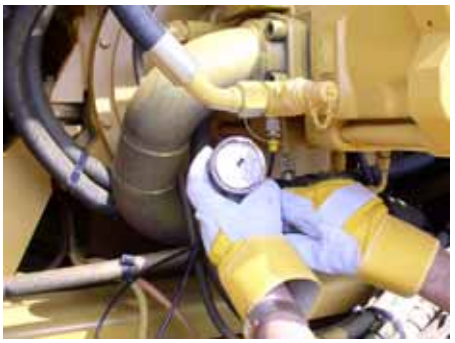
6.1 Checking Hydraulic Pressure



3: Check tank return pressure using a 0 - 10 bar pressure gauge - this should be not greater than 4 bar.



4: Check control pressure using a 0 - 100 bar pressure gauge. This should be 40 bar at all times.



5: Check suction pressure using a 0 - 6 bar pressure gauge - this should be between ½ bar min. and 1½ bar max.

6.2 Checking 5 Station Manifold Pressure

Check pressure at test points shown to check the feeder, magnet, side and main conveyor using a 0 - 250 bar pressure gauge. Pressure readings when running empty should be:

1. Side conveyor - 30 bar. Peak pressure - 200 bar.
2. Feeder (Cold start) - 100 bar - this should drop to 50 bar when warm. Peak pressure - 200 bar.
3. Feeder pan - 50 bar. Peak pressure - 200 bar.
4. Main conveyor - 50 bar. Peak pressure - 240 bar.
5. Magnet - 30 bar. Peak pressure - 200 bar.



Figure 6-1: Test points are on manifold block on side of valve plate.

6.3 Test Procedures for Electronics

See drawings in the Appendix B: Drawing Pack for lamp diagnostics, jaw control and wiring diagrams.

Symptoms:

Engine is shutting down and **REMOTE STOP** lamp on EPU is showing.

The crusher electronics shuts down the engine via the EPU for 3 reasons:

1. Signal received by receiver from correctly coded handset requesting “fast stop”.
2. Red button on override handset has been pressed.
3. Crusher control box has lost communications with the receiver unit.

To identify which of the above cases is correct please look at the lamps above the **INTERLOCK ON** switch, the **INTERLOCK OFF** switch and the lamp above the **JAW REMOTE** switch.

Case 1)

Receiver believes it is receiving a signal from a handset. Lamp state as follows:

Lamp above **JAW REMOTE** switch: **Flashing**

Lamp above **INTERLOCK OFF** switch: **Lit**

Lamp above **INTERLOCK ON** switch: **Dark**

Before the crusher shuts down, the green lamp on the track LED box should flash briefly to indicate signal being received from handset.

Check:

All handsets are switched off. If necessary remove batteries from small handset.

Case 2)

Override handset used. Lamp state as follows:

Lamp above **JAW REMOTE** switch: **Flashing**

Lamp above **INTERLOCK OFF** switch: **Dark**

Lamp above **INTERLOCK ON** switch: **Dark**

Check:

Unplug manual handset, check back of socket for manual handset for dirt/ water contamination or damage to wiring.

Case 3)

Lost communications. The crusher control box (unit with 36 way connector inside switch box) is having problems communicating with the receiver unit. Lamp state as follows:

Lamp above JAW REMOTE switch: **Lit**

Lamp above INTERLOCK OFF switch: **Flashing**

Lamp above INTERLOCK ON switch: **Flashing**

Check:

- Receiver is switched on, red lamp should flash whilst crusher is still running, will change to constantly illuminated when crusher shuts down.
- Track lamps run through start up test, this test is actually performed by the receiver, if the track lamps perform test then the receiver is communicating correctly with the track lamps box.
- Check 6 way connector near the receiver; all wires are matched up with the correct colour wire on both sides of the receiver. Connector is plugged in securely and all wires are secure in the crimp contacts.
- Check yellow and white wires inside switch box are securely fitted to screw terminals.
- Check yellow and white wires from screw terminal inside switch box to 36 way connector on crusher control box. White wire should go to bottom row, end contact on the right of the connector as you look into the switch box. The yellow wire is on the same row to the left of this. The important point is that the white wire is on the end contact and the yellow is one contact in. Check these wires to ensure they are not swapped or poorly crimped.

IF ANY PROBLEM PERSISTS AFTER CARRYING OUT THE RECOMMENDED SOLUTION, OR A PROBLEM ARISES THAT IS NOT ON THIS LIST, CONTACT Extec Screens & Crushers Ltd SERVICE DEPARTMENT FOR FURTHER ASSISTANCE.

ADJUSTING PRESSURE SETTINGS OR REFILLING HYDRAULIC OIL ON THE MACHINE SHOULD ONLY BE CARIED OUT BY TRAINED Extec Screens & Crushers Ltd SERVICE ENGINEERS.

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Appendix A Parts Manual



Contact Details

Extec Screens & Crushers Ltd
Hearthcote Road
Swadlincote
Derbyshire
DE11 9DU
United Kingdom

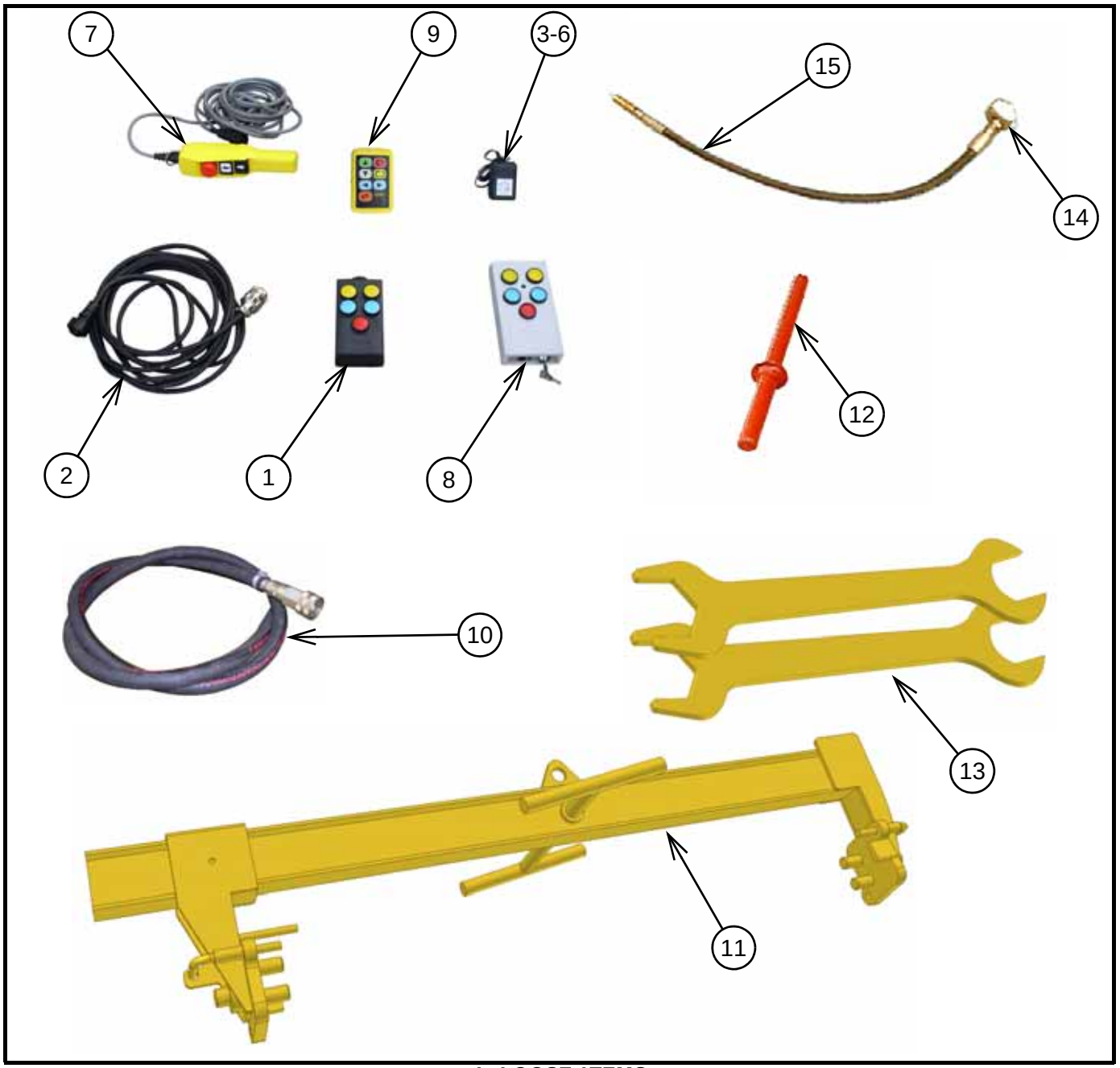
Telephone: +44 (0)1283 212121
Fax: +44 (0)1283 226465
Parts and Service: +44 (0)8000 181945
www: http://www.extecscreens.com

Note: Every effort has been made to ensure the accuracy of this manual at the time of publication. However, with Extec Screens & Crushers Ltds' policy of continually improving their products, your machine may not coincide exactly with this manual. Therefore, before placing any order for spare parts, we recommend that you contact our Service Department (with your machine Serial No.) for Part No. verification.

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AA.1 Loose Items

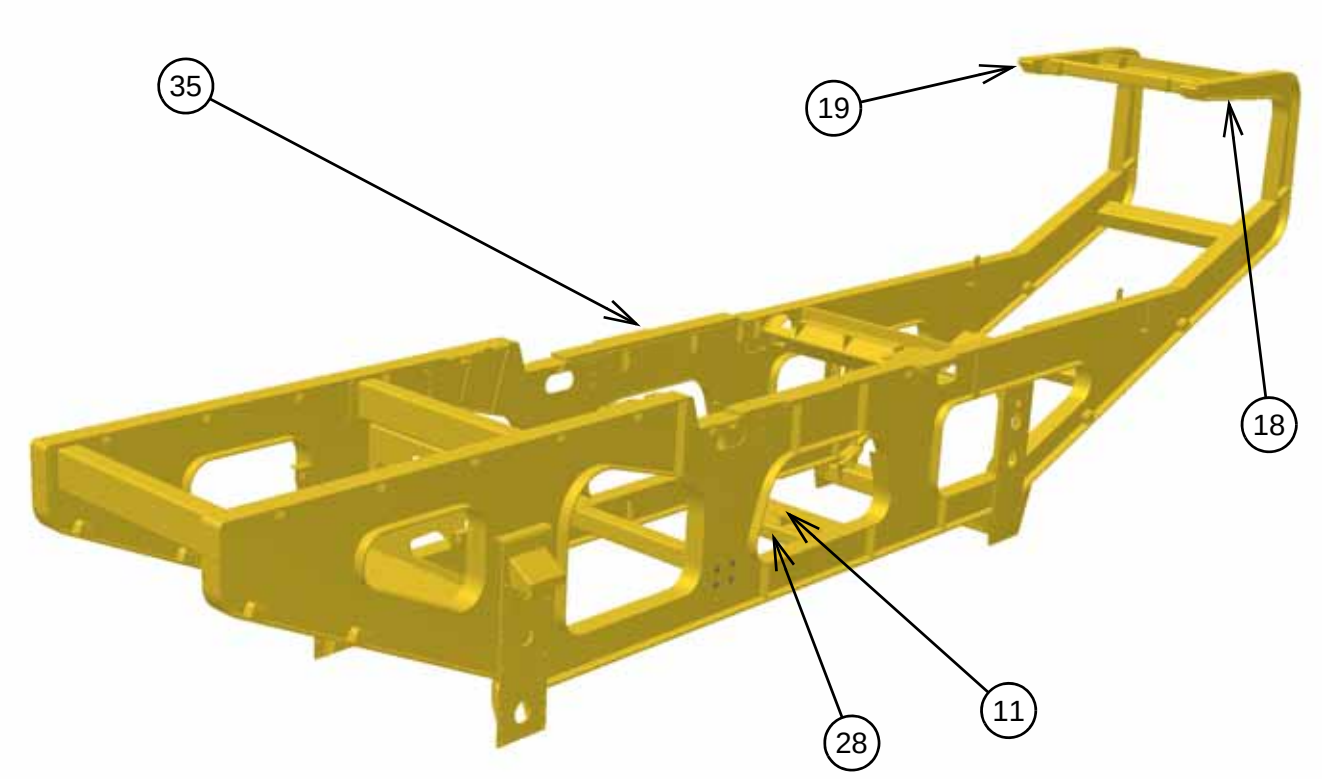


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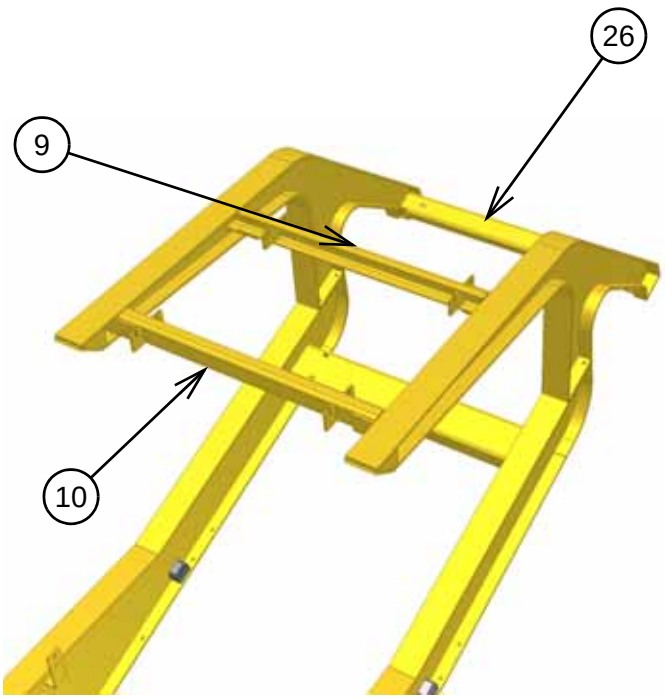
Part No.	Part Description	Quantity
1. EL2069	MANUAL HANDSET	1
2. EL2009	UMBILICAL CHORD (7 m)	1
3. EL2104	REMOTE CONTROL HANDSET CHARGER (UK ONLY)	1
4. EL2105	REMOTE CONTROL HANDSET CHARGER (CONTINENT ONLY)	1
5. EL2106	REMOTE CONTROL HANDSET CHARGER (JAPAN ONLY)	1

Part No.	Part Description	Quantity
6. EL2109	REMOTE CONTROL HANDSET CHARGER (USA ONLY)	1
7. EL2110	JAW ADJUST REMOTE CONTROL	1
8. EL4418	REMOTE CONTROL HANDSET (433 MHz)	1
9. EN4420	FEEDER REMOTE CONTROL	1
10. HAH101401	FUEL SUCTION PIPE	1
11. IM1036	LIFTING GEAR	1
12. PN1088	JACKING LEG SUPPORT PINS	8
13. J2910000	SPANNER	2
14. UC4003	GREASE NIPPLE ADAPTOR (TRACKS)	1
15. HHGR33	GREASE NIPPLE ADAPTER HOSE	1

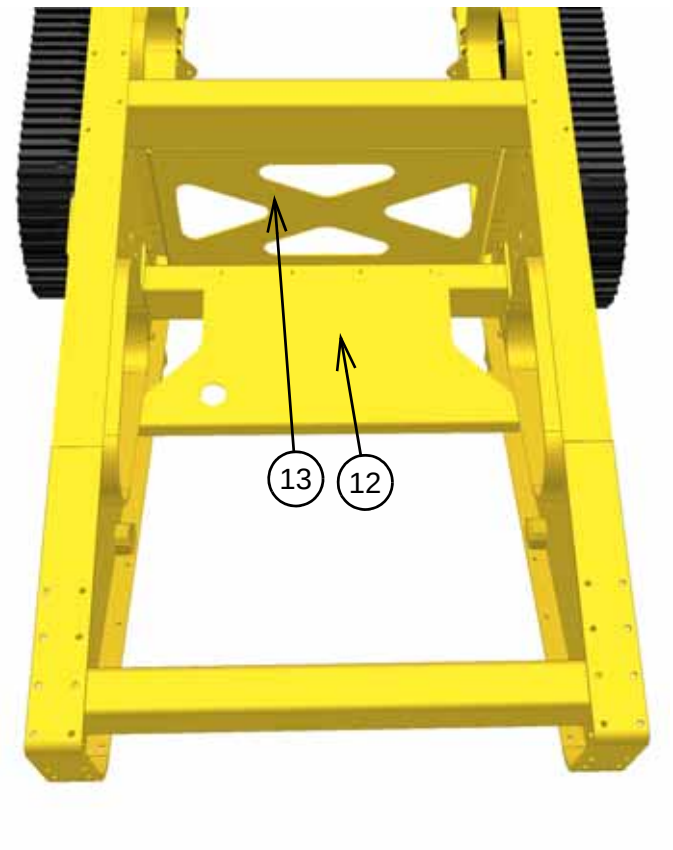
AA.2 Chassis, Walkways and Tracks



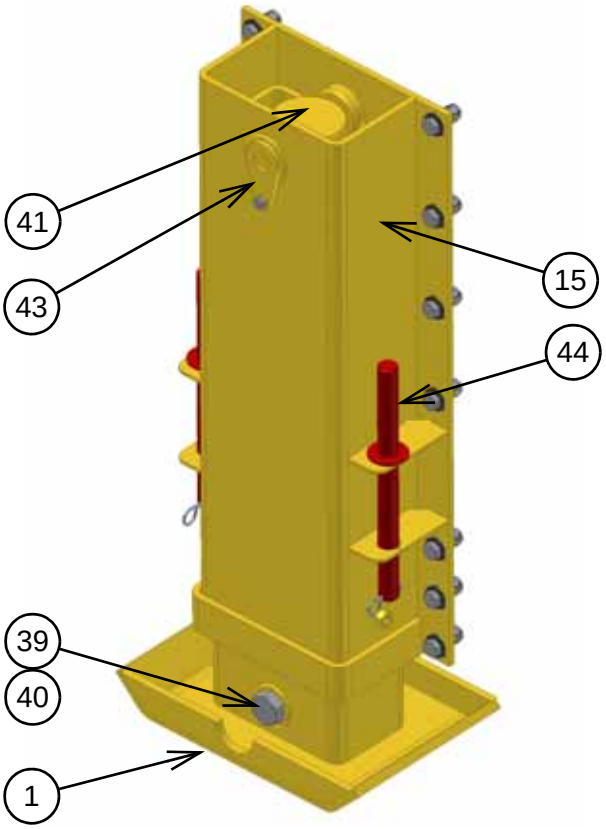
1: CHASSIS ASSEMBLY



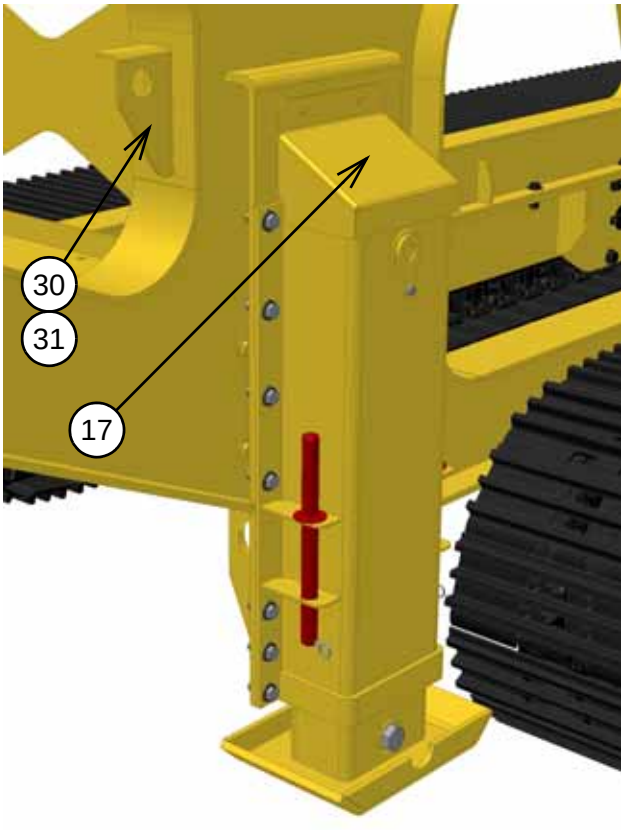
2: CHASSIS FRONT END



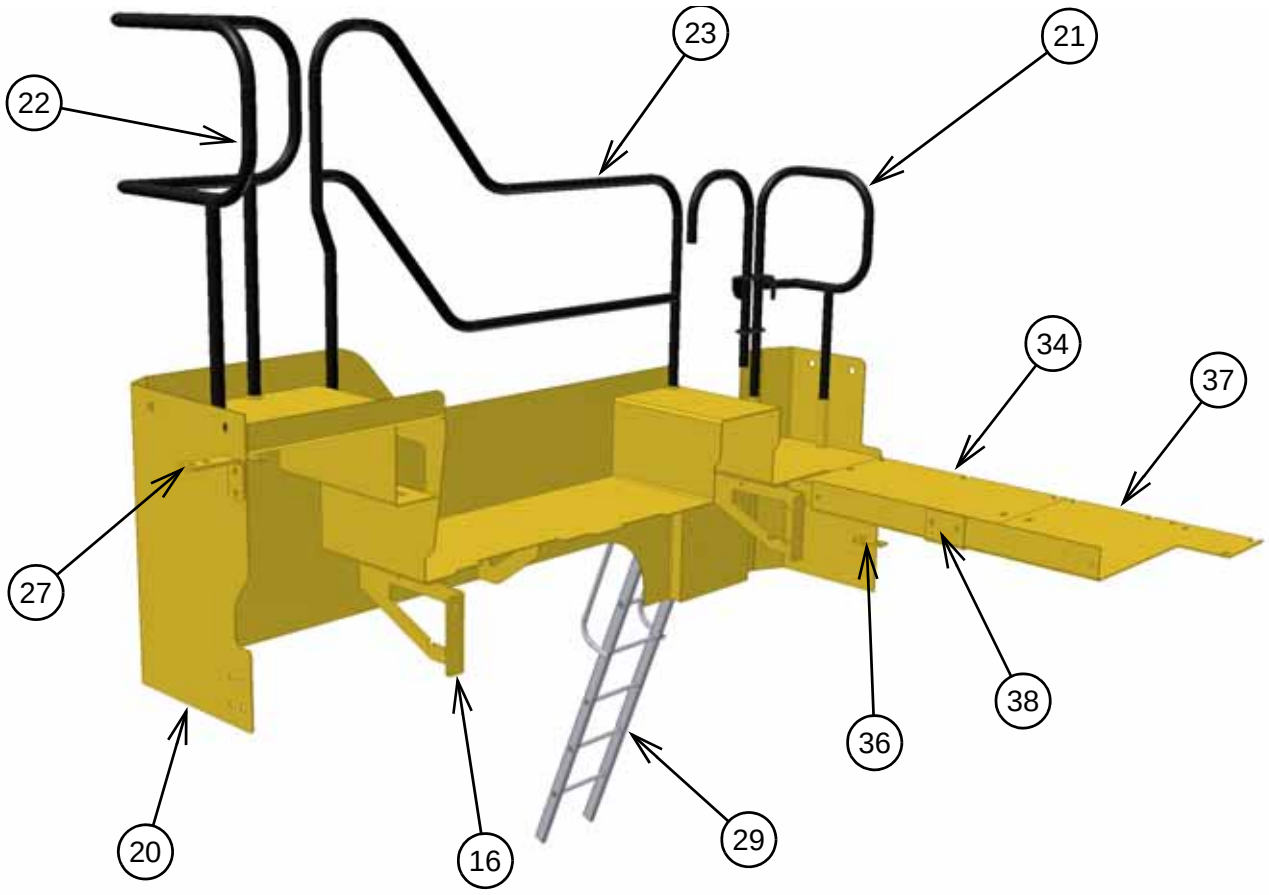
3: CHASSIS REAR END



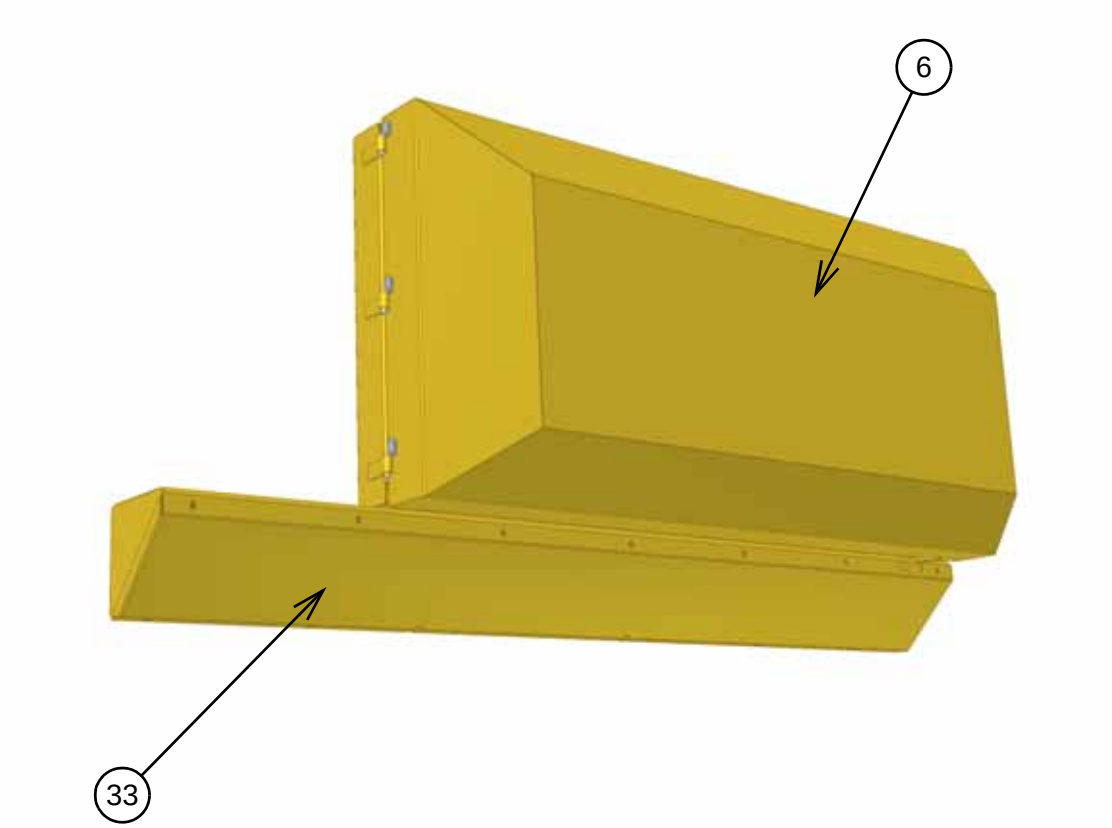
4: JACKING LEG



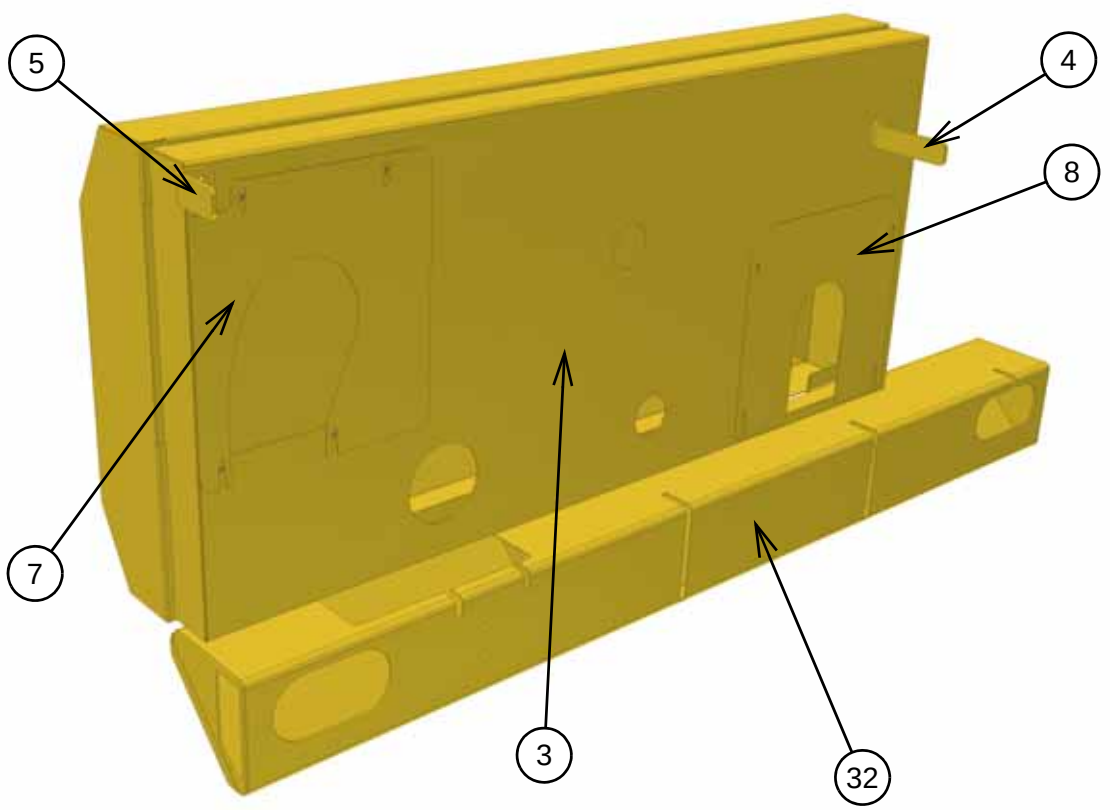
5: JACKING LEG MOUNTED



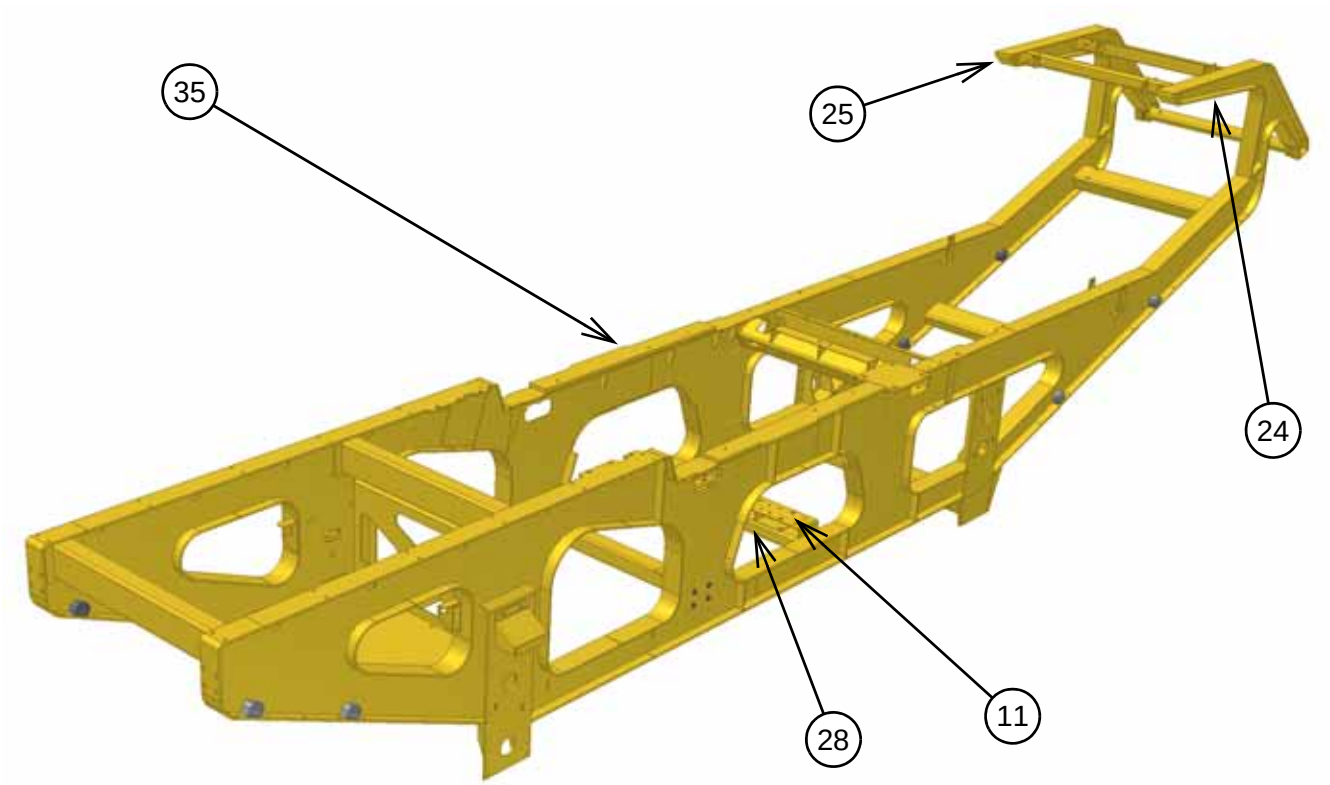
6: WALKWAY



7: PULLEY GUARD



8: PULLEY GUARDS REAR

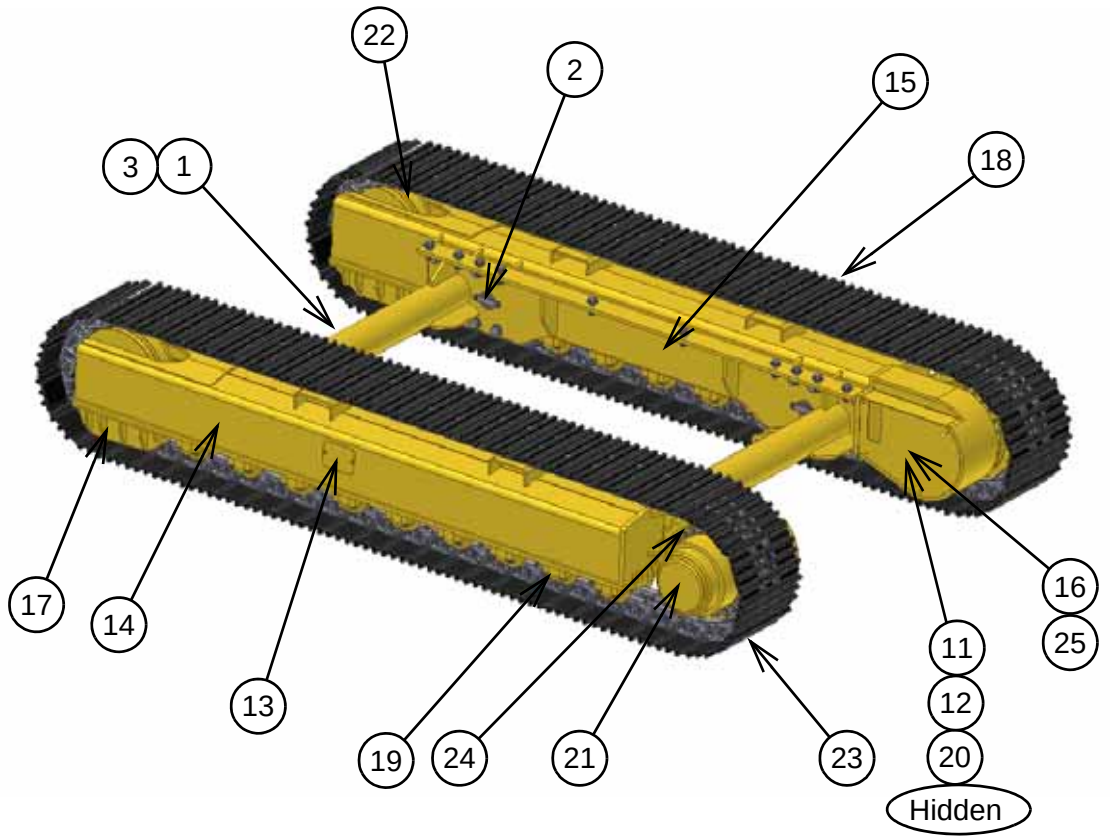


9: RECIRCULATION CHASSIS ASSEMBLY

Part No.	Part Description	Quantity
1. A4110000	JACKING LEG INNER	4
2. A6160000	JACKING LEG COVER REAR LEFT	1
3. A6620000	IMPACTOR PULLEY INNER GUARD	1
4. A6620600	BRACKET	1
5. A6620700	BRACKET	1
6. A6630000	IMPACTOR PULLEY OUTER GUARD	1
7. A6640000	IMPACTOR PULLEY SPLIT COVER TOP	1
8. A6660000	IMPACTOR PULLEY GUARD	1
9. A8880000	MAGNET SUPPORT FRAME (DRIVE SIDE)	1
10. A8890000	MAGNET SUPPORT FRAME	1
11. A10340000	MOUNT	1
12. A14040000	DIESEL TANK SUPPORT	1
13. A14060000	CHASSIS STIFFENING PLATE	1
14. A14130000	TRI-AXLE BOGIE MOUNTING	A/R
15. A14180000	JACKING LEG	4

Part No.	Part Description	Quantity
16. A14200000	WALKWAY BRACKET	2
17. A14460000	JACKING LEG COVER	2
18. A14710000	MAGNET SUPPORT R/H	1
19. A14720000	MAGNET SUPPORT L/H	1
20. A14840000	WALKWAY ASSEMBLY NON-DRIVE SIDE	1
21. A14880000	WALKWAY END RAILING (LARGE R/H)	1
22. A14900000	WALKWAY RAILING	1
23. A14910000	WALKWAY RAILING	1
24. A14940000	MAGNET SUPPORT L/H	1
25. A14950000	MAGNET SUPPORT R/H	1
26. A14960000	CONVEYOR SUPPORT BEAM	1
27. A14970000	WALKWAY BRACKET	2
28. A14990000	CROSS BRACE	1
29. A15000000	ALUMINIUM LADDER	2
30. A15240000	EMERGENCY STOP GUARD	1
31. A15250000	EMERGENCY STOP GUARD	1
32. A15310000	IMPACTOR PULLEY GUARD SUPPORT ASSY	1
33. A15400000	IMPACTOR PULLEY GUARD SUPPORT COVER PLATE	1
34. A15440000	PLATFORM	1
35. A15810000	CHASSIS	1
36. A15880000	TIE BRACKET	2
37. A16180000	PLATFORM	1
38. A16190000	CLEAT	1
39. FAB30X200	M30X200 HT BOLT	4
40. FAN30N	M30 NYLOC NUT	4
41. HR1028	JACKING LEG HYDRAULIC RAM	4
42. HV8004	¾" BSP BALL VALVE	2
43. PN1085	PIN	4
44. PN1088	PIN	8

AA.3 Tracks

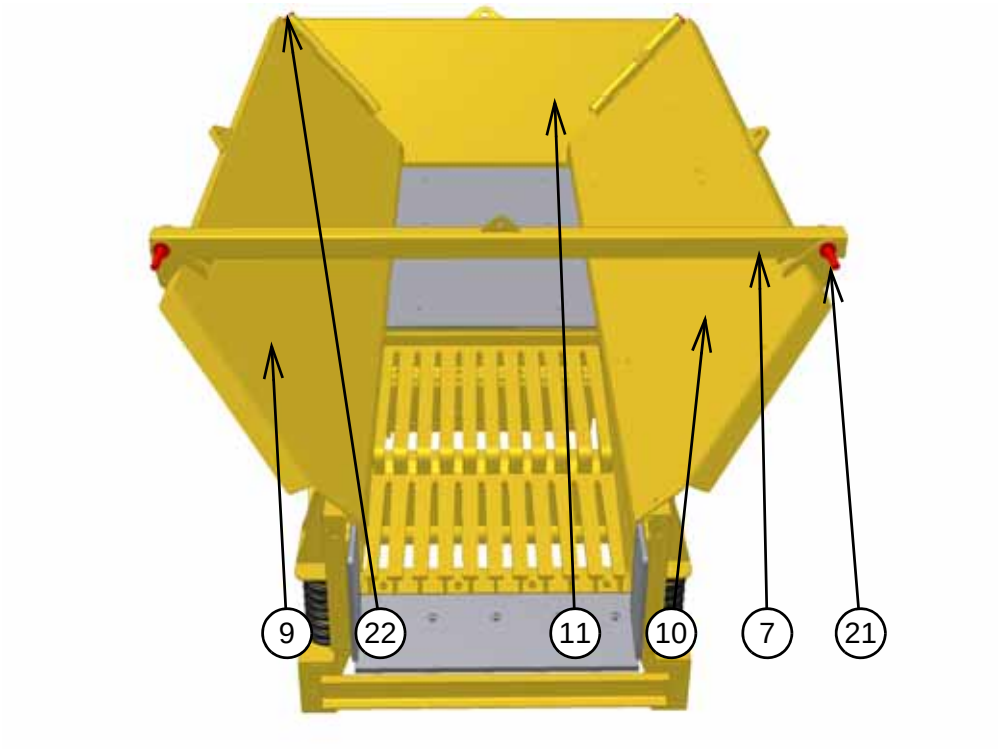


1: VIEW OF TRACKS

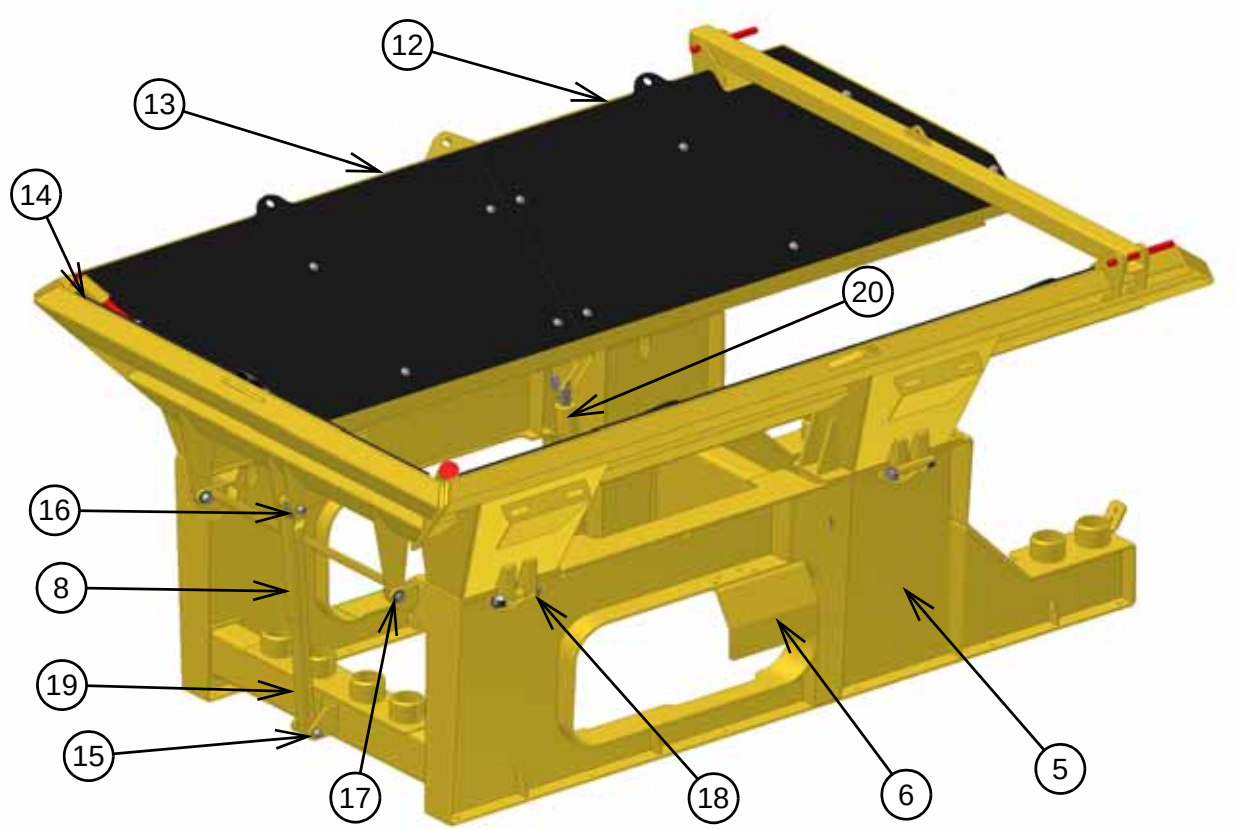
Part No.	Part Description	Quantity
1. A13920000	TRACK FRAME MOUNTING BOGIE	1
2. A13930000	TRACK DOWEL	4
3. A15910000	TRACK FRAME MOUNTING BOGIE (REPLACE 1 FOR RECIRCULATION MACHINE)	A/R
4. FAB1009	3/4 UNC X 3½" BOLT [8.8]	72
5. FAB16X45	M16 X 45 BOLT	6
6. FAB20X60(10.9)	M20 X 60 BOLT GRADE 10.9	48
7. FAB20X80(10.9)	M20 X 80 BOLT GRADE 10.9	48
8. FAS16X40	M16 X 40 SETSCREW	8
9. FAW1007	3/4" UNC SPRING WASHER	72
10. FAW16SP	M16 SPRING WASHERS	96
11. HV3019	TRACK CONTROL BLOCK	2
12. HV3530	TRACK RELIEF VALVE	4
13. R0550000	C12 & IMPACTOR TRACKS ACCESS C	2

Part No.	Part Description	Quantity
14. R0800000	CONE TRACKS BODY ASSEMBLY R/H	1
15. R0810000	CONE TRACKS BODY ASSEMBLY L/H	1
16. R0820000	TRACK MOTOR HOUSING COVER PLAT	1
17. R0840000	TRACK CHAIN GUIDE DTL	2
18. UC2020	TRACK COMPLETE	1
19. UC3950	PC395 TRACK ROLLERS-C12 [18 PER PAIR]	18
20. UC5002	TRACK MOTOR	2
21. UC7113	713A2FE90 GEARBOX + MOTORCOMP WITH MOTION CONTROL V/V	2
22. UC7120	FT2764HD/M IDLER GROUPC12 2 PER PAIR C/W D6 SPRING	2
23. UC7135	CR3048A/54/500 TRACK GROUPC12 / IMP	2
24. UC7215	D5 SPROCKET	2
25. UC7310	TRACK MOTION CONTROL BLOCK	2

AA.4 Hopper



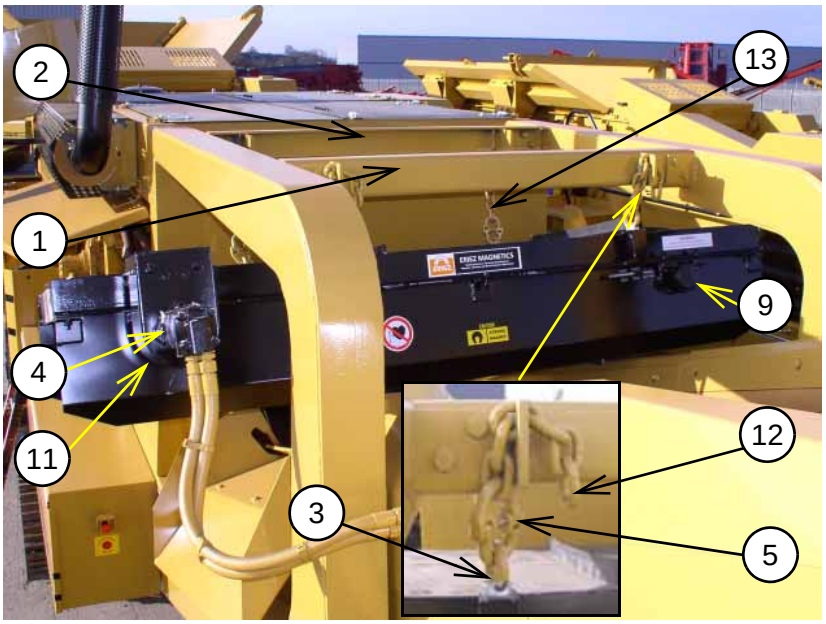
1: HOPPER DOORS



2: HOPPER RAMS

Part No.	Part Description	Quantity
5. A15190000	FEEDER FRAME	1
6. A15200000	GUARD	1
7. C1020000	HOPPER DOOR TIE BAR	1
8. C1080000	HOPPER REAR DOOR RAM SHIELD	1
9. C9250000	HOPPER R/H SIDE DOOR	1
10. C9260000	HOPPER L/H SIDE DOOR	1
11. C9270000	HOPPER REAR DOOR	1
12. C9280000	HOPPER FRONT SIDE LINER PLATE: 10mm M/S	2
13. C9290000	HOPPER REAR SIDE LINER PLATE: 10mm M/S	2
14. C9300000	HOPPER REAR DOOR LINER PLATE: 10mm M/S	1
15. FAB20X130	M20 X 130 BOLT	1
16. FAB20X150	M20 X 150 BOLT	1
17. FAB24X90	M24 X 90 HT BOLT	2
18. FAB30X200	M30 X 200 HT BOLT	4
19. HR1044	HYDRAULIC RAM	1
20. HR1045	HYDRAULIC RAM	2
21. PN1087	PIN	2
22. PN1089	PIN	2

AA.5 Magnetic Conveyor and Supports



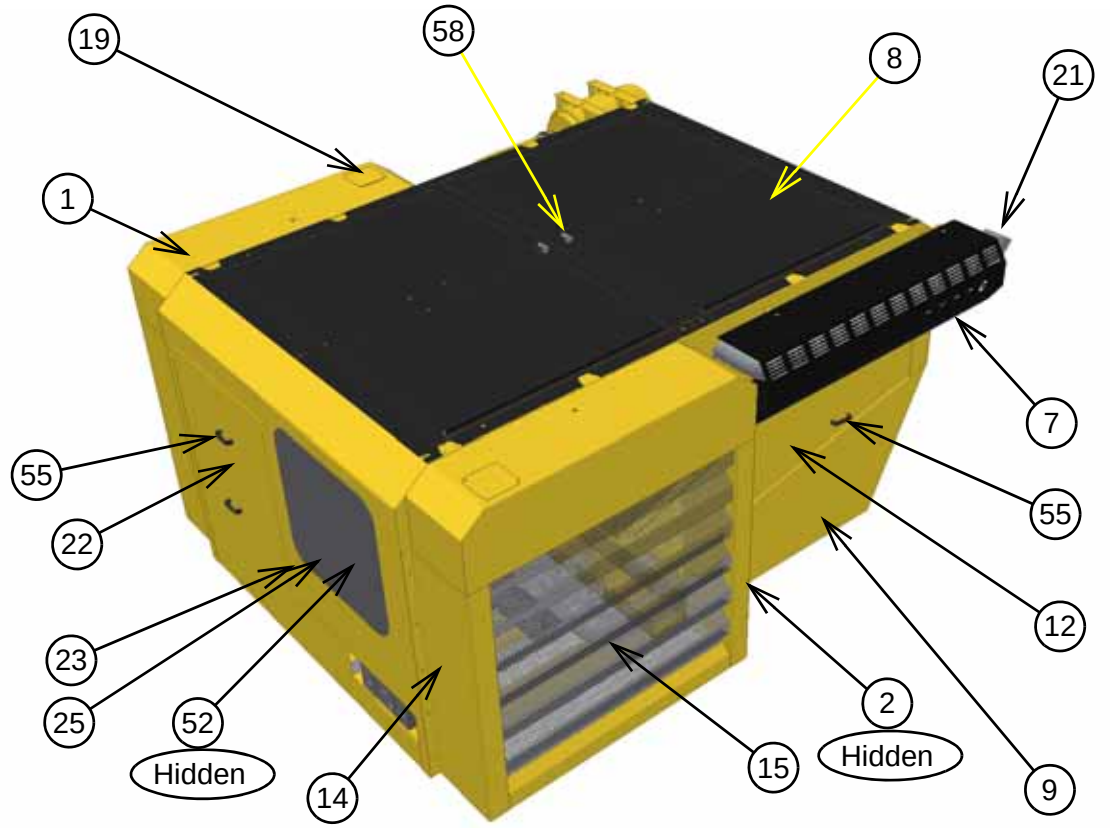
1: MAGNETIC CONVEYOR FITTED



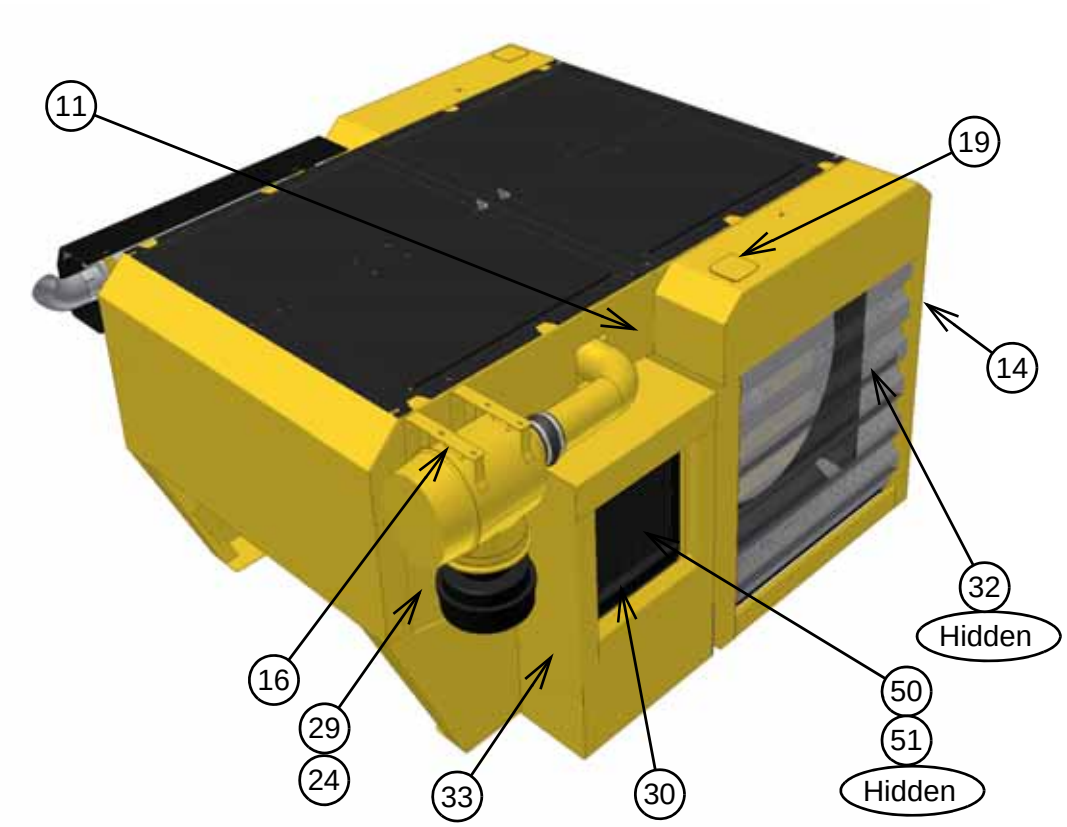
2: MAGNETIC CONVEYOR

Part No.	Part Description	Quantity
1. A8880000	MAGNET SUPPORT FRAME (DRIVE SIDE)	1
2. A8890000	MAGNET SUPPORT FRAME	1
3. FAEB1002	M24 LIFTING EYE	4
4. HM1010	BELT DRIVE MOTOR 305 cc	1
5. MA1001	COUPLEX CONNECTOR	4
6. MA1050	CP20/80SC2 ERIEZ MAGNET	1
7. MA1051	DRIVE PULLEY	1
8. MA1052	NON DRIVE PULLEY	1
9. MA1053	PLUMBER BEARINGS	4
10. MA1054	CONVEYOR BELT	1
11. MA1055	DRIVE COUPLING	1
12. MA1060	CHAIN (10 LINK)	2
13. MA1065	CHAIN (16 LINK)	2

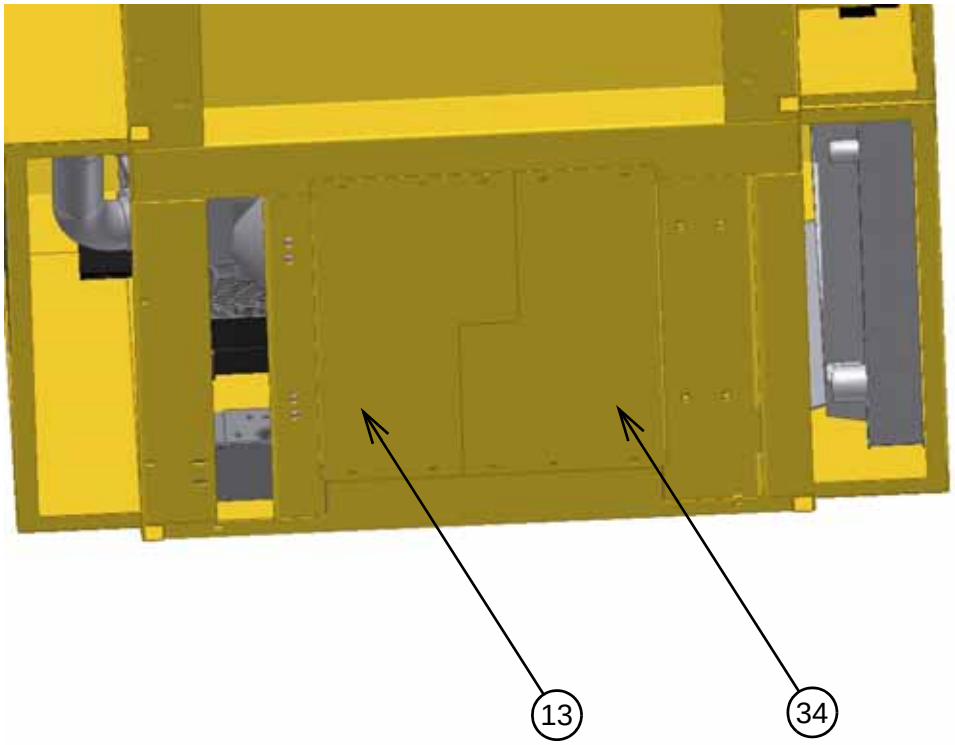
AA.6 Power Pack



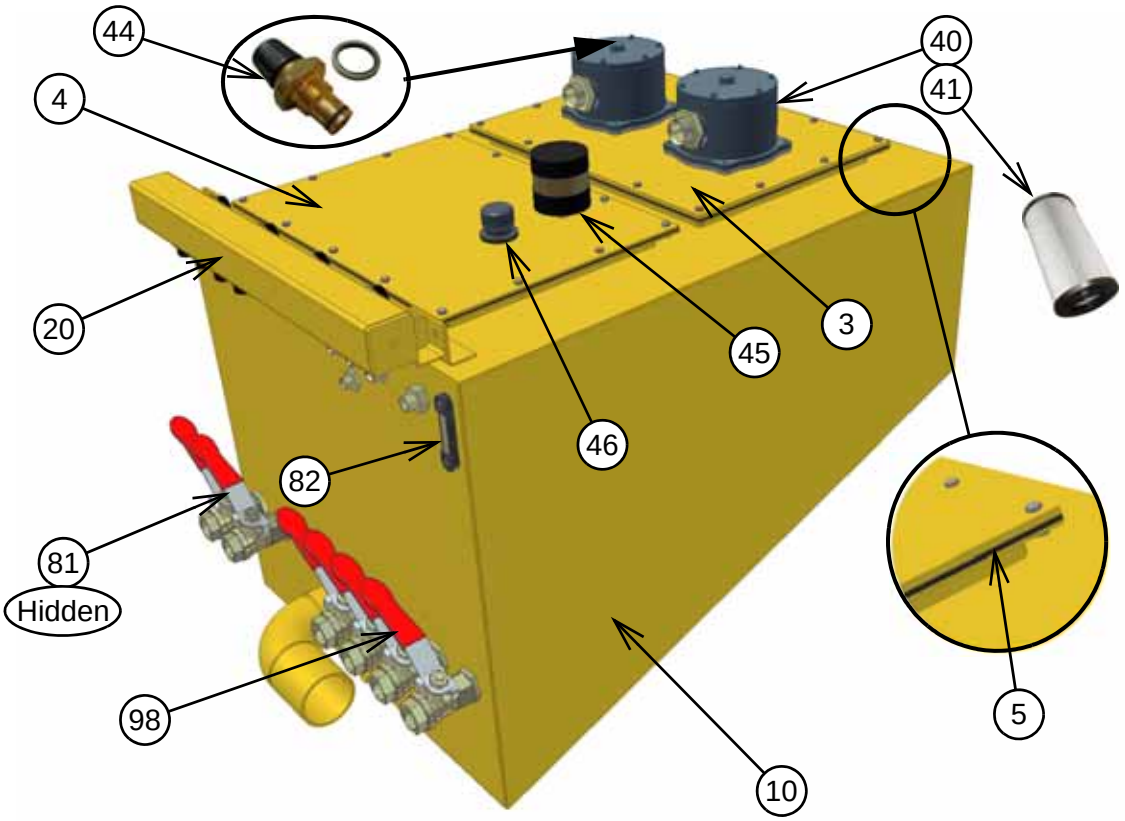
1: R/H VIEW OF POWER PACK



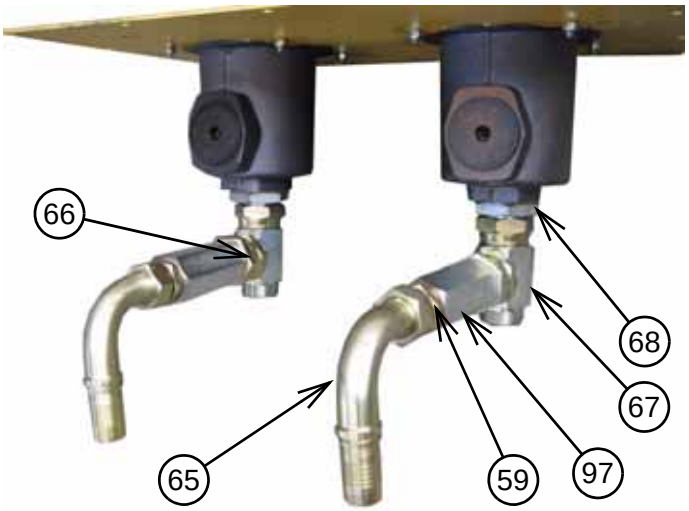
2: L/H VIEW OF POWER PACK



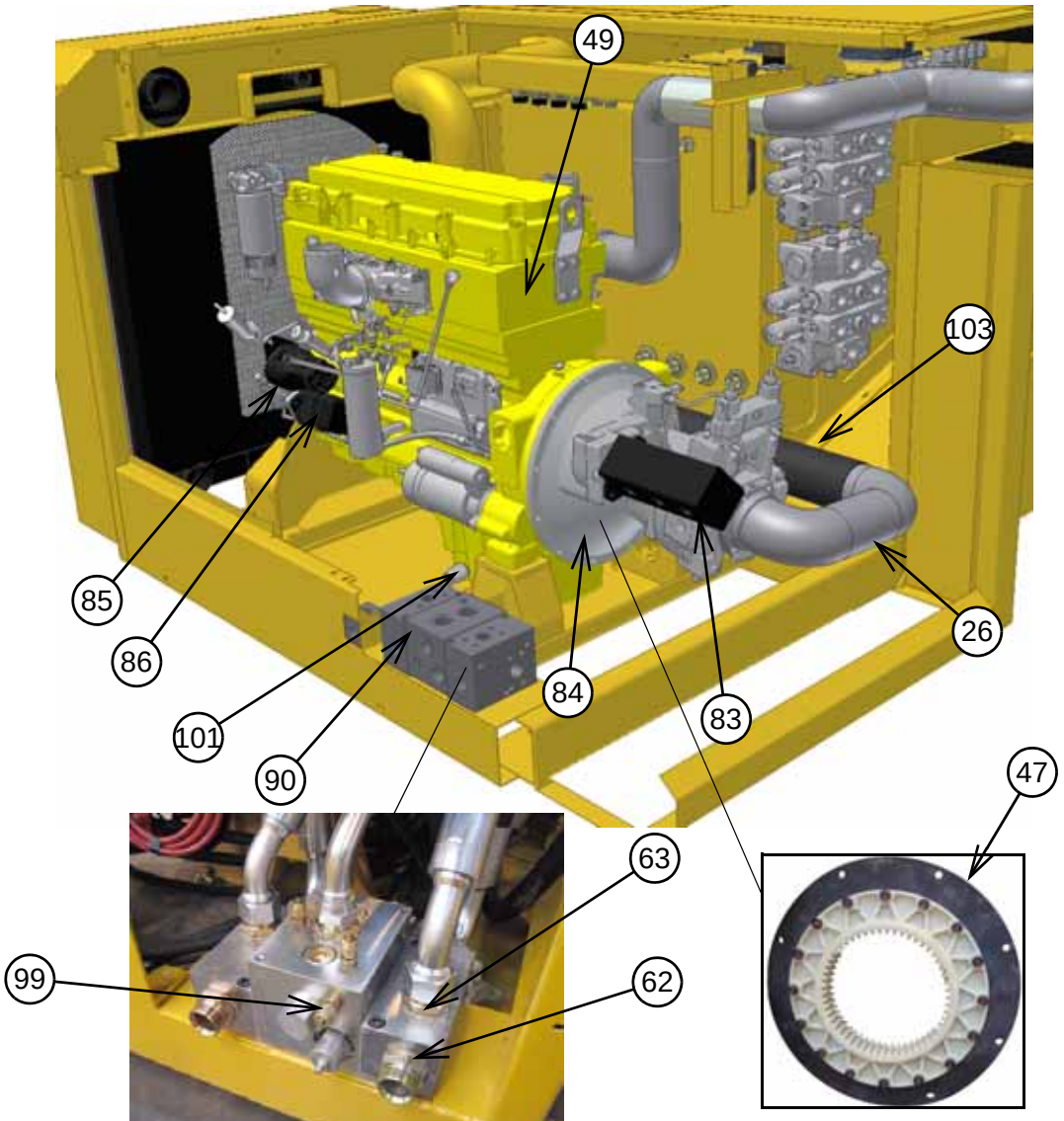
3: VIEW ON BOTTOM OF POWER PACK



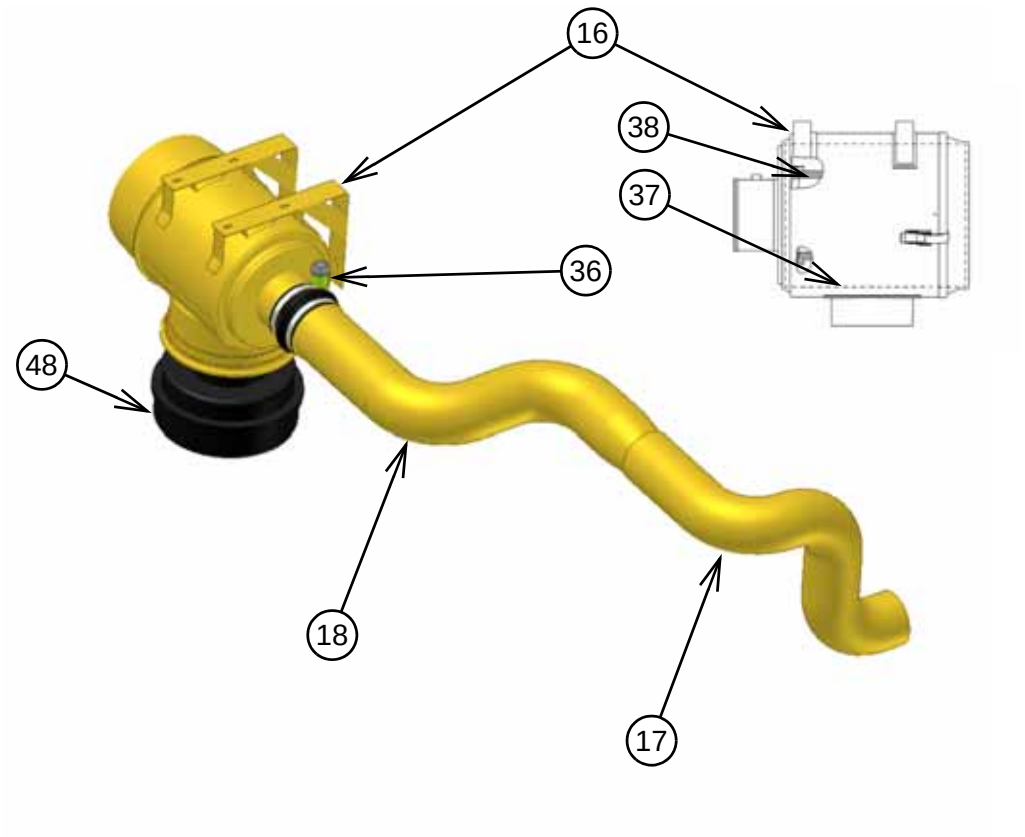
4: HYDRAULIC TANK



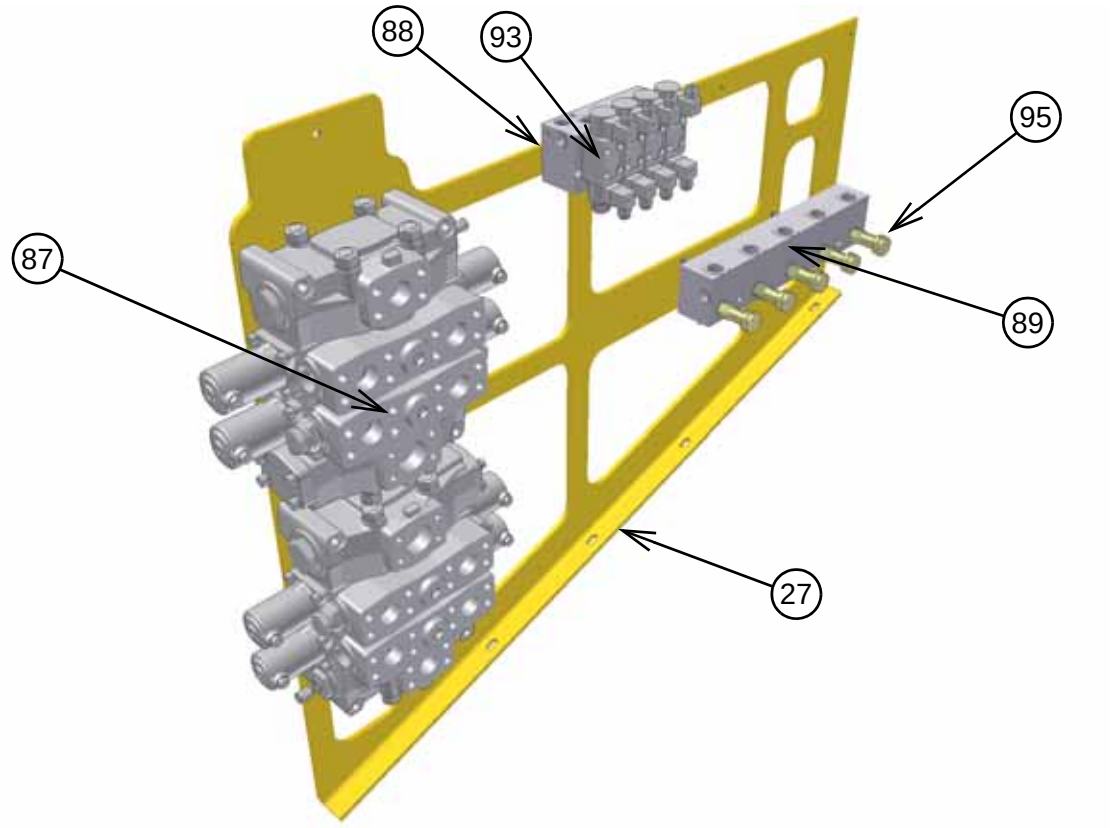
5: HYDRAULIC TANK - BELOW RETURN FILTERS



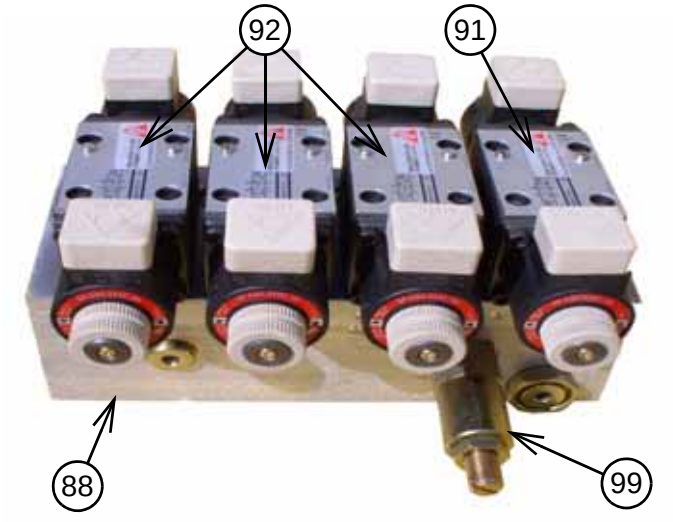
6:



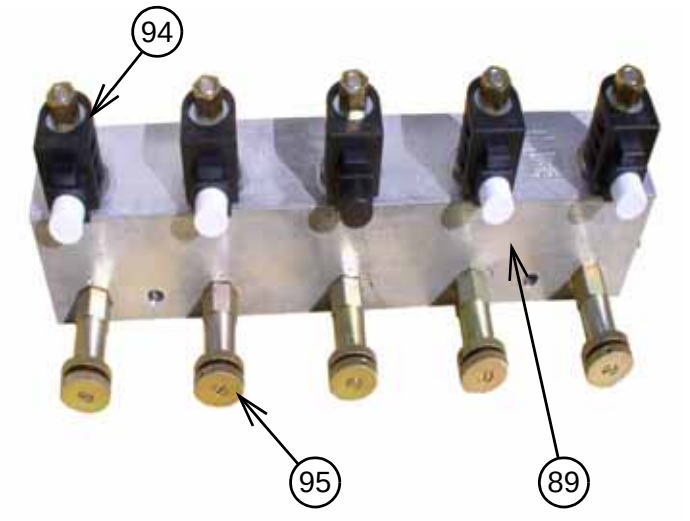
7: VIEW ON AIR FILTER



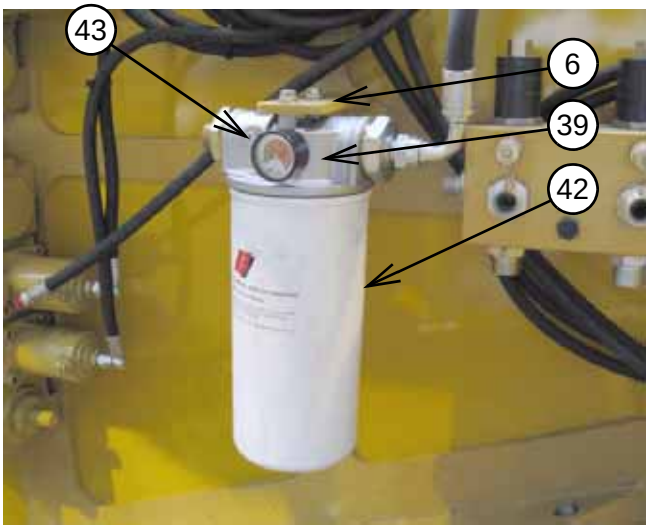
8: VIEW ON VALVE PLATE ASSEMBLY



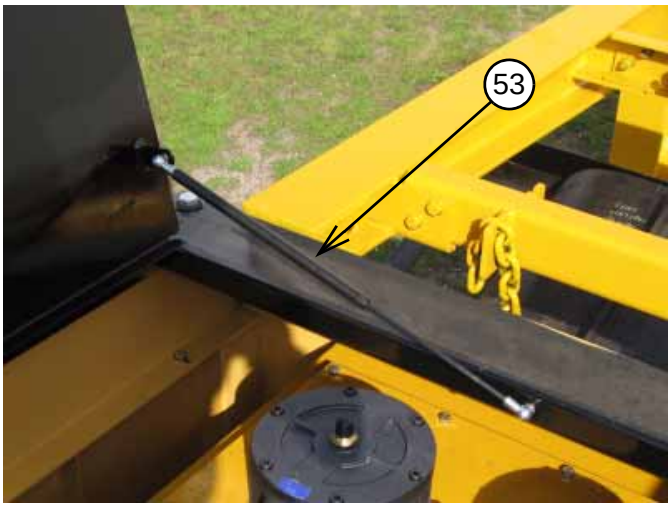
9: VIEW ON SOLENOID VALVE



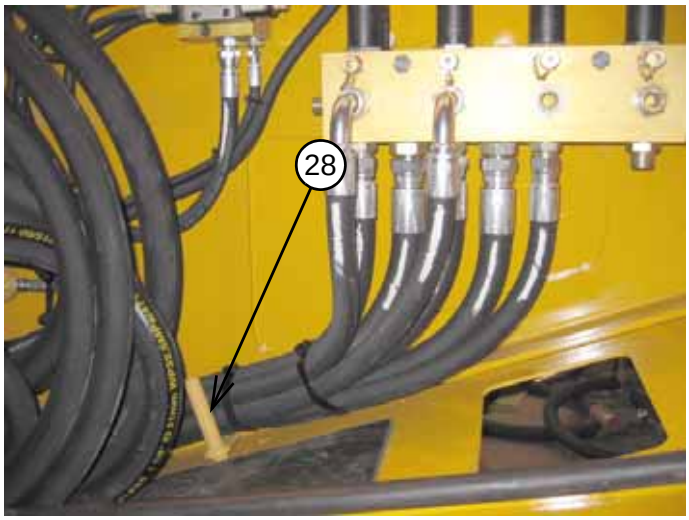
10: VIEW ON 5 STATION MANIFOLD BLOCK



11: HYDRAULIC WATER TRAP

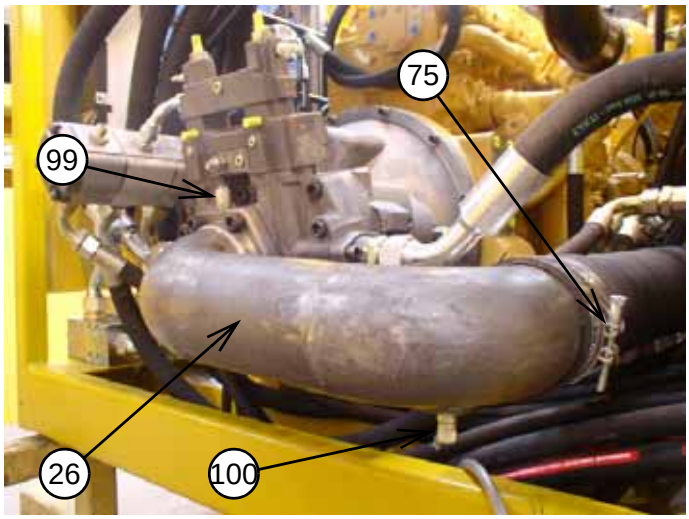


12: VIEW ON TOP OF POWER PACK

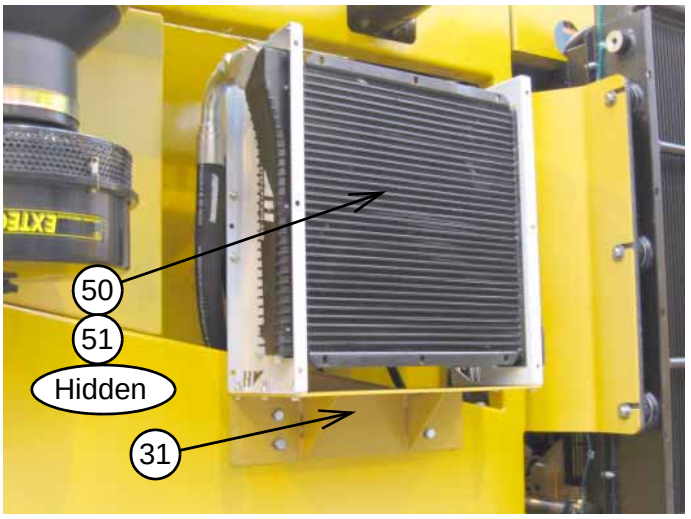




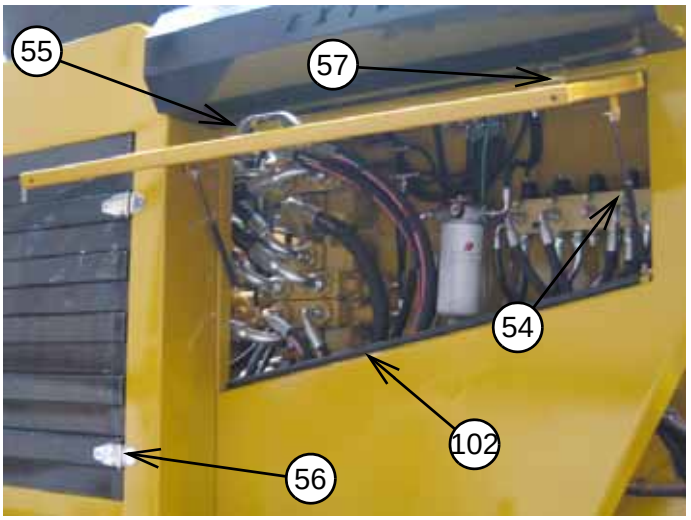
13: VIEW INSIDE POWER PACK



14: VIEW ON SUCTION PIPE



15: OIL COOLER - OPTIONAL



16: ACCESS DOOR TO VALVE PLATE

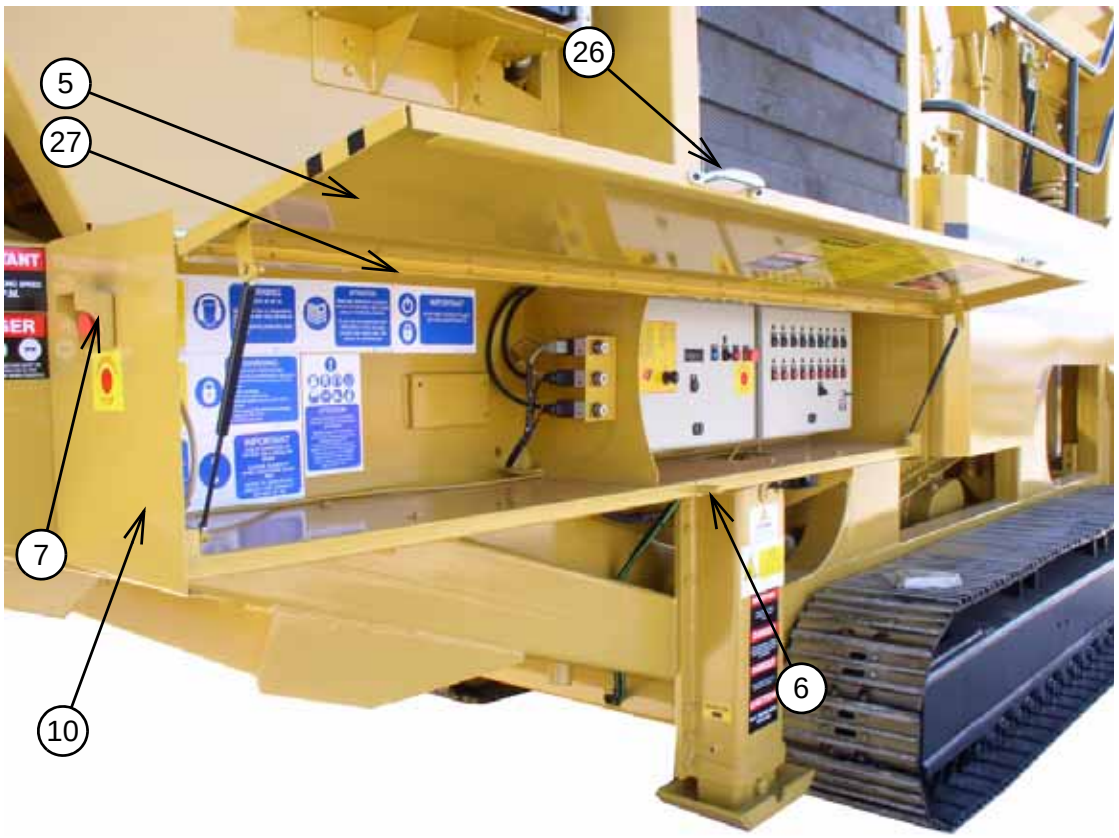
Part No.	Part Description	Quantity
1. A4870000	PACKER	A/R
2. A16510000	PIPE TRAY	1
3. B1300000	HYDRAULIC TANK LID	1
4. B1310000	HYDRAULIC TANK LID	1
5. B2410000	HYDRAULIC TANK LID GASKET	2
6. B3260000	WATER FILTER BRACKET	1
7. B5610000	EXHAUST SHROUD	1
8. B6740000	CANOPY ASSY	1

Part No.	Part Description	Quantity
9. B6800000	POWER PACK ASSY	1
10. B6810000	HYDRAULIC TANK	1
11. B6820000	POWER PACK INFILL PANEL ASSY	1
12. B6830000	POWER PACK CALVE PLATE ACCESS DOOR ASSY	1
13. B6840000	POWER PACK BELLY PANEL	2
14. B6850000	POWER PACK DOOR	2
15. B6860000	C13 BISHOP HAT MESH	2
16. B6870000	AIR FILTER BRACKET	2
17. B6890000	5" AIR HOSE	1
18. B6910000	6" TO 5" AIR PIPE	1
19. B6930000	RAD FILLER CAP COVER PLATE	2
20. B6960000	C13 RETURN MANIFOLD	1
21. B6970000	EXHAUST	1
22. B6980000	C13 POWER PACK INFILL PANEL	1
23. B6990000	OIL COOLER BRACKET	1
24. B7320000	SIDE INFILL PANEL (NO OIL COOLER)	A/R
25. B7330000	OIL COOLER MESH	1
26. B7340000	C13 POWER PACK SUCTION PIPE	1
27. B7570000	VALVE PLATE ASSEMBLY	1
28. B7740000	PIPE BRACE	1
29. B7790000	SMALL INFILL PANEL	1
30. B7820000	C13 OIL COOLER MESH PANEL	1
31. B7830000	SIDE OIL COOLER BRACKET	1
32. B7920000	RADIATOR PACKER	A/R
33. B7970000	C13 OIL COOLER GUARD (FULL)	1
34. B8250000	BELLY PANEL	1
35. EL1051	WIRING SYSTEM COMPLSETE	1
36. EN1008	INDICATOR-AIR FILTER CHANGE	1
37. EN1349	FILTER AIR OUTER	1
38. EN1350	FILTER AIR INNER	1
39. EN1401	SPIN ON WATER FILTER 10 MICRON INLINE	1
40. EN1402	COMPLETE FILTER ASSEMBLY (GASKET INCLUDED)	1
41. EN1403	RETURN LINE ELEMENT (25 µm)	2

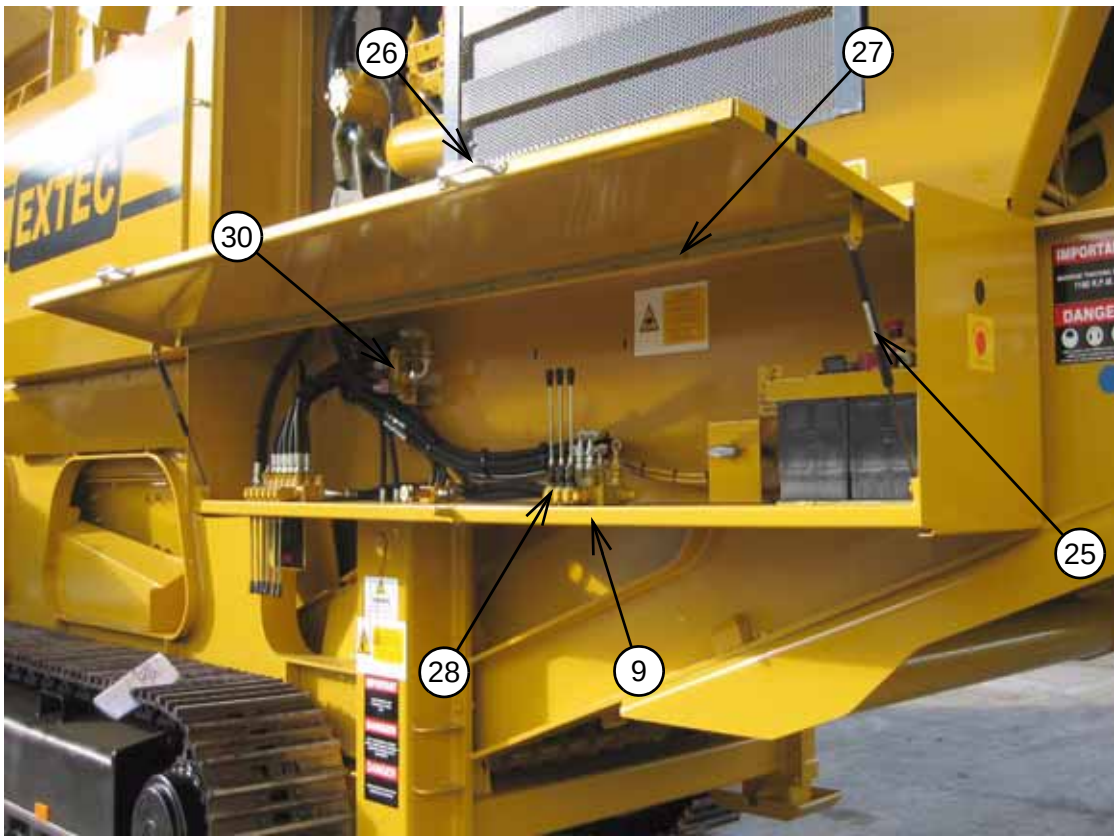
Part No.	Part Description	Quantity
42. EN1404	HYDRAULIC WATER TRAP	1
43. EN1504	VISUAL POP UP INDICATOR	1
44. EN1505	VISUAL POP UP INDICATOR	2
45. EN1523	DESECANT AIR BREATHER	1
46. EN1601	LOCKABLE FILLER CAP0	1
47. EN2028	CFK-200-14-64225 C13/BOSCH ENG	1
48. EN5025	VORTEX PRE CLEANER	1
49. EN7705	C13 CATERPILLAR ENGINE	1
50. EX5000	ASA 0257 OIL COOLER	1
51. EX5001	24 VOLT FAN ASSY TO SUIT ASA 0257	0
52. EX5015	OIL COOLER	1
53. FD1005	500 NM GAS STRUT	4
54. FD1006	550 NM GAS STRUT	2
55. FD2007	MOULDED PLASTIC HANDLE	5
56. FD2102	HINGE	2
57. FD2105	HINGE 3+2 HOLE	2
58. FD3114	ANTI-LOOSE FASTENER	2
59. HA01200018	½" M/M ADAPTOR	1
60. HA03400007	¾" x 1¼" M/M	1
61. HA03400044	¾" M/M ADAPTOR	11
62. HA1000004	1¼" M/M ADAPTOR	2
63. HA1000016	1" X ½" M/M ADAPTOR	4
64. HA1000068	1 X 1 1/16 12UNF M/M	2
65. HA1120007	1½" R2T 90S INSERT	2
66. HA2000011	2" X 1½" M/F SWIVEL	2
67. HA2000016	2" BSP F/M/M TEE	2
68. HA21200002	2½" X 2" M/M ADAPTOR	2
69. HAB100001	1" BSP SAE6000 FLANGE FITTING	2
70. HAB100003	1¼" BSP SAE6000 FLANGE	2
71. HADW03400	3/4" DOWTY WASHER	11
72. HADW10000	1" DOWTY WASHER	2
73. HADW10120	1½" DOWTY WASHER	8
74. HADW10140	1¼" DOWTY WASHER	6

Part No.	Part Description	Quantity
75. FAHC1063	BAND CLAMP 150 MM - 162 MM	6
76. HAN100001	1¼" FLANGE CFS104	1
77. HAN100002	1" BSP SAE3000 FLANGE + BOLTS	1
78. HAN100008	1½" BSP SAE6000	2
79. HAN100009	1½" BSP SAE 6000 FLANGE	16
80. HAN100010	2" BSP SAE 3000 FLANGE	2
81. HF1017	FILTER SUCTION STR1004SG1M90-2	6
82. HG1002	LEVEL GAUGE	1
83. HP1051	44/44/19 TRIPPLE PUMP	1
84. HP1054	REXROTH A8VO 200/200 PUMP	1
85. HP1057	TRIPLE PUMP CAT C13 ENGINE	1
86. HP1058	PTO PUMP	1
87. HV1056	HC D40 CONTROL VALVE	2
88. HV3017	4 STATION CETOP 3 SERIES (INCL HV3521, HV3522, HV8501)	1
89. HV3021	FRFEXT 2381/24 5STATION SOLENOID BLOCK (INCL HV3527, HV3528)	1
90. HV3029	MOTOR CONTROL BLOCK 800LPM	1
91. HV3521	CETOP 3 V/V AT-DHI-0714	3
92. HV3522	VALVE	3
93. HV3524	CETOP 3 SHUTTLE	4
94. HV3527	VALVE	3
95. HV3528	RELIEF VALVE	5
96. HV3535	3/4" RELIEF VALVE	1
97. HV5017	1½" BSP CHECK VALVE	2
98. HV8008	1¼" L/P BALL VALVE	5
99. HV8501	¼" TEST POINTS	12
100. HV8502	¼" BSP PRESSURE/TEMP TEST	1
101. HV8506	ENGINE OIL DRAIN VALVE	1
102. RU5328	CAPPING RUBBER	A/R
103. RU6013	5½" SUCTION HOSE	1

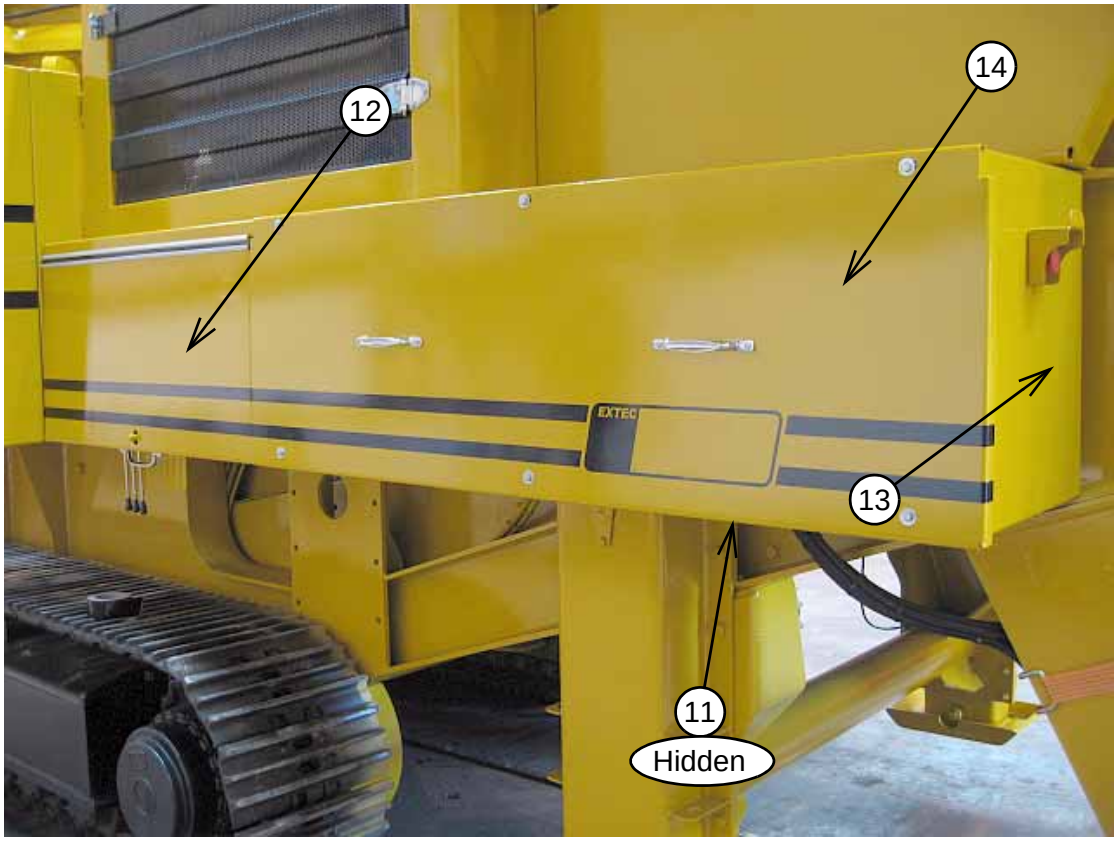
AA.7 Control Boxes



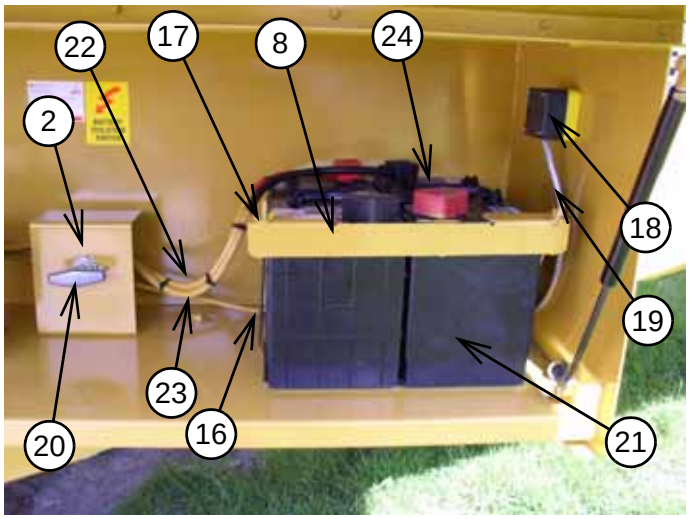
1: ELECTRICAL CONTROL BOX



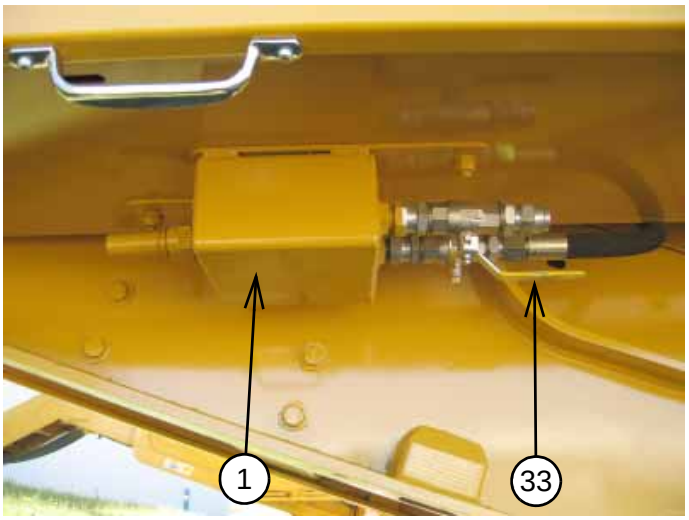
2: HYDRAULIC CONTROL BOX



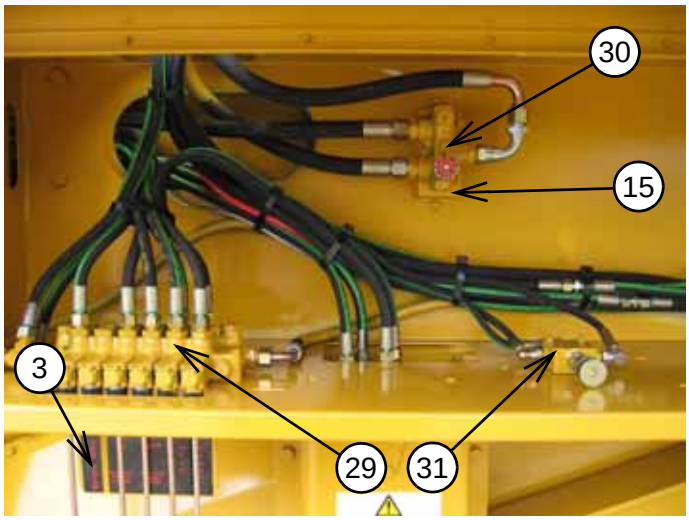
3: RECIRCULATION CONTROL BOX (WHERE FITTED)



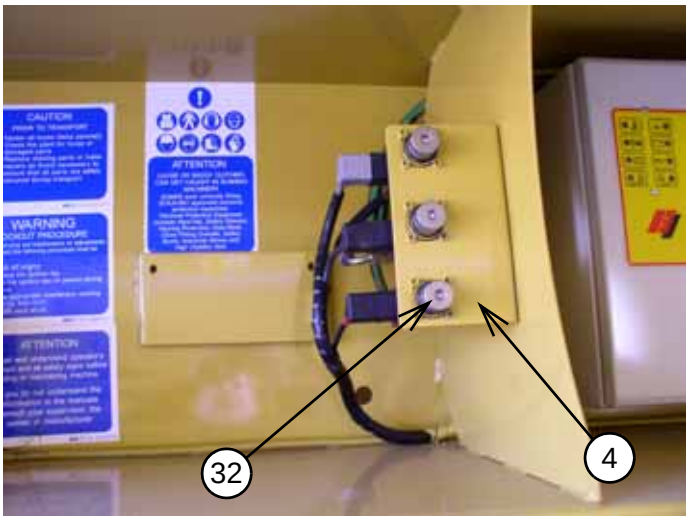
4: VIEW ON ISOLATION SWITCH AND BATTERIES



5: VIEW ON WATER MANIFOLD



6: VIEW ON ACCUMULATOR PRESSURE GAUGES

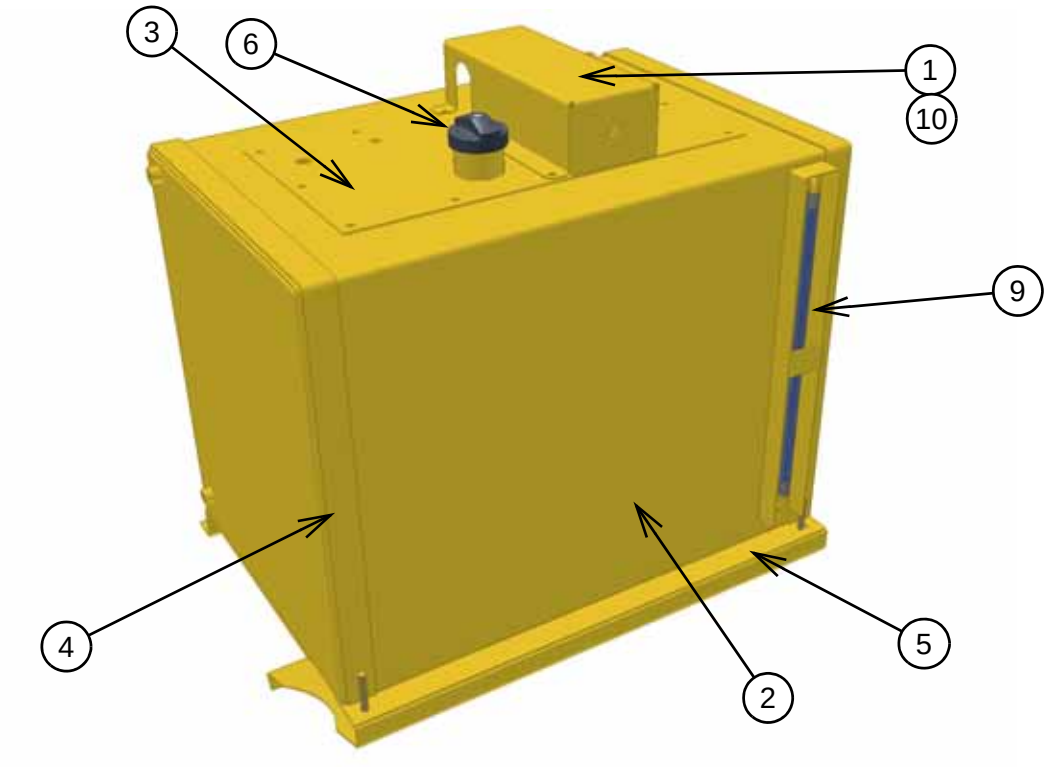


7: VIEW ON PRESSURE SWITCHES

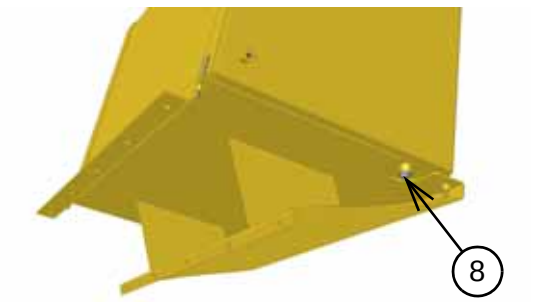
Part No.	Part Description	Quantity
1. A5020000	WATER MANIFOLD	1
2. A6590000	BATTERY ISOLATING BRACKET	1
3. A7700000	SPOOL INDICATOR	1
4. A7710000	MOUNTING PLATE	1
5. A7820000	CONTROL BOX LID	2
6. A8850000	LYNCH PIN	2
7. A10630000	EMERGENCY STOP GUARD	2
8. A14390000	BATTERY LOCATION ANGLE	1
9. A14730000	HYDRAULIC CONTROL BOX	1
10. A14740000	ELECTRICAL CONTROL BOX	1
11. A16210000	ISOLATOR ACCESS COVER	1
12. A16220000	RE-CIRC HYDRAULIC CONTROL BOX SMALL DOOR	1
13. A16240000	RE-CIRC HYDRAULIC CONTROL BOX	1
14. A16270000	RECIRC HYDRAULIC CABINET DOOR PANEL	1
15. B0070000	WEBTEC MOUNTING	1
16. FAB06X300H	BATTERY HOOK BOLT	2
17. FAW06W	WING NUT	2
18. EL2030	EMERGENCY STOP SWITCH	4
19. EL2035	ARMOURED CABLE 2 CORE	1
20. EL2143	BATTERY ISOLATING SWITCH	1

Part No.	Part Description	Quantity
21. EL3001	HEAVY DUTY BATTERY	2
22. EL3004	POSITIVE LEAD	
23. EL3005	NEGATIVE LEAD	1
24. EL3010	BATTERY CROSSOVER	1
25. FD1007	GAS STRUT (ONE EYE)	4
26. FD2006	CHROME PULL HANDLE	6
27. FD2109	POLIALL HINGE	2
28. HV1020	4 LEVER SPOOL VALVE	1
29. HV1049	6 LEVER SPOOL VALVE	1
30. HV2002	FLOW DIVERTER	1
31. HV3544	SPEED CONTROL	1
32. HV5009	PRESSURE SWITCH ADAPTOR	3
33. HV8004	3/4” BSP BALL VALVE	2

AA.8 Diesel Tank



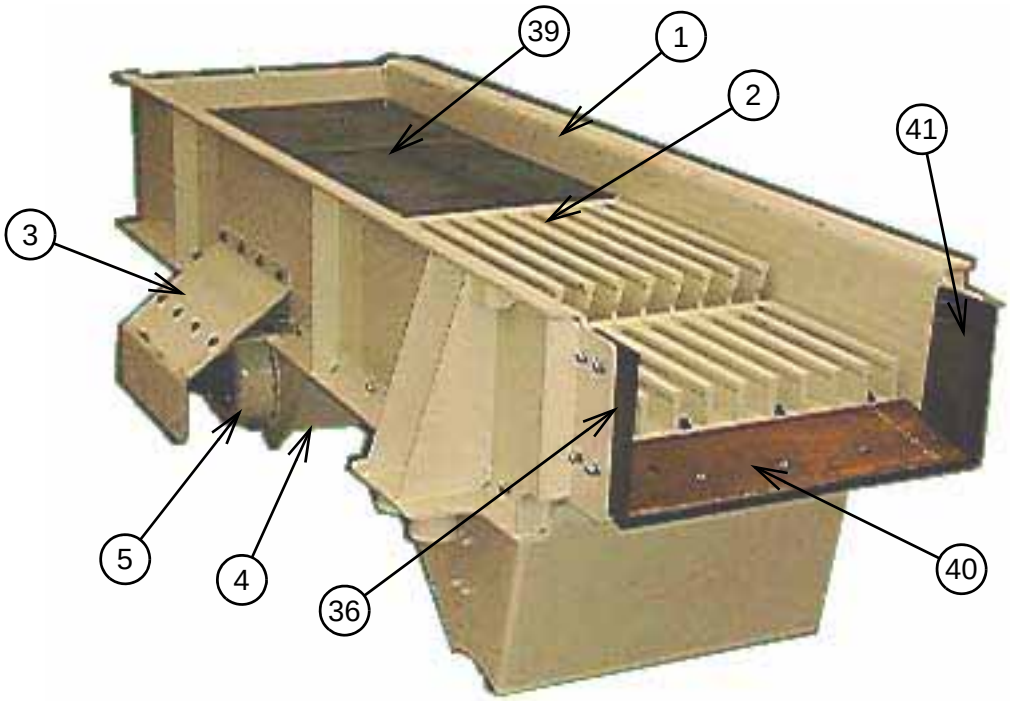
1: DIESEL TANK ASSEMBLY



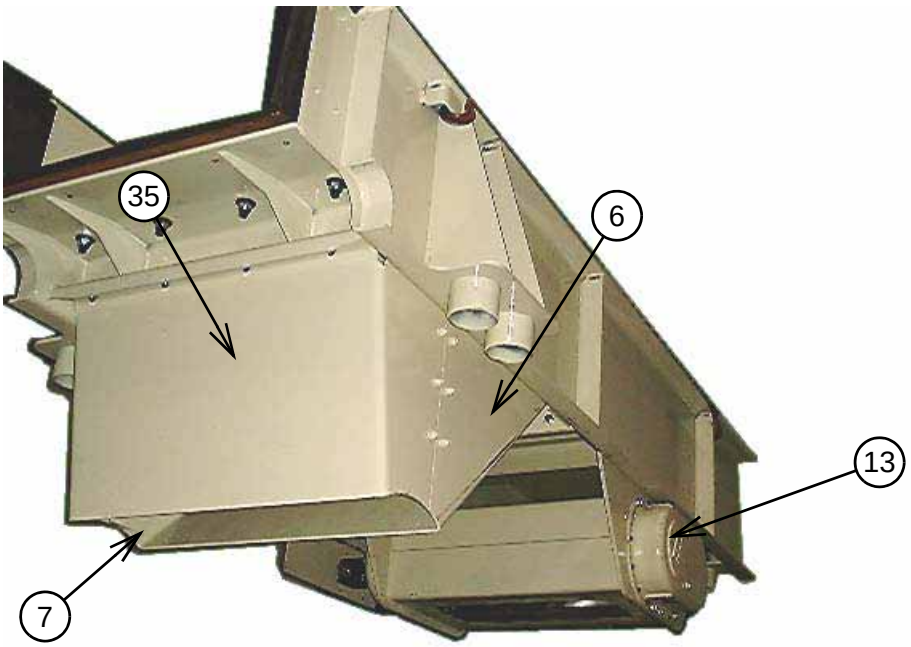
2: VIEW ON BOTTOM OF DIESEL TANK

Part No.	Part Description	Quantity
1. A10800000	DIESEL PUMP GUARD	1
2. A12500000	DIESEL TANK	1
3. A12510000	DIESEL TANK LID	1
4. A12530000	DIESEL TANK STRAPS	2
5. A14040000	DIESEL TANK PLATFORM	1
6. EN1609	FILLER CAP	1
7. FAHC1001	SIZE 00 JUBILEE CLIP	2
8. HAP034001	¾" BLANKING CAP	1
9. HG3006	PIPE SIGHT GAUGE	1
10. HP3001	DIESEL FILLER PUMP	1

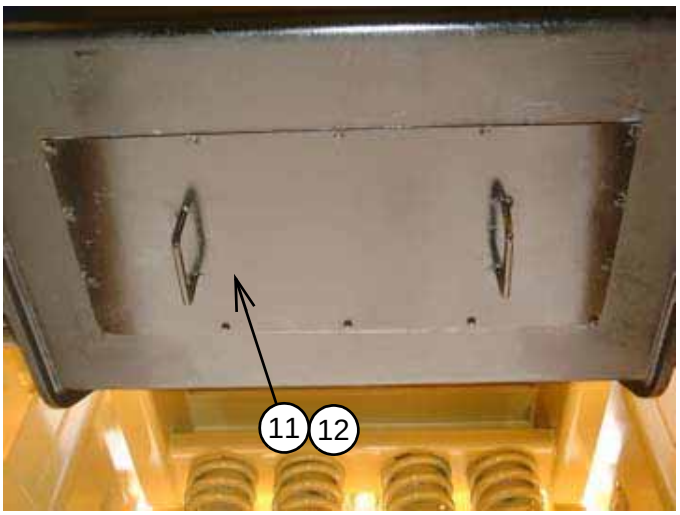
AA.9 Feeder and Vibrator Box



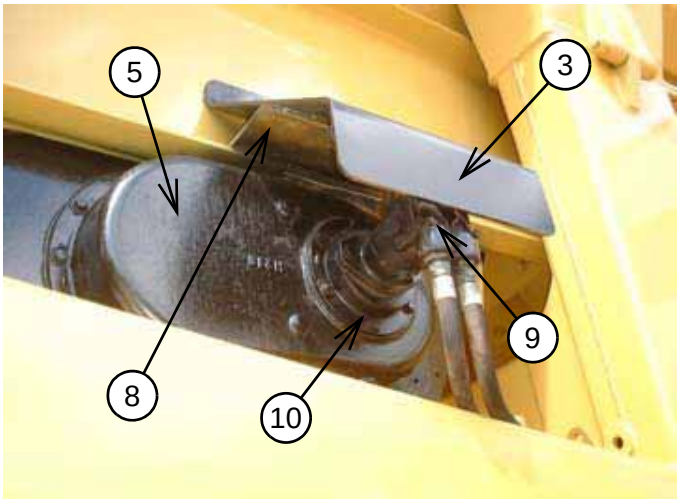
1: FEEDER ASSEMBLY - VIEW ON TOP FROM MOTOR SIDE



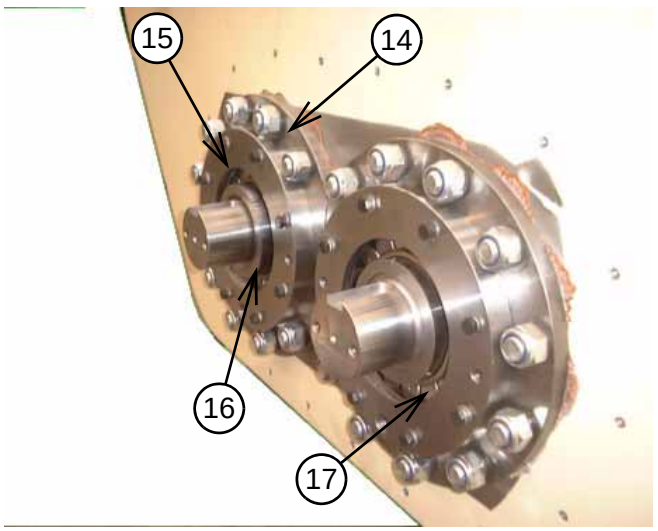
2: FEEDER ASSEMBLY - VIEW FROM BOTTOM FROM GEAR SIDE



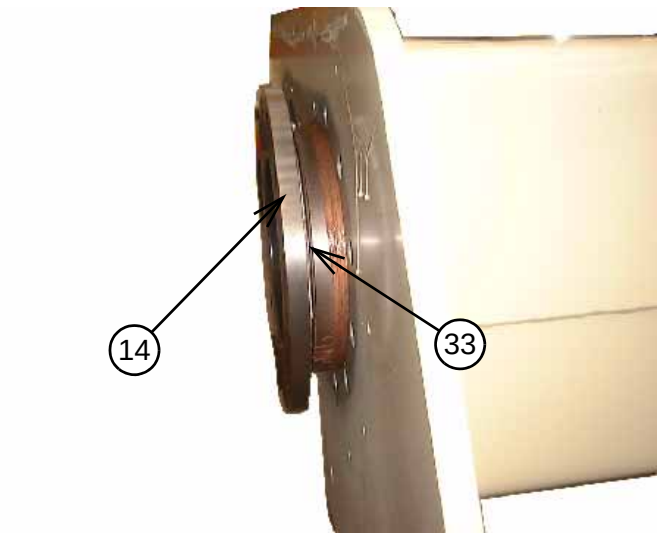
3: VIEW ON BOTTOM FROM MOTOR SIDE



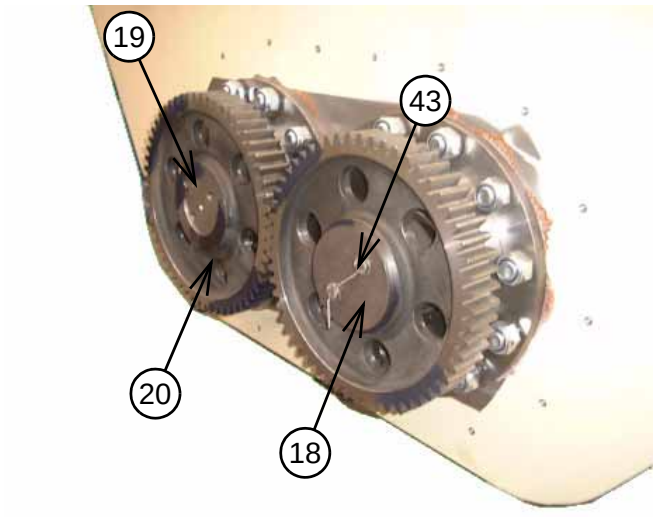
4: VIEW ON MOTOR AND COVERS



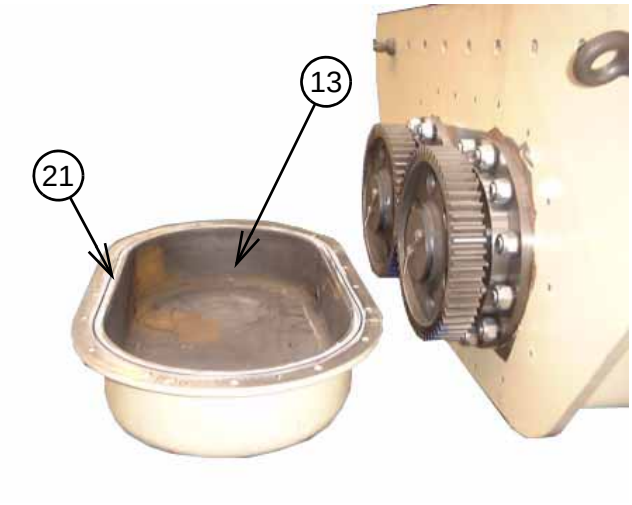
5: GEAR SIDE WITHOUT GEARS FITTED



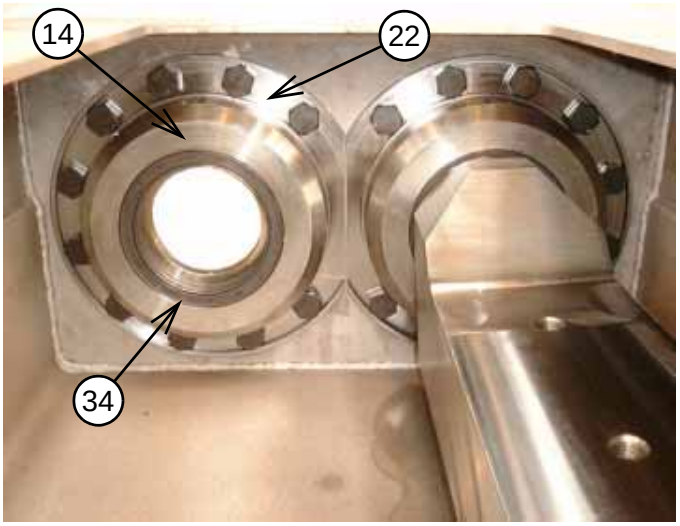
6: VIEW ON BEARING CARTRIDGE



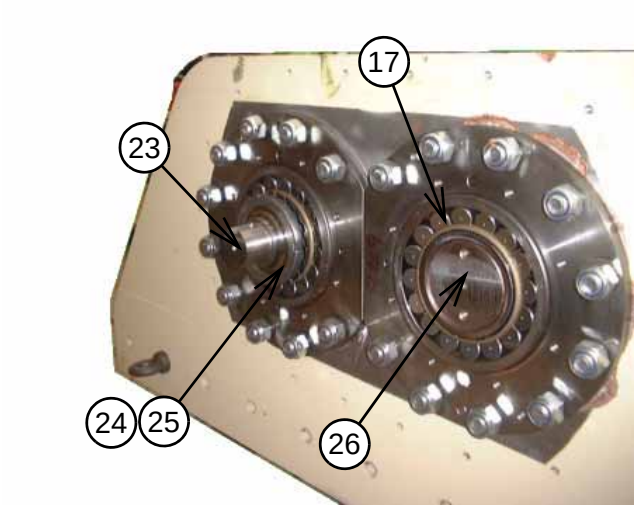
7: GEAR SIDE GEARS FITTED



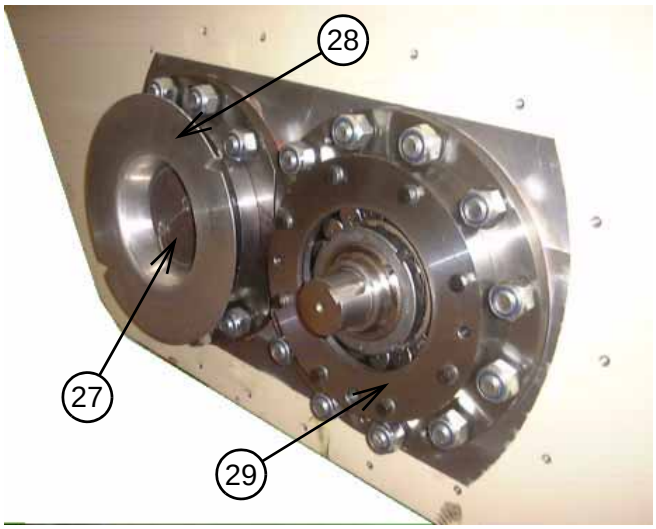
8: VIEW ON GEAR SIDE WITH COVER



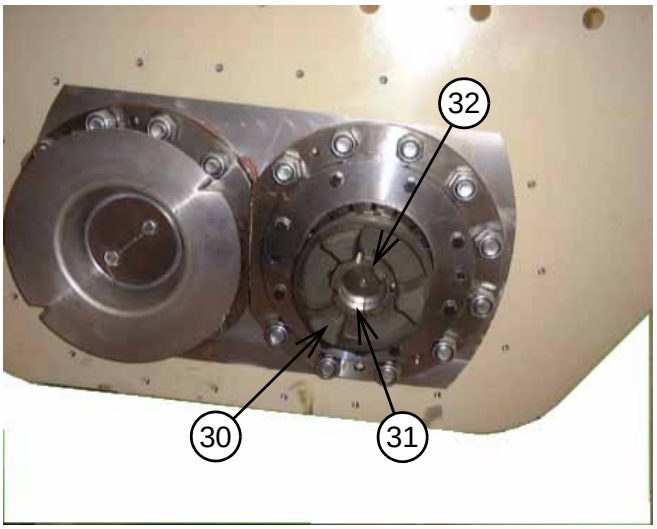
9: VIBRATOR BOX - INSIDE



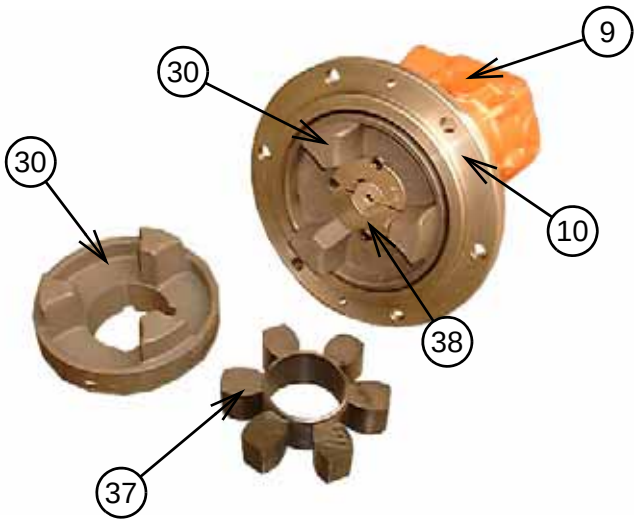
10: VIBRATOR BOX - MOTOR SIDE



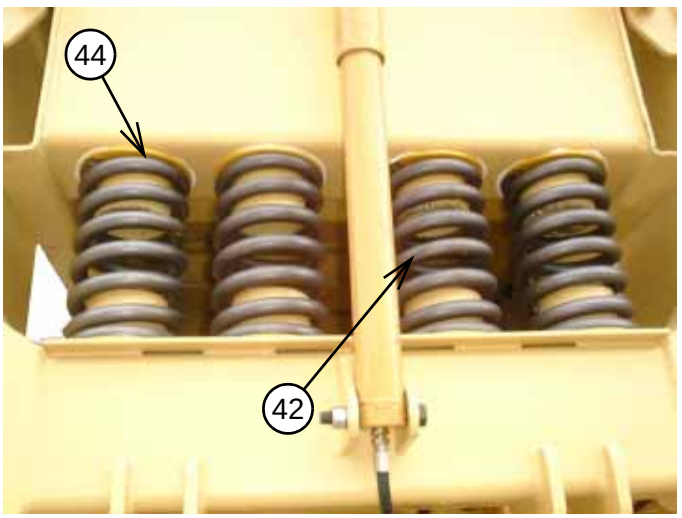
11: VIBRATOR BOX - MOTOR SIDE



12: VIBRATOR BOX - MOTOR SIDE



13: VIBRATOR MOTOR ASSEMBLY

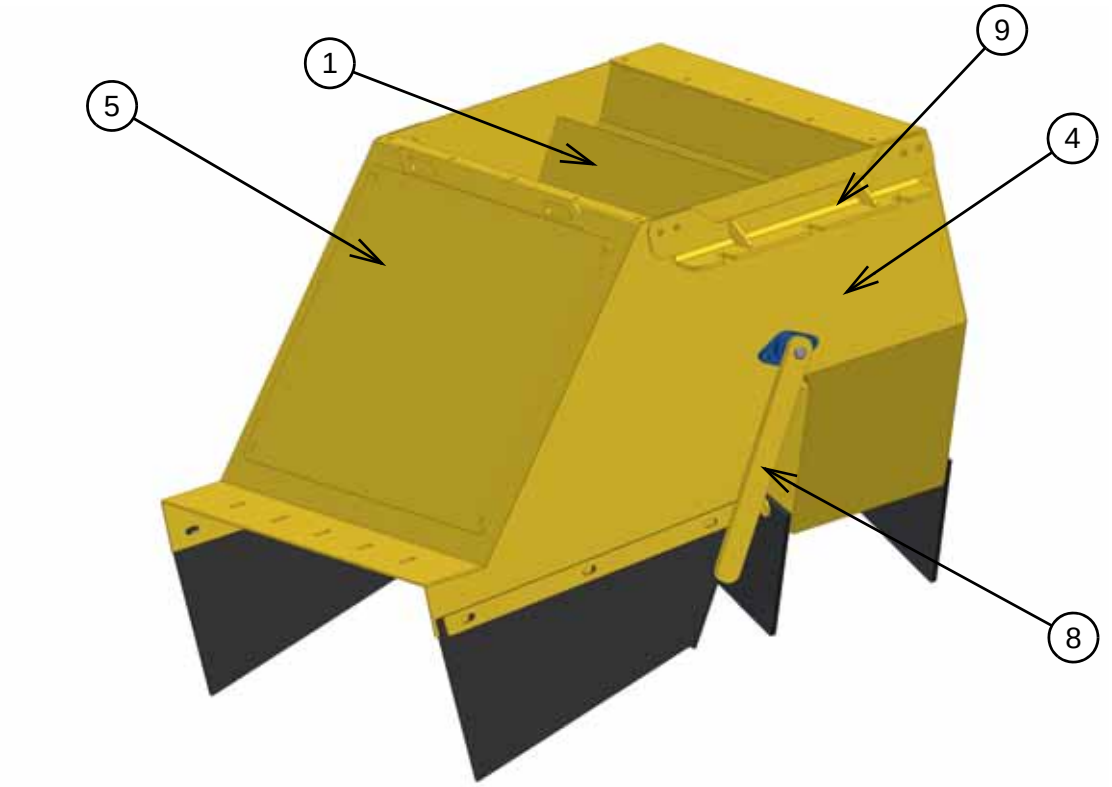


14: VIEW ON FEEEDER SUPPORT SPRINGS

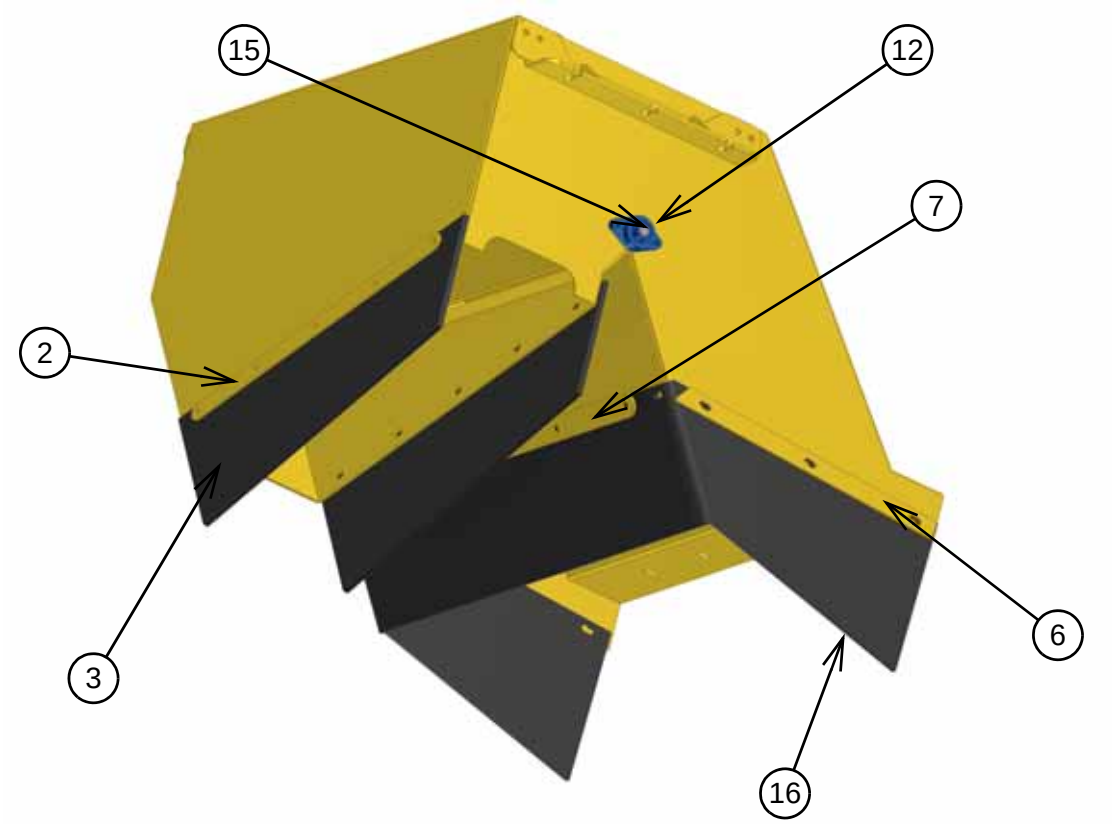
Part No.	Part Description	Qty
1. H2700000	FEEDER	1
2. H2770000	GRIZZLY BAR	1
3. H1910000	FEEDER MOTOR GUARD	1
4. H2000000	VIBRATOR HOUSING ASSEMBLY	1
5. H2160000	MOTOR END COVER - DRIVE	1
6. H2760000	FEEDER OUTLET CHUTE - REAR SECTION	1
7. H2540000	FEEDER OUTLET CHUTE SIDE JOINT PLATE	2
8. H1900000	FEEDER MOTOR GUARD SUPPORT PLATE	1
9. HM1024	HYDRAULIC MOTOR	1
10. H7450000	VIBRATOR MOTOR COWL CASTING	1
11. H2010000	INSPECTION COVER PLATE	1
12. H2030000	GASKET - INSPECTION COV ER PLATE	1
13. H2080000	GEAR END COVER - NON DRIVE	1
14. H2090000	VIBRATOR BEARING CARTRIDGE	4
15. H2100000	BEARING RETAINING PLATE - NON DRIVE	2
16. H2140000	SPACER	2
17. BT3001	BEARING	4
18. H2060000	SHAFT END PLATE	2
19. FAKS22X14	KEY - 22 x 14 x 60	2
20. H2020000	GEAR WHEEL	2
21. BT8001	O-RING - DIA. 4mm	4
22. H2050000	INNER BOLT RETAINING PLATE	4
23. H2170000	VIBRATOR SHAFT - DRIVE	1
24. BT3503	LOCK NUT	1
25. BT3504	LOCK WASHER	1
26. H2180000	VIBRATOR SHAFT - NON DRIVE	1
27. H2070000	SHAFT END PLATE	1
28. H2040000	OIL THROWER	1
29. H2120000	BEARING RETAINING PLATE - DRIVE SIDE	2
30. BT6515	COUPLING	1
31. BT5006	TAPER LOCK BUSH	1
32. FAKS14X09	KEY - 14 x 9	1

Part No.	Part Description	Qty
33. BT8506	O-RING - DIA . 3.5mm	4
34. BT8006	OIL SEAL	4
35. H2720000	FEEDER OUTLET CHUTE - FRONT SECTION	1
36. H2750000	WEAR PLATE - R.H.S	1
37. BT6514	SPIDER	1
38. BT5020	TAPER LOCK BUSH	1
39. H2310000	FEEDER WEAR PLATE	2
40. H2730000	OUTLET WEAR PLATE	1
41. H2740000	WEAR PLATE - L.H.S	1
42. H2390000	SPRING - FEEDER MOUNT	8
43. FAS10X20	M10 x 20 SET SCREW - DRILLED DIA . 3mm	6
44. RU5103	SPRING MOUNT	16

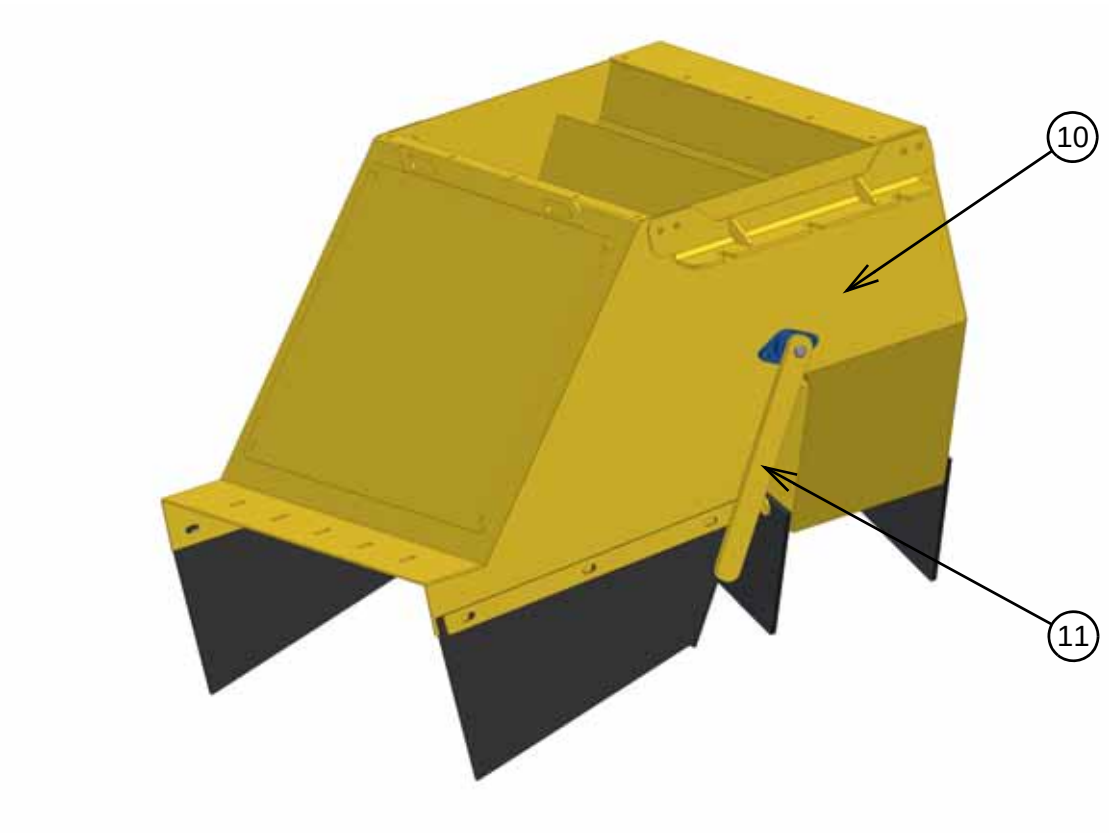
AA.10 Transfer Chute



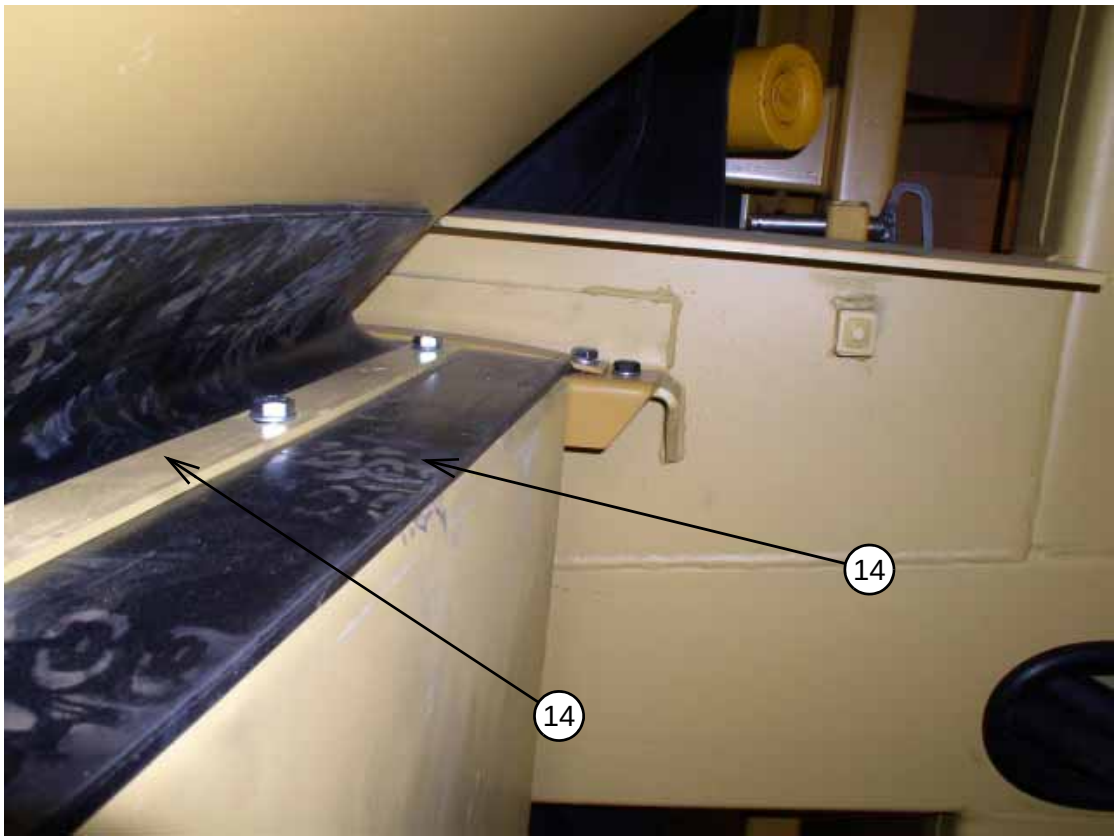
1: TRANSFER CHUTE ASSEMBLY



2: VIEW ON DISCHARGE END



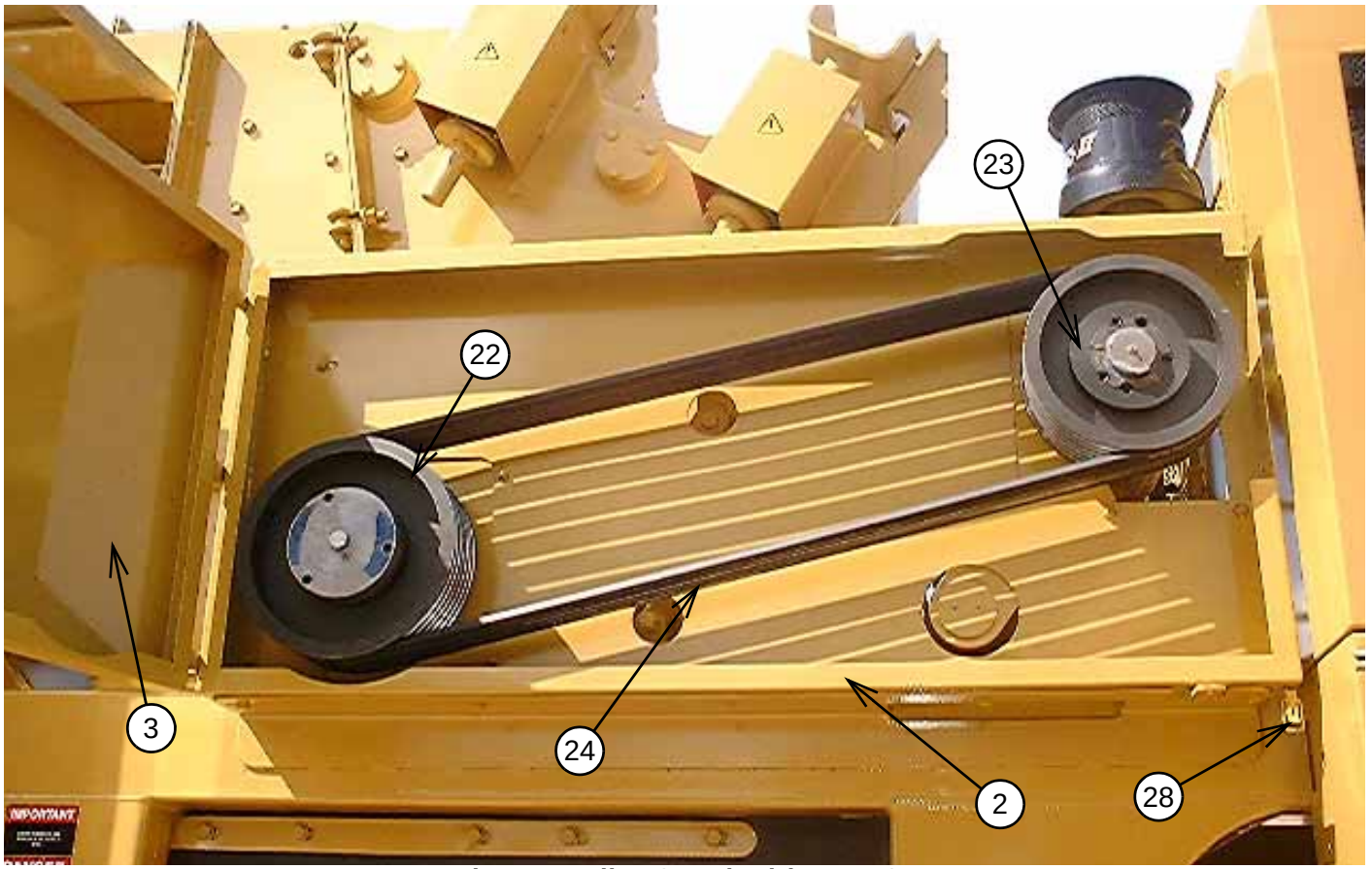
3: OPPOSITE HAND TRANSFER CHUTE ASSEMBLY



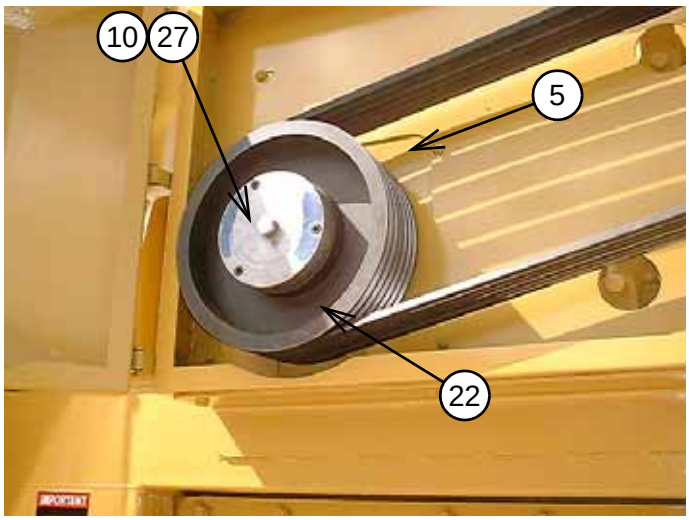
4: TRANSFER CHUTE TUBBER

Part No.	Part Description	Quantity
1. A4650000	TRANSFER CHUTE DEFLECTOR PLATE	1
2. A6150000	TRANSFER CHUTE RUBBER CLAMP	2
3. A6430000	CHUTE SIDE CONVEYOR RUBBER	2
4. A9840000	TRANSFER CHUTE	1
5. A9850000	TRANSFER CHUTE COVER PLATE	1
6. A9860000	IMPACTOR CHUTE RUBBER CLAMP	2
7. A10160000	TRANSFER CHUTE REAR CLAMP	1
8. A13560000	TRANSFER CHUTE HANDLE	
9. A14120000	MOUNTING BRACKETS	2
10. A16250000	TRANSFER CHUTE	1
11. A16260000	TRANSFER CHUTE HANDLE	1
12. BT2501	DISCHARGE CHUTE PIVOT BEARING	2
13. H7530000	RUBBER CLAMP	1
14. H7540000	TRANSFER CHUTE RUBBER	1
15. PN1094	DEFLECTOR PLATE PIVOT BAR	1
16. RU1052	IMPACTOR CHUTE RUBBER	1

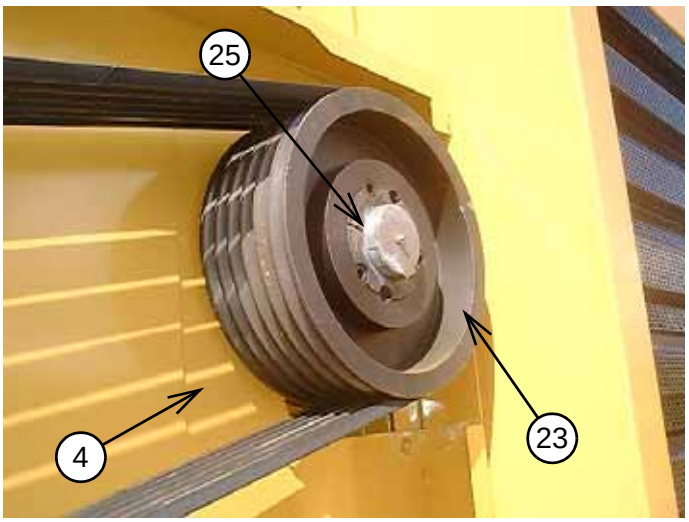
AA.11 Crusher Box



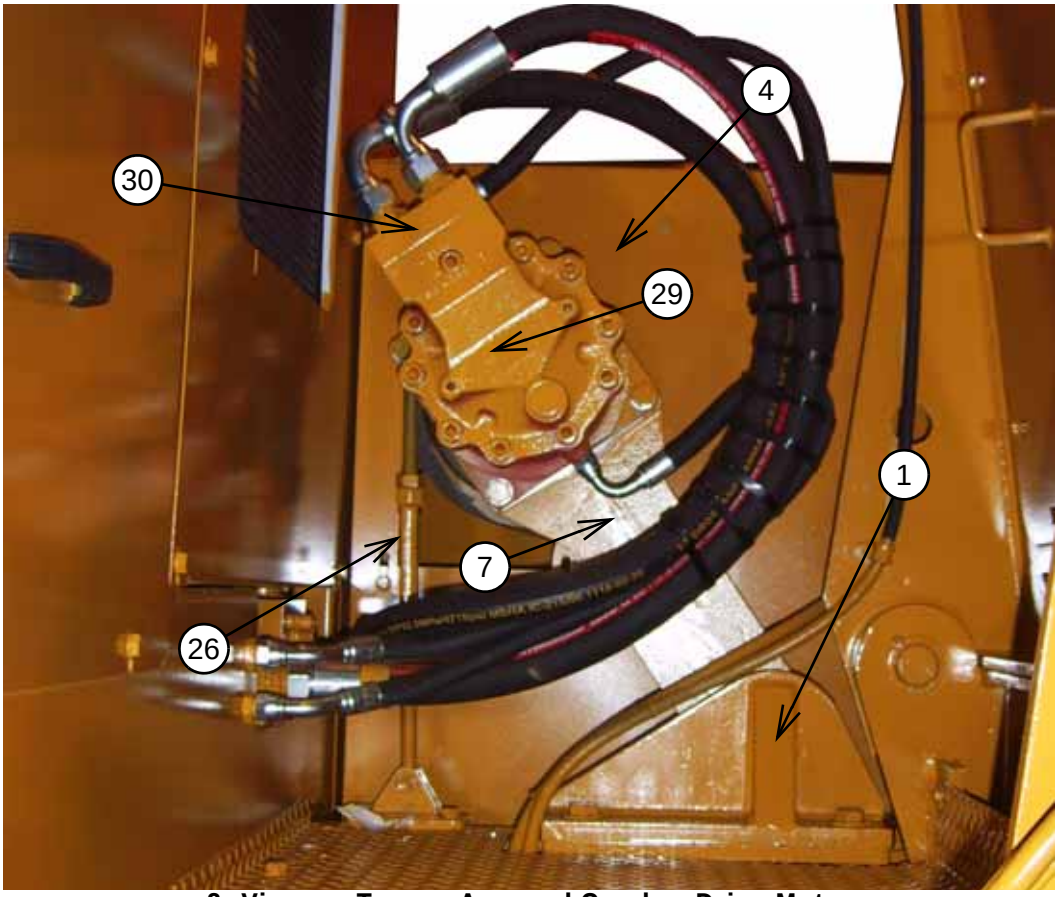
5: View on Pulley Guard With Door Open



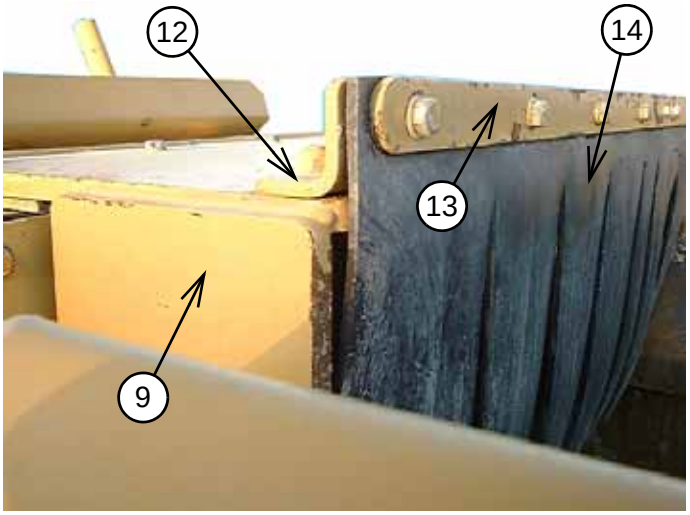
6: Detail View on Pulley Wheels



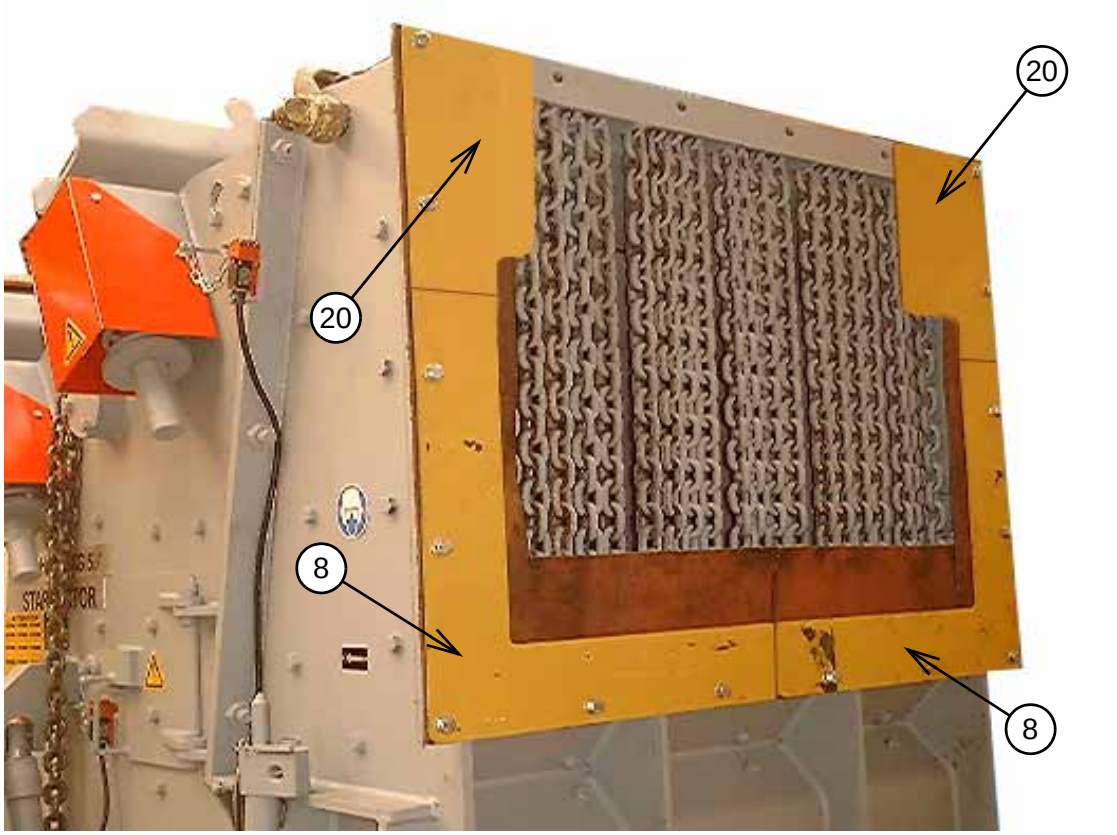
7: Detail View on Pulley Wheels



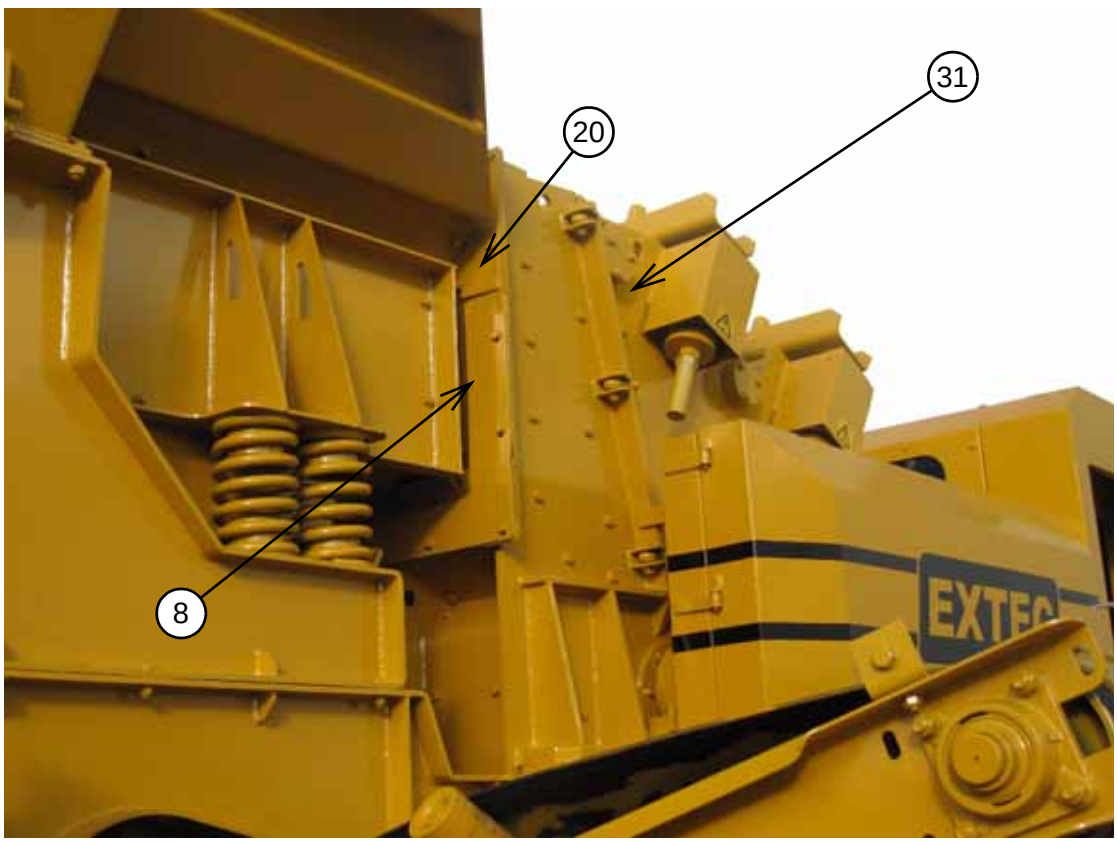
8: View on Torque Arm and Crusher Drive Motor



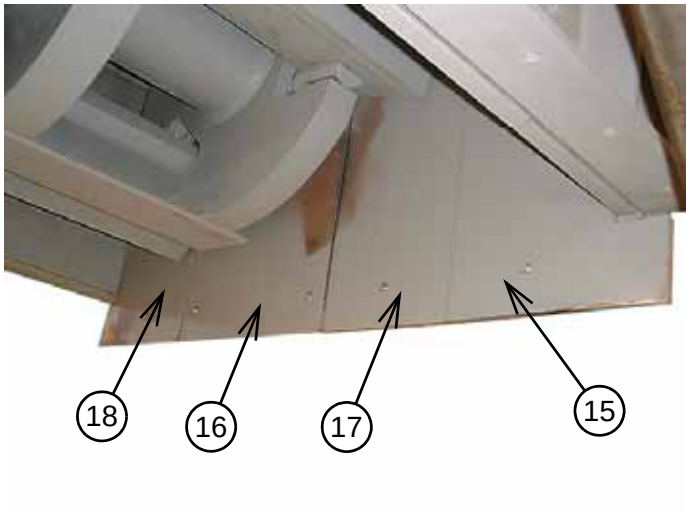
9: Inlet to Crusher Box Viewed From Feeder

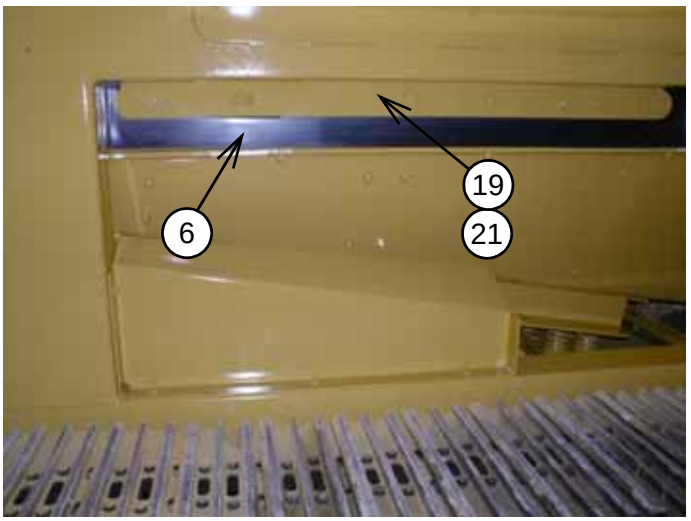


10: HYDRAULIC CONTROL BOX



11: HYDRAULIC CONTROL BOX





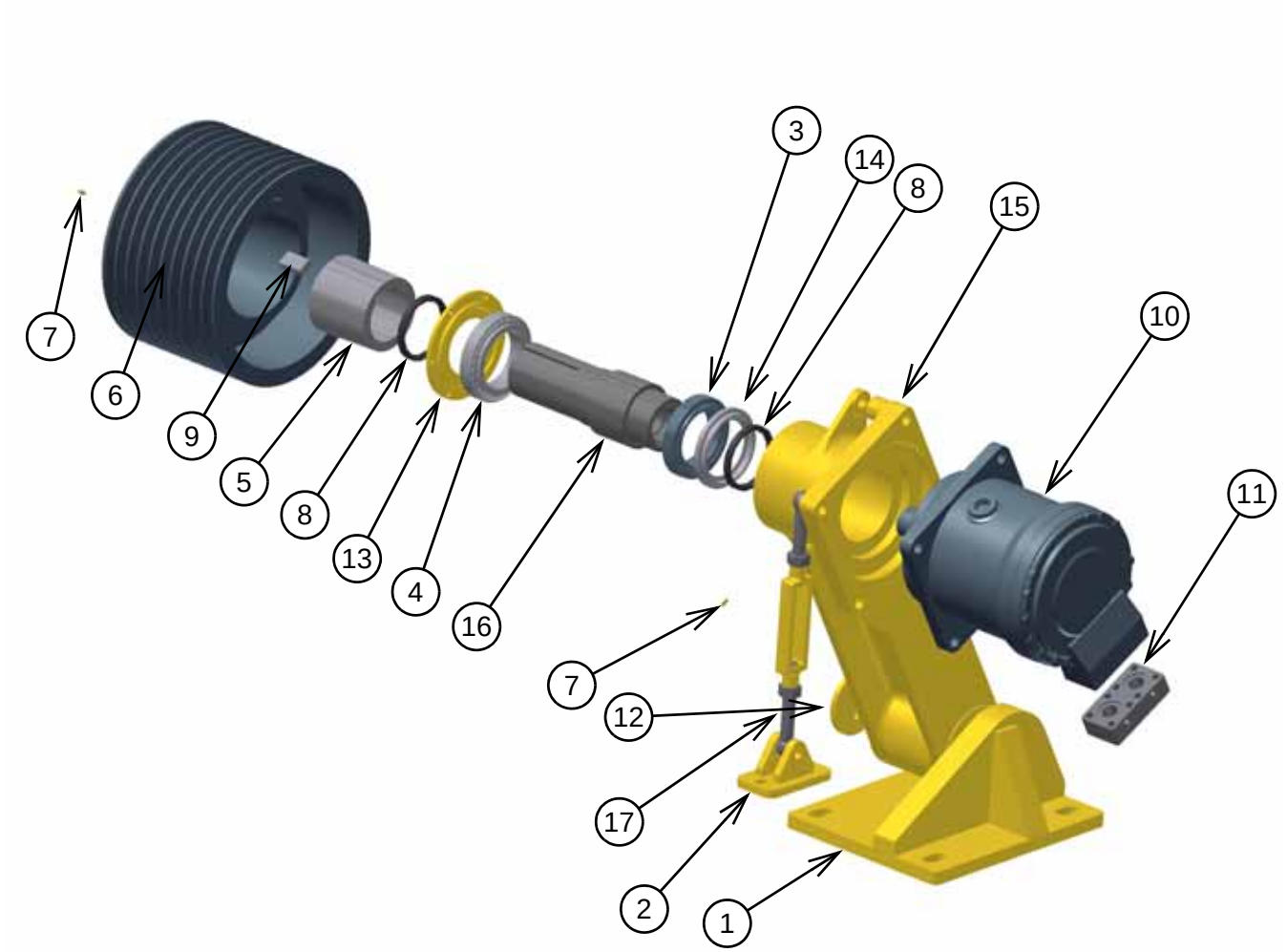
12: Side Rubber Clamp

Note: FOR FURTHER DETAILS OF PARTS WITHIN THE IMPACT CRUSHER BOX, SEE SEPARATE HAZEMAG PARTS & MAINTENANCE MANUAL SUPPLIED IN CONJUNCTION WITH THIS PARTS MANUAL. IF REQUIRED, CONTACT EXTEC SERVICE DEPARTMENT FOR FURTHER ASSISTANCE.

Part No.	Part Description	Qty
1. A6610000	PIVOT ARM MOUNTING BLOCK	1
2. A6620000	PULLEY INNER GUARD	1
3. A6630000	PULLEY GUARD DOOR	1
4. A6640000	DRIVE PULLEY GUARD	1
5. A6660000	DRIVEN PULLEY GUARD	1
6.	CRUSHER TO FEEDER PAN OUTER RUBBER	2
7. J0930000	PIVOT ARM	1
8. J2760000	CRUSHER INLET BOTTOM RUBBER CLAMP PLATE	2
9. J2770000	CRUSHER INLET COVER PLATE	1
10. J2890000	DRIVEN PULLEY COVER	1
11. J2900000	SPACER (NOT SHOWN)	3
12. J3500000	RUBBER MOUNTING ANGLE- INLET COVER PLATE	1
13. J3510000	RUBBER CLAMP PLATE - INLET COVER	1
14. J3580000	OUTLET CHUTE RUBBER - INLET COVER	1
15. J5440000	CRUSHER BOX WEAR PLATE (SPARES ONLY)	2
16. J5450000	CRUSHER BOX WEAR PLATE (SPARES ONLY)	2
17. J5460000	CRUSHER BOX WEAR PLATE (SPARES ONLY)	2

Part No.	Part Description	Qty
18. J5470000	CRUSHER BOX WEAR PLATE (SPARES ONLY)	2
19. J5480000	CRUSHER BOX SIDE RUBBER CLAMP OUTER	2
20. J3630000	CRUSHER INLET TOP RUBBER CLAMP PLATE	2
21. J5620000	SIDE RUBBER CLAMP SPACER	10
22. BT4035	SPC PULLEY	1
23. BT4040	SPC PULLEY	1
24. BT4506	SPC4750 PULLEY BELT	6
25. BT5017	TAPER LOCK BUSH	1
26. J6960000	TURN BUCKLE ASSEMBLY	1
27. BT5026	TAPER LOCK BUSH	1
28. FD3109	OVER CENTRE DOOR CATCH	2
29. HM1021	HYDRAULIC MOTOR	1
30. j8400000	MOTOR CONTROL BLOCK	1
31. IM1001	IMPACTOR BOX	1

AA.12 Torque Arm Assembly

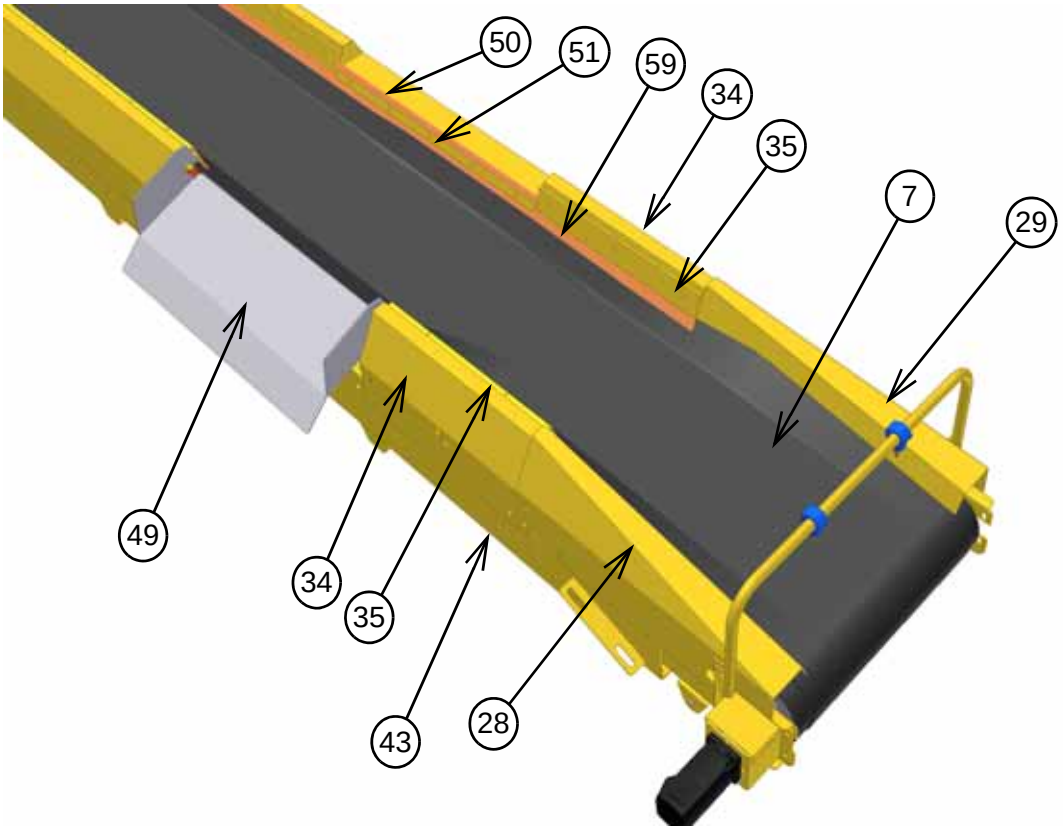


1: TORQUE ARM ASSEMBLY

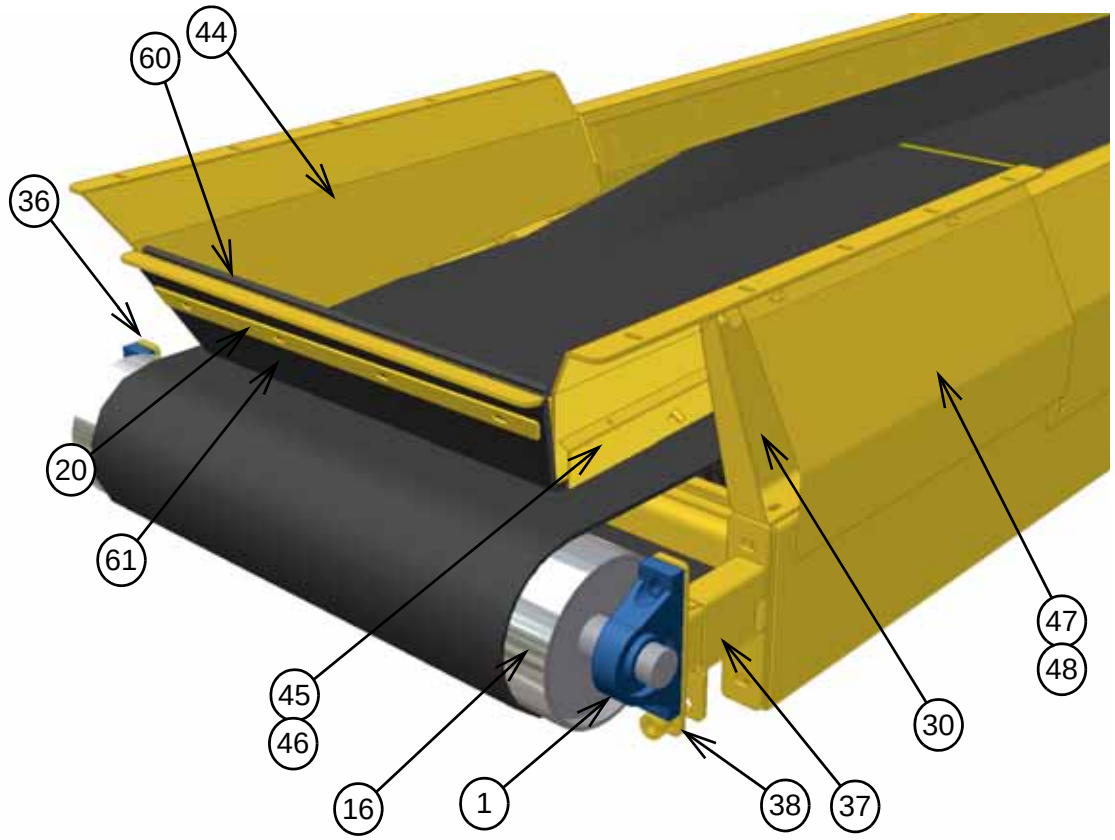
Part No.	Part Description	Quantity
1. A6610000	MOUNTING PIN	1
2. A13580000	BASE PLATE	1
3. BT3015	INNER BEARING	1
4. BT3016	OUTER BEARING	1
5. BT5017	TAPER LOCK BUSH 50/50-100	1
6. BT4040	400 X 10 SPC PULLEY	1
7. BT5504	LUBRICATING NIPPLE	1
8. BT8013	SHAFT SEAL RING	2
9. FAKS28X16	KEY	1
10. HM1021	HYDRAULIC MOTOR	1

Part No.	Part Description	Quantity
11. J8400000	MOTOR CONTROL BLOCK	1
12. J0250000	PIN CAP	1
13. J0330000	OUTER BEARING CAP	1
14. J0820000	INNER BEARING SPACER RING	1
15. J0930000	TENSIONING FRAME	1
16. J5050000	PULLEY SHAFT	1
17. J6970000	TURN BUCKLE	1

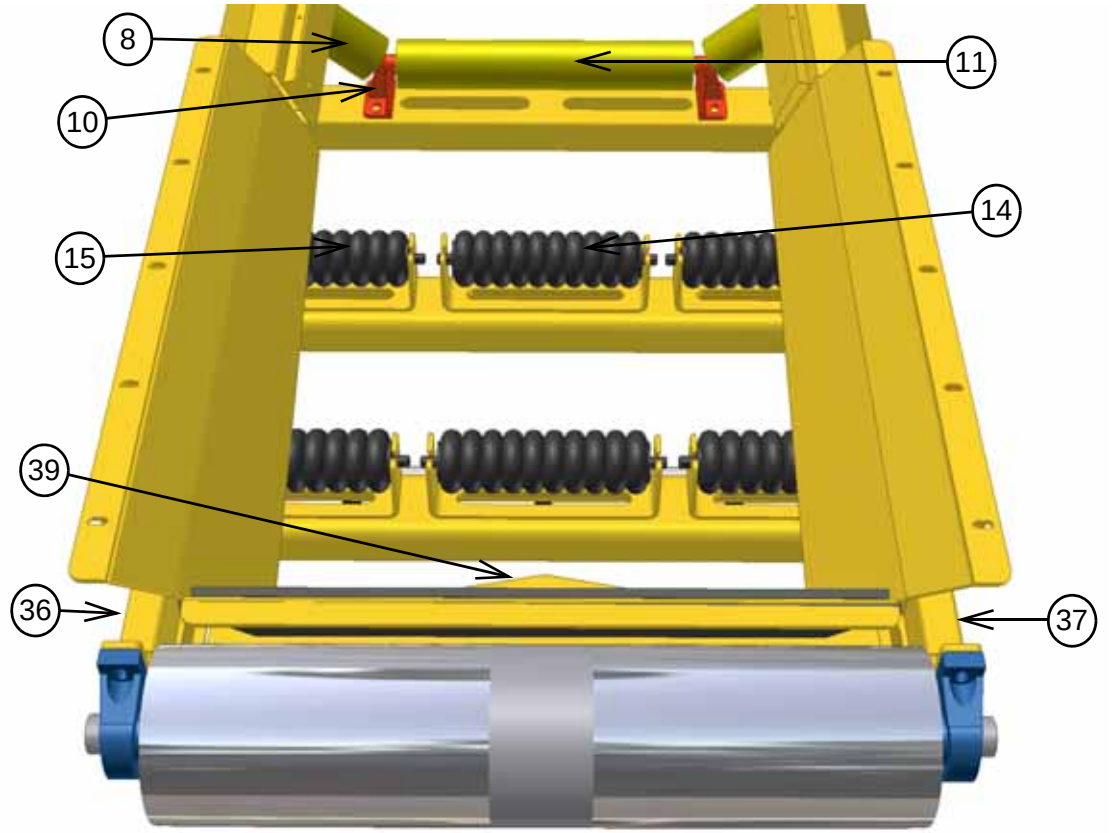
AA.13 Main Conveyor



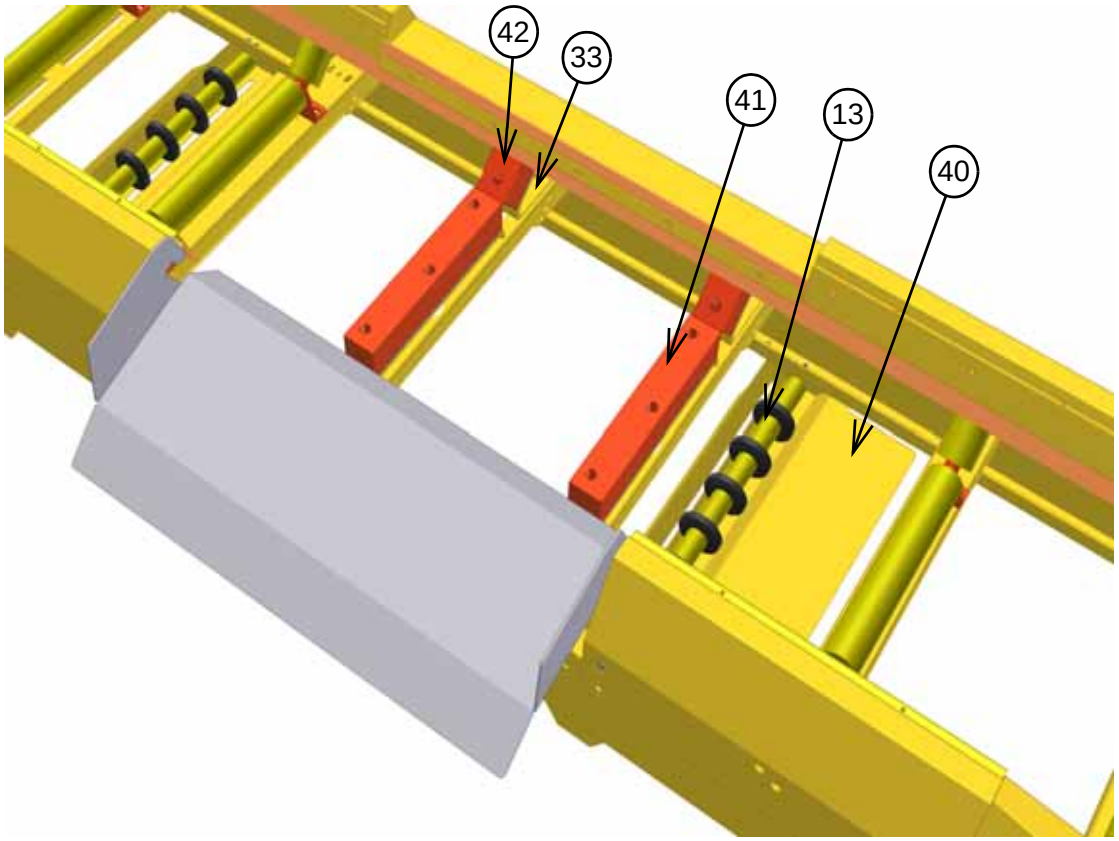
1: MAIN CONVEYOR TOP SECTION



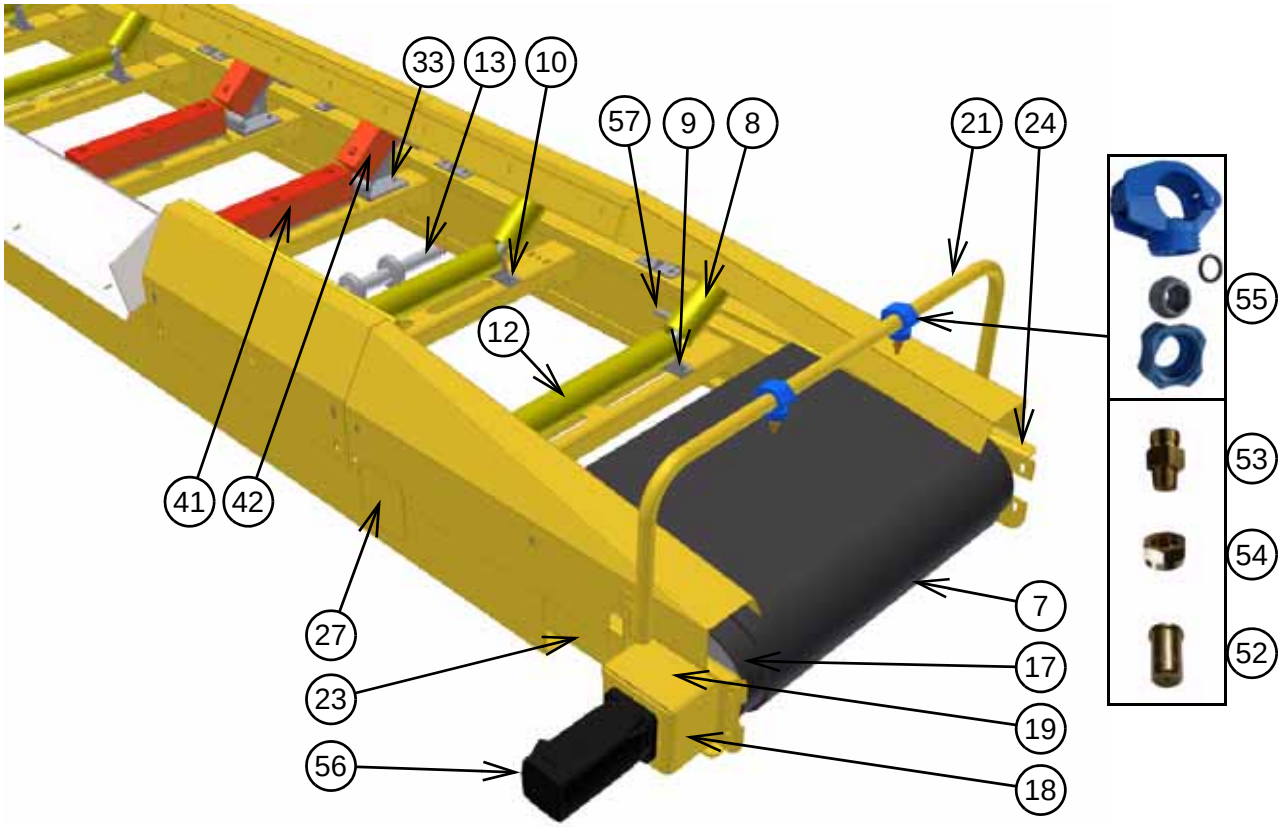
2: VIEW ON FEED BOOT



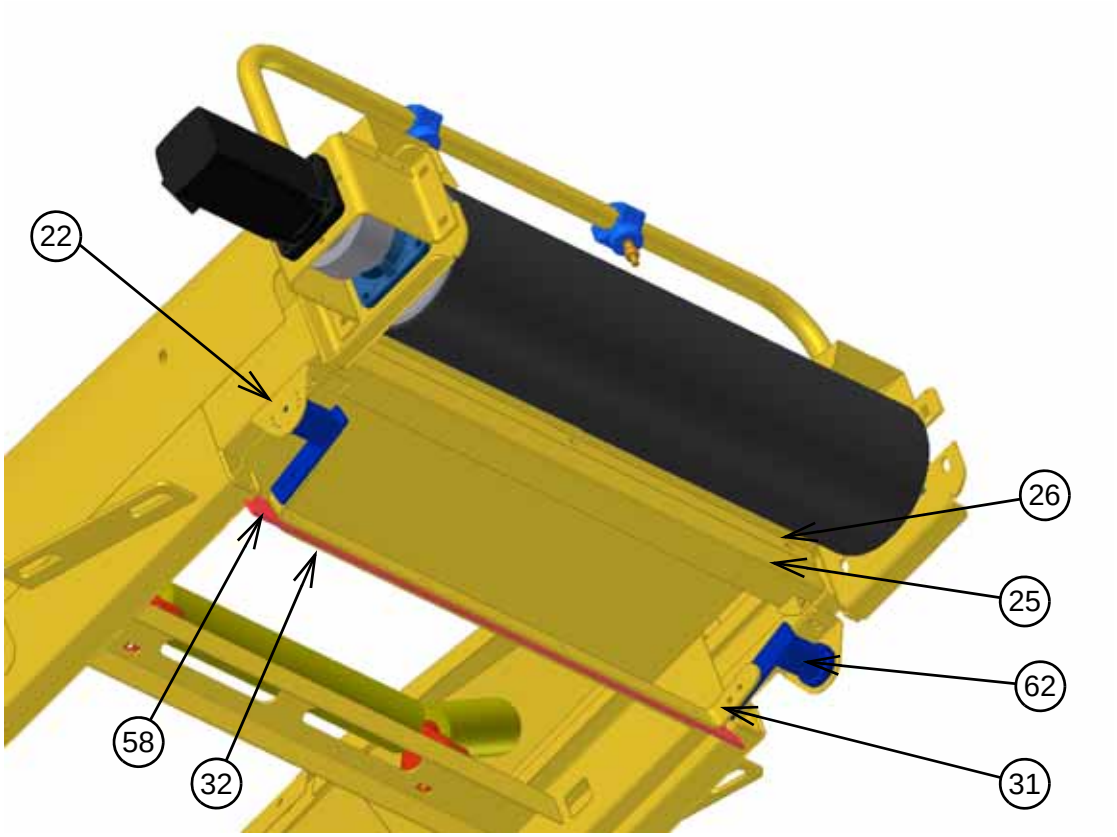
3: VIEW OF REAR ROLLERS



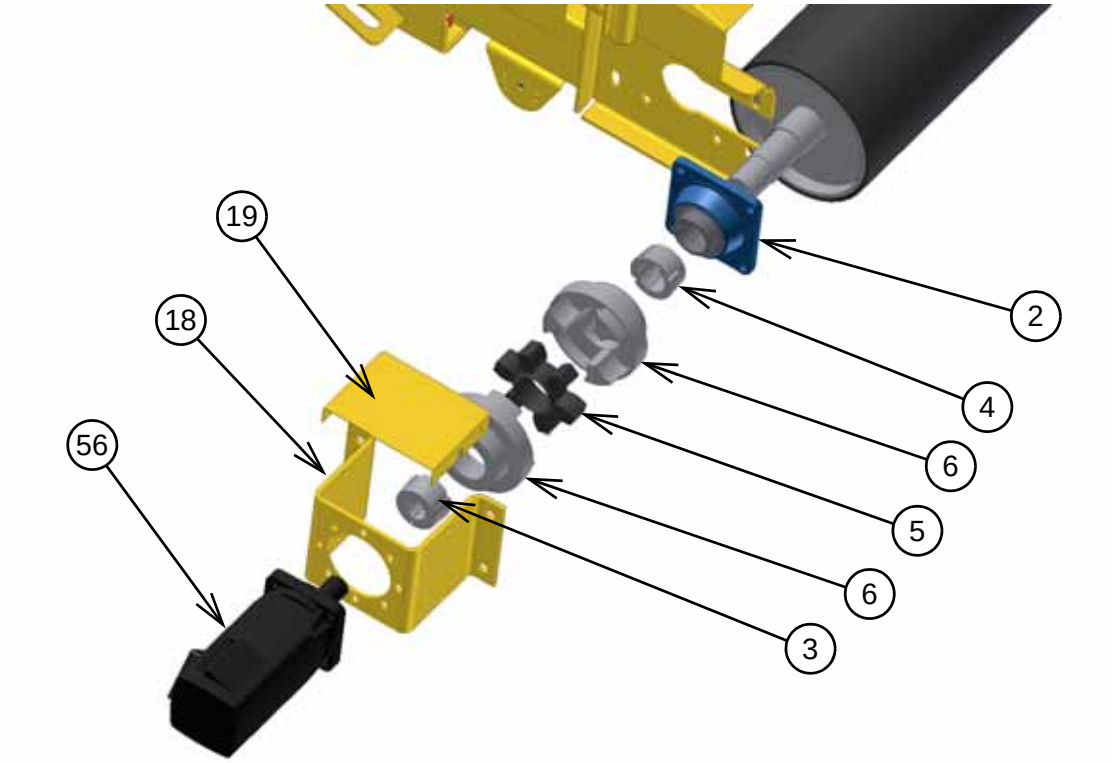
4: VIEW ON MID SECTION



5: MAIN CONVEYOR TOP SECTION



6: VIEW ON HEAD DRUM SCRAPER



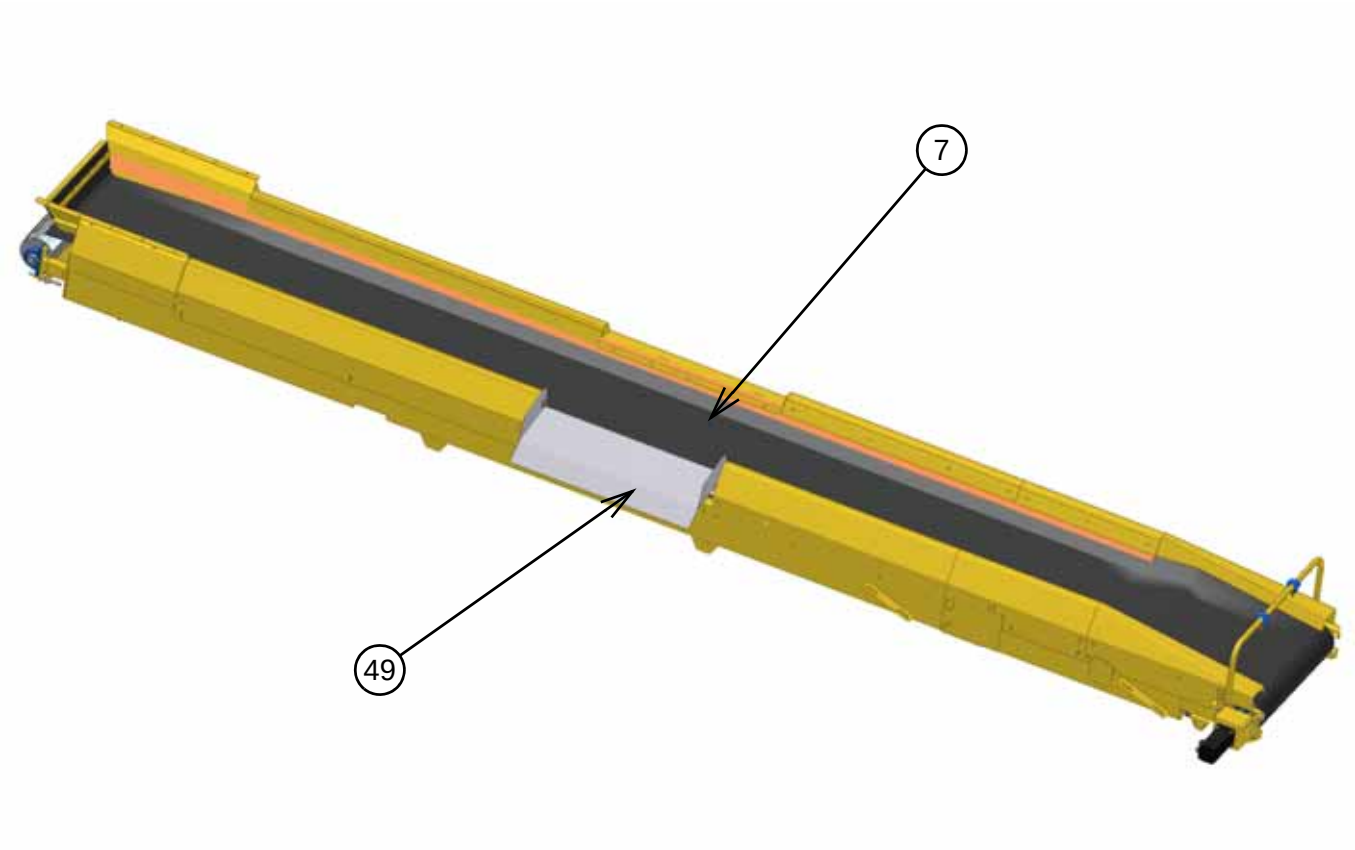
7: DRIVE COUPLING

Part No.	Part Description	Quantity
1. BT1010	BEARING PLUMMER SY60TF	2
2. BT2010	BEARING FLANGE FY60TF	2
3. BT5009	2517/40 TAPER LOCK BUSH	1
4. BT5011	2517/55 TAPER LOCK BUSH	1
5. BT6516	TX180 DRIVE COUPLING INSERT	1
6. BT6517	TX180F DRIVE COUPLING COMPLETE	1
7. CBHD160001000	CONVEYOR BELT	1
8. CR1003	MCON WING ROLLER	12
9. CR1004	30° ROLLER BRACKET	2
10. CR1006	40° ROLLER BRACKET	12
11. CR1017	BED ROLLER	6
12. CR1024	TRACKING ROLLER	4
13. CR1030	MAINCONVEYOR RETURN ROLLER	3
14. CR1042	CRUSHER IMPACT CENTRE ROLLER	2

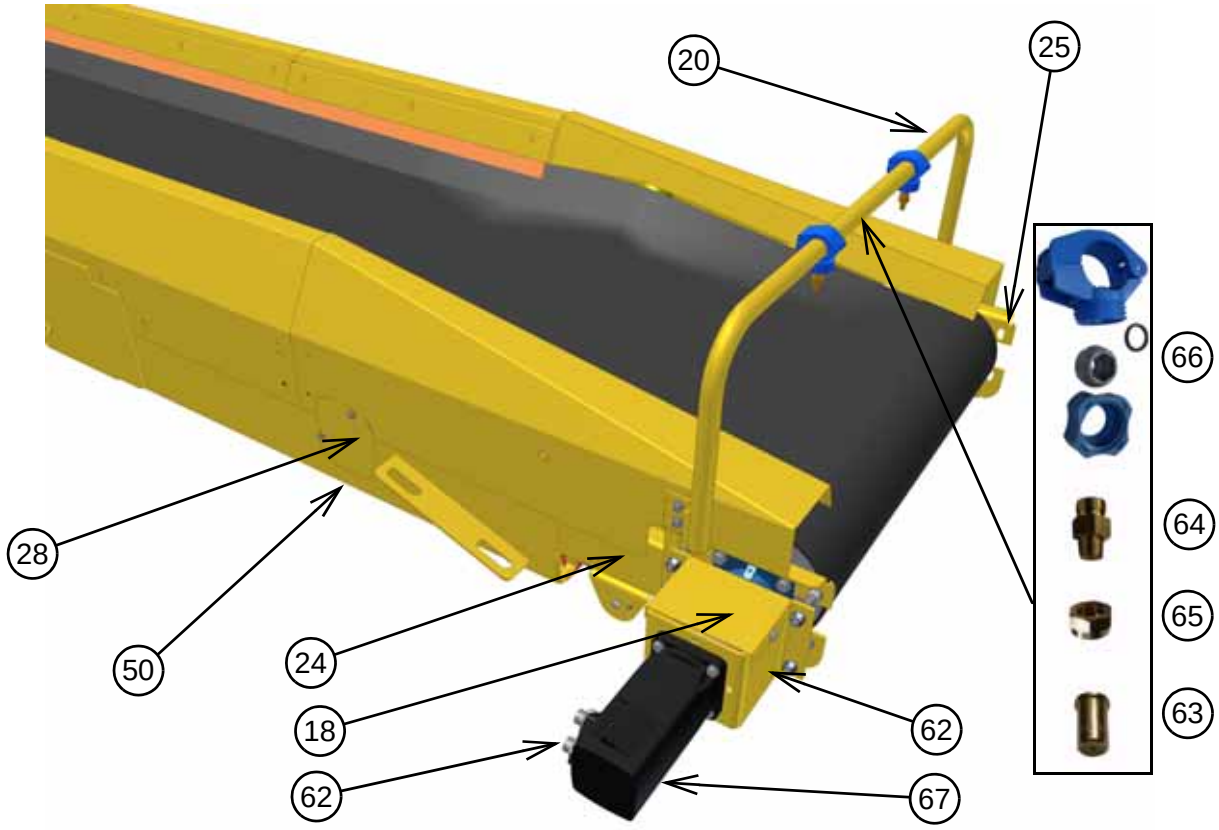
Part No.	Part Description	Quantity
15. CR1043	IMPACT ROLLER	4
16. D0100000	MAIN CONV TAIL DRUM ASSEMBLY	1
17. D0140000	MAIN CONV DRIVE DRUM ASSEMBLY	1
18. D0180000	MC MTR MTG BRKT	1
19. D0190000	MC MTR MTG COVER PLATE	1
20. D1460000	MCONV FEED BOOTCLAMP	2
21. D1790000	SPRAY BAR ASSY	1
22. D4080000	MCONV ROSTA SCRAPER SUPT BRKT	2
23. D5090000	HEAD DRUM MOUNTING FRAME ASSY	1
24. D5100000	HEAD DRUM MOUNTING FRAME ASSY	1
25. D5110000	HEAD DRUM SUPPORT FRAME	1
26. D5120000	NIP GUARD	1
27. D5130000	ACCESS HOLE COVER PLT	2
28. D5230000	HEAD DRUM FLAIR R/H	1
29. D5240000	HEAD DRUM FLAIR L/H	1
30. D5300000	FEED BOOT SUPPORT LEG FRONT	4
31. D5450000	TOP SCRAPER MTG PLT	1
32. D5460000	TOP SCRAPPER CLAMP PLT	1
33. D5490000	MEGABITE WING BAR MOUNTING PLA	2
34. D6650000	FLATE	1
35. D6660000	CLAMP	1
36. D6770000	TAIL DRUM BEARING SUPPORT OUTE	1
37. D6780000	TAIL DRUM BEARING SUPPORT	1
38. D6790000	BRG SUPPORT SLIDE TAIL DRUM	2
39. D6800000	SCRAPER PLATE ASSY	1
40. D6810000	RETURN ROLLER GUARD (AS REQUIR	2
41. D6890000	CONVEYOR MAGNET BASE	2
42. D6900000	CONVEYOR WING BAR	2
43. D8350000	FRAME	1
44. D8380000	FEED BOOT ASSY	1
45. D8390000	FEED BOOT RUBBER CLAMP	1
46. D8400000	FEED BOOT RUBBER CLAMP	1
47. D8410000	FEED BOOT GUARD L/H	1

Part No.	Part Description	Quantity
48. D8420000	MC FEED BOOT GD L/H	1
49. D8430000	ALUMINIUM CHUTE	1
50. D11810000	CONVEYOR FLARE	1
51. D11820000	CLAMP PLATE	1
52. HA99000010	DXF1235T1 30° FULL CONE TIP	2
53. HA99000011	ZLA2358T1 ¼ X 3/8" THREADED	2
54. HA99000012	VAA0038T1 3/8" BRASS RETAINING	2
55. HA99000013	ZPF0125D6 1½" CLAMP C/W VAB	2
56. HM1016	MOTOR CHARLYNN 6K490 AAA 006	1
57. PN1033	ADJUSTER BOLT M24 X 485	2
58. PY1004	POLYURETHANE SCRAPER 1210*80*8	2
59. RU1027	SUPER RED RUBBER 10MM X 110MM	2
60. RU1080	FEED BOOT INNER RUBBER	1
61. RU1081	FEED BOOT OUTER RUBBER	1
62. RU5501	SE27 TENSIONING ELEMENT	2

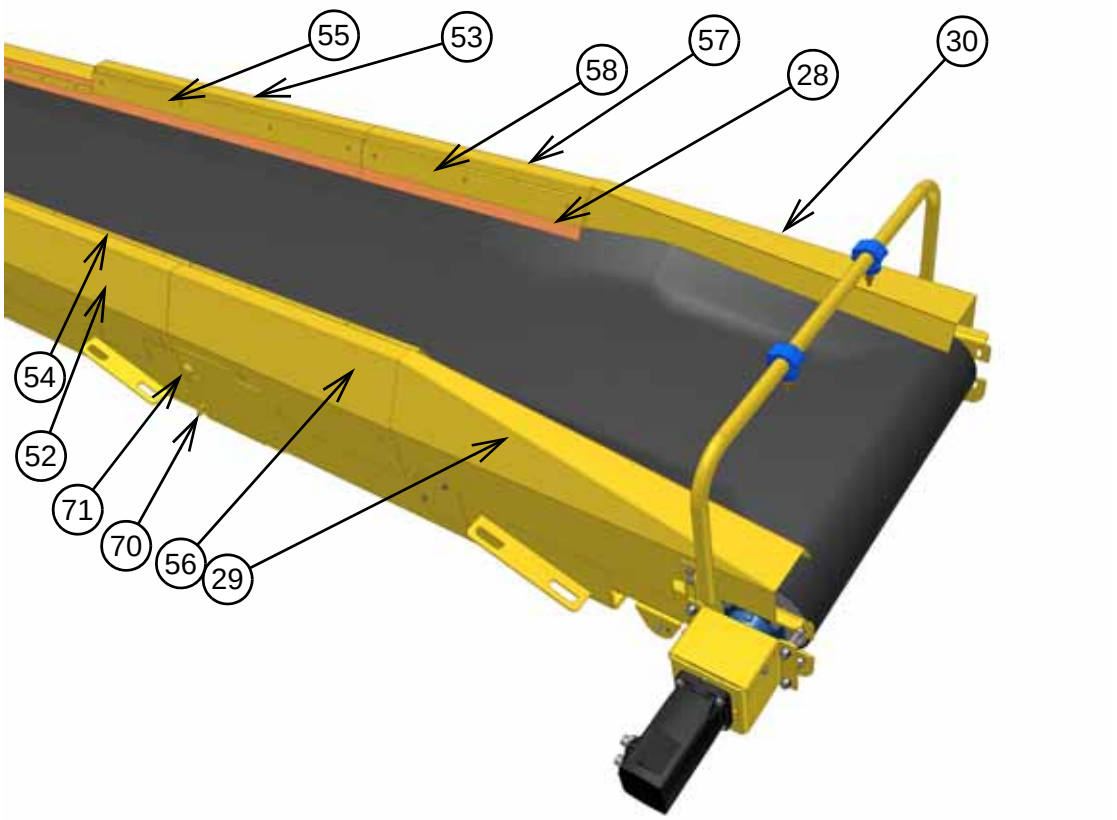
AA.14 .Extended Main Conveyor (Where fitted)



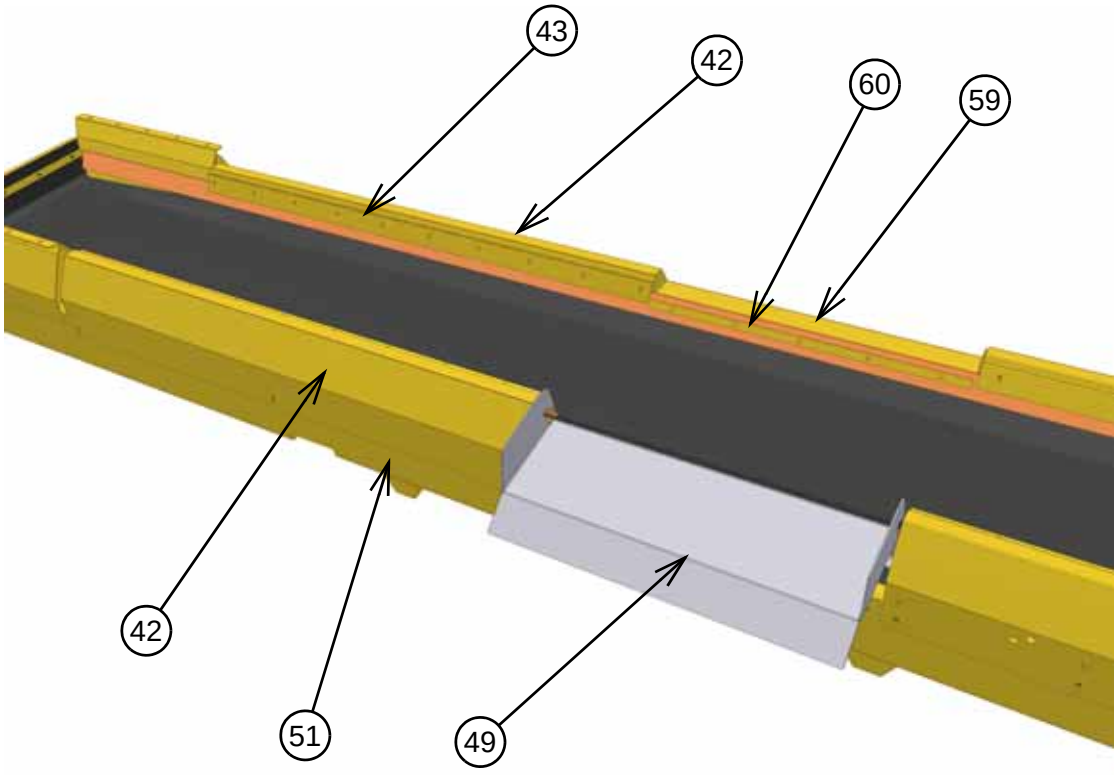
1: EXTENDED MAIN CONVEYOR ASSEMBLY



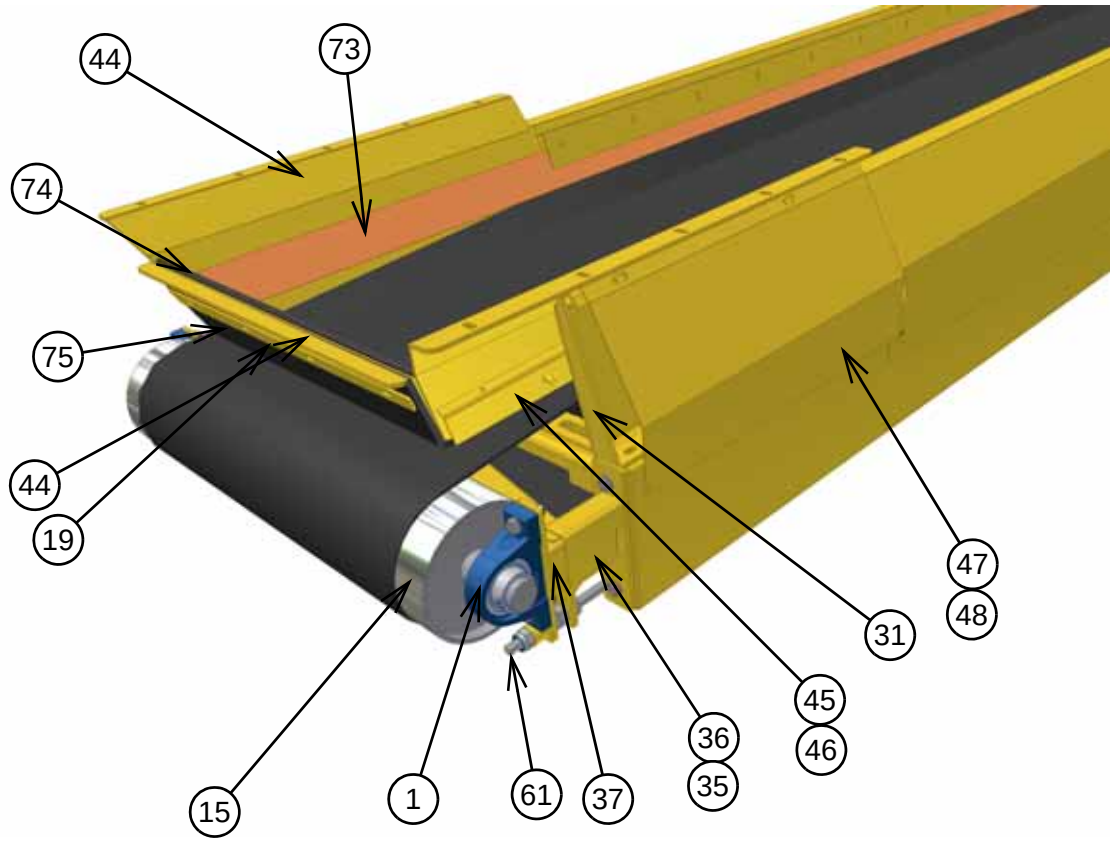
2: VIEW ON CONVEYOR HEAD DRUM



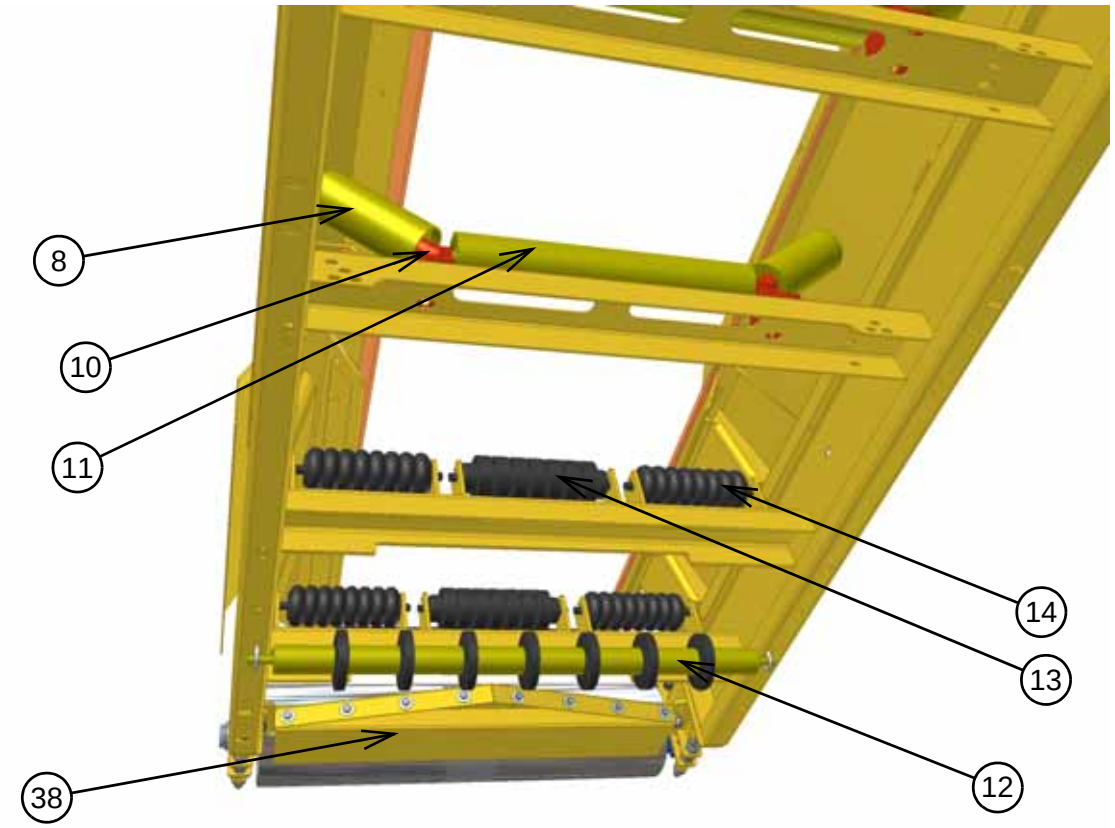
3: VIEW ON CONVEYOR TOP SECTION



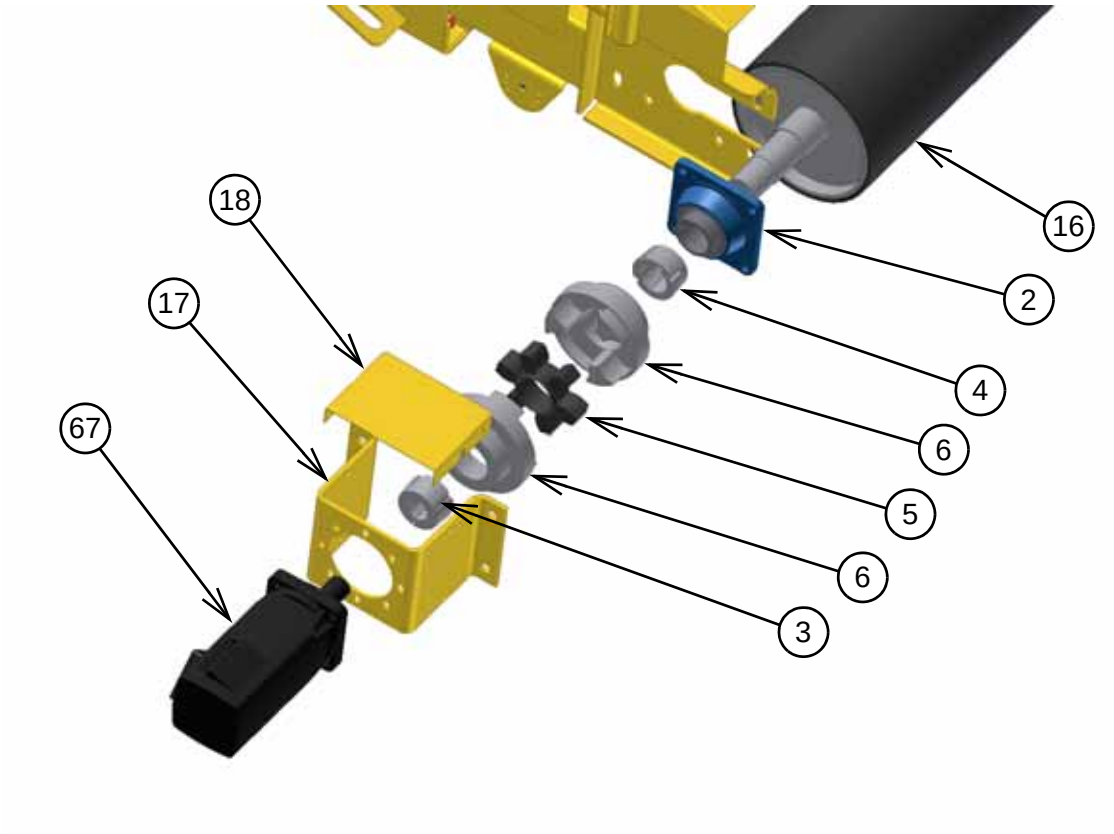
4: VIEW ON MIDDLE SECTION



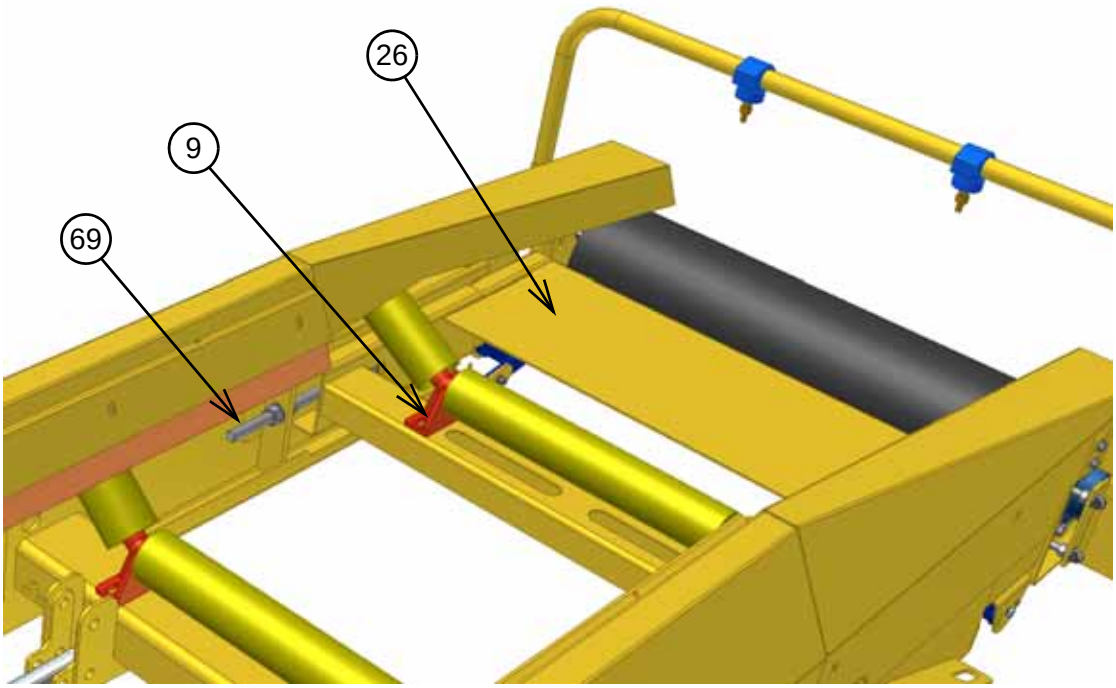
5: VIEW ON TAIL DRUM



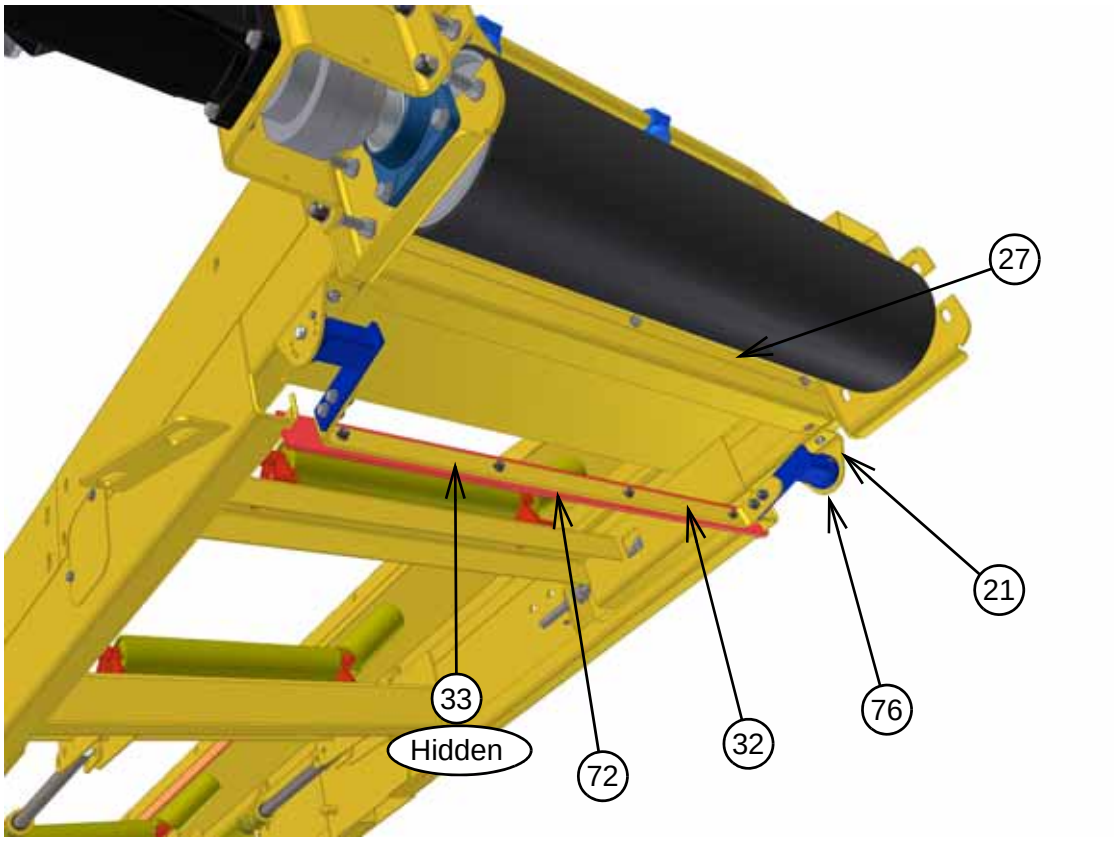
6: VIEW UNDERNEATH CONVEYOR



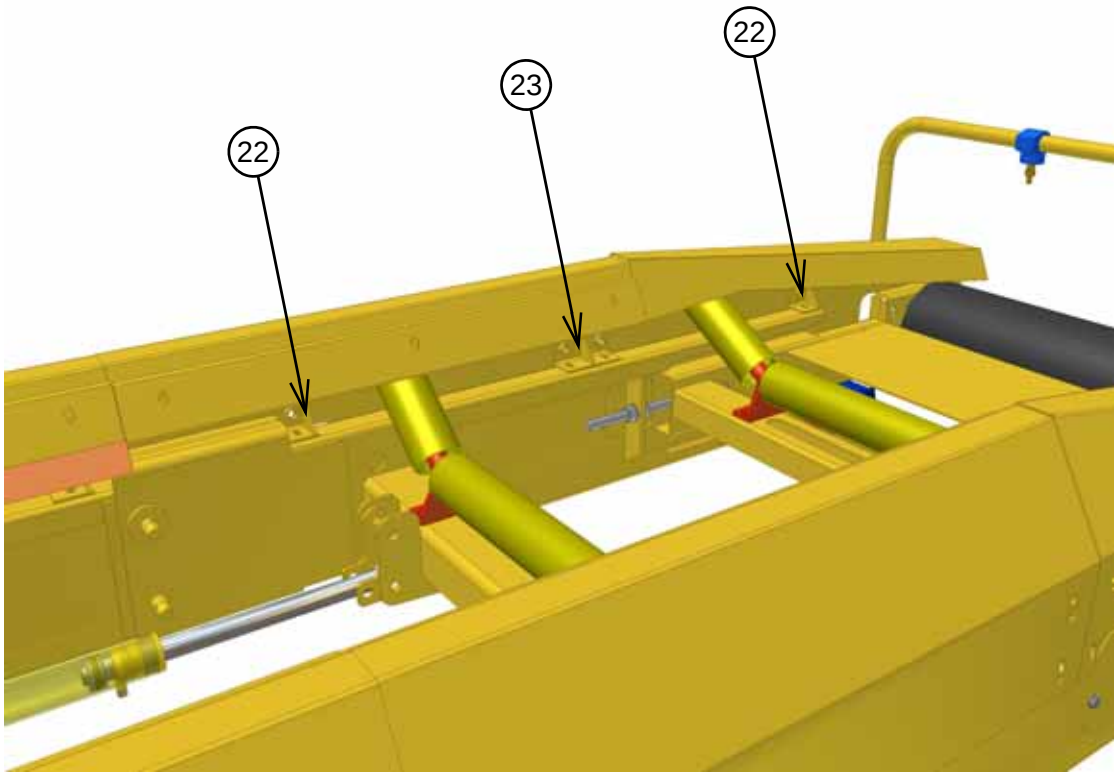
7: VIEW ON DRIVE COUPLING



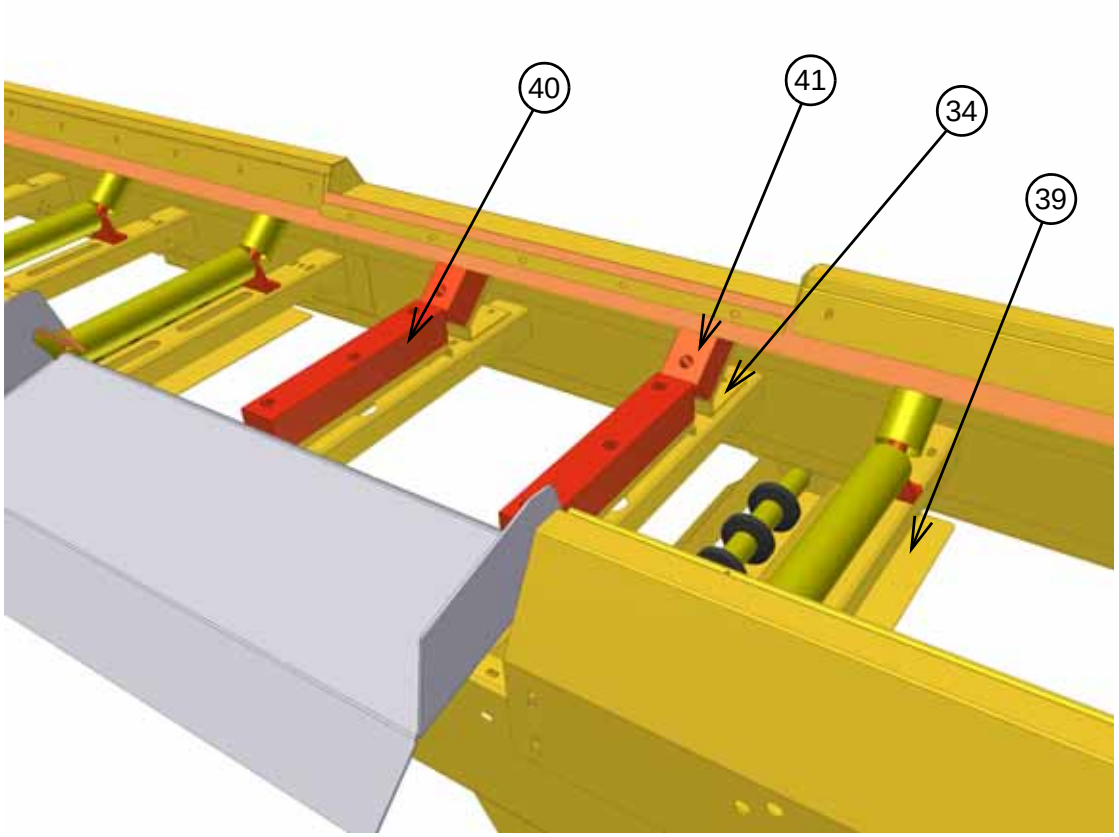
8: VIEW ON TOP SECTION



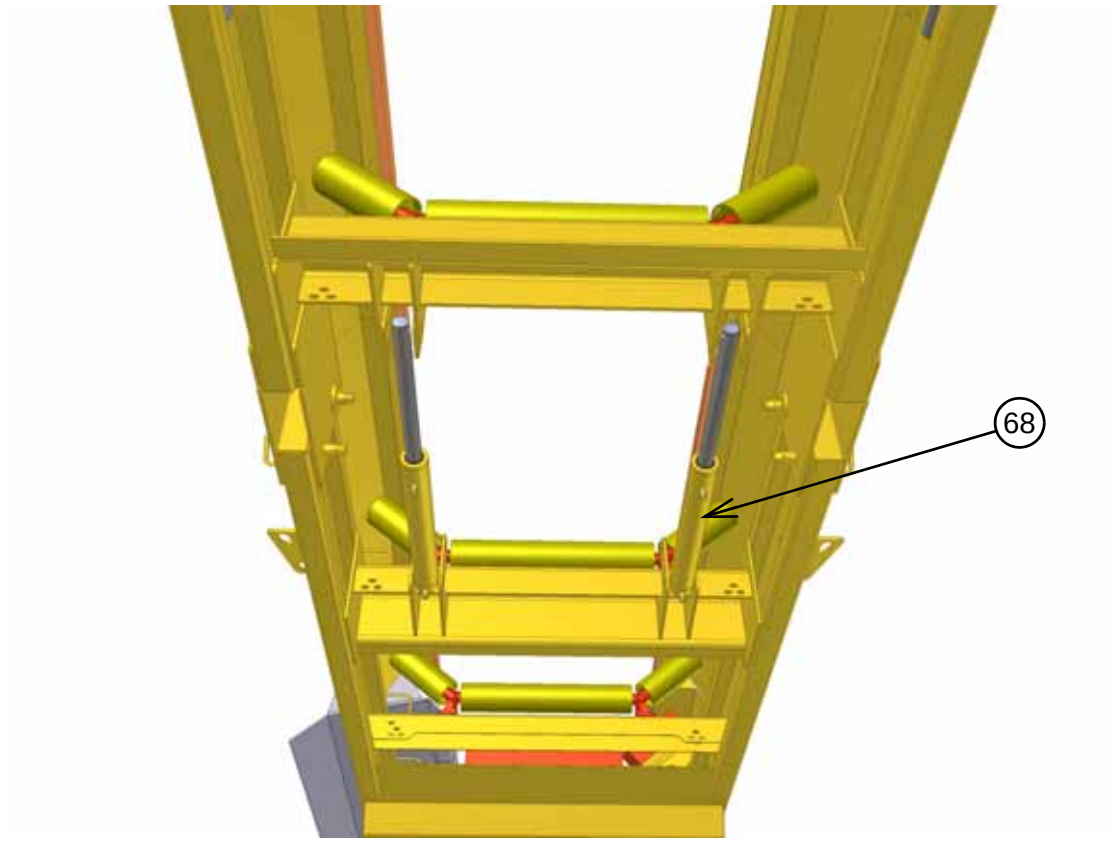
9: ROSTA SCRAPER



10: FLAIR MOUNTING BRACKETS



11: IMPACT BLOCKS



12:

Part No.	Part Description	Quantity
1. BT1010	BEARING PLUMMER SY60TR	2
2. BT2010	FLANGE BEARING	2
3. BT5009	TAPER LOCK BUSH	1
4. BT5011	TAPER LOCK BUSH	1
5. BT6516	DRIVE COUPLING INSERT	1
6. BT6517	DRIVE COUPLING	2
7. CBHD200001000	CONVEYOR BELT- IC13 EXTENDED	1
8. CR1003	WING ROLLER (Ø102 x 254mm)	6
9. CR1004	30° ROLLER BRACKET	2
10. CR1006	40° TROUGH ROLLER BRACKET	4
11. CR1017	CENTRE ROLLER (Ø102 x 617mm)	3
12. CR1030	MAIN CONV RETURN ROLLER	1
13. CR1042	CENTRE IMPACT ROLLER (Ø102 x 340mm)	2
14. CR1043	OUTER IMPACT ROLLER (Ø102 x 272mm)	4
15. D0100000	1000 WIDE TAIL DRUM	1
16. D0140000	HEAD DRUM	1
17. D0180000	MOTOR MTG BRACKET	1
18. D0190000	MOTOR MTG BRACKET TOP	1
19. D1460000	FEED BOOT REAR RUBBER CLAMP	2
20. D1790000	SPRAY BAR	1
21. D4080000	ROSTA SCRAPER BRACKET	2
22. D4910000	SINGLE FLAIR MOUNTING BRACKET	16
23. D4920000	DOUBLE FLAIR MOUNTING BRACKET	4
24. D5090000	HEAD DRUM RH MOUNTING ARM	1
25. D5100000	HEAD DRUM RH MOUNTING ARM	1
26. D5110000	HEAD DRUM SUPPORT FRAME	1
27. D5120000	NIP GUARD	1
28. D5130000	ADJUSTER BOLT COVER PLATE	2
29. D5230000	HEAD DRUM RH FLAIR PANEL	1
30. D5240000	HEAD DRUM LH FLAIR PANEL	1
31. D5300000	FEED BOOT FRONT SUPPORT LEG	4
32. D5450000	HEA D DRUM SCRAPER	1

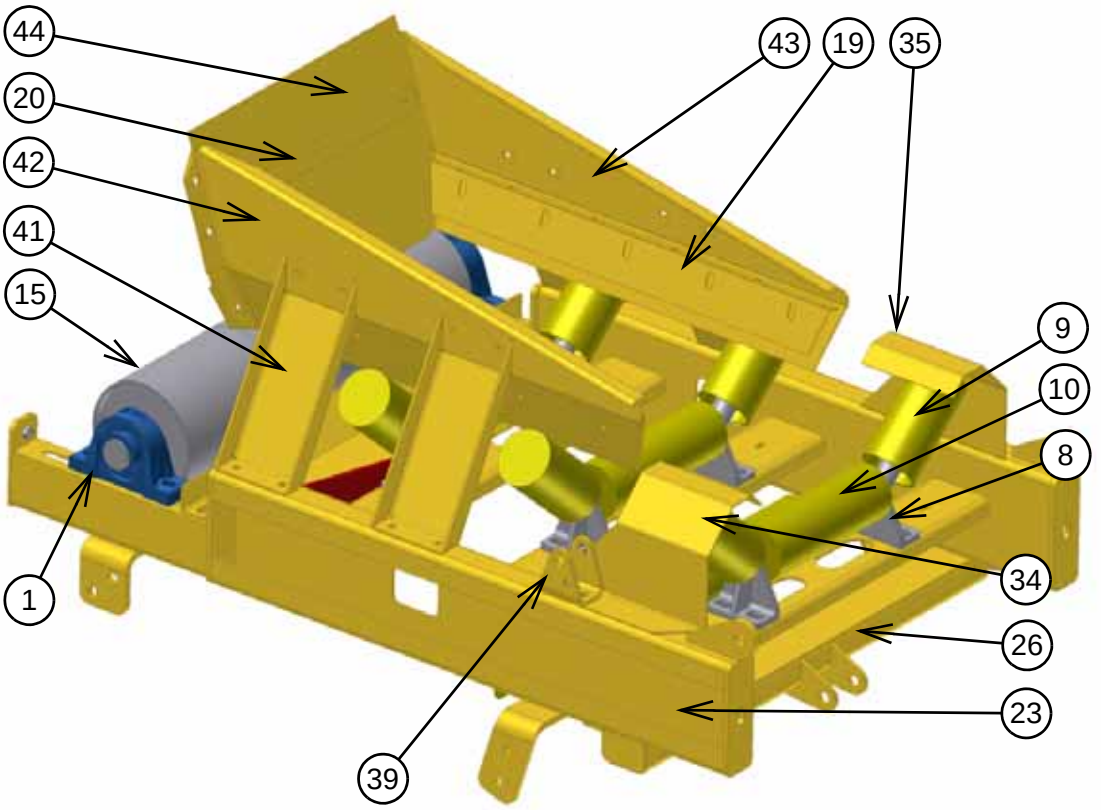
Part No.	Part Description	Quantity
33. D5460000	SCRAPER CLAMP PLT	1
34. D5490000	IMPACT BLOCK MOUNTING BRACKET	2
35. D6770000	TAIL DRUM LH MOUNTING BRACKET	1
36. D6780000	TAIL DRUM LH MOUNTING BRACKET	1
37. D6790000	TAIL DRUM SUPPORT ARM	2
38. D6800000	PLOUGH SCRAPER ASSEMBLY	1
39. D6810000	RETURN ROLLER GUARD	2
40. D6890000	LARGE IMPACT BLOCK	2
41. D6900000	SMALL IMPACT BLOCK	2
42. D8360000	SIDE PANEL	2
43. D8370000	RUBBER CLAMP	2
44. D8380000	FEED BOOT	1
45. D8390000	FEED BOOT CLAMP	1
46. D8400000	FEED BOOT CLAMP	1
47. D8410000	FEED BOOT R/H SIDE GAURD	1
48. D8420000	FEED BOOT L/H SIDE GAURD	1
49. D8430000	ALIMINIUM DISCHARGE CHUTE	1
50. D10150000	EXTENDED MAIN CONVEYOR TOP FRAME	1
51. D10200000	EXT PRIMARY IMPACTOR CONVEYOR FRAME	1
52. D11700000	SIDE FLAIR	1
53. D11710000	SIDE FLAIR	1
54. D11720000	SIDE FLAIR RUBBER CLAMP	1
55. D11730000	SIDE FLAIR RUBBER CLAMP	1
56. D11740000	SIDE FLAIR	1
57. D11750000	SIDE FLAIR	1
58. D11760000	SIDE FLAIR CLAMP	2
59. D11810000	MAGNET SIDE FLAIR	1
60. D11820000	MAGNET SIDE FLAIR CLAMP	1
61. FATB20X250	BEARING ADJUSTER	2
62. HA03400030	3/4" - 1" BSP MALE/MALE ADAPTOR	2
63. HA99000010	WATER NOZZLE	2
64. HA99000011	SPRAY NOZZLE NIPPLE	2
65. HA99000012	RETAINING CAP	2

Part No.	Part Description	Quantity
66. HA99000013	SPRAY NOZZLE HOUSING	2
67. HM1016	HYDRAULIC MOTOR	1
68. HR1058	HYDRAULIC RAM	2
69. PN1033	HEAD DRUM ADJUSTER BOLT	2
70. PN1170	EXTENDED CONVEYOR LOCK OUT PIN	2
71. PN1174	EXTENDED CONVEYOR PIVOT PIN	2
72. PY1004	POLY SCRAPER 1210 X 80 X 8	1
73. RU1027	SUPER RED RUBBER	1
74. RU1080	FEED BOOT REAR RUBBER	1
75. RU1081	FEED BOOT REAR RUBBER	1
76. RU5501	ROSTA SUPPORT	2

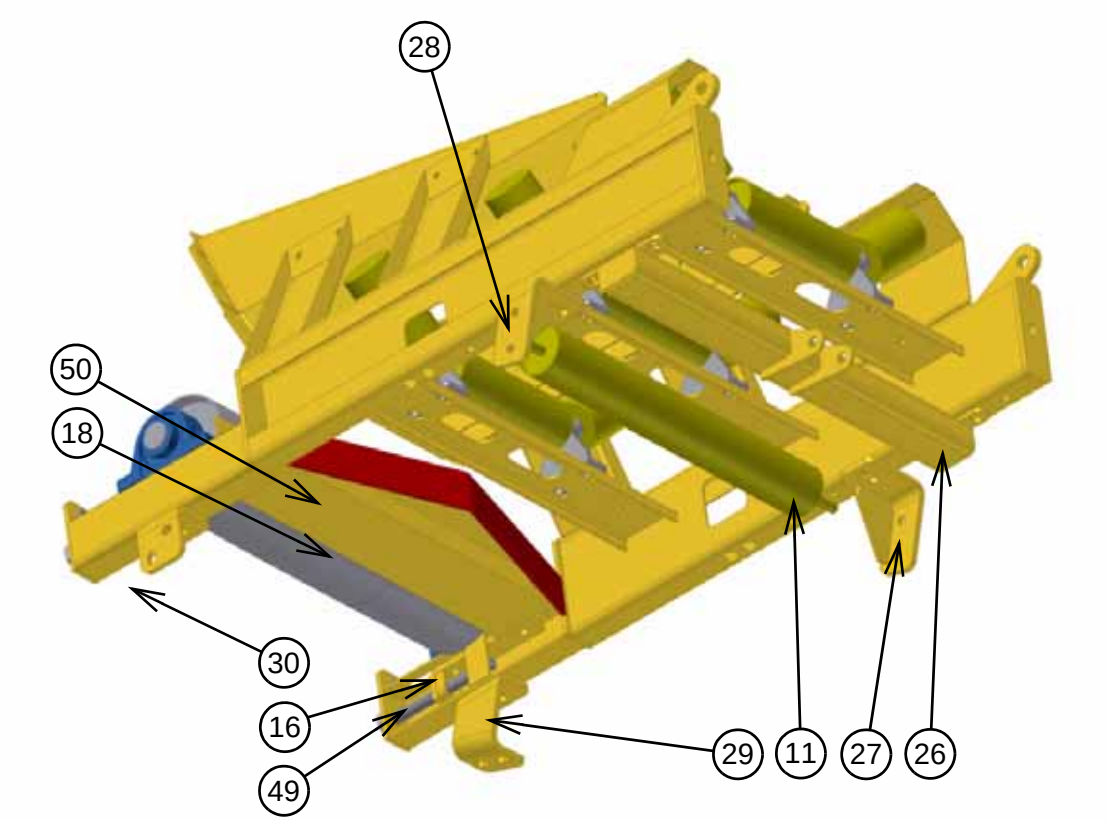
AA.15 Side Conveyor



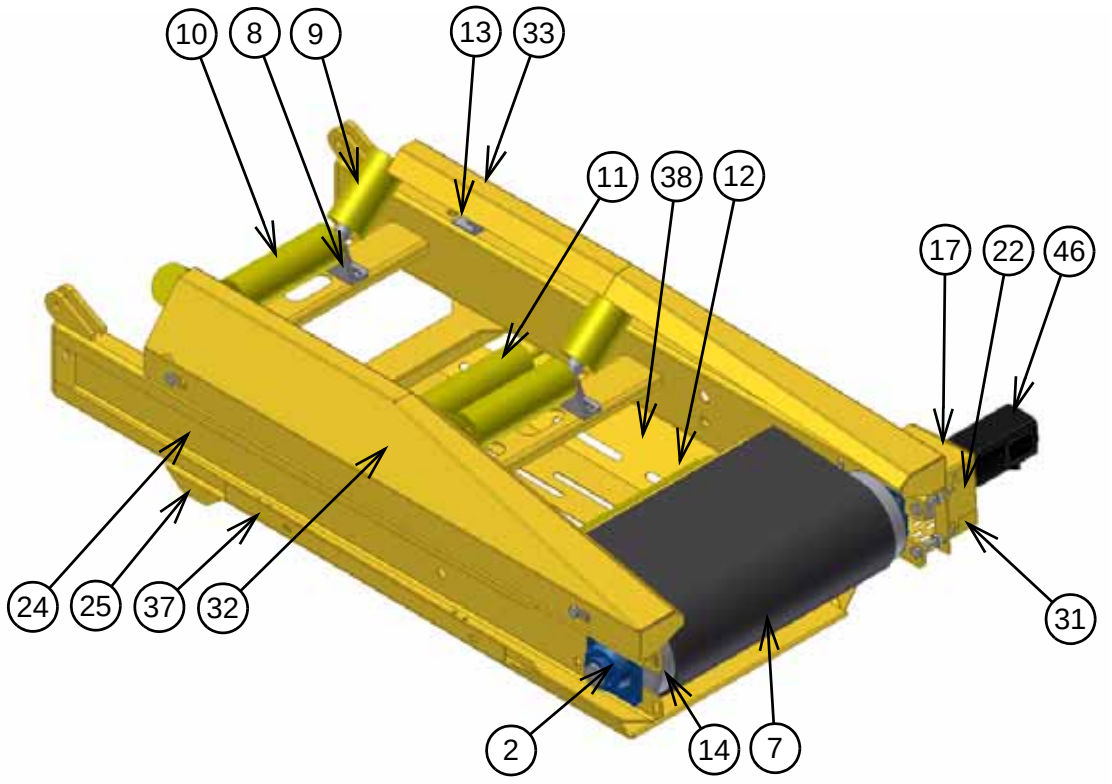
1: VIEW OF SIDE CONVEYOR



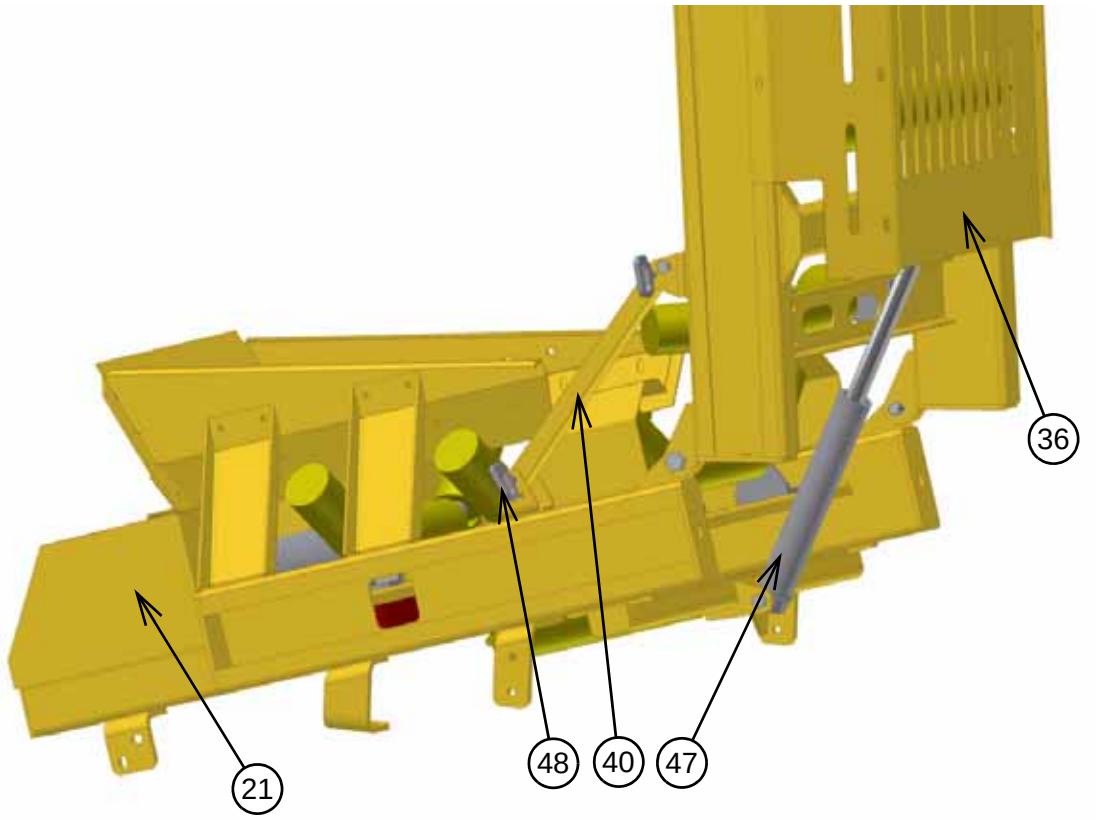
2: SIDE CONVEYOR BOTTOM SECTION



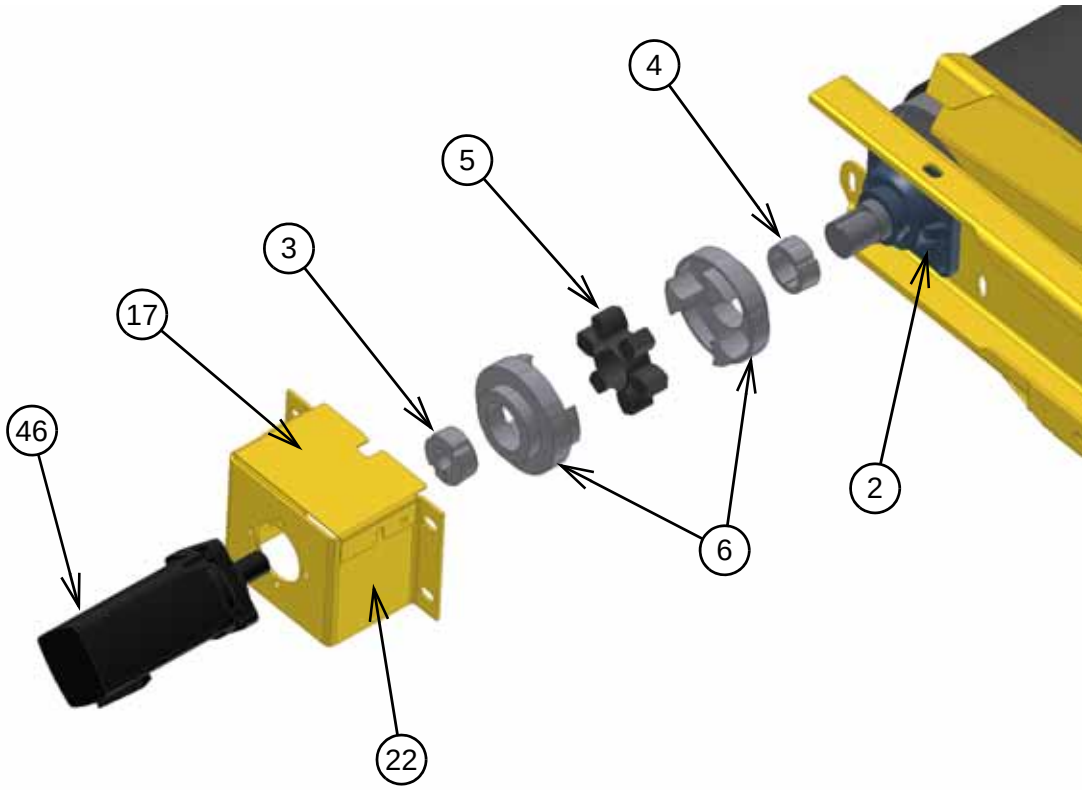
3: SIDE CONVEYOR BOTTOM SECTION



4: SIDE CONVEYOR TOP SECTION



5: CONVEYOR IN TRANSPORT POSITION

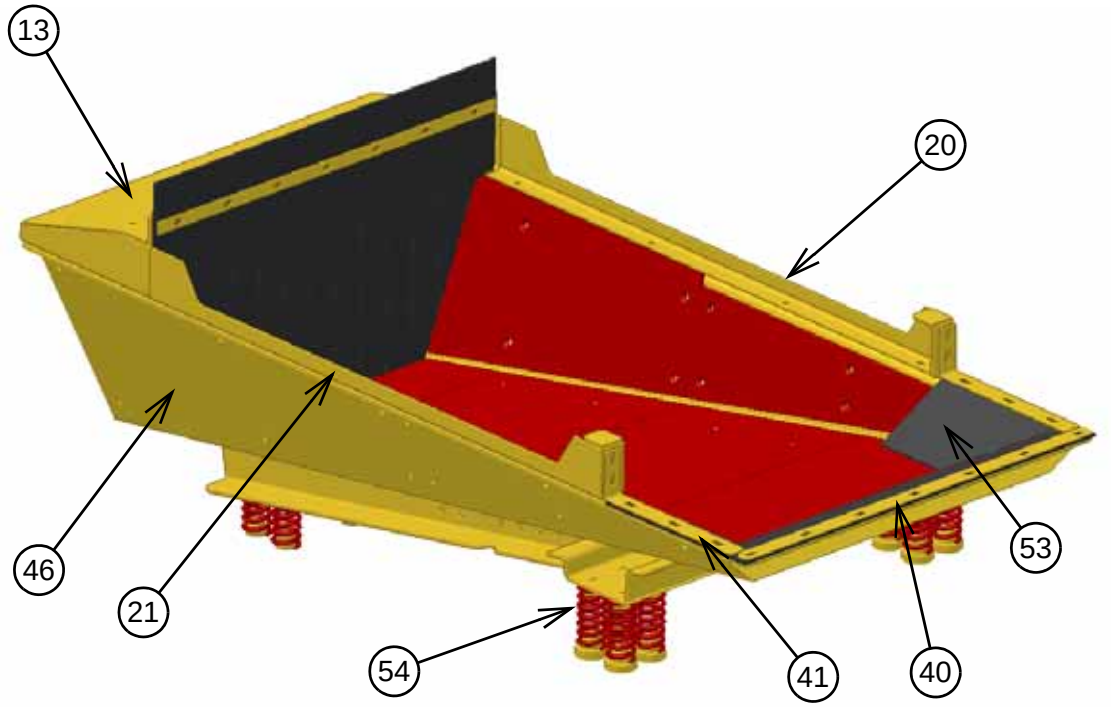


6: DRIVE COUPLING

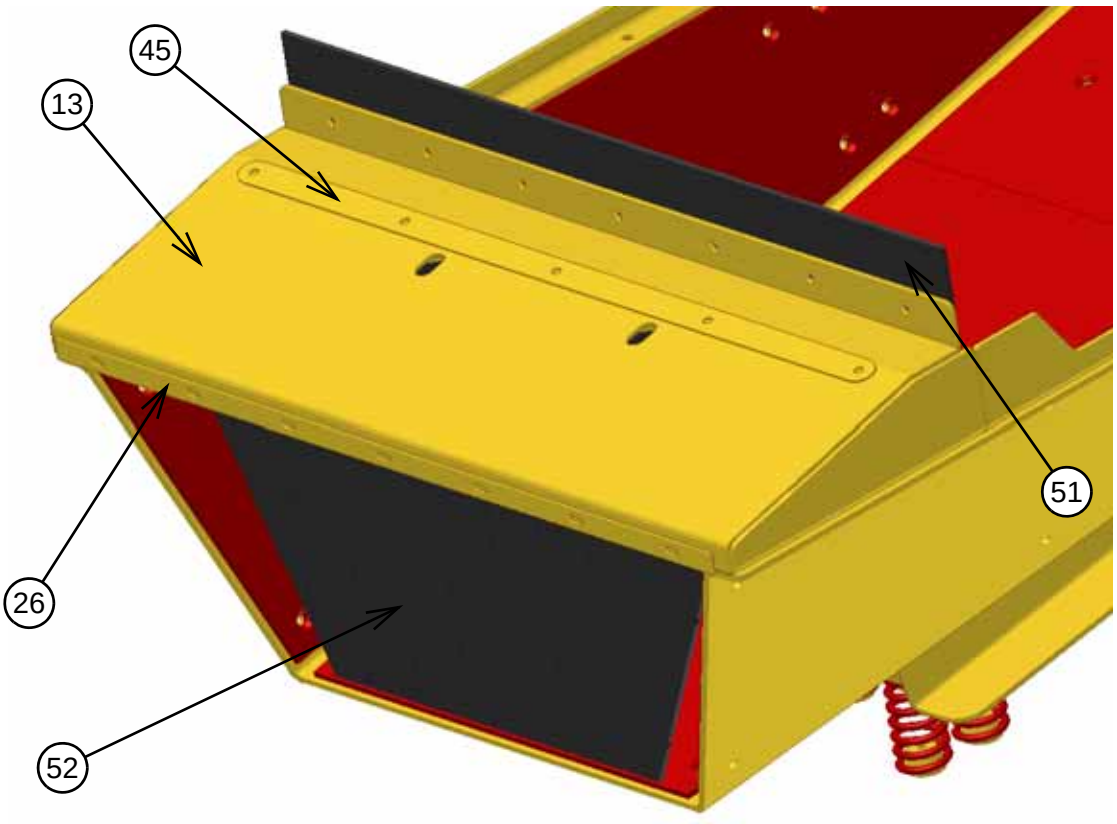
Part No.	Part Description	Quantity
1. BT1009	PLUMBER BLOCK BEARING	2
2. BT2009	FLANGE BEARING	2
3. BT5005	TAPER LOCK	1
4. BT5006	TAPER LOCK	1
5. BT6514	DRIVE COUPLING INSERT	1
6. BT6515	DRIVE COUPLING INCLUDES 3, 4, 5	1
7. CB69250700CH	ENDLESS CHEVRON BELT	1
8. CR1006	40° ROLLER BRACKET	2
9. CR1013	SIDE WING ROLLER	8
10. CR1016	CENTRE ROLLER	4
11. CR1028	RETURN ROLLER	2
12. CR1031	SLAPPER ROLLER	1
13. D4910000	MOUNTING BRACKET	3
14. E0070000	DRIVE DRUM	1
15. E0080000	END DRUM	1
16. E0150000	BEARING SLIDER	2
17. E0240000	MOUNTING BRACKET COVER	1
18. E1030000	TAIL DRUM SCRAPER	1
19. E1070000	FEED BOOT CLAMP	2
20. E1090000	FEED BOOT CLAMP	1
21. E1130000	END DRUM GUARD	1
22. E1440000	MOTOR MOUNTING	1
23. E1500000	SIDE CONVEYOR BOTTOM SECTION	1
24. E1510000	SIDE CONVEYOR TOP SECTION	1
25. E1520000	FOLD RAM - TOP MOUNTING BRACKET	1
26. E1530000	FOLD RAM - BOTTOM MOUNTING BRACKET	1
27. E1540000	MOUNTING BRACKET	1
28. E1550000	MOUNTING BRACKET	1
29. E1560000	MOUNTING BRACKET	1
30. E1570000	MOUNTING BRACKET	1
31. E1860000	MOUNTING BRACKET COVER	1
32. E1890000	CONVEYOR FLARE	1

Part No.	Part Description	Quantity
33. E1900000	CONVEYOR FLARE	1
34. E1920000	NIP GUARD	1
35. E1930000	NIP GUARD	1
36. E1940000	LOWER BOTTOM GUARD	1
37. E1950000	LOWER SIDE GUARD	1
38. E1960000	LOWER SIDE GUEARD	1
39. E2020000	TRANSPORT LINK ARM BRACKET	2
40. E2030000	TRANSPORT LINK ARM	1
41. E2100000	FEED BOOT LEG	4
42. E2110000	FEED BOOT SIDE	1
43. E2120000	FEED BOOT SIDE	1
44. E2140000	FEED BOOT BACK	1
45. E2910000	PIPE CLAMP	1
46. HM1006	HYDRAULIC MOTOR	1
47. HR1021	HYDRAULIC RAM	1
48. PN1019	TRANSPORT PIN	2
49. PN1076	TENSIONING BOLT	2
50. PY1008	POLYSCRAPER	1

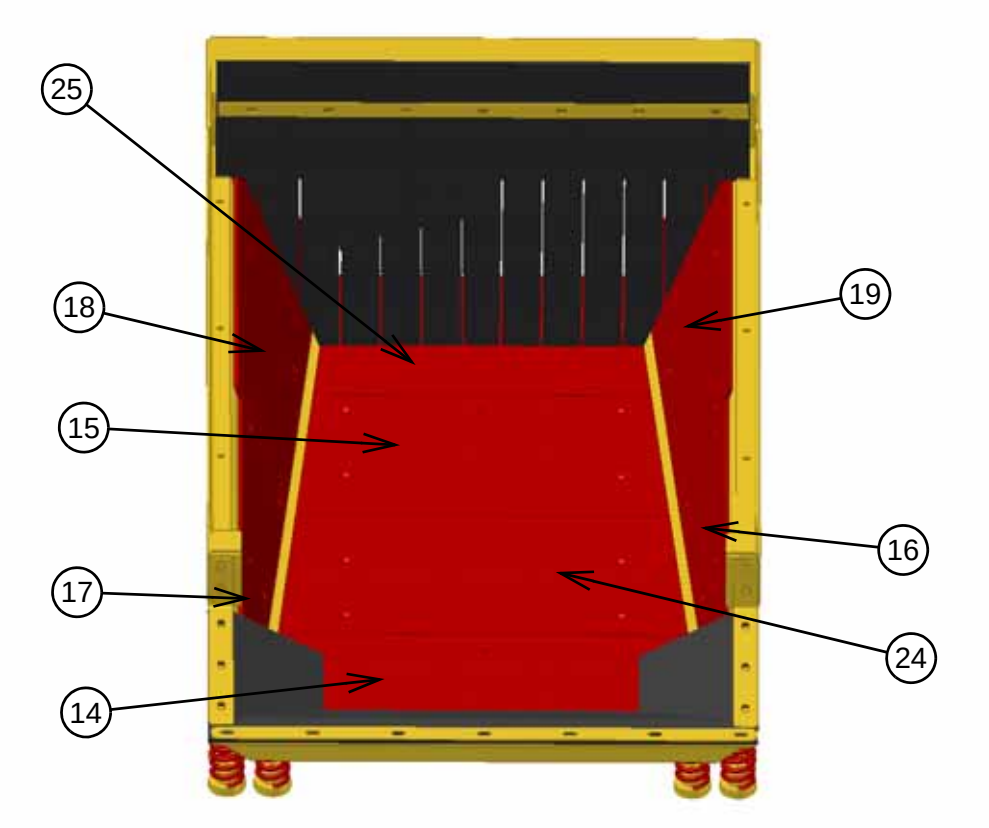
AA.16 Feeder Pan



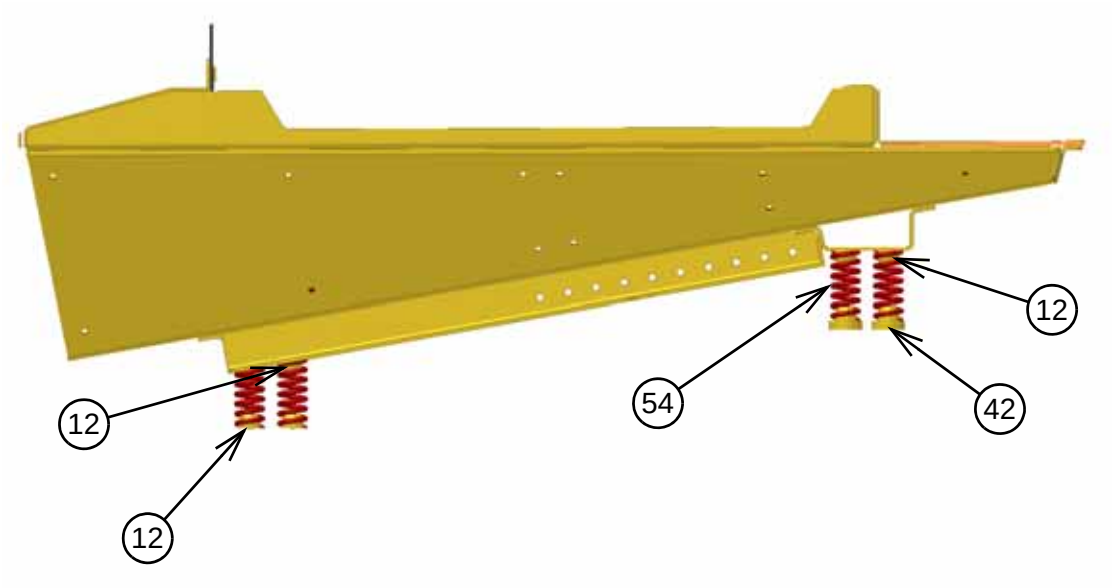
1: VIEW OF FEEDER PAN



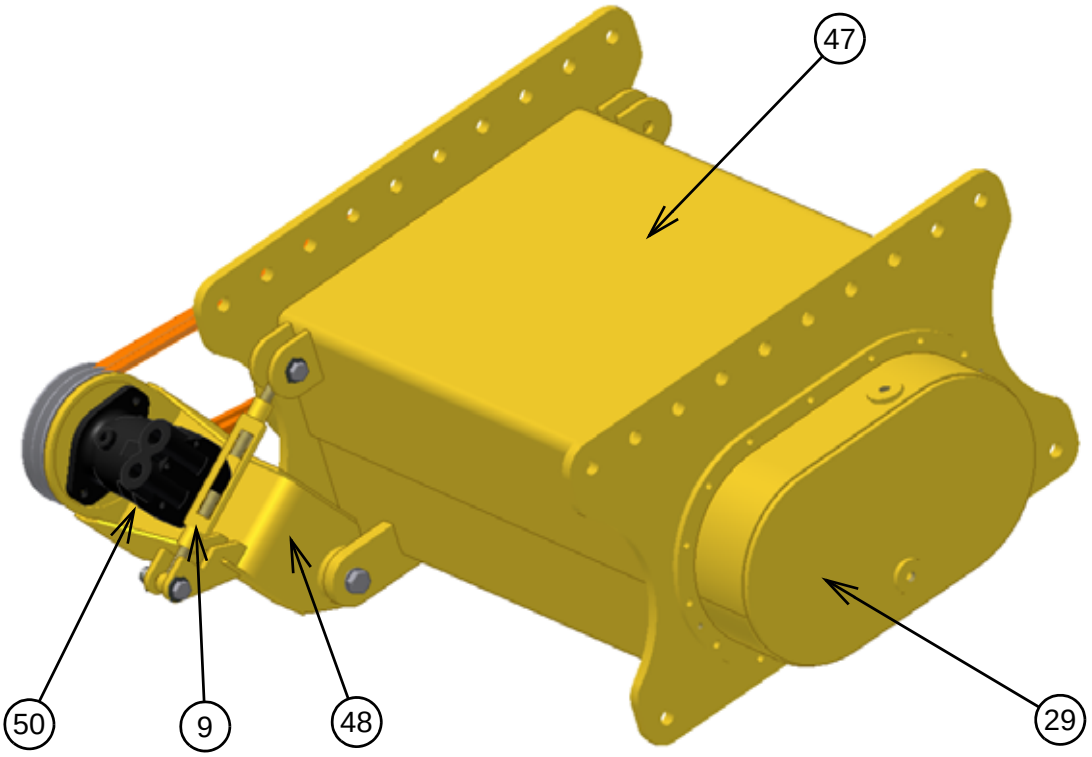
2: FRONT OF FEEDER PAN



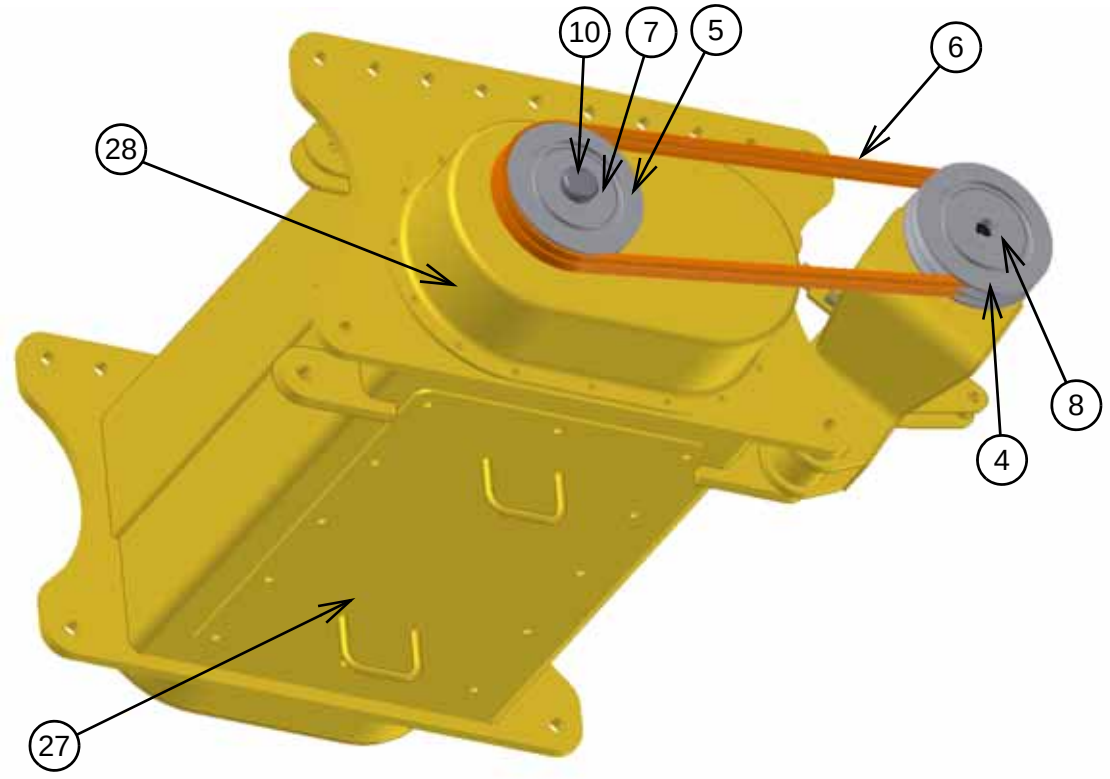
3: FEEDER PAN WEARPLATES



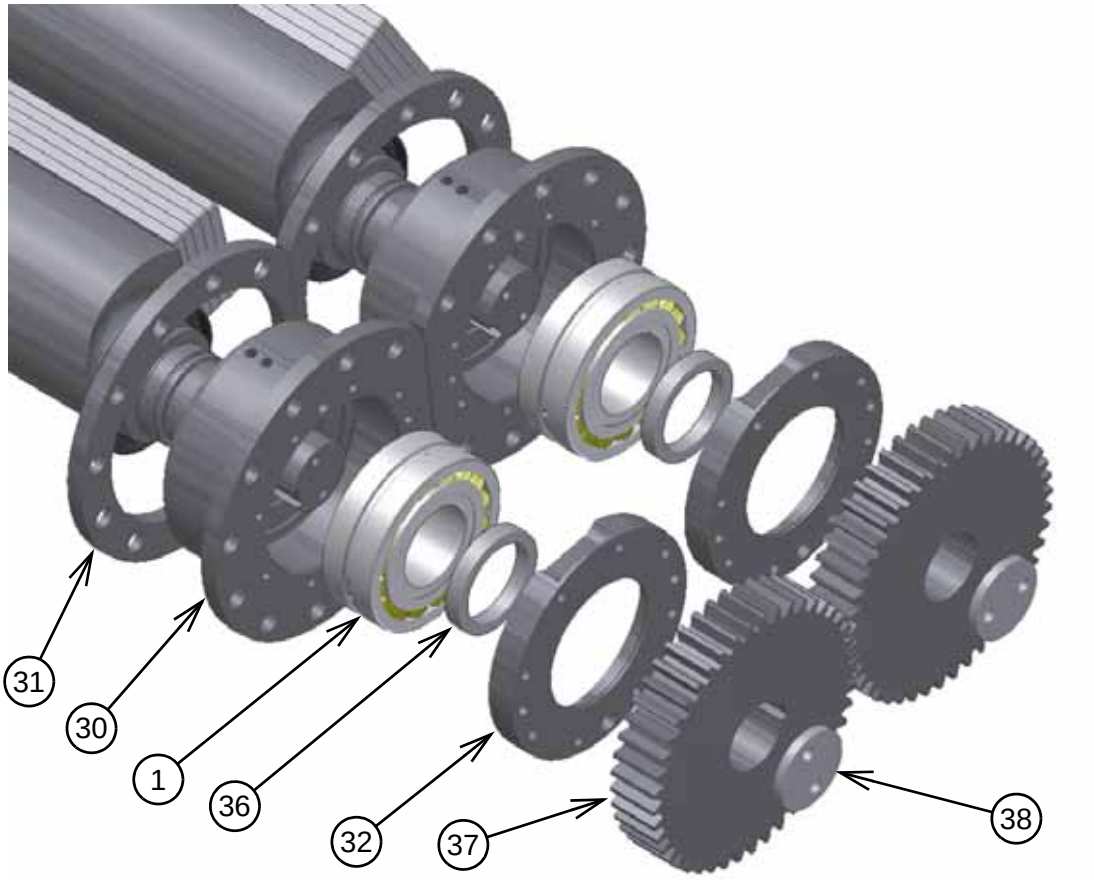
4: VIEW ON FEEDER SUPPORT SPRINGS



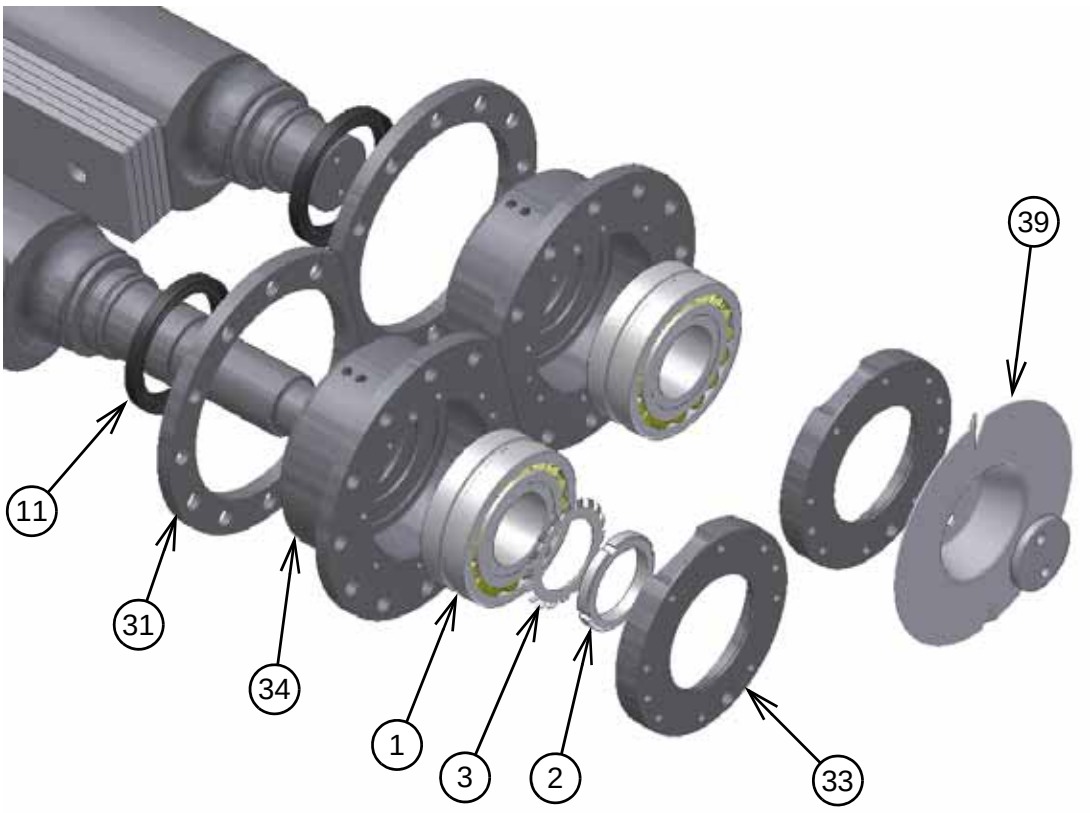
5: VIEW ON DRIVE MOTOR



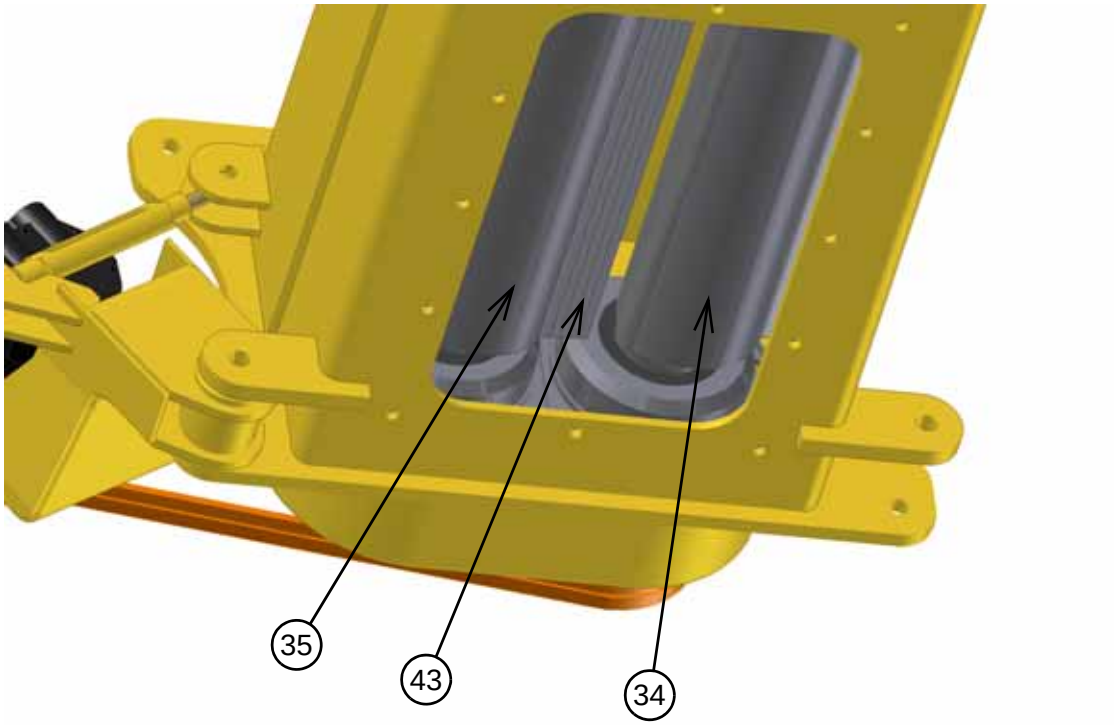
6: VIEW ON BELT ARRANGEMENT



7: VIEW ON NON-DRIVE END BEARING



8: VIEW ON DRIVE END BEARING



9: VIEW ON DRIVE SHAFTS

Part No.	Part Description	Quantity
1. BT3017	22314E SPHERICAL BEARING	4
2. BT3512	KM14 LOCK NUT	1
3. BT3513	MB14 TAB WASHER	1
4. BT4003	160 X 2SPB PULLEY	1
5. BT4007	200 X 2SPB PULLEY	1
6. BT4510	SPB1800 V.BELT	2
7. BT5010	2517/50 TAPER LOCK BUSH	1
8. BT5020	2012/1 1/8 TAPER LOCK BUSH	"1
9. BT6541	TURNBUCKLE	1
10. BT8010	90*60*10 R23 DOUBLE LIP SEAL	1
11. BT8011	130*100*12 R23 DOUBLE LIP SEAL	4
12. G3980000	SPRING SUPPORT	12
13. H7040000	TOP CROSS MEMBER	1
14. H7050000	REAR BASE WEAR	1

Part No.	Part Description	Quantity
15. H7060000	FRONT BASE WEAR PLATE	1
16. H7070000	L/H SIDE REAR WEAR PLATE	1
17. H7080000	R/H SIDE REAR WEAR PLATE	1
18. H7090000	L/H SIDE FRONT WEAR PLATE	1
19. H7100000	R/H SIDE FRONT WEAR PLATE	1
20. H7160000	MOUNTING ANGLE	1
21. H7170000	MOUNTING ANGLE	1
22. H7180000	BULKHEAD BRACKET	2
23. H7190000	DUST SUPRESSION	1
24. H7200000	LOWER REAR BASE	1
25. H7210000	LOWER FRONT BASE WEAR PLATE	1
26. H7240000	FRONT RUBBER CLAMP	3
27. H7270000	FEEDER PAN DRIVE	1
28. H7280000	DRIVE HOUSING	1
29. H7290000	DRIVE HOUSING	1
30. H7300000	BEARING HOUSINGS	4
31. H7310000	BEARING HOUSING CLAMP	4
32. H7320000	DRIVE BEARING CLAMP	2
33. H7330000	NON DRIVE BEARING CLAMP	2
34. H7340000	DRIVE SHAFT	1
35. H7350000	DRIVE SHAFT	1
36. H7360000	SPUR GEAR SPACER	2
37. H7370000	SPUR GEARS	2
38. H7380000	SHAFT END PLATE	3
39. H7390000	OIL THROWER	1
40. H7510000	REAR RUBBER CLAMP	1
41. H7520000	DUST SUPPRESSION CLAMP	2
42. H7550000	SPRING SUPPORT	12
43. H7560000	BALANCE WEIGHTS	10
44. H7570000	RUBBER CLAMP	2
45. H7660000	FRONT RUBBER CLAMP	1
46. H7700000	FEEDER PAN ASSY	1
47. H7710000	SHAKER BOX	1

Part No.	Part Description	Quantity
48. H7720000	MOTOR MOUNTING ARM	1
49. HA00001811	1/8” SILENCER	2
50. HM1011	74318-KS173 AXIAL PISTON MOTOR	1
51. RU1051	FEEDER PAN 1ST CURTAIN	1
52. RU1053	IMPACTOR FEED PAN 2ND CURTAIN	1
53. RU1144	IMPACTOR FEEDER PAN REAR RUBBER	1
54. SC1003	SPRING	16

AA.17 Hydraulic Hoses

When ordering hydraulic hoses, please quote the number stamped on the end of the hose. The number is in the format HH****.

Power Pack Hose Kit

Kit Number: HH9700

Revision: 2

Date: 14/03/2006

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH9701	¼" R2T	0.325	F	90C	
HH9702	¼" R2T	0.325	F	90C	
HH9703	¼" R2T	0.485	F	F	
HH9704	¼" R2T	0.505	F	F	
HH9705	¼" R2T	0.785	F	90C	
HH9706	¼" R2T	1.350	F	90C	
HH9707	¼" R2T	1.540	F	90C	
HH9708	¼" R2T	1.930	F	90C	
HH9709	¼" R2T	2.500	F	F	
HH9710	¼" R2T	2.500	F	F	
HH9711	¼" R2T	3.000	F	90S	
HH9712	3/8" R2T	2.720	F	90S	
HH9713	2" R1T	1.100	F	135	
HH9714	2" R1T	1.000	F	135	
HH9715	1½" R13	2.300	F	F	90
HH9716	1½" R13	2.000	F	F	90
HH9717	1½" R13	1.800	90S	135	90
HH9718	1½" R13	0.600	90S	135	90
HH9719	1½" R1T	3.300	F	90S	
HH9720	1½" R1T	2.800	135	90S	90
HH9721	1½" R1T	1.820	90S	135	90
HH9722	1½" R1T	1.250	F	90S	
HH9723	1¼" R1T	1.500	90S	135	90
HH9724	1" R1T	1.020	90S	135	90

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH9725	1" R1T	1.500	90S	135	90
HH9726	¾" R2T	3.500	F	90S	
HH9727	¾" R2T	3.500	F	90S	
HH9728	¾" R2T	3.650	F	90S	
HH9729	¾" R2T	3.400	F	90S	
HH9730	¾" R2T	1.400	F	F	
HH9731	1½" R13	2.100	90S	135	90
HH9732	1¼" R1T	1.500	90S	135	90
HH9733	1¼" R1T	1.400	F	135	
HH9734	1" R1T	3.150	F	135	
HH9735	1" R1T	3.250	F	135	
HH9736	1" R13	1.560	F	90S	
HH9737	1" R13	1.560	F	90S	
HH9738	1" R13	2.38	F	90S	
HH9739	1" R13	2.29	F	90S	
HH9740	¾" R2T	2.6	90C	90S	
HH9741	¾" R2T	2.4	F	F	
HH9742	¾" R2T	2.05	F	90S	
HH9743	¾" R2T	2.15	F	90S	
HH9744	½" R2T	4.2	90S	90S	
HH9745	½" R2T	3.2	90S	90S	
HH9746	½" R2T	1.5	90S	90S	
HH9747	¼" R2T	3.3	F	90S	
HH9748	¼" R2T	3.6	90S	90S	
HH9749	1½" R13	1.9	90S	135	

Valve Plate Hose Kit

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH8044	1/4" R2T	0.22	F	F	SOLENOID BLOCK (B4) TO TEE ON TOP D25 SPOOL ON VALVE PLATE
HH8048	1/4" R2T	3	F	90S	BOTTOM OF SOLENOID BLOCK (P2) TO KAWASAKI PUMP
HH8070	1/4" R2T	2.67	F	F	SOLENOID BLOCK (C2) TO BULKHEAD PLATE
HH8071	1/4" R2T	2.55	F	F	SOLENOID BLOCK (C3) TO BULKHEAD PLATE
HH8074	3/8" R2T	2.75	F	90S	TOP OF SOLENOID BLOCK (P1) TO BULKHEAD PLATE
HH8092	1/4" R2T	0.255	F	90C	TOP D25 SPOOL VALVE TO LOWER D25 SPOOL VALVE
HH8093	1/4" R2T	0.6	F	F	LOWER D25 SPOOL VALVE TO SOLENOID BLOCK (B3)
HH8094	1/4" R2T	0.265	F	F	TOP D25 SPOOL VALVE TO SOLENOID BLOCK (B2)
HH8095	1/4" R2T	1.23	F	90S	TOP D25 SPOOL TO BOTTOM OF SOLENOID BLOCK (A4)
HH8096	1/4" R2T	0.94	F	90S	TOP D25 SPOOL VALVE TO SOLENOID BLOCK (A2)
HH8098	1/4" R2T	0.255	F	90C	TOP D25 SPOOL VALVE TO LOWER D25 SPOOL VALVE
HH8099	1/4" R2T	1.4	F	90S	LOWER D25 SPOOL TO SOLENOID BLOCK (A3)
HH8116	1 1/2" R1T	0.865	Un-Swaged		TOP OF HYDRAULIC TANK
HH8117	1 1/2" R1T	0.865	Un-Swaged		TOP OF HYDRAULIC TANK
HH8118	1 1/2" R1T	0.865	Un-Swaged		TOP OF HYDRAULIC TANK
HH8119	1 1/2" R1T	0.865	Un-Swaged		TOP OF HYDRAULIC TANK
HH8122	1/4" R2T	0.5	90S	90C	KAWASAKI PUMP TO KAWASAKI PUMP - (CROSS PIPE)
HH8228	3/4" R2T	0.6	F	90S	INSIDE HYDRAULIC TANK
HH8229	3/4" R2T	0.6	F	90S	INSIDE HYDRAULIC TANK
HH8245	1 1/2" R1T	1.15	F	135	INSIDE HYDRAULIC TANK
HH8246	1 1/2" R1T	1.08	F	135	INSIDE HYDRAULIC TANK
HH8401	3/4" R2T	2.25	F	90S	TANDEM PUMP TO 5 STATION MANIFOLD (P2)
HH8404	3/4" R2T	2.45	F	90S	TANDEM PUMP TO 5 STATION MANIFOLD (P5)

Side Conveyor Hose Kit

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH8009	3/4" R2T	0.63	90S	90S	HEAD DRUM MOTOR TOP TO TOP BULKHEAD

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH8010	3/4" R2T	0.63	90S	90S	HEAD DRUM MOTOR BOTTOM TO BOTTOM BULKHEAD
HH8011	3/4" R2T	3.7	90S	90S	FROMBOTTOM BULKHEAD TO BACK BULKHEAD INSIDE SIDE CONVEYOR
HH8012	3/4" R2T	3.7	90S	90S	FROM TOP BULKHEAD TO FRONT BULKHEAD INSIDE SIDE CONVEYOR
HH8128	3/8" R2T	0.44	F	90C	SIDE CONV LIFT RAM TO BULKHEAD ON SIDE CONVEYOR FRAME
HH8129	3/8" R2T	0.9	90C	90C	BULKHEAD TO BULKHEAD INSIDE SIDE CONVEYOR FRAME
HH8151	3/16" R1T	0.65	F	F	GREASE PIPE - SIDE CONV. TAIL BRG TO COVER
HH8152	3/16" R1T	0.65	F	F	GREASE PIPE - SIDE CONV. TAIL BRG TO COVER

Main Conveyor Hose Kit

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH8076	3/4" R2T	5.80	F	135	HEAD DRUM MOTOR TO 5 STATION MANIFOLD (P4)
HH8077	3/4" R2T	5.86	F	135	HEAD DRUM MOTOR TO 5 STATION MANIFOLD (END)
HH8130	3/4" R2T	3.88	F	90S	5 STATION MANIFOLD (END) TO BOTTOM BULKHEAD IN FLARE
HH8131	3/4" R2T	3.73	F	90S	5 STATION MANIFOLD (P5) TO TOP BULKHEAD IN FLARE
HH8226	3/4" R2T	0.86	F	F	TOP FLARE BULKHEAD TO MAGNET MOTOR
HH8227	3/4" R2T	0.86	F	F	BOTTOMFLARE BULKHEAD TO MAGNET MOTOR

Chassis and Auxiliary Hose Kit

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH8009	3/4" R2T	6.500	90S	90S	DISTRIBUTION BLOCK (P2) TO FEEDER PAN MOTOR
HH8010	3/4" R2T	7.000	90S	135	FEEDER PAN MOTOR TO DISTRIBUTION BLOCK RETURN (END)
HH8225 A	3/8" R2T	1.500	F	F	CRUSHER BOXRAM TO TEE IN HOSE TRAY
HH8451	3/8" R2T	7.200	F	F	SIDE CONVEYOR LIFT RAM
HH8453	3/8" R2T	2.000	F	F	REAR R/H JACKING LEG TO TEE
HH8454	3/8" R2T	2.000	F	F	REAR R/H JACKING LEG TO TEE
HH8455	3/8" R2T	6.750	F	F	FROM TEE TO 6 LEVER SPOOL VALVE
HH8456	3/8" R2T	6.650	F	F	FROM TEE TO 6 LEVER SPOOL VALVE
HH8457	3/8" R2T	2.000	F	F	REAR L/H JACKING LEG TO TEE
HH8458	3/8" R2T	2.000	F	F	REAR L/H JACKING LEG TO TEE
HH8459	3/8" R2T	5.850	F	F	R/H HOPPER SIDE RAM TO 6 LEVER SPOOL VALVE
HH8460	3/8" R2T	5.850	F	F	R/H HOPPER SIDE RAM TO 6 LEVER SPOOL VALVE
HH8461	3/8" R2T	7.200	F	F	L/H HOPPER SIDE RAM TO 6 LEVER SPOOL VALVE
HH8462	3/8" R2T	7.200	F	F	L/H HOPPER SIDE RAM TO 6 LEVER SPOOL VALVE
HH8463	3/8" R2T	8.300	F	F	REAR HOPPER RAM TO 6 LEVER SPOOL VALVE
HH8466	1/4" R2T	7.820	F	F	BULKHEAD TO R/H TRACK BRAKE
HH8467	1/4" R2T	8.920	F	F	BULKHEAD TO L/H TRACK BRAKE
HH8470	3/4" R2T	1.100	F	90S	L/H TRACK TO TEE
HH8471	3/4" R2T	2.275	F	90S	R/H TRACK TO TEE

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH8472	3/4" R2T	1.500	F	F	SIDE CONVEYOR
HH8473	3/4" R2T	3.210	F	F	WEBTEC (PR) PLATE TO BULKHEAD
HH8474	3/4" R2T	4.750	F	F	WEBTEC (REG) PLATE TO FEEDER MOTOR
HH8475	3/4" R2T	3.500	F	F	FEEDER MOTOR TO CROSS IN CHASSIS
HH8476	3/4" R2T	5.860	F	F	MALE / MALE TO BULKHEAD PLATE
HH8477	3/4" R2T	7.500	F	F	TEE FOR L/H & R/H TRACK TO 3/4" TEE ON DISTRIBUTION
HH8478	3/4" R2T	4.260	F	F	WEBTEC (BP) TO CROSS IN CHASSIS
HH8479	3/4" R2T	7.420	F	F	SIDE CONVEYOR TO BULKHEAD
HH8480	1" R2T	8.200	F	F	CROSS IN CHASSIS TO BULKHEAD PLATE
HH8481	1" R13	7.380	F	90S	R/H TRACK MOTOR (V2) TO BULKHEAD PLATE
HH8482	1" R13	7.380	F	90S	R/H TRACK MOTOR (V1) TO BULKHEAD PLATE
HH8483	1" R13	8.580	F	90S	L/H TRACK MOTOR (V1) TO BULKHEAD PLATE
HH8484	1" R13	8.580	F	90S	L/H TRACK MOTOR (V2) TO BULKHEAD PLATE
HH8537	1/2" R2T		90S	90S	FEEDER MOTOR DRAIN TO TEE ON TRACK DRAIN

Control Box Hose Kit

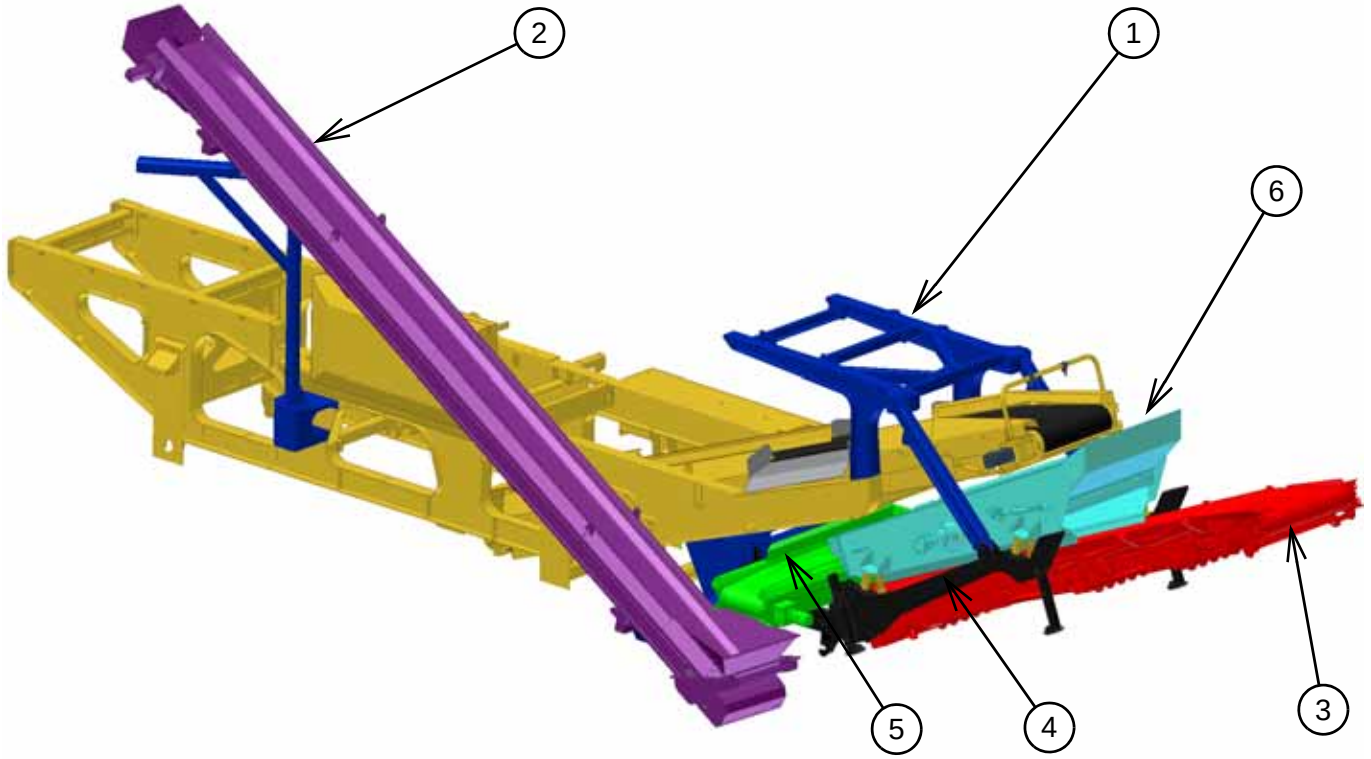
Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH8001	1 1/4"R2T	1.800	F	90S	CRUSHER MOTOR TO DISTRIBUTION BLOCK (RETURN)
HH8002	3/4" R2T	1.600	135	90S	CASE DRAIN ONMX530 TO DISTRIBUTION BLOCK (P2)
HH8003	1 1/4" R13	1.840	F	90S	DISTRIBUTION BLOCK (P3) TO CRUSHER MOTOR (V1 FEED)
HH8004	1 1/4" R13	1.910	F	90S	DISTRIBUTION BLOCK (P2) TO CRUSHER MOTOR (V2 FEED)
HH8005 A	3/8" R2T	1.570	90C	F	CRUSHER BOX RAM TO TEE IN HOSE TRAY
HH8006 A	3/8" R2T	3.900	F	F	6 LEVER SPOOL VALVE TO 1st RAM APRON ADJUSTER
HH8007 A	3/8" R2T	1.050	F	F	TEE ON 1st APRON ADJUSTER RAM TO SECOND RAM
HH8008 A	3/8" R2T	2.270	F	90S	CRUSHER BOX TEE TO 6 LEVER SPOOL VALVE
HH8196	3/8" R2T	3.400	F	F	FRONT JACKING LEG CROSS PIPE
HH8197	3/8" R2T	3.400	F	F	FRONT JACKING LEG CROSS PIPE
HH8231 A	1/4" R2T	3.700	F	F	PRESSURE SWITCH TO KAWASAKI PUMP
HH8232 A	1/4" R2T	0.130	F	90C	PRESSURE SWITCH TO TEE
HH8233 A	1/4" R2T	1.930	90C	90C	SPEED CONTROLLER (P2) TO KAWASAKI PUMP
HH8234 A	1/4" R2T	1.900	90C	90C	SPEED CONTROLLER (P3 TO KAWASAKI PUMP WATER TRAP
HH8235 A	1/4" R2T	1.930	90C	90C	SPEED CONTROLLER (P1) TO KAWASAKI PUMP
HH8235 B	1/4" R2T	5.500	F	90C	PRESSURE SWITCH TO 5 STATION MANIFOLD
HH8420	3/8" R2T	0.750	F	F 6	LEVER TOR/H JACKING LEG TEE
HH8421	3/8" R2T	0.690	F	F 6	LEVER TOR/H JACKING LEG TEE
HH8422	3/8" R2T	1.670	F	90S 6	LEVER SPOOL VALVE TO BULKHEAD (RETURN TO C TOP)
HH8429	1/2" R2T	2.750	F	F 6	LEVER SPOOL VALVE TO RETURN MANIFOLD (P7)

Recirculation Hose Kit

Kit Number: HH9700R

Hose No	Pipe	Length (m)	Fitting (A)	Fitting (B)	LOCATION
HH9998	¼" R2T	1.66	F	F	TAIL CONVEYOR FOLD RAM
HH9999	¼" R2T	1.78	F	F	TAIL CONVEYOR FOLD RAM
HH10000	¼"R2T	1.29	F	F	TAIL CONVEYOR FOLD RAM
HH10001	¼"R2T	1.29	F	F	TAIL CONVEYOR FOLD RAM
HH10002	¼"R2T	1.29	F	F	TAIL CONVEYOR FOLD RAM
HH10003	¼"R2T	1.29	F	F	TAIL CONVEYOR FOLD RAM
HH10004	¼" R2T	4.60	F	90C	TAIL CONVEYOR RAM
HH10005	¼" R2T	4.60	F	90C	TAIL CONVEYOR RAM
HH10006	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10007	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10008	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10009	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10010	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10011	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10012	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10013	¼" R2T	0.32	90C	90C	TAIL CONVEYOR RAM
HH10014	¾" R2T	1.21	90S	90S	TAIL CONVEYOR MOTOR
HH10015	¾" R2T	1.31	90S	90S	TAIL CONVEYOR MOTOR
HH10016	¾" R2T	6.50	F	90C	TAIL CONVEYOR MOTOR
HH10017	¾" R2T	6.50	F	90C	TAIL CONVEYOR MOTOR
HH10018	¾" R2T	4.00	F	F	SCREEN BOX MOTOR FEED
HH10019	¾" R2T	2.80	F	F	SCREEN BOX MOTOR RETURN
HH10020	¾" R2T	2.06	F	90S	SMALL SIDE CONVEYOR MOTOR FEED
HH10021	¾" R2T	1.56	F	90S	SMALL SIDE CONVEYOR MOTOR RETURN
HH10022	3/8" R2T	1.20	F	90C	SMALL SIDE CONVEYOR RAM
HH10023	3/8" R2T	1.40	F	90C	SMALL SIDE CONVEYOR RAM
HH10024	¾" R2T	8.30	F	135S	LONG SIDE CONVEYOR MOTOR FEED
HH10025	¾" R2T	8.30	F	135S	LONG SIDE CONVEYOR MOTOR FEED

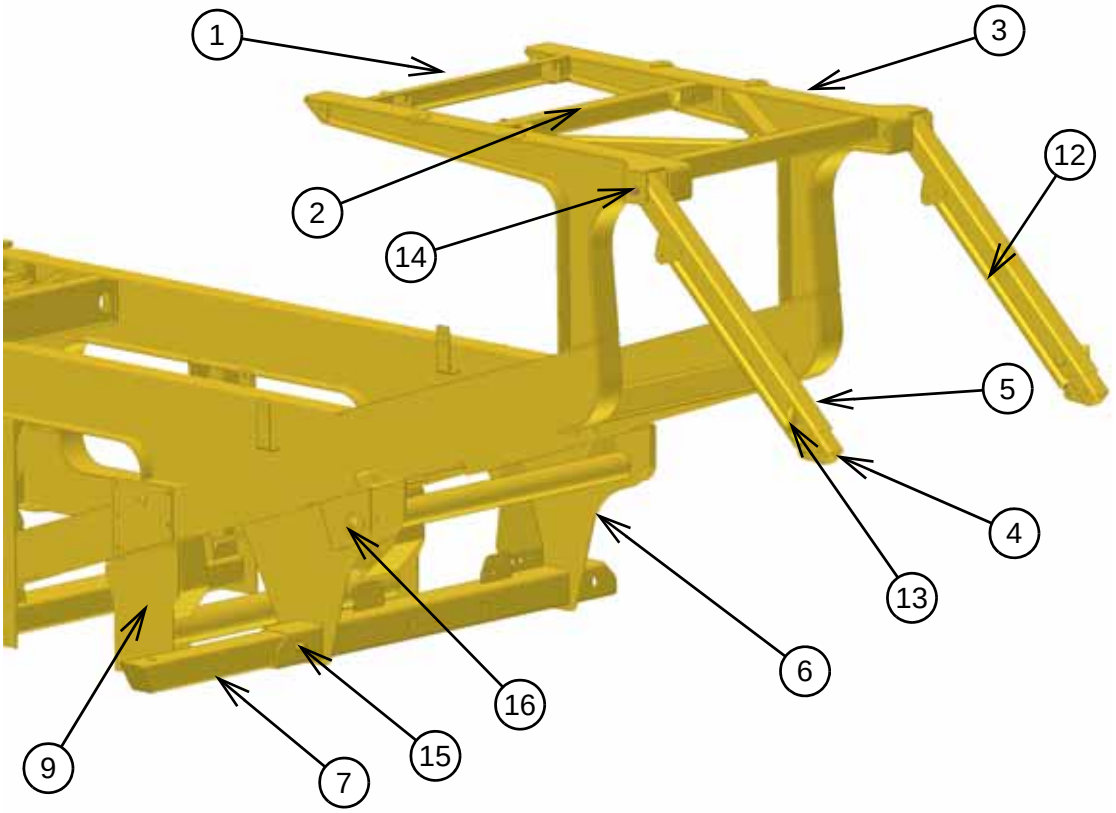
AA.18 Recirculation Layout (Where fitted)



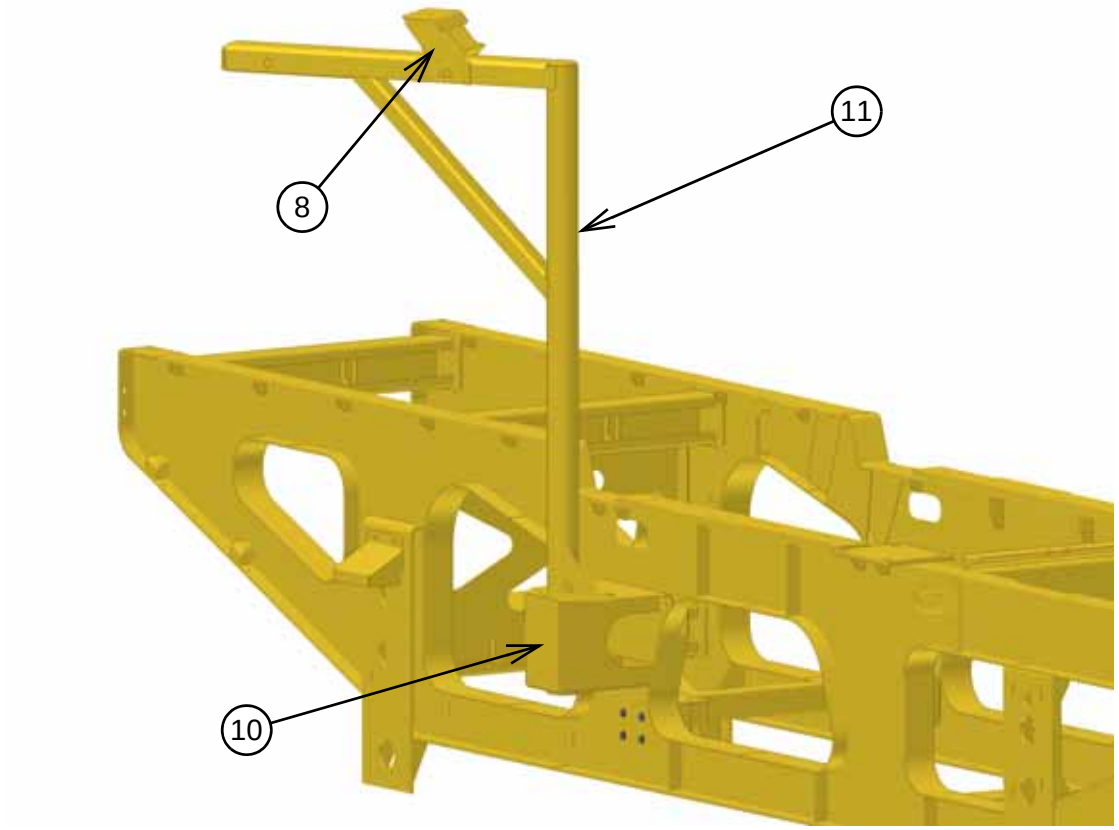
1: RECICULATION LAYOUT

Part No.	Part Description	Quantity
1.	Recirculation Chassis	See page 151.
2.	Recirculation Conveyor	See page 153.
3.	Recirculation Fines Conveyor	See page 165.
4.	Recirculation Screen Sub Assembly	See page 159.
5.	Recirculation Side Conveyor	See page 170.
6.	Recirculation Vibrating Grid	See page 161.

AA.19 Recirculation Chassis



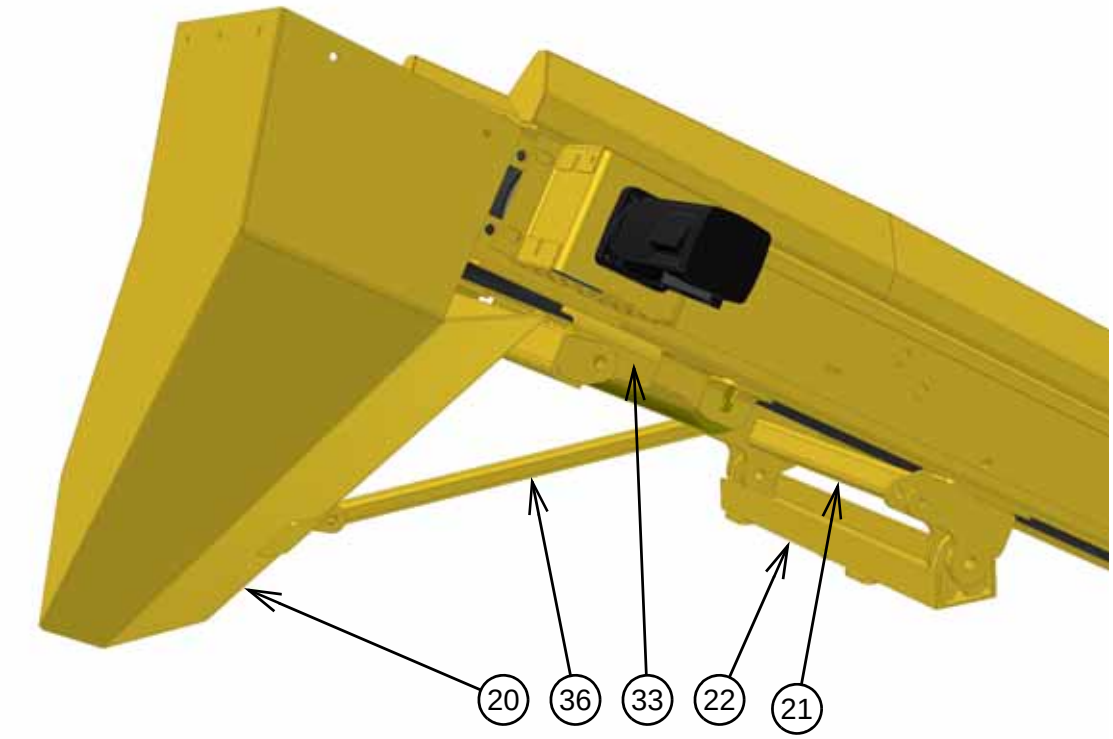
1: MAIN SUPPORT



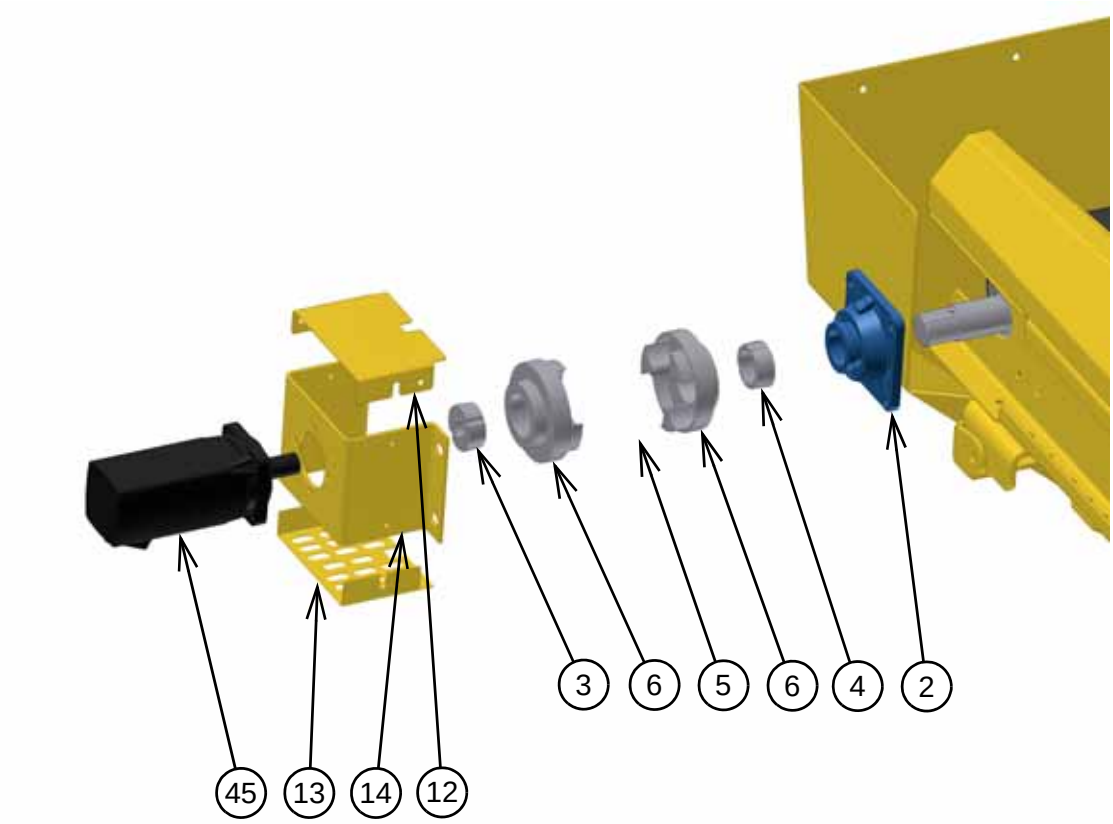
2: CONVEYOR SUPPORT

Part No.	Part Description	Quantity
1. A8880000	MAGNET SUPPORT FRAME (DRIVE SIDE)	1
2. A8890000	MAGNET SUPPORT FRAME	1
3. A15430000	MAGNET FRAME ASSEMBLY	1
4. A15700000	TELE-LEG INNER	2
5. A15710000	TELE-LEG OUTER	2
6. A15720000	CHASSIS MOUNTING	1
7. A15730000	BTM TELE LEG SUPPORT	1
8. A15760000	EXTENED SUPPORT ARM SLIDE	1
9. A15770000	FRONT JACKLEG SUPPORT	1
10. A15920000	CONV SUPPORT ARM BASE ASSY	1
11. A15930000	CONV SUPPORT ARM	1
12. HR1025	HYDRAULIC RAM	2
13. PN1027	STOP PIN	2
14. PN1042	PIN	2
15. PN1147	PIN	1
16. PN1155	PIN	2

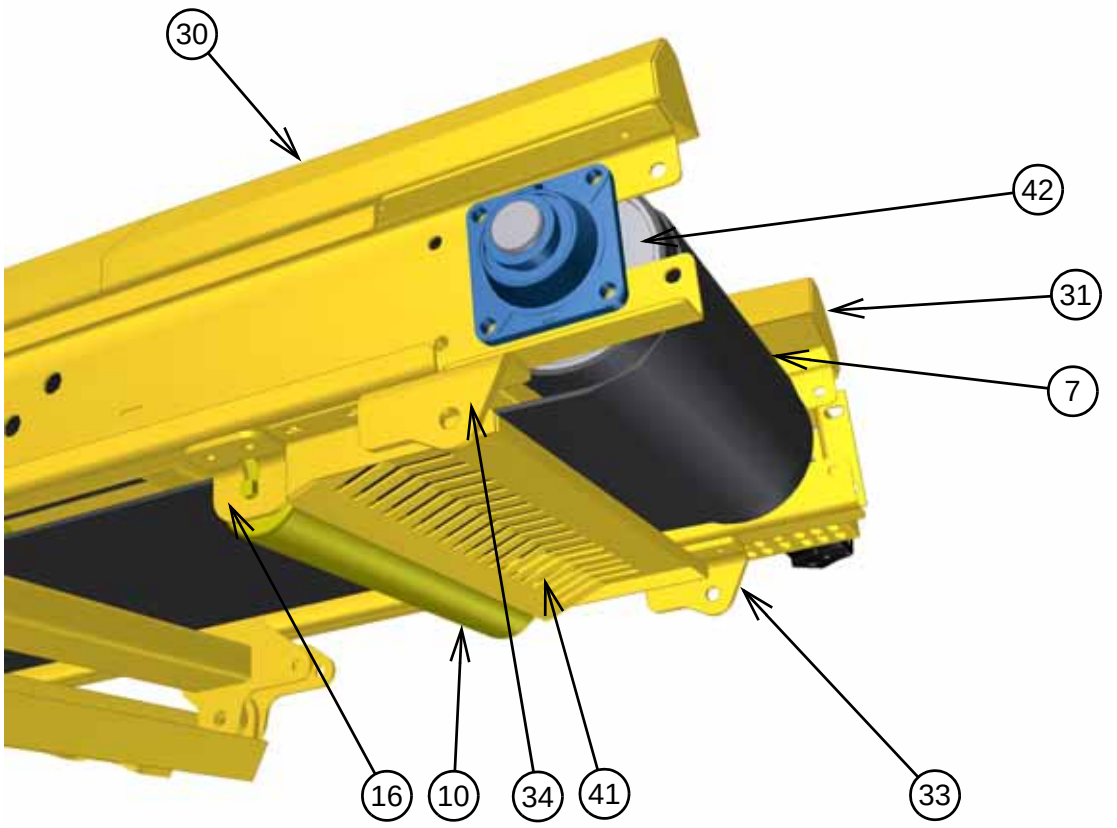
AA.20 Recirculation Conveyor



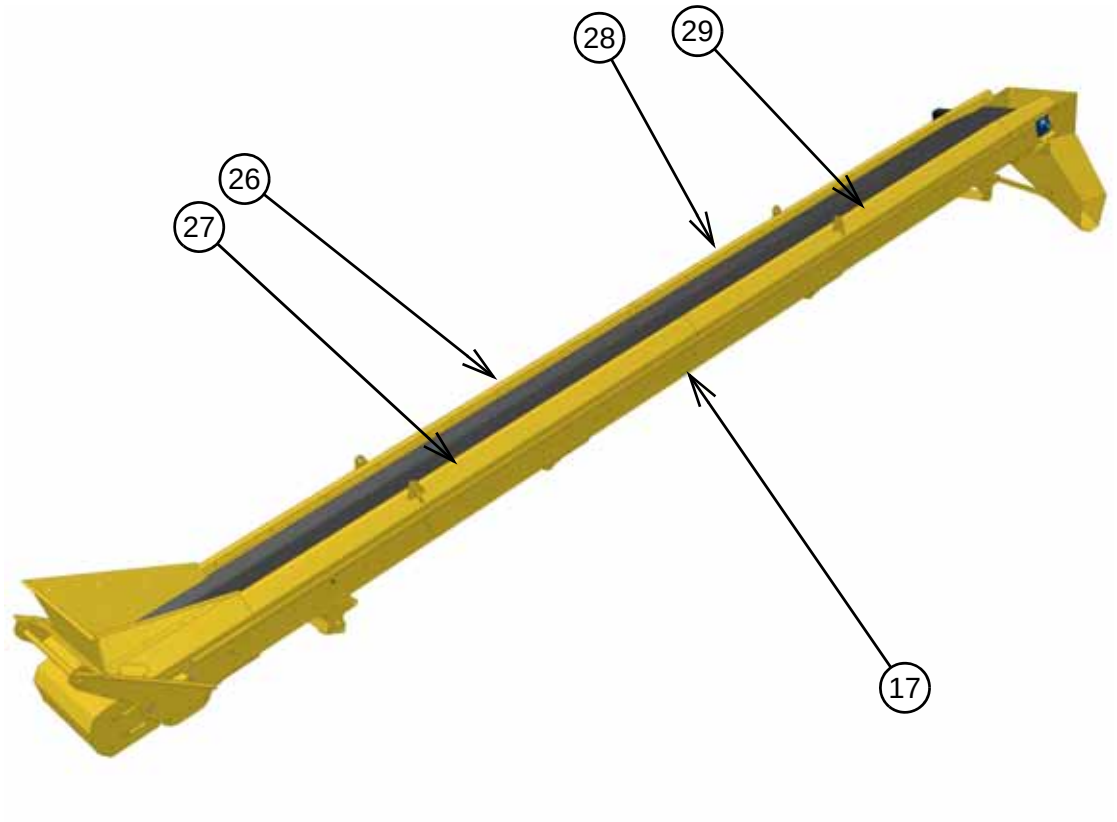
1: VIEW ON DISCHARGE END



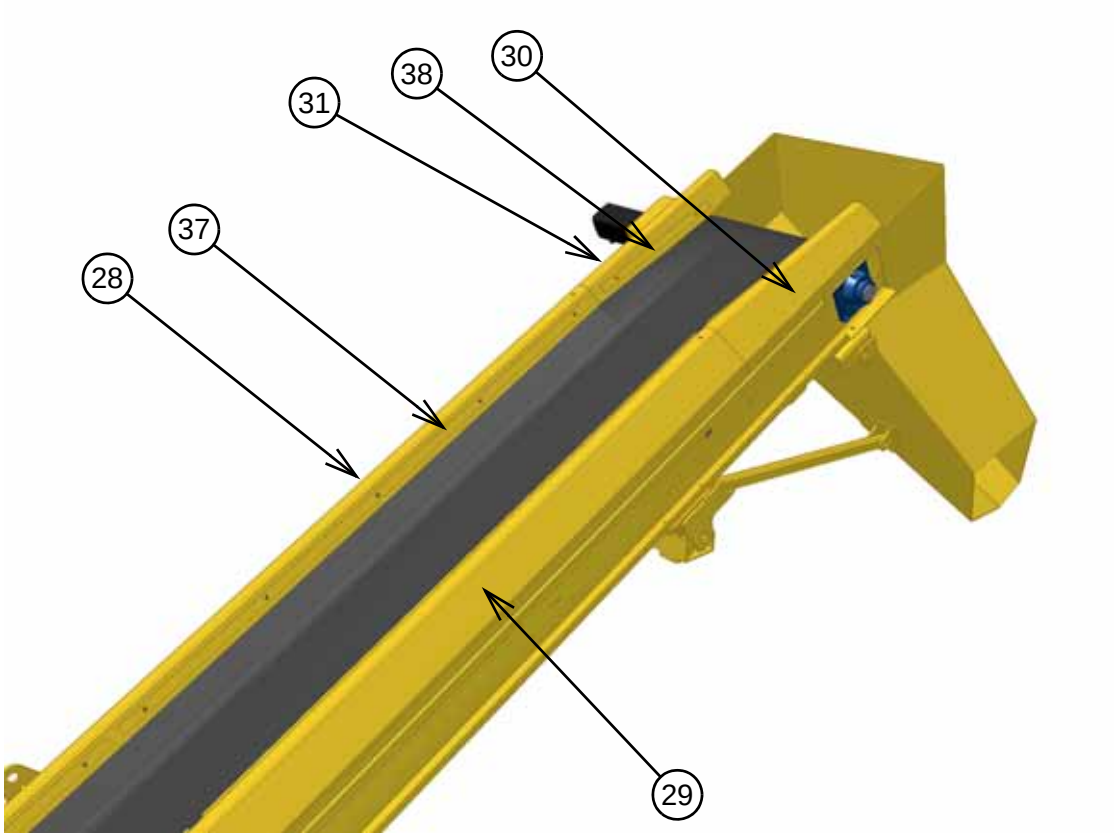
2: DRIVE COUPLING



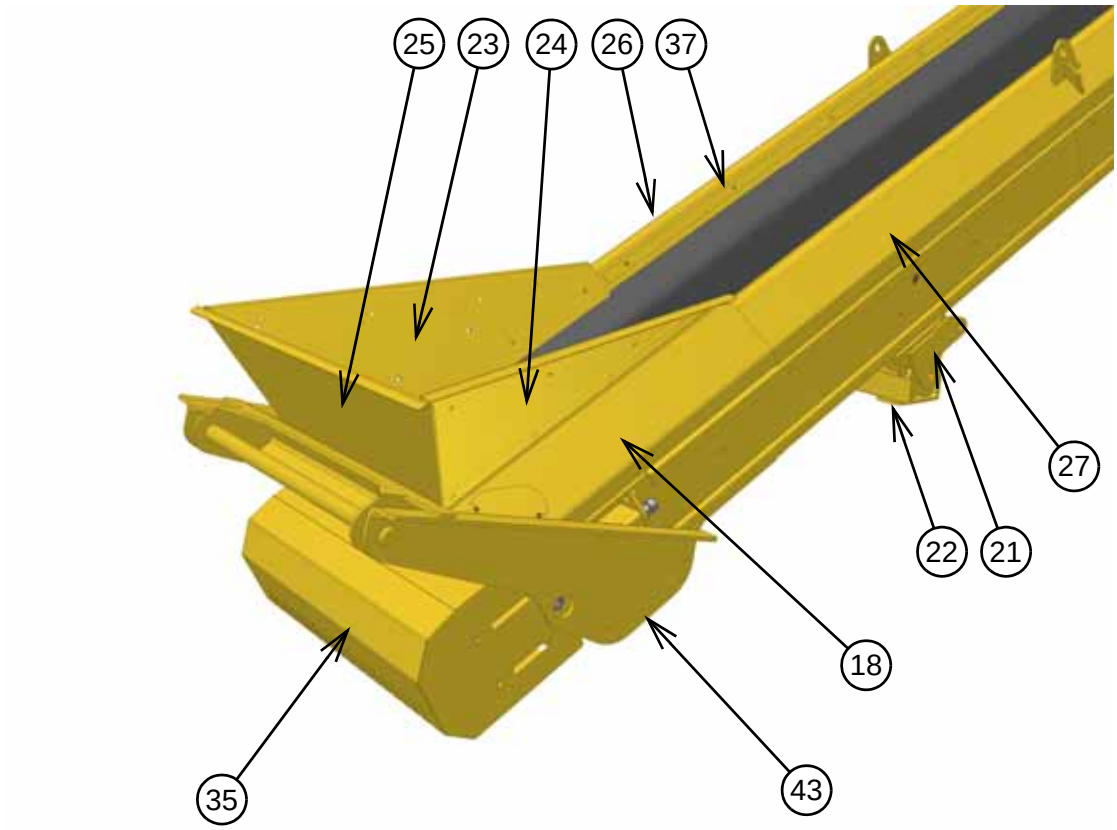
3: VIEW ON HEAD DRUM



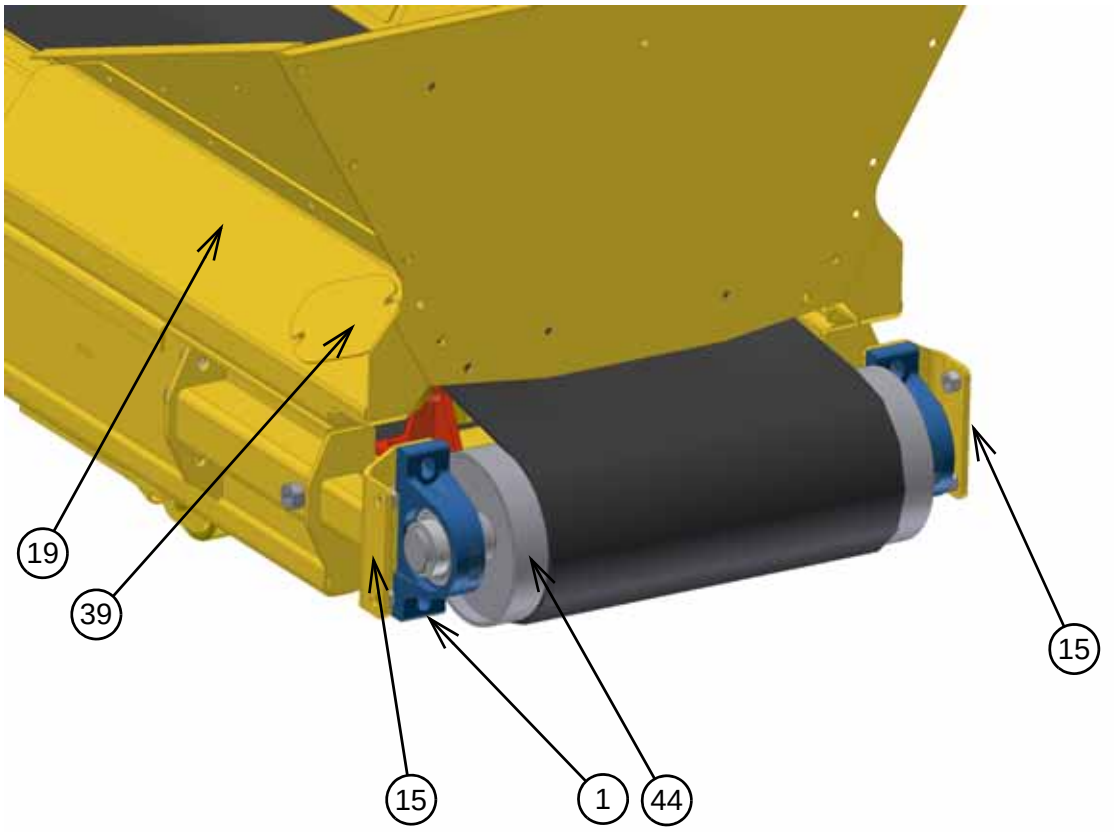
4: VIEW OF CONVEYOR



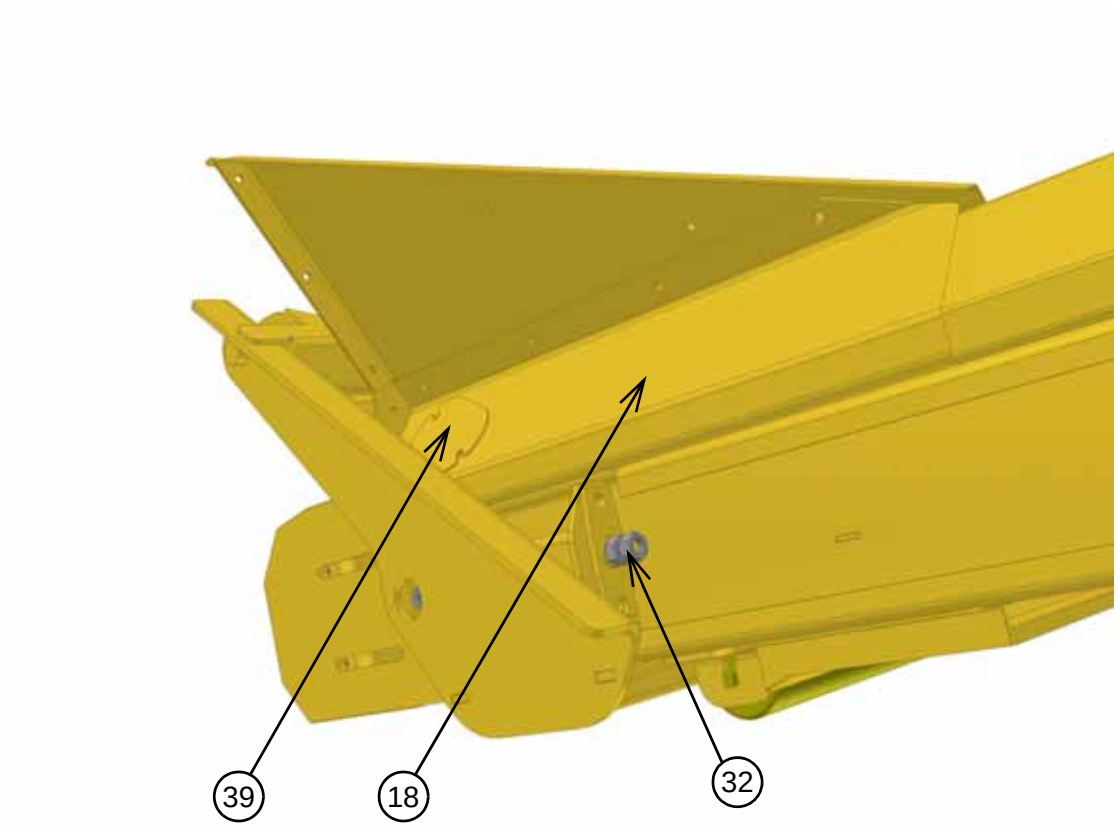
5: VIEW ON CONVEYOR TOP SECTION



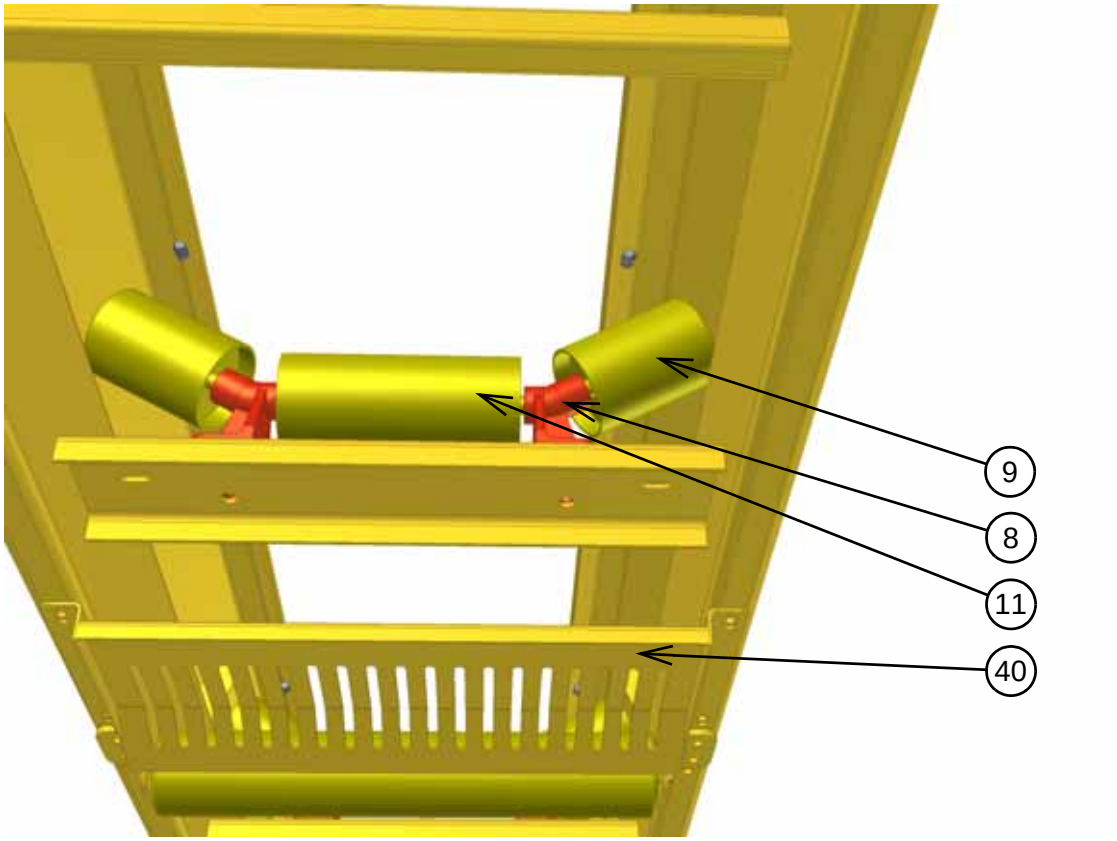
6: VIEW ON CONVEYOR BOTTOM SECTION



7: VIEW ON TAIL DRUM



8: VIEW ON FEED BOOT

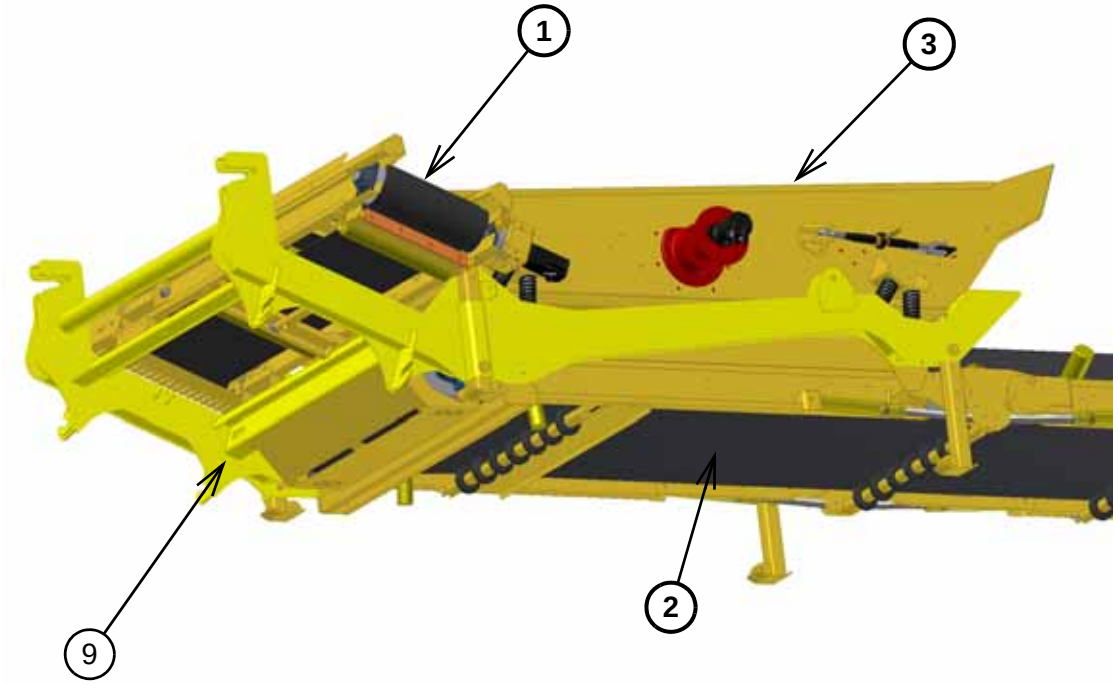


9: VIEW ON CONVEYOR BOTTOM

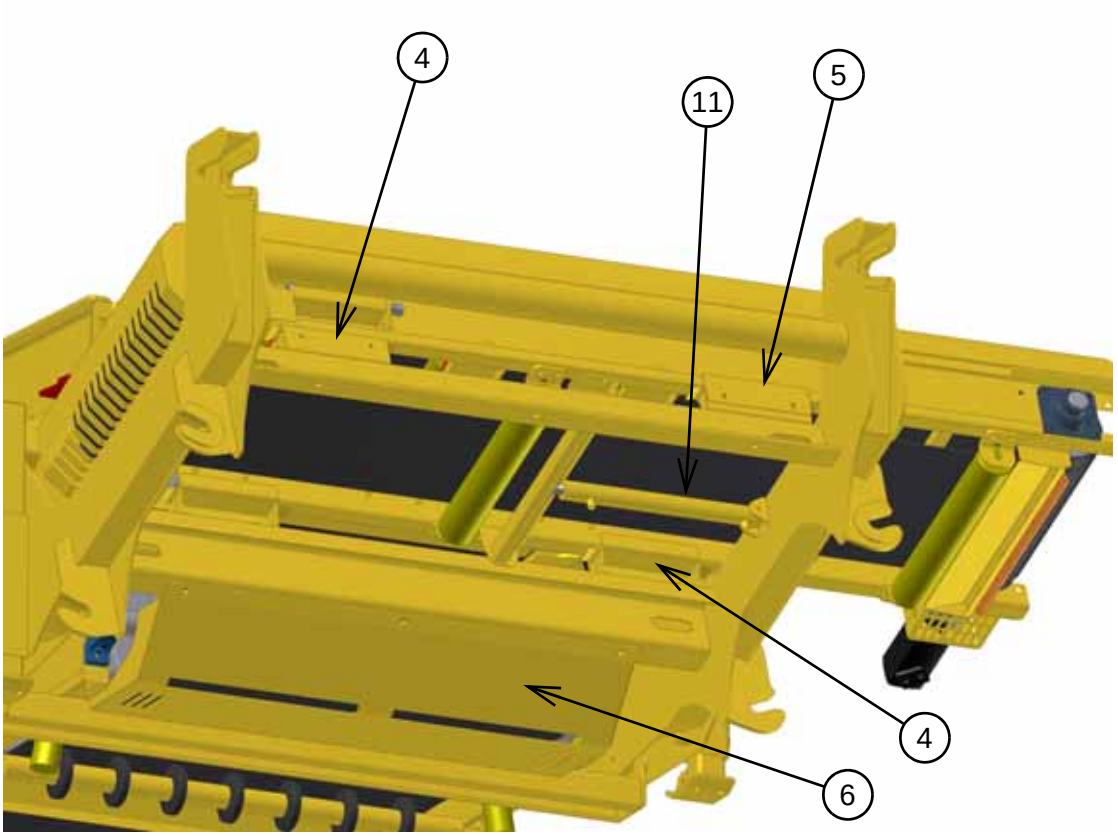
Part No.	Part Description	Quantity
1. BT1009	PLUMBER BEARING	2
2. BT2003	FLANGE BEARING	2
3. BT5005	2012/32 TAPER LOCK BUSH	1
4. BT5006	2012/50 TAPER LOCK BUSH	1
5. BT6514	SPIDER INSERT	1
6. BT6515	COUPLING INCLUDES 3, 4, 5	1
7. CB191300500CH	CONVEYOR BELT	1
8. CR1004	30° ROLLER BRACKET	2
9. CR1012	WING ROLLER	2
10. CR1018	CENTRE ROLLER	4
11. CR1026	WING ROLLER	1
12. E0240000	MOTOR MOUNTING PLATES	1
13. E0250000	MOTOR MOUNTING BOTTOM BRACKET COVER	1
14. E1440000	MOTOR MOUTING BRACKET	1

Part No.	Part Description	Quantity
15. E4160000	BEARING ADJUSTER	2
16. E4170000	RETURN ROLLER BRACKET	8
17. E4220000	FRAME ASSY	1
18. E4230000	FEED BOOT SUPPORT	1
19. E4240000	R/H FEED BOOT SUPPORT	1
20. E4250000	FEED CHUTE ASSY	1
21. E4260000	SUPPORT CROSS MEMBER	2
22. E4270000	BOTTOM PIVOT SUPPORT	2
23. E4280000	L/H FEED BOOT SIDE	1
24. E4290000	R/H FEED BOOT SIDE	1
25. E4300000	FEED BOOT BACK	1
26. E4310000	BOTTOM L/H SIDE FLAIR	1
27. E4320000	BTM R/H SIDE FLAIR	1
28. E4330000	TOP L/H SIDE FLAIR	1
29. E4340000	TOP R/H SIDE FLAIR	1
30. E4350000	R/H HEAD FLAIR	1
31. E4360000	L/H HEAD FLAIR	1
32. E4370000	BEARING ADJUSTER BOLT	2
33. E4380000	L/H SUPPORT BRACKET	1
34. E4390000	R/H SUPPORT BRACKET	1
35. E4400000	TAIL DRUM GUARD	1
36. E4410000	FEEDER CHUTE SUPPORT ARM	882 mm
37. E4420000	SIDE FLAIR RUBBER CLAMP	8
38. E4430000	TOP FLAIR RUBBER CLAMP	2
39. E4440000	FEED BOOT SUPPORT ACCESS COVER	2
40. E4460000	RETURN ROLLER GUARD	3
41. E4470000	RETURN ROLLER GUARD	1
42. E4510000	HEAD DRUM	1
43. E4520000	90° SUPPORT FRAME	1
44. E4530000	TAIL DRUM	1
45. HM1006	HYDRAULIC MOTOR	1

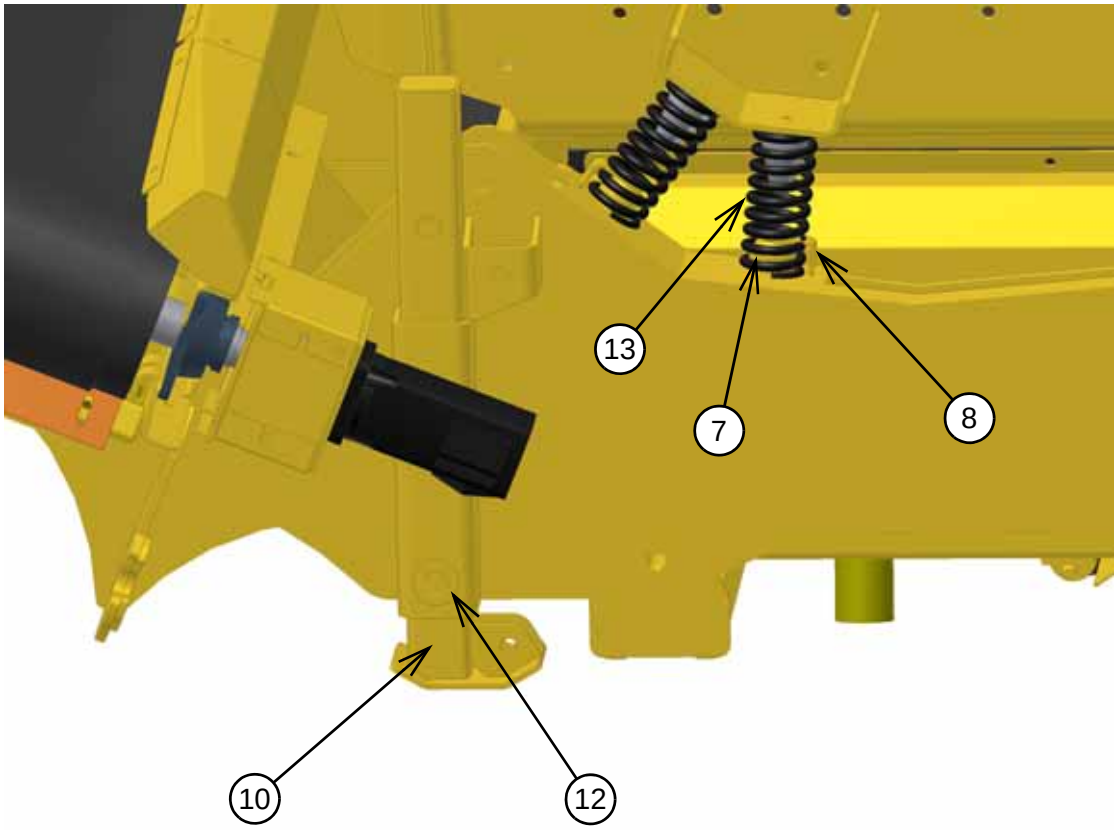
AA.21 Recirculation Screen Sub Assembly



1: SCREEN SUB ASSEMBLY



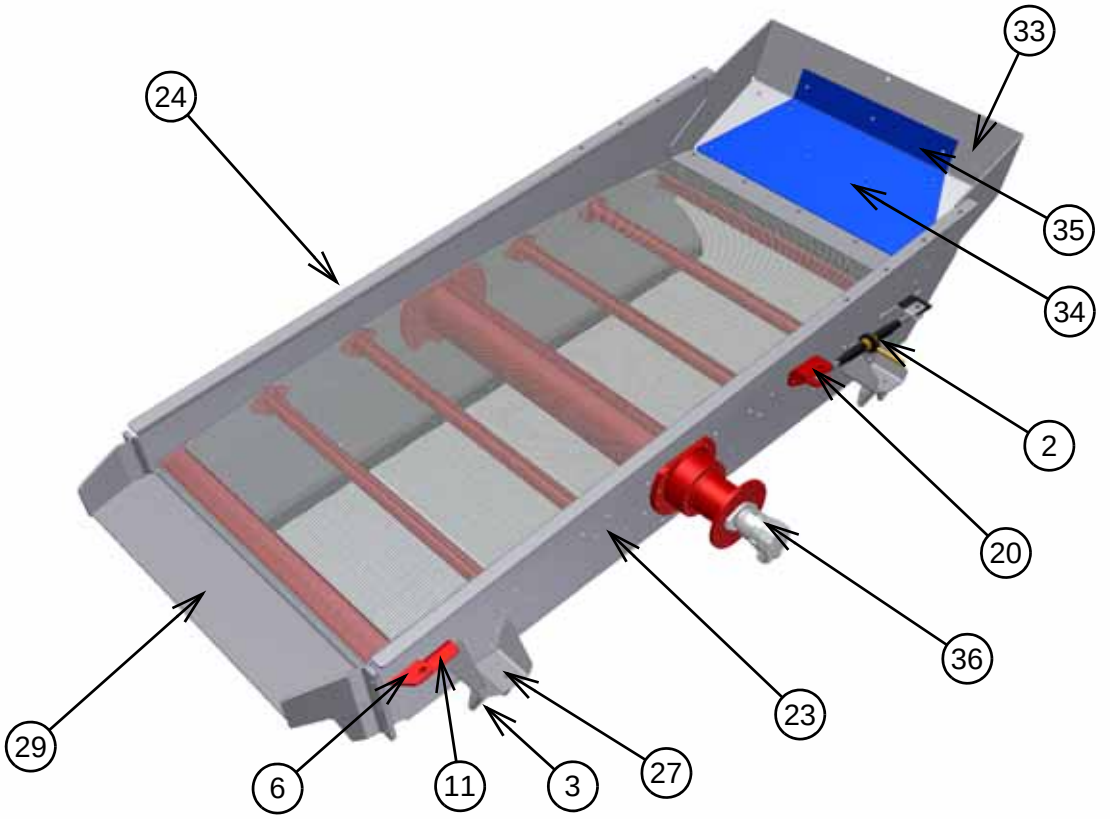
2: VIEW ON REAR END OF SCREEN ASEMBLY



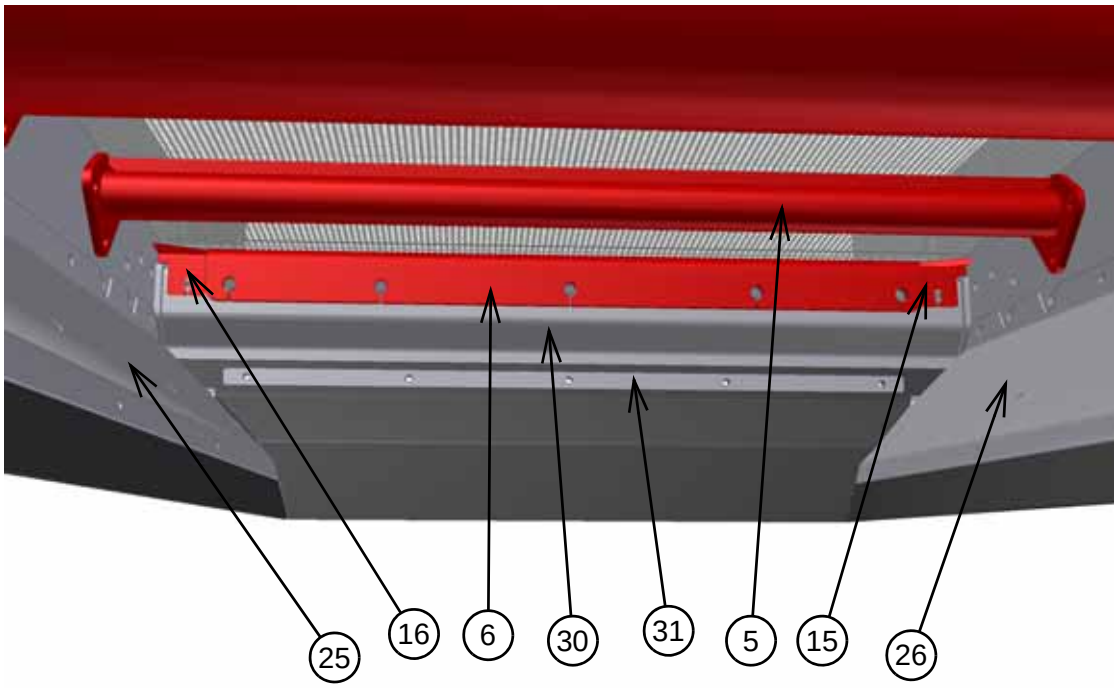
3: DETAILED VIEW ON RIGHT HAND SIDE

Part No.	Part Description	Quantity
1.	RECIRCULATION SIDE CONVEYOR	See page 170.
2.	RECIRCULATION FINES CONVEYOR	See page 165.
3.	RECIRCULATION VIBRATING GRID	See page 161.
4. E 419 00 00	SIDE CONVEYOR SLIDE SUPPORT BRACKET	5
5. E 420 00 00	RE-CIRC SHORT SIDE CONV SLIDE SUPPORT RETAINER	2
6. F2720000	RE-CIRC FINES CONV TAIL DRUM GUARD	1
7. G3090000	SCREENBOX SPRING SUPPORT UPPER	8
8. G3870000	SPRING RETAINER	8
9. G8600000	SCREENBOX SUBFRAME	1
10. G8690000	SUBFRAME JACK LEG	4
11. HR1092	HYDRAULIC RAM	1
12. PN1022	SCREENBOX LOCK LEG PIVOT PIN	4
13. SC2001	SCREEN BOX SPRING	8

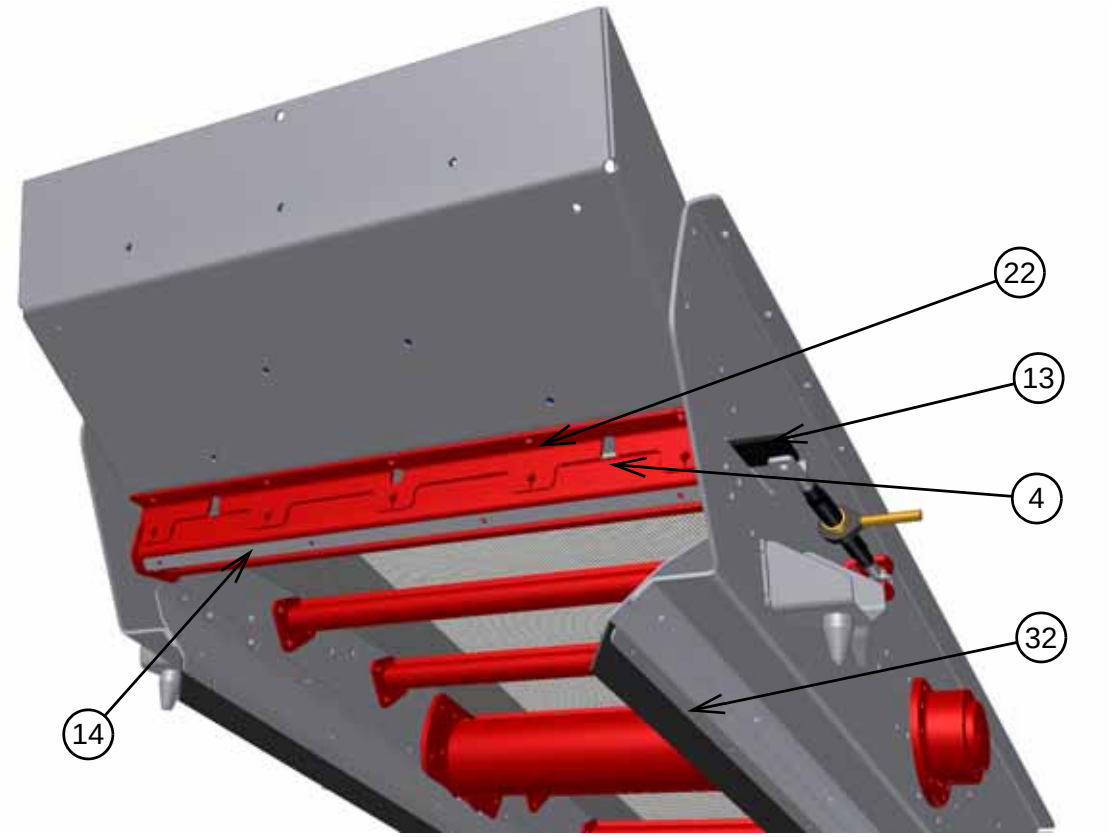
AA.22 Recirculation Vibrating Grid



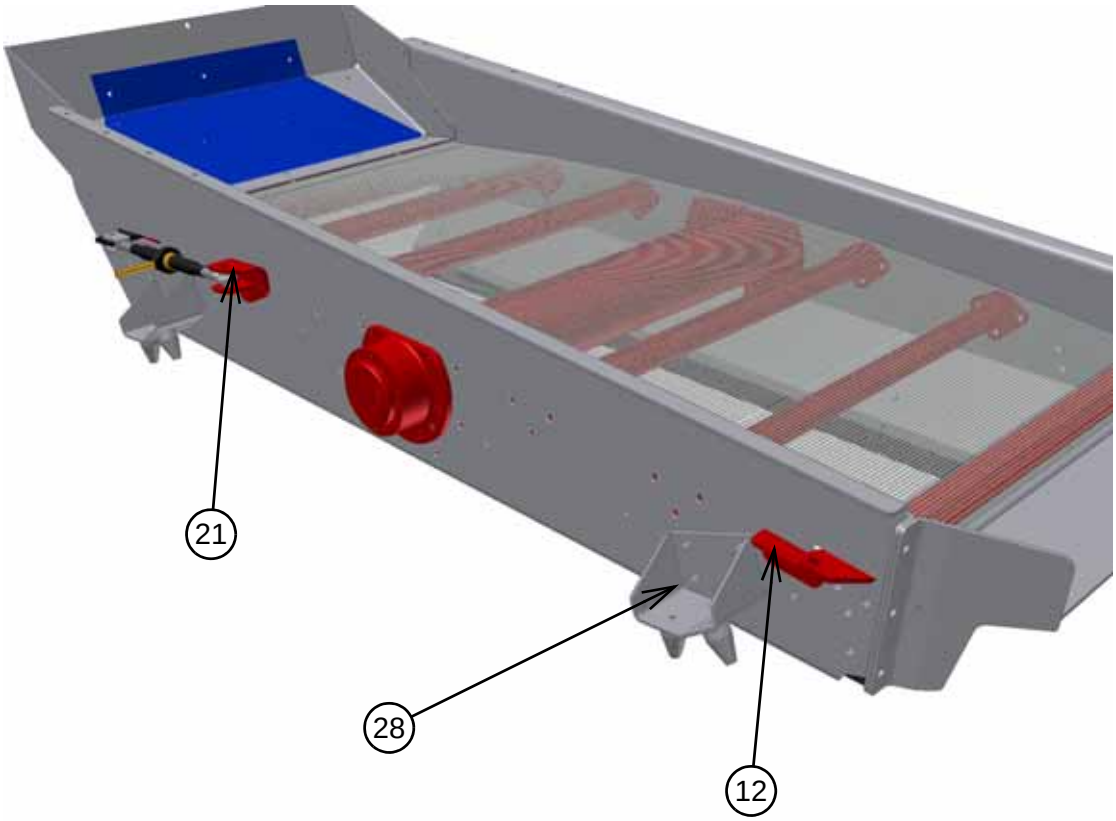
1: VIEW ON VIBRATING GRID



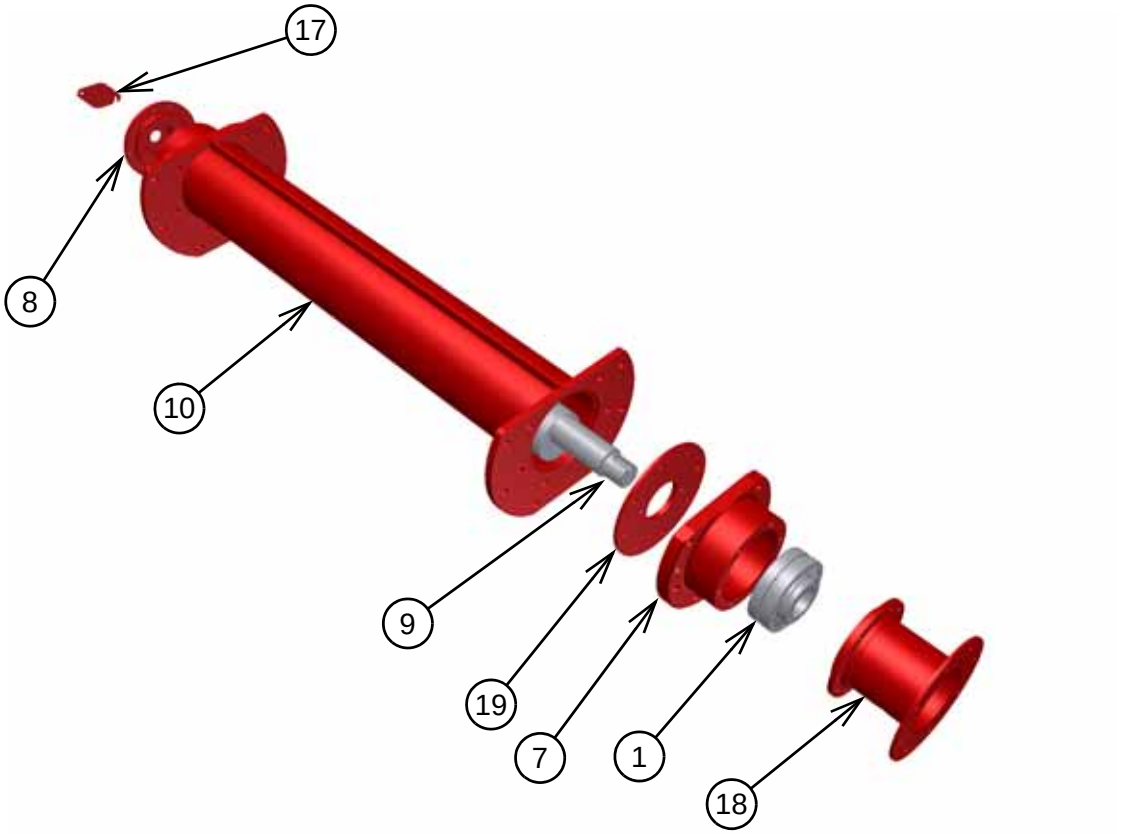
2: VIEW ON REAR UNDERSIDE



3: FRONT END



4: LEFT HAND SIDE

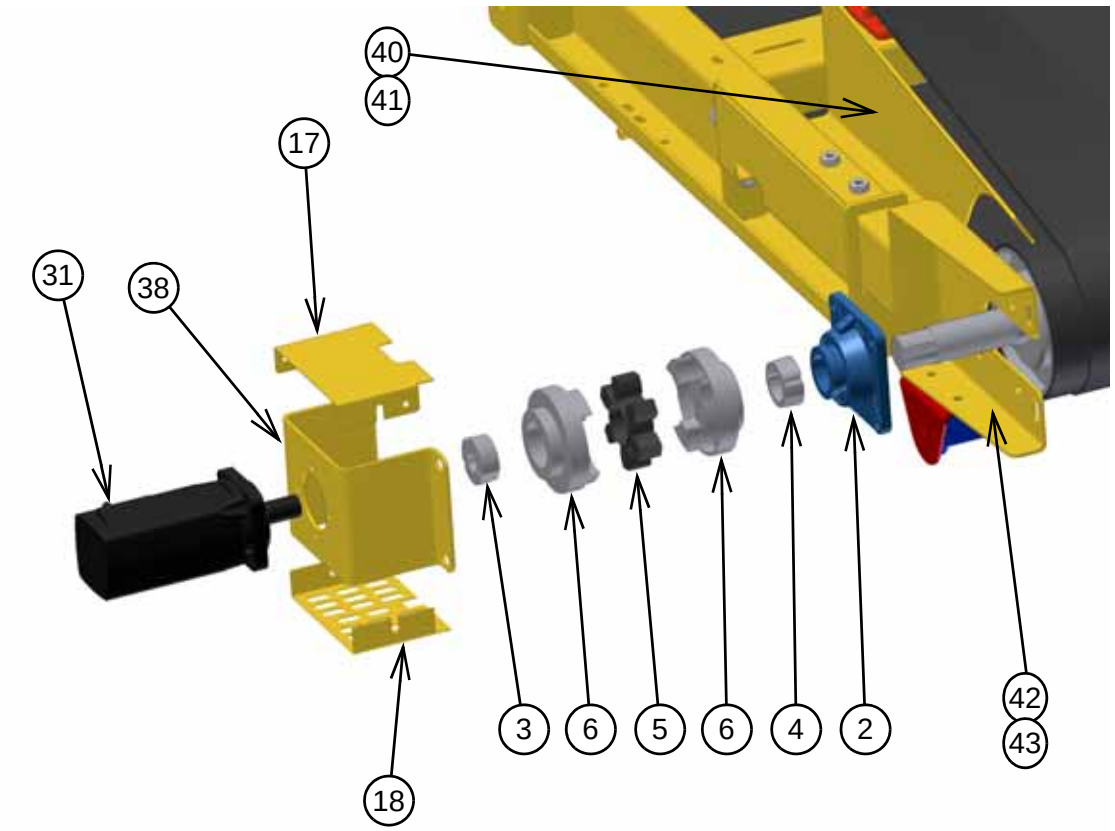


5: SHAFT ASSSEMBLY

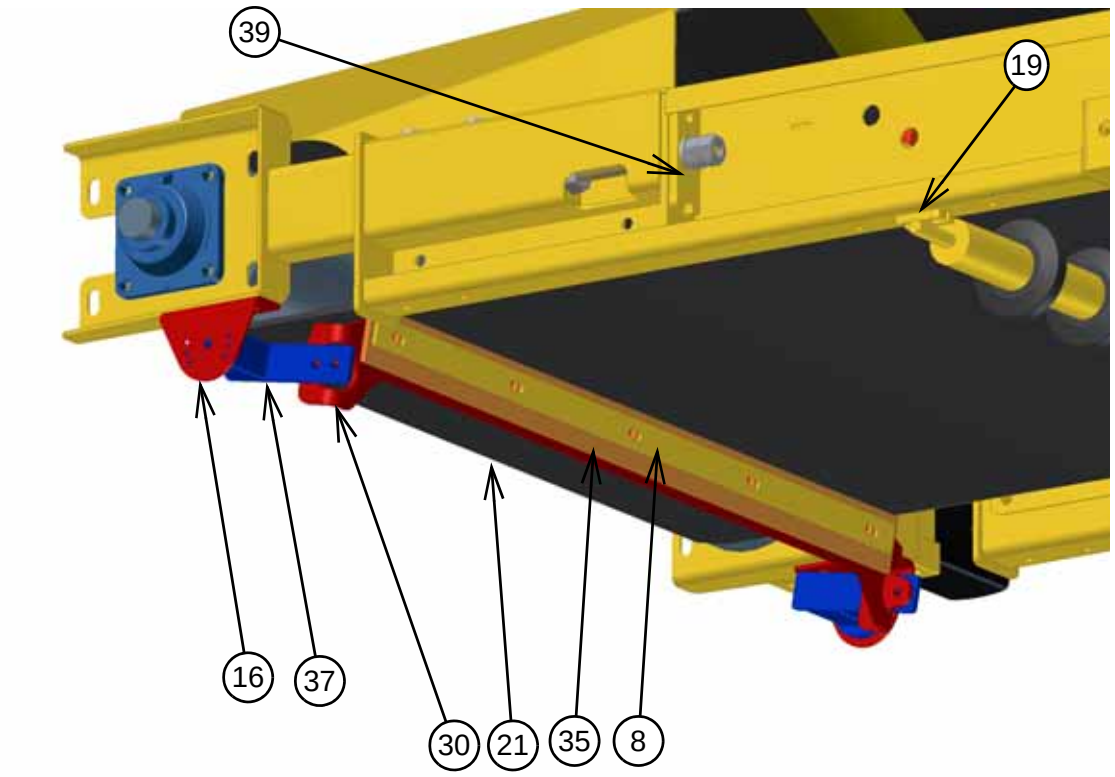
Part No.	Part Description	Quantity
1. BT3010	OUTER BEARING	2
2. FD4108	MINI TOP LINK	2
3. G3490000	SPRING SUPPORT LOWER	8
4. G4030000	REAR CROSS MEMBER	1
5. G4040000	CROSS MEMBER	4
6. G4080000	FRONT MESH HOOK	1
7. G4100000	BEARING HOUSING	2
8. G4110000	BEARING HOUSING CAP	1
9. G4130000	BOX SHAFT	1
10. G4140000	CENTER TUBE	1
11. G4170000	BOTTOM HOOK RETAINER	1
12. G4180000	BOTTOM HOOK RETAINER	1
13. G4320000	TENSIONING SPRING BAR	1
14. G4450000	RUBBER CLAMP	1

Part No.	Part Description	Quantity
15. G4840000	END SEAL	1
16. G4850000	END SEAL	1
17. G4870000	SCREEN BOX ACCESS COVER	1
18. G5220000	MOTOR DRIVE HOUSING	1
19. G5230000	MOTOR MOUNTING PLATE	1
20. G5640000	RATCHET	1
21. G5650000	RATCHET LINK BRACKET	1
22. G5680000	REAR CHUTE SUPPORT	1
23. G8610000	L/H SIDE PLT	1
24. G8620000	SIDE PLATE	1
25. G8630000	L/H CHUTE	1
26. G8640000	R/H CHUTE	1
27. G8650000	SPRING MOUNT	2
28. G8660000	SPRING MOUNT OPP-HAND	2
29. G8670000	NOSE ASSY	1
30. G8680000	FRONT CROSS MEMBER	1
31. G8710000	REAR RUBBER CLAMP	1
32. G8720000	SIDE RUBBER CLAMP	2
33. G8730000	IMPACT CHUTE	1
34. G8740000	IMPACT BASE WEAR LINER	1
35. G8750000	IMPACT REAR WEAR LINER	1
36. HM1026	AXIAL PISTON MOTOR	1

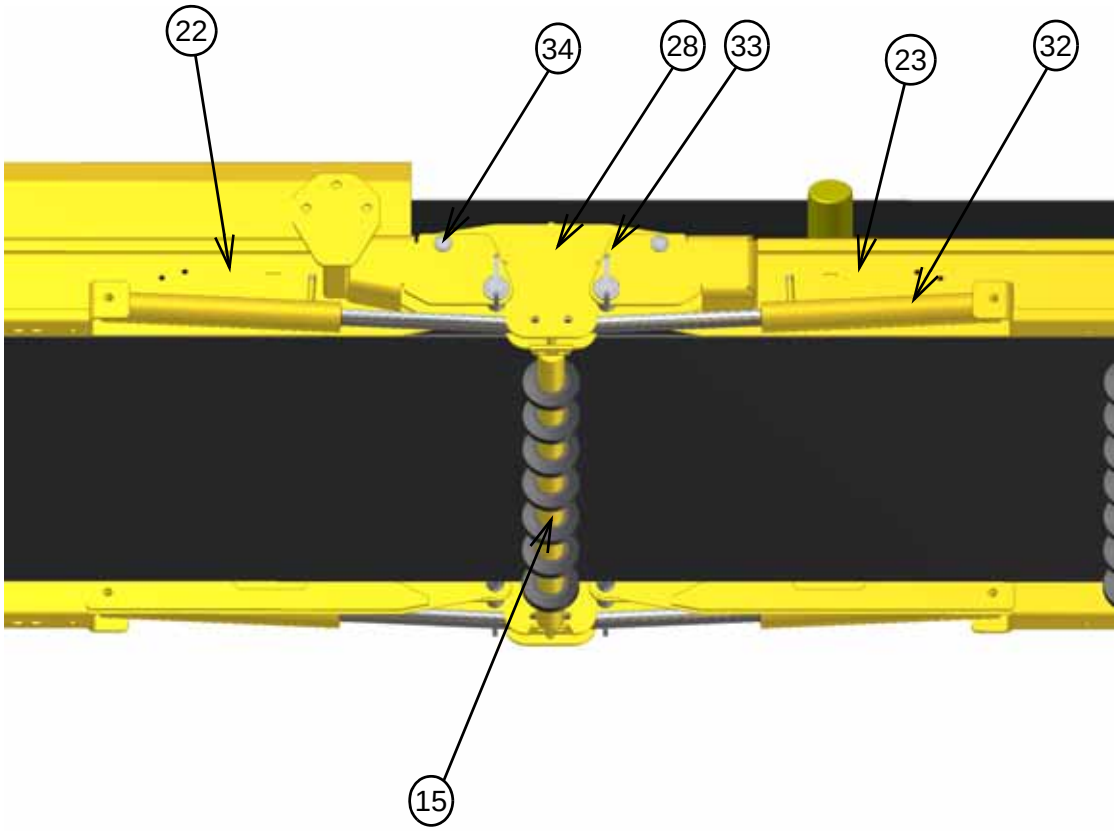
AA.23 Recirculation Fines Conveyor



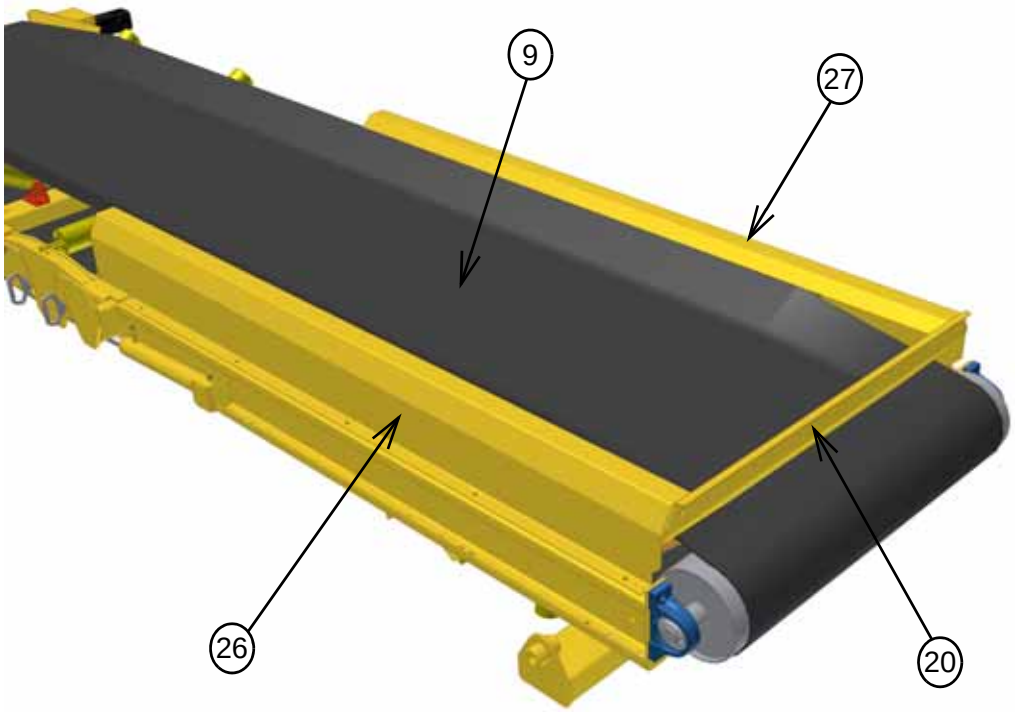
1: DRIVE COUPLING



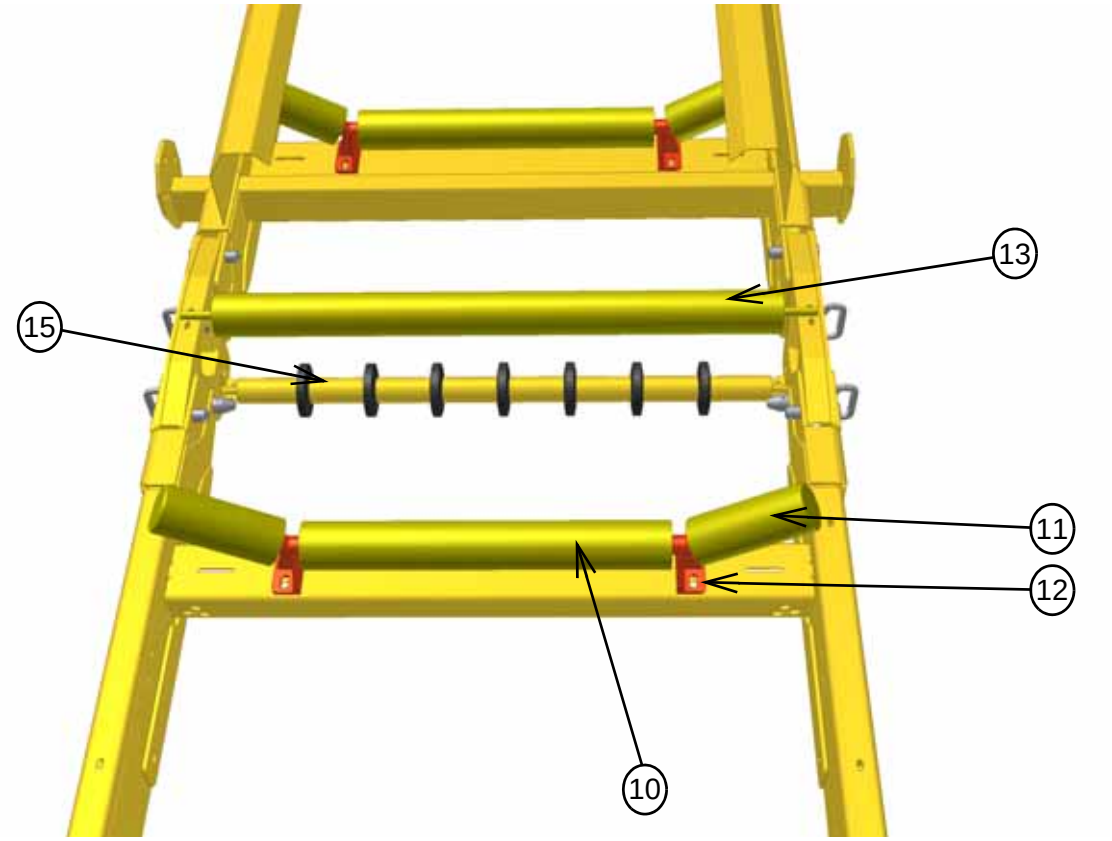
2: VIEW ON HEAD DRUM SCRAPER



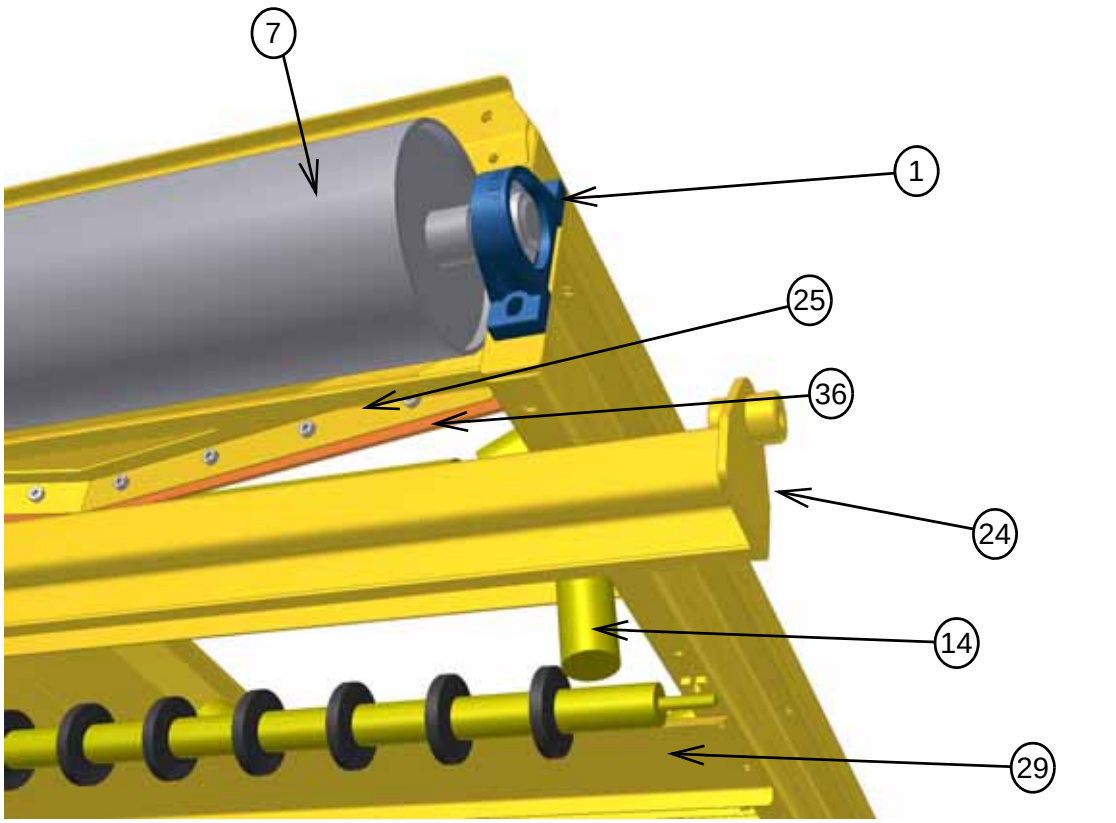
3: VIEW ON MID SCTION OF CONVEYOR



4:



5:

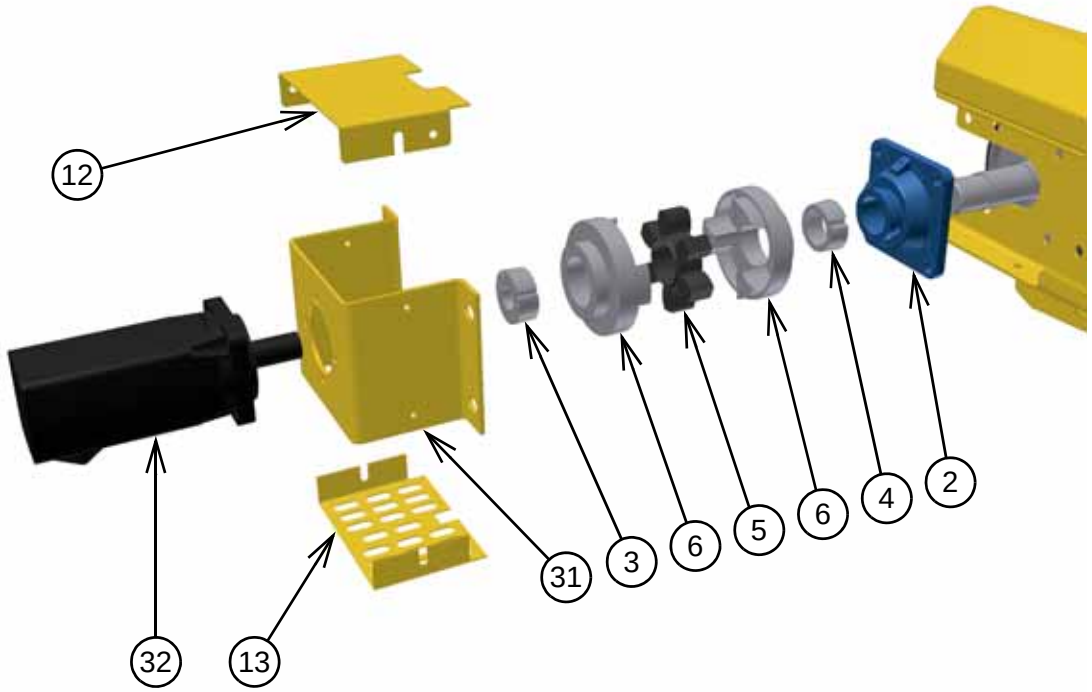


6: VIEW ON HEAD DRUM

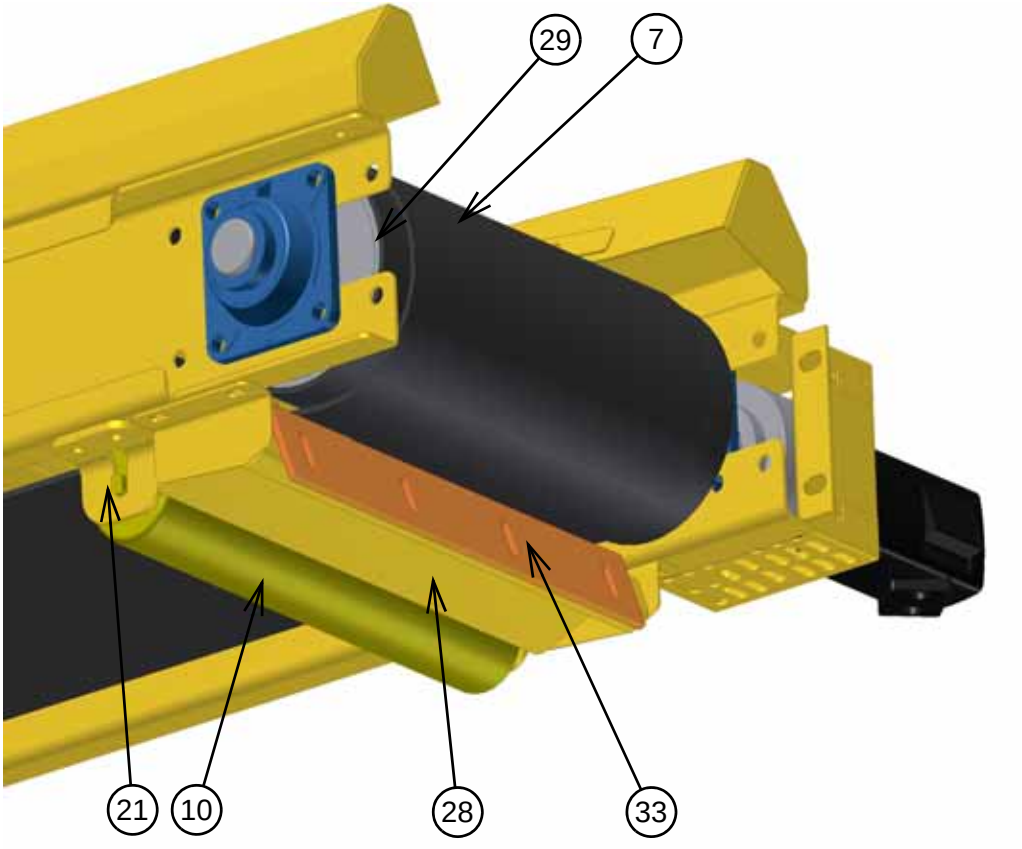
Part No.	Part Description	Quantity
1. BT1009	PLUMBER BEARING	2
2. BT2003	FLANGE BEARING	2
3. BT5005	2012/32 TAPER LOCK BUSH	1
4. BT5006	2012/50 TAPER LOCK BUSH	1
5. BT6514	SPIDER INSERT	1
6. BT6515	COUPLING INCLUDES 3, 4, 5	1
7. C0090000	TAIL DRUM	1
8. C2870000	HOPPER SCRAPER CLAMP	1
9. CB119001200	CONVEYOR BELT	1
10. CR1002	CENTRE ROLLER	2
11. CR1003	WING ROLLER	4
12. CR1004	30° ROLLER BRACKET	4
13. CR1005	RETURN ROLLER	1
14. CR1024	BELT TRACKING ROLLER	2
15. CR1040	DISC ROLLER	3
16. D4080000	ROSTA SCRAPER BRACKET	2
17. E0240000	COVER PLATES	1
18. E0250000	MOTOR MOUNTING BOTTOM BRACKET COVER	1
19. E4480000	RETURN ROLLER PACKER	4
20. E4490000	FLAIR BACK PLT	1
21. F0260000	HEAD DRUM	1
22. F2650000	BTM FRAME	1
23. F2660000	TOP FRAME	1
24. F2670000	BTM SUPPORT BEAM	1
25. F2680000	BELT FEEDER PLOUGH SCRAPER	1
26. F2690000	L/H SIDE FLAIR	1
27. F2700000	FEED BOOT PLATE	1
28. F2710000	PIVOT	2
29. F2730000	RETURN ROLLER GUARD	1
30. F4230000	SCRAPER PLATE	1
31. HM1006	CHARLYNN 2K395 BAA MOTOR	1
32. HR1053	HYDRAULIC RAM	4

Part No.	Part Description	Quantity
33. PN1133	TAIL CONV JOINT LOCK PIN	4
34. PN1142	REAR JACK RAM TOP PIN	4
35. PY1015	POLY SCRAPER	1
36. PY1019	POLY SCRAPER	1
37. RU5501	ROSTA SUPPORT	2
38. T0250000	MOUNTING BRACKET	1
39. T6130000	BEARING PUSH ADJUSTER BOLT	2
40. T6310000	MOUNTING PLATE	1
41. T6320000	MOUNTING PLATE	1
42. T6360000	HEAD DRUM SLIDER	1
43. T6370000	HEAD DRUM SLIDER	1

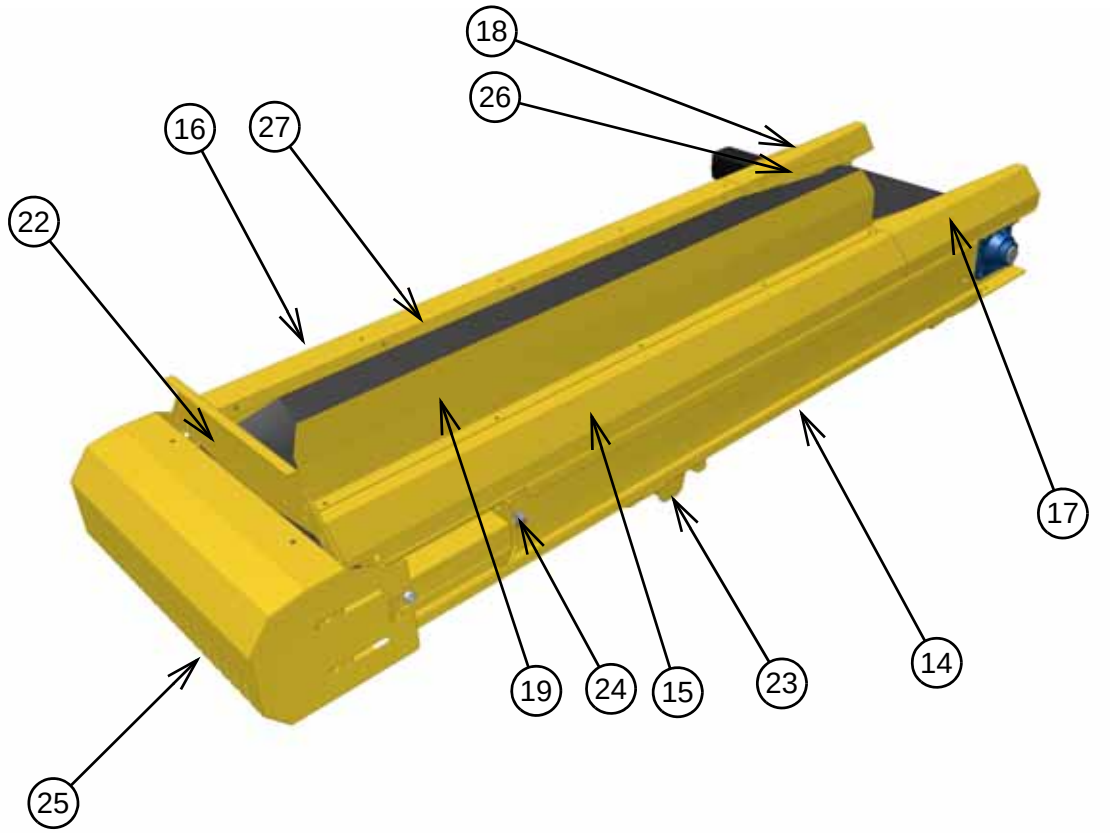
AA.24 Recirculation Side Conveyor



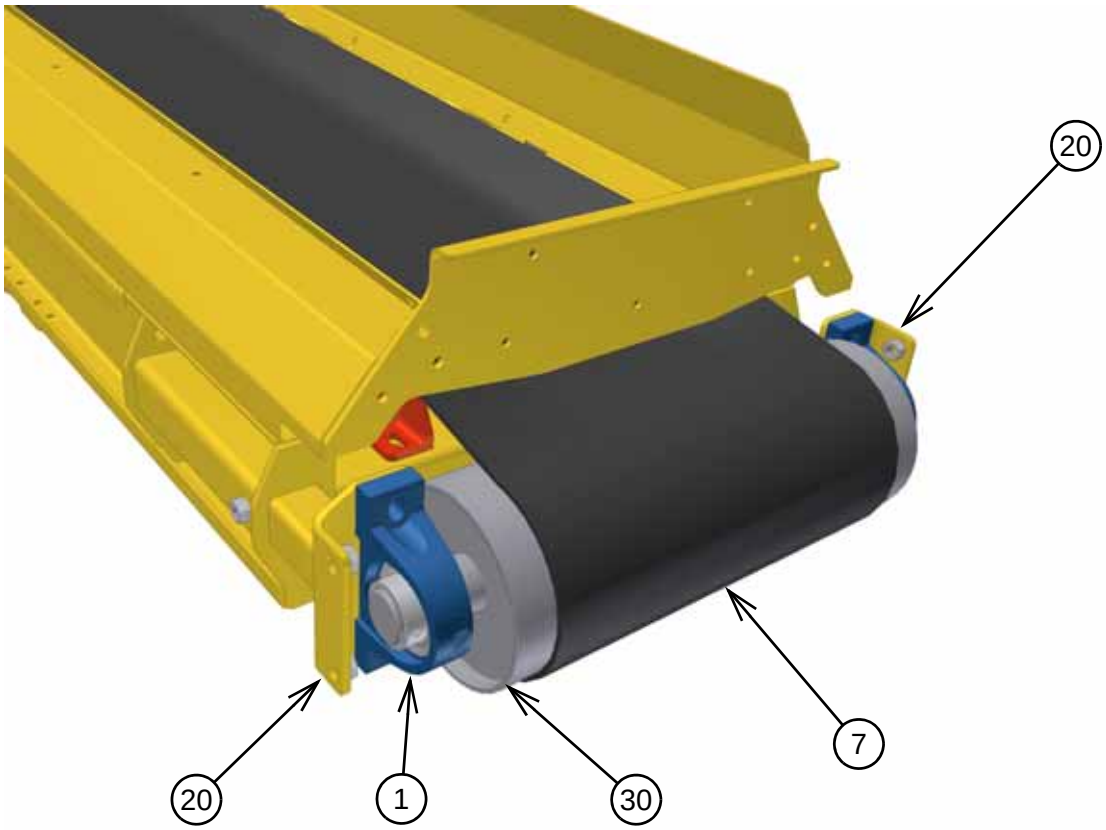
1: DRIVE COUPLING



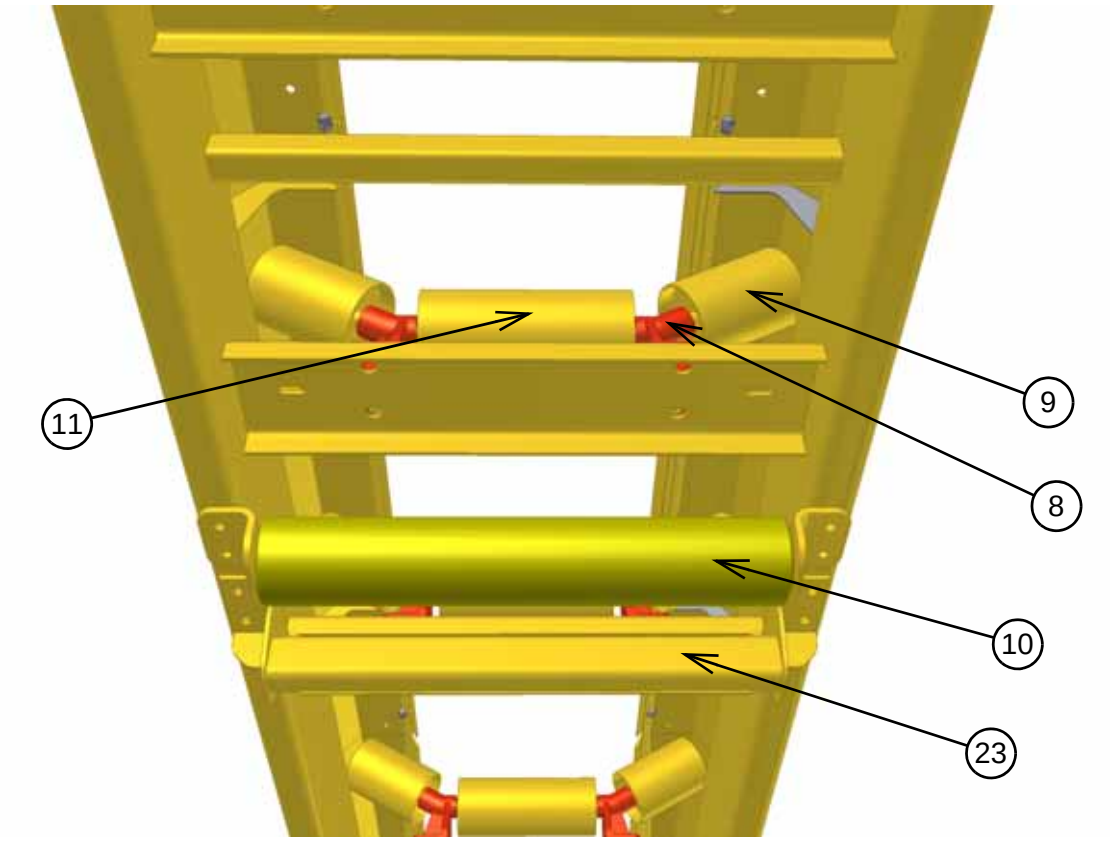
2: VIEW ON HEAD DRUM



3: VIEW OF CONVEYOR



4: VIEW ON TAIL DRUM



5: VIEW OF CONVEYOR ROLLERS

Part No.	Part Description	Quantity
1. BT1009	PLUMBER BEARING	2
2. BT2003	FLANGE BEARING	2
3. BT5005	2012/32 TAPER LOCK BUSH	1
4. BT5006	2012/50 TAPER LOCK BUSH	1
5. BT6514	SPIDER INSERT	1
6. BT6515	COUPLING INCLUDES 3, 4, 5	1
7. CB56500500	CONVEYOR BELT	1
8. CR1004	30° ROLLER BRACKET	2
9. CR1012	SCONV WING ROLLER	2
10. CR1018	CENTRE ROLLER	2
11. CR1026	CENTRE ROLLER	1
12. E0240000	COVER PLATES	1
13. E0250000	MOTOR MOUNTING BOTTOM BRACKET COVER	1
14. E4100000	CONVEYOR FRAME ASSY	1

Part No.	Part Description	Quantity
15. E411 0000	L/H SIDE FLAIR	1
16. E4120000	R/H SIDE FLAIR	1
17. E4130000	L/H HEAD FLAIR	1
18. E414000	R/H HEAD FLAIR	1
19. E4150000	FLAIR SPILL PLATE	1
20. E4160000	BEARING ADJUSTER	2
21. E4170000	RETURN ROLLER BRACKET	4
22. E4180000	SIDE FLAIR BACK PLATE	1
23. E4210000	SLIDE CROSS MEMBER	1
24. E4370000	BEARING ADJUSTER BOLT	2
25. E4400000	TAIL DRUM GUARD	1
26. E4430000	TOP FLAIR RUBBER CLAMP	2
27. E4450000	SIDE FLAIR RUBBER CLAMP	2
28. E4500000	HEAD ROLLER GUARD/ HEAD SCRAPER	1
29. E4510000	HEAD DRUM	1
30. E4530000	TAIL DRUM	1
31. E1440000	MOTOR MOUNTING BRACKET	1
32. HM1017	CHARLYNN 2K395 BAA MOTOR	1
33. PY1039	SCRAPER BLADE	1

AA.25 Stickers - English

1



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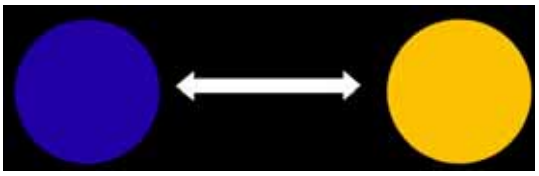
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TRACKING PROCEDURE

1. START ENGINE (ENGINE REVS MUST NOT EXCEED 1100 R.P.M.)
2. PRESS INTERLOCK IN
3. PRESS MAIN CONVEYOR RAISE
4. RAISE JACK LEGS FULLY
5. CHECK ALL AROUND MACHINE FOR OBSTACLES
6. PRESS TRACK, THEN USING THE REMOTE HAND SET OR HARD WIRE DRIVE, SET OFF (DO NOT RIDE ON MACHINE WHILST TRACKING)

N.B. THE REMOTE HAND SET MUST BE FULLY RECHARGED AT REGULAR INTERVALS!

CRUSHER STARTING PROCEDURE

1. CHECK THE HYDRAULIC OIL, ENGINE OIL AND WATER (THIS MUST BE DONE EVERY DAY)
2. START ENGINE ON IDLE
3. BOTH CRUSHER TRACKS MUST BE IN CONTACT WITH FIRM LEVEL GROUND TO AVOID EXCESS VIBRATION & ROCKING
4. BOTH JACKING LEGS MUST BE LOWERED AND IN CONTACT WITH THE GROUND AT ALL TIMES WHILST THE MACHINE IS BEING OPERATED
5. MAIN CONVEYOR MUST BE LOWERED AND THE SIDE CONVEYOR UNFOLDED BEFORE OPERATING
6. GRADUALLY ADJUST ENGINE REVS TO 1000 R.P.M. THEN BEGIN IN THIS SEQUENCE:- SIDE CONVEYOR-MAGNET-MAIN CONVEYOR-CRUSHER-FEEDER ALLOWING TIME FOR EACH MOVING SECTION TO REACH FULL SPEED
7. THE JACK LEGS MAY NEED TO BE RAISED OR LOWERED DEPENDING ON MACHINE VIBRATION

TO STOP THE MACHINE, REVERSE THE SEQUENCE ALLOWING TIME FOR EACH MOVING SECTION TO COME TO A COMPLETE STOP, MAKING SURE ALL MATERIAL HAS BEEN DISCHARGED
LOWER ENGINE R.P.M. AND ALLOW TO IDLE BRIEFLY, THEN STOP ENGINE.
IMPORTANT! ENGINE R.P.M. MUST NOT EXCEED 1900 R.P.M.

13

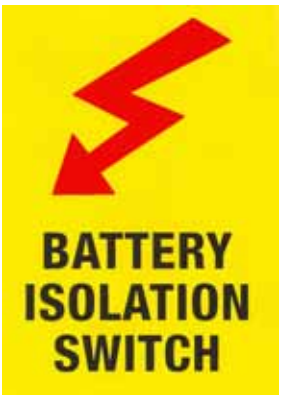
DAILY CHECKS

CLEAN AIR FILTER
CHECK ENGINE OIL LEVEL
CHECK HYDRAULIC OIL LEVEL
CHECK WATER LEVEL
CHECK FOR LEAKS

WEEKLY CHECKS

CHECK CONDITION OF CONVEYOR BELTS AND OTHER MOVING PARTS
CHECK OIL LEVEL IN FEEDER (SEE OPERATOR MANUAL)
CLEAR ANY OBSTRUCTIONS IN THE GRIZZLY BARS AND JAWS
CHECK TENSION ON THE FLY WHEEL DRIVE BELTS
GREASE ALL BEARINGS (SEE OPERATOR MANUAL)
CLEAR ANY BUILD UP OF DUST FROM THE OIL COOLER AND THE RADIATOR USING COMPRESSED AIR
CHECK ALL BOLTS AND PANELS ARE SECURE AND IN PLACE

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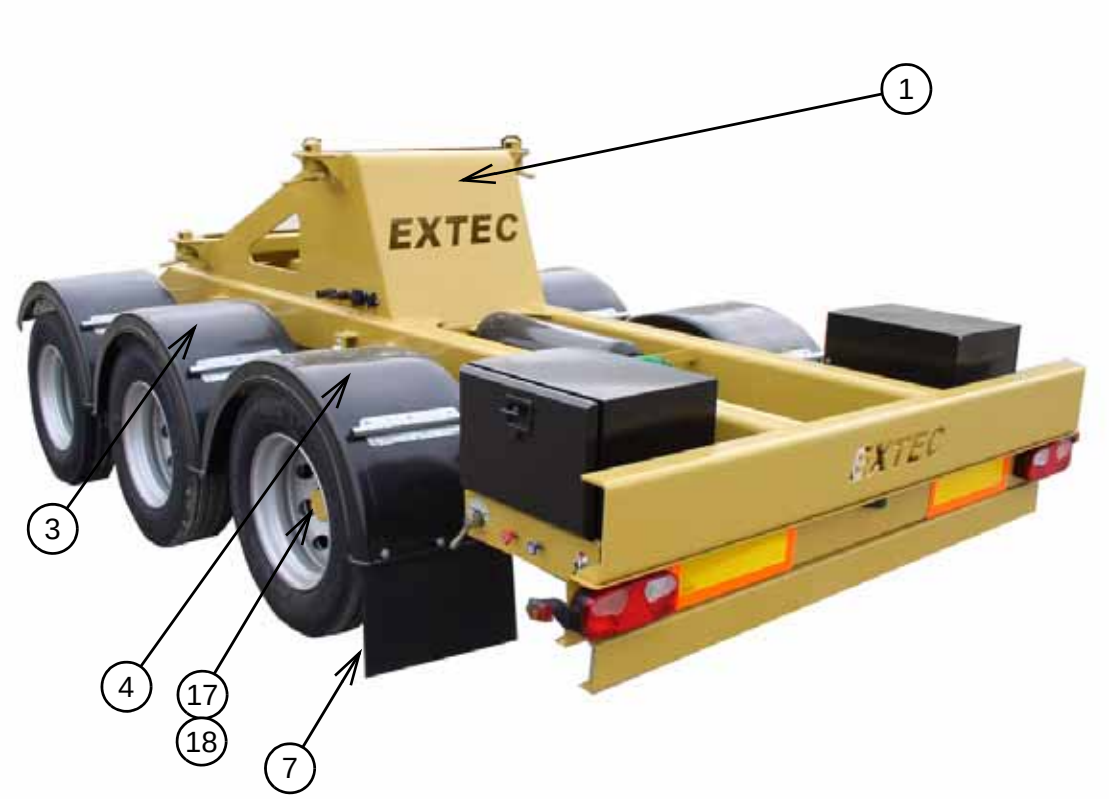
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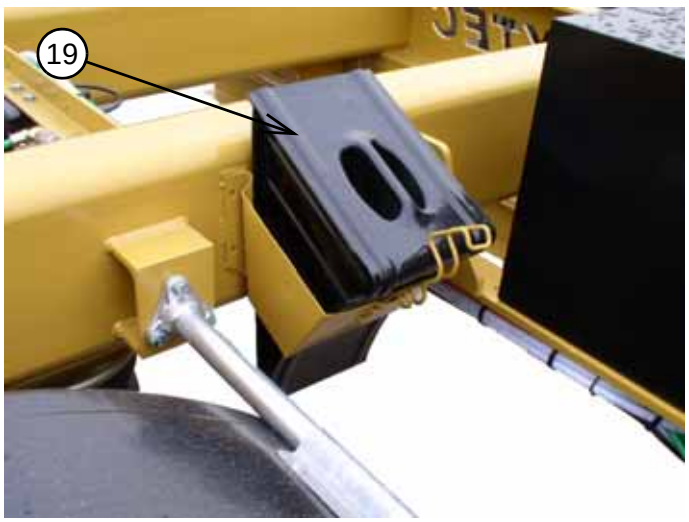
Part No.	Part Description	Quantity
1. DE0021	IMPORTANT SIDE CONVEYOR	2
2. DE0022	IMPORTANT CHECK OIL LEVELS DAILY	4
3. DE0023	DANGER STOP EQUIPMENT	4
4. DE0024	CAUTION - MAX ENGINE REVS 1900 RPM	2
5. DE0025	DANGER - DRIVE GUARDS MUST BE FITTED	4
6. DE0026	IMPORTANT MAX TRACKING SPEED	2
7. DE0027	EMERGENCY STOP 100X90 MM	5
8. DE0039	WARNING - AUTOMATIC MACHINEMAY START WITHOUT WARNING	4
9. DE0051	DANGER - HEAD, EAR & EYE PROTECTION	2
10. DE1005	CE YEAR DATE DECAL	2
11. DE1007	FORWARD/REVERSE DECAL BLUE YELLOW DOTS	4
12. DE1013	TRACKING STARTING PROCEDURE	1
13. DE1014	DAILY WEEKLY CHECKS DECAL	1
14. DE1043	BATTERY ISOLATION SWITCH	1
15. DE1044	ANCHOR POINT (LEFT)	1
16. DE1045	ANCHOR POINT (RIGHT)	1
17. DE2048	PRIMARY IMPACTOR	2
18. DE5001	DANGER - FALLING MATERIAL HAZARD (HARD HAT)	4
19. DE5023	DANGER - FALLING HAZARD/ SWITCH OFF, LOCKOUT & TAGOUT	1
20. DE5003	DANGER -STRONG MAGNETIC HAZARD	2
21. DE5004	DANGER - FALLING HAZARD	1
22. DE5005	DANGER - ENTANGLEMENT HAZARD SWITCH OFF, LOCKOUT	1
23. DE5006	DANGER - CRUSHING / SHEARINGHAZARD	1
24. DE5007	DANGER ENTANGLEMENT HAZARD	2
25. DE5008	DANGER - CRUSHING HAZARD	4

Part No.	Part Description	Quantity
26. DE5009	DANGER -FLYING MATERIAL HAZARD DO NOT USE PLATFORM	1
27. DE5010	DANGER - ENTANGLEMENT HAZARD SWITCH OFF, LOCKOUT	2
28. DE5011	DANGER - SKIN INJECTION HAZARD DO NOT USE HANDS	2
29. DE5012	DANGER - SKIN INJECTION HAZARD	2
30. DE5013	DANGER - IMPACT HAZARD	2
31. DE5014	DANGER - LOOSE OR BAGGY CLOTHING	1
32. DE5016	DANGER - PRIOR TO TRANSPORT	1
33. DE5018	DANGER - EXCEEDS 90dB (A)	1
34. DE5019	DANGER - LOCKOUT PROCEDURE	1
35. DE5020	DANGER - CHECK FILTERS ON REGULAR BASIS	1
36. DE5021	DANGER - READ OPERATORS MANUALBEFORE MAINTANING MC	1
37. DE5022	DANGER - STOP & LOCKOUT PLANTBEFORE MAINTENANCE	1

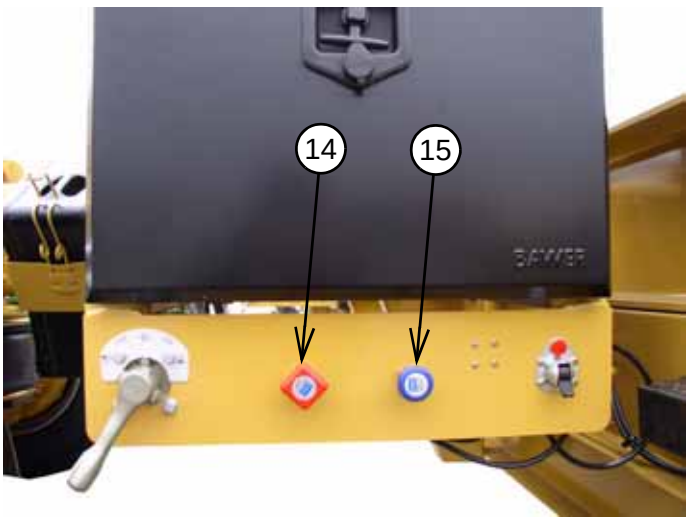
AA.26 Transport Bogie and Fifth Wheel - Optional



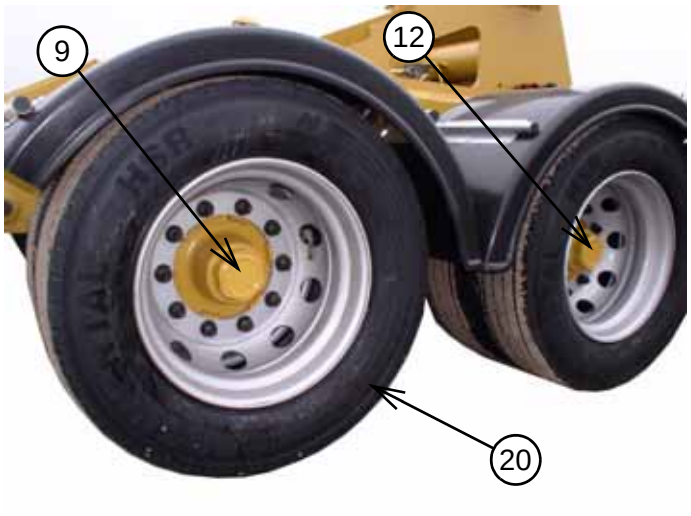
1: VIEW ON TRANSPORTATION BOGIE



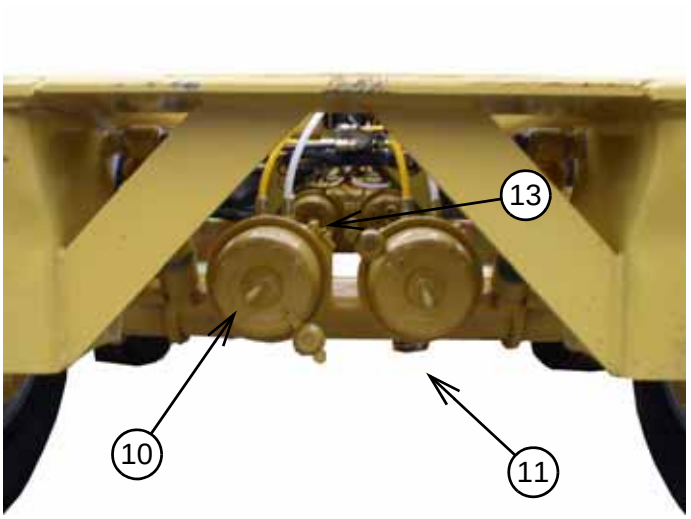
2: WHEEL CHOCK



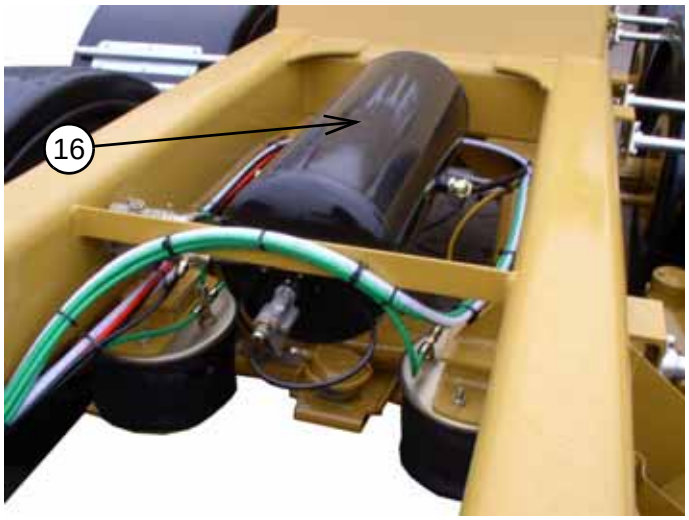
3: VIEW ON SHUNT & PARK VALVES



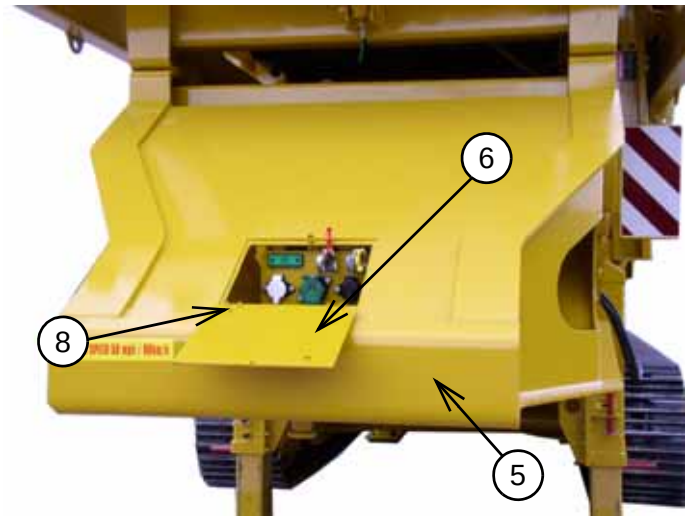
4: SIDE VIEW OF BOGIE



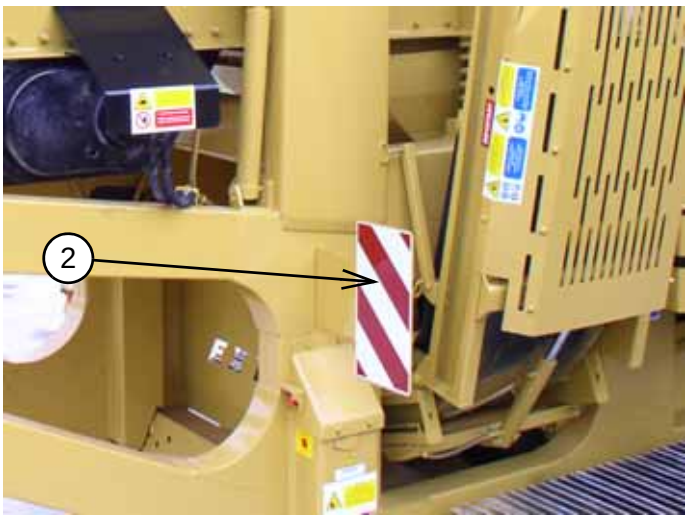
5: FRONT AXLE AIR CHAMBERS



6: VIEW ON TOP OF BOGIE



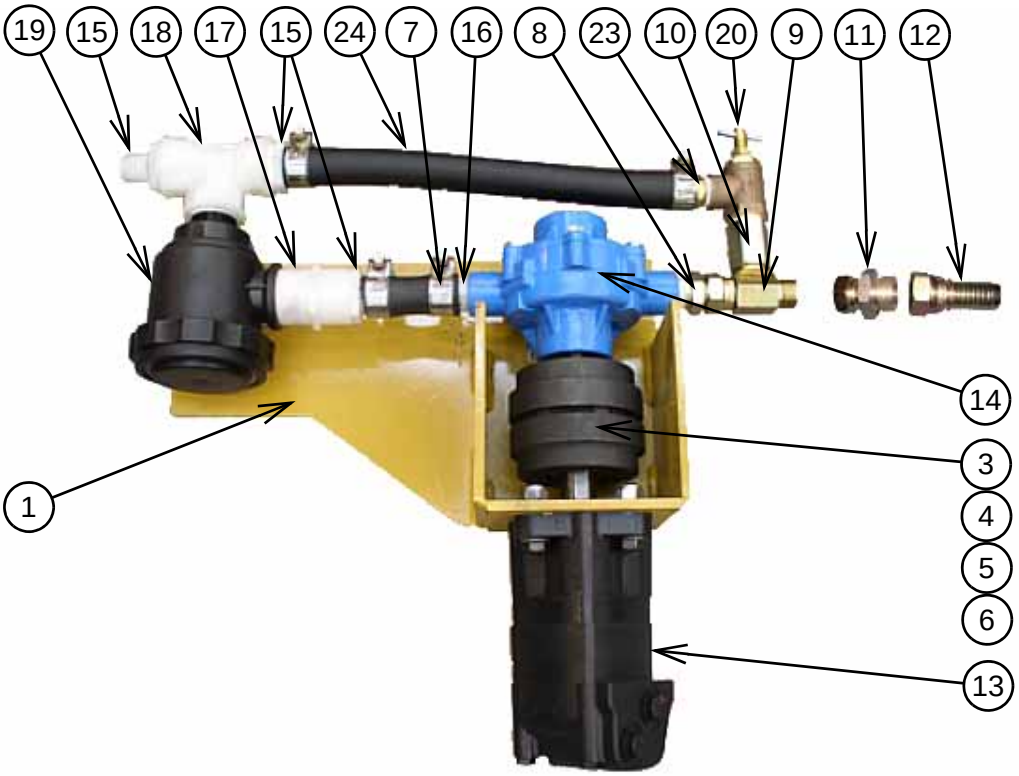
7: VIEW ON FIFTH WHEEL NECK



8: CHEVRON BOARD

Part No.	Part Description	Quantity
1. A6270000	BOGIE ASSEMBLY COMPLETE	1
2. A6340000	FRONT HAZARD WARNING MOUNTING PLATE	2
3. A6360000	MUDGUARD - FIXED AXLE	4
4. A6370000	MUDGUARD - STEER AXLE	2
5. A14440000	FIFTH WHEEL RUBBING NECK	1
6. A15490000		1
7. AX3503	MUDFLAP	6
8. FD2105	HINGE	1
9. TR519436	FRONT AXLE COMPLETE (13 TONNE, 40 x 180)	
10. TR519441	AXLE AIR C/BER-24/30SP BRAKE	
11. TR519442	FRONT AXLE AUTO SLACK ADJUSTER	
12. TR519451	CENTRE AXLE COMPLETE(13 TONNE, 40 x 180)	
13. TR519456	CENTRE AXLE AUTO SLACK ADJUSTER	
14. TR519480	PARK VALVE	
15. TR519481	SHUNT VALVE	
16. TR519482	60 LTR AIR RESERVOIR	
17. TR519486	PARK VALVE	
18. TR519487	SELF STEER AXLE AUTO SLACK ADJUSTER (L/H)	
19. UC5503	WHEEL CHOCK & MOUNTING ASSEMBLY	2
20. WT1016	WHEEL	12

AA.27 Water Pump - Optional



1: WATER PUMP



2: WATER PUMP FITTED

Part No.	Part Description	Quantity
1. B10860000	WATER PUMP BASE PLATE ASSY	1
2. B10870000	WATER PUMP DRIVE COVER	1
3. BT5001	1610/32 TAPER LOCK BUSH	1
4. BT6543	H110F COUPLING	2
5. BT6545	1610/ 15/16 TAPER LOCK BUSH	1
6. BT6546	H110N INSERT	1
7. FAHC1031	MIKALOR CLAMP 29-31MM	6
8. HA03400044	¾" M/M ADAPTOR	1
9. HA03400049	¾" M/M/F TEE	1
10. HA03400058	¾" BARREL NUT	1
11. HA1000021	1 X ¾" M/F SWIVEL ADAPTOR	1
12. HA1000039	1 FEMALE INSERT	1
13. HM1005	CHARLYNN 2K155 BAA MOTOR	1
14. HP2004	WATER PUMP HYPRO 7560C	1
15. HP2006	HOSE TAIL	3
16. HP2009	HOSE TAIL	1
17. HP2010	HOSE TAIL	1
18. HP2011	TEE	1
19. HP2012	SUCTION FILTER	1
20. HP2013	WATER REGULATING VALVE	1
21. HV1011	1 LEVER SPOOL VALVE	1
22. HV1502	SPOOL LEVER	1
23. HP2014	HOSE BARB	1
24. RU6039	1" DELIVERY HOSE	3"

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Appendix B Drawing Pack

	Drawing Number	Title	Issue No	Date
1.	IMPACTOR CONTROL CONN	TED6300sht9		26/04/04
2.	IMPACTOR CONTROLLER CONN	TED6300sht10		26/04/04
3.	ENGINE SCHEMATIC IMPACTOR DEUTZ	TED6300sht11		26/04/04
4.	IMPACTOR RECEIVER AND LOOM	TED6300sht12		26/04/04
5.	IMPACTOR SOLENOID CONTROL PANEL	TED6300sht13		26/04/04
6.	IMPACTOR ENGINE PANEL ELECTRONIC	TED6300sht14		26/04/04
7.	IMPACTOR AUX LOOMS	TED6300sht15		26/04/04
8.	CRUSHER JAW CONTROL		REV1	
9.	LAMP DIAGNOSTICS		REV 1	
10.	SCHEMATIC FOR IMPACTOR RECIRC, REL, TRACK VALVE LOOM	TED65000shtA		26/04/07

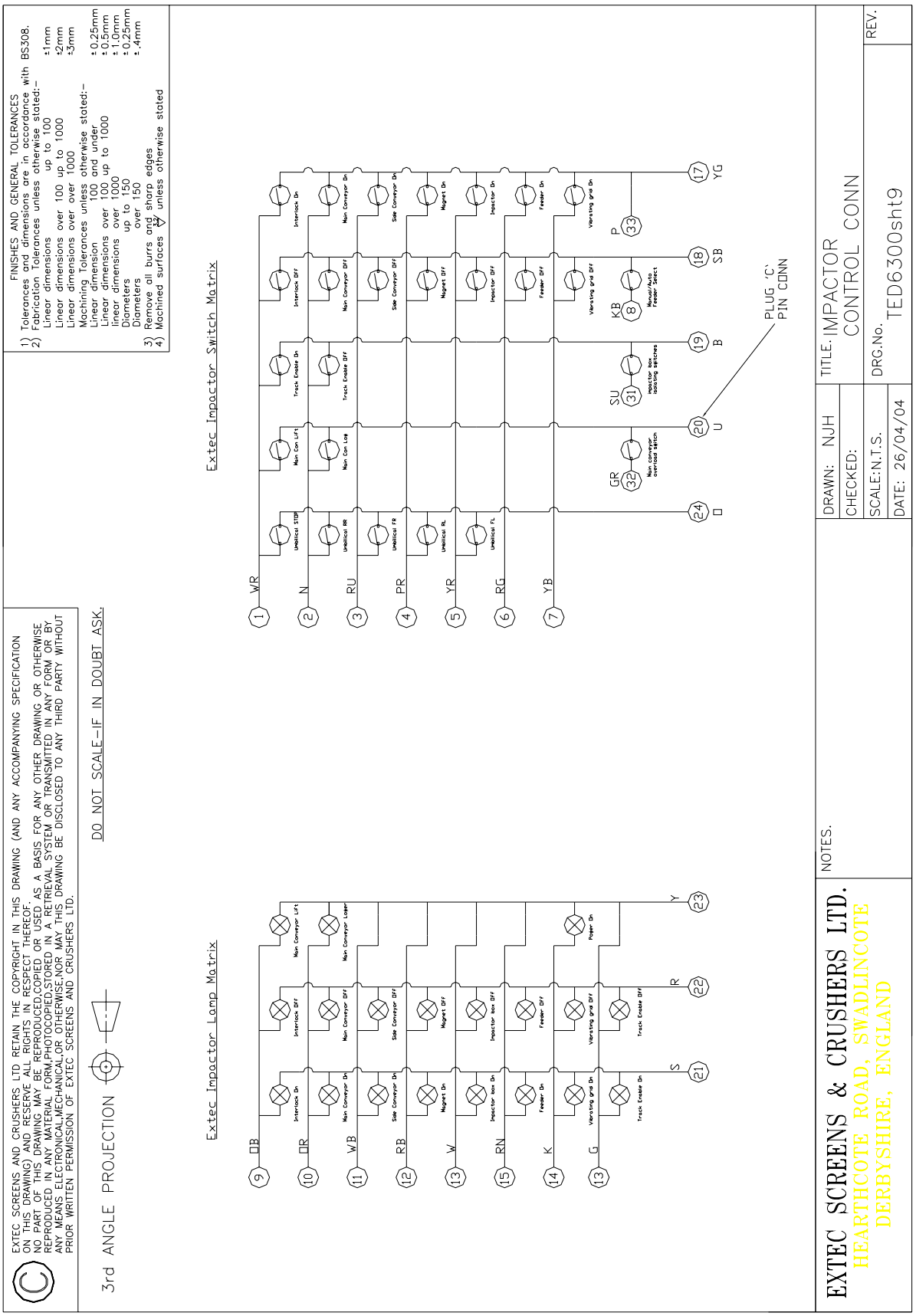


Figure B-1: CONTROL CONNECTOR

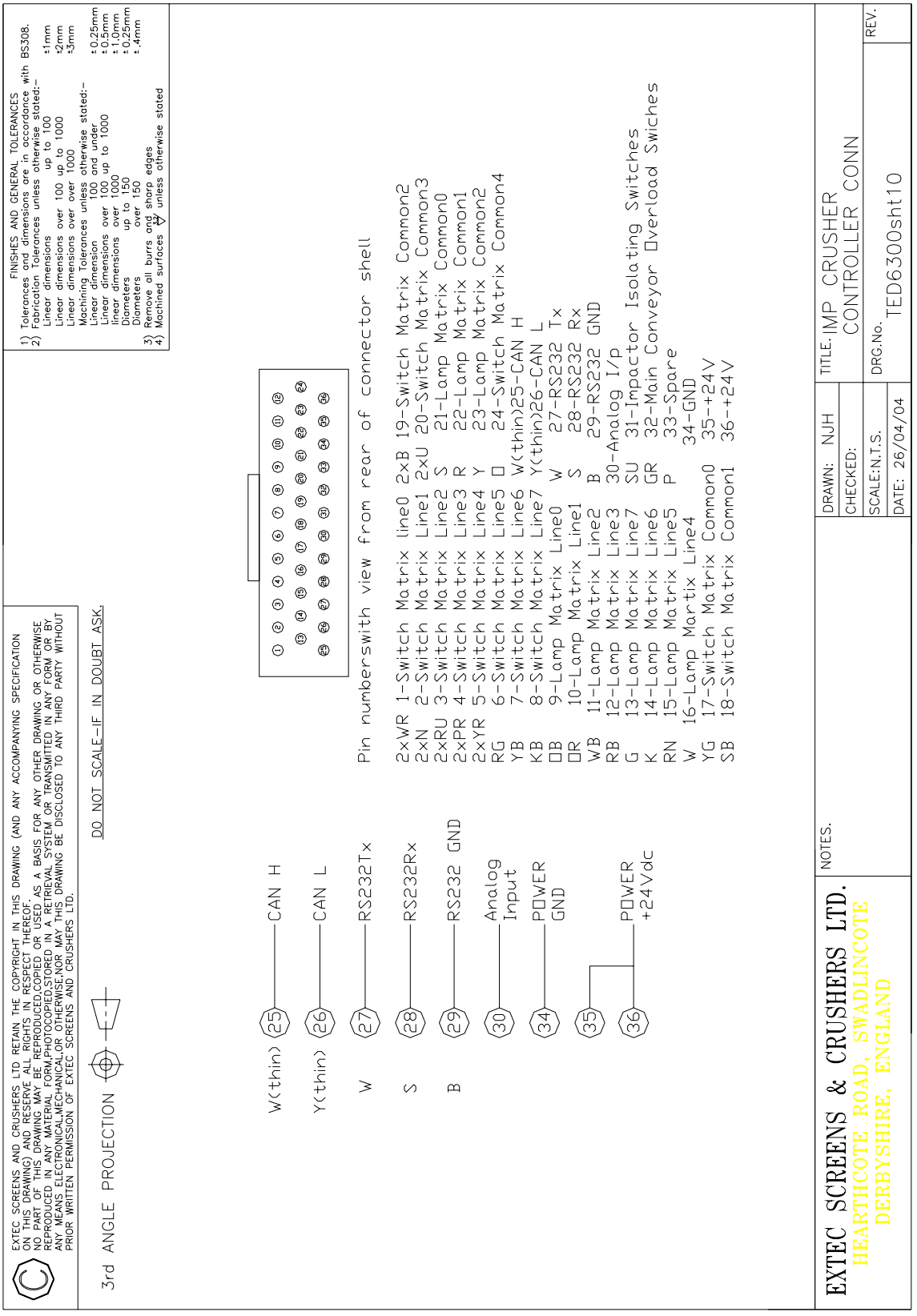


Figure B-2: CONTROLLER CONNECTOR

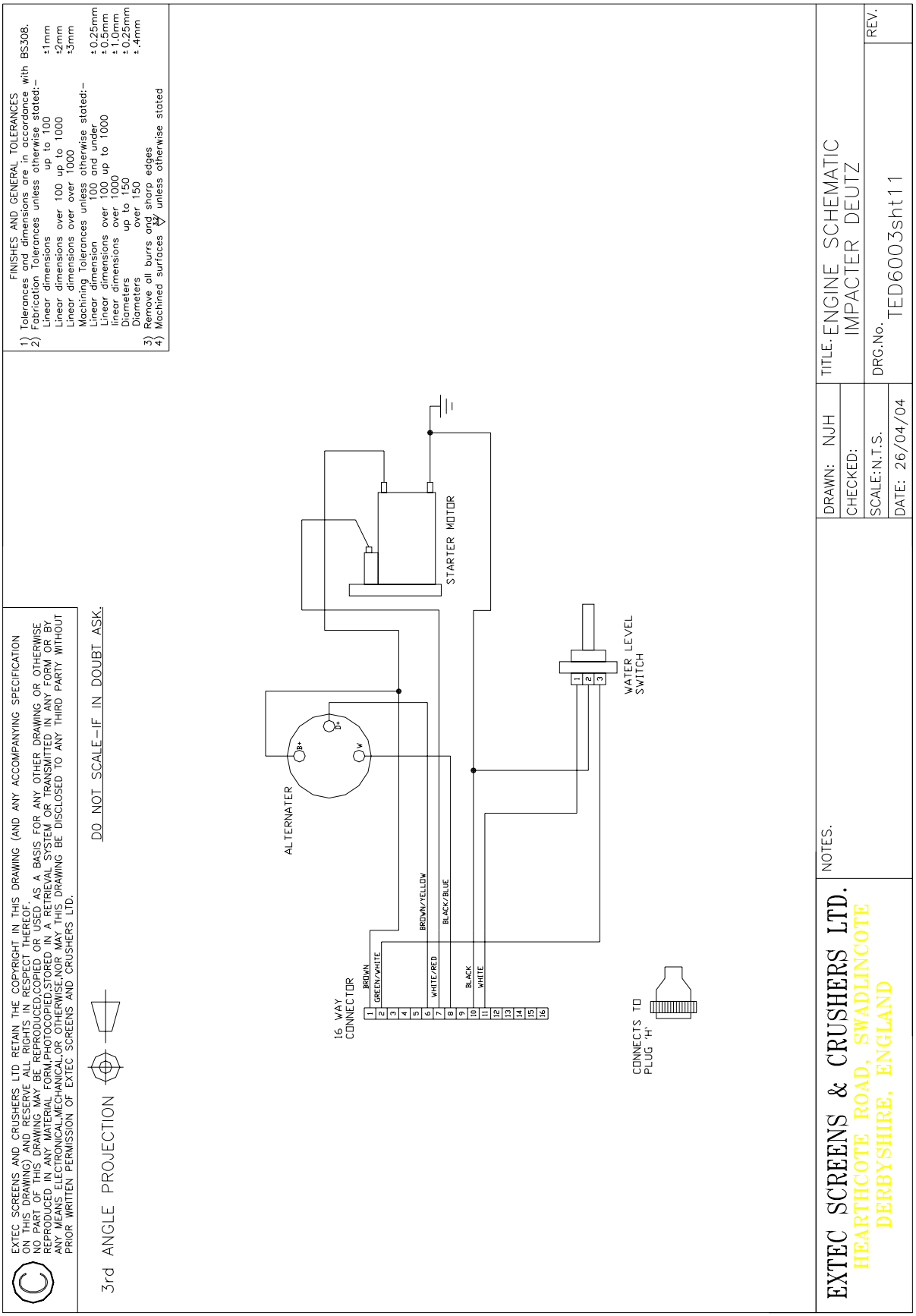


Figure B-3: ENGINE SCHEMATIC

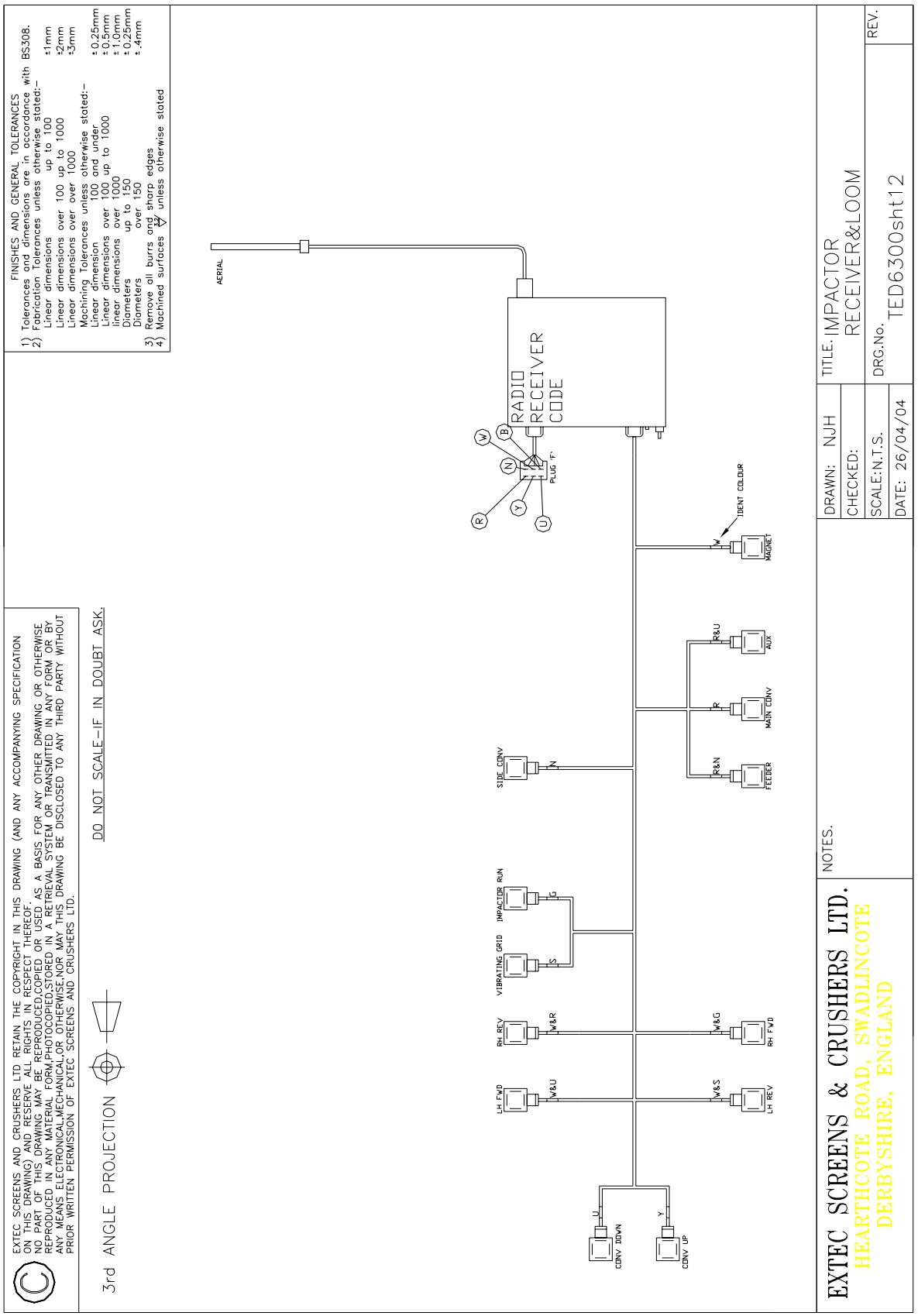


Figure B-4: RECEIVER AND LOOM

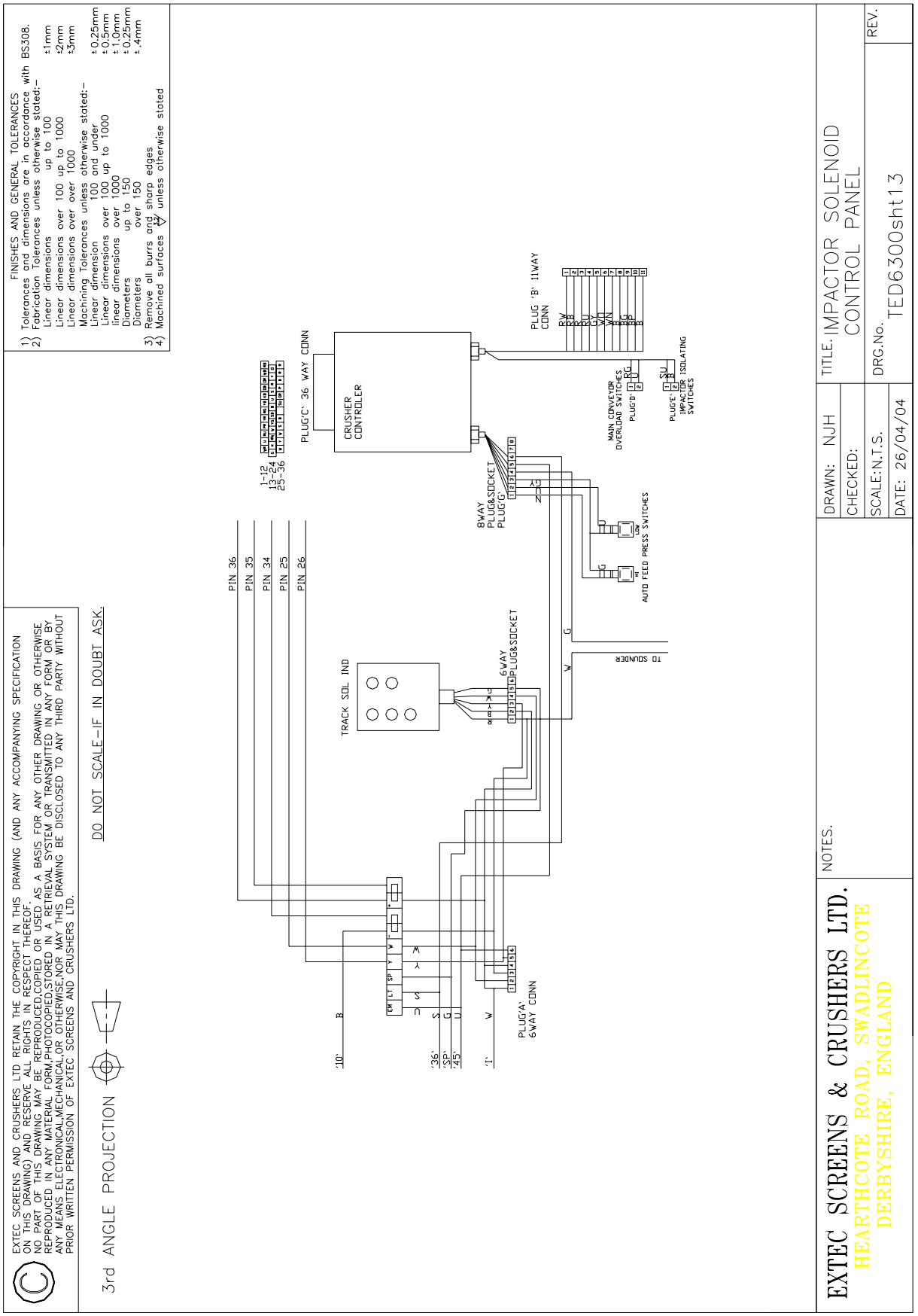


Figure B-5: SOLENOID CONTROL PANEL

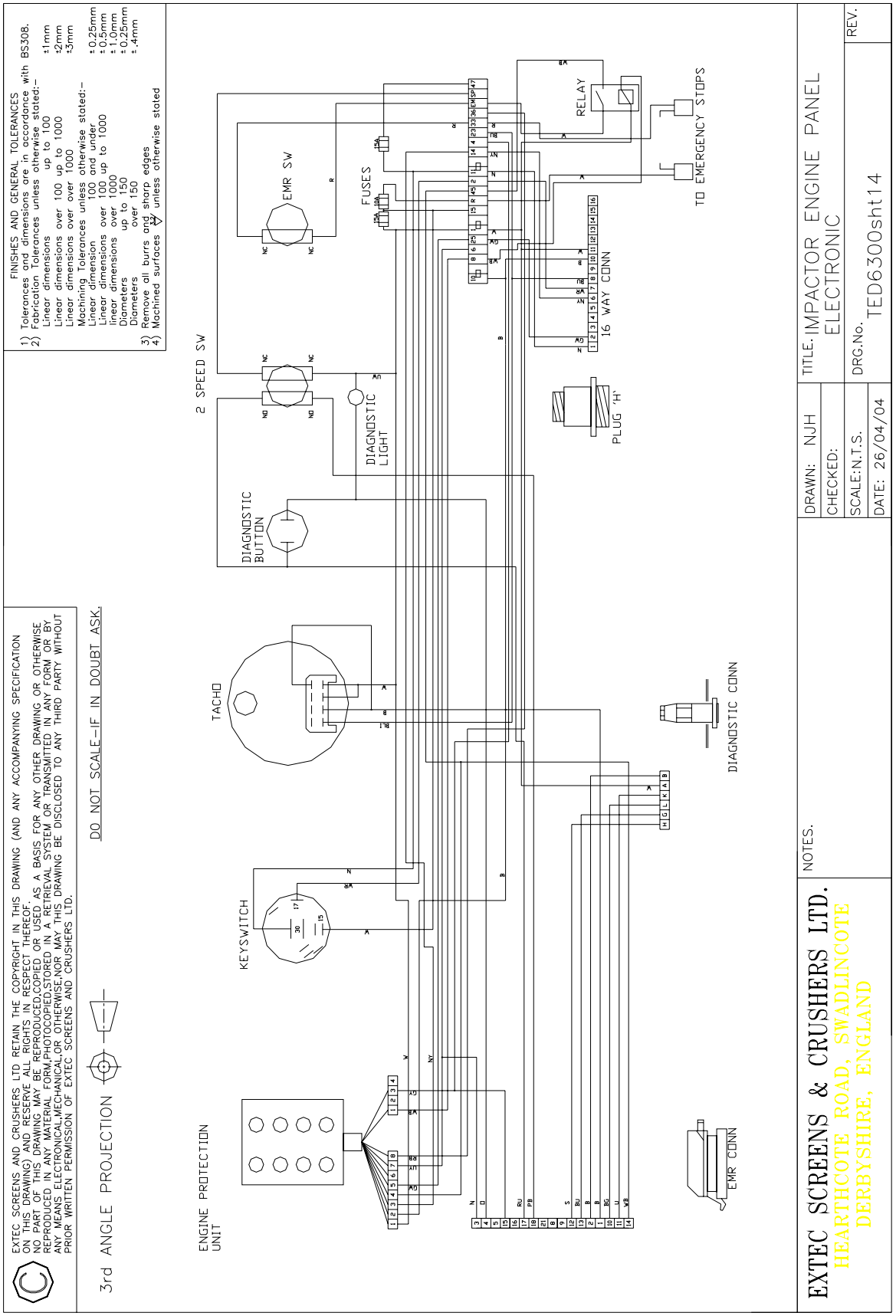


Figure B-6: ELECTRONIC PANEL

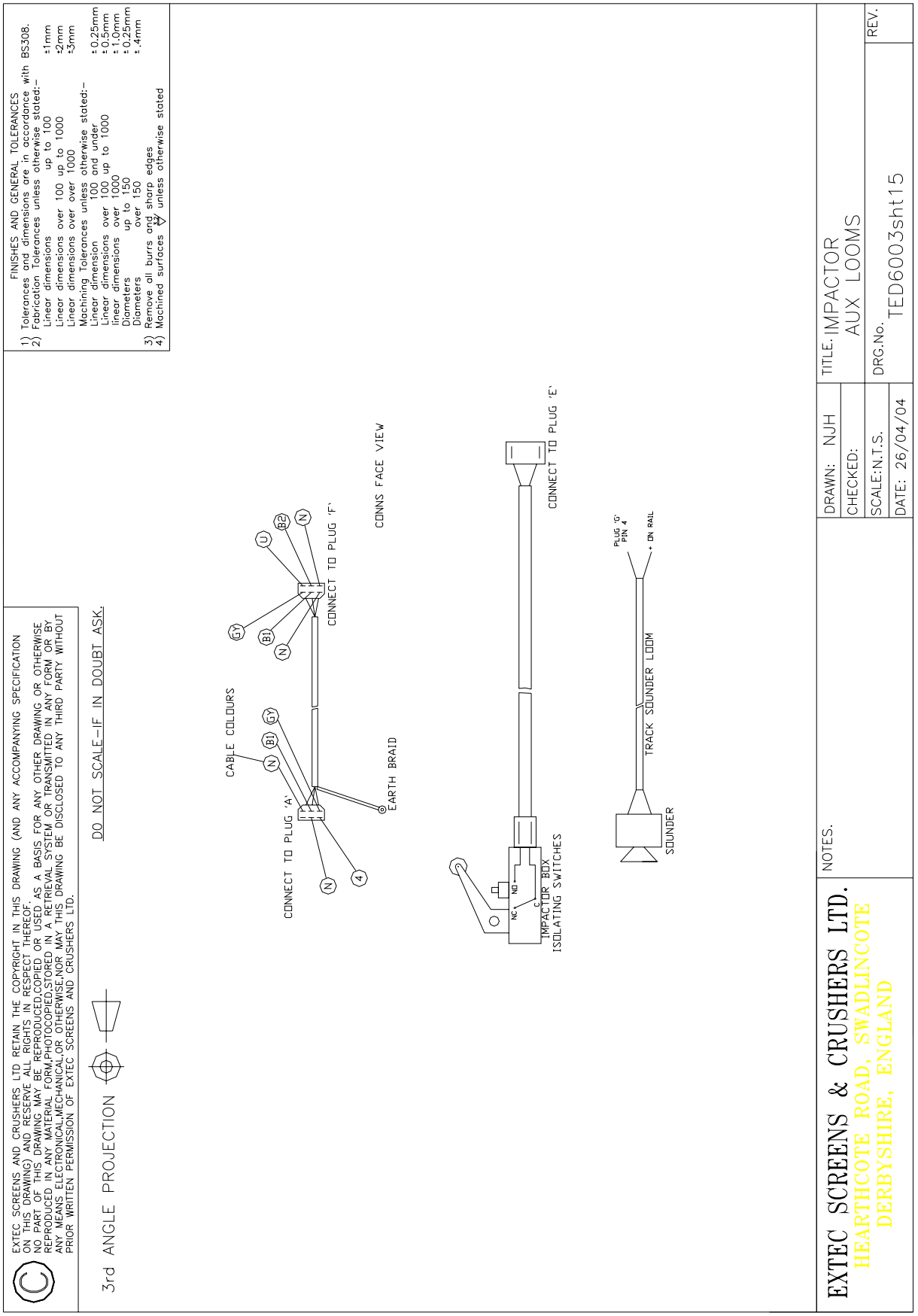


Figure B-7: AUXILARY LOOMS

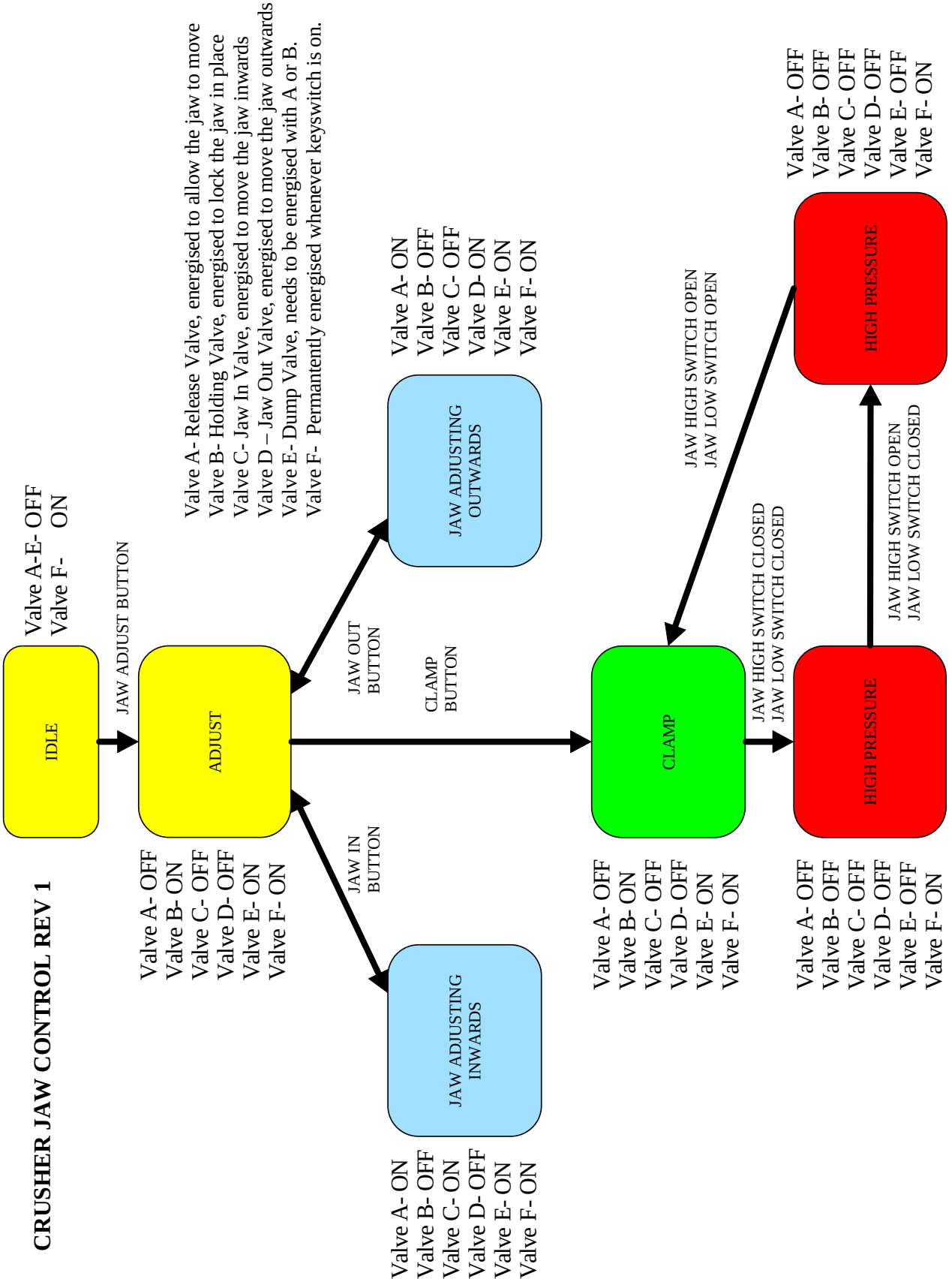


Figure B-8: CRUSHER JAW CONTROL

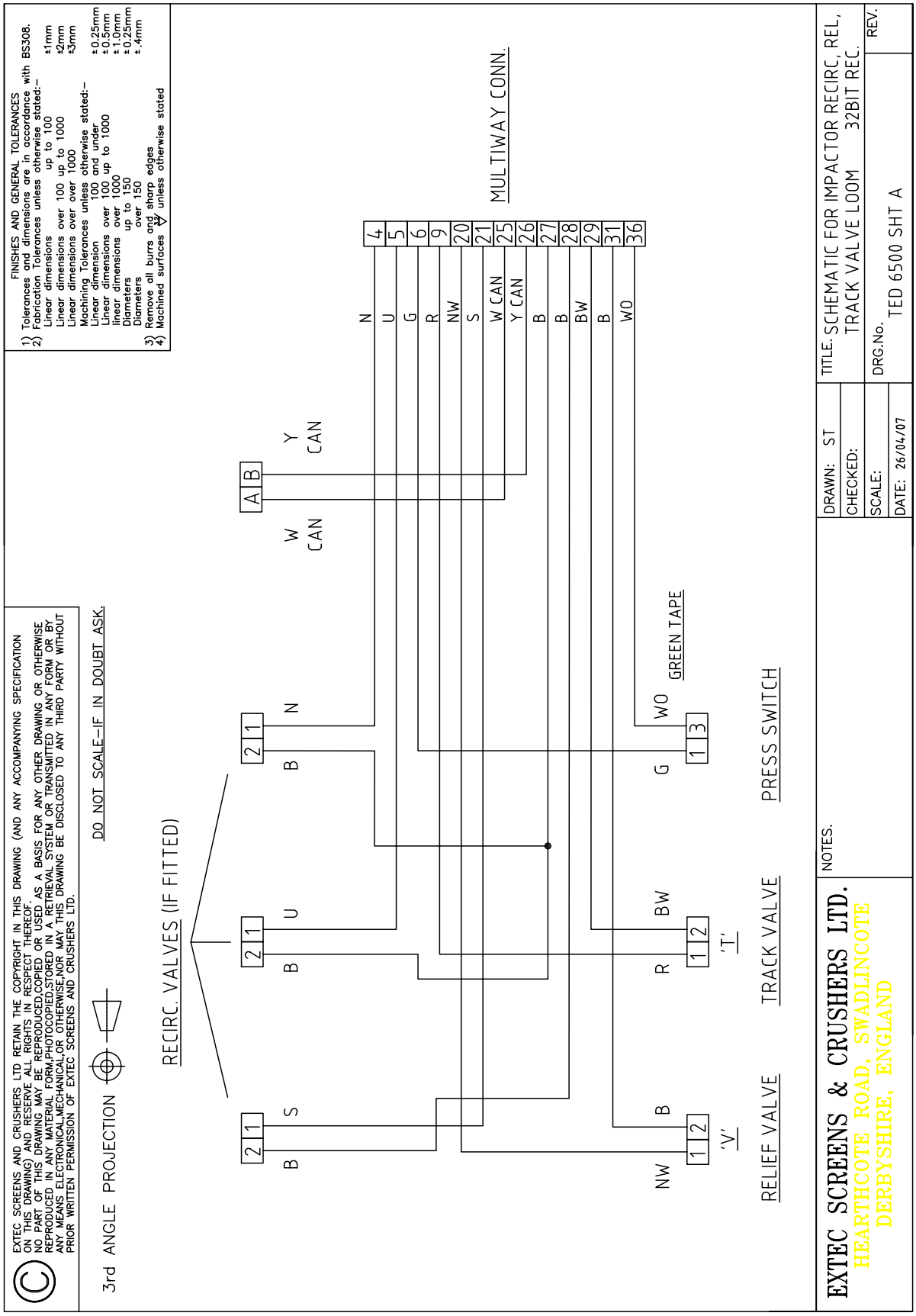
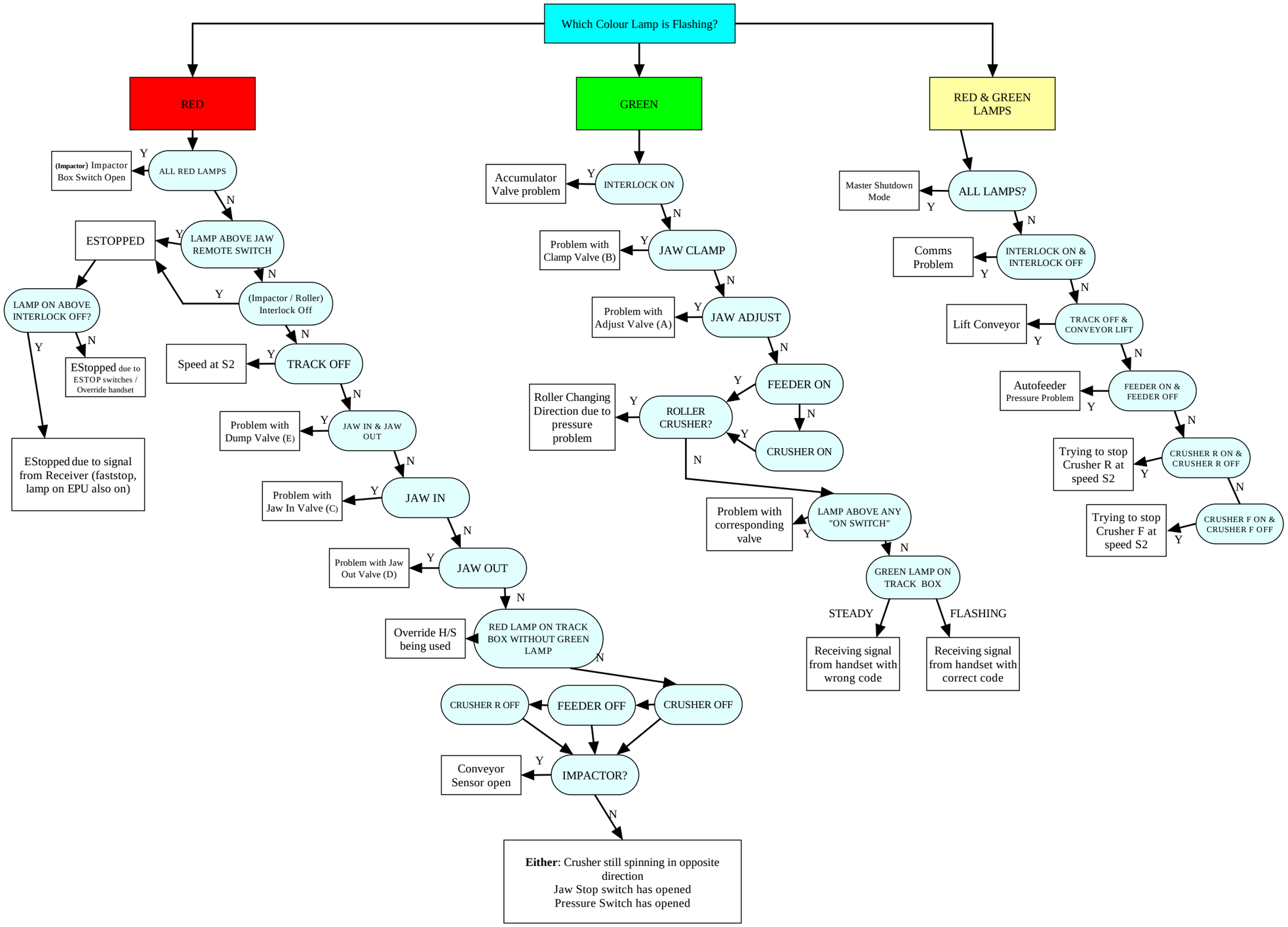


Figure B-9: RECIRC, REL, TRACK VALVE LOOM


Which Colour Lamp is Flashing?
RED
GREEN
RED & GREEN LAMPS
(Impactor) Impactor Box Switch Open
ALL RED LAMPS
ESTOPPED
LAMP ABOVE JAW REMOTE SWITCH
LAMP ON ABOVE INTERLOCK OFF?
(Impactor / Roller) Interlock Off
EStopped due to ESTOP switches / Override handset
EStopped due to signal from Receiver (faststop, lamp on EPU also on)
Speed at S2
TRACK OFF
Problem with Dump Valve (E)
JAW IN & JAW OUT
Problem with Jaw In Valve (C)
JAW IN
Problem with Jaw Out Valve (D)
JAW OUT
Override H/S being used
RED LAMP ON TRACK BOX WITHOUT GREEN LAMP
CRUSHER R OFF
FEEDER OFF
CRUSHER OFF
Conveyor Sensor open
IMPACTOR?
Either: Crusher still spinning in opposite direction
Jaw Stop switch has opened
Pressure Switch has opened
Accumulator Valve problem
INTERLOCK ON
Problem with Clamp Valve (B)
JAW CLAMP
Problem with Adjust Valve (A)
JAW ADJUST
FEEDER ON
Roller Changing Direction due to pressure problem
ROLLER CRUSHER?
CRUSHER ON
Problem with corresponding valve
LAMP ABOVE ANY "ON SWITCH"
GREEN LAMP ON TRACK BOX
STEADY
FLASHING
Receiving signal from handset with wrong code
Receiving signal from handset with correct code
Master Shutdown Mode
ALL LAMPS?
Comms Problem
INTERLOCK ON & INTERLOCK OFF
Lift Conveyor
TRACK OFF & CONVEYOR LIFT
Autofeeder Pressure Problem
FEEDER ON & FEEDER OFF
Trying to stop Crusher R at speed S2
CRUSHER R ON & CRUSHER R OFF
Trying to stop Crusher F at speed S2
CRUSHER F ON & CRUSHER F OFF
Y
N

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Appendix C OEM Manuals supplied with this machine

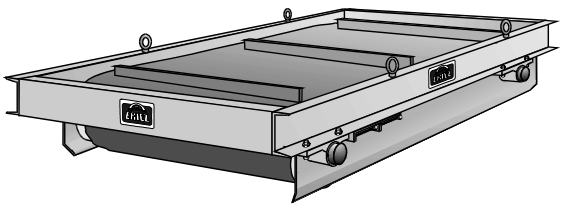
	Title	Issue No	Date
1.	CATERPILLAR C-13 Operation and Maintenance Manual	SEBU7901	May 2004
2.	C13 Industrial Engine Parts Manual CD	SERP4130-06	April 2005
3.	ERIEZ MAGNET MODELS CP & OP INSTRUCTIONS	IM-108GB-(F.01)	
4.	IMPACTOR BOX MANUAL		

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INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

SUSPENDED PERMANENT MAGNETIC SEPARATORS

MODELS CP & OP



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SUSPENDED PERMANENT MAGNETIC SEPARATORS

MODELS CP & OP

INTRODUCTION

Suspended, permanent magnet heavy-duty separators are designed for use over a moving bed of material from which iron is to be removed. Basically, they are box-shaped units containing blocks of permanent magnet material, arranged to produce a powerful magnetic field. The block arrangement determines the magnetic circuit configuration, designated CP or OP.

Two simple methods of cleaning the extracted ferrous material from the surface of the magnet are available; ***manual cleaning*** (Fig. 1) or ***self cleaning*** (Fig. 2). There is a wide range of sizes available for either style and separators can be mounted in-line with the conveyor belt ***(Position 1)*** or across the conveyor belt ***(Position 2)*** to suit customer requirements.

Manual cleaned magnets are designed for use when tramp iron contamination levels are small. Periodically, it is necessary to remove the accumulation of tramp iron, either by hand or with a moveable stripper plate.

Where large amounts of tramp iron require separation, self-cleaning magnets are more practical. The construction of the magnet box is the same as for the manual cleaning magnet, with the addition of a short belt conveyor built around the assembly to provide an automatic discharge for the tramp iron.

WARNING

THIS EQUIPMENT CONTAINS MAGNETISED MATERIAL AND MUST BE TREATED WITH UTMOST CAUTION TO SAFEGUARD AGAINST INJURY.

- Do not allow the pole faces to face each other. Opposite polarity poles will come together with considerable force.



- Before handling this equipment personnel with pacemakers should confirm that their pacemaker is not affected by magnetism.



- Take care when using ferrous tools or ferrous parts near the pole faces.



- Do not place pre-recorded tapes, computer disks, or credit cards near the magnet box since this could cause erasure.



- Keep all delicate mechanisms, such as mechanical watches, away from the magnet.



- Do not drill or weld near the magnetic unit without first seeking the advice of: ERIEZ MAGNETICS EUROPE LIMITED

INSTALLATION

General

When unpacking, take care to avoid damage to the equipment and possible personnel injury - ***the magnet assembly is very powerful and permanently charged***. Remove loose ferrous material closer than 600 mm to the magnet box. Spanners and other tools within the vicinity where the equipment is to be installed could become magnetically induced and be attracted to the magnet box with considerable force. Also, when installing OP magnets check that the unit is in the correct orientation, with the heavy steel end poles at right angles to the direction of material flow.

Magnet Position

Position 1 (*In-Line installation)*
The preferred installation of a suspended magnet is over the trajectory of the product material where it discharges from the belt conveyor. This position is referred to as ***Position 1,*** (Figs. 1 and 2). For optimum separation in ***Position 1*** there must be provision to adjust the location of the magnet in relation to the material trajectory.

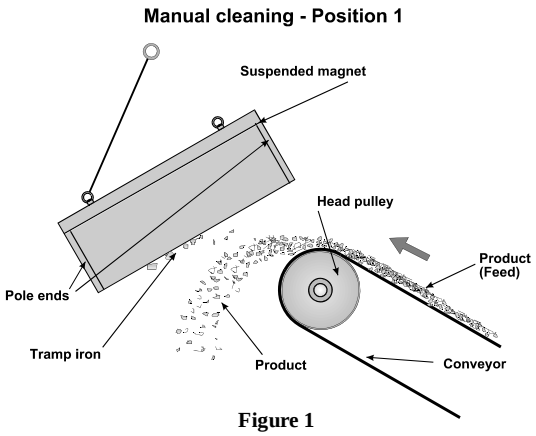


Figure 1

- For low feed conveyor belt speeds, typically less than 100m/min, greater separation efficiency will be achieved by using a non-magnetic head pulley. ***Note: It is preferable if a non-magnetic head pulley is installed, regardless of the speed of the conveyor***

- When installing a self-cleaning unit, examine the area to ensure there is adequate clearance for the belt to run and that provision has been made to collect discharged tramp iron. A hinged ***non-magnetic splitter***, adjustable in length, will be required to prevent extracted tramp from re-entering the non-magnetics.

- At the working suspension height the centreline of the magnet should be approximately perpendicular to the trajectory of the material and

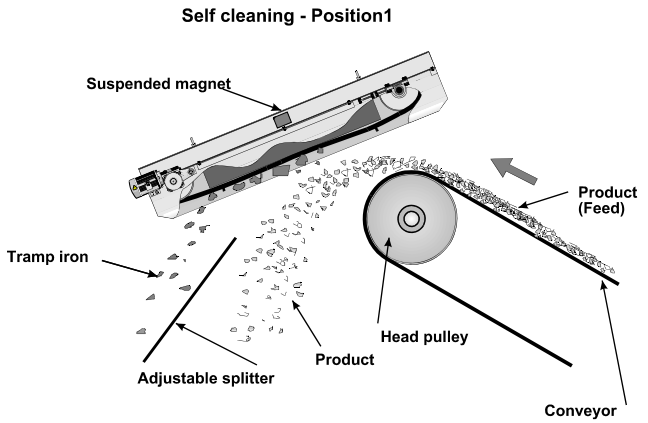


Figure 2

Position 2 (*Cross Belt installation)*

A separator mounted over a moving bed of material at right angles to the conveyor is referred to as ***Position 2*** (Figs. 3 and 4). This installation usually requires a stronger magnet than ***Position 1*** since tramp iron at the bottom of the burden is more difficult to extract.

- The efficiency of magnetic separators in ***Position 2*** is dependent upon the speed of the conveyor carrying the feed. As conveyor speed increases above 100m/min separation efficiency may fall.
- Conveyor idlers beneath the separator in ***Position 2*** must be ***non-magnetic.***
- Manually cleaning suspended magnets should be installed on the centreline of the material conveyor, Fig. 3. Self-cleaning suspended magnets should be installed with the trailing edge of the magnet box immediately above the outer edge of the conveyor idler. Refer to Fig. 4.

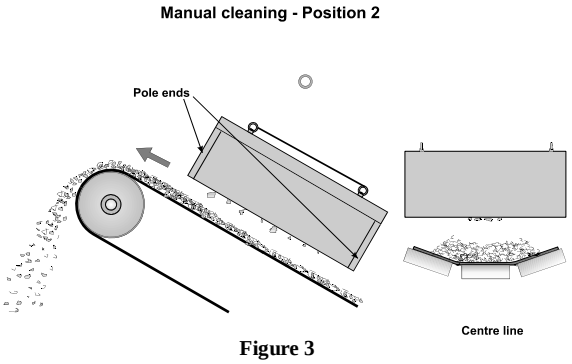


Figure 3

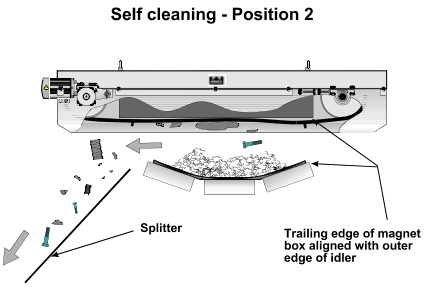


Figure 4

Suspension Height

The magnetic strength and configuration of an OP/CP separator is selected for a specific suspension height and application. The suspension height quoted should be considered a maximum.

When setting the suspension height, Fig. 5, lower the magnet as close as possible to the top of the burden, without interfering with the material flow. If the unit is self-cleaning, ensure that the separator belt is clear to operate freely whilst carrying tramp iron. Failing to do this could result in tramp iron being knocked back into the non-magnetics.

A clearance of 75 mm between the magnet face and the top of the product burden / trajectory should be maintained for self-cleaning units; this clearance can be reduced to 50 mm for manually cleaned units.

WARNING: ***Do not over-tighten the self-cleaning belt as this could damage the bearings. The equipment is designed to operate with belt sag of approximately 25 mm.***

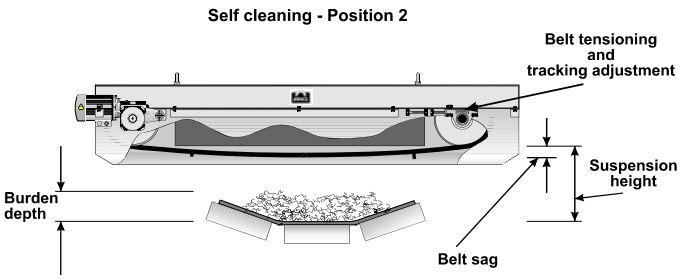


Figure 5

Burden Depth

One factor in achieving optimum separator performance is to control the burden depth.

- **Position 1 installation.** The installation location is calculated on product throughput. Any variation from this will change the trajectory of the product material with respect to the working surface of the magnet and could result in poor separation.

- **Position 2 installation.** A plough or leveller installed before the magnet will remove high spots or surges in material flow.

COMMISSIONING

Self-Cleaning Separators

After installation, examine for any obvious visual damage; in particular check that the frame is square and has not been twisted.

Momentarily close the power supply switch to the belt drive and check that the belt is tracking properly and is not wandering laterally. ***Never start the belt drive and allow it to run continuously until the belt is properly trained***. If the belt wanders, note the direction and adjust as follows:

Self-cleaning magnet belts run on two pulleys, one fixed and the other adjustable. The adjustable tail pulley has approximately 10 mm of take up available for both belt stretch and tracking. To track the belt, the tail pulley should be adjusted to tighten the belt on the ***same side*** to which the belt is seen to wanders.

MAINTENANCE

Manual Cleaning Separators No maintenance is required.

Self-Cleaning Separators

- Belt tracking should be checked frequently and adjusted as necessary. Refer to COMMISSIONING
- Lubricate the bearings on a schedule consistent with other equipment in use at the site for the product and environment.
- If the unit is installed within a separate enclosure, provision must be made to the construction of the enclosure to gain easy access to moving parts.
- Check the self-cleaning belt for damage and, if necessary, replace as follows:

Vulcanised Belt

Replacing a vulcanised belt requires the self-cleaning gear to be dismantled after the separator has been removed from its installation. This is a major operation and is not always practical. An alternative method is to replace the belt in situ.

- Slacken the bolts securing the non-drive pulley.
- Slacken the belt tensioning screws.
- Cut through the damaged belt and remove it.
- Wrap the new belt and vulcanise.
- Re-tension the belt; allowing for belt sag, refer to INSTALLATION.
- Re-track; refer to COMMISSIONING.
- Tighten the bearing securing bolts.

Appendix D Hazardous Substances associated with this machine

	Title	COSHH Sheet Reference
1.	Exxon Unirex N 3 Grease	570317-00 UNIREX N 3
2.	Shell Albida Grease EP2	ACIYK GB/eng/C 19/03/2005
3.	Shell Rimula Super 15W-40	ACK9D GB/eng/C 26/11/2003
4.	Shell Naturelle Fluid HF-M 46	ACKXR GB/eng/C 09/06/2004
5.	Shell Tellus Oil 46	ACKQ6 GB/eng/C 29/04/2004
6.	Shell Omala 220 Gear Oil	ACH75 GB/eng/C 29/01/2003
7.	Shell Safe Anti Freeze	L84042 Revision 23 08 2004
8.	Shell Agricultural Gas Oil	F32002 Revision 02 10 2002
9.	Exol Ethena EP90 Gear Oil	2nd October 2002

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ExxonMobil

570317-00 UNIREX N 3
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: UNIREX N 3
20/10/2003

SUPPLIER: Esso Petroleum Company
ExxonMobil House
Ermyn Way, Leatherhead
Surrey, KT22 8UX
UK

Environmental/Health Emergency telephone: 01372 222 000 (UK)
44 1372 222 000 (Ireland)

INTENDED USE: GREASE

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%	EU Classification
HYDROXYALKYL LONG-CHAIN ALKENYL IMIDAZOLINE (CAS 27136-73-8)	<1	C;R34 Xn;R22 N;R50/53
N-OLEYLSARCOSINE (CAS 110-25-8)	<1	Xi;R36/38 N;R50/53

3. HAZARDS IDENTIFICATION

This product is considered hazardous according to EU regulatory guidelines (see Section 15).

Symbol: Not applicable.

Risk Phrase(s): R52/53.

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

POTENTIAL ENVIRONMENTAL EFFECTSHarmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

For further health effects/toxicological data, see Section 11.

NOTE: This product should not be used for any other purpose without expert advice.

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4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a doctor.
SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.
INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.
INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

---

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposures. Prevent runoff from fire control or dilution from entering waterways or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, firefighters MUST use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None.
COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC)).
Flammable Limits (approx.% vol.in air) - LELNE, UEL: NE
NFPA HAZARD ID: Health: 0 , Flammability: 1 , Reactivity: 0

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6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. In case of accident or road spill, contact the Police and Fire Brigade and, if appropriate, the Area Water Authority.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Shut off source taking normal safety precautions.

Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.
ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.
PERSONAL PRECAUTIONS: See Section 8

---

7. HANDLING AND STORAGE

SPECIFIC USES: GREASE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.
SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.
EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapour) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD BRAZE, SOLDER,DRILL,GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

This product does not contain any components which have recognized exposure limits.

VENTILATION: Use adequate ventilation.
RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.
EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.
SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves MUST be worn. Good personal hygiene practices should always be followed.

ENVIRONMENTAL CONTROLS: SEE SECTION 7

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9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

GENERAL:
PHYSICAL STATE: Grease
COLOUR: Green
ODOUR: Mild
ODOUR THRESHOLD-ppm: NE

IMPORTANT HEALTH, SAFETY AND ENVIRONMENTAL INFORMATION:
pH: NA
BOILING POINT C(F): NE
FLASH POINT C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC))
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOUR PRESSURE-mmHg 20 C: < 0.1
RELATIVE DENSITY, 15/4 C: 0.93
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 150.0
VISCOSITY AT 100 C, cSt: 13.0
VAPOUR DENSITY: NE
EVAPORATION RATE: NE

OTHER INFORMATION:
DROP POINT C(F): > 219(426)
POUR POINT C(F): NA
FREEZING POINT C(F): NE
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidisers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERISATION: Will not occur.

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11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---
ORAL TOXICITY: Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY: Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the

components.
INHALATION TOXICITY: Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION: Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION: Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---
No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---
No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---
Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. Synthetic base oils representative of those in this producthave been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---
Not expected to be sensitizing based on tests of this product, components, or similar products.

---

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: This product is expected to be harmful to aquatic

organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

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13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at any licensed waste disposal site. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

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14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

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15. REGULATORY INFORMATION

EU Labelling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: Not applicable.

Risk Phrase(s): R52/53.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrase(s): S61.
Avoid release to the environment. Refer to special instructions/Safety data sheets.

THE FOLLOWING PRODUCT INGREDIENTS ARE CITED ON THE LISTS BELOW:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
*** NO REPORTABLE INGREDIENTS ***		

--- REGULATORY LISTS SEARCHED ---

1=IARC 1	6=NO ALLERGI	11=DE TERAT B	16=DE CARC B	21=CH CARC
2=IARC 2A	7=SE ALLERGY	12=DE TERAT C	17=AT TERAT A	
3=IARC 2B	8=SE CARC	13=DE TERAT D	18=AT TERAT B	

4=NTP CARC 9=DK CARC 14=DE CARC A1 19=AT TERAT C
5=NTP SUS 10=DE TERAT A 15=DE CARC A2 20=AT TERAT D

CARC=CARCINOGEN; SUS=SUSPECTED CARCINOGEN; TERAT=TERATOGENIC

AT = Austria DE = Germany NO = Norway
CH = Switzerland DK = Denmark SE = Sweden

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16. OTHER INFORMATION

LIBRARY OF RISK PHRASES LISTED IN SECTION 2 OF THIS DOCUMENT:

R22	Harmful if swallowed.
R34	Causes burns.
R36/38	Irritating to eyes and skin.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

NOTE: EXXONMOBIL PRODUCTS ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested, do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

COSHH Regulations: Product reviewed and considered to be potentially hazardous to health. The Regulations must be followed and measures to control exposure may be necessary.

Any sections of this Material Safety Data Sheet which are printed in bold text highlights recent significant changes which have been made to the advice or information given.

****

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 570317-00, ELIS: 407975, CMCS97: 97Q677
EHS Approval Date: 20OCT2003

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Safety Data Sheet

Shell Albida Grease EP 2

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Product Code 001A0091
Infosafe No. ACIYK GB/eng/C
Issued Date 19/03/2005
Product Type/Use Automotive and industrial grease.

Other Names	**Name**	**Code**
	Shell Albida Grease EP 2	140000006899

Supplier

SHELL UK PRODUCTS LTD
Stanlow Manufacturing Complex
PO Box 3
Ellesmere Port CH65 4HB
Technical Contact: Product HSE Department
United Kingdom

Telephone Numbers

Emergency Tel.
0151-350-4595
Telephone/Fax Number
Tel: 0151-350-4000

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description
A lubricating grease containing highly-refined mineral oils and additives. The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

Dangerous Components / Constituents
Exposure limits apply to the following components: Highly refined mineral oil.

Name	CAS	EINECS	Proportion		
Zinc naphthenate	12001-85-3	234-409-2	1-2.4 %		

Other Information
See Section 16 'Other Information' for full text of each relevant Risk Phrase.

3. HAZARDS IDENTIFICATION

EC Classification	Not classified as Dangerous under EC criteria.

Human Health Hazards
No specific hazards under normal use conditions. Prolonged or repeated exposure to skin may give rise to

dermatitis. Used grease may contain harmful impurities.

Safety Hazards
Not classified as flammable, but will burn.

4. FIRST AID MEASURES

Symptoms and Effects
Not expected to give rise to an acute hazard under normal conditions of use.

Inhalation
In the unlikely event of dizziness or nausea, remove casualty to fresh air. If symptoms persist, obtain medical attention.

Skin
Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.

Eye
Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion
Wash out mouth with water and obtain medical attention. Do not induce vomiting.

Advice to Doctor
Treat symptomatically. Aspiration into the lungs may result in chemical pneumonitis. Dermatitis may result from prolonged or repeated exposure. High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function.
High pressure injection injuries require surgical intervention and possibly steroid therapy to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.
There may be a risk to health where low viscosity products are aspirated into the lungs following vomiting, although this is uncommon in adults. Such aspiration would cause intense local irritation and chemical pneumonitis. Children, and those in whom consciousness is impaired, will be more at risk. Emesis of lubricants is not usually necessary, unless a large amount has been ingested, or some other compound has been dissolved in the product. If this is indicated, for example, when there is rapid onset of central nervous system depression from large ingested volume - gastric lavage under controlled hospital conditions, with full protection of the airway is required. Supportive care may include oxygen, arterial blood gas monitoring, respiratory support, and, if aspiration has occurred, treatment with corticosteriods and antibiotics. Seizures should be controlled with Diazepam, or appropriate equivalent drug.

5. FIRE FIGHTING MEASURES

Specific Hazards
Combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds.

Extinguishing Media
Foam and dry chemical powder. Carbon dioxide, sand or earth may be used for small fires only.

Unsuitable Extinguishing Media
Water in jet. Use of halon extinguishers should be avoided for environmental reasons.

Protective Equipment
Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid contact with skin and eyes. Wear PVC, Neoprene or nitrile rubber gloves. Wear rubber knee length safety boots and PVC Jacket and Trousers. Wear safety glasses or full face shield if splashes are likely to occur.

Environmental Precautions
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform local authorities if this cannot be prevented.

Clean-up Methods - Small Spillages
Dispose into a suitable, clearly marked container for disposal or reclamation in accordance with local regulations.

Clean-up Methods - Large Spillages
As for small spills.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Avoid prolonged or repeated contact with skin. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Cloth, paper and other materials that are used to absorb spills present a fire hazard. Avoid their accumulation by disposing of them safely and immediately. In addition to any specific recommendations given for controls of risks to health, safety and the environment, an assessment of risks must be made to help determine controls appropriate to local circumstances. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication 'COSHH Essentials'.

Storage
Keep in a cool, dry, well-ventilated place. Use properly labelled and closeable containers. Avoid direct sunlight, heat sources, and strong oxidizing agents. The storage of this product maybe subject to the Control of Pollution (Oil Storage) (England) Regulations. Further guidance maybe obtained from the local environmental agency office.

Storage Temperatures
0ºC Minimum. 50ºC Maximum.

Recommended Materials
For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials
For containers or container linings, avoid PVC.

Other Information
Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits

Substance	Regulations	Exposure Duration	Exposure Limit	Units	Notes
Oil mist, mineral	Health and Safety Executive. EH40; Occupational Exposure Limits.	TWA	5	mg/m3	
	Health and Safety Executive. EH40; Occupational Exposure Limits.	STEL	10	mg/m3	

Other Exposure Information

Due to the product's semi-solid consistency, generation of mists and dusts is unlikely to occur.

Exposure Controls

The use of personal protective equipment is only one aspect of an integrated approach to the Control Of Substances Hazardous to Health.
The management of Health and Safety at Work Regulations 1992 require employers to identify and evaluate the risks to health and to implement appropriate measures to eliminate or minimise those risks. The choice of personal protective equipment is highly dependent upon local conditions, e.g. exposure to other chemical substances and micro-organisms, thermal hazards (protection from extremes of cold and heat), electrical hazards, mechanical hazards and appropriate degree of manual dexterity required to undertake an activity.
Whilst the content of this section may inform the choice of personal protective equipment used, the limitations of any information which can be provided must be fully understood, e.g. personal protective equipment chosen to protect employees from occasional splashes maybe entirely inadequate for activities involving partial or complete immersion.If the levels of oil mist or vapour in air are likely to exceed the occupational exposure standards then consideration should be given to the use of local exhaust ventilation to reduce personal exposure.
The choice of personal protective equipment should only be undertaken in the light of a full risk assessment by a suitably qualified competent person (e.g. a professionally qualified occupational hygienist).
Effective protection is only achieved by correctly fitting and well maintained equipment and employers should ensure that appropriate training is given. All personal protective equipment should be regularly inspected and replaced if defective. Reference should be made to HSE's publication Methods for the Determination of Hazardous Substances (MDHS) 84 - Measurement of oil mist from mineral oil-based metalworking fluids. Measurement of an employee's exposure to oil vapour maybe supplemented through the use of stain tubes. In the first instance, further guidance maybe obtained through HSE's publication 'COSHH - a brief guide to the regulations' (INDG 136(rev1)).

Respiratory Protection

At standard temperature and pressure, the Occupational Exposure Standard for oil vapour is unlikely to be exceeded. Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate pre-filter should be considered. Half masks (EN 149) or valved half masks (EN 405) in combination with type A2 (EN 141) and P2/3 (EN 143) pre-filters maybe considered.
If product is subjected to elevated temperatures, half masks (EN 149) or valved half masks (EN 405) in combination with type AX (EN 371) and P2/3 (EN 143) prefilters maybe considered.

Hand Protection

Chemical protective gloves are made from a wide range of materials, but there is no single glove material (or combination of materials) which gives unlimited resistance to any individual or combination of substances or preparations. The extent of the breakthrough time will be affected by a combination of factors which include permeation, penetration, degradation, use pattern (full immersion, occasional contacts) and how the glove is stored when not in use.
Theoretical maximum levels of protection are seldom achieved in practice and the actual level of protection can be difficult to assess. Effective breakthrough time should be used with care and a margin of safety should be applied. HSE guidance on protective gloves recommends a 75% safety factor to be applied to any figures obtained in a laboratory test. Nitrile gloves may offer relatively long breakthrough times and slow permeation rates. Test data, e.g breakthrough data obtained through test standard EN374-3:1994 are available from reputable equipment suppliers.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using

gloves, hands should be washed and dried thoroughly. A non perfumed moisturiser should be applied.

Eye Protection
Goggles conforming to a minimum standard of EN 166 345B should be considered if there is a possibility of eye contact with the product through splashing. Higher rated eye protection must be considered for highly hazardous operations or work areas. For example, employees involved in metalworking operations such as chipping, grinding or cutting may require additional protection to avert injury from fast moving particles or broken tools.

Body Protection
Minimise all forms of skin contact. Overalls and shoes with oil resistant soles should be worn. Launder overalls and undergarments regularly.

Environmental Exposure Controls
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour	Light brown.
Physical State	Semi-solid at ambient temperature.
Odour	Characteristic mineral oil.
pH Value	Data not available.
Vapour Pressure	Expected to be less than 0.5 Pa at 20°C.
Initial Boiling Point	Data not available.
Solubility in Water	Negligible.
Density	circa 900 kg/m3 at 15ºC.
Flash Point	>250ºC (COC) (based on mineral oil).
Flammable Limits - Upper	10% V/V (typical) (based on mineral oil).
Flammable Limits - Lower	1% V/V (typical) (based on mineral oil).
Auto-Ignition Temperature	Expected to be above 320ºC.
Kinematic Viscosity	Data not available.
Vapour Density (Air=1)	Greater than 1.
Partition co-efficient, n-octanol/water	Log Pow expected to be greater than 6.
Dropping Point	>250ºC (ASTM D-566).

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to Avoid
Extremes of temperature and direct sunlight.

Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment
Toxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the toxicology of similar products.

Acute Toxicity - Oral
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Dermal
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Inhalation
Not considered to be an inhalation hazard under normal conditions of use.

Eye Irritation
Expected to be slightly irritating.

Skin Irritation
Expected to be slightly irritating.

Respiratory Irritation
If vapours are inhaled, slight irritation of the respiratory tract may occur.

Skin Sensitisation
Not expected to be a skin sensitizer.

Carcinogenicity
Product is based on mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Other components are not known to be associated with carcinogenic effects.

Mutagenicity
Not considered to be a mutagenic hazard.

Reproductive Toxicity
Not considered to be toxic to reproduction.

Other Information
Prolonged and/or repeated contact with products containing mineral oils can result in defatting of the skin, particularly at elevated temperatures. This can lead to irritation and possibly dermatitis, especially under conditions of poor personal hygiene. Skin contact should be minimised. High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed. Used grease may contain harmful impurities that have accumulated during use.The concentration of such harmful impurities will depend on use and they may present risks to health and the environment on disposal. ALL used grease should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Basis for Assessment
Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Mobility
Semi-solid under most environmental conditions. Floats on water. If it comes into contact with soil, it will strongly adsorb to soil particles.

Persistence / Degradability
Not expected to be readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation
Contains components with the potential to bioaccumulate.

Ecotoxicity
Data not available. Poorly soluble mixture. May cause physical fouling of aquatic organisms.

Other Adverse Effects
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Dispose into a suitable, clearly marked container for disposal or reclamation in accordance with local regulations. The competence of the contractor to deal satisfactorily with this type of product should be established beforehand. Do not pollute the soil, water or environment with the waste product.

Product Disposal
As for waste disposal.

Container Disposal
Recycle or dispose of in accordance with the legislation in force with a recognised collector or contractor.

14. TRANSPORT INFORMATION

Transport Information
Not dangerous for transport under ADR/RID, IMO and IATA/ICAO regulations.

15. REGULATORY INFORMATION

EC Symbols	None.
EC Risk Phrase	Not classified.
EC Safety Phrase	Not classified.

EINECS	All components listed or polymer exempt.
TSCA (USA)	All components listed.

National Legislation
Environmental Protection Act 1990 (as amended).
Health and Safety at Work Act 1974
Consumers Protection Act 1987
Control of Pollution Act 1974
Environmental Act 1995
Factories Act 1961
Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations
Chemicals (Hazard Information and Packaging for Supply) Regulations 2002.
Control of Substances Hazardous to Health Regulations 1994 (as amended).
Road Traffic (Carriage of Dangerous Substances in Packages) Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations

Reporting of Injuries, Diseases and Dangerous Occurences Regulations
Health and Safety (First Aid) Regulations 1981
Personal Protective Equipment (EC Directive) Regulations 1992
Personal Protective Equipment at Work Regulations 1992

Packaging & Labelling
Safety data sheet available for professional user on request.

16. OTHER INFORMATION

Revisions Highlighted
To assist harmonisation of sds authoring practices, a version number has been introduced.

References
GUIDANCE NOTES
UK Chemicals Regulatory Atlas, An Overview of how to guide your chemical through to regulatory compliance (DTI).
HSG71 The storage of packaged dangerous substances.
EH/40 Occupational Exposure Limits.
EH/58 The Carcinogenicity of Mineral Oils.
MS24 Health surveillance of occupational skin disease.
HSG 53 The selection, use and maintenance of respiratory protective equipment: A practical guide.
HSG 206 Cost and effectiveness of chemical protective gloves for the workplace: Guidance for employers and health and safety specialists.
L74 First Aid at work: Approved Code of Practice and Guidance.
HSG 136 Workplace transport safety : guidance for employers.
INDG234 (rev) Are you Involved in the Carriage of Dangerous Goods by Road or Rail
OTHER LITERATURE
Concawe Report 3/82 Precautionary Advice on the Handling of Used Engine Oils
Concawe Report 86/69 Health Aspects of Worker Exposure to Oil Mists
Concawe Report 01/97 Petroleum Products - First Aid Emergency and Medical Advice
Concawe Report 01/53 Classification and labelling of petroleum substances according to the EU dangerous substances directive (Concawe recommendations August 2001)
Concawe Report 01/54 environmental classification of petroleum substances summary data and rationale
Concawe Report 5/02 amended safety data sheet directive (2001/58/EC)
Department of the Environment - Waste Management - The Duty of Care - A Code of Practice
Concawe, Boulevard du souverain 165 B - 1160 Brussels, Belgium
www.concawe.be

Restrictions
This product must not be used in applications other than recommended without first seeking the advice of the SHELL technical department.

List of R Phrases in Section 2
R36/38 Irritating to eyes and skin.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Technical Contact Numbers
0151-350-4000.

Further Information
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It does not constitute a guarantee for any specific property of the product.

... End Of SDS ...

Shell Albida Grease EP 2

Safety Data Sheet

Shell Rimula Super 15W-40

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Product Code	001B0415
Infosafe No.	ACK9D GB/eng/C
Issued Date	26/11/2003
Product Type/Use	Engine oil.

Other Names	**Name**	**Code**
	Shell Rimula Super 15W-40	140001010602

Supplier

SHELL UK PRODUCTS LTD
Stanlow Manufacturing Complex
PO Box 3
Ellesmere Port
CH65 4HB
Technical Contact: Product HSE Department
United Kingdom

Telephone Numbers

Emergency Tel.
0151-350-4595
Telephone/Fax Number
Tel: 0151-350-4000

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description
Highly refined mineral oils and additives. The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

Dangerous Components / Constituents
Exposure limits apply to the following components: Highly refined mineral oil.

Name	CAS	EINECS	Proportion	Hazard	R Phrase
Zinc alkyl dithiophosphate	-	-	1-2.49 %	Xi, N	R38, R41, R51/53

Other Information
See Section 16 'Other Information' for full text of each relevant Risk Phrase.

3. HAZARDS IDENTIFICATION

EC Classification	Not classified as Dangerous under EC criteria.

Human Health Hazards
No specific hazards under normal use conditions. Prolonged or repeated exposure may give rise to dermatitis. Used oil may contain harmful impurities.

Safety Hazards
Not classified as flammable, but will burn.

Environmental Hazards
Not classified as dangerous to the environment.

4. FIRST AID MEASURES

Symptoms and Effects
Not expected to give rise to an acute hazard under normal conditions of use.

Inhalation
In the unlikely event of dizziness or nausea, remove casualty to fresh air. If symptoms persist, obtain medical attention.

Skin
Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. If high pressure injection injuries occur, obtain medical attention immediately.

Eye
Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion
Wash out mouth with water and obtain medical attention. Do not induce vomiting.

Advice to Doctor
Treat symptomatically. Aspiration into the lungs may cause chemical pneumonitis. Dermatitis may result from prolonged or repeated exposure.
High pressure injection injuries require surgical intervention and possibly steroid therapy to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.
There may be a risk to health where low viscosity products are aspirated into the lungs following vomiting, although this is uncommon in adults. Such aspiration would cause intense local irritation and chemical pneumonitis. Children, and those in whom consciousness is impaired, will be more at risk. Emesis of lubricants is not usually necessary, unless a large amount has been ingested, or some other compound has been dissolved in the product. If this is indicated, for example, when there is rapid onset of central nervous system depression from large ingested volume - gastric lavage under controlled hospital conditions, with full protection of the airway is required. Supportive care may include oxygen, arterial blood gas monitoring, respiratory support, and, if aspiration has occurred, treatment with corticosteriods and antibiotics. Seizures should be controlled with Diazepam, or appropriate equivalent drug.

5. FIRE FIGHTING MEASURES

Specific Hazards
Combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds.

Extinguishing Media
Foam and dry chemical powder. Carbon dioxide, sand or earth may be used for small fires only.

Unsuitable Extinguishing Media
Water in jet. Use of halon extinguishers should be avoided for environmental reasons.

Protective Equipment
Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid contact with skin and eyes. Wear PVC, Neoprene or nitrile rubber gloves. Wear rubber knee length safety boots and PVC Jacket and Trousers. Wear safety glasses or full face shield if splashes are likely to occur.

Environmental Precautions
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform local authorities if this cannot be prevented.

Clean-up Methods - Small Spillages
Absorb liquid with sand or earth. Sweep up and remove to a suitable, clearly marked container for disposal in accordance with local regulations.

Clean-up Methods - Large Spillages
Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Dispose of as for small spills.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Avoid prolonged or repeated contact with skin. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Cloth, paper and other materials that are used to absorb spills present a fire hazard. Avoid their accumulation by disposing of them safely and immediately. In addition to any specific recommendations given for controls of risks to health, safety and the environment, an assessment of risks must be made to help determine controls appropriate to local circumstances. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication 'COSHH Essentials'.

Storage
Keep in a cool, dry, well-ventilated place. Use properly labelled and closeable containers. Avoid direct sunlight, heat sources, and strong oxidizing agents. The storage of this product maybe subject to the Control of Pollution (Oil Storage) (England) Regulations. Further guidance maybe obtained from the local environmental agency office.

Storage Temperatures
0°C Minimum. 50°C Maximum.

Recommended Materials
For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials
For containers or container linings, avoid PVC.

Other Information
Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits

Substance	Regulations	Exposure Duration	Exposure Limit	Units	Notes
Oil mist, mineral	Health and Safety Executive. EH40; Occupational Exposure Limits.	TWA	5	mg/m3	
	Health and Safety Executive. EH40; Occupational Exposure Limits.	STEL	10	mg/m3	

Exposure Controls

The use of personal protective equipment is only one aspect of an integrated approach to the Control Of Substances Hazardous to Health.
The management of Health and Safety at Work Regulations 1992 require employers to identify and evaluate the risks to health and to implement appropriate measures to eliminate or minimise those risks. The choice of personal protective equipment is highly dependent upon local conditions, e.g. exposure to other chemical substances and micro-organisms, thermal hazards (protection from extremes of cold and heat), electrical hazards, mechanical hazards and appropriate degree of manual dexterity required to undertake an activity.
Whilst the content of this section may inform the choice of personal protective equipment used, the limitations of any information which can be provided must be fully understood, e.g. personal protective equipment chosen to protect employees from occasional splashes maybe entirely inadequate for activities involving partial or complete immersion.If the levels of oil mist or vapour in air are likely to exceed the occupational exposure standards then consideration should be given to the use of local exhaust ventilation to reduce personal exposure.
The choice of personal protective equipment should only be undertaken in the light of a full risk assessment by a suitably qualified competent person (e.g. a professionally qualified occupational hygienist).
Effective protection is only achieved by correctly fitting and well maintained equipment and employers should ensure that appropriate training is given. All personal protective equipment should be regularly inspected and replaced if defective. Reference should be made to HSE's publication Methods for the Determination of Hazardous Substances (MDHS) 84 - Measurement of oil mist from mineral oil-based metalworking fluids.
Measurement of an employee's exposure to oil vapour maybe supplemented through the use of stain tubes. In the first instance, further guidance maybe obtained through HSE's publication 'COSHH - a brief guide to the regulations' (INDG 136(rev1)).

Respiratory Protection

At standard temperature and pressure, the Occupational Exposure Standard for oil vapour is unlikely to be exceeded. Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate pre-filter should be considered. Half masks (EN 149) or valved half masks (EN 405) in combination with type A2 (EN 141) and P2/3 (EN 143) pre-filters maybe considered.
If product is subjected to elevated temperatures, half masks (EN 149) or valved half masks (EN 405) in combination with type AX (EN 371) and P2/3 (EN 143) prefilters maybe considered.

Hand Protection

Chemical protective gloves are made from a wide range of materials, but there is no single glove material (or combination of materials) which gives unlimited resistance to any individual or combination of substances or preparations. The extent of the breakthrough time will be affected by a combination of factors which include permeation, penetration, degradation, use pattern (full immersion, occasional contacts) and how the glove is stored when not in use.
Theoretical maximum levels of protection are seldom achieved in practice and the actual level of protection can be difficult to assess. Effective breakthrough time should be used with care and a margin of safety should be applied. HSE guidance on protective gloves recommends a 75% safety factor to be applied to any figures obtained in a laboratory test. Nitrile gloves may offer relatively long breakthrough times and slow permeation rates. Test data, e.g breakthrough data obtained through test standard EN374-3:1994 are available from

reputable equipment suppliers.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. A non perfumed moisturiser should be applied.

Eye Protection
Goggles conforming to a minimum standard of EN 166 345B should be considered if there is a possibility of eye contact with the product through splashing. Higher rated eye protection must be considered for highly hazardous operations or work areas. For example, employees involved in metalworking operations such as chipping, grinding or cutting may require additional protection to avert injury from fast moving particles or broken tools.

Body Protection
Minimise all forms of skin contact. Overalls and shoes with oil resistant soles should be worn. Launder overalls and undergarments regularly.

Environmental Exposure Controls
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour	Amber.
Physical State	Liquid at ambient temperature.
Odour	Characteristic mineral oil.
pH Value	Data not available.
Vapour Pressure	Expected to be less than 0.5 Pa at 20°C.
Initial Boiling Point	Expected to be above 280°C.
Solubility in Water	Negligible.
Density	888 kg/m3 at 15ºC.
Flash Point	230ºC. PMCC ASTM D93.
Flammable Limits - Upper	10%(V/V).
Flammable Limits - Lower	1%(V/V).
Auto-Ignition Temperature	Expected to be above 320ºC.
Kinematic Viscosity	110 mm2/s at 40ºC.
Vapour Density (Air=1)	Greater than 1.
Partition co-efficient, n-octanol/water	Log Pow expected to be greater than 6.
Pour Point	-30ºC maximum.

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to Avoid
Extremes of temperature and direct sunlight.

Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment
Toxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the toxicology of similar products.

Acute Toxicity - Oral
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Dermal
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Inhalation
Not considered to be an inhalation hazard under normal conditions of use.

Eye Irritation
Expected to be slightly irritating.

Skin Irritation
Expected to be slightly irritating.

Respiratory Irritation
If mists are inhaled, slight irritation of the respiratory tract may occur.

Skin Sensitisation
Not expected to be a skin sensitizer.

Carcinogenicity
Product is based on mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Other components are not known to be associated with carcinogenic effects.

Mutagenicity
Not considered to be a mutagenic hazard.

Reproductive Toxicity
Not considered to be toxic to reproduction.

Other Information
Prolonged and/or repeated contact with this product can result in defatting of the skin, particularly at elevated temperatures. This can lead to irritation and possibly dermatitis, especially under conditions of poor personal hygiene. Skin contact should be minimised. Used engine oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. It is prudent to assume that prolonged or repeated exposure to used engine oils may cause skin cancer.

12. ECOLOGICAL INFORMATION

Basis for Assessment
Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Mobility
Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence / Degradability
Not expected to be readily biodegradable. Major constituents are expected to be inherently biodegradable, but

the product contains components that may persist in the environment.

Bioaccumulation
Contains components with the potential to bioaccumulate.

Ecotoxicity
Poorly soluble mixture. May cause physical fouling of aquatic organisms. Product is expected to be practically non-toxic to aquatic organisms, LL/EL50 >100 mg/l. (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

Other Adverse Effects
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Recycle or dispose of in accordance with prevailing regulations, with a recognised collector or contractor. The competence of the contractor to deal satisfactorily with this type of product should be established beforehand. Do not pollute the soil, water or environment with the waste product.

Product Disposal
As for waste disposal.

Container Disposal
Recycle or dispose of in accordance with the legislation in force with a recognised collector or contractor.

14. TRANSPORT INFORMATION

Transport Information
Not dangerous for transport under ADR/RID, IMO and IATA/ICAO regulations.

15. REGULATORY INFORMATION

EC Symbols	None.
EC Risk Phrase	Not classified.
EC Safety Phrase	Not classified.

EINECS	All components listed or polymer exempt.
TSCA (USA)	Not established.

National Legislation
Environmental Protection Act 1990 (as amended).
Health and Safety at Work Act 1974
Consumers Protection Act 1987
Control of Pollution Act 1974
Environmental Act 1995
Factories Act 1961
Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations

Chemicals (Hazard Information and Packaging for Supply) Regulations 2002.
Control of Substances Hazardous to Health Regulations 1994 (as amended).
Road Traffic (Carriage of Dangerous Substances in Packages) Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations
Reporting of Injuries, Diseases and Dangerous Occurences Regulations
Health and Safety (First Aid) Regulations 1981
Personal Protective Equipment (EC Directive) Regulations 1992
Personal Protective Equipment at Work Regulations 1992

Packaging & Labelling
Safety data sheet available for professional user on request.

16. OTHER INFORMATION

Revisions Highlighted
No amendments made to information. To assist harmonisation of sds authoring practices, a version number has been introduced.

References
GUIDANCE NOTES
UK Chemicals Regulatory Atlas, An Overview of how to guide your chemical through to regulatory compliance (DTI).
HSG71 The storage of packaged dangerous substances.
EH/40 Occupational Exposure Limits.
EH/58 The Carcinogenicity of Mineral Oils.
MS24 Health surveillance of occupational skin disease.
HSG 53 The selection, use and maintenance of respiratory protective equipment: A practical guide.
HSG 206 Cost and effectiveness of chemical protective gloves for the workplace: Guidance for employers and health and safety specialists.
L74 First Aid at work: Approved Code of Practice and Guidance.
HSG 136 Workplace transport safety : guidance for employers.
INDG234 (rev) Are you Involved in the Carriage of Dangerous Goods by Road or Rail
OTHER LITERATURE
Concawe Report 3/82 Precautionary Advice on the Handling of Used Engine Oils
Concawe Report 86/69 Health Aspects of Worker Exposure to Oil Mists
Concawe Report 01/97 Petroleum Products - First Aid Emergency and Medical Advice
Concawe Report 01/53 Classification and labelling of petroleum substances according to the EU dangerous substances directive (Concawe recommendations August 2001)
Concawe Report 01/54 environmental classification of petroleum substances summary data and rationale
Concawe Report 5/02 amended safety data sheet directive (2001/58/EC)
Department of the Environment - Waste Management - The Duty of Care - A Code of Practice
Concawe, Boulevard du souverain 165 B - 1160 Brussels, Belgium
www.concawe.be

Restrictions
This product must not be used in applications other than recommended without first seeking the advice of the SHELL technical department.

List of R Phrases in Section 2
R38 Irritating to skin.
R41 Risk of serious damage to eyes.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Technical Contact Numbers
0151-350-4000.

Further Information

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It does not constitute a guarantee for any specific property of the product.

... End Of SDS ...

Safety Data Sheet

Shell Tellus Oil 46

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Product Code	001B0669
Infosafe No.	ACKQ6 GB/eng/C
Issued Date	29/04/2004
Product Type/Use	Hydraulic oil.

Other Names	**Name**	**Code**
	Shell Tellus Oil 46	140001010640

Supplier

SHELL UK PRODUCTS LTD
Stanlow Manufacturing Complex
PO Box 3
Ellesmere Port
CH65 4HB
Technical Contact: Product HSE Department
United Kingdom

Telephone Numbers

Emergency Tel.
0151-350-4595
Telephone/Fax Number
Tel: 0151-350-4000

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description
Highly refined mineral oils and additives. The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

Dangerous Components / Constituents
Exposure limits apply to the following components: Highly refined mineral oil.

3. HAZARDS IDENTIFICATION

EC Classification	Not classified as Dangerous under EC criteria.

Human Health Hazards
No specific hazards under normal use conditions. Prolonged or repeated exposure may give rise to dermatitis. Used oil may contain harmful impurities.

Safety Hazards
Not classified as flammable, but will burn.

Environmental Hazards

Not classified as dangerous for the environment.

4. FIRST AID MEASURES

Symptoms and Effects
Not expected to give rise to an acute hazard under normal conditions of use.

Inhalation
In the unlikely event of dizziness or nausea, remove casualty to fresh air. If symptoms persist, obtain medical attention.

Skin
Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. If high pressure injection injuries occur, obtain medical attention immediately.

Eye
Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion
Wash out mouth with water and obtain medical attention. Do not induce vomiting.

Advice to Doctor
Treat symptomatically. Aspiration into the lungs may result in chemical pneumonitis. Dermatitis may result from prolonged or repeated exposure.
High pressure injection injuries require surgical intervention and possibly steroid therapy to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.
There may be a risk to health where low viscosity products are aspirated into the lungs following vomiting, although this is uncommon in adults. Such aspiration would cause intense local irritation and chemical pneumonitis. Children, and those in whom consciousness is impaired, will be more at risk. Emesis of lubricants is not usually necessary, unless a large amount has been ingested, or some other compound has been dissolved in the product. If this is indicated, for example, when there is rapid onset of central nervous system depression from large ingested volume - gastric lavage under controlled hospital conditions, with full protection of the airway is required. Supportive care may include oxygen, arterial blood gas monitoring, respiratory support, and, if aspiration has occurred, treatment with corticosteriods and antibiotics. Seizures should be controlled with Diazepam, or appropriate equivalent drug.

5. FIRE FIGHTING MEASURES

Specific Hazards
Combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide, oxides of sulphur, and unidentified organic and inorganic compounds.

Extinguishing Media
Foam and dry chemical powder. Carbon dioxide, sand or earth may be used for small fires only.

Unsuitable Extinguishing Media
Water in jet. Use of halon extinguishers should be avoided for environmental reasons.

Protective Equipment
Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid contact with skin and eyes. Wear PVC, Neoprene or nitrile rubber gloves. Wear rubber knee length safety boots and PVC Jacket and Trousers. Wear safety glasses or full face shield if splashes are likely to occur.

Environmental Precautions
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform local authorities if this cannot be prevented.

Clean-up Methods - Small Spillages
Absorb liquid with sand or earth. Sweep up and remove to a suitable, clearly marked container for disposal in accordance with local regulations.

Clean-up Methods - Large Spillages
Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Dispose of as for small spills.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Avoid prolonged or repeated contact with skin. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Cloth, paper and other materials that are used to absorb spills present a fire hazard. Avoid their accumulation by disposing of them safely and immediately. In addition to any specific recommendations given for controls of risks to health, safety and the environment, an assessment of risks must be made to help determine controls appropriate to local circumstances. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication 'COSHH Essentials'.

Storage
Keep in a cool, dry, well-ventilated place. Use properly labelled and closeable containers. Avoid direct sunlight, heat sources, and strong oxidizing agents. The storage of this product maybe subject to the Control of Pollution (Oil Storage) (England) Regulations. Further guidance maybe obtained from the local environmental agency office.

Storage Temperatures
0°C Minimum. 50°C Maximum.

Recommended Materials
For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials
For containers or container linings, avoid PVC.

Other Information
Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits

Substance	Regulations	Exposure Duration	Exposure Limit	Units	Notes
Oil mist, mineral	Health and Safety Executive. EH40; Occupational Exposure Limits.	TWA	5	mg/m3	

	Health and Safety Executive. EH40; Occupational Exposure Limits.	STEL	10	mg/m3	

Exposure Controls

The use of personal protective equipment is only one aspect of an integrated approach to the Control Of Substances Hazardous to Health.
The management of Health and Safety at Work Regulations 1992 require employers to identify and evaluate the risks to health and to implement appropriate measures to eliminate or minimise those risks. The choice of personal protective equipment is highly dependent upon local conditions, e.g. exposure to other chemical substances and micro-organisms, thermal hazards (protection from extremes of cold and heat), electrical hazards, mechanical hazards and appropriate degree of manual dexterity required to undertake an activity.
Whilst the content of this section may inform the choice of personal protective equipment used, the limitations of any information which can be provided must be fully understood, e.g. personal protective equipment chosen to protect employees from occasional splashes maybe entirely inadequate for activities involving partial or complete immersion.If the levels of oil mist or vapour in air are likely to exceed the occupational exposure standards then consideration should be given to the use of local exhaust ventilation to reduce personal exposure.
The choice of personal protective equipment should only be undertaken in the light of a full risk assessment by a suitably qualified competent person (e.g. a professionally qualified occupational hygienist).
Effective protection is only achieved by correctly fitting and well maintained equipment and employers should ensure that appropriate training is given. All personal protective equipment should be regularly inspected and replaced if defective. Reference should be made to HSE's publication Methods for the Determination of Hazardous Substances (MDHS) 84 - Measurement of oil mist from mineral oil-based metalworking fluids.
Measurement of an employee's exposure to oil vapour maybe supplemented through the use of stain tubes. In the first instance, further guidance maybe obtained through HSE's publication 'COSHH - a brief guide to the regulations' (INDG 136(rev1)).

Respiratory Protection

At standard temperature and pressure, the Occupational Exposure Standard for oil vapour is unlikely to be exceeded. Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate pre-filter should be considered. Half masks (EN 149) or valved half masks (EN 405) in combination with type A2 (EN 141) and P2/3 (EN 143) pre-filters maybe considered.
If product is subjected to elevated temperatures, half masks (EN 149) or valved half masks (EN 405) in combination with type AX (EN 371) and P2/3 (EN 143) prefilters maybe considered.

Hand Protection

Chemical protective gloves are made from a wide range of materials, but there is no single glove material (or combination of materials) which gives unlimited resistance to any individual or combination of substances or preparations. The extent of the breakthrough time will be affected by a combination of factors which include permeation, penetration, degradation, use pattern (full immersion, occasional contacts) and how the glove is stored when not in use.
Theoretical maximum levels of protection are seldom achieved in practice and the actual level of protection can be difficult to assess. Effective breakthrough time should be used with care and a margin of safety should be applied. HSE guidance on protective gloves recommends a 75% safety factor to be applied to any figures obtained in a laboratory test. Nitrile gloves may offer relatively long breakthrough times and slow permeation rates. Test data, e.g breakthrough data obtained through test standard EN374-3:1994 are available from reputable equipment suppliers.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. A non perfumed moisturiser should be applied.

Eye Protection

Goggles conforming to a minimum standard of EN 166 345B should be considered if there is a possibility of eye contact with the product through splashing. Higher rated eye protection must be considered for highly hazardous operations or work areas. For example, employees involved in metalworking operations such as chipping, grinding or cutting may require additional protection to avert injury from fast moving particles or broken

tools.

Body Protection
Minimise all forms of skin contact. Overalls and shoes with oil resistant soles should be worn. Launder overalls and undergarments regularly.

Environmental Exposure Controls
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour	Light brown.
Physical State	Liquid at ambient temperature.
Odour	Characteristic mineral oil.
pH Value	Not applicable.
Vapour Pressure	Expected to be less than 0.5 Pa at 20°C.
Initial Boiling Point	Expected to be above 280°C.
Solubility in Water	Negligible.
Density	879 kg/m3 at 15ºC.
Flash Point	218ºC. (PMCC).
Flammable Limits - Upper	10%(V/V) (typical).
Flammable Limits - Lower	1%(V/V) (typical).
Auto-Ignition Temperature	Expected to be above 320ºC.
Kinematic Viscosity	46 mm2/s at 40°C.
Vapour Density (Air=1)	Greater than 1.
Partition co-efficient, n-octanol/water	Log Pow expected to be greater than 6.
Pour Point	-30ºC.

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to Avoid
Extremes of temperature and direct sunlight.

Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment
Toxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the toxicology of similar products.

Acute Toxicity - Oral
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Dermal
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Inhalation
Not considered to be an inhalation hazard under normal conditions of use.

Eye Irritation
Expected to be slightly irritating.

Skin Irritation
Expected to be slightly irritating.

Respiratory Irritation
If mists are inhaled, slight irritation of the respiratory tract may occur.

Skin Sensitisation
Not expected to be a skin sensitizer.

Carcinogenicity
Product is based on mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Other components are not known to be associated with carcinogenic effects.

Mutagenicity
Not considered to be a mutagenic hazard.

Reproductive Toxicity
Not considered to be toxic to reproduction.

Other Information
Prolonged and/or repeated contact with products containing mineral oils may result in defatting of the skin, particularly at elevated temperatures. This may lead to irritation and possibly dermatitis, especially under conditions of poor personal hygiene. Skin contact should be minimised. Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Basis for Assessment
Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Mobility
Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence / Degradability
Not expected to be readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation
Contains components with the potential to bioaccumulate.

Ecotoxicity
Poorly soluble mixture. May cause physical fouling of aquatic organisms. Product is expected to be practically non-toxic to aquatic organisms, LL/EL50 >100 mg/l. (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

Other Adverse Effects
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Recycle or dispose of in accordance with prevailing regulations, with a recognised collector or contractor. The competence of the contractor to deal satisfactorily with this type of product should be established beforehand. Do not pollute the soil, water or environment with the waste product.

Product Disposal
As for waste disposal.

Container Disposal
Recycle or dispose of in accordance with the legislation in force with a recognised collector or contractor.

14. TRANSPORT INFORMATION

Transport Information
Not dangerous for transport under ADR/RID, IMO and IATA/ICAO regulations.

15. REGULATORY INFORMATION

EC Symbols	None.
EC Risk Phrase	Not classified.
EC Safety Phrase	Not classified.

EINECS	All components listed or polymer exempt.
TSCA (USA)	All components in compliance.

National Legislation
Environmental Protection Act 1990 (as amended).
Health and Safety at Work Act 1974
Consumers Protection Act 1987
Control of Pollution Act 1974
Environmental Act 1995
Factories Act 1961
Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations
Chemicals (Hazard Information and Packaging for Supply) Regulations 2002.
Control of Substances Hazardous to Health Regulations 1994 (as amended).
Road Traffic (Carriage of Dangerous Substances in Packages) Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations
Reporting of Injuries, Diseases and Dangerous Occurences Regulations
Health and Safety (First Aid) Regulations 1981
Personal Protective Equipment (EC Directive) Regulations 1992

Personal Protective Equipment at Work Regulations 1992

Packaging & Labelling
Safety data sheet available for professional user on request.

16. OTHER INFORMATION

Revisions Highlighted
No amendments made to information. To assist harmonisation of sds authoring practices, a version number has been introduced.

References
GUIDANCE NOTES
UK Chemicals Regulatory Atlas, An Overview of how to guide your chemical through to regulatory compliance (DTI).
HSG71 The storage of packaged dangerous substances.
EH/40 Occupational Exposure Limits.
EH/58 The Carcinogenicity of Mineral Oils.
MS24 Health surveillance of occupational skin disease.
HSG 53 The selection, use and maintenance of respiratory protective equipment: A practical guide.
HSG 206 Cost and effectiveness of chemical protective gloves for the workplace: Guidance for employers and health and safety specialists.
L74 First Aid at work: Approved Code of Practice and Guidance.
HSG 136 Workplace transport safety : guidance for employers.
INDG234 (rev) Are you Involved in the Carriage of Dangerous Goods by Road or Rail
OTHER LITERATURE
Concawe Report 3/82 Precautionary Advice on the Handling of Used Engine Oils
Concawe Report 86/69 Health Aspects of Worker Exposure to Oil Mists
Concawe Report 01/97 Petroleum Products - First Aid Emergency and Medical Advice
Concawe Report 01/53 Classification and labelling of petroleum substances according to the EU dangerous substances directive (Concawe recommendations August 2001)
Concawe Report 01/54 environmental classification of petroleum substances summary data and rationale
Concawe Report 5/02 amended safety data sheet directive (2001/58/EC)
Department of the Environment - Waste Management - The Duty of Care - A Code of Practice
Concawe, Boulevard du souverain 165 B - 1160 Brussels, Belgium
www.concawe.be

Restrictions
This product must not be used in applications other than recommended without first seeking the advice of the SHELL technical department.

Technical Contact Numbers
0151-350-4000.

Further Information
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It does not constitute a guarantee for any specific property of the product.

... End Of SDS ...

Safety Data Sheet

Shell Naturelle Fluid HF-M 46

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Product Code	001A0871
Infosafe No.	ACKXR GB/eng/C
Issued Date	09/06/2004
Product Type/Use	Hydraulic oil.

Other Names	**Name**	**Code**
	Shell Naturelle Fluid HF-M 46	140000000988

Supplier

SHELL UK PRODUCTS LTD
Stanlow Manufacturing Complex
PO Box 3
Ellesmere Port
CH65 4HB
Technical Contact: Product HSE Department
United Kingdom

Telephone Numbers

Emergency Tel.
0151-350-4595
Telephone/Fax Number
Tel: 0151-350-4000

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description
Blend of vegetable oils, esters and additives.

3. HAZARDS IDENTIFICATION

EC Classification	Not classified as Dangerous under EC criteria.

Human Health Hazards
No specific hazards under normal use conditions. Prolonged or repeated exposure may give rise to dermatitis. Used oil may contain harmful impurities.

Safety Hazards
Not classified as flammable, but will burn.

Environmental Hazards
Not classified as dangerous for the environment.

4. FIRST AID MEASURES

Symptoms and Effects
Not expected to give rise to an acute hazard under normal conditions of use.

Inhalation
In the unlikely event of dizziness or nausea, remove casualty to fresh air. If symptoms persist, obtain medical attention.

Skin
Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. If high pressure injection injuries occur, obtain medical attention immediately.

Eye
Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion
Do not induce vomiting. Wash out mouth with water and obtain medical attention.

Advice to Doctor
Treat symptomatically. Aspiration into the lungs may result in chemical pneumonitis. Dermatitis may result from prolonged or repeated exposure.
High pressure injection injuries may require surgical intervention and possibly steroid therapy to minimise tissue damage and loss of function. Because entry wounds are small and may not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary.
Emesis of lubricants is not usually necessary, unless a large amount has been ingested, or some other compound has been dissolved in the product. If this is indicated, for example, when there is rapid onset of central nervous system depression from large ingested volume - gastric lavage under controlled hospital conditions, with full protection of the airway is required. Supportive care may include oxygen, arterial blood gas monitoring, respiratory support, and, if aspiration has occurred, treatment with corticosteriods and antibiotics. Seizures should be controlled with Diazepam, or appropriate equivalent drug.

5. FIRE FIGHTING MEASURES

Specific Hazards
Combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds.

Extinguishing Media
Foam and dry chemical powder. Carbon dioxide, sand or earth may be used for small fires only.

Unsuitable Extinguishing Media
Water in jet. Use of halon extinguishers should be avoided for environmental reasons.

Protective Equipment
Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid contact with skin and eyes. Wear PVC, Neoprene or nitrile rubber gloves. Wear rubber knee length safety boots and PVC Jacket and Trousers. Wear safety glasses or full face shield if splashes are likely to occur.

Environmental Precautions
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform local authorities if this cannot be prevented.

Clean-up Methods - Small Spillages

Absorb liquid with sand or earth. Sweep up and remove to a suitable, clearly marked container for disposal in accordance with local regulations.

Clean-up Methods - Large Spillages
Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Dispose of as for small spills.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Avoid prolonged or repeated contact with skin. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Cloth, paper and other materials that are used to absorb spills present a fire hazard. Avoid their accumulation by disposing of them safely and immediately. In addition to any specific recommendations given for controls of risks to health, safety and the environment, an assessment of risks must be made to help determine controls appropriate to local circumstances. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication 'COSHH Essentials'.

Storage
Keep in a cool, dry, well-ventilated place. Use properly labelled and closeable containers. Avoid direct sunlight, heat sources, and strong oxidizing agents.

Storage Temperatures
0°C Minimum. 50°C Maximum.

Recommended Materials
For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials
For containers or container linings, avoid PVC.

Other Information
Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits
No Exposure Limit Established

Exposure Controls
The use of personal protective equipment is only one aspect of an integrated approach to the Control Of Substances Hazardous to Health.
The management of Health and Safety at Work Regulations 1992 require employers to identify and evaluate the risks to health and to implement appropriate measures to eliminate or minimise those risks. The choice of personal protective equipment is highly dependent upon local conditions, e.g. exposure to other chemical substances and micro-organisms, thermal hazards (protection from extremes of cold and heat), electrical hazards, mechanical hazards and appropriate degree of manual dexterity required to undertake an activity.
Whilst the content of this section may inform the choice of personal protective equipment used, the limitations of any information which can be provided must be fully understood, e.g. personal protective equipment chosen to protect employees from occasional splashes maybe entirely inadequate for activities involving partial or complete immersion.If the levels of oil mist or vapour in air are likely to exceed the occupational exposure standards then consideration should be given to the use of local exhaust ventilation to reduce personal exposure.
The choice of personal protective equipment should only be undertaken in the light of a full risk assessment by a suitably qualified competent person (e.g. a professionally qualified occupational hygienist).

Effective protection is only achieved by correctly fitting and well maintained equipment and employers should ensure that appropriate training is given. All personal protective equipment should be regularly inspected and replaced if defective.

Respiratory Protection

Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate pre-filter should be considered. Half masks (EN 149) or valved half masks (EN 405) in combination with type A2 (EN 141) and P2/3 (EN 143) pre-filters maybe considered.
If product is subjected to elevated temperatures, half masks (EN 149) or valved half masks (EN 405) in combination with type AX (EN 371) and P2/3 (EN 143) prefilters maybe considered.

Hand Protection

Chemical protective gloves are made from a wide range of materials, but there is no single glove material (or combination of materials) which gives unlimited resistance to any individual or combination of substances or preparations. The extent of the breakthrough time will be affected by a combination of factors which include permeation, penetration, degradation, use pattern (full immersion, occasional contacts) and how the glove is stored when not in use.
Theoretical maximum levels of protection are seldom achieved in practice and the actual level of protection can be difficult to assess. Effective breakthrough time should be used with care and a margin of safety should be applied. HSE guidance on protective gloves recommends a 75% safety factor to be applied to any figures obtained in a laboratory test. Nitrile gloves may offer relatively long breakthrough times and slow permeation rates. Test data, e.g breakthrough data obtained through test standard EN374-3:1994 are available from reputable equipment suppliers.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. A non perfumed moisturiser should be applied.

Eye Protection

Goggles conforming to a minimum standard of EN 166 345B should be considered if there is a possibility of eye contact with the product through splashing. Higher rated eye protection must be considered for highly hazardous operations or work areas. For example, employees involved in metalworking operations such as chipping, grinding or cutting may require additional protection to avert injury from fast moving particles or broken tools.

Body Protection

Minimise all forms of skin contact. Overalls and shoes with oil resistant soles should be worn. Launder overalls and undergarments regularly.

Environmental Exposure Controls

Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour	Red.
Physical State	Liquid at ambient temperature.
Odour	Slight.
pH Value	Data not available.
Vapour Pressure	Expected to be less than 0.5 Pa at 20°C.
Initial Boiling Point	Expected to be above 280°C.
Solubility in Water	Negligible.
Density	circa 920 kg/m3 at 15ºC.
Flash Point	214ºC (COC).
Flammable Limits - Upper	Data not available.

Flammable Limits - Lower	Data not available.
Auto-Ignition Temperature	Data not available.
Kinematic Viscosity	circa 42 mm2/s at 40ºC.
Evaporation Rate	Data not available.
Vapour Density (Air=1)	Greater than 1.
Partition co-efficient, n-octanol/water	Data not available.
Pour Point	circa -42ºC.

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to Avoid
Extremes of temperature and direct sunlight.

Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment
Toxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the toxicology of similar products.

Acute Toxicity - Oral
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Dermal
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Inhalation
Not considered to be an inhalation hazard under normal conditions of use.

Eye Irritation
Expected to be slightly irritating.

Skin Irritation
Expected to be slightly irritating.

Respiratory Irritation
If mists are inhaled, slight irritation of the respiratory tract may occur.

Skin Sensitisation
Not expected to be a skin sensitizer.

Carcinogenicity
Components are not known to be associated with carcinogenic effects.

Mutagenicity
Not considered to be a mutagenic hazard.

Reproductive Toxicity
Not considered to be toxic to reproduction.

Other Information
Prolonged and/or repeated contact with this product can result in defatting of the skin, particularly at elevated temperatures. This can lead to irritation and possibly dermatitis, especially under conditions of poor personal hygiene. Skin contact should be minimised. Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Basis for Assessment
Ecotoxicity/biodegradability studies have been performed on this product. Other information given is based on the knowledge of similar products.

Mobility
Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence / Degradability
Readily biodegradable.

Bioaccumulation
Not expected to bioaccumulate significantly.

Ecotoxicity
Poorly soluble mixture. May cause physical fouling of aquatic organisms. Product is expected to be practically non-toxic to aquatic organisms, LL/EL50 >100 mg/l. (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Other Adverse Effects
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Recycle or dispose of in accordance with prevailing regulations, with a recognised collector or contractor. The competence of the contractor to deal satisfactorily with this type of product should be established beforehand. Do not pollute the soil, water or environment with the waste product.

Product Disposal
As for waste disposal.

Container Disposal
Recycle or dispose of in accordance with the legislation in force with a recognised collector or contractor.

14. TRANSPORT INFORMATION

Transport Information
Not dangerous for transport under ADR/RID, IMO and IATA/ICAO regulations.

15. REGULATORY INFORMATION

EC Symbols	None.
EC Risk Phrase	Not classified.
EC Safety Phrase	Not classified.

EINECS	All components listed or polymer exempt.
TSCA (USA)	All components in compliance.

National Legislation
Environmental Protection Act 1990 (as amended).
Health and Safety at Work Act 1974
Consumers Protection Act 1987
Control of Pollution Act 1974
Environmental Act 1995
Factories Act 1961
Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations
Chemicals (Hazard Information and Packaging for Supply) Regulations 2002.
Control of Substances Hazardous to Health Regulations 1994 (as amended).
Road Traffic (Carriage of Dangerous Substances in Packages) Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations
Reporting of Injuries, Diseases and Dangerous Occurences Regulations
Health and Safety (First Aid) Regulations 1981
Personal Protective Equipment (EC Directive) Regulations 1992
Personal Protective Equipment at Work Regulations 1992

Packaging & Labelling
Safety data sheet available for professional user on request.

16. OTHER INFORMATION

Revisions Highlighted
No amendments made to information. To assist harmonisation of sds authoring practices, a version number has been introduced.

References
European Model Code of Safe Practice in the Storage and Handling of Petroleum Products. EN 374-2:1994 Protective gloves against chemicals and micro-organisms
EN 149:2001 Respiratory protective devices - filtering half masks to protect against particles - requirements, testing, marking
EN 405:1992 Respiratory protective devices - valved filtering half masks to protect against gases or gases and particles - requirements, testing, marking.
EN 141:2000 Respiratory protective devices - gas filters and combined filters - requirements, testing, marking
EN 143:2000 Respiratory protective devices - particle filters - requirements, testing, marking
EN 166:1995 Personal eye-protection - specification.

Restrictions
This product must not be used in applications other than recommended without first seeking the advice of the SHELL technical department.

Technical Contact Numbers
0151-350-4000.

Further Information
This information is based on our current knowledge and is intended to describe the product for the purposes of

health, safety and environmental requirements only. It does not constitute a guarantee for any specific property of the product.

... End Of SDS ...

Safety Data Sheet

Shell Omala Oil 220

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Product Code	001A0776
Infosafe No.	ACH75 GB/eng/C
Issued Date	29/01/2003
Product Type/Use	Gear lubricant.

Other Names	**Name**	**Code**
	Shell Omala Oil 220	140000006378

Supplier

SHELL UK PRODUCTS LTD
Stanlow Manufacturing Complex
PO Box 3
Ellesmere Port
CH65 4HB
Technical Contact: Product HSE Department
United Kingdom

Telephone Numbers

Emergency Tel.
0151-350-4595
Telephone/Fax Number
Tel: 0151-350-4000

2. COMPOSITION/INFORMATION ON INGREDIENTS

Preparation Description
Highly refined mineral oils and additives. The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

Dangerous Components / Constituents
Exposure limits apply to the following components: Highly refined mineral oil.

3. HAZARDS IDENTIFICATION

EC Classification	Not classified as Dangerous under EC criteria.

Human Health Hazards
No specific hazards under normal use conditions. Prolonged or repeated exposure may give rise to dermatitis. Used oil may contain harmful impurities.

Safety Hazards
Not classified as flammable, but will burn.

Environmental Hazards

Not classified as dangerous for the environment.

4. FIRST AID MEASURES

Symptoms and Effects
Not expected to give rise to an acute hazard under normal conditions of use.

Inhalation
In the unlikely event of dizziness or nausea, remove casualty to fresh air. If symptoms persist, obtain medical attention.

Skin
Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. If high pressure injection injuries occur, obtain medical attention immediately.

Eye
Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion
Do not induce vomiting. Wash out mouth with water and obtain medical attention.

Advice to Doctor
Treat symptomatically. Aspiration into the lungs may result in chemical pneumonitis. Dermatitis may result from prolonged or repeated exposure.
High pressure injection injuries require surgical intervention and possibly steroid therapy to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.
There may be a risk to health where low viscosity products are aspirated into the lungs following vomiting, although this is uncommon in adults. Such aspiration would cause intense local irritation and chemical pneumonitis. Children, and those in whom consciousness is impaired, will be more at risk. Emesis of lubricants is not usually necessary, unless a large amount has been ingested, or some other compound has been dissolved in the product. If this is indicated, for example, when there is rapid onset of central nervous system depression from large ingested volume - gastric lavage under controlled hospital conditions, with full protection of the airway is required. Supportive care may include oxygen, arterial blood gas monitoring, respiratory support, and, if aspiration has occurred, treatment with corticosteriods and antibiotics. Seizures should be controlled with Diazepam, or appropriate equivalent drug.

5. FIRE FIGHTING MEASURES

Specific Hazards
Combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds.

Extinguishing Media
Foam and dry chemical powder. Carbon dioxide, sand or earth may be used for small fires only.

Unsuitable Extinguishing Media
Water in jet. Use of halon extinguishers should be avoided for environmental reasons.

Protective Equipment
Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid contact with skin and eyes. Wear PVC, Neoprene or nitrile rubber gloves. Wear rubber knee length safety boots and PVC Jacket and Trousers. Wear safety glasses or full face shield if splashes are likely to occur.

Environmental Precautions
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Inform local authorities if this cannot be prevented.

Clean-up Methods - Small Spillages
Absorb liquid with sand or earth. Sweep up and remove to a suitable, clearly marked container for disposal in accordance with local regulations.

Clean-up Methods - Large Spillages
Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Dispose of as for small spills.

7. HANDLING AND STORAGE

Handling
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Avoid prolonged or repeated contact with skin. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Cloth, paper and other materials that are used to absorb spills present a fire hazard. Avoid their accumulation by disposing of them safely and immediately. In addition to any specific recommendations given for controls of risks to health, safety and the environment, an assessment of risks must be made to help determine controls appropriate to local circumstances. Exposure to this product should be reduced as low as reasonably practicable. Reference should be made to the Health and Safety Executive's publication 'COSHH Essentials'.

Storage
Keep in a cool, dry, well-ventilated place. Use properly labelled and closeable containers. Avoid direct sunlight, heat sources, and strong oxidizing agents. The storage of this product maybe subject to the Control of Pollution (Oil Storage) (England) Regulations. Further guidance maybe obtained from the local environmental agency office.

Storage Temperatures
0°C Minimum. 50°C Maximum.

Recommended Materials
For containers or container linings, use mild steel or high density polyethylene.

Unsuitable Materials
For containers or container linings, avoid PVC.

Other Information
Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits

Substance	Regulations	Exposure Duration	Exposure Limit	Units	Notes
Oil mist, mineral	Health and Safety Executive. EH40; Occupational Exposure Limits.	TWA	5	mg/m3	

	Health and Safety Executive. EH40; Occupational Exposure Limits.	STEL	10	mg/m3	

Exposure Controls

The use of personal protective equipment is only one aspect of an integrated approach to the Control Of Substances Hazardous to Health.
The management of Health and Safety at Work Regulations 1992 require employers to identify and evaluate the risks to health and to implement appropriate measures to eliminate or minimise those risks. The choice of personal protective equipment is highly dependent upon local conditions, e.g. exposure to other chemical substances and micro-organisms, thermal hazards (protection from extremes of cold and heat), electrical hazards, mechanical hazards and appropriate degree of manual dexterity required to undertake an activity.
Whilst the content of this section may inform the choice of personal protective equipment used, the limitations of any information which can be provided must be fully understood, e.g. personal protective equipment chosen to protect employees from occasional splashes maybe entirely inadequate for activities involving partial or complete immersion.If the levels of oil mist or vapour in air are likely to exceed the occupational exposure standards then consideration should be given to the use of local exhaust ventilation to reduce personal exposure.
The choice of personal protective equipment should only be undertaken in the light of a full risk assessment by a suitably qualified competent person (e.g. a professionally qualified occupational hygienist).
Effective protection is only achieved by correctly fitting and well maintained equipment and employers should ensure that appropriate training is given. All personal protective equipment should be regularly inspected and replaced if defective. Reference should be made to HSE's publication Methods for the Determination of Hazardous Substances (MDHS) 84 - Measurement of oil mist from mineral oil-based metalworking fluids.
Measurement of an employee's exposure to oil vapour maybe supplemented through the use of stain tubes. In the first instance, further guidance maybe obtained through HSE's publication 'COSHH - a brief guide to the regulations' (INDG 136(rev1)).

Respiratory Protection

At standard temperature and pressure, the Occupational Exposure Standard for oil vapour is unlikely to be exceeded. Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate pre-filter should be considered. Half masks (EN 149) or valved half masks (EN 405) in combination with type A2 (EN 141) and P2/3 (EN 143) pre-filters maybe considered.
If product is subjected to elevated temperatures, half masks (EN 149) or valved half masks (EN 405) in combination with type AX (EN 371) and P2/3 (EN 143) prefilters maybe considered.

Hand Protection

Chemical protective gloves are made from a wide range of materials, but there is no single glove material (or combination of materials) which gives unlimited resistance to any individual or combination of substances or preparations. The extent of the breakthrough time will be affected by a combination of factors which include permeation, penetration, degradation, use pattern (full immersion, occasional contacts) and how the glove is stored when not in use.
Theoretical maximum levels of protection are seldom achieved in practice and the actual level of protection can be difficult to assess. Effective breakthrough time should be used with care and a margin of safety should be applied. HSE guidance on protective gloves recommends a 75% safety factor to be applied to any figures obtained in a laboratory test. Nitrile gloves may offer relatively long breakthrough times and slow permeation rates. Test data, e.g breakthrough data obtained through test standard EN374-3:1994 are available from reputable equipment suppliers.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. A non perfumed moisturiser should be applied.

Eye Protection

Goggles conforming to a minimum standard of EN 166 345B should be considered if there is a possibility of eye contact with the product through splashing. Higher rated eye protection must be considered for highly hazardous operations or work areas. For example, employees involved in metalworking operations such as chipping, grinding or cutting may require additional protection to avert injury from fast moving particles or broken

tools.

Body Protection
Minimise all forms of skin contact. Overalls and shoes with oil resistant soles should be worn. Launder overalls and undergarments regularly.

Environmental Exposure Controls
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour	Brown.
Physical State	Liquid at ambient temperature.
Odour	Characteristic mineral oil.
pH Value	Data not available.
Vapour Pressure	<0.5 Pa at 20ºC.
Initial Boiling Point	>280ºC.
Solubility in Water	Negligible.
Density	899 kg/m3 at 15ºC.
Flash Point	199ºC (PMCC).
Flammable Limits - Upper	10%(V/V) (typical).
Flammable Limits - Lower	1%(V/V) (typical).
Auto-Ignition Temperature	>320º (typical).
Kinematic Viscosity	220 mm2/s at 40ºC.
Evaporation Rate	Data not available.
Vapour Density (Air=1)	>1 at 20ºC.
Partition co-efficient, n-octanol/water	Log Pow >6 (typical).
Pour Point	-18ºC.

10. STABILITY AND REACTIVITY

Stability
Stable.

Conditions to Avoid
Extremes of temperature and direct sunlight.

Materials to Avoid
Strong oxidizing agents.

Hazardous Decomposition Products
Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment
Toxicological data have not been determined specifically for this product. Information given is based on a

knowledge of the components and the toxicology of similar products.

Acute Toxicity - Oral
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Dermal
LD50 expected to be > 2000 mg/kg.

Acute Toxicity - Inhalation
Not considered to be an inhalation hazard under normal conditions of use.

Eye Irritation
Expected to be slightly irritating.

Skin Irritation
Expected to be slightly irritating.

Respiratory Irritation
If mists are inhaled, slight irritation of the respiratory tract may occur.

Skin Sensitisation
Not expected to be a skin sensitizer.

Carcinogenicity
Product is based on mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Other components are not known to be associated with carcinogenic effects.

Mutagenicity
Not considered to be a mutagenic hazard.

Reproductive Toxicity
Not considered to be toxic to reproduction.

Other Information
Prolonged and/or repeated contact with products containing mineral oils may result in defatting of the skin, particularly at elevated temperatures. This may lead to irritation and possibly dermatitis, especially under conditions of poor personal hygiene. Skin contact should be minimised. Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Basis for Assessment
Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Mobility
Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile.

Persistence / Degradability
Not expected to be readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.

Bioaccumulation
Contains components with the potential to bioaccumulate.

Ecotoxicity
Poorly soluble mixture. May cause physical fouling of aquatic organisms. Product is expected to be practically non-toxic to aquatic organisms, LL/EL50 >100 mg/l. (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Mineral oil is not expected to cause any chronic effects to aquatic

organisms at concentrations less than 1 mg/l.

Other Adverse Effects
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.
Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Recycle or dispose of in accordance with prevailing regulations, with a recognised collector or contractor. The competence of the contractor to deal satisfactorily with this type of product should be established beforehand. Do not pollute the soil, water or environment with the waste product.

Product Disposal
As for waste disposal.

Container Disposal
Recycle or dispose of in accordance with the legislation in force with a recognised collector or contractor.

14. TRANSPORT INFORMATION

Transport Information
Not dangerous for transport under ADR/RID, IMO and IATA/ICAO regulations.

15. REGULATORY INFORMATION

EC Symbols	None.
EC Risk Phrase	Not classified.
EC Safety Phrase	Not classified.

EINECS	All components listed or polymer exempt.
TSCA (USA)	All components in compliance.

National Legislation
Environmental Protection Act 1990 (as amended).
Health and Safety at Work Act 1974
Consumers Protection Act 1987
Control of Pollution Act 1974
Environmental Act 1995
Factories Act 1961
Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations
Chemicals (Hazard Information and Packaging for Supply) Regulations 2002.
Control of Substances Hazardous to Health Regulations 1994 (as amended).
Road Traffic (Carriage of Dangerous Substances in Packages) Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers in Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations
Reporting of Injuries, Diseases and Dangerous Occurences Regulations
Health and Safety (First Aid) Regulations 1981

Personal Protective Equipment (EC Directive) Regulations 1992
Personal Protective Equipment at Work Regulations 1992

Packaging & Labelling
Safety data sheet available for professional user on request.

16. OTHER INFORMATION

Revisions Highlighted
No amendments made to information. To assist harmonisation of sds authoring practices, a version number has been introduced.

References
GUIDANCE NOTES
UK Chemicals Regulatory Atlas, An Overview of how to guide your chemical through to regulatory compliance (DTI).
HSG71 The storage of packaged dangerous substances.
EH/40 Occupational Exposure Limits.
EH/58 The Carcinogenicity of Mineral Oils.
MS24 Health surveillance of occupational skin disease.
HSG 53 The selection, use and maintenance of respiratory protective equipment: A practical guide.
HSG 206 Cost and effectiveness of chemical protective gloves for the workplace: Guidance for employers and health and safety specialists.
L74 First Aid at work: Approved Code of Practice and Guidance.
HSG 136 Workplace transport safety : guidance for employers.
INDG234 (rev) Are you Involved in the Carriage of Dangerous Goods by Road or Rail
OTHER LITERATURE
Concawe Report 3/82 Precautionary Advice on the Handling of Used Engine Oils
Concawe Report 86/69 Health Aspects of Worker Exposure to Oil Mists
Concawe Report 01/97 Petroleum Products - First Aid Emergency and Medical Advice
Concawe Report 01/53 Classification and labelling of petroleum substances according to the EU dangerous substances directive (Concawe recommendations August 2001)
Concawe Report 01/54 environmental classification of petroleum substances summary data and rationale
Concawe Report 5/02 amended safety data sheet directive (2001/58/EC)
Department of the Environment - Waste Management - The Duty of Care - A Code of Practice
Concawe, Boulevard du souverain 165 B - 1160 Brussels, Belgium
www.concawe.be

Restrictions
This product must not be used in applications other than recommended without first seeking the advice of the SHELL technical department.

Technical Contact Numbers
0151-350-4000.

Further Information
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It does not constitute a guarantee for any specific property of the product.

... End Of SDS ...

Data Sheet No. L84042 Revision : 23 08 2004 REPLACES L84042 :

This data sheet has been prepared in accordance with the requirements of the Data Sheet Directive 91/155/EEC.

RECOMMENDED USES

Antifreeze Concentrate is recommended for use as :

an antifreeze

If Antifreeze Concentrate is used for a purpose not covered in this section, Shell UK Ltd would be grateful to receive information on the application.

KNOWN MISUSES/ABUSES

Antifreeze Concentrate is not to be used as :

The most common misuse is that of ingestion by children. For this reason, Antifreeze Concentrate contains an aversive agent. It is most important that Antifreeze Concentrate be kept safely out of reach or locked away.

The disposal of Antifreeze Concentrate to soil, watercourses and drains is a legal offence.

1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

PRODUCT :	**ANTIFREEZE CONCENTRATE**
COMPANY :	**SHELL UK OIL PRODUCTS LIMITED**
TECHNICAL CONTACT:	**PRODUCT HSE DEPARTMENT**
ADDRESS :	**STANLOW MANUFACTURING COMPLEX, PO BOX 3, ELLESMERE PORT, CH65 4HB**
TELEPHONE :	**0151-350-4000**
EMERGENCY TELEPHONE NUMBER :	**0151-350-4595**

2: COMPOSITION/INFORMATION ON INGREDIENTS

Antifreeze Concentrate is a preparation manufactured from ethanediol (ethylene glycol), additives and a taste aversive agent.

CONC.	COMPONENT	EINECS	CLASS	RISK PHRASES
>90%	Ethanediol	203-473-3	Xn	R22 Harmful if swallowed

Exposure limit values exist for the following constituents:

Ethanediol

3: HAZARD IDENTIFICATION

Antifreeze Concentrate is classified as dangerous for supply.

Antifreeze Concentrate is not classified as dangerous for conveyance.

It contains ethanediol to which exposure limits apply.

Ethanediol is readily biodegradable and poses a significant risk of oxygen deletion in aquatic systems.

4: FIRST AID MEASURES

INHALATION

Remove the person affected to fresh air. If rapid recovery does not occur, obtain medical attention.

SKIN

Wash contaminated skin with water. Use soap if available. Do not delay.

EYES

Flush the eye with copious quantities of water for up to 10 minutes. Refer for medical attention.

INGESTION

The normal advice given in the case of ingestion of hydrocarbon products is that vomiting should be avoided due to the risk of aspiration into the lungs, however, owing to the toxic effects and rapid absorption from the stomach, this advice is modified for Antifreeze Concentrate as follows :

SEEK QUALIFIED MEDICAL ASSISTANCE IMMEDIATELY.

IF THE PATIENT IS UNCONSCIOUS, DO NOT INDUCE VOMITING.

WITH A CONSCIOUS PATIENT, if hospital assistance is not likely to be immediately available, attempt to induce vomiting.

SHOW A COPY OF THIS DATA SHEET TO THE PHYSICIAN,
draw attention to "Notes for Doctors" in Section 11 below.

5: FIRE-FIGHTING MEASURES

Extinguishants	- Large Fire :	Alcohol Resistant Foam/Water Fog - NEVER USE WATER JET
	- Small Fire :	Alcohol Resistant Foam/Water Fog/Dry Powder/CO2/Sand/Earth

Special Protective Equipment for Firefighters

The choice of protective equipment must only be undertaken in the light of a dynamic risk assessment by the officer in charge of the incident. Whilst the content of this section may inform the choice of protective equipment used, the choice of protective equipment will be highly dependent on local conditions.

For large fires, the officer in charge may consider; self contained breathing apparatus (EN 137).

Further guidance on protective equipment for professional fire fighters can be obtained from the home office.

DECOMPOSITION PRODUCTS

Refer to section 10 - stability and reactivity.

6: ACCIDENTAL RELEASE MEASURES

Extinguish naked flames, avoid contact with skin, eyes, and clothing. Wear plastic or rubber gloves, goggles or face shield and boots. Make best endeavours to prevent entry to drains or watercourses.

LARGE SPILLS should be bunded by a suitable medium such as sand or earth. The liquid should be reclaimed directly or in an adsorbent medium and then transferred to suitable, clearly marked containers and disposed of in accordance with local byelaws and the requirements of the Environmental Protection Act 1990. Any containers used to collect the spilled material or absorbent should be labelled to indicate contents and hazards.

SMALL SPILLS should be soaked up with sand or earth and disposed of as for large spills.

7: HANDLING AND STORAGE

HANDLING

Antifreeze Concentrate does not require any special handling techniques, but it should be handled in suitable containers and spillage avoided. Avoid contact with skin, eyes and clothing. Do not breathe mists, aerosols or vapours. Maximum handling temperature 60 Deg. C.

STORAGE

The storage of Antifreeze Concentrate is not subject to any special controls or restrictions. It should be stored in properly designed, closable, labelled containers, eg mild steel or high density polyethylene (HDPE). Keep away from children, foodstuffs and animal feed.

8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

The following limits are taken from The Health and Safety Executive's Guidance Note EH40 Occupational Exposure Limits 2002.

UK Occupational Exposure Standards :

Ethanediol, particulate	10 mg/cubic metre 8-hour TWA value
Ethanediol, vapour	60 mg/cubic metre 8-hour TWA value 125 mg/cubic metre 15-min TWA value

RECOMMENDED MONITORING PROCEDURES

Reference should be made to HSE's publication Methods for the Determination of Hazardous Substances (MDHS) 14/3 and 88.

PERSONAL PROTECTIVE EQUIPMENT

The use of personal protective equipment is only one aspect of an integrated approach to the Control Of Substances Hazardous to Health.

The management of Health and Safety at Work Regulations 1992 require employers to identify and evaluate the risks to health and to implement appropriate measures to eliminate or minimise those risks.

The choice of personal protective equipment is highly dependent upon local conditions, e.g. exposure to other chemical substances and micro-organisms, thermal hazards (protection from extremes of cold and heat), electrical hazards, mechanical hazards and appropriate degree of manual dexterity required to undertake an activity.

Whilst the content of this section may inform the choice of personal protective equipment used, the limitations of any data which can be provided must be fully understood, e.g. personal protective equipment chosen to protect employees from occasional splashes maybe entirely inadequate for activities involving partial or complete immersion.

If the levels of vapour or particulate in air are likely to exceed the occupational exposure standards then consideration should be given to the use of local exhaust ventilation to reduce personal exposure. The choice of personal protective equipment should only be undertaken in the light of a full COSHH and risk assessment by a suitably qualified competent person (e.g. a professionally qualified occupational hygienist).

Effective protection is only achieved by correctly fitting and well maintained equipment and employers should ensure that appropriate training is given. All personal protective equipment should be regularly inspected and replaced if defective.

In the first instance, further guidance maybe obtained through HSE's publication "COSHH - a brief guide to the regulations" (INDG136(rev1)).

Hand Protection :-

Chemical protective gloves are made from a wide range of materials, but there is no single glove material (or combination of materials) which gives unlimited resistance to any individual or combination of substances or preparations. The extent of

the breakthrough time will be affected by a combination of factors which include permeation, penetration, degradation, use pattern (full immersion, occasional contacts) and how the glove is stored when not in use.

Theoretical maximum levels of protection are seldom achieved in practice and the actual level of protection can be difficult to assess.

Effective breakthrough time should be used with care and a margin of safety should be applied. HSE guidance on protective gloves recommends a 75% safety factor to be applied to any figures obtained in a laboratory test.

Nitrile gloves may offer relatively long breakthrough times and slow permeation rates. Test data, e.g breakthrough data obtained through test standard EN374-3:1994 are available from reputable equipment suppliers.

Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. A non perfumed moisturiser should be applied.

Respiratory Protection

At standard temperature and pressure, the Occupational Exposure Standards are unlikely to be exceeded.

Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate prefilter should be considered.

Half masks (EN 149) or valved half masks(EN 405) in combination with type A2 (EN 141) and P2/3 (EN 143) prefilters maybe considered.

If Antifreeze Concentrate is subjected to elevated temperatures, say, half masks (EN 149) or valved half masks(EN 405) in combination with type AX (EN 371) and P2/3 (EN 143) prefilters maybe considered.

Eye Protection

Goggles conforming to a minimum standard of BS EN 166 345B should be considered if there is a possibility of eye contact with Antifreeze Concentrate through splashing.

Higher rated eye protection must be considered for highly hazardous operations or work areas, employees involved in metalworking operations such as chipping, grinding or cutting may require additional protection to avert injury from fast moving particles or broken tools.

9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State :		Liquid at ambient temperature
Appearance :		Dyed or colourless
Odour :		Characteristic
Acidity/Alkalinity :		pH 7-9 (solution in water at 50gms/100mls)
Initial Boiling Point :		>150 Deg. C.
Freezing Point :		<-30 Deg. C. (50% solution in water)
Flashpoint :		>100 Deg. C.
Flammability :		Not applicable
Autoflammability :		417 Deg. C. *
Flammability Limits	- Upper :	Not determined
	- Lower :	3.0 % vol. *
Explosive Properties :		Not applicable
Oxidising Properties :		Not applicable
Vapour Pressure @ 20 Deg. C. :		<10 Pa
Relative Density @ 20 Deg. C. :		1.12-1.14
Solubility :	Water Solubility :	Completely miscible
	Fat solubility/solvent :	Not determined
Partition Coefficient, n-octanol water :		>1.0 *
Vapour Density (Air =1) :		Not determined
Viscosity @ 20 Deg. C. :		Not determined

Values marked with a * refer to ethanediol

10: STABILITY AND REACTIVITY

CONDITIONS TO AVOID

Extremes of temperature. Store between 0 and 50 Deg. C.

MATERIALS TO AVOID

Strong oxidising agents, eg. chlorates which may be used in agriculture.

DECOMPOSITION PRODUCTS

The substances arising from the thermal decomposition of these products will largely depend upon the conditions bringing about decomposition. The following substances may be expected from normal combustion :

Carbon Dioxide	Unidentified Organic and Inorganic Compounds
Carbon Monoxide	Particulate Matter
Water	Nitrogen Oxides

11: TOXICOLOGICAL INFORMATION

Basis of Assessment

Toxicological data may not have been determined specifically for all end points (e.g. mutagenicity, carcinogenicity, reproductive toxicity, repeated dose and acute toxicity, corrosivity, irritation, sensitisation etc) for this substance/preparation. Assessment will be based on a combination of test data, human experience, toxicological data generated on similar components and the conventional method.

Antifreeze Concentrate is classified as harmful by ingestion (deaths have been reported on swallowing large quantities). The toxicity of ethanediol is principally due to it's metabolites. Renal damage has been observed in man with the deposition of oxalate crystals.

At very high doses in animal experiments, foetotoxicity has been observed, but it's relevance to man has still to be clarified.

Antifreeze Concentrate contains an aversive agent which has an extremely bitter taste.

ACUTE HEALTH HAZARDS AND ADVICE

INHALATION

Due to its low vapour pressure, Antifreeze Concentrate is not considered likely to present an inhalation hazard at ambient temperature. At elevated temperatures, the vapour may irritate the respiratory tract.

Precautions :

Inhalation of vapour, mists and aerosols should be avoided. If this cannot be achieved by safe working practices, suitable respiratory protection should be used.

First Aid :

Remove the person affected to fresh air. If rapid recovery does not occur, obtain medical attention.

SKIN

Antifreeze Concentrate is expected to be slightly irritating to the skin and is harmful by skin absorption on prolonged or repeated exposure.

Precautions :

All contact must be avoided by the use of suitable protective clothing Launder contaminated clothing before reusing.

First Aid :

Wash contaminated skin with water. Use soap if available.

EYES

Antifreeze Concentrate is expected to be moderately, possibly severely, irritating to the eye.

Precautions :

If there is a risk of splashing while handling the liquid, suitable eye protection should be used.

First Aid :

Do not delay. Flush the eye with copious quantities of water for up to 10 minutes. Refer for medical attention.

INGESTION

Ingestion of ethanediol may lead to serious intoxication, and possibly death. There may be effects on the central nervous system, on the cardio-pulmonary system, and on the kidneys, with renal failure. Ingestion of as little as 100 millilitres may be fatal for an adult. Antifreeze Concentrate is rapidly absorbed causing symptoms resembling alcohol intoxication, and cardio-vascular effects. Death may occur from renal or hepatic failure : survivors usually have complete recovery of renal function, although cerebral damage may be permanent.

Precautions :

Accidental ingestion is unlikely except in the case of children. Normal handling and hygiene precautions to avoid ingestion, especially by keeping out of reach of children.

First Aid :

The normal advice given in the case of ingestion of hydrocarbon products is that vomiting should be avoided owing to risks of aspiration into the lungs. Owing to the toxic effects and rapid absorption from the stomach, this advice is modified for Antifreeze Concentrate as follows :

SEEK QUALIFIED MEDICAL ASSISTANCE IMMEDIATELY.

IF THE PATIENT IS UNCONSCIOUS, DO NOT INDUCE VOMITING.

WITH A CONSCIOUS PATIENT, if hospital assistance is not likely to be immediately available, attempt to induce vomiting.

SHOW A COPY OF THIS DATA SHEET TO THE PHYSICIAN.

CHRONIC HEALTH HAZARD AND ADVICE

Continued exposure to vapour of Antifreeze Concentrate can induce unconsciousness, nystagmus and lymphocyosis. Death from ingestion of the liquid is due to renal or hepatic failure. Survivors usually have complete recovery of renal function. Cerebral damage may however be permanent. There is no human or animal evidence for carcinogenicity or mutagenicity.

HEALTH ADVICE TO PHYSICIANS

Treat by observation and supportive measures as indicated by the patient's condition.

The essentials of therapy are :

1. Supportive treatment of respiratory distress and shock.
2. Correction of metabolic acidosis and hypocalcemia.
3. Rapid and sustained diuresis when possible with the use of hypertonic mannitol.
4. Immediate peritoneal or haemodialysis.
5. Thiamine and pyridoxine supplements.
6. Intravenous administration of ethanol if the diagnosis is recognised within 6 hours after ingestion, and
7. Treatment for renal failure with dialysis as needed to keep patient free from signs and symptoms of uraemia.

12: ECOLOGICAL INFORMATION

Ecotoxicological data may not have been determined specifically for all end points for this substance/preparation. Assessment will be based on a combination of test data, other available evidence, ecotoxicological data generated on similar components and the conventional method.

Antifreeze Concentrate should be managed in the environment as a preparation at most slightly toxic but posing an indirect hazard to the aquatic environment because of ready biodegradation leading to oxygen depletion. Avoid gross contamination of the soil. Minimise contamination of water because of deoxygenation hazard. Spilled material should be contained and removed as completely as possible. Final traces can be dispersed with water.

AIR

Antifreeze Concentrate is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.

WATER

If released to water, Antifreeze Concentrate will dissolve. In view of deoxygenation hazard, consider dilution or (artificial) reaeration. It will not bioaccumulate significantly.

SOIL

If released to soil Antifreeze Concentrate is highly mobile and will, in significant quantities, permeate to lower soil levels and may reach groundwater in which it will dissolve.

13: DISPOSAL CONSIDERATIONS

Antifreeze Concentrate should be disposed of to a licensed waste contractor.

Any disposal route must satisfy the requirements of the of the Environmental Protection Act, 1990, the Environment Act 1995, and should comply with any local byelaws. byelaws.

Antifreeze Concentrate is controlled by the Special Waste Regulations 1996.

Envirowise offers free advice through a national helpline. Initial contact by industry and commerce should be made to the Environment and Energy helpline (0800 585 794). The Envirowise programme is sponsored by Government and seeks to encourage good practice in environmental protection technology and techniques.

Further guidance can also obtained from the local environment agency agency office.

14: TRANSPORT INFORMATION

Not Dangerous for Conveyance

15: REGULATORY INFORMATION

Dangerous for Supply

Category of Danger :	Harmful
Symbols :	St Andrew's Cross
Risk Phrases :	Harmful if swallowed
Safety Phrases:	S2 Keep out of reach of Children S24/25 Avoid contact with skin and eyes S46 If swallowed, seek medical advice immediately and show this container or label
Contains :	Ethanediol

Additional Information

Safety data sheet available on request

LEGISLATION

Consumer Protection Act 1987
Control of Pollution Act 1974
Environmental Protection Act 1990
Environment Act 1995
Factories Act 1961
Health and Safety at Work Act 1974

Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations
Chemical (Hazards, Information, and Packaging for Supply) Regulations
Control of Substances Hazardous to Health Regulations
Dangerous Substances in Harbour Areas Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Packages etc.) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers and Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
Special Waste Regulations 1996
Health and Safety (First Aid) Regulations 1981
Personal Protective Equipment (EC Directive) Regulations 1992
Personal Protective Equipment at Work Regulations 1992

16: OTHER INFORMATION

GUIDANCE NOTES

	UK Chemicals Regulatory Atlas, An Overview of how to guide your chemical through to regulatory compliance (DTI).
HSG71	The storage of packaged dangerous substances
EH/40	Occupational Exposure Limits
MS24	Health surveillance of occupational skin disease
HSG 53	The selection, use and maintenance of respiratory protective equipment: A practical guide
HSG 206	Cost and effectiveness of chemical protective gloves for the workplace: Guidance for employers and health and safety specialists.
HSG 136	Workplace transport safety : guidance for employers
INDG234 (rev)	Are you Involved in the Carriage of Dangerous Goods by Road or Rail.

OTHER LITERATURE

Department of the Environment - Waste Management - The Duty of Care - A Code of Practice

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Data Sheet No. F32002 Revision : 02 10 2002 REPLACES F32002 : 11 01 01

This data sheet has been prepared in accordance with the requirements of the Data Sheet Directive 91/155/EEC.

RECOMMENDED USES

Shell Agricultural Gas Oil is recommended for use as :

a fuel for small industrial boilers for horticultural and agricultural space heating applications, furnaces and dryers.

If Shell Agricultural Gas Oil is used for a purpose not covered in this section, Shell UK Ltd would be grateful to receive information on the application.

KNOWN MISUSES/ABUSES

Shell Agricultural Gas Oil is not to be used as :

a solvent or cleaning agent. It should never be siphoned by sucking the liquid up a tube by mouth, or stored near sources of heat or ignition.

The disposal of Shell Agricultural Gas Oil to soil, watercourses and drains is a legal offence.

1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

PRODUCT :	**SHELL AGRICULTURAL GAS OIL**
COMPANY :	**SHELL UK OIL PRODUCTS LIMITED**
TECHNICAL CONTACT:	**PRODUCT HSE DEPARTMENT**
ADDRESS :	**STANLOW MANUFACTURING COMPLEX, PO BOX 3, ELLESMERE PORT, CH65 4HB**
TELEPHONE :	**0151-350-4000**
EMERGENCY TELEPHONE NUMBER :	**0151-350-4595**

2: COMPOSITION/INFORMATION ON INGREDIENTS

Shell Agricultural Gas Oil is a preparation manufactured from gas oils, derived from crude petroleum, and additives, none of which impart any additional hazard to the finished product.

The hydrocarbon components will include straight-run gas oil, and may contain vacuum and/or cracked gas oil components.

It is a requirement of H.M. Customs and Excise that all reduced duty fuels contain Quinizarin and C.I. Solvent Red 24. Rebated fuels marketed within the European Union must also contain C.I. Solvent Yellow 124. Shell Agricultural Gas Oil contains C.I.Solvent Red 24, Quinizarin and C.I. Solvent Yellow 124 at 4 ppm, 1.75 ppm and 6 ppm respectively.

The following components, which have health effects, are present at significant concentrations.

CONC.	COMPONENT	EINECS	CLASS	RISK PHRASES
< 100%	Fuels, diesel	269-822-7	Xn	R40 Limited evidence of a carcinogenic effect
			Xn	R65 Harmful: may cause lung damage if swallowed
				R66 Repeated exposure may cause skin dryness and cracking
			N	R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Exposure limit values exist for the following constituents:

None.

3: HAZARD IDENTIFICATION

Shell Agricultural Gas Oil is classified for supply purposes as : Harmful (R40: Limited evidence of a carcinogenic effect and R65: Harmful: may cause lung damage if swallowed), and Dangerous for the Environment (R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment).

Shell Agricultural Gas Oil satisfies the criteria for the additional risk phrase - R66: Repeated exposure may cause skin dryness or cracking.

Shell Agricultural Gas Oil is a combustible liquid, which may explode under certain conditions, e.g. in the presence of electrostatic charges generated, for example, during pumping or tank cleaning or by other sources of ignition or flame impingement on containers.

Accidental ingestion can lead to vomiting and aspiration into the lungs, which can result in chemical pneumonitis, which can be fatal.

Prolonged and repeated skin contact can lead to defatting of the skin, drying, cracking, dermatitis, erythema, oil acne and oil folliculitis. Warty growths have occurred and these can become cancerous.

Exposure to high vapour concentrations can lead to nausea, headache and dizziness. Excessive and prolonged exposure to mists may cause a chronic inflammatory reaction of the lungs and a form of pulmonary fibrosis.

It should be assumed that the flashpoint of Shell Agricultural Gas Oil is equal to or less than 60.5 Deg. C. unless the carrier has obtained contrary test data. Consequently, Shell Agricultural Gas Oil is classified for conveyance purposes as a flammable liquid.

Shell Agricultural Gas Oil will not biodegrade in anaerobic conditions and, hence, can be persistent. It contains components which have a high potential to bioaccumulate.

4: FIRST AID MEASURES

INHALATION

Remove the affected person to fresh air. If breathing has stopped administer artificial respiration. Give cardiac massage if necessary. If the person is breathing, but unconscious, place in the recovery position. Obtain medical assistance immediately.

SKIN

Flush the contaminated skin with water. Use soap if available. Contaminated clothing should be soaked with water, removed, and laundered before reuse.

EYES

Flush the eye with copious quantities of water. If irritation persists refer for medical attention.

INGESTION

DO NOT INDUCE VOMITING. If ingestion is suspected, wash out the mouth with water, and send to hospital immediately. Show this Data Sheet to the physician drawing attention to "Notes for Doctors" in Section 11 below.

5: FIRE-FIGHTING MEASURES

Extinguishants	- Large Fire :	Foam/Water Fog - NEVER USE WATER JET
	- Small Fire :	Foam/Dry Powder/CO2/Sand/Earth

6: ACCIDENTAL RELEASE MEASURES

LAND SPILLAGES

IMMEDIATE EMERGENCY ACTION
Clear people away from the area to a safe place
Do not operate electrical equipment unless flameproof
Summon aid of emergency services if warranted
Treat or refer casualties if necessary

FURTHER ACTION - FIRE

IF SAFE : -
Stop product flow
Use foam, dry powder or carbon dioxide extinguishers
Containers exposed to fire can be cooled by water fog/spray
*** NEVER USE WATER JET ***

FURTHER ACTION - SPILLAGE
IF SAFE : -
Extinguish naked lights, eg cigarettes - AVOID MAKING SPARKS
Position fire fighting equipment
Try to stop the flow of liquid product
Prevent product entering waterways, drains etc. (Covering with wet sacking helps)
Use sand, earth or other suitable material
If product reaches waterways, drains etc. inform local and fire authorities
Reclaim product directly or absorb in suitable medium and transfer to suitable, clearly marked containers
See section 13 for disposal of contaminated product and waste

MARITIME SPILLAGES

Any spillage of Shell Agricultural Gas Oil which results in overside pollution must be treated in accordance with the guidelines laid down in the respective Vessel Oil Spill Response Contingency Plan, as required by MARPOL 73/78 Annex 1, Regulation 26. Where the vessel is not required to comply with such legislation, the Owner's and/or Charterer's instructions must be followed. In the absence of any other guidelines, any spillage in territorial/coastal waters must be immediately reported to the appropriate maritime authority, e.g. coast guard, the vessel's local agent if applicable, and the vessel's Owner/Charterer. In international waters, any spillage should be reported to the nearest coastal state, and additional guidance should sought immediately from the vessel's Owner/Charterer.

7: HANDLING AND STORAGE

HANDLING

Shell Agricultural Gas Oil is designed to be used in closed systems and in off-road vehicle fuel systems. No special handling precautions are necessary other than care to avoid skin contact with the product. Owing to its classification as a carcinogen, care should be taken to minimise contact. Electrical continuity is required between the transport and storage vessels during product transfer.

STORAGE

The main considerations relating to the storage of Shell Agricultural Gas Oil are the suitability of the storage vessel and the avoidance of sources of ignition.

8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

The following limits are taken from The Health and Safety Executive's Guidance Note EH40 Occupational Exposure Limits 2000.

None.

RECOMMENDED PROTECTIVE CLOTHING

Impervious gloves and overalls where regular contact is likely, and goggles if there is a risk of splashing

9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State :		Mobile liquid at ambient temperature
Appearance :		Clear Red/ Brown
Odour :		Characteristic
Acidity/Alkalinity :		Not applicable
Initial Boiling Point :		180 Deg. C.
Flashpoint :		> 56 Deg. C.
Flammability :		Not applicable
Autoflammability :		ca. 220 Deg. C.
Flammability Limits	- Upper :	6 % vol.
	- Lower :	1 % vol.
Explosive Properties :		Not applicable
Oxidising Properties :		Not applicable
Vapour Pressure @ 20 Deg. C. :		<0.1 k.Pa
Relative Density @ 15 Deg. C. :		0.82 to 0.87
Solubility :	Water Solubility :	Very Low
	Fat solubility/solvent :	Not available
Partition Coefficient, n-octanol water :		3 to >6
Vapour Density (Air =1) :		> 5
Viscosity @ 40 Deg. C. :		2 to 5 cSt.

10: STABILITY AND REACTIVITY

CONDITIONS TO AVOID

Sources of ignition. Extremes of temperature.

MATERIALS TO AVOID

Strong oxidising agents, eg. chlorates which may be used in agriculture.

DECOMPOSITION PRODUCTS

The substances arising from the thermal decomposition of these products will largely depend upon the conditions bringing about decomposition. The following substances may be expected from normal combustion :

Carbon Dioxide
Carbon Monoxide
Water
Particulate Matter
Polycyclic Aromatic Hydrocarbons
Unburnt Hydrocarbons
Unidentified Organic and Inorganic Compounds
Nitrogen Oxides
Sulphur Oxides

11: TOXICOLOGICAL INFORMATION

ACUTE HEALTH HAZARDS AND ADVICE

Shell Agricultural Gas Oil is classified as harmful owing to the aspiration hazard.

Shell Agricultural Gas Oil carries the additional risk phrase - repeated exposure may cause skin dryness or cracking.

The main hazards are: in the case of inhalation of higher vapour concentrations, of effects on the central nervous system ; in the case of skin contact of, defatting and irritation ; in the unlikely event of ingestion, of aspiration into the lungs with possible resultant chemically induced pneumonia.

Exposure to higher vapour concentrations can lead to nausea, headache, dizziness, loss of consciousness, and, in oxygen deficient environments, death. A person exposed to significant concentrations of vapour may display drunken behaviour, and his judgement can be impaired.

If the product is accidentally ingested, irritation to the gastric mucous membranes can lead to vomiting. If this occurs, there is a high probability of the product being aspirated into the lungs, which can lead to chemical pneumonitis which can be fatal.

INHALATION

Under normal conditions of use Shell Agricultural Gas Oil is not expected to present an inhalation hazard.

Precautions :

Inhalation of vapours should be avoided. Where, exceptionally, higher concentrations of the vapour may be encountered, e.g. in the event of a spillage in a badly ventilated area, persons should not be allowed to enter the area, even in an emergency, until the atmosphere has been checked and passed as safe for entry by a competent person.

First Aid :

Remove the affected person to fresh air. If breathing has stopped administer artificial respiration. Give cardiac massage if necessary. If the person is breathing, but unconscious, place in the recovery position. Obtain medical assistance immediately.

SKIN

Shell Agricultural Gas Oil is slightly irritating to the skin, and has a defatting action on the skin.

Precautions :

Avoid contact with the skin by the use of suitable protective clothing.

First Aid :

Flush the contaminated skin with water. Use soap if available. Contaminated clothing should be soaked with water, removed, and laundered before reuse.

EYES

Shell Agricultural Gas Oil may cause discomfort to the eye.

Precautions :

If there is a risk of splashing while handling the liquid, suitable eye protection should be used.

First Aid :

Flush the eye with copious quantities of water. If irritation persists refer for medical attention.

INGESTION

Shell Agricultural Gas Oil is classified as harmful owing to the aspiration hazard. Ingestion can lead to vomiting and aspiration into the lungs, which can result in chemical pneumonitis, which can be fatal.

Precautions :

Accidental ingestion is unlikely. Normal handling and hygiene precautions should be taken to avoid ingestion.

First Aid :

DO NOT INDUCE VOMITING Wash out the mouth with water, and, if ingestion is suspected, send to hospital immediately. Show this Data Sheet to the physician drawing attention to "Notes for Doctors" below.

CHRONIC HEALTH HAZARD AND ADVICE

Shell Agricultural Gas Oil is classified as a category 3 carcinogen.

The main hazards arise from skin contact and in the inhalation of mists.

Skin contact over prolonged and repeated periods can lead to defatting of the skin, dermatitis, erythema, oil acne and oil folliculitis. Where occupational and personal hygiene practices have been of a poor standard, warty growths have occurred and these can become cancerous.

Excessive and prolonged inhalation of mists may cause a chronic inflammatory reaction of the lungs and a form of pulmonary fibrosis.

NOTES FOR DOCTORS

HIGH PRESSURE INJECTION INJURIES

High pressure injection injuries require surgical intervention and possibly steroid therapy to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. PROMPT surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetic, and wide exploration is essential.

INGESTION AND ASPIRATION OF PETROLEUM PRODUCTS

There may be a risk to health where low viscosity products are aspirated into the lungs following vomiting, although this is uncommon in adults. Such aspiration would cause intense local irritation and chemical pneumonitis. Children, and those in whom consciousness is impaired, will be more at risk. Emesis of lubricants is not usually necessary, unless a large amount has been ingested, or some other compound has been dissolved in the product. If this is indicated - for example, when there is rapid onset of CNS depression from a large ingested volume - gastric lavage under controlled hospital conditions, with full protection of the airway is required. Supportive care may include oxygen, arterial blood gas monitoring, respiratory support and, if aspiration has occurred, treatment with corticosteroids and antibiotics. Seizures should be controlled with Diazepam, or appropriate equivalent drug.

12: ECOLOGICAL INFORMATION

Shell Agricultural Gas Oil contains fuels, diesel which is classified as toxic to aquatic organisms/ may cause long-term adverse effects in the aquatic environment.

AIR

Shell Agricultural Gas Oil is a mixture of mainly non-volatile components, which when released to air will react rapidly with hydroxyl radicals and ozone.

WATER

If released to water, Shell Agricultural Gas Oil will evaporate at a very slow rate. A small proportion will dissolve. Dissolved components will be either absorbed in sediments or evaporate to air. In aerobic water and sediments they will biodegrade, but in anaerobic conditions they will persist.

SOIL

Small volumes released on land will evaporate at a very slow rate, with a proportion of the product being absorbed in the upper soil layers and being subject to biodegradation. Larger volumes may penetrate into anaerobic soil layers in which the product will persist. The product may reach the water table on which it will form a floating layer, and move along with the groundwater flow. In this case the more soluble components, such as aromatics, will cause groundwater contamination.

13: DISPOSAL CONSIDERATIONS

Shell Agricultural Gas Oil is a special waste owing to its supply classification. It should be disposed of to a licensed waste contractor. Any disposal route should comply with local byelaws and the requirements of the Environmental Protection Act, 1990.

14: TRANSPORT INFORMATION

It should be assumed that the flashpoint of Shell Agricultural Gas Oil is equal to or less than 60.5 Deg. C. unless the carrier has obtained contrary test data.

UN Number :	1202
Proper Shipping Name :	Gas Oil
Symbol :	Flammable Liquid
Packing Group :	III
Marine Pollutant :	No
IATA/ICAO Hazard Class :	3
IMO Hazard Class :	3.3
Class :	3
Classification Code :	F1
Hazard Identification No. :	30
Hazchem Code :	3|Z

15: REGULATORY INFORMATION

This material has been classified according to the requirements of the Chemicals (Hazard Information and Packaging for Supply) Regulations.

Dangerous for Supply

Symbols :	St Andrew's Cross Dead Fish and Tree	
Categories of Danger :	Category 3 Carcinogen Harmful	
Risk Phrases :	R40	Limited evidence of a carcinogenic effect
	R65	Harmful: may cause lung damage if swallowed
	R66	Repeated exposure may cause skin dryness or cracking
	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the
Safety Phrases :	S2	Keep out of the reach of children
	S24	Avoid contact with the skin.
	S36/37	Wear suitable protective clothing and gloves
	S61	Avoid release to the environment. Refer to special instructions / safety data sheets
	S62	If swallowed, do not induce vomiting : seek medical advice immediately and show this label or container
Contains :	Fuels, diesel	

16: OTHER INFORMATION

The references set out below give further information on specific aspects.

LEGISLATION

Consumer Protection Act 1987
Control of Pollution Act 1974
Environmental Protection Act 1990
Factories Act 1961
Health and Safety at Work Act 1974

Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labelling) Regulations
Chemical (Hazards, Information, and Packaging for Supply) Regulations
Control of Substances Hazardous to Health Regulations
Dangerous Substances in Harbour Areas Regulations
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations
Road Traffic (Carriage of Dangerous Substances in Packages etc.) Regulations
Road Traffic (Carriage of Dangerous Substances in Road Tankers and Tank Containers) Regulations
Road Traffic (Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
Special Waste Regulations

GUIDANCE NOTES

CS/15	The cleaning and gas freeing of tanks containing flammable residues
HS(G)22	Electrical apparatus for use in potentially explosive atmospheres
HS(G)50	The storage of flammable liquids in fixed tanks (up to 10000m3 total capacity)
HS(G)51	The storage of flammable liquids in containers
HS(G)50	The storage of flammable liquids in fixed tanks (exceeding 10000m3 total capacity)
HS(G)140	The safe use and handling of flammable liquids
HS(G)71	The storage of packaged dangerous substances
EH/40	Occupational Exposure Limits
EH/58	The Carcinogenicity of Mineral Oils
MS24	Health surveillance of occupational skin disease

BRITISH STANDARDS

BS 799	Specification for Oil Burning Equipment
BS 2000	Methods of Test for Petroleum and its Products
BS 2869	Fuel Oils for Oil Engines and Burners for Non-Marine Use
BS 5345	Selection, Installation and Maintenance of Electrical Apparatus for Use in Potentially Explosive Atmospheres
BS 5410	Oil Firing
BS 5958	Control of Undesirable Static Electricity
BS 6380	Low Temperature Properties and Cold Weather Use of Diesel Fuel and Gas Oils (Classes A1, A2 and D of BS 2869)

OTHER LITERATURE

Concawe Report 01/97 Petroleum Products - First Aid Emergency and Medical Advice

Department of the Environment - Waste Management - The Duty of Care - A Code of Practice

European Model Code of Safe Practice in the Storage and Handling of Petroleum Products
Institute of Petroleum Marketing Safety Code
Department of Trade - Code of Portable Tanks and Road Tank Vehicles for the Carriage of Liquid Dangerous Goods in Ships

ADDRESSES

Concawe, Boulevard du Souverain 165 B - 1160 Brussels, Belgium
Institute of Petroleum, 61 New Cavendish Street, London W1

SAFETY DATA SHEET

ATHENA EP 90 (Group 2)

Mineral oil based GL-4 gear oil
Product code: G010

Date of issue: 2nd October 2002

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Identification of substance/preparation
Athena EP 90

Application
Automotive gear lubricant
For specific application advice see appropriate Technical Data Sheet or consult your eXOL representative

Company Identification
eXOL Lubricants Limited
All Saints Road
Wednesbury
West Midlands
WS10 9TS

Emergency Telephone Number
+44 (0) 121 568 6800

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Composition
Highly refined mineral oil (IP 346 DMSO extract < 3%)
Proprietary performance additives.

Hazardous Components
No component is present at sufficient concentration to require a hazardous classification.

3. HAZARDS IDENTIFICATION

This material is not considered to be hazardous, but should be handled in accordance with good industrial hygiene and safety practices.

USED ENGINE OILS
Used engine oil may contain hazardous components which have the potential to cause skin cancer.
See Toxicological Information, section 11 of this Safety Data Sheet.



SAFETY DATA SHEET

4. FIRST-AID MEASURES

Eyes
Wash eye thoroughly with copious quantities of water, ensuring eyelids are held open. Obtain medical advice if any pain or redness develops or persists.

Skin
Wash skin thoroughly with soap and water as soon as reasonably practicable. Remove heavily contaminated clothing and wash underlying skin.

Ingestion
If contamination of the mouth occurs, wash out thoroughly with water.
Except as a deliberate act, the ingestion of large amounts of product is unlikely. If it should occur, do not induce vomiting; obtain medical advice.

Inhalation
If inhalation of mists, fumes or vapour causes irritation to the nose or throat, or coughing, remove to fresh air. If symptoms persist obtain medical advice.

Medical Advice
Treatment should in general be symptomatic and directed to relieving any effects.

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5. FIRE-FIGHTING MEASURES

Use foam, dry powder or water fog. DO NOT USE water jets.
Fires in confined spaces should be dealt with by trained personnel wearing approved breathing apparatus.
Water may be used to cool nearby heat exposed areas/objects/packages. Avoid spraying directly into storage containers because of the danger of boil-over.

Combustion Products
Toxic fumes may be evolved on burning or exposure to heat.
See Stability and Reactivity, Section 10 of this Safety Data Sheet.

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6. ACCIDENTAL RELEASE MEASURES

Contain and recover spilled material using sand or other suitable inert absorbent material.
It is advised that stocks of suitable absorbent material should be held in quantities sufficient to deal with any spillage which may be reasonably anticipated.
Spilled material may make surfaces slippery.
Protect drains from potential spills to minimise contamination. Do not wash product into drainage system.
In the case of large spills contact the appropriate authorities or telephone 0121-568-6800
In the case of spillage on water, prevent the spread of product by the use of suitable barrier equipment. Recover product from the surface. Protect environmentally sensitive areas and water supplies.



SAFETY DATA SHEET

7. HANDLING AND STORAGE

Handling Precautions

Avoid contact with eyes. If splashing is likely to occur wear a full face visor or chemical goggles as appropriate.
Avoid frequent or prolonged skin contact with fresh or used product.
Good working practices, high standards of personal hygiene and plant cleanliness must be maintained at all times.
Wash hands thoroughly after contact.
Use disposable cloths and discard when soiled. Do not put soiled cloths into pockets.

Fire Prevention

Product contaminated rags, paper or material used to absorb spillages, represent a fire hazard, and should not be allowed to accumulate. Dispose of safely immediately after use.

Storage Conditions

Store under cover away from heat and sources of ignition.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits

There is no appropriate occupational exposure limit for this material.
Ensure good ventilation.
Avoid, as far as reasonably practicable, inhalation of vapour, mists or fumes generated during use.
If vapour, mists or fumes are generated, their concentration in the workplace air should be controlled to the lowest reasonably practicable level.

Protective Clothing

Wear face visor or goggles in circumstances where eye contact can accidentally occur.
If skin contact is likely, wear impervious protective clothing and/or gloves.
Protective clothing should be regularly dry cleaned. Change heavily contaminated clothing as soon as reasonably practicable; dry clean, launder and preferably starch before re-use. Wash any contaminated underlying skin with soap and water.

Respiratory Protection

Respiratory protection is unnecessary, provided the concentration of vapour, mists or fumes is adequately controlled.
The use of respiratory equipment must be strictly in accordance with the manufacturers' instructions and any statutory requirements governing its selection and use.



SAFETY DATA SHEET

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical Values			
Grades:			**EP 90**
	Test Method	**Units**	
Physical state			
Colour			
Odour			
Density @ 15°C	ASTM D 1298	**kg/m³**	891
Kinematic viscosity @ 40°C	ASTM D 445	**mm²/s**	229.1
Kinematic viscosity @ 100°C	ASTM D 445	**mm²/s**	19.85
Flash point (COC)	ASTM D 93	**°C**	222
Pour point	ASTM D 97	**°C**	-11

10. STABILITY AND REACTIVITY

Products of this type are stable and unlikely to react in a hazardous manner under normal conditions of use.
Hazardous polymerisation reactions will not occur.
This material is combustible.

Materials to Avoid
Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products
Thermal decomposition products will vary with conditions.
Incomplete combustion will generate smoke, carbon dioxide and hazardous gases, including carbon monoxide, hydrogen sulphide and oxides of sulphur and phosphorus.

11. TOXICOLOGICAL INFORMATION

Eyes
Unlikely to cause more than transient stinging or redness if accidental eye contact occurs.

Skin
Unlikely to cause harm to the skin on brief or occasional contact but prolonged or repeated exposure may lead to dermatitis.



SAFETY DATA SHEET

USED ENGINE OILS
Combustion products resulting from the operation of internal combustion engines contaminate engine oils during use. Used engine oil may contain hazardous components which have the potential to cause skin cancer. Frequent or prolonged contact with all types and makes of used engine oil must therefore be avoided and a high standard of personal hygiene maintained.

Ingestion
Unlikely to cause harm if accidentally swallowed in small doses, though larger quantities may cause nausea and diarrhoea.

Inhalation
At normal ambient temperatures this product will be unlikely to present an inhalation hazard because of its low volatility.
May cause irritation to eyes, nose and throat due to exposure to vapour, mists or fumes.
May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs.

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12. ECOLOGICAL INFORMATION

Mobility
Spillages may penetrate the soil causing ground water contamination.

Persistence and degradability
This product is inherently biodegradable.

Bioaccumulative potential
There is no evidence to suggest bioaccumulation will occur.

Aquatic toxicity
Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

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13. DISPOSAL CONSIDERATIONS

Where possible, arrange for product to be recycled.
Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.
Incineration may be carried out under controlled conditions provided that local regulations for emissions are met.

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14. TRANSPORT INFORMATION

Not classified as hazardous for transport (ADR, RID, UN , IMO, IATA/ICAO).



SAFETY DATA SHEET

15. REGULATORY INFORMATION

Not classified as hazardous for supply.

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16. OTHER INFORMATION

Compiled by:

Technical Department
eXOL Lubricants Limited
All Saints Road
Wednesbury
West Midlands
WS10 9TS

This data sheet and the health, safety and environmental information it contains is considered to be accurate as of the date specified below. We have reviewed any information contained herein which we received from sources outside eXOL Lubricants Limited. However, no warranty or representation, express or implied is made as to the accuracy or completeness of the data and information contained in this data sheet.

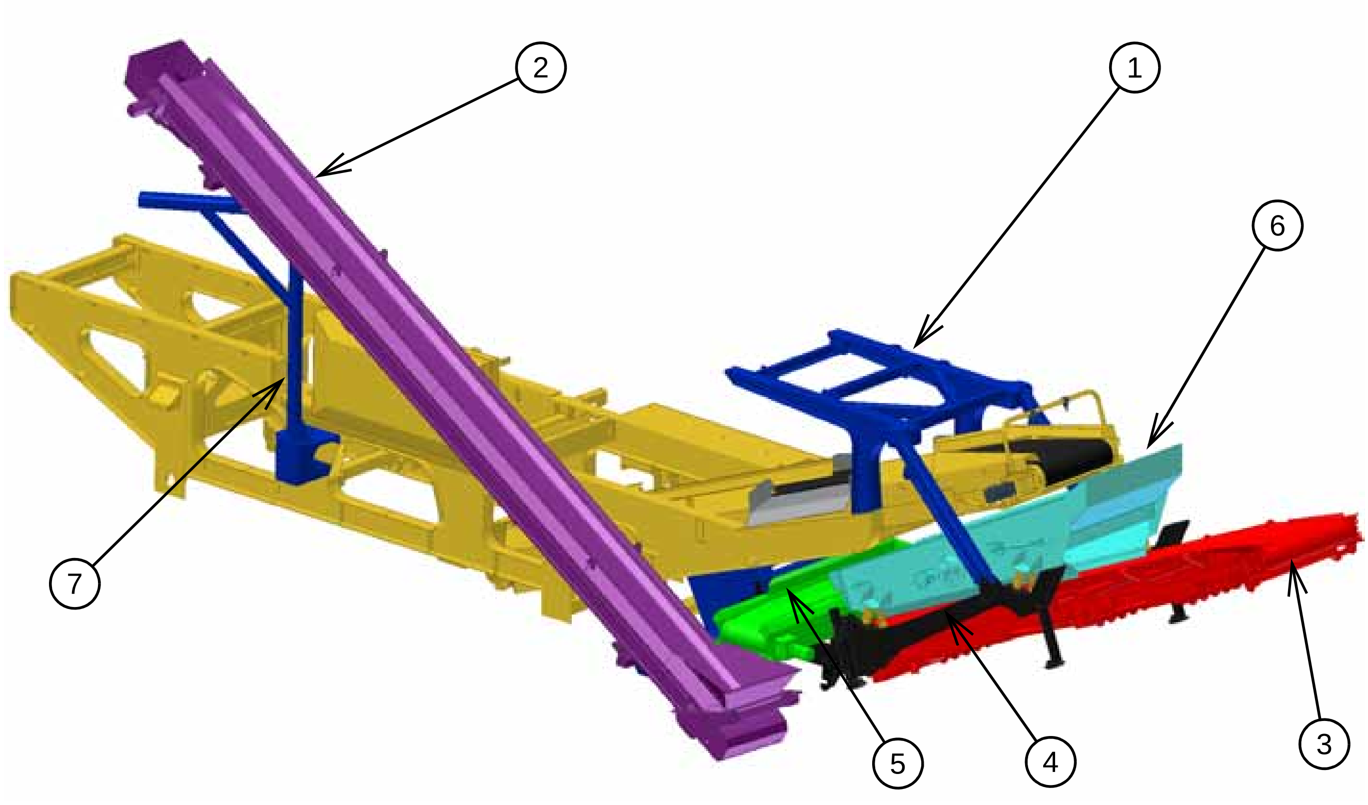
Health and safety precautions and environmental advice noted in this data sheet may not be accurate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission, recommendation or authorization given or implied to practise any patented invention without a valid licence.

eXOL Lubricants Limited shall not be responsible for any damage or injury resulting from abnormal use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material.

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Appendix E Heavy Component Weights

Part Number & Description -Weight



1: RECIRCULATION LAYOUT

1. Return Conveyor (**2**) - 1125 kg
2. Chassis Frame (**1**) - 1125 kg
3. Screen Sub Assy (**3,4,5,6)** - 3668 kg
4. A15930000 Support Arm (**7**) -150 kg

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