MECALAC

SITE DUMPER

TA3H, TA3SH & TA3.5SH

Original Instructions

OPERATOR'S MANUAL

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Serial Number	
Year of Construction	
Date of Delivery	
Dealer Stamp	
Notice	

Table Of Contents

1 Introduction

1.1 Important Information

Please read and follow this manual carefully. If you use the machine correctly:

- You will stay safe.
- Your machine will perform better and last longer.

We strongly recommend

- That your machine is properly maintained and regularly serviced, as specified in this manual.
- That you use original spare parts obtained from a Mecalac dealer.

We continually make improvements to these machines. We reserve the right to amend the machine without changing these instructions.

Any modification to this machine which has not been approved by Mecalac in writing is prohibited and immediately invalidates the manufacturer's warranty.

The operator of this machine must be a **competent person** who has received thorough training in the use of this type of machine. The operator must be supervised by a **knowledgeable supervisor**.

For further information, please contact the Mecalac Service Department who will be happy to help you.

1.2 Safety Alert System

The Safety Alert System identifies important safety messages in this manual. When you see this symbol, adhere to all safety messages that follow to avoid possible injury or death.

1.3 Intended Use

The machine has been designed and tested to carry out the function of transporting various free flowing materials. If used correctly, it will provide an effective means of transportation and meet the appropriate performance standards and regulations.

This machine is not suitable for under ground working or use in hazardous environments.

Use of this product in any other way is prohibited and contrary to its intended use

1.4 Operations Manual

This manual is a guide to the safe operation of the machine and the layout and position of all controls. It also contains details of checks and procedures within the scope of the operator to keep the machine in a safe and serviceable condition.

This manual is not a training manual. Contact Mecalac or your local dealer for details of suitable training courses.

Any person who intends to use this equipment must read this operations manual carefully before operating the machine.

Make sure this operations manual is kept with the machine at all times and is in good condition - replace the manual immediately if it becomes dirty, damaged or has been lost. The manual holder is located in the back of the seat (Figure 1.1) and is lockable

Replacement or additional copies of this publication can be ordered from your dealer.

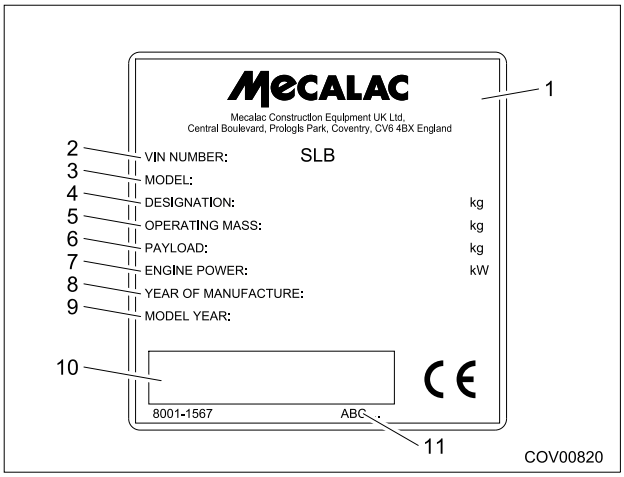
Figure 1.1 - Operations Manual Location

1.5 Identification Plate

The Vehicle Identification Number is recorded on a plate (Figure 1.2) located on the right hand side of the rear chassis frame.

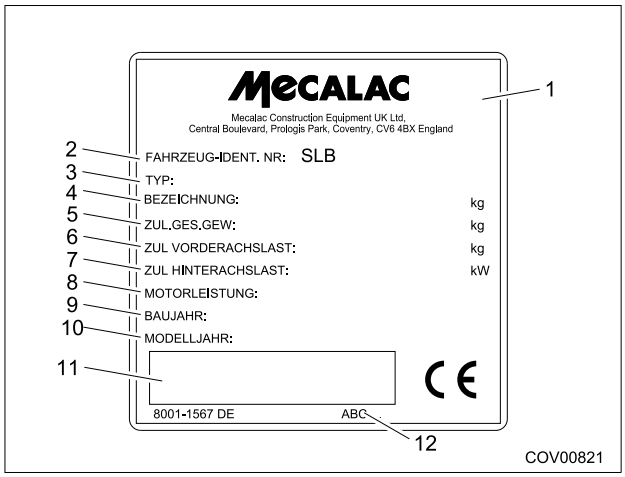
Figure 1.2 - Vehicle Identification Number Plate Location

You are advised to keep a record of your machines VIN number and the information recorded on the plate in a safe place



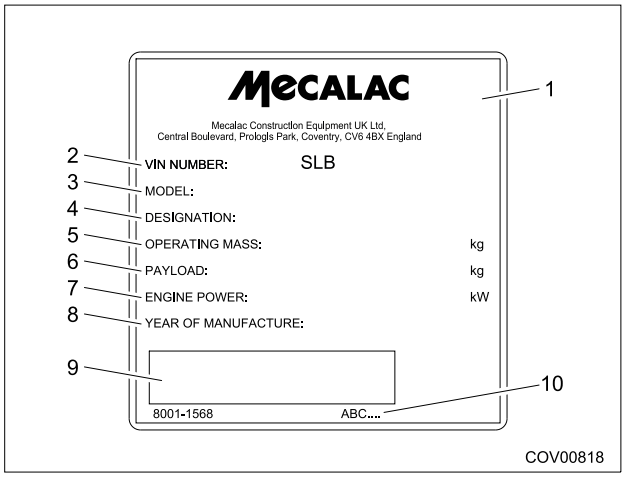
1. Company Address
2. Vehicle Identification Number
3. Machine Model
4. Designation
5. Operating Mass (Unladen)
6. Payload
7. Engine Power
8. Year Of Manufacture
9. Model Year
10. Bar Code
11. Works Order Number

Figure 1.3 - Vehicle Identification Plate Information - CE Machines



1. Company Address
2. Vehicle Identification Number
3. Model
4. Designation
5. Operating Mass (Laden)
6. Maximum Front Axle Load
7. Maximum Rear Axle Load
8. Engine Power
9. Build Year
10. Model Year
11. Bar Code
12. Works Order Number

Figure 1.4 - Vehicle identification Plate - German



1. Company Address
2. Vehicle Identification Number
3. Machine Model
4. Designation
5. Operating Mass
6. Payload
7. Engine Power
8. Year Of Manufacture
9. Bar Code
10. Works Order Number

Figure 1.5 - Vehicle Identification Plate Non CE

1.6 Warranty Registration

Your dealer will have registered you as the owner with Mecalac at the time of sale. Should you have any queries please consult your dealer in the first instance.

1.7 Warranty Terms and Conditions

Full terms and conditions of the machines warranty will be found on the warranty certificate incorporated in or accompanying this manual.

1.8 Service and Replacement Parts Enquiries

Please state the vehicle type and the Vehicle Identification Number (VIN) when making enquiries or orders and in all written correspondence.

1.9 Official Documents European Community Only

(1) CE mark

The Machinery Safety directive is intended to harmonise all the machinery safety regulations throughout the community so that there will be no technical barriers to trade.

Compliance with the essential safety requirements of the EEC directives 2006/42/EC (machinery), 2000/14/EC (Noise) and 2004/108/EC, permits companies to CE mark their products.

The directive affects almost every equipment supplier and user in the community and in particular, applies to this type of machine.

The regulations require that potential hazards from machinery are properly addressed and guarded against.

The EC declaration of conformity is a requirement of CE marking. The declaration for this machine (Figure 1.6) follows.

Figure 1.6 - Copy of CE Certificate

Contents of the EC Declaration of Conformity

2006/42/EC Machinery Directive

Manufacturer:	Mecalac Construction Equipment UK Limited Central Boulevard Prologis Park Keresley End Coventry CV6 4BX United Kingdom
Name of Person to Compile Technical File:	Steve Price
Address of Person to Compile Technical File:	Mecalac Construction Equipment UK Ltd
Generic Denomination:	Compact Dumper
Machine Function:	Earth-moving machinery
Model / Type :	TA3H TA3SH TA3.5SH
Serial/VIN number	
Commercial Name:	Same as Model /Type

Mecalac Construction Equipment UK Limited hereby declares that the above piece of machinery is in conformity with the relevant provisions of the Machinery Directive 2006/42/ EC

Mecalac Construction Equipment UK Limited hereby declares that the above piece of machinery is in conformity with the provisions of the following other EC-directives: Noise - Equipment Used Outdoors (2000/14/EC), Emissions - Non-Road Engines (97/68/EC) and Electromagnetic Compatibility (2004/108/EC).

Mecalac Construction Equipment UK Limited hereby declares that the following European harmonised standards have been used:

EN474-1 & EN474-6

Place of Issue: Coventry, United Kingdom

Date of Issue:

Empowered signatory

Gregg Horne

General Manager

1.10 California Proposition 65

California (USA) state law stipulates that the manufacturers of machines operated within its borders must provide a clear warning to customers regarding exposure to substances commonly associated with the machine that are recognized by the state as harmful. Mecalac complies with this requirement by providing the following information.

California Proposition 65
Warning: This product contains and/or emits lead and lead compounds, diesel engine exhaust, and used engine oil, chemicals known to the state of California to cause cancer

California Proposition 65
Warning: This product contains and/or emits lead, lead compounds and carbon monoxide chemicals known to the state of California to cause birth defects or other reproductive harm

1.11 Bulletin Compliance

- You must take action and comply with any safety bulletins transmitted to you by your dealer or by Mecalac.
- Make sure the details of ownership of the machine are recorded by your dealer and the information is accurate and up to date. Failure to do so may result in critical safety information being withheld.
- Bulletins can only be issued to the recorded owner or keeper of the equipment. It is your responsibility to make sure that your dealer or Mecalac has your correct details.
- If you are the new owner contact your local dealer with your details and quote the machines VIN number to make sure you receive any future bulletins or updates.

1.12 Contacting the Manufacturer

At times it may be necessary to contact the manufacturer of this machine. You must supply the Model and VIN Number of the machine together with your name and contact details.

You must contact Mecalac for:-

- For any product modifications to your machine.
- To report an accident involving Mecalac equipment.
- Product applications and safety.
- Standards and regulations compliance.
- To report change of ownership or ownership details (if not reported to a Mecalac dealer).

1.13 Transfer of Machine ownership

If you sell or otherwise dispose of your machine you must tell your dealer or otherwise Mecalac.:-

- The name and address of the new owner
- The model and VIN number of the machine
- The date of transfer or disposal.

2 Safety

This manual is designed as a guide to the Machines Controls, Operation and Maintenance. IT IS NOT A TRAINING MANUAL

2.1 Safety Alert System

The Safety Alert Symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death

2.2 ANSI Hazard Classification System

(1) Only Applicable to ANSI Safety Signs)

ANSI safety signs are only fitted to machines used in the US, Canada, Australia and New Zealand

A multi-tier hazard classification system is used to communicate potential personal injury hazards.

The following signal words used with the safety alert symbol indicate a specific level of severity of the potential hazard

All are used as attention getting devices on safety signs fixed to the machinery to assist in potential hazard recognition and prevention

DANGER

DANGER - (Always used with a safety alert symbol and white letters on a red background) Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING - (Always used with a safety alert symbol and black letters on an orange background) Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION - (Always used with a safety alert symbol and black letters on a yellow background) Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

(2) Property Damage

NOTICE

NOTICE - (Used without a safety alert symbol and white italic letters on a blue background) Is used to address practices not related to personal injury

(3) Procedure

PROCEDURE

PROCEDURE - (Used without a safety alert symbol and black letters on a green background). This indicates a procedure that must be followed step by step for safe operation. Make sure all safety notes have been considered before beginning the procedure.

2.3 Personal Protective Equipment (PPE)

You must wear the PPE shown in the tables below **at all times** when operating this equipment. Do not wear rings, scarves or open jackets. Make sure that all loose clothing is tightly secured. Long hair must be restrained.

Protective Helmet		A protective helmet must be worn at all times to prevent injury from falling objects	Safety Boots		Safety boots must be worn at all times when operating this equipment
Ear Defenders		Ear protection must be worn at all times when operating or near this equipment	Safety Glasses		Safety glasses must be worn at all times to prevent eye injury from flying objects
High Visibility Clothing		High visibility clothing must be worn at all times when operating this equipment.	Seat Belt		The seat belt must be worn at all times when operating this equipment

You must wear the following PPE **when site conditions dictate**.

Protective Gloves		Protective gloves must be worn when necessary to prevent injury from sharp objects.	Face Shield		A face shield must be worn when conditions dictate to prevent eye or facial injury from flying objects
Dust Mask		A dust mask must be worn when site conditions dictate	Respirator		A respirator must be worn when site conditions dictate
Protective Clothing		Protective clothing must be worn when site conditions dictate			

You must wear the following PPE when **performing maintenance** on the machine.

Safety Glasses		Safety glasses must be worn at all times to prevent eye injury from flying objects.	Safety Boots		Safety boots must be worn at all times to prevent injury.

You must wear the following PPE **when site conditions dictate when performing maintenance on the machine.**

Protective Clothing		Protective clothing must be worn when conditions dictate.	Protective Gloves		Protective gloves must be worn when conditions dictate
Dust Mask		A dust mask must be worn when conditions dictate	Face Shield		A face shield must be worn when conditions dictate to prevent eye or facial injury from flying objects

2.4 General Safety Information

Consult your dealer or distributor for details of training courses.

All the time you are working on or with the machine you must consider any possible hazards and how to avoid them.

Only authorised persons must be allowed to operate this machine.

Unauthorised use of this machine may invalidate your insurance.

Operators and maintenance staff **must always comply with the following precautions**. These precautions are given here for your protection. Review them carefully before operating the machine and before performing general maintenance or repairs. Supervising staff must develop additional precautions relating to the specific work area and local safety regulations.

Warnings about the Operator

- Before operating the machine make sure you have had proper training and are fully conversant with the machine and its operation - If in doubt ASK!
- Make sure you, and anyone else who uses the machine, have been trained to operate it correctly and are physically and mentally fit.
- Do not operate the machine if you are unfit to do so because of alcohol or drugs etc.
- Personal Protective Equipment must be used as specified on *pages 2 - 2 and 2 - 3.*
- Read this instruction manual carefully before operating the machine. Make sure this instruction manual is kept with the machine at all times and is in good condition - replace the manual immediately if it becomes dirty, damaged or lost.
- Read and understand all safety signs before operating the machine.
- Check seat belts daily. YOU MUST ALWAYS WEAR A SEAT BELT WHEN OPERATING THE MACHINE**.**
- If the machine is fitted with ROPS and the machine should roll over, the Operator must grip the steering wheel firmly allowing the seat belt to restrain him/her in the seat until the machine comes to rest.

Warning for the supervisor

- Establish a training programme for all operators to make sure they are fully familiar with its operation.

Warnings about other people

- Make sure all bystanders are made fully aware of the safety instructions associated with this machine and are kept well clear of the operating area.
- Do not carry passengers.

Warnings about the machine

- Make sure the ROPS is not damaged and has no unauthorised modifications.
- Always make sure there is adequate ventilation around the machine. Never run the engine in an enclosed area without good ventilation or next to combustible materials.

- Stop the engine before refuelling, if there is a spillage mop it up and do not start the engine until it has been done.
- The exhaust gets extremely hot. Do not place anything on top of it and keep all combustible materials clear. Do not attempt any maintenance on a hot engine.
- Check your local laws and regulations, the engine may require a spark arrester etc.
- Before performing any maintenance on the machine, place a warning tag on the machine to prevent accidental start-up and remove the start key and battery isolator. Put the locking bar into position to prevent the front and rear chassis moving and creating a crushing zone.
- Do not inspect or clean the machine with the engine running.
- Make sure all guards or shields are in place before using the machine.
- Before carrying out maintenance on the hydraulic system make sure the hydraulic fluid is cool and there is no residual pressure in the hydraulic circuit - hydraulic fluid leaking under pressure can penetrate the skin.
- Do not operate the machine if it is damaged, improperly adjusted or not completely and correctly assembled.
- Keep footplates and steps free from dirt, oil, snow, ice etc.
- Do not remove the radiator cap when the engine is hot. Do not add coolant to a hot engine.
- Tyre changes and repairs to punctured tyres MUST only be carried out by fully trained operatives using the correct equipment. The manufacturer of this machine recommends a competent firm is employed to carry out these tasks.

Warnings about the work environment

- Be familiar with all prohibited work areas such as excessive slopes and dangerous terrain conditions.
- Do not drive on slopes or gradients that exceed the safe limits stated for this machine in this manual.
- If the machine is to be used on the public highway or at night lighting in accordance with national requirements of the country concerned must be fitted.
- Always use driveways approved by site management when driving around the site.
- In the event of an electrical/lightening storm park the machine in a safe place, dismount and seek shelter
- Always park machine correctly on firm, level ground where it will not cause an obstruction or danger - chock the wheels if necessary. DO NOT LEAVE THE ENGINE RUNNING or the start key in the start switch.
- Before taking the machine on public roads make sure that the machine complies with all road traffic regulations and obey all driving laws.Warnings about using the Skip
- Do not work under a raised skip unless the props/supports are fitted and locked in position.
- Only fill skip with free flowing loads.

- When manoeuvring or driving the machine with the skip raised take extreme care as forward visibility will be restricted.
- Do not drive around the site with the skip raised.
- The operator must get off machine when loading the dumper skip.
- Do not drive the machine on the public highway with the skip in the fully tipped position.

If anyone has any concerns with any safety aspect of the machine the problem must be reported and the machine must not be used until the safety concerns have been rectified or an authorised person has checked and satisfied the site personnel the machine is safe to use.

2.5 Seat Belt

A seat belt is provided for operator safety. It is important that the seat belt is inspected and checked regularly *See Maintenance Section.*

Failure to properly inspect and maintain a seat belt can result in death or serious injury.

The seat belt MUST be worn at all times when operating this equipment.

An optional green beacon is available. The green beacon shows from a distance that teh dumper driver is wearing his seatbelt. The beacon is mounted on the ROPS frame and flashes when in operation. Do not use the green beacon on a public highway.

2.6 ROPS

A ROPS (Roll Over Protective Structure) is provided for operator safety.

Although ROPS appear to be relatively maintenance-free, regular periodic inspections to make sure ROPS are damage free and thus capable of functioning in a roll over cannot be over emphasized.

Through periodic inspections, cracks, loose bolts, damage, and other normal wear and tear related problems can be eliminated before they become serious.

Proper inspection and maintenance procedures can make sure that ROPS will perform the life saving function they are designed for and expected to do.

Details on the inspection and maintenance of the ROPS will be found in the *Maintenance Section*.

A damaged ROPS must be replaced by a genuine part from the original manufacturer of the machine and fitted by an authorised dealer.

Do NOT modify or attach items to the ROPS without the manufacturers approval.

Do NOT use the ROPS as an attachment point for towing or pulling equipment.

2.7 Lockout and Tag Out

To prevent unauthorised starting of the machine, before any maintenance you must always:-

- Apply parking brake.
- Place transmission in Neutral
- Remove start key.
- Turn battery isolator to OFF and remove key
- Place warning notice in a prominent position warning others not to attempt to start or drive the machine.

2.8 Hydraulic Fluid

Fine jets of hydraulic fluid under pressure can penetrate the skin.

Relieve all pressure before dismantling any hydraulic system.

Do not use your fingers to check for small leaks or expose uncovered areas of your body to leaks.

Use a piece of cardboard or thick paper to check for leaks.

Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene will result

2.9 Fluid Levels

Make sure the machine is on firm, level stable ground. It must not be in a dangerous position or causing an obstruction. Apply the parking brake. Place gear lever is in neutral and the make sure engine is stopped before checking ALL fluid levels.

2.10 Battery Electrolyte

Contact with battery acid can cause serious burns, blindness or even death. Protective clothing, gloves and a face shield must be worn at all times when handling or working on a battery.

(1) Skin Exposure

If the skin is exposed to battery electrolyte, the affected skin must be washed immediately with running water.

If burning is severe seek immediate medical attention.

(2) Eye Contact

If eyes are exposed to battery electrolyte, wash eyes with running water and obtain immediate professional medical attention.

(3) Battery Charging

When charging the battery hydrogen gas is produced.

Make sure the area is well ventilated to prevent the risk of explosion from a build up of hydrogen.

(4) Frozen Battery Electrolyte

Batteries with frozen electrolyte may explode if used or charged.

Never 'jump start' a machine with a frozen battery.

To help prevent freezing, keep the battery fully charged.

Do Not Use a Machine with Frozen Battery Electrolyte

2.11 Fires

Using water to extinguish an oil fire could spread the fire or give you a shock from an electrical fire.

Use a carbon dioxide, dry chemical or foam extinguisher whilst waiting for the fire brigade.

Keep fire extinguisher seviceable and have it checked regularly

Do Not Use Water to Extinguish a Machine Fire

2.12 Water Cooled Engines

Water cooled systems operate under pressure to increase the boiling point of the coolant. Therefore, the coolant temperature may be greater than boiling water at standard atmospheric pressure (100ºC).

Never Maintain Cooling System when the Engine is HOT.

2.13 Lubricants

Lubricants should be handled in accordance to the lubrication manufacturers recommended practices.

Whenever handling oil products, maintain good standards of care plus personal and plant hygiene.

For details of these precautions we advise you to read the relevant publications issued by your local health authority.

- Avoid contact with lubricants. Wear oil resistant gloves when performing maintenance.
- ALWAYS keep lubricants out of reach of children.
- NEVER store lubricants in open or unlabelled containers.

(a) New Oil

There are no special precautions needed for the handling or use of new oil other than the normal care and hygiene practices.

(b) Old Oil

Used engine crankcase lubricants contain harmful contaminants. In laboratory tests it was shown used engine oils can cause skin cancer and reproductive harm. Avoid inhalation of vapours, ingestion and prolonged skin contact with used engine oils. Dispose of used oil in accordance with local environmental regulations.

Observe the following precautions.

- Avoid prolonged, excessive or repeated skin contact with used engine oil.
- Apply a barrier cream to the skin before handling used engine oil.
- Note the following when removing engine oil from the skin.
- Wash skin thoroughly with soap and water. Using a nail brush will help.
- Use special hand cleansers to help clean dirty hands.
- Never use petrol, diesel fuel or kerosene.
- Avoid skin contact with oil soaked clothing.
- Do not keep oily rags in pockets.
- Wash dirty clothing before reuse.
- Throw away oil soaked shoes.

(C) First Aid - Oil

(1) Swallowing Oil

If oil is swallowed, do not induce vomiting.

Get Medical Advice.

(2) Skin Contact

In the case of excessive skin contact, wash with soap and water.

(3) Eye Contact

In the case of eye contact, flush with water for 15 minutes. If the irritation persists, get medical attention.

2.14 Oil or Fuel Spillage

Absorb with sand or a locally approved brand of absorbent granules. Scrape up and dispose of in a chemical disposal area.

2.15 Working on a Gradient

(1) Always face the top of a slope.

When ascending or descending a gradient with a dumper the skip MUST ALWAYS **face the top of the slope**. Always **drive up and reverse down** slopes (Figure 2.1). Do not attempt to drive down a slope as there is a serious risk of overturning.

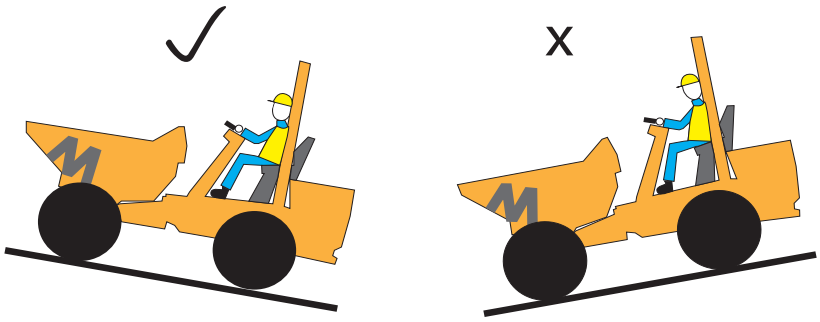


Figure 2.1 - Ascending or Descending Gradients

(2) Maximum Gradient

The maximum gradient for this machine is 25% (or 14º, or 1 in 4) See X in Figure 2.2. Do not exceed the maximum gradient.

Poor ground conditions such as muddy, slippy or uneven surfaces will reduce the maximum gradient.

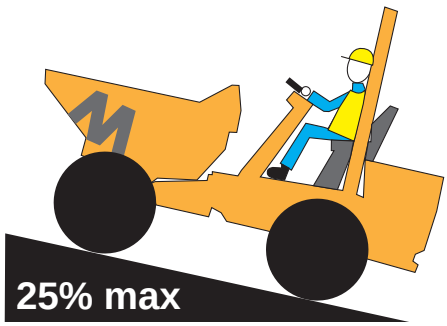


Figure 2.2 - Maximum Gradient

(3) Crossing a Slope

Greater care must be taken when crossing a slope to prevent the machine sliding sideways and out of control.

The maximum slope is 25% (14º, 1 in 4) See Y in Figure 3.3. Do not attempt to exceed this figure.

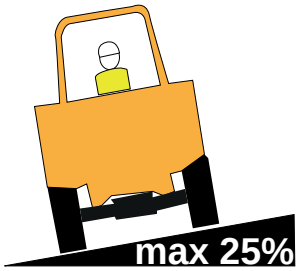


Figure 3.3 - Crossing a Slope

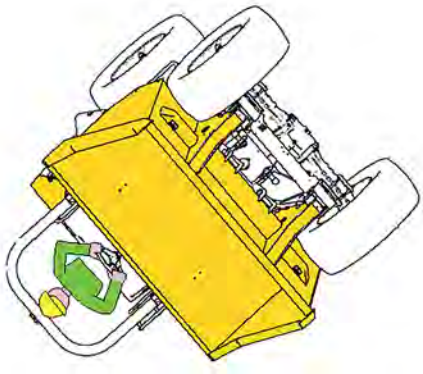
2.16 Responsibilities

Site management must identify possible dangers and make arrangements to eliminate them.

Site management are responsible for planning driveways around the site which will prevent the machine from experiencing excessive slopes, soft ground or having to drive over edges especially at an angle etc. The driveways must also avoid any other possible dangers e.g. overhead cables, work areas etc.

The operator must make sure the machine is driven correctly at all times especially with regards to speed, overloading, only using the machine for the intended task, not driving dumpers with a lift-skip in the raised position etc.

2.17 Overturning



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If the machine begins to overturn you must grip the steering wheel firmly allowing the seat belt to hold you in the seat until the machine comes to rest. Do not try to jump clear of the machine when it is overturning -the machine may crush you. The ROPS will provide protection in the event of a roll over.

2.18 Safety Signs

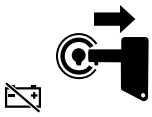
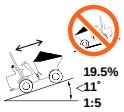
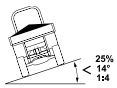
Safety signs are fitted to the machine to warn of possible dangers and MUST be replaced immediately if they become unreadable or lost.

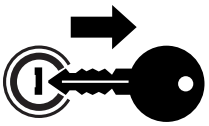
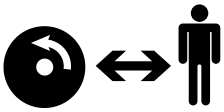
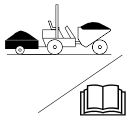
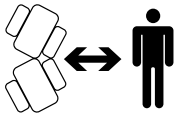
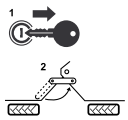
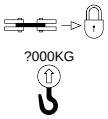
If the machine is repaired and parts have been replaced on which safety signs were fixed new safety signs must be fitted before the machine is put into service. Use mild soap and water to clean safety signs - DO NOT use solvent based cleaners as they will damage safety sign material.

ALL safety signs listed must be present on the machine and must be legible.

(a) Safety Sign Symbols

Table 2.1 - Description of Safety Symbols

HAZARD		AVOIDANCE	
Attention - for your safety!			Read and understand operator's manual before using the equipment
Attention - for your safety!			Remove start key and isolate battery before maintaining the machine
Fall/Crush			Do not carry passengers or allow people to ride on the machine
Skin injection from high pressure fluid			Use cardboard or wood to check for leaks.
Crush during roll over			Only drive up and reverse down inclines of 14° or less.
Crush during roll over			Do not drive across slopes exceeding 14°
Crushing			Insert skip cylinder safety lock/ support
Burn			Keep clear of hot surfaces

Entanglement			Keep away from fan and belt.Turn off engine and remove key before servicing.
Crushing			Stay clear of machine
Machine Instability			Read operators manual
Crush during roll over			Always wear a seat belt when operating the machine
Crush Zone			Stay clear of machine
Crush Zone			Turn the machine off and remove the key. Fit articulation lock
Lifting			Fit articulation lock before lifting Use equipment rated for lifting the stated weight.

(b) Safety Sign Location - ISO

Figure 3-4 - Safety Sign Location - ISO

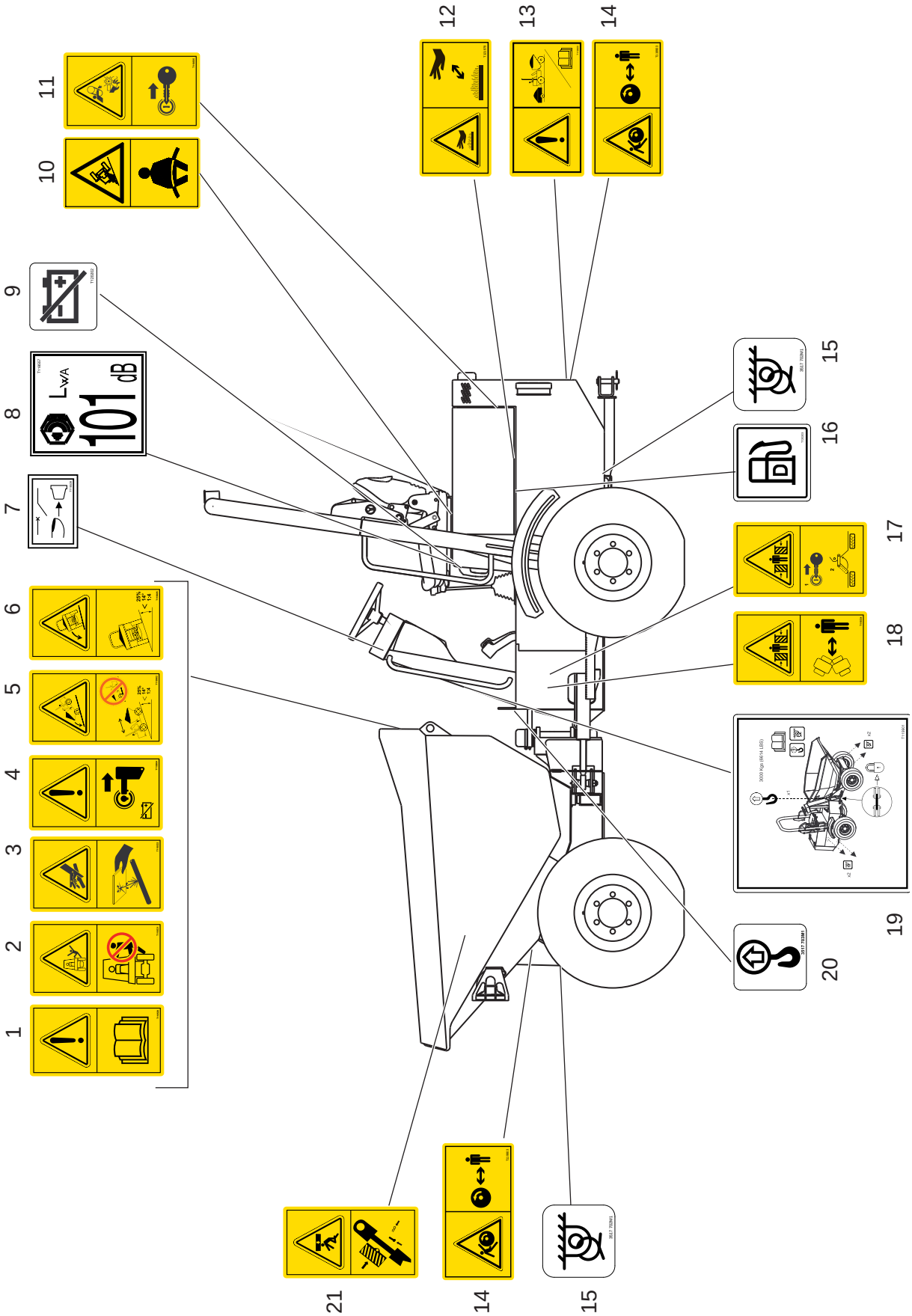


Table 2.2 - Safety Signs - ISO

1.	Safety - Read Instruction Book	
2.	Safety - Fall Hazard - No Passengers	
3.	Safety - High Pressure Oil Leaks	
4.	Safety - Energised Equipment Hazard	
5.	Safety - Tip Over Hazard	
6.	Safety - Tip Over Hazard	
7.	Information - Push to Reset Circuit Breaker	
8.	Information - Noise LWA	
9.	Information - Disconnect or Isolate Battery	
10.	Safety - Crush Hazard - Use Seat Belt	
11.	Safety - Entanglement Hazard	Each Side
12.	Safety - Burn Hazard	
13.	Safety - Towing Hazard	
14.	Safety - Crush Hazard	Front and Rear
15.	Information - Tie Down	4 Points
16.	Information - Diesel Filling Point	
17.	Safety - Crush Hazard	Each Side
18.	Safety - Crush Hazard	Each Side
19.	Information - Lifting	
20.	Information - Lift Point	
21.	Safety - Crush Hazard	

(c) Safety Decal Location - ANSI

Figure 3.5 - Safety Sign Location - ANSI

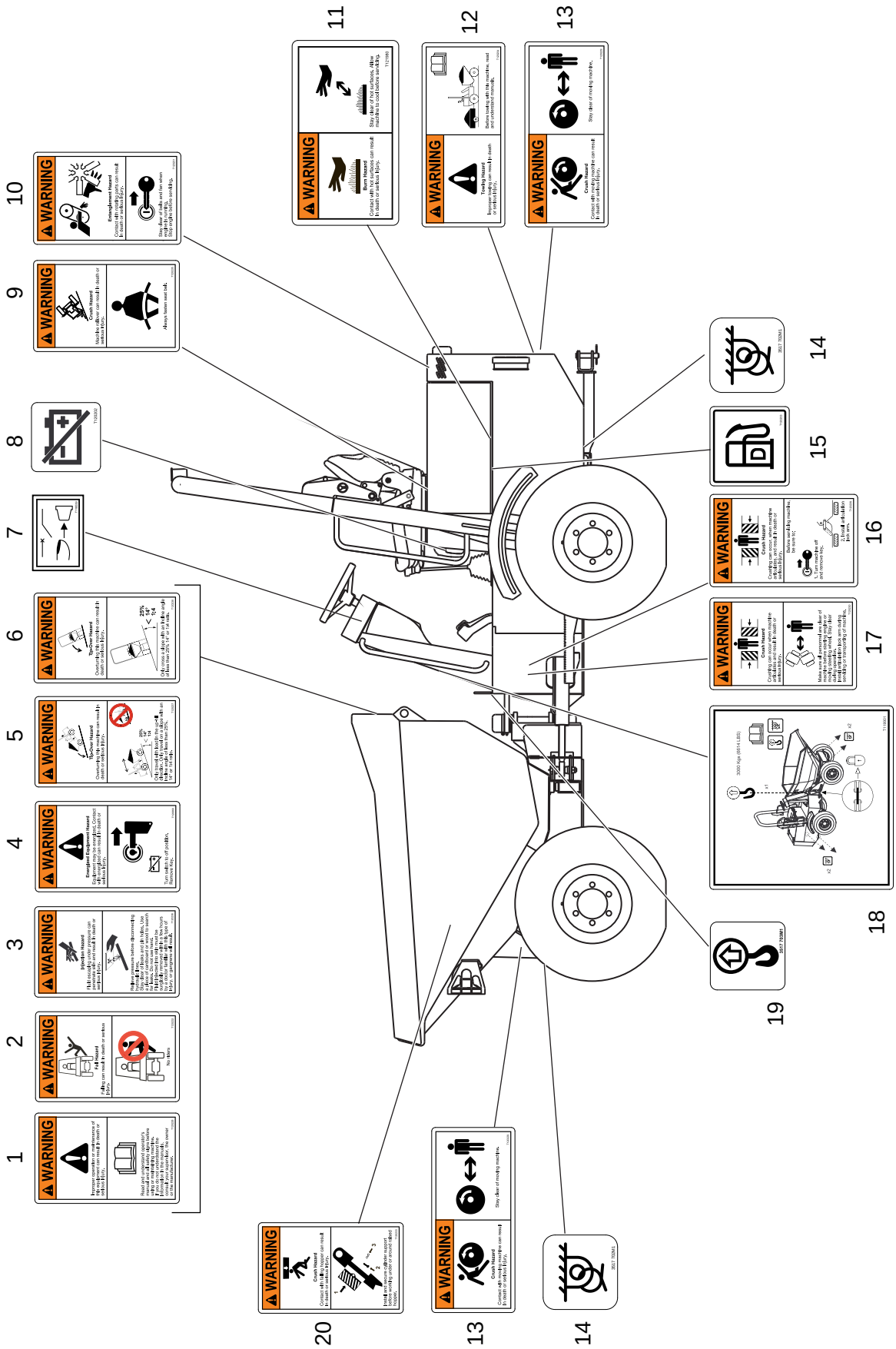


Table 2.3 - Safety Signs - ANSI

1.	Safety - Read Instruction Book	
2.	Safety - Fall Hazard - No Passengers	
3.	Safety - High Pressure Oil Leaks	
4.	Safety - Energised Equipment Hazard	
5.	Safety - Tip Over Hazard	
6.	Safety - Tip Over Hazard	
7.	Information - Push to Reset Circuit Breaker	
8.	Information - Disconnect or Isolate Battery	
9.	Safety - Crush Hazard - Use Seat Belt	
10.	Safety - Entanglement Hazard	Each Side
11.	Safety - Burn Hazard	
12.	Safety - Towing Hazard	
13.	Safety - Crush Hazard	Front and Rear
14.	Information - Tie Down	4 Points
15.	Information - Diesel Filling Point	
16.	Safety - Crush Hazard	Each Side
17.	Safety - Crush Hazard	Each Side
18.	Information - Lifting	
19.	Information - Lift Point	
20.	Safety - Crush Hazard	

3 Technical Data

3.1 Dimensions

(a) TA3H

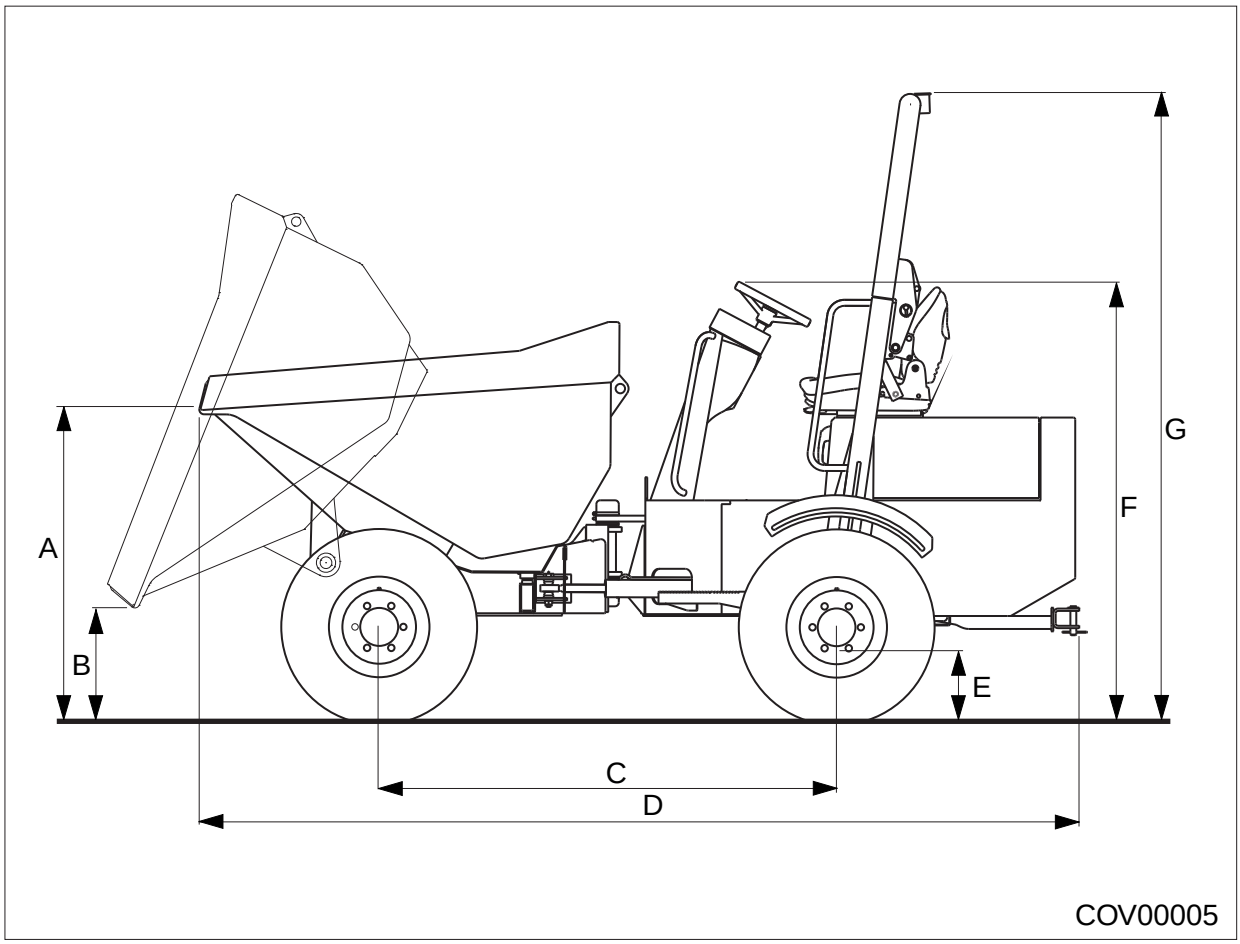


Figure 3.1 - Dimensions

Table 3.1 - Dimensions

Dimensions mm (in)											
Model	A	B	C	D	E	F	G ROPS Beacon		H Across Skip	I Across Tyres	Mass
TA3H	1401 (55.15)	239 (9.4)	1939 (76.3)	3725 (146.6)	213 (8.3)	1891 (74.4)	2689 (105.8)	2920 (114.9)	1957 (77.0)	1846 (72.6)	2395 Kg* (5289lb) 2320 Kg** (5114lb)

* With Operator (75kg)
** Without Operator

(b) TA3SH & TA3.5SH

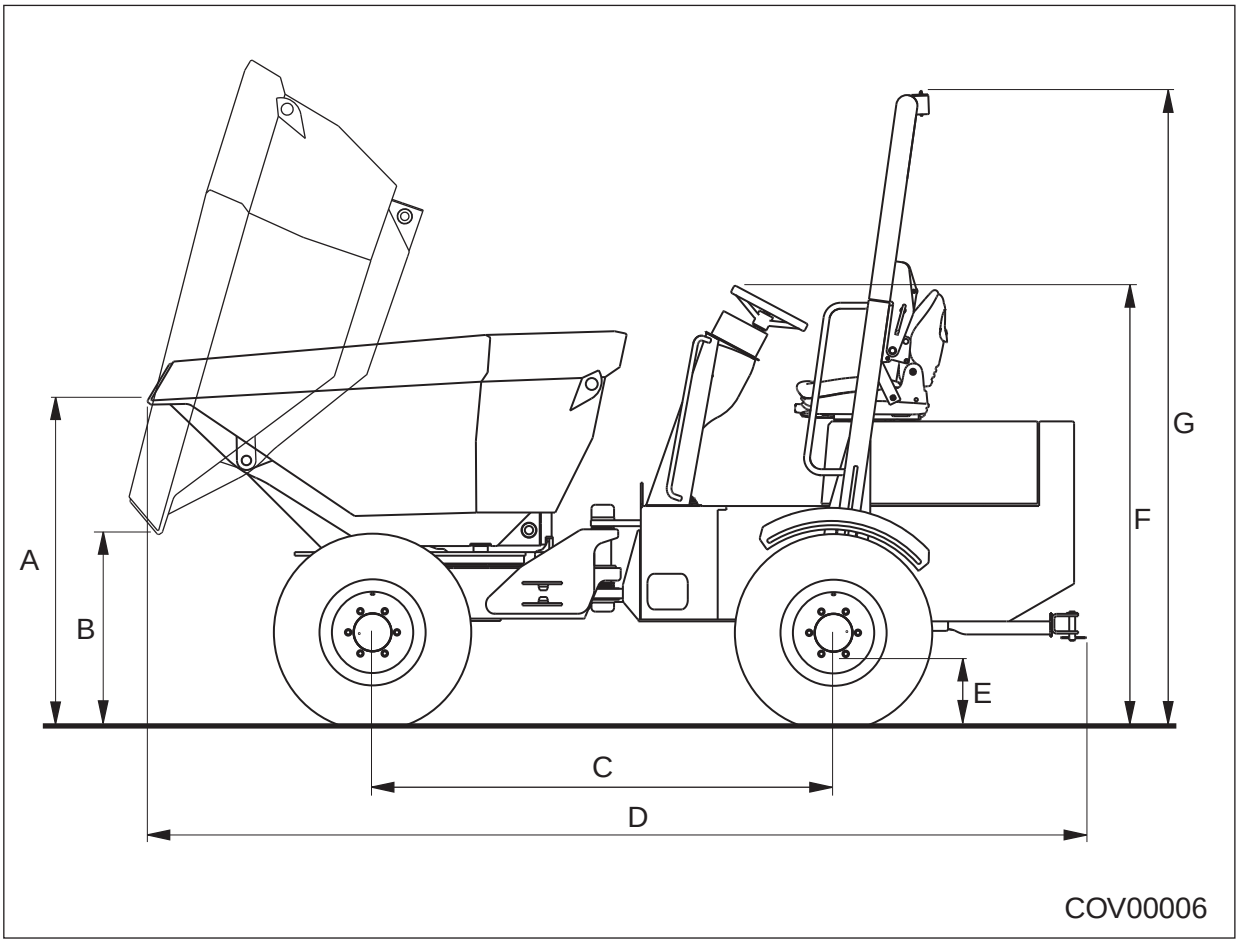


Figure 3.2 - Dimensions

Table 3.2 - Dimensions

Dimensions mm (in)											
Model	**A**	**B**	**C**	**D**	**E**	**F**	**G ROPS Beacon**		**H Across Skip**	**I Across Tyres**	**Mass**
TA3SH	**1467 (57.7)**	**792 (31.2)**	**1939 (76.3)**	**3952 (155.5)**	**213 (8.3)**	**1892 (74.4)**	**2689 (105.8)**	**2919 (114.9)**	**1690 (66.5)**	**1846 (72.6)**	**2455 Kg* (5412lb) 2340 Kg** (5159lb)**
TA3.5SH	**1467 (57.7)**	**792 (31.2)**	**1939 (76.3)**	**3952 (155.5)**	**213 (8.3)**	**1892 (74.4)**	**2689 (105.8)**	**2919 (114.9)**	**1690 (66.5)**	**1846 (72.6)**	**2455 Kg* (5412lb) 2340 Kg** (5159lb)**

* With Operator (75kg)

** Without Operator

3.2 Turning Circle

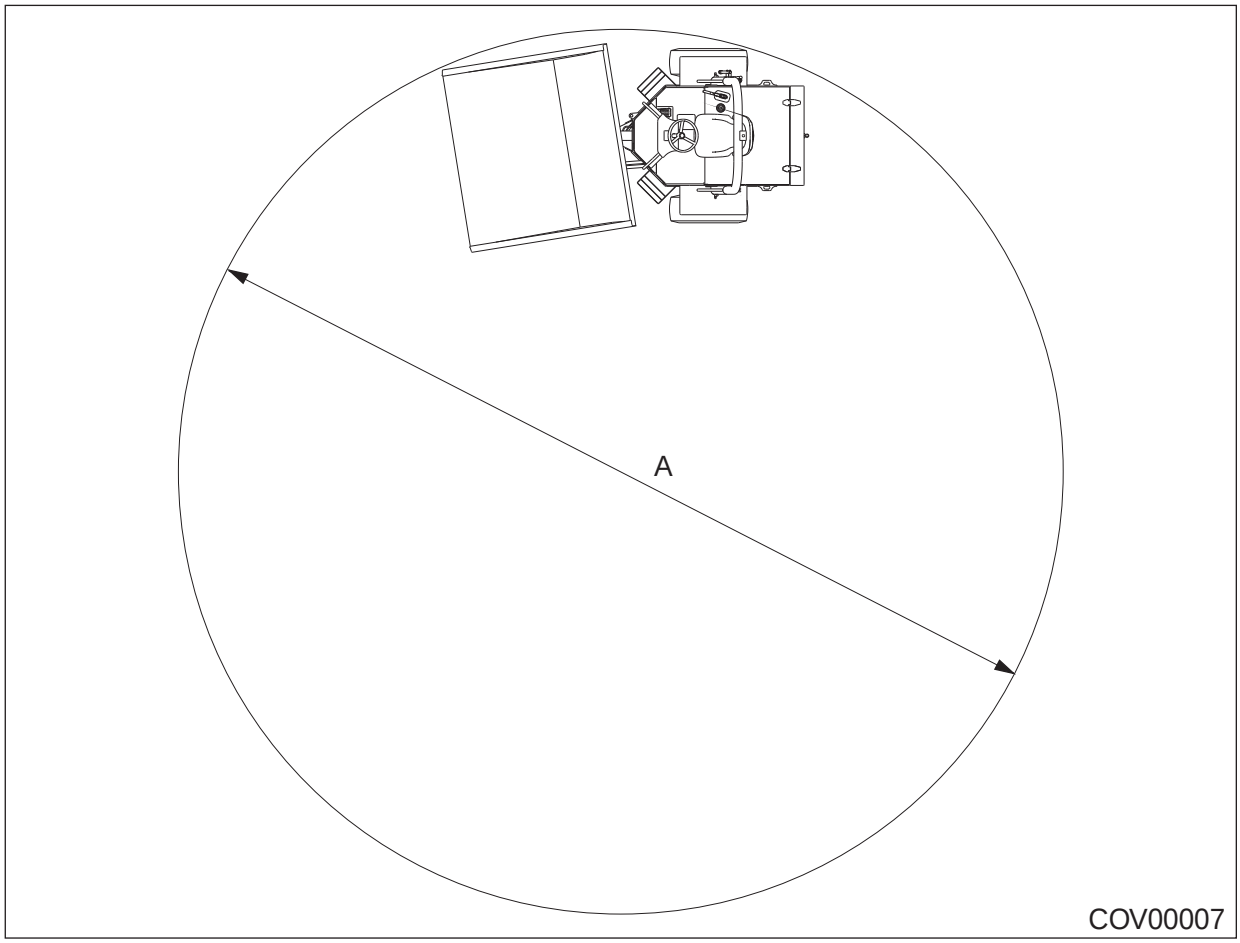


Figure 3.3 - Turning Circle

Table 3.3 - Turning Circle

Turning Circle A mm (in)		
TA3H	**TA3SH**	**TA3.5SH**
Ø 9421 (370.0)	**Ø 9105 (358.4)**	**Ø 9105 (358.4)**

3.3 Data

Table 3.4 - Data

Engine	TA3H	TA3SH	TA3.5SH
Manufacturer/Model	Kubota V2203-M		
Power	32.4kW (43.5hp) @ 2,600 r.p.m.		
Oil Capacity	9.5ltr (2.5US Gal)		
Cooling System Capacity	9.0ltr (2.37 US Gal)		
Transmission			
Type	Hydrostatic		
Drive	4 Wheel Drive - High & Low Range - Forward & Reverse		
Transfer Box/Rear Axle			
Manufacturer/Model	Dana		
Oil Capacity (Axle)	4.7ltr (1.24 US Gal)		
Oil Capacity (Transfer Box)	0.35ltr (0.092 US Gal)		
Front Axle			
Manufacturer/Model	Dana		
Oil Capacity	4.7ltr (1.24 US Gal)		
Tyres & Wheels			
	Mitas		
Size	11.5/80 x 15.3 x 10ply	11.5/80 x 15.3 x 10ply	11.5/80 x 15.3 x 14ply
Pressure - Front	3.0 bar (43.5 psi)	3.0 bar (43.5 psi)	4.4 bar (64 psi)
Pressure - Rear	2.0 bar (29 psi)	2.0 bar (29 psi)	2.0 bar (29 psi)
	Starco		
Size	295/80 x15.3 x 10ply		
Pressure - Front	3.9 bar (56.5 psi)	3.9 bar (56.5 psi)	3.9 bar (56.5 psi)
Pressure - Rear	2.0 bar (29 psi)	2.0 bar (29 psi)	2.0 bar (29 psi)
Wheel Nut Torque	450 Nm (335 ft-lb)		
Brakes			
Primary	Hydraulic Multi Plate In Board Wet Disc - Front Axle Only		
Parking	Mechanical - Front Only		
Electrical System			
Voltage	12v Negative Earth		
Alternator	Belt Driven		
Output	55 amp		
Battery	74Ah 12v		
Battery Cold Start Amps	Type 072 DIN340A - IEC 420A		
Hydraulic System			
Tank Capacity	37ltr (9.8 US Gal)		
Fuel System			
Type	Diesel		
Tank Capacity	37ltr (9.8 US Gal)		

Table 3.4 Data (continued

	TA3H	TA3SH	TA3.5SH
Machine Weights			
Unladen- Kg (tons)	2320 (2.55)	2380 (2.62)	2380 (2.62)
Operating Mass - Kg (Tons)	2395 (2.64)	2455 (2.70)	2455 (2.70)
Laden - Kg (Tons)	5395 (5.94)	5455 (6.01)	5955 (6.56)
Front Axle Laden - Kg (Tons)	3073 (3.38)	3651 (4.02)	4124 (4.54)
Rear Axle Laden - Kg (Tons)	2322 (2.55)	1804 (1.98)	1831 (2.01)
Skip Capacity			
Maximum Safe Payload	3000kg (6600lb)	3000kg (6600lb)	3500kg (7716lb
Heaped Capacity	1.95 cu M (2.5 cu yds)	1.87 cu M (2.4 cu yds)	1.87 cu M (2.4 cu yds)
Water Capacity	1.25 cu M (1.6 cu yds)	1.00 cu M (1.3 cu yds)	1.00 cu M (1.3 cu yds)
Struck Capacity	1.60 cu M (2.0 cu yds)	1.50 cu M (1.9 cu yds)	1.50 cu M (1.9 cu yds)
Operating Environment	This machine can operate in ambient temperatures of between -15°C and +46°C without special preparation. Refer to fluids and lubricants		

3.4 Noise Emmissions

Table 3.5 - Noise Emissions

Model	Declared Single-Number Noise Emission Values to ISO 4871	
	A- rated sound pressure level at operator station	A - rated sound power of machine
	LpAd	LWAd
TA3H	84dB	101dB
TA3SH	84dB	101dB
TA3.5SH	84dB	101dB

Note: The noise figures are only applicable for European CE Markets only.

3.5 Vibration Levels

Table 3.6 - Hand/Arm Vibration

	Operation	Value	Uncertainty
Hand Arm Vibration as defined in EN474-1	All operations	<2.5m/s2	N/A
Whole body vibration values as defined in ISO/TR 25398	Work Cycle	0.529 rms	0.264m/s2

Note: these values are for guidance only. Actual work site, operation and operator characteristics will have a large influence on actual values for specific circumstances.

4 Description

4.1 TA3H Dumper - Forward Tip Skip

Figure 4.1 - TA3H Forward Tip Skip

4.2 TA3SH Dumper - Swing Skip

Fig 4.2 - TA3SH Swing Skip

4.3 Description

This range of 3 and 3.5 tonne payload, 4 wheel drive site dumpers have been designed to provide the greatest degree of component standardisation possible, thus providing the user with simplified servicing requirements.

There are 3 models in the range: the TA3H with a conventional forward tipping skip and the TA3SH and TA3.5SH which have a rotatable skips.

(1) Skip

All models in the range have a load carrying skip located over the front axle, ahead of the driver. The TA3H discharges its load to the front of the machine; the TA3SH and TA3.5SH have a swing skip which rotates through 180° enabling the load to also be discharged on either side of the machine.

(2) Engine

A Kubota naturally aspirated 4 cylinder cylinder diesel engine is fitted. The engine is positioned at the rear of the machine behind the driver.

All machines are fitted with electric starting; a separate key operated switch is provided and is located adjacent to the steering wheel.

(3) Chassis

The chassis is of the two part articulating type having a centre pivot which articulates in both vertical and horizontal planes. Front and rear axles are bolted directly to the chassis.

(4) Steering

Steering of the dumper is by an 'Orbitrol' hydrostatic steering unit, that powers a single ram connecting the front and rear chassis units.The steering unit is operated by a conventional steering wheel.

The steering wheel is fitted with a "spinner" knob to aid low speed manoeuvring on the worksite. Under no circumstances must the knob be used to control the machine when it is used on the public highway. If possible the knob should be removed from the steering wheel before highway travel.

⚠ WARNING

Use of a steering wheel knob when travelling on the public highway is illegal and strictly prohibited. Its use at travelling speeds may cause accidents leading to serious injury or even death.

In the event of hydraulic failure the steering will still operate but under these circumstances steering wheel loads are high and the dumper must only be driven at slow speeds.

(5) Transmission

Power is transmitted to the wheels by means of an hydrostatic drive to a conventional mechanical transfer box and axles.

Because the machine has hydrostatic drive and will not "free wheel" as with a conventional gearbox the transmission pumps free wheel facility must be engaged before the machine is towed. Failure to do this will cause serious damage to the machine

NOTICE

Place Hydrostatic Drive In "Freewheel" Before Towing Dumper. Failure To Do So Will Cause Serious Damage

(6) Brakes

The vehicle braking is provided by means of totally enclosed oil immersed brakes located within the front axle

These brakes are self adjusting sintered multi-plate discs which are hydraulically operated. A separate mechanically operated parking brake is fitted.

(7) Electrical System

A 12 volt negative earth electrical system is fitted. All models use a belt driven alternator to charge the battery. Machines are available with full lighting when specified to comply with current road traffic regulations.

(8) ROPS

Machines are fitted with a ROPS (Roll Over Protective Structure) to protect the operator in the event the machine overturns.

4.4 Skip

The dumper vehicle is basically a load carrier and the skip can be used for a multitude of building/ contracting site functions, but essentially it is used for carrying free flowing materials from excavations or demolitions and general site building activities.

On forward tip machines the skip is raised and lowered by a double acting hydraulic cylinder mounted between the front chassis and the underside of the skip and controlled by joystick operated control valve.

On swing skip machines the ram is mounted between the top of the turntable and the underside of the skip.

The swing skip is mounted on a ball bearing slew ring and is rotated by twin hydraulic rams.The swing skip must be mechanically locked in the straight ahead position to prevent movement when travelling.

The joystick control for skip operations is positioned to the right of the drivers seat.

(1) Raised Skip

As a safety aid when working on the machine a stop is provided that fits over the skip ram when the skip is raised. This prevents the skip lowering accidentally and causing injury. You must not reach or work under a raised skip without the ram stop fitted.

(2) Swing Stop

On swing skip machines a locking device is used to locate the skip in the straight ahead position when the skip is fully lowered.Before slewing to the left or right, it is necessary to raise the skip slightly to clear the stop.

4.5 Chassis

The two part chassis is of the centre pivot articulating type and is of a design which enables both front and rear axles to be attached directly to the chassis members.

The front and rear frames are connected in the middle by a vertical pivot in spherical bearings and a horizontal link, which connects between the spherical bearing of the vertical pivot and an additional spherical bearing located in the rear frame.

This arrangement is illustrated in Figure 4.3 and shows full movement of the chassis in both horizontal and vertical planes, thus ensuring maximum wheel adhesion at all times

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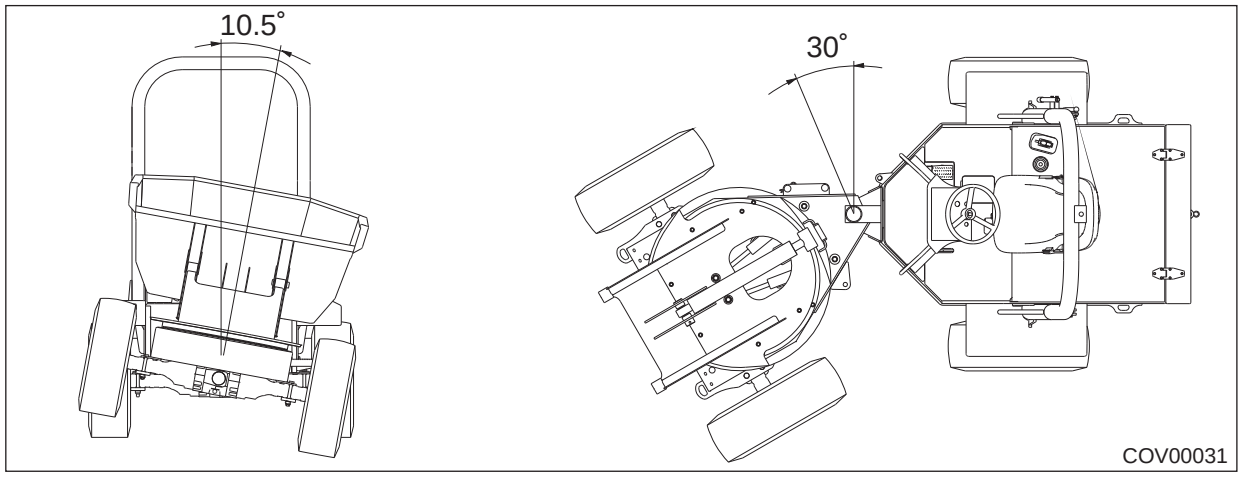


Figure 4.3 - Chassis Articulation

4.6 Hydraulic System

The hydraulic system Figures 4.4 & 4.5 provides power to move the machine, through the hydrostatic drive, operate the vehicle steering and to power the skip elevation. It also provides power for skip rotation on swing skip models.

An engine driven hydraulic pump powers the hydraulic motor mounted on the transfer box which transmits power to both axles. A second engine driven hydraulic pump provides power for steering and skip operation. The pumps draw oil from a tank located inside the chassis. The tank is fitted with a suction strainer, an oil level gauge, and a filler/breather cap.

The pump providing power for steering and skip operations generates a maximum pressure of 170bar (2500 psi) for forward tip machines and 210 bar (3045 psi) swing skip machines. The system is protected by a relief valve in the control valve that is set at the same pressure.

A return line filter is fitted to the circuit and is of the replaceable cartridge type.

An oil cooler is fitted to cool the hydraulic oil.

Steering of the dumper is by means of a single hydraulic ram connecting the front and rear frames, the oil supply to the ram is controlled by an “Orbitrol” hydrostatic steering unit.

The unit receives oil via a carry over port in the 3 way control valve and constantly meters oil to the steering ram as the steering wheel is turned.

The control valve, operated by a lever next to the drivers seat, controls the lifting, lowering and (on swing skip models) slewing of the dumper skip.

The skip can be elevated at varying speeds dependent on engine speed, and it can be stopped at any intermediate point for discharging of partial loads.

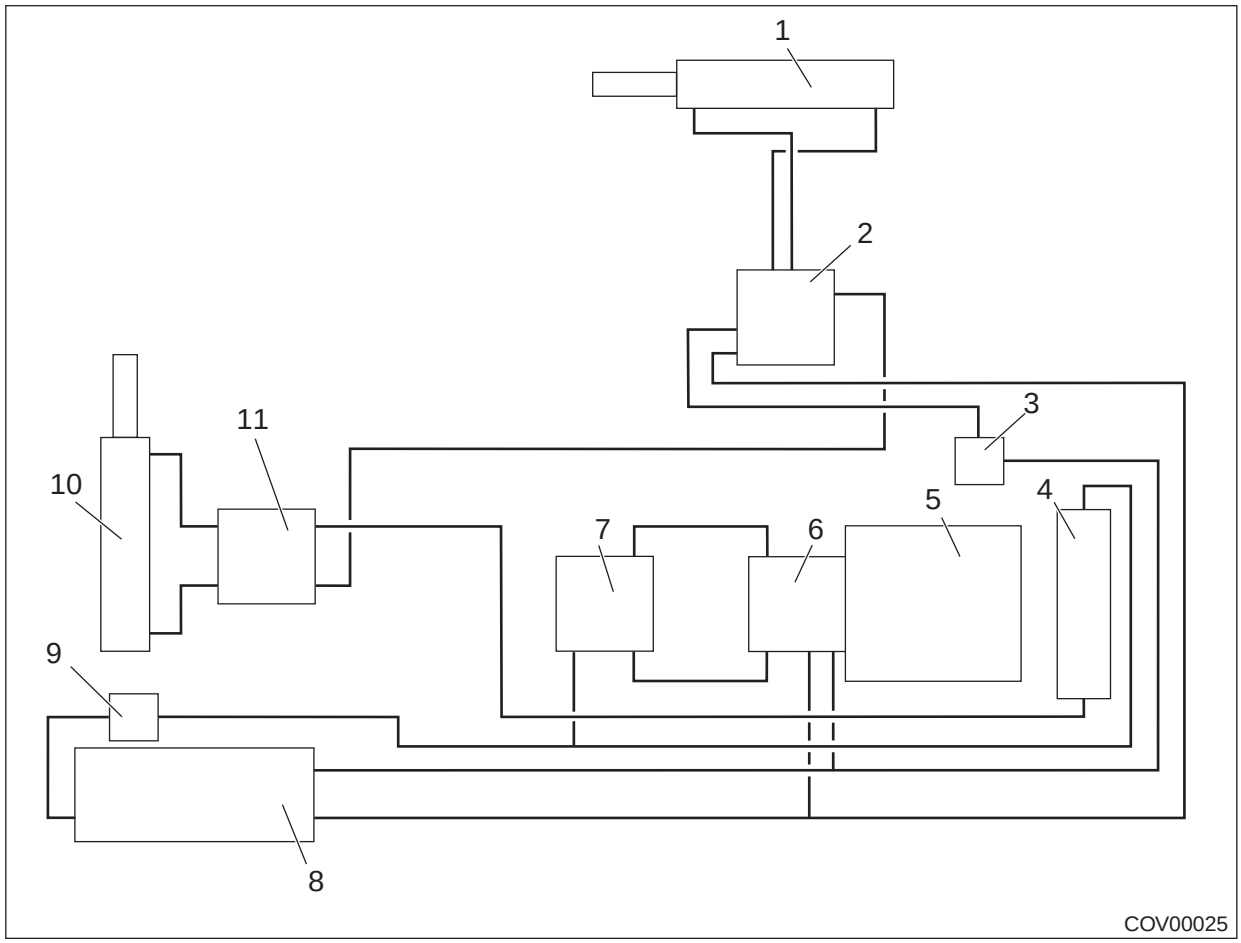


Figure 4.4 - Hydraulic System - Forward Tip

1. Ram - Skip Tip
2. Skip Control Valve
3. Hydraulic Pump - Steering and Skip Functions
4. Oil Cooler
5. Engine
6. Hydraulic Pump - Transmission
7. Hydraulic Motor - Transmission
8. Hydraulic Tank
9. Return Filter
10. Ram - Steering
11. “Orbitrol” Steering Unit

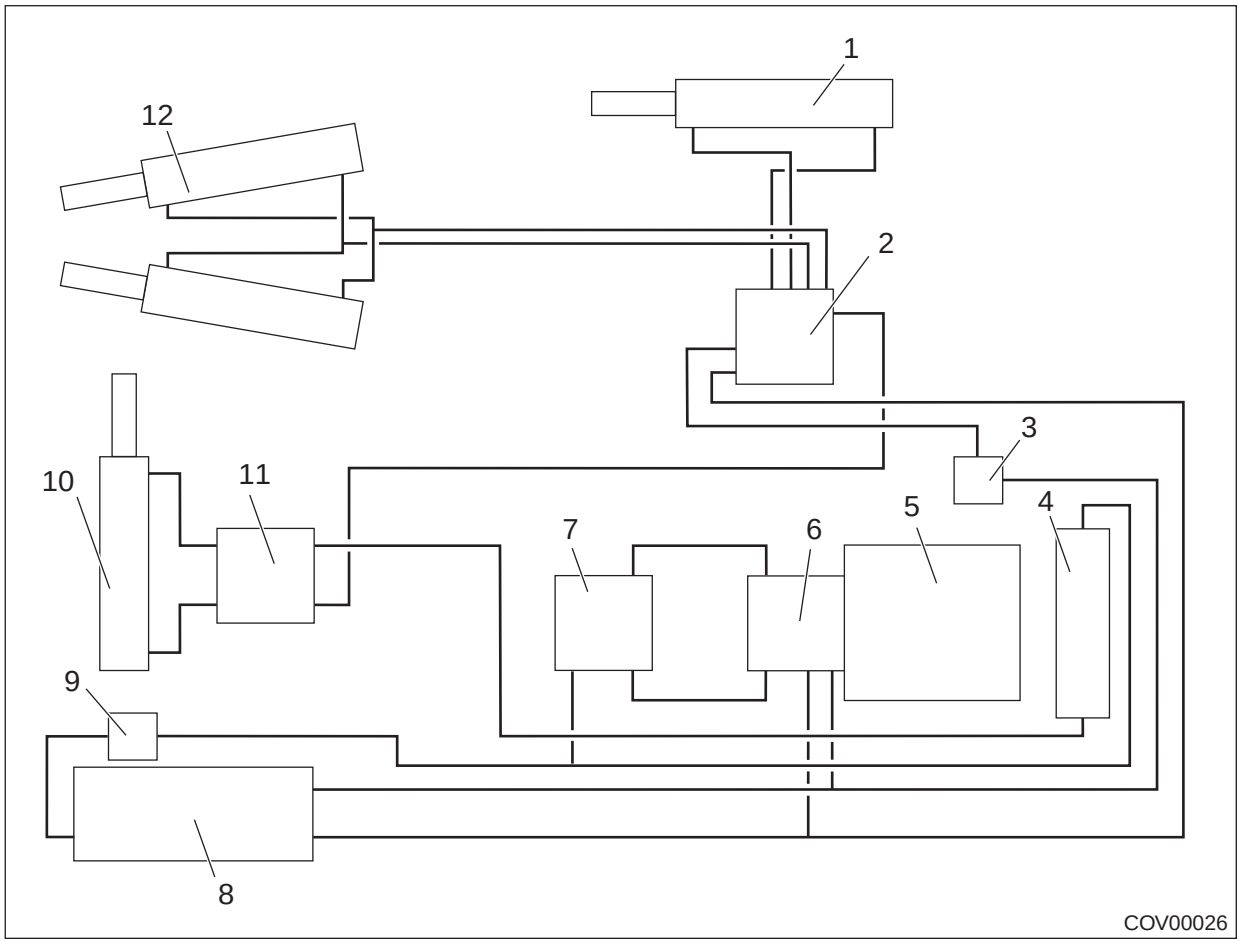


Figure 4.5 - Hydraulic System - Swing Skip

1. Ram - Skip Tip
2. Skip Control Valve
3. Hydraulic Pump - Steering and Skip Functions
4. Oil Cooler
5. Engine
6. Hydraulic Pump - Transmission
7. Hydraulic Motor - Transmission
8. Hydraulic Tank
9. Return Filter
10. Ram - Steering
11. “Orbitrol” Steering Unit
12. Slew Rams

4.7 Transmission System

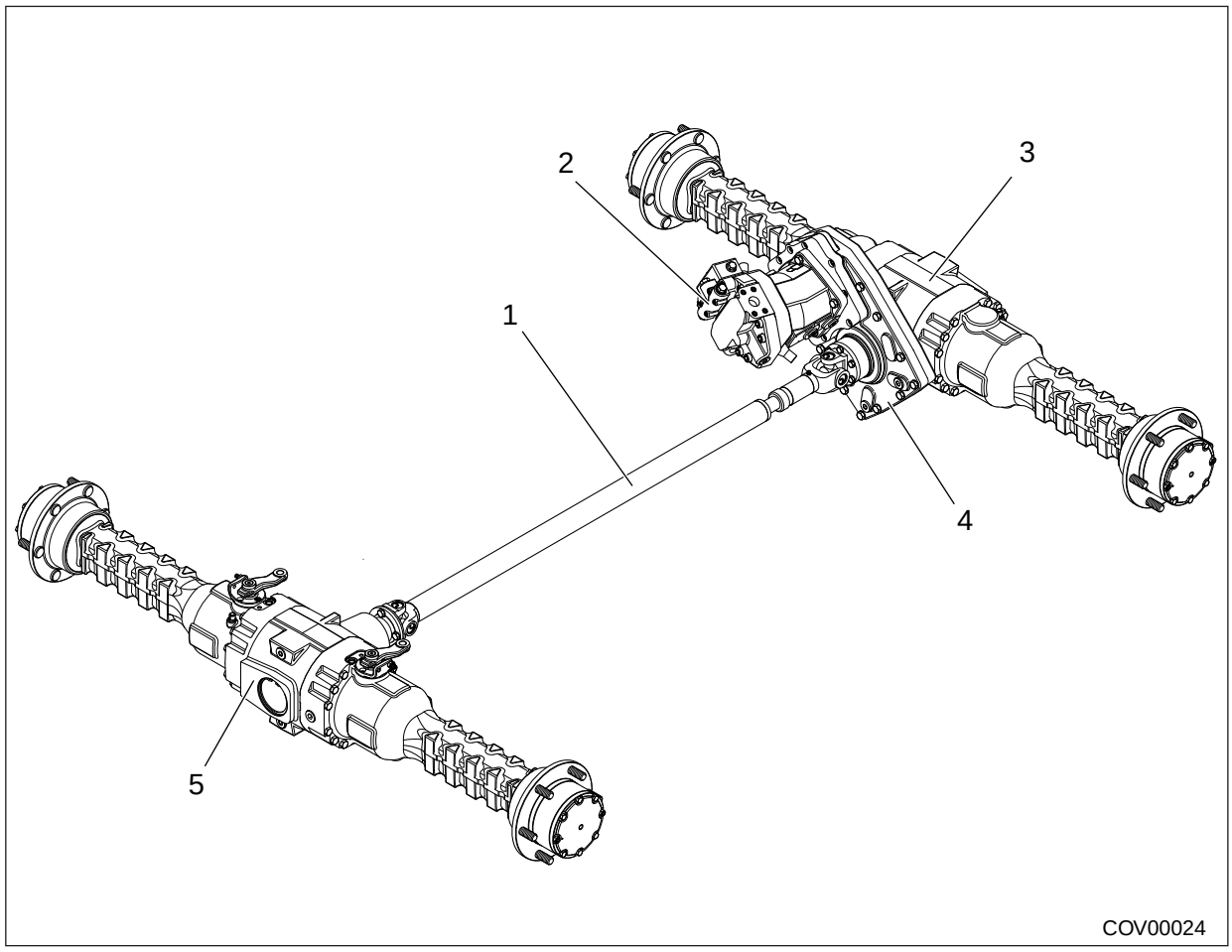


Figure 4.6 - Transmission System

1. Drive Shaft
2. Hydraulic Motor
3. Rear Axle
4. Transfer Box
5. Front Axle

A hydrostatic drive transmission system fitted. A piston type hydraulic pump attached to; and driven by the engine drives an hydraulic motor mounted to the transfer box. The transfer box is integral with the rear axle and transmits drive to both axles; the front axle is driven by a driveshaft connecting the axle to the transfer box. The machine is in permanent 4 wheel drive.

To enable the dumper to be towed in an emergency there is provision to disconnect the relief valves on the pump to permit oil to flow freely through the system.

4.8 Battery Isolator

The battery isolator; Figure 4.7, is both a maintenance aid and an anti-theft and vandalism device. It has a removable key 1.

When carrying out any maintenance on the machine, the battery isolator key must be removed to prevent the engine from being started or the electric circuit being activated.

When parking or leaving the machine, remove the battery isolator key to prevent unauthorised people from using or stealing the machine.

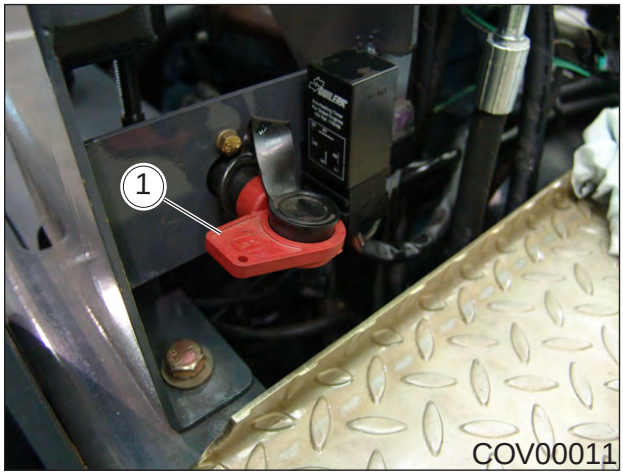


Figure 4.7 - Battery Isolator

(1) Operation

When the key is in the horizontal position the battery is supplying power to the machine and the machine may be used normally.

Turning the key anti-clockwise to the vertical position - 2; Figure 4.8, disconnects the power supply to the machine and allows the key to be removed from the isolator switch.

Figure 4.8 - Battery Isolator - OFF Position

4.9 Circuit Breakers & Audible Warning

Refer to Figure 4.9. Circuit breakers are located on the left hand side of the dashboard. A 15 amp circuit breaker is fitted protecting the engine starting system. On machines with highway lighting a second 30 amp circuit breaker is fitted.

In the event of a fault occurring the circuit breaker will trip out, this being indicated by the button protruding out beyond its normal position.

Should this occur the reason for the overload should be investigated and the components at fault replaced or repaired.

When the repair has been completed the circuit breaker should be reset by pressing the button until it locks in position thus restoring the electrical supply.

The audible warning is fitted to warn the operator that the engine is overheating. If the alarm sounds the machine must be parked safely and the engine stopped until the cause of the overheating is determined.

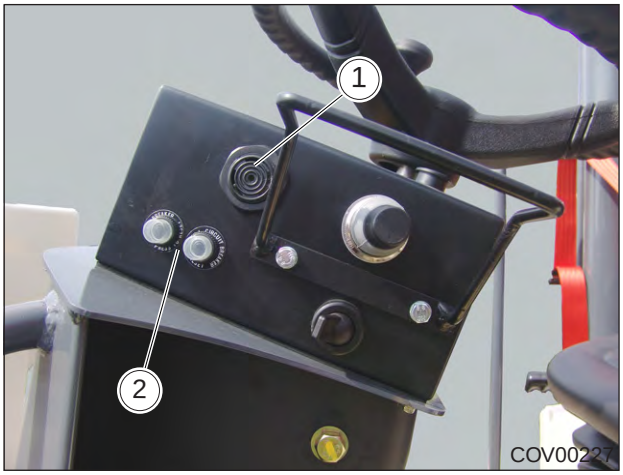


Figure 4.8 - Circuit Breakers & Audible Warning

1. Audible Warning
2. Circuit Breakers

4.10 Hour Meter

The hour meter, Figure 4.9. records the amount of time the engine has been running. This is useful for determining service intervals, maintenance etc.

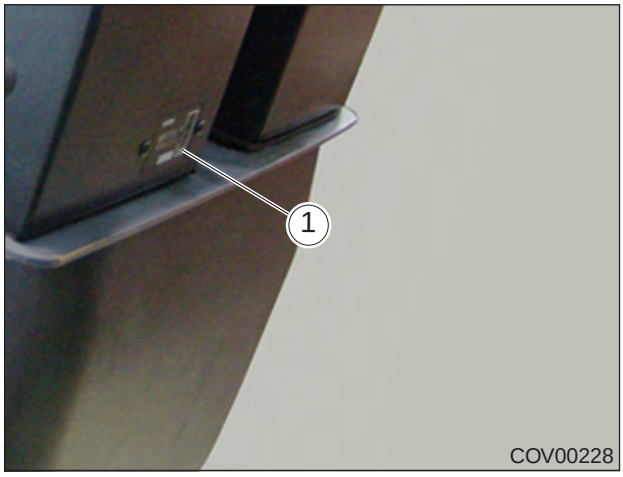


Figure 4.9. - Hour Meter

1. Hour Meter

4.11 Control Panel and Switch Functions

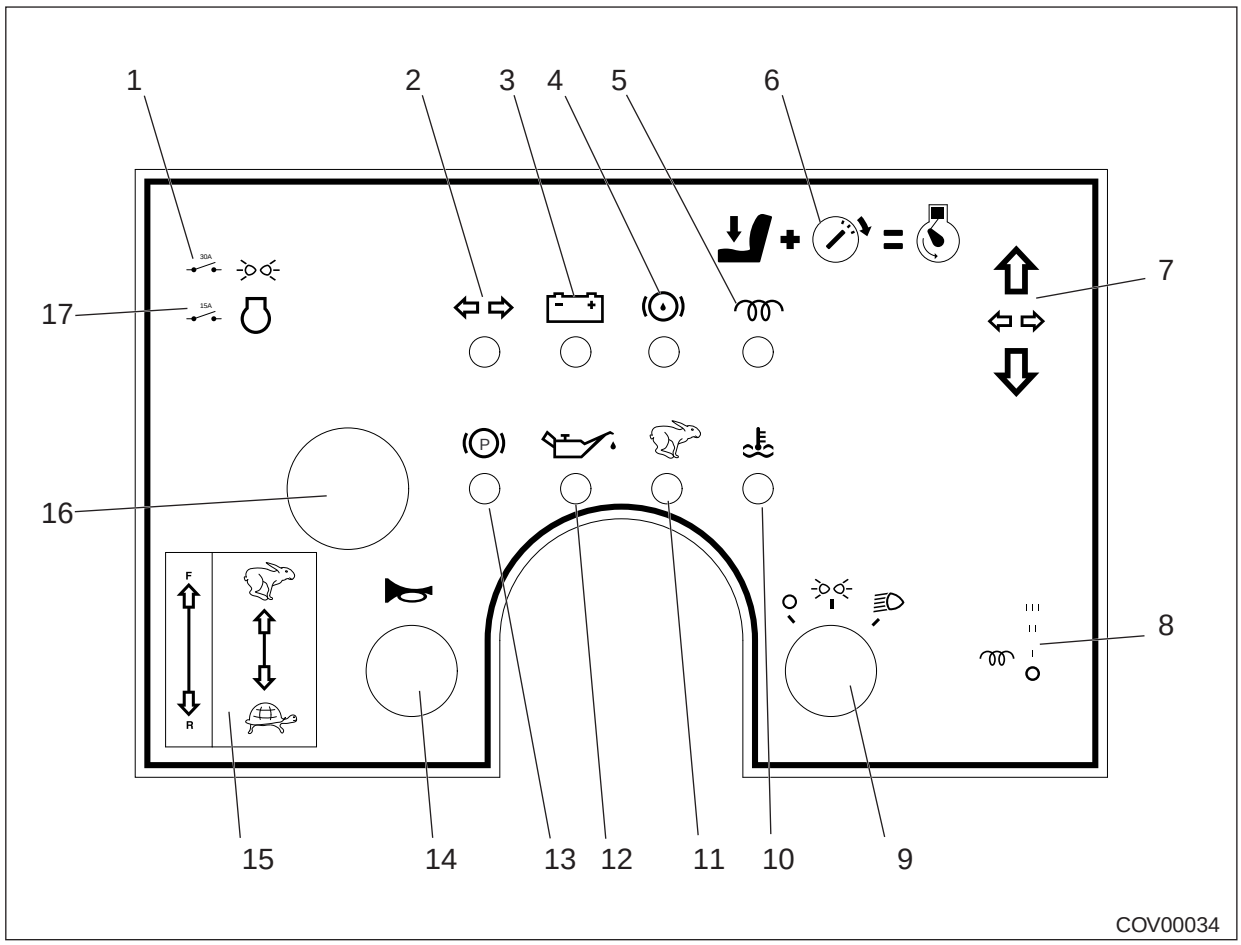


Figure 4.9 - Control Panel

1. 30A Circuit Breaker - Lighting (When Fitted)
2. Warning Light - Direction Indicators (When Fitted)
3. Warning Light - Battery Charge
4. Warning Light - Brake Fluid Level LOW
5. Warning Light - Engine Cold Start
6. Instruction - Start Inhibitors
7. Instruction - Direction Indicators (When Fitted)
8. Instruction - Engine Start Switch
9. Switch - Lighting -(When Fitted)
10. Warning Light - Engine Coolant Temperature HIGH
11. Warning Light - High Speed Selected
12. Warning Light - Engine Oil Pressure LOW
13. Warning Light - Parking Brake ON
14. Horn Button
15. Instruction - Forward/Reverse and Low/High Speed
16. Switch - Hazard Warning Lights

17 15A Circuit Breaker - Engine Electrical System

Table 4.1 - Dashboard Symbol Description

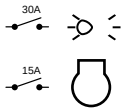
Symbol	Name	Description
	Circuit breaker - Electric Circuit	A - 15A Engine Starter System B - 30A Lights (if fitted) Circuit breakers protect the machines electrical system.
	Horn Button	The horn is used to warn others and must only be used for this purpose. Excessive use may cause others to ignore a genuine warning.
	Warning Light - Engine Oil Pressure	This warning light will come on when the start switch is turned to the RUN position. When the engine starts, the light should go off. If the light fails to go off or come on when the engine is running - STOP THE ENGINE IMMEDIATELY Do not use the machine until the fault has been rectified.
	Warning Light - Battery Charge	The battery charge warning light should only come on when the start switch is ON and the engine is not running. When the engine starts and full RPM is selected the charge warning light goes off. The warning light should stay off while the engine is running. If the light fails to go off when the engine is running - STOP THE ENGINE IMMEDIATELY Do not use the machine until the fault has been rectified.
	Warning Light - Engine Coolant Temperature	The water temperature warning light should only come on when the start switch is in the RUN position and should go out when the engine is cranked. If the warning light comes on when the engine is running the water temperature is too high, a warning buzzer will also sound. If engine temperature warning light comes on when engine is running - STOP THE ENGINE IMMEDIATELY Do not use the machine until the fault has been rectified
	Warning Light - Direction Indicator	When fitted, this light will flash when the indicator switch is moved into the left or right turn position. If the light fails to perform this function, do not use the machine until the cause has been rectified.

Table 4.1 - Dashboard Symbol Description (continued)

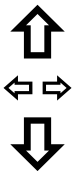
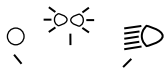
Symbol	Name	Description
	Instruction - Start Inhibitor	This instruction informs the operator that they must sit on the seat before the engine will start. A start inhibitor is fitted which prevents the engine being started unless the operated is seated.
	Switch Instruction - Direction Indicator	When fitted, this instruction informs the Operator in which direction to move the switch in order to operate the LEFT and RIGHT direction indicators
	Switch - Hazard Warning Lights	When fitted, the hazard warning light switch will cause all four indicator lights to flash and is used to warn others the machine is experiencing problems and should be given special attention.
	Switch - Lighting - When fitted	This switch will turn the headlights and front, rear side lights on and off.
	Instruction - Engine Start Key Switch	This instruction shows the start key position to use when the engine cold start aid is required.

Table 4.2 - Switch Operation

Switch	Name	Description
	Hazard Light Switch	Pressing the button will cause all four direction indicator lights to begin flashing and will continue to do so until the button is pressed again
	Horn Button	When pressed, this button will cause the horn to sound.
	Light Switch	Turning the switch clockwise from the OFF position (A) to position (B) will cause the front and rear side (marker) lights and the registration plate lights to come on. Turning the switch to the next position (C) will cause the main headlights to come on.

4.12 Start Interlock

A interlock is fitted for safety purposes and prevents the engine from starting unless the operator is sitting on the seat. This interlock comprises an inhibitor switch within the seat that is operated when the operator is seated on the machine. If you attempt to start the machine without sitting on the seat the engine will not start.

The symbol (1), on the dashboard decal - Figure 4.10, indicates the Operator must be seated to deactivate the start inhibitor before starting the machine.

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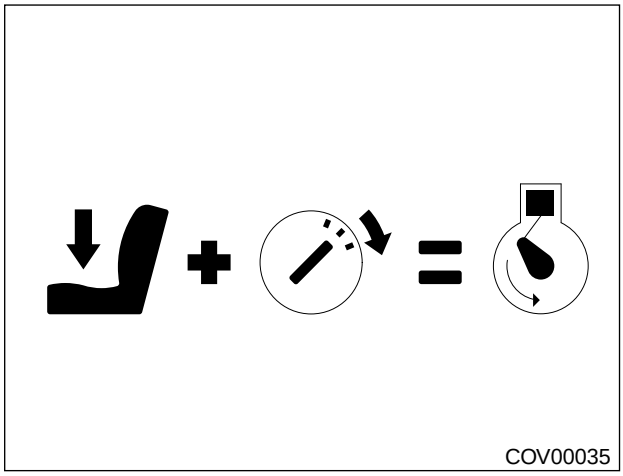

Figure 4.10 - Start Interlock Function

4.13 Start/Stop Switch

The Start/Stop Switch - Figure 4.11, is operated by a removable key. The switch has a protective cover that must be fitted when the key is removed to prevent the ingress of damp and moisture.

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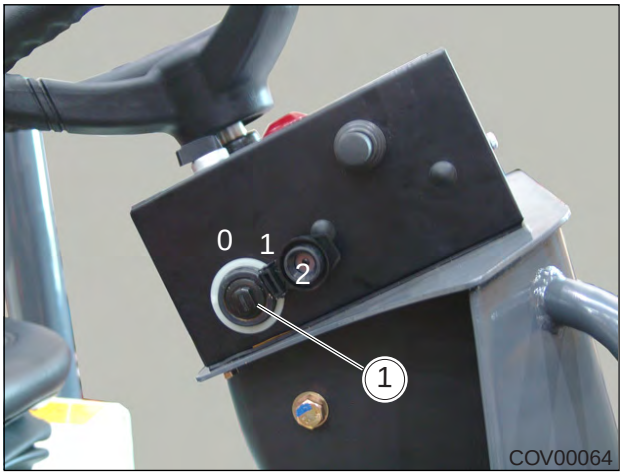

Figure 4.11 - Start/Stop Switch

1. Star/Stop Switch

The switch has 3 positions-

- 0 - Off
- 1 - Run
- 2 - Start

Once the engine has started the switch should return to the run position.

4.14 Direction Indicator Switch - When Fitted

This switch; Figure 4.12, is used to turn on the LEFT or RIGHT, front and rear indicator lights to inform others of the operators intention to turn the machine to the Left or Right.

Moving indicator lever forwards, A will turn on the left hand indicator lights. Moving the lever backwards, B will turn on the right hand indicator lights.

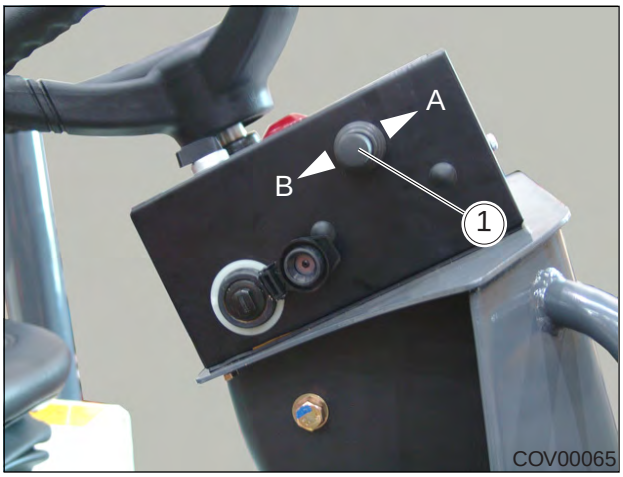

Figure 4.12 - Direction Indicator Switch

1. Direction Indicator Switch

4.15 Machine Lighting

Each front light cluster, Figure 4.13, contains a headlight (2), side light (3) and a direction indicator light (1).

Figure 4.13 - Front light cluster

Each rear light cluster, Figure 4.14, contains a rear light (4), brake light (3), direction indicator light (1) and reflector (2). The registration plate light is fitted separately.

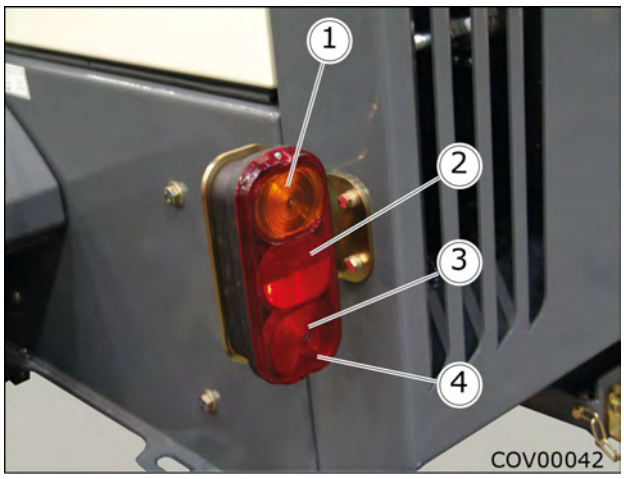

Figure 4.14 - Rear light cluster

The brake lights come on when the brake pedal is pushed down and go out when the pedal is released. They operate independently of the main lighting. The registration plate lights are mounted independently but operate in conjunction with the rear lights.

4.16 Orange Flashing Beacon

The Flashing Beacon, Figure 4.16, is provided to warn people of the dumpers presence. The beacon is fitted to the machines ROPS and is controlled by switch (1) located on the ROPS.

The Flashing Beacon is easily removed to prevent theft or vandalism by slackening nut (2) and lifting the beacon off its mounting stem.

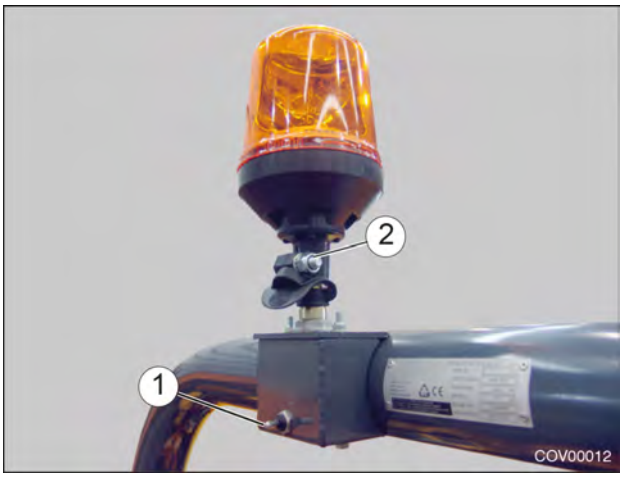

Figure 4.16 - Flashing Beacon

1. Switch
2. Securing Nut

When the beacon has been removed, the top of the mounting stem is covered by pulling the rubber stem cap (1) over the mounting stem, Figure 4.17.

Figure 4.17 - Beacon Mounting Stem

1. Rubber Cover

(1) Storage

To help prevent damage, theft and vandalism the flashing beacon can be removed from its working position on the ROPS and stored inside the lockable engine compartment when not required. A dedicated mounting point, Figure 4.16, is provided. It is held in position by tightening the nut (1).

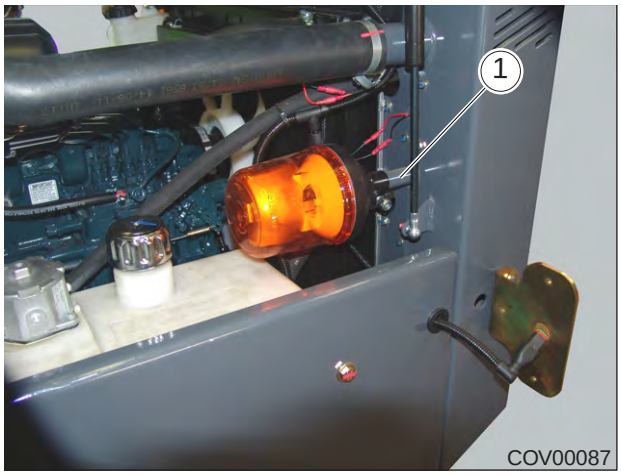

Figure 4.16 - Beacon Storage Position

1. Beacon Storage Mounting

4.17 Parking Brake

The parking brake lever - Figure 4.17, is located to the right of the drivers seat. With the lever (1) vertical the brake is applied. A catch prevents the brake from being released accidentally. Before the brake can be released it is necessary to lift the catch (2) to enable the lever to be moved to the horizontal (released) position.

Figure 4.17. - Parking Brake

1. Parking Brake Lever
2. Release Catch

⚠ WARNING

The parking brake may not hold on gradients steeper than 8.5° (15%). If possible always park on flat level ground. If it is necessary to park on a slope it must not exceed the figures stated above and the machine must be parked across the slope and the wheels chocked to prevent movement.

4.18 Skip Control Lever

The skip control lever - Figure 4.18, is located to the right of the drivers seat. Moving the lever forward towards the skip will cause the skip to tip. Moving the lever towards the rear of the machine will cause the skip to lower. Upon releasing the lever it will automatically return to the centre (Neutral) position.

Figure 4.18. - Skip Control

1. Skip Control Lever

On swing skip machine by moving the lever to right the skip will rotate to the right and by moving the lever to the left the skip will rotate to the left. The skip must be raised by 75mm to clear the skip lock - Figure 4.19 before it can be rotated to the left or right.

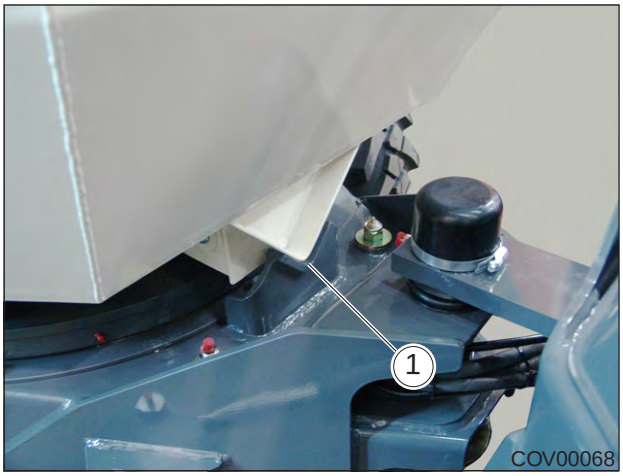

Figure 4.19. Skip Lock (Swing Skip Machines Only)

1. Skip Lock

4.19 Seat Belt

A seat belt is provided for the safety of the operator and must be worn at all times when operating this equipment. It is prohibited to alter or modify a seat belt. Avoid twisting the webbing.

(1) Standard Seat Belt

This is a normal lap type seat belt Figure 4.22 refers.

Figure 4.22 - Standard Seat Belt

1. Buckle
2. Button
3. Tongue

(2) Retracting Seat Belt with Green Beacon (Optional)

This type of belt retracts automatically when the release button is pressed and the tongue is released. Figure 4.23 refers. When the tongue of the belt is inserted in the buckle and clicks into place, a green beacon, Figure 4.24 located on the ROPS frame will flash indicating to site management and others that the driver of the machine is correctly wearing their seat belt. The engine will not start unless the operator is wearing the seat belt correctly.

Figure 4.23 - Automatically Retracting Seat Belt

1. Release Button
2. Tongue
3. Retractor Unit

Figure 4.24 - Green Beacon - Seat Belt Warning

4.20 Tow Hitch

A tow hitch Figure 4.20 is provided primarily for recovery purposes. The machine has not been designed for, and we do not recommend its use as a towing vehicle, but if so used always make sure that the weight of the trailer and its load does not exceed half the rated payload of the dumper.

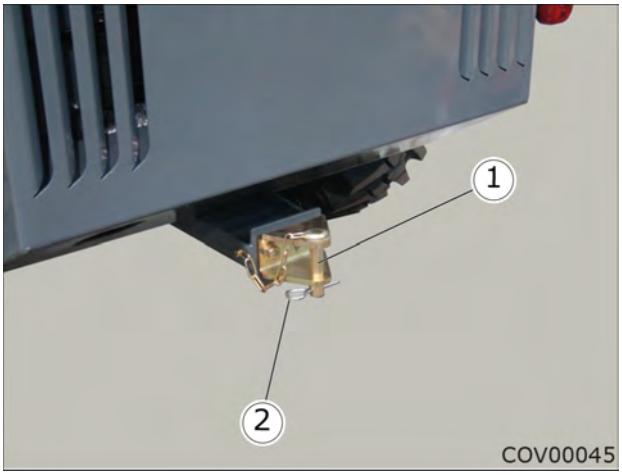

Figure 4.20 - Tow Hitch

1. Pin
2. Grip Clip

It is important that if the machine is used for towing:

- The skip is loaded with half the rated payload to provide adhesion when braking.
- The machine must NEVER be driven down a gradient as “jackknifing” may occur.
- Only “low” speed is selected and the machine is never driven on or across gradients.

The grip clip (2) must be fitted to the pin (1) once the trailer etc. has been coupled up.

⚠ WARNING

The dumper must not be used as a towing vehicle on the public highway

5 Transportation

5.1 Loading on to a Trailer or Lorry Using Ramps

DANGER

Keep all bystanders well clear when loading or unloading a dumper.

When loading dumper onto a trailer or lorry, strong loading ramps must be used. Ramps must be strong enough to take the weight of the machine.

The angle of the loading ramps must not exceed the grade ability (1 in 4 - 25%) of the dumper. In wet, muddy or icy conditions this angle will be reduced considerably.

Make sure the trailer or lorry will not move during loading by applying its brakes and also chocking its wheels if necessary.

The skip must be empty when transporting the machine.

When the machine has been loaded and is positioned correctly fit the articulation lock.

Secure the machine to the Trailer or Lorry - *see Securing the Machine for Transport.*

Release the articulation lock before unloading.

5.2 Loading or Unloading using a Crane

Refer to Figure 5.1. A single lifting point (1) is provided for lifting the machine. Using this point will give a safe stable lift. Other methods of lifting are not recommended.

The crane must have adequate capacity to lift the machine.

Any chains, ropes and straps used must be of sufficient strength to support the machine safely.

Before lifting the machine must be in the straight ahead position with the front and rear chassis in line.

Fit and secure the articulation lock before lifting.

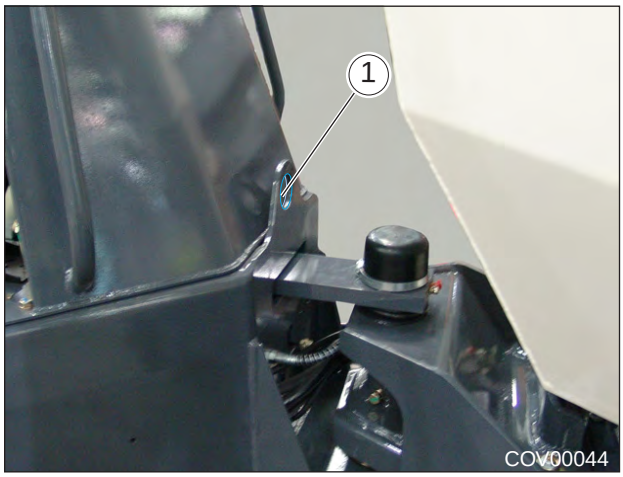

Figure 5.1 - Lifting Point

1. Lift Point

5.3 Articulation Lock

The articulation lock, Figure 5.2 prevents chassis movement when lifting the machine with a crane or during transport or maintenance.

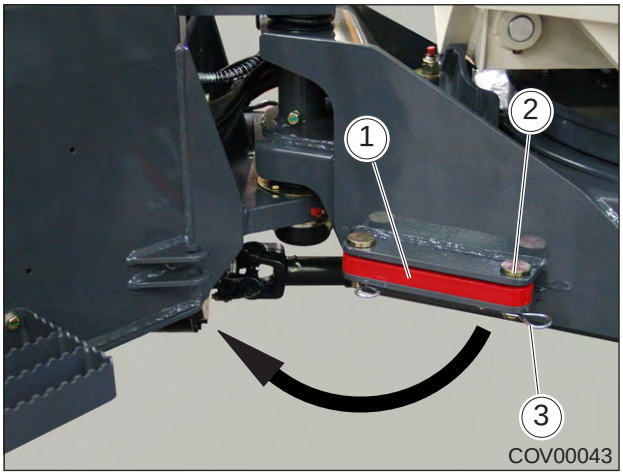

Figure 5.2 - Articulation Lock

1. Lock Bar
2. Pin
3. R Clip

PROCEDURE

1 To fit the lock bar remove the grip clip and pin from the lock bar.

2 Pivot the lock bar around until the hole in the bar aligns with the hole in the rear chassis.

3 It may be necessary to move the steering wheels slightly to align the holes.

4 Refit the pin and secure with the grip clip.

5.5 Tie Down Points

Tie down points are provided at the front and rear of the machine. The chains, straps, ropes etc. must be attached to the machine's front tie down points (1) forward tip skip, Figure 5.3. or (2) swing skip, Figure 5.4. and rear tie down points, Figure 5.5 (each side of machine).

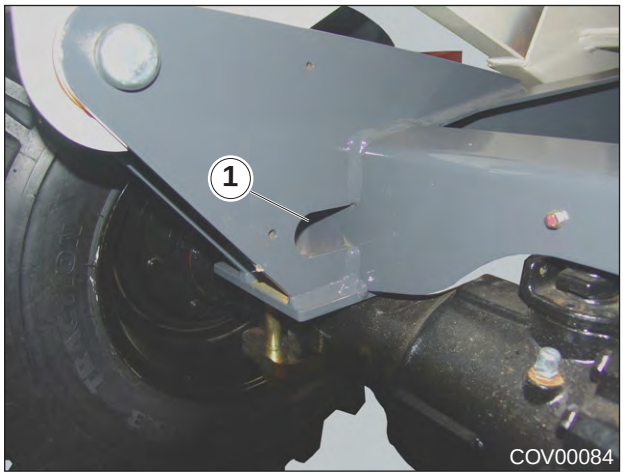

Figure 5.3. - Front Tie Down - Forward Tip Skip

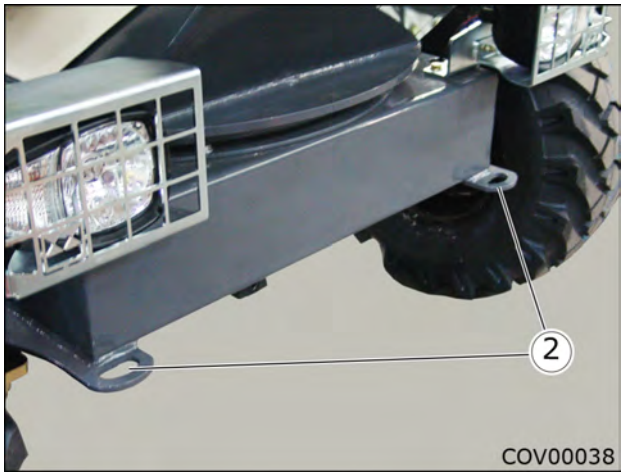

Figure 5.4. - Front Tie Down - Swing Skip

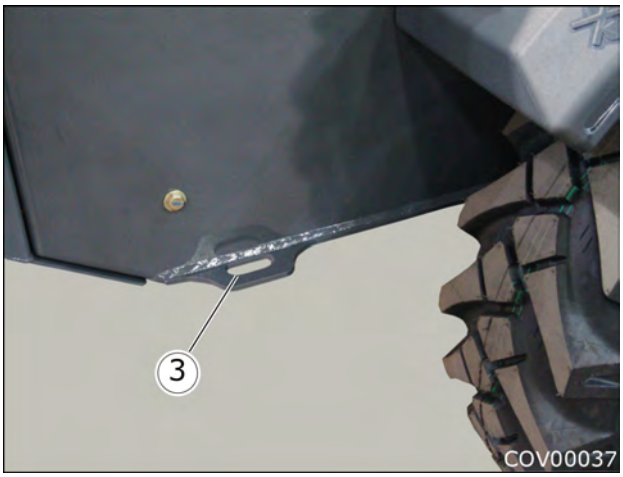

Figure 5.5. - Rear Tie Down Point (3)

5.6 Tie Down

When the machine has been put in an acceptable position on the lorry or trailer it must be secured in place.

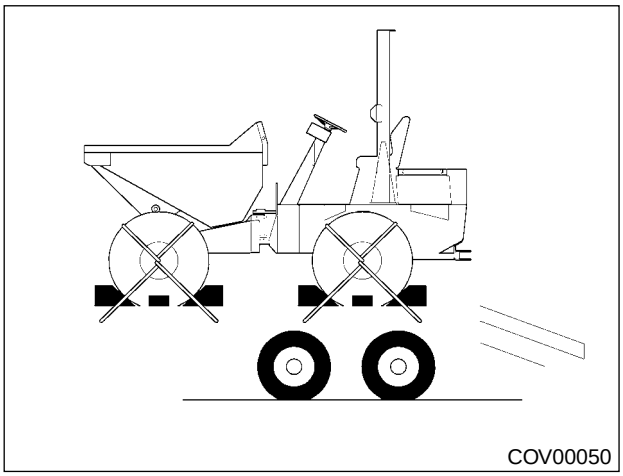

Figure 5.6 - Alternative Tie Down Method

PROCEDURE

1 Place the machine in a suitable position.

2 Apply the parking brake.

3 Fit the articulation lock.

4 Lower ROPS to transport position.

5 Nail blocks/chocks at the front, rear and outside of each wheel.

6 Tie down using tie down points provided with suitable chains straps or ropes. Ropes may also be placed over wheels as shown in Figure 5.6.

7 Loose ends of chains, straps or ropes must be secured to the lorry/trailer bed.

6 Initial Setup & Adjustments

6.1 Delivery Checks

On delivery of the machine:-

- Remove any packaging and shipping supports.
- Release any transport locks.
- Clean any protective coating from bright metal parts.
- Check for damage and missing parts.
- Check all fluid levels.
- Check tyres are inflated to correct pressures.

6.2 Setup

Place the ROPS in the work position, Figure 6.1. refers.

DANGER

The machine must not be used until the ROPS has been raised and secured in the work position. It is prohibited to use a machine without the ROPS installed in the work position.

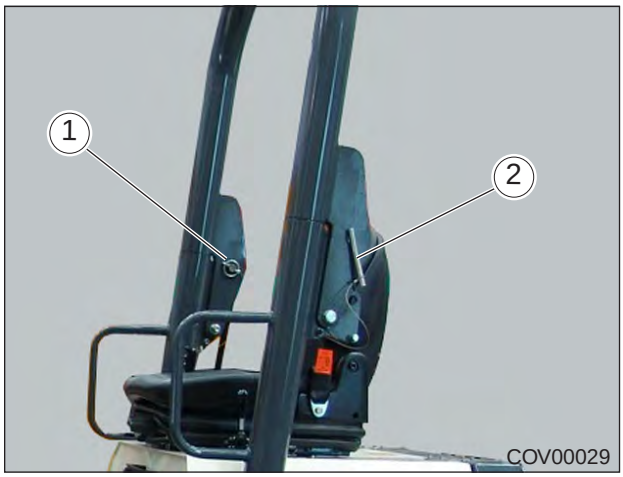

Figure 6.1 - ROPS Set Up

1 Linch Pin

2 Locking Pin

PROCEDURE

1. Remove the linch pins from the locking pins either side of the ROPS.
2. Remove the locking pins.
3. Push the top half of the ROPS upwards to the working position.
4. Refit the locking pins.
5. Secure the locking pins in position with the linch pins.
6. Remove the rubber cover and fit the beacon to the stem on top of the ROPS.
7. Switch on the beacon and check it is working correctly.

6.3 Start Up and Adjustments

When all delivery checks have been made and the ROPS has been placed and secured in the work position:-

- Start the engine and allow to run for a few minutes to warm up.
- Check all instruments and warning lights are functioning correctly.
- Check lighting and indicators operate (if fitted).
- Stop the engine and check for any fluid leaks or signs of overheating.
- Re-start the engine, drive the machine a short distance to check operation of transmission, brakes and steering.
- Check if the skip tips, lowers and (swing skip models only) rotates in either direction.
- Park up and stop the engine.
- Report and have rectified any faults before placing machine into service.

7 Standard Operating Procedures

Before using this equipment the operator must read and fully understand this Instruction Manual and pay particular attention to Section 2 - Safety and Section 4 - Description which describes the major components of the machine and the layout and function of all the controls.

NOTICE

ALL Operators of this machine must be authorised, mentally and physically capable of operating this machine and fully trained in its operation.

7.1 Pre Start Checks

Make sure the machine has been cleaned to enable leaks etc. to be noticed easily during the pre-start check and during normal operation.

PROCEDURE

1. Check general condition of machine - missing parts, loose fasteners, fuel lines for damage, hydraulic hose end fittings for leakage, hose outer covers for ballooning, etc.
2. Check engine and hydraulic oil levels - make sure the engine and hydraulic tank are filled using clean oil and a clean container.
3. Check fuel tank is full - make sure the tank is filled when the engine is cold and the machine is in a well ventilated area, with the engine stopped using clean fuel and container. It is advisable to fill the tank at the end of a working session to prevent condensation forming in the tank during long periods of inactivity, e.g. overnight.
4. Check battery and battery cable condition.
5. Check for adequate ventilation if the machine is to be started or run in a building etc.
6. Make sure the ROPS is in the “work” position.

7.2 To Set the ROPS in the Work Position.

Refer to figure 7.1

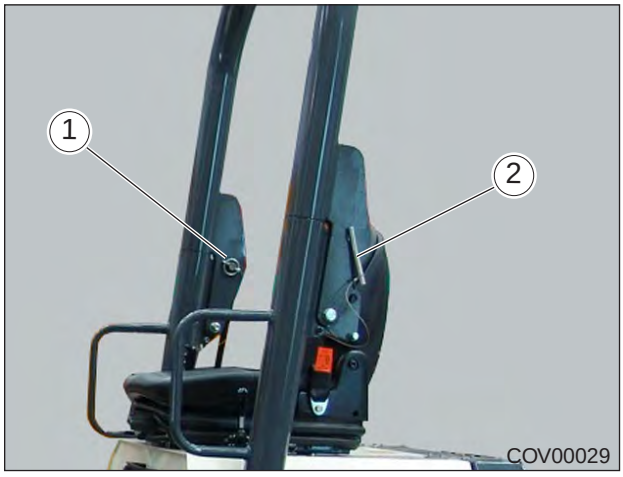

Figure 7.1. - ROPS pins

1 Lynch Pin

2 Locking Pin

PROCEDURE

1. Remove the linch pins from the locking pins.
2. Remove the locking pins.
3. Push the top section of the ROPS upwards to its working position.
4. Refit the locking pins and secure with the linch pins.
5. Fit the beacon.

7.3 To Lower the ROPS for Transport

PROCEDURE

1. Remove the beacon.
2. Remove the linch pins from the locking pins.
3. Remove the locking pins.
4. Lower the top section of the ROPS downwards.
5. Refit the locking pins and secure with the linch pins.

7.4 Seat

The seat is adjustable for operator comfort. The adjustments allow the seat to be moved forwards and backwards, the back of the seat may be tipped forwards and backwards and the seat suspension may be adjusted to the weight of the operator.

Figure 7.2. - Operators Seat

1. Fore and aft movement
2. Backrest Angle Adjustment
3. Weight Adjustment

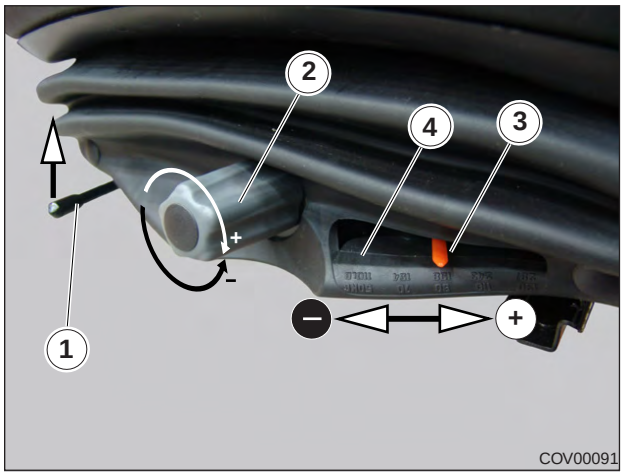

Figure 7.3. - Seat Adjustment

1. Fore and aft adjustment
2. Weight adjustment knob
3. Scale
4. Pointer

(1) Seat Adjustment

Refer to Figure 7.3. Lifting the lever (1) allows the seat to move forwards or backwards to suit the leg length of the operator. When the lever is released the seat is locked in position.

(2) Weight Adjustment

The weight adjustment knob (2) is used to adjust the seat characteristics to suit the weight of the operator.

Turning knob clockwise adjusts the seat for the larger person and anticlockwise for the smaller person.

When the knob is turned, the pointer (4) moves to allow the operator to select the correct weight from the scale (3).

If the seat weight adjustment is not set, the Operator may experience discomfort or personal injury.

The engine will not start unless the seat is adjusted correctly for the operators weight and the operator is seated.

(3) Backrest Angle Adjustment

Refer to Figure 7.4. Lifting the lever (1) allows the back of the seat to be pushed forwards or backwards to suit the preference of the operator. When the lever is released the seat is locked in the selected position.

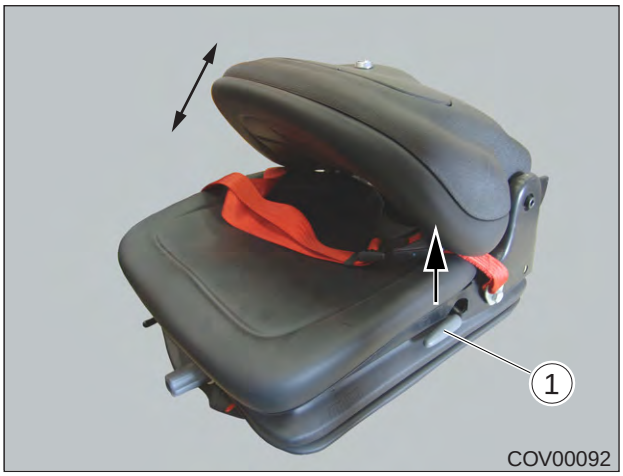

Figure 7.4. - Backrest Angle

1. Adjustment Lever

(4) Seat belt

Refer to Figure 7.5. Sit on the seat, place the seat belt across the hips and insert the latch (3) into the buckle (1) until it locks into position.

Adjust by pulling the belt through buckle (B) until it is a firm, comfortable fit across the hips.

To remove the seat belt, press the button (2) and lift the latch (3) out of the buckle (1).

Figure 7.5. - Seat Belt

1. Buckle
2. Button
3. Latch

7.5 To Start the Engine

Before starting the engine check to see that there are no obvious faults with the machine. Refer to Figure 7.6 which shows the start key positions.

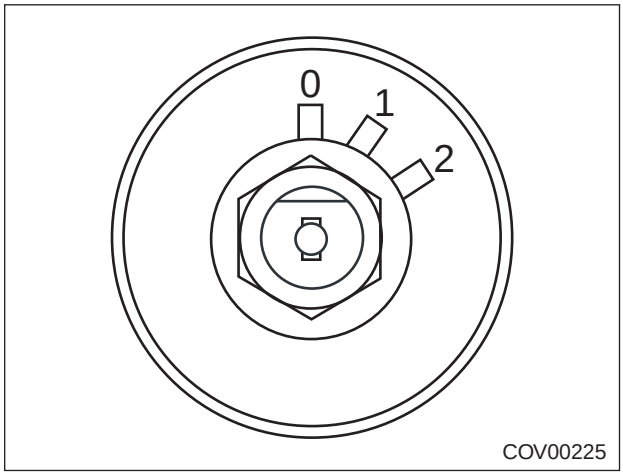

Figure 7.6. - Key Switch Positions

0. Off
1. Run/Pre Heat
2. Start

PROCEDURE

1. Sit on the seat.
2. Check that the parking brake is applied and the forward/reverse switch is in Neutral.
3. Turn the start key to position 1 (Run) an audible warning will sound indicating the parking brake is applied.
4. Wait for the heater warning light to go out.
5. Further turn the switch to position 2 (START) and crank the engine.
6. Release the key immediately the engine starts and allow the to return to position 1.

NOTICE

Do Not use starting sprays to assist engine starting.

Do Not crank engines for more than 10 seconds - allow 30 seconds before between starting attempts.

Never engage the starter motor when the engine is running.

7.6 To Stop the Engine

PROCEDURE

1. Stop the machine in a safe position on firm level ground.
2. Apply parking brake and place the forward/reverse switch in Neutral.
3. Turn start key anticlockwise to OFF - position 0.

7.7 To Move the Machine

Refer to Figure 7.7

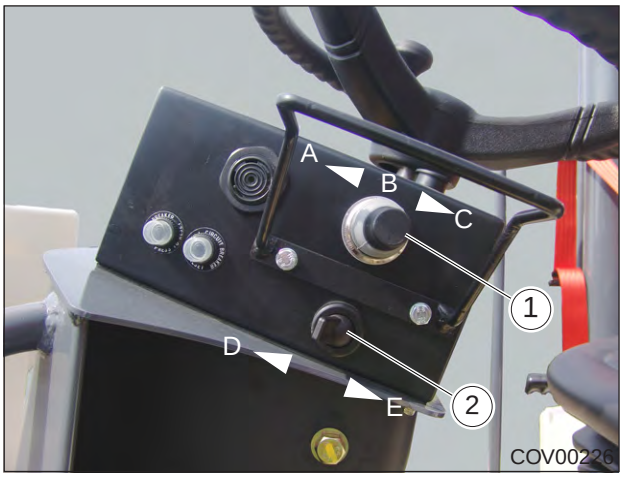

Figure 7.7. - Forward/Reverse and Fast Slow Switches

1. Forward Reverse Switch - A, Forward - B, Neutral - C, Reverse
2. Speed Switch - D, Fast - E, Slow

PROCEDURE

1. Make sure the parking brake is ON.
2. Make sure the forward/reverse switch in Neutral.
3. Start the engine.
4. Select Fast or Slow on the speed switch.
5. Select Forward or Reverse.
6. Release the parking brake.
7. Depress the accelerator pedal gently and the machine will begin to move.
8. Control the speed of the machine with the accelerator or brakes as required.

7.8 Loading the Skip

Before the skip is loaded the operator should:-

- Park the machine safely.
- Apply parking brake and stop engine.
- Get off the machine and stand clear.

⚠ WARNING

It is important to get off and stand clear of the machine when loading the dumper with a backhoe loader, digger, loader shovel or similar to prevent injury from falling objects.

7.9 Skip Operation

⚠ WARNING

The machine must be in the “straight ahead” position before tipping. Do not try to tip the load when the machine is turned.

⚠ WARNING

Only tip or lower the skip when sitting on the operators seat. It is prohibited to tip or lower the skip from ground level.

⚠ CAUTION

The centre of gravity will change when the load is being discharged. Take care when tipping sticky loads or single large objects.

(1) To Tip the Load - Forward Tip Machines

Refer to Figure 7.8

Figure 7.8. - Control Lever - Operation

PROCEDURE

1. Position the machine where the load is to be discharged.
2. Make sure the area is clear of bystanders.
3. Push the control lever forwards towards the front of the machine; the skip will tip and the load will be discharged.

(2) To Lower the Skip

PROCEDURE

1. When the load has been discharged.
2. Move the control lever towards the back of the machine.
3. The skip will lower.

(3) To Tip the Load - Swing Skip Machines

Refer to Figure 7.8

PROCEDURE

1. Position the machine where the load is to be discharged.
2. Make sure the area is clear of bystanders.
3. Push the control lever forwards towards the front of the machine; the skip will tip and the load will be discharged.

(4) To Lower the Skip

PROCEDURE

1. When the load has been discharged.
2. Move the control lever towards the back of the machine.
3. The skip will lower.

(5) To Rotate and Tip the Skip

PROCEDURE

1. Position the machine where the load is to be discharged.
2. Make sure the area is clear of bystanders.
3. Push the control lever forwards towards the front of the machine to raise the skip by 75mm to enable the catch to clear the skip lock.
4. Move the control lever to the right or left; the skip will rotate.
5. Push the control lever forwards; the skip will tip and the load will be discharged.

(6) To Lower the Skip

PROCEDURE

1. When the load has been discharged.
2. Move the control lever towards the back of the machine.
3. The skip will lower.

(7) To Return the Skip to the Ahead (Travelling) Position

PROCEDURE

1. If necessary raise the skip to clear the lock.
2. Rotate the skip to the ahead position.
3. .Move the control lever towards the back of the machine; the skip will lower.
4. Make sure the skip is locked in the ahead position.

7.10 Parking the Machine After Use

At the end of the working day make sure the machine is parked safely and securely.

PROCEDURE

1. Find a safe, flat, well lit area to park the machine where it will not cause an obstruction or danger to others.
2. Set the forward/reverse switch to the Neutral position and apply the parking brake.
3. Stop the engine and remove the start key.
4. Lift the engine cover, turn the battery isolator to OFF and remove the isolator key.
6. Close the engine cover, lock and remove the key.

8 Emergency Operating Procedures

In the event of an emergency or system failure the following procedures must be followed to place the machine in a position of safety or in a safe condition.

Once the machine has been rendered safe the start key and battery isolator key must be removed to prevent start up and a warning tag placed in a prominent position warning others not to use the machine.

The fault or failure must be rectified before the machine is put back into use.

8.1 Running Out of Fuel on a Slope

PROCEDURE

1. If Possible place the machine across the slope in a safe position.
2. Apply parking brake.
3. Chock or block the wheels.
4. Re-fuel the machine.

8.2 To Support or Lower the Skip with the Engine “Dead”

If the skip is partially raised and the engine fails it will lower under gravity when the control lever is moved to the “down” position.

If the skip is raised fully it may not lower by gravity and the skip prop or other suitable method of support must be fitted. Once the fault has been rectified and the engine restarted the skip can be lowered normally.

⚠ DANGER

NEVER reach or work under a raised skip unless the prop or other support has been fitted.

8.3 “Jump Starting” the Machine

⚠ DANGER

It is essential to avoid sparks when connecting cables to a discharged battery because the battery generates inflammable gases and may pose a fire risk.
If the battery is frozen it may explode if the machine is “jump started” and the engine run.

It is possible to connect a slave battery to boost a discharged battery on the machine - Refer to figure 8.1. When doing so you must wear the correct protective clothing, gloves and a face shield - *see Safety Section* in this manual.

Observe the following points:-

- The discharged battery must not be frozen.
- The slave battery must be of the same nominal voltage as the discharged battery.
- The “jumper” cables are of sufficient capacity to carry the starting current.

It is necessary to remove the floor plate to gain access to the battery - see *Battery Access* in *Maintenance* section.

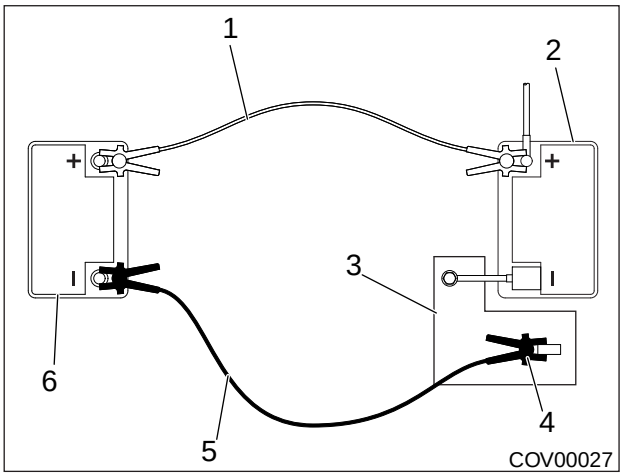

Figure 8.1. - Battery “Jump” Starting

1. Positive (+) Jump Lead.
2. Discharged Battery on Machine.
3. Machine Chassis.
4. Jump Lead Connection on Chassis.
5. Negative (-) Jump Lead.
6. Slave Battery.

PROCEDURE

1. Connect the positive jump lead from the positive terminal on the slave battery to the positive terminal on the machine battery.
2. Connect the negative cable from the negative terminal on the slave battery to a suitable point on the machine chassis.
3. Start the engine using the machines start key.
4. Allow engine speed to fall to idle.
5. Carefully remove the negative jump lead from the machine chassis. Do not let the cable touch any part of the machine.
6. Remove the negative jump lead from the slave battery.
7. Carefully remove the positive jump lead from the machines battery.
8. Remove the positive jump lead from the slave battery.

8.4 Towing the Machine

In the event of a breakdown it is possible to tow the machine but before doing so it is necessary to set the transmission pump to “freewheel” mode.

The machine should be towed at a maximum speed of 2km/h (1.2 m.p.h.) for a maximum distance of 2 km (0.6 miles).

NOTICE

Failure to place the machine in “Freewheel” mode before towing will cause serious damage to the pump, motor and hydraulic system.

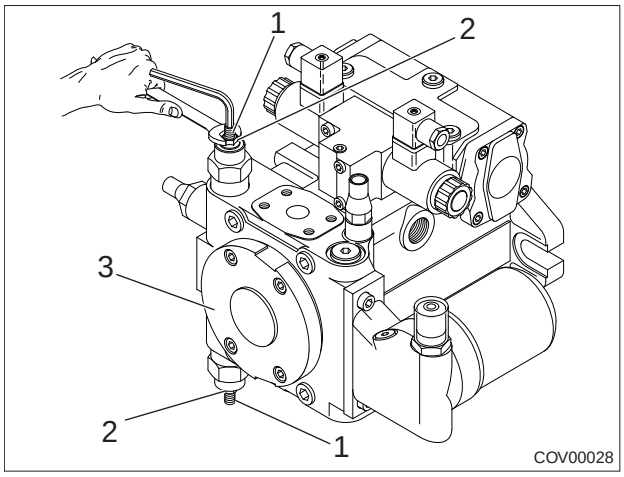

Figure 8.2. - Setting the Pump to “Freewheel”

1. Adjusting Screws.
2. Lock Nuts.
3. Pump.

1 To Set the Pump to Freewheel.

It is necessary to remove the floor plate to gain access to the pump - see *Battery Access* in *Maintenance* section.

PROCEDURE

1. Slacken the lock nuts each side of the pump.
2. Screw in the adjusting screws until the top of the screw is level with the top of the nut.
3. Tighten the lock nuts.
4. The machine can now be towed with care.

2 To Reset the Pump

PROCEDURE

1. Slacken the lock nuts each side of the pump.
2. Unscrew in the adjusting screws until they reach their stops.
3. Tighten the lock nuts.

9 Maintenance & Lubrication

9.1 General Information

Regular maintenance and lubrication will prolong the life of the machine and keep it in a safe working condition.

Refer to the Safety section of this manual and understand its contents before performing any maintenance tasks on this machine.

Contaminated water, fluids and oils removed from the machine must be disposed of legally.

9.2 Maintenance Notes

Before carrying out any service or maintenance work make sure that the following precautions have been taken.

- Park the machine on firm level ground.
- Stop engine and chock the wheels.
- Remove Start key to prevent accidental start up.
- Place a warning tag on the machine informing others not to use the machine.
- Only jack or raise the machine using the correct equipment.
- Make sure jacks, axle stands etc. are capable of supporting the weight of the machine.
- Always fit and lock in position a support before working under a raised skip.
- Always fit the articulation lock when working in the area of the centre pivot.
- Refer to and adhere to the Lubricating and Service Schedules detailed in this manual.
- When checking fluid levels park the machine on a firm, level surface, in a well ventilated position away from naked flames, grinding sparks etc.
- Make sure the work area is clean and tidy before starting and on completion of any maintenance.
- Make sure strict cleanliness is observed especially when dealing with hydraulic systems.
- Isolate electrical system by using the isolator switch or by disconnecting the battery.
- Make sure all guards and covers removed during maintenance are replaced before the machine is put back into work.
- OIL - Refer to Safety Section BEFORE handling oil and other lubricants and observe and adhere to all the warnings and precautions listed. Avoid skin contact with used oils and lubricants.
- Always use genuine original equipment manufacturers parts.

9.3 Cleaning The Machine

Clean the dumper thoroughly, this will make it easier to find oil leaks and loose fittings etc.

- Take care to clean the oil and fuel tank filler necks.

- Drain plugs must also be cleaned.
- Using water or a pressure washer to wash down the exterior of the dumper with or without detergent is generally all that is required.
- Avoid spraying electrical equipment with pressure washers.
- When cleaning the dumper it is preferable to use a biodegradable cleaner. Do not use solvents or like products which can damage rubber and plastics.

(1) Safety Signs

All safety signs fitted to the machine must be legible, when cleaning only use mild soap and water to clean the signs - DO NOT use solvent based cleaners because they may damage the safety sign material. All safety signs MUST be replaced immediately they become damaged or unreadable.

9.4 Battery Disposal

Refer to Section 12 - Storage, Decomissioning and Disposal.

9.5 Hydraulic Oil Under Pressure

Release any pressure in the hydraulic circuit before carrying out repairs to the hydraulic system or components.

⚠ WARNING

Fine jets of hydraulic fluid under pressure can penetrate the skin. Do not use your fingers to check for small leaks or expose uncovered areas of your body to leaks. Check for leaks using a piece of cardboard. If skin is penetrated with Hydraulic Fluid, Get Immediate Medical Help. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene will result.

To release pressure in the hydraulic system:- with the skip down and the engine stopped move the control lever in all directions.

9.6 Skip Support

⚠ DANGER

A skip support or other method of supporting the skip in the raised position MUST be fitted and locked in position before working under a raised skip. Do not reach or work under a raised skip unless a prop is fitted.

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(1) To fit a Skip Support

Refer to Figure 9.1. A support is fitted and locked over the piston rod of the skip ram to prevent the rod retracting. Refer to Figure 9.1.

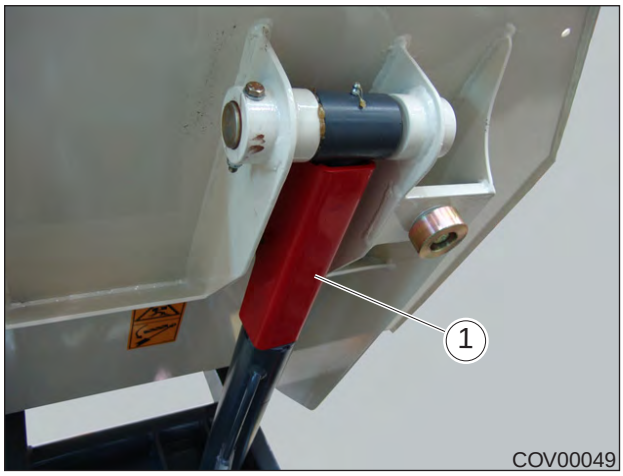

Figure 9.1 - Skip Support

PROCEDURE

1. Fully raise the skip.
2. Remove the support (1) from its storage position and place over the piston rod of the ram.
3. Fit the pin to the support and secure with the grip clip.
4. Carefully lower the skip until the weight is resting on the support.

9.7 Articulation Lock

⚠ DANGER

The articulation lock must be fitted before working in the area of the centre pivot, failure to fit the lock could cause a pinch point or trap that will result in death or serious injury.

(1) To Fit the Articulation Lock

Refer to Figure 9.2

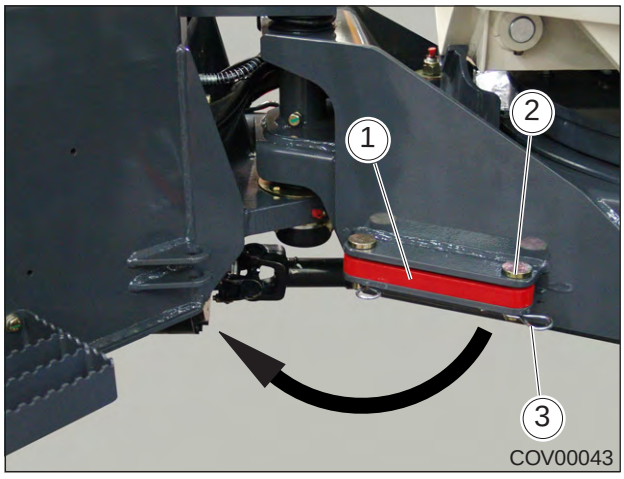

Figure 9.2 - Articulation Lock

1. Lock Bar
2. Pin
3. Grip Clip

PROCEDURE

1 To fit the lock bar remove the grip clip and pin from the bar.

2 Pivot the locking bar around until the holes in the bar are in line with the holes in rear chassis bracket.

3 Re fit the pin through the holes and secure with the grip clip.

9.8 ROPS

Check for:-

- Worn, damaged or missing mountings. If there is excessive movement or rattling during operation the ROPS mountings must be checked and replaced if necessary.
- Loose or missing nuts, bolts and washers. Missing items must be replaced with those of the same grade/specification. Bolts and nuts should be tightened to the correct torque.
- Cracks in the ROPS and its mountings.
- Paint peeling and corrosion. If necessary take corrective action.

If the machine has rolled over or been involved in an accident in which the ROPS could have been damaged the ROPS must be replaced.

If you have any doubts regarding the integrity of the ROPS and for replacement parts consult your Mecalac dealer.

9.9 Floor Plate Removal

To gain access to the battery, hydrostatic transmission pump and various other components it will be necessary to remove the floor plate - Figure 9.3 refers

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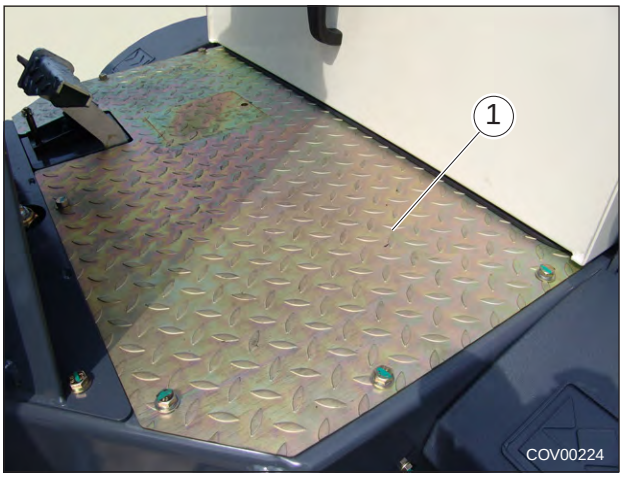

Figure 9.3 - Floor Plate Removal

1. Floor plate bolts

PROCEDURE

1. Open the engine cover.
2. Set battery isolator to OFF position.
3. Undo the 7 bolts and washers securing the floor plate.
4. Lift the floor plate clear of the machine.

9.10 Battery Removal

⚠ DANGER

Battery Acid - Contact with battery acid can cause serious burns, blindness or even death. Protective clothing, gloves and a face shield must be worn at all times when handling or working on a battery.

Set battery isolator to OFF position. It will be necessary to remove the floor plate to gain access to the battery - refer to para. 9-4.

To remove the battery refer to Figure 9.4.

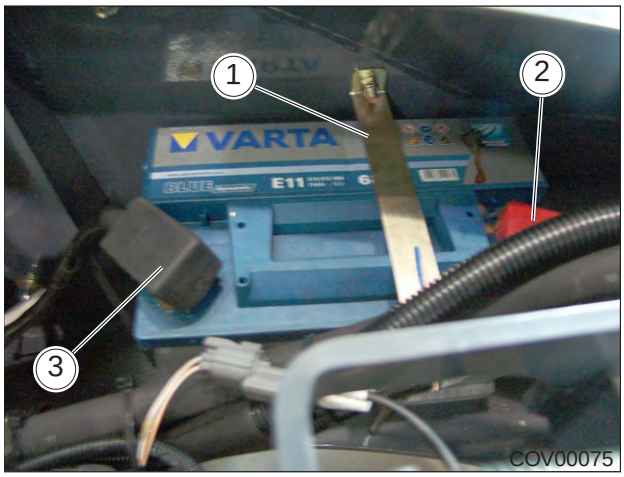

Figure 9.4 Battery Removal

1. Battery Clamp
2. Positive (+ve) Terminal
3. Negative (-ve) Terminal

PROCEDURE

1. Remove the protective covers from the battery terminals.
2. Disconnect the negative (-ve) cable from the battery.
3. Disconnect the positive (+ve) cable.
4. Undo the nuts and washers and remove the battery clamp.
5. Lift the battery clear of the machine.

With the battery removed clean battery terminals and cable connections. When the battery is reconnected protect connections with grease or petroleum jelly before fitting the plastic terminal covers.

9.11 Air Cleaner

(1) Daily Maintenance

To access the air cleaner lift the engine cover. Check the blockage indicator, Figure 9.5. If the indicator is showing RED the air cleaner requires servicing. Check system for leaks.

NOTICE

Maximum protection against dust is only possible if the air cleaner is serviced at regular intervals. Check the blockage indicator daily. In dusty conditions checks should be more frequent. If the indicator shows RED clean or replace the filters immediately. Operating a machine with a blocked filter can cause serious damage to the engine.

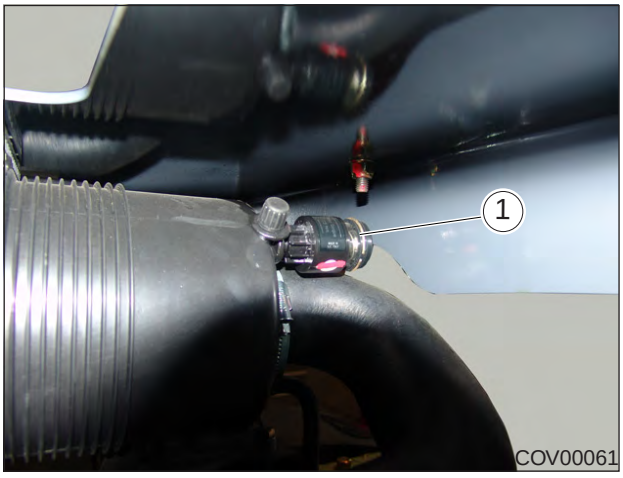

Figure 9.5 Air Cleaner Blockage Indicator.

(2) Servicing

Refer to Figure 9.6 illustrating the major air cleaner components.

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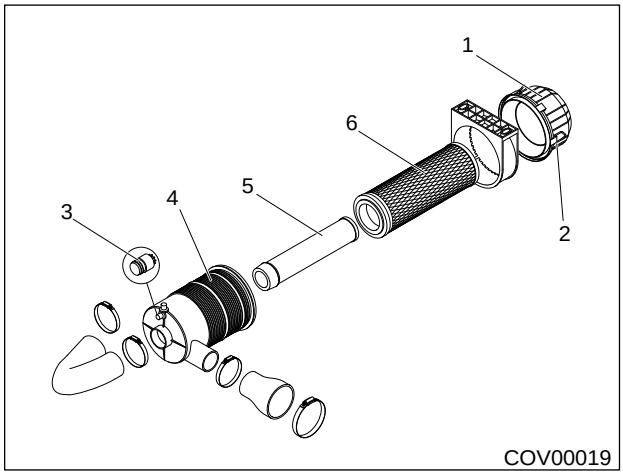

Figure 9.6 - Air Cleaner

1. Sediment Cup.
2. Clamp
3. Blockage Indicator
4. Body
5. Secondary Element
6. Main Element

PROCEDURE

1. Clean the area around the air cleaner.
2. Loosen clamps holding the sediment cup to the air cleaner body and pull cup clear.
3. Remove the elements from the body.
4. Clean the main element by tapping gently on a firm object or by blowing gently with compressed air from inside the element.
5. If the main element is damaged or severely contaminated it must be replaced.
6. DO NOT attempt to clean the secondary element; if contaminated it must be replaced.
7. Thoroughly clean the main body and sediment cup.
8. Re assemble the cleaner.

(3) Cleaning the Main Element

The main element should cleaned by tapping gently on a hard surface or by blowing gently from the inside with compressed air line. Figure 9.7 refers.

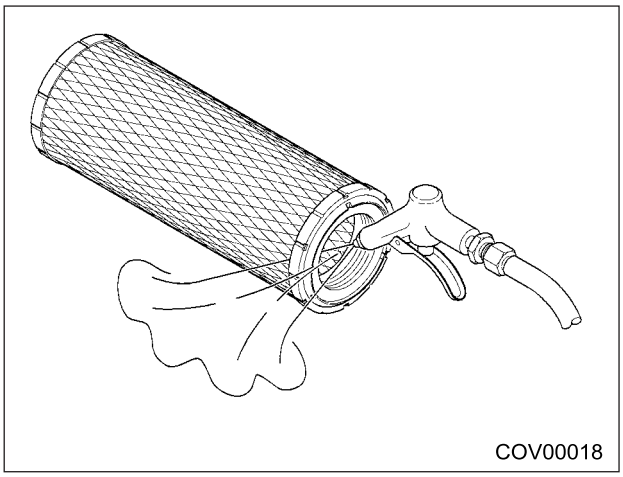

Figure 9.7 - Cleaning the Main Element

9.12 Engine Oil

Always refer to the engine manufacturers handbook, if available; when carrying out engine maintenance. The engine oil must be changed after the first 50 hours operation and then every 200 hours thereafter.

(1) To Check the Level

A dipstick - Figure 9.8 for checking the engine oil level is accessible from within the engine compartment.

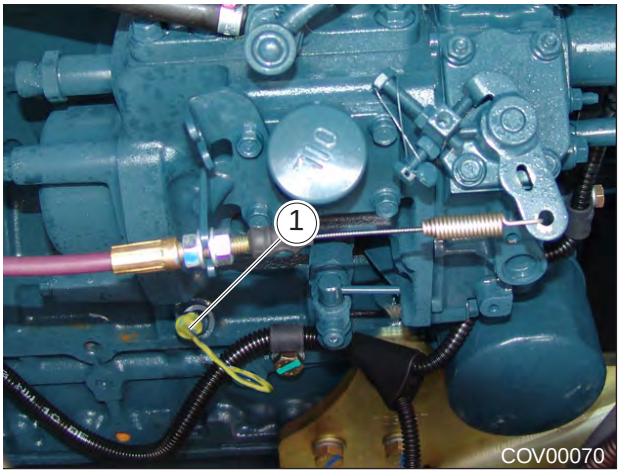

Figure 9.8 - Dipstick Location

1. Dipstick

The oil level should be between the MAX and MIN marks on the dipstick - Figure 9.?.

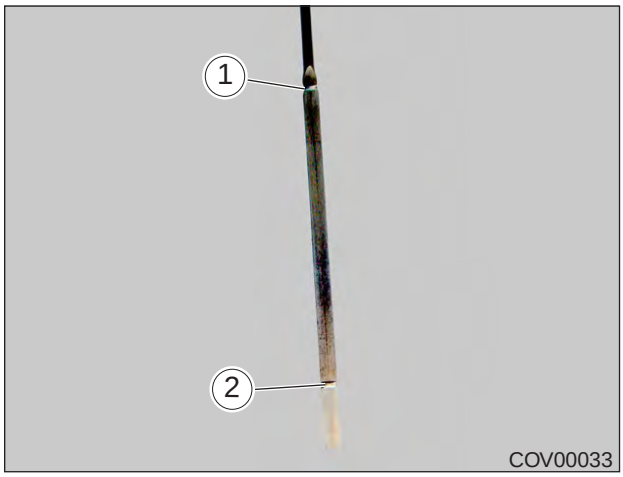

Figure 9.9 - Dipstick MAX and MIN marks.

1. Maximum (MAX) Oil Level
2. Minimum (MIN) Oil Level

PROCEDURE

1. Open the engine cover.
2. Allow oil to settle for a few minutes.
3. Remove the dipstick, wipe clean with paper, check level and replace the dipstick.
4. If the oil level is below the MIN level oil must be added.

(2) To Add Oil.

Oil is added through the filler cap - Figure 9.10 accessible in the engine compartment. Refer to the Lubrication Tables for the correct grade and quantity of oil.

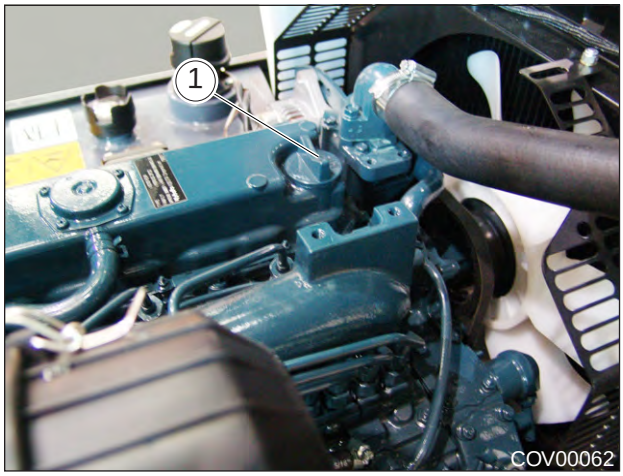

Figure 9.10. - Engine Oil Filler

PROCEDURE

1. Remove the engine oil filler cap.
2. Add clean, fresh oil of the correct grade to the engine.
3. While adding oil, check the level frequently to make sure it does not go over the MAX level.
4. When the oil is up to the required level replace the filler cap.
5. Wipe up any spilt oil.

NOTICE

Do not overfill the engine. Too much engine oil may cause damage to the engine.

(3) To Drain the Engine Oil

When changing the engine oil the oil filter must be replaced. (Refer to the engine manufacturers handbook). The engine must be warm when draining the oil.

PROCEDURE

1. Park the machine on firm, level ground, apply parking brake, place transmission in neutral, remove the starter key, set the battery isolator to off and remove the battery isolator key.
2. Place a suitable container under the machine and remove the drain plug and allow the old oil to drain into the container.
3. When the oil has finished draining, replace the drain plug and securely tighten.
4. Replace engine oil filter.
5. Refill engine with the correct grade of oil.
6. Start the engine and check for any leaks.

9.13 Engine Coolant

The cooling system is pressurised to increase boiling point of the coolant and therefore extreme caution must be taken when performing any maintenance on the cooling system when hot to prevent scalding.

⚠ WARNING

NEVER perform checks or maintenance on the cooling system when it is hot. NEVER remove radiator cap when engine is hot - severe risk of scalding. NEVER remove radiator cap when the engine is running. Antifreeze is TOXIC. If accidentally swallowed, medical advice must be sought Immediately. Antifreeze is corrosive to the skin. If accidentally spilled on to skin, it must be washed off immediately. Protective clothing and eye protection must be worn when handling antifreeze.

(1) To Top Up the Cooling System

This operation must only be performed by topping-up the plastic expansion tank, Figure 9.11 to maintain coolant level within the Full (Maximum) (2) and Add (Minimum) (3) marks on expansion tank. The tank is accessible when the engine cover is open.

When topping-up the system, always check the water hoses for damage or wear and for any obvious leaks.

Only fill the system via the radiator cap, after draining the system

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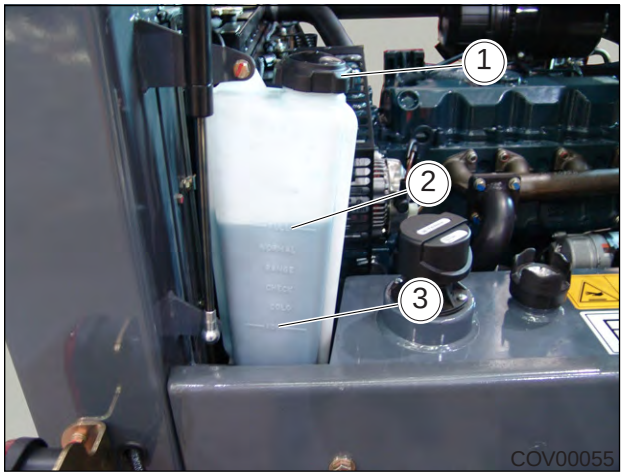

Figure 9.11 - Cooling System Expansion Tank

1. Filler Cap
2. Full Mark
3. Add Mark

NOTICE

Never over fill the expansion tank. Do not use anti leak additives in the cooling system. Never run the engine without coolant in the system.

(2) Coolant

The coolant used to top up the cooling system must be a pre-mixed solution of antifreeze and water in the correct ratio for the temperature range the machine is to be used in. See notes about antifreeze in *Antifreeze* section.

(3) Radiator Cap

To gain access to the radiator cap, Figure 9.12; open the engine cover.

Make sure radiator cap has been replaced and tightened before closing engine cover.

Only use the radiator cap orifice to fill the system during major servicing when hoses have been removed or after the system has been drained down. At all other times use the filler on the expansion tank.

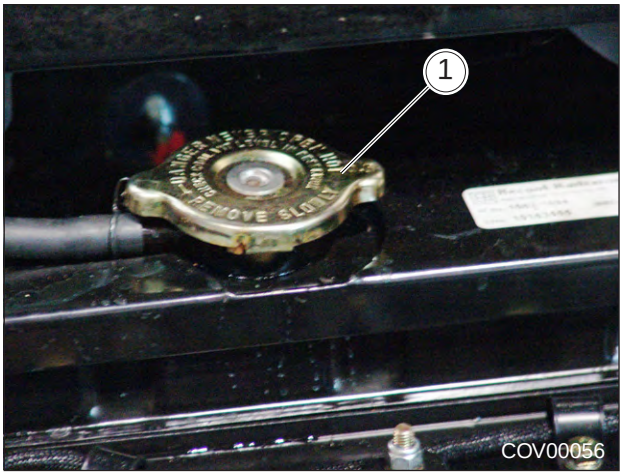

Figure 9.12 - Radiator Cap

⚠ WARNING

NEVER remove the radiator cap when the cooling system when it is hot - severe risk of scalding.

9.14 Hydraulic System

⚠ WARNING

Damaged hydraulic components and hoses can cause serious injury. Do not use a machine if a component or hose is damaged.

During ANY maintenance extreme care must be taken to make sure the cleanliness of the hydraulic circuit is maintained. By observing strict cleanliness the machine will benefit from fewer hydraulic failures through contamination.

- Always thoroughly clean machine before any hydraulic maintenance. Use paper roll, not rag, to wipe parts.
- Release hydraulic pressure before working on the system.
- Always use fresh, clean hydraulic oil from a sealed container.
- Always make sure old gasket particles and excess sealing compound etc. do not enter the system. If they do clean them out.
- Always make sure new parts and fittings are kept in sealed bags etc. and they are stored away from any contamination.

- Always remove flaking paint from around the area being maintained. Inspect the inside of new tanks for debris etc.
- Never fit new hoses if both ends of the hose have not been protected with plastic caps.
- Never fit new valves, pumps, motors, filters etc. if all the ports have not been protected with plastic plugs.
- Never use dirty containers for oil storage.
- Never use dirty containers or funnels for filling hydraulic system.
- Never store hydraulic components on the floor, in areas where welding or grinding is done, in a dirty environment etc.

A description of the hydraulics, and circuit diagrams are contained in Section 4 of this manual. The hydraulic system components are maintenance free other than the suction strainer and return line filter.

9.15 Hydraulic Tank

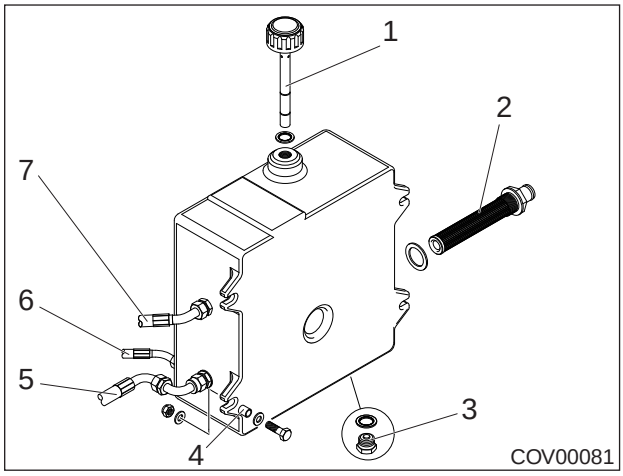

Figure 9.13 Hydraulic Tank

1. Breather/Dipstick
2. Suction Filter
3. Drain Plug
4. Mounting Spacer (4 off)
5. Line from Return Filter
6. Line from Control Valve
7. Line from Transmission Pump

(1) To Check the Hydraulic Oil Level

Refer to Figure 9.14

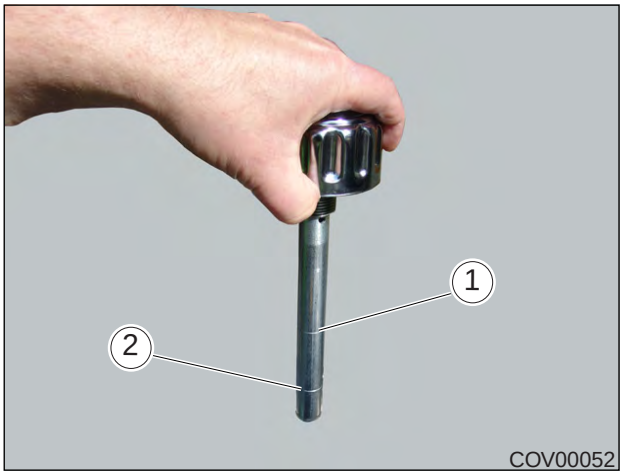

Figure 9.14- Checking Hydraulic Oil Level

1. Full (Max.) Mark
2. Low (Min.) Mark

PROCEDURE

1. Stop the engine and unscrew the dipstick/breather and remove from the tank.
2. Wipe all traces of oil from the dipstick with clean paper and refit the dipstick.
3. Remove the dipstick again and check the level of the oil.
4. Never allow the oil level to go below the minimum mark - Min. (2) or above the maximum mark - Max (1).
5. Add the correct grade of oil as required.
6. Check the level and replace the filler breather.

(2) To Add Hydraulic Oil

Refer to Figure 9.13. Make sure a clean container and clean, new oil is used.

PROCEDURE

1. Unscrew the dipstick/breather.
2. Add oil as required.
3. Use the dipstick/breather to check the level.
4. Continue adding oil until it reaches the upper mark on the dipstick.
5. Replace the dipstick/breather.
6. Wipe up any spilt oil.

(3) to Drain the Hydraulic Tank

Make sure the hydraulic oil is warm not hot before draining. Refer to Figure 9.13.

PROCEDURE

1. Park the machine on firm level ground and apply the parking brake.
2. Place a suitable receptacle, of sufficient capacity, under the drain plug to catch the oil.
3. Remove the drain plug.
4. Remove the dipstick/breather to vent.
5. When the oil has finished draining, clean the drain plug and replace the sealing washer.
6. Refit the drain plug and tighten.
7. Refill the hydraulic tank with the correct grade and quantity of hydraulic oil.

(5) Suction Filter

When servicing this filter it is recommended the tank is removed and cleaned. Refer to Figure 9.14.

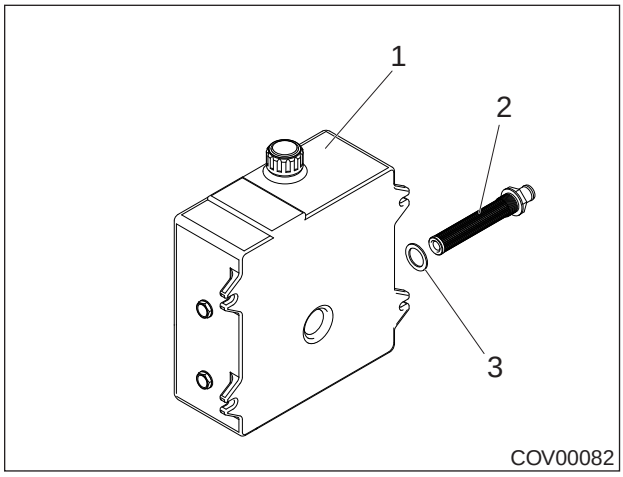

Figure 9.14 - Suction Filter.

1. Hydraulic Tank
2. Suction Filter
3. Seal

PROCEDURE

1. Thoroughly clean the outside of the tank in the area around the suction filter.
2. Drain off the hydraulic oil from the tank.
3. Undo hose clip on suction hose and pull hose from suction filter.
4. Unscrew suction filter from tank.
5. Clean the suction filter mounting face on the tank.
6. Clean or replace the suction filter.
7. Refit the suction filter using a new seal and fully tighten.
8. Refit the suction hose and fully tighten the hose clip.

9.16 Hydraulic Tank Removal

Thoroughly clean the tank and surrounding area before removal. Refer to Figure 9.15.

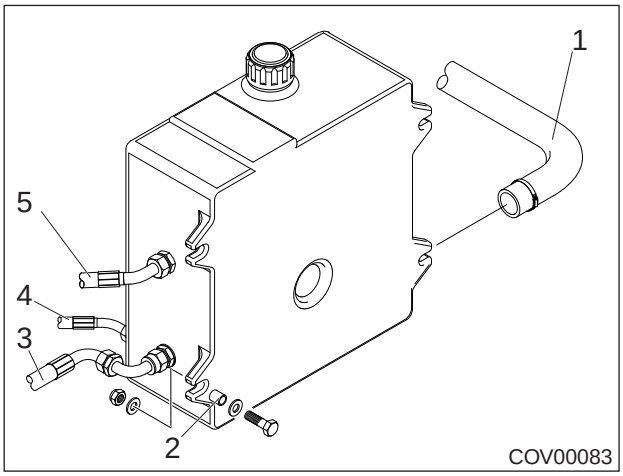

Figure 9.15. - Hydraulic Tank Removal

1. Suction Hose (Pump)
2. Spacers (4off)
3. Return Line from Filter
4. Return Line from Control Valve
5. Return Line from Transmission Pump

PROCEDURE

1. Drain off the hydraulic oil from the tank.
2. Undo hose clip securing the suction hose and pull the hose (1) from suction filter.
3. Remove the return hoses.
4. Remove the nuts and bolts securing the tank.Take care not to loose the spacers (2).
5. Lift the tank from the machine.

With the tank removed the inside should be thoroughly cleaned and flushed out. When refitting the tank make sure the spacers are in position before tightening the bolts. After refitting the tank refit and tighten all hoses fill with oil and check for leaks.

9.17 Transmission Pump

Refer to figure 9.16. The transmission pump has an integral filter and is flitted with a filter blockage indicator. The indicator band is normally GREEN. If the blockage indicator band shows RED the transmission pump filter must be changed.

Otherwise the filter must be changed at the suggested service intervals shown in the Lubrication Schedule.

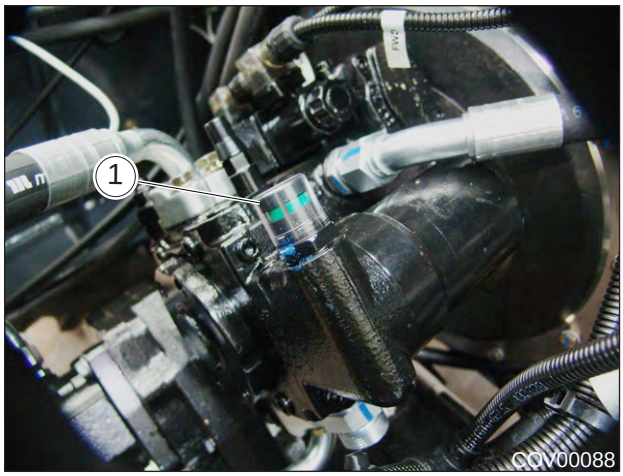

Figure 9.16 - Transmission Pump

1. Blockage indicator

(1) To change the Transmission Pump Filter

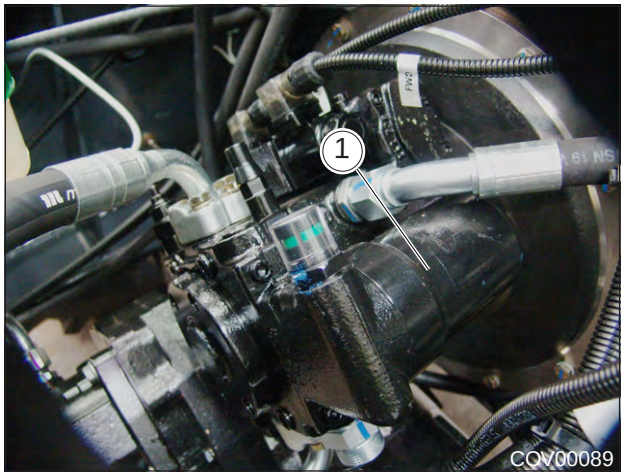

Figure 9.17. - Transmission Pump Filter

1. Filter Bowl

PROCEDURE

1. Remove the floor plate.
2. Drain the hydraulic oil.
3. Clean the area around the filter.
4. Unscrew the filter bowl.
5. Remove the old filter element.
6. Clean the inside of the bowl and fit a new element.
7. Refit the filter bowl.
8. Refill the system with clean fresh oil and test for leaks.

9.18 Hydraulic System Return Filter

Refer to figure 9.18 which shows a typical return line filter. The return filter is fitted with a blockage indicator.The indicator band is normally GREEN. If the blockage indicator band shows RED the return filter must be changed.

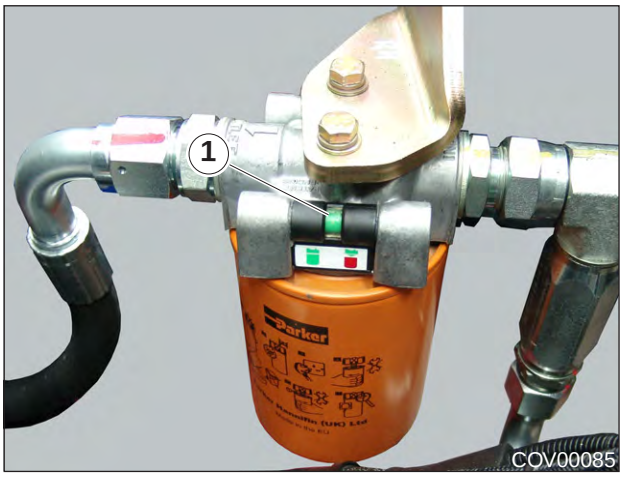

Figure 9.18 - Typical Hydraulic System Return Filter

1. Blockage Indicator

(1) To Change the Filter

PROCEDURE

1. Remove the floor plate.
2. Drain the hydraulic oil.
3. Clean the area around the filter.
4. Unscrew the filter cartridge.
5. Clean the sealing face on the filter body and smear with grease.
6. Smear hydraulic oil onto the sealing ring fitted to the new filter.
7. Screw on the new filter cartridge and tighten using hand pressure only.
8. Refill the system with clean fresh oil and test for leaks.

9.19 Hydraulic Hoses

Examine all hydraulic hoses for wear, damage and ballooning. Replace hoses with those of the same size, specification and pressure rating. Hydraulic hoses must be replaced by genuine manufacturers parts available from your dealer. Do not attempt to repair hoses - they must be replaced.

9.20 Fuel System

DANGER

Avoid sparks, naked flames etc. when filling or maintaining the fuel system. Do not smoke when filling the fuel tank or maintaining the fuel system. Do not leave the engine running when filling/ working on the fuel system.

(1) To Add Fuel

The indicator gauge, Figure 9.19; mounted on the tank will indicate the amount of fuel remaining in the tank. The gauge markings indicate when the tank is Empty, half full or Full.

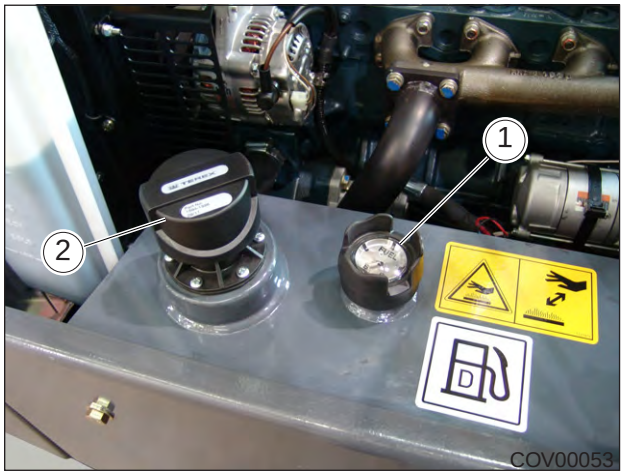

Figure 9.19 - Fuel Tank

1. Level Gauge
2. Filler Cap

PROCEDURE

1. Remove the filler cap.
2. Add fuel until the gauge reaches the full mark.
3. Refit the filler cap.
4. Clean up any spilt fuel.

(2) Fuel Filter - Canister Type Element

The fuel filter, Figure 9.20, has a removable canister (1) which must be replaced. It is not a serviceable item.

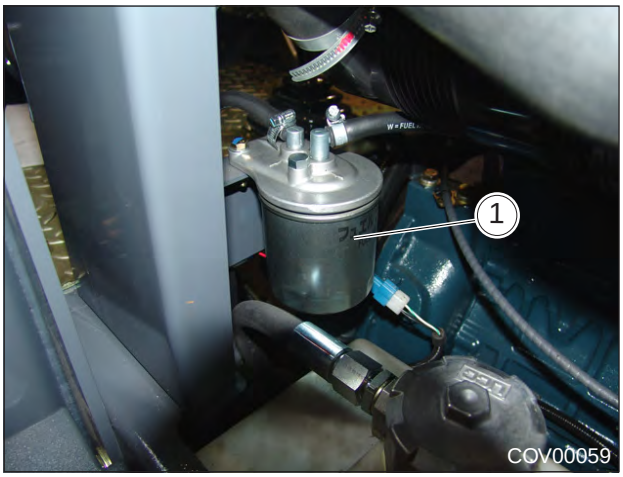

Figure 9.20 - Fuel Filter.

PROCEDURE

1. Unscrew the filter canister.
2. Dispose of the filter canister in an environmentally safe way.
3. Smear the rubber ring on the new filter canister with grease.
4. Screw on the filter canister.
5. Hand tighten only - do not use grips etc.

(3) Fuel Filter - In Line

.Refer to Figure 9.21.The in line fuel filter (2) is located below the electric fuel pump (1). is not a serviceable item and must be replaced. It is not possible to dismantle and clean the filter.

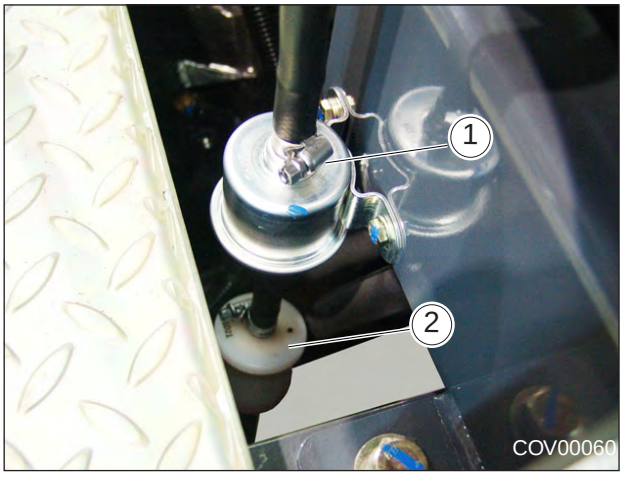

Figure 9.21 - In Line Fuel Filter

1. Electric Fuel Pump
2. In Line Filter

PROCEDURE	
1.	Loosen the hose clips either side of the filter.
2.	Pull the hoses off the filter; there may be some fuel spillage.
3.	Discard the old filter.
4.	Reconnect the hoses to the new filter.
5.	Tighten the hose clips.
6	Clean up any spilt fuel.

9.21 Braking System

(1) Brake Arrangement

Oil immersed multi-plate brakes are fitted to the front axle only and are operated hydraulically. The brake system is charged with mineral oil not conventional brake fluid. A mechanically applied parking brake is incorporated.

NOTICE

The braking system uses mineral oil not conventional brake fluid. Only use mineral oil to top up the brake reservoir. Never use conventional brake fluid. Never purge the brake system and refill with brake fluid as this will damage rubber components in the brake system and may cause brake failure.

(2) Maintenance

Maintenance on the braking system is limited. The fluid level in the reservoir on the master cylinder should be checked daily.

The brakes adjust automatically for wear but over a period of time it will be necessary to replace the friction discs and slave cylinder seals.

Check the pipe work and components for leaks or damage at regular intervals. When components are replaced it will be necessary to bleed the system.

(a) Access to Master Cylinder

The master cylinder reservoir is located under the floor plate. The cover plate, Fig 9.22 is unlocked with a removable key.

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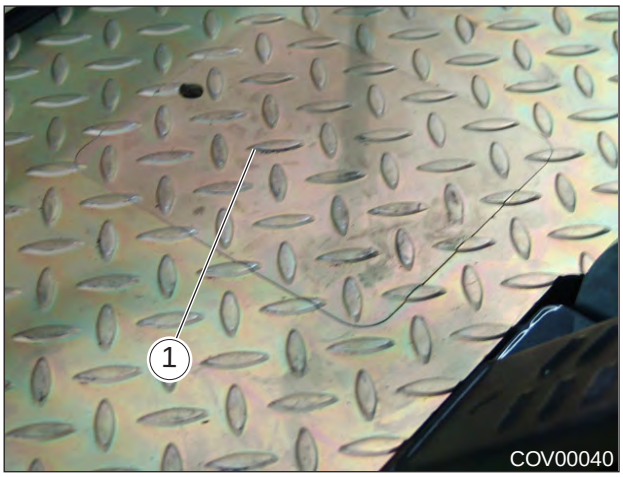

Figure 9.22 - Cover Plate

(b) To Check the Fluid Level

Refer to Figure 9.23

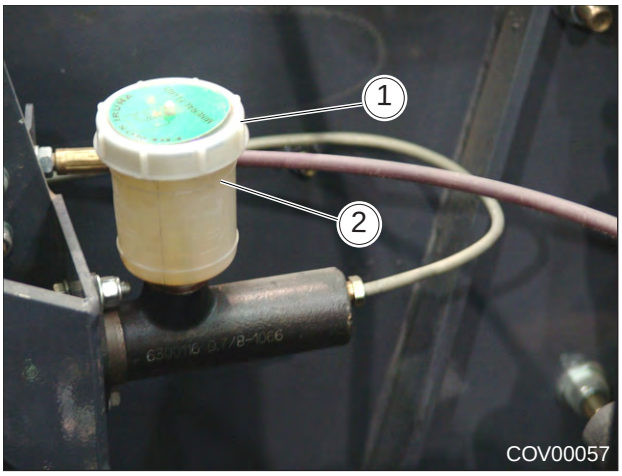

Figure 9.23 - Brake Reservoir

1. Filler Cap
2. Full Mark

PROCEDURE

1. Clean the area around the filler cap.
2. Unscrew the cap and check that the fluid is level with the “Full” mark on the reservoir.
3. Fill as necessary.
4. Replace the filler cap.
5. Clean up any spilt fluid.

(c) Parking Brake

The parking brake lever, Figure 9.24 is of the over centre type with a safety release lever preventing the parking brake being released accidentally.

Figure 9.24

1. Parking Brake Lever
2. Release Lever

(d) Parking Brake Test

With the parking brake adjusted correctly the engine should stall without movement of the machine. The machine must not be used if it fails the parking brake test, it must be checked immediately by a qualified engineer. Test as follows:-

PROCEDURE

1. Place the machine on level ground.
2. Make sure there is 20 metres (65 feet) of clear area in front of the machine.
3. Apply the parking brake.
4. Start the engine.
5. Select ‘Fast’ speed (‘Hare’ light comes on) lower switch LH side of dash.
6. Select ‘Forward’ top switch left hand side of dash.
7. Increase engine speed gradually up to maximum RPM for 2 - 4 seconds.
8. If the machine moves abort the test immediately and have the adjustment rechecked by a qualified service engineer.

⚠ WARNING

Do not use the machine until the parking brake is adjusted correctly and passes the above test procedure. Make sure all personnel are clear of the area before performing the parking brake test. Danger of the machine moving unexpectedly.

9.22 Axle Breathers

The axle breathers, Figure 9.27 should be checked regularly; refer to the Servicing Schedule. If blocked the breather should be cleaned or replaced.

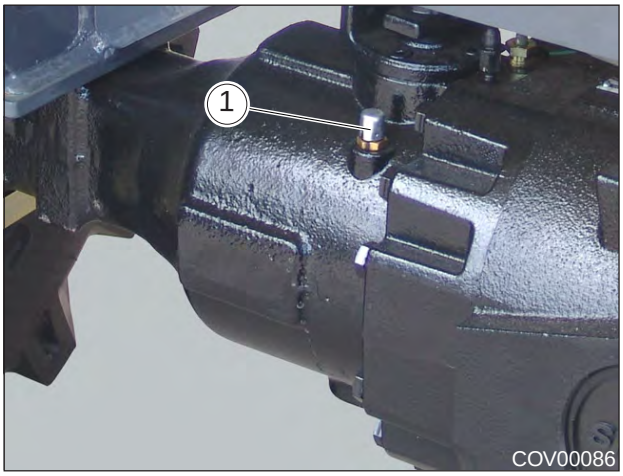

Figure 9.27

1. Axle Breather

9.23 Front Axle

For servicing intervals refer to the Servicing Schedule in this book.

(1) To Check the Oil Level

Figure 9.28 illustrates the position of the level, fill and drain plugs.

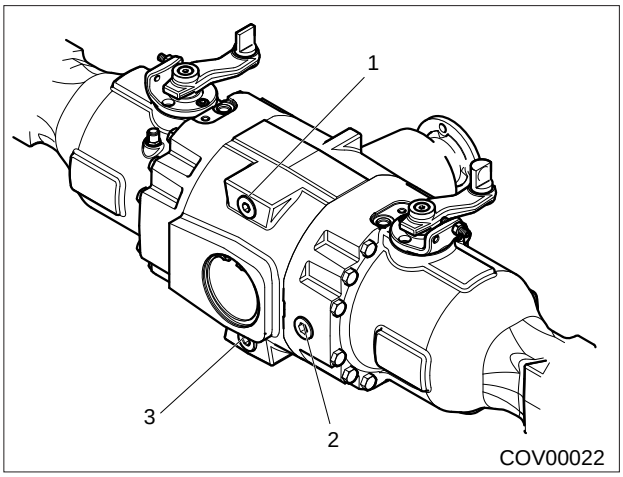

Figure 9.28. - Front Axle

1. Fill Plug
2. Level Plug
3. Drain Plug

PROCEDURE

Park the machine on firm, level ground.

Clean the dirt from around the plugs.

Remove the oil level plug - 2.

The oil should be level with the bottom of the hole.

To add oil, remove the filler plug - 1.

Add the correct grade of oil through the filler plug until it begins to discharge from the level hole.

Re fit and tighten the level and filler plugs.

(2) To Change the Oil

To ease draining make sure the oil in the axles is warm.

PROCEDURE

1. Park the machine on firm, level ground.
2. Clean the dirt from around the plugs.
3. Place a suitable container under the drain plug
4. Remove the filler plug and drain plug and permit the oil to drain.
5. When oil has fully drained clean and refit the drain plug.
6. Remove the level plug.
7. Add the correct grade of oil through the filler plug until it begins to discharge from the level hole.
8. Re fit and tighten the level and filler plugs.

9.24 Rear Axle/Transfer Box

The rear axle and transfer box are a combined unit illustrated in Figure 9.24. For servicing intervals refer to the Servicing Schedule in this book

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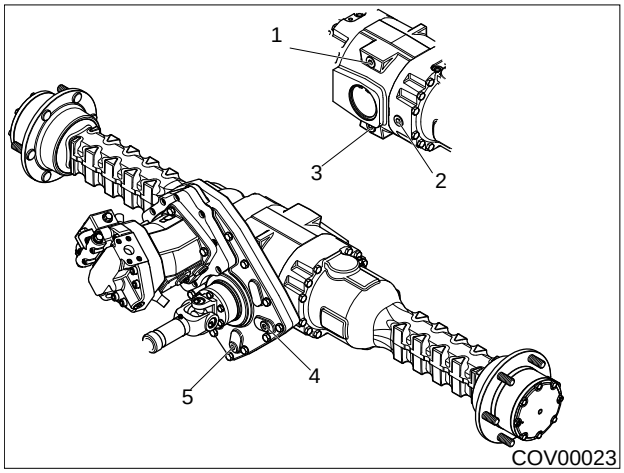


Figure 9.24 - Rear Axle/Transfer Box

1. Axle Fill Plug
2. Axle Level Plug
3. Axle Drain Plug
4. Transfer Box Level/Fill Plug
5. Transfer Box Drain Plug

(1) To Check the Oil Level in the Axle

PROCEDURE

1. Park the machine on firm, level ground.
2. Clean the dirt from around the plugs.
3. Remove the oil level plug - 2.
4. The oil should be level with the bottom of the hole.
5. To add oil, remove the filler plug - 1.
6. Add the correct grade of oil through the filler plug until it begins to discharge from the level hole.
7. Re fit and tighten the level and filler plugs.

(2) To Change the Oil in the Axle

PROCEDURE

1. Park the machine on firm, level ground.
2. Clean the dirt from around the plugs.
3. Place a suitable container under the drain plug - 3.
4. Remove the filler plug - 1 and drain plug - 3 and permit the oil to drain.
5. When oil has fully drained clean and refit the drain plug.
6. Remove the level plug.
7. Add the correct grade of oil through the filler hole until it begins to discharge from the level hole.
8. Re fit and tighten the level and filler plugs.

(3) To Check the Oil Level in the Transfer Box

PROCEDURE

1. Make sure the oil is warm not hot.
2. Park the machine on firm level ground, stop the engine and remove the start key.
3. Clean any dirt from around the level/fill plug - 4
4. Remove the plug -the oil should be level with the level/fill plug hole.
5. If necessary add oil of the correct specification until it just starts to flow from the hole.
6. Refit the plug and tighten.
7. Clean up any spilt oil.

(4) To Change the Oil in the Transfer Box

PROCEDURE

1. Make sure the oil is warm not hot.
2. Park the machine on firm level ground, stop the engine and remove the start key.
3. Clean any dirt from around the drain plug -5.
4. Place a suitable container under the drain plug.
5. Remove drain plug and allow the oil to drain.
6. Remove the filler/level plug to aid draining.
7. Refit and tighten drain plug.
8. Add the correct grade of oil through the filler hole until it begins to discharge from the hole.
9. Refit filler level plug and tighten.

9.25 Axle Bolts

The tightness of the axle bolts; Figure 9.25. must be checked every 800 hours or Annually which ever comes first.

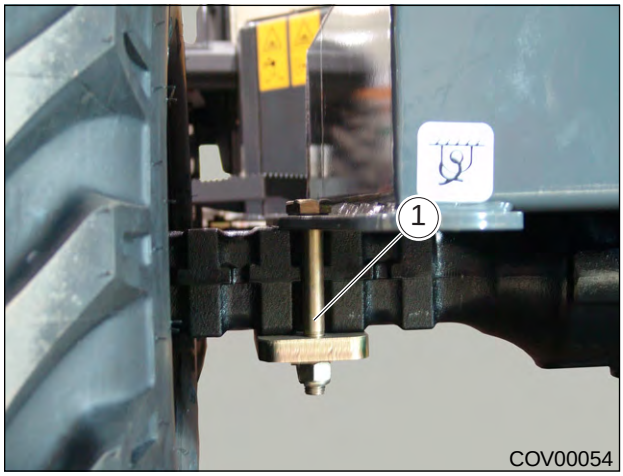


Figure 9.5. - Axle Location Bolts

9.26 Centre Pivot

(1) Pivot Lock Screws

The pivot pin locking screws, Figure 9.26 (1); should be checked periodically and if necessary re-tightened to a torque of 45Nm (33 lbf/ft).

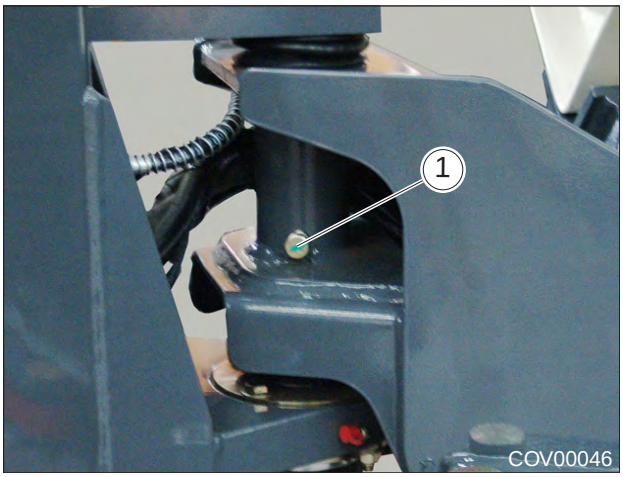


Figure 9.26.- Pivot Lock Screws

(2) Protective Caps

The protective caps fitted over the centre pivot bearings must be checked regularly. If split or otherwise damaged they must be replaced to prevent the ingress of dirt or moisture into the bearings.

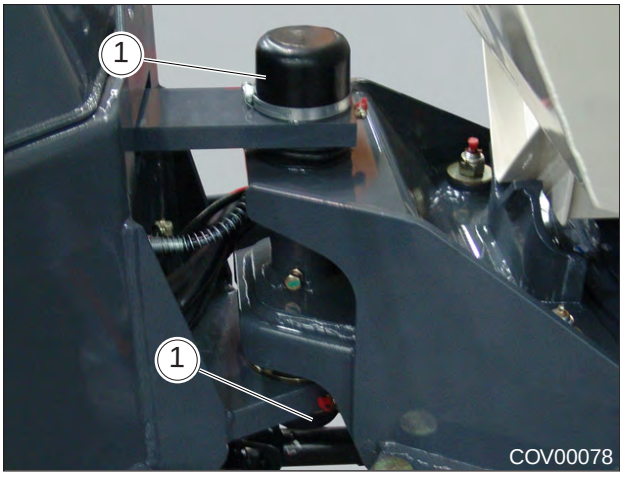


Figure 9.27. - Protective Caps

1. Protective Cap

(3) Lubrication

Lubrication of the centre pivot is very important and must be carried out every 50 hours. - See Service Schedule.

9.27 Skip

In the lowered (travelling) position the skip rests on two support pads, Figure 9.28; so that the weight is not supported by the ram.

The maximum clearance between the skip; in the lowered position, and the chassis must no greater than 10 mm. If necessary shims must be added to or removed from the support pads to obtain this clearance.

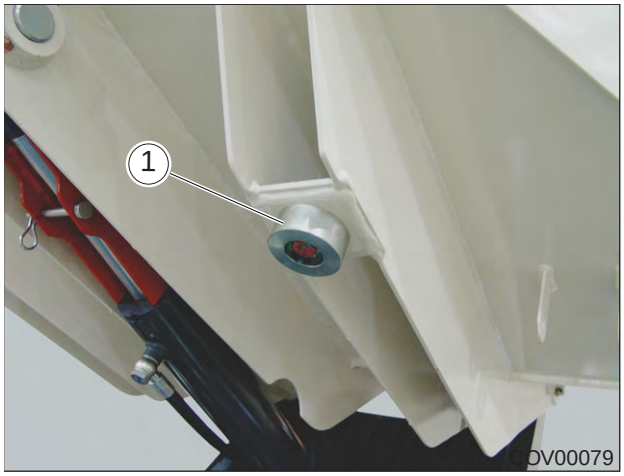


Figure 9.28 - Skip Support Pads

9.28 Wheels and Tyres

Check the tyres regularly for damage by cuts and embedded particles, i.e. nails, steel, glass etc. A valve; Figure 9.29., is fitted to inflate and check the pressure in the tyres. The pressures should be checked and adjusted if necessary weekly using valve (1).

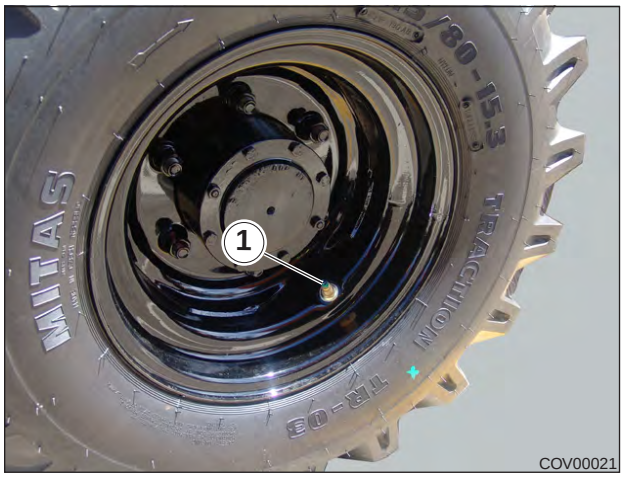


Figure 9.29 - Tyre Inflation Valve

1. Tyre Inflation Valve

9.29 Maintenance Schedule

The following service schedules are for guidance only. Under extreme operating conditions the service schedules should be adjusted accordingly to allow for the local working environment. Before carrying out any service or maintenance work ensure ALL safety precautions have been taken. Always follow the instructions given in the engine manufacturers handbook when servicing, adjusting and especially when starting and stopping the engine.	
ALL Faults MUST be Reported Immediately and Corrected BEFORE the Machine is Used	
10 Hours	Check tyre condition and pressures. Check ROPS for damage etc. Report ALL faults immediately. Check seat belt. Check the air cleaner blockage indicator. Squeeze the air cleaner dust ejector. Remove air cleaner and clean in dusty environments. Check fuel tank level - NEVER allow the fuel tank to empty. Fill at the end of each shift. Check engine oil level and top up as necessary. Check hydraulic oil level. Check all warning lights and gauges are working correctly. Check engine coolant level - expansion tank (engine cold). Check brake fluid reservoir level. Check operator platform and steps are clean and free from damage and obstructions. Check start inhibitors are functioning correctly. Check skip prop is present and functional. Check articulation lock is present and functional. Visually check machine for fluid leaks, damage, missing parts, unreadable safety signs etc.
50 Hours	**As for 10 hours and including :-** Lubricate the centre pivot. Lubricate all other grease nipples including prop shaft UJ's and slip joints - see lubrication chart. Oil all control pivots, e.g. throttle etc. Check handbrake adjustment. Check wheel nut torque. Check, clean and grease battery connections. Check for air leaks on the air inlet/filter system. Remove the end cap on the cyclone type air cleaner and inspect elements. Clean or replace as necessary. Replace any damaged safety signs.
200 Hours	**As for 50 hours and including :-** Drain engine and refill with fresh, clean oil. Replace engine oil filter. Replace inline fuel filter. Check engine cooling fan and alternator belt for damage and tension - adjust/replace if necessary. Check front and rear axle/transfer box oil levels - top up as necessary. Check tightness of centre pivot lock screws. Check hoses for chaffing, adjust as necessary.
400 Hours	**As for 200 hours and including :-** Drain and clean fuel tank. Replace fuel filter element. Change hydraulic filter(s). Drain hydraulic tank and clean hydraulic suction strainer. Renew return line filter. Refill hydraulic system with clean, fresh oil. Drain front and rear axles/transfer box and refill with clean, fresh oil. Remove and clean or replace axle breathers. Check engine coolant antifreeze / water ratio - especially in sub zero conditions.
600 Hours	**As for 200 hour service**
800 Hours	**As for 400 hours and including :-** Drain and bleed brake system and refill with new mineral oil. Check axle location bolts. Check engine valve clearances - adjust as necessary. Check centre pivot pin nut torque setting.
1600 Hours	**As for 800 hours and including:-** Remove and check engine injector nozzles - adjust pressure or replace as necessary. Drain and replace engine coolant.
Only Perform the Applicable Service Checks Above **Thoroughly Clean the Machine BEFORE Performing ANY Service or Maintenance Tasks**	

9.30 Lubrication Schedule Forward Tip

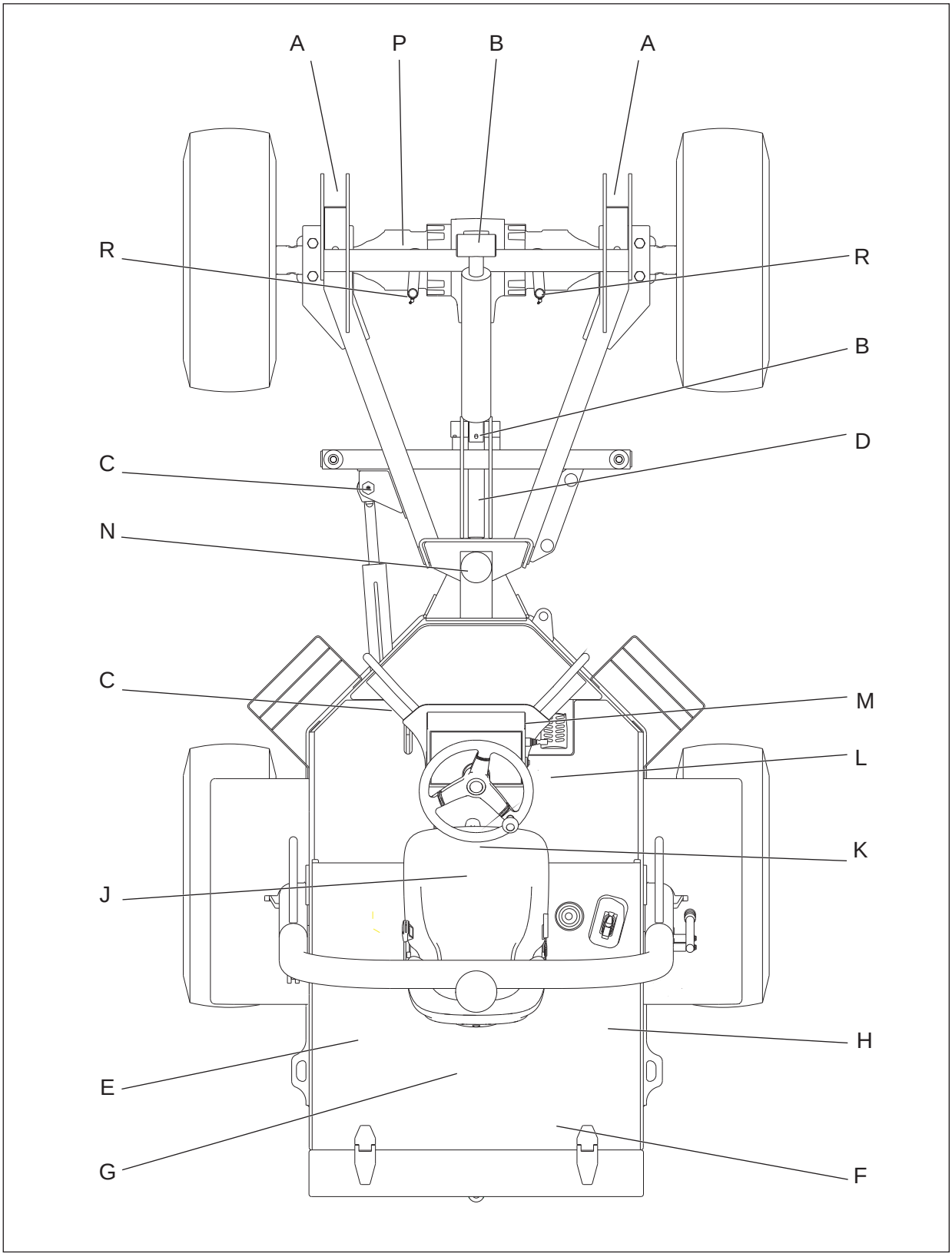


Figure 9.30 - Lubrication Diagram - Forward Tip Skip

Item	Component	Lubricant	International Specification	Service Hours	
				Check or Apply	Change
A	Skip pivot pins	Multi Purpose Grease EP2	Lithium Grease - Gr Li, NLGI2	50	--
B	Skip Ram				
C	Steering Ram Pins				
D	Prop Shaft				
E	Hydraulic Oil Tank	Shell Tellus S2 V46	High VI Hydraulic Oil HV ISO 46	10	400
F	Radiator	BASF Glysantin G48 / Water Mixture 50%	Extended Life Antifreeze	10	Autumn
G	Engine Sump	Shell Rimula R3X 15W/40	API: CH-4, CG-4, CF-4, CF ACEA: ES, E3 SAE 15W/40	10	200
H	Fuel Tank	Diesel	DERV to EN590	10	400
J	Rear Axle	Shell Spirax S4 TXM	-	200	400
K	Transfer Box	Shell Spirax S4 CX 10W	-	200	400
L	Brake Reservoir	Shell Tellus S2 V46	High VI Hydraulic Oil HV ISO VG 46	10	800
M	Pedals	Multi Purpose Grease EP2	Lithium Grease - Gr Li, NLGI2	50	-
N	Centre Pivot	Starplex All Purpose Grease EP2	Lithium Complex Grease Gr Li, NLGI 2	50	-
P	Front Axle	Shell Spirax S4 TXM	-	200	400
R	Parking Brake Lever Pivots	Multi Purpose Grease EP2	Lithium Grease - Gr Li, NLGI2	50	-

9.31 Lubrication Schedule - Swing Skip

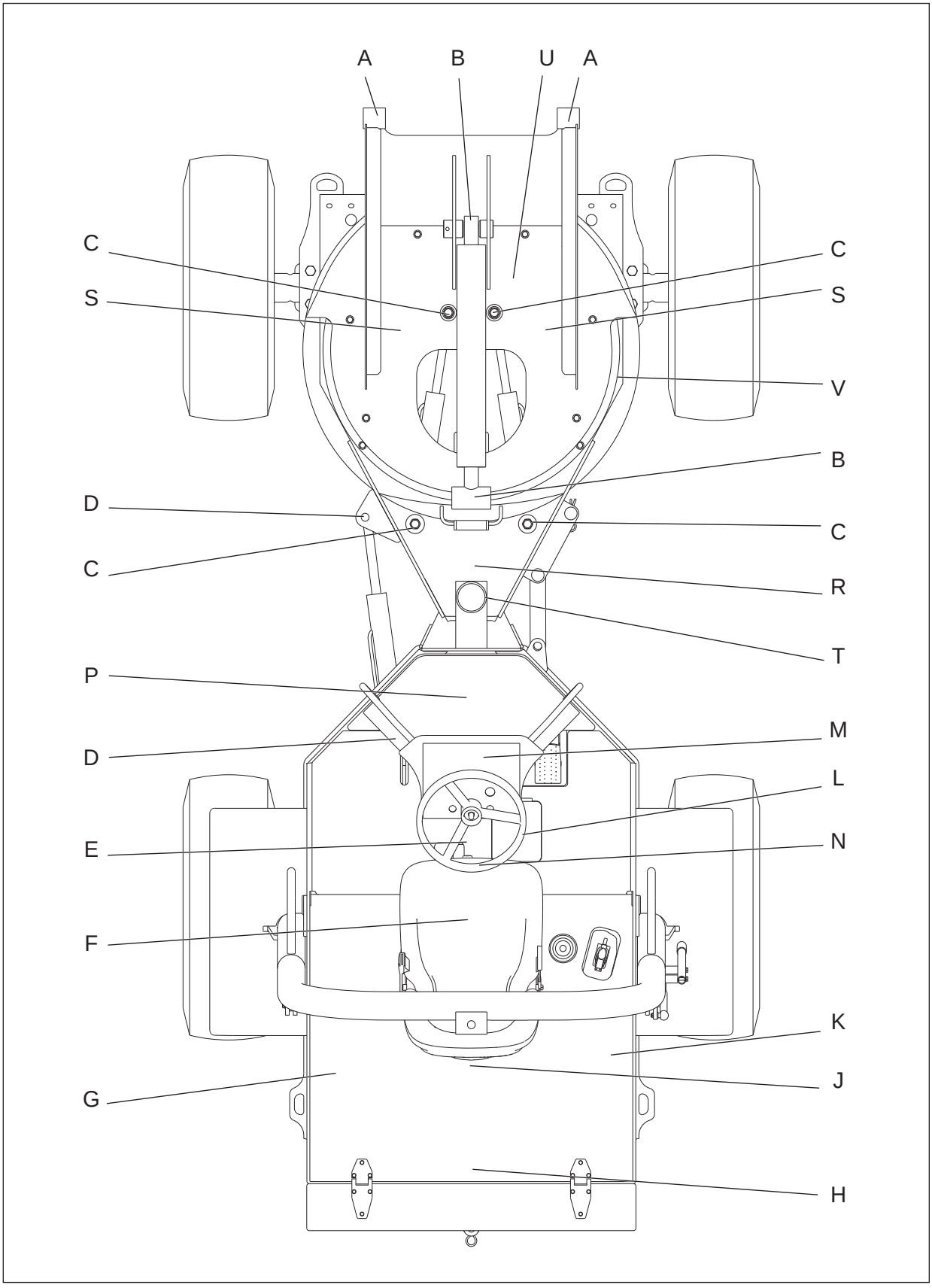


Figure 9.31 Lubrication Diagram - Swing Skip

Item	Component	Lubricant	International Specification	Service Hours	
				Check or Apply	Change
A	Skip pivot pins	Multi Purpose Grease EP2	Lithium Grease - Gr Li, NLGI2	50	-
B	Skip Ram				
C	Slew Ram Pins				
D	Steering Ram Pins				
E	Prop Shaft				
F	Hydraulic Oil Tank	Shell Tellus S2 V46	High VI Hydraulic Oil HV ISO 46	10	400
G	Radiator	BASF Glysatin G48 / Water Mixture 50%	Extended Life Antifreeze	10	Autumn
H	Engine Sump	Shell Rimula R3X 15W/40	API: CH-4, CG-4, CF-4, CF ACEA: ES, E3 SAE 15W/40	10	200
J	Fuel Tank	Diesel	DERV to EN590 ASTM D975	10	400
K	Rear Axle	Shell Donax S4 TXM	-	200	400
L	Transfer Box	Shell Spirax S4 CX 10W	-	200	400
M	Brake Reservoir	Shell Tellus S2 V46	High VI Hydraulic Oil HV ISO VG 46	10	800
N	Pedals	Multi Purpose Grease EP2	Lithium Grease - Gr Li, NLGI2	50	-
P	Centre Pivot	Starplex All Purpose Grease EP2	Lithium Complex Grease Gr Li, NLGI 2	50	-
R	Swing Turn Table	Multi Purpose Grease EP2	Lithium Grease - Gr Li, NLGI2	50	-
S	Front Axle	Shell Donax S4 TXM	API GL4 M1135	200	400
T	Parking Brake Lever Pivots	Multi Purpose Grease EP2	Lithium Grease - Gr Li, NLGI2	50	-

10. Troubleshooting

10.1 General Troubleshooting

(1) Engine will not start

Check fuel level.

Check electrical supply (see Electrical Troubleshooting).

Incorrect type or grade of fuel.

(2) “Low” engine oil pressure light comes on

Low engine oil level.

Consult dealer before using the machine.

(3) “High” coolant temperature light comes on

Check if fan belt is loose or missing.

Check coolant level on header tank (Do NOT add coolant until system is cold).

(4)Loss of coolant

Loose hose clips

Split coolant hose.

Radiator leaking.

10.2 Electrical Troubleshooting

(1) Circuit breaker keeps “tripping out”.

Check wiring for damage and short circuits.

Check beacon socket (if the rubber cover is split or fitted incorrectly water can enter).

(2) System Dead

Check battery isolator is set to “ON”.

Check battery connections.

Check circuit breaker has not “tripped”.

(3) Charge warning light remains On with engine running

Check if fan belt is loose or missing.

(4) Lights and direction indicators do not work

Check circuit breaker has not “tripped”.

Check if bulb has blown.

10.3 Hydraulic Troubleshooting

(1) No Pressure

Check if sufficient oil in tank.

(2) Machine will not steer

Check steering lock is NOT fitted.

Check steering ram hoses for leaks.

(3) Skip will not tip or rotate

Check hoses for leaks.

11. Recovery

11.1 Towing

⚠ CAUTION

With the engine dead the hydraulic system will not function, the steering will still operate but under these circumstances steering wheel loads are high and the dumper must only be towed at very slow speeds.

NOTICE

The machine may be towed at a maximum speed of 2km/h (1.2 mph) for a maximum distance of 1 km (0.6 miles). Exceeding this speed or distance may damage the pump, motor and hydraulic system. Before the machine can be towed it is necessary to set the transmission pump to “freewheel” mode. For instructions on this procedure refer to Section 8 - *Emergency Operating Procedures.*

The machine may be towed for short distances; see notice above, by attaching a suitable strap, chain or rope to the rear towing eye of the machine or either or both of the tie down and recovery eyes at the front of the machine. Take care if placing ropes etc. around the front axle as there is a risk of damaging or deforming brake pipes or other components.

11.2 Lifting with a Crane

Refer to section 5 - *Transportation* for details of lifting the machine with a crane. It is important that the articulation lock is fitted before lifting operations commence.

12 Storage, Decomissioning & Disposal

12.1 Long Term Storage

The machine must be stored in a dry environment protected from the elements and on a hard standing. Any contaminated Water / Fluids / Oils removed from the machine must be disposed of legally.

12.2 Decomissioning

Before placing the machine into storage:-

- Thoroughly wash down the exterior of the machine and remove any build up of dirt etc.
- Repair all damaged paint work o prevent further corrosion.
- Grease all greasing points.
- Start and warm up the engine. Drain the engine oil and refill with clean fresh oil. Refer to the engine manufacturers handbook for further information on prolonged engine storage with regards to anti corrosion oils and fluids.
- Check hydraulic oil level and top up as required.
- Drain and refill cooling system with water/antifreeze mixture of the correct ratio.
- Fill the diesel tank to prevent corrosion of the tank walls.
- Store the machine on solid level ground which is not liable to flooding, standing water or airborne contamination.
- Chock the wheels securely to prevent the dumper moving.
- Smear exposed metal parts with grease.
- Remove the battery, store in a safe place and keep fully charged.
- Seal off the air intake opening on the air cleaner and the exhaust opening.
- Leave the parking brake in the OFF position.

12.3 Recomissioning

Before putting the machine back into use the following operations must be carried out:-

- Clean grease or other protective film from piston rods and other exposed metal parts.
- Remove seals or covers from the air cleaner inlet and exhaust pipe.
- Check the condition of the air filter elements and replace if necessary.
- Thoroughly clean the machine.
- Make sure the battery has remained fully charged and re-connect to the machine.
- Carry out all measures for putting the engine back into use described in the engine manufacturers manual.
- Check all other fluid levels.

- Lubricate machine in accordance with lubrication diagram
- Examine tyres and inflate to correct pressure.

(a) If stored for more than a period of 6 months:-

- Replace hydraulic filters.
- Examine hydraulic oil for degradation and replace if necessary.
- Drain and replace oils in transfer box and axles.

12.4 Disposal

At the end of its life the machine must be disassembled by a competent person using safe working practices, wearing the appropriate Personal Protective Equipment and working in accordance with local regulations.

The appropriate lifting equipment, chocks and stands must be used to maintain a stable machine as components are removed and the machines centre of mass changes.

Care must be taken when dealing with flammable liquids and the machine parts that contained those liquids. Any process that could ignite flammable materials must not be used on components that have contained flammable liquids in them or have residual flammable liquids on them.

Fire extinguishers must be readily available if cutting/welding equipment is so used.

Fluids must be drained off into suitable containers and if possible recycled or otherwise disposed of in an environmentally friendly way in accordance with local regulations.

Where possible recyclable materials must be separated out and processed in accordance with local regulations using an authorised agent.

12.5 Disposal of Used Batteries

When the battery reaches the end of its usual life it must be removed from the machine and recycled in an approved way in accordance with local environmental regulations.

This service is usually operated by battery vendors.

Machine users that cannot find a suitable battery recycling facility should contact Mecalac for assistance.

13 Glossary of Terms

ANSI - American National Standards Institute.

Articulation Lock - Device preventing chassis elements moving during maintenance, transport etc.

Battery Isolator - Device to shut of electrical supply from the battery.

Chock - Device placed in front of and behind wheels to prevent movement.

Hour Meter - An instrument that records and displays the total number of hours the engine has been running.

Hydrostatic Drive - Method of transfering engine power to the front and rear axles using a hydraulic pump and motor.

ISO - International Standards Organisation

Linch Pin - Pin with spring loaded retaining clip.

Orbitrol - Hydrostatic steering unit - a valve controlled by the machines steering wheel that meters oil to the steering ram to turn the machine to the left or right.

Parking Brake - Mechanical device to prevent machine moving when not in use.

R Clip - A spring steel clip inserted through a hole in a pin to retain the pin in place.

ROPS - Roll Over Protective Structure - roll over bar.

Skip - Load carrying body.

Skip Prop - Mechanical device supporting a raised skip to prevent it lowering should the hydraulic system fail.

Slew - To rotate either side of the center line of the machine.

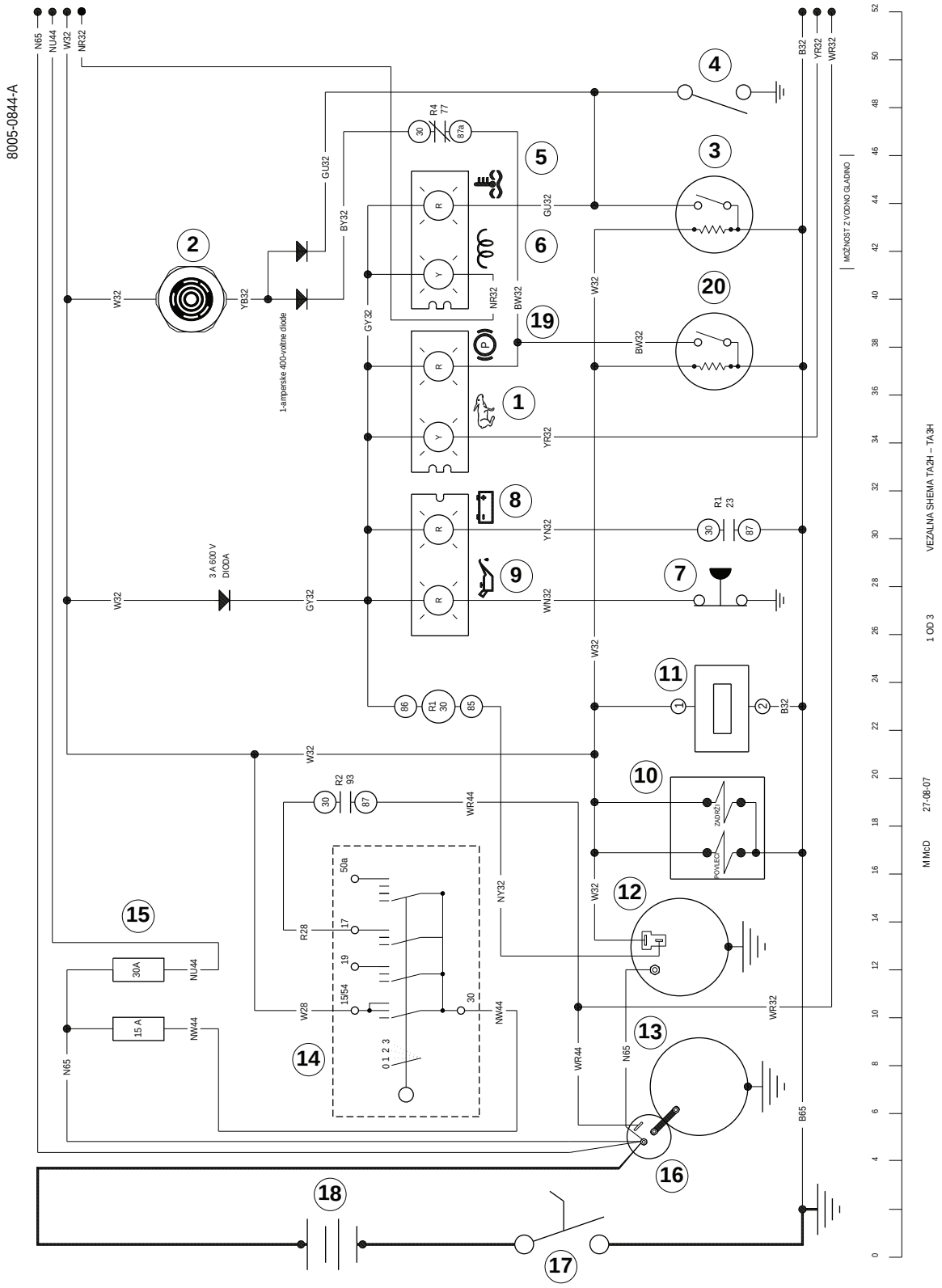
Slew Ring -Turntable to enable skip to rotate.

Swing Skip - Skip that can be rotated either side of the machine to discharge the load.

Transfer Box - Device to enable front and rear axles to be driven by the engine.

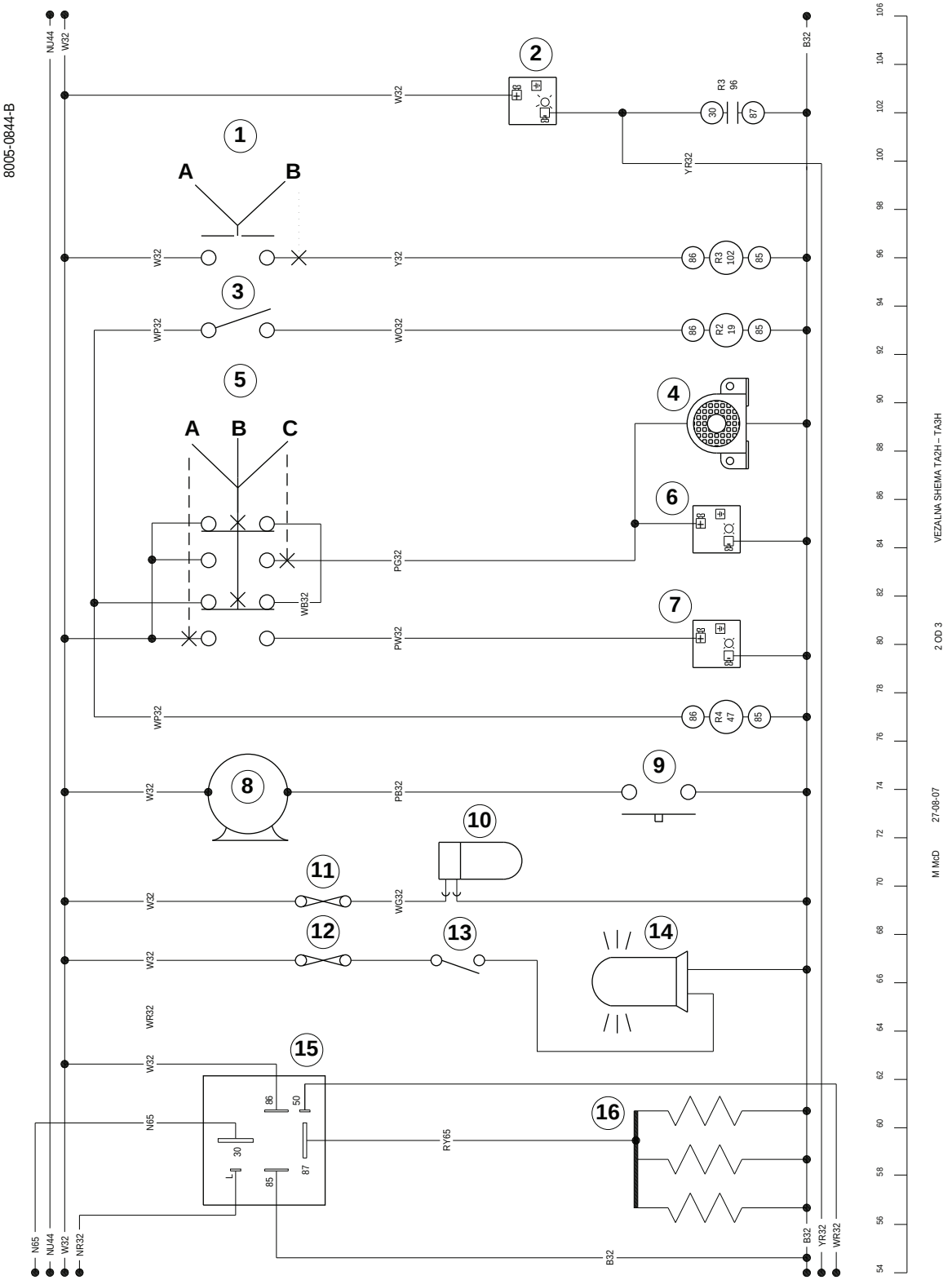
VIN Plate - Plate fixed to the machine recording the serial number and other identifying information.

Appendix 1 - Electrical Diagrams



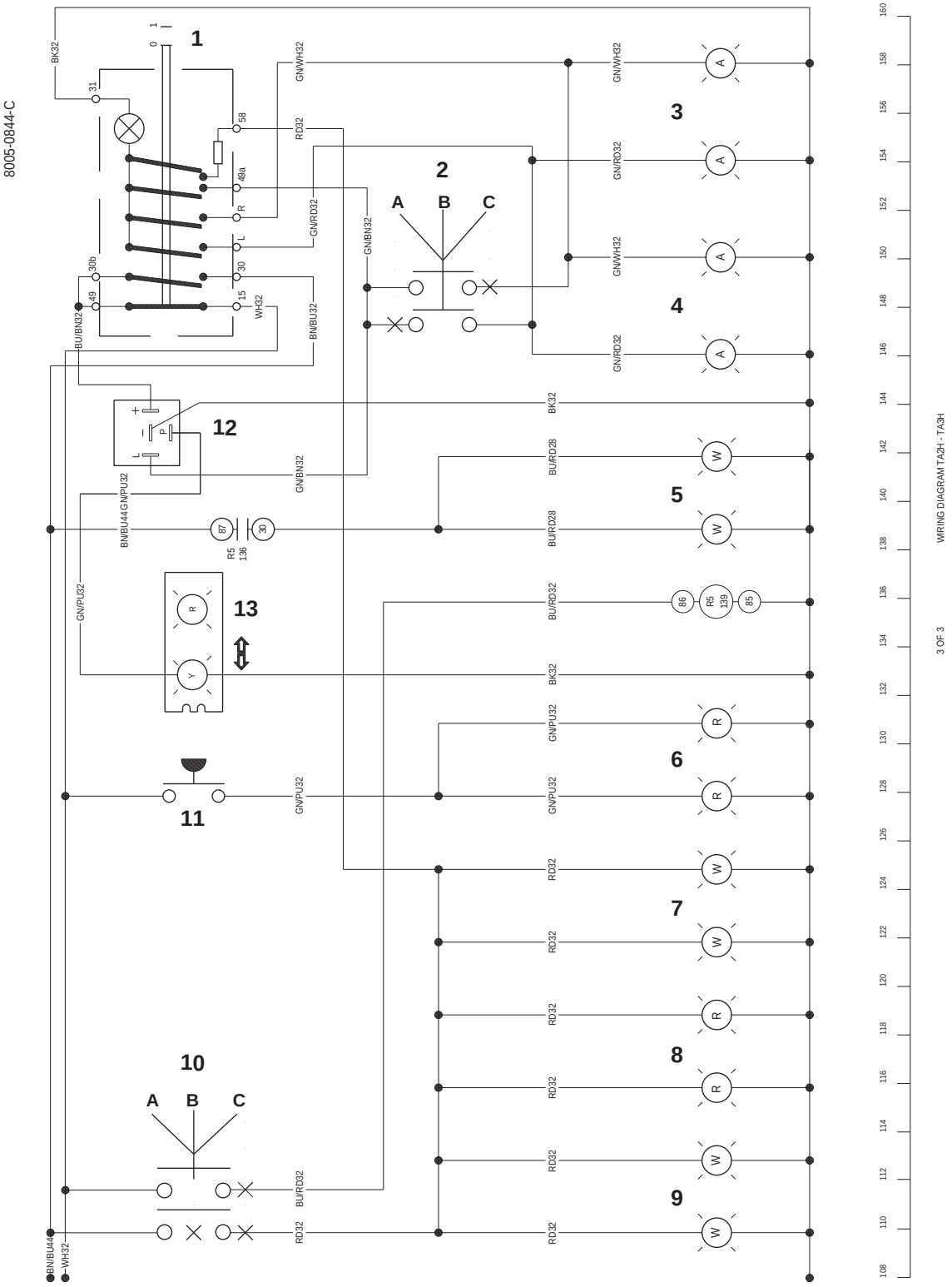
Electrical Diagram 1

1	Warning Light - Fast Speed Selected	Colour Codes
2	Audible Warning	RD - Red
3	Switch - Low Engine Coolant Level	WH - White
4	Switch - Engent Coolant Temperature	YE - Yellow
5	Warning Light - Engine Coolant Temperature	GN - Green
6	Warning Light - Cold Start	BU - Blue
7	Switch - Engine Oil Pressure	GY - Grey
8	Warning Light - Battery Charge	OR - Orange
9	Warning Light - Engine Oil Pressure	BK - Black
10	Solenoid - Run/Stop	PU - Purple
11	Hour Meter	PK - Pink
12	Alternator	BN - Brown
13	Starter Motor	
14	Switch - Engine Key Start	
15	Circuit Breakers	
16	Solenoid - Starter	
17	Battery Isolator	
18	Battery - 12v	
19	Warning Light - parking Brake	
20	Switch - Parking Brake	



Electrical Diagram 2

1	Switch - Speed	Colour Codes
	A = Slow	RD - Red
	B = Fast	WH - White
2	Solenoid - Fast Speed	YE - Yellow
3	Inhibitor Switch - Seat	GN - Green
4	Reverse Alarm (Optional)	BU - Blue
5	Switch - Direction	GY - Grey
	A = Forward	OR - Orange
	B = Neutral	BK - Black
	C = Reverse	PU - Purple
6	Solenoid - Drive - Reverse	PK - Pink
7	Solenoid - Drive - Forward	BN - Brown
8	Horn	
9	Horn Button	
10	Fuel Pump	
11	Fuse 3A (In Engine Compartment)	
12	Fuse 10A	
13	Switch - Beacon	
14	Beacon	
15	Engine Glow Plug Timer (In Engine Compartment)	
16	Engine Glow Plugs	

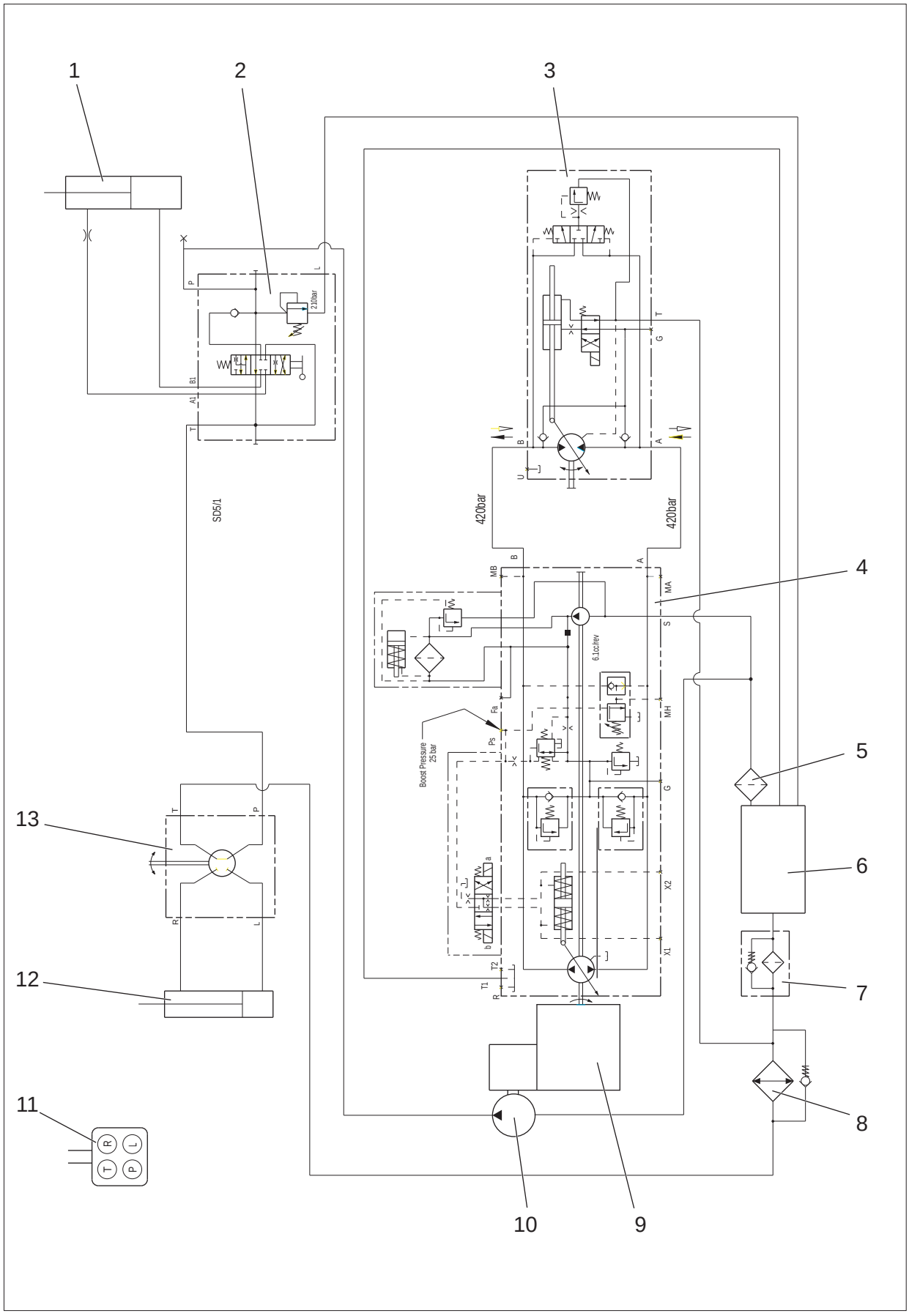


Electrical Diagram 3 - Optional Highway Light

1	Hazard Warning Light Switch	Colour Codes
2	Direction Indicator Switch	RD - Red
	A - Left Turn	WH - White
	B - Off	YE - Yellow
	C - Right Turn	GN - Green
3	Direction Indicator Lights - Rear	BU - Blue
4	Direction Indicator Lights - Front	GY - Grey
5	Head Lights	OR - Orange
6	Brake Lights	BK - Black
7	Registration Plate Lights	PU - Purple
8	Side Lights - Rear	PK - Pink
9	Side Lights - Front	BN - Brown
10	Light Switch	
	A - Off	
	B - Side Lights	
	C - Head Lights	
11	Brake Light Switch	
12	Flasher Unit	
13	Warning Light - Direction Indicators	

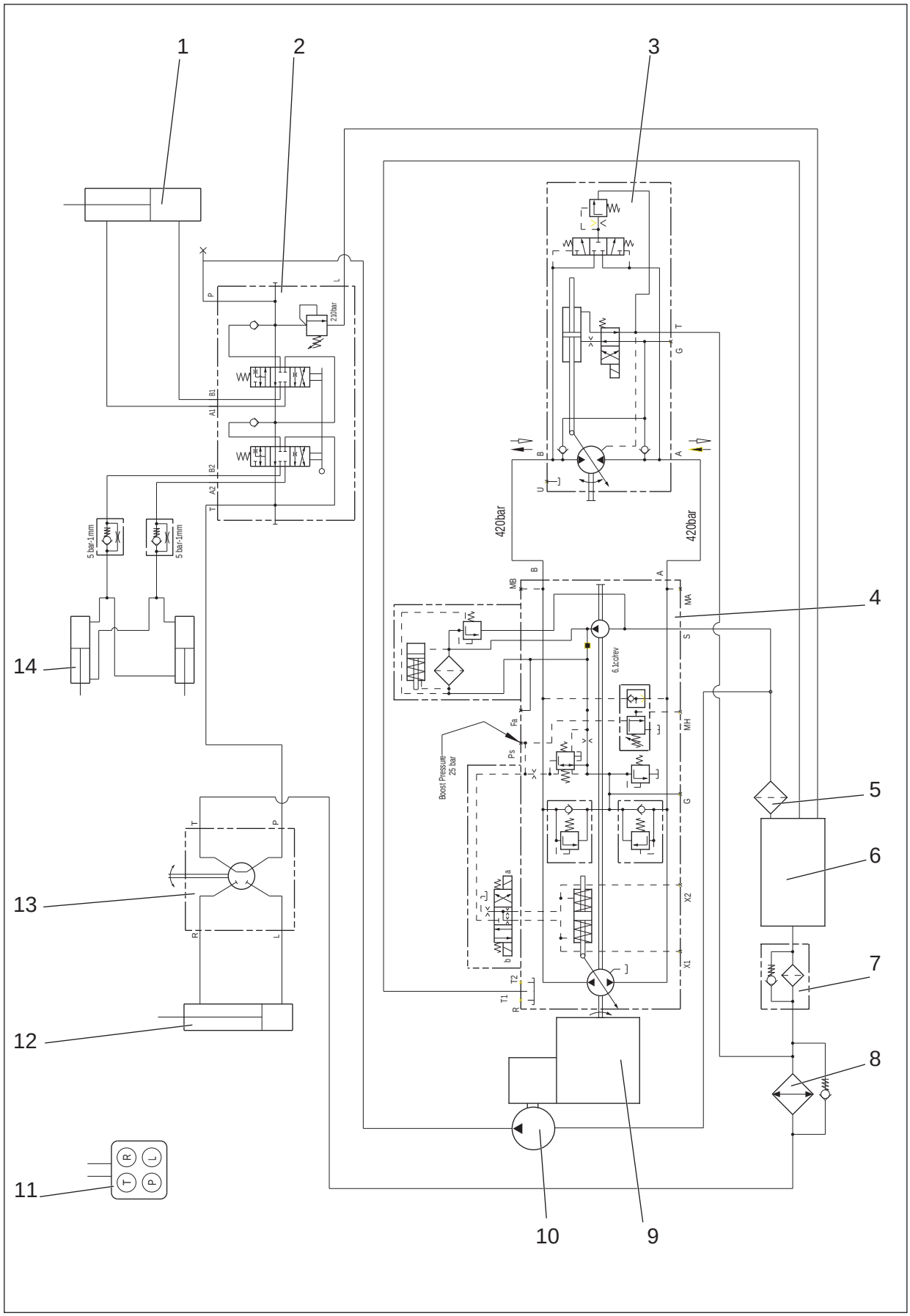
Appendix 2 - Hydraulic Diagrams

Hydraulic Diagram - TA3H



1	Hydraulic Cylinder - Skip Tip
2	Control Valve - Skip Tip - SD5/1
3	Hydraulic Motor - A6VM80
4	Hydraulic Pump - A4VG40
5	Strainer - 100 micron
6	Hydraulic Tank
7	Filter - 10 microns - 1 bar
8	Oil Cooler
9	Engine - Kubota V2203-M -32.4kW @ 2800 rpm
10	Auxillary Pump 11.2cc/rev
11	View on Steering Unit Ports - T = Tank, R = Right, P = Pressure, L = Left
12	Hydraulic Cylinder - Steering System
13	Steering Unit - Orbitrol OSPB200 ON

Hydraulic Diagram - TA3SH & TA3.5SH



1	Hydraulic Cylinder - Skip Tip
2	Control Valve - Skip Tip/Rotate - SD5/1
3	Hydraulic Motor - A6VM80
4	Hydraulic Pump - A4VG40
5	Strainer - 100 micron
6	Hydraulic Tank
7	Filter - 10 microns - 1 bar
8	Oil Cooler
9	Engine - Kubota V2203-M -32.4kW @ 2800 rpm
10	Auxillary Pump 11.2cc/rev
11	View on Steering Unit Ports - T = Tank, R = Right, P = Pressure, L = Left
12	Hydraulic Cylinder - Steering System
13	Steering Unit - Orbitrol OSPB200 ON
14	Hydraulic Cylinders - Skip Rotate

STANDARD LIMITED NEW PRODUCT WARRANTY - CONSTRUCTION

Mecalac Construction Equipment UK Limited ("Mecalac Construction"), warrant the new Products manufactured or sold by it, to be free, under normal use and service, of any defects in manufacture or materials for the period of 12 months from (a) delivery to, and placement into service by the first user (including as a demonstrator) or (b) delivery to the first retail purchaser, or (c) will activate 6 months from delivery of the machine to the dealer regardless of use, whichever occurs first; provided that Mecalac Construction receives written notice of the defect within thirty (30) days of its discovery and Buyer establishes that (i) the equipment has been maintained and operated within the limits of rated and normal usage and (ii) the defect did not result in any manner from the intentional or negligent action or inaction by Buyer, its agents or employees. If requested by Mecalac Construction, Buyer must return the defective equipment to an authorized distributor of the Products ("Distributor") and defective parts to Mecalac Construction, and if Buyer cannot establish that conditions (i) and (ii) above have been met, then this warranty shall not cover the alleged defect. The term "Products" shall include only the following equipment manufactured by the following Mecalac Construction: Tractor loader backhoes, site dumpers, compaction equipment, rollers

The obligation and liability of Mecalac Construction under this warranty is expressly limited to, at Mecalac Construction's sole option, repairing or replacing, with new or remanufactured parts or components, any part, which appears, upon inspection by Mecalac Construction that manufactured or sold the equipment, to have been defective in manufacture or materials. Such parts shall be provided at no cost to the owner, FCA Mecalac Construction's parts facility from which the parts were purchased. This warranty shall be null and void if parts (including wear parts) other than genuine OEM Mecalac Construction parts are used in the equipment. No warranty shall cover any item on which serial numbers have been altered, defaced or removed. In addition, the foregoing warranty shall apply to powertrain and major structural components only on site dumpers, rollers and tractor loader backhoes, for a period of 24 months or 2,500 hours, whichever comes first.

BHL:
Powertrain – Engine, gearbox, axles, prop shaft (not inc U/J's & retaining hardware)
Structures – Chassis, ROP's/cab frame, loader arm, boom, dipper, mast casting

Dumper:
Powertrain – Engine, gearbox, dropbox , axles, prop shaft (not inc U/J's & retaining hardware)
Structures – Chassis, ROP's, seat support, cross-members/rear panel

Roller: TV
Powertrain – Engine, drive motor, vib motor, belt drive
Structures – Frame/Chassis, seat support, cross-members/rear panel, drum legs

Roller : MBR
Powertrain – Engine, Transmission Unit
Structure - Bedplate/chassis

Normal maintenance, adjustments, or maintenance/wear parts are not covered by this warranty and are the sole maintenance responsibility of Buyer.

No employee or representative is authorized to modify this warranty unless such modification is made in writing and signed by an authorized officer of Mecalac Construction sought to be bound by such modification. The obligations of Mecalac Construction under this warranty shall not include duty, taxes, environmental fees, including without limitation disposal or handling of tires, batteries, petrochemicals, or any other charges whatsoever, or any liability for indirect, incidental, or consequential damages. Improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, or alteration or repair of the equipment by persons not authorized by Mecalac Construction shall render this warranty null and void.

Mecalac Construction reserves the right to inspect the installation of its respective Products and review maintenance procedures to determine if the failure was due to improper maintenance, improper use, abuse, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, or alteration or repair of the equipment by persons not authorized by Mecalac Construction. Mecalac Construction reserves the right to make improvements or changes to its Products without incurring any obligation to make such changes or modifications to Products previously sold.

Parts Warranty: Mecalac Construction warrant the parts ordered from their respective Parts Departments to be free of defect in manufacture or materials for a period of 12 months from date of retail sale to the owner / user. Parts fitted during an equipment warranty repair will take on the remaining equipment warranty.

TRANSFERABILITY OF WARRANTY: The unexpired portion of this warranty may be transferred, provided that (i) the warranty has not been voided or breached by the transfer or prior to transfer, (ii) Mecalac Construction has received warranty registration for the relevant Product and (iii) the transferee completes and returns to the appropriate Mecalac Construction the appropriate warranty transfer documentation which shall be provided on request. Contact your local Distributor for additional details.

THIS WARRANTY IS EXPRESSLY IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED (INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) AND ALL OTHER OBLIGATIONS OR LIABILITY ON THE PART OF MECALAC CONSTRUCTION. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY CONTAINED HEREIN.

ITEMS NOT COVERED BY THIS WARRANTY

The following items are **NOT** covered under this Warranty (the following list is not exhaustive):

1. **Non-Distributor Sales:** Items sold by any individual, corporation, partnership or any other organization or legal entity that is not an authorized Distributor.

2. Replacement of assemblies: Mecalac Construction has the option to repair or replace any defective part or assembly. It is the policy of Mecalac Construction to refuse claims for the replacement of a complete assembly that is field repairable by the replacement or repair of defective part(s) within the assembly.

3. Normal Operational Maintenance Services and Wear Parts: Maintenance services and wear parts are excluded from warranty claims. Maintenance services not covered include, but are not limited to, such items as: tune-up, lubrication, fuel or hydraulic system cleaning, brake inspection or adjustment, or the replacement of any service items such as filters or brake linings made in connection with normal maintenance services.

4. Transportation: Any damage caused by carrier handling is a transportation claim and should be filed immediately with the respective carrier.

5. Deterioration: Repairs, work required or parts exposed as the result of age, storage, weathering, lack of use, demonstration use, or for transportation of corrosive chemicals.

6. Secondary Failures: Should the Buyer continue to operate a machine after it has been noted that a failure has occurred, Mecalac Construction will not be responsible under the warranty for resultant damage to other parts due to that continued operation.

7. Workmanship of Others: Mecalac Construction does not accept responsibility for improper installation or labor costs of personnel other than authorized Distributor personnel.

8. Stop and Go Warranty: Mecalac Construction does not recognize "Stop and Go" warranties; after the period of warranty commences, it shall not be tolled for any reason. No action by either party shall operate to extend or revive this limited warranty without the prior written consent of Seller

9. Incidental or Consequential Damage: LIMITATIONS ON LIABILITY: **NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED IN THIS WARRANTY, MECALAC CONSTRUCTION SHALL NOT BE LIABLE FOR ANY, AND SPECIFICALLY DISCLAIMS ALL, INDIRECT, CONSEQUENTIAL, INCIDENTAL AND OTHER DAMAGES OR LOSSES OF ANY KIND (INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, LOSS OF PRODUCTION, LOSS OF USE, DOWNTIME OR HIRE CHARGES, INCREASED OVERHEAD, LOSS OF BUSINESS OPPORTUNITY, DELAYS IN PRODUCTION, COSTS OF REPLACEMENT COMPONENTS, PENALTIES OF ANY KIND, FAILURE OF EQUIPMENT TO COMPLY WITH ANY APPLICABLE LAWS AND INCREASED COSTS OF OPERATION) THAT MAY ARISE FROM ANY BREACH OF THIS WARRANTY, WHETHER OR NOT CAUSED DIRECTLY OR INDIRECTLY BY ANY NEGLIGENCE OF MECALAC CONSTRUCTION. Nothing in this paragraph, however, shall operate to exclude Mecalac Construction's liability for death or personal injury. Buyer's sole remedy for breach of this warranty shall be limited to (at the sole option of Mecalac Construction) repair or replacement of the defective part.**

10. **Labor:** Mecalac Construction shall not be responsible for related travel expenses such as meals and lodging; overtime or premium labor rates.

Mecalac Construction neither assumes nor authorizes any other person to assume for Mecalac Construction any other liability in connection with the sale of any Mecalac Construction's equipment. This warranty shall not apply to any Mecalac Construction equipment or any part thereof which has been subject to misuse, alteration, abuse, negligence, accident, acts of God or sabotage. No action by any party shall operate to extend or revive this limited warranty without the prior written consent of Mecalac Construction . The aggregate liability of Mecalac Construction shall in no event exceed the purchase price of the equipment, provided that nothing herein shall exclude liability of Mecalac Construction for death or personal injury.

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EUROPE (Rev March 2017)


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