

Operation & Maintenance Manual



*Self-Propelled
Articulating Boom Lifts*

BA28RT
BA24RT

Dingli
Machinery

Part Number: SM0319113



Rev2.0, First Edition, April 2020 Printing

Important

Read, understand and observe the following safety regulations and operating instructions before using the machine. The machine must be used only by qualified and authorized personnel. This Manual is an integral part of the machine and must always be kept safe in the machine. In case of doubt, contact DINGLI at the address shown below.

Identification of the Manual

The identification code of the Manual is shown on the cover; it is advisable to note this down in the Inspection Register.

If the Manual is lost, to request a new Manual, mention the code on the cover or the manufacturing number of the machine.

It is advisable to mention the machine manufacturing number on the cover in such a way as to clearly identify the Manual with the machine.

Contents

Marking.....	1
Introduction.....	2
Personnel safety.....	4
Work Area Safety.....	5
Legend.....	11
Specification.....	12
Controls.....	20
Placards and Decals.....	28
Pre-operative Inspections.....	33
Workplace Inspection.....	35
Functional Tests.....	36
Operating Instructions.....	40
Instructions for Transport.....	44
Maintenance.....	47
Schematic.....	73
Inspection Register.....	80

Contact us:

Zhejiang Dingli Machinery Co., Ltd.

1255 Baiyun South Road. Leidian Town.
Deqing Zhejiang

China

Tel: +86-572-8681688

Fax: +86-572-8681690

Web: www.cndingli.com

E-mail: market@cndingli.com

Marking

09210006.B

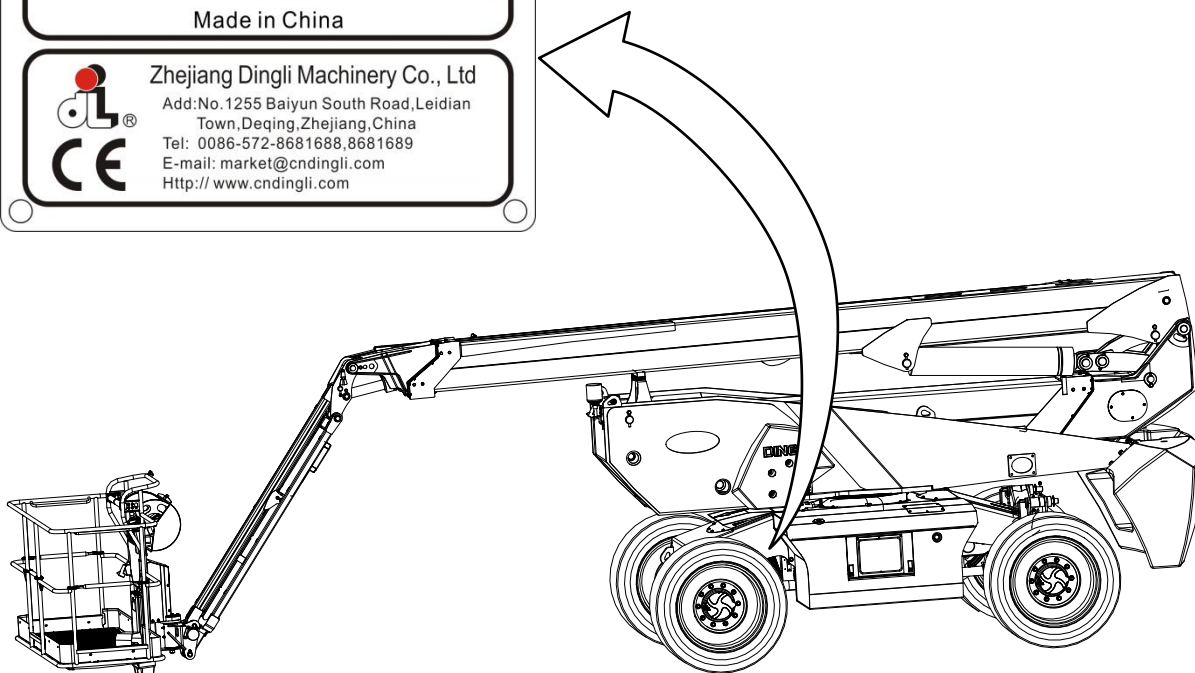
**Self-Propelled
Articulating Boom Lifts**

Model	
Serial No.	
Engine model	
Power	
Rated Load	
Max. Working Height	
Max. Inclination	
Max. Wind Speed	
Max. Manual Force	
Max. Work Pressure	
Up and Over Clearance	
Overall Dimension (L×W×H)	
Gross Weight	
Year of MFG	

Made in China

Zhejiang Dingli Machinery Co., Ltd
Add: No. 1255 Baiyun South Road, Leidian
Town, Deqing, Zhejiang, China
Tel: 0086-572-8681688, 8681689
E-mail: market@cndingli.com
Http://www.cndingli.com

The identification tag bearing the manufacturing number and CE marking shown here is affixed on the RH side of the chassis and shows the machine data.





Introduction

Owners, users and operators:

Thanks for having chosen a DINGLI machine. The main priority of DINGLI is the user's safety; a joint effort is however required to achieve this. DINGLI in fact believes that the greatest contribution to safety is given by operators and users of equipment:

- 1 Follow the employer's rules, the workplace rules and the national regulatory standards in force.
- 2 Read, understand and observe the instructions contained in this and other Manuals provided with this machine.
- 3 Put into practice safe operating procedures according to common sense.
- 4 Can count on trained operators or those with suitable certification, under informed and skilled supervision, for carrying out activities with the machine.

Maintenance of the safety stickers

Replace all missing or damaged safety stickers. Always bear the safety of operators in mind. Use neutral soap and water for cleaning the safety stickers. Do not use cleaning products containing solvents as these can damage the materials of the stickers.

Conditions of use

The machine described in this Manual is designed to lift persons, tools and equipment within the maximum capacity allowed by the platform to the working positions, only for working from the platform. Access to the platform is allowed only from the ground through the entrance gate. The limits of use are described in this Manual.

Any method or condition of use outside the limits of use described or not envisaged by the Manufacturer is strictly forbidden.

Intended Use

This machine is designed only for lifting persons, tools and materials to an aerial work site.



DANGER

Failure to observe the instructions and safety standards contained in this Manual can cause severe injuries or death.

- ☒ Read, understand and observe the national regulatory standard in force.
- ☒ The machine must be used only by qualified personnel, familiar with the necessary safety standards.

Before using the vehicle, it is necessary to:

- ☒ Understand and apply the fundamental operating principles of the machine in the safety conditions contained in this Operator Manual.

1 Avoid hazard situations.

Read and understand the safety regulations before proceeding with the next section.

- 2 Always carry out the pre-operative inspection.
- 3 Check the work area.
- 4 Always carry out functional test before using the machine.
- 5 Use the machine only for the purposes which it is designed for.

- ☒ Read, understand and observe the Manufacturer's instructions and safety regulations, the Safety and Operator's Instruction Manuals and the stickers present on the machine.

- ☒ Read, understand and observe the workplace safety standards concerned.



Personnel safety

Protection of personnel from falls

Personal protective equipment (PPE) for protection from falling from heights must be used with this machine.

The workers in the platform must wear a safety belt or harness in compliance with the national regulations in force. Fix the safety cord to the fitting provided on the platform.

The workers must follow the instructions put in place by the employer, the workplace and the national safety standards in force concerning use of the personal protective equipment for protection from falling from a height.

All the PPE must conform to the national safety standards in force and must be checked and used according to the PPE manufacturer's instructions.

⚠ Electrocuting Hazards

The machine has no electrical isolation and does not provide protection from contact or proximity to electricity lines.



Observe the local and national regulatory standards in force concerning the distance required from electricity lines. At least the safety distance indicated in the Table below must be respected.

Line voltage	Minimum distance
From 0 to 50KV	3.05 m
From 50 to 200KV	4.60 m
From 200 to 350KV	6.10 m
From 350 to 500KV	7.62 m
From 500 to 750KV	10.67 m
From 750 to 1,000KV	13.72 m



Move away from the machine in case of contact with live electricity lines. Workers on the ground or on the platform must not touch or operate the machine until the electric power supply has been disconnected.

Do not use the machine in case of thunder storms or lightning. Do not use the machine as earth for carrying out welding operations.

⚠ Danger of tilting over

The workers, equipment and materials must not exceed the maximum capacity of the platform or of the platform extension element.

Maximum platform capacity

Model	Maximum platform capacity	Maximum number of occupants
BA28RT	250kg	2
BA24RT	300kg	2

If accessories are used, read, understand and follow the indications on the stickers, instructions and Manuals supplied with the accessories.



Do not raise or extend the boom unless the machine is placed on a stable level surface.



Never exceed the maximum permitted inclination of the truck; the maximum permitted inclination of the truck is indicated in the technical specifications and on the ID plate on-board the machine.

Do not use the inclination alarm as a level indicator. The inclination alarm sounds in the platform only when the machine is on a steep slope.

If the inclination alarm sounds when the boom is lowered, do not extend, rotate or raise the boom with respect to the horizontal position. Move the machine to a stable level surface before lifting the platform.

If the inclination alarm sounds while the platform is lifted, use it with utmost care. The

Work Area Safety

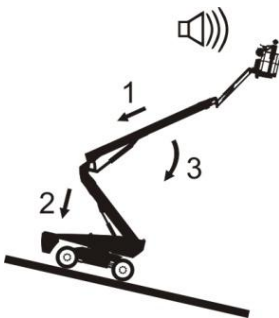
indicator lights up if the machine is not level and the side-shift function in one or both directions is not operative. Stabilise the position of the boom with respect to the slope as shown below. Follow the procedure to lower the boom before moving the machine to a stable, level surface. Do not rotate the boom while lowering it.

If the inclination alarm sounds when the platform is oriented towards the ascending part of the slope:



- 1 Lower the main boom.
- 2 Retract/lower the secondary boom.
- 3 Retract the main boom.

If the inclination alarm sounds when the platform is oriented towards the descending part of the slope:



- 1 Retract the main boom.
- 2 Retract/lower the secondary boom.
- 3 Lower the main boom.

Do not raise the boom if the wind speed can exceed 12.5 m/s. If the wind speed exceeds 12.5 m/s when the boom is raised, lower the boom and suspend use of the machine.

Do not increase the surface or the load of the platform. The increased surface exposed to the wind reduces the stability of the machine.



Use utmost caution and low speed when the machine is moved with the platform retracted on surfaces that are irregular, unstable, with detritus or slippery, or near ditches and cliffs.

Do not move the machine or close to irregular, unstable surfaces or those with other hazardous conditions when the boom is raised or extended.



Make sure the ground is able to support the weight of the machine indicated in the technical specifications in the Manual. Do not use the machine on muddy, icy, slippery, uneven ground or where there are holes in the ground.

Do not use the machine to lift hanging loads; do not use it as a crane.

Do not use the machine to lift loads in the platform, and it must not be used as a lift.

Do not use the machine to transfer persons from one floor to another one, and do not use it as a lift.

Do not use the machine to lift hanging loads; do not use it as a crane.

Do not use the machine to lift loads in the platform, and it must not be used as a lift.

Do not use the machine to transfer persons from one floor to another, do not use it as a lift.

Do not push the machine or other objects

Work Area Safety

using the machine boom.

Do not allow the boom to come in contact with adjacent structures.

Do not fix the boom or platform to adjacent structures.

Do not position loads outside the platform perimeter.



Do not pull or push on any object which is outside the platform.

Maximum permitted manual stress – CE 400 N

Do not modify or deactivate the components which affect the safety and stability of the machine.

Do not replace the components crucial for the stability of the machine with components which have different weight or technical specifications.

Do not replace the original tyres with tyres having different technical specifications or different serial number.

Do not replace the tyres with original foam rubber filling with tyres having inner tube. The weight of the wheels is important for the stability of the machine.

The tyres with wide profile must be installed by the machine manufacturer. Do not replace the original standard tyres with models having wide profile.

Do not modify or alter an aerial work platform without written authorisation from the manufacturer. Attaching fittings for supporting tools and other materials on the platform, on the foot board or on the platform railing increases the weight and exposed surface of the platform or of the load.



Do not position or fix weights or loads projecting from any part of the machine.



Do not position ladders or scaffolding inside the platform or against any part of the machine.

Do not transport equipment and materials if the load is not distributed appropriately and if it cannot be controlled by personnel on the platform in safety conditions.

Do not use the machine on a mobile surface or on a moving vehicle.

Make sure all the tyres are in good condition, that the pressure of the tyres with inner tube is appropriate and that the crown nuts are tightened correctly.

Do not use the controls in the platform to free the platform if it is blocked or obstructed in any way by an adjacent structure which prevents its normal movement. All the workers must leave the platform before trying to free it using the controls on the ground.

Work Area Safety

⚠ Danger due to movement on slopes

Do not move the machine on a slope that exceeds the maximum limits established for ascent, descent and lateral movement of the machine. The slope limit only refers to machines in the retracted position.

Maximum slope limit

Platform in descent	24.2°	(45%)
Platform in ascent	24.2°	(45%)
Lateral slope	5°	(8.7%)

Note: The slope limit depends on the conditions of the ground and presupposes an adequate traction. Consult the section regarding the machine transfer on a slope in the operating instructions chapter.

⚠ Danger of falling



The workers in the platform must wear a safety belt or harness in compliance with the national regulations in force. Fix the safety cord to the fittings present on the platform and indicated by the graph alongside.



Do not sit, stand or climb on the railings of the platform. Always maintain a stable position on the platform foot board.



Do not climb down from the platform if it is raised.

Keep the platform foot board free of detritus.

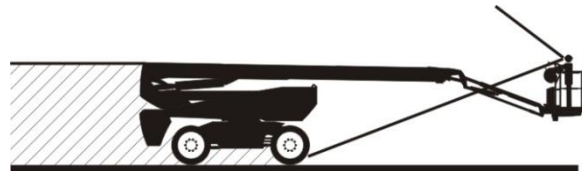
Lower the safety bar or close the entrance gate before using the platform.

Do not enter or leave the platform if the machine is not in a retracted position and the platform is not at ground level.

⚠ Danger of collision

Take care in situations of pure visibility and blind spots while driving or during the manoeuvre.

Take into consideration the position of the boom or the drift during the rotation of the slewing ring gear.



Check the work area to make sure there are no obstacles at a height or other potential hazards.



Take extreme care while gripping the platform railing to prevent danger of crushing.

The workers must follow the instructions put in place by the employer, the workplace and the national safety standards in force concerning use of the personal protective equipment for protection from falling from a height.

Always observe the use the direction arrows with color codes on the platform controls and on the chassis and the organs for side-shift and steering operations.



Do not lower the boom if the area underneath is not clear of persons or obstructions.



Reduce the transfer speed according to the conditions of the ground, the traffic, the slopes, presence of workers or other factors which can cause collisions.

⚠ Danger of personal injuries

Always use the machine in a well-ventilated area to prevent the risk of poisoning by carbon monoxide.

Do not use the machine if there is an oil or air leak. Hydraulic or air leaks can cause injury to the skin and burns.

Contact with the components present in any of the compartments can cause serious personal injury. Access to the machine compartments must only be allowed for workers qualified for maintenance. Access these compartments only during pre-operative checks. All the compartments must remain closed and locked during the working of the machine.

⚠ Danger of explosion and fire

Do not start up the engine if there is an odour or trace of LPG, petrol, diesel or other explosive substances.

Do not refuel the machine if the engine is switched On.

Refuel the machine solely in a well-ventilated area far away from sparks, flames and lighted cigarettes.

Do not use the machine in hazardous ambient or in the presence of gas or flammable or explosive materials or in areas with explosive atmosphere.

Do not spray ether in engines fitted with pre-heating spark plugs.

⚠ Dangers due to faulty machine

Do not use damaged or faulty machines.

Proceed with detailed pre-operative checking of the machine and test all the functions before each work shift. Mark and put damaged or faulty machines immediately out of service.

Make sure the maintenance checks have been carried out as specified in this Manual and in the DINGLI Maintenance Manual concerned.

Make sure all the stickers are present and legible.

Make sure the Operator Manual, Manuals on safety and responsibilities are intact, legible and placed safe inside the container concerned on the machine.

⚠ Hazards linked to the work area

Do not use the machine in environmental temperatures below -20°C or above 40°C. To



Work Area Safety

operate at other environmental temperatures, contact the manufacturer.

Do not use the machine in the presence of an explosive atmosphere.

Do not use the machine if the environmental lighting does not ensure sufficient visibility in carrying out the jobs or movements in safety conditions.

Do not use the machine if someone is present in the range of actions of the machine and in the immediate vicinity.

Danger of burns

The batteries contain acid. Always wear protective clothing and glasses when working with the batteries.

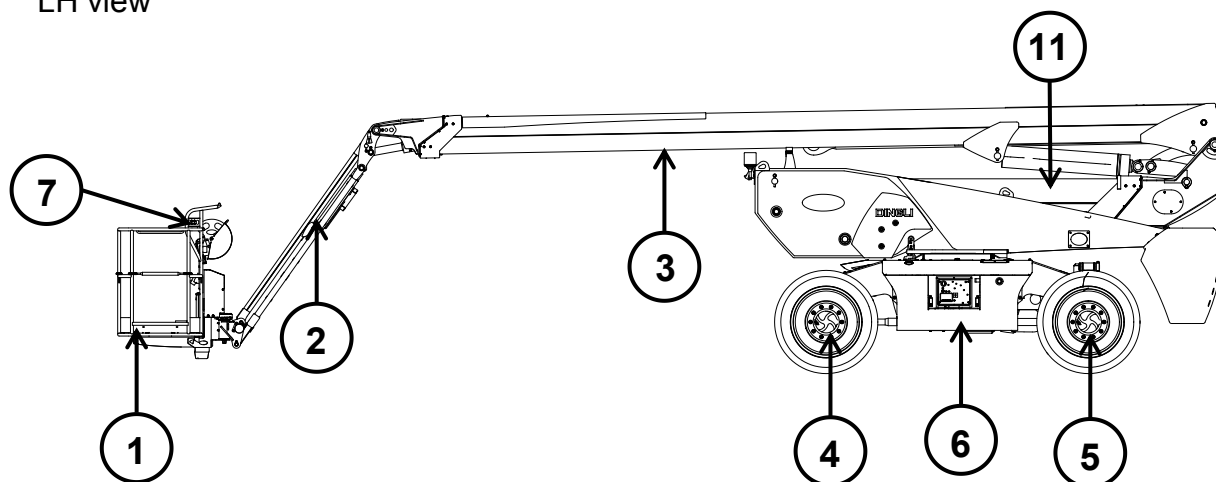
Do not spill the battery acid and avoid contact with it. Neutralise leakage of acid from the batteries with sodium bicarbonate and water.

Block after every use

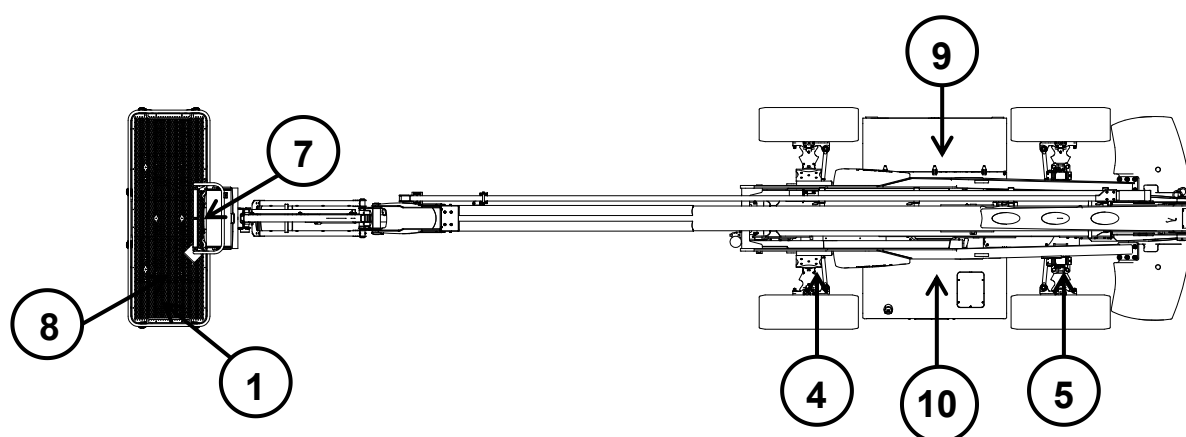
- 1 Identify a safe parking area with a level stable surface, free of obstacles and traffic.
- 2 Retract and lower the platform.
- 3 Align the turret with the truck axis.
- 4 Turn the key-operated switch of the control panel on the ground to OFF (O) and remove the key to prevent the machine being used by unauthorised personnel.

BA28RT/BA24RT Legend

LH view



Top view



1 - Aerial platform

2 - Jib

3 - Primary telescopic boom

4 - Rear wheels axle

5 - Front wheels axle

6 - Control panel on the ground

7 - Control panel on platform

8 - Pedal-operated enable switch

9 - Engine compartment

10 - Tanks compartment

11 - Second telescopic boom



Specification

Machine Specification

Item \ model	BA28RT	BA24RT
Stowed Dimension		
Overall Length	11.83m	9.83m
Overall Width	2.5m	
Width (transport position)	2.28m	
Overall Height	2.89m	
Height (transport position)	2.61m	
Rated Load		
Rated Load	250kg	300kg
Max. occupants	2	
Platform Size		
Platform Length	2.44m	
Platform Width	0.9m	
Operation Dimension		
Maximum Platform Height	26.1m	22.3m
Maximum Working Height	28.1m	24.3m
Maximum Horizontal Reach	18.8m	16.5m
Maximum Working Radius	19.4m	17.1m
Maximum boom up Angle	72°	
Maximum Up and Over Height	9.14m	
Maximum Depth of Descend	6.61m	4.03m
Maximum boom down Angle	-40°	
Minimum Turning Circle Inside/ Outside	1.87m/3.22m	
Grade ability (Stowed)	45%	
Maximum slope	X-5°, Y-5°	
Turntable rotation	360° (continuously)	
Platform rotation	180°	
Jib lifting angle	135°	
Tail Swing	1.61m	

Wheel Base	2.8m	
Gross Machine Weight	18400kg	17200kg
Ground Clearance	0.41m	
Battery		
Model	FULLRIVER: HC110	
Type	Lead-Acid Battery	
Capacity (20 hours rate)	110AH	
Nominal Voltage	12VDC	
Tire and Wheels		
Type	Foam Filled Tire And Wheel	
Model	385/45-28	
Outer Diameter	1088mm	
Width	376mm	

Performance Specification

Item \ Model	BA28RT	BA24RT
Driving Speed (Boom Stowed, high range) (km/h)	5	
Driving Speed (Boom Raised or Extended) (km/h)	1.1	
Main Boom Lift Up (s)	45~55	
Main Boom Lift Down (s)	55~70	
Main Boom Telescope Extent Out (s)	40~50	
Main Boom Telescope Retract In s	35~40	
Swing Right & Left (Fully retracted) (s)	80~100	
Articulate Boom Lift Up (s)	40~50	
Articulate Boom Lift Down (s)	40~50	
Articulate Boom Telescope Extent Out (s)	20~30	
Articulate Boom Telescope Retract In (s)	20~30	
Jib Up (s)	24~36	
Jib Down (s)	22~34	
Platform Rotate R & L (s)	10~15	



Specification

Machine Orientation When Doing Speed Tests

Lift: Boom Retracted. Telescope Retracted. Lift Up, Record Time, Lift Down, Record Time. The result will be different when the boom is fully extended.

Swing: Boom at lifted position. Telescope Retracted. Swing the Turntable to the end stop, Record Time. Swing the Opposite Direction, Record Time. Telescope extended, repeat it above.

Telescope: Boom at Full Elevation; Telescope Retracted; Telescope Out, Record Time. Telescope In, and record Time.

Drive: Test to be done on a smooth level surface. Drive Select Switch should be set at **high speed mode**. Start approximately 8 m from starting point so that the unit is at maximum speed when starting the test. Results should be recorded for a 60 m course. Drive Forward, record time. Drive Reverses, Record Time.

Drive (Above Horizontal): Test should be done on a smooth level surface. Drive Select Switch should be set to **low speed mode**. This verifies that the switches are working when the boom is above horizontal. Results should be recorded for a 15 m. course. Drive Forward, Record Time. Drive Reverse, Record Time.

Platform Rotate: Platform level and completely rotated one direction. Rotate the opposite direction, Record Time. Rotate the other direction, Record Time.

Articulating Jib: Platform level and centered with the boom. Start with the Jib down. Jib Up, Record Time. Jib Down, Record Time.

Test Notes

- 1 Stop watch should be started with the function, not with the controller or switch.
- 2 Drive test results reflect 385/45-28 tires.
- 3 All speed tests are run from the platform. These speeds do not reflect the ground control operation.
- 4 **The platform speed knob control must be turned to rapid position.**
- 5 Function speeds may vary due to cold, thick hydraulic oil. Test should be run with the oil temperature above 100° F (38° C).
- 6 Some flow control functions may not work with the speed knob clicked into the creep position.

DEUTZ TD 2.9-L4 Engine Specification

Displacement	2.925L
Number of Cylinder	4
Bore & Stoke	92×110mm
Rated Power	55.4kW/2600r/min
Maximum Torque	260N.m/1800r/min

Firing Order	1-3-4-2
Low idle	900r/min
Governor	Electric
Lubrication System	
Oil Pressure (Low idle, Engine Warm)	140 kPa/1.4bar
Oil Capacity (without/with filter)	9L
Oil Temperature in the lube oil Tray, maximum	125℃
Unit ships with 15W-40 oil, Extreme operating temperatures may require the use of alternative engine oils. Please refer the Engine Operator Manual for detail.	
Fuel Requirement	
The fuel added in should be satisfied with EN590. Refer to engine manual operation when the local environment changes.	
Engine Coolant	
Type of cooling	water cooling
Capacity	3.5L
V-belt tension (width 10mm) Pre-tensioning/Re-tensioning	650±50/400±50N

Oil and Coolant Fluid Capacity Table

Item	Name	mode	Dosage	Remark
1	Engine oil	Mobil 15W-40	9L	
2	coolant		20L	
3	wheel reduction oil		moderate	
4	differential oil		moderate	
5	grease or oil for lubricating rotating parts		moderate	refer to the chapter of lubrication
6	Hydraulic oil		145L	confirm to change the oil according to the local environment
7	Diesels		120L	be satisfied with EN590



Specification

Hydraulic System Specification

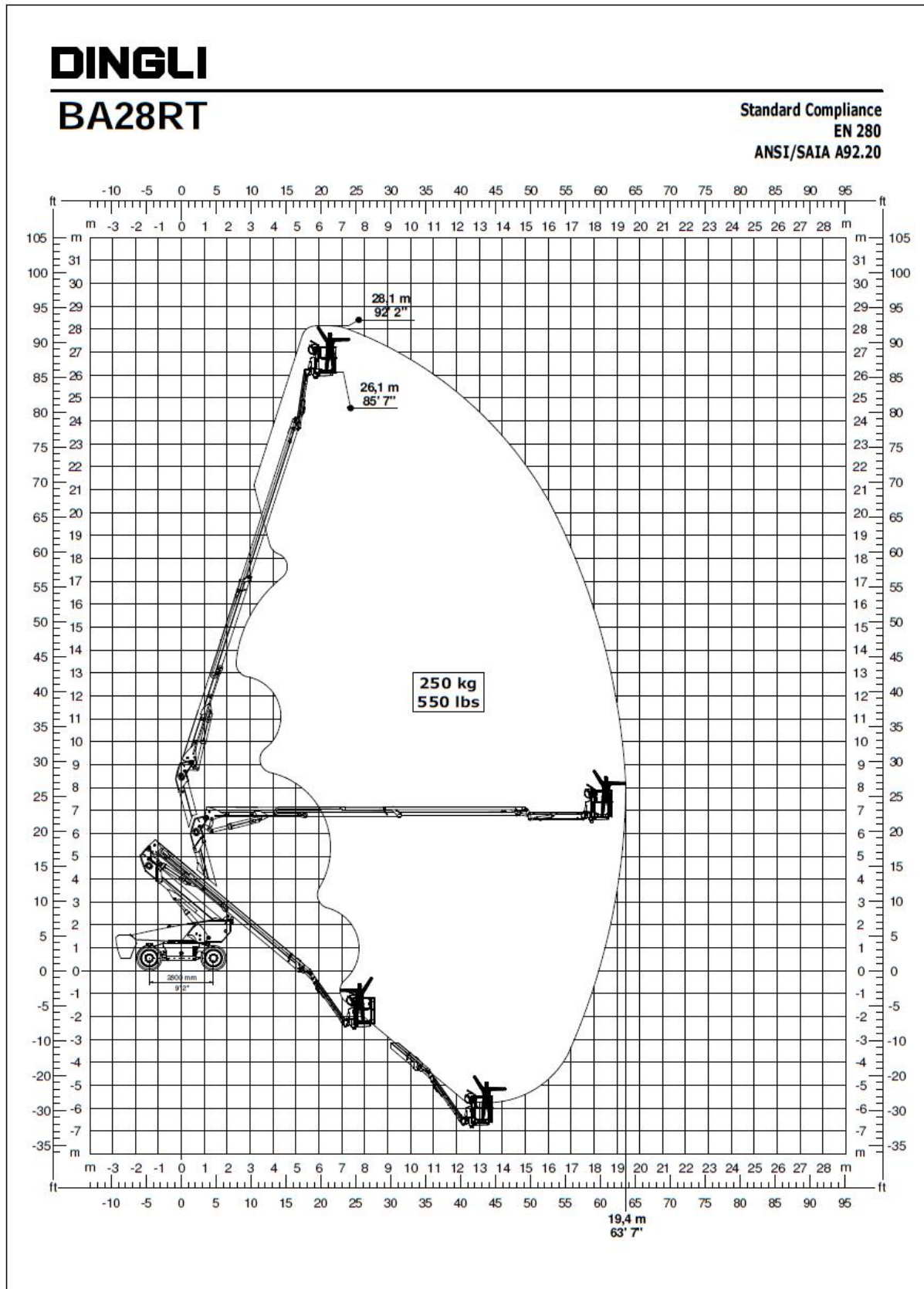
Drive Pump	
Type	Bi-directional Variable Displacement piston pump
Displacement per revolution	90cc
Maximum Peak Pressure	420bar
Maximum Continuous Working Pressure	398bar
Charge pressure	25bar
Driven motor	
Type	Fixed displacement piston motor
Displacement per revolution	90cc
Rated Working Pressure	400bar
Function Pump	
Type	Variable displacement piston pump
Rated Working Pressure	265bar
Displacement per revolution	28cc
PVG	
Function Main Relief Pressure	300bar
Main Boom Telescopic Extend Pressure Setting	160bar
Main Boom Telescopic Retract Pressure Setting	240bar
Main Boom Lift Up Pressure Setting	200bar
Main Boom Lift Down Pressure Setting	180bar
Articulate Boom Extend Out Pressure Setting	115bar
Articulate Boom Retract In Pressure Setting	105bar
Articulate Boom Lift Up Pressure Setting	200bar
Articulate Boom Lift Down Pressure Setting	180bar
Rotating pressure setting	120bar
Jib levelling up pressure setting	240bar
Jib levelling down pressure setting	200bar

Platform valve pressure setting	220bar
Platform control valve	
Platform swing pressure setting	140bar
Jib lifting down pressure setting	160bar
Hydraulic Reservoir	
Maximum Capacity	165L
Auxiliary Pump Unit	
Model	ET135AK/X0 100/1,7 S 819
Displacement	1.7cc
Hydraulic Generator (Option)	
Mode	HG9-E230SD23-51-R
Power	9kW



Specification

Work Scope



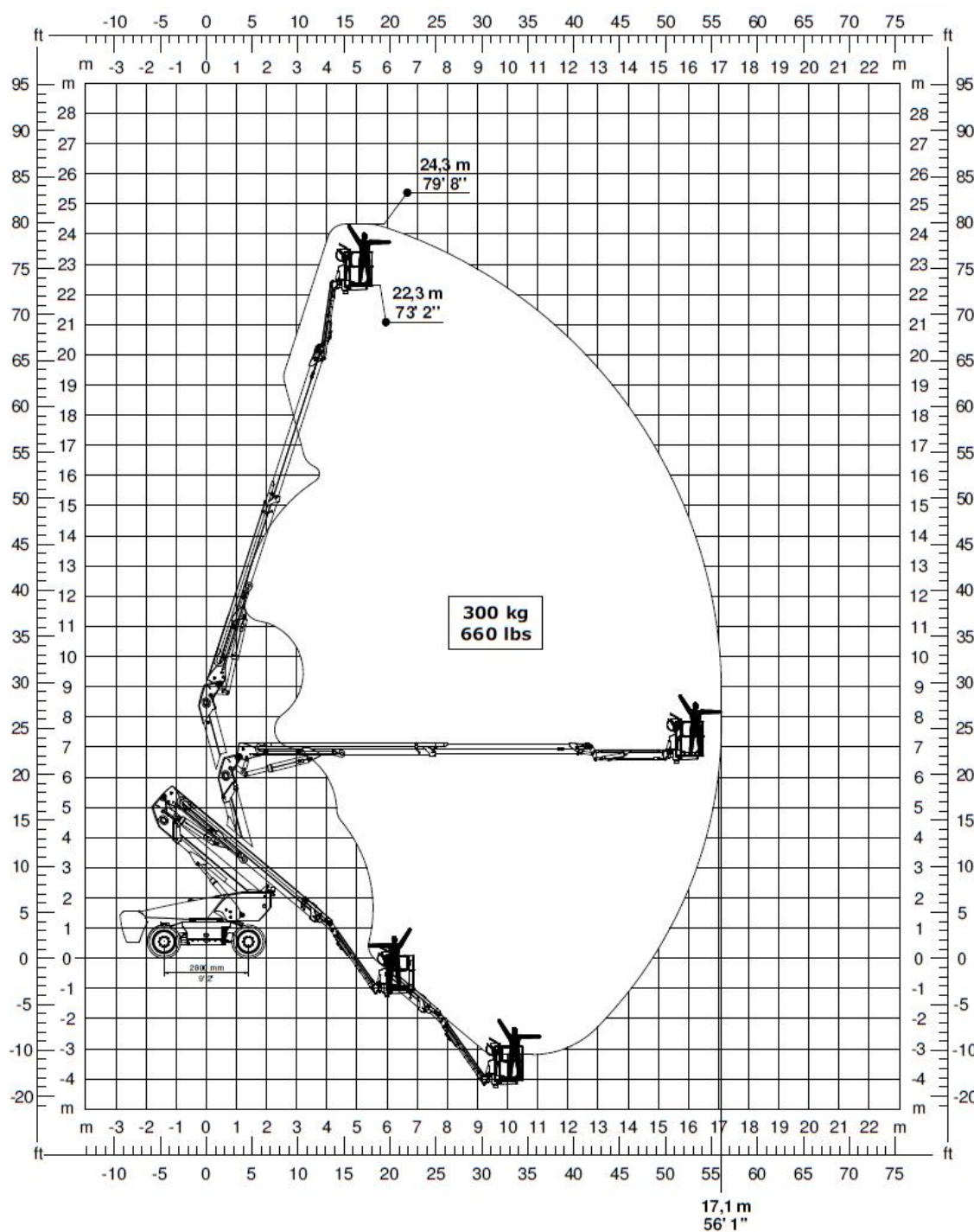
DINGLI

BA24RT

Standard Compliance

EN 280

ANSI/SAIA A92.20

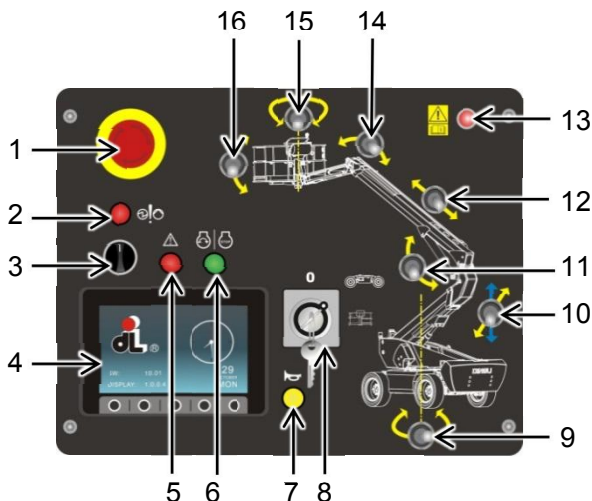


Controls

Control panel on the ground

The control panel on the ground must be usually used to operate the platform for storage and for operating tests. The control panel on the ground can be used in case of emergency to save a person who is unable to move on the platform. When the control panel on the ground is activated, the controls from the platform are deactivated, except for the emergency stop.

The control panel on the ground is housed in a removable compartment placed on the LH side of the truck near the fuel tank. To remove it, act on both the handles, opening it by pressing the lock as described below, then lift the technical compartment.



1 Red emergency stop button

To stop all the functions and switch off the engine, press down the red emergency stop button. To activate the machine, pull the red emergency stop button to the ON position by turning it clockwise.

2 Auxiliary power supply button

Use the auxiliary power supply in case of a fault in the main power supply (I.C. engine).

Press down the button to activate the auxiliary power supply, and then set the platform in safety condition.

3 Movement enable key

To enable the hydraulic movements from the control panel on the ground, turn the key clockwise and hold it in this position.

4 Diagnostics panel



This panel contains the basic information for monitoring the working of the truck. The pages and options available are displayed in the lower part of the screen [A] and are controlled by the corresponding buttons present below [B].

Main page

The upper band shows:

- alarm indicator light;
- battery electric voltage low indicator light;
- engine spark plugs preheating indicator light;
- steering mode selection indicator light;
- parking brake active indicator light;
- work lights active indicator light;

- engine oil level low indicator light;
- differential block active indicator light;
- front axle block active indicator light;
- cooling fan inversion active indicator light;
- movement speed selection indicator light: slow/fast;
- controls position indicator light; ground/basket.

The central band shows:

- the motor rev counter to the LH,
- the number of working hours in the centre, the batteries voltage, the fuel level and the code of the faulty of the engine;
- The engine oil pressure indicator and the engine water temperature indicator on the RH.

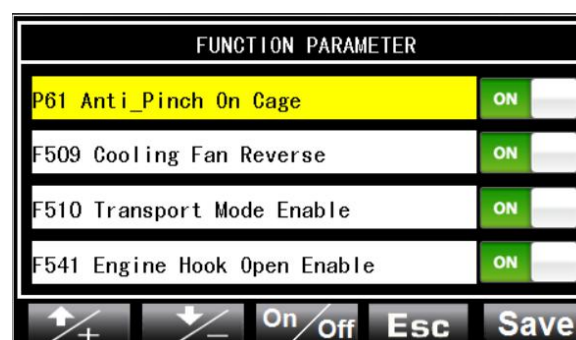
The bottom band shows the indications of the pages that can be consulted:

- engine data (rpm, drive torque percentage measured, coolant temperature, oil pressure, engine consumption measured, instant and maximum fuel consumption, operating hours, quantity of fuel used, required engine speed);
- operational data (angular inclination of boom, angular inclination of secondary boom, angular inclination of JIB, inclination of the platform, inclination of the truck on the horizontal plane, hydraulic fluid temperature, load measured on platform);
- options settings (activation/deactivation of basket safety system, cooling fan inversion activation/deactivation, transport mode activation/deactivation; engine

compartment hood micro switch activation/deactivation; telescopic boom closure confirmation activation/deactivation.





The setting interface could be entered by depressing setting button and hold on for one second. The optional function can be turned on or off without password, after entering setting interface. The procedures are as follows:



- A Depressing or is used to choose the item separately. For example “P61 Anti_Pinch On Cage”, “F509 Cooling Fan Reverse”, “F510 Transport Mode Enable” and “F541 Engine Hook Open Enable”. The chosen item would be shown in yellow background.
- B Depressing and holding on is used to turn on or off corresponding function.



Controls

- C Save the modified value by depressing the button .
- D Modifying “P61 Anti_Pinch On Cage”, “F509 Cooling Fan Reverse”, “F510 Transport Mode Enable” and “F541Engine Hook Open Enable”, is only valid in condition of power on. It will return back at the moment of interruption of power supply.
- E It returns back to main interface, when the button  is depressed.

NOTE:: The modification of transport mode would be invalid at the moment of one of the following being activated.

- ✓ Platform control is chosen.
- ✓ The degree of chassis inclining exceeds 5.
- ✓ The angle of main boom lifting exceeds 20.
- ✓ Main boom extends more than one meter.

- exit button
- MENU button

5 Basket signal bypass selector

To enable movements from the control panel on the ground with the red emergency button pressed from the platform, keep the selector enabled together with the enable key activated and the movement selectors concerned.

6 Engine start-up button

Press the green button to start up/switch off the engine.

7 Acoustic warning button

To activate the acoustic signal press the yellow button.

8 Key-operated switch

With the key in position 0 the truck is switched off: in another position, if brought to 0 the electric circuit closes, switching off the truck.

To activate the controls on the ground, turn the key-operated switch to the icon representing the truck. To activate the controls in the platform, turn the key-operated switch to the position representing the platform.

9 Turret rotation selector

To rotate the turret counter clockwise, turn the selector to the LH.

To rotate the turret clockwise, turn the selector to the RH.

10 Articulate boom lift/extend selector

To extend the articulate boom, move the selector up.

To retract the articulate boom, move the selector down.

To lift up the articulate boom, move the selector up.

To lower the articulate boom, move the selector down.

The extension is valid when the boom is lifted up completely.

The operation of lifting down is valid when the boom is retracted completely.

11 Primary telescopic boom lifting selector

To lift up the primary telescopic boom, move the selector up.

To lower the primary telescopic boom, move the selector down.

12 Primary telescopic boom extension selector

To extend the primary boom, turn the selector to the LH.

To retract the primary boom, turn the selector to the RH.

13 Red indicator light

The red indicator lights up in condition of the truck being dangerous or in case of the truck being in mechanical faulty.
(together with the specific signal)

In this situation, stop the vehicle after lowering the platform and check the signals highlighted on the diagnostics panel.

14 Jib lifting selector

To lift the jib, turn up the selector.

To lower the jib, turn down the selector.

15 Platform rotation selector

To rotate the platform counter clockwise, turn the selector to the LH.

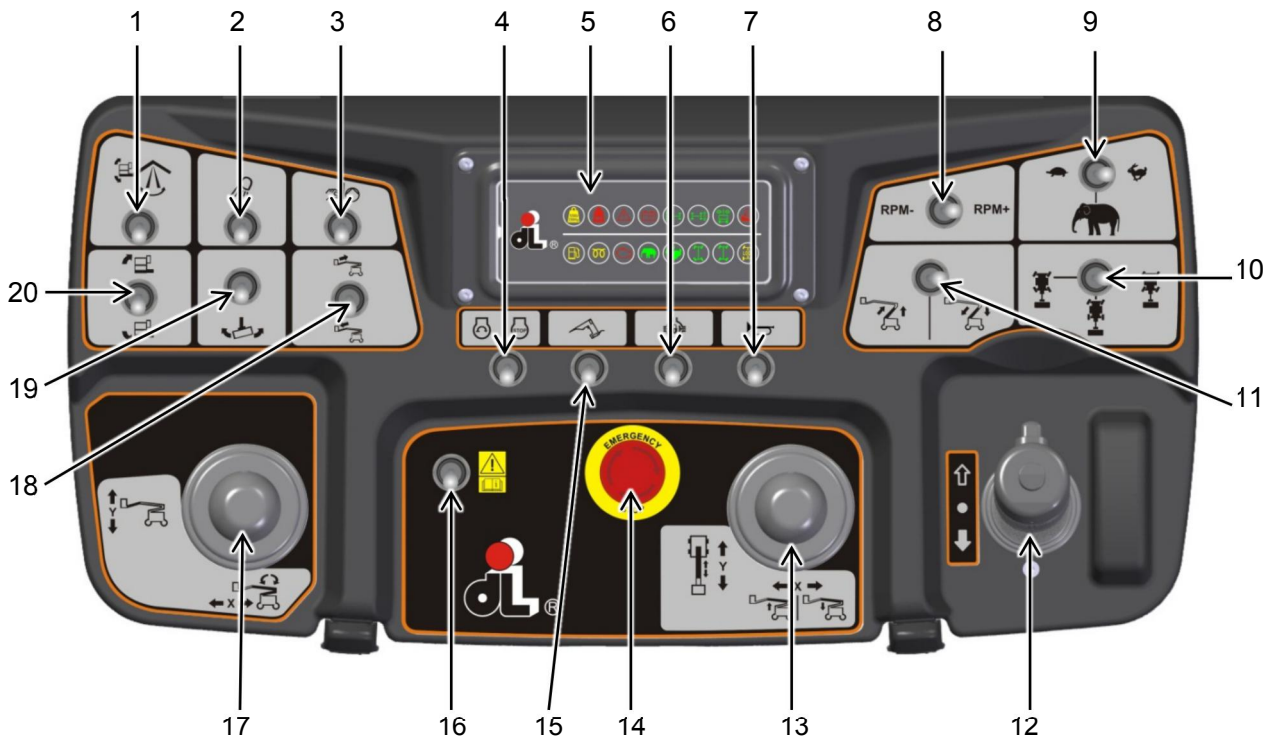
To rotate the platform clockwise, turn the selector to the RH.

16 Platform levelling selector

To level up the platform, move the selector upwards.

To lower the platform, move the selector downwards.

Control panel on platform



⚠ To impart the platform commands, press the movement enable pedal present on the platform.

1 Levelling the jib

When the secondary boom exceeds the horizontal levelling limit in positive or negative, Push the toggle up or pull down and then hold on to recover the correct position. When the operation is complete, the red indicator and emergency warning sound are deactivated

2 Work lights

Activate the selector to switch on the work lights fitted on the structure

3 Auxiliary pump

Use the emergency power supply in case of a fault in the main power supply (I.C. engine).

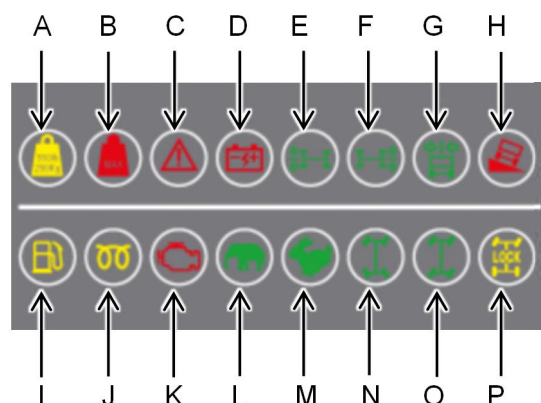
Act on the selector for activation.

⚠ Extended use will affect the battery charge: only use in case of emergency.

4 Engine start up

Activate the selector to start up/switch off the I.C. engine.

5 Indicator lights panel



- A Load indicator on platform**
The yellow indicator lights up to indicate that the load in the platform has exceeded the permitted load when the platform is at the permitted location.
- B Maximum load indicator**
The red indicator lights up to indicate that the load in the platform has exceeded the maximum permitted load.
- C Generic hazard indicator**
The red indicator lights up in hazard conditions of the truck (together with the specific signalling) or in case of mechanical fault of the truck.

In this situation, stop the vehicle after lowering the platform and check the signals highlighted on the diagnostics panel.
- D Batteries low voltage indicator light**
The red indicator light switches on when the battery voltage level is below the threshold allowable for the correct working of the truck.

In this situation, the operators must get down and charge it.

If the indicator still lights up after completing charging it, the battery should be checked or replaced.
- E Front axle wheels alignment**
The green indicator light indicates the alignment of the front axle wheels with the truck axis.
- F Rear axle wheels alignment**
The green indicator light indicates the alignment of the front axle wheels with the truck axis.
- G Turret/telescopic boom alignment**
The green indicator light indicates the alignment of the turret/telescopic boom with the truck axis.
- H Roll-over indicator light**
The red light indicates that the maximum slope with respect to the horizontal plane of the platform is reached. The side shift function in one or both directions will not be operational.

Only movements for restoring safety and levelling to the vertical plane are enabled.
- I Fuel level indicator**
The yellow indicator lights up to indicate low fuel level.
- J Spark plugs pre-heating**
The orange indicator lights up to indicate pre-heating of the spark plugs for powering the electrical system.

Wait for this to be switched off to start-up the engine.
- K Engine fault**
The red light indicates a fault in the I.C. engine. Stop the vehicle and check the engine parameters from the panel present on the truck in the tanks compartment.
- L ELEPHANT drive mode**
The green light indicates activation of the transfer mode for moving over sloping sections.
- M HARE drive mode**
The green light indicates activation of the transfer mode at maximum speed.
- N Round steering mode**
The green light indicates selection of



Controls

steering mode with opposite axles to reduce the steering radius on the ground.

O Crab steering mode

The green light indicates selection of steering mode with the axles parallel for lateral movements.

P Differential block

The yellow light indicates activation of the differential block

6 Differential block

Keeping the selector activated activates the differential block, increasing the traction of the wheels on the rear axle




7 Warning buzzer

Use the selector to activate the acoustic signal.

8 Engine rpm control

Activating the selector will increase [+] or decrease [-] the engine rpm.

9 Speed selector

- position : low speed,
- position : low speed with high rpm of engine because level differences are exceeded.
- position : high speed.

The movement speed is controlled by the position of the primary telescopic boom: high speed can only be used: with controls from the platform, with boom completely lowered, retracted and with turret rotation centred.

As soon as one of the conditions described above is not respected, the speed changes automatically to slow.

10 Steering mode selector:

- axles with round steering;

- only steers the front axle;
- axles with parallel steering:

Note: The four wheels should be at original position before changing the steering mode.

11 Articulate boom lift/extend selector

To extend the articulate boom, move the selector up.

To retract the articulate boom, move the selector down.

To lift up the articulate boom, move the selector up.

To lower the articulate boom, move the selector down.

The extension is valid when the boom is lifted up completely.

The operation of lifting down is valid when the boom is retracted completely.

12 Lateral movements of the truck

To activate the joystick commands press the enable pedal on the platform as well as the enable button present on the front of the joystick.

To move the truck forwards/backwards, move the joystick on the vertical axis.

To pilot the steering, act on the selector provided at the top of the joystick.

13 Primary telescopic boom movement

Move the joystick in both horizontal directions to extend/retract the primary boom.

Move the joystick in both vertical directions to raise/lower the primary boom.

14 Red emergency stop button

To stop all the functions and switch off the engine, press the red emergency stop button To activate the machine, set the

red emergency stop button to the ON position by turning it clockwise

15 Hydraulic generator (optional)

When present, the selector activates the power socket on the platform to power up the work tools.

16 Basket signal bypass selector

To enable movements from the control panel on the platform when something wrong with the machine happened, keep the selector enabled together with the enable key activated and the movement selectors concerned.

Note: Just when there is some failure warning except deadly security alarm, and the machine has to be moved or loaded, the switch can be used to do, while the persons in the platform and around the machine are safe. Arbitrary usage of the switch will result in damage and serious injury.

17 Turret rotation /secondary boom lifting

Move the joystick in both horizontal directions to rotate the turret.

Move the joystick in both vertical directions to raise/lower the secondary boom.

18 Secondary telescopic boom (if present) extension

Not used.

19 Platform rotation

Move the joystick in both horizontal directions to rotate the platform.

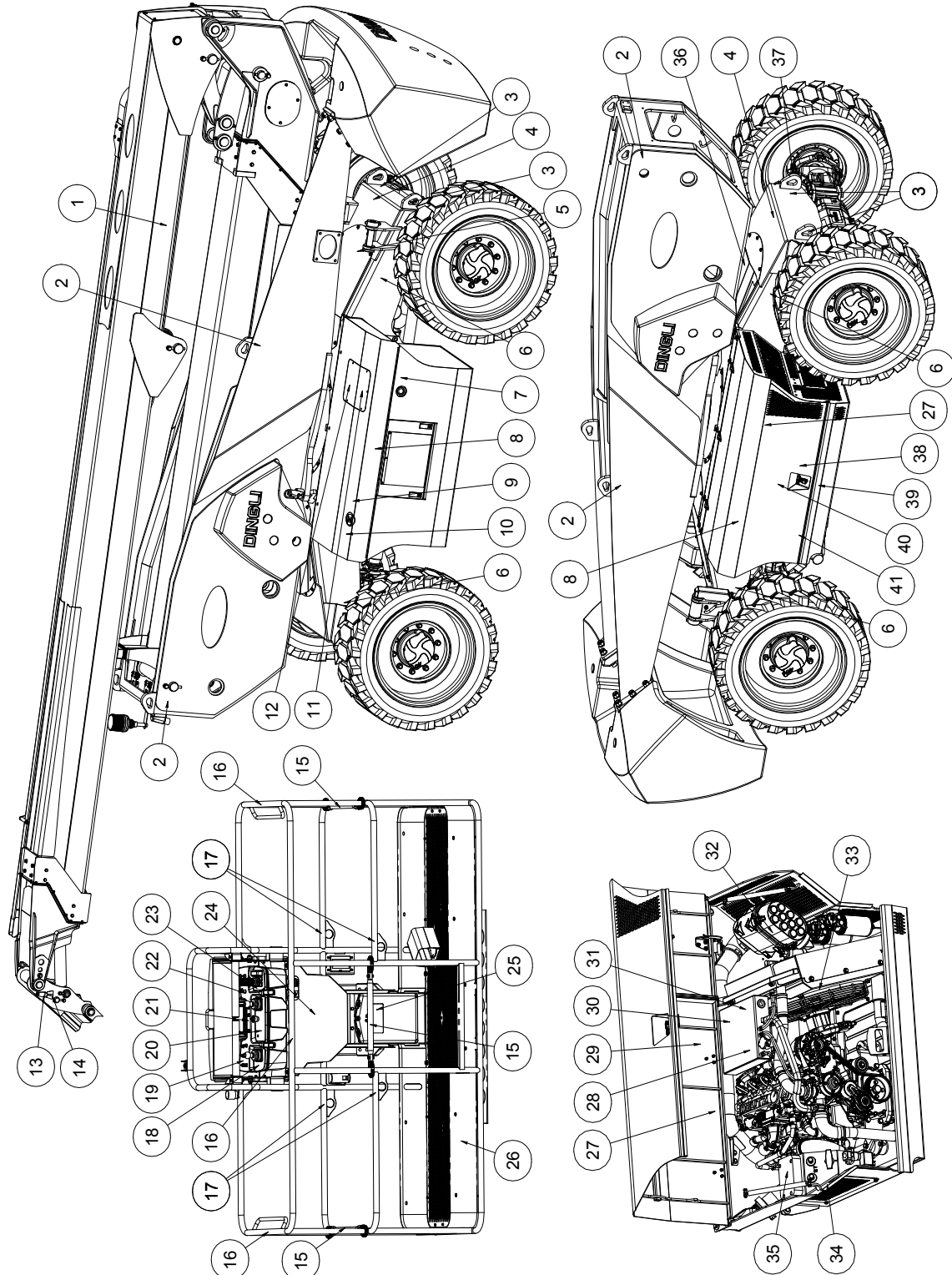
20 Levelling the platform

Not used.

Placards and Decals

Placards and Decals

Read and understand all placards and decals. Do not operate any machine on which DANGER, WARNING, CAUTION OR INSTRUCTION PLACARDS OR DECALS ARE MISSING OR ILLEGIBLE. Replace placards and decals if damaged, missing or illegible.



① 09630019

BA28RT

① 09630020

BA24RT

② 09320013

⑤ 09310251

④ 09410117

⑥ 09310282

⑦ 09310240

③ 09310256

⑧ 09910022

⑧ 09910023

⑨ 09410113

⑩ 09310253

⑫ 09310242

⑬ 09330002

⑭ 09330004

⑪ 09310252

⑮ 09340016

⑯ 09440212

⑰ 09340041

⑱ 09140040

⑲ 09140037

⑳ 09140041

㉑ 09140038

㉒ 09140039

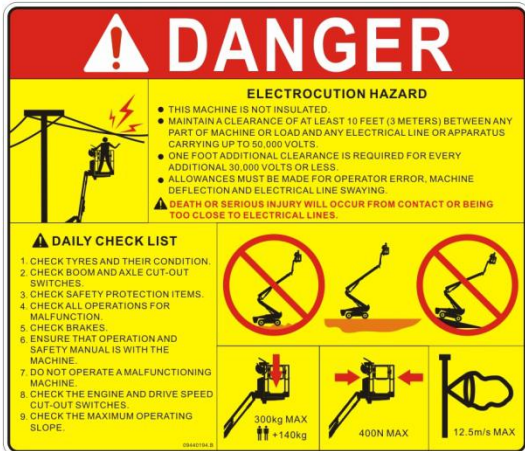
㉓ 09140042

Placards and Decals

24 09440272



24 09440194



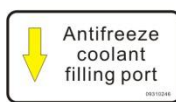
25 09340001



27 09410119



28 09310246



30 09410123



32 09310254



26 09440259

CAPACITY • 250kg

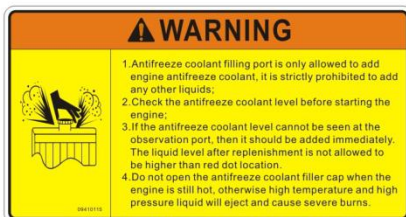
26 09440192

CAPACITY • 300kg

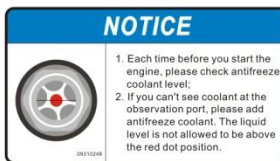
33 09410120



29 09410115



31 09310248



34 09410122



37 09310300



36 09310250



35 09410121



39 09410118



40 09310255



38 09310244



41 09610005

BA28RT BA24RT

41 09610006

Placards and Decals

No.	Parts No.	Description	Qty.	Remark
1	09630019	Decal, Label-BA28RT	1	BA28RT
	09630020	Decal, Label-BA24RT	1	BA24RT
2	09320013	Decal, Instructions-Lift point	4	
3	09310256	Decal, Instructions-Tie down point	4	
4	09410117	Decal, Symbols-Crushing hazard	2	
5	09310251	Decal, Instructions-Black arrow forward	1	
6	09310282	Decal, Instructions-Maximum wheel load 9350kg	4	BA28RT
	09310285	Decal, Instructions-Maximum wheel load 8800kg	4	BA24RT
7	09310240	Decal, Notice-Check the hydraulic oil level	1	
8	09910022	Decal, Label-BA28RT	2	BA28RT
	09910023	Decal, Label-BA24RT	2	BA24RT
9	09410113	Decal, Warning-Filling diesel warning	1	
10	09310253	Decal, Instructions-Diesel	1	
11	09310252	Decal, Instructions-Hydraulic	1	
12	09310242	Decal, Notice-Filling hydraulic oil notice	1	
13	09330002	Decal, Instructions-Pendular arm	1	
14	09330004	Decal, Instructions-Horizontal alignment	1	
15	09340016	Decal, Instructions-Open/close	3	
16	09440212	Decal, Warning-Crushing hazard	3	
17	09340041	Decal, Label-Lanyard anchorage point	4	
18	09140040	Decal, Platform control panel	1	
19	09140037	Decal, Platform control panel	1	
20	09140041	Decal, Platform control panel	1	
21	09140038	Decal, Platform control panel	1	
22	09140039	Decal, Platform control panel	1	
23	09140042	Decal, Platform control panel	1	
24	09440272	Decal, Danger-General safety rules	1	BA28RT
	09440194	Decal, Danger-General safety rules	1	BA24RT



Placards and Decals

No.	Parts No.	Description	Qty.	Remark
25	09340001	Decal, Notice-Keep the manual with the machine	1	
26	09440259	Decal, Label-Capacity 250kg	1	BA28RT
	09440193	Decal, Label-Capacity 300kg	1	BA24RT
27	09410119	Decal, Symbols-High temperature	2	
28	09310246	Decal, Instructions-Antifreeze coolant filling port	1	
29	09410115	Decal, Warning-Filling antifreeze coolant warning	1	
30	09410123	Decal, Symbols-Pressurized liquids	1	
31	09310248	Decal, Notice-Filling antifreeze coolant notice	1	
32	09310254	Decal, Instructions-Air filter	1	
33	09410120	Decal, Symbols-Cutting hazard	1	
34	09410122	Decal, Symbols-Entangled hazard	1	
35	09410121	Decal, Symbols-Electricity	1	
36	09310250	Decal, Instructions-White arrow reverse	1	
37	09310300	Decal, Instructions-Grease filling port	4	
38	09310244	Decal, Notice-Open door notice	1	
39	09410118	Decal, Symbols-Hand crushing hazard	1	
40	09310255	Decal, Instructions-Engine	1	
41	09610005	Decal, Label-BA28RT	1	BA28RT
	09610006	Decal, Label-BA24RT	1	BA24RT



Do Not Operate Unless:

- ☒ Before using the machine, it is necessary to understand and apply the fundamental principles regarding the working of the machine in the safety conditions contained in this Operator's Manual.

- 1 Avoid hazard situations.
- 2 **Always carry out the pre-operative inspection.**

Read and understand the pre-operative inspection before proceeding with the next section.

- 3 Check the work area.
- 4 Always carry out functional test before using the machine.
- 5 Use the machine only for the purposes for which it is designed: operating instructions.

Fundamental elements of pre-operative inspection

The operator is responsible for carrying out the pre-operative inspection and routine maintenance.

The pre-operative inspection is a visual inspection carried out by the operator before every work shift. The inspection must be carried out on the machine to check for faults before the operator proceeds with testing the functions.

The pre-operative inspection is also meant to establish if routine maintenance procedures are necessary. The operator must only carry out the routine maintenance specified in this Manual.

If damage or unauthorised modification is found on the machine differing from the original conditions, mark and put the machine out of service.

The repairs must be done only by qualified technical personnel, according to the manufacturer's technical specifications. After completing the repairs, the operator must repeat the pre-operative inspection before testing the functions.

The scheduled maintenance must be carried out by qualified technical personnel, according to the manufacturer's technical specifications and the requirements listed in the Operation and Maintenance Manual of this machine.



Pre-operative Inspections

Pre-operative inspections

- ☐ Make sure the Operator Manual, Manuals on safety and responsibilities are intact, legible and placed safe inside the container concerned on the platform.
- ☐ Make sure all the stickers are present and legible. Consult the placards and decals chapter.
- ☐ Check for oil leaks from the hydraulic system and check the correct oil level. Add oil if necessary. Consult the Maintenance chapter.
- ☐ Check for oil leaks from the engine and check the correct oil level. Add oil if necessary. Consult the Maintenance chapter.
- ☐ Check for coolant leakage from the engine and check the correct coolant level. Add coolant if necessary. Consult the Maintenance chapter.
- ☐ Check if the fuel level is correct. Some fuel may be needed to be added in if necessary. Especially, the fuel added in should be satisfied with EN590. If not, it may damage the engine.

Check the following components or the following areas for damage, missing components or incorrect assembly and unauthorised modifications:

- ☐ Electrical components, cables and wiring.
- ☐ Hydraulic piping, connections, cylinders and manifolds.
- ☐ Fuel and hydraulic tanks.
- ☐ Motors for movement of the slewing ring gear and transmission hubs.
- ☐ Braking sliding blocks.
- ☐ Tyres and wheels.
- ☐ Engine and its components.

- ☐ Limit switches and warning sound.
- ☐ Flashing lights and alarms (if present)
- ☐ Nuts, bolts and other safety retainer devices.
- ☐ Safety bar or platform entrance gate.
- ☐ Cord fixing point.

Check the entire machine if necessary for the presence of:

- ☐ Cracks in the welds or in the structural components.
- ☐ Dents or damage to the machine.
- ☐ Rust, oxidation or excessive corrosion.
- ☐ Make sure that all the structural components and other critical components are present and that all the relative retainers and pins are fitted and tightened properly.

After completing the inspection, make sure all the covers of the compartments are fitted in the correct position and are blocked.

Never use a faulty machine. If faults are found, the machine must be marked and put out of service. The repairs must be done only by qualified technical personnel, according to the manufacturer's technical specifications.

After completing the repairs, the operator must repeat the pre-operative inspection and test the functions before using the machine.



- ☒ Before using the machine, it is necessary to understand and apply the fundamental principles regarding the working of the machine in the safety conditions contained in this Operator's Manual.

- 1 Avoid hazard situations.
- 2 Always carry out the pre-operative inspection.

3 Check the work area.

Read and understand the work area before proceeding with the next section.

- 4 Always carry out functional test before using the machine.
- 5 Use the machine only for the purposes for which it is designed: operating instructions.

Fundamental elements of control of the work area

The control of the work area makes it possible for the operator to decide whether the work area is compatible with the working of the machine in safety conditions. The checking must be done by the operator before transporting the machine to the work place.

It is the operator's responsibility to remember the hazards concerning the work area and, consequently, be ready to avoid these during the movement, preparation and the working of the machine.

Inspection of the workplace

Identify and avoid the following hazard situations:

- cliffs or ditches
- dips, obstructions along the floor or detritus
- sloping surfaces
- support surfaces not suitable to withstand the load stresses cause by the machine
- obstacles present above the machine and high voltage electricity lines
- wind exceeding 12.5 m/s and unfavourable atmospheric conditions (rain, snow, etc.)
- ambient temperature less than -20°C or more than 40°C
- presence of explosive atmosphere
- poor or insufficient lighting
- insufficient ventilation
- hazardous environments
- presence of unauthorised workers
- other potential hazard conditions

Functional Tests



✓ Before using the machine, it is necessary to understand and apply the fundamental principles regarding the working of the machine in the safety conditions contained in this Operator's Manual.

- 1 Avoid hazard situations.
- 2 Always carry out the pre-operative inspection.
- 3 Check the work area.
- 4 **Always carry out functional test before using the machine.**

Read and understand the functional test before proceeding with the next section.

- 5 Use the machine only for the purposes for which it is designed: operating instructions.

Fundamental elements of functional test

Functional test makes it possible for the operator to make sure the machine is in safety conditions, before using the machine to work. All the function operation must be done before starting work by the functional test operating procedures.

Never use a faulty machine. If faults are found, the machine must be marked and put out of service. The repairs must be done only by qualified technical personnel, according to the manufacturer's technical specifications.

After completing the repairs, the operator must repeat the pre-operative inspection and test the functions before using the machine.

Controls on the ground

- Select a stable, level work area free of obstacles.
- Position the key-operated switch of the truck panel on the controls on the ground; the LCD must light up without showing any error message.

Note: in cold climates, the LCD display requires a short warm up time before lighting up.

- Turn the ignition key on the symbol representing the truck then start up the engine by pressing the green button.

Emergency stop test

- Press the red emergency stop button by turning it to the OFF position: the engine must switch off and no function can be operative.
- Turn the red stop emergency button to the ON position and restart the engine

Testing the machine functions

- Do not activate the movement enable key. Activate each of the platform and boom functions buttons: the boom and platform functions must not be operative.
- Activate the movement enable key and activate each of the boom and platform functions buttons: all the platform and boom functions must be operative for a complete cycle.

Auxiliary pump test

- Press the red emergency stop button: stop the I.C. engine and then reset the button.
- Activate the auxiliary pump and test the movements of the booms and platform.

NOTE: to avoid consuming the batteries, limit the test duration time.

- After confirming the correct working, deactivate the auxiliary pump and restart the I.C. engine.

Testing the warning sound

- Press the yellow button of the warning sound and check its working.

Checking the errors

- Select from the control panel the alarm pages and check for the absence of alarms.
- If this is not the case, immediately proceed with solving the problem.

Controls on the platform

- Position the key-operated switch of the trucks control panel on the controls in the platform and start up the I.C. engine.

Emergency stop test

- Press the red emergency stop button on the platform by turning it to the OFF position: the engine must switch off and no function can be operative
- Turn the red stop emergency button to the ON position and restart the engine.

Testing the pedal switch

- Press the red emergency stop button on the controls in the platform, bringing it to the OFF position.
- Turn the red emergency button to the ON position.
- Press the pedal switch and try to start up the engine: if everything works correctly, the engine will not start up.
- Do not press the pedal switch down and start up the engine: if everything works correctly, the engine will start up.
- Do not press the pedal switch down and



Functional Tests

test each function of the machine: none of the functions must be operative.

Testing the machine functions

- Do not press the movement enable pedal. Activate the functions of the joysticks for movement and telescopic booms: the functions must not be operative.
- Press the movement enable pedal and act on the joysticks: the functions must be operative.

Auxiliary pump test

- Press the red emergency stop button: stop the I.C. engine and then reset the button.
- Activate the emergency pump and test the movements of the booms and platform.

NOTE: to avoid consuming the batteries, limit the test duration time.

- After confirming the correct working, deactivate the auxiliary pump and restart the I.C. engine.

Testing the steering methods

- Operate on the selector concerned and check the working of the three types of steering of the wheels.

Testing the warning sound

- Push up the switch of the warning sound and check its working.

Testing the selection of the movement speed

It is possible to select mainly 2 speeds from the control panel on the platform:

- high movement speed (represented by the hare) of 5 km/h that can only be activated with the primary telescopic boom completely lowered and retracted;
- low movement speed (represented by the tortoise) of 1 km/h, that can be activated

with the boom in the operating position.

- The third option makes it possible to overcome small obstacles keeping the transfer speed minimum but with the engine rpm maximum to impress all the power on the drive wheels

The high/low movement speed can be selected not only by the selector mentioned but also electronically by means of software installed on the truck: as soon as the primary telescopic boom moves from the completely lowered, retracted position, the electronic control automatically activates low speed to protect the operators on board.

At the end of the electronic control tests, proceed as described below.

Select the maximum movement speed; with the primary telescopic boom lowered and retracted slowly activate the movement: the truck moves at a speed of 1.4 m/s (5 km/h).

- With the primary telescopic boom in the completely lowered and retracted position, lift it by 10° and slowly activate the movement: the truck must not exceed a speed of 30 cm/s (1 km/h).
- Restore the boom to the completely lowered hold position.
- With the primary telescopic boom in the completely lowered and retracted position, extend it by 1.00 m and slowly activate the movement: the truck must not exceed a speed of 30 cm/s (1 km/h).
- Restore the boom to the completely lowered hold position.
- If the movement speed with the primary telescopic boom raised and extended exceeds 30 cm/sec (1 km/h), stop the truck immediately and call an authorised service centre.

Testing the movement and braking

- Press the pedal switch down.
- Slowly move the movement control knob in the direction indicated by the black arrow on the control panel until the machine starts moving, then restore the knob to the central position.
- Result: the machine must move in the direction shown by the black arrow on the truck then stop suddenly.
- Slowly move the movement control knob in the direction indicated by the white arrow on the control panel until the machine starts moving, then restore the knob to the central position.
- Result: the machine must move in the direction shown by the white arrow on the truck then stop suddenly.

Note: the brakes must keep the vehicle stationary on the maximum slope that can be travelled by the vehicle.

Operating Instructions



✓ Before using the machine, it is necessary to understand and apply the fundamental operating principles of the machine in the safety conditions contained in this Operator Manual.

- 1 Avoid hazard situations.
- 2 Always carry out the pre-operative inspection.
- 3 Check the work area.
- 4 Always carry out functional test before using the machine.
- 5 **Use the machine only for the purposes for which it is designed: operating instructions.**

Fundamental elements of operating instructions

The machine described in this Manual is designed to lift persons, tools and equipment within the maximum capacity allowed by the platform to the working positions, only for working from the platform. Access to the platform is allowed only from the ground through the entrance gate.

Any method or condition of use outside the limits of use described or not envisaged by the Manufacturer is strictly forbidden.

Only trained and authorized personnel should be permitted to operate a machine. If more than one operator is expected to use a machine at different times in the same work shift, they must all be qualified operators and are all expected to follow all safety rules and instructions in the operator's manual. That means every new operator should perform a pre-operation inspection, function tests, and a workplace inspection before using the machine.

Emergency Stowing

Just when there is some failure warning except deadly security alarm and the platform has to be lowered or loaded, push Bypass Switch up and hold on, and then activate the footswitch and corresponding switch to complete it.

The fault is divided into three classes: class A/B/C. Different class, different emergency stowing procedure.

Class A

Item	Fault	Description
1	Load sensor fault	/
2	Angle sensor fault	Because the angle of the main boom cannot be monitored timely, when there is angle sensor fault, so that the angle of the main boom is less than 30 should be confirmed at the diagnostic panel when lowering the articulate boom. (Switch the option for angle of the main boom less than 30 to on.) Refer to diagnostic panel for more information.
3	Length sensor fault	Because the length of the boom cannot be monitored timely, when there is length sensor fault, so that the boom completely retracted should be confirmed at the diagnostic panel when retracting boom. (Switch the option for main boom retracted to on.) Refer to diagnostic panel for more information.
4	Platform angle sensor fault	/
5	Jib levelling angle sensor fault	/
6	Chassis inclining sensor fault	/
7	Power on self test fault	/
8	Pedal switch and redundancy fault	/
9	Differential lock feedback fault	/
10	Articulate boom retracted completely sensor fault	Because the length of the boom cannot be monitored timely, when there is articulate boom retracted completely sensor fault, so that the boom completely retracted should be confirmed at the diagnostic panel when retracting boom. (Switch the option for articulate boom retracted to on.) Refer to diagnostic panel for more information.

Lower the platform as the follow procedure when there is one fault or more belonging to class A.



Operating Instructions

Lowering platform procedure for class A fault

Item	condition	permitted operation
1	Jib operation would be valid at any location.	jib lifting up and down
		jib levelling up and down
		platform rotation
		platform levelling up and down
2	Lower the platform after completing step 1	main boom retracting
3	retract main boom completely after step 2	main boom lifting down
		turret rotation
		Retracting articulate boom
4	retract articulate boom completely after step 3	Lowering articulate boom
		Move forward and backward

Class B

Item	Fault	Restriction logic
1	moving joystick fault	1 restrict moving, showing code 46 2 moving joystick initialization fault after restarting up system, restrict moving and show code 36
2	main boom telescopic joystick fault	1 restrict main boom telescopic operation, showing corresponding faulty code. 2 telescopic joystick initialization fault after restarting up system, restrict telescopic and show code 36
3	main boom lifting joystick fault	1 restrict main boom lifting operation, showing corresponding faulty code. 2 lifting joystick initialization fault after restarting up system, restrict lifting and show code 36
4	jib lifting joystick fault	1 restrict jib lifting operation, showing corresponding faulty code. 2 jib lifting joystick initialization fault after restarting up system, restrict jib lifting and show code 36
5	turret rotation joystick fault	1 restrict turret rotation, showing corresponding faulty code. 2 turret rotation joystick initialization fault after restarting up system, restrict turret rotation and show code 36

Class C

Item	Fault	Restriction logic
1	PVG fault	1 No restriction 2 Show corresponding faulty code.
2	chains broken switch	1 Restrict main boom extending out, showing code 51
3	engine fault	1 No restriction for operation system 2 Show corresponding faulty code.
4	tower sensor for articulate boom fault	1 No restriction for operation system, but showing code 95 when moving.
5	upper sensor for articulate boom fault	1 Restrict articulate boom extending out, showing code 37. 2 The main boom only can be located between -55~55°, showing code 66.

Lower the platform by activating bypass button on ground console or platform console, and then operating corresponding operation, when there is one fault or more belonging to class B or class C.

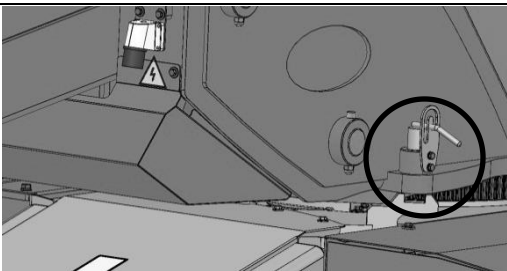
Instructions for Transport



Setting the machines in safety correctly and choosing appropriate transport means according to the provisions of the Ministry of Industry and Public Transport, the regulatory standards in force and the corporate policies are solely the responsibility of the owner of the machine.

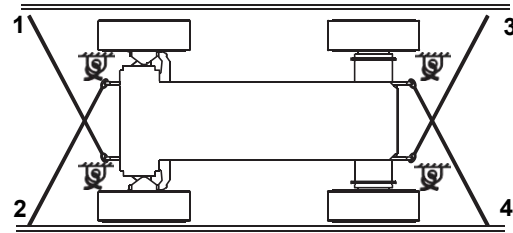
DingLi provides the following information regarding the handling and transport of the machine only as recommendation.

- Loading and unloading the machine from a transport vehicle must be done solely by operators skilled in lifting operations.
- Make sure the load capacity of the vehicle, the loading surface, the chains or blocking devices are capable of supporting the machine weight. For the machine weight, refer to the technical data shown on the ID plate of the machine model.
- Make sure the rotation block of the slewing ring gear positioned on the RH side of the turret is activated and turret is locked before proceeding with transport.



- Release the slewing ring gear before restoring the working of the machine.
- Check for the presence of any mobile objects on the platform and remove these if necessary.

Blocking the chassis

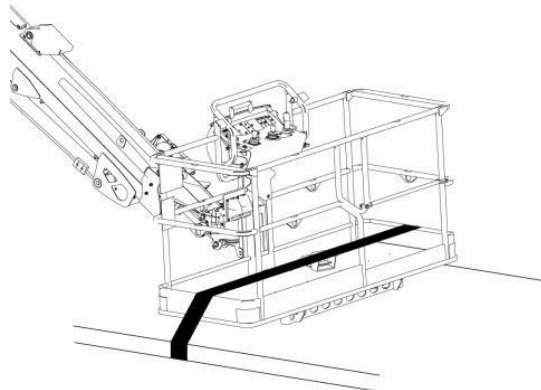


Use all four fixing devices provided on the chassis according to the diagram shown above.

Blocking the platform

Fold the platform using the transport mode that can be selected from the control panel on the truck: this option eliminates the operating constraints of the machine, making it possible to fold the telescopic boom back.

If the boom cannot be folded, make sure the primary and secondary parts are completely retracted and that none of the parts touch the loading surface; place the platform on the loading deck and secure it in place on the transport bed using nylon belts.



Towing the vehicle



Towing the vehicle using an incorrect procedure can cause serious accidents.

Before disengaging the negative brake manually, block the machine to prevent its movement.

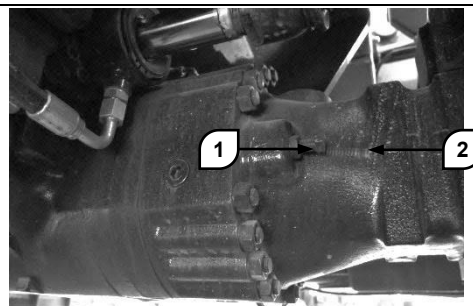
Follow the instructions given below to tow the machine correctly.

A faulty machine can only be towed for short distances and at speeds not exceeding 10km/h. If necessary, to transport the vehicle over longer distances and at greater speeds, use a suitable vehicle for transport.

Before towing the vehicle, retract and lower the telescopic boom completely and remove the load.

Do not use chains for towing the machine. Use steel cables with rings at the ends, or a special rigid tow bar. Make sure the cable is in good condition. Make sure the cable has a nominal carrying capacity 1.5 times the weight of the vehicle to be towed.

Connect one end of the cable to the two front eyelets on the towing vehicle. Connect the other end of the cable to the two front eyelets of the vehicle to be towed.



Go under the vehicle near the rear axle. Unscrew lock nut 1 of power screw 2. Tighten the power screw to fit flush to disengage the negative command brake. Repeat the operation for other three screws on the same axle. And then repeat the operation for front axle.

Remove the hoses from the port A and B of the driven pump and then connect two ends of the hoses removed together after completing releasing brake.

Have an operator climb on the machine to be towed to control the moving and steering. An observer must stand in a safe position to check the outcome of the operations. The observer must not stand on the vehicle to be towed.

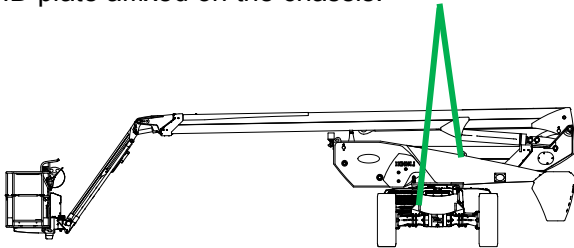
Tighten the tow cable slowly. Avoid sudden movements to avoid overload on the cable. Keep the angle between the machine and the towing cable minimum; it must not exceed 30° in any case whatsoever.

Because of the impossibility of listing all the precautions and towing procedures for all the situations, it is advisable to consult your Dealer for assistance.

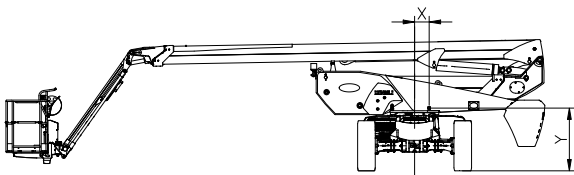
Instructions for Transport

Lifting

Use only devices suitable for the movement concerned: make sure the capacity of the lifting crane, chains, ropes and relative hooks are able to support the weight of the machine; to check the data, consult the manufacturer's ID plate affixed on the chassis.



Adjust the lifting devices in such a way as to keep the machine level and without causing damage to it.



Centre of gravity

Model	X (mm)	Y (mm)
BA28RT	20	774
BA24RT	23	774

Note: The centre of gravity of every machine is not accurate but recommendation.

**Observe and Obey:**

- ☒ The operator must only carry out the routine maintenance specified in this Manual.
- ☒ The scheduled maintenance activities must be performed by the workers trained and qualified by manufacture and according to the requirements listed in the Maintenance Manual of this machine.
- ☒ Dispose of the materials in compliance with the national regulatory standards in force.
- ☒ Only use spare parts authorised by DingLi.

Preliminary checks

Every time the machine is used by a new owner, make sure the correct Use and Maintenance Manual corresponding to the machine is present on board.

If this is not the case, immediately contact the dealer for the correct Manual.

Check to make sure the plates and stickers are present on the machine and are in good condition.

If they are damaged or illegible, ask your dealer for a replacement copy.



Maintenance

MAINTENANCE SCHEDULE

Read and understand all the warnings and instructions before starting any maintenance operation.

Before carrying out any maintenance operation, make sure all the scheduled actions have been carried out as planned.

A Every 10 hours of operation or daily

- A-1 Visual inspection - checking
- A-2 Engine oil level - check
- A-3 Coolant level - check
- A-4 Telescopic boom sliding blocks - check
- A-5 Auxiliary pump - operating test
- A-6 Overload sensor - check

B Every 50 hours of operation or every 2 weeks

- B-1 Transmission shaft - lubrication of universal joints
- B-2 Axles - lubrication of oscillation bushes
- B-3 Hydraulic oil level - check
- B-4 Telescopic boom sliding blocks - lubrication
- B-5 Fuel pre-filter - draining the water
- B-6 Turret rotation slewing ring gear - lubrication
- B-7 Wheels - check tightening of nuts
- B-8 Radiator - cleaning by rotating reversely

C Every 250 hours of operation or every 3 months

- C-1 Transmission belt - check
- C-2 Differentials oil - check
- C-3 Wheel reduction gears oil - check
- C-4 Steering elements - lubrication

- C-5 Turret rotation slewing ring gear - check reduction gear oil level

D Every 500 hours of operation or every 6 months

- D-1 Hydraulic oil filter - replacement
- D-2 Engine oil and filter - replacement
- D-3 Fuel pre-filter - replacement
- D-4 Engine radiator - cleaning
- D-5 Turret rotation slewing ring gear - check tightening of bolts

E Every 1000 hours of operation or every year

- E-1 Fuel filter - replacement
- E-2 Air filter - replacement of primary cartridge
- E-3 Differentials oil - change
- E-4 Wheel reduction gears oil - change
- E-5 Telescopic boom sliding blocks - adjust the play
- E-6 Turret rotation slewing ring gear - change reduction gear oil - check play
- E-7 Overload sensor - calibration

F Every 1500 hours of operation

- F-1 Fuel filter - clean mesh element

G Every 2000 hours of operation or every 2 years

- G-1 Hydraulic fluid - change
- G-2 Air filter - replacing the safety cartridge

A-1 Visual inspection

To ensure the maximum useful operating life of the vehicle, proceed with a thorough visual inspection before every starting up.

- 1 Look around and under the vehicle, checking to make sure there are no slack or missing bolts, no accumulated dirt, leakage of oil, fuel and other liquids, broken or worn parts.
- 2 Check the state of the accessories and hydraulic components.
- 3 Check the state and wear of the tyres. If necessary
- 4 Check the oil, coolant and fluid levels.
- 5 Check the AdBlue® tank level (if present).
- 6 Remove all accumulated dirt and debris. Carry out all the repairs necessary before starting up the vehicle.

A-2 Engine oil level-check



ATTENTION

Do not operate with the engine running!

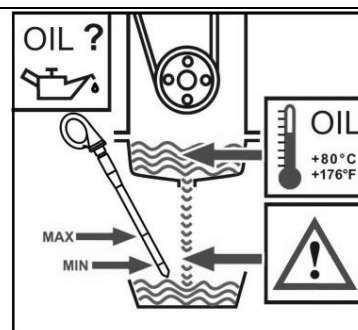
Do not smoke or use naked flames!

Danger of burns!

During operations on the lubricant oil system, ensure utmost cleanliness. Thoroughly clean the area around the components concerned from time to time.

Dry the damp parts with air jets. For handling lubricant oils follow the safety directives and specific local standards.

Dispose of the leaked lubricant oil and the filter elements. Do not let the used lubricant oil spread in the ground. Run a test cycle after every intervention. At the same time, ensure sealing and pressure of the lubricant oil and then check its level.



An insufficient and/or excessive lubricant oil level can damage the engine. Check the oil level only with the engine horizontal and stopped. Check the lubricant oil level only while it is warm, 5 minutes after the engine is switched off. Do not remove the oil level rod with the engine running. Danger of burns.

- 1 Remove the rod and wipe it clean with a cloth, do not leave fibres. Insert the oil rod up to the stop then remove it and read the lubricant oil level.
- 2 The level must be between the MIN and MAX level! Top up to the MAX notch if



Maintenance

necessary.

A-3 Coolant level-check

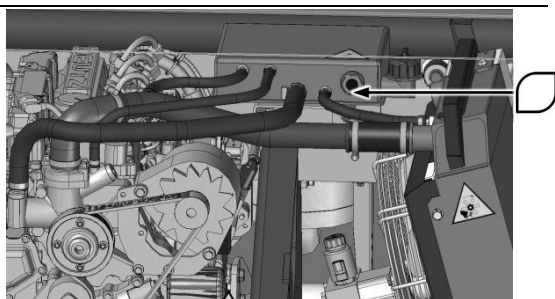


DANGER OF BURNS

The coolant is pressurised and at high temperature with the engine switched on. When the cap is removed, the liquid may flow out violently and cause serious burns.

Make sure the engine is cold before working on the cooling system.

Checking



- 1 Set the vehicle in the parking position.
- 2 Check the level in the expansion tank placed above the radiator. The level is correct when it is half-way on the inspection window.
- 3 Open the tank, check the coolant additive concentration ratio using the instrument concerned (e.g. hydrometer, refractometer)
- 4 If necessary, top up with a suitable mixture depending on the use.
- 5 Refit the cap and make sure it is tightened properly. Run the engine to bring it to the required temperature. Switch off the engine and check for leaks in the circuit.

A-4 Telescopic boom sliding blocks - check

- 1 Extend the telescopic boom completely.
- 2 Check to make sure the boom movement is smooth. Ensure that there are no abnormal vibrations, unusual noises, and no part of the boom gets heated due to friction during the movement.
- 3 Remove the dust guard gaskets at the head of the extensions and check to ensure there is a sufficient layer of grease on the sliding surfaces and on the sliding blocks.

Maintenance

A-5 Auxiliary pump test

Press the red emergency button: reset it to stop the I.C. engine.

Activate the emergency pump and test the movements of the booms and platform.

NOTE: to avoid consuming the batteries, limit the test duration time.

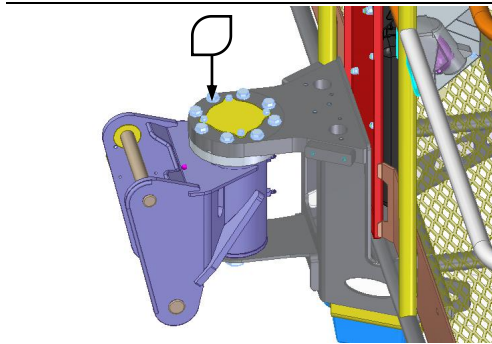
To confirm the correct working, deactivate the emergency electric pump and restart the I.C. engine.

A-6 Overload Sensor - checking

How much the load weighted by the overload sensor is in the platform will be indicated on the panel on the ground control console. If the load in the platform does not exceed rated load, the vehicle is safe during work.

Otherwise, it is dangerous and the alarm will be activated. So, it is important to make sure the sensor is in good condition before starting work every day.

Bolt -checking



Check if there is some bolts is slacken or missing and the sensor undamaged. If there is abnormal condition, ask for help from DingLi or your agency.

Overload Sensor - checking

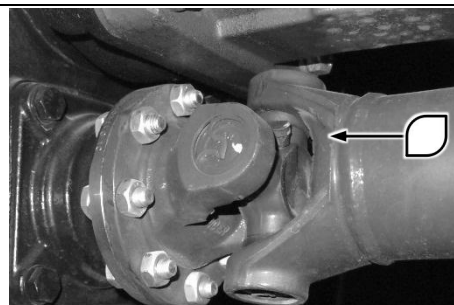
It is critically important for safety of life and property of operators to make sure the sensor works well. Checking and Making sure the sensor is in good condition before starting work every day could protect operators from danger. When there is some collision on platform, stop working and to check if the sensor is well. The procedures as follows:

- 1 Vehicle Condition Interface indicating data on vehicle condition can be entered by depressing down the Data button on the ground control contation.

MAIN BOOM ANGLE	12.3 °
MAIN BOOM LENGHT	0.123 m
JIB ANGLE	12.3 °
CAGE ANGLE	12.3 °
CHASSIS TILT ANGLE X	12.3 °
CHASSIS TILT ANGLE Y	12.3 °
HYDRAULIC TEMPERATUR	60 °C
CAGE LOAD	120 Kg
BT30 LOADCHART	0 Kg
<div> <div>Engine</div> <div>Data</div> <div>Set</div> <div>ESC</div> <div>Menu</div> </div>	

- 2 Cage load parameter shows the current load in the platform.
- 3 Cage load parameter will show 0kg when the load in the platform is removed completely.
- 4 Cage load parameter will show 250kg at the moment of 250kg being added in the platform.
- 5 Continue to add load in platform, and then the alarm will be activated when the load is up to 275kg (330 for BA24RT). Otherwise, stop to ask for repairing.
- 6 The accuracy of weighting is $\pm 10\%$. If the data exceeds it, stop to calibrate it, referring to the chapter E-7.

B-1 Transmission shaft - lubrication of universal joints

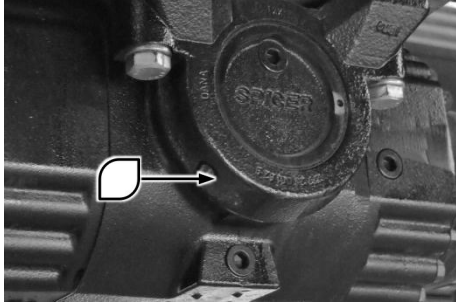


Set the vehicle in the parking position. Make sure no one approaches the work area.

Lubricate the universal joints by injecting grease into the grease nipples. Repeat for all the transmission shaft joints. Remove the excess grease.

Maintenance

B-2 Axles-lubrication of oscillation bushes



Set the vehicle in the parking position. Make sure no one approaches the work area.

Stand near the front axle oscillation bushes. Inject grease in the grease nipples present on both sides of the axle (front and rear).

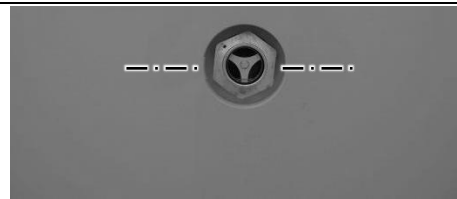
Repeat the lubrication for the rear axle.

B-3 Hydraulic oil level-check

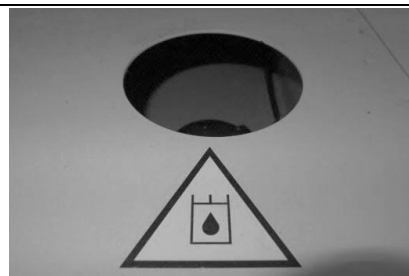
For correct working of the machine, check to make sure the level of oil in the hydraulic system is sufficient. Incorrect level of oil in the hydraulic system can damage the components. Daily inspections will make it possible to detect changes in the oil level which could indicate the presence of faults in the hydraulic system

- 1 Make sure the boom is in the retracted position.
- 2 Check the oil level indicator on the side of the hydraulic tank.

Result: the oil level in the hydraulic system must be near the centre line of the level indicator present on the tanks.

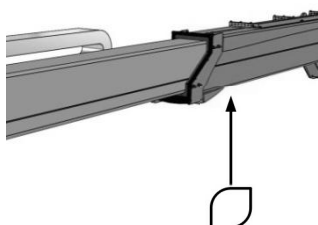


Add oil if necessary. Do not exceed the level indicated.



Note: The hydraulic oil should be applied to the local environment, and be filtered at the accuracy of 20 μ m.

B-4 Telescopic booms sliding blocks - Lubrication



- 1 1. Position the machine in an area with sufficient clearance around it; centre the turret and bring the telescopic boom to the horizontal position. Extend the telescopic boom completely.
- 2 2. Remove the dust guard gaskets at the head of the extension and clean all the sliding surfaces thoroughly.
- 3 3. Using a brush, apply a thin layer of grease on the sliding surfaces on all four sides of the boom. Repeat the operation for each stage of the extension.
- 4 4. Retract and extend the telescopic boom a number of times to distribute the grease uniformly.
- 5 5. Remove excess grease to prevent dirt build-up and refit the dust guard gaskets.
- 6

B-5 Fuel pre-filter – draining the water



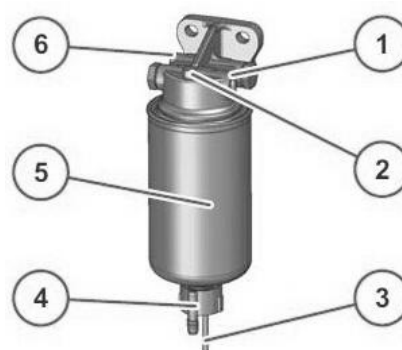
FLAMMABLE MATERIAL

Fuel is flammable and can cause severe burns and death.

Do not smoke or use naked flames while working on the fuel line.

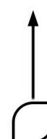
Clean the engine parts and engine compartment to remove all traces of fuel to prevent risk of fire.

Deutz pre-filter-draining water



- (1) Pump fuel supply
- (2) Bleed screw
- (3) Electric connection for the water level sensor
- (4) Drainage cap
- (5) Filter cartridge
- (6) Fuel tank inlet

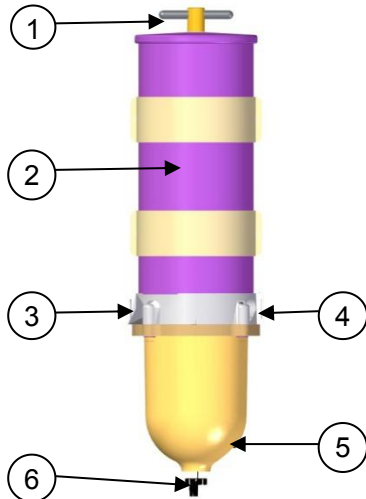
- 1 Stop the engine.
- 2 Place a suitable container.
- 3 Disconnect the cables.
- 4 Slacken the drainage screw.
- 5 Drain the liquid until the pure diesel fuel starts flowing out.
- 6 Fit the drainage cap by applying a tightening torque of 1.6 ± 0.3 Nm.



Maintenance

7 Reconnect the cables.

Parker pre-filter-draining water



- (1) Joystick
- (2) Filter cartridge
- (3) Pump fuel supply
- (4) Fuel tank inlet
- (5) Plug
- (6) Drainage cap

- 1 Stop the engine.
- 2 Place a suitable container.
- 3 Slacken the drainage screw.
- 4 Drain the liquid until the pure diesel fuel starts flowing out.
- 5 Fit the drainage cap by applying a tightening torque of 3.5~4 Nm.

B-6 Turret rotation slewing ring gear - Lubrication

Lubricate both the turret axial bearing tracks by means of the two grease nipples provided inside. Lift the primary telescopic boom for access into the slewing ring gear, inject a number of shots of grease and move the turret to distribute the grease uniformly.

Lubricate the outer teeth of the slewing ring gear. Apply grease manually using a brush. Ensure that the grease is distributed uniformly. Remove grease buildup.

Anyone in the follow table should be chosen when the vehicle is used in the normal environment.

Grease for standard application		
GREASE BRAND	FOR RACEWAY	FOR GEAR TEETH
Shell	GADUS S2 v220 2 EP2	MALLEUS OGH
Mobil	MOBILUX EP2	MOBILTAC 81
Castrol	SPHEEROL EPL2	MOLLUB-ALLOY 970/2500-1
TOTAL	MULTIS EP2	CERAN AD PLUS
FUCHS	LAGERMEISTER EP2	CEPLATTYN KG 10 HMF

If the machine is used in the severe environment, refer to DingLi for the grease.

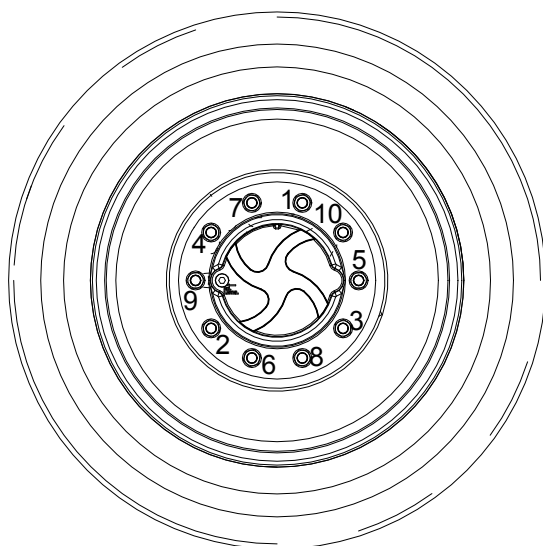
B-7 Wheels - check tightening of nuts

It is extremely important to apply and maintain proper mounting torque.

- ⚠ **Tighten the lug nuts to the proper torque to prevent coming loose.**

Wheel nuts should be torque after first 50 hours of operation and after each wheel removal. Use a torque wrench to tighten fasteners. If you do not have a torque wrench, tighten the fasteners with a lug wrench, then immediately have a service garage tighten the lug nuts to the proper torque. Over-tightening result in breaking the studs or permanently deforming mounting stud holes in the wheels. The proper procedure attaching wheels is as follows:

- 1 Set the torque wrench to 450Nm.
- 2 Tighten nuts in the following sequence:



- 3 When there is sound like 'kada', the lug nut is fastened at proper torque.

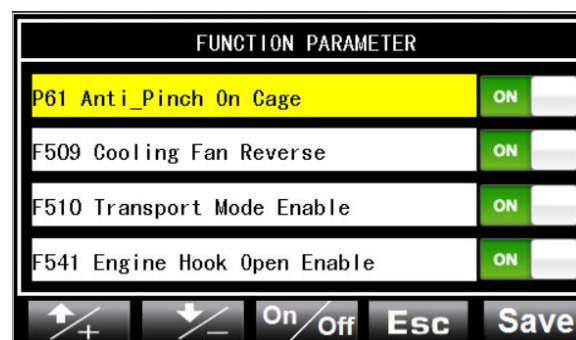
B-8 Radiator-cleaning by rotating reversely

The radiator should be cleaned termly for cooling effectively. There is a method for cleaning the radiator easily.



Cooling fan reverse

The setting interface could be entered by depressing setting button and hold on for one second. Cooling fan reverse can be activated as follows:



- 1 Depressing or is used to change the item. Chose F509. The chosen item would be shown in yellow background.
- 2 Depressing and holding on for one second is used to turn on or off corresponding function.
- 3 Save the modified value by depressing the button .
- 4 Modifying "F509 cooling fan reverse", is only valid in condition of power on. It will

Maintenance

return back at the moment of interruption of power supply.

- 5 It returns back to main interface, when the button **Esc** is depressed.
- 6 After continuing for 5 minutes, recover the above settings.

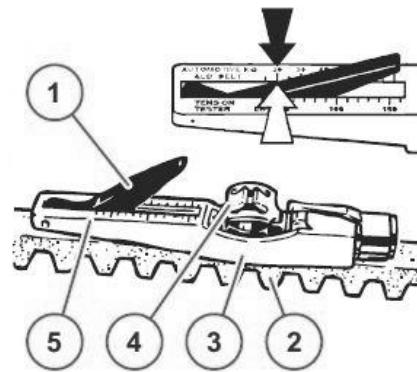
C-1 Transmission belt



ATTENTION

Work on the transmission belt only with the engine stopped! After repairs, make sure all the protection devices have been refitted and that no tool has been forgotten on the engine.

Checking the belt tension

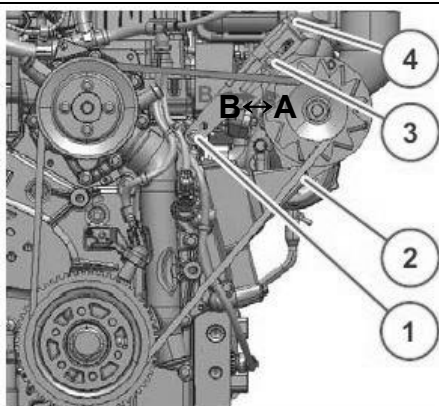


- 1 To check the tension of the belts, lower the arm of indicator (1) in the tester.
- 2 Place the guide (3) between two pulleys on the V-belt (2). At this point, the stop must be on the side.
- 3 Press button (4) in the RH corner with respect to V-belt (2) uniformly until the spring clicks audibly.
- 4 Lift the tester gently, without modifying the position of the indicator arm (1).
- 5 Read the value measured on the intersection point (arrow), scale (5) and indicator arm (1).

Correct the tension if necessary and repeat the measurement.

The belt tension tester can be ordered through the Customer Service.

Replacement (when required)



- (1) Screw
- (2) Screw
- (3) Screw
- (4) Adjuster wrench

To replace the transmission belt:

- 1 Slacken the screw and lock nut,
- 2 Move the generator above the adjuster wrench in direction (B) until the belt slackens,
- 3 Remove the belts and fit the new ones,
- 4 Reposition the generator above the adjuster wrench in direction (A) until the belt tension is correct,
- 5 Check the belt tension:

pre-tensioning 650 ± 50 Nm

correct tension 400 ± 50 Nm

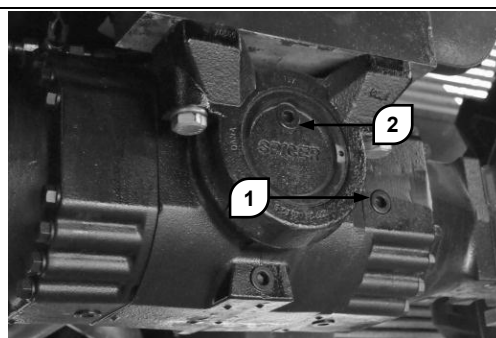
- 6 Tighten the screw and lock nut.

Tightening torque: screw (1) 30 Nm

screw (2) 42 Nm

screw (3) 30 Nm

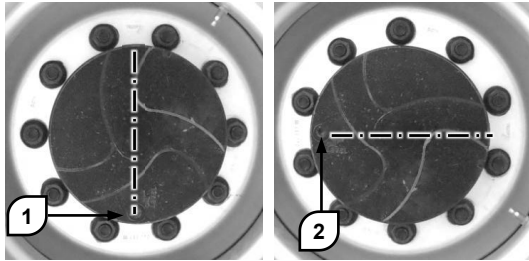
C-2 Differentials oil - Check



- 1 Set the vehicle in the parking position. Make sure no one approaches the work area.
- 2 Remove level cap 1. The oil must flow out through the opening.
- 3 If necessary, remove filler cap 2. Add oil to the correct level. Close level cap 1, and then filler cap 2. Clean the axle surfaces.
- 4 Repeat the operations for the front and rear differential.

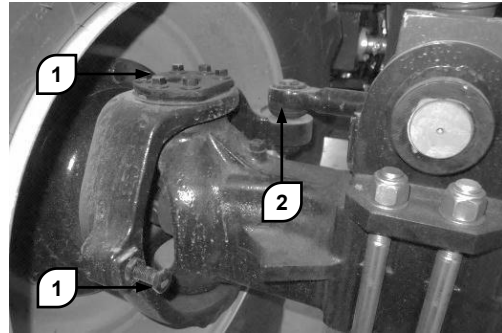
Maintenance

C-3 Wheel reduction gears oil - Check



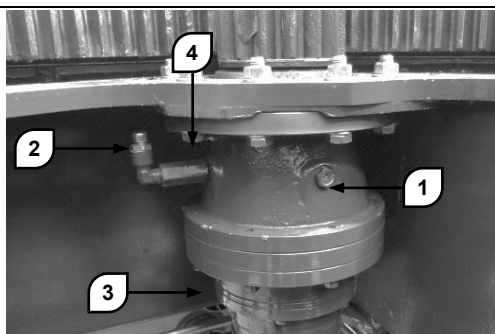
- 1 Set the vehicle in the parking position. Turn the reduction gear cap in the horizontal position 2.
- 2 Remove the cap. The oil level is correct when the oil flows out through the filler hole.
- 3 If necessary, top up with oil (photo) 2 to the correct level.
- 4 Refit the cap.
- 5 Repeat this operation for each wheel.

C-4 Steering elements - Lubrication



- 1 Lubricate the wheels rotation pins 1 by injecting grease in the grease nipples provided for the purpose. Remove the excess grease.
- 2 Lubricate the ball joint 2 injecting grease in the grease nipples provided for the purpose. Remove the excess grease.

C-5 Turret rotation slewing ring gear - check reduction gear oil level



- 1 Retract and lift the telescopic boom completely. Rotate the turret for better access to the reduction gear.
- 2 Check the hydraulic fluid level through the inspection window 1. The level is correct when it overflows.
- 3 If necessary, top up with oil of the right strength up to the filler hole 2.

When checking the oil level, also check the bolts fixing the reduction gear to the chassis. In case of faults (rusted, slackened or missing bolts), contact your dealer.

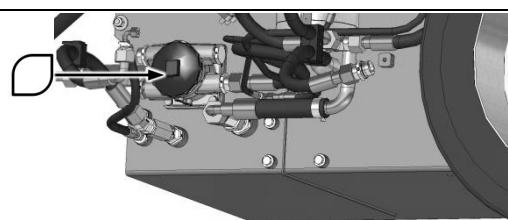
D-1 Hydraulic oil filter - replacement



ATTENTION

The machines use four filters for hydraulic fluid: one filter placed on the inside of the hydraulic tank has the combined function for oil at the suction as well as return, and the second one is wire mesh filter. The others are PLFA series filters used in the pressure line of hydraulic system. One is placed on the back side of the hydraulic tank, and the other is placed in the end of the second boom.

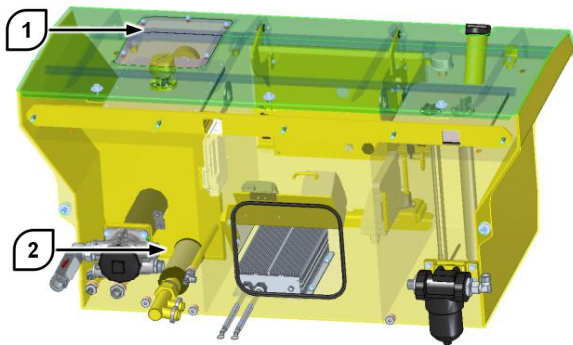
Suction filter



- 1 Stabilise the machine to facilitate accessibility to the filter in question: clean the filter housing and surrounding areas to prevent dirt from entering the circuit. Unscrew the cap.
- 2 Replacing the filter cartridge does not involve draining the tank: the filter cartridge is provided with a special plant closure system. When it is being removed, the oil present inside the filter normally flows out
- 3 Remove the filter cartridge and dispose of according to the regulatory standards in force. Insert a new filter cartridge of the same type.
- 4 Refit the filter cover. Start up the engine and check for leaks.
- 5 Check for a drop in the oil level through the window present on the tank: if required, top up with the quantity necessary to reach the correct level.

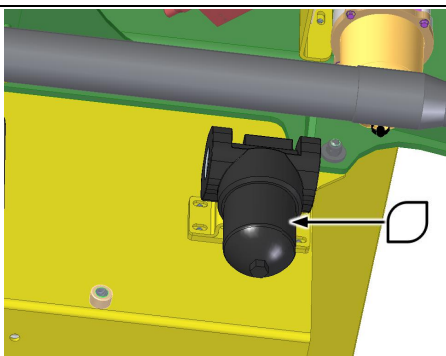
Maintenance

Wire mesh filter



- 1 Remove the cover 1 from the hydraulic tank.
- 2 Clean the area around the cover of the hydraulic oil reservoir.
- 3 Use a wrench to loose and remove the bolts from the hydraulic oil reservoir cover, move the cover away from the reservoir, then turn the filter element 2 from the adaptor.
- 4 Take a new filter element to screw it onto the filter adaptor.
- 5 Install the covers back, and screw down bolts.

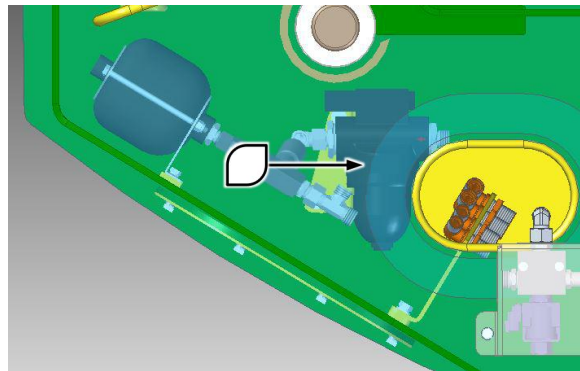
PLFA filter (outlet of pump)



- 1 Clean the area around the oil filter, and then remove the cap components.
- 2 Pull out the filter element from the filter assembly chamber.
- 3 Install the new filter element to the filter assembly chamber.

- 4 Refit the cap components and tighten it. Clean up any oil that may have spilled during the replacement procedure.

PLFA filter (Inlet of upper control valve)



- 1 Clean the area around the oil filter, and then remove the cap components.
- 2 Pull out the filter element from the filter assembly chamber.
- 3 Install the new filter element to the filter assembly chamber.
- 4 Refit the cap components and tighten it. Clean up any oil that may have spilled during the replacement procedure.

D-2 Engine oil and filter - replacement



ATTENTION

Do not operate with the engine running!

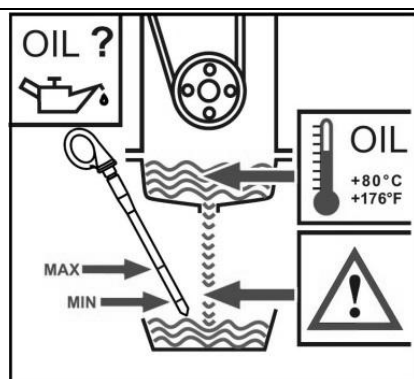
Do not smoke or use naked flames!

Danger of burns!

During operations on the lubricant oil system, ensure utmost cleanliness. Thoroughly clean the area around the components concerned from time to time.

Dry the damp parts with air jets. For handling lubricant oils follow the safety directives and specific local standards.

Dispose of the leaked lubricant oil and the filter elements. Do not let the used lubricant oil spread in the ground. Run a test cycle after every intervention. At the same time, ensure sealing and pressure of the lubricant oil and then check its level.



An insufficient and/or excessive lubricant oil level can damage the engine. Check the oil level only with the engine horizontal and stopped. Check the lubricant oil level only while it is warm, 5 minutes after the engine is switched off. Do not remove the oil level rod with the engine running. Danger of burns.

Changing the engine oil

- 1 Heat the engine until the oil temperature reaches $> 80^{\circ}\text{C}$.
- 2 Park the vehicle on a horizontal surface and stop the engine.
- 3 Place a container under the drain screw, unscrew the latter and drain out the lubricant oil.
- 4 After draining, reposition the screw with a new sealing ring and tighten by applying a 55 Nm torque.
- 5 Fill lubricant oil, warm the engine to a temperature $> 80^{\circ}\text{C}$ and check the lubricant oil level.
- 6 Top up, if necessary.

Replacing the lubrication oil cartridge



- 1 Slacken the filter using the tool and unscrew it.
- 2 Collect the lubricant oil that flows out.
- 3 Wipe the surface of the filter-holder with a clean cloth that does not leave lint.
- 4 Oil the original DEUTZ filter cartridge seal slightly.
- 5 Screw the manual filter by hand until it is tight.



Maintenance

D-3 Fuel pre-filter - replacement



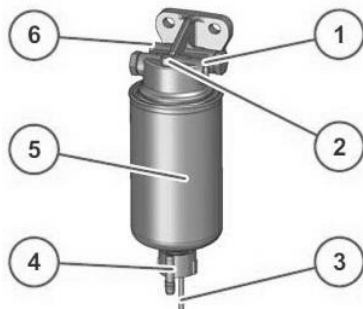
FLAMMABLE MATERIAL

Fuel is flammable and can cause severe burns and death.

Do not smoke or use naked flames while working on the fuel line.

Clean the engine parts and engine compartment to remove all traces of fuel to prevent risk of fire.

Deutz Fuel pre-filter replacement



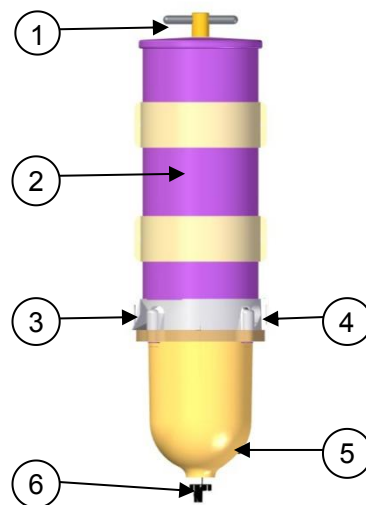
- (1) Pump fuel supply
- (2) Bleed screw
- (3) Electric connection for the water level sensor
- (4) Drainage cap
- (5) Filter cartridge
- (6) Fuel tank inlet

- 1 Stop the engine.
- 2 Block the fuel intake to the engine (if the tank is positioned at the top).
- 3 Place a suitable container.
- 4 Disconnect the cables.
- 5 Slacken the drainage cap and drain out the liquid.
- 6 Remove the filter element.
- 7 Wipe the surface of the new filter cartridge and the opposite side of the filter head to

remove dirt.

- 8 Slightly dampen the surfaces of the filter cartridge with fuel and re-screw the filter head clockwise (17-18 Nm).
- 9 Fit the drainage cap by applying a tightening torque of $1.6 \pm 0.3 \text{ Nm}$.
- 10 Connect the cables.
- 11 Open the fuel cock and bleed the system.

Parker Fuel pre-filter replacement.

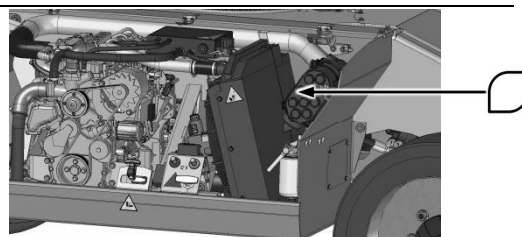


- (1) Joystick
- (2) Filter cartridge
- (3) Pump fuel supply
- (4) Fuel tank inlet
- (5) Plug
- (6) Drainage cap

- 1 Stop the engine.
- 2 Block the fuel intake to the engine (if the tank is positioned at the top).
- 3 Place a suitable container.
- 4 Disconnect the cables.
- 5 Slacken the drainage cap and drain out the liquid.
- 6 Remove the filter element.

- 7 Wipe the surface of the new filter cartridge and the opposite side of the filter head to remove dirt.
- 8 Slightly dampen the surfaces of the filter cartridge with fuel and re-screw the filter head clockwise (17-18 Nm).
- 9 Fit the drainage cap by applying a tightening torque of 3.5~4Nm.
- 10 Connect the cables.
- 11 Open the fuel cock and bleed the system.

D-4 Engine radiator - Cleaning

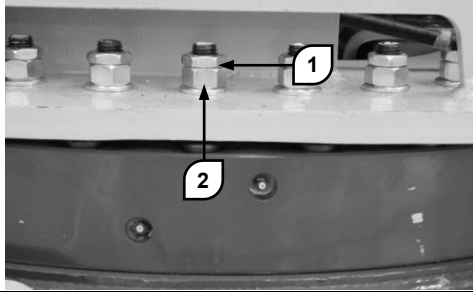


To remove dust and debris from the radiator mass, compressed air, pressurised water or steam can be used. However, it is preferable to use compressed air.

When using pressurised water, keep the high pressure jet cleaning nozzles at a distance of at least 50cm from the radiator mass. Bringing the nozzle too close to the radiator mass can lead to risk of damaging the radiator.

Maintenance

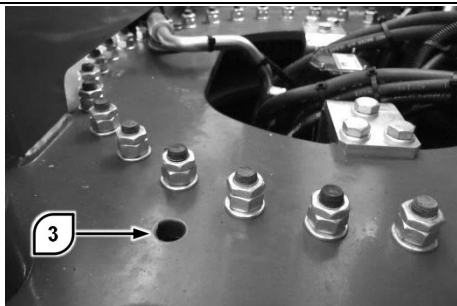
D-5 Turret rotation slewing ring gear - check tightening of bolts



Check the turret fixing nuts on the slewing ring gear. Check for rusted, slackened or missing nuts.

Contact your dealer in case of serious problems.

To check the tightening torque slacken lock nuts 1. Tighten nuts 2 by applying a 290 Nm torque. Again tighten lock nut 1. The help of a second operator may be necessary to hold the screw steady.



To check the fixing screws of the slewing ring gear on the chassis, align hole 3 with the screw underneath by rotating the turret.

Tighten the screws by applying a 290 Nm torque. Repeat the operation for each screw, rotating the turret from time to time.

E-1 Fuel filter - replacement



- 1 Slacken the filter using the tool and unscrew it.
- 2 Collect the fuel that flows out.
- 3 Wipe the surface of the filter-holder with a clean cloth that does not leave lint.
- 4 Oil the original DEUTZ filter cartridge seal slightly.
- 5 Screw the manual filter by hand until it is tight
- 6 Tighten the clamps of the anti-twisting safety (optional).
- 7 Bleed the fuel supply system.

E-2 Air filter - replacement of primary cartridge

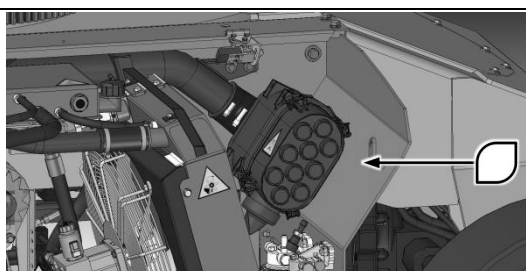
The efficiency and life of the engine depend greatly on the quality of air taken in. A dirty or damaged air filter can seriously affect the correct working of the engine and increase the possibility of a fault.

Replace the air filters strictly according to the schedule indicated in this Manual. Do not try to wash dirty filters.

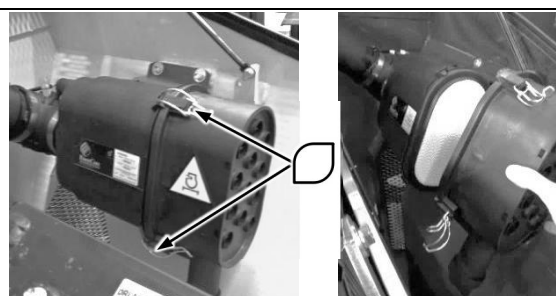
If the machine is expected to be used in environments with a lot of dust or high concentrations of contaminating or polluting agents in the air, halve the time interval between one filter replacement and the next.

Replacing the primary cartridge

- 1 To access the filter housing, open the engine compartment



- 2 Release the catches and remove the cover on the front of the filter.

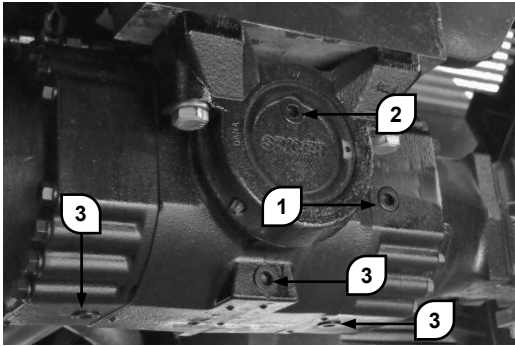


- 3 Grip the filter element and remove it from its seat.



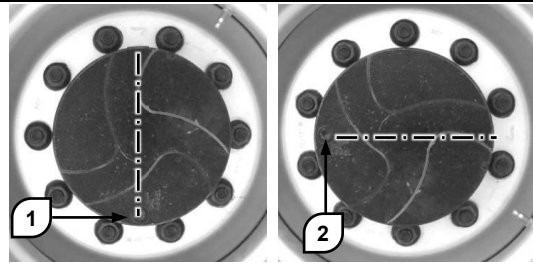
- 4 Wipe thoroughly inside the filter housing with a damp cloth. Avoid the use of aggressive solvents or products as these can damage the safety filter or the filter housing.
- 5 Install a new filter element. Make sure the filter element is inserted properly in its seat. If installation is difficult, grease the rubber gasket slightly with silicone grease.

E-3 Differentials oil - Change



- 1 Place suitable sized containers under the axle. Remove the three drainage caps of the differential 3. 2. Wait for the oil to drain out completely. To speed up the operation, remove filler cap 2.
- 2 Refit caps 3 and tighten adequately. Remove level cap 1.
- 3 Pour fresh oil of the correct type through hole 2. Fill in stages and check the flow of oil through level hole 1.
- 4 When the correct level is reached, refit level cap 1 and filler cap 2.

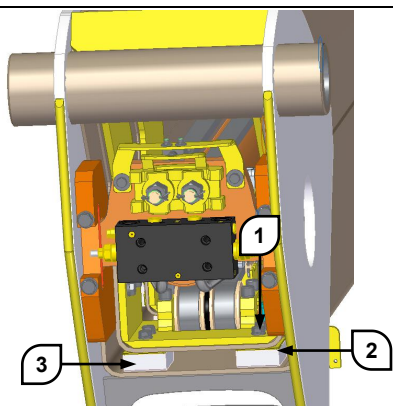
E-4 Wheel reduction gears oil - Change



- 1 Place a suitable sized container under the reduction gear. Turn the reduction gear cap in position 1.
- 2 Remove the cap and wait for the oil to drain out completely.
- 3 Turn the reduction gear cap in position 2. Fill oil through the hole to the correct level.
- 4 Refit the cap. Repeat this operation for each wheel.

E-5 Telescopic boom sliding blocks - Adjusting the play

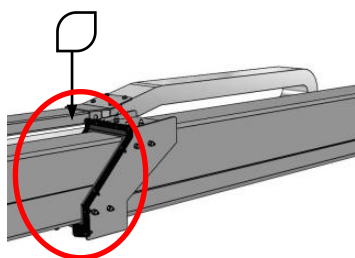
- 1 Park the vehicle in a suitable sized area. Remove the accessory from the quick-fit coupling. Centre the turret and set the telescopic boom in the horizontal position. Retract the telescopic boom completely.



- 2 Remove the cover on the rear part of the boom.
- 3 Slacken all the bolt 1 of the upper and lower sliding blocks of the first extension stage. If the space between the sliding surface of the block 3 and the sliding surface of the first boom exceeds 0.5mm, some pads 2 need to be added. And then tighten bolts 1.

Tightening torque: 100 Nm.

- 4 Repeat the adjustment operations for the lateral sliding blocks.



- 5 Move to the front of the boom, and identify the sliding blocks of the first extension stage.
- 6 Slacken all the bolt 1 of the upper and lower sliding blocks of the first extension

stage. If the space between the sliding surface of the block 3 and the sliding surface of the first boom exceeds 0.5mm, some pads 2 need to be added. And then tighten bolts 1.

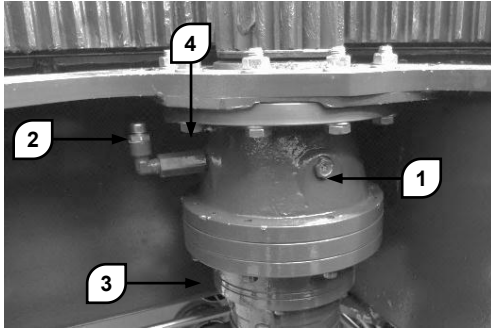
Tightening torque: 100 Nm.

- 7 Repeat the adjustment operations for the lateral sliding blocks.
- 8 Repeat the operations described above for the sliding blocks of all the extension stages, proceeding in order towards the front part of the boom.
- 9 Always try to adjust the sliding blocks symmetrically, so that each stage is centered with respect to the adjacent ones.
- 10 After completing the operations try to extend and retract the boom to check the boom movement is smooth. If the movement of the boom is not smooth, repeat the adjustments.

Maintenance

E-6 Turret rotation slewing ring gear - change reduction gear oil - check play

Changing the rotation reduction gear oil



- 1 Place a suitable sized container under the bleed cap 3. Unscrew the cap and drain out the oil.
- 2 Close the drainage cap 3. Add oil through the filler hole 2 up to the prescribed level visible through the transparent bush 1.
- 3 Lubricate the reduction gear shaft bushes by injecting grease into grease nipple 4.

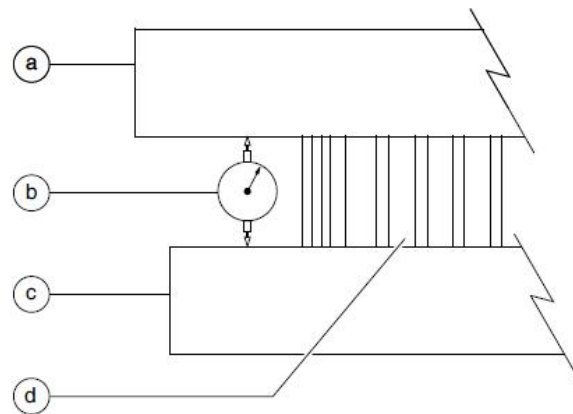
Check the slewing ring gear bearings for wear

The factory setting of the play of the bearings is between 0.05 and 0.25 mm.

The slewing ring gear must be replaced if the wear limit value exceeds 2.2 mm; to check the bearings for wear, proceed as described below.

- 1 Park the vehicle stably on level ground, align the turret to the chassis axis, without load.
- 2 Lubricate both the turret axial bearing tracks by means of the two grease nipples provided inside, and apply grease manually to the outer teeth of the slewing ring gear using a brush. Refer to chapter B-6 for the grease brand
- 3 Check tightening of bolts fastening turret rotation slewing ring gear, referring to chapter D-5.

- 4 Start the machine from the ground controls and fully elevate, but do not extend, the primary boom and jib. The riser should remain in its stowed position.
- 5 Place a dial indicator with accuracy of 0.01, between the drive chassis and the turntable at a point that is directly under, or in line with, the boom and no more than 1inch/2.5cm from the bearing.



- a turret
- b dial indicator
- c drive chassis
- d turret rotation bearing

- 6 Adjust the dial indicator need to the "zero" position.
- 7 Elevate the riser, but do not extend it. Move the primary boom and jib to horizontal and fully extend.
- 8 Note the reading on the dial indicator. If the measurement is less than 2.2mm, the bearing is good. Otherwise, the bearing is worn and needs to be replaced.
- 9 Remove the dial indicator and rotate the turntable 90° .
- 10 Repeat steps 5 through 9 until the rotation bearing has been checked in at least four equally spaced areas 90° apart.
- 11 Lower the boom to the stowed position and turn the machine off.
- 12 Remove the dial indicator from the machine.

E-7 Overload Sensor - calibration

How much the load weighted by the overload sensor is in the platform will be indicated on the panel on the ground control console. If the load in the platform does not exceed rated load, the vehicle is safe during work. Otherwise, it is dangerous and the alarm will be activated. So, the sensor must be calibrated when the data showed on the panel is incorrect.

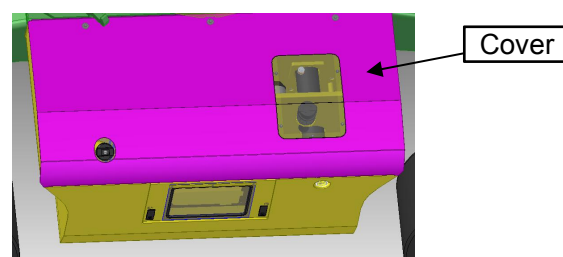
Calibration

The weighting system must be calibrated termly. The interval is 1000 hours for running or every year. Besides, stop to calibrate the overload sensor at once the data showed on the panel is incorrect.

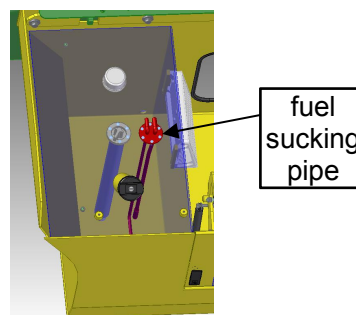
F-1 Fuel filter - clean mesh element

It is important for operating life of the vehicle to clean the fuel suction mesh element. The pressure of fuel suction would be higher when the mesh element is dirty, which will damage the engine and shorten the operating life of the vehicle. The procedures of cleaning the mesh element as follows

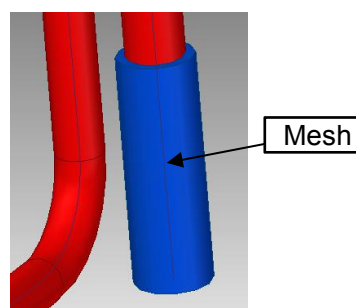
- 1 Remove the cover of hydraulic tank.



- 2 Slacken the bolts of fastening the fuel sucking pipe and pull out the fuel sucking pipe.



- 3 Remove the mesh element.



- 4 Clean the mesh slightly. The corrosive chemical solvent should be forbidden to use.

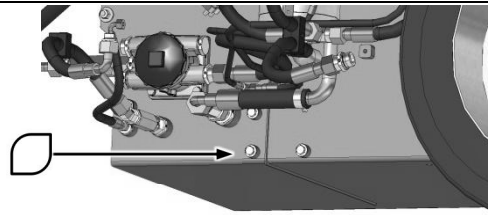
Replacing the mesh should be performed

Maintenance

when the mesh is too dirty to clean or damaged. Please refer to DingLi for mode of the mesh.

- 5 Refit the mesh after completing cleaning and blowing with pressured air.

G-1 Hydraulic fluid - change

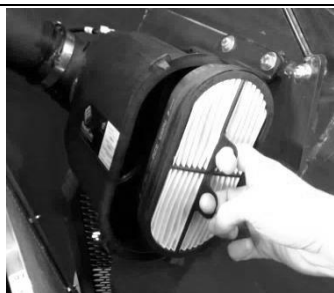


- 1 Go under the vehicle to access the tanks drainage caps.
- 2 Place a suitable sized container under the drainage cap. Unscrew the cap and drain out the oil. To speed up the operation, also unscrew the filler cap.
- 3 Install the plug on the drain port. Fill the tank with hydraulic oil filtered with a 20um filter and applied to the local environment until the level is correct. Not overfill.
- 4 Look around for enough space for extending and lifting completely.
- 5 Place a suitable sized container under the PVG.
- 6 Disconnect the lifting down hose from B port of PVG and block the B port with plug.
- 7 Start the engine, and lift up the boom completely to lead the oil from the cylinder rod chamber into the container.
- 8 Recover the hose.
- 9 Repeat the step 4-8 for leading oil out from the other cylinder rod chamber.

Park the vehicle and check the hydraulic oil level. Add it, if necessary.

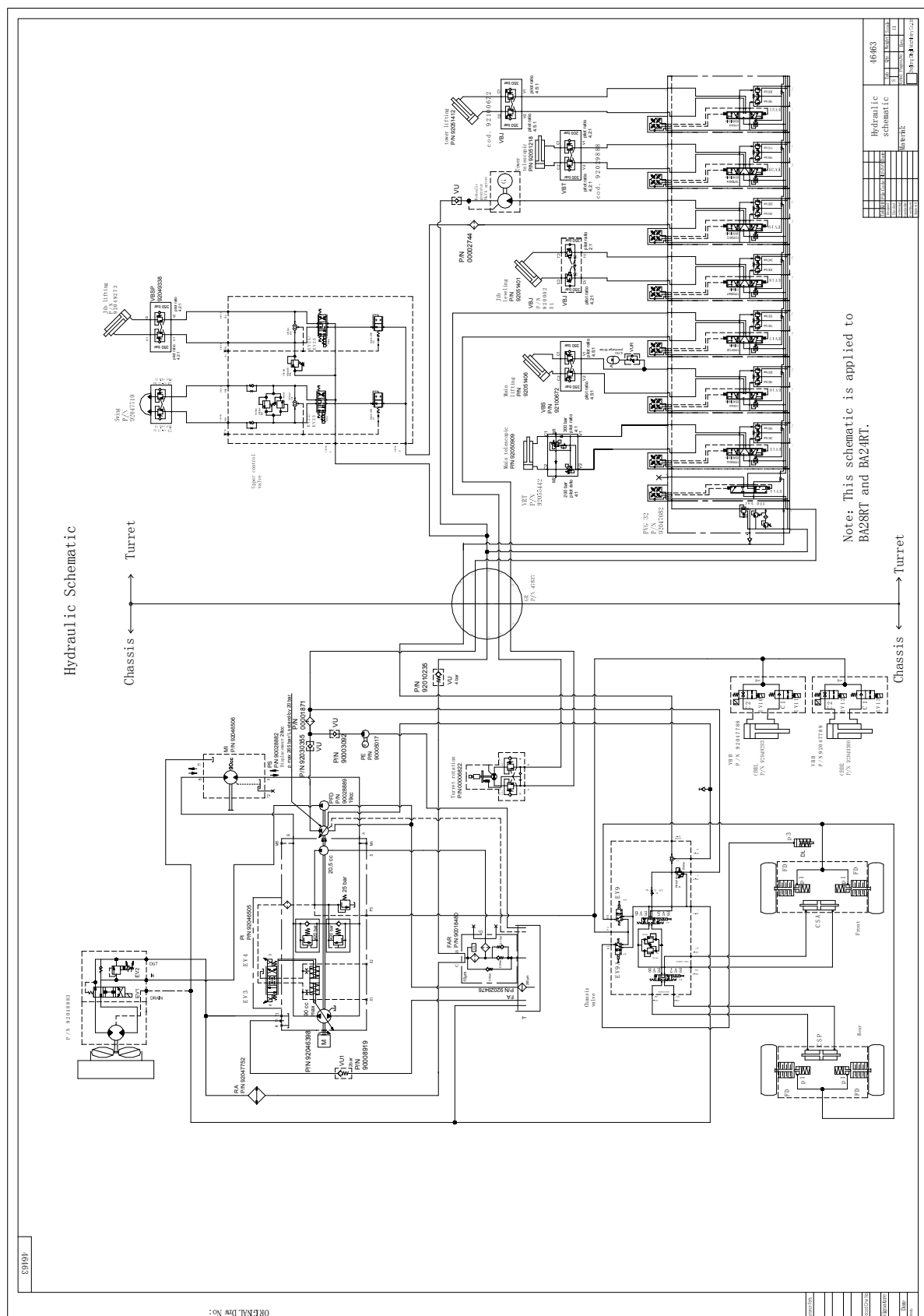
G-2 Air filter - replacing the safety cartridge

- 1 Carry out the primary filter removal procedure described earlier.

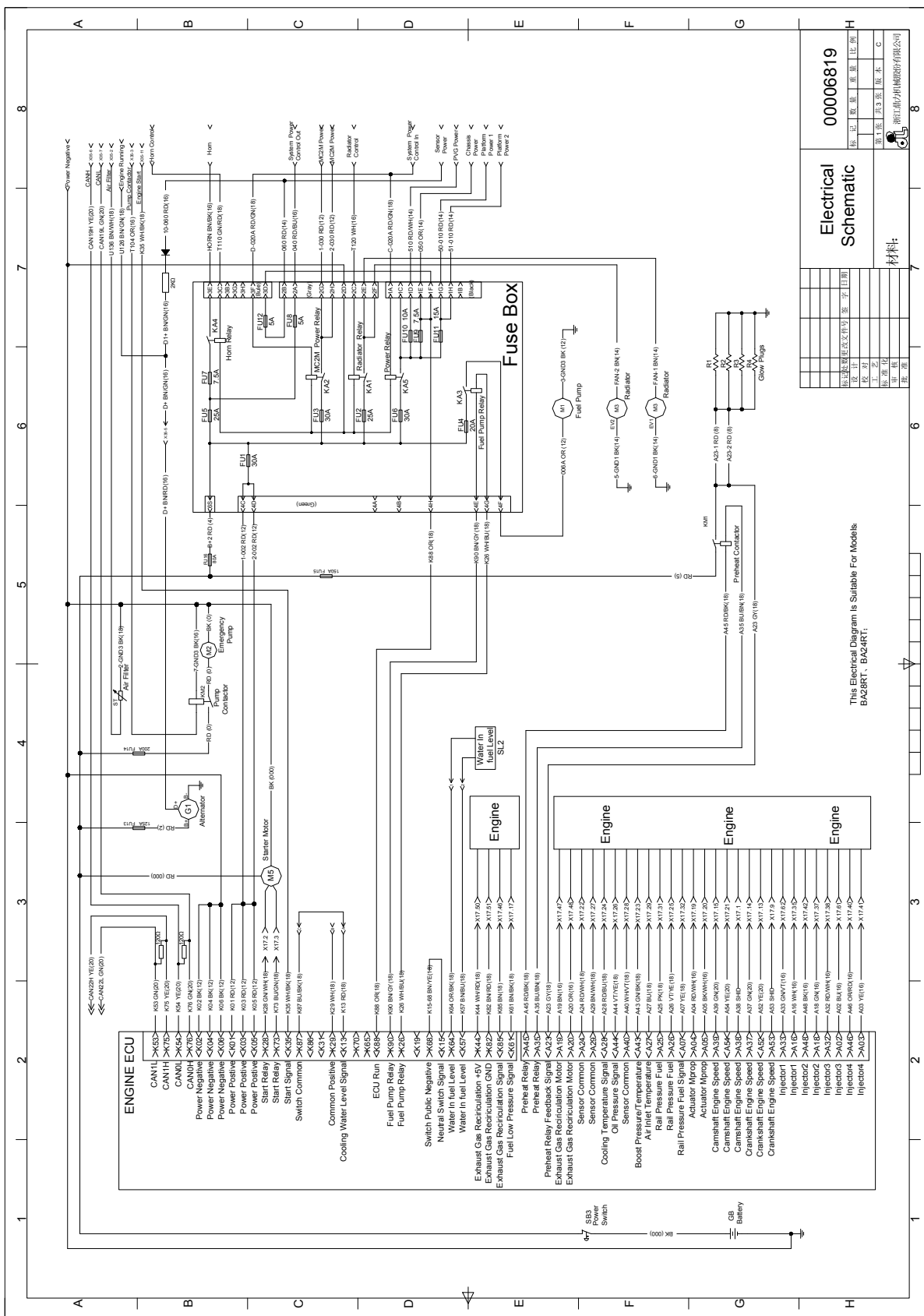


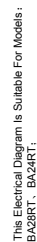
- 2 Hold the filter element by means of two fingers in the grips and pull to separate it from its seat.
- 3 Wipe thoroughly inside the filter housing with a damp cloth. Avoid using aggressive solvents or chemical products as these can damage the filter casing.
- 4 Install a new filter element. Grease the outer gasket of the new filter element slightly with silicone grease.

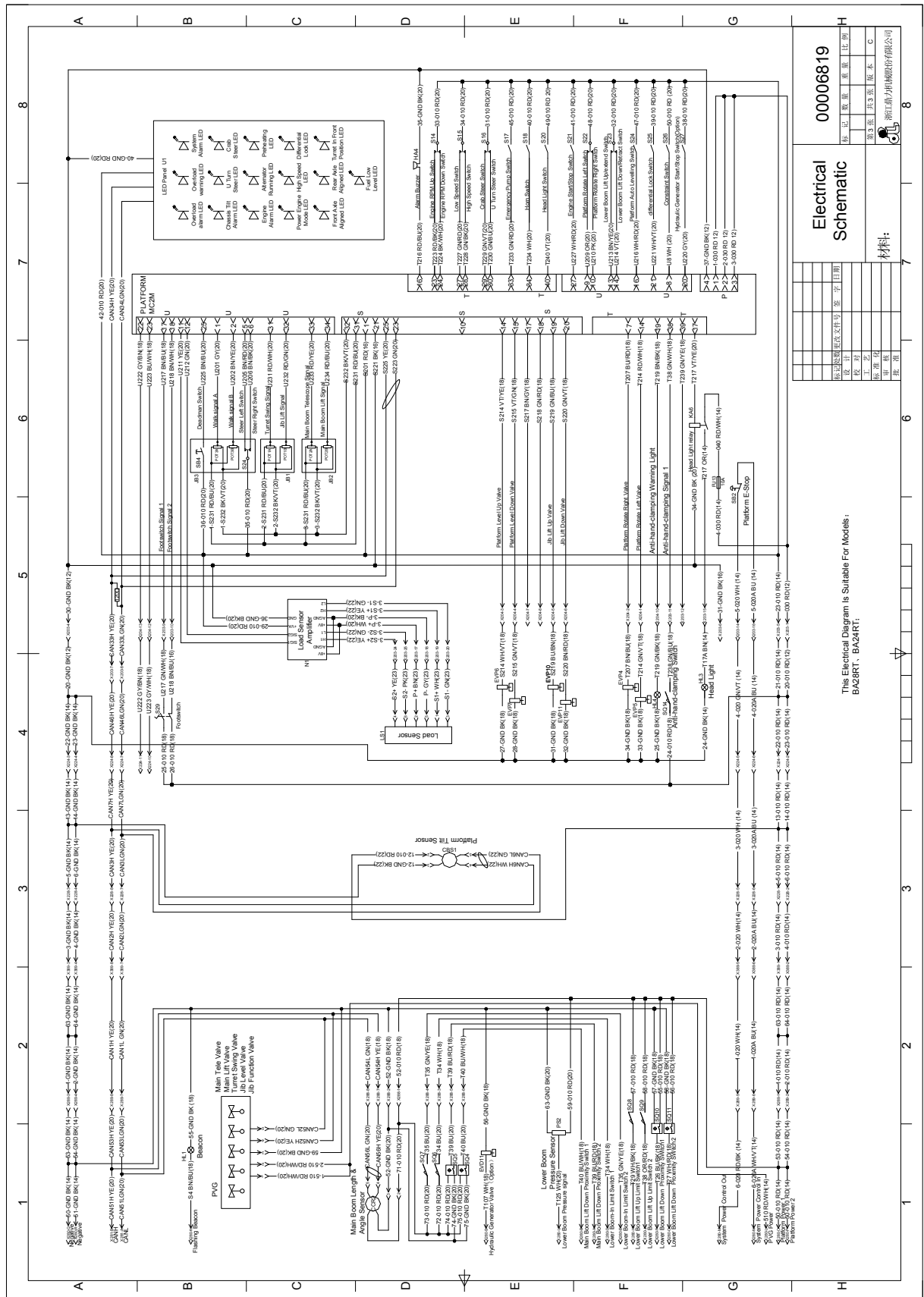
Hydraulic Schematic



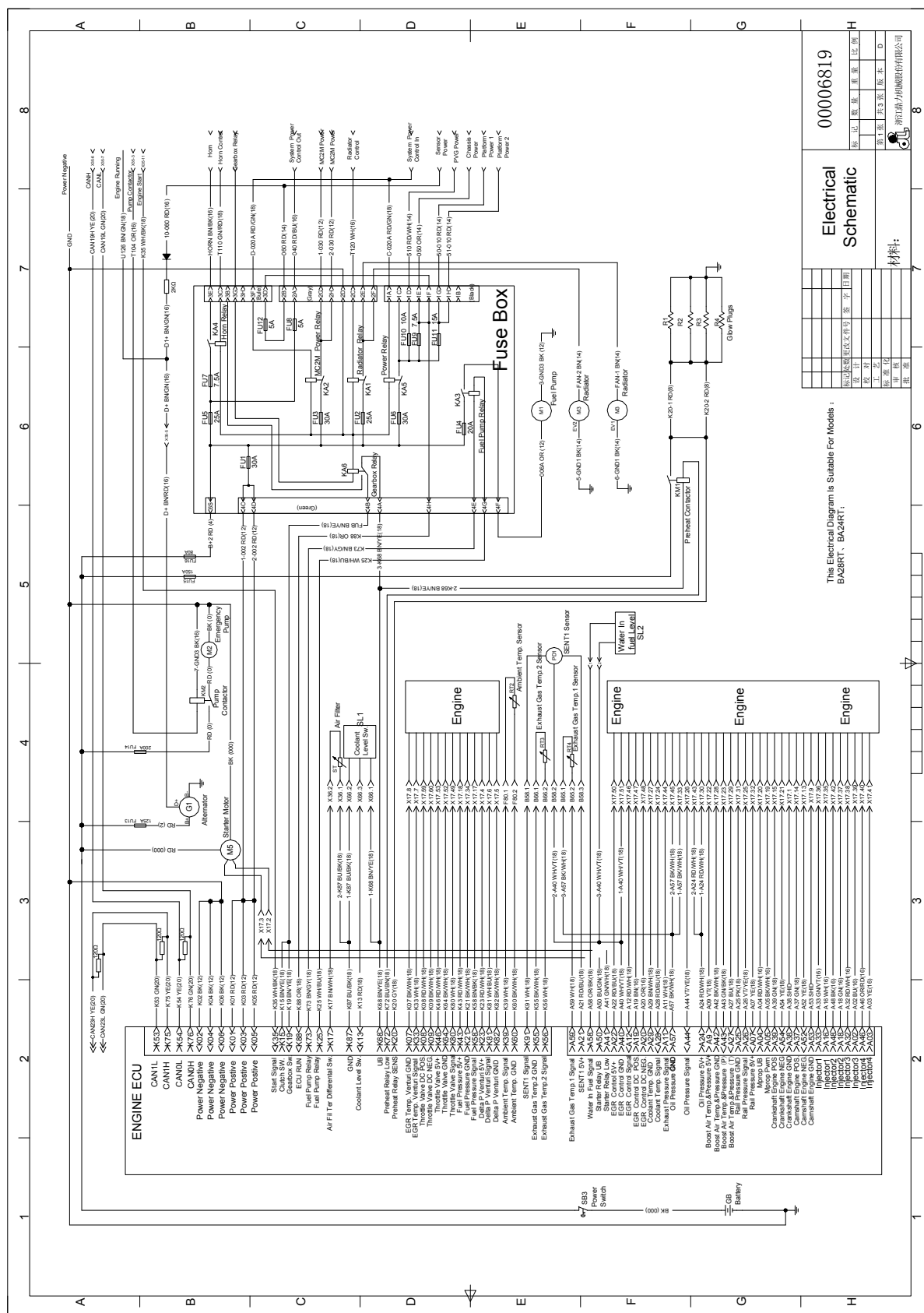
Electrical Schematic (Stage IV)



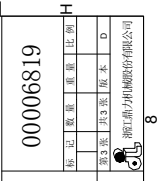




Electrical Schematic(Stage V)







Inspection Register

The maintenance checks carried out on the machine must be recorded in a document called the Inspection Register. Replacements of the components of the hydraulic system, electrical system, mechanisms or structural elements, safety devices as well as faults of a certain entity and relative repairs must also be recorded in the Inspection Register.

The Inspection Register must be considered as an integral part of the machine; it must accompany the machine throughout its life, up to final disposal. The Inspection Register must be at the disposal of the competent vigilance authorities for a period of five years from the last records or until the equipment is decommissioned, depending on whichever is done first. A document certifying the last inspection must accompany the equipment wherever it is used.

Inspection Register

Date	Comments