

Part No.505031110002

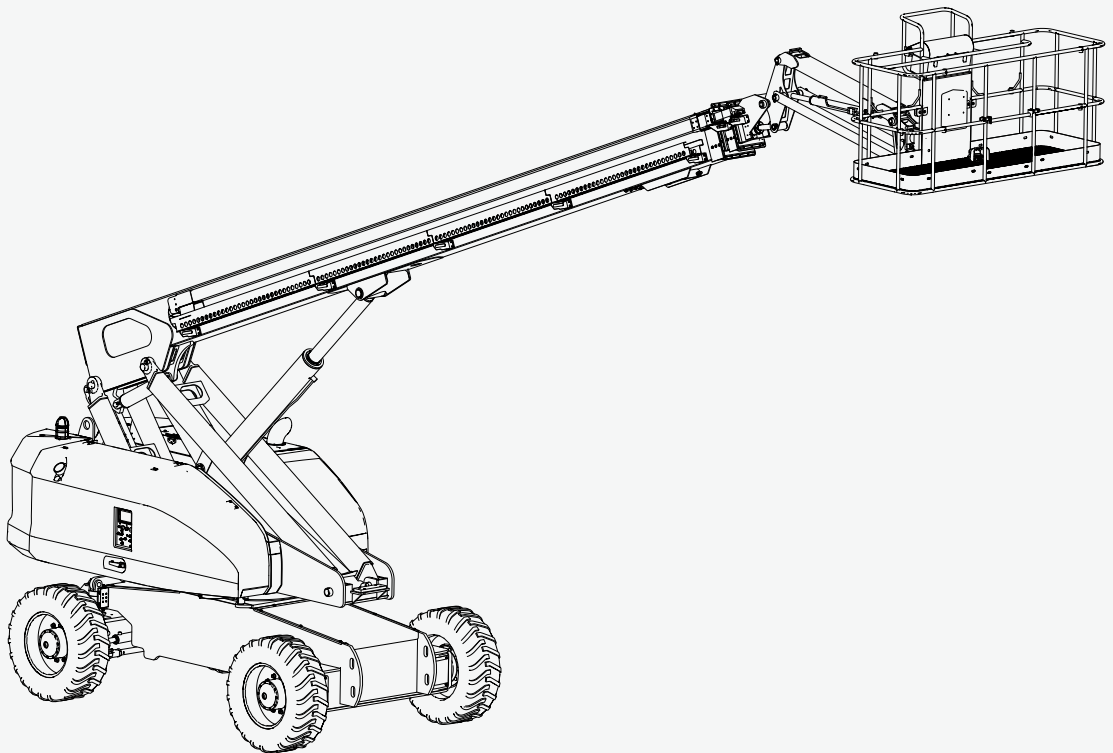
Rev: A

Aug 2020

Maintenance Manual

GTBZ26/TB26/TB850

GTBZ28J/TB28J/TB910J



CE   EAC GB

SINOBOOM



WARNING

Operating, servicing and maintaining this vehicle or equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle or equipment in a well-ventilated area and wear gloves or wash your hands frequently when servicing. For more information go to: www.P65warnings.ca.gov.

Manual revision history :

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A	Aug, 2020	Original issue of the manual	

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APPLICATION

Use the following table to identify the specific serial number for models included in this manual. Check the model of your machine before consulting the manual, and then use the correct manual according to the serial number of the model. See the nameplate on your machine to identify the model and serial number. (See of the *Operation Manual* for details.)

Model	Trade Identification		Serial No.
	Metric	Imperial	
GTBZ26	TB26	TB850	From 0503100100 to present
GTBZ28J	TB28J	TB910J	From 0503200400 to present

NOTE:

- Product model is applied in product nameplate for distinction of products of different main parameters.
- Product trade identification is applied in marketing and machine decals for distinction of products of different main parameters, and can be classified as metric type and imperial type: The metric type of trade identification is applicable to machines for countries/regions using metric system or as specially required by customers; The imperial type of trade identification is applicable to the machines for countries/regions using imperial system or as specially required by customers.

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STATEMENTS

Hunan Sinoboom Intelligent Equipment Co., Ltd. (Hereinafter referred to as Sinoboom) will upload the latest product manual information to the website www.sinoboom.com as soon as possible. However, due to continuous product improvement, the information in this manual is subject to change without prior notice.

This manual covers the basic parts information of one or more products. Therefore, please use this manual according to your needs. If you find problems in the manual or have suggestions for improvement, feel free to share your feedback with Sinoboom, and we will address these issues as soon as possible.

Feel free to consult and download the *Operation Manual*, *Maintenance Manual* and *Parts Manual* of the products you need online at www.sinoboom.com.

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INTRODUCTION

Thank you for choosing and using the machinery of Hunan Sinoboom Intelligent Equipment Co., Ltd. Always read, understand and become familiar with the operation requirements of the machine and its associated safety procedures before operating, maintaining and repairing the machine. Operating the machine without becoming familiar with its specific operation requirements and safety procedures poses serious risks. Operators who follow safety rules and operate the machine carefully and effectively will prevent personal injury, property loss and accidents.

Use this machine only to transport tools to work locations and for performing tasks on the work platform. Operators must be competent and must obtain training to carefully use the machine and follow safety procedures. Only trained and authorized personnel may operate the machine.

This manual guides the operator and authorized personnel in maintaining the machine. The operator is responsible for reading, understanding and implementing the maintenance and safety procedures in this manual and for following the manufacturer's instructions before beginning any work. Read, understand and follow all safety rules and operating instructions. The operator must also consider the machine's uses and limitations and the conditions at the jobsite before using this machine. Strictly following all safety requirements in this manual is critical.

Consider this manual a part of the machine, along with *Operation Manual* and *Parts Manual*, and always keep the manuals with the machine. The owner or administrator of the machine shall offer all manuals and other necessary information provided by the machine manufacturer regarding the daily inspection and maintenance to each of the renters. If the machine is sold, the owner or administrator must pass along the manuals and other necessary information to the purchaser. The owner or administrator of the machine shall also provide the manufacturer's maintenance information to the person responsible for maintaining the machine.

If you have any questions, contact Hunan Sinoboom Intelligent Equipment Co., Ltd..

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1 SAFETY

Read, understand and comply with the safety rules and regulations of your workplace and your government.

Before using the machine, obtain proper training on safe machine operation and make sure you can safely control and operate the machine.

Understand that as the operator you have the responsibility and right to shut down the machine in case of failure with the machine or other emergency at your workplace.

NOTICE

People suffering from heart disease, hypertension, epilepsy and other diseases and people who fear heights must never operate or use this machine. Also, people who have alcohol or drugs in their system, or experience excessive fatigue or depression, are prohibited from operating or using this machine.

NOTICE

Indicates a situation that can cause damage to the engine, personal property and/or the environment, or cause the equipment to operate improperly.

NOTE: Indicates a procedure, practice or condition that should be followed in order for the engine or component to function in the manner intended.

REPORTING ACCIDENTS

In case of any accident involving the machinery of Hunan Sinoboom Intelligent Equipment Co., Ltd., notify Hunan Sinoboom Intelligent Equipment Co., Ltd. Immediately, even if no personal injury or property damage occurs during the accident. Contact Hunan Sinoboom Intelligent Equipment Co., Ltd. by telephone and provide all necessary details. Failure to notify the manufacturer within 48 hours of the incident involving the machinery of Hunan Sinoboom Intelligent Equipment Co., Ltd. may void the product's warranty.

SAFETY DEFINITIONS



This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.



DANGER

Indicates a hazardous situation that, if not avoided, **will** result in death or serious injury.



WARNING

Indicates a hazardous situation that, if not avoided, **could** result in death or serious injury.



CAUTION

Indicates a hazardous situation that, if not avoided, **could** result in minor or moderate injury.

NOTICE

Thoroughly inspect the machine and all its functions after any accident, being sure to test first from the ground controller and then from the platform controller. Ensure the machine's lifting height does not exceed 3 m(9.8 ft) until all damage has been repaired and all controllers operate properly.

ELECTROCUTION HAZARDS

NOTE: This machine is not insulated and does not have an electric shock protection function.

All operators and managers shall comply with national or local regulations regarding the minimum safe distance of live conductors above the ground. In the absence of such requirements, operators and managers should follow the minimum safety distance requirements in [Table 1-1](#), [page 1-2](#).

SAFETY

 **WARNING**

ELECTRICAL SHOCK HAZARDS





- Always maintain a safe distance from power lines and electrical equipment in accordance with applicable government regulations and see [Table 1-1](#), [page 1-2](#).
- Consider platform and boom movement, wire swinging or drooping, beware of strong winds or gusts, and do not operate the machine when there is lightning or heavy rain.
- If the machine comes into contact with live wires, keep away from the machine. Personnel on the ground or on the platform must not touch or operate the machine until the power is switched off.
- Do not use the machine as a ground wire during welding and polishing operations.

Imperial	551 lb (unrestricted/2 persons & tools) 1058 lb (restricted/2 persons & tools)
GTBZ28J	
Metric	250kg (unrestricted/2 persons & tools)
Imperial	551 lb (unrestricted/2 persons & tools)

Table 1-1

Voltage (Phase to Phase, kV)	Minimum Safe Distance (m/ft)
0-50	3.05 (10)
50-200	4.60 (15)
200-350	6.10 (20)
350 -500	7.62 (25)
500 -750	10.67 (35)
750 -1000	13.725 (45)

TIPPING HAZARDS AND RATED LOAD

Maximum rated load bearing capacity of the platform:

Table 1-2

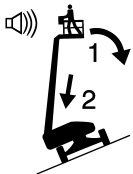
GTBZ26	
Metric	250kg (unrestricted/2 persons & tools) 480kg (restricted/2 persons & tools)

⚠ WARNING

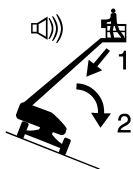
TIPPING HAZARDS



- Personnel, equipment and materials on the platform must not exceed the maximum load capacity.
- Only raise or extend the boom when the machine is on solid, level ground.
- Select only the low speed when driving the machine on a slope.
- Do not use the tilt alarm as a level indicator. The tilt alarm on the platform will sound only if the machine is heavily tilted.
- If the tilt alarm sounds when the machine drives up a slope, please lower the boom per the following procedure and move the machine onto firm level ground. Be sure not to rotate the boom when lowering.



1. Lower the main boom;
 2. Retract the telescopic boom.
- If the tilt alarm sounds when the machine drives down a slope, please lower the boom per the following procedure and move the machine onto firm level ground. Be sure not to rotate the boom when lowering.



1. Retract the telescopic boom ;
 2. Lower the main boom.
- Do not drive faster than 0.8 km/h (0.5 mph) when the platform is raised.
 - When the platform is raised, the machine cannot travel on uneven terrain, unstable surfaces or in other dangerous conditions.
 - Do not operate the machine during strong winds or gusts, and do not increase the surface area of the platform or load. Increasing the area exposed to the wind will reduce the stability of the machine.
 - When the machine is on rough ground, with gravel or other uneven surfaces, or near holes and steep slopes, maintain a minimum distance of 0.6m (2ft) and reduce the speed.

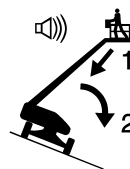
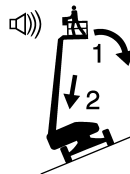
⚠ WARNING

TIPPING HAZARDS

- When on the platform do not push and pull objects outside of it. The maximum lateral force allowed is: 400 N (90 lbf).
- Tow the machine only from the tiedown/lifting points on the chassis.
- Never use the boom or platform to stabilize or support any objects outside of the machine.
- Do not change any machine parts that may affect safety and stability.
- Do not replace key parts that affect machine stability with different weights or specifications.
- Do not modify or change moving aerial platforms without the manufacturer's prior written permission.
- On the platform, do not attach an additional device for placing tools or other materials to the guardrail. This will increase the platform weight, surface area and load.
- Do not place on, or fasten any overhanging load to any part of this machine.
- Do not place ladders or scaffolding on the platform or any parts of the machine.
- Do not use the machine on a moving or active surface or on a vehicle. Ensure all tires are in good condition, the slotted nuts tightened and the cotter pins complete.
- Do not use a battery that weighs less than the original one (26kg [57 lb]), and do not remove or modify the counterweight or other parts of the battery box. The battery not only provides power, it also serves as a counterweight. The battery is vital to maintaining the stability of the machine.
- Do not use the platform or boom assembly to push other machines or objects.

⚠ WARNING**TIPPING HAZARDS**

- Do not let the platform or boom assembly touch the nearby structures.
- Do not tie off the platform with rope or other binding materials to the nearby structures.
- Do not put a load outside the platform.
- When the platform is caught or stuck or when other objects in the vicinity impede its normal movement, do not use the platform controller to lower the platform. If you intend to lower the platform with a ground controller, you must operate it only after all personnel have left the platform.

WORK ENVIRONMENT HAZARDS**⚠ WARNING****UNSAFE JOBSITE HAZARDS**

- Do not operate the machine on surfaces, edges or potholes that cannot bear the weight of the machine. Raise or extend the boom only when the machine is on firm, flat ground.
- Never travel on uneven terrain or unstable surfaces or in other dangerous conditions when raising the platform.
- When the machine is on rough ground, with gravel or other uneven surfaces, or near holes and steep slopes, maintain a minimum distance of 0.6m(2ft) and reduce the speed.
- Do not use the tilt alarm as a horizontal indicator. The tilt alarm on the platform will sound only when the machine is heavily tilted.
- If the tilt alarm sounds when the machine drives up a slope, lower the boom per the following procedure and move the machine onto firm level ground. Be sure not to rotate the boom while lowering.
 1. Lower the main boom ;
 2. Retract the telescopic boom.
- If the tilt alarm sounds when the machine drives down a slope, lower the boom per the following procedure and move the machine onto firm level ground. Be sure not to rotate the boom while lowering.
 1. Retract the telescopic boom ;
 2. Lower the main boom.
- Running speed should not exceed 0.8 km/h (0.5 in./second) when the platform rises.
- If the machine can be used outdoors, never operate it during strong winds or gusts. Do not lift the platform when the wind speed exceeds 12.5 m/s (18 mph). If the wind speed exceeds 12.5 m/s (18

WARNING**UNSAFE JOBSITE HAZARDS**

mph) after the platform is lifted, fold the platform and do not continue to operate the machine.

- Do not drive or lift the machine on slopes, steps or vaulted surfaces that exceed the maximum gradeability of the machine.

Before or during machine operation, check the possible hazards on the jobsite and beware of the restrictions within the environment, including flammable and explosive gas/dust.

Table 1-3

BEAUFORT NUMBER	METERS/SECOND	MILE/HOUR	DESCRIPTION	GROUND CONDITION
0	0 ~ 0.2	0 ~ 0.5	Calm	Calm. Smoke rises vertically.
1	0.3 ~ 1.5	1 ~ 3	Light air	Wind motion visible in smoke.
2	1.6 ~ 3.3	4 ~ 7	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	3.4 ~ 5.4	8 ~ 12	Gentle breeze	Leaves and smaller twigs in constant motion.
4	5.5 ~ 7.9	13 ~ 18	Moderate breeze	Dust and loose paper rise. Small branches begin to move.
5	8.0 ~ 10.7	19 ~ 24	Fresh breeze	Smaller trees sway.
6	10.8 ~ 13.8	25 ~ 31	Strong breeze	Large branches in motion. Flags waving near horizontal. Umbrella use becomes difficult.
7	13.9 ~ 17.1	32 ~ 38	Near gale/moderate gale	Whole trees in motion. Effort needed to walk against the wind.
8	17.2 ~ 20.7	39 ~ 46	Fresh gale	Twigs broken from trees. Cars veer on road.
9	20.8 ~ 24.4	47 ~ 54	Strong gale	Light structure damage.

NOTICE

Maximum gradeability is suitable for machines with platform retracted.

Gradeability means the maximum allowable tilt angle of the machine when it is on solid ground and the platform is only capable of carrying one person. As the weight of the machine's platform increases, the machine's climbing capacity reduces.

sideslope	25%/14° (2WD); 25%/14° (4WD)
GTBZ28J GRADEABILITY	
Uphill	30%/17° (2WD); 45%/24° (4WD)
Downhill	10%/6° (2WD); 30%/17° (4WD)
Sideslope	25%/14° (2WD); 25%/14° (4WD)

Table 1-4

GTBZ26 GRADEABILITY	
Uphill	30%/17° (2WD); 45%/24° (4WD)
downhill	10%/6° (2WD); 30%/17° (4WD)

UNSAFE OPERATION HAZARDS

At a minimum, operators must operate and maintain the machine as stated in this manual and in the *Maintenance Manual* in addition to following more

SAFETY

stringent industry regulations and workplace rules.
Never engage in unsafe machine operation.



WARNING

UNSAFE OPERATION HAZARDS



- Do not push any object outside the platform. The maximum lateral force allowed is 400N (90 lbf) .
- Tow the machine only from the tiedown/lifting points on the chassis.
- Never use the boom or platform to stabilize or support any objects outside of the machine.
- Do not modify any component that may affect the machine safety and stability.
- Do not replace key parts that affect machine stability with the ones of different weights or specifications.
- Do not change or modify moving aerial platforms without the manufacturer's written permission.
- On the platform, do not attach an additional device for placing tools or other materials to the guardrail. This will increase the platform weight, surface area and load.
- Do not put ladders or scaffolding on the platform or any part of this machine.
- Do not use the machine on any mobile or movable surface or vehicle. Ensure all tires are in good condition, the slotted nuts tightened and the cotter pins complete.
- Do not use a battery that weighs less than the original one(26kg[57 lb]), and do not remove or modify the counterweight or other parts inside the battery box. The battery not only provides power, it also serves as a counterweight. The battery is vital to maintaining the stability of the machine.
- Do not place or attach any suspended load onto any part of the machine.
- Do not use the machine as a crane.

⚠ WARNING**UNSAFE OPERATION HAZARDS**

- Do not use the platform to push the machine or other objects.
- Do not allow the platform or boom to touch structures.
- Do not use rope or other binding materials to tie the platform or boom onto nearby structures.
- Do not put the load outside the platform.
- When the platform is caught or stuck or when other objects in the vicinity impede its normal movement, do not use the platform controller to lower the platform. If you intend to lower the platform with a ground controller, you must operate it only after all personnel have left the platform.
- When one or more of the machine's tires are off the ground, evacuate all personnel before attempting to stabilize the equipment. Use a crane, forklift or other suitable equipment to stabilize the machine.

⚠ WARNING**FALL HAZARDS**

- Each person on the platform must wear harnesses or use safety equipment consistent with government regulations. Fasten the cable to the fixed point of the platform. Never fasten the cable of more than one person to a fixed point on the platform.
- Do not sit, stand or crawl on the guardrails. When on the platform always remain standing on the platform floor.
- Do not enter or exit the platform through the boom.
- Keep the platform floor free of obstacles.
- Do not allow mud, oil stains, grease or other slippery substances reside on the footwear or platform floor.
- Do not enter or exit the platform unless the machine is fully in stowed position.
- Close the platform entrance door before operating the machine.
- Do not operate the machine if the handrails are not properly installed and the platform entry door is not closed.

FALL HAZARDS

At a minimum, operators must operate and maintain the machine as stated in this manual and in the maintenance manual in addition to following more stringent industry regulations and workplace rules.

COLLISION HAZARDS

At a minimum, operators must operate and maintain the machine as stated in this manual and in the *Maintenance Manual* in addition to following more stringent industry regulations and workplace rules.

SAFETY

 WARNING**COLLISION HAZARDS**

- Pay attention to the field of sight and the presence of blind spots when moving or operating the machine.
- The non-staff must maintain a minimum of 1.8m (5.9ft) distance from the machine while it is travelling or swinging.
- When the work platform of a moving machine is approx.2m away from the obstructions, use the boom lifting/lowering function (rather than the driving function) to get close to the obstructions.
- Switch to the low speed gear before parking the machine that drives at high speed.
- Do not use the high speed gear when the machine is driving reverse or in restricted or enclosed work area.
- Check the work area to avoid ground and overhead obstructions or other possible risks.
- Be sure to exercise caution when using the platform controller and ground controller. Color-marked directional arrows show the function of travel, lift and steering.
- Users must comply with user, workplace and government rules regarding the use of personal protective equipment (hard hats, safety belts and gloves, etc.).
- Place the machine on level ground or in a secured position before releasing the brakes.
- Only lower the platform when there are no people or obstructions in the area beneath it.
- When the machine is conducting aerial work, warn the staff/non-staff not to work, stand or walk under the raised boom or platform.
- Limit the speed of travel according to ground conditions, crowding, gradients, the presence and location of personnel and any

 **WARNING****COLLISION HAZARDS**

- other factors that may cause collisions.
- Do not operate the machine on any crane or overhead traveling device unless the crane control is locked or precautions have been taken to prevent any potential collision.
- Never operate a machine dangerously or for fun.

CRUSH HAZARDS

A potential crush hazard exists during movement of the machine. Always keep body parts and clothing a safe distance from the machine during machine operation.

 WARNING**CRUSH HAZARDS**

- Do not place your hands and arms where they may become crushed or trapped.
- Do not work under the platform or the boom when the boom is not protected by a crane.
- Maintain good judgment and planning when using the controller on the ground to operate the machine. Maintain proper distance between operator, machine and fixed object.

EXPLOSION AND FIRE HAZARDS

WARNING

EXPLOSION AND FIRE HAZARDS



Do not use the machine or charge the battery in hazardous or potentially flammable or explosive atmospheres.



DAMAGED MACHINE HAZARDS

NOTICE

To avoid machine damage, follow all operation and maintenance requirements in this manual and the Maintenance Manual.

WARNING

DAMAGED MACHINE HAZARDS



- Do not use the machine if it is damaged or not in proper operating condition.
- Thoroughly inspect and test for all functions of the machine before use. Immediately mark and stop damaged or faulty machines.
- Ensure that all maintenance operations have been performed in accordance with this manual and the corresponding *Maintenance Manual*.
- Make sure all labels are in place and are legible.
- Ensure that the *Operation Manual* and *Maintenance Manual* are sound, easy to read and stored in the storage compartment on the platform.

BODILY INJURY HAZARDS

Always follow all operation and maintenance requirements in this manual and the Maintenance Manual.

WARNING

BODILY INJURY HAZARDS



- Do not operate the machine when there are oil spills/leaks. Oil spills or leaks in hydraulic fluids may penetrate and burn the skin.
- Always operate the machine in well ventilated atmosphere to prevent carbon monoxide poisoning.

NOTE: The operator must carry out maintenance during the pre-operation inspection only. During operation, keep the left and right doors of the chassis closed and locked. Only trained service personnel can open the left and right doors to repair the machine.

BATTERY HAZARDS

WARNING

FIRE AND EXPLOSION HAZARD



- Batteries contain sulfuric acid and generate explosive mixtures of hydrogen and oxygen gases. Keep any device that may cause sparks or flames (including cigarettes/smoking materials) away from the battery to prevent explosion.
- Do not touch the battery terminals or cable clips with tools that may cause sparks.

SAFETY

SINOBOOM

 WARNING**BATTERY HAZARD**

- Be sure to read and follow the recommendations given by the battery manufacturer regarding how to correctly use and maintain the battery.



- Always wear protective glasses or goggles and protective clothing when working with batteries. Remove all rings, watches and other accessories.

NOTICE

After charging the battery, be sure that:

- The battery cable connections are free of corrosion.
- The battery hold-down and cable connections are secured.

Adding terminal protection and anti-corrosion sealants will help reduce corrosion of the battery terminals and cables.

HYDRAULIC HAZARDS **WARNING****CHEMICAL BURN HAZARD**

Avoid spilling or contacting battery acid with unprotected skin. Seek medical attention immediately if battery acid contacts skin.

 WARNING**BATTERY HAZARD**

- Only the properly trained personnel authorized by the workplace are allowed to remove the battery from the machine.
- Before replacing the battery, be sure to identify the appropriate number of personnel and the lifting method.
- During the assembling or disassembling process, never use the battery in a forcible manner, and never allow the battery to fall off.
- Never directly short-circuit the battery outputs with electrical cords.
- Should the battery acid spill out, use bicarbonate (baking soda) mixed with water to neutralize the acid.
- Never store the battery in water or humid atmosphere.
- Daily check the battery cable for damage, and replace any damaged parts before operating the machine.

 WARNING**BURN AND SPRAY HAZARDS**

- When the hydraulic system is hot, do not touch to avoid severe skin burn.
- After the machine shutdown, thoroughly clean the spilled hydraulic oil. Do not throw the oil on the ground. Once the maintenance and repair is complete, immediately clean any oil on the skin. Dispose of the used oil as per the governing laws and regulations.
- Do not use your hand to block the hydraulic leaks. If the leakage occurs, please first release the system pressure and maintain only after the hydraulic oil cools down. If any injury is caused by the spray of hydraulic oil, go to the doctor immediately, otherwise severe complication may develop.

WELDING AND POLISHING REQUIREMENTS

Before welding, grinding and polishing operations, always ensure you read and understand all operation and maintenance requirements in this manual and the *Maintenance Manual*.

⚠ WARNING**WELDING HAZARDS**

- Comply with the welder manufacturer's recommendations for procedures concerning proper use of the welder.
- Welding leads or cables may only be connected after turning off the power unit.
- Carry out welding operations only after the welding cable has been correctly connected.
- Do not use the machine as a ground wire during welding operation.
- At all times, make sure that the power tools are completely stored in the working platform. Do not hang the power tools on the railing of the working platform or the work area outside the working platform, or hang the power tools directly by the wire.

NOTICE

After using the machine, the main power switch must be disconnected.

Before performing welding, grinding and polishing work, welders must seek permission of the responsible department at the workplace.

AFTER USING THE MACHINE

1. Choose a safe parking location that is on sturdy, level ground and that is free of obstructions. Avoid areas with heavy traffic.
2. Lower the boom to stowed position.
3. Take off all loads from the platform and run the engine at low speed for 3–5 minutes to reduce the engine inside temperature.
4. Push in the emergency stop button at the platform controls to the OFF position.
5. Close the cover of platform controls to protect the control panel, handle and controller from hostile weather conditions.
6. Push in the emergency stop button at ground controls to the OFF position.
7. Turn the key switch at the ground controls to OFF position and remove the key to avoid unauthorized operation of the machine.
8. Turn off the main power switch.

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2 SPECIFICATIONS

PERFORMANCE PARAMETERS

Table 2-1 GTBZ26 specifications

MEASURE	GTBZ26 (METRIC)	TB850 (IMPERIAL)
DIMENSION PARAMETERS		
Max platform height	25.8 m	84 ft 8 in
Max working height	27.8 m	91 ft 2.5 in
Max horizontal reach	20.4 m	66 ft 11 in
Overall length(stowed)	11.54 m	37 ft 10 in
Overall width(stowed)	2.49 m	8 ft 2 in
Overall height (stowed)	2.88 m	9 ft 5 in
Wheelbase	3.0 m	9 ft 10 in
Ground clearance	0.41 m	1 ft 4 in
Tire size (spec / type)	Options 385 / 65-24 / 10 (solid) 12.00-20 / 8.5 (solid) 385 / 65-22.5 (foam-filled)	
Platform dimension (L×W×H)	Options 1.45×0.85×1.1 m 1.83×0.85×1.1 m 2.44×0.91×1.1 m	Options 57×33.5×43.3 in 72×33.5×43.3 in 96×36×43.3 in
PERFORMANCE PARAMETERS		
Platform capacity	250 kg (unrestricted / 2 persons & tools) 480 kg (restricted / 2 persons & tools)	551 lb (unrestricted / 2 persons & tools) 1058 lb (restricted / 2 persons & tools)
Turntable rotation / continuous	360° / continuous	
Platform rotation	160°	
Max drive speed (stowed)	5.2 km / h (2WD) 4.4 km / h (4WD)	3.2 mph (2WD) 2.7 mph (4WD)
Max drive speed (raised)	0.8 km / h	0.5 mph
Drive mode (drive×steer)	Options 2WD×2WS 4WD×2WS	
Gradeability	30% / 17° (2WD) 45% / 24° (4WD)	
Turntable tailswing	1.46 m	4 ft 9.5 in

SPECIFICATIONS

MEASURE	GTBZ26 (METRIC)	TB850 (IMPERIAL)
Max allowable inclination	5°	
Turning radius (inside)	2.44 m	8 ft
Turning radius (outside)	5.84 m	19 ft 2 in
Max allowable side force	400 N	90 lbf
Max operating noise level	82 dB	
IP grade	IP54	
POWER PARAMETERS		
Engine (rated power, rated rpm)	54 Kw, 2400 rpm (Cummins) 55.4 Kw, 2300 rpm (Deutz)	
Hydraulic tank capacity	170 L	37.4gal (Imperial) / 45gal (US)
Fuel tank capacity	160 L	35.2gal (Imperial) / 42.3 gal (US)
Hydraulic system pressure	28 MPa	4061 Psi
Battery (number×voltage, capacity)	2×12V, 110Ah	
System voltage	12 VDC	
Control voltage	12 VDC	
GROUND BEARING DATA		
Max tire load	8755 kg	19301 lb
Pressure against ground	16.7 kPa	2.42 Psi
ENVIRONMENT REQUIREMENT		
Max allowable wind speed	12.5 m / s	28 mph
Max allowable altitude	1000 m	3280 ft
Allowable ambient temperature (lead-acid battery)	-10°C ~ 40°C	14°F ~ 104°F
Allowable ambient temperature (-lithium battery)	-20°C ~ 40°C	-4°F ~ 104°F
Max allowable RH	90%	
Storage environment	Stored at -20°C to 50°C(-4°F to 122°F) in a well-ventilated environment with 90% relative humidity (20°C [68°F]), and away from rain, sun, corrosive gas,inflammables and explosives.	
WEIGHT		
Gross weight (unladen)2WD	16442 kg	36248 lb
Gross weight (unladen)4WD	16532 kg	36447 lb

Note :

- a) The working height adds 2m(6ft7in) of human height to platform height.
- b) The ground bearing data is approximate value, not factoring the different options, thus it serves only in adequately safe conditions
- c) In different areas, hydraulic oil, engine oil, coolant, fuel and lubrication should be added in accordance with the environmental temperature.
- d) In cold weather, auxiliary devices are needed to start the machines

Table 2-2 GTBZ28J specifications

MEASURE	GTBZ28J (Metric)	TB910J (Imperial)
DIMENSION PARAMETERS		
Max platform height	27.7 m	90 ft 10.5 in
Max working height	29.7 m	97 ft 5 in
Max horizontal reach	20.0 m	65 ft 7.5 in
Overall length(stowed)	13.22 m	43 ft 4.5 in
Overall width(stowed)	2.49 m	8 ft 2 in
Overall height (stowed)	2.88 m	9 ft 5 in
Wheelbase	3.0 m	9 ft 10 in
Ground clearance	0.41 m	1 ft 4 in
Tire size (spec / type)	Options 385 / 65-24 / 10 (solid) 12.00-20 / 8.5 (solid) 385 / 65-22.5 (foam-filled)	
Platform dimension (L×W×H)	Options 1.45×0.85×1.1 m 1.83×0.85×1.1 m 2.44×0.91×1.1 m	Options 57×33.5×43.3 in 72×33.5×43.3 in 96×36×43.3 in
PERFORMANCE PARAMETERS		
Platform capacity	250 kg (unrestricted / 2 persons & tools)	551 lb (unrestricted / 2 persons & tools)
Turntable rotation / continuous	360° / continuous	
Platform rotation	160°	
Max drive speed (stowed)	5.2 km / h (2WD) 4.4 km / h (4WD)	3.2 mph (2WD) 2.7 mph (4WD)
Max drive speed (raised)	0.8 km / h	0.5 mph
Drive mode (drive×steer)	Options 2WD×2WS 4WD×2WS	
Gradeability	30% / 17° (2WD) 45% / 24° (4WD)	
Turntable tailswing	1.46 m	4 ft 9.5 in
Max allowable inclination	5°	
Turning radius (inside)	2.44 m	8 ft
Turning radius (outside)	5.84 m	19 ft 2 in
Max allowable side force	400 N	90 lbf
Max operating noise level	82 dB	
IP grade	IP54	
POWER PARAMETERS		

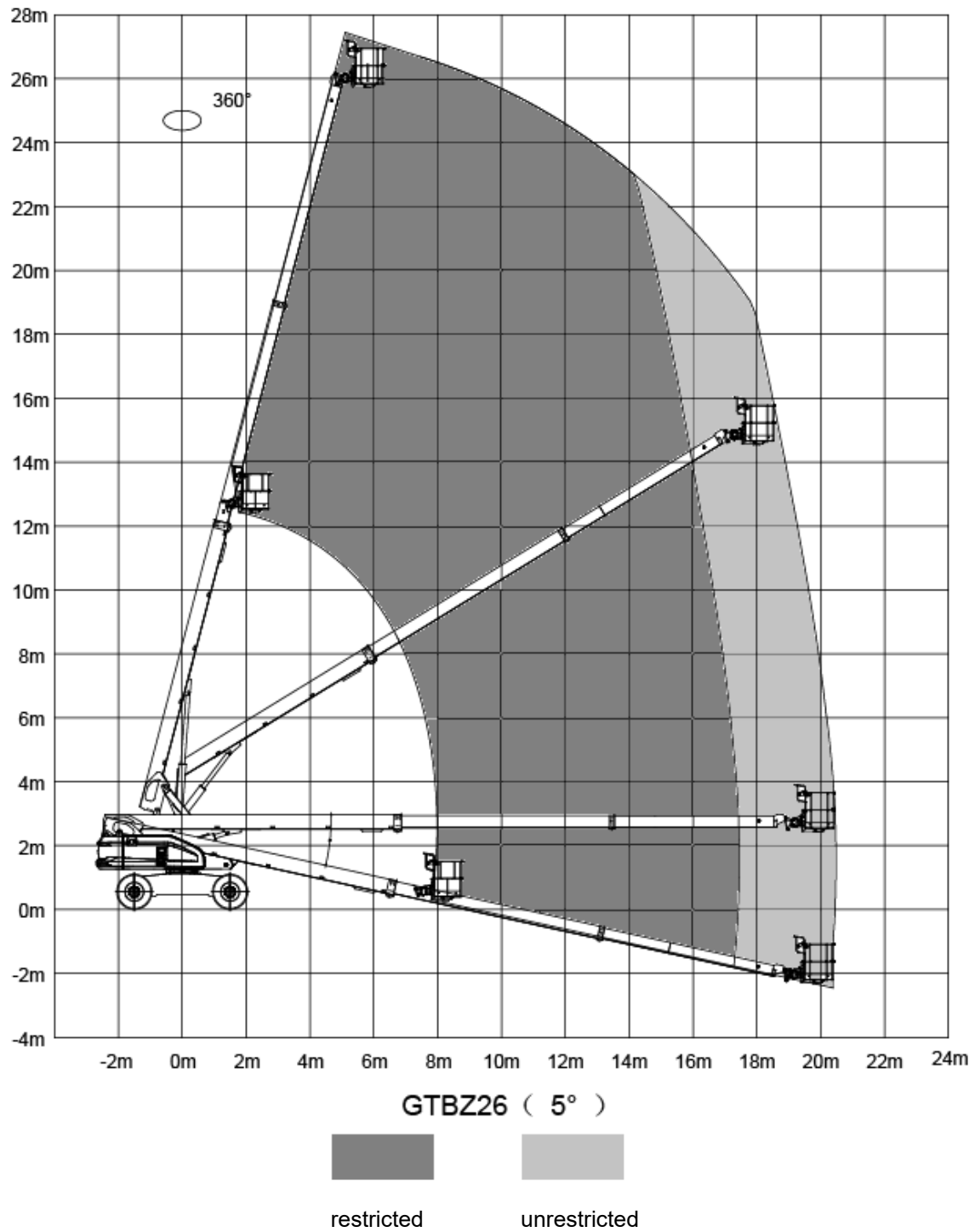
SPECIFICATIONS

MEASURE	GTBZ28J (Metric)	TB910J (Imperial)
Engine (rated power, rated rpm)	54 Kw, 2400 rpm (Cummins) 55.4 Kw, 2300 rpm (Deutz)	
Hydraulic tank capacity	170 L	37.4 gal (Imperial) / 45 gal (US)
Fuel tank capacity	160 L	35.2gal (Imperial) / 42.3 gal (US)
Hydraulic system pressure	28 MPa	4061 Psi
Battery (number×voltage, capacity)	2×12V, 110Ah	
System voltage	12 VDC	
Control voltage	12 VDC	
GROUND BEARING DATA		
Max tire load	8755 kg	19301 lb
Pressure against ground	16.7 kPa	2.42 Psi
ENVIRONMENT REQUIREMENT		
Max allowable wind speed	12.5 m / s	28 mph
Max allowable altitude	1000 m	3280 ft
Allowable ambient temperature (lead-acid battery)	-10°C ~ 40°C	14°F ~ 104°F
Allowable ambient temperature (-lithium battery)	-20°C ~ 40°C	-4°F ~ 104°F
Max allowable RH	90%	
Storage environment	Stored at -20°C to 50°C(-4°F to 122°F) in a well-ventilated environment with 90% relative humidity (20°C [68°F]), and away from rain, sun, corrosive gas,inflammables and explosives.	
WEIGHT		
Gross weight (unladen) 2WD	16581 kg	36555 lb
Gross weight (unladen) 4WD	16671 kg	36753 lb

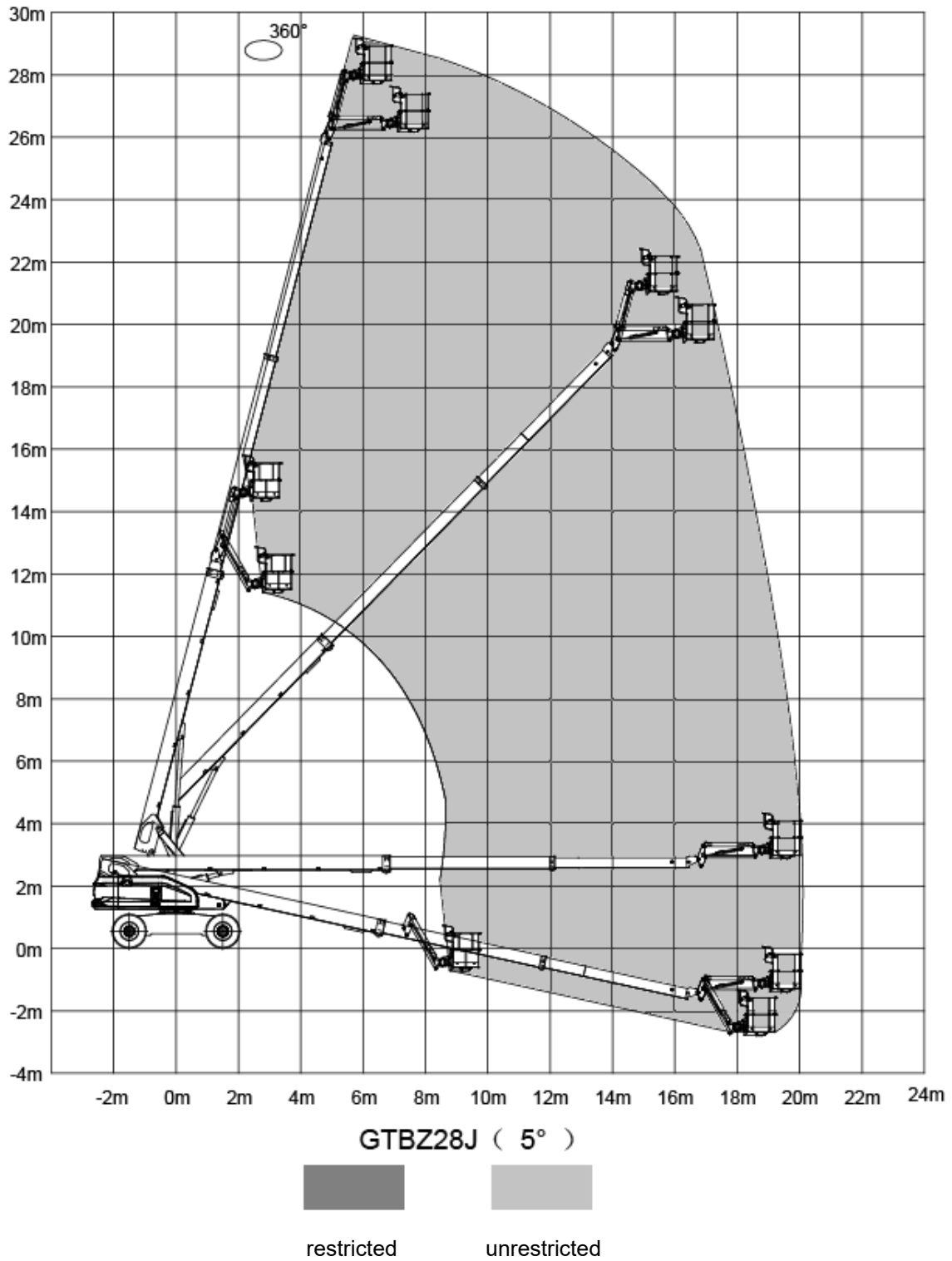
Note :

- a) The working height adds 2m(6ft7in) of human height to platform height.
- b) The ground bearing data is approximate value, not factoring the different options,thus it serves only in adequately safe conditions
- c) In different areas, hydraulic oil, engine oil, coolant, fuel and lubrication should be added in accordance with the environmental temperature.
- d) In cold weather, auxiliary devices are needed to start the machines

GTBZ26 platform reach chart



GTBZ28J platform reach chart



ENGINE SPECIFICATIONS

Table 2-3 Cummins QFS2.8t3TC72

Type	Liquid-cooled
Number of Cylinders	4
Bore	94mm (3.7 in)
Stroke	100mm (3.9 in)
Total Displacement	2.8L 0.62 gal (Imperial) 0.74 gal (US)
Compression Ratio	16.7
Firing Order	1-2-4-3
Output	54kw@2200rpm
Torque	270Nm (199 ft-lb) @1800rpm
Coolant Capacity	3.5L 0.77 gal (Imperial) 0.92 gal (US)
Oil Capacity	8L 1.76 gal (Imperial) 2.11 gal (US)
Low RPM	1500rpm
High RPM	2200rpm

Table 2-4 Deutz TD 2.9L4

Type	Liquid-cooled
Number of Cylinders	4
Bore	92mm (3.6 in)
Stroke	110mm (4.3 in)
Total Displacement	2.9L 0.64 gal (Imperial) 0.77 gal (US)
Compression Ratio	17 : 1
Firing Order	1-2-4-3
Output	55.4kw@2200rpm
Torque	260Nm (192 ft-lb) @1800rpm
Coolant Capacity	3.3L 0.73 gal (Imperial)

	0.87 gal (US)
Oil Capacity	8.9L 1.96 gal (Imperial) 2.35 gal (US)
Low RPM	1500rpm
High RPM	2200rpm

FUNCTION SPEED

Table 2-5

ITEM	GTBZ26	GTBZ28J
Boom up (fully retracted)	100 ~ 115s	100 ~ 115s
Boom up (fully extended)	84 ~ 99s	84 ~ 99s
Boom down (fully retracted)	90 ~ 105s	90 ~ 105s
Boom down (fully extended)	76 ~ 91s	76 ~ 91s
Turntable rotation (- fully retracted)	95 ~ 103s	95 ~ 103s
Turntable rotation (- fully extended)	220 ~ 260s	220 ~ 260s
Boom extend	85 ~ 95s	85 ~ 95s
Boom retract	75 ~ 85s	75 ~ 85s
Platform rotate	18 ~ 22s	18 ~ 22s
Jib up	/	28 ~ 32s
Jib down	/	28 ~ 32s
Max drive speed (30m)	20 ~ 25s	20 ~ 25s

- a) The function speed depends on the start and end point of the movement rather than the controls/ switches.
- b) The test results of drive speed vary with tires of different specifications.
- c) All the speed tests should be conducted from the platform controller, The test results will differ if tested from the ground controller.
- d) All the tests should be conducted with the hydraulic oil temperature higher than 38°C. If the hydraulic oil temperature is too low, the test results will be affected.

Test requirements:

SPECIFICATIONS

Boom up/down : Fully lower and retract the boom, and then raise and lower the boom twice respectively.

Turntable rotating : With the boom in center position, rotate a turn of the turntable and test twice.

Boom telescoping : Fully raise and retract the boom, and then extend and retract the boom twice respectively.

Driving : With the machine on a level surface, select the engine high RPM and drive high speed, deflect the drive control handle to the maximum to drive forward and backward for 30m twice respectively.

Platform rotating : With the platform horizontal, rotate the platform clockwise and anticlockwise twice respectively.

Jib up/down : Position the platform horizontally and the jib boom to the lowest, and then raise and lower the jib boom twice respectively.

MAJOR COMPONENT WEIGHTS



WARNING

UNSAFE OPERATION HAZARD



- Do not move heavy components without mechanical assistance.
- Do not place heavy component upon instable surface.

Table 2-6

Component	Metric (kg)	Imperial (lb)
Chassis assembly (2WD)	6691	14751
Chassis assembly (4WD)	7269	16025
Turntable assembly	8068	17786
Boom assembly	3708	8174
Base boom	929	2048
1st telescopic boom	583	1285
2nd telescopic boom	373	822
Jib boom assembly (GTBZ28J only)	156	344
Platform	206	454
Counterweight	4900	10802
Slewing mechanism	366	807
Turntable cover assembly	192	423
Main boom telescopic cylinder	453	999
Main boom level cylinder, upper	32	71
Main boom level cylinder, lower	36	79
Main boom lift cylinder	380	838
Jib boom cylinder	28	62
Reducer and motor	135	298
Wheel assembly	320	705
Engine-Cummins	448	988
Engine-Deutz	474	1045

POWER SYSTEM SPECIFICATIONS

Table 2-7

ITEM	SPECIFICATION
Hydraulic Oil	
Normal temperature region (0°C~40°C [32°F~104°F])	L-HM46
Cold temperature region (-25°C~25°C [-13°F~77°F])	L-HV32
High temperature region (> 40°C [104°F])	L-HM68
Extremely cold temperature region (< -30°C [-22°F])	Special program to be determined
Hydraulic Pump	
Type	Closed type variable pump
Flow (rated rpm=2200r/min)	100 L/min
Max drive pressure	28 MPa (4061 Psi)
Drive Motor	
Type	Plunger motor
Displacement	45 cc/r
Function Manifold	
Drive variable pump pressure	28 MPa (4061 Psi)
Boom function valve pressure	21 MPa (3046 Psi)
Return oil pressure	2.1 MPa (304.5 Psi)
Brake start pressure	3.5 MPa (508 Psi)
Return Filter	
Return filter bypass pressure	0.4 MPa (58 Psi)
High-pressure Filter	
High-pressure filter bypass pressure	0.7 MPa (101.5 Psi)

NOTICE

The factory-filled hydraulic oil can be selected to suit the customer's demand. Do not intermix different types of hydraulic oil.

SPECIFICATIONS

HYDRAULIC HOSE AND FITTING SPECIFICATIONS

HYDRAULIC HOSE TORQUE

Hydraulic hoses must be torqued to the following specifications.

Table 2-8 Hydraulic Hose Torque

METRIC THREAD	L (LIGHT-DUTY)	S (HEAVY-DUTY)
M12 × 1.5	19 ± 1 Nm (14 ± 1 ft-lb)	
M14 × 1.5	26 ± 2 Nm (19 ± 2 ft-lb)	
M16 × 1.5	40 ± 3 Nm (30 ± 2 ft-lb)	
M18 × 1.5	50 ± 4 Nm (37 ± 3 ft-lb)	
M20 × 1.5	-	60 ± 4 Nm (44 ± 3 ft-lb)
M22 × 1.5	70 ± 5 Nm (52 ± 4 ft-lb)	-
M24 × 1.5	-	85 ± 6 Nm (63 ± 4 ft-lb)
M26 × 1.5	90 ± 6 Nm (66 ± 4 ft-lb)	-
M30 × 2	120 ± 8 Nm (89 ± 6 ft-lb)	140 ± 10 Nm (103 ± 7 ft-lb)
M36 × 2	150 ± 12 Nm (111 ± 9 ft-lb)	180 ± 12 Nm (133 ± 9 ft-lb)
M42 × 2	-	260 ± 16 Nm (192 ± 12 ft-lb)
M45 × 2	240 ± 15 Nm (177 ± 11 ft-lb)	-
M52 × 2	250 ± 16 Nm (184 ± 12 ft-lb)	280 ± 18 Nm (207 ± 13 ft-lb)

HYDRAULIC FITTING TORQUE

Hydraulic fittings with metric thread must be torqued to the following specifications.

Table 2-9 Hydraulic Fitting Torque – Metric

THREAD SIZE	INSTALLED INTO ALUMINUM	INSTALLED INTO STEEL	
	ED, O-RING + CIRCLIP	ED, O-RING + CIRCLIP	O-RING
L (LIGHT-DUTY)			
M10×1	18 ± 1 Nm (13 ± 1 ft-lb)	20 ± 2 Nm (15 ± 2 ft-lb)	18 ± 1 Nm (13 ± 1 ft-lb)
M12×1.5	30 ± 2 Nm (22 ± 2 ft-lb)	35 ± 2 Nm (26 ± 2 ft-lb)	30 ± 2 Nm (22 ± 2 ft-lb)
M14×1.5	42 ± 3 Nm (31 ± 2 ft-lb)	48 ± 4 Nm (35 ± 3 ft-lb)	35 ± 2 Nm (26 ± 2 ft-lb)
M16×1.5	55 ± 4 Nm (41 ± 3 ft-lb)	60 ± 4 Nm (44 ± 3 ft-lb)	40 ± 3 Nm (30 ± 3 ft-lb)
M18×1.5	75 ± 5 Nm (55 ± 4 ft-lb)	75 ± 5 Nm (55 ± 4 ft-lb)	45 ± 3 Nm (33 ± 4 ft-lb)

THREAD SIZE	INSTALLED INTO ALUMINUM	INSTALLED INTO STEEL	
	ED, O-RING + CIRCLIP	ED, O-RING + CIRCLIP	O-RING
M22×1.5	90 ± 6 Nm (66 ± 4 ft-lb)	130 ± 8 Nm (96 ± 6 ft-lb)	60 ± 4 Nm (44 ± 3 ft-lb)
M27×2	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	100 ± 7 Nm (74 ± 5 ft-lb)
M30×2	140 ± 8 Nm (103 ± 6 ft-lb)	245 ± 15 Nm (181 ± 11 ft-lb)	135 ± 8 Nm (100 ± 6 ft-lb)
M33×2	180 ± 10 Nm (133 ± 7 ft-lb)	320 ± 20 Nm (236 ± 15 ft-lb)	160 ± 10 Nm (118 ± 7 ft-lb)
M42×2	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	210 ± 13 Nm (155 ± 10 ft-lb)
M48×2	280 ± 20 Nm (207 ± 15 ft-lb)	540 ± 30 Nm (398 ± 22 ft-lb)	260 ± 15 Nm (192 ± 11 ft-lb)
S (HEAVY-DUTY)			
M12×1.5	33 ± 2 Nm (24 ± 2 ft-lb)	43 ± 3 Nm (32 ± 2 ft-lb)	35 ± 2 Nm (26 ± 2 ft-lb)
M14×1.5	42 ± 3 Nm (31 ± 2 ft-lb)	50 ± 4 Nm (37 ± 3 ft-lb)	45 ± 3 Nm (33 ± 2 ft-lb)
M16×1.5	55 ± 4 Nm (41 ± 3 ft-lb)	75 ± 5 Nm (55 ± 4 ft-lb)	55 ± 4 Nm (41 ± 3 ft-lb)
M18×1.5	75 ± 5 Nm (55 ± 4 ft-lb)	95 ± 6 Nm (70 ± 4 ft-lb)	70 ± 5 Nm (52 ± 4 ft-lb)
M22×1.5	90 ± 6 Nm (66 ± 4 ft-lb)	140 ± 8 Nm (103 ± 6 ft-lb)	100 ± 10 Nm (74 ± 7 ft-lb)
M27×2	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	160 ± 10 Nm (118 ± 7 ft-lb)
M30×2	140 ± 8 Nm (103 ± 6 ft-lb)	245 ± 15 Nm (181 ± 11 ft-lb)	210 ± 13 Nm (155 ± 10 ft-lb)
M33×2	180 ± 10 Nm (133 ± 7 ft-lb)	320 ± 20 Nm (236 ± 15 ft-lb)	260 ± 15 Nm (192 ± 11 ft-lb)
M42×2	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	330 ± 20 Nm (243 ± 15 ft-lb)
M48×2	280 ± 20 Nm (207 ± 15 ft-lb)	540 ± 30 Nm (398 ± 22 ft-lb)	420 ± 25 Nm (310 ± 18 ft-lb)

Hydraulic fittings with inch thread (British Standard Pipe [BSP]) must be torqued to the following specifications.

Table 2-10 Hydraulic Fitting Torque – British Standard Pipe (BSP)

THREAD SIZE	INSTALLED INTO ALUMINUM	INSTALLED INTO STEEL	
	ED, O-RING + CIRCLIP	ED, O-RING + CIRCLIP	O-RING
L (LIGHT-DUTY)			
G1/8A	20 ± 1 Nm (15 ± 1 ft-lb)	20 ± 1 Nm (15 ± 1 ft-lb)	-
G1/4A	35 ± 2 Nm (26 ± 2 ft-lb)	40 ± 2 Nm (30 ± 2 ft-lb)	-
G3/8A	50 ± 3 Nm (37 ± 2 ft-lb)	75 ± 5 Nm (55 ± 2 ft-lb)	-
G1/2A	75 ± 5 Nm (55 ± 2 ft-lb)	95 ± 6 Nm (70 ± 4 ft-lb)	-
G3/4A	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	-
G1A	180 ± 10 Nm (133 ± 7 ft-lb)	320 ± 20 Nm (236 ± 15 ft-lb)	-
G1-1/4A	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	-
G1-1/2A	280 ± 20 Nm (207 ± 15 ft-lb)	540 ± 30 Nm (398 ± 22 ft-lb)	-

SPECIFICATIONS

THREAD SIZE	INSTALLED INTO ALUMINUM	INSTALLED INTO STEEL	
	ED, O-RING + CIRCLIP	ED, O-RING + CIRCLIP	O-RING
S (HEAVY-DUTY)			
G1/4A	40 ± 3 Nm (30 ± 2 ft-lb)	43 ± 3 Nm (32 ± 2 ft-lb)	-
G3/8A	55 ± 3 Nm (41 ± 2 ft-lb)	85 ± 5 Nm (63 ± 4 ft-lb)	-
G1/2A	80 ± 5 Nm (59 ± 4 ft-lb)	120 ± 8 Nm (89 ± 6 ft-lb)	-
G3/4A	120 ± 8 Nm (89 ± 6 ft-lb)	185 ± 12 Nm (136 ± 9 ft-lb)	-
G1A	180 ± 10 Nm (133 ± 7 ft-lb)	320 ± 20 Nm (236 ± 15 ft-lb)	-
G1-1/4A	240 ± 15 Nm (177 ± 11 ft-lb)	450 ± 25 Nm (332 ± 18 ft-lb)	-
G1-1/2A	280 ± 20 Nm (207 ± 15 ft-lb)	540 ± 30 Nm (398 ± 22 ft-lb)	-

Hydraulic fittings with Unified Thread Standard (UNC/UNF) must be torqued to the following specifications.

Table 2-11 Hydraulic Fitting Torque – Unified Thread Standard (UNC/UNF)

THREAD SIZE	INSTALLED INTO ALUMINUM	INSTALLED INTO STEEL
	O-RING	O-RING
L (LIGHT-DUTY)		
7/16-20	21 ± 2 Nm (15 ± 2 ft-lb)	21 ± 2 Nm (15 ± 2 ft-lb)
9/16-18	34 ± 2 Nm (25 ± 2 ft-lb)	35 ± 2 Nm (26 ± 2 ft-lb)
11/16-12	40 ± 3 Nm (30 ± 2 ft-lb)	50 ± 4 Nm (37 ± 3 ft-lb)
3/4-16	50 ± 3 Nm (37 ± 2 ft-lb)	65 ± 4 Nm (48 ± 3 ft-lb)
7/8-14	75 ± 5 Nm (55 ± 4 ft-lb)	110 ± 8 Nm (81 ± 6 ft-lb)
1-1/16-12	110 ± 8 Nm (81 ± 6 ft-lb)	140 ± 10 Nm (103 ± 7 ft-lb)
1-5/16-12	160 ± 10 Nm (118 ± 7 ft-lb)	210 ± 15 Nm (155 ± 11 ft-lb)
S (HEAVY-DUTY)		
7/16-20	21 ± 2 Nm (15 ± 2 ft-lb)	23 ± 2 Nm (17 ± 2 ft-lb)
9/16-18	34 ± 2 Nm (25 ± 2 ft-lb)	40 ± 3 Nm (30 ± 2 ft-lb)
11/16-12	40 ± 3 Nm (30 ± 2 ft-lb)	65 ± 4 Nm (48 ± 3 ft-lb)
3/4-16	50 ± 3 Nm (37 ± 2 ft-lb)	80 ± 6 Nm (59 ± 4 ft-lb)
7/8-14	75 ± 5 Nm (55 ± 4 ft-lb)	125 ± 10 Nm (92 ± 7 ft-lb)
1-1/16-12	110 ± 8 Nm (81 ± 6 ft-lb)	185 ± 15 Nm (136 ± 11 ft-lb)
1-5/16-12	160 ± 10 Nm (118 ± 7 ft-lb)	280 ± 20 Nm (207 ± 15 ft-lb)

HYDRAULIC HOSE AND FITTING TORQUE PROCEDURE

The hydraulic hose and fitting must be torqued to the following requirements when they are installed.

1. Replace the O-ring if damaged. The O-ring cannot be reused if the fitting or hose end has been tightened beyond finger tight.
2. Lubricate the O-ring before installation.
3. Properly seat the O-ring.

4. Position the tube and nut squarely on the fitting. Then tighten the nut as required.
5. Tighten the nut or fitting to the torque specified in the appropriate table.
6. Operate all machine functions and inspect the hose, fittings and related components to confirm there are no leaks.

FASTENER TORQUE SPECIFICATIONS

Unless special torque requirements are stated in this manual or other instructions, torque metric bolts to the values listed in the table below.

Table 2-12 Fastener Torque Specifications – Metric

NOMINAL DIAMETER (MM)	PITCH (MM)	CLASS 8.8	CLASS 10.9	CLASS 12.9
5	0.8	7 Nm (5 ft-lb)	9 Nm (7 ft-lb)	10 Nm (7 ft-lb)
6	1	12 Nm (9 ft-lb)	15 Nm (11 ft-lb)	18 Nm (13 ft-lb)
8	1.25	30 Nm (22 ft-lb)	35 Nm (26 ft-lb)	42 Nm (31 ft-lb)
	1	30 Nm (22 ft-lb)	37 Nm (27 ft-lb)	45 Nm (33 ft-lb)
10	1.5	55 Nm (41 ft-lb)	75 Nm (55 ft-lb)	85 Nm (63 ft-lb)
	1.25	56 Nm (41 ft-lb)	77 Nm (57 ft-lb)	87 Nm (64 ft-lb)
	1	60 Nm (44 ft-lb)	80 Nm (59 ft-lb)	92 Nm (68 ft-lb)
12	1.75	95 Nm (70 ft-lb)	125 Nm (92 ft-lb)	150 Nm (111 ft-lb)
	1.5	100 Nm (74 ft-lb)	130 Nm (96 ft-lb)	155 Nm (114 ft-lb)
	1.25	105 Nm (77 ft-lb)	135 Nm (100 ft-lb)	160 Nm (118 ft-lb)
14	2	150 Nm (110 ft-lb)	200 Nm (148 ft-lb)	230 Nm (170 ft-lb)
	1.5	165 Nm (122 ft-lb)	210 Nm (155 ft-lb)	250 Nm (184 ft-lb)
16	2	230 Nm (170 ft-lb)	300 Nm (221 ft-lb)	360 Nm (266 ft-lb)
	1.5	250 Nm (184 ft-lb)	320 Nm (236 ft-lb)	380 Nm (280 ft-lb)
18	2.5	320 Nm (236 ft-lb)	420 Nm (310 ft-lb)	500 Nm (369 ft-lb)
	1.5	360 Nm (266 ft-lb)	470 Nm (345 ft-lb)	550 Nm (406 ft-lb)
20	2.5	450 Nm (332 ft-lb)	600 Nm (443 ft-lb)	700 Nm (516 ft-lb)
	1.5	500 Nm (369 ft-lb)	650 Nm (479 ft-lb)	770 Nm (568 ft-lb)
22	2.5	600 Nm (443 ft-lb)	800 Nm (590 ft-lb)	980 Nm (723 ft-lb)
	2	650 Nm (479 ft-lb)	850 Nm (627 ft-lb)	1050 Nm (774 ft-lb)
24	3	750 Nm (553 ft-lb)	1050 Nm (774 ft-lb)	1250 Nm (923 ft-lb)

SPECIFICATIONS

NOMINAL DIAMETER (MM)	PITCH (MM)	CLASS 8.8	CLASS 10.9	CLASS 12.9
	2	800 Nm (590 ft-lb)	1100 Nm (811 ft-lb)	1300 Nm (959 ft-lb)
27	3	1150 Nm (848 ft-lb)	1500 Nm (1106 ft-lb)	1800 Nm (1327 ft-lb)
30	3.5	1500 Nm (1106 ft-lb)	2000 Nm (1475 ft-lb)	2400 Nm (1770 ft-lb)

Unless special torque requirements are listed in this manual or other instructions, torque Unified Thread Standard bolts (label: UNC) to the values listed in the table below.

Table 2-13 Bolt Torque Specifications Unified – Thread Standard (UNC)

NOMINAL DIAMETER (IN)	OPPOSITE NUT SIZE (S)	CLASS 5	CLASS 8
1/4-20	7/16"	10 Nm (7 ft-lb)	14 Nm (10 ft-lb)
5/16-18	1/2"	21 Nm (15 ft-lb)	29 Nm (21 ft-lb)
3/8-16	9/16"	37 Nm (27 ft-lb)	51 Nm (38 ft-lb)
7/16-14	5/8"	60 Nm (44 ft-lb)	82 Nm (60 ft-lb)
1/2-13	3/4"	90 Nm (66 ft-lb)	130 Nm (96 ft-lb)
9/16-12	13/16"	130 Nm (96 ft-lb)	180 Nm (133 ft-lb)
5/8-11	15/16"	178 Nm (131 ft-lb)	250 Nm (184 ft-lb)
3/4-10	1-1/8"	315 Nm (232 ft-lb)	445 Nm (328 ft-lb)
7/8-9	-	509 Nm (375 ft-lb)	715 Nm (527 ft-lb)

Unless special torque requirements are listed in this manual or other instructions, torque Unified Thread Standard bolts (label: UNF) to the values listed in the table below.

Table 2-14 Bolt Torque Specifications – Thread Standard (UNF)

NOMINAL DIAMETER (IN)	OPPOSITE NUT SIZE (S)	CLASS 5	CLASS 8
1/4-28	7/16"	11.5 Nm (8 ft-lb)	16 Nm (11 ft-lb)
5/16-24	1/2"	23 Nm (17 ft-lb)	32 Nm (24 ft-lb)
3/8-24	9/16"	41 Nm (30 ft-lb)	58 Nm (43 ft-lb)
7/16-20	5/8"	65 Nm (48 ft-lb)	92 Nm (68 ft-lb)
1/2-20	3/4"	100 Nm (74 ft-lb)	145 Nm (107 ft-lb)
9/16-18	13/16"	145 Nm (107 ft-lb)	200 Nm (148 ft-lb)
5/8-18	15/16"	200 Nm (148 ft-lb)	280 Nm (207 ft-lb)
3/4-16	1-1/8"	350 Nm (258 ft-lb)	495 Nm (365 ft-lb)
7/8-14	-	560 Nm (413 ft-lb)	780 Nm (575 ft-lb)

3 SYSTEM DESCRIPTIONS

POWER SYSTEM

The machine is powered by one of the diesel engines below (optional):

- Cummins QSF2.8t3TC72
- Deutz TD2.9L4

The auxiliary power consists of two 12V batteries in tandem connection to drive a 12V DC motor. The gear pump is splined to the output shaft of the motor to provide auxiliary power for the systems.

HYDRAULIC SYSTEM

All functions of the machine are driven by hydraulic system. The entire hydraulic system can be divided into two sections: one for boom functions, driven by a open type variable pump; the other for chassis driving, driven by a closed type variable pump.

When the engine operates, the hydraulic pump diverts the pressure oil to the boom function manifold, on which is intalled with directional valves and flow regulator valves for completing various boom functions and regulating the speed. Relief valve is fitted on the manifold to avoid system overload, and counterbalance valve is fitted to each boom cylinder to prevent the boom or platform from moving if the hydraulic system fails.

ELECTRICAL SYSTEM

The system adopts 2 series-connected 12V batteries to start the engine, auxiliary pump as well as the three controllers for engine control, platform control and ground control. The battery is charged by the DC generator powered by the engine. The battery separator is used for charging one of the two batteries first and the other thereafter. Two circuit breakers are used to protect the control system.

MACHINE CONTROL SYSTEM

The machine functions are controlled by two controllers, one installed on the left side of turntable to

control the boom functions, the other on the platform to control the machine drive and boom functions. The controller communicates signals through a high-speed data bus.

SAFETY MEASURES

A series of proximity switches and limit switches are used to provide signals for the controller.

- The level sensor measures the inclinations in X axis and Y axis of the chassis. When the inclined angle in X or Y axis exceeds 5°, the alarm will go off and restrict such functions as lift, drive and steer.
- The length sensor measures the boom extended length. When the boom extended length exceeds the maximum allowable horizontal reach, the boom is restricted from continuing extending.
- The angle sensor measures the boom lift angle. When the boom lift angle exceeds the limits, the boom is restricted from continuing lifting/lowering.
- The weight sensor measures the weight on the platform. When the weight on the platform exceeds the rated load, the buzzer will sound continuously, the overload indicator will flash, the display will indicate platform overload, the associated functions will be restricted.

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4 SERVICE AND GUIDELINES

MACHINE PREPARATION, INSPECTION AND MAINTENANCE

GENERAL

This section provides safety and necessary information for the machine operators. For maximum service life and safe operation, ensure that all necessary inspections and maintenance have been completed before placing the machine into service

About machine positions

Stowed position :

The boom is fully lowered and retracted.

Non-operating position :

The boom lifts within 15° above the horizontal, and the boom extends not exceeding 1.2m.

Operating/raised position

The boom lifts beyond 15° above the horizontal, or the boom extends exceeding 1.2m.

PREPARATION, INSPECTION AND MAINTENANCE

It is important to establish and conform to a comprehensive inspection and preventive maintenance program. This manual outlines the scheduled machine inspections and maintenance recommended by Hunan Sinoboom Intelligent Co., Ltd.. Consult your national, regional or local regulations for aerial work platforms. The frequency of inspections and maintenance must be increased as environment, severity and frequency of usage requires.

QUALIFIED SINOBOOM EQUIPMENT MECHANIC

Qualified Sinoboom equipment mechanic is a person recognized by Sinoboom as one who, by possession of a recognized degree, certificate, training, has successfully demonstrated the ability and proficiency to service, repair and maintain the subject Sinoboom product model.

PRE-OPERATION INSPECTION

Prior to daily use or work shift of operators, the user or operator should perform a pre-operation inspection. Refer to the *Operation Manual* for the complete procedure for the pre-operation inspection. The *Operation Manual* must be entirely read and understood before performing the pre-operation inspection.

PRE-DELIVERY INSPECTION AND FREQUENT INSPECTION

The pre-delivery inspection shall be performed by qualified Sinoboom equipment mechanic. The pre-delivery inspection and the frequent inspection are performed in the same manner, but at different times. The pre-delivery inspection shall be performed before each sale, lease or rental delivery. The frequent inspection shall be accomplished for each machine in service for 3 months or 150 hours (whichever comes first); out of service for a period of more than 3 months; or when purchased used. The frequency of this inspection must be increased as environment, severity and frequency of usage requires.

Reference the *Prepare the Work Record before Delivery* and *Repair & Inspection Report* for items requiring inspection. Reference the *Inspection Procedures* in appropriate areas of this manual to perform the inspection and maintenance procedures.

ANNUAL MACHINE INSPECTION

The annual machine inspection must be performed on an annual basis, no later than 13 months from the date of the prior annual machine inspection. Hunan Sinoboom Intelligent Equipment Co., Ltd. recommends this task be performed by a factory-trained service technician, a person recognized by Sinoboom as one who, by possession of a recognized degree, certificate, training, has successfully demonstrated the ability and proficiency to service, repair and maintain the subject Sinoboom product model.

Reference the *Repair & Inspection Report* for items requiring inspection. Reference the *Inspection Procedures* in appropriate areas of this manual to perform the inspection and maintenance procedures.

For the purpose of receiving the safety-related bulletins, it is important that Hunan Sinoboom Intelligent Equipment Co., Ltd. has updated ownership information for each machine. When performing each

SERVICE AND GUIDELINES



annual machine inspection, notify Hunan Sinoboom Intelligent Equipment Co., Ltd. of the current machine ownership information.

PREVENTIVE MAINTENANCE

The preventive maintenance must be performed by a qualified Sinoboom equipment mechanic.

Reference the *Repair & Inspection Report* and *Maintenance Schedule* in this manual for the inspection items and intervals. Reference the *Inspection Procedures* in appropriate areas of this manual to perform the inspection and maintenance procedures.

Table 4-1

Type	Frequency	Primary Responsibility	Service Qualification	Reference
Pre-operation Inspection	Prior to use each day; or at each operator change.	User or operator	User or operator	Operation Manual
Pre-delivery Inspection	Prior to each sale, lease or rental delivery.	Owner, dealer or user	Qualified Sinoboom mechanic	Maintenance Manual, Pre-delivery Preparation Form, and Maintenance Inspection Report
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	Qualified Sinoboom mechanic	Maintenance Manual and Maintenance Inspection Report
Annual Machine Inspection	Annually, no later than 13 months from the date of the prior annual inspection.	Owner, dealer or user	Factory-trained service technician	Maintenance Manual, Pre-delivery Preparation Form, and Maintenance Inspection Report
Preventive Maintenance	At intervals as specified in the Maintenance Manual.	Owner, dealer or user	Qualified Sinoboom mechanic	Maintenance Manual, Maintenance Inspection Report, and Maintenance Schedule

MAINTENANCE AND SERVICING PRECAUTIONS

GENERAL

This section assists you in the use and application of the maintenance and servicing procedures contained in this manual.

SAFETY AND WORKMANSHIP

Your safety, and that of others, is the first consideration when engaging in the maintenance of equipment. Never attempt to move heavy parts without the aid of a mechanical device. Do not allow heavy objects to rest in an unstable position. When raising a portion of the equipment, ensure that adequate support is provided.

CLEANLINESS

1. The most important single item in preserving the service life of a machine is to keep dirt and foreign materials out of the vital components. Precautions have been taken to safeguard against this. Shields,

covers, seals and filters are provided to keep air, fuel and oil supplies clean; however, these items must be maintained on a scheduled basis to function properly.

2. When air, fuel or oil lines are disconnected, clean the adjacent areas as well as the openings and fittings. As soon as a component or line is disconnected, cap or cover all openings to prevent entry of foreign matter.
3. Clean and inspect all parts during servicing and maintenance, and assure that all passages and openings are unobstructed. Cover all parts to keep them clean. Be sure all parts are clean before they are installed. New parts should remain in their containers until they are ready to be used.

COMPONENT REMOVAL AND INSTALLATION

1. Use adjustable lifting devices, whenever possible, if mechanical assistance is required. All slings (-chains, cables, etc.) should be parallel to each other and as near perpendicular as possible to top of part being lifted.
2. Should it be necessary to remove a component on an angle, keep in mind that the capacity of an eyebolt or similar bracket lessens, as the angle

SERVICE AND GUIDELINES

between the supporting structure and the component becomes less than 90 degrees.

3. If a part resists removal, check to see whether all nuts, bolts, cables, brackets, wiring, etc, have been removed and that no adjacent parts are interfacing.

COMPONENT DISASSEMBLY AND ASSEMBLY

When disassembling or reassembling a component, complete the procedural steps in sequence. Do not partially disassemble or assemble one part, then start on another. Always recheck your work to assure that nothing has been overlooked. Do not make any adjustments, other than those recommended, without obtaining proper approval.

PRESSURE-FIT PARTS

When assembling pressure-fit part, use a molybdenum disulfide base compound or equivalent to lubricate the mating surface.

BEARINGS

1. When a bearing is removed, cover it to keep out dirt and abrasives. Clean bearings in nonflammable cleaning solvent and allow to drip dry. Compressed air can be used but do not spin the bearing.
2. Discard bearings if the races and balls (or rollers) are pitted, scored, or burned.
3. If bearing is found to be serviceable, apply a light coat of oil and wrap it in clean (waxed) paper. Do not unwrap reusable or new bearings until they are ready to install.
4. Lubricate new or used serviceable bearings before installation. When pressing a bearing into a retainer or bore, apply pressure to the outer race. If the bearing is to be installed on a shaft, apply pressure to the inner race.

GASKETS

Check that holes in gaskets align with openings in the mating parts. If it becomes necessary to hand-fabricate a gasket, use gasket material or stock of equivalent material and thickness. Be sure to cut holes in the right location, as blank gaskets can cause serious system damage.

BOLT USAGE AND TORQUE APPLICATION

NOTICE

Self-locking fasteners, such as nylon insert and thread deforming locknuts, are not intended to be reinstalled after removal.

1. Always use new replacement hardware when installing locking fasteners. Use bolts of proper length. A bolt which is too long will bottom before the head is tight against its related part. If a bolt is too short, there will not be enough thread area to engage and hold the part properly. When replacing parts, use only those having the same specifications of the original, or one which is equivalent.
2. Unless specific torque requirements are given within the text, standard torque values should be used on heat-treated bolts, studs, and steel nuts, in accordance with recommended shop practices. (See [Fastener Torque Specifications, page 2-13](#))

HYDRAULIC LINES AND ELECTRICAL WIRING

Clearly mark or tag hydraulic lines and electrical wiring, as well as as their receptacles, when disconnecting or removing them from the unit. This will assure that they are correctly reinstalled.

HYDRAULIC SYSTEM

1. The primary enemy of a hydraulic system is contamination. Contaminants enter the system by various means, e.g., using inadequate hydraulic oil, allowing moisture, grease, filings, sealing components, sand, etc., to enter when performing maintenance.
2. Keep the system clean. If evidence of metal or rubber particles are found in the hydraulic system, drain and flush the entire system.
3. Disassemble or reassemble parts on clean work surface. Clean all metal parts with non-flammable cleaning solvent. Lubricate components, as required, to aid assembly.

LUBRICATION

Service applicable components with the amount, type, and grade of lubricant recommended in this manual, at the specified intervals. When recommended lubricants are not available, consult your local supplier for an

equivalent that meets or exceeds the specifications listed.

BATTERY

Clean battery, using a non-metallic brush and a solution of baking soda and water. Rinse with clean water. After cleaning, thoroughly dry battery and coat terminals with an anti-corrosion compound.

PINS AND COMPOSITE BEARING

1. Pinned joints should be disassembled and inspected if the following occurs :
 - Excessive sloppiness in joints.
 - Noise originating from the joint during operation.
2. The composite bearing should be replaced if the following occurs :
 - Frayed or separated fibers on the liner surface.
 - Cracked or damaged liner backing.
 - Bearing that have moved or spun in their housing.
 - Debris embedded in liner surface.
3. Pins should be replaced if any of the following is observed (pin should be properly cleaned prior to inspection) :
 - Detectable wear in the bearing area.
 - Flaking, peeling, scoring, or scratches on the pin surface.
 - Rusting of the pin in the bearing area.
4. Reassembly of pins and composite bearing:
 - Housing should be blown out to remove all dirt and debris. Bearings and bearing housings must be free of all contamination.
 - Bearing/pins should be cleaned with a solvent to remove all grease and oil. The composite bearing is a dry joint and needs no lubricating.
 - Pins should be inspected to ensure it is free of burrs, nicks, and scratches which would damage the bearing during installation and operation.

APPLICATION OF INSULATING SILICONE GREASE TO ELECTRICAL CONNECTIONS

Insulating silicone grease should be applied to all electrical connections for the purpose of :

- Avoiding oxidization of the mechanical joints between the male pins and female pins.
- Avoiding electrical failure due to low conductivity between the pins in humid environment.

The following procedure should be observed to apply the insulating silicone grease to the electrical connections. The procedure applies to all plugged connections outside of the power distribution box. The silicone grease is not suitable for the connectors with enclosed outer surface.

1. Prior to the machine assembling, apply silicone grease around the male pins and female pins inside the connectors to prevent oxidization. An injector may be used for the convenience of operation.

NOTICE

The oxidization exceeding a certain period will increase the resistance of the connector and eventually lead to electrical failure.

2. Silicone grease should be applied to each electrical cord that is exposed at the outside of the connector to prevent short circuit. Besides, the joint between the male and female connectors should also been applied with silicone grease. Other joints that may allow entry of water into the connectors, like the area around the anti-pull buckle, should be properly sealed as well.

NOTICE

Since the electrical conductivity of cleaning solvent is superior to that of water, it is mostly likely that this will occur when using pressure cleaning method to clean the machine.

3. Silicone grease should be applied to each contact of the connectors for battery case and charger.

NOTICE

The setting type sealant can be used to avoid short circuit and keep the connections tidy, but it will make the future removal of pins more difficult.

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5 MAINTENANCE PROCEDURES

This section provides specific procedures for scheduled maintenance inspection.

**WARNING**

**UNSAFE OPERATION HAZARD**
Improper maintenance may result in death, severe injury or machine damage.

Observe the following rules :

- Maintenance inspections shall be completed only by a person trained and qualified on the maintenance of this machine.
- Routine maintenance inspection contains the inspection items to be performed daily for normal machine operation. The service technician must perform the routine maintenance inspection and complete the report in details.
- Scheduled maintenance inspection shall be completed quarterly, half-yearly, and annually. The service technician must perform the scheduled maintenance inspection and complete the report in details.
- Timely tag and remove from service a damaged or malfunctioning machine.
- Repair any machine damage or malfunction before operating machine.
- Keep all inspection records for at least 10 years or until the machine has been removed from service or as required by the machine owner/company/keeper.
- Machines that have been out of service for a period longer than 3 months must complete the quarterly inspection.
- The replacement parts used in the maintenance should be identical or equivalent to the original parts.
- Unless otherwise specified, perform the maintenance procedures according the following terms and conditions:
 - Park the machine on flat, level and solid ground.
 - Place the machine in non-operating position.
 - Turn the key switch on ground controller to OFF position and remove the key to prevent unauthorized use of the machine.
 - Pull out the red emergency stop buttons on ground and platform controls to OFF position to

avoid unintended start-up of the operating system.

- Turn off the main power switch.
- Disconnect all DC power supply.
- Lock all wheels to prevent movement of the machine.
- Before releasing or removing the hydraulic components, release the hydraulic oil pressure in the hydraulic circuit, particularly with the counterweight valve.

CONDUCTING A PRE-DELIVERY INSPECTION

When the machine owner/company changes, in addition to conducting a pre-delivery inspection, the corresponding inspection shall be carried out according to the maintenance schedule requirement and repair & inspection report. When conducting a pre-delivery inspection, comply with the following requirements:

1. It is the responsibility of the machine owner/company to perform a pre-delivery inspection.
2. Follow this procedure each time before delivery. Performing a pre-delivery inspection could reveal potential problems with the machine before you begin putting the machine into service.
3. Never use a damaged or malfunctioning machine. Tag the machine and do not use it.
4. Only professionally trained, qualified personnel may repair the machine and must follow the procedures as stated in *operation manual* and *maintenance manual*.
5. A competent operator must conduct daily maintenance on this machine as stated in *operation manual* and *maintenance manual*.

Before delivering the machine, complete the following record using these instructions:

1. Prepare the machine before delivery, which includes performing a pre-delivery inspection, following maintenance procedures and performing functional inspections.
2. Use the following table to note the results. After each section is complete, mark the appropriate box.
3. Record the inspection results. If any inspection results are "NO", the machine must be stopped and

MAINTENANCE PROCEDURES

re-inspected after repair is completed and marked in the box marked "inspection".

Table 5-1

PREPARE THE WORK RECORD BEFORE DELIVERY			
Model			
Serial No.			
Inspection Item	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired
Pre-operational Inspection			
Maintenance Procedure			
Functional Inspection			
Machine Buyer/ Renter			
Inspector Signature			
Inspector Title			
Inspector Company			

FOLLOWING A MAINTENANCE SCHEDULE

Regular maintenance inspections must occur daily, quarterly, biannually (every 6 months) and annually. Use the table to help you adhere to a routine maintenance schedule.

Table 5-2

INSPECTION INTERVAL	INSPECTION PROCEDURES
Every day or every 8 hours	A
Every quarter or every 250 hours	A+B
Every half a year or every 500 hours	A+B+C
Every year or every 1000 hours	A+B+C+D

COMPLETING A REPAIR & INSPECTION REPORT

1. Divide the Repair & Inspection Report into four sections (A, B, C and D) according to the time requirements of the maintenance schedule and the maintenance procedure requirements.
2. The Repair & Inspection Report shall include the inspection table of each regular inspection.
3. Duplicate the Repair & Inspection Report for each inspection. Store the completed tables for 10 years or until the machine is no longer in use or as required by machine owner/company/custodian.
4. Use the following table to note the results. After each section is complete, mark the appropriate box.
5. Record the inspection results. If any inspection results are "NO", the machine must be stopped and re-inspected after repair is completed and marked in the box marked "inspection". Select the appropriate inspection procedure based on the inspection type.

Table 5-3

REPAIR & INSPECTION REPORT	
Model	
Serial No.	

REPAIR & INSPECTION REPORT				
Checklist A Procedures				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired	Problem Description
A-1 Inspect All Manuals				
A-2 Inspect All Decals				
A-3 Inspect Damaged, Loose or Lost Parts				
A-4 Inspect Hydraulic Oil Level				
A-5 Inspect Hydraulic Oil Leakage				
A-6 Inspect Fuel Level				
A-7 Inspect Fuel Leakage				
A-8 Inspect Engine Oil Level				
A-9 Inspect Coolant Level				
A-10 Inspect Engine Belt				
A-11 Inspect Fuel Filter				
A-12 Inspect Cooling Fan				
A-13 Inspect Engine Intake System				
A-14 Functional Tests				
A-15 Test Floating Outrigger (if Equipped)				
A-16 Test Drive Speed				
A-17 Test Emergency Lowering Function				
A-18 Test Tilt Protection System				
A-19 Test Weighing System				
A-20 Perform Maintenance after 30 Days				
Checklist B Procedures				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired	Problem Description
B-1 Replace Hydraulic Oil Tank Return Filter				

MAINTENANCE PROCEDURES



REPAIR & INSPECTION REPORT				
B-2 Inspect Rim ,Tire and Fasteners				
B-3 Inspect Hydraulic Oil				
B-4 Inspect Cooling System				
B-5 Replace Fuel filter				
B-6 Inspect Air filter of Hydraulic Tank				
B-7 Replace High-Pressure Filter				
B-8 Replace Air Filter of Engine				
B-9 Inspect Length and Angle Sensors				
B-10 Inspect Engine Exhaust System				
B-11 Inspect Drive Reducer Oil Level				
B-12 Inspect Slewing Reducer Oil Level				
B-13 Inspect Slewing Bearing Bolts				
B-14 Lubricate Slewing Bearing				
B-15 Inspect Platform Rotate Cylinder Fasteners				
B-16 Test Cylinder Drift				
B-17 Test Float Cylinder Exhausting and Counterbalance Valve Locking				
B-18 Inspect Electrical Wiring				
B-19 Inspect the battery				
Checklist C Procedures				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/ Machine Has Been Repaired	Problem Description
C-1 Replace Fuel Filter Element				
C-2 Inspect Boom Extend/ Retract Cables and Pulleys				
C-3 Replace Engine Oil				

REPAIR & INSPECTION REPORT				
C-4 Replace Engine Oil Filter				
Checklist D Procedures				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired	Problem Description
D-1 Replace Drive Reducer Gear Oil				
D-2 Replace Slewing Reducer Gear Oil				
D-3 Replace Hydraulic Oil				
D-4 Replace Hydraulic Tank Suction Filter				
D-5 Replace Coolant and Coolant Hoses				
D-6 Replace Fuel Hoses				
D-7 Inspect Boom Wear Pads				
User				
Inspector Signature				
Inspector Date				
Inspector Title				
Inspector Company				

CHECKLIST A PROCEDURES

A-1 Inspect All Manuals

Keeping the *Operation Manual* and *Maintenance Manual* in appropriate place is vital to safe machine operation. The manuals should be kept at all times in the manual storage container on the platform. If the manual is missing or illegible, it will fail to provide the information necessary for safe machine operation.

- Verify the manual storage container is properly installed on the platform.
- Verify the *Operation Manual* and *Maintenance Manual* are in good condition and placed inside the storage container.
- Verify each page of the manuals is legible and intact.

- Return the manual to the storage container after each use.

Note: If the manuals need to be replaced, please contact Hunan Sinoboom Intelligent Equipment Co., Ltd..

A-2 Inspect All Decals

Ensuring all decals in good condition is vital to safe machine operation. Decals serve not only to alert the operator to potential hazards but also to provide the user with information regarding operation and maintenance. An illegible decal will fail to provide correct instructions for the operator, which may lead to the occurrence of unsafe operation.

- Refer to the Decals/Nameplate Inspection in *Operation Manual* and use the list and chart of decals to determine the correct location of a decal.

MAINTENANCE PROCEDURES

- Verify all decals are legible and free of damage, and replace in time if necessary.

Note: If the decals on the machine need to be replaced, please contact Hunan Sinoboom Intelligent Equipment Co., Ltd..

A-3 Inspect Damaged, Loose or Lost Parts

Check the machine for any damaged, improperly installed, loose or lost parts and unauthorized changes:

- Electrical components, wirings and cables
- Hydraulic hoses & fittings, hydraulic cylinder and valve block
- Fuel tank and hydraulic tank
- Storage battery pack and its connection
- Drive motor & reducer, slewing motor & reducer
- Boom wear pads and telescopic axle wear pads
- Limit switch and horn
- Tire and rim
- Engine and associated parts
- Alarms and lighting (if equipped)
- Guardrail and entry gate
- Structure and welding cracks
- Nuts, bolts and other fasteners

NOTICE

If damaged parts, incorrect installation or missing parts are discovered, please replace immediately and install correctly; if the fasteners are found detached or loose, please secure immediately.

A-4 Inspect Hydraulic Oil Level

Ensuring appropriate hydraulic oil level is vital to proper operation of the machine. If too high, the oil will spill out from the oil tank during machine operation, if too low, the oil pump will suction air and damage hydraulic components. Performing daily inspection of the hydraulic oil level will help you determine if a problem exists in the hydraulic system.

Perform the following procedures with the boom in stowed position:

1. Open the left turntable cover to make visual inspection of the sides of hydraulic tank, the hydraulic oil level should be within the marking range of oil level indicator.

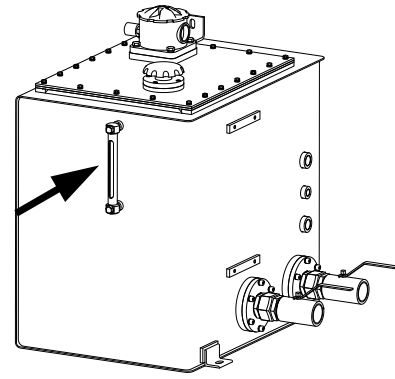


Figure 5-1

2. Ensure the hydraulic tank body and its connections are free of leaks.
3. Add oil as needed. Never overfill the tank.

Table 5-4

CUSTOMER REQUIREMENTS	HYDRAULIC OIL MARK
Normal-temperature region 0°C to 40°C (32°F to 104°F)	L-HM46
Cold region -25°C to 25°C (-13°F to 77°F)	L-HV32
High-temperature region greater than 40°C (104°F)	L-HM68
Extremely cold region less than -30°C (-22°F)	Special programmes need to be identified.

NOTICE

Different hydraulic oils can be added according to customer requirements upon factory delivery, but cannot be mixed.

A-5 Inspect Hydraulic Leakage

Preventing the hydraulic oil from leaking is vital to safe and normal machine operation. If the hydraulic leaks fail to be discovered, it will lead to hazardous situations, reduce the machine performance and damage components.

Inspect the area on or around the following components for hydraulic spill, dripping or residues:

- Hydraulic tank, filters, hoses, fittings, and emergency power unit
- All hydraulic cylinders, manifolds and pumps

- Engine
- Boom system
- Slewing bearing
- Drive chassis
- Areas around the machine

A-6 Inspect Fuel Level

NOTICE

Be sure to shut down the engine before inspection.

Keeping the diesel fuel at an appropriate level is vital to maintaining the engine performance and extending service life. An inappropriate fuel level will bring damage to the engine parts and lead to improper functioning of the machine.

Perform the following procedures with the boom in stowed position:

1. Turn on the key switch at ground control, the indicator panel of the ground control will show the fuel level percentage.

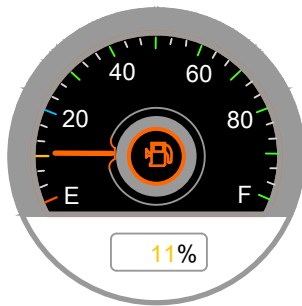


Figure 5-2

2. When the fuel level is less than or equal to 10%, the alarm will sound, be sure to add fuel to continue working.
3. Ensure the fuel tank and its connections are free of leaks.
4. Add fuel with the engine off only.
5. Open the cap of fuel tank, add fuel as need. Never overfill the tank, it is recommended to add 50%–100% of the tank capacity.

Table 5-5

DIESEL GRADE	RECOMMENDED AMBIENT TEMP
5#	Lowest temperature 8°C or higher
0#	Lowest temperature 4°C or higher

DIESEL GRADE	RECOMMENDED AMBIENT TEMP
-10#	Lowest temperature -5°C or higher
-20#	Lowest temperature -14°C or higher
-35#	Lowest temperature -29°C or higher
-50#	Lowest temperature -44°C or higher

NOTICE

- The diesel has been drained off before delivery, so the customer should add diesel of appropriate grade to suit the operating ambient temperature and the governing emission regulations.
- Do not add mixed diesel of different grades.
- The light fuel may affect the fuel economy or damage the combustion components.
- It is recommended to use the diesel with sulphur content less than 5000ppm.
- It is recommended to use the diesel with min. cetane number of 45 in operating temperatures below 0°C and min. cetane number of 40 in operating temperatures over 0°C. When the cetane number of the diesel in use is less than the recommended number, it may lead to startup failure, instable running or large amount of white smoke.
- The max cloud point and pour point of the diesel must be 6°C less than the lowest operating ambient temperature.



WARNING

EXPLOSION AND FIRE HAZARD



- Do not mix the diesel with gasoline, alcohol or their mixture.
- Do not add diesel when the engine is running.

MAINTENANCE PROCEDURES

WARNING



DAMAGED MACHINE HAZARD

Due to the extremely accurate tolerance match of the diesel injection system, it is critical to keep the fuel clean and free of dirt or water. The dirt or water entering the combustion system can cause severe damage to the fuel pump and injectors.

A-7 Inspect Fuel Leakage

Inspecting fuel leakage is vital to safe and normal machine operation. If a fuel leak is not discovered and corrected in a timely manner, it will pose hazardous situations.

NOTICE

Shut off the engine before inspection.

WARNING

EXPLOSION AND FIRE HAZARD



- Diesel is an inflammable material. This procedure must be performed outdoors in well-vented area and far away from flames.
- Ensure that a conforming fire extinguisher is readily accessible when performing this inspection procedure.

Inspect for diesel spills, drippings or residues in the following areas :

- Fuel tank, piping and fittings
- Fuel pump and fuel filter
- Fuel injection system

WARNING

EXPLOSION AND FIRE HAZARD



If fuel leakage is discovered, immediately forbid any other personnel from entering the area or operating the machine, and repair the leakage as soon as possible.

A-8 Inspect Engine Oil Level

NOTICE

Turn off the engine before inspection.

The appropriate engine oil level is vital to maintaining the engine performance and extending its service life, otherwise it will damage the engine parts. Through the daily check the inspector can know about the changes on engine oil level which may indicate a system distress with the engine.

1. Turn the ground/platform select switch to ground control.
2. Pull out the emergency stop button at ground controls to ON position.
3. Turn the key switch at ground controls to ON position.
4. Move the engine start switch and idle for 2 minutes.
5. Switch off the engine, and 5 minutes later open the turntable cover on the right side.
6. Remove the engine dipstick to inspect the engine oil level.
7. The engine oil level should be between the FULL and ADD marks.
8. Add engine oil as needed. Do not overfill. It is recommended to use engine oil equivalent to or higher than CH-4 with viscosity grade of 15W-40.

Table 5-6

VISCOSITY	RECOMMENDED AMBIENT TEMP
0W-30	-35°C ~ 0°C
5W-40	-25°C ~ 30°C
15W-40	-15°C ~ 40°C
20W-50	0°C ~ 50°C

NOTICE

- The engine oil filled by the factory is generally CH-4 with viscosity 15W-40, suitable for regions with ambient temperature range of 15°C ~ 40°C. If the operating ambient temperature is outside of the range, please change the engine oil as appropriate.
- The multi-grade engine oil can provide excellent lubrication under high-temperature operating condition, reduce the sediments, and improve the engine low-temperature start performance and durability. Also, the multi-grade engine oil plays an important role in fulfilling the machine with the emission standards.
- Do not mix the engine oils of different grades.
- It is recommended that the sulphated ash content not exceed 1%, otherwise it will damage the air valve or piston, and lead to excessive consumption of engine oil.
- The use of high-quality engine oil in conjunction with suitable oil filter and change interval is very critical to maintaining engine performance and extending service life. If the oil or oil filter is not changed as recommended, there will be sediments, contaminants or wear incurred which will shorten the engine service life.

A-9 Inspect Coolant Level

The appropriate coolant level is vital to maintaining the engine performance and extending its service life, otherwise it will damage the engine parts. Through the daily check the inspector can know about the changes on coolant level which may indicate a system distress with the engine.

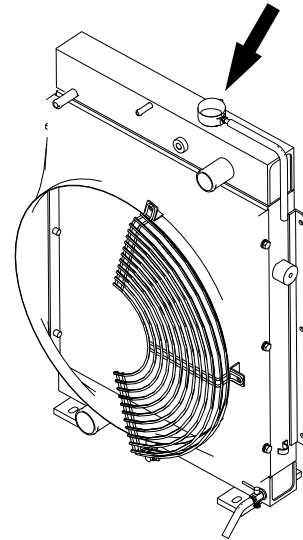
! WARNING**HIGH TEMPERATURE AND PRESSURE HAZARDS**

Before inspecting the coolant level, allow the coolant to cool down to room temperature, and slowly open the cover to release the pressure.

**NOTICE**

Turn off the engine before inspection.

1. Turn off the engine, and open the right turntable cover.
2. Open the cover of coolant box over the radiator to inspect the coolant level.

**Figure 5-3**

3. The coolant level should be at the fill inlet of the coolant box.
4. Add coolant as needed. Do not overfill. It is recommended to choose the -18°C ready-mix coolant or the ethylene glycol(ethylene and propene) in ratio mix with water. The water quality must meet the requirements as listed in the table below.

Table 5-7

COOLANT TYPE	RECOMMENDED AMBIENT TEMP
-18°C ready-mix coolant	-18°C or higher
-37°C ready-mix coolant	-37°C or higher
50% ethylene glycol and 50% water mixed coolant	-32°C ~ 0°C
65% ethylene glycol and 40% water mixed coolant	-54°C ~ -32°C

MAINTENANCE PROCEDURES

NOTICE

- Do not apply sealing additive to the cooling system, otherwise it will cause blockage to the low-fluidity area, radiator and engine oil cooler, or damage the water pump sealing.
- Do not apply soluble engine oil to the cooling system, otherwise it will corrode the brass and copper, damage the surface of heat exchanger, sealings and hose.
- The water added into the coolant must meet the requirements of calcium and magnesium less than 170ppm and sulphur less than 100ppm. Excessive calcium and magnesium can lead to scale formation, and excessive chloride and sulfate can corrode the cooling system.

NOTICE

The engine manufacturer recommends the drive belt not be applied with belt oil or anti-slipping agent.

A-11 Inspect Fuel Filter

NOTICE

Shut off the engine before inspection.

Inspecting the fuel filter is vital to proper functioning of engine. Failure to perform this inspection procedure will result in engine working improperly or component damage.

A-10 Inspect Engine Belt

Maintaining the engine belt in good condition is vital to good machine performance and service life. The machine should not continue operation with the engine belt being loose or deficient, or it will result in component damage.

NOTICE

Shut off the engine before inspection.

Inspect the engine belt for :

- Crack or breakage
- Wear or misalignment
- Peeling-off
- Glazing or hardening
- Improper tensioning (press at the middle position of the mostly extended belt between the pulleys to check the tensioning condition, the press-down of belt should not exceed 13mm [0.5 in.])

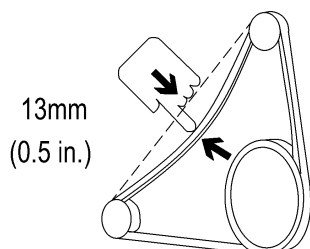


Figure 5-4

Replace the engine belt immediately if the above conditions occur.



WARNING

EXPLOSION AND FIRE HAZARD



- Diesel is an inflammable material. This procedure must be performed outdoors in well-vented area and far away from flames.
- Ensure that a conforming fire extinguisher is readily accessible when performing this inspection procedure.

1. Open the right turntable cover.
2. Locate the fuel filter.
3. Loosen the plug of drain valve at the bottom, and drain the water into a suitable vessel until the fuel flows out.

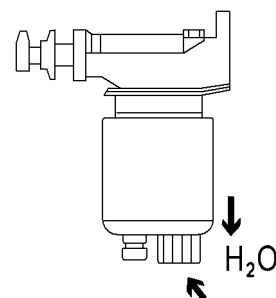


Figure 5-5

4. Tighten the valve plug.
5. Clean up the fuel spill.
6. Start the engine from the ground controller and inspect the fuel filter for leakage.

A-12 Inspect Cooling Fan

Inspecting cooling fan is vital to normal functioning of engine and extending service life.

NOTICE

Shut off the engine before inspection.

1. Open the cover on the right side of engine.
2. Locate the cooling fan in the radiator of engine.
3. Inspect the cooling fan for :
 - Cracks
 - Tilting or loosening
 - Abrasion
4. Please replace immediately if any of the above conditions occurs.

A-13 Inspect Engine Intake System

Inspecting the engine intake system is vital to good engine performance and extending service life.

NOTICE

Shut off the engine before inspection.

1. Inspect whether the engine intake tube is damaged or extruded flat, or getting loose. If such conditions occur, the dust or debris may enter the engine.

2. Tighten or replace parts, if needed, to assure the intake system free from leakage.

NOTICE

Even if a tiny amount of dust or debris gets inside the engine, it will result in severe wear of piston ring and increased exhaust. Be sure to keep the intake system clean and free of leakage.

A-14 Functional Tests

Testing each machine function is vital to safe machine operation. If any function operates improperly, it will pose dangers to safe operation. Ensure any function operates smoothly and reliably, without shaking, sharp or unusual noise.



WARNING

UNSAFE OPERATION HAZARD



Be sure to observe the instructions and safety rules noted in this manual and *Operation Manual*, otherwise it may lead to death or severe injury.

For the specific procedure for function tests, please reference the Pre-operation Function Test section in *Operation Manual*. Before performing the function test, ensure that the safety rules in the operation manual are fully read and understood.

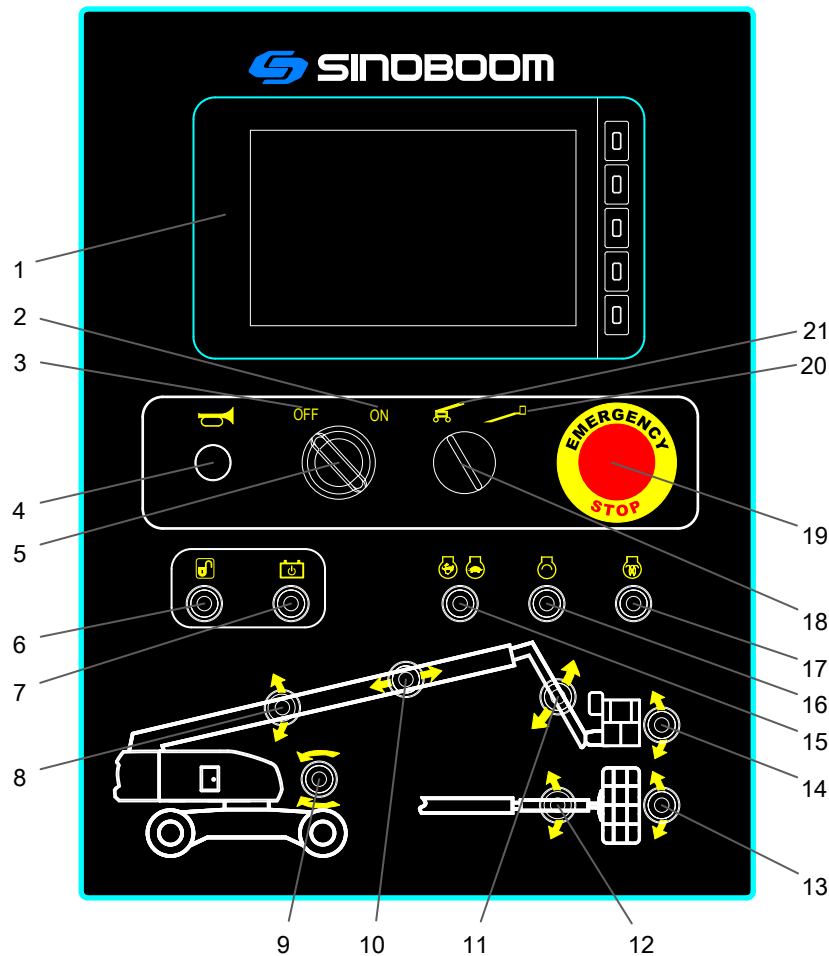


Figure 5-6 Ground Controller

Table 5-8

1. Display screen (See the Fig and Table below)	8. Main boom up/down switch	15. Engine high/low speed select switch
2. ON position	9. Turntable rotate switch	16. Engine start switch
3.OFF position	10. Main boom telescoping switch	17. Engine preheat switch (if equipped)
4. Horn	11. Jib up/down switch-GTBZ28J	18. Ground/Platform select switch
5. Key switch	12.Jib rotate switch-GTBZ28J (if equipped)	19. Emergency stop button
6. Enable switch	13. Platform rotate switch	20. Platform control position
7. Emergency power switch	14. Platform level switch	21. Ground control position

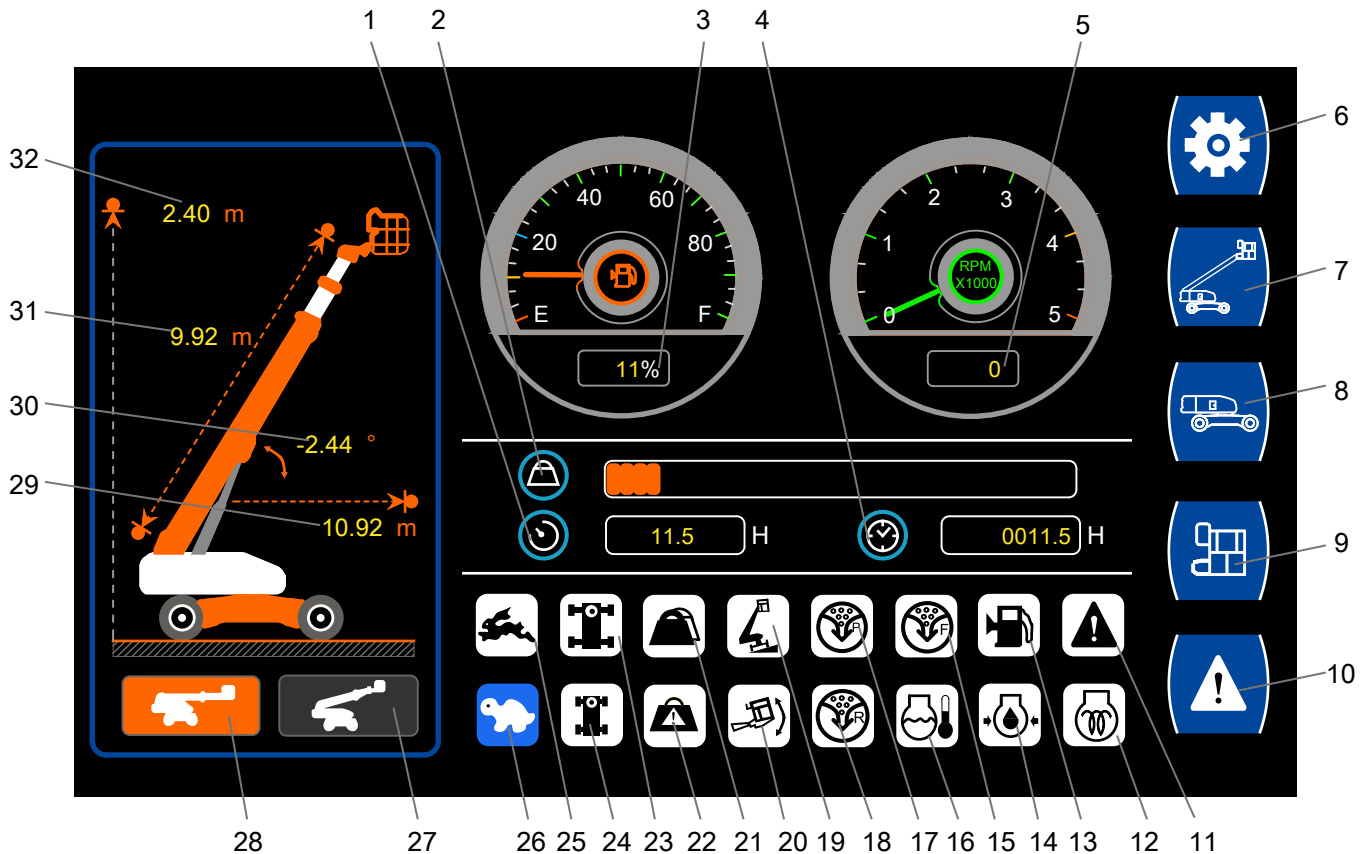
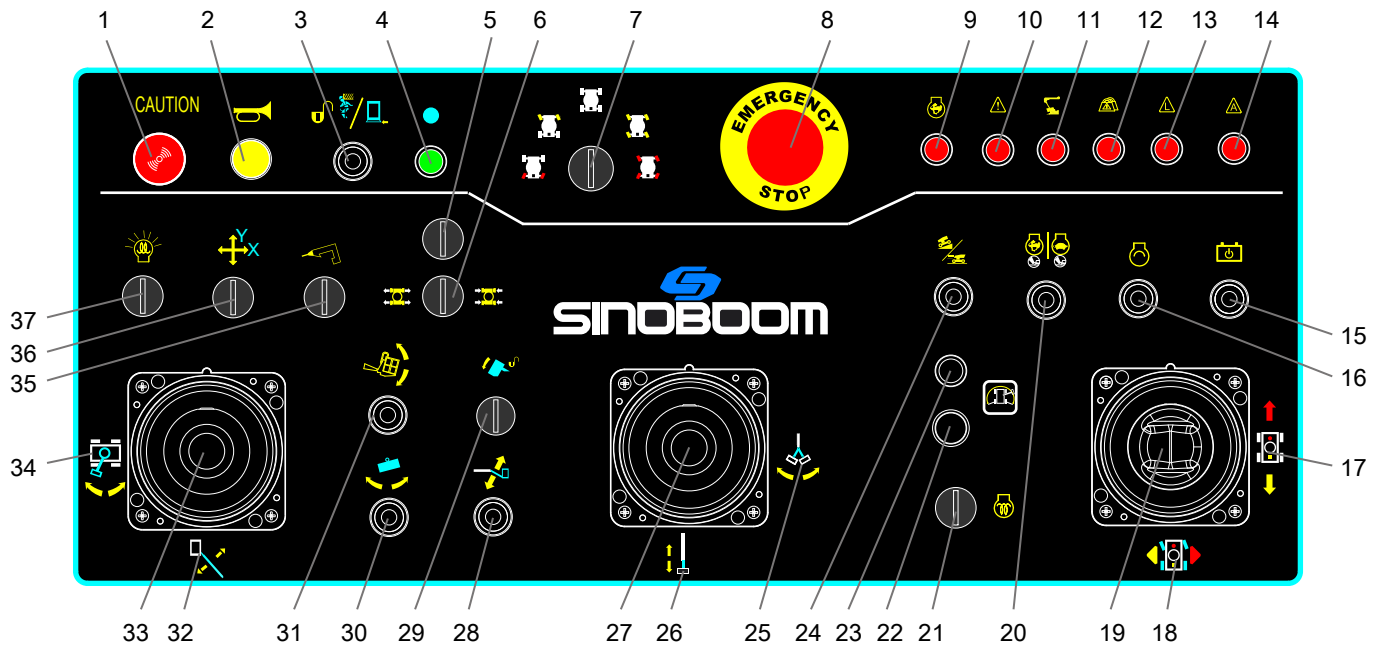


Figure 5-7 Ground controller display screen

Table 5-9

1. Current work hours	12. Engine preheat	23. Axle extended in place
2. Platform load	13. Low diesel alarm	24. Axle extracted in place
3. Diesel gauge	14. Engine oil pressure alarm	25. Engine high speed
4. Accumulated work hours	15. Diesel filter alarm	26. Engine low speed
5. Tachometer	16. Water temp alarm	27. Operating position
6. Setup menu	17. High-pressure filter alarm	28. Non-operating position
7. Machine info	18. Return filter blockage alarm	29. Boom horizontal length
8. Turntable info	19. Chassis tilt alarm	30. Boom angle relative to the horizontal plane
9. Platform info	20. Platform tilt alarm	31. Boom length
10. Alarm message	21. Heavy load alert	32. Platform height
11. Trouble alarm	22. Overload alarm	

MAINTENANCE PROCEDURES

SINOBOOM

Figure 5-8 Platform controller
Table 5-10

1. Buzzer	14. Angle sensor malfunction indicator	27. Main boom telescope/jib rotate proportional control handle
2. Horn	15. Emergency power switch	28. Jib up/down switch-GTBZ28J
3. Anti-pinch/soft touch unlock switch (if equipped)	16. Engine start switch	29. Machine stowed switch (if equipped)
4. Power indicator	17. Drive orientation	30. Platform rotate switch
5. Unused	18. Steer orientation	31. Platform level switch
6. Outrigger telescoping switch (if equipped)	19. Drive/Steer proportional control handle	32. Main boom up/down orientation
7. Steer mode select switch (if equipped)	20. Engine high/low speed select switch	33. Main boom lift/turntable rotate proportional control handle
8. Emergency stop button	21. Engine preheat switch (if equipped)	34. Turntable rotate orientation
9. Engine high speed indicator	22. Reverse drive switch	35. Hydraulic generator switch (if equipped)
10. System distress indicator	23. Rear detection indicator	36. X/Y drive switch (if equipped)
11. Chassis tilt indicator	24. Drive high/low speed select switch	37. Work lamp switch (if equipped)
12. Overload indicator	25. Jib rotate orientation -GTBZ28J (if equipped)	
13. Length sensor malfunction indicator	26. Main boom telescope orientation	

A-15 Test Floating Outrigger (if Equipped)

WARNING



TIPPING HAZARD

To perform this test, the machine must be in stowed position.

1. Start the machine at the platform controller.
2. Drive the machine to allow the right steer wheel upon the kerb or a block with thickness of 12cm (4.7 in).
3. The other 3 wheels of the machine should come in close contact with the ground.
4. Drive the machine to allow the left steer wheel upon the kerb or a block with thickness of 12cm (4.7 in).
5. The other 3 wheels of the machine should come in close contact with the ground.
6. Drive the machine to allow the both steer wheels upon the kerb or a block with thickness of 12cm (4.7 in).
7. The non-steer wheels of the machine should come in close contact with the ground.

A-16 Test Drive Speed

1. Turn the Ground/Platform select switch on the ground controller to the platform position.
2. Pull out the emergency stop buttons on both the ground and platform controllers to the ON position.
3. Turn the key switch on the ground controller to the ON position.
4. Move the engine start switch on the platform controller.
5. Move the engine high/low speed select switch on the platform controller to select the engine high speed.
6. Move the drive high/low speed select switch on the platform controller to select the drive high speed.
7. Depress the footswitch.
8. Slowly push forward the drive/steer control handle to full drive speed.
9. The test results are shown in the table below:

Table 5-11

MODELS	TEST RESULTS
GTBZ26	Boom in non-operating position: the max drive speed is 5.2 km/h (2WD) and 4.4 km/h (4WD). Boom in operating position: the max drive speed is 0.8 km/h.
GTBZ28J	Boom in non-operating position: the max drive speed is 5.2 km/h (2WD) and 4.4 km/h (4WD). Boom in operating position: the max drive speed is 0.8 km/h.

NOTICE

If the drive speed exceeds the test results as shown above, please immediately remove the machine from service and have it tagged.

A-17 Test Emergency Lowering Function

When the engine fails, depending on the actual conditions, move the emergency power switch on the ground or platform controller to start the hydraulic pump, and meanwhile move the function switch to enable the boom lowering, retracting and rotating.

NOTICE

- The emergency power switch serves only for a short time of use (with the platform lowered to the maximum degree possible) when the engine fails.
- When the emergency power is in use, do not operate two or more functions simultaneously, otherwise the auxiliary motor and pump will get overloaded.

Operating from the ground controller:

1. Turn the Ground/Platform select switch on the ground controller to the ground control position.
2. Pull out the emergency stop button on the ground controller to the ON position.
3. Turn the key switch on the ground controller to the ON position.
4. Move and the hold the emergency power switch on the ground controller.
5. Move the corresponding boom function switch on the ground controller to lower the platform.

Operating from the platform controller:

MAINTENANCE PROCEDURES

1. Turn the Ground/Platform select switch on the ground controller to the platform control position.
2. Pull out the emergency stop buttons on both the ground and platform controllers to the ON position.
3. Turn the key switch on the ground controller to the ON position.
4. Move and the hold the emergency power switch on the platform controller.
5. Move the corresponding boom function switch on the platform controller to lower the platform.

A-18 Test Tilt Protection System

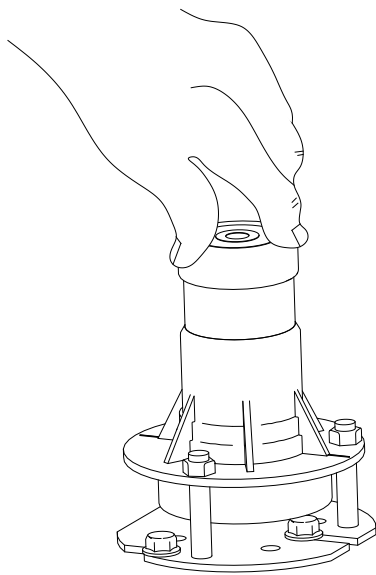


Figure 5-9

1. Turn the Ground/Platform select switch to the ground control position.
2. Pull out the emergency stop button on the ground controller to the ON position.
3. Turn the key switch on the ground controller to the ON position.
4. With the machine in non-operating position, flip the level switch to exceed 5° in X (left-to-right)/Y (front-to-back) direction.
5. The tilt alarm sounds and the chassis tilt indicator light flashes, no functions are restricted.
6. With the machine in operating position, flip the level switch to exceed 5° in X (left-to-right)/Y (front-to-back) direction.
7. The tilt alarm sounds and the chassis tilt indicator light flashes, some functions are restricted, but the boom retracting, lowering and turntable rotating are allowed.
8. With the machine in non-operating position, place two wooden blocks under the two wheels on the left or right side of the machine, and then drive the machine onto the two wooden blocks. The wooden block should measure 750mm L×250mm W×218mm H.
9. The tilt alarm sounds and the the chassis tilt indicator light flashes, no functions are restricted.
10. Drive the machine off, and remove the wooden blocks.
11. With the machine in operating position, place two wooden blocks under the two wheels on the front or back side of the machine, and then drive the machine onto the two wooden blocks. The wooden block should measure 750mm L×250mm W×262mm H.
12. The tilt alarm sounds and the chassis tilt indicator light flashes, some functions are restricted, but the boom retracting, lowering and turntable rotating are allowed.
13. Retract and lower the boom, drive off the machine in non-operating position and remove the wooden blocks.

A-19 Test Weighing System

Before the test, move the boom fully up and down and telescope in and out for at least twice to ensure the pulley and track are adequately lubricated.

Table 5-12

MODELS	TEST RESULTS
GTBZ26	When the load does not exceed 480kg (1058 lb), ensure that the platform is able to lift to the highest position. Boom in non-operating position: when the load exceeds 480kg (1058 lb), the buzzer will sound continuously, the overload indicator light will flash, the display screen will indicate platform overload, such functions as machine driving , boom raising and extending will be restricted and will not resume until the excessive load is removed. Boom in operating position (for GB models): when the load exceeds 480kg (1058 lb), the buzzer will sound continuously, the overload indicator light will flash, the display screen will indicate platform overload, some functions will be restricted but boom retracting, lowering and turntable rotating is allowed. The machine will not resume all the functions until the excessive load is removed. Boom in operating position (for models except GB): when the load exceeds 480kg (1058 lb), the buzzer will sound continuously, the overload indicator light will flash, the display screen will indicate platform overload, all the functions will be restricted and will not resume until the excessive load is removed.
GTBZ28J	When the load does not exceed 250kg (551 lb), ensure that the platform is able to lift to the highest position. Boom in non-operating position: when the load exceeds 250kg (551 lb), the buzzer will sound continuously, the overload indicator light will flash, the display screen will indicate platform overload, such functions as machine driving , boom raising and extending will be restricted and will not resume until the excessive load is removed. Boom in operating position (for GB models): when the load exceeds 250kg (551 lb), the buzzer will sound continuously, the overload indicator light will flash, the display screen will indicate platform overload, some functions will be restricted but boom retracting, lowering and turntable rotating is allowed. The machine will not resume all the functions until the excessive load is removed. Boom in operating position (for models except GB): when the load exceeds 250kg (551 lb), the buzzer will sound continuously, the overload indicator light will flash, the display screen will indicate platform overload, all the functions will be restricted and will not resume until the excessive load is removed.

A-20 Perform Maintenance after 30 Days

Perform maintenance on a new machine after the machine is operated for 30 days or 50 hours. After performing the 30-day maintenance, continue performing maintenance as scheduled.

Perform the following procedure :

- B-1 Inspect and replace the return filter of hydraulic oil tank.
- B-2 Inspect rims, tires and fasteners
- B-13 Inspect slewing bearing bolts
- B-14 Inspect platform rotate cylinder fasteners

CHECKLIST B PROCEDURES

B-1 Replace Hydraulic Oil Tank Return Filter

Replacing the hydraulic tank return filter on a regular basis is vital to proper machine operation and extending service life. Repeated use of a dirty or blocked filter could cause damage to the machine components. Replace the return filter more frequently in very dirty environments.



WARNING

BURN HAZARD



Allow the hydraulic oil to cool to room temperature before servicing the hydraulic system.

MAINTENANCE PROCEDURES

NOTICE

Shut off the engine before inspection.

1. Open the left side cover of the turntable.
2. Locate the return filter of hydraulic oil tank.

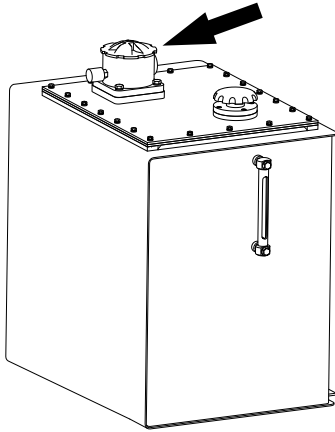


Figure 5-10

3. Use a wrench to remove the return filter.



WARNING



HIGH PRESSURE HAZARD

Slowly remove the hydraulic components to reduce hydraulic oil pressure. High hydraulic oil pressure could penetrate the skin. Seek medical attention immediately.

4. Apply a thin coat of oil film over the gasket of the new return filter.
5. Install and tighten the new return oil filter element.
6. Clean all oil spills during the replacement process.
7. Start the engine from the ground controller.
8. Inspect the filter and hydraulic components to ensure no leakage exists.

B-2 Inspect Rim, Tire and Fasteners

Good maintenance of rims and tires is vital to safe machine operation. The machine might tip over if the rim or the tire has problems. Repair any problems with the rims and tires before operating the machine.

The machine is equipped with solid tires that do not need to be inflated.

1. Inspect the tires on a daily basis for damage or excessive wear. If any of the following condition occurs, immediately remove the machine from service and replace tires or tire assembly (including rims). For the requirements and procedure for the replacement, please reference [Tires and Rims, page 6-6](#).
 - Play separation of tires, i.e., circumferential rips or lamination occurring to in between the rubbers.
 - Detachment from rims: the rubber comes off from the steel rims.
 - Rubber surface locally peeling off in lumps.
 - Rubber cracks in radial direction.
 - Rubber worn to the wear mark.
2. Inspect the lug nuts are torqued to specification (800Nm[590ft-lb]).

NOTICE

Tighten the lug nuts prior to the first use or after each tire removal, inspect and retorqued every 3 months or 150 hours of operation.

B-3 Inspect Hydraulic Oil

Inspecting and replacing the hydraulic oil is vital to proper machine operation and extending service life. The machine may be unable to operate properly if the hydraulic oil becomes dirty, and the hydraulic parts may be damaged if using contaminated oil. Replace the hydraulic oil often, especially when the service environment is very dirty.

Note: Due to wear and tear on the mesh components, metal particles may appear in the hydraulic fluid or filter of the new machine.



WARNING



BURN HAZARD

Before maintaining the hydraulic system, allow the hydraulic fluid to cool to room temperature.

Replace the hydraulic oil if any of the following conditions exist :

- The hydraulic oil is milky white and cloudy.
- The hydraulic oil is blackened.
- Obtain a sample of the hydraulic oil and inspect it in sunlight. Rub the oil between two fingers to determine if it contains metal particles.

- The hydraulic oil has an abnormal smell.

See **D-3 Replace Hydraulic Oil, page 5-28** for the replacement steps.

B-4 Inspect Cooling System

Inspecting cooling system on a regular basis is vital to proper operation of engine and extending service life.



WARNING

BURN HAZARD



Be cautious of the heated parts of engine. Bodily contact with them may result in severe burn.

NOTICE

Shut off the engine before inspection.

- Inspect the cooling system for leakage or loose connections.
- Inspect all hoses of radiator for crack, abrasion, free of getting flattened, and clamps secured.
- Ensure the cooling fins of radiator are not blocked by debris.

B-5 Replace Fuel filter

Replacing fuel filter on a regular basis is vital to proper operation of engine and extending service life. A dirty or blocked filter may cause the machine to work improperly, and continued operation may result in component damage. The fuel filter should be replaced at increased frequency if the machine uses fuel of inferior quality or operates in humid environment.

NOTICE

Shut off the engine before inspection.



WARNING

EXPLOSION AND FIRE HAZARD



- Diesel is an inflammable material. This procedure must be performed outdoors in well-vented area and far away from flames.
- Ensure that a conforming fire extinguisher is readily accessible when performing this inspection procedure.

1. Open the right side cover of turntable.
2. Locate the fuel filter.
3. Disconnect the fuel flow from the fuel tank to the fuel filter.
4. Loosen the valve plug over the fuel filter.
5. Place a suitable vessel under the fuel filter.
6. Remove the drain plug at the bottom to drain the water and the remaining fuel into the vessel.
7. Remove the fuel filter, replace with a new one and install.
8. Tighten the plug.
9. Clean up the fuel spills.
10. Start the engine from the ground controller and inspect the fuel filter for leakage.

B-6 Inspect Air filter of Hydraulic Tank

Keeping the breather cap of hydraulic tank in well-ventilated condition is vital to normal operation of hydraulic pump and extending service life. Dirty or blocked air filter of hydraulic tank may cause the hydraulic pump to suction improperly, and continued operation may result in component damage. The air filter of hydraulic tank should be inspected more often in hostile operating environment.

NOTICE

Shut off the engine before inspection.

1. Remove the air filter of hydraulic tank.

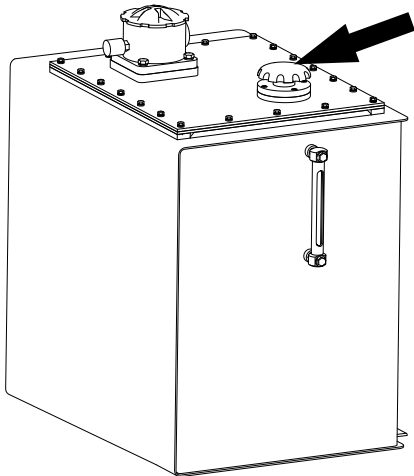


Figure 5-11

2. Check the air filter of hydraulic tank.
3. The air should pass through the air filter smoothly.
4. If the air has difficulty in passing through the air filter, observe the following steps to clean the air filter.
5. Use neutral solvent to clean the air filter, then blow dry and repeat the Step 2.
6. Install the air filter back to the hydraulic tank.

B-7 Replace High-Pressure Filter

Replacing high-pressure filter on a regular basis is vital to proper machine operation and extending service life. A dirty or blocked filter could cause the machine to work improperly, and continued operation may result in component damage. The high-pressure filter should be replaced more often in hostile operating environment.



WARNING

BURN HAZARD

Be cautious of hot hydraulic oil.
Bodily contact with hot hydraulic oil
may result in severe burn.



NOTICE

Shut off the engine before inspection.

1. Open the right side cover of turntable, and locate the high-pressure filter.
2. Place a suitable vessel under the filter.

3. Remove the filter from the mounting bracket.
4. Replace the filter element as needed.
5. Clean up the hydraulic oil spills.
6. Start the engine from the ground controller.
7. Inspect the high-pressure filter and relevant components for leakage.

B-8 Replace Air Filter of Engine

NOTICE

Shut off the engine before inspection.

Inspecting the engine air filter is vital to proper engine operation. Failure to perform this inspection procedure will result in engine malfunction and component damage.

1. Open the right side cover of turntable.
2. Locate the engine air filter, as shown in the below figure :

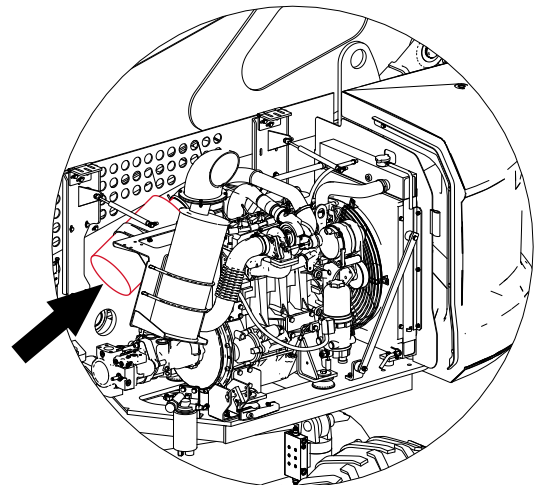


Figure 5-12

3. Loosen the clip at the end cap of air filter, and remove the end cap.
4. Remove the air filter element.
5. Use a wet cloth to scrub the inside of filter housing and end cap.
6. Inspect the filter element for contamination or blockage. Replace the filter element if needed.
7. Install the filter element.
8. Install the end cap back to the filter and secure the clip.

B-9 Inspect Length and Angle Sensors

Regularly inspecting length and angle sensors is vital to safe machine operation. If the sensors can't function properly, it will pose dangers to machine operation.

Inspecting length sensor

1. Turn the Ground/Platform select switch to ground control position.
2. Pull out the emergency stop button on ground controller to ON position.
3. Turn the key switch on ground controller to ON position.
4. Activate the main boom up/down function and jib up/down function to adjust the main boom and jib boom to horizontal position.
5. Activate the main boom telescope function to extend the boom.
6. GTBZ26 : The boom extends to the upper limit (the ground controller display indicates 20.4m[66ft 11in]) and stops extending further.
7. GTBZ28J : The boom extends to the upper limit (the ground controller display indicates 20m[65ft 7.5in]) and stops extending further.
8. Activate the main boom telescope function to retract the boom.
9. The boom can be fully retracted.

Inspecting angle sensor

1. Turn the Ground/Platform select switch to ground control position.
2. Pull out the emergency stop button on ground controller to ON position.
3. Turn the key switch on ground controller to ON position.
4. Activate the main boom up/down function and jib up/down function to adjust the main boom to horizontal and raise jib boom to full height.
5. Activate the main boom up/down function to raise/lower the boom to the limits.
6. The boom stops moving further after raised to the max angle (the ground controller display indicates $75^{\circ}[\pm 1^{\circ}]$).
7. The boom stops moving further after lowered to the max angle (the ground controller display indicates $-12^{\circ}[\pm 1^{\circ}]$).
8. Activate the boom telescope function and boom up/down function to retract and lower the boom.
9. The boom can be fully retracted.

B-10 Inspect Engine Exhaust System

Inspecting engine exhaust system is vital to proper engine operation and extending service life.

NOTICE

Shut off the engine before inspection.

1. Inspect whether the engine exhaust pipe is damaged or crushed flat.
2. Inspect whether the exhaust pipe is tightly connected.
3. Inspect whether the muffler shows signs of heating fatigue or possibility of internal malfunction.
4. Inspect the catalytic converter for blockage.
5. Tighten or replace parts, if needed, to ensure the exhaust system is free of leakage.

B-11 Inspect Drive Reducer Oil Level

Inappropriate gear oil level of drive reducers will reduce the machine performance, and continued use could result in component damage.

1. Drive the machine to rotate the reducer until one bolt at top and the other one at 90 degrees, as shown in the figure below.

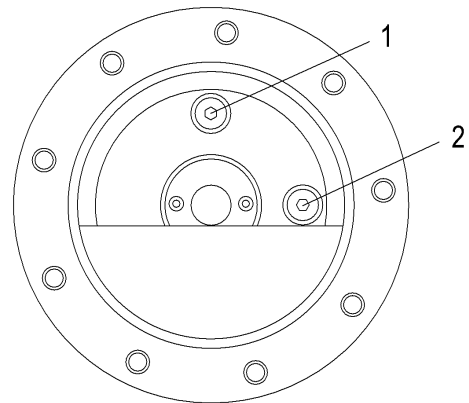


Figure 5-13

2. Remove the bolt #2, and check the oil level.
3. The oil level should be even with the bolt hole.
4. If necessary, add oil to the bolt hole.
5. Remove the bolt #1, add gear oil to the bolt hole #1 until the oil level is even with that of the bolt hole #2.
6. Install the bolts back.
7. Clean up the gear oil spills during the inspection.
8. Perform this inspection procedure to all drive reducers of the machine.

MAINTENANCE PROCEDURES

B-12 Inspect Slewing Reducer Oil Level

Inappropriate gear oil level of slewing reducers will reduce the machine performance, and continued use could result in component damage.

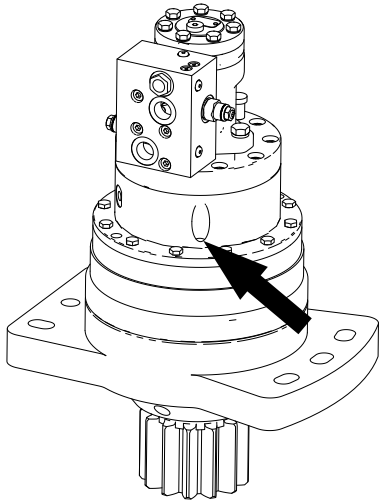


Figure 5-14

1. Open the left side cover of turntable, and locate the slewing reducer.
2. Remove the plug of fill port to check the oil level.
3. The oil level should be even with the plug hole.
4. If the oil level is lower than the plug hole, add oil.

5. Add gear oil from the fill port until the oil level is even with the plug hole.
6. Install the plug back.
7. Clean up the gear oil spills during the inspection.

B-13 Inspect Slewing Bearing Bolts

Regularly inspecting the slewing bearing bolts is vital to proper machine operation. This inspection should be performed after the first 50 hours of operation and every 600 hours thereafter. If the bolts come off or get loose, replace with new ones. Apply threadlocker Loctite 272 to the new bolts and torque to specification. After the bolts are replaced and torqued, re-inspect the bolts for tightness.

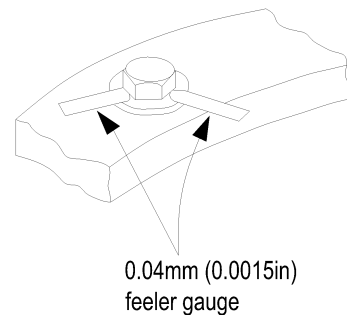


Figure 5-15

Inspecting the connecting bolts between chassis and slewing bearing

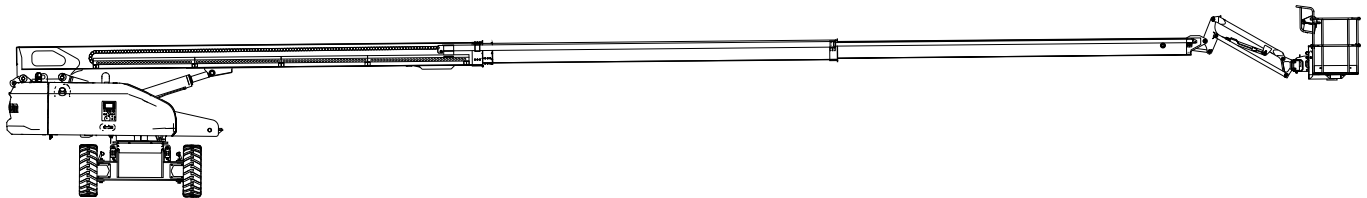


Figure 5-16

1. Fully extend the boom and raise to horizontal position.
2. Locate the connecting bolts between chassis and slewing bearing.
3. As indicated by the arrow [Fig 5-14 , page 5-22](#), insert 0.04mm feeler gauge in between the bolt and washer.
4. Ensure the feeler gauge won't go through the outside of bolt head to the bolt shank.
5. Rotate the turntable to inspect all the bolts.

Inspecting the connecting bolts between turntable and slewing bearing



Figure 5-17

1. Fully retract the boom and raise to full height.
2. Locate the connecting bolts between turntable and slewing bearing.
3. As indicated by the arrow **Fig 5-14 , page 5-22**, insert 0.04mm feeler gauge in between the bolt and washer.
4. Ensure the feeler gauge won't go through the outside of bolt head to the bolt shank.
5. Lower the main boom to horizontal position, and fully extend the main boom.
6. As indicated by the arrow **Fig 5-14 , page 5-22**, insert 0.04mm feeler gauge in between the bolt and washer.
7. Ensure the feeler gauge won't go through the outside of bolt head to the bolt shank.

B-14 Lubricate Slewing Bearing

Regularly lubricating the slewing bearing from a long distance is vital to proper machine operation. The Lubricating frequency and the amount of lubricant used should be increased if the machine is operated on successive work shifts or in hostile environment.

- Lube point : 1 grease nipple (see the following figure)

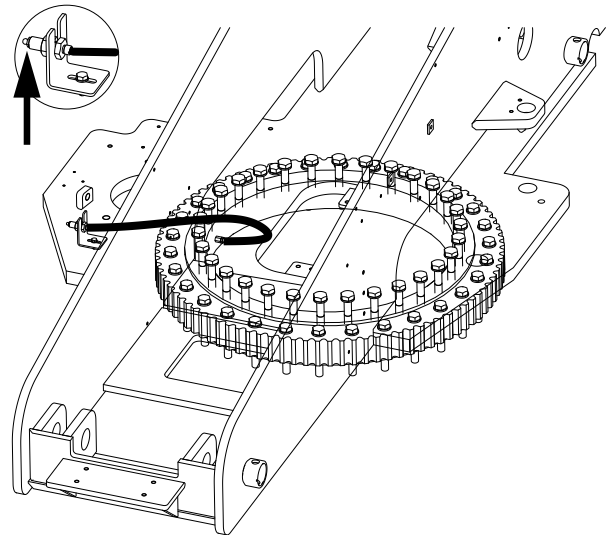


Figure 5-18

- Amount : as needed
- Lubricant : ZL-3 lithium based grease

B-15 Inspect Platform Rotate Cylinder Fasteners

Regularly inspecting the platform rotate cylinder fasteners is vital to proper and safe machine operation.

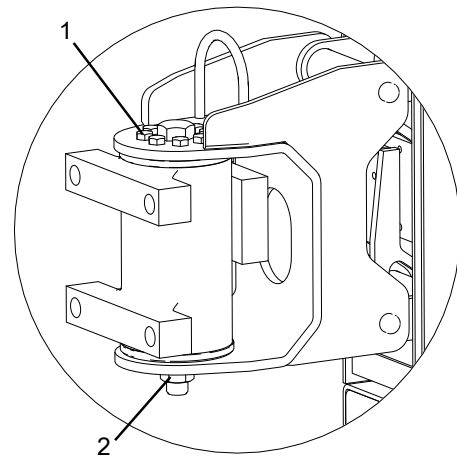


Figure 5-19

1. Place the machine in stowed position.
2. Locate the platform rotate motor.
3. Inspect whether the bolt #1 as indicated in the above figure is properly torqued to specification (68Nm[50ft-lb]).
4. If necessary, replace the bolt, torque to specified value, and apply threadlocker Loctite 272.

MAINTENANCE PROCEDURES

5. Inspect whether the bolt #2 as indicated in the above figure is properly torqued to specification (650Nm[480ft-lb])
6. If the bolt needs to be replaced, be sure to torque to specification.

B-16 Test Cylinder Drift

Platform drift

Measuring the drift from platform to ground: with rated load on platform and power off, fully extend the main boom. The maximum allowable drift in 10 minutes is 50cm (19.7 in). If the test result exceeds this value, please proceed as below.

Cylinder drift

Table 5-13

Cylinder Bore Diameter (mm/in)	Maximum Allowable Drift in 10 Minutes (mm/in)
63/2.48	0.96/0.037
80/3.15	0.63/0.025
100/3.94	0.39/0.015
125/4.92	0.23/0.009
160/6.30	0.14/0.006
180/7.09	0.13/0.005
200/7.87	0.10/0.0038
220/8.66	0.08/0.0030

- Measure drift at cylinder rod with a calibrated dial indicator.
- The oil in cylinder must be at ambient temperature and consistent.
- The cylinder must be applied with normal load from the platform.
- The cylinder is acceptable if it passes this test.

NOTE : This information is based on 6 drops per minute cylinder leakage. Since the hydraulic oil expands or contracts due to thermal effect, thus the test value of cylinder drift may have a tolerance of 7/10000.

B-17 Test Float Cylinder Exhausting and Counterbalance Valve Locking

Testing Float cylinder exhausting

NOTICE

Ensure the platform remains in stowed position while performing the float cylinder exhausting test.

1. Loosen the plug over the floating counterbalance valve on the left side of machine until fluid flows out.
2. Place a 120mm (4.7 in) wooden block with bevel side in front of the front left wheel of the machine.
3. Drive the machine to rest the front left wheel on the wooden block.
4. During the process, there should be hydraulic oil and air mixture flowing out of the loosened plug.
5. Repeatedly drive the machine on and off the wooden block until there are only hydraulic oil flowing out of the loosened plug, and then tighten the plug.
6. Now the left float cylinder exhausts successfully.
7. Drive the machine off the wooden block.
8. Perform the same procedure to test the exhausting of float cylinder on the right side.
9. Proceed to test the counterbalance valve locking.

Testing counterbalance valve locking

NOTICE

Be sure to test the floating system quarterly, or after replacing any system component, or when any system malfunction is discovered.

1. Place a 120mm (4.7 in) wooden block with bevel side in front of the front left wheel of the machine.
2. Extend the boom by at least 1.2m to place the machine in operating position.
3. Drive the machine to rest the front left wheel on the wooden block.
4. Slowly rotate the turntable to the right by 90 degrees.
5. The rear detection indicator light will illuminate, move the function switches to keep the boom horizontal and fully extended.
6. Inspect the float cylinder, ensure the float cylinder on the side with load applied is without any evidence of retracting, and then retract the boom.
7. Move the reverse drive switch to drive the machine off the wooden block.
8. The assistant on the ground should inspect whether the wheel on the front left or rear right still remains off the ground, and keep it elevated.
9. Slowly rotate the turntable to allow the turntable back to the center position (at the center between the two drive wheels)

10. Drive the machine forward or reverse, the float cylinder on the front left wheel should be released to lower the wheel to come in close contact with the ground.
11. Perform the same procedure to test the float cylinder on the front right side.
12. If the float cylinder malfunctions, the malfunction must be cleared by qualified service technician before proceeding to next step.

B-18 Inspect Electrical Wiring

Maintaining electrical wiring in good condition is vital to safe operation and good machine performance. Continued use of the machine with damaged electrical wiring or in corrosive environment will cause severe injury. Before operating the machine, be sure to replace or repair the damaged or corroded electrical wires.



WARNING

ELECTROCUTION HAZARD



Before inspecting the electrical wires, be sure to disconnect the battery and the charger on the AC outlet. Contact with hot or live circuits could result in death or serious injury.

1. Inspect the following areas for damage or corrosion :
 - Engine wiring harness
 - Turntable manifold wiring
 - Junction box at ground controller
 - Junction box at platform controller
2. Start the engine from the ground controller, and raise the boom above the turntable.
3. Shut off the engine.
4. Inspect the cable track system for damaged or corroded power cords.
5. Start the engine from the ground controller, and lower the boom to stowed position.
6. Shut off the engine.

B-19 Inspect the battery

The condition of the battery affects the performance of the machine. Improper levels of battery electrolyte or damaged cable and wiring may harm battery parts and may pose dangerous conditions.

NOTICE

Be sure to wear protective gloves before inspection.



WARNING

BODILY INJURY HAZARD



Lead-acid batteries and lead-acid maintenance-free batteries contain acid. Avoid acid overflow or contact with acid in lead-acid batteries and lead-acid maintenance-free batteries.

If battery acid spills, use water mixed with bicarbonate (baking soda) to neutralize the acid.

- Check the acid level of the battery, if a refill is needed, add distilled water to the inlet pipe on top of the battery until the acid level is above the battery plate. Do not overfill.
- Ensure the battery wiring is not corroded.
- Ensure the battery is adequately supported and the wiring is secure.

NOTE: Add wiring end protectors and antiseptic sealants to help eliminate corrosion of the battery terminals and cables.

CHECKLIST C PROCEDURES

C-1 Replace Fuel Filter Element

Regularly replacing fuel filter element is vital to good engine performance and extending service life. A dirty or blocked filter may fail the engine and continued use may result in component damage. The filter element should be replaced more often if operating the machine in hostile environment.



WARNING

EXPLOSION AND FIRE HAZARD



- Diesel is an inflammable material. This procedure must be performed outdoors in well-vented area and far away from flames.



- Ensure that a conforming fire extinguisher is readily accessible when performing this inspection procedure.

MAINTENANCE PROCEDURES

NOTICE

Shut off the engine before inspection.

1. Open the right side cover of turntable and locate the fuel filter.
2. Disconnect and cap the line between fuel tank and fuel filter.
3. Remove the fuel filter element.
4. Clean the inside of filter head.
5. Add clean fuel to the new filter element, and lubricate the seal ring with the clean fuel and install it to the filter head.
6. Clean up the fuel spills in performing the procedure.

C-2 Inspect Boom Extend/Retract Cables and Pulleys

Boom extend/retract cables are responsible for the extension and retraction of boom. The boom extension and retraction should operate smoothly and be free of hesitation, jerking and unusual noise.

NOTICE

Shut off the engine before inspection.

1. Remove the boom end cover.
2. Inspect for the following :
 - In case of frayed, broken wire stands, corrosion, kinks in the cables, and broken or damaged pulleys, replace the cables and pulleys.
 - In case of foreign materials on the cables, clean the cables.
 - If the cables are located outside of the pulleys, adjust the cables to the appropriate place.
 - Manually guide the cables and inspect the cable tension, a properly tensioned cable should be impossible or hard to be moved.
3. If no deficiencies are discovered after the inspection, install back the boom end cover.
4. Start the engine from the ground controller.
5. Extend the boom approximately 0.6m.
6. Retract the boom, and visually inspect the movement of the 2nd and 3rd boom sections.
7. The retraction displacement of the 2nd boom section should not be more than 1/2 that of the 3rd boom section.

NOTICE

The cables and pulleys should be replaced together, i.e., if the cable is replaced, the matching pulley should also be replaced.

C-3 Replace Engine Oil

NOTICE

The engine oil filter must also be replaced after replacing the engine oil. Replace the oil with engine started to circulate the oil more smoothly and avoid contamination.

1. Turn the Ground/Platform select switch to Ground.
2. Pull out the emergency stop button on the ground controller to ON.
3. Turn the key switch on the ground controller to ON.
4. Move the engine start switch to idle for 2 minutes.
5. Shut off the engine.
6. Open the drain valve to drain the engine oil.

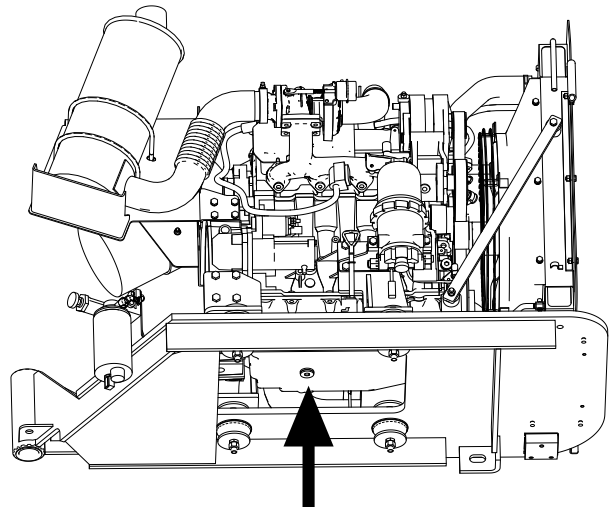


Figure 5-20



WARNING

BURN HAZARD

Do not come in contact with the hot engine oil when draining to avoid burns.



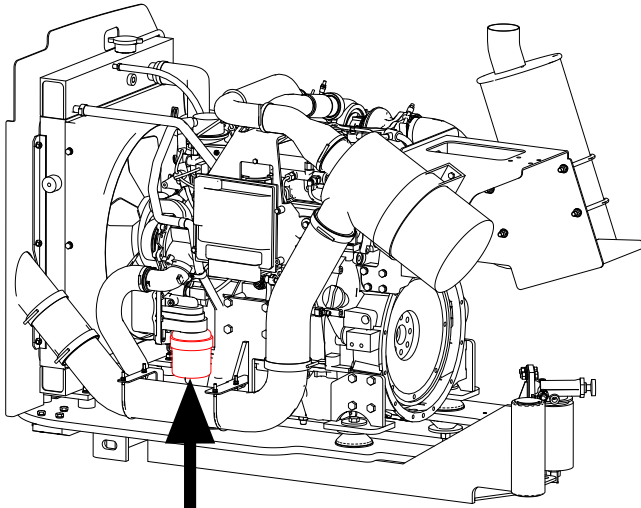
NOTICE

The waste engine oil should be collected in a suitable vessel for disposal or recycling. The waste engine oil should be treated in compliance with the environment laws or regulations.

7. Close the drain valve.
8. Add the new engine oil. For the recommended viscosity grade of the engine oil, please reference [A-8 Inspect Engine Oil Level, page 5-8](#).

C-4 Replace Engine Oil Filter**NOTICE**

Replace the engine oil filter each time the engine oil is replaced.

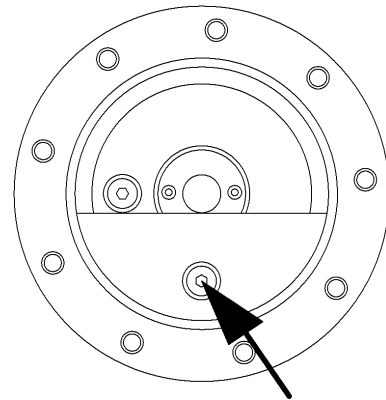
**Figure 5-21**

1. Clean the areas around the filter.
2. Remove and discard the seal ring of the engine oil filter.
3. Thoroughly clean the residues on the seal surface of the filter support.
4. Apply clean engine oil to the rubber washer of the new engine filter.
5. Mount the new filter.
6. For the engine oil level inspection procedure, please reference [A-8 Inspect Engine Oil Level, page 5-8](#).
7. Inspect the engine oil filter element to make sure no leakage occurs.

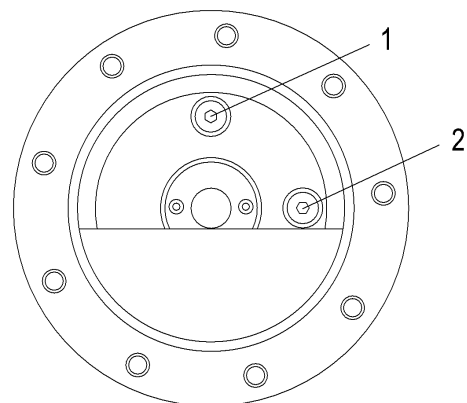
CHECKLIST D PROCEDURES**D-1 Replace Drive Reducer Gear Oil**

Regularly replacing drive reducer gear oil is vital to good machine performance and extending service life of the reducer.

1. Drive the machine to rotate the reducer to the position with one bolt at the bottom, as shown in the figure below.

**Figure 5-22**

2. Place a suitable vessel under the bolt as indicated by the arrow in the figure.
3. Remove the bolt as indicated.
4. Fully drain the drive reducer gear oil to the vessel.
5. Mount back the loosened bolt.
6. Drive the machine to rotate the reducer until one bolt is at top and the other is at 90 degrees.

**Figure 5-23**

7. Remove the #1 and #2 bolts as indicated.

MAINTENANCE PROCEDURES

8. Add new gear oil to the port #1 until the oil level is even with that of the port #2.
9. Mount back the bolts.
10. Clean up the oil spills in performing the inspection procedure.
11. Perform the same procedure on all drive reducers of the machine.

D-2 Replace Slewing Reducer Gear Oil

Regularly replacing slewing reducer gear oil is vital to good machine performance and extending reducer service life.

1. Open the left side cover of turntable, and locate the slewing reducer.
2. Place a suitable vessel under the drain plug of the slewing reducer.
3. Remove the drain plug.
4. Fully drain the slewing reducer gear oil to the vessel.
5. Mount back the drain plug.
6. Remove the fill plug (for the location, reference [B-12 Inspect Slewing Reducer Oil Level, page 5-22](#)), add new gear oil to the fill port until the oil level is even with the bottom of the fill plug.
7. Mount back the fill plug.
8. Clean up the gear oil spills in performing the inspection procedure.

D-3 Replace Hydraulic Oil

Regularly replacing hydraulic oil is vital to good machine performance and extending service life. Dirty oil may cause the machine to perform poorly and continued use may result in hydraulic component damage. Extremely dirty condition requires the oil changes to be performed more frequently.

 WARNING	
	BURN HAZARD Before servicing the hydraulic system, allow the hydraulic oil to cool down to room temperature.

NOTICE

*The inspection must be performed with the engine in off position.
When removing the hose and fittings, the O-rings on the hose and fittings must be replaced.*

1. Open the left side cover of turntable, and locate the hydraulic tank.
2. Close the hydraulic shutoff valve located on the side of hydraulic tank.
3. Remove the drain plug at the bottom of the tank, and completely drain the oil into a suitable vessel. For the capacity of hydraulic tank, please reference [Performance Parameters, page 2-1](#).

 WARNING	
HIGH PRESSURE HAZARD	
	Slowly remove the hydraulic elements to reduce the oil pressure. High oil pressure may penetrate the skin. Should any injury occur, go to a doctor at once.

4. Disconnect and plug the suction hoses.
5. Disconnect and plug the return hoses.
6. Remove the retaining fasteners from the hydraulic tank, and remove the hydraulic tank.
7. Rinse out the inside of the tank using a mild solvent, and dry it up.
8. Install the hydraulic tank onto the machine.
9. Attach the suction hoses and return hoses to the hydraulic tank.

D-4 Replace Hydraulic Tank Suction Filter

Regularly replacing hydraulic tank suction filter is vital to good machine performance and extending service life. Dirty hydraulic oil may cause the machine to function improperly and continued use may result in hydraulic component damage. Extremely dirty condition requires the oil changes to be performed more frequently.

When performing the procedure [D-3 Replace Hydraulic Oil, page 5-28](#), the hydraulic tank suction filter must also be replaced.

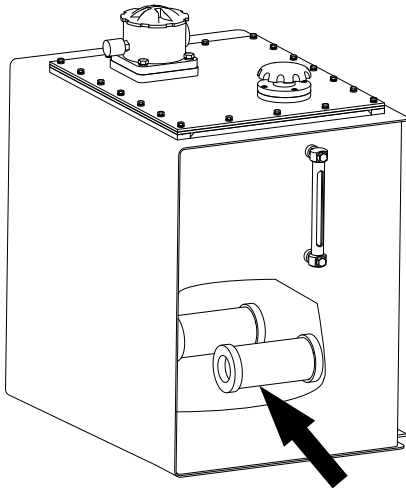


Figure 5-24

D-5 Replace Coolant and Coolant Hoses

Regularly replacing the coolant and coolant hoses is vital to good engine performance and extending service life. Dirty coolant may cause the machine to function improperly and continued use could result in hydraulic component damage. Extremely dirty condition requires the coolant changes to be performed more frequently.

 WARNING	
 	BURN AND HIGH PRESSURE HAZARD Before replacing the coolant, allow the fluid in the coolant tank to cool down to room temperature.

NOTICE
<i>Shut off the engine before inspection.</i>

1. Open the right side cover of turntable, and locate the coolant tank.
2. Disconnect the the coolant return hose, and drain the coolant inside the return hose into a suitable vessel.
3. Open the coolant tank cover.

4. Open the coolant tank drain valve to completely drain the coolant into a suitable vessel.
5. After the coolant is fully drained, close the drain valve.
6. Remove the coolant hose clamp, and remove the coolant hoses from each connector.
7. Install the clamp onto the new coolant hose, and attach the hose to the corresponding connector.
8. Secure the hose clamp in place.
9. Add new coolant into the tank until the coolant level reaches the fill port of the tank.
10. Clean up the coolant spills in performing the procedure.
11. Start the engine from the ground controller to circulate the coolant in the cooling system.
12. Shut off the engine.

D-6 Replace Fuel Hoses

Regularly replacing the fuel hoses is vital to safe engine operation and extending service life. Long-time use of old, frayed or broken fuel hoses may pose dangers to machine operation.

 WARNING	
EXPLOSION AND FIRE HAZARD	
 	• Diesel is an inflammable material. This procedure must be performed outdoors in well-vented area and far away from flames. • Ensure that a conforming fire extinguisher is readily accessible when performing this inspection procedure.

NOTICE
<i>Shut off the engine before inspection.</i>

1. Open the right side cover of turntable.
2. Disconnect and plug the fuel hoses between fuel tank and fuel filter.
3. Locate the following fuel hoses:
 - Hoses between fuel tank and fuel filter.
 - Hoses between fuel filter and fuel pump.
 - Hoses between injector and fuel tank.
4. Remove the clamps from the hoses, and remove the hoses.

MAINTENANCE PROCEDURES

5. Install the clamps onto the new hoses, and attach the hoses to the respective fittings.
6. Adjust the clamp to secure each hose.
7. Clean up the fuel spills during performing the procedure.
8. Connect the fuel hoses between the fuel tank and the fuel filter.

2. Measure the thickness of each wear pad as indicated in the above figure. The wear pad thickness specifications are listed in the table below.

Table 5-14

NO.	Thickness Specifications
1	16mm (0.63in)
2	25mm (0.98in)
3	11mm (0.43in)
4	28mm (1.1in)
5	16mm (0.63in)
6	20mm (0.79in)
7	30mm (1.180in)

3. When the wear extent of the wear pad is greater or equal to 3mm, the wear pad assembly should be timely replaced.

NOTICE

The wear pad disassembled from the boom should never be reused. Be sure to replace with a new wear pad assembly.

D-7 Inspect Boom Wear Pads

Regularly inspecting the boom wear pads is vital to safe machine operation. Friction pair develops between each wear pad and the telescope boom surface. Improperly shimmed wear pads or continued use of extremely worn wear pads may result in component damage and unsafe operating conditions.

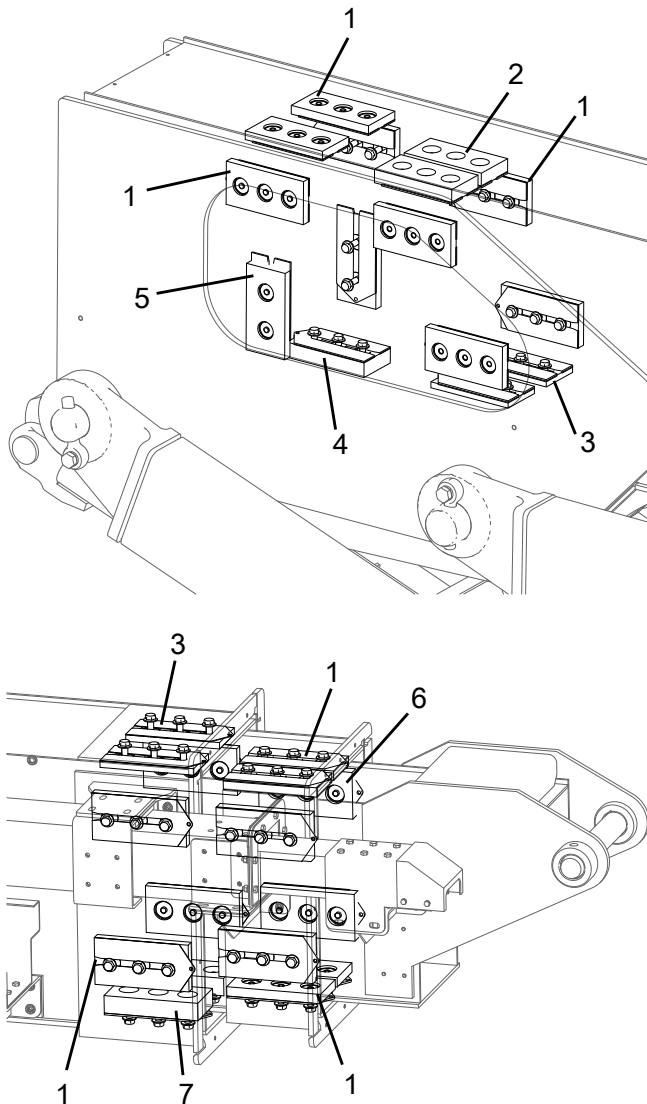


Figure 5-25

1. Remove the both boom end covers or nylon brush.

6 REPAIR PROCEDURES



WARNING



Repair procedures shall be completed by a person trained and qualified on the repair of this machine.

Immediately tag and remove from service a damaged or malfunctioning machine.

Repair any machine damage or malfunction before operating the machine.

Before machine startup :

- **Read, understand and obey the safety rules and operating instructions contained in operation manual.**
- **Read all procedures and rules.**
- **Unless otherwise specified, perform each repair procedure with the machine in the following configuration:**
 - **Machine parked on a firm, level surface.**
 - **Platform in the stowed position.**
 - **Key switch in the OFF position with the key removed.**
 - **All wheels chocked.**

revealing to the operator. Failures with the extend cable require the addition of the Broken Cable Indicator System in order to be self-revealing to the operator. This system uses a proximity sensor to detect excessive movement of the sensed rope as would be expected with a rope failure. A broken cable detection results in illuminating the indicator on the ground control display panel and triggering the alarm, and such functions as boom extending and raising are restricted while boom retracting and lowering is permitted. It is the responsibility of the operator to take the appropriate action.

Platform Control Enable System

The platform controls make use of a time dependent enable circuit to limit the time availability of "live" or enabled controls. When the footswitch is depressed, the controls are enabled and the operator has 7 seconds to operate any function. The controls will remain enabled as long as the operator continues to use any function and will remain enabled 7 seconds after the last function has been used. While the controls are "live", the enabled light will be illuminated in the platform display panel. When the time limit has been reached, the enabled light will turn off and the controls will be "dead" or disabled. To continue use of the machine the controls must be re-enabled to start the timer system over again. This is done by releasing all functions, then releasing and re-depressing the footswitch.

Boom Position Sensing System

The boom position sensing system uses the boom angle sensor and boom length sensor mounted in the pivot end of base boom to indicate the boom position. The boom operating position is recognized when the angle sensor reads more than 15° with respect to gravity or the length sensor reads more than 1.2m extension, otherwise it indicates that the boom is in the non-operating position. The jib boom position is excluded from consideration.

This system is used to control the following systems :

- Drive Speed Cutback System
- Axle Extension System

Drive Speed Cutback System

When boom is positioned in operating position, the drive motors are automatically restricted to the low speed mode.

BOOM AND PLATFORM COMPONENTS

Boom and Platform Systems

Broken Cable Indicator System

The boom of this machine is a 3–section proportionally driven telescopic boom. The first telescopic boom is cylinder-driven, the second telescopic boom is driven by a separate wire rope system. Rope system contains redundant ropes that are capable of allowing the operator to continue use of the machine with a single rope failure. The retract cable is installed outside the boom so that the failures with retract cable are self-

REPAIR PROCEDURES

Platform Controller

⚠ WARNING



ELECTROCUTION HAZARD

Before performing this procedure, be sure to disconnect the battery and the charger on AC outlet. Contact with live conductors may result in death or serious injury.

NOTICE

Perform this procedure with the machine in stowed position.

1. Disconnect external power supply, and push in the emergency stop buttons on the platform and ground controllers to OFF position.
2. Locate the cable connected to the bottom of the platform controller.
3. Disconnect and tag the cable from the bottom of the platform controller.
4. Remove the retaining bolts from the platform controller.
5. Remove the platform controller from the machine.

Platform

1. Remove the platform controller from the platform. For the specific procedure, please reference [Platform Controller, page 6-2](#).
2. Remove the footswitch.
3. Support and secure the platform to an appropriate lifting device.
4. Remove the platform mounting bolts.

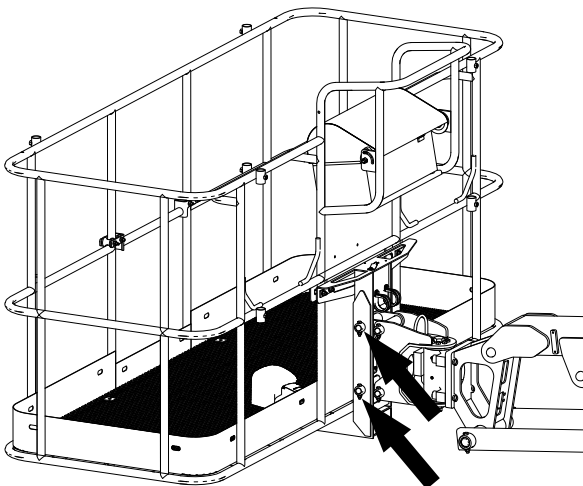


Figure 6-1

5. Use a brass drift or wooden hammer to tap the connecting pin out.
6. Slowly move the platform away with a lifting device.

Platform Swing Motor

NOTICE

Perform this procedure with the machine in stowed position.

NOTICE

When removing a hose or fitting, the O-ring on the fitting or hose end must be replaced.

1. Remove the platform. See [Platform, page 6-2](#).
2. Disconnect and remove the platform angle sensor from the connection.
3. Tag, disconnect and plug the hydraulic lines to the platform swing motor.
4. Remove the retaining screws from the platform swing motor, and remove the platform swing motor.

Jib Boom Assembly (GTBZ28J only)

⚠ WARNING



MOVING OBJECT HAZARD

Wear eye protection when tapping the brass drift with wooden hammer.

NOTICE

When removing the hose and fitting, the O-ring on the fitting and hose end must also be removed and tagged.

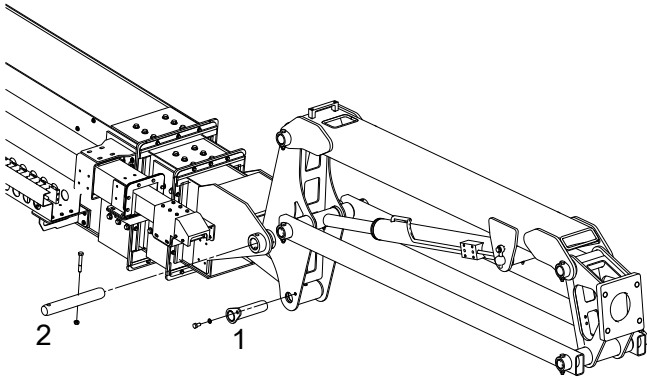


Figure 6-2

1. Remove the platform and platform swing motor. See [Platform, page 6-2](#) and [Platform Swing Motor, page 6-2](#).
2. Support and secure the jib boom to an appropriate lifting device.
3. Remove the bolt from the upper level cylinder pivot pin #1.
4. Tap the pivot pin #1 out with a brass drift and wooden hammer.
5. Remove the bolt from the pivot pin #2.
6. Tap the pivot pin #2 out with a brass drift and wooden hammer.
7. Slowly move the jib boom assembly away from the main boom with a lifting device.

Platform Level Cylinder



WARNING

MOVING OBJECT HAZARD



Wear eye protection when tapping the brass drift with wooden hammer.

NOTICE

When removing the cylinder, special care should be taken to avoid the fall of the cylinder and component damage.

The machine is configured with 2 platform level cylinders located at the boom upper end and lower end.

1. Extend the boom until the platform level cylinder rod-end pivot pin is accessible.
2. Slightly raise the boom and place a support under the platform.
3. Lower the boom until the platform sits on the support. Take special care not to press the total weight of boom over the support.
4. Disconnect and plug the hydraulic lines to the platform level cylinder.
5. Remove the retaining screw from the rod-end pivot pin #1 of the platform level cylinder. And do not move the pivot pin.

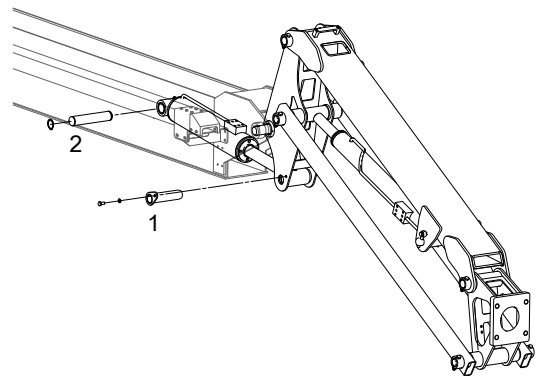


Figure 6-3

6. Remove the retaining ring from the pivot pin #2. And do not move the pivot pin.
7. Support the platform level cylinder with an appropriate supporting device to protect the piston rod from damage.
8. Use brass drift and wooden hammer to tap the pivot pin #1 out.
9. Use brass drift and wooden hammer to tap the pivot pin #2 out.
10. Carefully remove the cylinder from the boom.

Cable Track Assembly

NOTICE

When removing a hose or fitting, the O-ring on the fitting or hose end must also be removed.

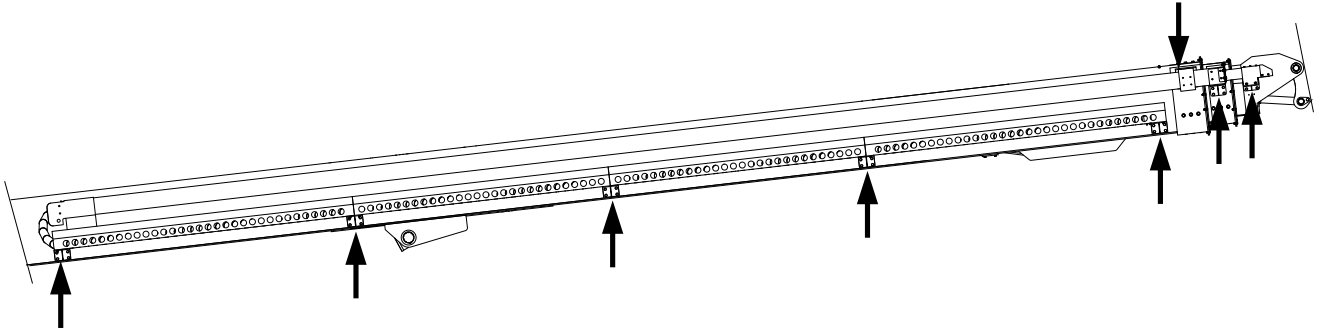


Figure 6-4

1. Tag, disconnect and plug all hydraulic hoses and cables from cable track guide to the platform.
2. Remove the hydraulic hoses and cables from the cable track guide.
3. Using suitable lifting device, fully support the cable track along the entire length.
4. Remove the bolts as indicated by the arrows in the above figure.
5. Using lifting device, slowly move the cable track away from the boom.

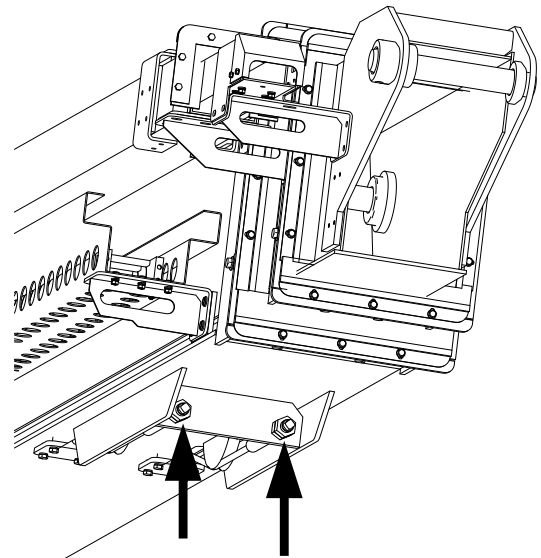


Figure 6-6

Wire Rope Tensioning Adjustment

1. Position the boom to horizontal and extend 1.5–1.8m (5ft-6ft) .
2. Remove the lock nuts from the wire rope retainer.
3. Using a tool, hold the thread end (platform end) of the retract cable to prevent it from rotating.

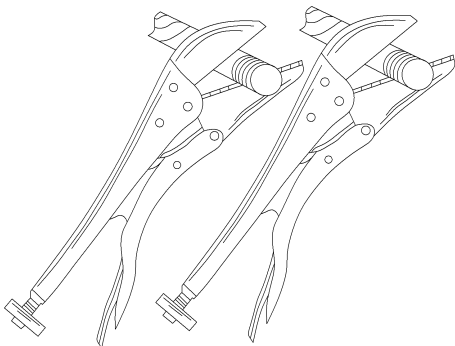


Figure 6-5

5. Retract the boom to 0.6–0.9m (2ft-3ft) of boom extension.
6. Using a tool, hold the thread end (turntable end) of the extend cable to prevent it from rotating.
7. Using a wrench, torque alternately the adjusting nuts of the both extend cables to 112 Nm (82.68 ft-lb) .

NOTICE

Do not hold the wire rope on the thread.

4. Using a wrench, torque alternately the adjusting nuts of the both retract cables to 112 Nm (82.68 ft-lb) .

Main Boom Assembly

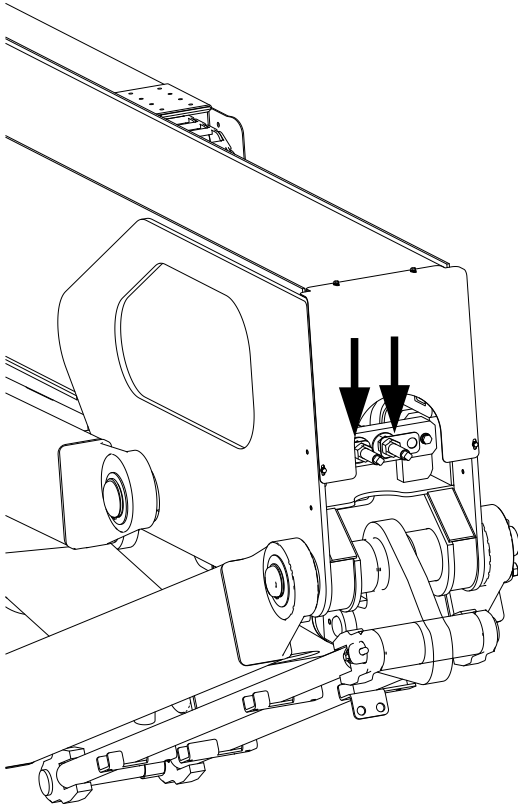


Figure 6-7

8. Fully retract the boom, and ensure each boom section position dimensions fall within the tolerances in the figure below.

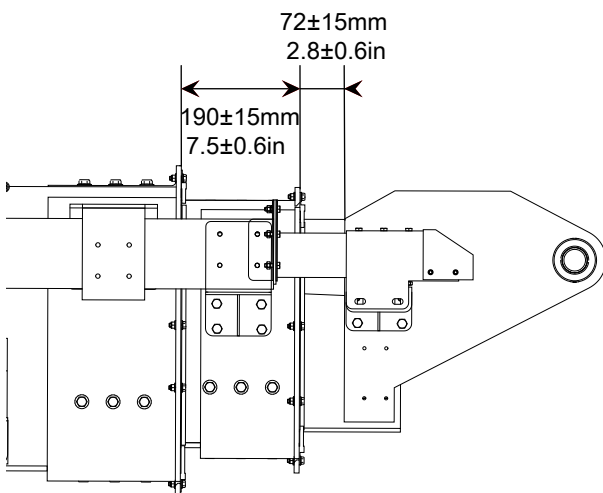


Figure 6-8

9. Re-install the locknut to the wire rope retainer.
10. Check each boom function operates properly.

WARNING

MOVING OBJECT HAZARD



Wear eye protection when tapping the brass drift with wooden hammer.

NOTICE

When removing a hose or fitting, the O-ring on the fitting or hose end must also be removed and tagged.

WARNING

UNSAFE OPERATION HAZARD



Before removing the main boom assembly and lift cylinder, verify that :

- The boom is positioned in the chassis drive direction, and the turntable lock pin is secured.
- The counterweight is adequately supported by a rigid structure.

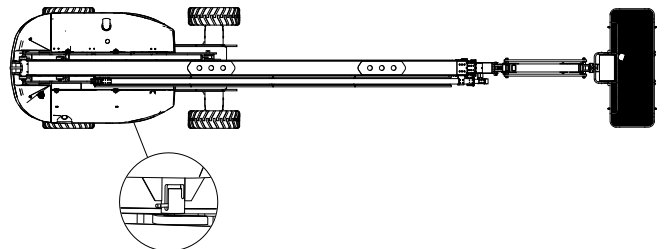


Figure 6-9

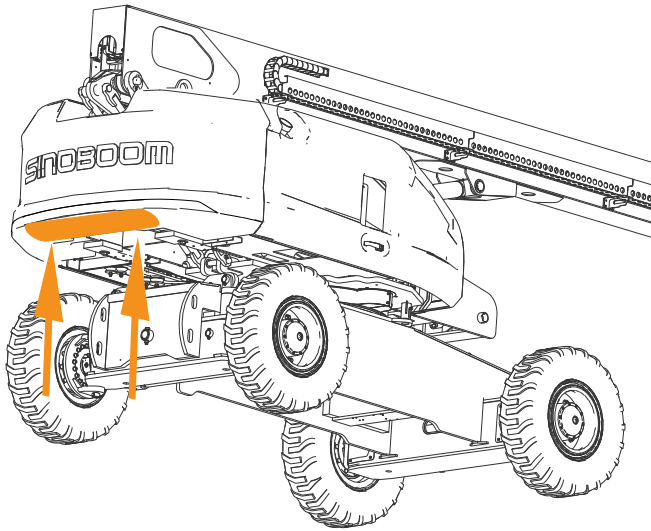


Figure 6-10

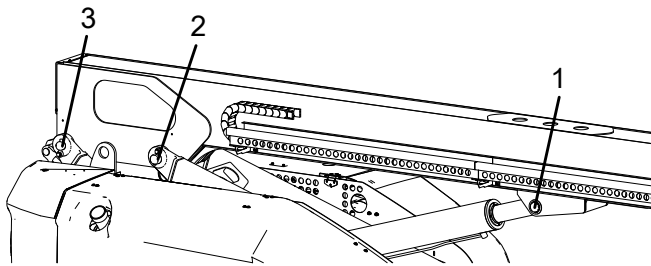


Figure 6-11

1. Slightly raise the boom until the main boom lift cylinder is accessible.
2. Tag, disconnect and plug the hydraulic hoses and cables to the boom assembly.
3. Using a suitable lifting device (capacity not less than 5t), secure the lifting straps to the main boom end.
4. Adequately support the main boom lift cylinder with a suitable supporting device.
5. Remove the retaining ring at the pivot pin #1 connecting the main boom lift cylinder with the boom.
6. Using brass drift and wooden hammer, tap the pivot pin #1 out.
7. Using a suitable lifting device (capacity not less than 5t), secure the lifting straps to the bottom end of the main boom.
8. Remove the bolts and keeper pins of the pivot pins #2 and #3 connecting the boom assembly with the support arm.
9. Using brass drift and wooden hammer, tap the pivot pins #2 and #3 out.

10. Using a lifting device, slowly move the boom assembly away from the turntable.

CHASSIS AND TURNTABLE COMPONENTS

Tires and Rims

Replacing tires and rims

Hunan SinoBoom Intelligent Equipment Co., Ltd. recommends the replacement tires be of the same size, ply rating and brand as the original tires. For the part number of a specific machine model, please reference the Part Manual. If the replacement tires are not as Hunan SinoBoom Intelligent Equipment Co., Ltd. recommends, the following requirements of tires should be met :

1. Ply rating/rated load and dimension equal or greater than original.
2. Tire tread contact width equal or greater than original.
3. Wheel diameter, width and offset dimensions equal to the original.
4. Approved for the application by the tire manufacturer (including intended purposes, maximum drive speed and maximum tire load, etc.).
5. Due to size variations between different tire brands, both tires on the same axle should be the same.



WARNING

UNSAFE OPERATION HAZARD



The tires and rims installed on each product model have been designed for stability requirements. Size changes such as rim width, center piece location, diameter, etc., without written factory recommendations, may result in an unsafe condition regarding stability.

Installing tires and rims

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

! WARNING**UNSAFE OPERATION HAZARD**

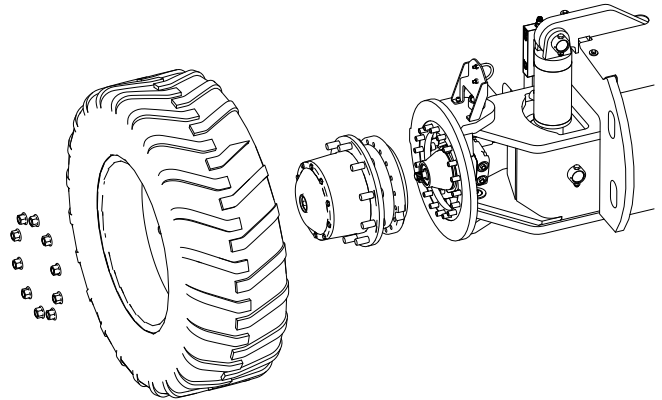
- Use the wheel nuts that suit the rim bolts. The wheel nuts must be installed and maintained at the proper torque to prevent loose wheels, broken studs and possible dangerous separation of wheels from the axle. Be sure to only use the nuts matched to the cone angle of the wheel.
- Tighten the lug nuts to the proper torque to prevent wheels from coming loose. Use a torque wrench to tighten the fasteners. If you do not have a torque wrench, tighten the fasteners with a socket wrench, then immediately have a service garage or dealer tighten the lug nuts to the proper torque. Over-tightening will result in breaking the studs or permanently deforming the mounting stud holes in the wheels.

Table 6-1

1st Stage	2nd Stage	3rd Stage
300Nm (221ft-lb)	600Nm (443ft-lb)	800Nm (591ft-lb)

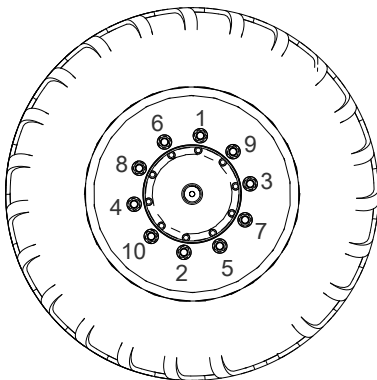
NOTICE

Wheel nuts should be torqued prior to first use of machine and after each wheel removal. Check torque every 3 months or 150 hours of operation.

Reducer and Drive Motor**Figure 6-13**

The proper procedure for attaching wheels is as follows:

1. First apply the threadlocker Loctite 272 to the nuts, then hand tighten all nuts to prevent cross-threading. Do not use a lubricant on threads or nuts.
2. Tighten the nuts in the sequence as shown below.

**Figure 6-12**

3. The tightening of the nuts should be done in stages. Following the recommended sequence, tighten nuts per wheel torque as listed in the table below.

Reducer Assembly

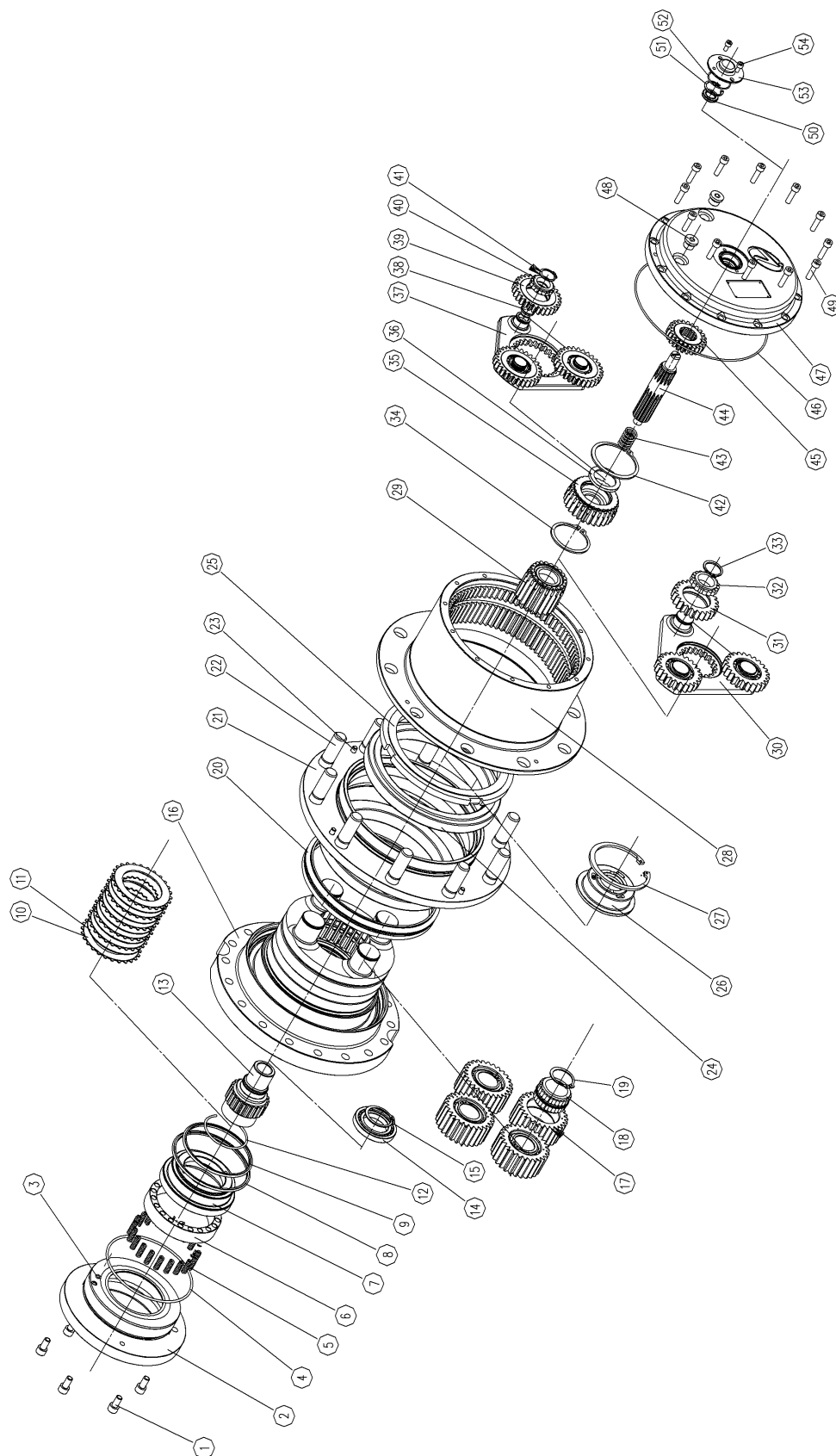


Figure 6-14

Table 6-2

NO.	PART NUMBER	DESCRIPTION	QTY
1	18112069	Socket Cap Screw	6
2	79913245	Coupling	1
3	18125605	O-ring	1
4	18125523	O-ring	1
5	11218001	Spring, Small	20
6	79913191	Spring Pocket	1
7	79913190	Piston	1
8	18125327	Glyd Ring for Shaft	1
9	18125111	Glyd Ring for Shaft	1
10	11219104	Static Friction Disc	6
11	11219103	Dynamic Friction Disc	5
12	18125443	Wire Snap Ring for Hole	1
13	79914192	Input Spline Assembly	1
14	18121107	Deep Groove Ball Bearing	1
15	18125716	Circlip for shaft	1
16	79912270	Brake Housing	1
17	79916013	Planet Gear	4
18	18121013	Cylindrical Roller Bearing	4
19	18125710	Circlip for Shaft	4
20	18125303	Floating Seal	1
21	79911015	Bearing Seat	1
22	18111020	Anti-spin Bolt	10
23	18111019	Socket Head Bolt	4
24	18121012	Cylindrical Roller Bearing	2
25	79913011	Locknut	1
26	79911183	Bearing Support	1
27	18125437	Circlip for Hole	1
28	79912186	Inner Gear Ring	1
29	79916156	Sun Gear	1
30	79911093	Planet Carrier	1
31	79916119	Planet Gear	3
32	18121066	Cylindrical Roller Bearing	3
33	18125703	Circlip for Shaft	3

REPAIR PROCEDURES

NO.	PART NUMBER	DESCRIPTION	QTY
34	18125706	Circlip for Shaft	1
35	79916216	Sun Gear	1
36	79913030	Retaining Ring	1
37	79911274	Planet Carrier	1
38	79917003	Ball Head	3
39	79916314	Planet Gear	3
40	18121067	Cylindrical Roller Bearing	3
41	18125718	Circlip for Shaft	3
42	18125717	Circlip for Shaft	1
43	11218010	Pressure Spring	1
44	79921012	Spline Assembly	1
45	79916315	Sun Gear	1
46	18125586	O-ring	2
47	79912187	Inner Gear Cover	1
48	18112003	Socket Head Plug	2
49	18112064	Socket Cap Screw	12
50	18125333	Framework Oil Seal	1
51	18125419	Circlip for hole	1
52	18125603	O-ring	1
53	79912188	End Cap, Small	1
54	18112047	Socket Cap Screw	2

Removal of reducer and drive motor

1. Place the machine on a solid, level surface.
2. Place a jack of sufficient capacity under the side of chassis to be removed. Lift the jack to make the wheel off the ground.
3. Remove the bolts and washers securing the wheel to the reducer. Use a suitable lifting device to remove the wheel.
4. Tag, disconnect and plug the hydraulic hoses to the drive motor.
5. Remove the mounting bolts from drive motor, and remove the drive motor.
6. Use a suitable lifting device to support the drive reducer.
7. Remove the bolts and washers securing the drive reducer to the outrigger, and remove the drive reducer.

Installation of reducer and drive motor

1. Use a lifting device with sufficient capacity to support the outrigger.
2. Align the reducer brake oil port with the nick of support.
3. Fit the washer with the mounting surface, apply threadlocker Loctite 272 to the bolts, and install in turns.
4. Tighten the bolts with a torque wrench.
5. After all installed, add a suitable level of gear oil.
6. Mesh the spline of motor with the inner gear of reducer, slowly rotate the motor housing until the oil port of motor faces outside and the motor mounting slot is aligned with the reducer mounting bolt.
7. Apply the threadlocker Loctite 272 to the bolts and torque the bolts after pretightening.
8. Attach the hydraulic hoses.

Turntable Slewing Mechanism

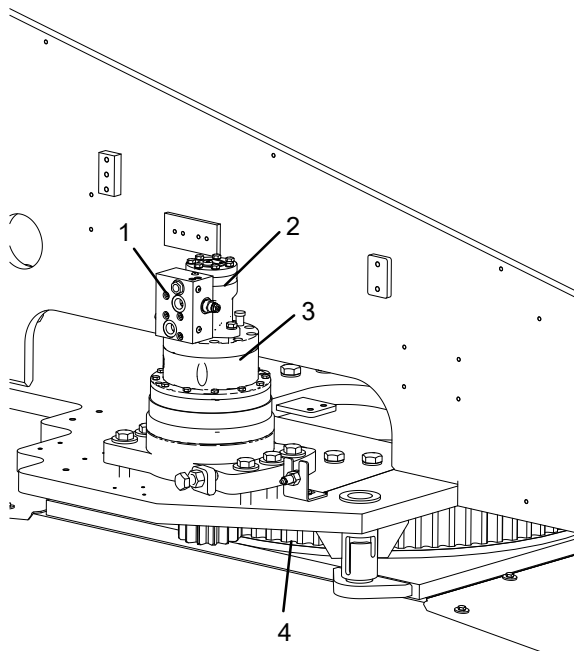


Figure 6-15

Table 6-3

NO.	DESCRIPTION
1	Slewing Buffer Valve
2	Slewing Motor
3	Slewing Reducer
4	Slewing Bearing

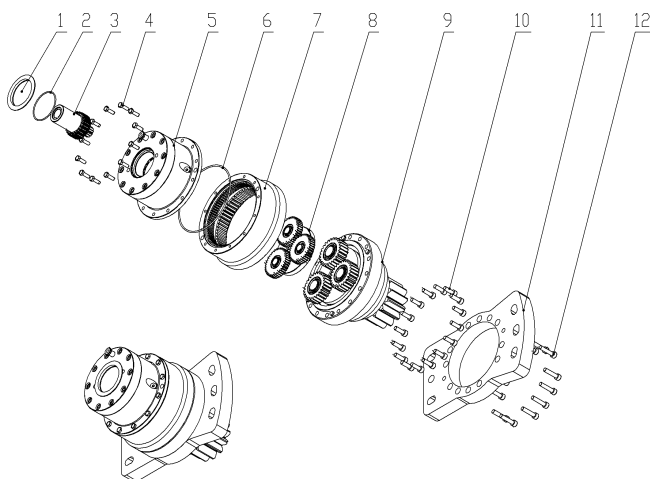


Figure 6-16 Slewing Reducer Assembly

Table 6-4

NO.	DESCRIPTION
1	Dust Cover
2	O-ring
3	Spline Sleeve
4	Bolt
5	Brake Assembly (see Fig 6-16 Brake Assembly, page 6-11)
6	O-ring
7	Gear Ring
8	First Stage Planetary Gear Set Assembly (see Fig 6-17 First Stage Planetary Gear Set Assembly, page 6-12)
9	Second Stage Planetary Gear Set Assembly (see Fig 6-18 Second Stage Planetary Gear Set Assembly, page 6-12)
10	Screw
11	Mounting Disc
12	Screw

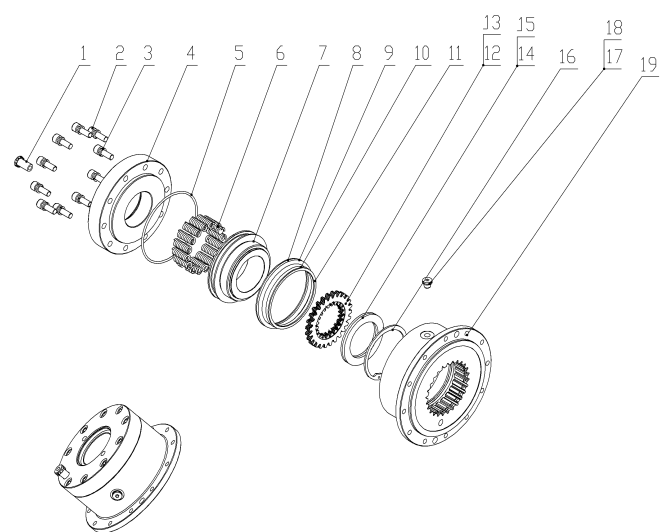
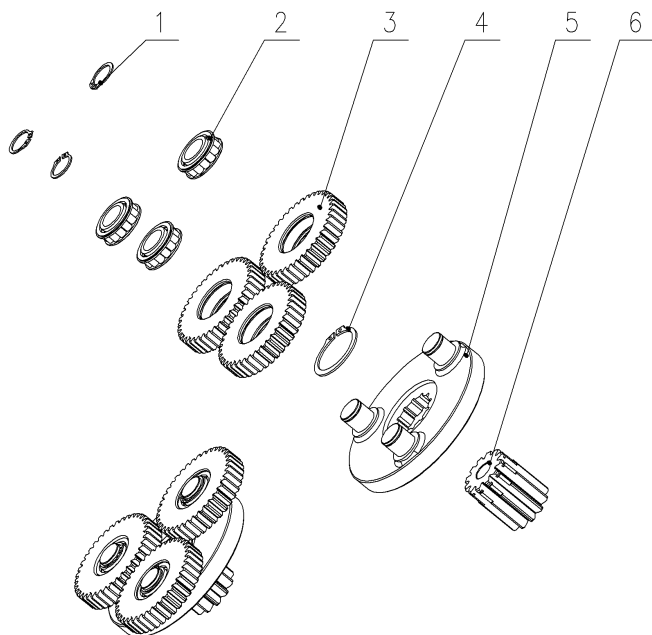


Figure 6-17 Brake Assembly

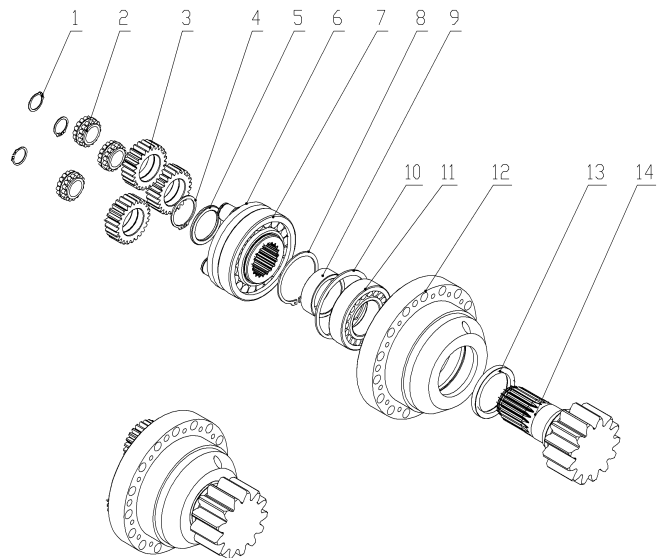
REPAIR PROCEDURES

Table 6-5

NO.	DESCRIPTION
1	Breather Plug
2	Screw
3	Standard Spring Washer
4	Motor Seat
5	O-ring
6	Spring
7	Piston
8	O-ring
9	Retainer Ring
10	O-ring
11	Retainer Ring
12	Outer Friction Disc
13	Inner Friction Disc
14	Adjuster Shim
15	Backing Plate
16	Standard Retainer Ring for Hole
17	Thread Plug
18	Compound Gasket
19	Brake Housing


Figure 6-18 First Stage Planetary Gear Set Assembly
Table 6-6

NO.	DESCRIPTION
1	Standard Retainer Ring for Shaft
2	Bearing
3	First Stage Planet Gear
4	Retainer Ring for Shaft
5	First Stage Planet Gear Carrier
6	Second Stage Sun Gear


Figure 6-19 Second Stage Planetary Gear Set Assembly
Table 6-7

NO.	DESCRIPTION
1	Retainer Ring for Shaft
2	Bearing
3	Second Stage Planet Gear
4	Retainer Ring for Shaft
5	Gasket
6	Second Stage Planet Gear Carrier

NO.	DESCRIPTION
7	Bearing
8	Retainer Ring for Shaft
9	Spacer Bush
10	Retainer Ring for Hole
11	Bearing
12	Bearing Seat
13	Oil Seal
14	Output Spline Shaft

Removal of slewing drive device

1. Tag, disconnect and plug the hydraulic hoses of slewing buffer valve and slewing reducer brake.
2. Remove the bolt and washer from the slewing buffer valve, and then remove the slewing buffer valve from the slewing motor.
3. Remove the bolts securing the slewing reducer to the turntable, and then remove the slewing reducer.

Installation of slewing drive device

1. Clear the foreign matters and burrs on the mounting surface and gears of slewing reducer.
2. Place the slewing reducer on the turntable mounting surface, use a feeler gauge to measure the gear backlash relative to the slewing bearing, be sure the gear backlash falls within 0.15—0.25mm (0.006—0.01in).

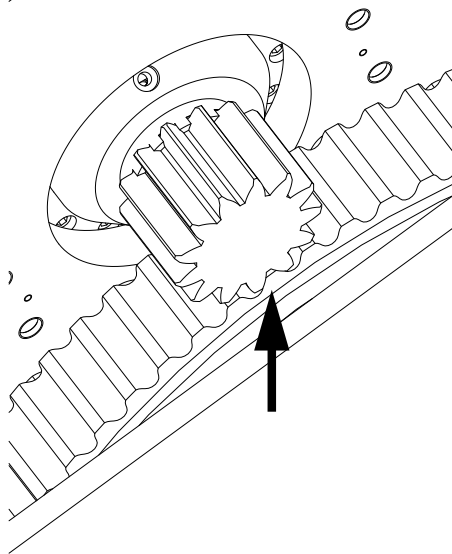


Figure 6-20

3. If the gear backlash exceeds the specification, adjust the nut to specification.
4. With washer on the bolt, apply threadlocker Loctite 272. Install the mounting bolts to secure the slewing reducer to the turntable, after installation pre-tighten in diagonal order.
5. Ensure the slewing reducer fits in well with the turntable.
6. Use a wrench to tighten the bolts in diagonal order.
7. Add gear oil to the slewing reducer until the gear surface is covered.
8. Clean the mounting surface of slewing reducer, and mate the axis pin of slewing motor with the reducer pin hole.
9. Rotate the motor housing to align the slewing motor bolt hole with the reducer bolt hole. Apply threadlocker Loctite 272 to the bolt with washer on, install the bolt and tighten.

Installation of slewing bearing

1. Use a lifting device with sufficient capacity to lift the slewing bearing over the mounting surface of chassis.
2. Ensure the soft strap installation area of the slewing bearing is vertical to the boom direction.

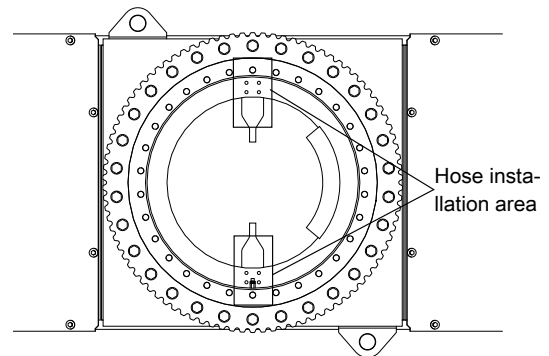


Figure 6-21

3. Use a feeler gauge to measure the clearance between the mounting surface of the slewing bearing and that of the chassis, ensure the clearance $\leq 0.2\text{mm}$ (0.008in).
4. Using the special washer for the high-strength bolt, mate the washer surface with the mounting surface, apply threadlocker Loctite 272 to the bolt, and install the bolts one by one.
5. Tighten the bolts in the sequence as shown in the figure below.

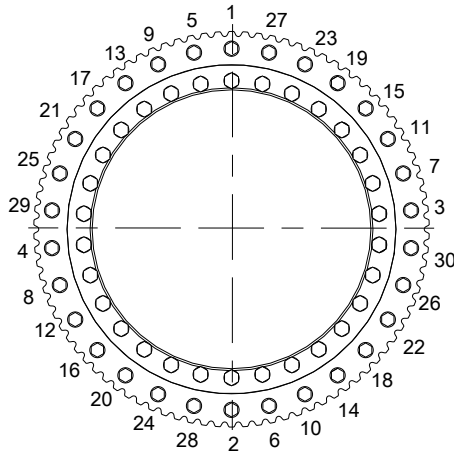


Figure 6-22

6. The tightening of bolts should be done in stages, Follow the stages and the recommended torques as listed in the table below to tighten the bolts.

Table 6-8

1st Stage	2nd Stage	3rd Stage
180Nm (133ft-lb)	360Nm (266ft-lb)	600Nm (443ft-lb)

7. Hand turn the inner ring of the slewing bearing, ensure it moves smoothly.
8. Detach the lifting device from the slewing bearing.
9. Rotate the inner ring of the slewing bearing until the soft strap area on the inner ring and that on the outer ring are symetrically arranged around the center of the slewing bearing.
10. Using a lifting device, lift the turntable to the mounting surface of the slewing bearing.
11. Using the special washer for the high-strength bolt, mate the washer surface with the mounting surface,

apply threadlocker Loctite 272 to the bolt, and intall the bolts one by one.

12. Refer to [Fig 6-21 , page 6-14](#) , and tighten the retaining bolts in the sequence as indicated.
13. Refer to [Table 6-8 , page 6-14](#), and tighten the bolts per the recommended torques and sequence.

Engine

Please read the engine manufacturer's manuals for the engine operation and maintenance instructions. For the convenience of referencing related information, this manual introduces part of engine maintenance items, please see the following sections for details :

- [A-6 Inspect Fuel Level, page 5-7](#)
- [A-7 Inspect Fuel Leakage, page 5-8](#)
- [A-8 Inspect Engine Oil Level, page 5-8](#)
- [A-9 Inspect Coolant Level, page 5-9](#)
- [A-10 Inspect Engine Belt, page 5-10](#)
- [A-11 Inspect Fuel Filter, page 5-10](#)
- [A-12 Inspect Cooling Fan, page 5-11](#)
- [A-13 Inspect Engine Intake System, page 5-11](#)
- [B-4 Inspect Cooling System, page 5-19](#)
- [B-5 Replace Fuel filter, page 5-19](#)
- [B-8 Replace Air Filter of Engine, page 5-20](#)
- [B-10 Inspect Engine Exhaust System, page 5-21](#)
- [C-1 Replace Fuel Filter Element, page 5-25](#)
- [D-5 Replace Coolant and Coolant Hoses, page 5-29](#)
- [D-6 Replace Fuel Hoses, page 5-29](#)

Main engine fault codes and causes :

Table 6-9

FAULT CODE	SPN	FMI	DESCRIPTION	CAUSE
111	629	12	Engine control model fails serverly	Smart control device or component damaged
131	91	3	Electrical circuit #1 of sensor at the accelerator padal or control handle	High-voltage short circuit
132	91	4	Electrical circuit #1 of sensor at the accelerator padal or control handle	Low-voltage short circuit
144	110	3	Electrical circuit #1 of engine coolant temperature sensor	High-voltage short circuit

FAULT CODE	SPN	FMI	DESCRIPTION	CAUSE
145	110	4	Electrical circuit #1 of engine coolant temperature sensor	Low-voltage short circuit
146	110	16	Engine coolant temperature	Data valid but higher than normal (medium-level severity)
147	91	1	Electrical circuit #1 frequency of sensor at the accelerator pedal or control handle	Data valid but lower than normal (highest-level severity)
148	91	0	Electrical circuit #1 frequency of sensor at the accelerator pedal or control handle	Data valid but higher than normal (highest-level severity)
151	110	0	Engine coolant temperature	Data valid but higher than normal (highest-level severity)
153	105	3	Electrical circuit #1 of intake manifold temperature sensor	High-voltage short circuit
154	105	4	Electrical circuit #1 of intake manifold temperature sensor	Low-voltage short circuit
155	105	0	Electrical circuit #1 of intake manifold temperature sensor	Data valid but higher than normal (highest-level severity)
195	111	3	Electrical circuit #1 of coolant level sensor	High-voltage short circuit
196	111	4	Electrical circuit #1 of coolant level sensor	Low-voltage short circuit
197	111	18	Coolant level	Data valid but lower than normal (medium-level severity)
234	190	0	Engine crankshaft rpm/position	Data valid but higher than normal (highest-level severity)
235	111	1	Coolant level	Data valid but lower than normal (highest-level severity)
415	100	1	Engine oil channel pressure	Data valid but lower than normal (highest-level severity)
418	97	15	Fuel moisture level indicator	Data valid but higher than normal (lowest-level severity)
427	639	9	SAE J1939 data communication interface	Update speed error
428	97	3	Electrical circuit of fuel moisture level sensor	High-voltage short circuit
429	97	4	Electrical circuit of fuel moisture level sensor	Low-voltage short circuit
441	168	18	Battery #1 voltage	Data valid but lower than normal (medium-level severity)
442	168	16	Battery #1 voltage	Data valid but higher than normal (medium-level severity)
471	98	17	Engine oil level	Data valid but lower than normal (lowest-level severity)
584	677	3	Electrical circuit of starter relay	High-voltage short circuit

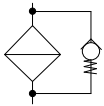
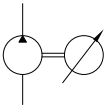
REPAIR PROCEDURES

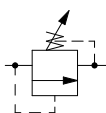
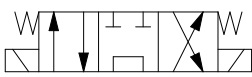
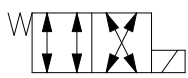
FAULT CODE	SPN	FMI	DESCRIPTION	CAUSE
585	677	4	Electrical circuit of starter relay	Low-voltage short circuit
1117	3597	2	Power off with ignition switch not closed	Data unstable, interrupted or incorrect
1239	2623	3	Electrical circuit #2 of sensor at the accelerator pedal or control handle	High-voltage short circuit
1241	2623	4	Electrical circuit #2 of sensor at the accelerator pedal or control handle	Low-voltage short circuit
1242	91	2	Accelerator pedal position sensor	Data unstable, interrupted or incorrect
2448	111	17	Coolant level	Data valid but lower than normal (lowest-level severity)
2555	729	3	Electrical circuit #1 of intake heater	High-voltage short circuit
2556	729	4	Electrical circuit #1 of intake heater	Low-voltage short circuit
2963	110	15	Engine coolant temperature	Data valid but lower than normal (lowest-level severity)
2964	105	15	Over temperature of intake manifold #1	Data valid but higher than normal (lowest-level severity)
3326	91	9	SAE J1939 accelerator pedal sensor system	Update error
3613	111	9	Coolant level sensor	Update error
3614	111	19	Engine coolant level sensor	Network data error
3697	630	12	Engine control calibration module	Smart control device or component damaged

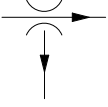
HYDRAULIC SYSTEM

Hydraulic Symbols

Table 6-10

Symbol	Description
	Filter
	Brake
	Power unit

Symbol	Description
	Hydraulic motor
	Overflow valve
	3-position 4-way solenoid directional valve
	2-position 4-way solenoid directional valve

Symbol	Description
	Pressure gradient control valve
	Check valve

Hydraulic Schematic Diagram

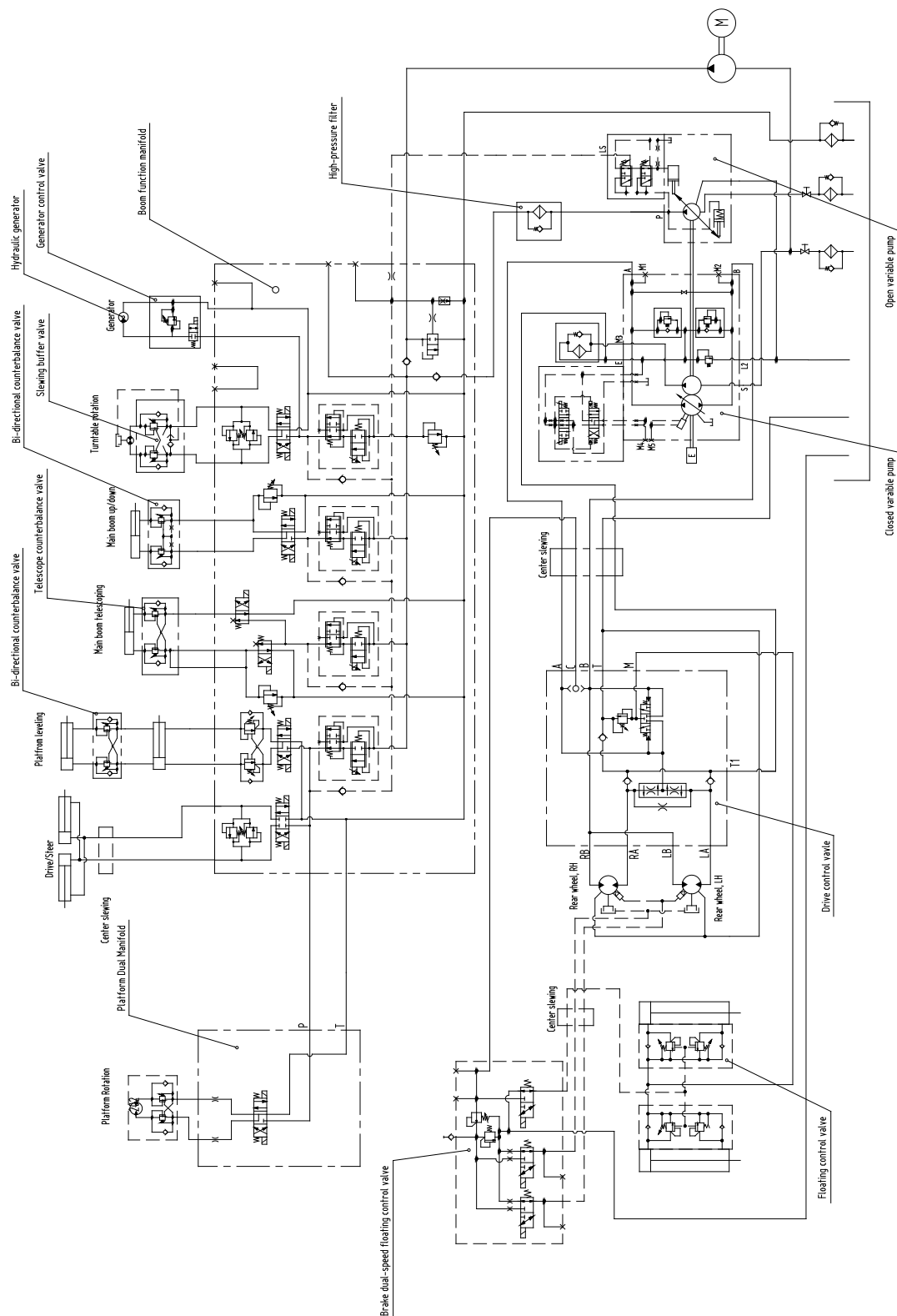


Figure 6-23 GTBZ26 hydraulic schematic diagram (2WD)

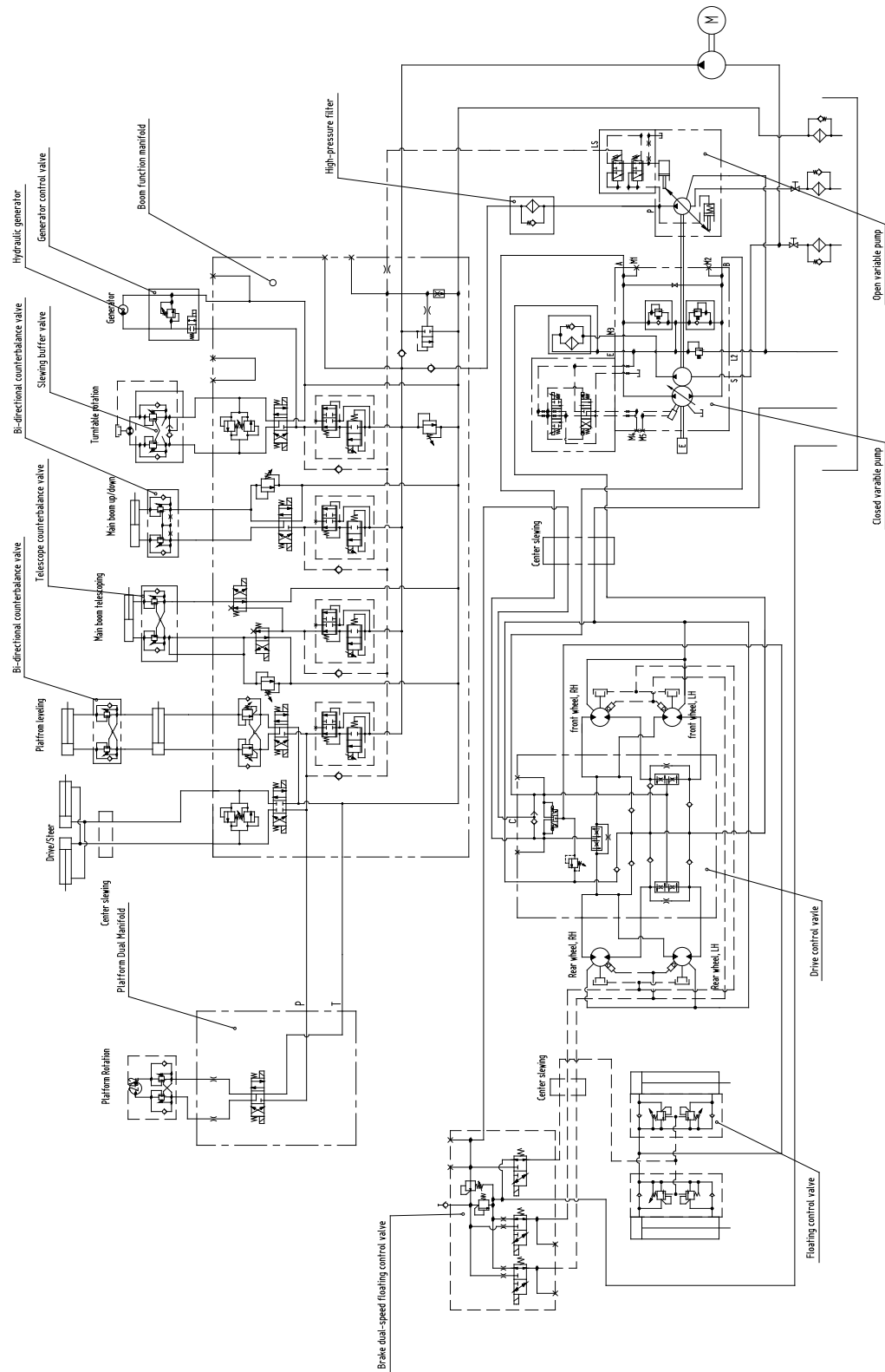


Figure 6-24 GTBZ26 hydraulic schematic diagram (4WD)

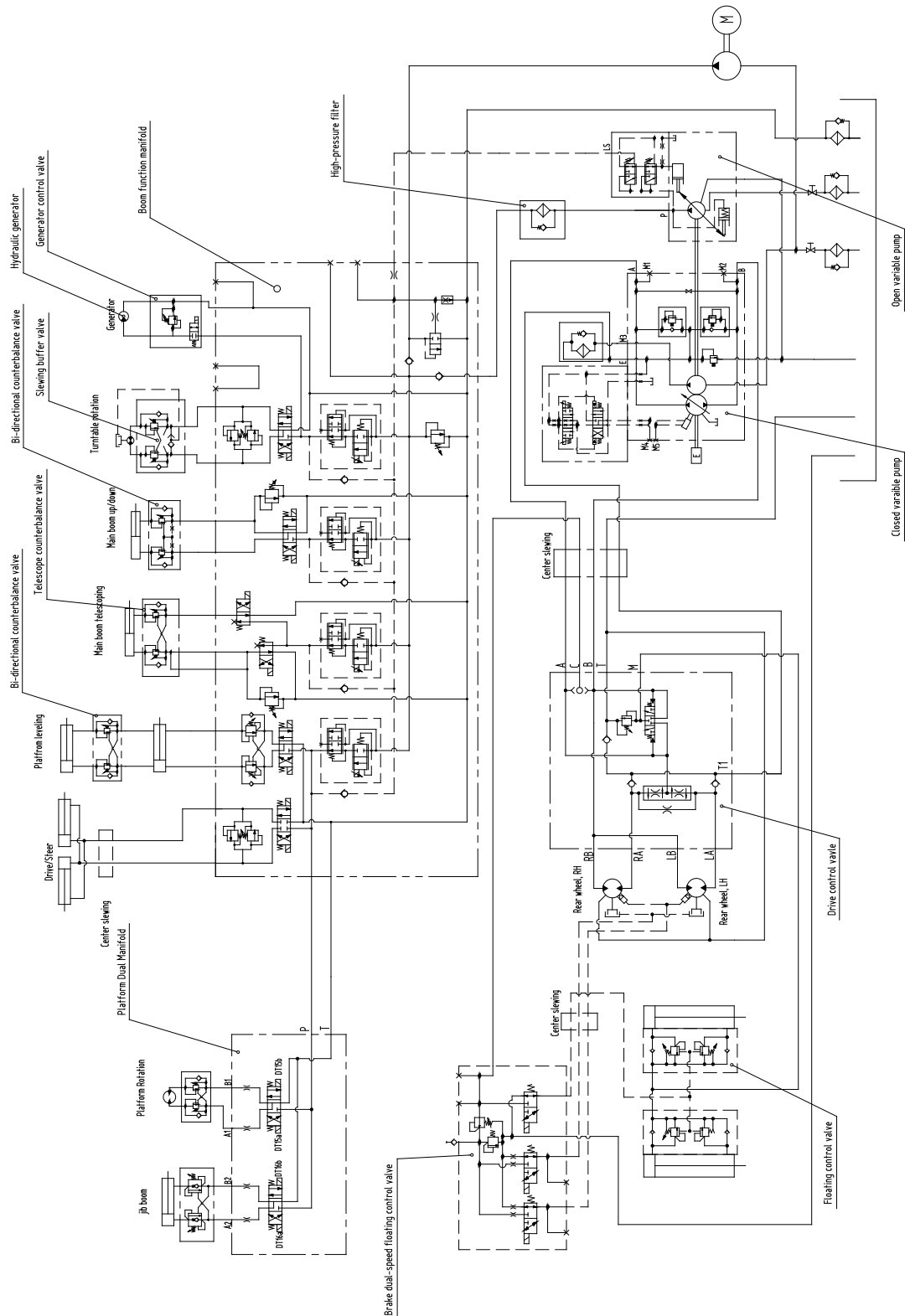


Figure 6-25 GTBZ28J hydraulic schematic diagram (2WD)

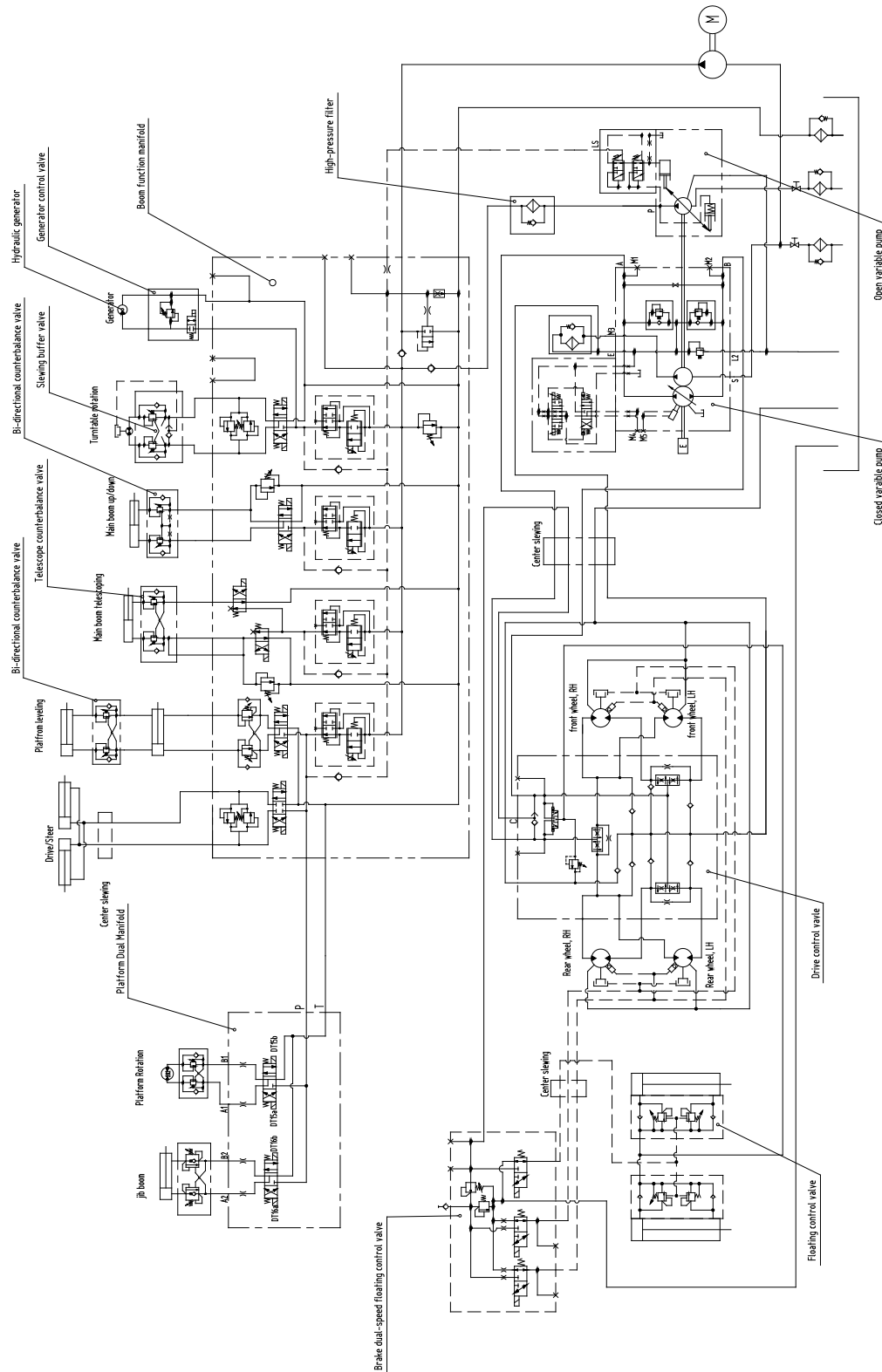


Figure 6-26 GTBZ28J hydraulic schematic diagram (4WD)

REPAIR PROCEDURES

ELECTRICAL SYSTEM

Use and Maintenance of Battery

 **WARNING**

BATTERY HAZARD



Always read and comply with the battery manufacturer's recommendations for procedures concerning proper battery use and maintenance.



Batteries contain sulfuric acid and generate explosive mixtures of hydrogen and oxygen gases. Keep any device that may cause sparks or flames away from the battery to prevent explosion.



Always wear protective glasses or goggles and protective clothing when working with batteries. You must follow the battery manufacturer's instructions on safety, maintenance and installation procedures.

This machine uses maintenance-free type of lead-acid battery. The requirements for its use and maintenance are as follows :

Preparation

- Before checking the fault, the operator must wear safety equipment, including insulating gloves, helmets and other necessary safety supplies and multimeters.
- Inspect the battery outer condition for problems such as battery deformation, damage of the positive and negative terminals, etc.
- Check and confirm the fault description and analyze the cause.

Charging

- Do not use an external charger.
- Charge using the correct AC input voltage indicated on the decal.
- Make sure the battery is connected before charging.
- Connect the battery charger to a grounded AC circuit.
- Charge the battery every time after using.

Maintenance

- While wearing proper hand and face protection, wipe the top and sides of the battery.

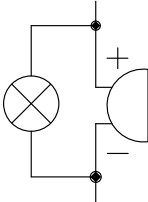
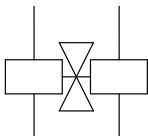
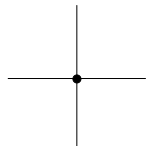
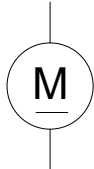
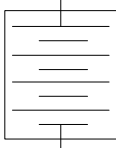
- Do not rinse or spray the battery pack with a water hose.
- Regularly check the cables and locknuts.
- Do not leave the battery in a discharged state during storage, as it will shorten the service life.

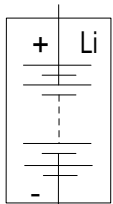
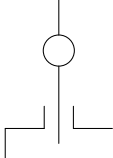
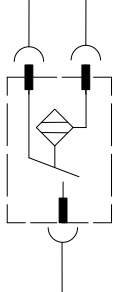
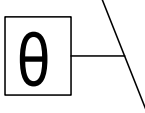
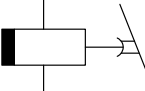
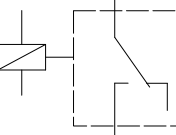
Cautions

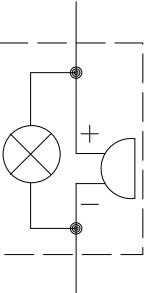
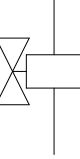
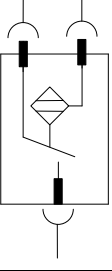
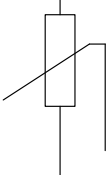
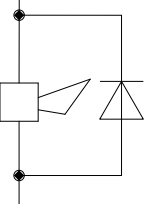
- Because there is a risk of high voltage, do not touch non-insulated terminals or connectors.
- The battery terminal and related accessories contain lead and lead components. Wash your hands after handling them.

Electrical Symbols

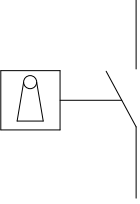
Table 6-11

Symbol	Description
	Buzzer
	Valve
	Two lines connected
	Motor
	Storage battery

Symbol	Description
	Lithium battery
	Toggle switch
	Level switch
	Oil temperature switch
	Delay relay
	Power-off switch
	Relay

Symbol	Description
	Warning lamp
	Valve
	Two lines non-connected
	Proximity switch/ Pressure sensor
	Fuel level sensor
	Horn

REPAIR PROCEDURES

Symbol	Description
	Key switch
	Preheating wire

Electrical Schematic Diagram

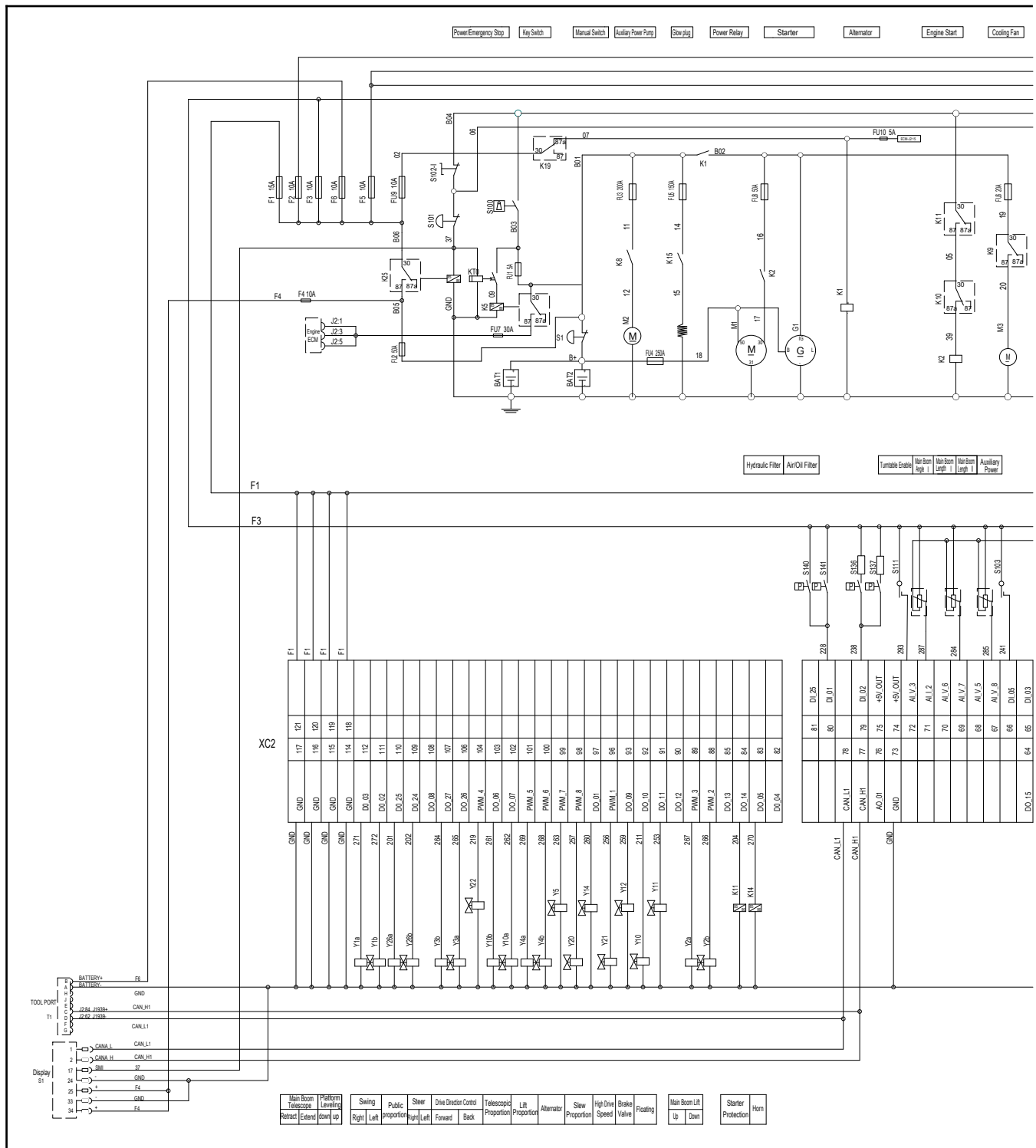


Figure 6-27 Electrical schematic diagram of turntable

REPAIR PROCEDURES

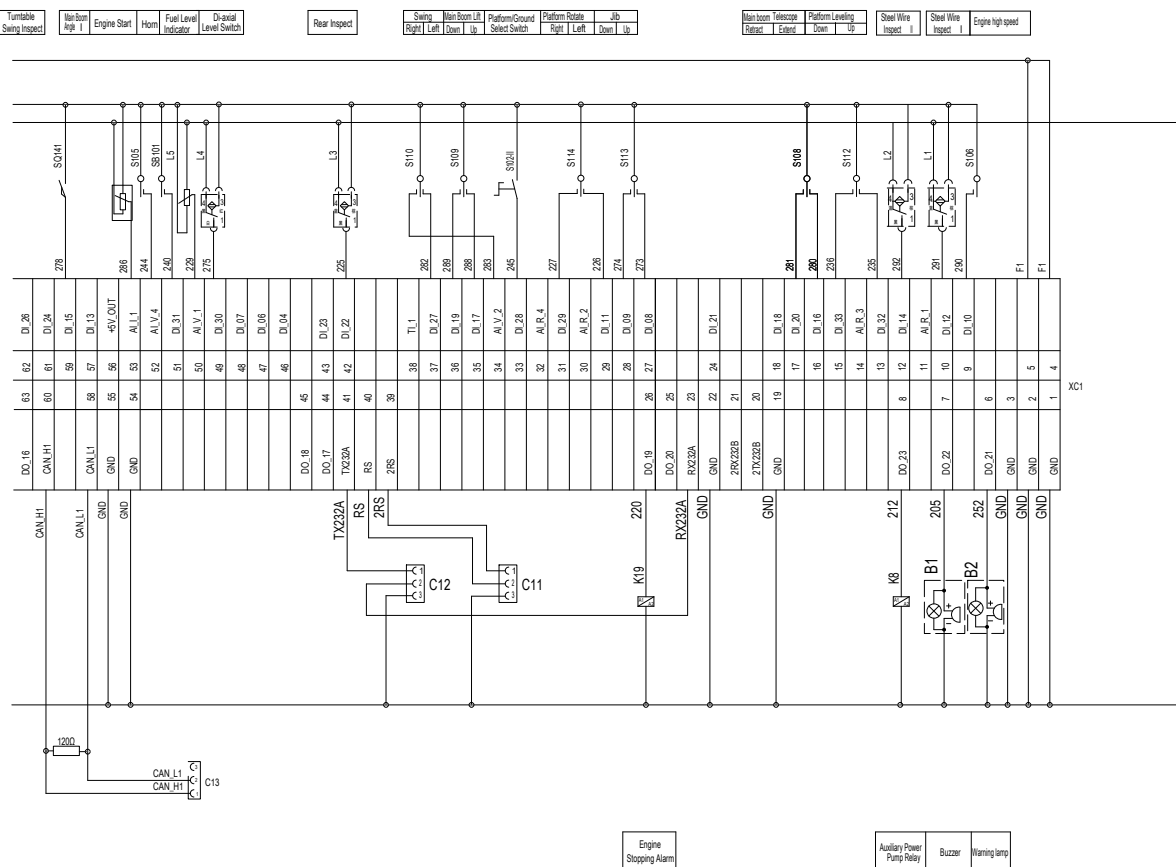
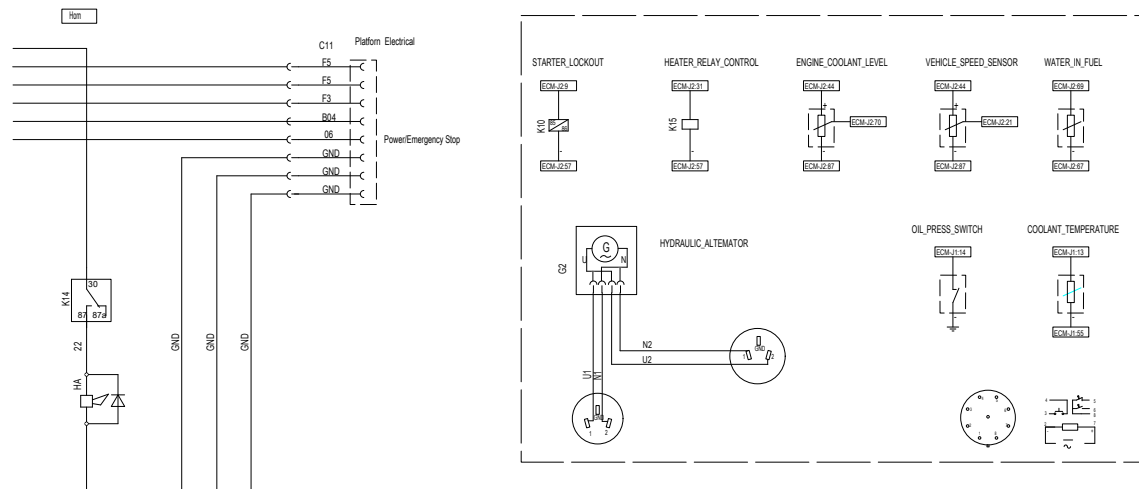


Figure 6-28 Electrical schematic diagram of turntable (continued)

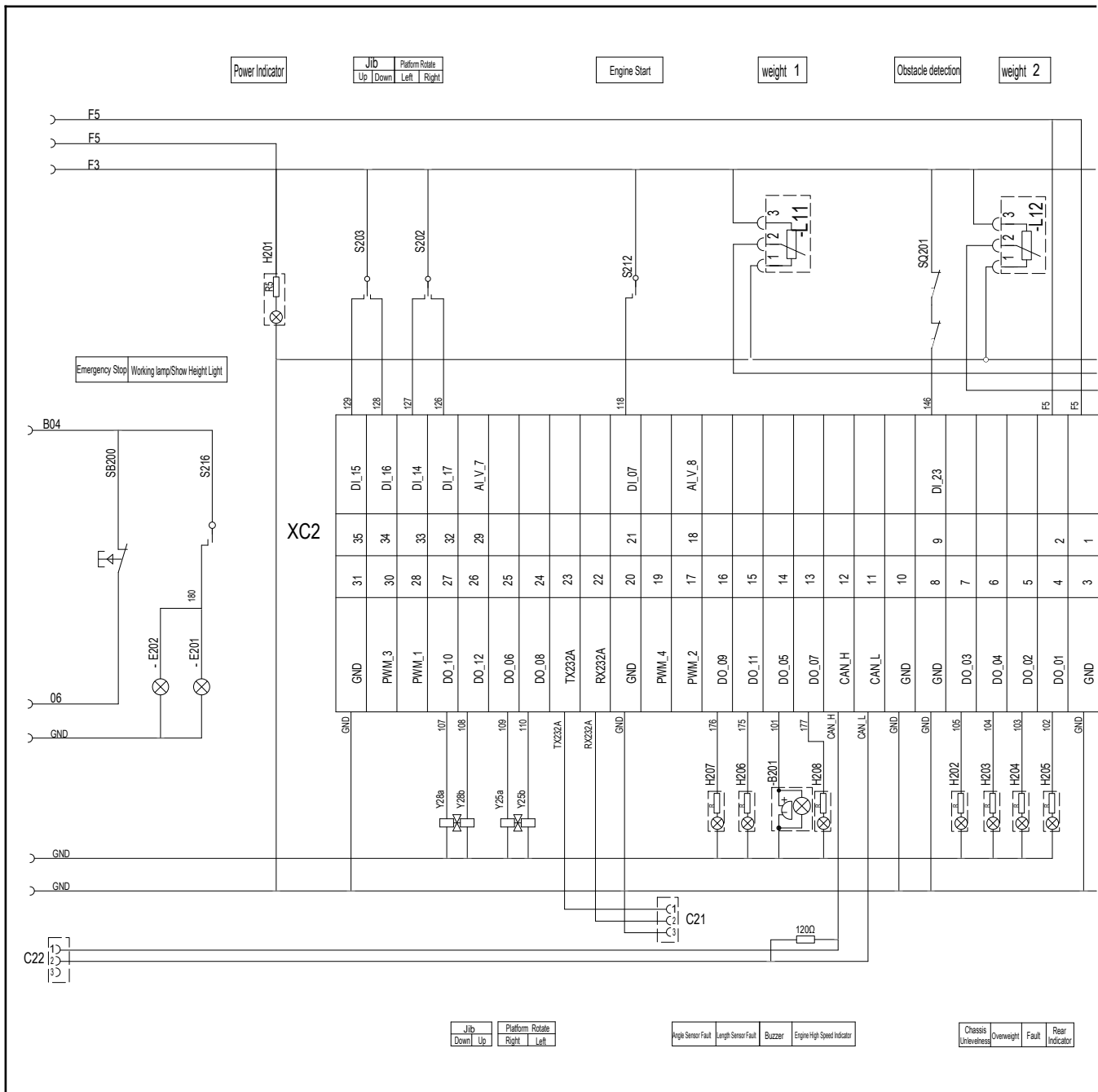


Figure 6-29 Electrical schematic diagram of platform

APPENDIX 1: PREPARE THE WORD RECORD BEFORE DELIVERY

PREPARE THE WORK RECORD BEFORE DELIVERY			
Model			
Serial No.			
Inspection Item	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired
Pre-operational Inspection			
Maintenance Procedure			
Functional Inspection			
Machine Buyer/ Renter			
Inspector Signature			
Inspector Title			
Inspector Company			
NOTE: 1. Prepare the machine before delivery, which includes performing a pre-delivery inspection, following maintenance procedures and performing functional inspections. 2. Use the table to record the results. After each section is complete, mark the appropriate box. 3. Record the inspection results. If any inspection results are "NO", the machine must be stopped and re-inspected after repair is completed and marked in the box marked "inspection".			

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APPENDIX 2: REPAIR & INSPECTION REPORT

REPAIR & INSPECTION REPORT				
Model				
Serial No.				
Checklist A Procedures				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/ Machine Has Been Repaired	Problem Description
A-1 Inspect All Manuals				
A-2 Inspect All Decals				
A-3 Inspect Damaged, Loose or Lost Parts				
A-4 Inspect Hydraulic Oil Level				
A-5 Inspect Hydraulic Oil Leakage				
A-6 Inspect Fuel Level				
A-7 Inspect Fuel Leakage				
A-8 Inspect Engine Oil Level				
A-9 Inspect Coolant Level				
A-10 Inspect Engine Belt				
A-11 Inspect Fuel Filter				
A-12 Inspect Cooling Fan				
A-13 Inspect Engine Intake System				
A-14 Functional Tests				
A-15 Test Floating Outrigger (if Equipped)				
A-16 Test Drive Speed				
A-17 Test Emergency Lowering Function				
A-18 Test Tilt Protection System				
A-19 Test Weighing System				
A-20 Perform Maintenance after 30 Days				

REPAIR PROCEDURES

REPAIR & INSPECTION REPORT				
Checklist B Procedures				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired	Problem Description
B-1 Replace Hydraulic Oil Tank Return Filter				
B-2 Inspect Rim ,Tire and Fasteners				
B-3 Inspect Hydraulic Oil				
B-4 Inspect Cooling System				
B-5 Replace Fuel filter				
B-6 Inspect Air filter of Hydraulic Tank				
B-7 Replace High-Pressure Filter				
B-8 Replace Air Filter of Engine				
B-9 Inspect Length and Angle Sensors				
B-10 Inspect Engine Exhaust System				
B-11 Inspect Drive Reducer Oil Level				
B-12 Inspect Slewing Reducer Oil Level				
B-13 Inspect Slewing Bearing Bolts				
B-14 Lubricate Slewing Bearing				
B-15 Inspect Platform Rotate Cylinder Fasteners				
B-16 Test Cylinder Drift				
B-17 Test Float Cylinder Exhausting and Counterbalance Valve Locking				
B-18 Inspect Electrical Wiring				
B-19 Inspect the battery				
Checklist C Procedures				

REPAIR & INSPECTION REPORT				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired	Problem Description
C-1 Replace Fuel Filter Element				
C-2 Inspect Boom Extend/Retract Cables and Pulleys				
C-3 Replace Engine Oil				
C-4 Replace Engine Oil Filter				
Checklist D Procedures				
Items	YES/Machine is in Good Condition	NO/Machine Has Damage or Malfunction	REPAIRED/Machine Has Been Repaired	Problem Description
D-1 Replace Drive Reducer Gear Oil				
D-2 Replace Slewing Reducer Gear Oil				
D-3 Replace Hydraulic Oil				
D-4 Replace Hydraulic Tank Suction Filter				
D-5 Replace Coolant and Coolant Hoses				
D-6 Replace Fuel Hoses				
D-7 Inspect Boom Wear Pads				
NOTES: 1. The Repair & Inspection Report shall include the inspection table of each regular inspection. 2. Duplicate the Repair & Inspection Report for each inspection. Store the completed tables for 10 years or until the machine is no longer in use or as required by machine owner/company/custodian. 3. Use the table to record the results. After each section is complete, mark the appropriate box. 4. Record the inspection results. If any inspection results are "NO", the machine must be stopped and re-inspected after repair is completed and marked in the box marked "inspection". Select the appropriate inspection procedure based on the inspection type.				
User				
Inspector Signature				
Inspector Date				
Inspector Title				
Inspector Company				

Always for Better Access Solutions



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