Operation & Maintenance Manual

Self-Propelled

Articulating Boom Lifts

BA20ERT
BA22ERT

Dingli

Machinery

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Version of the Record

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SM0419111_ Rev1.0	September 2019		
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Foreword

We are very appreciated for your interesting with Dingli machine and choosing it for your application. Our priority above all is you can use the machine safely for your application and you can benefit from the Dingli machine mostly. For these reason we hope you can:

1. Comply with employer, job site and local governmental rules.
2. The manual provides very important information about the machine. It is essential to the owner or the operator who use the machine. So we strongly recommend that you should read the manual thoroughly before attempting to do anything with the machine, so as to understand and follow the instruction or other information in the manual, especially the safety information.
3. Dingli cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, therefore, not all inclusive. If a tool, procedure, work method or operating technique that is not specifically recommended by Dingli is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or be made unsafe by the operation, lubrication, maintenance or repair procedure that you choose.
4. The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. Due to the continuous improvements, Dingli reserve the rights to make the specifications changes without prior notification. Please contact with Dingli dealers or Dingli distributors to obtain the complete and most current information.
5. Any one who read the manual or used the machine, is encouraged to notify Dingli Machinery Co, Ltd of any errors or send in suggestions for improvement. All communications will be carefully considered for future printings of this and other manuals, certainly if you have any question about the machine, please contact with our team by dialing technical support phone, sending email, or any methods you want, etc. Our contact information as bellow:

If you are in China Mainland, Please contact with:

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Safety Precaution

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1.1 General

This section prescribes the proper and safe practices for major areas of machine usage. In order to promote proper usage of the machine, it is mandatory that a daily routine be established based on instructions given in this section. A maintenance program must also be established by a qualified person and must be followed to ensure that the machine is safe to operate.

The owner/user/operator of the machine should not accept operating responsibility until this manual has been read and understood, and operation of the machine, under the supervision of an experienced and qualified person, has been completed. If there is a question on application and/or operation, Dingli Machinery Co.,Ltd. should be consulted.

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alerted to potential hazards. This person should also have the necessary training, skills, and tools to perform these functions properly.

Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death. Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, and maintenance & repair information.

1.2 Safety Alert Symbols and Safety Signal Words

This Safety Alert Symbol is used to call attention to POTENTIAL HAZARDS, if these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons. The hazards are identified by the “Safety Alert Symbol” and followed by a “Signal Word” such as DANGER, WARNING” or CAUTION, which have been inserted throughout this manual to emphasize these areas. They are defined as follows:

Indicate an IMMINENTLY HAZARDOUS SITUATION, which if not avoided, WILL RESULT IN SERIOUS INJURY or DEATH. This decal will have a red background

⚠WARNING

Indicate a potentially HAZARDOUS SITUATION, which if not been avoided, Could RESULT IN SERIOUS INJURY OR DEATH. This decal will have an orange background.

⚠CAUTION

Indicate a potentially HAZARDOUS SITUATION, which if not avoided, may RESULT IN minor or moderate INJURY. This decal will have a yellow background.

NOTICE

Indicate a potentially hazardous situation, which if not avoided, could result in property damage, this decal have a blue background.

1.3 Safety Precaution

⚠WARNING

FAILURE TO COMPLY WITH THE SAFETY PRECAUTIONS LISTED IN THIS MANUAL COULD RESULT IN MACHINE DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

1.3.1 Operator Training and Knowledge

- Read and understand this manual before operating the machine.
- Read, understand, and obey all **DANGERS, WARNINGS, CAUTIONS**, and operating instructions on the machine and in this manual.
- Do not operate this machine until complete training is performed by authorized persons. Only authorized and qualified personnel can operate the machine.
- Use the machine in a manner which is within the scope of its intended application.
- All operating personnel must be familiar with the emergency controls and emergency operation of the machine as specified in this manual.
- Read, understand, and obey all applicable employer, local, and governmental regulations as they pertain to operation of the machine.
- Read, understand, and obey national traffic regulations.

1.3.2 Workplace Inspection

- The operator is to take safety measures to avoid all hazards in the work area prior to machine operation.
- Do not operate or raise the platform while on trucks, trailers, railway cars, floating vessels,

scaffolds or other equipment.

- Do not operate the machine in hazardous environments unless approved for that purpose by Dingli.
- Be sure that the ground conditions are able to support the maximum load shown on the decals located on the machine.
- This machine can be operated in temperatures of -20℃ to 40℃. Consult Dingli for operation outside this range.

1.3.3 Machine Inspection

- Before machine operation, perform inspections and functional checks. Refer to **Section 3** of this manual for detailed instructions.
- Do not operate this machine until it has been serviced and maintained according to requirements specified by the manufacture.
- Be sure the footswitch and all other safety devices are operating properly. Modification of these devices is a safety violation.

⚠WARNING

MODIFICATION OR ALTERATION OF AN AERIAL WORK PLATFORM SHALL BE MADE ONLY WITH WRITTEN PERMISSION FROM THE MANUFACTURER.

- Do not operate any machine on which safety or instruction placards or decals are missing or illegible.
- Avoid any buildup of debris on the platform floor. Keep mud, oil, grease, and other slippery substances from footwear and platform floor.

1.4 Operation

1.4.1 General

- Do not use the machine for any purpose other than positioning personnel, their tools, and equipment.
- Never operate a machine that is not working properly. If a malfunction occurs, shut down the machine for troubleshooting.
- Never slam a control switch or lever through neutral to an opposite direction. Always return switch to neutral and stop before moving the switch to the next function. Operate controls with slow and even pressure. Hydraulic cylinders should never be left fully extended or fully retracted before shutdown or for long periods of time.
- Do not allow personnel to tamper with or operate the machine from the ground with personnel

in the platform, except in an emergency.

- Do not carry materials directly on platform railing.
- When two or more persons are in the platform, the operator shall be responsible for all machine operations.
- Always ensure that power tools are properly stowed and never left hanging by their cord from the platform work area.
- Supplies or tools which extend outside the platform are prohibited unless approved.
- When driving, always position boom over rear axle in line with the direction of travel. Remember, if boom is over the front axle, steer and drive functions will be reversed.
- Do not assist a stuck or disabled machine by pushing, pulling, or by using boom functions. Only pull the unit from the tie-down lugs on the chassis.
- Do not place boom or platform against any structure to steady the platform or to support the structure.
- Stow boom and shut off all power before leaving machine.

1.4.2 Trip and Fall Hazards

- During operation, occupants in the platform must wear a full body harness with a lanyard attached to an authorized lanyard anchorage point. Attach only one (1) lanyard per lanyard anchorage point.
- Before operating the machine, make sure all gates are closed and fastened in their proper position.

- Keep both feet firmly positioned on the platform floor at all times. Never use ladders, boxes, steps, planks, or similar items on platform to provide additional reach.

- Never use the boom assembly to enter or leave the platform.
- Use extreme caution when entering or leaving platform. Be sure that the boom is fully lowered. It may be necessary to telescope out to position the platform closer to the ground for entry/exit. Face the machine, maintain “three point contact” with the machine, using two hands and one foot or two feet and one hand during entry and exit.

1.4.3 Electrocution Hazards

- This machine is not insulated and does not provide protection from contact or proximity to electrical current.

- Maintain distance from electrical lines, apparatus, or any energized (exposed or insulated) parts according to the Minimum Approach Distance (MAD) as shown in Table 1.1

Table 1-1. Minimum Approach Distances (M.A.D.)

Voltage Range (Phase to Phase)	MINIMUM APPROACH DISTANCE in Feet (Meters)
0 to 50 KV	10 (3)
Over 50KV to 200 KV	15 (5)
Over 200 KV to 350 KV	20 (6)
Over 350 KV to 500 KV	25 (8)
Over 500 KV to 750 KV	35 (11)
Over 750 KV to 1000 KV	45 (14)
NOTE: This requirement shall apply except where employer, local or governmental regulations are more stringent.	

- Allow for machine movement and electrical line swaying.
- Maintain a clearance of at least 10 ft. (3m) between any part of the machine and its occupants, their tools, and their equipment from any electrical line or apparatus carrying up to 50,000 volts. One foot additional clearance is required for every additional 30,000 volts or less.
- The minimum approach distance may be reduced if insulating barriers are installed to prevent contact, and the barriers are rated for the voltage of the line being guarded. These barriers shall not be part of (or attached to) the machine. The minimum approach distance shall be reduced to a distance within the designed working dimensions of the insulating barrier. This determination shall be made by a qualified person in accordance with the employer, local, or governmental requirements for work practices near energized equipment.

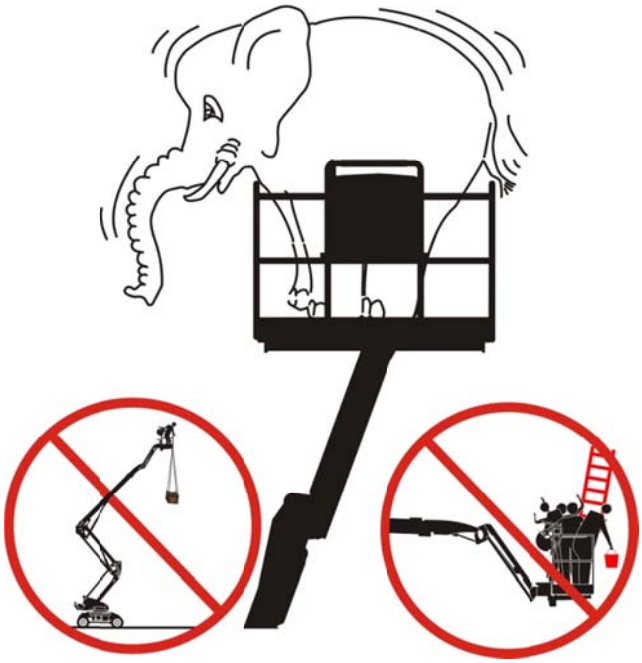
⚠ DANGER

DO NOT MANEUVER MACHINE OR PERSONNEL INSIDE PROHIBITED ZONE (MAD). ASSUME ALL ELECTRICAL PARTS AND WIRING IS ENERGIZED UNLESS KNOWN OTHERWISE.

1.4.4 Tipping Hazards

- The user should be familiar with the surface before driving. Do not exceed the allowable side slope and grade while driving.
- Do not elevate platform or drive with platform elevated while on a sloping, uneven, or soft surface.
- Before driving on floors, bridges, trucks, and other surfaces, check allowable capacity of the surfaces.

- Never exceed the maximum platform capacity. Distribute loads evenly on platform floor.



- Do not raise the platform or drive from an elevated position unless the machine is on firm, level and smooth surfaces.
- Keep the chassis of the machine at least 2 ft. (0.6m) from holes, bumps, drop-offs, obstructions, debris, concealed holes, and other potential hazards on the floor/surface.
- Do not push or pull any object with the boom.
- Never attempt to use the machine as a crane.
- Do not tie off machine to any adjacent structure.
- Do not operate the machine when wind conditions exceed 28 mph (12.5 m/s).

- Do not make any addition that would increase the wind loading on the machine.
- Do not increase the platform size with unauthorized deck extensions or attachments.
- If boom assembly or platform is in a position that one or more wheels are off the ground, all persons must be removed before attempting to stabilize the machine. Use cranes, forklift trucks, or other appropriate equipment to stabilize machine and remove personnel.

1.4.5 Crushing and Collision Hazards

- Approved head gear must be worn by all operating and ground personnel.
- Check work area for clearances overhead, on sides, and bottom of platform when lifting or lowering platform, and driving.

- During operation, keep all body parts inside platform railing.
- Use the boom functions, not the drive function, to position the platform close to obstacles.
- Always post a lookout when driving in areas where vision is obstructed.
- Keep non-operating personnel at least 6 ft. (1.8m) away from machine during all driving and swing operations.
- Limit travel speed according to conditions of ground surface, congestion, visibility, slope, location of personnel, and other factors which may cause collision or injury to personnel.
- Be aware of stopping distances in all drive speeds. When driving in high speed, switch to low speed before stopping. Travel grades in low speed only.
- Do not use high speed drive in restricted or close quarters or when driving in reverse.

- Exercise extreme caution at all times to prevent obstacles from striking or interfering with operating controls and persons in the platform.
- Be sure that operators of other overhead and floor level machines are aware of the aerial work platform's presence. Disconnect power to overhead cranes.
- Warn personnel not to work, stand, or walk under a raised boom or platform. Position barricades on floor if necessary.

1.5 Towing, Lifting and Hauling

- Never allow personnel in platform while towing, lifting, or hauling.
- This machine should not be towed, except in the event of emergency, malfunction, power failure, or loading/unloading. Refer to the Emergency Procedures section of this manual for emergency towing procedures.
- Ensure boom is in the stowed position and the turret locked prior to towing, lifting or hauling. The platform must be completely empty of tools.
- When lifting machine, lift only at designated areas of the machine. Lift the unit with equipment of adequate capacity.
- Refer to the Machine Operation section of this manual for lifting information.

1.6 Additional Hazards / Safety

- Do not use machine as a ground for welding.
- When performing welding or metal cutting operations, precautions must be taken to protect the chassis from direct exposure to weld and metal cutting spatter.
- Battery fluid is highly corrosive. Avoid contact with skin and clothing at all times.
- Do not operate the machine or charge the batteries in hazardous locations where potentially flammable or explosive gases or particles may be present. Charge batteries only in a well ventilated area.

Specification

Section 2

2.1 Machine Specification

Item \ Model	BA20ERT	BA22ERT
Stowed Dimension		
Overall Length	8.72m	9.55m
Overall Width	2.29m	
Overall Height	2.49m	
Rated Load		
Rated Load	230kg	
Max. occupants	2	
Platform Size		
Platform Length	1.83m	
Platform Width	0.79m	
Operation Dimension		
Maximum Platform Height	18.28m	20.21m
Maximum Working Height	20.28m	22.21m
Maximum Up and Over Height	7.7m	8.13m
Maximum Horizontal Reach	10.69m	12.72m
Maximum Working Radius	11.29m	13.32m
Crank Arm up/down Angle	0° /65°	
Boom up/down Angle	-15° /75°	
Minimum Turning Circle Inside/ Outside	1.56m/2.57m	
Grade ability (Stowed)	30%	
Maximum Slope	5°	

Turret Rotation	360° continuous	
Platform Rotation	±90°	
Jib Up/Down Angle	+70° /-60°	
Tail Swing	0.73m	0.93m
Wheel Base	2.4m	
Gross Machine Weight(Platform Empty)	9590kg	10100kg
Ground Clearance	0.279m	
Tire and Wheels		
Foam Filled Tire		
Size	315/55 D20	
Outer Diameter	830mm	
Width	319mm	
Airborne Noise Emission		
Maximum Sound Level in the platform	＜70dB	
Vibration Value	＜2.5m/s^2	

2.2 Performance Specification

Driving Speed	
Boom Stowed, high range	6.1km/h
Boom Raised or Extended	1.1km/h
Main Lift Up	35-40 sec
Main Lift Down	40-45 sec
Swing Right & Left	100-200 sec
Telescope Extent Out	30-35 sec
Telescope Retract In	30-35 sec
Platform Rotate R & L	5-10 sec
Jib Up	20-25 sec
Jib Down	20-25 sec

Lower and Mid Boom Up	30-35 sec
Lower and Mid Boom Down	30-35 sec

Machine Orientation When Doing Speed Tests

Lift: Boom Retracted. Telescope Retracted. Lift Up, Record Time, Lift Down, Record Time.

Swing: Boom at Full Elevation. Telescope Retracted. Swing the Turret to the end stop. Swing the Opposite Direction, Record Time.

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

Drive: Test to be done on a smooth level surface. The Driving Mode choosing Switch should be selected Run Mode and Drive Speed Controller pulled to limit. Start approximately 25 ft. (7.62 m) from starting point so that the unit is at maximum speed when starting the test. Results should be recorded for a 200 ft. (60.96 m) course. Drive Forward, record time. Drive Reverse, Record Time.

Drive (Above Horizontal): Test should be done on a smooth level surface. Driving Mode choosing Switch should be selected Creep Mode and Drive Speed Controller pulled to limit. This verifies that the switches are working when the boom is above horizontal. Results should be recorded for a 50 ft. 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.

Lower Lift: Upper Boom horizontal. Telescoped In. Lower Lift Up, Record Time. Lower Lift 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 315/55 D20 tires.
3. All speed tests are run from the platform. These speeds do not reflect the ground control operation.
4. The platform speed Toggle Switch control must be at full speed
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.

2.3 Hydraulic System Specification

Drive Motor	
Type	Electrical Motor
Input Volts	34V AC
Power	9kw
Pump	
Type	Gear Pump
Rated Working Pressure	240 bar
Displacement per revolution	6+3 cc
Hydraulic Tank Return Filter	10 um
Function Manifold	
Function Main Relief Pressure, used for Main Boom Up and Down	240 bar
Function Main Relief Pressure, used for Lower Boom Up and Down	240 bar
Turret Swing Pressure Setting	150 bar
Main Boom Telescopic Extent and Retract Pressure Setting	240 bar
Jib Up and Down Pressure Setting	240 bar
Platform Level Up Pressure Setting	140 bar
Platform Level Down Pressure Setting	140 bar
Steering Pressure Setting	150 bar
Hydraulic Reservoir	
Maximum Capacity	67 L

2.4 Battery Specification

Type	Flooded/wet lead-acid battery
Mode	5PZ375AH
Capacity	48V DC/375Ah

2.5 Bolt Torque Specification

Thread Size	Class 8.8 Metric Bolts and Nuts (Nm)	Class 10.9 Metric Bolts and Nuts (Nm)	Class 12.9 Metric Bolts and Nuts (Nm)
M4	3	4.4	5.1
M5	5.9	8.7	10
M6	10	16	18
M8	25	36	43
M8×1	27	39	46
M10	49	72	84
M10×1	52	76	90
M12×1.25	93	135	160
M12×1.5	89	130	155
M12	86	126	145
M14×1.5	145	215	255
M14	135	200	236
M16×1.5	226	330	390
M16	210	310	365
M18×1.5	340	485	570
M18	300	430	600
M20×1.5	475	680	790
M20	425	610	710
M22×1.5	630	900	1050
M22	580	820	960
M24×2	800	1150	1350
M24	730	1050	1220
M27×2	1150	1650	1950
M27	1100	1550	1800
M30×2	1650	2350	2750
M30	1450	2100	2450

User responsibility, Machine Preparation and Inspection

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3.1 Personnel Training

The aerial platform is a personnel handling device; so it is necessary that it be operated and maintained only by trained personnel.

⚠WARNING

PERSONS UNDER THE INFLUENCE OF DRUGS OR ALCOHOL OR WHO ARE SUBJECT TO SEIZURES, DIZZINESS OR LOSS OF PHYSICAL CINTROL MUST NOT OPERATE THIS MACHINE.

3.1.1 Operator Training

Operator training must cover:

- Use and limitations of the controls in the platform and at the ground, emergency controls and safety systems.
- Control labels, instructions, and warnings on the machine.
- Rules of the employer and government regulations.
- Use of approved fall protection device.
- Enough knowledge of the mechanical operation of the machine to recognize a malfunction or potential malfunction.
- The safest means to operate the machine where overhead obstructions, other moving equipment, and obstacles, depressions, holes, drop offs.
- Means to avoid the hazards of unprotected electrical conductors.
- Specific job requirements or machine application.

3.1.2 Training Supervision

Training must be done under the supervision of a qualified person in an open area free of obstructions until the trainee has developed the ability to safely control and operate the machine.

3.1.3 Operator Responsibility

The operator must be instructed that he/she has the responsibility and authority to shut down the machine in case of a malfunction or other unsafe condition of either the machine or the job site.

3.2 Preparation, Inspection and Maintenance

3.2.1 General

This section provides the necessary information needed by those personnel that are responsible to place the machine in operation readiness, and lists checks that are performed prior to use of the machine. It is important that the information contained in this section be read and understood before any attempt is made to operate the machine. Ensure that all the necessary inspections have been completed successfully before placing the machine into service. These procedures will aid in obtaining maximum service life and safe operation.

Before make an inspection, the operator and other auxiliaries must wear the personnel protective equipment such as gloves, safety belt, safety cap and so on.

The following table covers the periodic machine inspections and maintenance recommended by Dingli Machinery Co.,Ltd. Consult local regulations for further requirements for aerial work platforms. The frequency of inspections and maintenance must be increased as necessary when the machine is used in a harsh or hostile environment, if the machine is used with increased frequency, or if the machine is used in a severe manner.

Table 3-1.Inspection and Maintenance Table

Type	Frequency	Primary Responsibility	Reference
Pre-Start Inspection	Before using each day; or whenever there's an Operator change.	User or Operator	Operation and Maintenance Manual
Pre-Delivery Inspection	Before each sale, lease, or rental delivery.	Owner, Dealer, or User	Operation and Maintenance Manual
Frequent Inspection	In service for 3 months or 150 hours, whichever comes first; or Out of service for a period of more than 3 months; or Purchased used.	Owner, Dealer, or User	Operation and Maintenance Manual
Annual Machine Inspection	Annually, no later than 13 months from the date of prior inspection.	Owner, Dealer, or User	Operation and Maintenance Manual
Preventative Maintenance	At intervals as specified in the Operation & Maintenance Manual	Owner, Dealer, or User	Operation and Maintenance Manual

3.2.2 Preparation for Use

Before a new machine is put into operation it must be carefully inspected for any evidence of damage resulting from shipment and inspected periodically thereafter, as outlined in Delivery and

Frequent Inspection (see section 3.2.3). During initial start-up and run, the unit should be thoroughly checked for hydraulic leaks. A check of all components should be made to assure their security.

All preparation necessary to place the machine in operation readiness status is the responsibility of management personnel. Preparation requires good common sense, (i.e. telescope works smoothly and brakes operate properly) coupled with a series of visual inspections. The mandatory requirements are given in the Daily Walk around Inspection (see section 3.2.4).

It should be assured that the items appearing in the Delivery and Frequent Inspection and Functional Check are complied with prior to putting the machine into service.

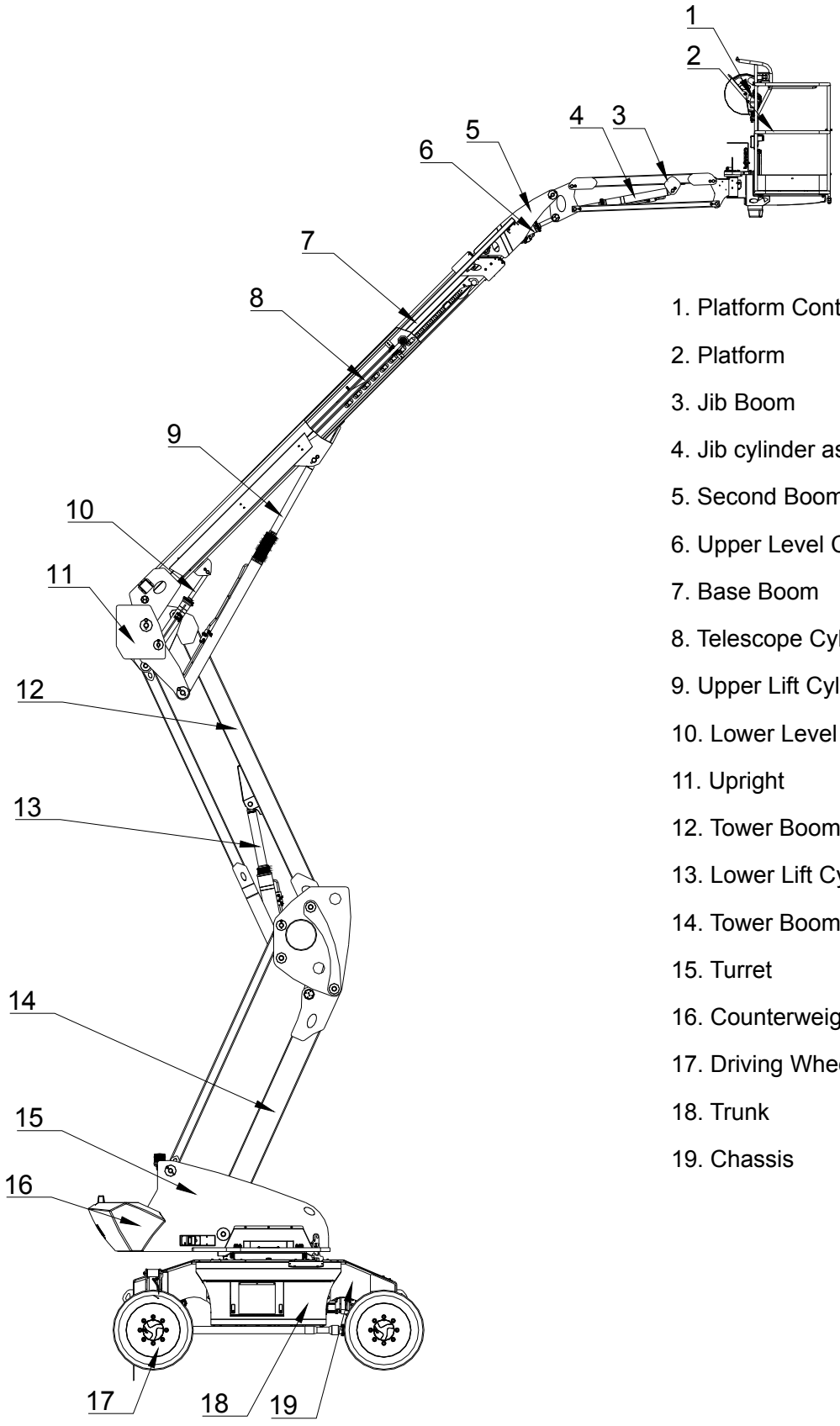
3.2.3 Delivery and Frequent Inspection

NOTICE

AN ANNUAL INSPECTION SHALL BE PERFORMED ON THE AERIAL PLATFORM NO LATER THAN THIRTEEN (13) MONTHS FORM THE DATE OF THE PRIOR ANNUAL INSPECTION. THE INSPECTION SHALL BE PERFORMED BY PERSON(S) QUALIFIED AS A MECHANIC ON THE SPECIFIC MAKE AND MODEL OF THE AERIAL PLATFORM.

The following checklist provides a systematic inspection to assist in detecting defective, damaged, or improperly installed parts. The checklist denotes the items to be inspected and conditions to examine. Frequent inspection shall be performed every 3 months or 150 hours whichever comes first or more often when required by environment, severity, and frequency of usage.

This inspection checklist is also applicable and must be followed for all machines that have been in storage or for all machines that will be exposed to harsh or changing climates. These checks are also to be performed after maintenance has been performed on the machine.



1. Platform Control Box
2. Platform
3. Jib Boom
4. Jib cylinder assembly
5. Second Boom
6. Upper Level Cylinder
7. Base Boom
8. Telescope Cylinder
9. Upper Lift Cylinder
10. Lower Level Cylinder
11. Upright
12. Tower Boom 2
13. Lower Lift Cylinder
14. Tower Boom 1
15. Turret
16. Counterweight
17. Driving Wheels
18. Trunk
19. Chassis

Figure 3-1 Machine Nomenclature

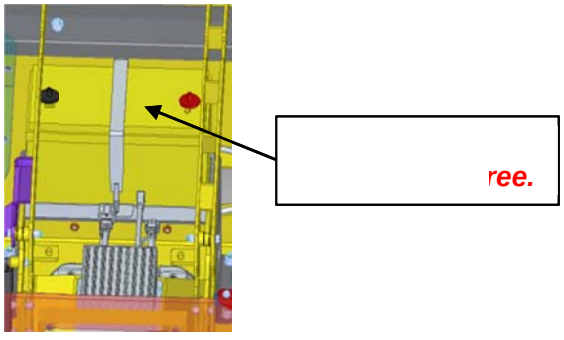
Chassis

1) Check front tires and wheel assemblies for loose or worn spindles, components and hardware for security, tires for wear and damage.
2) Check Steering cylinder rod of front axle for damage, and hydraulic lines for leaks and security.
3) Check Steering cylinder rod of rear axle for damage, and hydraulic lines for leaks and security.
4) Check electric motors and electric lines for damage and leaks. Contact Service Personnel for assistance if needed.
5) Check rear tires and wheel assemblies for security, tires for wear and damage.
6) Check Hydraulic Reservoir for security, hydraulic elements in(on) the Hydraulic Reservior for wear and damage.
7) Check oil level in Planetary Gear Hub of front and rear axle. (Contact Service Personnel for assistance if needed).

NOTICE

TORQUE HUBS SHOULD BE ONE-HALF FULL OF LUBRICANT.

8) Check differentials oil level by removing level cap, the oil must flow out through the opening, if not, some oil should be added.
9) Check oscillating cylinder assembly, hydraulic fitting and lines for leaks.
10) Check charger for wear and damage.
11) Check ground controls for damage, loose or missing parts, security and electric connections for evidence of corrosion and tightness and wiring for insulation damage. Assure that all switches function properly.
12) Check battery for damage, loose or missing vent caps, electrical connections for tightness, and evidence of corrosion, hold-down brackets for tightness, and electrolyte for proper water level. Add only clean distilled water to battery.



13) Check all access doors for damage, proper operation of latches, props and security.

14) Check Function Manifold, PLFA filter, steering valve and hydraulic lines for damage, leakage and security.

15) Check gear pump and electric motor for damage or slacken.

Turret

1) Check turret for damage, loose or missing parts, and security. Check swing drive and brake for damage, loose or missing parts, hydraulic lines and component housings for evidence of leakage; worm gear for proper mesh with swing gear.

2) Check swing bearing for damage, wear, lubrication and loose or missing bearing bolts.

3) Check all pin and shaft retaining hardware for security and wear.

4) Check all electrical cables for defects, damage, loose or corroded connections.

Boom

1) Check Lower Boom and leveling link for damage, missing parts and security.

2) Check all pin and shaft retaining hardware for security and wear.

3) Check hydraulic lines and electrical cable for damage, missing parts and security.

4) Check limits switch connections and plunger for corrosion and security.

5) Check Lower Upright, cross pins, lower hydraulic cylinder and hydraulic lines for damage, wear, lubrication, leakage and security.

6) Check boom pivot bushings for wear.

7) Check Upper Upright, cross pins, upper lift cylinder and hydraulic lines for damage, wear, lubrication, leakage and security.

8) Check Upper Boom for damage, missing parts and security.

9) Check Upper Boom wear pads for damage, missing parts and security.

10) Check Upper Boom telescope cylinder, cross pins and hydraulic lines for damage, wear, lubrication, leakage and security.

11) Check Platform Leveling Cylinder, cross pins and hydraulic lines for damage, wear, lubrication, leakage and security.

12) Check jib articulating cylinder, cross pins and hydraulic lines for damage, wear, lubrication, leakage and security.

13) Check solenoid valve for transition platform swinging and jib lifting, connection-peg and cable for damage, wear and security.

Platform

1) Check platform and control console for damage, loose or missing parts, and security.

2) Check control switches and levers for damage, loose or missing parts and security. Assure that levers function properly.

3) Check control switches, levers and electrical connections for tightness and evidence of corrosion, and wiring for defects and chafing damage. Assure that switches function properly.

4) Check access gate hinges, stop, and latch for proper operation, damage and security.

5) Check platform rotator mechanism for proper operation, damage, security. Check hydraulic lines for leakage, damage and security.

NOTICE

CHECK ALL DANGER, WARNING, CAUTION AND INSTRUCTION PLACARDS FOR LEGIBILITY AND SECURITY ON THE ENTIRE MACHINE. (REFER TO SECTION 4.4 PLACARDS AND DECALS)

Torque Requirements

The Reference Torque Value for Metric Thread Table (Figure 2-5.) consists of standard Metric bolts and Nuts torque values based on bolt diameter and grade, also specifying dry and wet torque values in accordance with recommended shop practices. Attentionly, the 70～80 percent of the value in the chart only be chosen during the installation and maintenance. This chart is provided as an aid to the operator in the event he/she notices a condition that requires prompt attention during the walk-around inspection or during operation, until the proper service personnel can be notified. The Service and Maintenance manual provides specific torque values and periodic maintenance procedures with a listing of individual components. Utilizing the 70～80 percent of the value in this Torque Value Table in conjunction with the preventive maintenance section will enhance safety, reliability, and performance of the machine.

3.2.4 Daily Walk - around Inspection

It is the operator's responsibility to inspect the machine before the start of each workday. It is recommended that each operator inspect the machine before operation, even if the machine has already been put into service under another operator. This Daily Walk-Around Inspection is the preferred method of inspection. These checks are also to be performed after maintenance has been performed on the machine.

In addition to the Daily Walk-Around Inspection, be sure to include the following as part of the daily inspection:

1) Overall cleanliness.

Check all standing surfaces for oil, hydraulic oil spillage and foreign objects. Ensure overall cleanliness.

2) Placards.

Keep all information and operating placards clean and unobstructed. Cover when spray painting or shot blasting to protect legibility.

3) Operation and Maintenance Manual.

Ensure a copy of this manual and other Safety Manual, are enclosed in the manual storage box.

4) Machine Log.

Ensure a machine operating record or log is kept, check to see that it is current and that no entries have been left unlearned, leaving machine in an unsafe condition for operation.

5) Check platform footswitch for proper operation.

Switch must be released to start and depressed to operate machine.

6) Check that drive brakes hold when machine is driven up a grade not greater than specified on the serial number placard and stopped.

7) Assure that all items requiring lubrication are serviced.

Refer to Figure 3-2, Daily Walk-around Inspection Position.

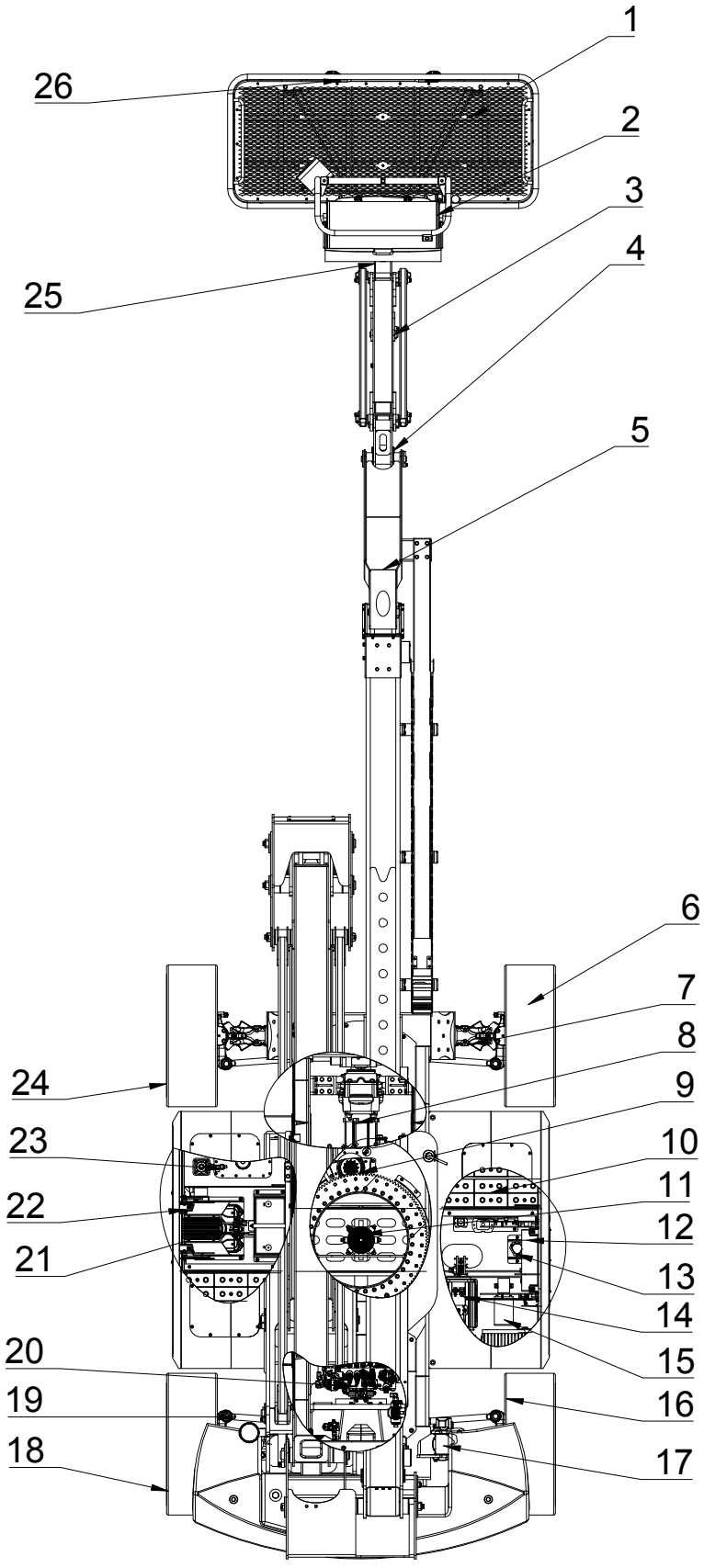


Figure 3-2 Daily Walk-around Inspection Position

Walk-Around Inspection Checklist

1) **Platform Assembly** – No loose or missing parts, no visible damage. Lock bolts in place. Footswitch in good working order not modified disabled or blocked.
2) **Platform Control Console** – Switches and levers return to neutral and are properly secured, no loose or missing parts, no visible damage, decals/placards secure and legible, control marking legible.
3) **Jib Articulating Cylinder** – No visible damage; pivot pins secure; hydraulic hoses undamaged, not leaking.
4) **Slave Cylinder** – No visible damage; pivot pins secure; hydraulic hoses undamaged, not leaking
5) **Boom Sections/Uprights/Lift Cylinders and Master Cylinder** – No visible damage; pivot pins secure; hydraulic hoses undamaged, not leaking. Uprights in vertical position.
6) **Wheel/Tire Assembly, Left Rear** – Properly secured, no loose or missing lug nuts, no visible damage.
7) **Rear shaft** – No visible damage, no loose or missing parts, hydraulic hoses undamaged, not leaking through the plugs and fittings, and no damage or wear on the rod of the steering cylinder.
8) **Drive Motor** – No visible damage and no wear on the cable.
9) **Turret Bearing** – No loose or missing hardware; no visible; evidence of proper lubrication; no evidence of loose bolts or looseness between bearing or structure.

   Swing Motor and Rotation Reduction Gear – No loose or missing hardware; no visible damage; evidence of proper lubrication.
10) **Battery** – Proper electrolyte levels; cables tight, no visible damage or corrosion.
11) **Center of rotors**- No visible damage, hydraulic hoses undamaged, not leaking.
12) **Ground Controls** – Switches operable, no visible damage, decals secure and legible. The control station won't close down automatically if not be pushed down emphatically, while be pulled up already.
13) **Tilt Sensor** – Switches operable; no visible damage.
14) **Hydraulic Pump** –Fixed tightly. No loose or missing parts, and no evidence of leakage.
15) Auxiliary pump– Fixed tightly. No loose or missing parts, and no evidence of leakage.
16) **Wheel/Tire Assembly, Left Front** – Properly secured, no loose or missing lug nuts, no visible damage.
17) **Oscillating cylinder**—No visible damage; pivot pins secure; hydraulic hoses undamaged, not leaking.
18) **Wheel/Tire Assembly, Right Front** – Properly secured, no loose or missing lug nuts, no visible damage.

19) **Front shaft** –No visible damage, no loose or missing parts, hydraulic hoses undamaged, not leaking through the plugs and fittings, and no damage or wear on the rod of the steering cylinder.

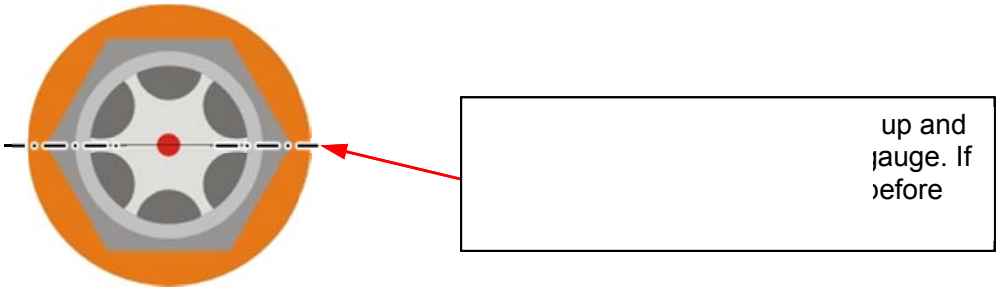
20) **Control Valve** – No loose or missing parts; evidence of leakage; unsupported wires or hoses; damaged or broken wires.

21) Charger –Fixed tightly. No loose or missing parts, and no visible wear.

22) **Door on the hydraulic reservoir-**Pulling Smoothly, and it won't close down automatically if not be pushed down emphatically, while be pulled up already.

23) **Hydraulic Oil Supply** – Recommended oil level sight gauge. (Check level with cold oil, systems shut down, machine in stowed position) Cap in place and secure.

Hydraulic Filter – Housing secure no visible damage; no evidence of leakage.



NOTICE

ON NEW MACHINES, THOSE RECENTLY OVERHAULED, OR AFTER CHANGING HYDRAULIC OIL, OPERATE ALL SYSTEMS A MINIMUM OF TWO COMPLETE CYCLES AND RECHECK OIL LEVEL IN RESERVOIR. SOME HYDRAULIC OIL MAY BE NEEDED, THAT SHOULD BE APPLIED TO THE ENVIRONMENT OF THE LOCATION AND FILTERED, WHILE THE FILTRATION ACCURACY IS 20um.

24) **Wheel/Tire Assembly, Right Rear** – Properly secured, no loose or missing lug nuts, no visible damage.

25) **Rotator Cylinders** – No visible damage; cylinder bolts secure; hydraulic hoses undamaged and not leaking.

26) **Platform Gate** – Latch, stop, and hinges in working condition and properly secured; no loose or missing parts.

3.2.5 Daily Function Check

A functional check of all systems must be performed, once the walk-around inspection is complete, in an area free of overhead and ground level obstructions. First, using the ground controls, check all functions controlled by the ground controls. Next, using the platform controls, check all functions controlled by the platform controls.

⚠WARNING

TO AVOID SERIOUS INJURY, DO NOT OPERATE MACHINE IF ANY CONTROL LEVERS OR TOGGLE SWITCHES CONTROLLING PLATFORM MOVEMENTS DO NOT RETURN TO THE OFF OR NEUTRAL POSITION WHEN RELEASED.

TO AVOID A COLLISION AND INJURY IF PLATFORM DOES NOT STOP WHEN A CONTROL SWITCH OR LEVER IS RELEASED, REMOVE FOOT FROM FOOTSWITCH OR USE EMERGENCY STOP TO STOP THE MACHINE.

IF THE MACHINE DOES NOT OPERATE PROPERLY, TURN OFF THE MACHINE IMMEDIATELY! REPORT THE PROBLEM TO THE PROPER MAINTENANCE PERSONNEL. DO NOT OPERATE THE MACHINE UNTIL IT IS DECLARED SAFE FOR OPERATION.

NOTICE

WHEN THE BOOM IS RAISED ABOVE HORIZONTAL, HIGH DRIVE SPEED IS CUT OUT.

3.2.5.1 Function Test at Ground Control Station

1) Turn the Key Switch Clockwise to Red Circle icon to choose operation at Ground Control Station
2) Raise, extend, retract and lower Upper Boom. Check for smooth operation.
3) Telescope boom IN and OUT several cycles at various degrees of elevation lengths. Check for smooth telescope operation.
4) Swing turret to LEFT and RIGHT a minimum of 45 degrees. Check for smooth motion.
5) Check that platform self-leveling system functions properly during raising and lowering of boom.
6) Check rotator for smooth operation and assure platform will rotate 90 degrees in both directions from centerline of boom.
7) Check the Emergency Stop switch in the Ground Control Station, Push in the red Emergency Stop switch to the off position. The operation system should turn off and all boom functions should not operate. Pull out the red Emergency Stop switch to the on position to energize the system again, the beacon should flash again.
8) Check the Emergency Control-ensure the Emergency Stop switch is Pulled up, pull The Auxiliary power Switch “DOWN” and hold, simultaneously activate the each boom function toggle switch, the boom function should be operate.

NOTICE

THE AUXILIARY POWER ONLY IS FUNCTIONAL FOR JIB LIFTING UP AND DOWN, MAIN BOOM DOWN, TELESCOPE BOOM RETRACTING, LOWER AND MID BOOM DOWN, PLATFORM LEVELING AND TURRET ROTATING.

TO CONSERVE THE BATTERY POWER, TEST EACH FUNCTION THROUGH ONE PARTIAL CYCLE.

3.2.5.2 Functional Test at platform

1) Turn the Key Switch Anticlockwise to ***Blue Square*** icon to choose operation at platform Control Station, Pull the Emergency Stop switch up.
2) Footswitch function check-ensure before pressing the footswitch down, push the any switch on the button, the function motion should be invalidated. Then push it down, the motion will be activated.
3) Raise, extend, retract and lower Upper Boom. Check for smooth operation.
4) Telescope boom IN and OUT several cycles at various degrees of elevation lengths. Check for smooth telescope operation.
5) Swing turret to LEFT and RIGHT a minimum of 45 degrees. Check for smooth motion.
6) Check that platform self-leveling system functions properly during raising and lowering of boom.
7) Check rotator for smooth operation and assure platform will rotate 90 degrees in both directions from centerline of boom.
8) Drive forward and reverse; check for proper operation.
9) Steer left and right; checks for proper operation.
10) Check the Emergency Stop switch in the Ground Control Station, Push in the red Emergency Stop switch to the off position. The operation system should turn off and all boom functions should not operate. Pull out the red Emergency Stop switch to the on position to energize the system again, the beacon should flash again.
11) Footswitch.

⚠WARNING

FOOTSWITCH MUST BE ADJUSTED SO THAT FUNCTIONS WILL OPERATE WHEN PEDAL IS APPROXIMATELY AT ITS CENTER OF TRAVEL. IF SWITCH OPERATES WITHIN LAST 1/4" OF TRAVEL, TOP OR BOTTOM, IT SHOULD BE ADJUSTED.

A. Activate hydraulic system, by depressing footswitch. Operate Telescope and hold control. Remove foot from footswitch, motion should stop. If it does not, shut down machine and contact a certified service technician.

B. With footswitch depressed, operate Lift and hold control. Remove foot from footswitch, motion should stop. If it does not, shut down machine and contact a certified service technician.

12) Check the Emergency Control-ensure the Emergency Stop switch is Pulled up，pull The Auxiliary power Switch “UP” and hold, simultaneously activate the each boom function toggle switch, the boom function should be operate.

NOTICE

THE AUXILIARY POWER ONLY IS FUNCTIONAL FOR JIB LIFTING UP AND DOWN, MAIN BOOM DOWN, TELESCOPE BOOM RETRACTING, LOWER AND MID BOOM DOWN, PLATFORM LEVELING AND TURRET ROTATING.

TO CONSERVE THE BATTERY POWER, TEST EACH FUNCTION THROUGH ONE PARTIAL CYCLE.

13) Ground and Platform control interlock function.

Place Ground/Platform Select switch to Ground.

Platform controls should not be operated.

In a similar way, Ground controls should not be operated when Place Ground/Platform Select switched to Platform.

3.3 Oscillating Axle Lockout Test

NOTICE

LOCKOUT SYSTEM TEST MUST BE PERFORMED QUARTERLY, ANY TIME A SYSTEM COMPONENT IS REPLACED, OR WHEN IMPROPER SYSTEM OPERATION IS SUSPECTED.

ENSURE BOOM IS FULLY RETRACTED, LOWERED AND CENTERED BETWEEN DRIVE WHEELS PRIOR TO BEGINNING LOCKOUT CYLINDER TEST.

1) Place 15cm high block with ascension ramp in front of left front wheel.
2) Operate the ground and platform console selecting switch to choose platform console.
3) Place the Drive control lever to the forward position and carefully drive machine up ascension ramp until left front wheel is on top of block.
4) Carefully activate Swing control lever and position boom over right side of machine.
5) With boom over right side of machine, place Drive control lever to Reverse and drive machine off of block and ramp.
6) Have an assistant check to see that left front wheel remains elevated in position off of ground.
7) Carefully activate Swing control lever and return boom to stowed position (centered between drive wheels). When boom reaches center, stowed position, lockout cylinders should release and allow wheel to rest on ground, it may be necessary to activate Drive to release cylinders.
8) Place the 6 inches (15 cm) high block with ascension ramp in front of right front wheel.

9) Place Drive control lever to Forward and carefully drive machine up ascension ramp until right front wheel is on top of block.

10) With boom over left side of machine, place Drive control lever to Reverse and drive machine off of block and ramp.

11) Have an assistant check to see that right front wheel remains elevated in position off of ground.

12) Carefully activate Swing control lever and return boom to stowed position (centered between drive wheels). When boom reaches center, stowed position, lockout cylinders should release and allow wheel to rest on ground, it may be necessary activate Drive to release cylinders.

If lockout cylinders do not function properly, have qualified personnel correct the malfunction prior to any further operation.

Machine Controls and Indicators

ion

4.1 General

NOTICE

THE MANUFACTURER HAS NO DIRECT CONTROL OVER MACHINE APPLICATION AND OPERATION. THE USER AND OPERATOR ARE RESPONSIBLE FOR CONFORMING WITH GOOD SAFETY PRACTICES.

This section provides the necessary information needed to understand control functions.

4.2 Controls and Indicators

4.2.1 Ground Control Station

NOTE: The Function Enable switch must be held down in order to operate Telescope, Swing, Tower Lift, Main Lift, Jib Lift, Platform Level Override, and Platform Rotate functions.

⚠ WARNING

DO NOT OPERATE FROM GROUND CONTROL STATION WITH PERSONNEL IN THE PLATFORM EXCEPT IN AN EMERGENCY.

PERFORM AS MANY PRE-OPERATIONAL CHECK AND INSPECTIONS FROM GROUND CONTROLS AS POSSIBLE.

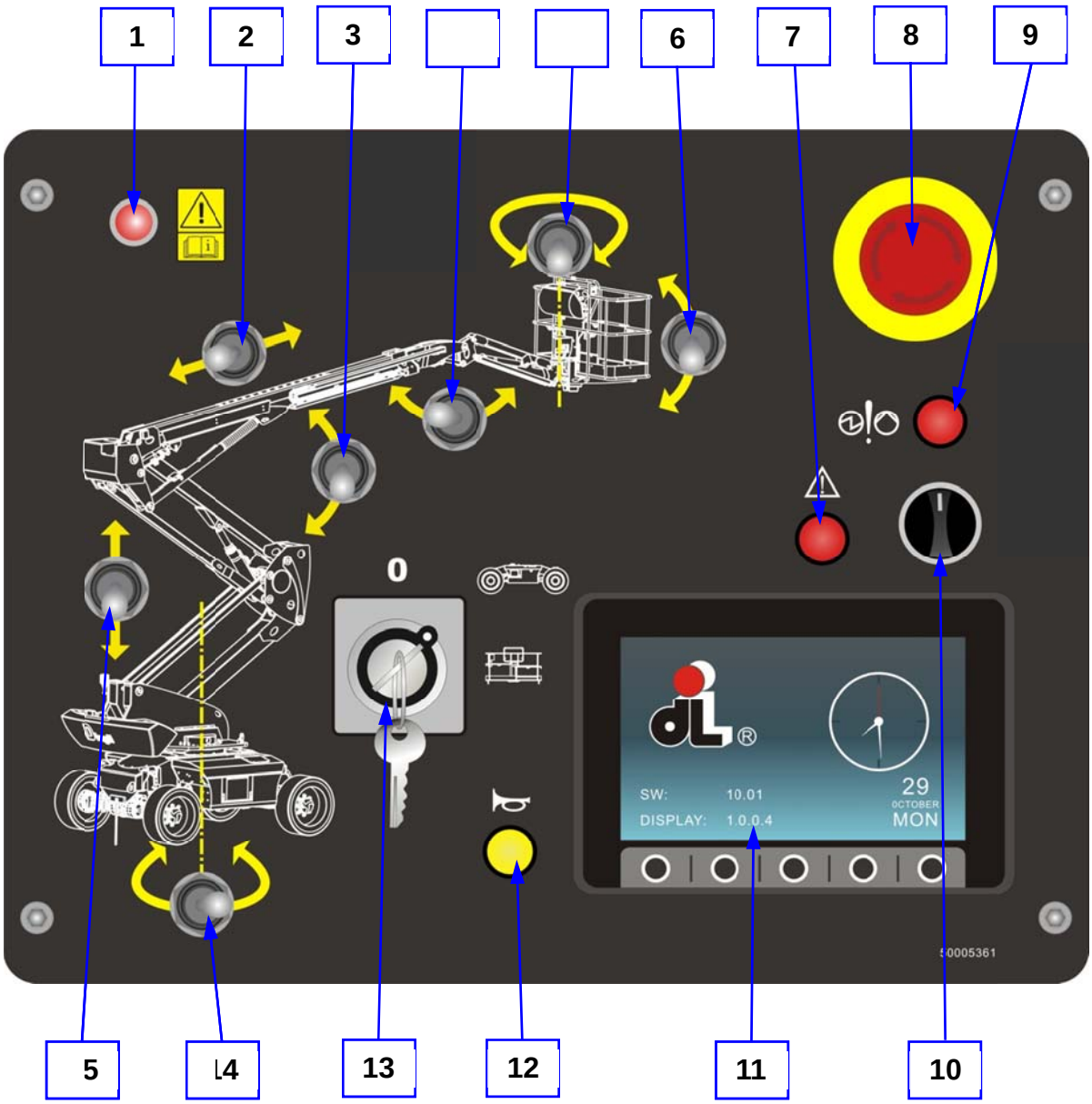
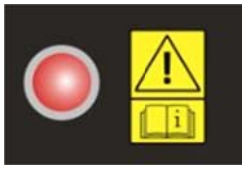


Figure 4-1 Ground Console Panel

Table 4-1 the Explanation for the Ground Console Panel

Item	Name	Description
1	Overload indicator 	The red overload indicator indicates the platform has been overloaded. It will go on when 110% of rated load has been in the platform.
2	The Main Boom Telescopic Controller 	A Three Position Toggle Switch. Push the toggle lever LEFT according to LEFT Arrow direction, the Main Boom would be Extended, until the Boom extend to the extending limited position. And Push the toggle lever to the opposite direction, the Main Boom would be extended until the Boom to the retracting Position. Once the toggle lever is released, it would return to the Original position automatically.
3	The Main Boom Up and Down Switch 	A Three Position Toggle Switch. Push the toggle lever Up according to UP Arrow direction, the Main Boom would be raised, until the Boom Up to the Up limited position. And Push the toggle lever to the opposite direction, the Main Boom would be got Down until the Boom to the Lowest Position. Once the toggle lever is released, it would return to the Original position automatically.
4	The Jib Boom Up & Down Controller 	A Three Position Toggle Switch. Push the toggle lever Up according to UP Arrow direction, the Jib Boom would be raised, until the Boom Up to the Up limited position. And Push the toggle lever to the opposite direction, the Jib Boom would be got Down until the Boom to the Lowest Position. Once the toggle lever is released. It would return to the Original position automatically.
5	The Platform Rotate Controller 	A three position Toggle Switch allows the operator to swing the platform clockwise or anticlockwise according the indication direction. It would return Back to Original Position Automatically once be released.  ***Range of platform swinging：±90°***

Item	Name	Description
6	The Platform Leveling Controller 	A three position switch allows the operator to adjust the automatic self-leveling system. This switch is used to adjust the platform level in situations such as ascending/descending a grad. **WARNING** ***ONLY USE THE PLATFORM LEVELING OVERRIDE FUNCTION FOR SLIGHT LEVELING OF THE PLATFORM. INCORRECT USE COULD CAUSE THE LOAD/OCCUPANTS TO SHIFT OR FALL. FAILURE TO DO SO COULD RESULT IN DEATH OR SERIOUS INJURY.***
7	Bypass Button 	The red button is used to control activating the system and stowing the machine in an emergency. If it is needed to activate the system at ground console, press the bypass button down and hold on, when the emergency stop switch on the platform console is pressed.
8	Emergency Stop switch 	A two-position red mushroom shaped switch furnishes power to the system, it is used to turn off the system power in emergency situation. ● Push Down to turn (OFF) the switch, so the power is shut off. ● Before starting system power, the emergency stop switch must be released, if not, the machine can not be started. Turning the mushroom clockwise to turn ON the switch, so to provide the power to the system.
9	Auxiliary Power Button 	The red button must be depressed to choose auxiliary power. **NOTICE** ***The auxiliary power only is function for jib lifting, main boom down, telescope boom retracting, Lower and Mid Boom down, Turret rotation, platform leveling and swing.*** ***When using auxiliary power, do not operate more than one function at a time.(Simultaneous operation can overload the Auxiliary Pump)*** ***Do not operate the auxiliary pump to save power.***

Item	Name	Description
10	Enable Switch 	A two position key switch. Normally it is kept in neutral position when released. Before operating any function, the switch must be depressed. Being released would invalidate the operation of any function.
11	Analysis Panel 	Refer to the chapter for analysis panel.
12	Horn button 	The yellow horn button is used to control the horn blaring and silent. ● Press it down and hold on ,the horn begin to ring and keep blaring; ● Release it, the horn will stop blaring.
13	The Ground and Platform Console Selecting Switch 	A three position toggle switch is used to supplies power to the platform console or platform console when positioned to Platform. ● Normally, it is in Neutral, the Power is cut off ● Turn the Key Switch to the chassis icon Position, the machine would be controlled by the Ground Console ● Turn the Key Switch to the platform icon Position, the machine would be controlled by the Platform Console. **NOTICE** ***When machine is shut down the Platform/Ground Select switch and Emergency Stop must be positioned to OFF.*** ***With PLATFORM/GROUND SELECT switch in the center position, power is shut off to controls at both operating Console.***
14	The Turret Swing Control Switch 	A three position Toggle Switch allows the operator to swing the turret clockwise or anticlockwise according the indication direction. It would return Back to Original Position Automatically once be released.

Item	Name	Description
15	The Lower and Mid Boom Control Switch 	A Three Position Toggle Switch. Push the toggle lever Up according to UP Arrow direction, the Lower and the Mid Boom would be raised simultaneously, until the Boom Up to the Up limited position. And Push the toggle lever to the opposite direction, the Lower and Mid Boom would be got Down until the Boom to the Lowest Position. Once the toggle lever is released, it would return to the Original position automatically.

4.2.2 Platform Control Station

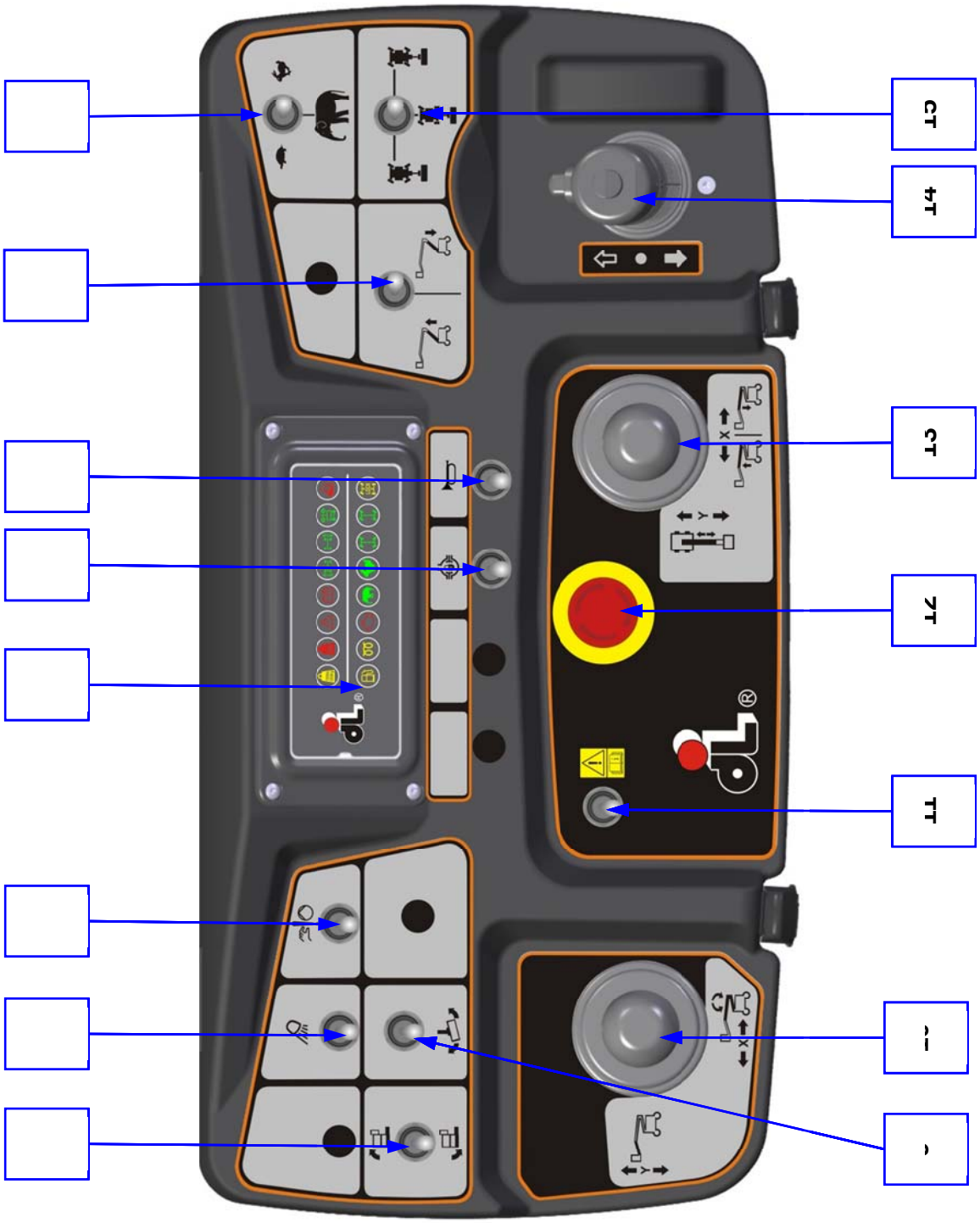
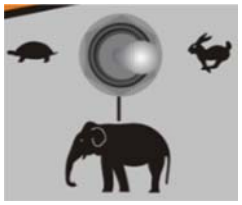
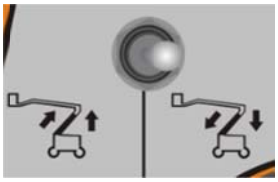


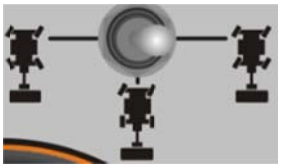
Figure 4-2 Platform Console Panel

Table 4-2 The Explanations for the Platform Console

Item	Name	Description
1	Speed model select switch 	A three position switch allows operator select the speed mode.  : lower speed  : climbing  : high speed Only three conditions followed satisfied must be, the high speed model is validated. 1) the switch turned to rabbit 2) the boom stowed completely 3) the turret posited original position
2	The Lower and Mid Boom Control Switch 	A Three Position Toggle Switch. ● Push the toggle lever Up according to UP Arrow direction, the Lower and the Mid Boom would be raised simultaneously, until the Boom Up to the Up limited position. ● Push the toggle lever to the opposite direction, the Lower and Mid Boom would be get Down until the Boom to the Lowest Position. Once the toggle lever is released, it would return to the Original position.
3	The Horn Switch 	A Two Position Toggle Switch. If pressed, this switch supplies power to the horn. It would return Back to Original Position Automatically once be released.
4	Differential Lock Switch 	A Two Position Toggle Switch would return Back to Original Position Automatically once be released. Toggling to differential lock icon will activate differential lock. The toggle will return to the original position automatically once be released, that will invalidate the differential lock.

Item	Name	Description
5	Indicator Panel 	Refer to the chapter of the Indicator panel for more information.
6	Auxiliary Power Switch 	A Two Position Toggle Switch. It would return Back to Original Position Automatically once be released. Push the toggle switch to the icon to activate the auxiliary power. **NOTICE** ***The auxiliary power only is function for jib lifting, main boom down, telescope boom retracting, Lower and Mid Boom down, Turret rotation, platform leveling and swing.*** ***When using auxiliary power, do not operate more than one function at a time.(Simultaneous operation can overload the Auxiliary Pump)*** ***Do not operate the auxiliary pump to save power.***
7	Work light switch 	A Two Position Toggle Switch. ● The work light turns on at the moment of the toggle switched to icon; ● The work light turns off at the moment of the toggle switched back to the original position.
8	The Platform Leveling Control Switch 	A three position switch allows the operator to adjust the automatic self leveling system. This switch is used to adjust the platform level in situations such as ascending/descending a grade. **⚠WARNING** ***ONLY USE THE PLATFORM LEVELING OVERRIDE FUNCTION FOR SLIGHT LEVELING OF THE PLATFORM. INCORRECT USE COULD CAUSE THE LOAD/OCCUPANTS TO SHIFT OR FALL. FAILURE TO DO SO COULD RESULT IN DEATH OR SERIOUS INJURY.***

Item	Name	Description
9	The Platform Rotate Control Switch 	A three position Toggle Switch allows the operator to swing the platform clockwise or anticlockwise according the indication direction. It would return Back to Original Position Automatically once be released. **NOTICE** ***Range of platform swinging：±90°***
10	The Jib Lifting/Turret Rotating Controller 	The dual axis joystick is provided for jib lifting and turret swinging. ● Push it forward and hold on to raise the jib up, pull backward to lower the jib. The father away its original position is, the faster its speed. It would return Back to Original Position Automatically once be released. ● Move right to swing the turret anticlockwise; move left to swing the turret clockwise. The father away its original position is, the faster its speed. It would return Back to Original Position Automatically once be released.
11	Bypass Switch 	A two position switch allows the operator to stow the machine in an emergency of security alarm except deadly security alarm. It would return Back to Original Position Automatically once be released. 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.
12	Emergency Stop switch 	A two-position red mushroom shaped switch furnishes power to the system; it is used to turn off the system power in emergency situation. ● Push Down to turn (OFF) the switch, so the power is shut off. ● Before starting system power, the emergency stop switch must be released, if not, the machine can not be started. Turning the mushroom clockwise to turn ON the switch, so to provide the power to the system.

Item	Name	Description
13	The Main Boom Lift/telescopic Joystick 	The dual axis joystick is provided for main lifting and telescopic. ● Push forward and hold on to raise the main boom (Upper boom) up, pull backward to lower the main boom (Upper boom). The father away its original position is, the faster its speed. It would return Back to Original Position Automatically once be released. ● Move towards right and hold on to retract the main boom; move towards left and hold on to extend the main boom. The father away its original position is, the faster its speed. It would return Back to Original Position Automatically once be released. **NOTICE** ***Main lift and telescopic functions can be selected at the same time. But the velocity will be decreased.***
14	Drive/Steer Controller 	The dual axis joystick with Deadman on the front surface and thumb switch on the top surface of the Drive/Steer controller is provided for driving and steering. ● Press Deadman and hold on ,then Push forward and hold on to drive forward, pull backward and hold on to drive backward. The father away its original position is, the faster its speed. ● Press Deadman and left thumb switch to turn left. Reversely, turn right. **NOTICE** ***If Deadman is not depressed, the functional operation will be invalidated.*** ***Driving and steering functions can be selected at the same time.***
15	The Steering Mode Choosing Switch 	A Three Position Toggle Switch, which is used to Set the Steering Mode. ● Turn the Toggle Switch to Right position, the steering mode would be changed to Crab steer mode. ● Turn the Toggle Switch to Left position, the steering mode would be changed to “coordinated” steering mode. ● Turn the Toggle Switch to down position, the steering mode would be changed to front wheel steer.

4.2.3 Analysis Panel

Figure 4-3 Analysis Panel

The panel can indicate the basic information used to monitor the vehicle. The optional pages and options, at the bottom of the panel, are chosen by the corresponding button below the panel.

4.2.3.1 Main interface

Figure 4-4 Main Interface

The icons at the top of the panel are:

- Alarm indicator
- Steering model indicator
- Parking brake on indicator
- Work light on indicator
- Differetial lock on indicator
- Speed model indicator：slow/fast
- Control Console chosen indicator：Ground/Platform

The icons at the middle of the panel are:

- Motor Tachometer the left, 0-6000rpm
- Weighting function on/off indicator, battery volt 48V/12V and percentage of battery level in the middle area
- Pump Tachometer the right, 0-4000rpm

Optional interface at the bottom of panel: data on motor, data on vehicle, option setting, exit and menu.

The desired interface can be chosen by depressing the corresponding botton.

4.2.3.2 Motor Interface

Figure 4-5 Motor Interface

Motor interface indicating data on motor can be entered by depressing down the motor button, including rotation rate, temperature, electric current and rated rotation rate of driven motor, rotation rate, temperature, electric current and rated rotation rate of Pump motor, and volt of battery.

4.2.3.3 Vehicle condition interface

Figure 4-6 Vehicle Condition Interface

Vehicle Condition Interface indicating data on vehicle condition can be entered by depressing down the Data button, including the angle of main boom lifting, the angle in X/Y direction, the load in the platform and work pressure.

4.2.3.4 Setting Interface

Figure 4-7 Setting Interface

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:

1. Depressing  or  is used to change the item. The chosen item would be shown in yellow background.
2. Depressing  and holding on is used to turn on or off corresponding function.
3. Save the modified value by depressing the button  . This measure is only applied to “P61 Anti_Pinch On Cage”. In the condition of interruption of power supply ,it is valid after being saved successfully.

4. Modifying“F58 Main Boom Angle In Safe Angle Confir”, is only valid in condition of power on. It will return back at the moment of interruption of power supply.

5. It returns back to main interface, when the button Esc is depressed.

Figure 4-8 Setting Interface

After entering the setting interface through entering password，The parameter such as “P51 DIS_2CH_CCR2”, “P59DIS_AntiHand2DI” and “P60 EnLoadLimit” can be modified. But it must be authorized by DingLi, because the parameters above relate to the security of the machine.

4.2.3.5 Alarm/Warning Interface (change automatically)

Figure 4-9 Alarm/Warning Interface

The interface appears automatically when there is system fault, to warn operator to ask proper service personnel for help.

1. The data on motor and vehicle would be read separately by depressing button Motor and Data at the current interface, but it does not return back main interface.
2. It will return back main interface when the alarming and warning are eliminated.
3. The messages will indicate circularly when many alarms or warnings are activated.

4.2.4 Indicator Panel

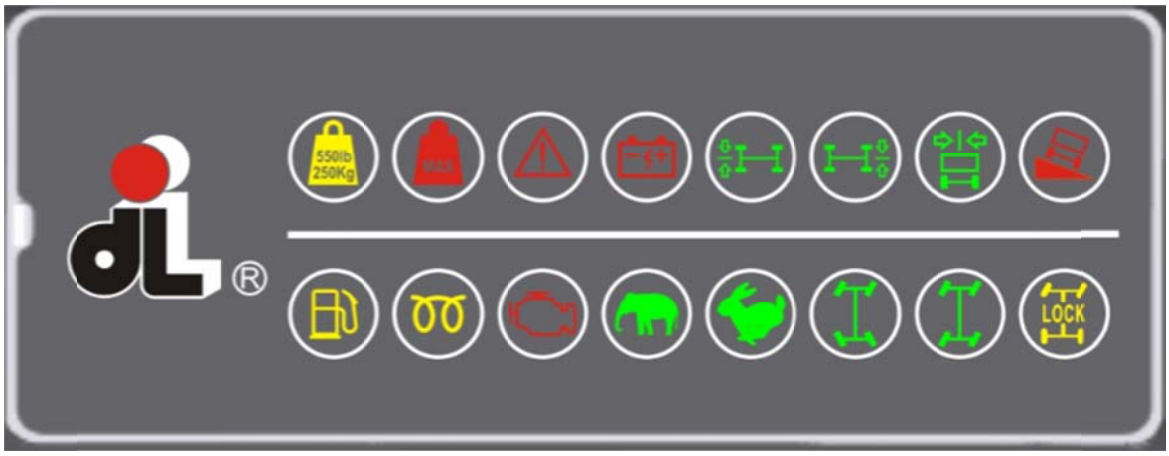


Figure 4-4 Indicator Panel

Indicator Abstract:

Item	Icon	Function Description
1		Yellow indicator being on means that the load in the platform exceeds the limited load at the limited length of boom.
2		Yellow indicator being on means that the load in the platform exceeds the rated load.
3		The red indicator would light when there is a danger or mechanical fauty. And then lower the platform and stop to read the message on the panel.
4		Red indicator lighting means that the system get the power from Battery.
5		Green indicator lighting means that the front wheels are at the original position.
6		Green indicator lighting means that the rear wheels are at the original position.
7		Green indicator lighting means that the turret is at the original position.
8		Red indicator lighting means that the degree of the chassis surpasses the rated angle when the machine is not stowed completely. At the moment, it is forbidden to move but stow the machine.
9		Not used.

Item	Icon	Function Description
10		Not used.
11		Not used.
12		Green indicator lighting means that climbing mode is chosen.
13		Green indicator lighting means that climbing mode is chosen.
14		Green indicator lighting means that “coordinated” steer mode is chosen.
15		Green indicator lighting means that Crab steer mode is chosen.
16		Yellow indicator lighting means that differential lock is open.

4.3 Tilt Alarm Warning

- A Tilt Sensor is installed in the Turret, which is used to detect if the chassis is horizontal.
- Once the Tilt Sensor detects that the chassis is inline and the X/Y degree is more than 5 degree for 1 second, the sensor judges that the chassis is inclined.
- The buzzer will sound, at the same time, red light on the platform control station will glitter and the corn indicating chassis inclining appear in the display as long as one of the following exists, while the degree exceeds 5.

  1) the lower and mid boom being not lowered completely,

  2) telescopic boom extended being not retracted completely,

  3) the degrees between the main boom and horizontal plat exceeds 0 degrees.
- Then, the machine can’t be driven forward and backward, and the boom can’t lift up and extend.
- The machine can be driven when the boom is lowered and retracted completely. Last, the machine should be driven to a safe and plat ground.

NOTICE

THE FOLLOWING INFORMATION IS ONLY APPLICABLE TO CE MACHINE:
WHEN THE DEGREES OF THE CHASSIS INCLINING EXCEED 5° AND ALARMED,ALL OPERATIONS OF THE MACHINE WOULD NOT BE OPERATED.

DANGER

IT IS FORBIDDEN THAT RELEASE THE BOLT FIXING UP THE TILT SENSOR TO FREE FROM ALARM, OTHERWISE, IT WOULD CAUSE SERIOUS DAMAGE TO THE MACHINE OR DEATH TO PERSONS.

4.4 Footswitch/Enable Indicator

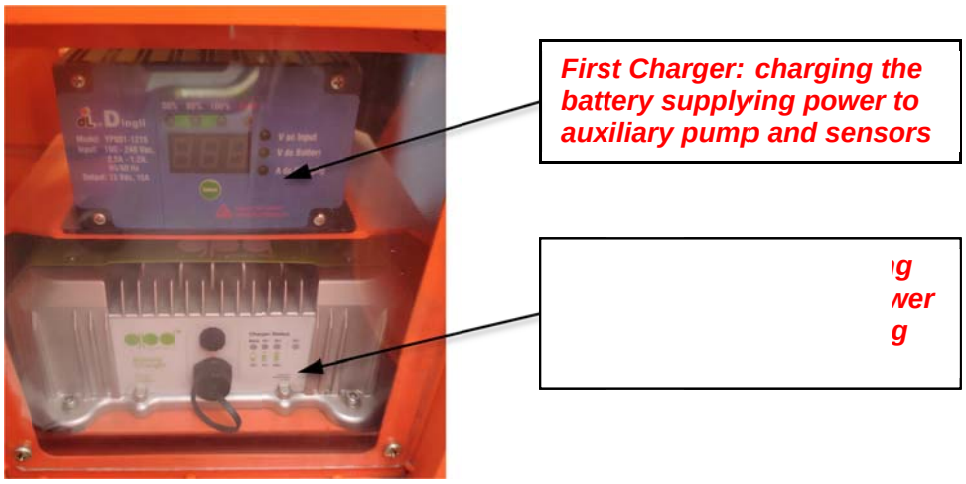
To operate any function, the footswitch must be depressed and then to choose the function selected within seven seconds. If a function is not selected within seven seconds, or if a seven second lapse between ending one function and beginning the next function, the enable function would go out and the footswitch must be released and depressed again to enable the controls.

DANGER

TO AVOID SERIOUS INJURY, DO NOT REMOVE, MODIFY OR DISABLE THE FOOTSWITCH BY BLOCKING OR ANY OTHER MEANS.

4.5 Charger

There are two chargers in the left cabin, which are used to charge the battery supplying power to auxiliary pump and sensors, and the battery supplying power to driven motor and lifting motor. The both chargers are shown as follows:



First charger, input voltage range: 100-240VAC, input current: 2.5A, frequency: 50-60Hz;

Second charger, input voltage range: 100-240VAC, input current: 16A, frequency: 50-60Hz.

The both groups of the batteries will be being charged when the charge plug is connected to 100-240 AC power, and then the charging is completed only when the both chargers shows the battery level is full.

4.6 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.

Decals are made of Pressure Sensitive Adhesive with a protective film on the front. Remove the damaged decal and thoroughly clean surface before installing a new decal. Simply peel off the back, and press new decal onto surface.

NOTICE

PLACARDS AND DECALS CAN BE ORDERED BY USING PART NUMBERS LOCATED BY EACH PLACARD OR DECAL. (SEE FIGURE4-5 DANGER AND WARNING DECAL AND PLACARD LOCATION.)

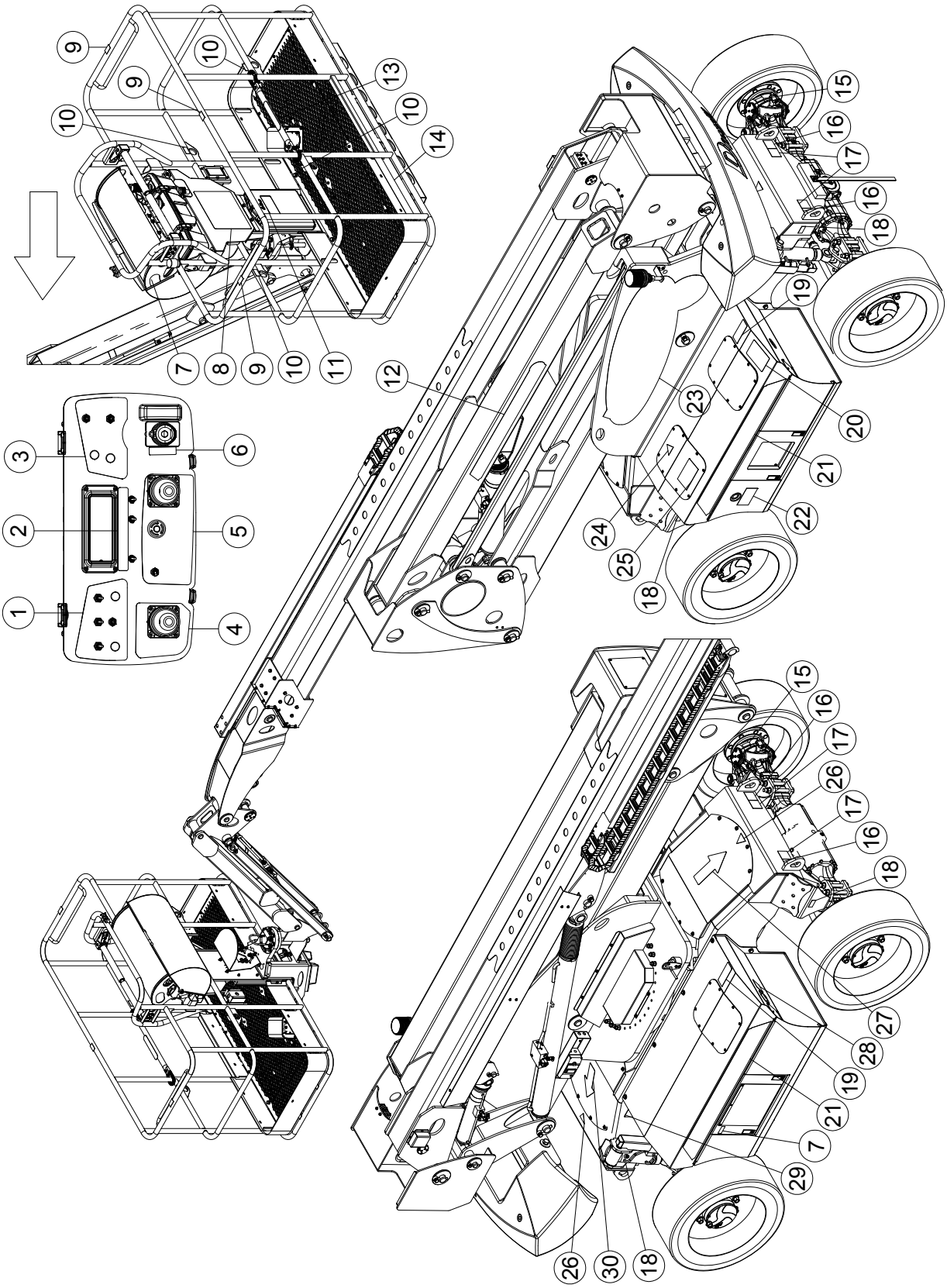


Figure4-5 Danger and Warning Decal Location

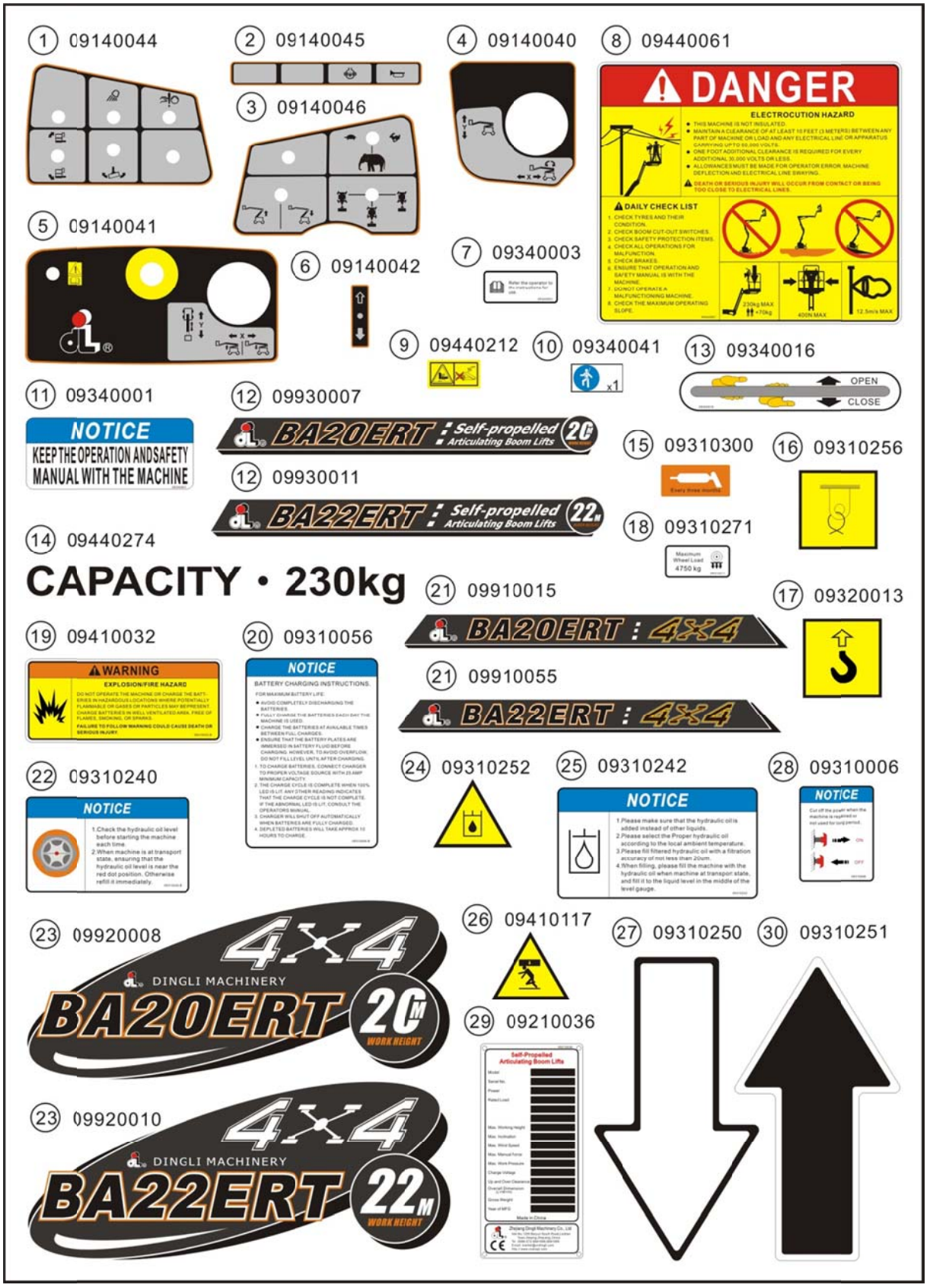

1 09140044
2 09140045
3 09140046
4 09140040
8 09440061
DANGER
ELECTROCUTION HAZARD
DAILY CHECK LIST
5 09140041
6 09140042
7 09340003
9 09440212
10 09340041
13 09340016
OPEN
CLOSE
11 09340001
NOTICE
KEEP THE OPERATION ANDSAFETY MANUAL WITH THE MACHINE
12 09930007
BA20ERT : Self-propelled Articulating Boom Lifts 20M
12 09930011
BA22ERT : Self-propelled Articulating Boom Lifts 22M
15 09310300
16 09310256
14 09440274
CAPACITY • 230kg
18 09310271
Maximum Wheel Load 4750 kg
21 09910015
BA20ERT : 4X4
17 09320013
19 09410032
WARNING
EXPLOSION/FIRE HAZARD
20 09310056
NOTICE
BATTERY CHARGING INSTRUCTIONS.
21 09910055
BA22ERT : 4X4
22 09310240
NOTICE
24 09310252
25 09310242
NOTICE
28 09310006
NOTICE
23 09920008
4X4
DINGLI MACHINERY
BA20ERT
20M
WORK HEIGHT
26 09410117
27 09310250
30 09310251
29 09210036
Self-Propelled Articulating Boom Lifts
23 09920010
4X4
DINGLI MACHINERY
BA22ERT
22M
WORK HEIGHT

Table 4-4 the description for the placard and decal table

Item	Part Number	Description	Qty.	Remark
1	09140044	Decal, Platform control panel	1	
2	09140045	Decal, Platform control panel	1	
3	09140046	Decal, Platform control panel	1	
4	09140040	Decal, Platform control panel	1	
5	09140041	Decal, Platform control panel	1	
6	09140042	Decal, Platform control panel	1	
7	09340003	Decal, Instructions-Refer the operator to the instructions for use	1	
8	09440061	Decal, Danger-General safety rules	1	
9	09440212	Decal, Warning-Crushing hazard	3	
10	09340041	Decal, Label-Lanyard anchorage point	4	
11	09340001	Decal, Notice-Keep the manual with the machine	1	
12	09930007	Decal, Label-BA20ERT	1	BA20ERT
	09930011	Decal, Label-BA22ERT	1	BA22ERT
13	09340016	Decal, Instructions-Open/close	1	
14	09440055	Decal, Label-Capacity 230kg	1	
15	09310300	Decal, Instructions-Grease filling port	4	
16	09310256	Decal, Instructions-Tie down point	4	
17	09320013	Decal, Instructions-Lift point	4	
18	09310271	Decal, Instructions-Maximum wheel load 4750kg	4	
19	09410032	Decal, Warning-Explosion/fire hazard	2	
20	09310056	Decal, Notice-Battery charging instructions	1	
21	09910015	Decal, Label-BA20ERT	2	BA20ERT
	09910055	Decal, Label-BA22ERT	2	BA22ERT
22	09310240	Decal, Notice-Check the hydraulic oil level	1	
23	09920008	Decal, Label-BA20ERT	1	BA20ERT
	09920010	Decal, Label-BA22ERT	1	BA22ERT
24	09310252	Decal, Instructions-Hydraulic	1	
25	09310242	Decal, Notice-Filling hydraulic oil notice	1	

Item	Part Number	Description	Qty.	Remark
26	09410117	Decal, Symbols-Crushing hazard	2	
27	09310250	Decal, Instructions-White arrow reverse	1	
28	09310006	Decal, Notice-Main power switch operation	1	
29	09210036	Nameplate, Manufacturer serial number	1	
30	09310251	Decal, Instructions-Black arrow forward	1	

Operation Instruction

Section 5

5.1 Description

This machine is a self-propelled hydraulic lift equipped with a work platform on the end of an elevating, articulating and rotating boom. Vibrations emitted by these machines are not hazardous to an operator in the work platform. The machine can be used to position personnel with their tools and supplies at position above ground level and can be used to reach work areas located above and over machinery or equipment.

A full and detailed implementation of EN ISO 13849-1/2 is correctly applied on our MEWP design. SISTEMA, a software tool for PL Calculation Tool, is also used to perform some relatively straightforward calculations on subsystem to determine the overall PL of the system. Reliability data, diagnostic coverage [DC], the system architecture [Category], common cause failure and, where relevant, requirements for software are used to assess the PL to comply with PLr of SRP/CS in Clause 5.11 of EN 280.

The primary operator control station is in the platform. From this control station, the operator can drive and steer the machine in both forward and reverse directions. The operator can raise or lower the boom or swing the boom to the left or right. Standard boom swing is 360 degree continuous left and right of the stowed position. The machine has a Ground Control Station which will override the Platform Control Station. Ground Controls operate boom lift and swing, and are to be used in an emergency to lower the platform to the ground should the operator in the platform be unable to do so. The Ground Control is also to be used in Pre-Start Inspection.

Instruction and hazard warnings are posted adjacent to both operator control stations and at other places on the machine. It is extremely important that operators know what instructions and warnings are placed on the machine, and review these periodically so that they are fresh in their minds.

There are efficient and safe operation in accordance with warnings on the machine, in the Operation & Maintenance Manual, and all jobsite and government rules and regulations. As with any type of machinery, the operator is very important to efficient and safe operation. It is absolutely necessary that the machine be regularly maintained in accordance with this manual and the machine Service and Maintenance manual, and that any evidence of lack of maintenance, malfunction, excessive wear, damage or modification to the machine be reported immediately to the machine owner or the jobsite supervisor or safety manager and that the machine be taken out of service until all discrepancies are corrected.

The machine is not intended to be used to lift material other than supplies which personnel in the platform require to do their job. Supplies or tools which extend outside the platform are prohibited. It must not be used as a forklift, crane, and support for overhead structure, or to push or pull another object.

The machine is hydraulically powered using hydraulic motors and cylinders for various machine motions. The hydraulic components are controlled by electrically activated hydraulic valves using switches and control levers. The speeds of functions controlled by control levers are variable from zero to maximum speed depending upon the position of the control lever. Functions controlled by toggle switches are either on or off. A foot operated switch in the platform must be depressed before any controls will function and provides a means of emergency stop when the operator's foot is removed from the footswitch.

The machine Lift is a four wheel drive available machine with drive power being supplied by a electric motor for each drive wheel, through the gear box and transmission shaft. Front wheel is supplied with hydraulic released, spring-applied brake. These brakes are automatically applied any time the Drive Control lever is returned to the neutral position

The rated load of the machine is 230kg. This means that with a platform load of 230 kg or less, the platform may be positioned anywhere the boom will reach.

Before operating the machine, the operator and other auxiliaries must wear the personnel protective equipment such as gloves, safety belt, safety cap and so on.

5.2 Operating Characteristics and Limitations

Capacities

The boom can be raised above horizontal with or without any load in platform, if:

1) Machine is positioned on a smooth, firm and level surface.
2) Load is within manufacturer's rated capacity.
3) All machine systems are functioning properly.
4) Machine is as originally equipped from Dingli Co., Ltd.

Stability

Machine stability is based on two (2) conditions which are called FORWARD and BACKWARD stability. The machine's position of least FORWARD stability is shown in (See Figure5-1.), and its position of least BACKWARD stability is shown in (See Figure 5-2.)

⚠ WARNING

TO AVOID FORWARD OR BACKWARD TIPPING, DO NOT OVERLOAD MACHINE OR OPERATE THE MACHINE ON AN OUT-OF-LEVEL SURFACE.

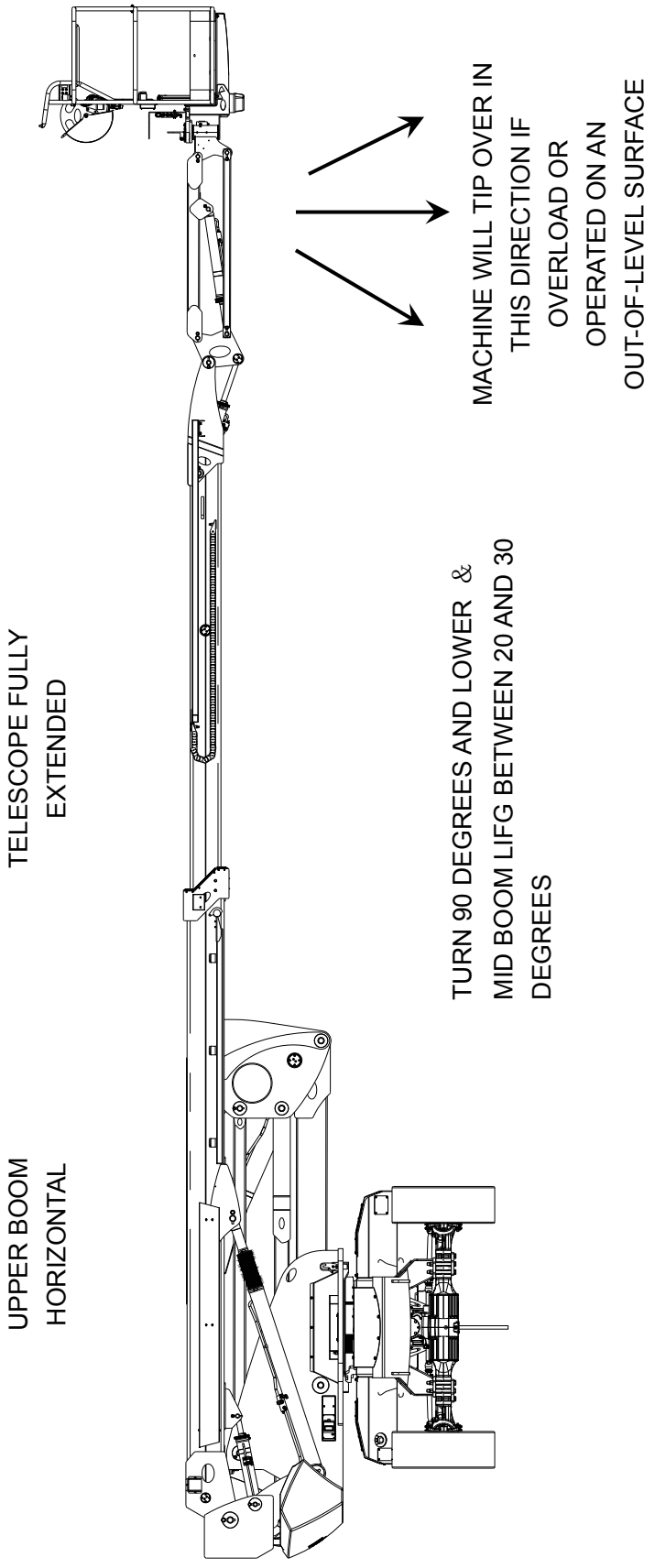


Figure 5-1 Position of Least Forward Stability

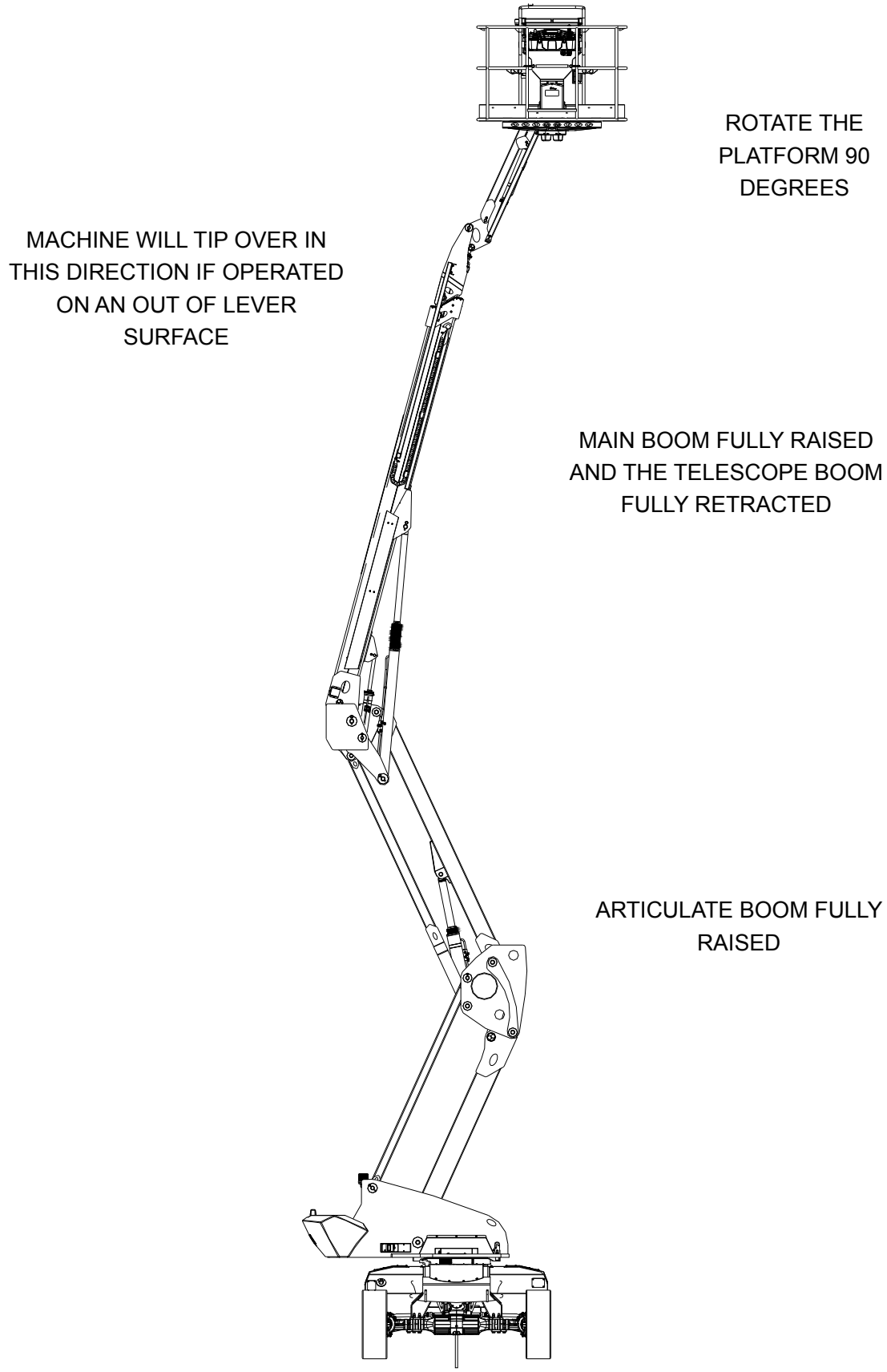


Figure 5-2 Position of Least Backward Stability

5.3 Traveling (Driving) Operation

⚠ WARNING

DO NOT DRIVE WITH BOOM EXTENDED OR ABOVE HORIZONTAL EXCEPT ON A SMOOTH, FIRM AND LEVEL SURFACE.

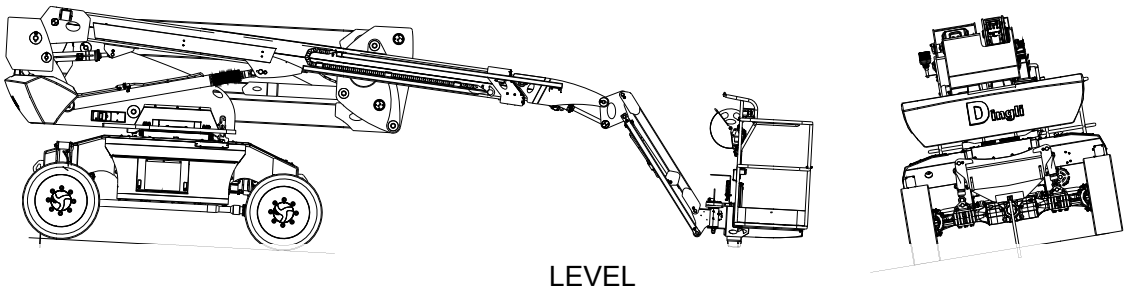
TO AVOID LOSS OF TRAVEL CONTROL OR "TIP OVER", DO NOT DRIVE MACHINE ON GRADES EXCEEDING THOSE SPECIFIED ON THE SERIAL NUMBER TAG OR AS NOTED IN THE OPERATORS MANUAL.

DO NOT DRIVE ON SIDE SLOPES WHICH EXCEED 3 DEGREES.

USE EXTREME CAUTION WHEN DRIVING IN REVERSE AND AT ALL TIMES WHEN THE PLATFORM IS ELEVATED.

TRAVEL GRADES WITH DRIVE SPEED/TORQUE SELECT SWITCH IN THE FORWARD POSITION. USE CAUTION WHEN DRIVING IN REVERSE AND WHEN DRIVING WITH PLATFORM ELEVATED, ESPECIALLY WHEN DRIVING WITH ANY PART OF MACHINE WITHIN 6 FEET (2 M) OF AN OBSTRUCTION.

BEFORE DRIVING, MAKE SURE BOOM IS POSITIONED OVER REAR DRIVE AXLE. IF BOOM IS OVER FRONT WHEELS, STEER AND DRIVE CONTROLS WILL BE REVERSED.



LEVEL

Do not drive the machine on grades and sideslopes exceeding those speicified on the technical specification.

Traveling Forward and Reverse

1) With the emergency switch on, activate footswitch. Push down the button in the front surface of Drive/Steer Controller and hold on.

2) Position Drive controller to FORWARD or REVERSE as desired.

5.4 Steering Operation

1) With the emergency switch on, activate footswitch. Push down the button in the front surface of Drive/Steer Controller and hold on.

2) Position thumb switch on Drive/Steer controller to RIGHT for steering right, or to LEFT for steering left.

5.5 Platform Operation

Platform Level Adjustment

⚠WARNING

ONLY USE THE PLATFORM LEVELING OVERRIDE FUNCTION FOR SLIGHT LEVELING OF THE PLATFORM. INCORRECT USE COULD CAUSE THE LOAD/OCCUPANTS TO SHIFT OR FALL. FAILURE TO DO SO COULD RESULT IN DEATH OR SERIOUS INJURY.

This switch is used to adjust the platform level in situations such as ascending/descending a grade.

1) Turn the Ground and Platform Console Selecting Switch to select Ground or Platform Console.
2) Activate footswitch（platform control station）or turn the Enabling Switch（ground control station）and hold on.
3) Leveling Up. Position the Platform Toggle Switch Level to Up and hold until platform is level.
4) Leveling Down. Position the Platform Level Toggle Switch Level to Down and hold until the platform is level.

Platform Rotation

1) Turn the Ground and Platform Console Selecting Switch to select Ground or Platform Console.
2) Activate footswitch（platform control station）or turn the Enabling Switch （ground control station）and hold on.
3) To rotate the platform clockwise or anticlockwise, use the Platform Rotate control switch to select the direction and hold until desired position is reached.

5.6 Turret Swinging Operation

⚠WARNING

DO NOT SWING OR RAISE BOOM ABOVE HORIZONTAL WHEN MACHINE IS OUT OF LEVEL.

DO NOT DEPEND ON TILT ALARM AS A LEVEL INDICATOR FOR THE CHASSIS.

TO AVOID SERIOUS INJURY, DO NOT OPERATE MACHINE IF ANY CONTROL LEVER OR TOGGLE SWITCH CONTROLLING PLATFORM MOVEMENT DOES NOT RETURN TO THE 'OFF' OR NEUTRAL POSITION WHEN RELEASED.

IF THE PLATFORM DOES NOT STOP WHEN A CONTROL SWITCH OR LEVER IS RELEASED, REMOVE FOOT FROM FOOTSWITCH OR USE EMERGENCY STOP SWITCH TO STOP THE MACHINE.

Swinging the turret

Platform control station

1) Turn the Ground and Platform Console Selecting Switch to select Platform Console.
2) Activated the Footswitch.
3) Move towards to right to swing the turret clockwise; move towards to left to swing the turret anticlockwise.

Ground control station

1) Turn the Ground and Platform Console Selecting Switch to select Ground Console.
2) Turn the Enabling Switch and hold on.
3) To swing turret clockwise or anticlockwise, use The Turret Swing Control Switch to select direction and hold until desired position is reached.

NOTICE

WHEN SWINGING THE BOOM MAKE SURE THERE IS AMPLE ROOM FOR THE BOOM TO CLEAR SURROUNDING WALLS, PARTS AND EQUIPMENT.

5.7 Boom Operation

Raising and Lowering the Lower and Mid Boom

1) Turn the Ground and Platform Console Selecting Switch to select Ground or Platform Console.
2) Activate footswitch（platform control station）or turn the Enabling Switch and hold on.
3) To raise or lower the Lower Boom, use Lower and Mid Boom Control Switch to select UP or DOWN movement.

Telescoping the Main Boom

Platform control station

1) Turn the Ground and Platform Console Selecting Switch to select Platform Console.
2) Activate footswitch.
3) Move Main Boom Lift/telescopic Joystick towards left and hold on to extend the main boom.
4) Move Main Boom Lift/telescopic Joystick towards right and hold on to retract the main boom.

Ground control station

1) Turn the Ground and Platform Console Selecting Switch to select Ground Console.

2) Turn the Enabling Switch and hold on.

3) Push the toggle lever left according to LEFT Arrow direction, the Main Boom extends.

4) Pull the toggle lever right according to right Arrow direction, the Main Boom retracts.

Raising and Lowering the Main (Upper) Boom

Ground control station

1) Turn the Ground and Platform Console Selecting Switch to select Ground Console.

2) Turn the Enabling Switch and hold on.

3) Push the Main Boom Up and Down Switch toggle lever up according to up Arrow direction, the Main Boom would be raised

4) Push the Main Boom Up and Down Switch toggle lever down according to down Arrow direction, the Main Boom would be got down.

Platform control station

1) Turn the Ground and Platform Console Selecting Switch to select Platform Console.

2) Activate footswitch.

3) Push Main Boom Lift/telescopic Joystick forward and hold on to raise the main boom up.

4) Pull backward to lower the main boom.

5.8 Auxiliary Pump Operation

NOTICE

THE AUXILIARY POWER ONLY IS function FOR JIB UP AND DOWN, MAIN BOOM DOWN, TELESCOPE BOOM RETRACTING, LOWER AND MID BOOM DOWN, PLATFORM LEVELING, PLATFORM ROTATING AND TURRET SWING.

WHEN USING AUXILIARY POWER, DO NOT OPERATE MORE THAN ONE FUNCTION AT A TIME.(SIMULTANEOUS operation CAN OVERLOAD THE AUXILIARY PUMP)

The main function of auxiliary power is to lower the platform in the event of primary power failure. Determine the reason for primary power failure and have the problem corrected by a certified service technician. Operate as follows:

Platform control station

1) Position Emergency Stop switch to the **ON** position.

2) Position Ground and Platform Console Selecting Switch to Platform.

3) Push up Auxiliary Power Switch and hold on.

4) Depress and keep footswitch depressed.

5) Operate appropriate control switch or lever for desired function and hold on.

6) Release **Auxiliary Power switch**, selected control switch or lever, and footswitch.

7) Position **Emergency Stop switch** to the off position.

Ground control station

1) Position Emergency Stop switch to the **ON** position.

2) Position The Ground and Platform Console Selecting Switch to Ground

3) Position Auxiliary Power Switch to the **ON** position and hold on.

4) Turn the Enabling Switch and hold on.

5) Operate appropriate control switch or lever for desired function and hold on.

6) Release **Auxiliary Power switch** and selected control switch or lever.

7) Position **Emergency Stop** switch to the off position.

It is forbidden to use auxiliary power under normal condition.

5.9 Jib Operation

Ground control station

1) Turn Ground and Platform Console Selecting Switch to select Ground Console.

2) Turn the Enabling Switch and hold on.

3) Push the Jib Boom Up & Down Controller toggle lever up according to up arrow direction, the Jib would be raised

4) Push the Jib Boom Up & Down Controller toggle lever down according to down arrow direction, the Jib would be got down.

Platform control station

1) Turn the Ground and Platform Console Selecting Switch to select Platform Console.

2) Activate footswitch.

3) Push Jib Lifting/Turret Rotating Controller joystick forward and hold on to raise the jib up.

4) Pull Jib Lifting/Turret Rotating Controller joystick backward to lower the jib.

5.10 Oscillating Axle Lockout Test

LOCKOUT SYSTEM TEST MUST BE PERFORMED QUARTERLY, ANY TIME A SYSTEM COMPONENT IS REPLACED, OR WHEN IMPROPER SYSTEM OPERATION IS SUSPECTED.

Refer to **Section 3.3**, Oscillating Axle **L**ockout Test (If Equipped) for procedure.

5.11 Shut Down and Parking

1) Drive machine to a reasonably well protected area.
2) Be sure the main boom is fully retracted and lowered.
3) Remove all load from the platform.
4) At Ground Controls, turn Ground and Platform Console Selecting Switch to OFF position. Push down the Emergency Stop Switch. Withdraw the key.
5) If necessary, cover Platform Control console to protect instruction placards, warning decals and operating controls from hostile environment.

5.12 Lifting and Tie Down

Lifting Operation

1) Refer to the Serial Number Tag, to make sure the Gross Vehicle Weight.
2) Place the boom in the stowed position.
3) Remove all loose items from the machine.
4) Properly adjust the rigging to prevent damage to the machine and so the machine remains level.

If it becomes necessary to lift the machine using an overhead or mobile crane, it is very important that the lifting devices are attached only to the designated lifting eyes. (See Figure 5-3. Lifting Diagram)

NOTICE

LIFTING EYES ARE provided AT THE FRONT AND REAR IN THE FRAME SLAB. EACH OF THE FOUR CHAINS OR SLINGS USED FOR LIFTING MACHINE MUST BE ADJUSTED INDIVIDUALLY SO MACHINE REMAINS LEVEL WHEN ELEVATED.

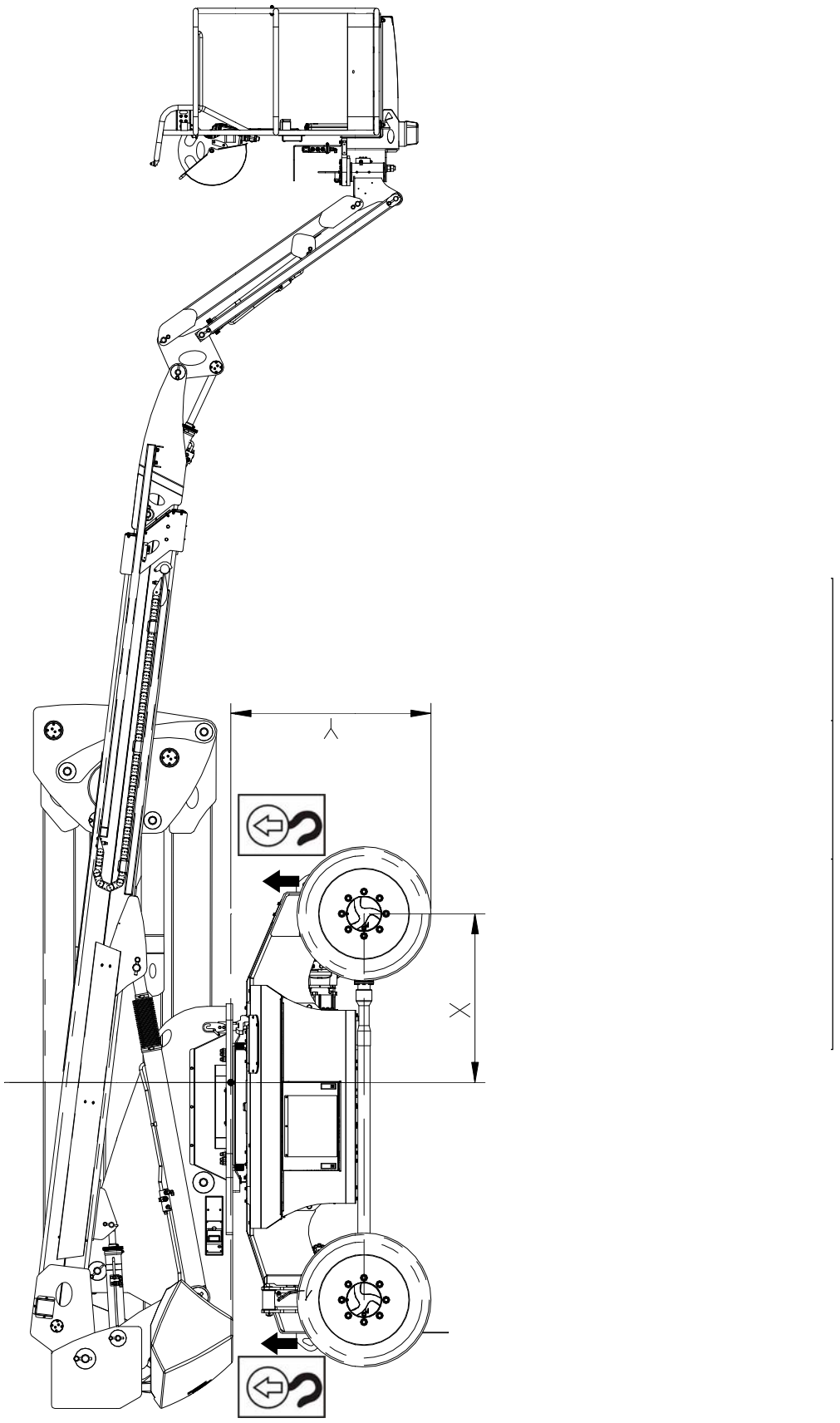


Figure 5-3 Lifting Diagram

Tie Down Operation

NOTICE

WHEN TRANSPORTING MACHINE, BOOM MUST BE IN THE STOWED MODE AND MACHINE SECURELY TIED DOWN TO TRUCK OR TRAILER DECK. FOUR TIE DOWN EYES ARE PROVIDED IN THE FRAME SLAB, ONE AT EACH CORNER OF THE MACHINE. (SEE FIGURE 5-3. AND FIGURE 5-4.)

1) Place the boom in the stowed position.
2) Remove all loose items from the machine.
3) Secure the chassis and the platform using straps or chains of adequate strength.

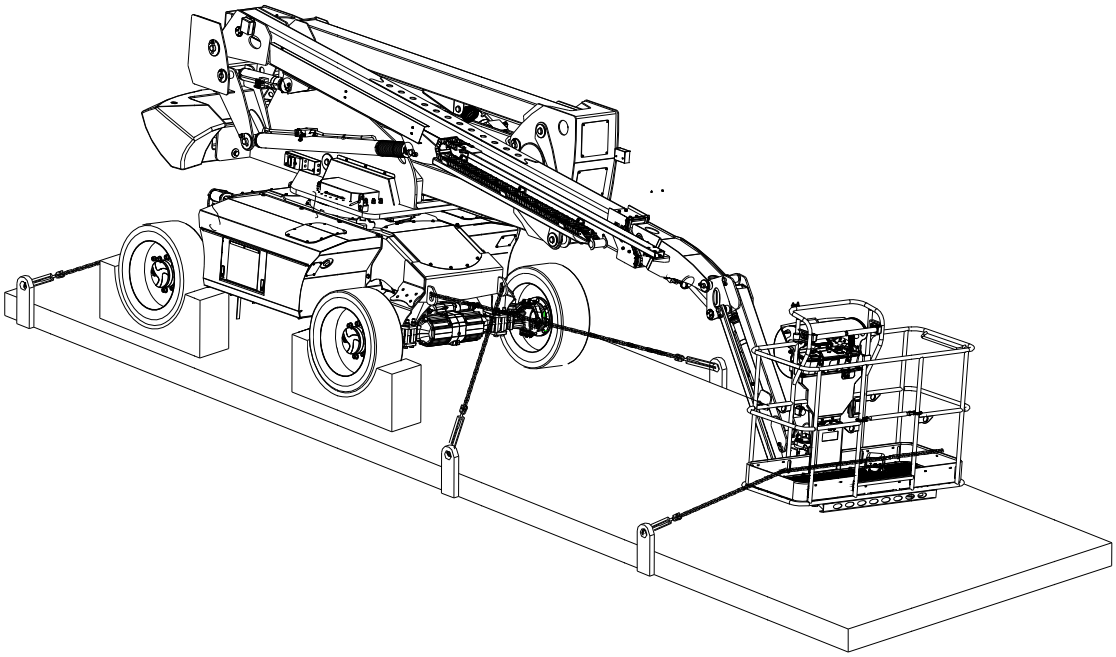


Figure 5-4 Tie Down Diagram

5.13 Towing Operation

⚠WARNING

RUNAWAY VEHICLE/MACHINE HAZARD. MACHINE HAS NO TOWING BRAKES. TOWING VEHICLE MUST BE ABLE TO CONTROL MACHINE AT ALL TIMES. ON-HIGHWAY TOWING IS NOT PERMITTED. FAILURE TO FOLLOW INSTRUCTIONS COULD CAUSE SERIOUS INJURY OR DEATH.

MAXIMUM TOWING SPEED IS 5 M.P.H. FOR NO LONGER THAN 30-45 MINUTES.

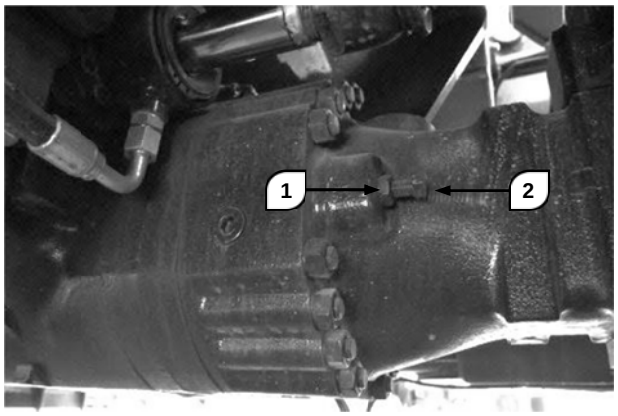
MAXIMUM TOWING GRADE 25%.

Prior to Towing

Prior to towing the machine, complete the following:

⚠ CAUTION

DO NOT TOW MACHINE WITH DRIVE HUBS OR PUMP ENGAGED.



1) Retract and lower the booms completely and remove the load.
2) Go under the vehicle near the front axle.
3) Unscrew lock nut **1** of power screw **2.**
4) Tighten the power screw to fit flush to disengage the negative command brake.
5) Repeat the operation for both screws on the same axle.
6) Connect one end of the cable to the two front eyelets on the towing vehicle, and then connect the other end of the cable to the two front eyelets of the vehicle to be towed.
7) An observer must stand in a safe position to check the outcome of the operations.
8) Tighten the tow cable slowly.

⚠ WARNING

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 WHATSEVER.

THE OBSERVER MUST NOT STAND ON THE VEHICLE TO BE TOWED.

9) Remove all rigging from the towing and towed machine and recover the axle after completing towing.

Emergency Procedures

ion

6.1 General

This section provides information on the procedures to be followed and on the systems and controls to be used in the event an emergency situation is encountered during machine operation. Prior to operation of the machine and periodically thereafter, the entire operating manual, including this section, should be reviewed by all personnel whose responsibilities include any work or contact with the machine.

6.2 Emergency Towing Procedures

Towing this machine is prohibited, unless properly equipped. However, provisions for moving the machine, in case of a malfunction or power failure, have been incorporated. The procedures to towing machine refer to chapter 5.13.

6.3 Emergency Controls and Their Locations

6.3.1 Power/Emergency Stop Switches

1) There is one of these red mushroom shaped switches at both the *Ground Controls* and *Platform Controls.* When it is depressed it will immediately stop the machine.

⚠WARNING

CHECK MACHINE DAILY TO MAKE SURE EMERGENCY STOP SWITCH GUARD IS IN PLACE AND THAT GROUND CONTROL INSTRUCTIONS ARE IN PLACE AND LEGIBLE.

2) Installed on the Console, this round red switch is pulled up for normal machine functions. In an emergency, push the button to the down position with your palm and machine will immediately stop.

6.3.2 Ground Control Station

The Ground Control Station is located on the left side of the cabin. The controls on this panel provide the means for overriding the platform controls, and for controlling the boom and swing functions from the ground. Place the Ground and Platform Console Selecting Switch to GROUND position and operate the proper switch to lift, swing, or telescope the boom, or level the platform.

6.3.3 Auxiliary Power Switch

The machine is equipped with two auxiliary power switch, located on the Ground and Platform Control Console. Only when the Controller or Pump Motor failure, these switches can be used. The Procedures to lift down the Main Boom and the Lower & Mid Boom, refers to chapter 5.8

6.3.4 Bypass Switch

The machine is equipped with two Bypass Switches, located on the Ground and Platform Control Console. Just at the moment of emergency for moving the machine or starting stowing it, the switch can be used

6.4 Emergency Operation

6.4.1 Use of Ground Controls

Know how to use the ground controls in an emergency situation.

Ground personnel must be thoroughly familiar with the machine operating characteristics and the ground control functions. Training should include operation of the machine, review and understanding of this section and hands-on operation of the controls in simulated emergencies.

6.4.2 Operator Unable to Control Machine

If the Platform Operator Is Pined, Trapped or Unable to Operate or Control the Machine

1) Operate the machine from ground controls ONLY with the assistance of other personnel and equipment (cranes, overhead hoists, etc.) as may be required to safely remove the danger or emergency condition.
2) Other qualified personnel on the platform should not continue operation, and then the assistant on the ground descent the booms slowly.
3) Cranes, forklift trucks or other equipment which may be available are to be used to remove platform occupants and stabilize motion of the machine in case machine controls are inadequate or malfunction when used.

6.4.3 Platform or Boom Caught Overhead

If the platform or boom becomes jammed or snagged in overhead structures or equipment, do not continue operation of the machine from either the platform or the ground until the operator and all personnel are safely moved to a secure location. Only then should an attempt be made to free the platform using any necessary equipment and personnel. Do not operate controls to cause one or more wheels to leave the ground.

6.4.4 Post Incident Inspection and Repair

Following any incident, thoroughly inspect the machine and test all functions first from the ground controls, then from the platform controls. Do not lift above 3 m (10 feet) until you are sure that all damage has been repaired, if required, and that all controls are operating correctly.

6.4.5 Emergency Stowing

Ground control station

If it is needed to activate the system at ground console, press the bypass button down and hold on, when the emergency stop switch on the platform console is pressed, and then activate enable switch and corresponding functional switch.

Platform control station

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

It is sure that the persons in the platform and around the machine are safe, when the bypass switch is being used.

Arbitrary usage of the switch will result in damage and serious injury.

6.5 Incident Notification

It is imperative that Dingli Machinery Co.,Ltd. be notified immediately of any incident involving a Dingli product. Even if no injury or property damage is evident, the factory should be contacted by telephone, fax or email and provided with all necessary details.

It should be noted that failure to notify the manufacturer of an incident involving a Dingli product within 48 hours of such an occurrence may void any warranty consideration on that particular machine.

In China Mainland:

Phone: +86 572 8681766 (8 Am till 4:30PM)

Fax: +86 572 8681700

Email: sales@cndingli.com

Outside China Mainland:

Phone: +86 572 8681688

Fax: +86 572 8681690

Email: export@cndingli.com

General Maintenance

ion

7.1 General

This section of the manual provides additional necessary information to the operator for proper operation and maintenance of this machine. The maintenance portion of this section is intended as information to assist the machine operator to perform daily maintenance tasks only, and does not replace the more thorough Preventive Maintenance and Inspection Schedule.

7.2 Lubrication Specification

Table 7-1 Lubrication Specifications

KEY	SPECIFICATIONS
MPG	Multipurpose Grease having a minimum dripping point of 350° F (177° C). Excellent water resistance and adhesive qualities, and being of extreme pressure type. (Timken OK 40 pounds minimum.)
EPGL	Extreme Pressure Gear Lube (oil) meeting API service classification GL-5 or MIL-Spec MIL-L-2105
HO	Hydraulic Oil. API service classification GL-3, e.g. Mobil fluid 424.
OGL	Open Gear Lubricant - Mobiltac 375 or equivalent.

NOTE: It is recommended as a good practice to replace all filters at the same time.

7.3 Lubrication Diagram

Refer to the configure for normally lubrication point and Item

NOTICE

LUBRICATION INTERVALS ARE BASED ON MACHINE OPERATION UNDER NORMAL CONDITIONS. FOR MACHINES USED IN MULTI-SHIFT OPERATIONS AND/OR EXPOSED TO HOSTILE ENVIRONMENTS OR CONDITIONS, LUBRICATION FREQUENCIES MUST BE INCREASED ACCORDINGLY.

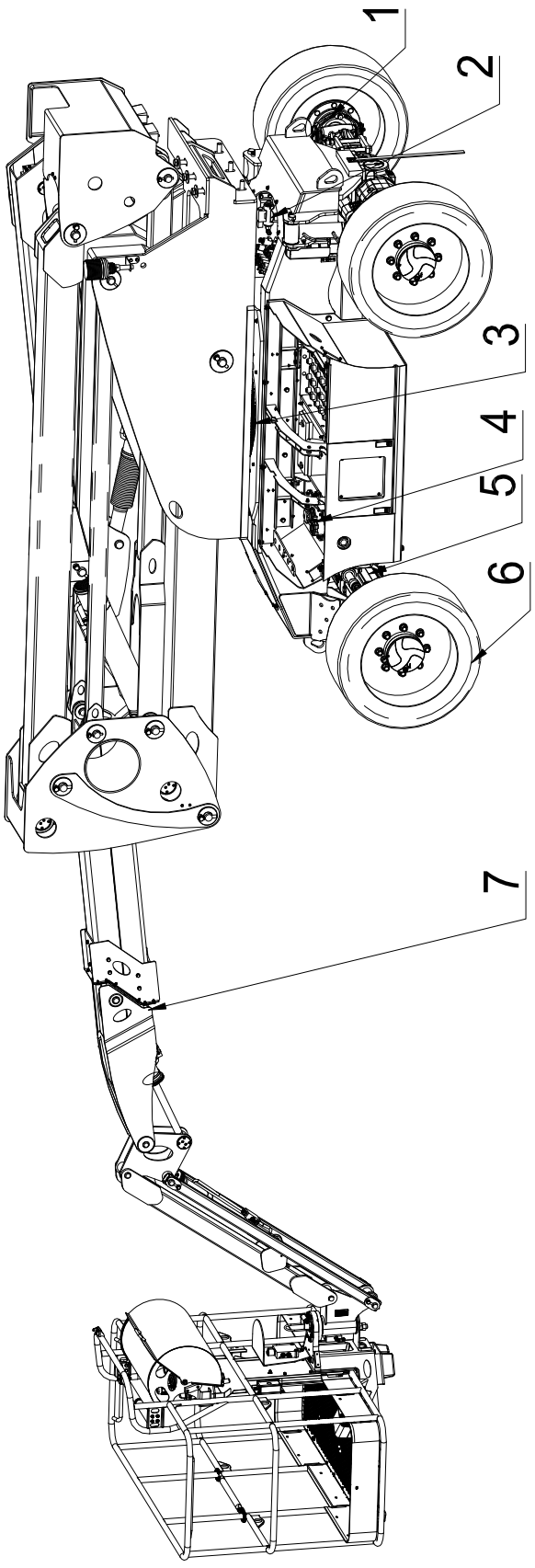


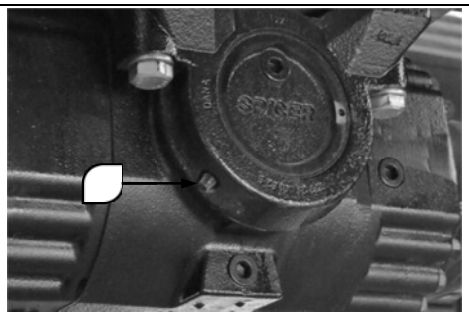
Figure 7-1 Operator Maintenance and Lubrication Diagram

7.4 Operator Maintenance

Before maintaining the machine, the workers must wear the personnel protective equipment such as gloves, safety shoes, safety cap and so on.

7.4.1 Axles

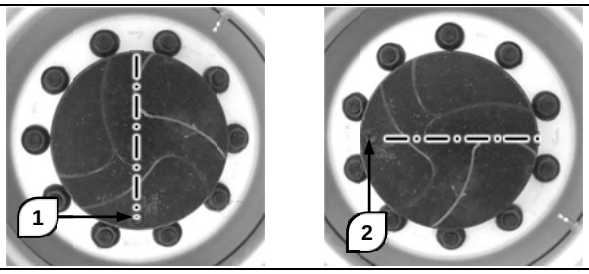
7.4.1.1 Lubrication of oscillation bushes



1) Set the vehicle in the parking position. Make sure no one approaches the work area.
2) Stand near the front axle oscillation bushes. Inject grease in the grease nipples present on both sides of the axle (front and rear).

Interval: Every 50 hours of operation or every 2 weeks

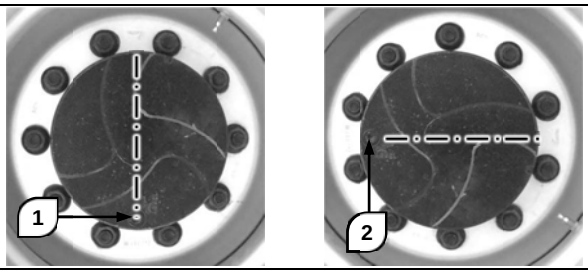
7.4.1.2 Wheel reduction gears oil - Check



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.

Interval: Every 250 hours of operation or every 3 months

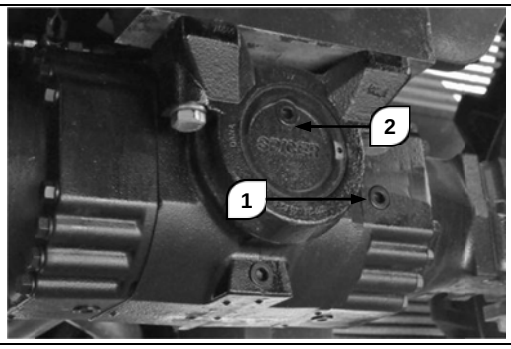
7.4.1.3 Wheel reduction gears oil - Change



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.

Interval: Every 1000 hours of operation or every year

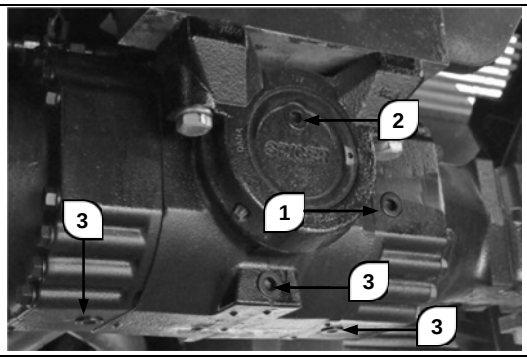
7.4.1.4 Differentials oil - Check



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.

Interval: Every 250 hours of operation or every 3 months

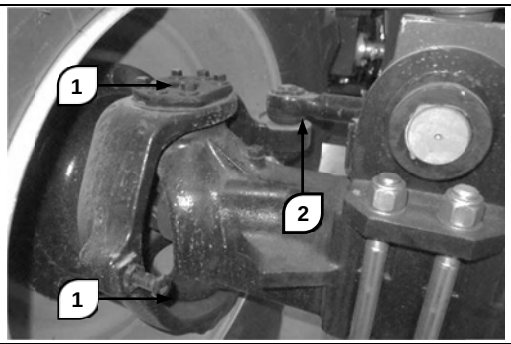
7.4.1.5 Differentials oil - Change



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

Interval: Every 1000 hours of operation or every year

7.4.1.6 Steering elements - Lubrication



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

Interval: Every 250 hours of operation or every 3 months

7.4.2 Rotation slewing ring gear and rotation reduction gear - lubrication

It is very important lubrication of rotation slewing ring gear and rotation reduction gear for maintaining super performance and prolonging life of vehicle. Operation in condition of lack of lubrication can damage the components.

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

Interval: First 50 hours of operation or every 2 weeks, and then every 250 hours of operation or every 3 months

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

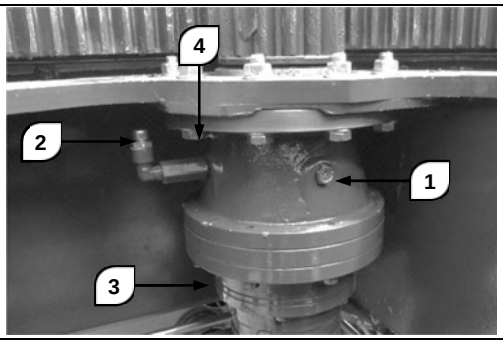
Grease for standard application		
GREASE BRAND	FOR RACEWAY	FOR GEAR TEETH
Shell	GADUS S2 v220 2 EP2	MALLEUS OGH
Mobil	MOBILUX EP2	MOBILTAC 81
Castrol	SPHEEROL EPL2	MOLLUB-ALLOY 970/2500-1
TOTAL	MULTIS EP2	CERAN AD PLUS
FUCHS	LAGERMEISTER EP2	CEPLATTYN KG 10 HMF

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

⚠ WARNING

CRUSHING HAZARDS. KEEP HANDS AWAY FROM CYLINDER AND ALL MOVING PARTS WHEN LOWERING THE SECONDARY BOOM.

7.4.2.2 Rotation reduction gear oil-check

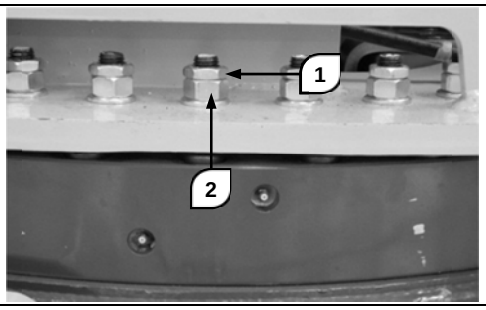


1) Retract and lift the telescopic boom completely. Rotate the turret for better access to the reduction gear.
2) Check the hydraulic fluid level through the inspection window 1. The level is correct when it overflows.
3) If necessary, top up with oil of the right strength up to the filler hole 2.

Interval: every 250 hours of operation or every 3 months

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.

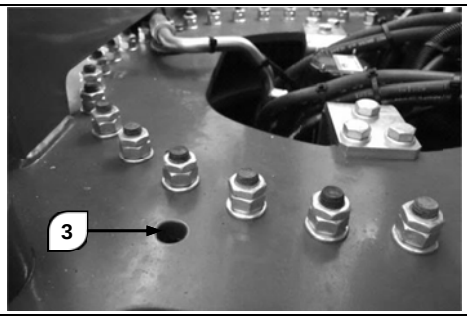
7.4.2.3 Checking the tightening of the rotation slewing ring gear bolts



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 nuts1. 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.

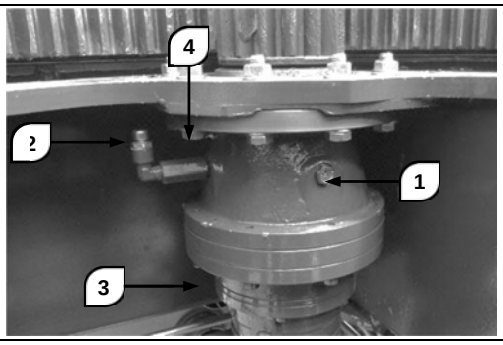


To check the fixing screws of the slewing ring gear on the chassis, align hole **3** with the screw underneath by rotating the turret.

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

Interval: Every 500 hours of operation or every 6 months

7.4.2.4 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.
3) Add oil through the filler hole 2 up to the prescribed level visible through the filler hole 1.

4) Lubricate the reduction gear shaft bushes by injecting grease into grease nipple 4.

Interval: Every 1000 hours of operation or every year.

7.4.2.5 Check the slewing ring gear bearings for wear

Periodic inspection of turntable bearing wear is essential to safe machine operation, good machine performance and service life. Continued use of a worn turntable bearing could create an unsafe operating condition, resulting in death or serious injury and component damage.

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) Position the machine on a firm, level surface and the boom in the stowed position.

2) Grease the turntable bearing. See 7.4.2.1 Rotation slewing ring gear - lubrication

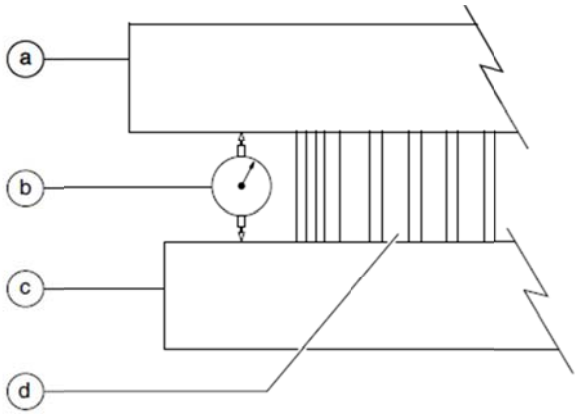
3) Torque the turntable bearing bolts to specification. See 7.4.2.3 Checking the tightening of the rotation slewing ring gear bolts

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.

NOTICE

TO OBTAIN AN ACCURATE MEASUREMENT, PLACE THE DIAL INDICATOR NO MORE THAN 1 INCH/2.5CM FROM THE TURNTABLE ROTATION 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. More 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.

Interval: every 1000 hours of operation or every year.

7.4.3 Checking and replacement of hydraulic fluid.

Replacement and checking of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine poorly and continued use may cause components damage. Extremely dirty conditions may require oil changes to be performed more often. If the temperature difference between winter and summer is too large, the hydraulic oil chosen would be different, referring to local hydraulic oil supplier for more information.

NOTICE

THE CORRECT HYDRAULIC OIL SHOULD BE CHOSEN APPLYING TO LACAL ENVIRONMENT. IF NECESSARY, ASK LOCAL SUPPLIER FOR MORE NIFORMATION.

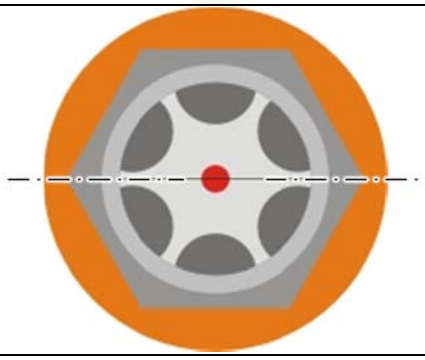
7.4.3.1 Checking the oil level of the hydraulic system

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

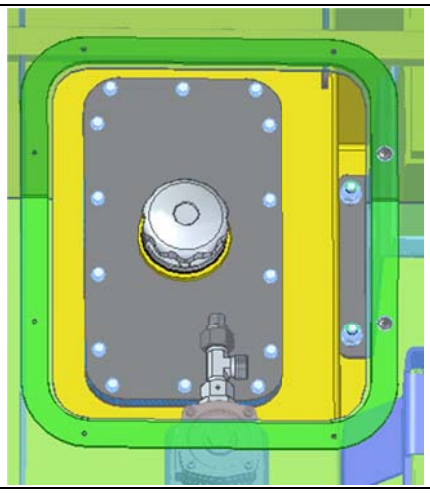
1) Make sure the boom is in the retracted position.

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 center line of the level indicator present on the tanks. The center line of the level indicator as follows.



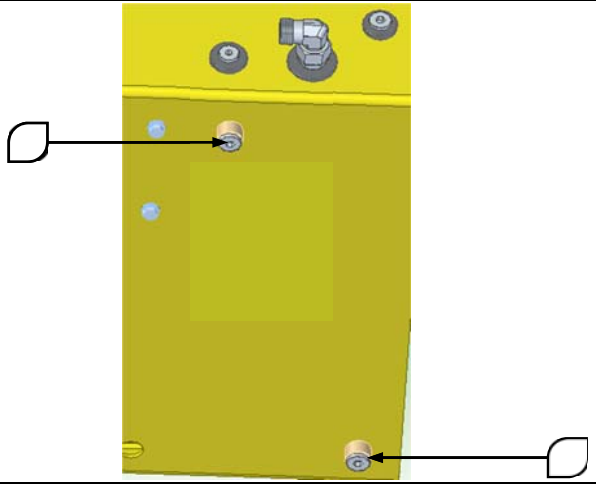
Add oil if necessary. Do not exceed the correct level. Refit the cap and tighten it.



NOTICE

THE HYDRAULIC OIL SHOULD BE APPLIED TO THE LOCAL ENVIRONMENT AND MUST BE FILTERED WITH ACCURACY OF 20UM, BEFORE BEING ADDED IN THE HYDRAULIC TANK.

7.4.3.2 Hydraulic oil - Replacement



1) Go under the vehicle to access the tanks drainage caps.

2) Place a suitable sized container under the drainage cap.

3) Unscrew the cap and drain out the oil. To speed up the operation, also unscrew the filler cap.

4) Clean the hydraulic tank completely.

5) Change the Suction port filter net (refer Replace the Suction Filter)

6) Change the Return filter element (refer to Replace the Return filter element)

7) Change the PLFA filter element (refer to Replace the PLFA filter element)

8) Install the plug on the drain port.

9) Fill the tank with hydraulic oil use a 20um filter until the level is correct. Not overfill.

NOTICE

THE HYDRAULIC OIL SHOULD BE APPLIED TO THE LOCAL ENVIRONMENT.

10) Disconnect the Port SD on the Main manifold, block it using a M18*1.5 Plug, and take a suitable container under the port of the hose.

11) Make sure the emergency stop switches on and put the toggle switch forward in the Ground Control Station to raise the main upper boom, take the hose and lead the oil from the cylinder rod chamber into the container.

12) Stop to reconnect the hose to the SD port.

13) Disconnect the Port PU on the Main manifold, block it using a M18*1.5 Plug, and take a suitable container under the port of the hose.

14) Put the toggle switch up in the Ground Control Station, to raise the Lower and Mid Boom, take the hose and let the oil from the cylinder rod chamber into the container.

15) Stop to reconnect the hose to the PU port.

16) Disconnect the Port PR on the Main manifold, block the port using a M18*1.5 Plug, and take a suitable container under the port of the hose.

17) Put the toggle switch forward in the Ground Control Station, to extend the main upper telescopic boom, take the hose to lead the oil from the cylinder rod chamber into the container.

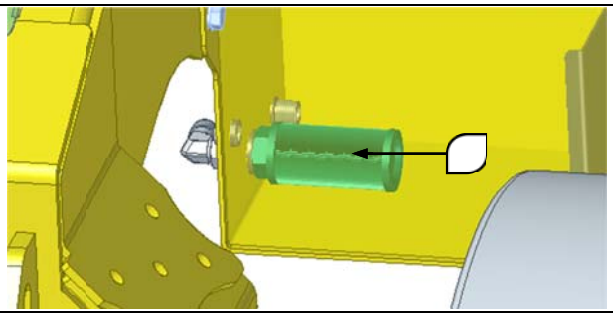
18) Stop to reconnect the hose to the PR port.

Interval: Firstly, 50 hours, and then 300 hours, 500 hours, 1000 hours or one year in proper order, at last no more than 2000 hours or 2 years. However, extremely dirty conditions may require oil changes to be performed more often. If the temperature difference between winter and summer is too large, the hydraulic oil chosen would be different. And the filters should be replaced when the oil is replaced.

7.4.4 Hydraulic fluid filter-replacement

Replacement of the hydraulic filters is essential for good machine performance and service life. A dirty or clogged filter may cause the machine to perform poorly and continued using may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

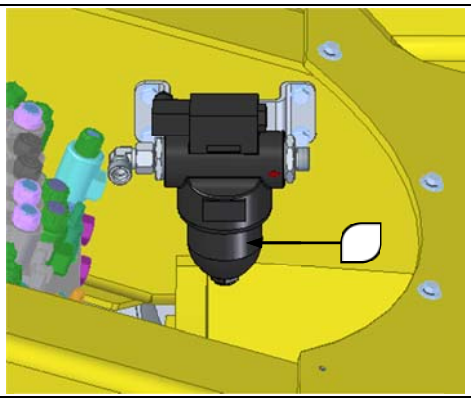
7.4.4.1 Replace the Suction Filter



1) Clean the area around the cover of the hydraulic oil reservoir.
2) Use a wrench to loose and remove the 14 bolts from the hydraulic oil reservoir cover, move the cover away from the reservoir, then turn the filter element from the adaptor.
3) Take a new filter element to screw it onto the filter adaptor.
4) Install the cover to hydraulic oil reservoir, and screw down 14 bolts.

Interval: Firstly, 50 hours, and then 300 hours, 500 hours, 1000 hours or one year in proper order, at last no more than 2000 hours or 2 years.

7.4.4.2 Replace the PLFA filter element



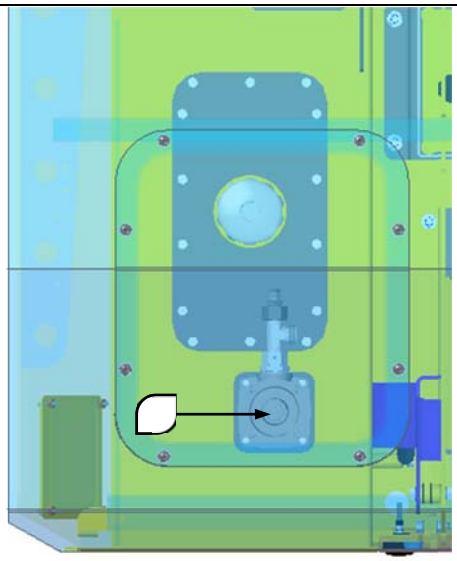
1) Clean the area around the oil filter, and then remove the cap components.
2) Pull out the filter element from the filter assembly chamber.
3) Install the new filter element to the filter assembly chamber.
4) Refit the cap components and tighten it. Clean up any oil that may have spilled during the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

Interval: Firstly, 50 hours, and then 300 hours, 500 hours, 1000 hours or one year in proper order, at last no more than 2000 hours or 2 years.

7.4.4.3 Replace the Return Filter

1) Clean the area around the oil filter, and then remove the cap.
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 and tighten it. Clean up any oil that may have spilled during the replacement procedure.

Interval: Firstly, 50 hours, and then 300 hours, 500 hours, 1000 hours or one year in proper order, at last no more than 2000 hours or 2 years.



7.4.5 Battery Maintenance

⚠WARNING

LEAD ACID BATTERIES PRODUCE FLAMMABLE AND EXPLOSIVE TO AVOID INJURY FROM AN EXPLOSION, DO NOT SMOKE OR ALLOW SPARKS OR A FLAME NEAR BATTERY DURING SERVICING. ALWAYS WEAR EYE PROTECTION WHEN SERVICING BATTERIES.

1) The battery is maintenance free except for occasional battery terminal cleaning, as noted in the following.
2) Remove battery cables from each battery post one at a time, negative first. Clean cables with acid neutralizing solution (e.g. baking soda and water or ammonia) and wire brush. Replace cables and/or cable clamp bolts as required.
3) Clean battery post with wire brush then re-connect cable to post. Coats non-contact surfaces with mineral grease or petroleum jelly (Vaseline).
4) When all cables and terminal posts have been cleaned, ensure all cables are properly positioned and are not pinched. Close battery compartment cover.

⚠ CAUTION

NEVER WORK ON THE ELECTRICAL SYSTEM OF ANY EQUIPMENT UNLESS YOU ARE THOROUGHLY FAMILIAR WITH SYSTEM DETAIL.

NEVER CHECK THE BATTERY BY PLACING A METAL OBJECT ACROSS THE POSTS. SEROUS BURNS OR AN EXPLOSION CAN RESULT.

NEVER CHARGE A FROZEN BATTERY; IT CAN EXPLODE.

LEAD ACID BATTERIES CONTAIN SULFURIC ACID WHICH WILL DAMAGE EYES OR SKIN ON CONTACT. WHEN WORKING AROUND BATTERIES ALWAYS WEAR A FACE SHIELD TO AVOID ACID IN EYES. IF ACID CONTACTS EYES, FLUSH IMMEDIATELY EITHER CLEAR WATER AND GET MEDICAL ATTENTION. WEAR RUBBER GLOVES AND PROTECTIVE CLOTHING TO KEEP ACID OFF SKIN. IF ACID CONTACTS SKIN, WASH OFF IMMEDIATELY WITH CLEAN WATER.

DISCONNECT THE BATTERY BEFORE WORKING ON THE ELECTRICAL SYSTEM. REMOVE THE GROUND TERMINAL FIRST. WHEN RECONNECTING THE BATTERY, RECONNECT THE GROUND TERMINAL LAST.

7.4.6 Tires & Wheels Maintenance

Tire Damage

For polyurethane foam filled tires, Dingli recommends that when any of the following are discovered, measures must be taken to remove the machine from service immediately and arrangements must be made for replacement of the tire or tire assembly.

- A smooth, even cut through the cord plies which exceeds 3 inches (7.5 cm) in total length.
- Any tears or rips (ragged edges) in the cord plies which exceeds 1 inch (2.5 cm) in any direction.
- Any punctures which exceed 1 inch in diameter.
- Any damage to the bead area cords of the tire

If a tire is damaged but is within the above noted criteria, the tire must be inspected on a daily basis to insure the damage has not propagated beyond the allowable criteria.

Tire Replacement

Dingli recommends a replacement tire be the same size, ply and brand as originally installed on the machine. Please refer to the Parts Manual for the part number of the approved tires for a particular machine model. If not using an approved replacement tire, we recommend that replacement tires have the following characteristics:

- Equal or greater ply/load rating and size of original
- Tire tread contact width equal or greater than original

- Wheel diameter, width, and offset dimensions equal to the original
- Approved for the application by the tire manufacturer (including inflation pressure and maximum tire load), unless specifically approved by the manufacture. Do not replace foam filled or ballast filled tire assembly with a pneumatic tire. When selecting and installing a replacement tire, ensure that all tires are inflated to the pressure recommended. Due to size variations between tire brands, both tires on the same axle should be the same.

- **Wheel Replacement**

- The rims installed on each product model have been designed for stability requirements which consist of track width, tire pressure, and load capacity. Size changes such as rim width, center piece location, larger or smaller diameter, etc., without written factory recommendations, may result in an unsafe condition regarding stability.

Wheel Installation

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

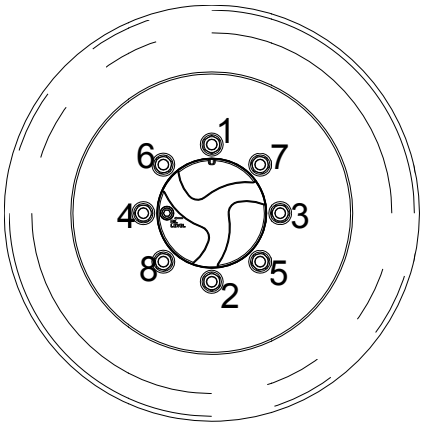
⚠WARNING

WHEEL NUTS MUST BE INSTALLED AND MAINTAINED AT TORQUE TO PREVENT LOOSE WHEELS, BROKEN STUDS, POSSIBLE DANGEROUS SEPARATION OF WHEEL FROM THE AXLE. TO USE ONLY THE NUTS MATCHED TO THE CONE ANGLE WHEEL.

Tighten the lug nuts to the proper torque to prevent coming loose. 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) Start all nuts by hand to prevent cross threading. NOT use a lubricant on threads or nuts.

2) Tighten nuts in the following sequence:



3) The tightening of the nuts should be done in stages. Following the recommended sequence tighten nuts per wheel torque chart.

TORQUE SEQUENCE		
1st Stage	2nd Stage	3rd Stage
95 ft. lbs. (130 N·m)	235 ft. lbs. (320 N·m)	330 ft. lbs. (450 N·m)

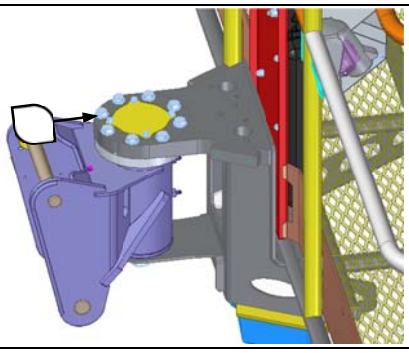
4) Wheel nuts should be torque after first 50 hours of operation and after each wheel removal. Check torque every 3 months or 150 hours of operation.

7.4.7 Overload Sensor - checking and calibration

7.4.7.1 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.

7.4.7.1.1 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.

7.4.7.1.2 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.

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 230kg at the moment of 230kg 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 255kg. Otherwise, stop to ask for repairing.

The accuracy of weighting is ±10%. If the data exceeds it, stop to calibrate it, referring to chapter 7.4.7.2.

7.4.7.2 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.

Termly 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.

7.4.8 Telescopic boom sliding blocks

7.4.8.1 Telescopic boom sliding blocks - checking

1) Park the vehicle in a suitable sized area, and rest the stabilisers on the ground. Remove the accessory from the quick-fit coupling.

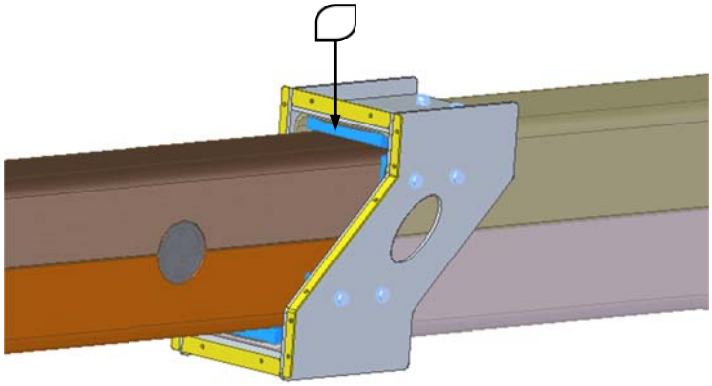
2) Centre the turret and lower the booms.

3) Set the telescopic boom in the horizontal position on the ground console.

4) Extend the telescopic boom on ground console.

5) Check that if is smooth the movement and is there some grease or scratch on the surface of the boom.

7.4.8.2 Telescopic boom sliding blocks – lubrication

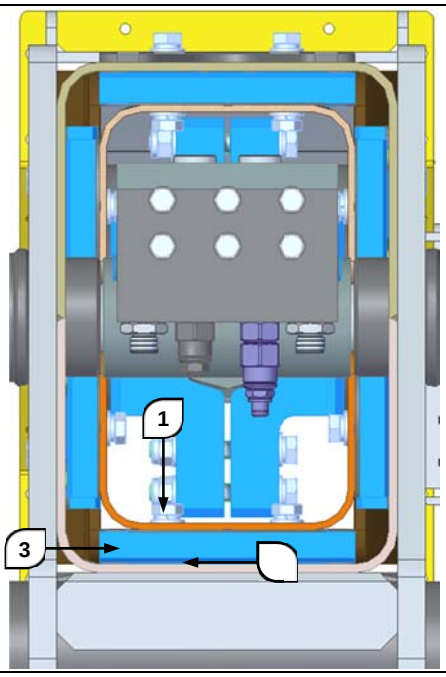


1) Park the vehicle in a suitable sized area. Remove the accessory from the quick-fit coupling. Centre the turret and set the telescopic boom in the horizontal position. Retract the telescopic boom completely.
2) Remove the cover on the rear part of the boom, and clean the sliding surface.
3) Brush the grease to the sliding surface of the boom.
4) Repeat retracting and extending some times, and then take off redundant grease.
5) Refit the cover to the rear part of the boom.

Interval: Every 50 hours of operation or every 2 weeks.

7.4.8.3 Telescopic boom sliding blocks - Adjusting the play

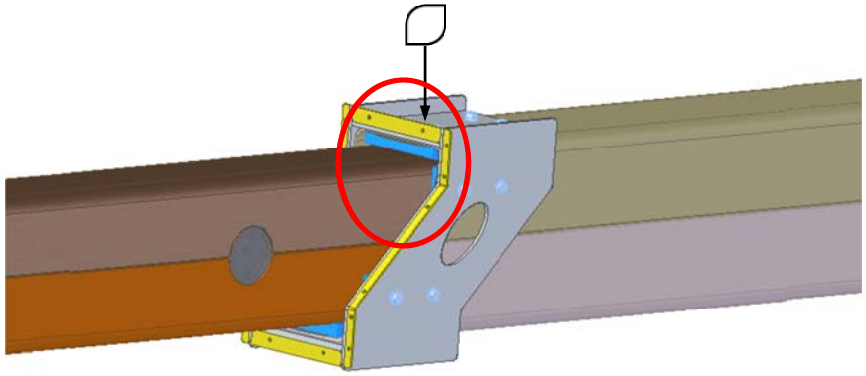
1) Park the vehicle in a suitable sized area, Remove the accessory from the quick-fit coupling. Centre the turret and set the telescopic boom in the horizontal position. Retract the telescopic boom completely.
2) Remove the cover on the front part of the boom.



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**.

   The torque of bolts: 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 bolts of the upper and lower sliding blocks. 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.

   The torque of bolts: 100 Nm

7) Repeat the adjustment operations for the lateral sliding blocks.

8) Always try to adjust the sliding blocks symmetrically, so that it is centered with respect to the adjacent ones.

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.

Interval: Every 1000 hours of operation or every year

Schematics

Section 8

8.1 General

This section contains schematics to be used for locating and correcting most of the operating problems which may develop.

8.2 Troubleshooting

It should be noted that there is no substitute for a thorough knowledge of the equipment and related systems.

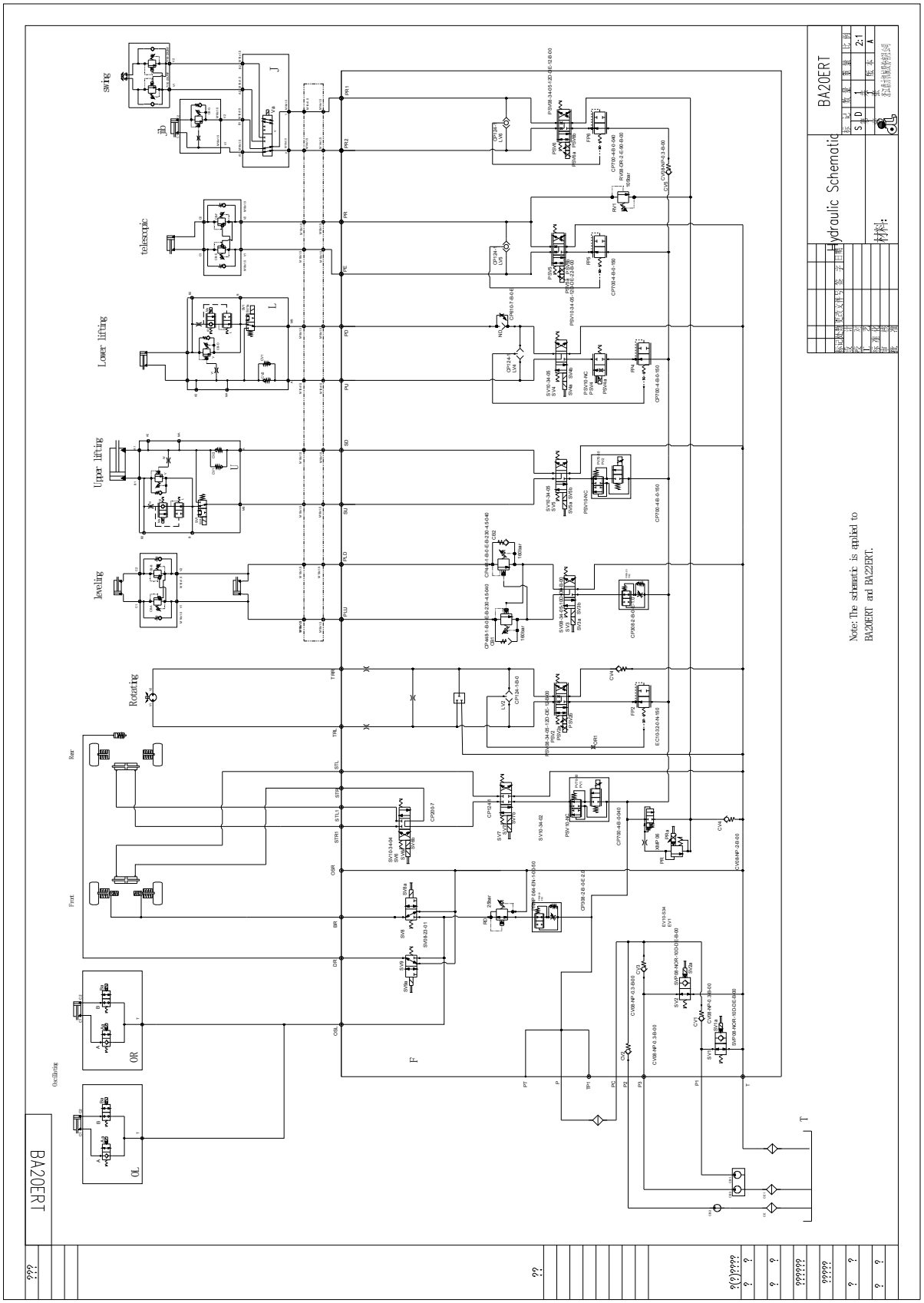
It should be recognized that the majority of the problems arising in the machine will be centered in the hydraulic and electrical systems.

The first rule for troubleshooting any circuit that is hydraulically operated and electrically controlled is to determine if the circuit is lacking hydraulic oil and electrical control power. This can be ascertained by overriding the bypass valve (mechanically or electrically) so that oil is available to the function valve, then overriding the function valve mechanically. If the function performs satisfactorily, the problem exists with the control circuit.

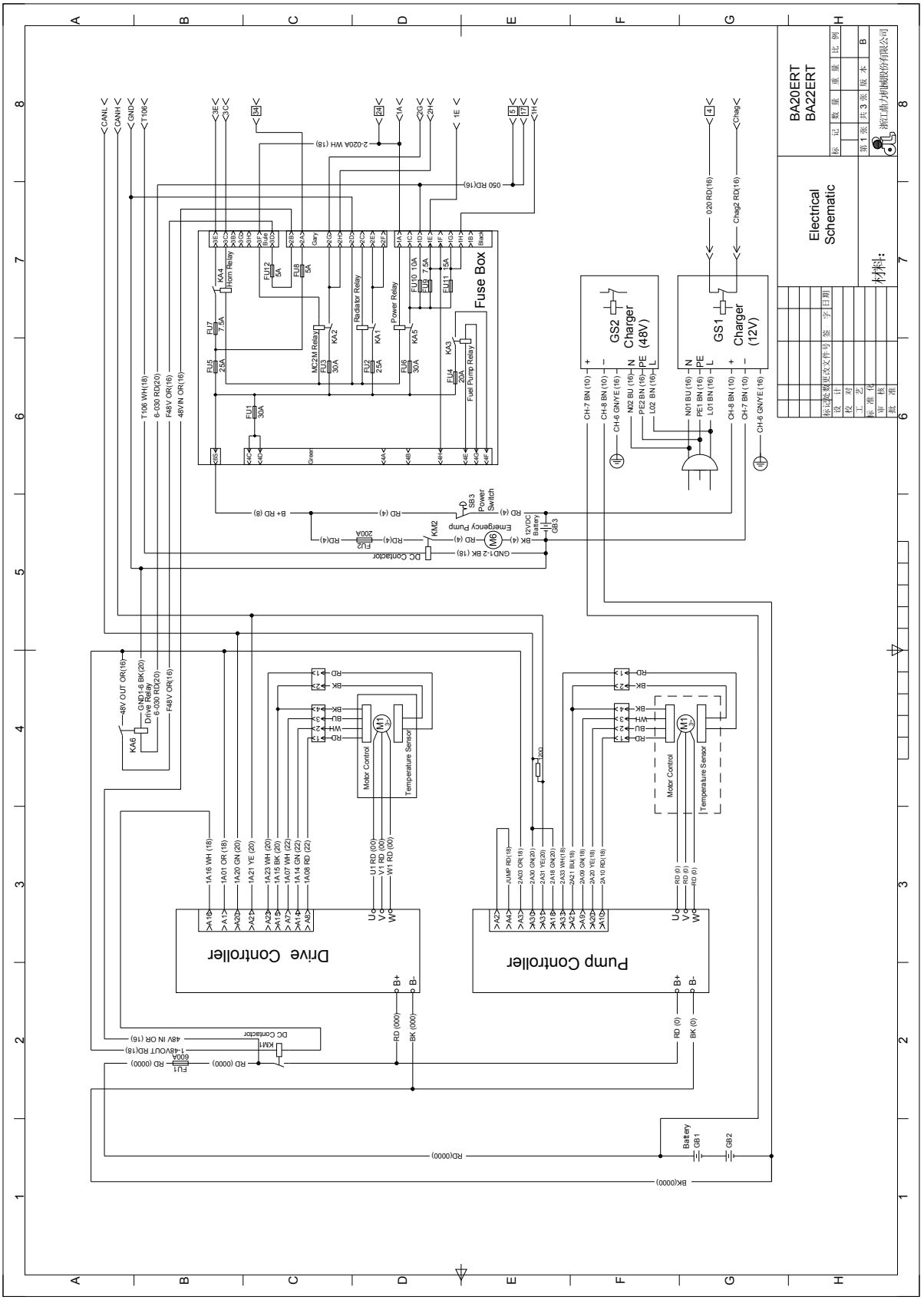
8.3 Hydraulic Circuit Checks

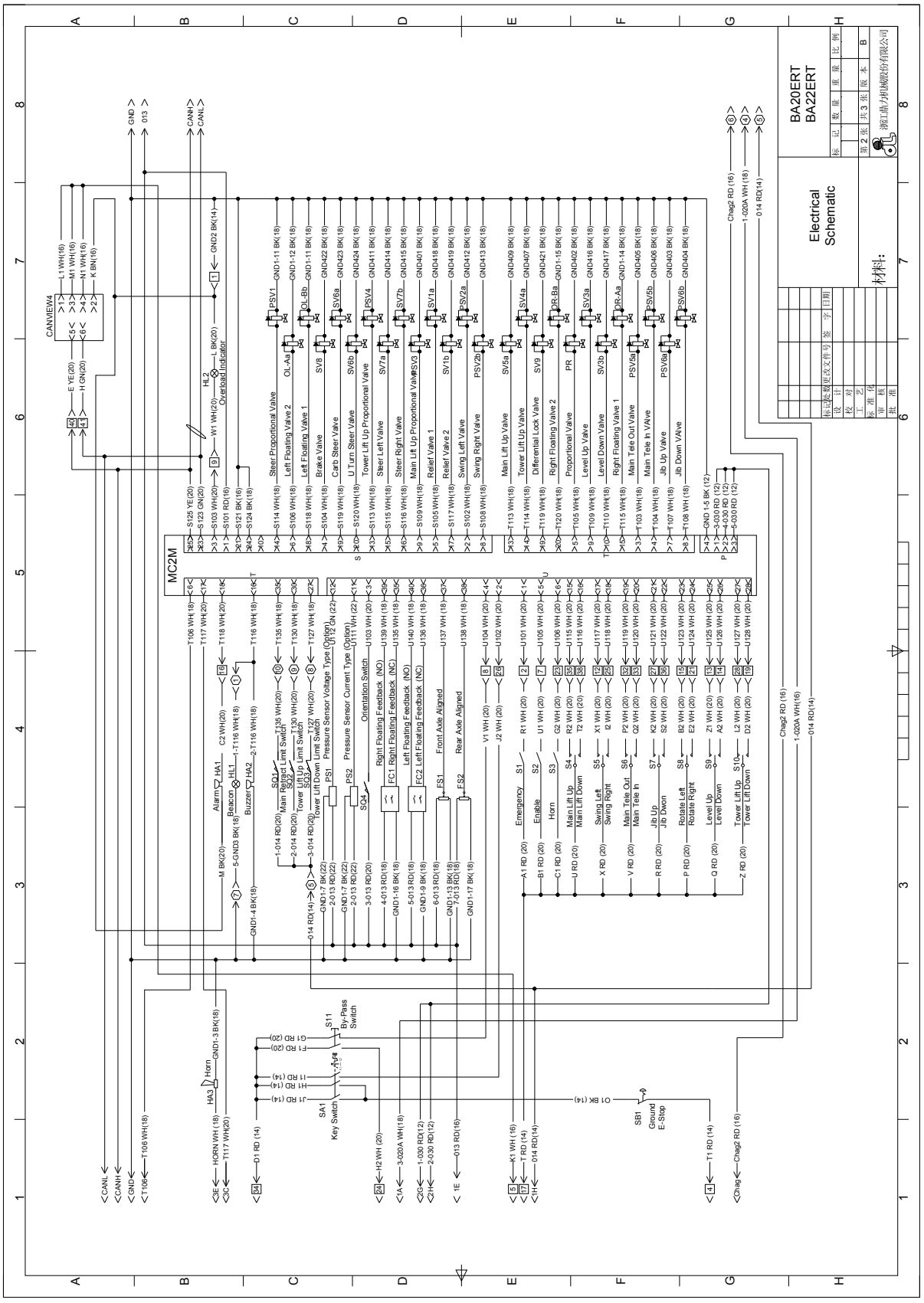
The best place to begin the problem analysis is at the power source (pump). Once it is determined that the pump is serviceable, then a systematic check of the circuit components, beginning with the control, would follow. For aid in troubleshooting, refer to the **followed hydraulic schematics and Electric schematics.**

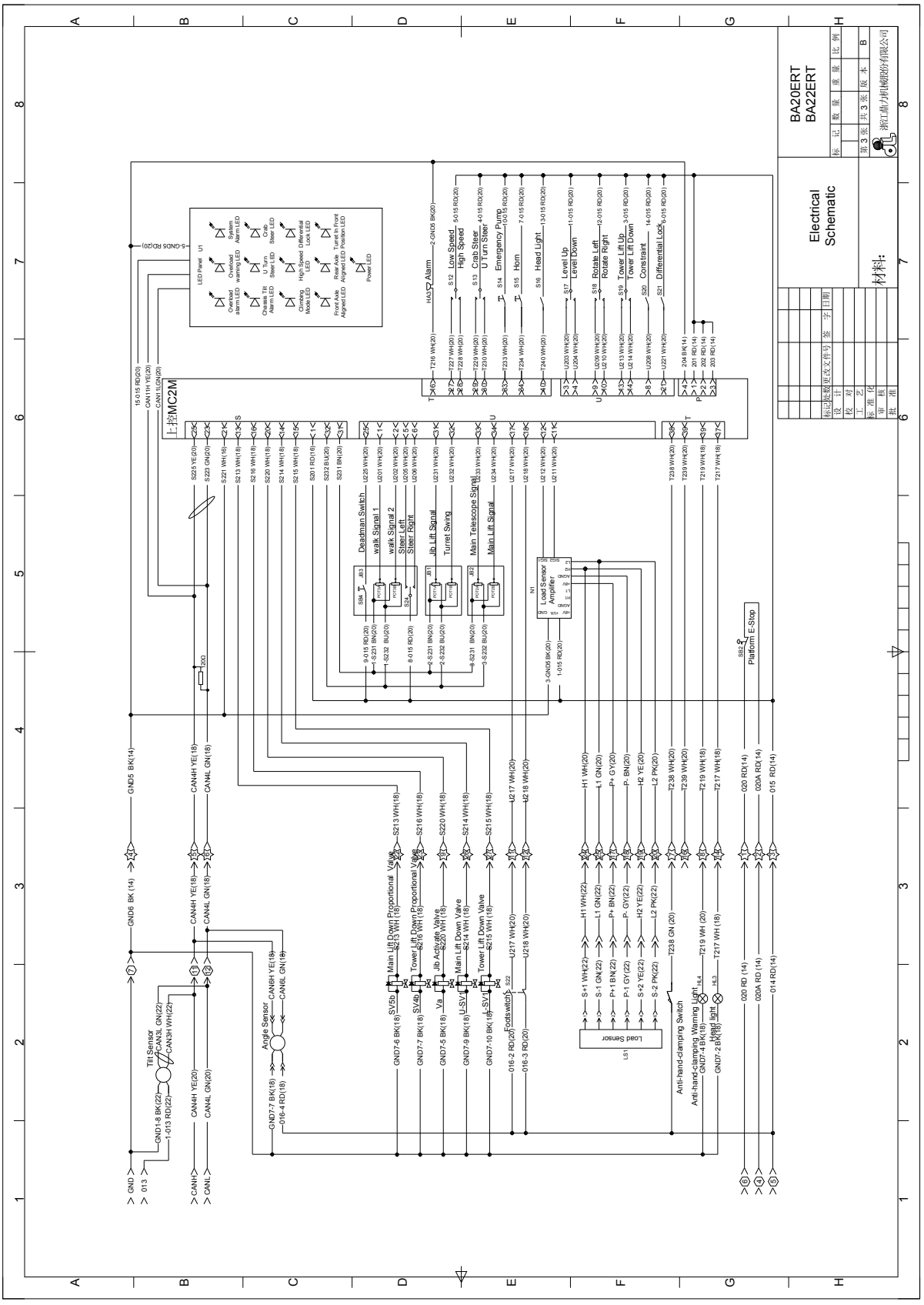
8.3.1 Hydraulic Schematics



8.3.2 Electric Schematics




MC2M
CANVIEW4
Electrical Schematic
BA20ERT
BA22ERT
浙江鼎力机械股份有限公司
Steer Proportional Valve
Left Floating Valve 2
Left Floating Valve 1
Brake Valve
Carb Steer Valve
U Turn Steer Valve
Tower Lift Up Proportional Valve
Steer Left Valve
Steer Right Valve
Main Lift Up Proportional Valve
Relief Valve 1
Relief Valve 2
Swing Left Valve
Swing Right Valve
Main Lift Up Valve
Tower Lift Up Valve
Differential Lock Valve
Right Floating Valve 2
Proportional Valve
Level Up Valve
Level Down Valve
Right Floating Valve 1
Main Tele Out Valve
Main Tele In Valve
Jib Up Valve
Jib Down Valve
Overload Indicator
Alarm
Beacon
Buzzer
Main Retract Limit Switch
Tower Lift Up Limit Switch
Tower Lift Down Limit Switch
Pressure Sensor Voltage Type (Option)
Pressure Sensor Current Type (Option)
Orientation Switch
Right Floating Feedback (NO)
Right Floating Feedback (NC)
Left Floating Feedback (NO)
Left Floating Feedback (NC)
Front Axle Aligned
Rear Axle Aligned
Emergency
Enable
Horn
Main Lift Up
Main Lift Down
Swing Left
Swing Right
Main Tele Out
Main Tele In
Jib Up
Jib Down
Rotate Left
Rotate Right
Level Up
Level Down
Tower Lift Up
Tower Lift Down
By-Pass Switch
Key Switch
Ground
E-Stop
Horn
CANL
CANH
GND
T106 WH(18)
HORN WH(18)
T117 WH(20)
D1 RD (14)
3-020A WH(18)
1-030 RD(12)
2-030 RD(12)
1E
013 RD(16)
K1 WH (16)
T RD (14)
014 RD(14)
T1 RD (14)
Chag
Chag2 RD (16)
1-020A WH(16)
014 RD(14)
O1 BK (14)
H2 WH (20)
GND1-3 BK(18)
GND1-4 BK(18)
GND1-7 BK(22)
GND1-17 BK(18)
GND1-9 BK(18)
GND1-13 BK(18)
GND1-16 BK(18)
GND1-11 BK(18)
GND1-12 BK(18)
GND1-15 BK(18)
GND1-14 BK(18)
GND1-5 BK (12)
GND2 BK(14)
GND
013
CANH
CANL
Chag2 RD (16)
1-020A WH (18)
014 RD(14)


BA20ERT
BA22ERT
Electrical Schematic
浙江鼎力机械股份有限公司
MC2M
Deadman Switch
walk Signal 1
walk Signal 2
Steer Left
Steer Right
Jib Lift Signal
Turret Swing
Main Telescope Signal
Main Lift Signal
Load Sensor Amplifier
Load Sensor
Tilt Sensor
Angle Sensor
Anti-hand-clamping Switch
Anti-hand-clamping Warning Light
Platform E-Stop
Footswitch
Main Lift Down Proportional Valve
Tower Lift Down Proportional Valve
Jib Activate Valve
Main Lift Down Valve
Tower Lift Down Valve
HAS2 Alarm
Low Speed
High Speed
Crab Steer
U Turn Steer
Emergency Pump
Horn
Head Light
Level Up
Level Down
Rotate Left
Rotate Right
Tower Lift Up
Tower Lift Down
Constraint
Differential Lock

Inspection and Repair Log

Section 9

Date	Comments