

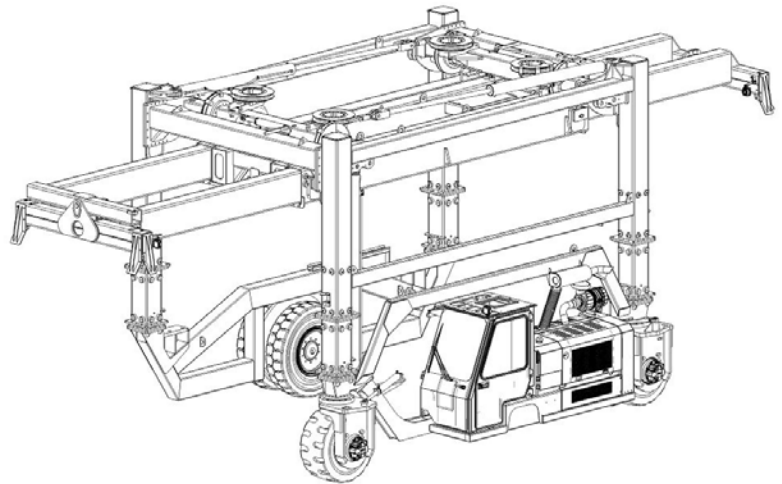
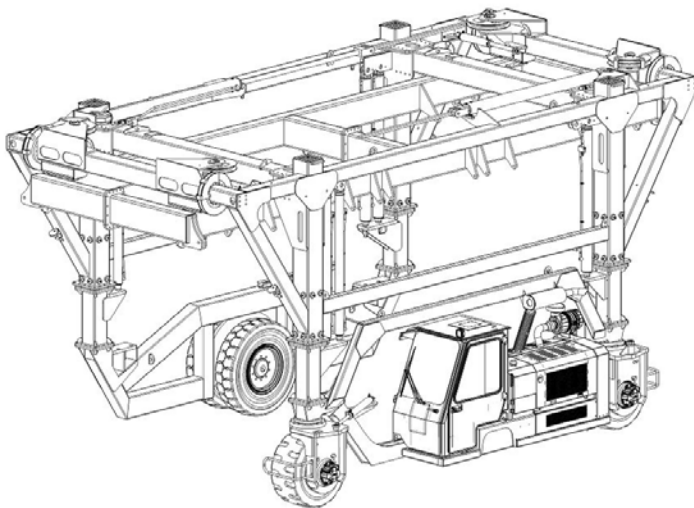
COMBiLiFT

LiFTING INNOVATION

Owners Operating &
Servicing Manual

Original Instructions

Models: SC3MK2 / SC3MK2.5



Serial Number: _____

Combilift

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Dear Customer,

Thank you for choosing us and showing your faith in the Combilift range of products. With this Combilift Product you now own a machine designed by our team of experienced engineers using the most up to date design techniques and technology with the sole aim of producing a machine that is efficient, reliable, and safe and the right tool for your business's material handling needs. The Combilift product possesses a vast range of multi-functional application possibilities that makes it one of the leading products in the material handling industry.

Combilift

The Purpose of this operators Manual

This Manual contains all of the information you will require to operate your Combilift product safely and efficiently. It is essential that this manual remain with the machine at all times. It is essential that the operator read this manual before attempting to operate the Combilift.

- Always follow all safety instructions laid out in this manual.
- All instructions, prohibitive or otherwise, found in this manual should be adhered to at all times. They are there to protect your life and the lives of others.
- Always perform the Daily Inspection as indicated in this manual and follow the guidelines on service intervals.

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Preface:

This manual has been written with regard to providing the operator of this Combilift product with information in order to ensure that this Combilift is operated in a safe and efficient manner. It does not take precedence over any local or nationally applicable laws or regulations with regard to the operation of SCs. If you are unsure, contact your local authorities in order to determine what tests and training courses must be completed in order to be fully qualified in the operation of this type of material handling equipment.

The information found has been arranged in a manner to ensure the safe operation of the machine. As can be seen the general principles of safe operation are presented before how the machine actual operates. It is essential that the operators spend time familiarizing themselves not only with the machine, but with the information contained in this manual also.

Throughout this manual there are a number of instructions that have been highlighted in a number of ways. These instructions must be followed at all times as they indicate warnings and advice which if not heeded can result in damage to the SC, product, or property. In the worst- case failure to adhere to the warnings and advice can result in serious injury and even death.

The table of contents on the following pages show the structure of the information contained in this manual and make for easier location of information.

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Abbreviations:

SC	Straddle Carrier
m	Metre
N/A	Not Applicable
WLL	Working Load Limit
Nm	Newton Metre
RPM	Rev's Per Minute
C.O.G	Centre of Gravity

1. SC Fundamentals

1.1 *The SC Operator*

The single most important aspect of a SC is the operator. The operator is responsible for the SC's safe operation. In order to operate the machine safely, the operator must act in a professional manner. Professional operators must have certain characteristics and qualities to achieve this.

The Professional SC Operator must:

- Be Responsible
- Be On time
- Be Rested, alert and physically prepared
- Be Knowledgeable with regards company rules
- Wear protective clothing and equipment, including but not limited to:
 - Hi-visibility clothing
 - Safety Helmet
 - Gloves
 - Safety Glasses
 - Safety Shoes/Boots
- Always use any safety equipment fitted to the machine
- Have a desire to learn.
- Be skilled in their actions and eager to develop / improve these skills.
- Be in complete control of their SC at all times
- You must be fully trained and certified in each and every machine that you will be required to operate.

1.2 *The Operators Manual*

It is vital that you read and familiarize yourself with this operator's manual. It contains all the information about the safe operation of your SC and details of all the controls, their location and their function. Every Combilift Machine is delivered with an operators' manual. Ensure that this manual is kept safe and in good condition. Also, included with the operators' manual is a spare parts manual. The Manuals delivered with your Combilift are specific to your machine. If they are lost, please contact your supplier for a new set.

1.3 Warning Decals

There are a number of different decals located around the Combilift. These decals have different functions. Some indicate warnings - such as nip points or moving parts, and some provide important information to the operator, such as grease point locations. It is important to study what each one means and where they are located.

1.4 The Serial Plate

The Serial Plate is required by law to be displayed on all SCs. On all SC's it is located on the dash box (See *Figure 1.4* below). Make sure you are aware of the location of the serial plate on your Combilift.

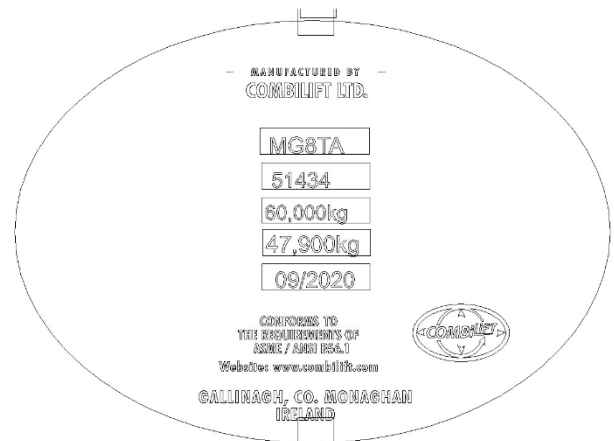


FIGURE 1.4 - SERIAL PLATE OF SC

1.5 Understand the Capacity of your SC

It is the responsibility of the operator to determine that the weight of the load to be handled is not greater than the capacity shown on the serial plate. The operator must not handle any load that is greater than the capacity shown. The basic function of an SC is to lift, move and place materials. The basic principle of an SC is to lift the load from various lift points, ensuring each pick point is securely fastened



Warning



Adding an attachment to a Combilift will alter the rated capacity of the machine. A load chart must be obtained from Combilift for any attachment that is fitted to indicate this change in capacity



Warning



ONLY attachments that have been approved by Combilift engineers may be fitted to Combilift SCs.

All CE Certified rigging gear, i.e. Shackles, straps, slings, may be used on an SC without the need for approval of a Combilift engineer.

1.6 Centre of Gravity

The centre of gravity of any object is the single point about which the object is balanced in all directions. Every object has a centre of gravity. When the SC picks up a load, the SC and load have a new, combined centre of gravity.

The SC has moving parts that change its centre of gravity. The centre of gravity moves up and down as the load is loaded and unloaded, and as the telescopic function is raised and lowered. Lifting a load and the type of load will determine the centre of gravity in a loaded state.

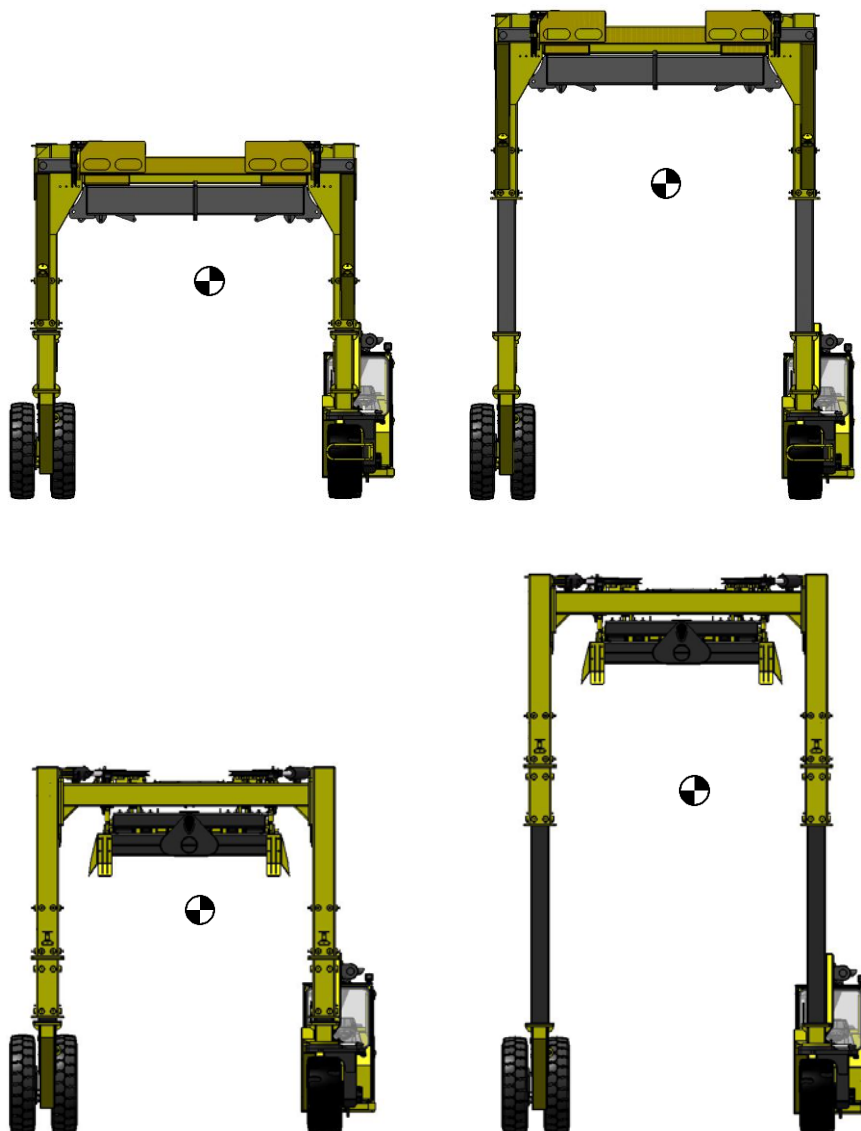


FIGURE 1.6 – C.O.G OF THE SC

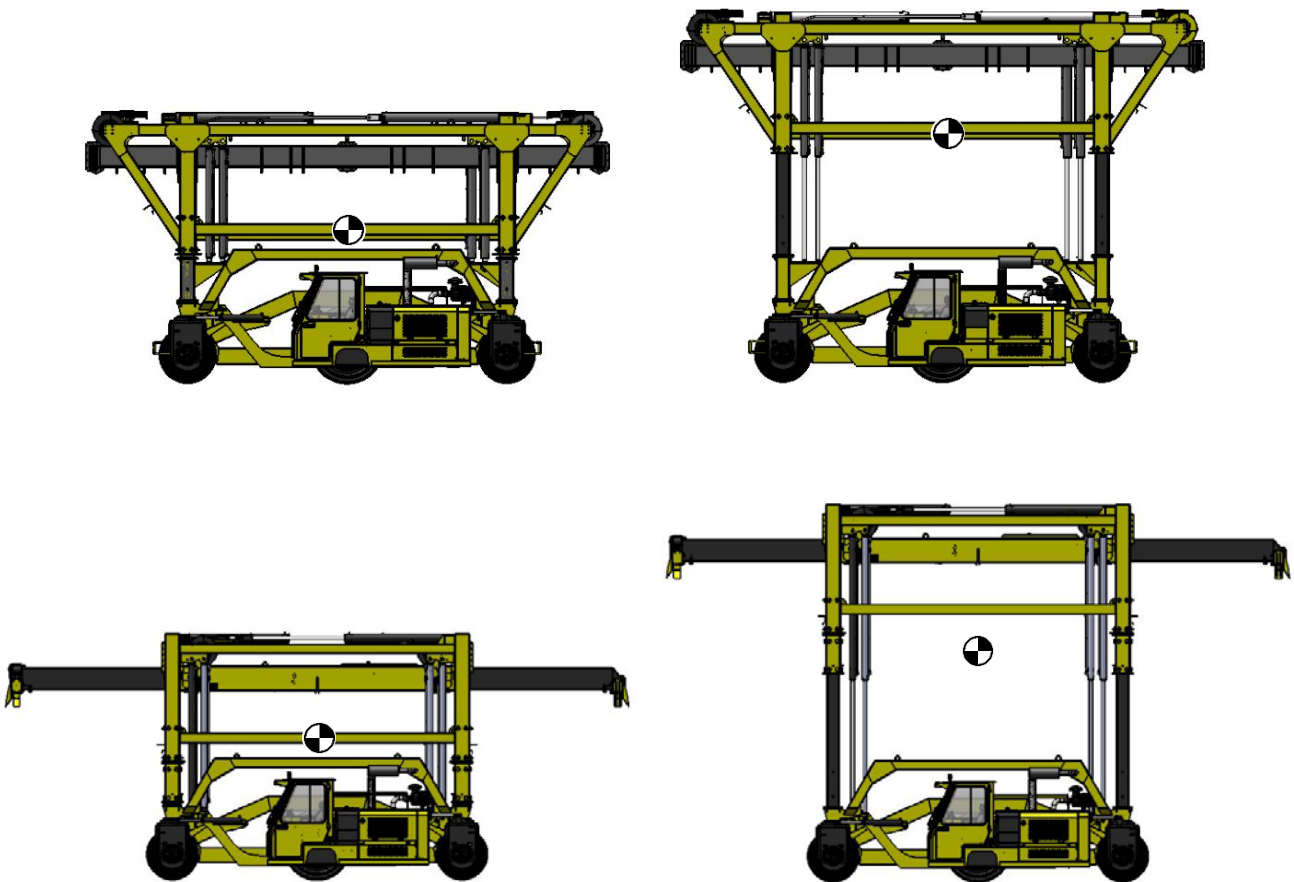


FIGURE 1.6.1 – C.O.G OF THE SC

The centre of gravity and therefore stability is also affected by the size, weight, shape and position of the load and the height to which it is raised. SC movement such as acceleration, braking, turning and uneven surfaces will also affect the SC stability.

Note: The load should be positioned so the centre of gravity is in the centre. Load to be distributed evenly on all wheels.

1.7 Operating Conditions

The SC can operate on a variety of different surfaces and in various conditions but the following should be noted:

Ground Surface

Floor and road surfaces need to be firm smooth and level. Approaches to curbs, railway crossings etc. should also be firm, smooth, and adequately ramped to prevent possible displacement.

This machine is equipped with four articulated swivels and eight puncture proof tires to allow for travel on un-even surfaces such as gravel yards. The eight-wheel design also decreases ground pressure exerted from the machine.

Surrounding/Headroom

Structures over aisles, which may be potential obstacles should be defined and marked with a conspicuous colour. Low doorways should be marked with their clearance limits. When travelling through openings such as gateways, ensure there is adequate space either side of the SC to drive through without damaging the SC or the gateway.

Warning

- Always be aware of overhead electrical power cables as an electric arc can occur even when approaching an electric line.
- To ensure the operators safety, a Trained Electrical Technician should determine the minimum distance in which the machine can travel from the electric lines.
- This poses a high risk for not only the operator but for other personnel nearby.

Operating in Hazardous Areas

Standard SC's are not equipped to operate in cold stores, flammable or explosive areas, corrosive atmospheres or areas containing a high degree of dust contamination. Whilst specialized Combilift's will be fitted with the required safety equipment, operators must adhere to all specific operation instructions laid out for hazardous areas by the relevant authorities. This Combilift SC is fitted with a Donaldson Top Spin Air Filter to allow the SC to operate in areas with a high degree of dust

Gradients

When differences in levels exist, low gradient ramps should be provided, having smooth, gradual level changes at top and bottom to prevent shocks to the load. Except in emergencies, do not turn the SC on gradients. Correct gradient procedure should

be followed at all times (see Safe Operation in section 3) Do not park on a gradient. In an emergency apply parking brake and apply a wedge both sides of the wheels, but do not leave the SC unattended.

Adverse Weather Conditions

There are a number of weather conditions for which extra care must be taken.

High Winds: Do not operate the SC in winds that are greater in speed than 31 m/hr / 50km/hr / 14 m/s as this can have serious effects on the stability of the machine.

Electrical Storms: Always discontinue operation of the SC in the event of an approaching electrical storm due to the associated risks of lightning.

Heavy Rain: heavy rain can cause flooding and can alter the ground surface. This may result in potholes and uneven ground. Potholes are to be avoided if possible. If a pothole cannot be avoided then the operator must drive the SC slowly and carefully through them. The four swivels on the SC can pivot to make it easier for the SC's to drive through potholes and uneven ground surfaces.

Extreme Temperatures: The SC is rated to operate between -30°C and +43°C. If the temperature falls below or rises above this range discontinue operation of the machine in order to prevent damage to various components.

1.8 Noise Levels

The Noise Levels of the SC do not exceed 80 dB(A). Noise Reducing insulation has been fitted in the engine bay of the SC to help reduce noise levels.

Noise level readings have been taken from the SC. Readings were taken on low RPM and full RPM at 1m increments, starting from 1m away from the engine bay up to 5m from the engine bay. None of the levels recorded exceed the 80 dB(A) level.

2. Machine Layout and Operator Controls

2.1 Machine Overview and Components

It is essential before you start operating the SC to be familiar with the main components and controls of the machine, their function and where they are located. Figure 2.1 below and Figure 2.1.1 on the following page indicate the major components of the machine and all of the operator controls

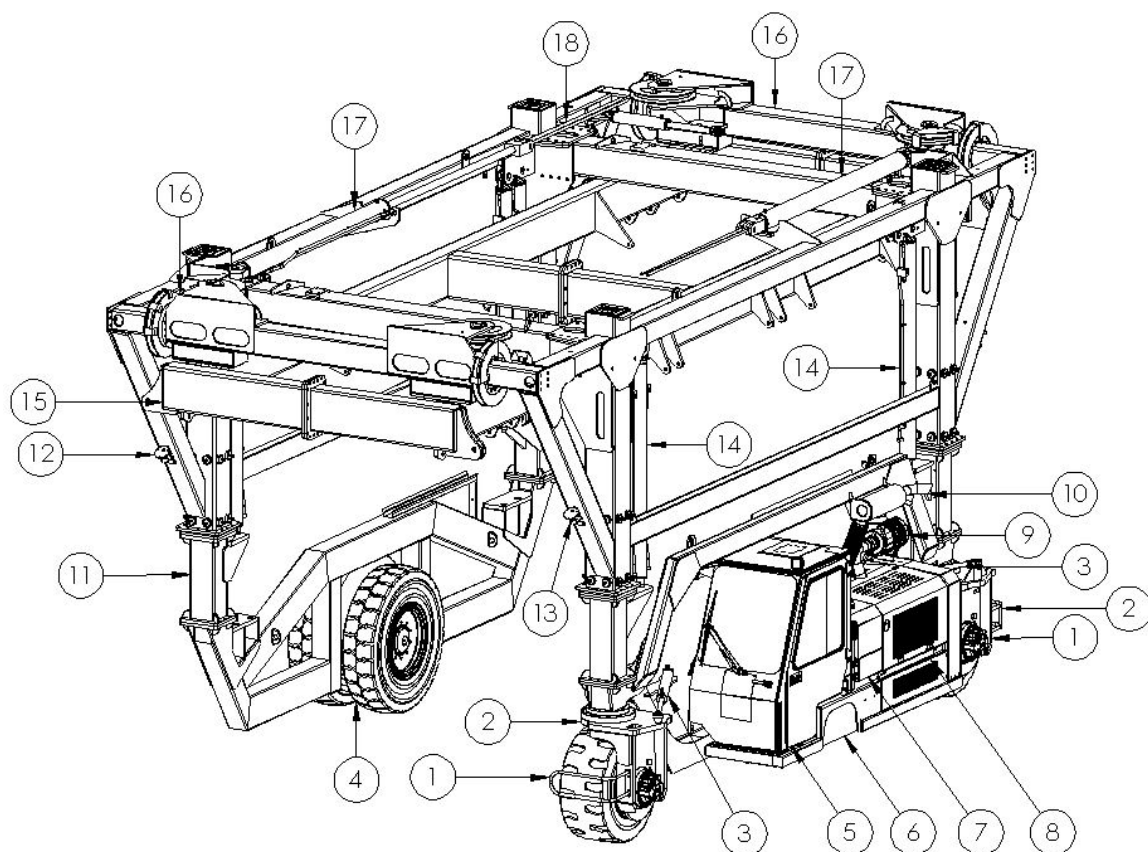


Figure 2.1 - Overview of Components

<u>Component List</u>	
1. Crash Guards	2. Swivel Assembly
3. Steering Cylinders	4. Right Hand Wheels
5. Cabin	6. Diesel Tank
7. Hydraulic Oil Tank	8. Engine Bay
9. Air Filter	10. Exhaust
11. Stool and Telescopic Leg Assembly	12. Flashing Beacon
13. LED Work Light	14. Telescopic Cylinders
15. Attachment	16. Side Shift Assembly
17. Lift Cylinder	18. Lifting Ropes

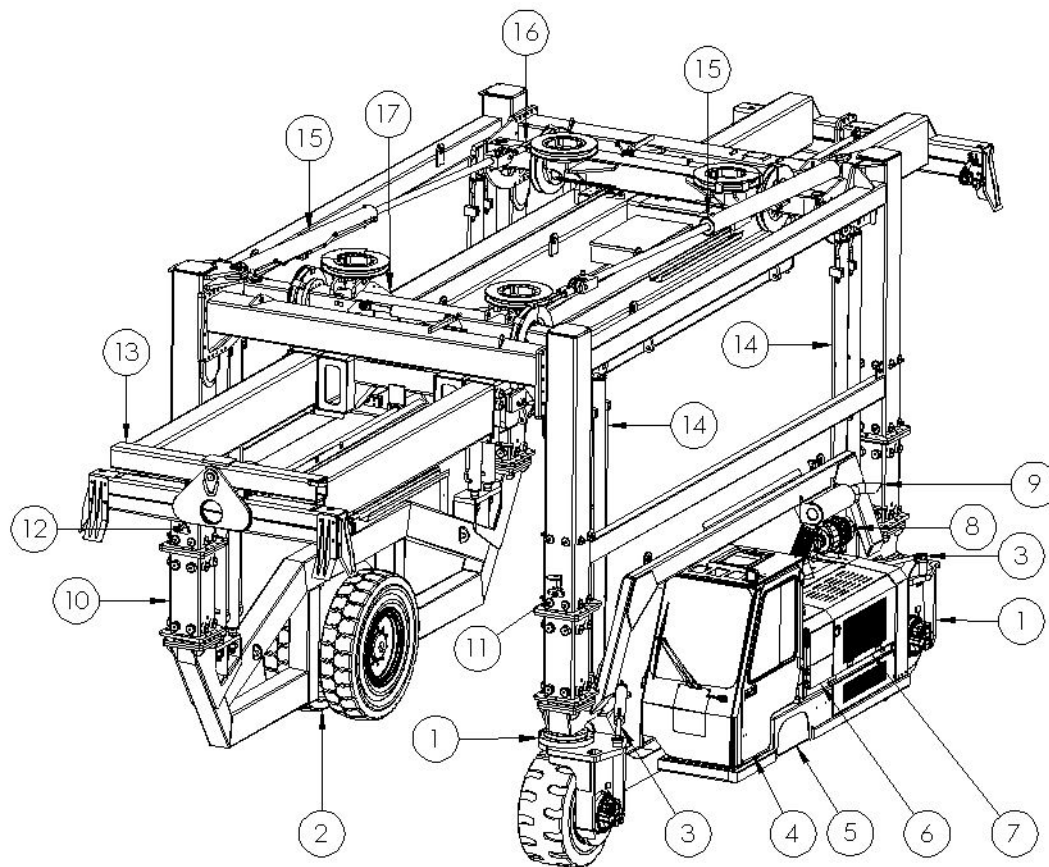


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3. Steering Cylinders	4. Cabin
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7. Engine Bay	8. Air Filter
9. Exhaust	10. Stool and Telescopic Leg Assembly
11. LED Work Light	12. Flashing Beacon
13. Attachment	14. Telescopic Cylinders
15. Lifting Cylinders	16. Lifting Ropes
17. Side Shift Assembly	

2.2 Cabin Layout

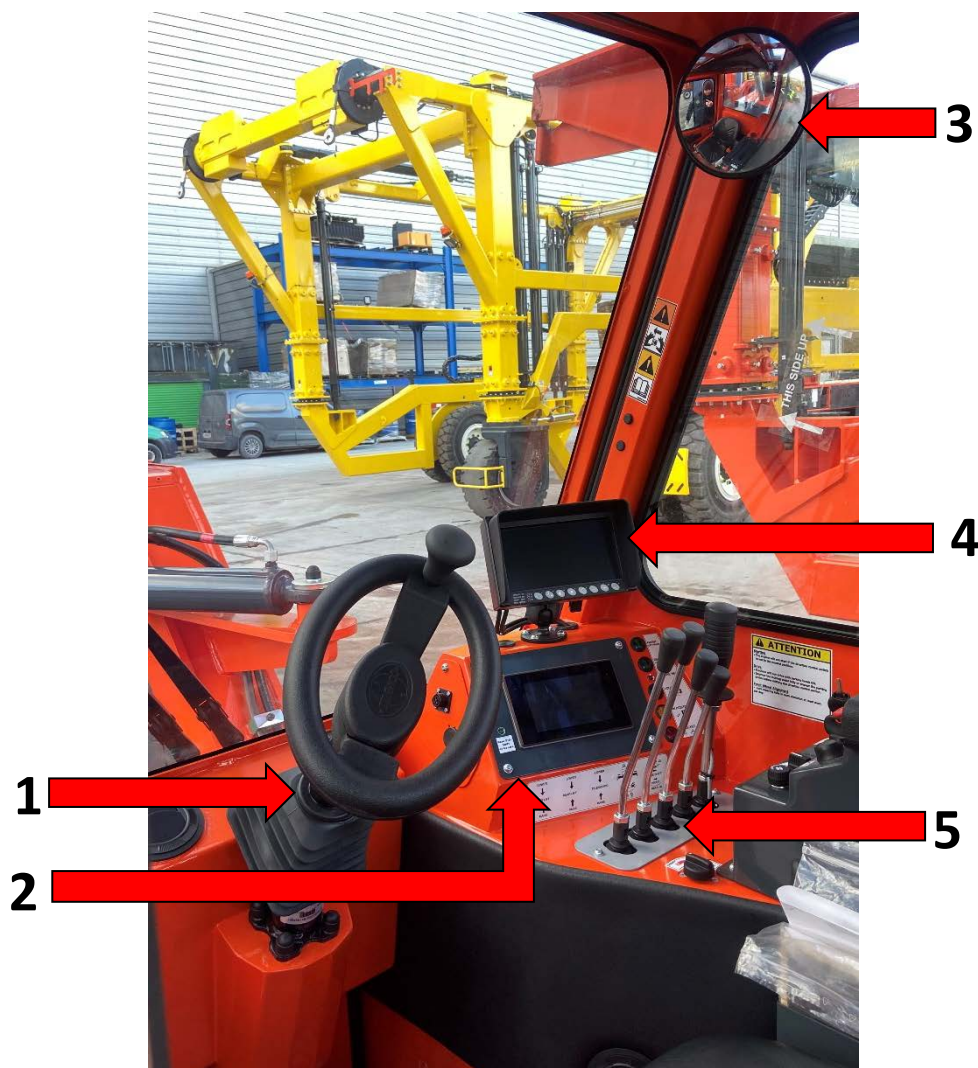


FIGURE 2.2 – CABIN LAYOUT

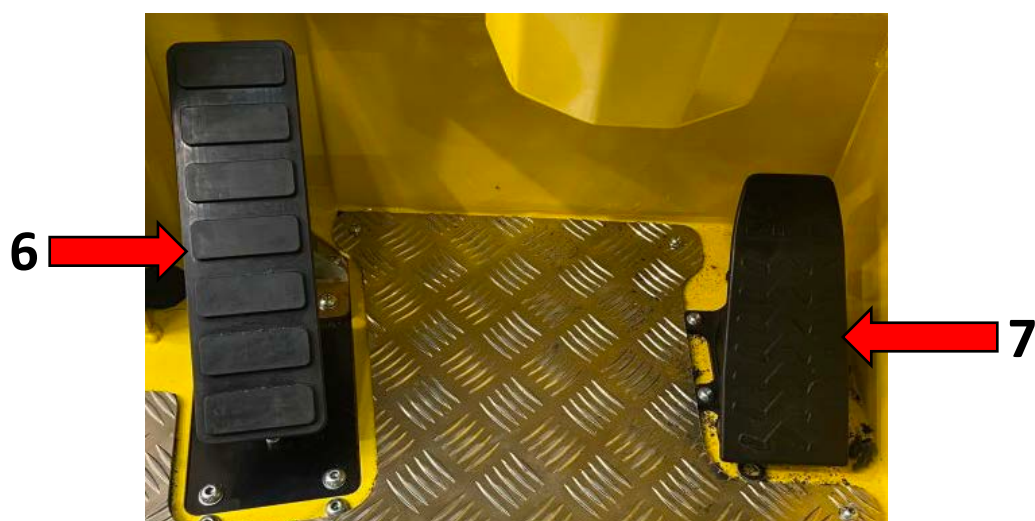


FIGURE 2.2.1 – CABIN LAYOUT

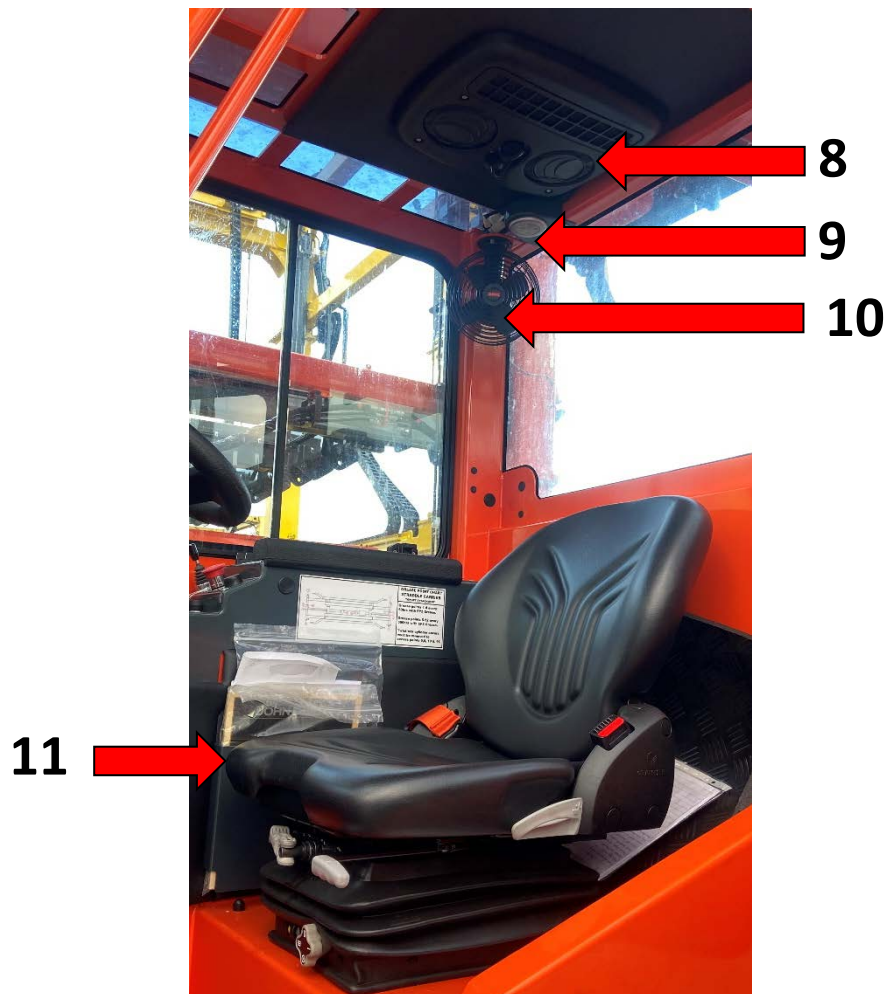


FIGURE 2.2.2 – CABIN LAYOUT

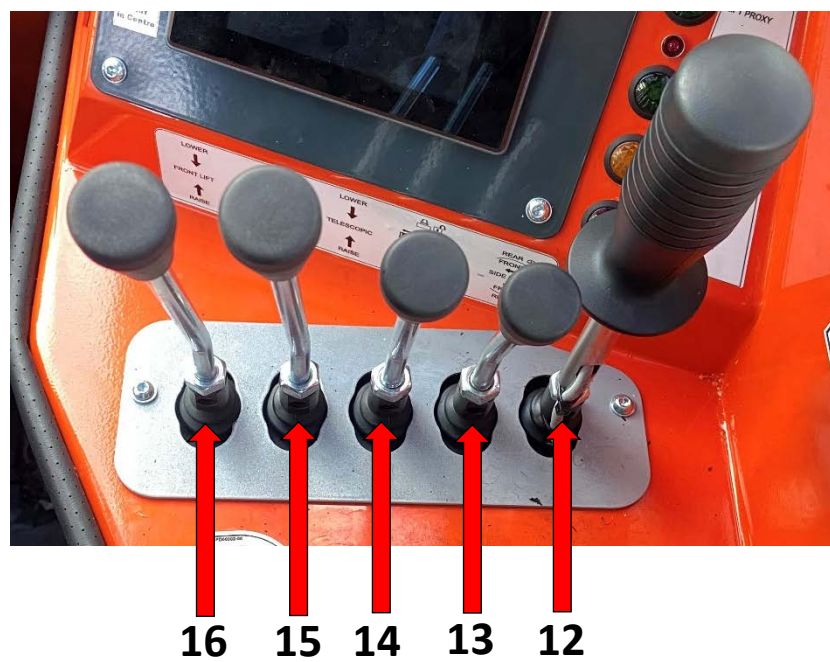


FIGURE 2.2.3 – CABIN LAYOUT

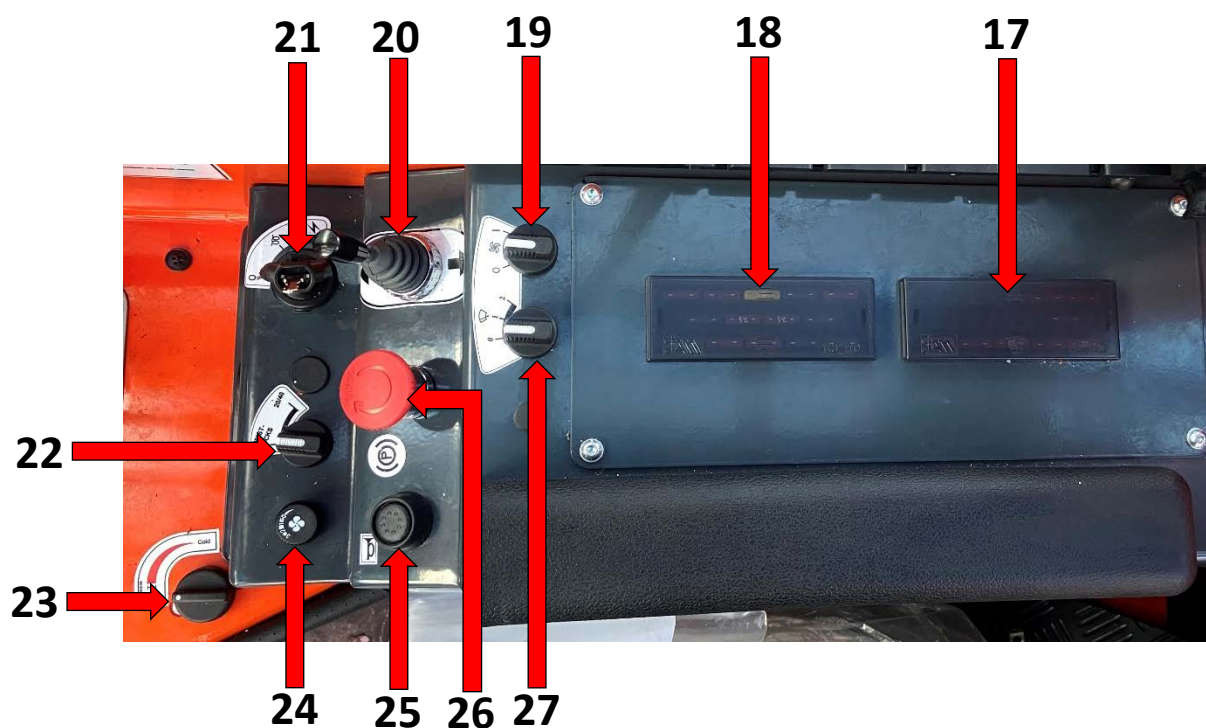


FIGURE 2.2.4 – CABIN LAYOUT



FIGURE 2.2.5 – CABIN LAYOUT

Cabin Control Details

<u>Cabin Control Layout</u>	
1. Steering Colum	2. Display Console
3. Rear View Mirror	4. Display Screen
5. Control Levers	6. Inch/Brake Pedal
7. Accelerator Pedal	8. Air Conditioning Control Unit
9. Interior Light	10. Operator Cooling Fan
11. Adjustable Suspension Seat	12. Side Shift Right/Left Lever
13. Attachment Control Lever	14. Telescopic Up/Down Lever
15. Rear Lift/Lower Lever	16. Front Lift/Lower Lever
17. Fuse Box 2	18. Fuse Box 1
19. Operator Cooling Fan Switch	20. Forward/Reverse Lever
21. Ignition Switch	22. Twist Lock Switch
23. Temperature Control Knob	24. Heat Fan Speed Switch
25. Horn Button	26. Parking Brake
27. Windscreen Wiper Switch	28. Front Lift Light
29. Rear Lift Light	30. Engine Light
31. Twist Locks Locked Light	32. Twist Locks in Position Light
33. Twist Locks Unlocked Light	34. Rear Side Shift in Centre Light
35. Front Side Shift in Centre Light	

Steering Wheel / Column (Item 1 Figure 2.2)

- All models have both front and rear-end steering.
- When driving forwards, turn steering wheel clockwise to turn truck clockwise, turn steering wheel anti clockwise to turn truck anti clockwise.
- When driving in reverse, turn steering wheel clockwise to turn truck anti clockwise, turn steering anti clockwise to turn truck clockwise.
- The steering wheel is also equipped with a spinner knob for easier steering.
- The angle of the steering column is adjustable to increase driver comfort.
- To adjust the angle of the steering column, loosen the locking handle on the side of the column by turning the handle clockwise.
- Adjust the steering column to the desired angle.
- To lock the column in position, turn the locking handle anticlockwise until tight.



Accelerator Pedal

The accelerator pedal is located on the floor on the right-hand side as shown below.

The accelerator pedal provides the operator control of the LC speed.

To INCREASE truck speed, DEPRESS pedal.



Inch/Brake Pedal

The Inch/Brake pedal is the pedal on the floor on the left-hand side of the steering Column as shown in the diagram opposite.

The combined Inch/Brake pedal has two functions:

- The inch function reduces the supply of oil to the motors to stop the drive and slow the machine down.
- The brake function applies a disc brake within the motor to bring the machine to a complete stop.



The Inch/Brake pedal may be used to permit slow speed, for precise manoeuvring of the truck in confined spaces. It will bring the machine to a complete stop when force on the pedal is increased.

Operator Lever Controls (Cabin)

Front Lift/Lower Control Lever (1st Lever)

- The front lift/lower control lever raises and lowers the front ropes
- To RAISE the front ropes, PULL this lever BACK
- To LOWER the front ropes, PUSH this lever FORWARD



Rear Lift/Lower Control Lever (2nd Lever)

- The rear lift/lower control lever raises and lowers the rear ropes
- To Raise the rear ropes, PULL this lever BACK
- To LOWER the rear ropes, PUSH this lever FORWARD



Telescopic Up/Down Lever (3rd Lever)

- The telescopic up/down lever raises and lowers the top section
- To RAISE the top section of the truck, PULL this lever BACK
- To LOWER the top section the truck, PUSH this lever FORWARD

**Attachment Lever (Twist lock Open / Close Lever if applicable) (4th Lever)**

- The Twist lock Open / Close Lever controls the Twist locks on the attachment
- To CLOSE the twist locks on the truck, PULL this lever BACK
- To OPEN the twist locks on the truck, PUSH this lever FORWARD

**Side Shift Right/Left Lever (5th Lever)**

- The side shift right/left lever moves the front and back ropes right or left independently
- This lever has a push button on top to select the rear side shift
- To MOVE the front ropes to the RIGHT, PULL this lever BACK
- To MOVE the front ropes to the LEFT, PUSH this lever FORWARD
- To MOVE the rear ropes to the RIGHT, PULL this lever BACK while depressing the push button
- To MOVE the rear ropes to the LEFT, PUSH this lever FORWARD while depressing the push button

*Side shift Indicators (Front & Rear)*

The front and rear side shift indicators allow the operator to determine the position of the front and rear ropes in relation to the frame.

- When the outer left-hand arrow is aligned with the left edge the side shift is fully right.
- When the large centre arrow is aligned with the left edge the side shift is centred.
- When the inner right-hand arrow is aligned with the left edge the side shift is fully left.

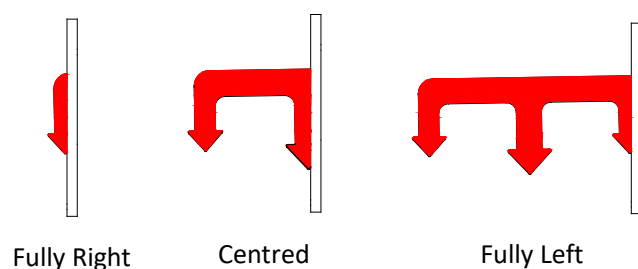


FIGURE 2.2.6 – SIDE SHIFT INDICATORS

Ignition On/Off Switch

- Once the SC key is in the Ignition it must be Turned Right for the operator to start the SC. Ignition the switch must be Turned Left for the operator to stop the SC.



Park Break Switch

- The parking brake switch is the red button located on the dash directly in front of the armrest.
- To APPLY the parking brake, depress the button. The button will lock in the depressed position and the parking brake symbol will appear on the display screen to alert the operator that the parking brake is on.
- To RELEASE the parking brake, rotate the button clockwise. It should pop up into its normal position.
- The Machine will NOT drive with the parking brake on



Drive Direction Switch

- This is a three-position switch that can be set to
- neutral, forward or reverse
- To select **neutral** set the switch in the **central** position
- To select **forward** push the switch to the **right**
- To select **reverse**, pull the switch to the **left**



Warning



Always return the lever to the neutral position when the SC is not moving

Cabin Interior LED Light

- This light illuminates the interior of the cabin.
- Press on the small circular recess on the bottom face of the light housing to illuminate the light.
- Press in the same place a second time to extinguish the light.



Windscreen Wiper Switch

- The windscreen wiper switch shown opposite is located on the dash.
- This 2-position rotary switch activates the windscreen wiper by turning it to position 1.



Horn Button

- The horn button is the push button located to the right of parking brake switch.
- To operate the horn, depress the button



Operator Cooling Fan Switch

- This is a 2-position rotary switch located on the dash
- Turning it to position 1 activates the cooling fan located in the top right-hand side of the cabin



Temperature Control Knob

- To increase cabin temperature, turn anti-clockwise
- To decrease cabin temperature, turn clockwise



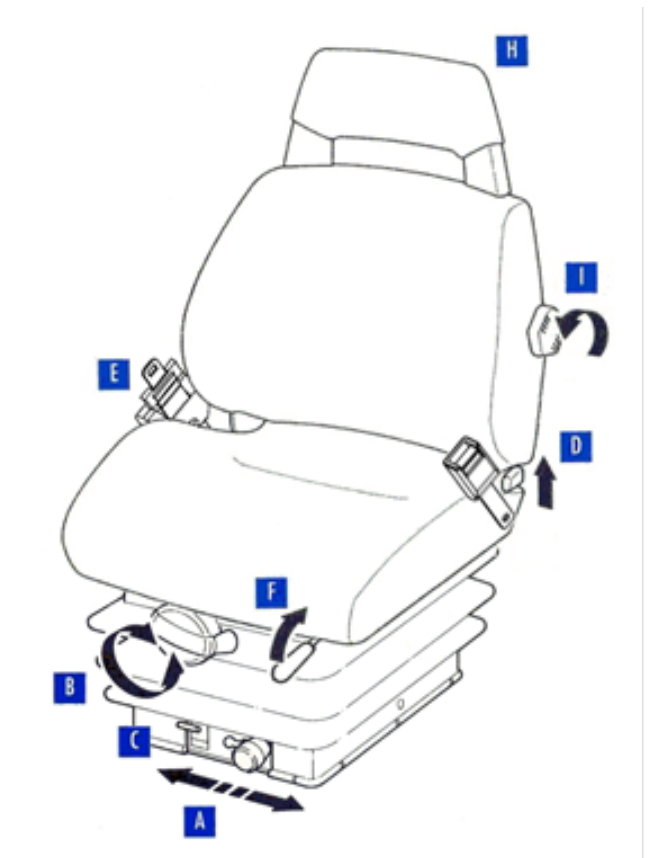
Heater Fan Switch

- This four-position rotary switch located on the dash allows the operator to select between off, low, medium or high fan speeds



Seat Adjustment

- It is the responsibility of the Operator to ensure that the seat is adjusted according to operator weight, height etc before operating the truck.
- ALWAYS report any malfunctioning of the seat adjustments immediately.
- ALWAYS wear the seat belt provided.
- DO NOT adjust the seat when vehicle is in operation.
- Keep clear of moving parts.
- Authorised & competent personnel should carry out Installation & Maintenance only



A. Upstop Adjustment

B. Height Adjustment – Depending on operator weight, rotate knob clockwise, to increase, and anti-clockwise to reduce suspension stiffness.

C. Using the height adjustment knob 'B', adjust the yellow ride indicator 'C' to the middle of the green area when seated.

D. Backrest angle adjustment

E. Seat belt

F. Horizontal Adjustment (Slide rails)

G. Backrest Extension

H. Lumbar Support adjustment (5 positions)

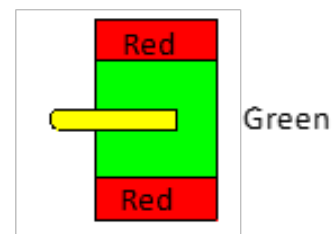


FIGURE 2.2.7 – ADJUSTABLE SEAT

2.3 Battery Isolator Key Switch

- This switch is used to disconnect power from the battery.
- The switch is located under the bonnet on the left-hand side of the machine as shown opposite.
- It can be accessed without opening the bonnet through the access hole provided
- When the machine is not in use turn switch to 'OFF' position, by turning switch ANTI-CLOCKWISE.
- The engine will not start unless the switch is returned to the 'ON' position, by turning the switch CLOCKWISE

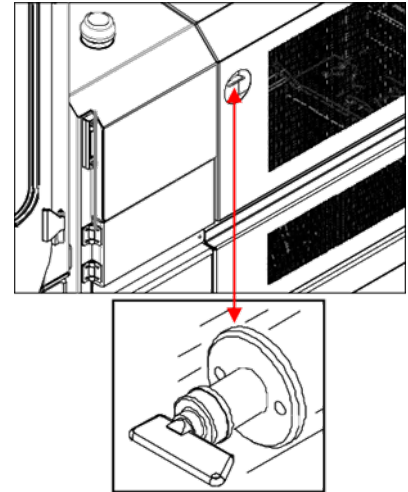
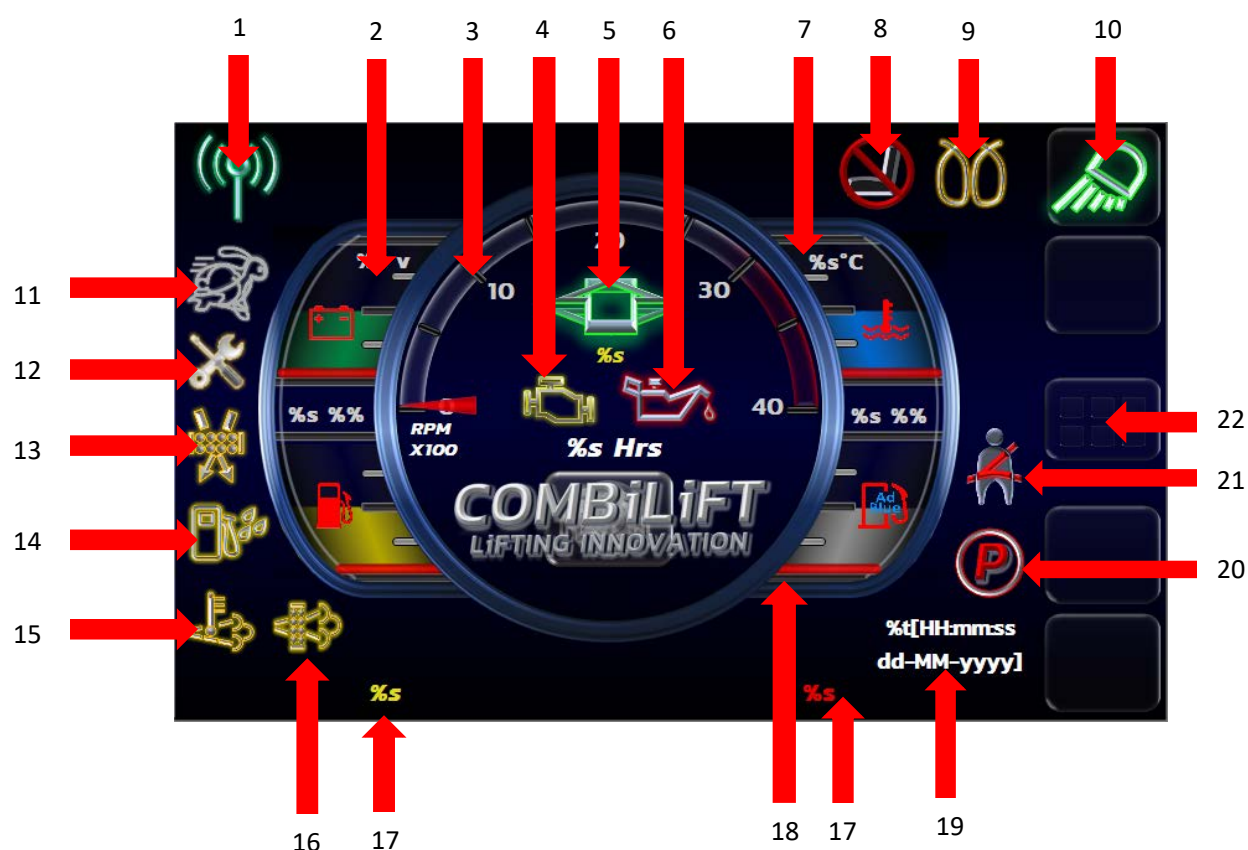


FIGURE 2.3 - ISOLATOR KEY SWITCH

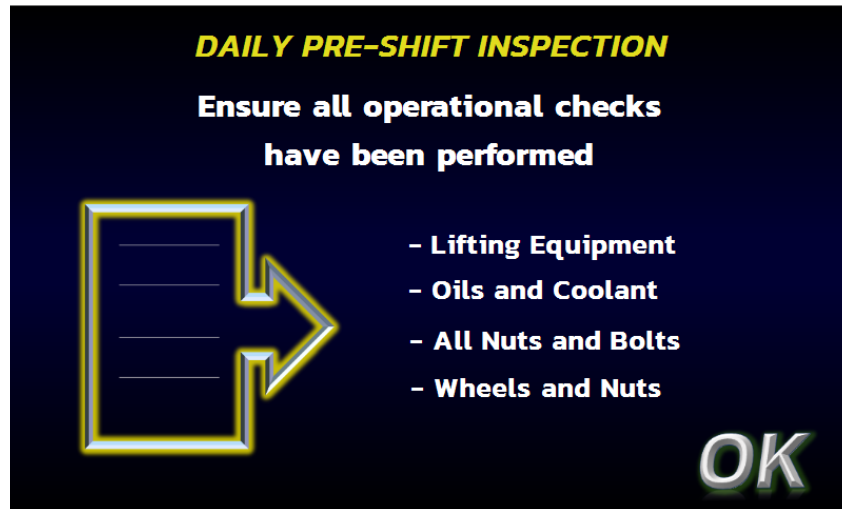
2.4 Topcon Screen Control List



Topcon Screen – Control List

1 Remote Connection	2 Battery Gauge
3 RPM	4 Engine Warning
5 Drive Direction	6 Oil Pressure Low
7 Water Temperature	8 Seat Switch On /Off
9 Heating Coil	10 Lights
11 Hare/Turtle Mode	12 Service Light
13 Air Filter Blocked	14 Water in Fuel
15 Exhaust High Temperature	16 DPF Lamp
17 Error / Warning Messages	18 AdBlue Level
19 Date / Hours	20 Park Brake On / Off
21 Seat Belt Warning	22 Navigation Pad

2.5 Topcon Display (Daily Pre-Shift Inspection)



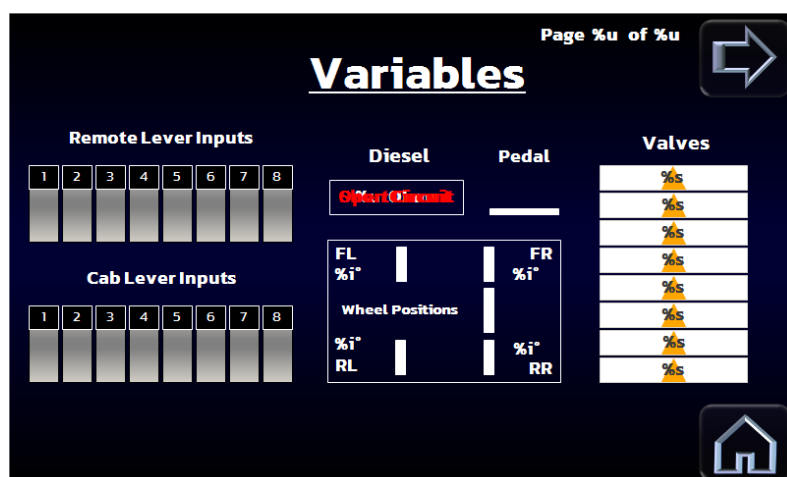
This screen will appear once the MG has been started as a reminder to the operator to perform daily pre-shift checks before using the MG.

These checks should cover:

- Cables & Wiring
- Tires/Wheel Pressure & Condition
- Safety
- Fuel, AdBlue, oil, water & hydraulic levels
- Wheel nuts (plastic arrows)
- Loose or missing parts

Press OK to proceed to the home screen.

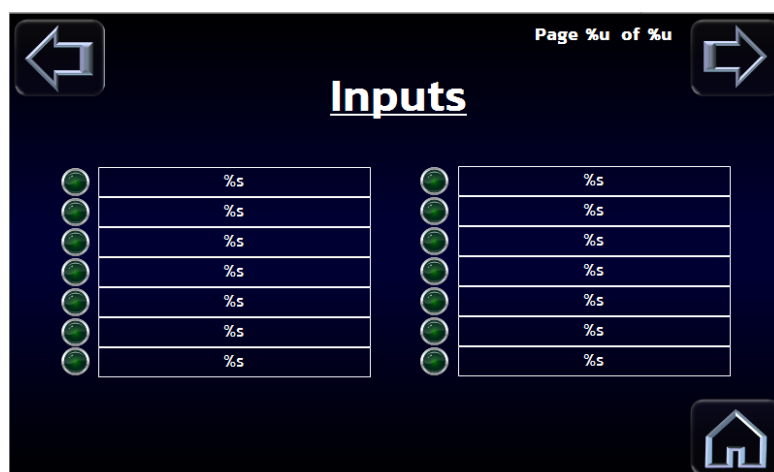
2.6 Topcon Display (Diagnostics)



To enter the diagnostics screen this is done from the home screen by using the Navigation Pad, No. 22 on the control list.

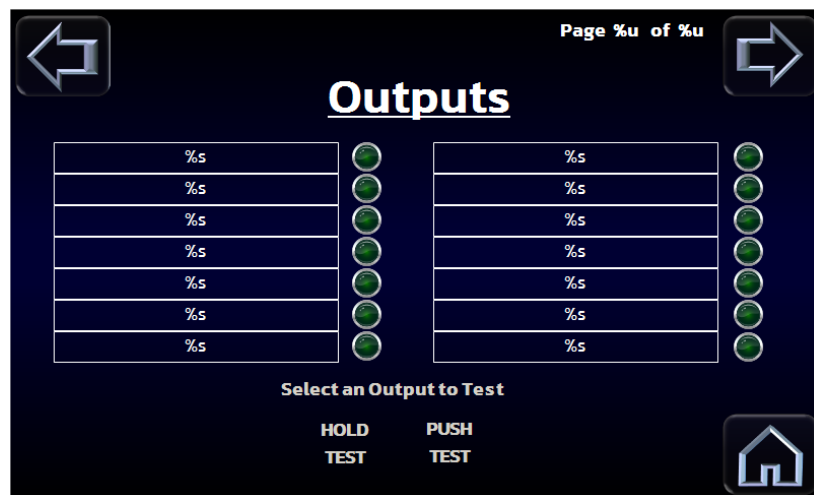
Analog inputs are displayed here, e.g. Fuel Sensor, Levers and Valve outputs. They will turn red if a fault is detected.

The Diagnostics/Inputs/Outputs pages can be entered by the operator in the case of an issue where a function does not work, these pages allow the operator to turn on and off the functions from the PMG. A Combilift Service technician should be contacted if there is a fault



Digital inputs are shown here.

The Inputs page can be entered by the operator in the case of an issue where a function does not work, this page allows the operator to turn on and off the functions from the PMG. A Combilift Service technician should be contacted if there is a fault.



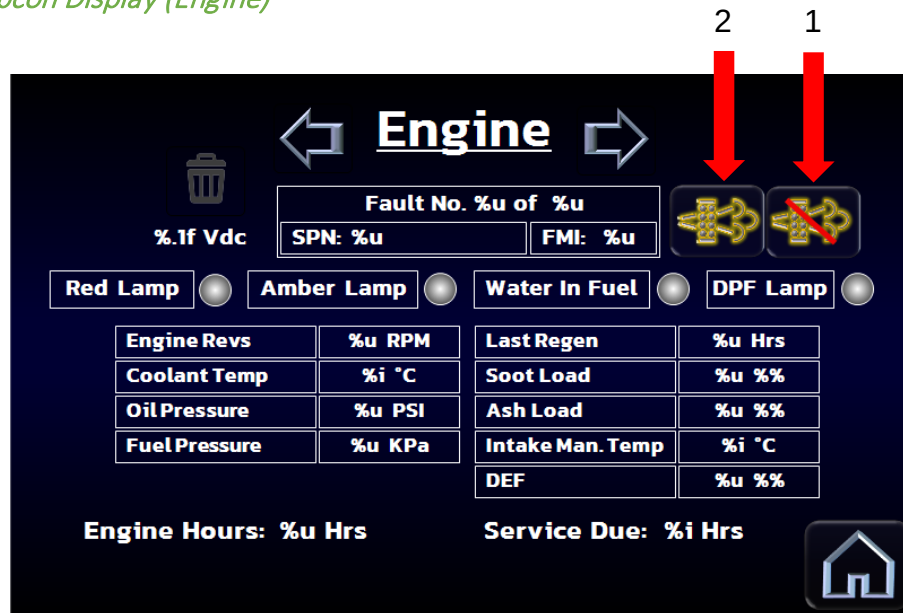
Digital Outputs are shown here.

The “UP” and “DOWN” arrow can be used to select and output for test. Pressing left will latch the test and stay on until the left button is pressed again. Pressing right will test the output while it is held down and release when let go. Testing inverts the current state, an output that is off will go on and an output that is on will go off.

Outputs cannot be tested while the engine is running

The Outputs page can be entered by the operator in the case of an issue where a function does not work, this page allows the operator to turn on and off the functions from the PMG. A Combilift Service technician should be contacted if there is a fault

2.7 Topcon Display (Engine)



Access the Engine Display Screen by using the navigation pad on the home screen, No. 22 on the control list.

This screen displays the outputs from the engine such as engine revs, coolant temperature, oil pressure and fuel pressure.

Deutz engine fault codes appear on this screen. The fault codes can be navigated through using the arrow buttons.

DOC & SCR control buttons are the two buttons on the top right of the screen and are labelled 1 & 2 in the image shown.

Button No. 1 is Refresh Inhibit

Button No. 2 is Stand Still Refresh

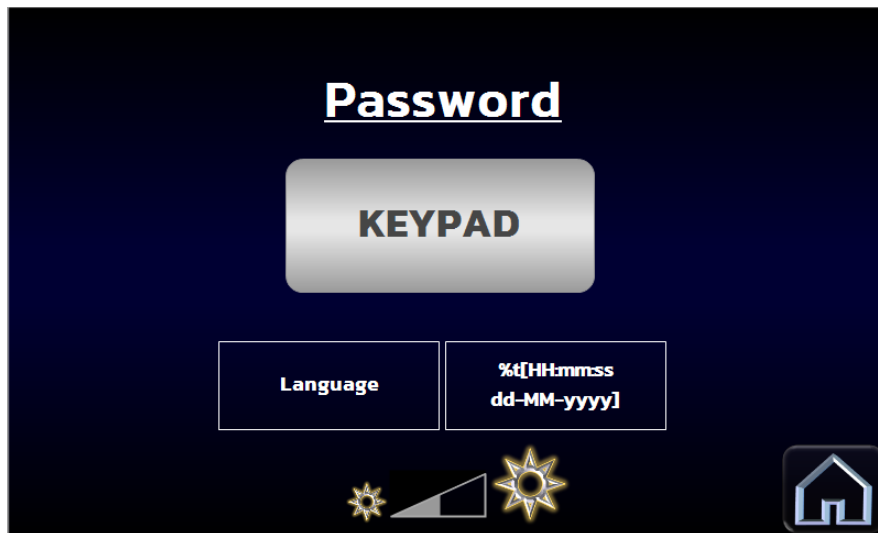
To stop a Refresh at any time press and hold Button No. 1 until the engine returns to idle speed *

To Refresh Allow press and hold Button No. 2.

A Stand Still Refresh/Regen may be needed if the engine has a buildup in the DOC or SCR *

*See engine documentation for further information which includes a detailed description of what DOC and SCR mean and what their function on the machine is. *

2.8 Topcon Display (Service Reset)



A service reset is to be performed by a trained service technician on completion of a servicing of the SC

To activate the Service Reset:

This is done by using the navigation pad in the control list and selecting the setting page.

After this is pressed it will require a password:

-2222

Type in the password by using the keypad on the screen.

From this screen the brightness of the screen can be changed, the date and time can be changed and the language can be changed.

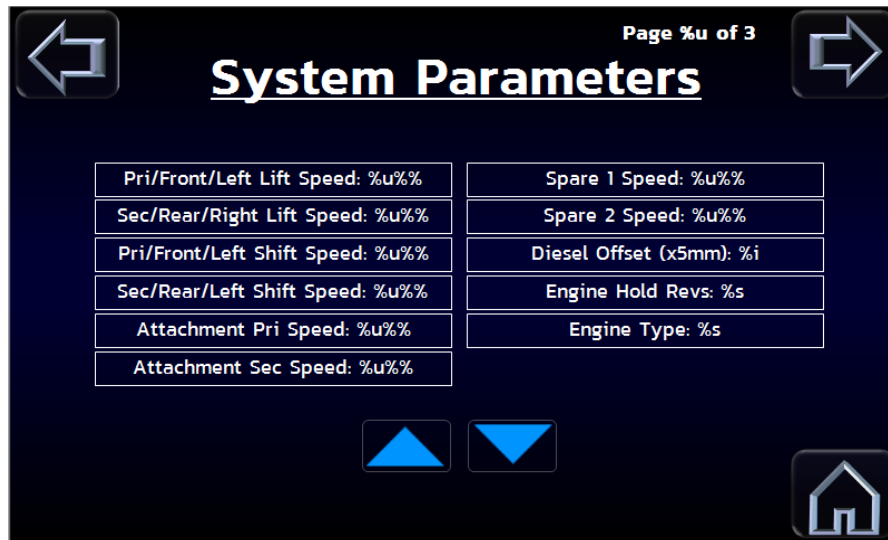


After the correct code is input:

The Maintenance screen should appear.

To confirm service reset please press button located at bottom of screen.

To enter the System Parameters screen, enter the code: 2211



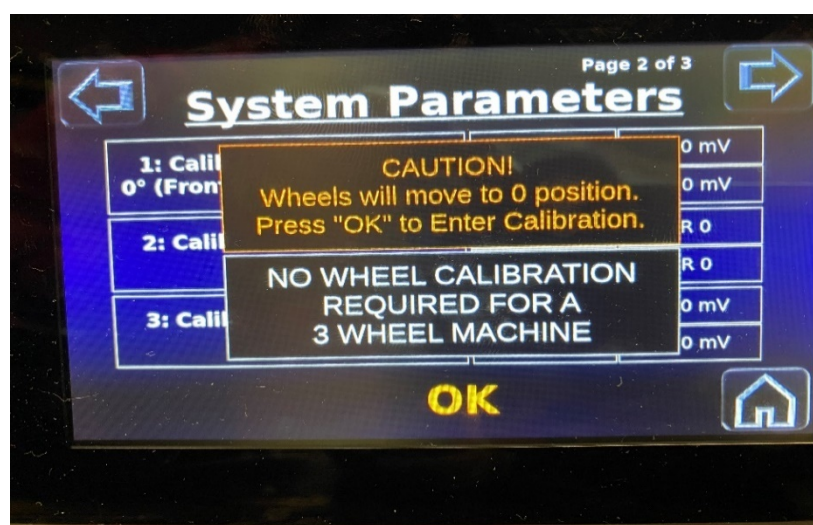
Caution: System Parameters are only to be changed by an experienced technician. Changing of parameters may cause undesired effects to the SC.

This screen shows the system parameters of the SC such as Lift Speed, Side Shift Speed and Rotation Speed.

Tap on the parameter you wish to change

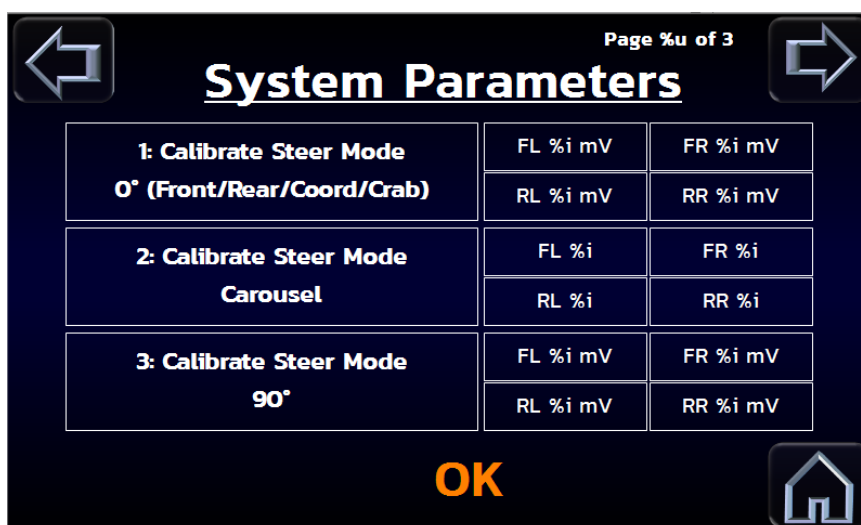
Use the Up/Down Arrows to change the value of the parameters

Press the arrows at the top to the next system parameters screen where the steering modes can be calibrated.



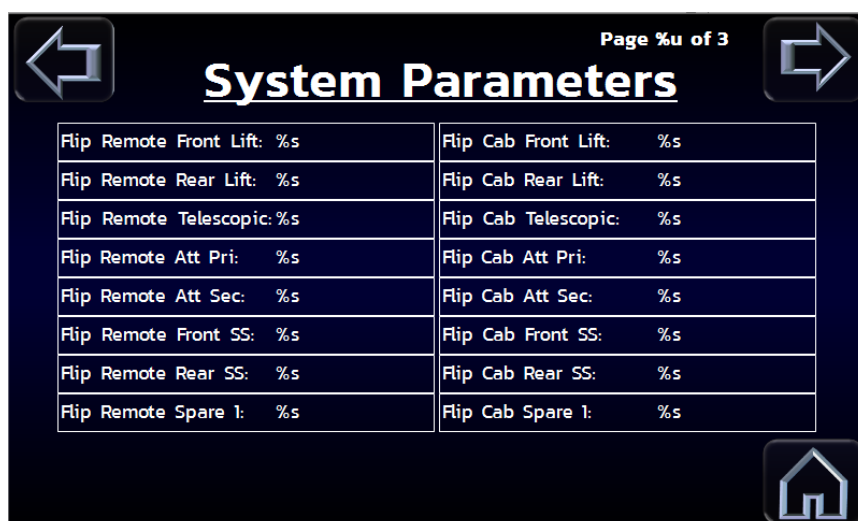
A caution message will appear on screen.

Press OK to move to steering mode calibration screen



The steering can be calibrated in the following modes:

- Mode 1-4 or 0° (this is the standard drive mode)
- Mode 5: Carousel Mode
- Mode 6: 90°
- First put the remote control in the desired steering mode you wish to calibrate
- Align the wheels to the desired position.
- Then press OK to calibrate the wheels
- It will only calibrate the wheels in the drive mode that is selected on the SC.



The third system parameters page lets you flip the direction of the levers in the cab or on the remote if fitted.

Errors:

If a critical error is detected the Error screen will pop up on the screen and on the remote screen showing some information about the errors.

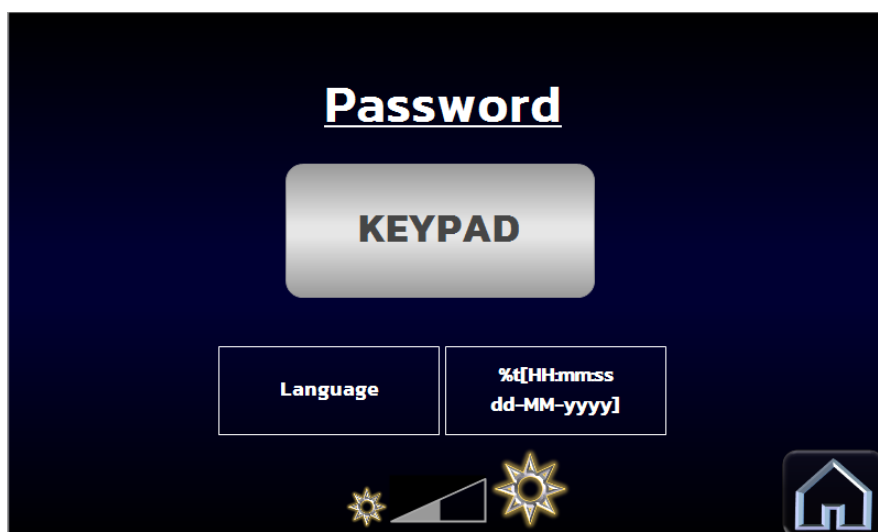
If a critical error appears on screen the operator should stop what they are doing and contact service personnel immediately.

The Operator can press the OK button and the screen will return to the home screen if there is only one critical error detected.

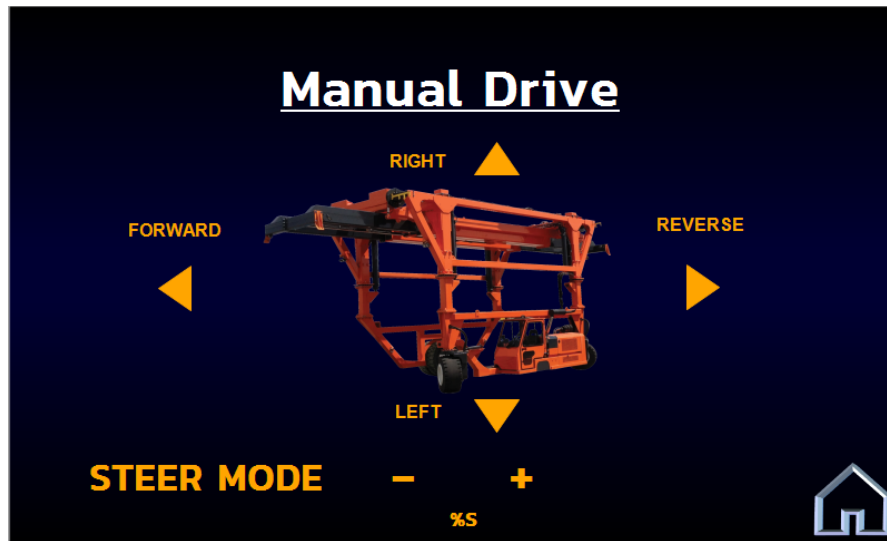
If more than one critical error is detected then press the OK button to move the next critical error

**Manual Drive**

Manual drive is an emergency function the operator can use to drive the MG if the remote becomes damaged or runs out of power. The operator can access the manual drive function by pressing the setting button on the navigation pad.



The operator must then enter the password “1122” to bring up the manual drive screen



The manual drive screen will allow the operator to use the screen to drive the SC to a safe place where it can be stopped until the remote is working again.

2.9 Remote Control Screen List

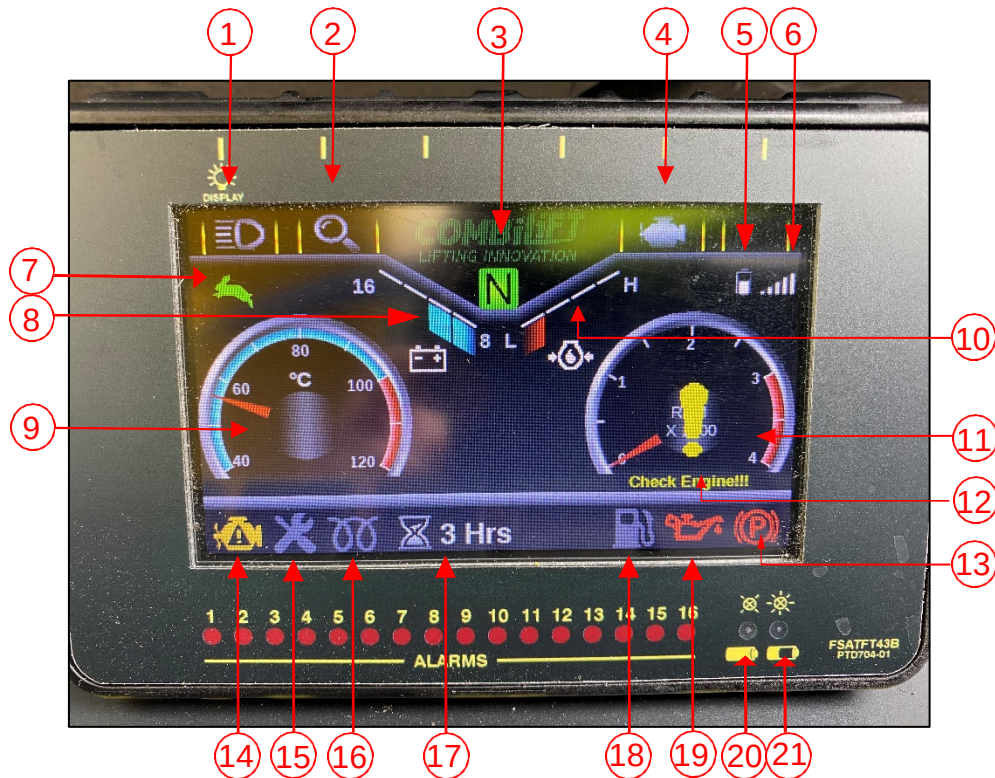


FIGURE 2.5 – REMOTE SCREEN CONTROL LIST

Remote Screen – Control List	
1 Lights	2 Diagnostics
3 Drive Mode	4 Engine
5 Remote Battery Level Indicator	6 Remote Signal Quality Level
7 Speed Indicator (Fast/Slow)	8 Battery Gauge
9 Water Temperature	10 Oil Pressure
11 RPM	12 Steering Mode / Warning Signal
13 Park Break - On	14 Engine Warning
15 Service Icon	16 Heating Coil
17 Machine Hours	18 Fuel Low
19 Oil Pressure Low	20 Battery Indicator / Connection Status
21 Battery / Error with Remote	

2.10 Remote Control Layout

The SC operated by a remote control that the operator must be familiar with if they are to operate the SC correctly. Figure 2.4 below shows the layout of the controls on the remote control.



FIGURE 2.10 - REMOTE CONTROL LAYOUT TOP VIEW

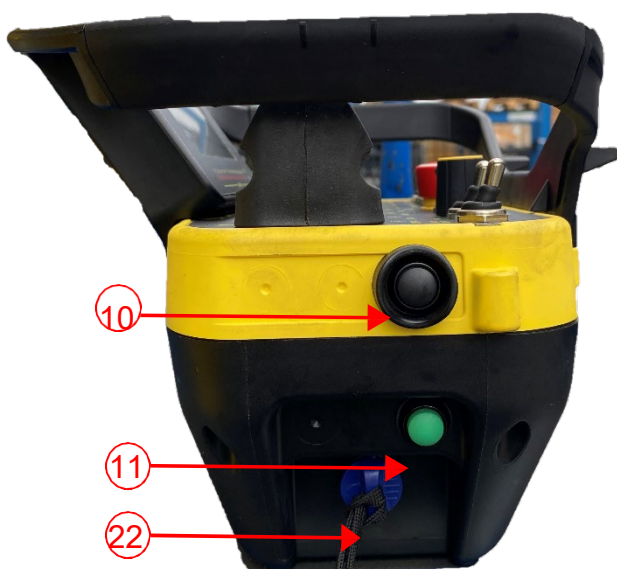


FIGURE 2.10.1 - REMOTE CONTROL LHS

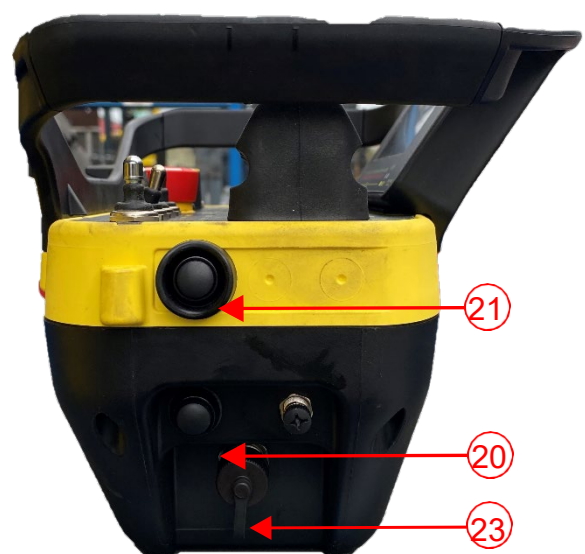


FIGURE 2.10.2 - REMOTE CONTROL RHS

Remote Control Layout	
1 Steering Lever	2 Left Lift Up/Down Lever
3 Right Lift Up/Down Lever	4 Telescopic Up/Down Lever
5 Screen Navigation Buttons	6 N/A
7 Left Side Shift Lever	8 Right Side Shift Lever
9 Accelerator / Throttle Lever	10 N/A
11 Remote Power On	12 N/A
13 N/A	14 Steering Mode Selection
15 Park Brake On/Off	16 Emergency Stop / Remote Off
17 Drive Direction	18 Speed Selection
19 N/A	20 Engine Crank
21 Horn	22 Remote ID Key
23 Hardwire Connection Point	

2.11 Remote Control Details

Steering Lever (1st Lever from Left, No. 1 Figure 2.10)

- The steering lever turns the wheels to steer the SC
- Push the lever FORWARD to steer RIGHT
- Pull the lever BACK to steer LEFT



Left Lift/Lower Lever (2nd Lever from Left, No. 2 Figure 2.10)

- The Left Lift/Lower lever raises and lowers the Left of the Attachment
- To RAISE the Attachment, PULL this lever BACK
- To LOWER the Attachment, PUSH this lever FORWARD



Right Lift/Lower Lever (3rd Lever from Left, No. 3 Figure 2.10)

- The Right Lift/Lower lever raises and lowers the Right of the Attachment
- To RAISE the Attachment, PULL this lever BACK
- To LOWER the Attachment, PUSH this lever FORWARD



Telescopic Lever (4th Lever from Left, No. 4 Figure 2.10)

- The Telescopic lever raises and lowers the Telescopic.
- To RAISE the Telescopic, PULL this lever BACK
- To LOWER the Telescopic, PUSH this lever FORWARD

**N/A** (4th Lever from Right, No. 6 Figure 2.6)**Left Side Shift Lever** (3rd Lever from Right, No. 7 Figure 2.10)

- To Side Shift the Left Attachment Beam to the RIGHT, PUSH this lever FORWARD
- To Side Shift the Left Attachment Beam to the LEFT, PULL this lever BACK

**Right Side Shift Lever** (2nd Lever from Right, No. 8 Figure 2.10)

- To Side Shift the Right Attachment Beam to the RIGHT, PUSH this lever FORWARD
- To Side Shift the Right Attachment Beam to the LEFT, PULL this lever BACK

**Accelerator/Throttle Lever** (1st Lever from Right, No.9 Figure 2.6)

- The accelerator/throttle lever allows the operator to control the drive and hydraulic function speed of the SC
- To Increase the Drive Speed of the SC, PUSH the lever FORWARD
- To Increase the Speed of the Hydraulic functions, PULL this lever BACK



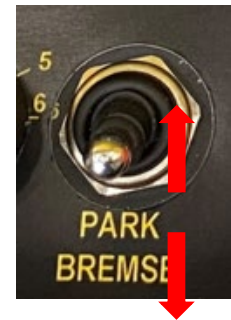
Remote Power on Button (No 11 Figure 2.6)

- This is a Push Button located on the Left-hand Side of the Remote.
- Press this button once to turn on the remote
- Press this button twice to link the remote with the SC once the ignition on the dash of the SC has been turned on



Park Brake On/Off Switch (No. 15 Figure 2.6)

- PUSH the Switch FORWARD to release the Park Brake
- PULL the Switch BACK to apply the Park Brake
- The Park Brake symbol will be displayed on the screen to alert the operator that the Park Brake is on.
- The machine will NOT drive when the Park Brake is on
- The Park Brake must be OFF when changing Steering Modes



Remote Power Off Button (No. 16 Figure 2.6)

- This is the large red button located in the middle of the Remote
- To power OFF the remote, depress the button. The button will lock in the depressed position and the transmitter will power OFF.
- The button must be released before the remote can be switched on.
- Rotate the button clockwise to release it to its normal position



Drive Direction Switch (No. 17 Figure 2.6)

- This is a three-position switch that can be set to neutral, forward or reverse
- To select neutral set the switch in the central position
- To select forward push the switch to the right
- To select reverse, pull the switch to the left



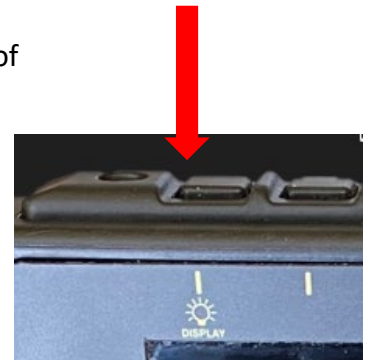
Always return the lever to the neutral position when the SC is not moving

Horn (No. 21 Figure 2.6)

- The Horn button is located on the Right-hand side of the remote
- Press this button to activate the horn of the SC

**Lights** (No. 5 Figure 2.6)

- The button to operate the lights on the SC is the 1st button on the Left of the Screen Navigation buttons on the top of the remote
- Press the button one time for all lights on the SC to turn on
- Press the button a second time for just the work lights on the SC to turn on
- Press the button a third time to turn off all lights on the SC



2.12 SC Start up Procedure

The SC can be started one of two ways. The first way to start the SC is by using the dash panel on the SC.

The image below shows the display screen, Engine start button and Ignition Switch.

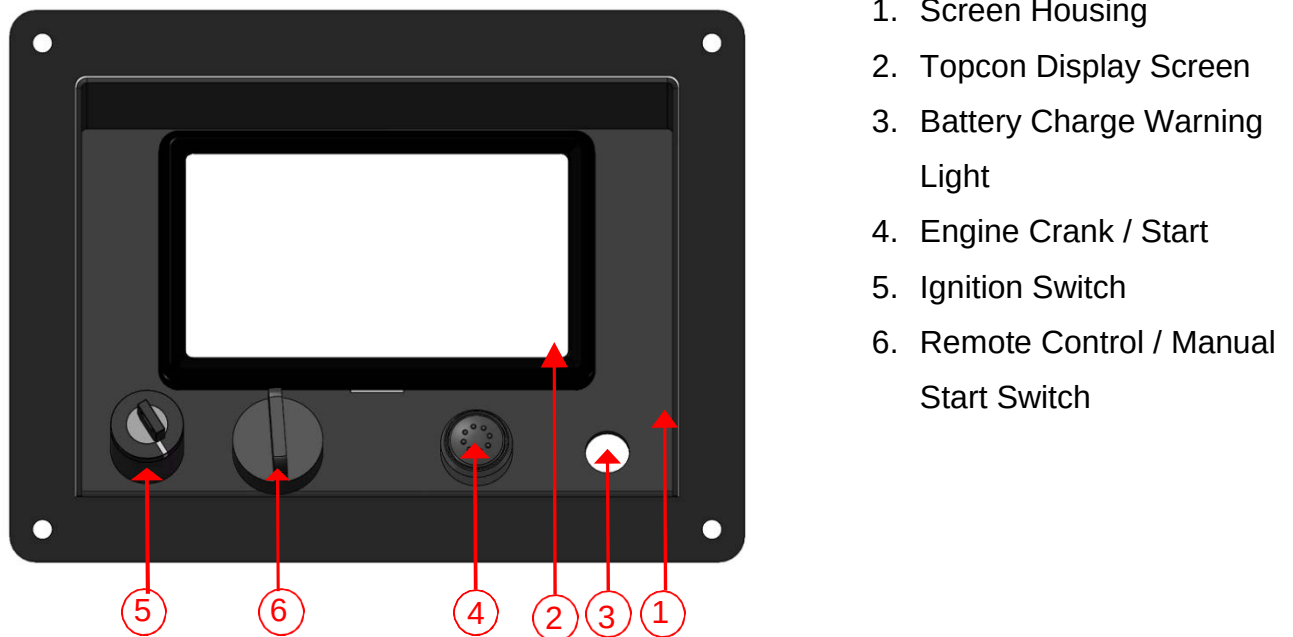


FIGURE 2.12 - TOPCON & DASH DISPLAY

- First turn on the ignition switch
- Turn the Remote/Manual start switch to the manual position
- Press and Hold the Engine Crank Button until the Engine starts running

To stop the machine, turn the ignition switch off

The second method of starting the SC is by using the Remote Control:

- First turn of the ignition switch
- Turn the Remote/Manual start switch to the remote position
- Release the emergency stop/remote off button on the remote control.
- Push the remote power on button on the left-hand side of the remote to turn on the remote.

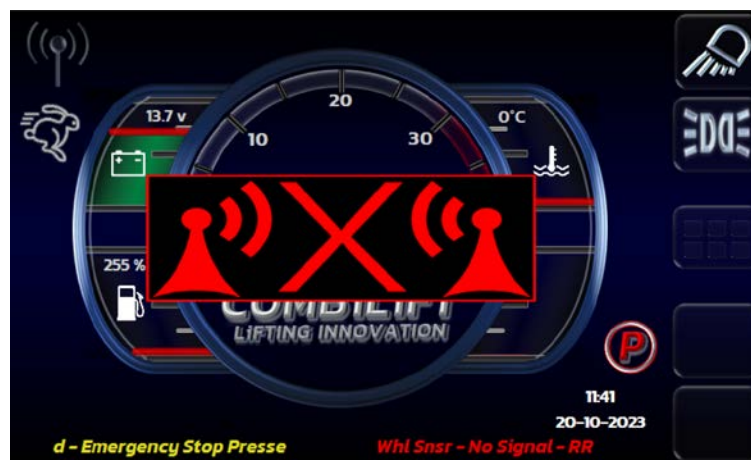


FIGURE 2.7.1 - IFM DISPLAY

- The screen shown in the image above shows that the remote is on but is not connected to the SC. Push the remote power on button again to link the remote to the SC.
 - Ensure the drive direction switch is in neutral and the park brake is on.
 - Push the ignition switch to the on position
 - Press and Hold the Engine Crank Button until the Engine starts running
- To stop the machine and turn off the remote press the emergency stop/remote off button on the remote

When the remote is not in use it must be stored in the remote-control box on the engine side of the SC.

2.13 Operating the Combilift with Optional Dual Drive

When the operator is sitting in the cabin, the remote control will not function. This is due to a pressure switch on the operator seat. This ensures that when the machine is being operated by a Combilift trained driver, no other drivers can operate the machine via remote.

To operate the machine remotely, the machine must first be turned on inside the operator's cabin. Once the machine is running, the remote controls are the same as those described in section 2.11.

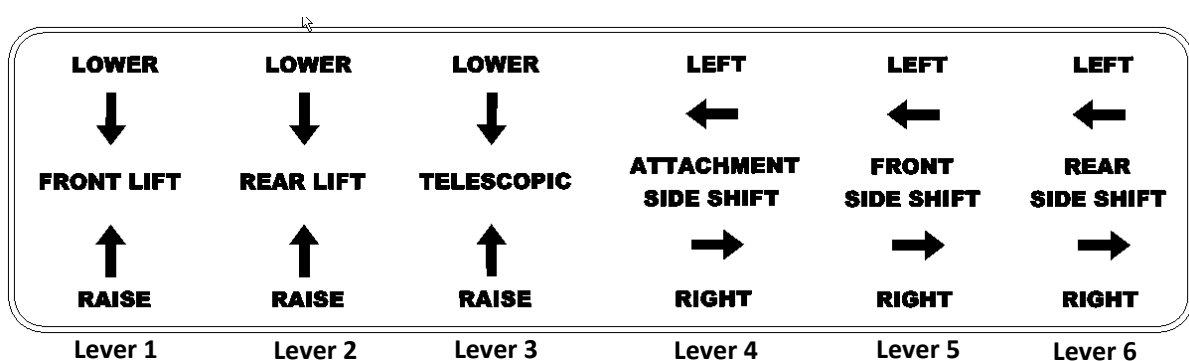
2.14 Dual Drive Operator Controls (Cabin)

These controls will vary depending on the machines design and the number of functions in which the attachment has. For more specific controls on your truck's attachment, please see the attachment manual that is supplied alongside this manual. If an attachment manual was not supplied, contact a Combilift dealer and one will be issued.

When a machine is fitted with Dual drive, the cabin controls will be different to a standard truck. See images below for the location of the paddle switches (circled in red) and descriptions on each levers function.



FIGURE 2.8 – DUAL DRIVE LEVERS



2.15 Crash Barriers (If fitted)

The SC Swivels have been fitted with crash barriers. They are designed to stop damage to the SC and to people who may come into contact with the SC. Drive will cutout if an obstacle is detected and the barrier is pushed in. Machine will not start until crash barrier sensor has been reset. Reset the sensor by pulling the crash barrier back out to its original position so the sensor cannot see the barrier.

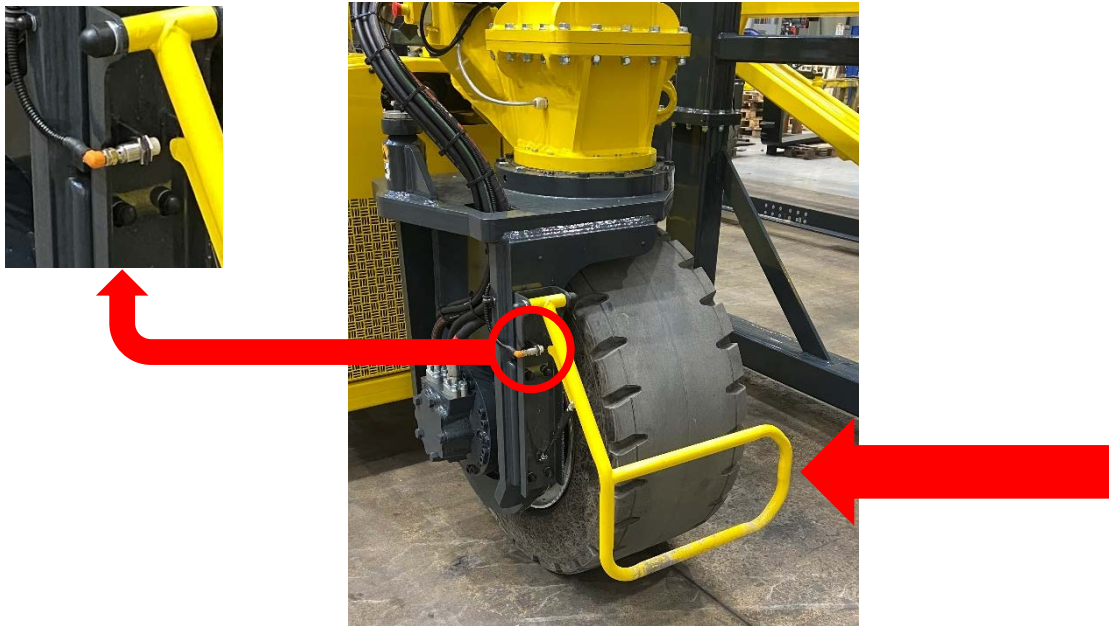


FIGURE 2.8 – CRASH BARRIERS

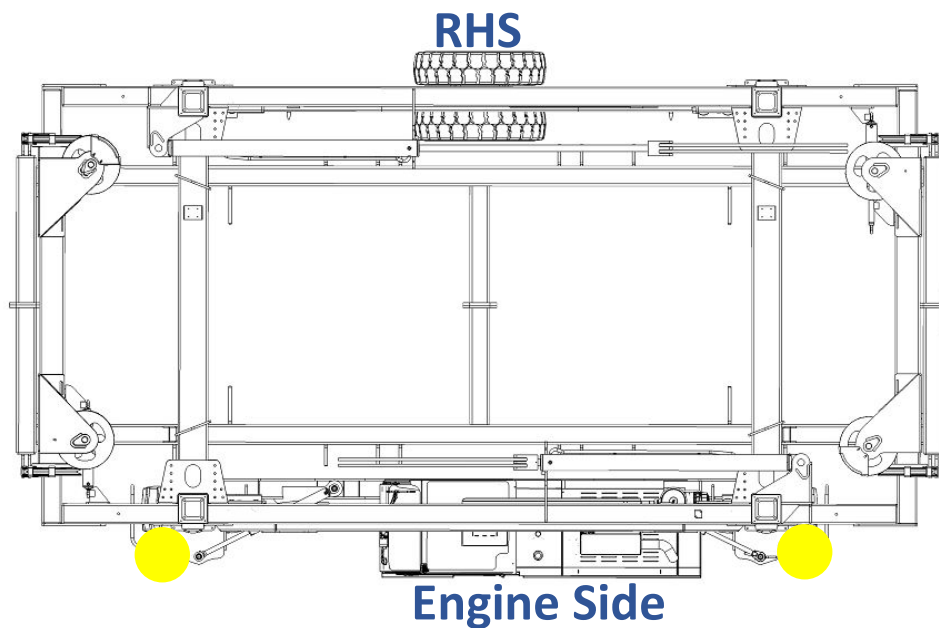


FIGURE 2.8.1 – CRASH BARRIERS LOCATION MARKED WITH YELLOW DOTS

2.16 Fixed Crash Barriers (If fitted)

The SC Swivels have been fitted with fixed crash barriers. They are designed to stop damage to the SC and to people who may come into contact with the SC.



FIGURE 2.8 – FIXED CRASH BARRIERS

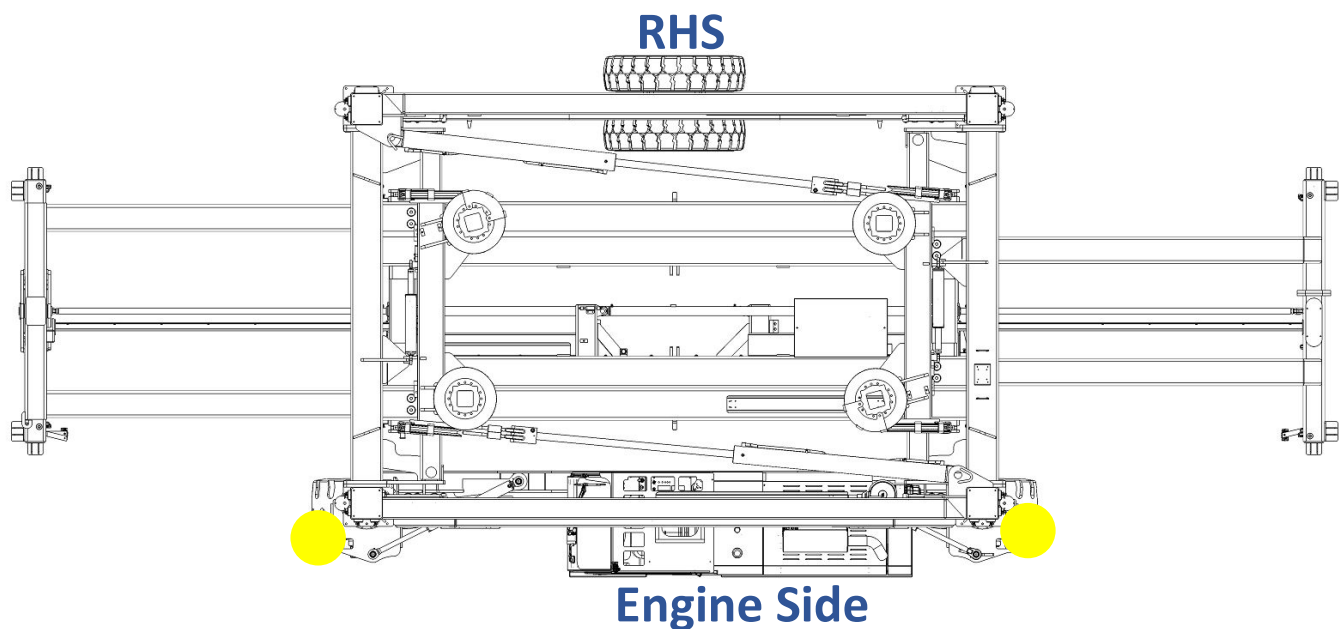
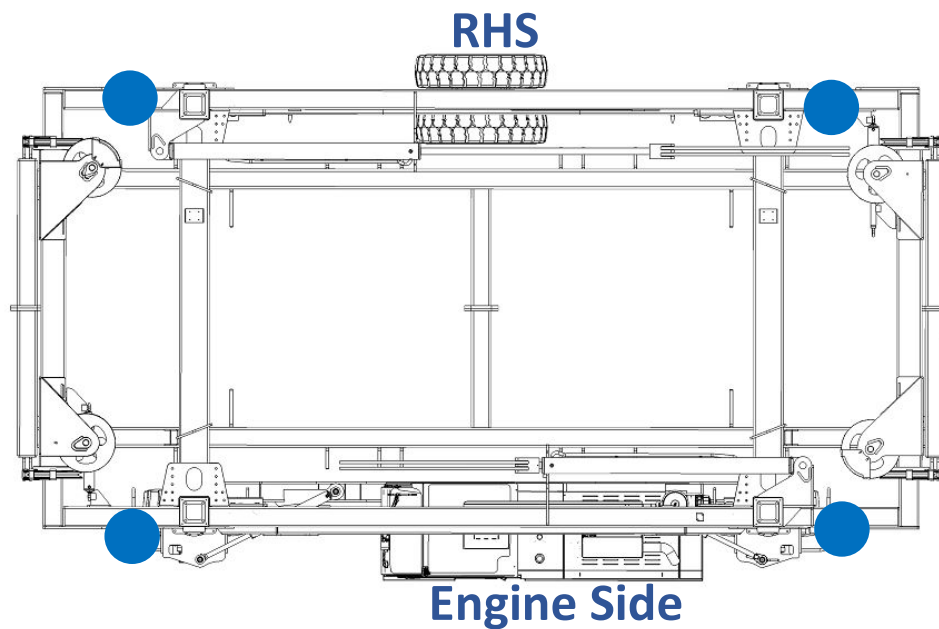


FIGURE 2.8.2 – CRASH BARRIERS LOCATION MARKED WITH YELLOW DOTS

2.17 Blue Spot Light (If fitted)

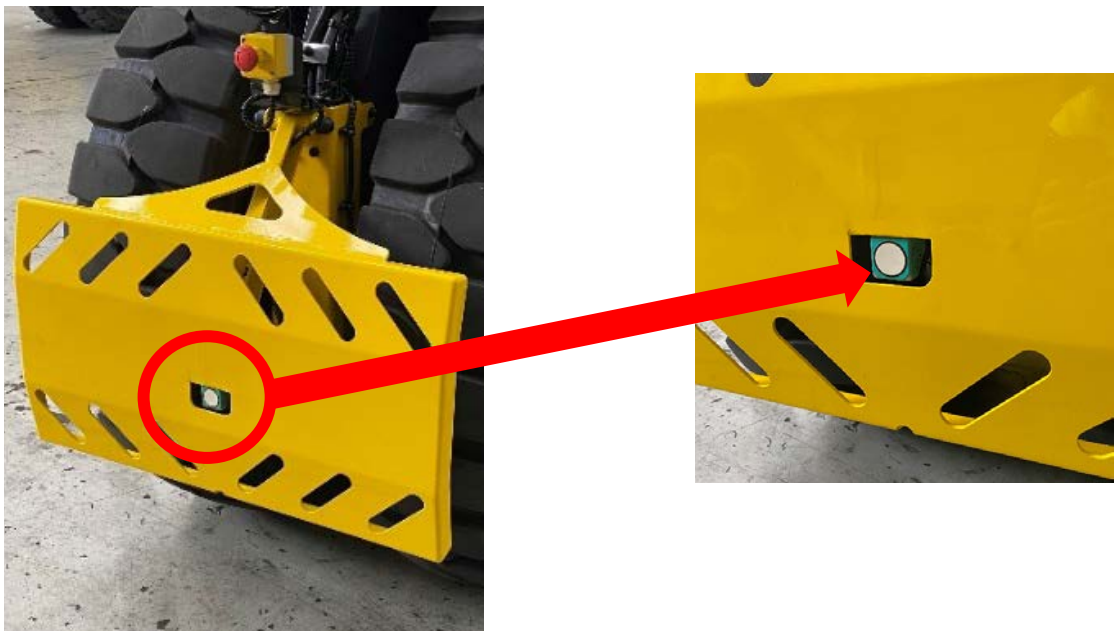
A blue directional light is also fitted above each Crash Barrier to indicate which direction the SC is travelling. It shines out on the ground ahead of the SC to warn people that the SC is oncoming.

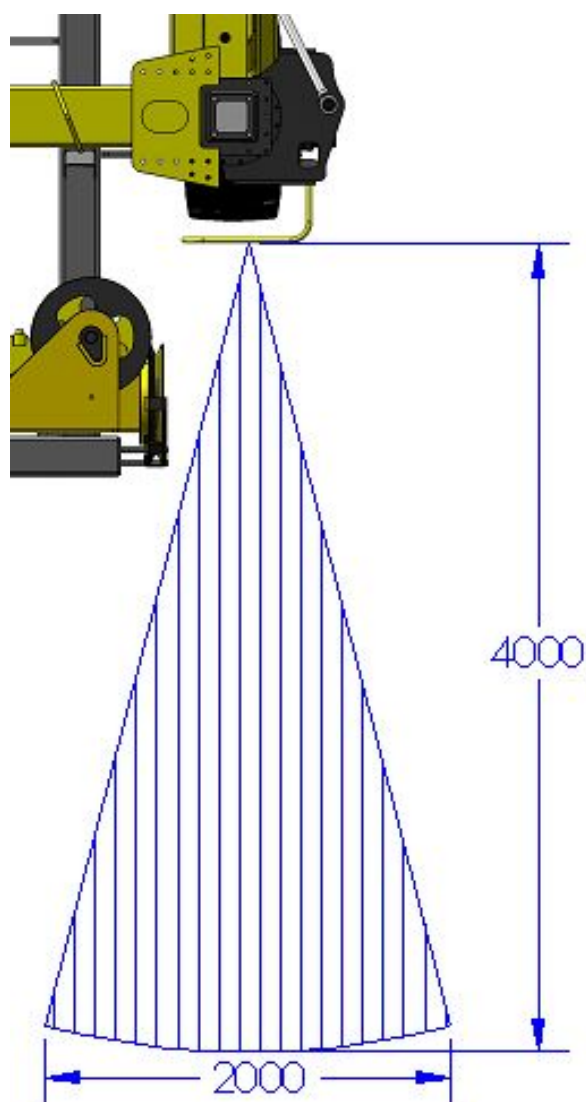
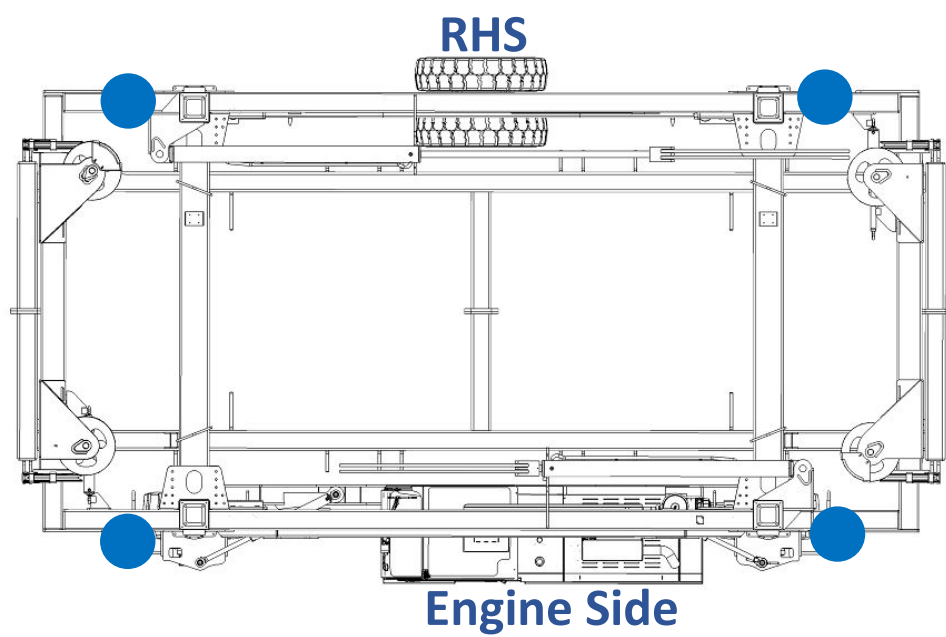


2.18 Ultrasonic Sensors (If fitted)

The SC is fitted with Ultrasonic sensors. The Ultrasonic sensors reduce the risk of injury to people around the SC and also reduce the risk of damaging the SC by alerting the operator when the SC is coming close to an object. This object may be a pedestrian or some debris in the yard or the corner of a building or a gateway. When the sensors pick up the object the SC will start a slow intermittent beeping noise. The closer the SC comes to the object the faster the beeping noise will become. The operator can see how close the SC is to the object by looking at the screen of the remote. When forward drive is selected on the SC the front ultrasonic sensors are active, when reverse drive is selected the rear ultrasonic sensors are activated

NB: some machines can be fitted without alarms and will only have the distances



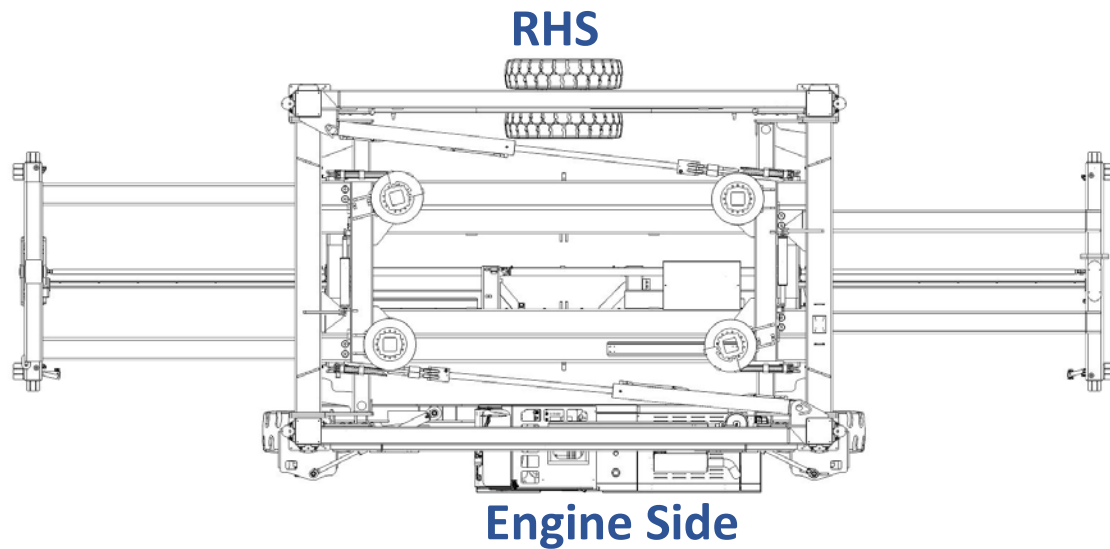


2.19 Diff Lock System (If fitted)

A Diff Lock system has been fitted to the SC. This system was designed to help the SC when driving in poor ground conditions and avoid the wheels skidding and the SC becoming stuck.

There are four buttons located above the engine bay, one button for each wheel labelled 1 – 4 as shown in Fig. 2.15 below

See Section 3.7 on how to use the Diff Lock System.



2.20 Hydraulic Weighing System (If fitted)

The SC is fitted with a hydraulic weighing system that is used by the operator to measure the weight of the loads being lifted by the SC. The Screen for the Weigh System is located below the dash on the engine side of the SC. An image of the display as well as an explanation of the function of all the buttons can be found in the image below.

Weighing Procedure:

If the indicator is turned off:

1 Turn on the indicator:

Press the **ON/OFF** button. A 0-calibration is automatically required

2 Zero Calibration:

Lift the empty lifting unit to a fixed lifting point.

3 Wait until the "STABLE" symbol is stabilized. Ignore if it does not stabilize after 5-10 seconds.

4 Press the **>0<** key and the lifting unit automatically lowers for 5 seconds

5 "0kg" is displayed and the 0-calibration is done

Weighing a load:

1 Lift the load to a fixed weighing position

2 Wait until the "STABLE" symbol is stabilized. (wait 10 seconds)

3 Press the **WEIGHING ACTIVATOR** key

4 The load lowers automatically for 5 seconds and the display shows the weighing result



KEY	FUNCTION	SHORT PRESS	LONG PRESS
ON/OFF	ON/OFF	Turn on the indicator.	Switch off the indicator.
SETTINGS	SETTINGS PROTECTED SETTINGS	Direct access to the Settings.	Long hold both the SETTINGS and G/N keys will give direct access to the Protected settings.
PRINT	PRINT STORE GROUP WEIGHINGS DELETE GROUP WEIGHINGS	Generate a print of the latest displayed weighing or the Accumulated weighings.	- Store each weighing in the Group memory. - Hold the PRINT key and the >0< key to delete the weighings in a selected Group.
ACC	ACCUMULATE LEFT ESCAPE	- Add up the current weighing result with the previously accumulated weighing result(s). Use in the Settings: - Moves to the next number to the left. - Escape from the Settings/Protected settings.	Cancel a setting.
TARE	TARE SCROLL	Temporary zero the scale (i.e., the weight of a container before starting a filling process) or taring the pallet weight from the gross weight. Use in the Settings: - Increases the numbers. - Scrolls forwards in the Settings/Protected settings.	
>0<	RESET TO ZERO DECREASE DELETE GROUP WEIGHINGS	Zero calibrating the weighing system (i.e., necessary with temperature changes or similar, which could cause small zero-point changes). Use in the Settings: - Decreases the numbers. - Scrolls back in the Settings/Protected settings.	Hold the PRINT key and the >0< key to delete the weighings in a selected Group.
G/N	GROSS/NET ENT PROTECTED SETTINGS	Switches alternatively between the gross and net weight (on the condition that the tare value has been selected using the TARE key). Use in the Settings: Works as ENTER key to save a registered parameter in the Settings/Protected settings.	Long hold both the SETTINGS and G/N keys will give direct access to the Protected settings.
PIECE COUNTING	PIECE COUNTING PRINT GROUP WEIGHINGS	The PIECE COUNTING key is used to store the unit weight during the piece counting procedure.	Printing of Group weighings.
WEIGHING ACTIVATOR	WEIGHING ACTIVATOR	The Weighing activator button is used to activate a weighing on the Hydraulic weighing system WeighMatic.	

Safe Operation & Load Handling

At the end of this section, you will know and be able to explain:

- The rules of the road for operating an SC
- The correct procedure for operating in close proximity to pedestrians
- The correct procedure for operating on ramps and other sloped surfaces
- The correct procedure for parking your SC
- The correct procedures for lifting, travelling with and depositing loads
- The correct procedure to travel without a load
- This section will cover everything you need to know about how to operate the SC safely and efficiently
- Everything that will be explained are to be followed unless company rules/site regulations state otherwise

3.1 Safe Operation of an SC

- NEVER reach into any moving parts of the SC
- Only use the SC in its designated areas
- Always drive with an unobstructed view.
- Only operate your SC at a safe speed and be aware of company rules on SC operation.
- Avoid sudden movements. Brake, accelerate and change directions slowly and smoothly.
- Always be aware of overhead obstructions
- Always use the correct protective equipment when operating in confined or enclosed areas.
 - Ear protection
 - Safety glasses
 - Safety shoes/boots
 - Safety helmet
 - Hi-visibility clothing
 - Gloves



- It is recommended to use your horn to make people around the area of the SC aware that the SC is moving. The horn should be used when:
 - At Junctions
 - At Door openings
 - At Blind corners
 - At Ramp openings
 - Near pedestrians
 - Near other vehicles
 - When reversing
- When travelling, always secure the load via tag lines between designated tie down points and the product – see list of components.
- When travelling, always drive with the CoG as low as possible.
- Slow down for rough or uneven terrain
- When loaded, never change the directional control lever while the SC is moving
- Never drive over debris. Either remove the debris before continuing or mark off the area with hazard warnings if it cannot be moved.
- Only cross railway tracks at an angle of 45 degrees. Drive over a railway slowly and carefully to reduce the impact of driving over the uneven surface on the SC and the load the SC is carrying
- Always maintain a safe distance from the side of any docks.
- Always make sure that the operating surface or floor can safely support the SC and its load.
- When transporting hazardous material:
 - Always refer to the Material Safety and Data Sheets
 - Know the procedure for handling the material
 - Always wear the correct protective clothing and
 - Know the procedure for cleaning any spills
 - Know what medical action is required, should you become exposed to the material
- Never raise anyone on the ropes of the SC at any time, this applies to operators, service personnel and anyone else who may come into contact with the SC.



Warning



NEVER stand under the load of the Combilift under any circumstances



Warning

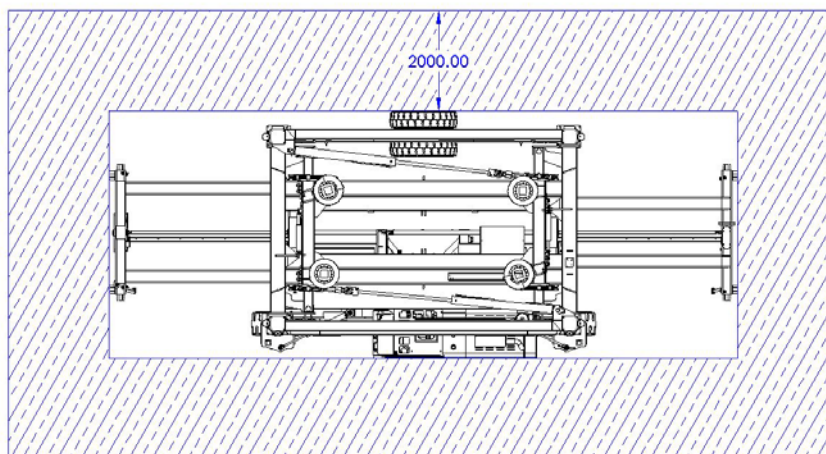
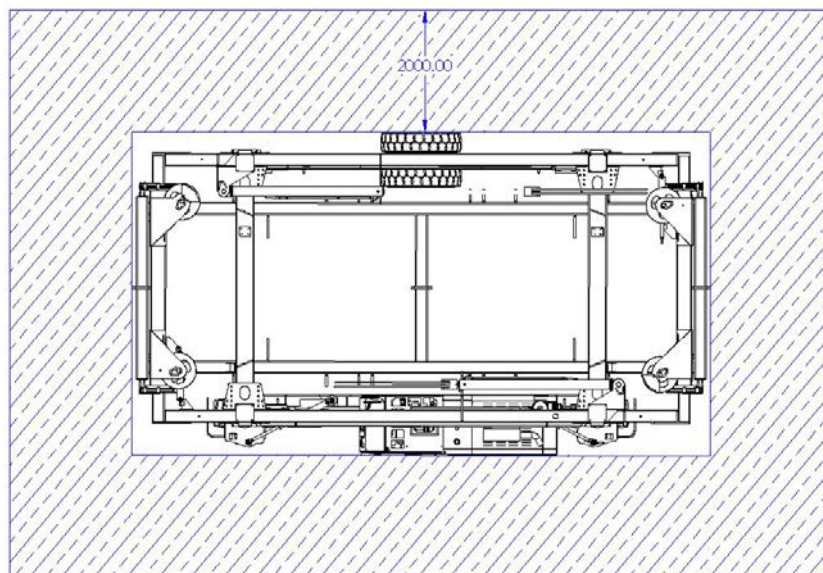


- The SC should only be used for its designated purpose and in accordance with manufacturer's instructions.
- Personnel should NOT ride on the SC or place themselves in, under, or directly adjacent to the lifting area.
- The load should be evenly balanced to ensure that excessive point loading does not occur.
- All lifting should be done in a smooth controlled manner to minimize shock to the SC and load.

2.2 Safe Operation around Pedestrians

All Operators must follow these guidelines unless company rules/site regulations state otherwise

- When working in close proximity to pedestrians always give pedestrians the right of way
- If you are in the middle of a task, finish the task, and only signal the pedestrian to continue to pass once you are finished. Ensure that the pedestrian is completely out of the way before continuing to your next task.
- If you are passing a pedestrian, establish eye contact with them and stay clear of them.
- Never allow a pedestrian to ride on your SC.
- Never allow a pedestrian to pass underneath the elevated portion of the SC.
- Keep pedestrians away from your SC.



Emergency Stop Buttons

The SC is fitted with several Emergency Stop Buttons for both the operators and other personal's safety. If the emergency stop button is pressed the SC will stop and the engine will cut out. For the SC to be turned back on the Emergency Stop Button must be released first.

One Emergency Stop Button is located on the remote of the SC. There are also four Emergency Stop Buttons on each corner of the SC on the crash barriers of the SC.

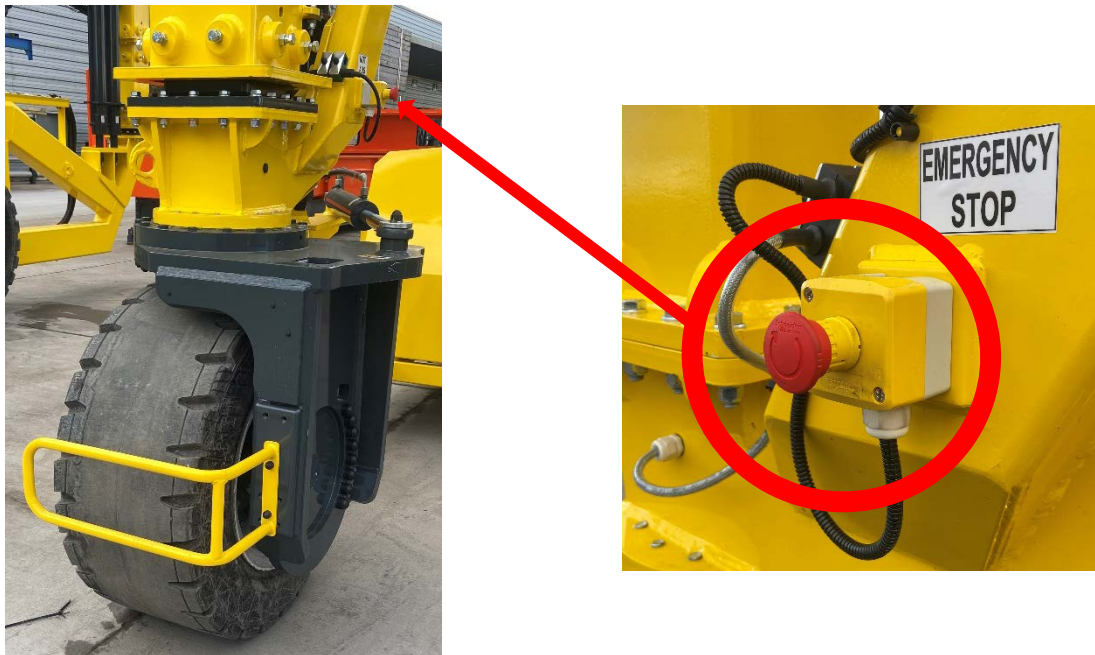


FIGURE 3.3 - EMERGENCY STOP BUTTON ON THE SC

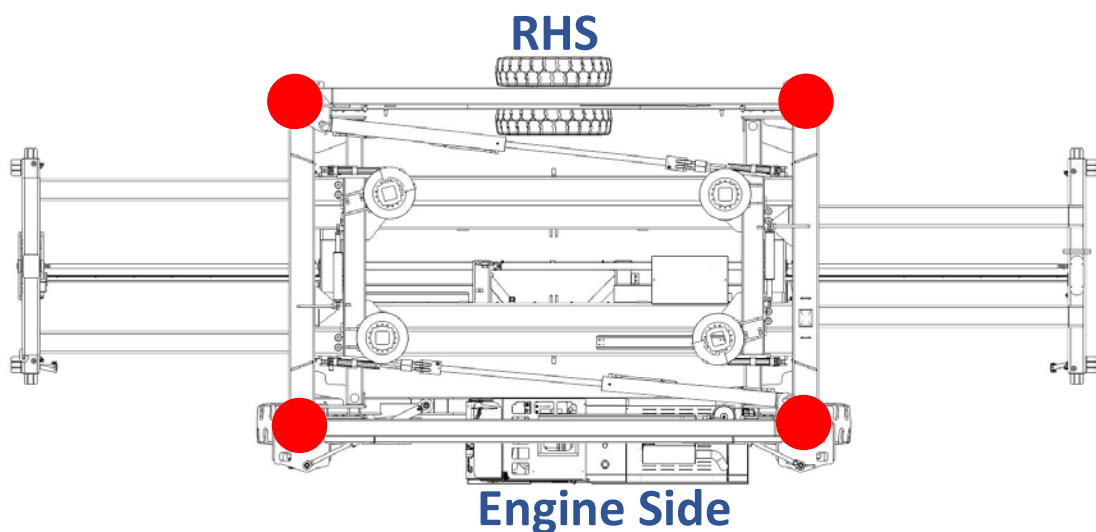
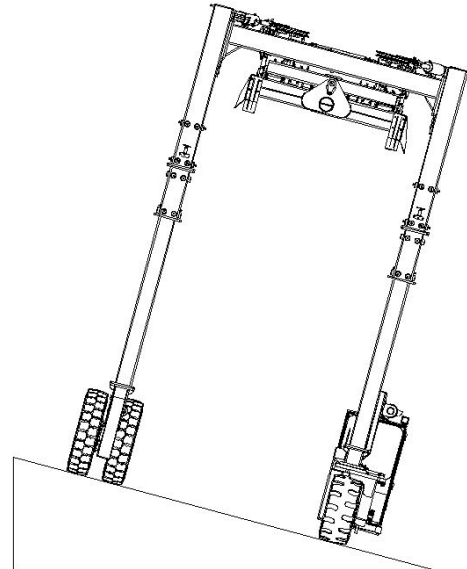
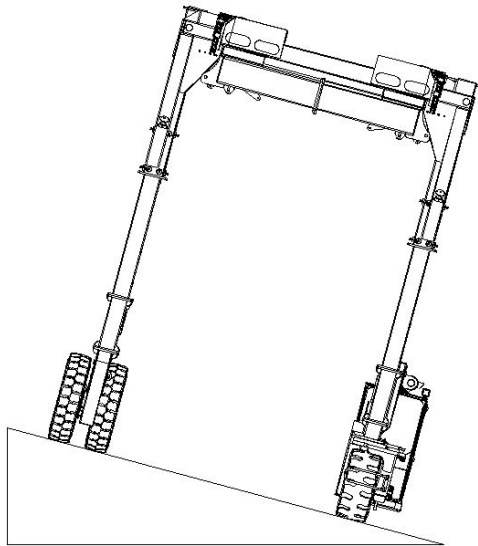


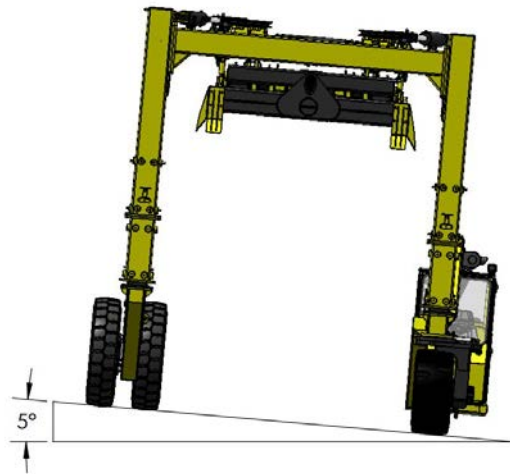
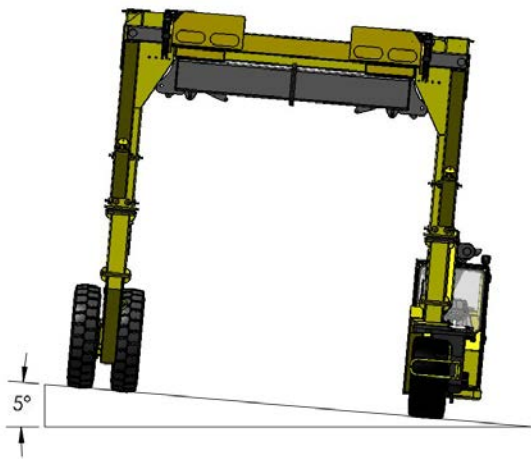
FIGURE 3.3.1 – RED DOTS SHOWING EMERGENCY STOP BUTTON LOCATIONS ON THE SC

2.3 Safe Operation on Inclines

- The SC can operate on slopes / ramps / inclines of up to but no more than 5°
- NEVER attempt to turn on a ramp
- The SC can drive straight up and down a ramp



- The SC can drive left and right on a ramp when the SC is facing straight up the ramp and the SC is in 90-degree mode



- Driving sideways on a ramp with the load raised too high may cause the SC to tip over
- The telescopic should always be as low as possible when driving on a ramp or an incline

2.4 *Parking the SC*

There are two recommended methods for parking your Combilift. One is called the Attended parking method, for cases where the operator needs to stop using machine but will be no more than 8 meters away. The other is the Unattended parking method, for cases where the operator must stop using machine but will be further than 8 meters away.

The Attended Parking Procedure

- Bring machine to a complete stop.
- Once stopped, apply the parking brake and set the directional control lever to the neutral position.
- If loaded, rest the load on the ground.
- Leave the machine turned on.
- Stay within 8 Meters of the machine at all times.
- NEVER leave Combilift unattended when engine is running.

The Unattended Parking Procedure

- Bring machine to a complete stop.
- Once stopped, apply the parking brake and set the directional control lever to the neutral position.
- If loaded, rest the load on the ground.
- Turn off the machine.
- Remove key from ignition and from the Combilift.
- Apply a wedge to the wheels if on an incline

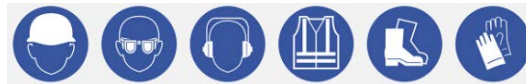


Warning



DO NOT leave the Combilift unattended with a load at any time.

2.5 Handling Loads – Lifting, Travelling & Depositing



There are a number of steps that need to be taken in order to safely move a load from one position to another with the minimal amount of risk.

Step 1: Assess the Load – Examine the load for the following:

- Is the load damaged or broken?
 - Are there any straps around the load that are Frayed or broken?
 - Is the load poorly balanced? Does it have excess weight to one side?
 - Is the load the correct weight? If unsure, have it weighed.
- If anything is wrong with the load, do not lift it, contact the supervisor/manager

Step 2: Lifting a Load:

- Drive the SC over the load to be lifted
- Position the SC as close as Possible to the centre of the load, please see Section 1.7 – Centre of Gravity.
- Lower the attachment of the SC down until it is less than 500mm away from the load, using the Lift/Lower Levers on the remote.
- Secure the load to the SC by connecting the straps/slides to the lift points on the attachment
- Lift the load off the ground and lift the attachment until it is fully raised and is secured against the crossmember.
- Check the stability of the load on the SC (e.g., wait 2 mins until load stabilizes) before moving off

 Warning

It is imperative to stop operating the lift function as soon as the load/container comes into contact with the upper frame of the Straddle Carrier. Excessive compressing of the load against the upper frame may cause damage to the load/container.

 Warning

Take care when handling refrigerated (reefer) containers. These containers are not as strong as traditional containers and can be damaged by compressing against the upper frame of the straddle.

Reefer containers must not be brought into contact with the upper frame of the straddle.

Note:

In cases where it is not possible to compress the load against the upper frame, the operator must take adequate precautions to prevent the load from swinging.

Swinging can cause damage to the load and/or truck and cause the truck to become unstable. Precautions may include driving slowly and smoothly, avoiding any erratic movements. Extra care should be taken when turning corners and/or driving on uneven ground.

Step 3: Travelling with a Load:

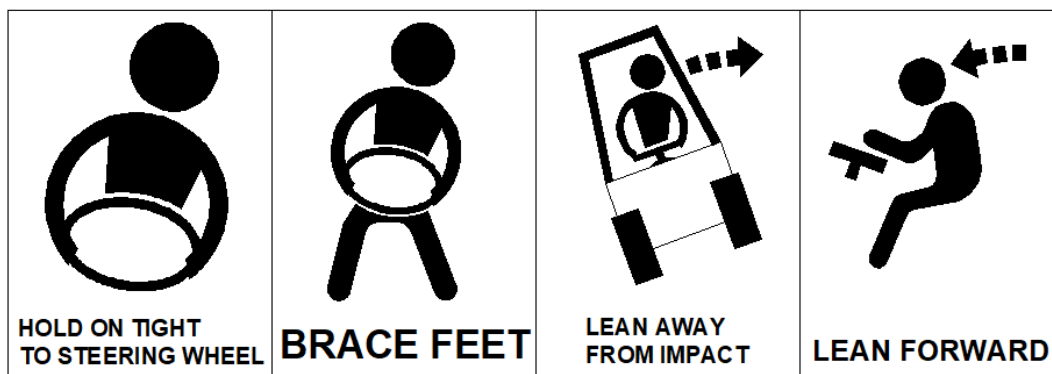
- Try to avoid sudden and erratic movements with the SC. Accelerate and brake as smoothly as possible.
- When approaching a junction or corner, slow down and proceed only when you are sure that your path is unobstructed. Remember to turn slowly.
- When handling loads containing a large amount of liquid, extra care must be taken while transporting the load. To keep the load centre of gravity in line with the SC centre of gravity, any sudden or erratic movements should be avoided where possible. Stopping suddenly should be avoided and extra stopping distance should be given when driving with a liquid load. The load should be raised fully and locked in position to avoid excess swinging.
- Extra care should be taken when driving on uneven ground such as gravel yards. Precautions may include driving slowly and smoothly and avoiding erratic movements.

Step 4: Placing a Load:

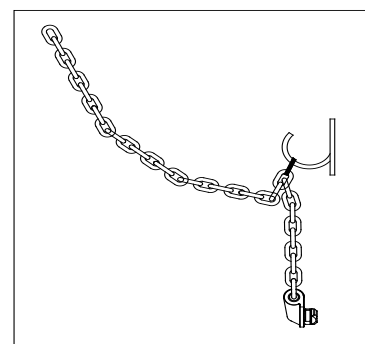
- Slow down and position the SC squarely alongside where you wish to place the load, stop as close to the centre of the placement area as possible
- Lower the attachment of the SC and place the load on the ground.
- Remove and straps/slings from the lift points of the attachment
- Fully raise the attachment and drive the SC away from the load

Step 4: Tip Over Procedure:

- When operating a Combilift or any industrial vehicle, always wear the safety belt
- Should a tip over occur, DO NOT jump from the truck. Stay in the cabin.
- Hold on tight to the steering wheel.
- Brace your feet on the floor.
- Lean forward and away from the impact.

**Step 5: Travelling without a Load:**

- Try to avoid sudden and erratic movements with the machine. Accelerate and brake as smoothly as possible.
- When approaching a junction or corner, slow down and proceed only when you are sure that your path is unobstructed. Remember to turn slowly.
- On all SCs, regardless of attachment type, chains should always be securely fastened when not in use so they are not swinging. Swinging chains can cause serious mechanical damage to the machine and serious injury to personnel. See below example of how chains should be secured to the tie down points.



2.6 Travelling in Telescopic mode (OPTIONAL)

- When in cabin Telescopic Indicator is constantly flashing this is to warn the operator that the Combilift has exceeded a height of 4.8M / 15ft 7in.
- The operator must ensure that the Combilift does not come into contact with overhead power lines, low ceilings or other structures.

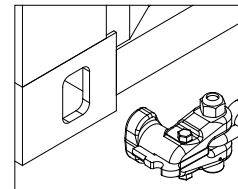
2.7 Container Lifting Lugs

The container lifting lugs supplied as standard with the machine have been designed specifically for lifting containers with standard ISO corner castings only.

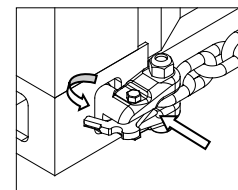
Inserting/Removing the Lifting Lugs

The lifting lugs must be inserted into the **bottom** corner castings on the container in accordance with the following procedure:

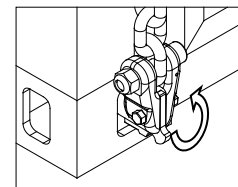
- .2 Align the lifting lug with the ISO corner casting



- .3 Pull the spring-loaded latch pin back and insert the lifting lug into the corner casting until it can be rotated in the casting.



- .4 Rotate the lifting lug 90° in the corner casting. The latch pin will spring back into its normal position preventing the lug from coming out of the corner casting.



- .5 Reverse the above procedure to remove the lifting lugs from the container corner castings. Hook the chains up before moving off.

 Warning

The lift truck MUST ONLY be used in accordance with the following safety points:

- The lift truck should only be used for its designated purpose and in accordance with manufacturer's instructions.
- Personnel should NOT ride on the lift truck or place themselves in, under, or directly adjacent to the lifting area.
- A test lift should be conducted at low height to confirm lift function and load stability.
- The load should be evenly balanced to ensure that excessive point loading does not occur.
- All lifting should be done in a smooth controlled manner to minimize shock to the lift truck and load.

2.8 Engine Break in Service

The engine is ready for normal operation. However, extra care during the first 100 hours of operation will result in more satisfactory long-term engine performance and life.

Operate the engine at heavy loads with minimal idling during the break in period. If the engine has significant operating time at idle, constant speeds, and/or light load usage, or makeup oil is required in the first 100-hour period, a longer break in period may be required. In these situations, an additional 100-hour break in period is recommended using a new change of John Deere ENGINE BREAK IN OIL and a new John Deere oil filter. For further details please see the engine manual that was supplied with this truck.

3. The Pre-Operational Inspection

At the end of this section, you will know how and be able to explain:

- The importance of the pre-operational inspection
- How to perform a pre-operational inspection

4.1 *Why are Pre-Operational Checks Needed?*

Pre-operational inspections are an ESSENTIAL part of any SC operator's working day. Pre-operational checks only take a few minutes to perform and have significant benefits. The operator must perform the pre-operational checks at the start of each work day. The main benefits being that a pre-operational inspection:

- Reduces the risk of injury to the operator and other employees.
- Improves and maintains the condition of the SC.
- Increases productivity.
- Reduces Downtime and maintenance costs

Pre-operational checks can be performed and recorded on a checklist such as the one at the end of this section. These inspection sheets should be filled out at the beginning of every day, or in the case of a multiple shift system, at the beginning of each shift.

3.2 The Visual Inspection



The visual inspection is basically a walk round of the machine checking various points. The points to look at in this section are:

- Overall condition – Look for scrapes, dents, and other signs of damage. Watch for missing or loose nuts and bolts. Check underneath the machine for signs of leaking fuel, engine coolant, or oil.
- Tyres and wheels – Check that all the wheel nuts are present and tight. Look for cuts in the tyres or lumps of rubber missing from the tyre. If the rubber is badly damaged the tyre may need to be replaced. If the tyre fails it may rip off the rim causing damage to the SC.
- Check for foreign objects in the rubber. Also, look for Plastic straps, wire, and other debris caught between the wheel and the wheel motor.
- Note: Always wear gloves when checking the tyres to avoid injury on sharp pieces of debris.
- Check the overall condition of the lifting ropes for any wear or damage of any kind. If the ropes become frayed damaged or broken, they will need to be replaced.
- Check the steering chain for any wear or damage of any kind. If any links are damaged or broken, they should be replaced by a trained technician.
- Check the air intake piping for cracks or other damage.
- Check All the Fluid levels – i.e., Diesel, AdBlue, engine oil, coolant and hydraulic oil. Do not operate the SC if any of these fluid levels are below the minimum value reading.

Adding Diesel:

Diesel can be added to the SC by filling up the diesel tank on the engine bay of the SC.

The Diesel tank capacity is 130 litres.



Diesel Tank Filler Cap

3.3 The Operational Checks



This inspection ensures that all the functions of the SC are fully operational. To perform the checks, follow through the list of instructions below in order to safely check your SC.

- Listen – Listen to the machine for a few seconds before driving off. Be alert for any strange sounds or noises from the engine, pump or motor. Also, be on the lookout for any strange odours that may indicate a problem such as a very strong smell of burning.
- Check the hydraulic functions – After checking that there is adequate space and headroom, perform checks on all hydraulic functions. Fully extend and retract all functions making sure that the operation is smooth and controlled watch for any sticking. The operator of the SC should fully extend all hydraulic controls fully and hold for 3 seconds and retract fully and hold for 3 seconds each day to ensure synchronized use.
- Check the Brakes – Set the directional control lever (No. 17 Figure 2.4) to the neutral position and apply the Parking Brake (No. 15 Figure 2.4). Turn the Machine on. With the parking brake still applied, select forward on the directional control lever. Sound the horn, apply light pressure to the accelerator lever, and release the parking brake. The machine should start to move slowly forward. Depress the accelerator lever fully. The machine will stop. Then reapply the parking brake and the machine should not move.
- If the brake is not working do not operate the machine and report the fault to your supervisor. In the highly unlikely event of the brake not working, you can also stop the machine by turning off the engine. Make sure that you have adequate space to perform this test and that it is performed on a level surface.
- Check the Directional Control Lever (No. 17 Figure 2.4) – With the machine turned on and the parking brake applied, select forward mode. Sound the horn, apply light pressure to the accelerator, and release the parking brake. The machine should move forward. Release the accelerator lever to stop the machine. Sound the horn, select reverse on the directional control stick and apply light pressure to the accelerator lever. The machine should now travel backwards. Release the accelerator lever to stop the machine and apply the parking brake.
- Check the steering –With the machine turned on and the parking brake applied, apply light pressure to the accelerator, and turn the steering fully to the left or right. The steering should move easily in either direction, and not seem excessively stiff or loose.

- Check Rotation Cylinders (If fitted) – Fully rotate the rotation cylinders clockwise and counter clockwise. The rotation wire ropes should move easily in either direction, and not seem excessively stiff or loose.
- Check Tilt Function Cylinders – Fully rotate the Tilt Function cylinders clockwise and counter clockwise. The Tilt Function wire ropes should move easily in either direction, and not seem excessively stiff or loose.
- Synchronize the Hydraulic Cylinders – the hydraulic cylinders can be synchronized by fully extending and holding the lever for 3 seconds then fully retracting the cylinder and holding the lever for 3 seconds. This can be done with the telescopic cylinders, lift cylinders, rotation cylinders and side shift cylinders.
- Hydraulic Fluid Level – To check there is enough Hydraulic Fluid all telescopic, lift and side shift cylinders must be fully closed. If the hydraulic oil tank is being topped up and these cylinders are not fully closed it may cause the hydraulic oil to overflow once the operator starts using the SC
- Cleaning the SC – Ensure all ultrasonic sensors and proximity sensors on the crash barriers are free from dust and debris. Ensure the dash is clean and is visible to the operator. Ensure there is no dirt or debris on the remote so no levers or buttons get damaged during operation.

On completion of the inspection:

- Report any defect immediately to the supervisor / appropriate person
- Never operate an SC that is in need of repair
- Repairs should only be performed by authorized personnel.

A sample of the daily inspection sheet is shown on page 69 and can also be downloaded from our website, www.combilift.com in the dealer logon area. If you do not have access, please speak to your local Combilift dealer.

3.4 Daily Maintenance Plan



As part of the daily maintenance plan the following should be checked every day and marked off on the Operators Daily Inspection Sheet at the end of this section. If any part of the maintenance plan is not OK and something needs repair, Do Not operate the SC, instead contact your supervisor immediately.

- **Damage** – there are no parts of the machine bent, damaged or broken
- **Leaks** – no leaks from and tanks, valves, fitting or hoses
- **Tyres** – no chunks missing or wheel nuts loose
- **Ropes/Chains/Shackles/Lifting Lugs** – nothing damaged or no signs of wear or cracking
- **Engine** – No unusual smells, belts tight and in good condition
- **Engine Oil Level** – No signs of damage or leaking
- **Coolant Level** – in acceptable range
- **Hydraulic Oil Level** – in acceptable range
- **Radiator & Oil Cooler** – no buildup of leaves, dust or debris
- **Hoses** – in good condition, no signs of wear
- **Fuel Tank** – no signs of damage or leaking
- **Check Fuel Filter Water Trap** – drain water/debris as necessary
- **Safety Equipment** – check horn and reversing beeper
- **Engine** – starts and runs OK, no unusual noises
- **Travel** – no unusual noises and smooth changes of directions
- **Steering** – no excessive play or restriction in any steering modes
- **Parking Brake** – Functions and releases properly
- **Hydraulic Controls** – all functions working smoothly and correctly



Inspect the Combilift before each shift. Should the Combilift be found to require servicing or if during the operation the Combilift malfunctions or becomes unsafe, stop the truck and report the situation immediately to the designated authority. DO NOT operate the Combilift or attempt to service it. Servicing is only to be conducted by a qualified technician.

Mark the Appropriate Box with **X** ☐ OK ☐ Machine OK ☐ Service Required

		Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Visual Checks	Damage Bent, Dented or Broken Parts	OK	OK	OK	OK	OK	OK	OK
	Leaks Tank, Valves, Fittings, Hoses	OK	OK	OK	OK	OK	OK	OK
	Tyres Chunks missing, Loose wheel nuts	OK	OK	OK	OK	OK	OK	OK
	Rope/ Chains/ Shackles/ Lifting lugs Damage, Signs of wear cracking	OK	OK	OK	OK	OK	OK	OK
	Engine Smell, Belts tight and in good condition	OK	OK	OK	OK	OK	OK	OK
	Engine Oil level Signs of damage or leaking	OK	OK	OK	OK	OK	OK	OK
	Coolant Level Acceptable Range	OK	OK	OK	OK	OK	OK	OK
	Hydraulic Oil Level Acceptable Range	OK	OK	OK	OK	OK	OK	OK
	Radiator & Oil Cooler Build up of leaves, dust or debris	OK	OK	OK	OK	OK	OK	OK
	Hoses Good Condition, No signs of wear	OK	OK	OK	OK	OK	OK	OK
	Fuel Tank / LPG Cylinder Signs of damage or leaking	OK	OK	OK	OK	OK	OK	OK
	Check Fuel Filter/Water Trap Drain water/debris as necessary	OK	OK	OK	OK	OK	OK	OK
	Operational Checks	Safety Equipment Horn, Operator Restraint, Reversing Bleeper	OK	OK	OK	OK	OK	OK
Engine Starts and runs OK, no unusual noise		OK	OK	OK	OK	OK	OK	OK
Travel No unusual Noise, Smooth changes		OK	OK	OK	OK	OK	OK	OK
Steering No excessive play or restriction in either mode		OK	OK	OK	OK	OK	OK	OK
Inching Pedal Stops travel, smooth deceleration		OK	OK	OK	OK	OK	OK	OK
Parking Brake Functions and releases		OK	OK	OK	OK	OK	OK	OK
Hydraulic Controls Lift/lower, side shift-left/right, Aux. functions		OK	OK	OK	OK	OK	OK	OK
Hour Meter Reading								
Operator Initials								
Supervisors Initials								

4. Service Information

The service intervals are given in both operating hours (recorded on the lift truck meter) and in calendar time. Service the machine at the interval that occurs first. These intervals are based on normal operation of 8 hours per day. The time intervals must be decreased from the recommendations in the maintenance schedule for the following reasons:

- If the lift truck is used more than 8 hours per day.
- If the lift truck must work in dusty operating conditions.

Combilift trucks are built with quality components. The use of inferior spare parts can result in inadequate safety and poor reliability. Only use genuine approved parts.

4.2 Initial Service at 00 hours and Refer to Maintenance Schedule Thereafter

The initial service at is conducted to ensure that the Combilift is in optimum working condition and to increase the working life of components. To complete the Initial service, the following steps must be carried out by a Combilift certified maintenance technician.

- Change engine oil and oil filter.
- Replace fuel filter.
- Check automatic belt tensioner (John Deere/Deutz Engine).
- Check fan belt tension and adjust if required (Kubota engine).
- Check battery electrolyte level.
- Replace hydraulic suction filter.
- Replace hydraulic return filter
- Check hydraulic oil level.
- Check coolant level.
- Check machine for hydraulic, coolant and fuel leaks.
- Check air cleaner and replace if necessary.
- Check that all bolts and fittings are tight.
- Check all wheel nuts
- Check the radiator for leaks and debris build up.
- Grease all points indicated on Grease Point Chart
- Check lifting ropes/chains. Lubricate and adjust as required.

Notes:

See **Error! Reference source not found.** Grease Point Chart for the location of grease points.

All wheel nuts should be visually inspected daily and torqued every 250 hours:

M20 Wheel Nuts - **600Nm (442ft.lbs)**

M22 Wheel Nuts - **650Nm (480ft.lbs)**

4.3 Engine Oil and Filter (Deutz Engine)

The engine oil used in the Combilift should have the correct temperature range for the ambient temperature in which the machine is to be operating. Temperature affects the viscosity of the oil and therefore its lubricating properties. All Combilift trucks leave the factory with a special, high multi-grade oil in the engine and this can be used all year round except in very cold climates.

Recommended Engine Oil Specification:

Deutz	DQC III-10 LA / DQC IV-10LA	
Diesel:	SAE 15W40	-20°C to +30°C (-4°F to +86°F)
	SAE 10W30	Above -15°C (5°F)

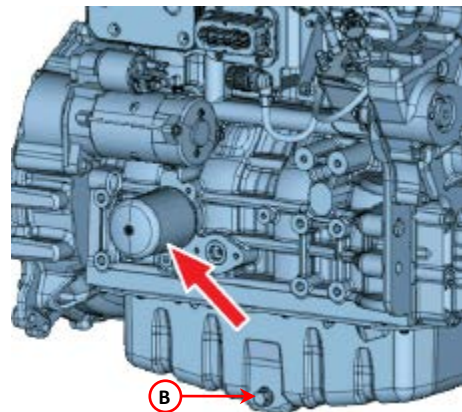
Viscosity classes are according to ambient temperature

A list of the DQC III-10 LA / DQC IV-10LA lubricating oils suitable for the Deutz engine can be downloaded from the internet at:

www.deutz.com – Service – Operating Liquids and Additives – Deutz Quality Class.

In order to change the oil and oil filter, the following steps should be taken:

- Park the truck on level ground.
- Run the engine to warm the oil (oil temperature >80°C) then shut off the engine.
- Open the LH bonnet in order to gain access to the engine oil filter and oil drain plug (B).
- Position a suitable container beneath the oil drain plug (B) (Container must be capable of holding 10 litres/10.5 quarts).
- Remove the drain plug (B) on the bottom of the engine and allow the system time to drain completely.
- Fit a new sealing ring to the oil drain plug and refit and tighten the oil drain plug (tightening torque 50Nm/37lbft), dispose of the used oil in a safe and responsible manner.

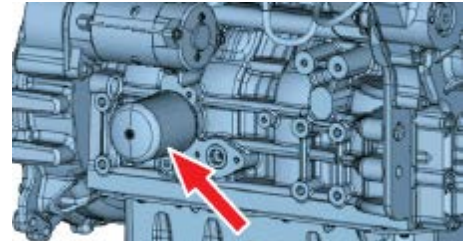


Note

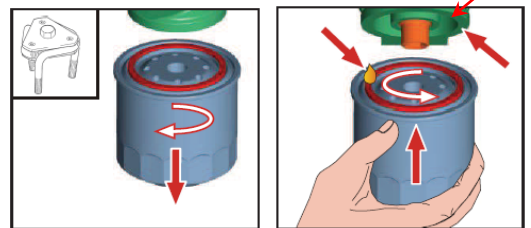
Do not pour fluids into the ground, down a drain or into a stream, pond or lake. Observe relevant environmental protection regulations when disposing of oil, coolant, fuel, electrolyte and other harmful waste.



- Remove the engine oil filter (A) located on the LH side of the engine using the cartridge removal tool (order number: FPD00034). Collect draining oil



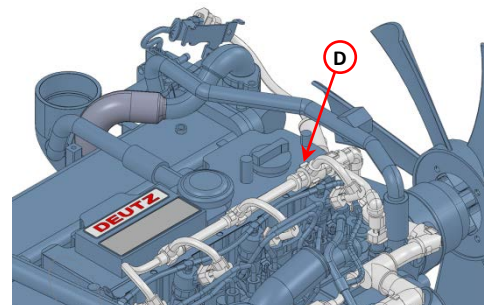
- Wipe the sealing surface (C) of the filter mount with a clean lint-free cloth.



- Lightly oil the gasket on the new oil filter cartridge.

- Install the new engine oil filter cartridge. **Tighten by hand until the gasket is touching the support. Then torque to 16Nm.**

- Fill the engine crankcase with the appropriate volume of recommended engine oil through the oil filler cap (D) on the valve cover.

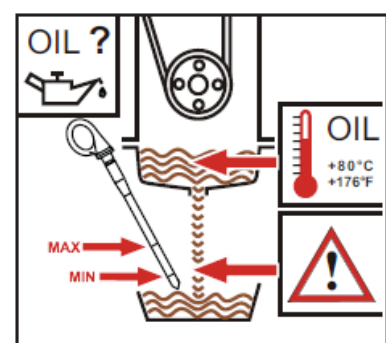


- The Volume of oil required is:

▪ **Deutz Engine: 8.0 litres / 8.45 quarts**

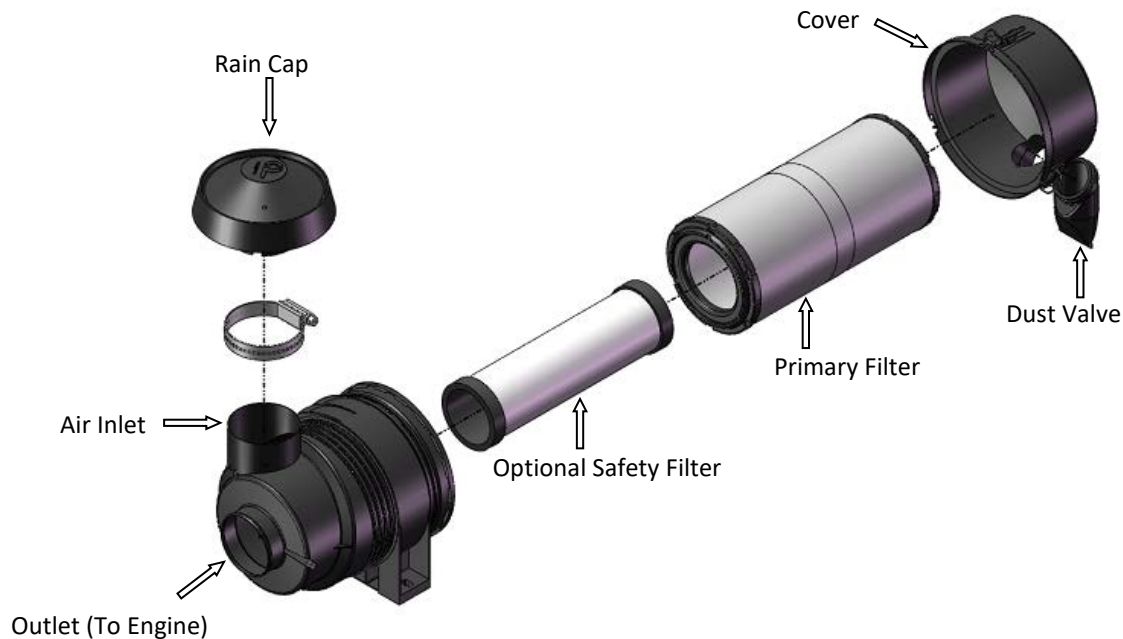
- Start the engine and run for 10 minutes. Stop the engine and check the oil level on the dipstick.
- Pull out the dipstick and wipe with a clean lint free cloth. Insert the dipstick as far as it will go.

- Extract the dipstick and ensure that the oil level is within the max and min marks on the dipstick. Top up to the max mark if necessary.



4.4 Air Filter

The air filter is located on the bonnet on the left-hand side of the truck behind the operator cabin. When replacing the outer cover, ensure that the dust valve is pointing downward. The filter must be maintained in accordance with the maintenance chart. (More frequent maintenance may be required if the truck is operating in high dust applications or environments).



In order to service the air filter, the following steps should be taken (with the engine shut off):

- Inspect all air intake hoses for cracks or other damage and repair replace as necessary. Inspect all connections and clamps. Any leaks here will admit dust directly to the engine.
- Clean out the dust valve. Visually inspect and squeeze the valve. Make sure it is flexible and not inverted, damaged or plugged.
- Unlatch and remove the cover. Remove the primary filter. Gently rock the filter back and forth to break the seal and rotate while pulling out. Avoid knocking it off the housing while removing.
- If the optional safety filter has been fitted visually check it in place for damage and check that it is properly seated. Do not remove the safety filter unless it is due for replacement. Change safety filters every three primary filter changes. DO NOT attempt to clean or reuse the safety filter. If changing use, a clean damp cloth to wipe the filter sealing surface and the inside of the outlet tube.
- Avoid leaving the outlet to the engine exposed for any period of time. Keep the outlet covered to avoid admitting dust to the engine.

- Inspect the old primary filter. Clean if possible or replace if necessary. If there is streak of dust on the clean side of the filter it must be replaced.
- Inspect the new filter for damage. Never install a damaged filter. Do not wipe the sealing area on the primary filter.
- Insert the new filter(s). If changing the safety filter at this service, seat it properly before installing the primary filter. Insert new filters carefully. Make sure filters are inserted completely into the housing. Press in by hand along the rim of the filter and not the flexible centre.
- Reinstall the cover ensuring that the dust valve is pointing down toward the ground. The cover should not come into contact with the filter before it is fully in place. If there is contact before the cover is fully in place the filter must be pushed in further before latching the cover.

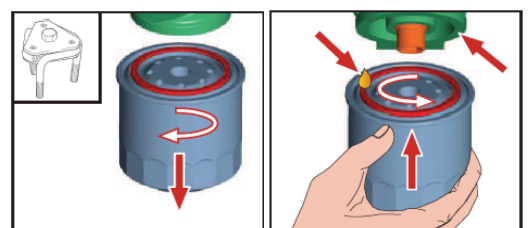
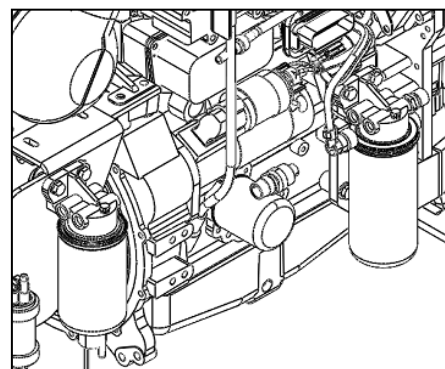
IMPORTANT: DO NOT use latches on cover to force filter into air cleaner. Using cover to force filter will damage cleaner housing.

4.5 Fuel Filter Elements (Deutz Engine)

The primary fuel filter (A) and secondary fuel filter (B) are both located on the LH side of the engine. Both filters are to be replaced at 500-hour intervals in accordance with the maintenance schedule. The filters are accessed by opening the LH bonnet.

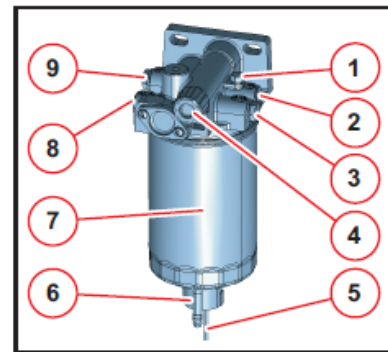
In order to replace the fuel filters, the following steps should be taken (with the engine shut off):

- Thoroughly clean the fuel filter assemblies and surrounding areas.
- Remove the secondary fuel filter (B) using the cartridge removal tool (order number: FPD00034). Collect draining fuel.
- Inspect filter mount and clean if necessary.
- Lightly oil the gasket on the new secondary fuel filter cartridge.



- Install the new filter cartridge. **Tighten by hand until the gasket is touching the support. Then torque to 11Nm.**

- Disconnect the electrical connection and loosen the drain plug (C) on the bottom of the primary filter and drain the fuel into a suitable container.
- Disassemble the old filter cartridge
- Inspect filter mount and clean if necessary.
- Wet the sealing surfaces of the new filter cartridge with fuel and screw onto the filter mount clockwise. Torque to 18Nm.
- Fit the drain plug. Torque to 1.6Nm. Connect the electrical connection.
- Bleed the system by opening the bleed screw (1) on top of the primary fuel filter.



Clean/change/vent the fuel pre-filter

Deutz Common Rail (DCR)

- 1 Venting screw
- 2 Fuel supply flow to the pump
- 3 Fuel return flow from the control block FCU (Fuel Control Unit)
- 4 Fuel pump
- 5 Electrical connection for water level sensor
- 6 Drain plug
- 7 Filter insert
- 8 Fuel inlet from the fuel tank
- 9 Fuel return to fuel tank

- Operate the pump until fuel starts to come out at the screw. Tighten the screw – torque 6.5Nm.
- Start the engine and idle for 5 minutes. Check the fuel system for leaks.

In order to empty the primary fuel filter's water tank/bowl, the following steps should be taken (with the engine shut off):

- Disconnect the electrical connection and place a suitable container underneath the filter.
- Loosen drain plug (A) at bottom of the primary fuel filter, two or three turns.
- Drain fluid from bottom into container until fuel starts to drain out. **DISPOSE OF Fluid PROPERLY.**
- When fuel starts to drain out, tighten drain plug – torque 1.6Nm.
- Reconnect the electrical connection.

4.6 Belt Tensioner & Wear (Deutz Engine)

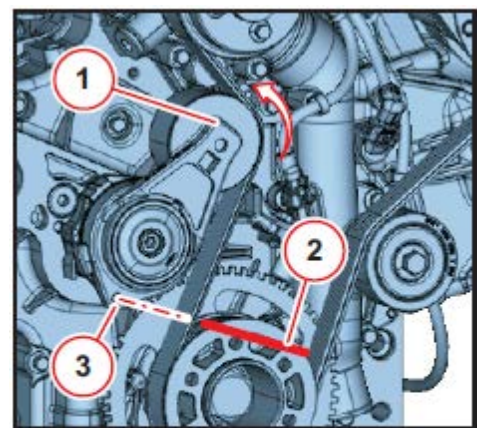
Belt drive systems equipped with automatic (spring) belt tensioners cannot be adjusted or repaired. The automatic belt tensioner is designed to maintain proper belt tension over the life of the belt. If tensioner spring tension is not within specification, replace tensioner assembly.

Checking Belt Wear

- Inspect belts for cracks, fraying, or stretched out areas. Replace if necessary.

Replacing Belt

- To replace belt with automatic tensioner, release tension on belt using a breaker bar and socket on tension arm.
- Rotate the tension arm in the direction of the arrow until a retaining pin can be inserted through the assembly borehole to hold the tension arm in place.
- Remove the vee belt from the pulleys starting and the smallest pulley and discard belt.



Replace V-rib belt

- 1 Tension pulley
- 2 Retaining pin
- 3 Assembly bore

NOTE: While belt is removed, inspect pulleys and bearings. Rotate and feel for hard turning or any unusual sounds. If pulleys or bearings need replacement, contact your Combilift dealer.

- Install new belt, making sure belt is correctly seated in all pulley grooves.
- Apply tension to belt with tensioner. Remove socket. Install fan guard if removed.
- Start engine and check belt alignment and tension after running for 15 minutes.

4.7 Engine Coolant (Deutz Engine)

All Combilift trucks leave the factory with a mixture of 50% water to 50% antifreeze (ethylene glycol-based coolant concentrate with anti-corrosion additives). This gives frost protection down to -37°C (-34.6°F) and also protects the cooling system parts against corrosion, cavitation and overheating. If greater frost protection below -37°C (-34.6°F) is required please contact your Combilift partner.

Water quality:

The water used to dilute the antifreeze must be clean and clear and must conform to the values in the table below:

Analysis Values		Minimum	Maximum	ASTM
pH		6.5	8.5	D 1293
Chlorine (Cl)	mg/l	-	100	D 512 D 4327
Sulphate (SO ₄)	mg/l	-	100	D 516
Total Hardness (CaCO ₃)	mmol/l		3.56	D 1126
	mg/l		356	
	°dGH		20.0	
	°e		25.0	
	°fH		35.6	

Water that deviates from the values in the table must be conditioned.

Checking Cooling System

CAUTION: Explosive release of fluids from pressurised cooling system can cause serious burns. Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.



- Coolant level should be maintained to approximately 1cm below the bottom of the header tank filler neck (B). If needed, add coolant as follows.
- Open the bonnet on the left-hand side of the truck. The header tank (A) is located above the engine.

IMPORTANT: When adding coolant to the system, use the appropriate glycol coolant solution.

A list of coolants that have been approved by Deutz for use with the Deutz engine can be downloaded from the internet via the following link:

<http://www.deutz.com/file/db7ad5c24b017772014b0bf1e7500303.en.0/dqc-kuehlsystemschutzmittelliste.pdf>

Do not overfill cooling system. A pressurised system needs space for heat expansion without overflowing at top of radiator.

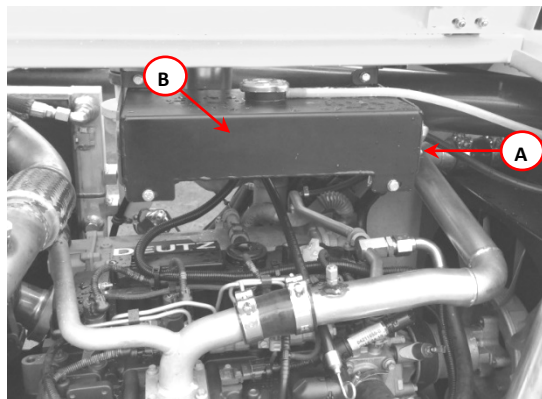
The coolant level is monitored via the header tank which is mounted to the cabin side of the radiator. The coolant level should always be kept to the bottom of the filler neck(B) on the header tank (A).



Caution



Health damaging nitrous amines form when nitrite-based cooling system corrosion protection agents are mixed with amine-based agents.



Coolants must be completely replaced when repairs are performed on the cooling system. Rinse out the cooling system before filling with new coolant. A mixture of clean water with 15% of the new coolant is recommended for rinsing.

Coolant manufacturers recommend completely replacing the coolant every 3-4 years in vehicles that are more than 6 years old.

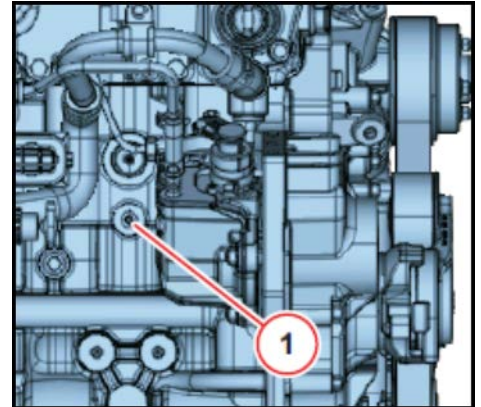
Note

Do not pour fluids into the ground, down a drain or into a stream, pond or lake. Observe relevant local environmental protection regulations when disposing of oil, coolant, fuel, electrolyte and other harmful waste.

The cooling system must be monitored regularly. This includes checking the concentration of the antifreeze. The concentration of antifreeze to water must never be allowed fall below 35% as the protective effects fall away rapidly below this concentration.

To drain the cooling system:

- 1) Remove the filler cap from the top of the header tank or radiator.
- 2) Use of a fluid extractor is recommended to remove most of the used coolant from the radiator.
- 3) Place suitable containers under the coolant drain bung (1).
- 4) Remove the drain bung (1) and allow the coolant to drain. Replace the drain bung when draining is complete.



4.8 Battery

The battery is located behind the operator cabin. Open the battery door to gain access to the battery.

Replacement batteries must meet or exceed the following specification: **12v - 105Ah - 735A**



Note

Careless disposal of batteries will harm the environment. Observe relevant environmental protection regulations when disposing of used batteries and battery electrolyte.



Servicing Battery

CAUTION: Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level. Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer. Always remove grounded NEGATIVE (-) battery clamp first and replace it last.

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to cause cancer and reproductive harm. **Wash hands after handling.**

- On regular batteries, check electrolyte level. Fill each cell to bottom of filler neck with distilled water.

CAUTION: Sulphuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes. **Avoid the hazard by:**

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.



In freezing weather, run engine at least 30 minutes to assure thorough mixing after adding water to battery.

- Keep batteries clean by wiping them with a damp cloth. Keep all connections clean and tight.

- Keep battery fully charged, especially during cold weather. If a battery charger is used, turn charger off before connecting charger to battery. Attach POSITIVE (+) battery charger lead to POSITIVE (+) battery post. Then attach NEGATIVE (-) battery charger lead to a good ground.

4.9 Hydraulic Oil and Filters

The hydraulic oil used in the Combilift should conform to the International Standard ISO G344 HV grade oils with improved viscosity / temperature characteristics. It should also have the correct temperature range for the ambient temperature in which the machine is being operated. If the operating temperature is outside the standard range, the standard oil should be replaced with the correct grade.

Ensure that the correct type of oil is used in the relevant ambient temperature. The table below indicates a number of commercially available oils and the temperature ranges that they are suitable for:

AMBIENT OPERATING TEMPERATURE	Low Range -20°C to 25°C -4°F to 77°F	Standard Range -10°C to 35°C 14°F to 77°F	High Range 0°C to 45°C 32°F to 113°F
Castrol: Hyspin	AWH 32	AWH 46	AWH 68
B.P. Bartran	HV 32	HV 46	HV 68
Esso: Unavis	N 32	N 46	N 68
Mobil	13 M	15 M	16 M
Shell: Tellus oil	T32	T46	T68
Texaco	HDZ 32	HDZ 46	HDZ 68

Note

The Sequence in which the brand names are listed does not signify any grading as to their quality or preference. Whilst other oil can be used they must first be approved by authorised Combilift personnel.

Note

The machine is supplied with an AWH46 hydraulic fluid when leaving the factory. Please check if this is suitable for the ambient temperature in which the machine is to be operated.

Note

Before adding hydraulic oil, ensure that all cylinders are fully retracted.
Fill the tank to the upper level on the hydraulic oil level gauge.
The capacity of the hydraulic tank is approximately 195 litres (205 quarts)

Note

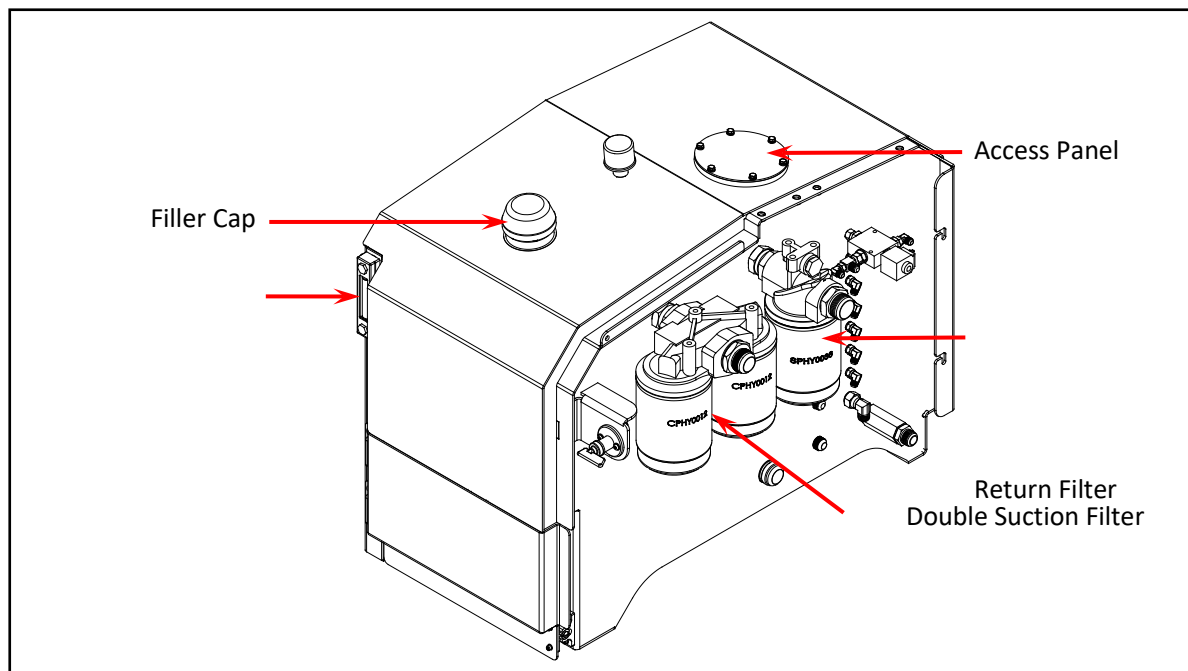
The In-tank strainer filters must be changed with every hydraulic oil change.

Hydraulic Oil Filters

There are 4 separate filters in the hydraulic system that must be replaced at certain intervals. These filters are:

1. The Double Suction Filter
2. The Return Filter
3. The 1 ½ Inch In-Tank Strainer Filter
4. The 1 Inch In-Tank Strainer Filter

The locations of these filters are shown in the following diagrams.



Double Suction Filter: (Service Interval = 500Hours)

The double suction filter is located on the back of the hydraulic tank as shown in the diagram above. The two filter elements must be replaced initially after 100 hours and then at intervals of every 500 hours (or 8 months depending on which occurs first).

To replace the Double Suction Filter elements:

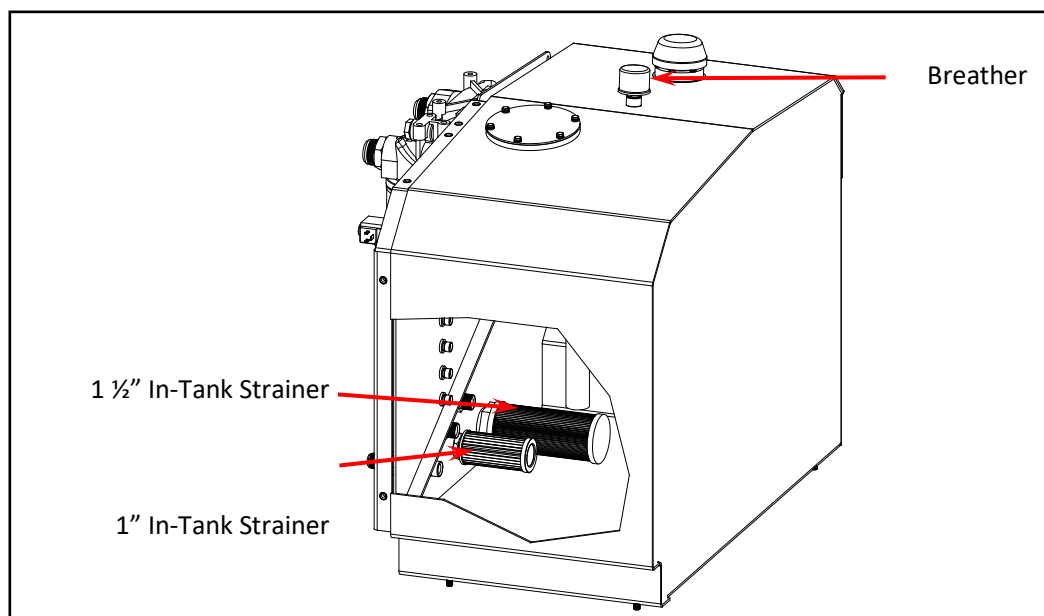
1. Shut off the engine. Open the bonnet on the left-hand side of the truck to gain access to the suction filter.
2. Place a suitable container under the filter cartridges to catch any spills.
3. Loosen and remove the old filter cartridges.
4. Partially fill the new filter cartridges with hydraulic oil of the same grade as that in the system.
5. Smear some oil on the O-ring seals on top of the filter cartridges.
6. Tighten the new filter cartridges onto the filter housing by hand only. DO NOT over tighten.
7. Only use genuine Combilift components.

Return Filter: (Service Interval = 500 Hours)

The return filter is located on the back of the hydraulic tank beside the double suction filter as shown in the diagram on the previous page. The filter element must be replaced at intervals of every 500 hours (or 8 months depending on which occurs first).

To replace the Return Filter:

1. Shut off the engine. Open the bonnet on the left-hand side of the truck to gain access to the suction filter.
2. Place a suitable container under the filter cartridges to catch any spills.
3. Loosen and remove the old filter cartridges.
4. Partially fill the new filter cartridges with hydraulic oil of the same grade as that in the system.
5. Smear some oil on the O-ring seals on top of the filter cartridges.
6. Tighten the new filter cartridges onto the filter housing by hand only. DO NOT over tighten.
7. Use only a genuine Combilift component.

**In-Tank Strainer Filters:** (Service Interval = 3000 Hours)

The In-Tank Strainer Filters, located inside the tank on the back wall as shown in the diagram above. They must both be replaced at intervals of every 3000 hours (or 24 months depending on which occurs first). The strainer filter can only be accessed when the hydraulic tank has been drained.

To replace the In-Tank Strainer Filters:

1. Drain the hydraulic oil tank through the drain plug in the bottom of the tank
2. Remove the access panel on the top of the tank
3. Insert your hand into the tank and remove the filters by rotating them anti-clockwise.
4. Fit the new strainer filters. Tighten by hand only. DO NOT over tighten the filters. Use only genuine Combilift components.
5. Replace the access panel in the side of the tank, remembering to correctly fit the access panel O-ring seal.

Changing Hydraulic Oil (service interval = 3000Hours)

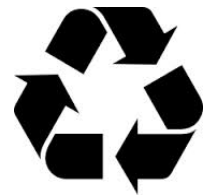
- Operate the machine for a period of time long enough for the oil in the system to become warm. This will help the oil to flow.
- Park on level ground and retract all hydraulic cylinders.
- Combilift recommends removing the old hydraulic oil from the tank by pumping it out into a suitable receptacle. This is most efficient and cleanest method of removing the old oil. The suction hose can be inserted through the filler cap or through the access panel on top of the tank.
- Alternatively the oil can be drained from the tank by removing the bung on the bottom of the tank and allowing the oil to drain into a suitable receptacle.
- Once completed fill system to the appropriate level with Hydraulic oil of the same grade as that, which was already in the tank.

Note

Before adding hydraulic oil, ensure that all cylinders are fully retracted.
Fill the tank to the upper level on the hydraulic oil level gauge.
The capacity of the hydraulic tank is approximately 195 litres (205 quarts)
The capacity of the hydraulic system is approximately 240 litres (253 quarts)

Note

Do not pour fluids into the ground, down a drain or into a stream, pond or lake. Observe relevant environmental protection regulations when disposing of oil, coolant, fuel, electrolyte and other harmful waste.



4.10 Wire Rope Maintenance

Wire ropes should be inspected on a daily basis as part of the routine daily checks. After 3 years of use/2000hrs, whichever occurs first, old wire ropes should be replaced with new ropes. Contact your nearest Combilift dealer to request new ropes.

Re-lubricating:

The ropes should be re-lubricated at least every 3 months/250hrs. It is recommended, if possible, to re-lubricate the ropes as they pass through the sheaves. Lubricants are most commonly painted or sprayed onto the rope; a complete film should be applied to the surface. In the case of special environmental conditions, for example high humidity, the lubricant type and frequency of re-lubrication may need to be reviewed and adjusted. The following lubricants are recommended:

- | | | |
|-------------------------|----------|----------------|
| • Anderol FRD 2 | Grade 32 | Wire Rope Lube |
| • Esso Elbac K-68 | Grade 68 | Wire Rope Lube |
| • ROCOL Wire Rope Spray | | |
| • Verolube Spray | | Wire Rope Lube |

Note

If ropes are not regularly re-lubricated shorter service life of the rope is to be expected.

Cleaning:

It is recommended that very dirty ropes be cleaned when necessary. This applies particularly to ropes operating in extremely abrasive conditions. After cleaning, the ropes must be allowed to dry thoroughly and then re-lubricated.

It is advised to follow the maintenance instructions in ISO 4309

4.11 Chain Maintenance

Chains should be visually inspected on a daily basis as part of the routine daily checks. Each chain requires its own individual tag and certificate, where the date and result of inspections can be recorded. These results should be documented every 6 months. After 3 years of use, the chains have to be examined via load testing or other certified test methods (Once the chain life has reached 3 years, it is recommended to change the chains for a new set). If a chain fails to meet the required specification, they should not be used and should be replaced immediately. The maximum number of load cycles should not exceed 20,000 cycles.

4.12 Service and Maintenance of AC (OPTIONAL)

Use suitable equipment for recovery and recharging of the air conditioning system. Ensure only trained technicians perform the servicing of the AC units. Un-safe handling of R134a gas can result in frostbite when in contact with the skin or eyes. All appropriate PPE should be worn when servicing the AC system.



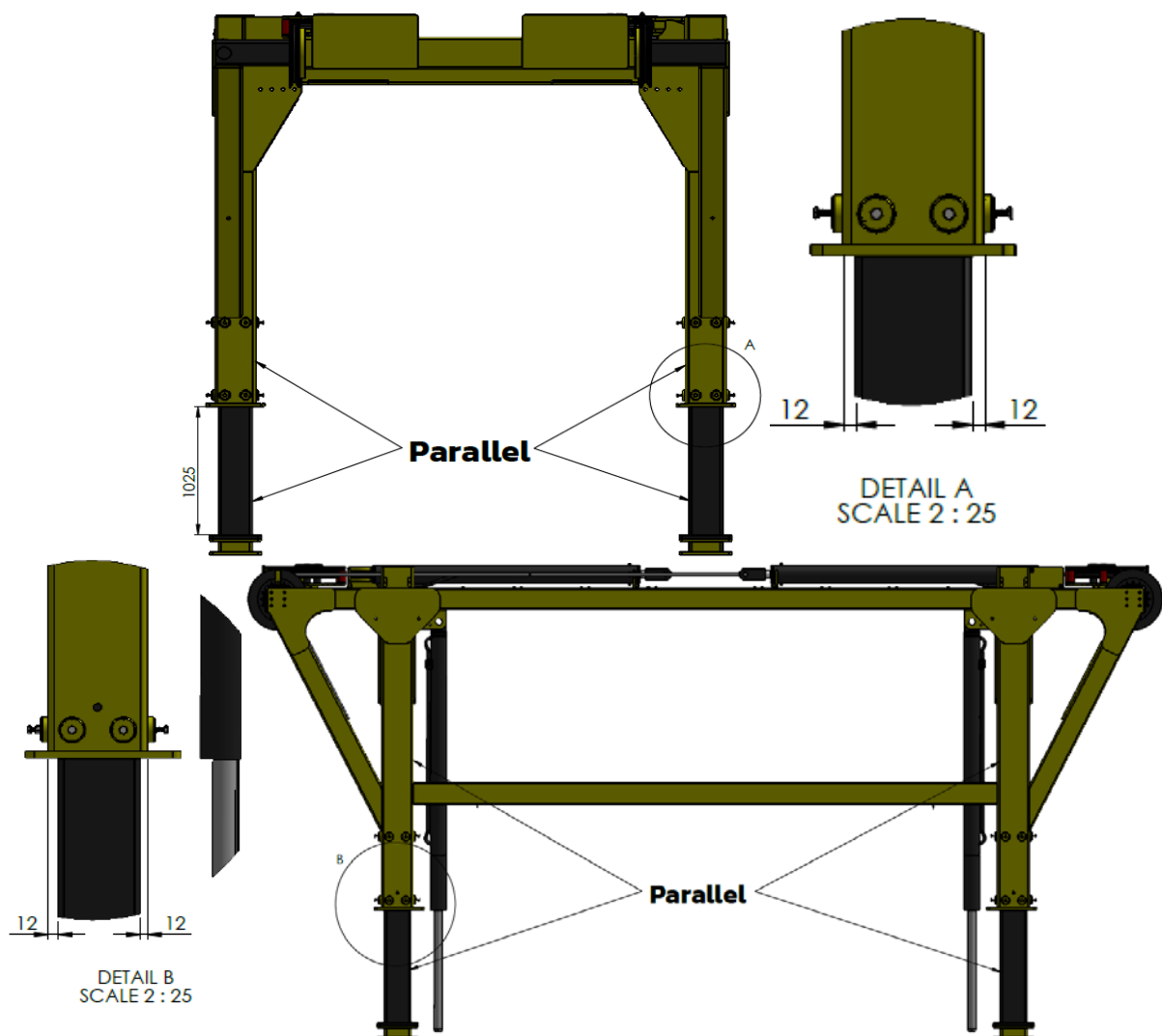
NOTE: Your Combilift Straddle Carrier uses only R134a gas. Do not mix R12 and R134a gas together.

4.13 Telescopic (OPTIONAL) / Sideshift

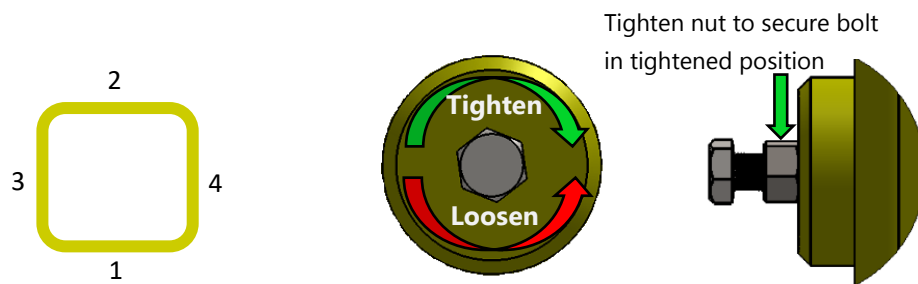
Telescopic legs and Sideshift should be kept lubricated at all times. Each should be kept as free from dirt build up as much as possible. Suitable grease must be of grade EP2. Telescopic Legs and Sideshift should be greased every 250 hours.

4.14 Shimming Telescopic Nylons

- The first step is to telescopic lift machine up 1 meter from collapsed position.
- When the machine is raised, the legs should be running parallel with the outer box on all sides.



- Adjust the nylons equally and tight.
- When tightening bolts ensure the gap between leg and inner box are equal on all sides.
- Unscrew the bolt a quarter of a turn (90 degrees).
- Note: When tightening shims, refer to image below. Tighten sides in order from 1 to 4 i.e. cross tightening
- Ensure the telescopic leg is running parallel to the outer box. If not, re-shim accordingly to ensure parallel.
- Final step is to tighten all nuts to keep shims tight.



4.15 Pneumatic Tyres (OPTIONAL)

The optional pneumatic tyres fitted by Combilift must be inflated to a pressure of:

10BAR (145PSI)

Check tyre pressures monthly when the tyres are cold e.g. before the start of a shift or when the truck has not been operated for a reasonable period of time to allow the tyres to cool to normal temperature.

4.16 Torque Settings

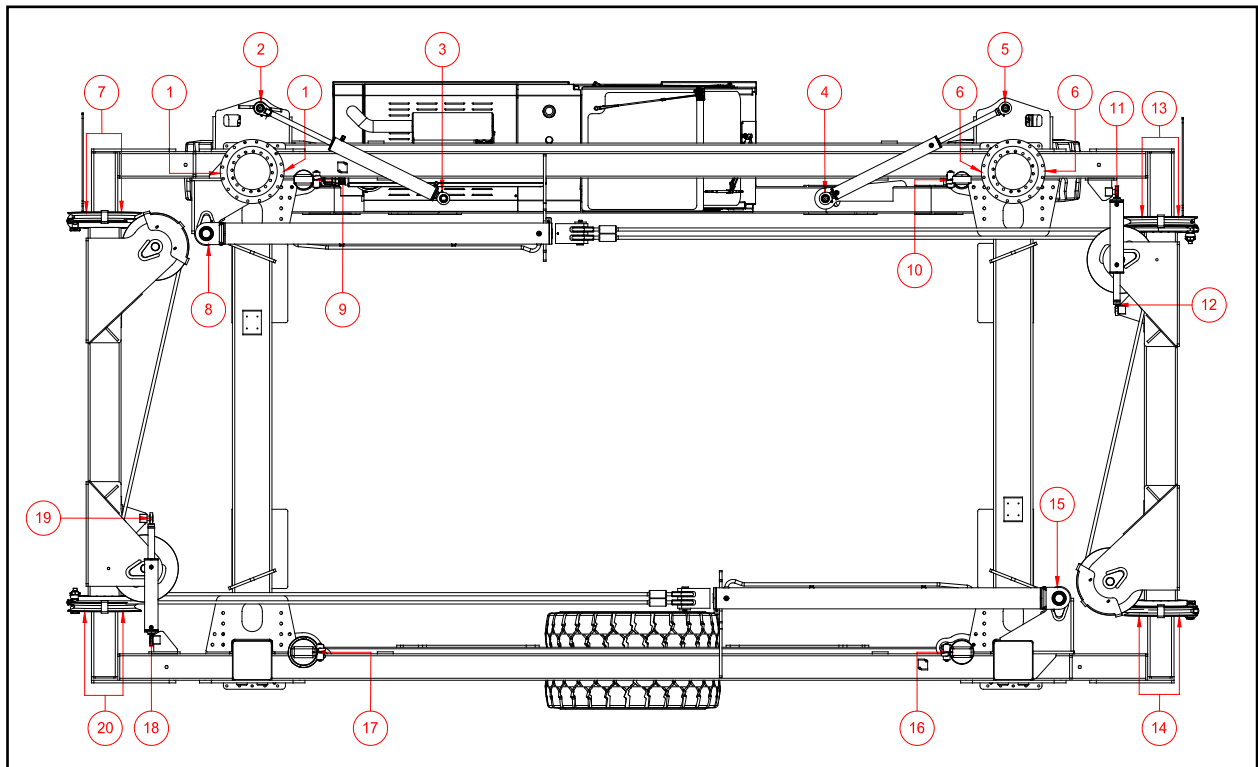
Torque values are based on clean dry threads and do not differ for fine or course							
Bolt Strength Marking		8.8		10.9		12.9	
Diameter	Wrench Size	lb ft	Nm	lb ft	Nm	lb ft	Nm
M8	13mm	18	25	26	35	33	45
M10	16mm	37	50	55	75	63	85
M12	18mm	63	85	97	130	111	150
M14	21mm	103	140	151	205	177	240
M16	24mm	159	215	232	315	273	370
M18	27mm	225	305	321	435	376	510
M20	30mm	321	435	457	620	535	725
M22	33mm	435	590	620	840	726	985
M24	36mm	553	750	789	1070	926	1255

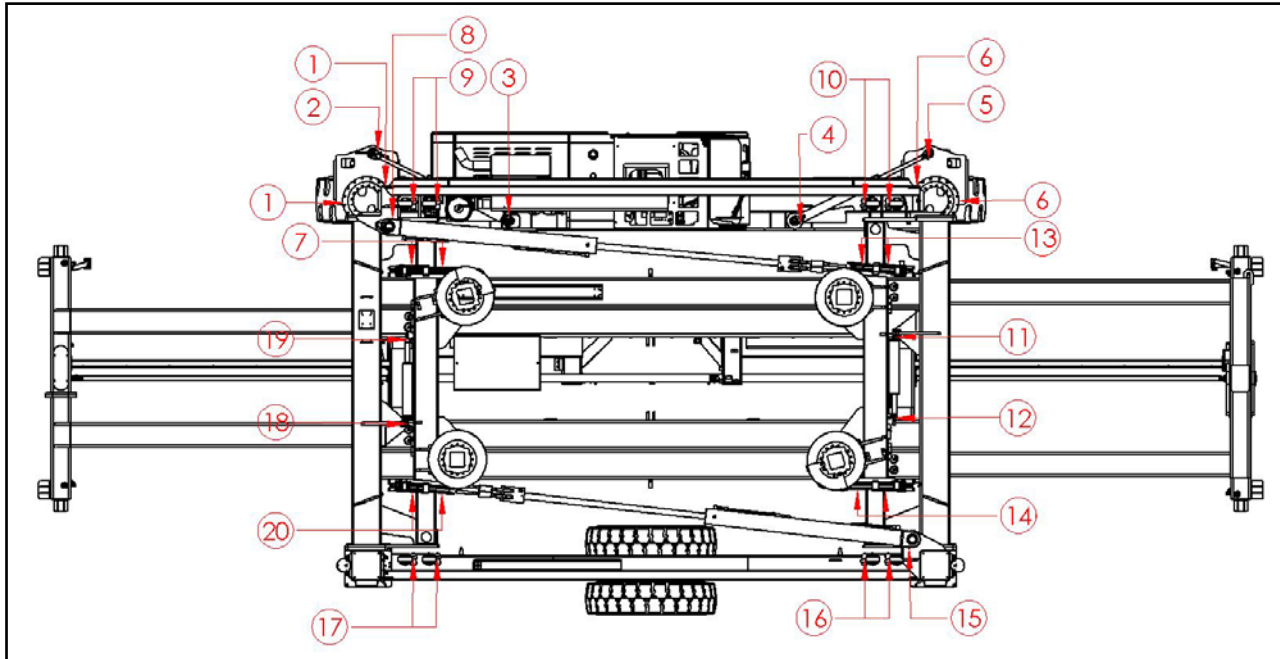
4.17 Grease Point Chart

Lubricate all lower-level grease points (1-6) indicated on the chart on a weekly basis using an appropriate EP2 Grease. Also lubricate all grease points on any attachments that may be fitted to the Combilift.

See Accompanying Top Lift Attachment Manual - Section 3.7 for the top lift attachment grease point chart.

Hard to reach grease points should be lubricated according to service schedule.





1. Rear Steering Slew Ring Bearing (2 Points)	2. Front of Rear Steering Cylinder
3. Back of Rear Steering Cylinder	4. Back of Front Steering Cylinder
5. Front of Front Steering Cylinder	6. Front Steering Bearing (2 Points)
7. Rear LH Lift Slew Ring Bearing (2 Points)	8. Back of LH Lift Cylinder
9. Top of Rear LH Telescopic Cylinder	10. Top of Front LH Telescopic Cylinder
11. Back of Front Side Shift Cylinder	12. Front of Front Side Shift Cylinder
13. Front LH Lift Slew Ring Bearing (2 Points)	14. Front RH Lift Slew Ring Bearing (2 Points)
15. Back of RH Lift Cylinder	16. Top of Front RH Telescopic Cylinder
17. Top of Rear RH Telescopic Cylinder	18. Back Of Rear Side Shift Cylinder
19. Top of Front LH Telescopic Cylinder	20. Rear RH Lift Slew Ring Bearing (2 Points)

4.18 Diesel Fuel

Diesel fuels specified to EN 590 or ASTM D975 Grade 1-D S15 are recommended.

Required Fuel Properties

In all cases, the fuel shall meet the following properties:

Cetane number 45 minimum. Cetane number greater than 50 is preferred, especially for temperatures below -20°C (-4°F) or elevations above 1500 m (5000 ft).

Cold Filter Plugging Point (CFPP) should be at least 5°C (9°F) below the expected lowest temperature or **Cloud Point** below the expected lowest ambient temperature.

Fuel lubricity should pass a maximum scar diameter of 0.45 mm as measured by ASTM D6079 or ISO 121561.

Sulphur Content for Interim Tier 4 and EU Stage IIIB Engines

- Diesel fuel quality and fuel sulphur content must comply with all existing emissions regulations for the area in which the engine operates.
- Use ONLY ultra low sulphur diesel (ULSD) fuel with a maximum of 0.0015% (15 ppm) sulphur content.

Handling and Storing Diesel Fuel

CAUTION: Handle fuel carefully. Do not fill the fuel tank when engine is running.

DO NOT smoke while you fill the fuel tank or service the fuel system.

- Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing during cold weather.
- Keep all storage tanks as full as practicable to minimize condensation.
- Ensure that all fuel tank caps and covers are installed properly to prevent moisture from entering.
- Monitor water content of the fuel regularly.

4.19 Maintenance Service Schedule

In order to keep the Straddle Carrier in optimum working condition it is necessary to carry out the following regular preventative maintenance.

Refer to page Error! Bookmark not defined. of this manual for initial 100hr service. All daily checks to be carried out by the operator.

Item	Service Interval (Hrs)				
	Daily	Weekly	250	500	3000
Check Engine Oil Level	•				
Check Air Filter & Intake Piping	•				
Change Engine Oil Filter				•	
Change Engine Oil				•	
Clean Air Filter Cartridge (replace if required)				•	
Change Diesel Engine Glow plugs					•
Check Engine & Cabin Mounts & Bolts				•	
Check Engine Idling Speed				•	
Check Fuel Filter Water Bowl. Drain If Necessary	•				
Change Both Diesel Fuel Filters				•	
Check Cooling Fan	•				
Check Radiator	•				
Check Belt Tension & Belt Wear	•				
Check Coolant Level	•				
Change Coolant in Cooling System					•
Check Oil Cooler	•				
Check Hydraulic Oil Level	•				
Change Hydraulic Oil					•
Change Hydraulic Suction Filter Cartridges				•	
Change Hydraulic Return Filter Cartridge				•	
Change Hydraulic In-Tank Strainer Filters					•
Service battery				•	
Check Swivel Bearings (Slew Rings)				•	
Check Wheel Nuts	•				
Torque Wheel Nuts			•		
Check Hydraulic Hoses for Leaks and Wear	•				
Check Tyres for Defects (Check optional Pneumatic tyres for Punctures)	•				
Grease Telescopic Legs / Sideshift			•		

Thoroughly Inspect Lifting Chains (Every 6 Months)				•	
Inspect & Lubricate Lifting Ropes (Every 3 Months)			•		
Torque Pump Mounting Bolts				•	
Inspect Serial Plate in Cabin				•	
Check Seat & Seatbelt for excessive wear	•			•	
Check Controls (Investigate Unusual Sounds)	•			•	
Check Accelerator (Functioning Smoothly)	•			•	
Check Parking Brake (Functioning Smoothly)	•			•	
Check Inch/Brake Pedal (Inching before braking)				•	
Check Steering (Functioning Smoothly)	•			•	
Check Drive Control (Forward/Reverse)	•			•	
Check Sideshift Control (Left/Right)	•			•	
Check Lift Control	•			•	
Check Attachment Control (optional extra)	•			•	
Check Horn, Lights & Flashing Beacon	•			•	
Check Gauges on Dash & Warning Lights	•			•	
Check Reversing Beeper	•			•	
Check Emergency Stop Button	•			•	
Grease Steering (Swivel & Cylinders)		•			
Check all Nylon Wear Pads				•	
Check Brakes	•			•	
Check Fuel Lines For Leaks or Wear				•	
Check Air Breather/Pipes and Exhaust Pipes for Leaks				•	
Check Cab Windows, Door Lock, Wipers & Heater/AC	•			•	

4.20 Service Checklist



Combilift Straddle Carrier
Initial Service at 100 Hour

To be performed after first 100 hours of truck operation in addition to the required pre-shift daily inspection.

Date _____ Inspector _____
 Location _____ Model No. _____
 Serial No. _____
 Drive Hour _____

FIRST 100 HOUR SERVICE		
SAFETY & OPERATIONAL CHECKS	O.K. (X)	Needs Maintenance
Check Structure for Defects		
Check Hydraulic oil level		
Check Movement of Lift & Telescopic Cylinders		
Grease All Points		
Check all Bolts and Fittings are Tight.		
Leaks - Hydraulic Oil		
Check Chains/Ropes - Lubricate		
Tyres - Check for Debris, Visually Inspect Nuts		
Check Steering		
Check Brakes		
Check Nylon Wear Pads		
Check Emergency Stop button		
Replace Hydraulic Suction Filters		
Replace Hydraulic Return Filter		
Replace Engine Oil Filter		
Replace Fuel Filter		
Replace Air Filters		
Replace Engine Oil		
Visually Check Swivel Bearings		

Comments / Modifications:

Signed _____

Date ____/____/____



Combilift
Every 500 Hour Service Checklist

To be performed after every 500 hours of truck operation in addition to the required pre-shift daily inspection.

Date _____ Inspector _____
 Location. _____ Model No. _____
 Serial No. _____
 Drive Hours _____

EVERY 500 HOUR SERVICE		
SAFETY & OPERATIONAL CHECKS	O.K. (X)	Comments
Leaks – Hydraulic Oil, Engine Oil, Coolant, Electrolyte		
Tyres - Check for Debris; - Torque Wheel Nuts to 600N.m or 442ft.lbs (Pressures On Optional Pneumatic Tyres)		
Hydraulic Hoses - Check for Wear / Rubbing		
Check Chains/Ropes - Lubricate		
Check Torque on Pump Mounting Bolts		
Check All Connections for Proper Torque		
Hydraulic Fluid Level		
Check Electrical Connections – Corrosion		
Operators Compartment Capacity Plate Attached - Information Matches Model, Serial No. And Attachments		
Seat Belt, Buckle and Retractors - Functioning Smoothly		
Controls (Turn Power On) Investigate Unusual Noises Immediately		
Accelerator - Functioning Smoothly		
Parking Brake - Functioning		
Steering Operation - Functioning Smoothly		
Drive Control - Forward/Reverse - Functioning Smoothly		
Sideshift Controls – Left and Right - Functioning Smoothly		
Hoist and Lowering Control - Functioning Smoothly		
Attachment Controls – Operational (Optional Extra – See Appendix 1)		
Horn – Functioning		
Lights - Functioning		
Gauges: Hour Meter – Functioning		
Warning Lights – Functioning		
Swivels - Functions Smoothly / Wear		
Emergency Stop Button - Functioning		
Load Monitor – Functioning (Optional Extra)		
Reversing Warning Bleeper		
Check Structure for Defects		
Grease All Points		
Check Nylons		
Check Engine Mount / Engine Mount Bolts		
Check Brakes		
Clean Radiator and Oil Cooler Core / Fins		
Replace Hydraulic Suction Filters		
Replace Hydraulic Return Filter		
Replace Engine Oil Filter		
Replace Fuel Filter		
Replace Air Filter		
Replace Engine Oil		

Comments / Modifications:

Signed _____

Date ____/____/____

5. Technical Information and Circuit Diagrams

5.2 Towing the Combilift

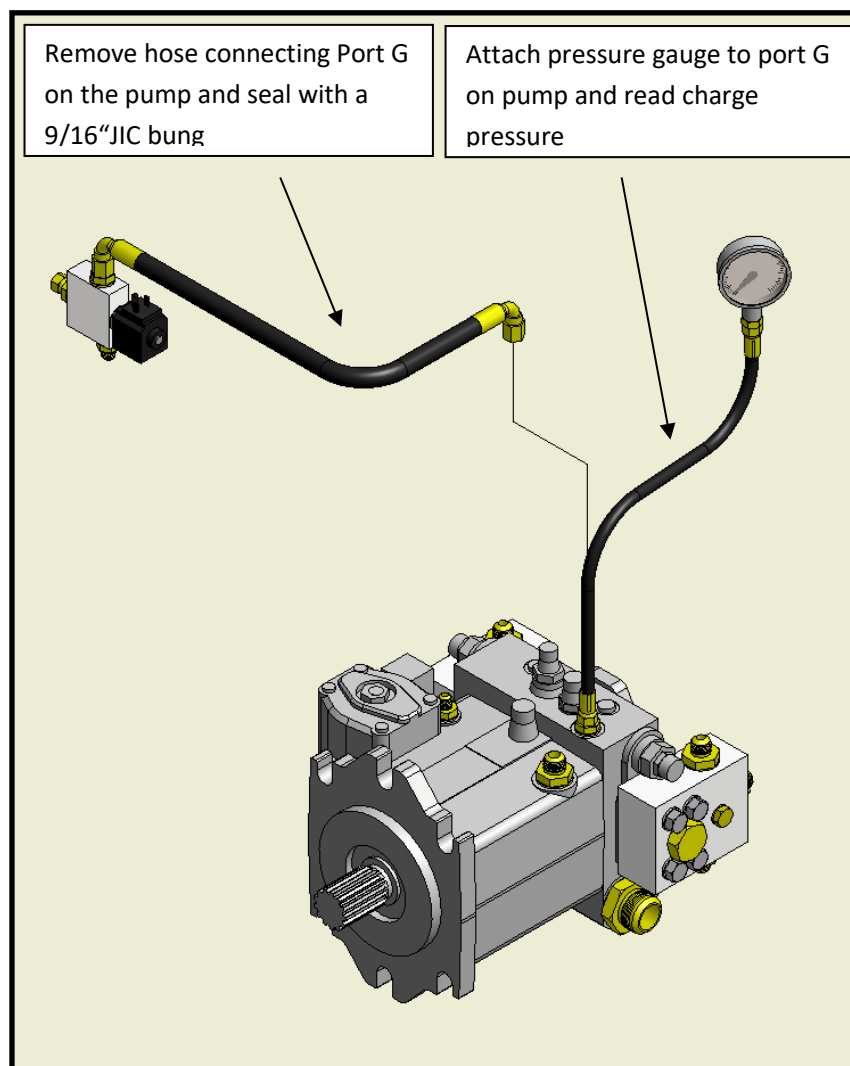
Combilift Straddle Carrier **MUST** not be towed. Towing the Combilift can result in serious mechanical damage.

5.3 Checking the charge Pressure

In order to check the charge pressure, the following steps should be taken:

- Ensure that the engine is switched off.
- Remove the hose connecting the pump to the brake valve at the pump end (port G) and seal the hose with a 9/16" JIC male bung. DO NOT allow any contaminants to enter the hydraulic system.
- Attach a pressure gauge to port G on the pump (see illustration below).
- Start the engine and read the pressure.

The charge pressure should measure between 20 - 28 bar (290 – 406 PSI).

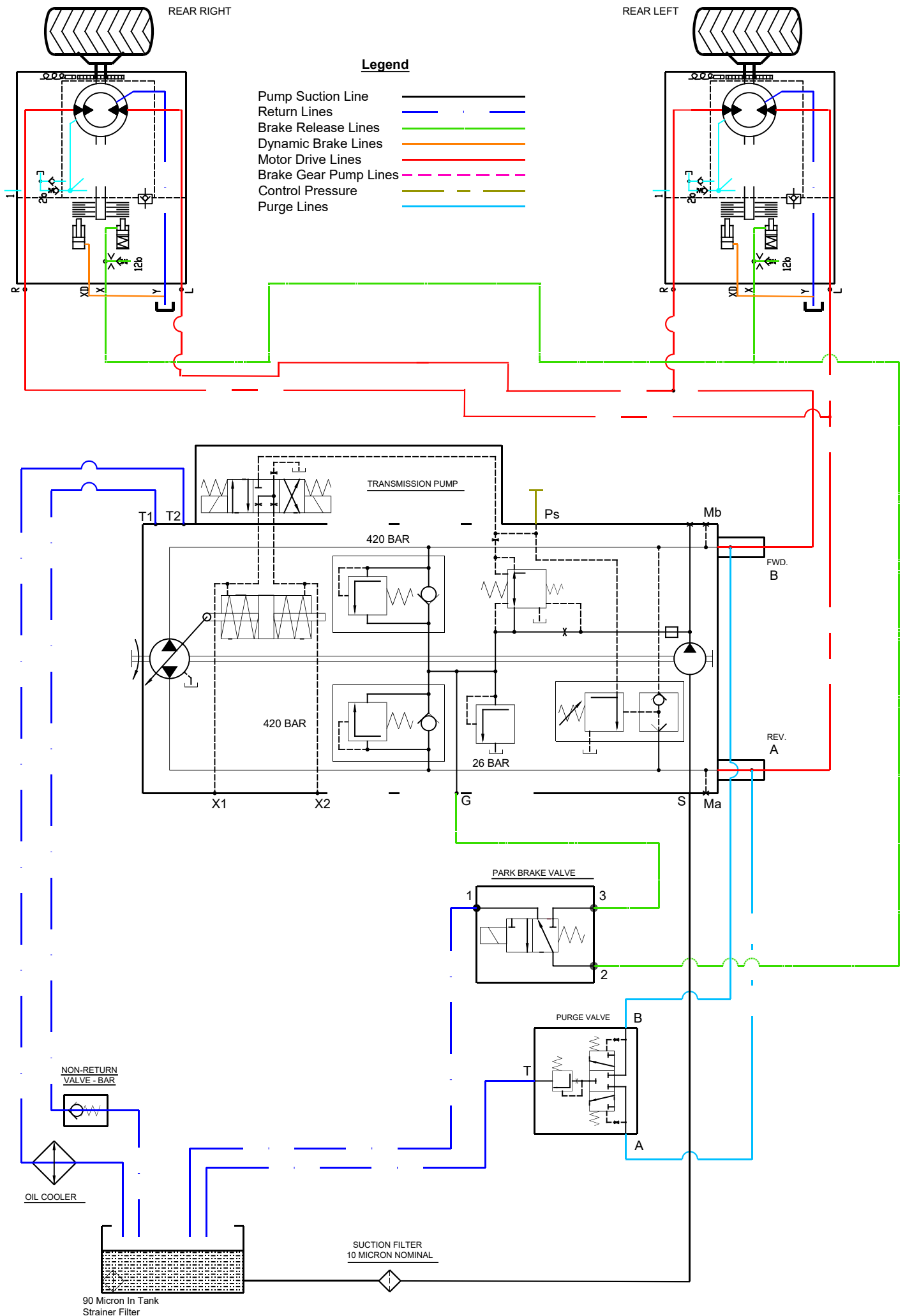


Title: Hydrostatic Drive Circuit

COMBILIFT LTD.

Models: SC3

Revised On: 27/05/19

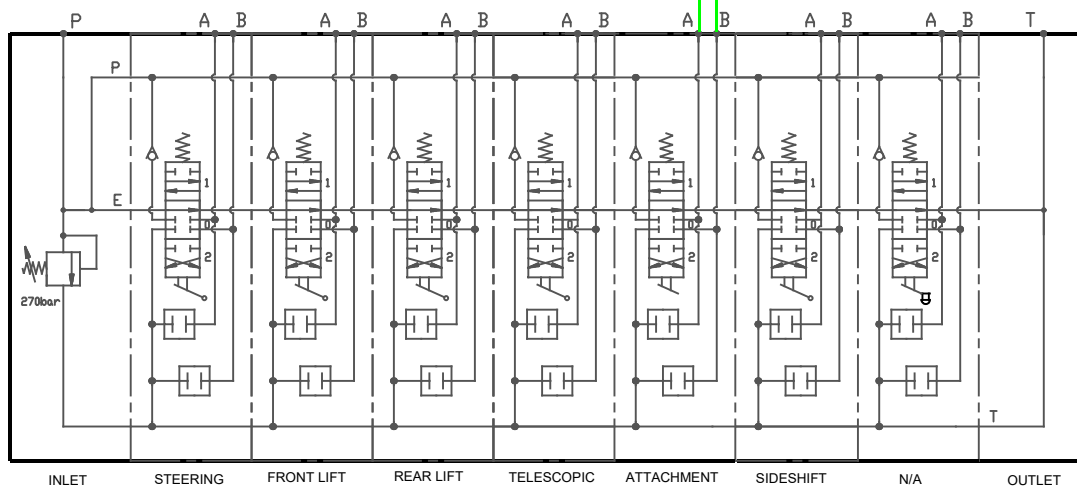
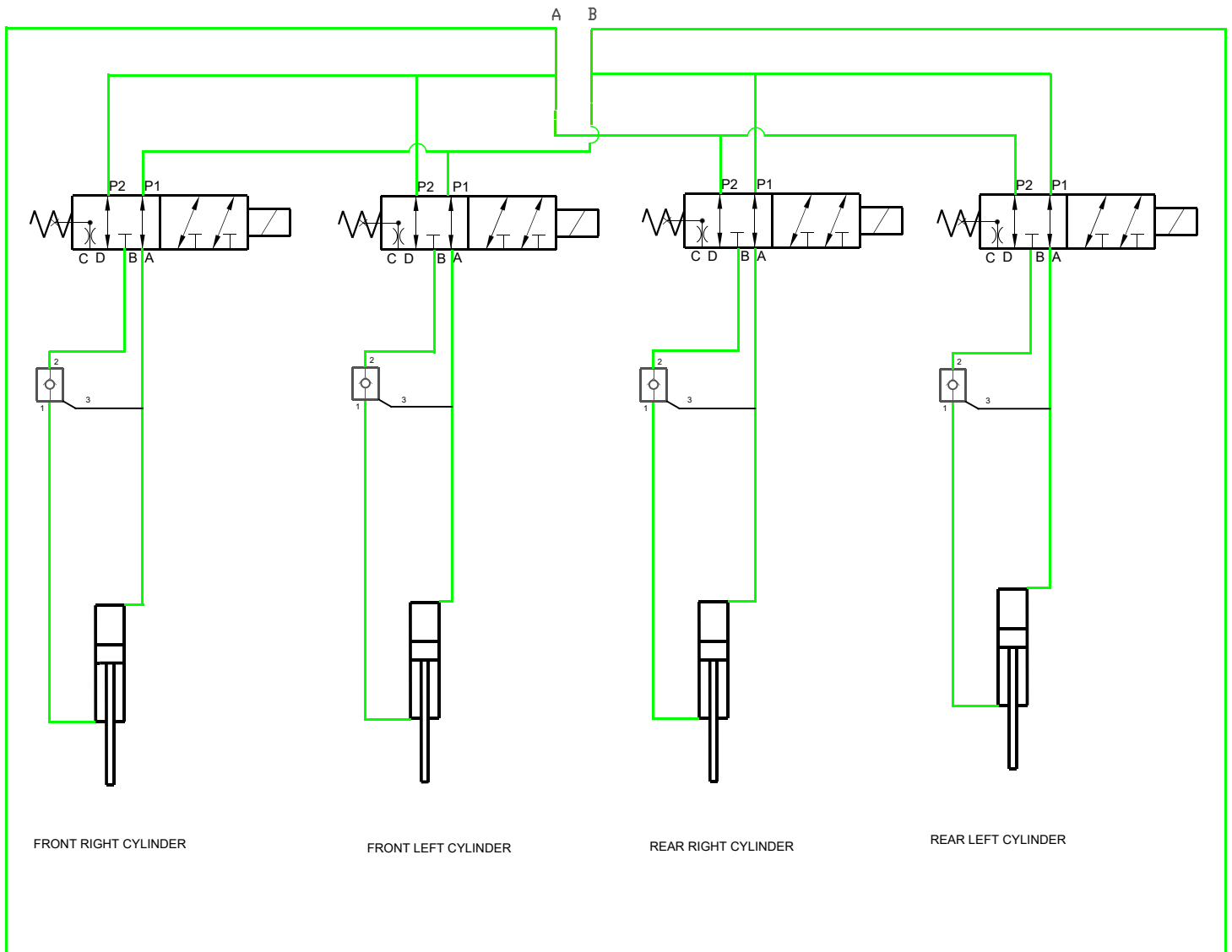


Title: Steering & Hydraulic Functions Circuit

COMBILIFT LTD.

Models: SC3

Revised On: 10/06/19



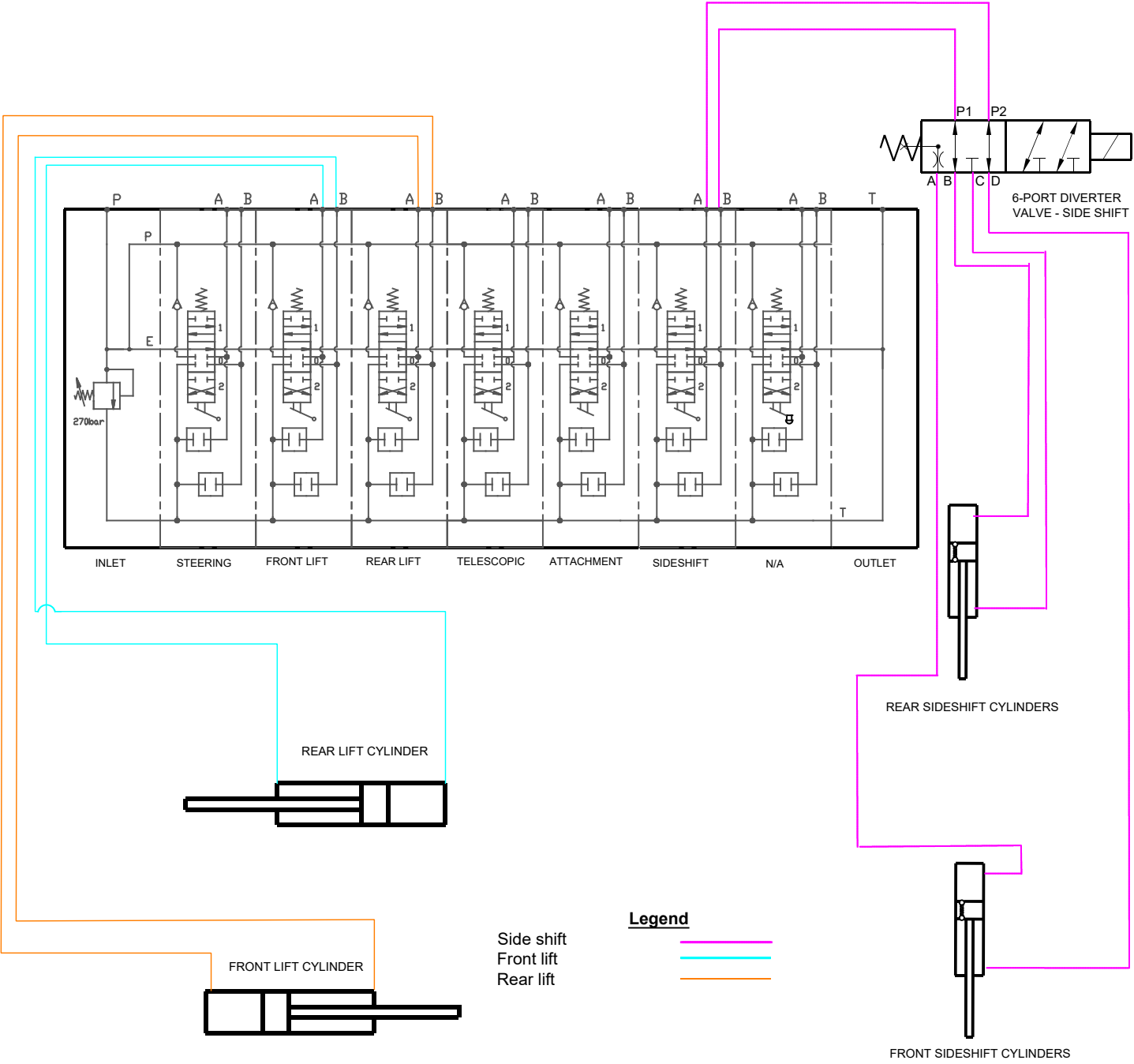
Legend

Fork attachment

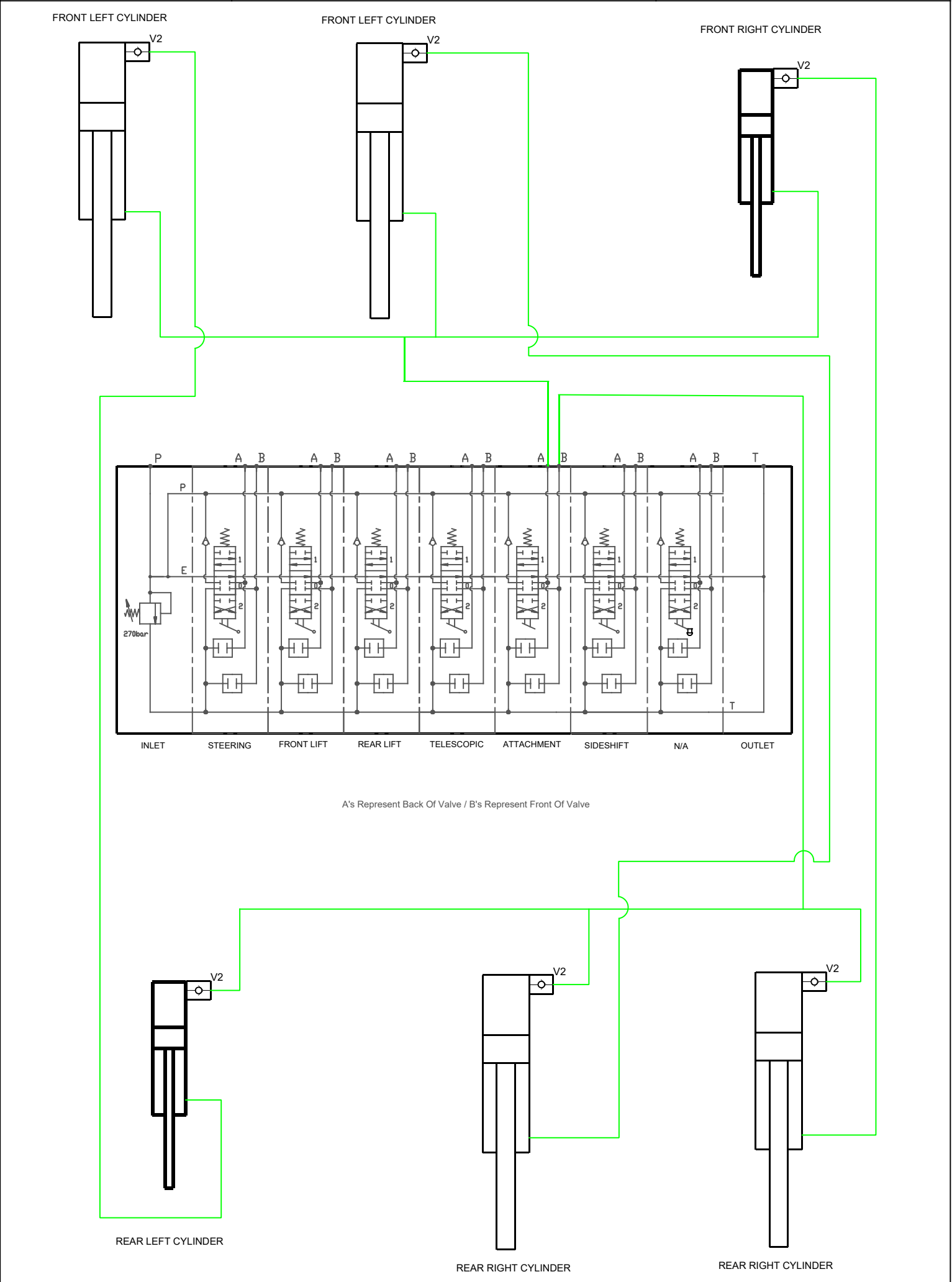


Title: Hydraulic Functions Circuit

COMBILIFT LTD.	Models: SC3(T)	Revised On: 10/06/19
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Title: Telescopic Circuit 6 Cylinder



Title: Steering & Hydraulic Functions Circuit

COMBILIFT LTD.

Models: SC3 MK2

Revised On: 09/07/19

