

ECB16S-B/ECB18S-B

OPERATOR MANUAL

< OM-ECB16/18S-B2019001-EN >



BYD FORKLIFT

ECB16S-B/ECB18S-B

ECB16S-B/ECB18S-B

< OM-ECB16/18S-B2019001-EN >

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FOREWORD

Thank you for choosing BYD electric forklifts.

These operating instructions explain in detail how to correctly operate the BYD electric forklifts, as well as the procedures that you should follow when conducting checks, maintenance and repairs on the forklifts.

Read through every chapter in the manual before operation for the correct use and maintenance of the forklifts. When the forklift is out for rental or transportation, keep this operation instruction together with the forklift and make sure that operators can use the manual whenever necessary.

Pay attention to the following signs:

Danger

(Indicates an imminent extremely hazardous situation. Failure to avoid it will cause severe injuries, major property damage or even death)

Warning

(Indicates a potential extremely hazardous situation. Failure to avoid it might cause severe injuries, major property damage or even death)

Caution

(Indicates a potential hazardous situation. Failure to avoid it might cause slight to medium injuries, or property damage)

Note

(Note for detailed operation. Complying with the instructions will ensure a better operation of the BYD forklift)

DESCRIPTIONS

Operation Notice

BYD industrial vehicles can only be operated in the designated areas in the factory or in other specific environments, in compliance with Regulations on safety supervision of special equipment.

Inappropriate use of the BYD forklift might cause damages and losses, which the operators or proprietor instead of BYD should be held liable for. If the forklift needs to be operated in the environments other than those mentioned in this manual, contact with your local BYD dealer first for confirmation.

Any modification to the forklift is not allowed unless BYD's written consent is granted. Contact with BYD first before modifying the forklifts.

If you have ordered other auxiliary attachments besides forks, please handle the loads in compliance with the loading capacity of the attachments. All the attachments are provided with operation instructions. Read through the manuals before operation.

This manual is devised based on the standard forklifts. For other questions not covered in the manual, please check with BYD after sales service. BYD forklift is subject to ongoing development and optimizing the design of products. BYD Forklift reserves the right to alter the design, equipment, technical features,

and technical specifications and so on. No guarantee of particular features of the forklift should therefore be assumed from the present operator manual.

Forklift Delivery

Every BYD forklift has passed through thorough performance tests before shipment. Although proper protection has also been adopted during transportation, it is advised to conduct a thorough inspection when the forklift arrives. Before delivering the forklift to end customers, to guarantee that the forklift is in perfect condition, the followings checks should be conducted at BYD dealers::

- (1) Check if the wheel nuts are securely fastened
- (2) Check the hydraulic oil level
- (3) Check the braking function
- (4) Check the travelling function
- (5) Check the steering function
- (6) Check the operation of mast and attachments
- (7) Check the high voltage connectors (transportation might have loosened the connectors)

To avoid inconveniences in future warranty claims, please check the functions of the forklift and check if the forklift is complete.

OPERATOR NOTICE

This chapter instructs on safety operation procedures that should be followed during the use of the BYD forklift.

The operator of the forklift should have obtained the driving permit in accordance with local regulations.

Before operating the forklift, check the nameplate and capacity chart to know the loading capacity of the forklift and avoid the overloading during operation.

Warning signs and decals are pasted on the forklift. Get familiar with the decals and its contents.

NOTICE

Operator Qualification

Industrial vehicle can only be allowed to be operated by people with the qualification regulated by local laws. The operators should be those who have been specially trained and have experience in operating the vehicles. The user or other entrusting part must confirm the qualification of the operators and make use of the tests before authorizing the person to operate the forklift.

The operating company must make sure that the operators understand all the safety messages on the forklifts.

For the proprietor, make sure following safety instruction on your industrial vehicles are observed.

Please abide by relevant regulations and guide-principles, such as:

- (1) Operation of industrial vehicle
- (2) Lane and operative area regulation
- (3) Driver's right, responsibility and standard of behavior
- (4) Special operation area
- (5) Daily maintenance and repair
- (6) Regular maintenance and repair

Danger

- (1) Unauthorized persons are not allowed to operate the forklift.
- (2) Safety devices and features (such as OPS system) will provide extra safety. Do not deactivate these safety device and features.
- (3) Make sure that the load is well palletized and trimmed to avoid its protruding the loading surface of forklift and thus slipping, collapsing and falling over.
- (4) Any modification on the forklift is not allowed. Contact with BYD before making any modification.
- (5) Do not overload. Before operation, please check the rated loading capacity and loading center on the capacity chart. When an attachment has been installed, abide by the rated loading capacity given on the attachment.
- (6) Do not operate the forklift after drinking. It might cause severe human injuries.

Caution

- (1) Read through the operation instructions before operating the forklift.
- (2) Operators should wear working boots and working clothes.
- (3) Do not operate the forklift with wet or greased hands.
- (4) Conduct the daily checking and regular maintenance on the forklift.
- (5) Stop operating the forklift when the abnormalities and damages are found on the forklift.
Do not use the forklift until the forklift is fully repaired.

Warning Decals and Signs

The BYD forklifts have warning decals and signs to remind the operators of potential risks, as well as safety notices. Find and read all these decals and signs.

If the warning decals and signs are missing or difficult to read, please contact your local BYD dealer for immediate replacement.

INTRODUCTION

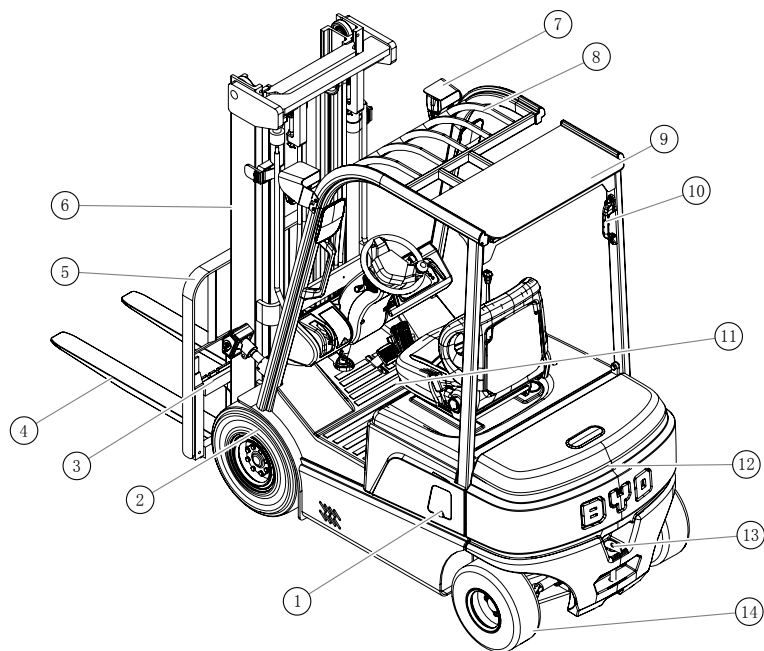
This chapter instructs on the general view and technical specifications of the forklift.

BYD electric counterweight forklifts are purely powered by batteries. These forklifts are characterized by high power, rapid charge, zero emission, and zero pollution. They may be used for picking up, depositing, handling, or stacking loads in harbors, stock yards, plants, warehouses, logistics centers, and marine shipment containers. They are notable for great convenience and high efficiency, gaining the reputation “master-hand for handling loads in plants and workshops” .

INTRODUCTION, TECHNICAL SPECIFICATIONS AND WORKING ENVIRONMENT

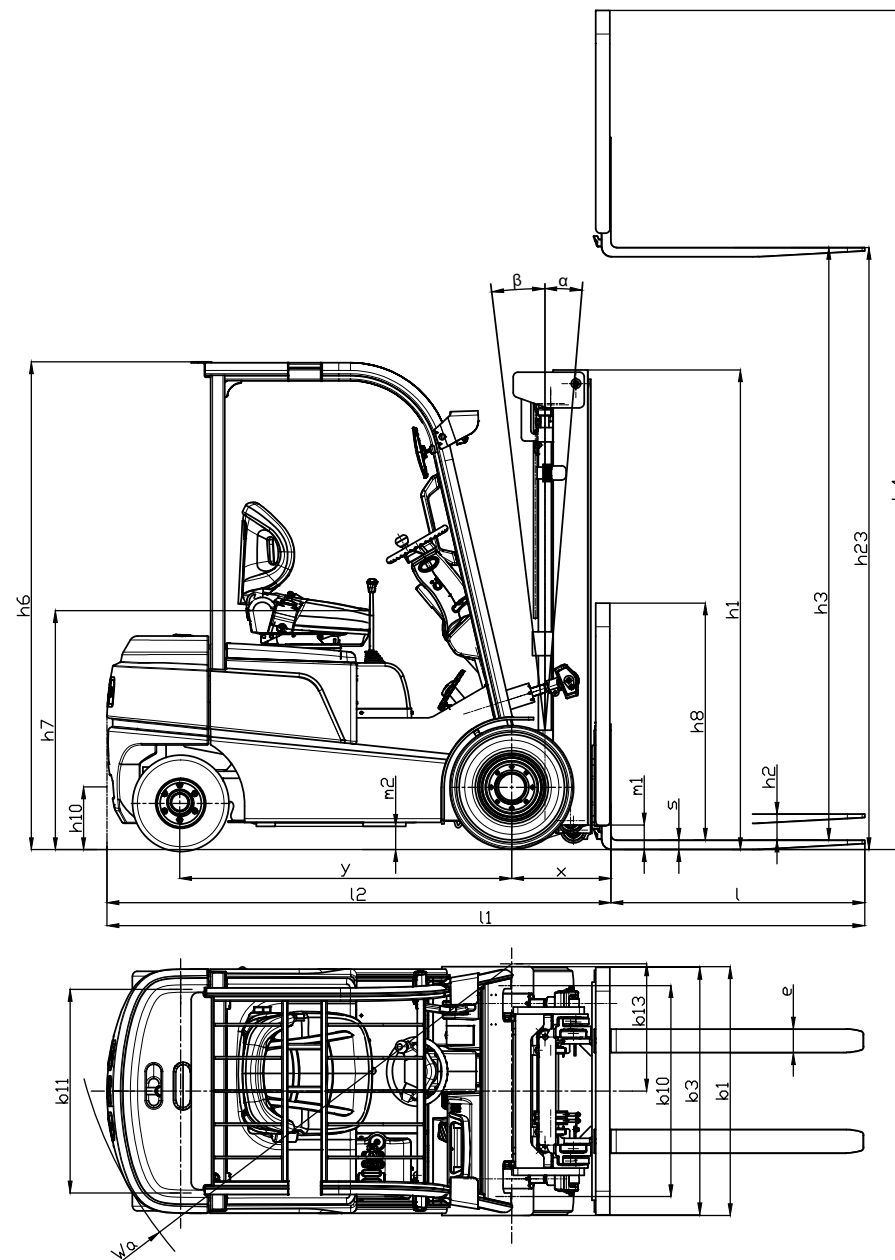
1、 Introduction of 1.6-1.8t

ECB16S-B/ECB18S-B battery counterweight forklifts are purely powered by 80V voltage platform. The drive axle is driven by three-phase AC motor. These forklifts are characterized by high power and adopt standard charging port of the car with rapid charge, zero emission and zero pollution. ECB16S-B/ECB18S-B mainly consists of body system, chassis system, hydraulic system, electrical system, accessory system, working device system and battery pack. They may be used for picking up, depositing, handling, or stacking loads in harbors, stock yards, plants, warehouses, logistics centers, and marine shipment containers. They are notable for great convenience and high efficiency. During working, the ECB16S-B/ECB18S-B can load the maximum cargo of 1.6t/1.8t, and the gradeability with full load can reach 15%, gaining the reputation “master-hand for handling loads in plants and workshops” .



No.	Name	No.	Name	No.	Name
1	Charging Door	6	Mast	11	Using Area
2	Front Wheel	7	Front Lamp	12	Counterweight
3	Carriage	8	Overhead Guard	13	Tow Pin
4	Fork	9	Rear Lamp	14	Rear Wheel
5	Load Backrest	10	Rear Handle		

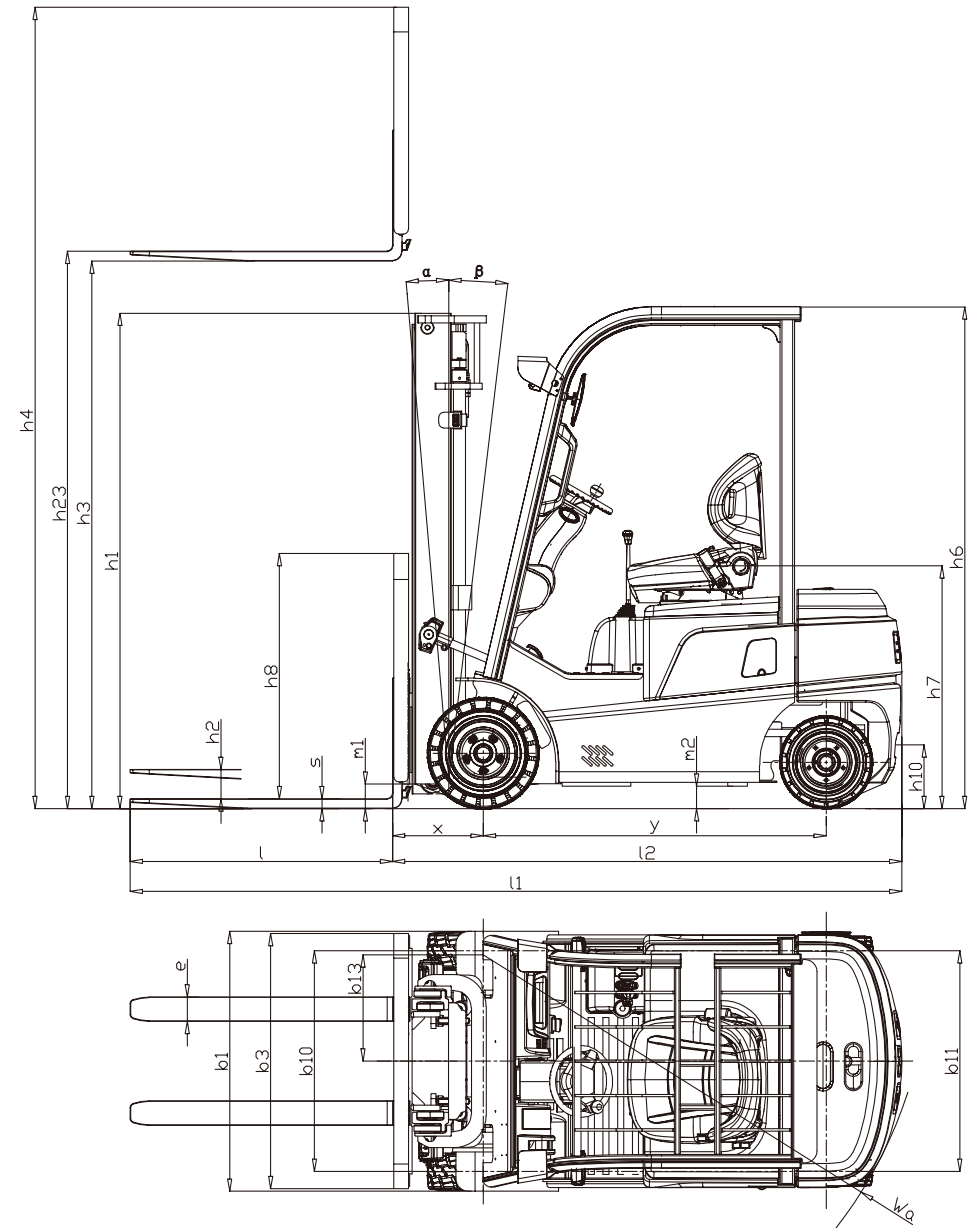
2. Technical Drawing (Single Drive)



2. Technical Specifications (Single Drive)

Identification	1.1	Manufacturer		BYD	BYD		
	1.2	Model		ECB16S-B	ECB18S-B		
	1.3	Drive		Electric	Electric		
	1.4	Operator type		Seat	Seat		
	1.5	Loading capacity	Q	kg	1600	1800	
	1.6	Load center	c	mm	500	500	
	1.7	Axle centre to fork face	x	mm	420	420	
	1.8	Wheelbase	y	mm	1400	1400	
Weight	2.1	Service weight		kg	3340	3490	
	2.2	Axle load, with load, front/rear		kg	4206/734	4553/737	
	2.3	Axle load, without load, front/rear		kg	1555/1785	1570/1920	
Wheel	3.1	Service weight		kg	SE	SE	
	3.2	Axle load, with load, front/rear		kg	6.00-9	6.00-9	
	3.3	Axle load, without load, front/rear		kg	16x6-8	16x6-8	
	3.4	Wheels, number front/rear (X=driven wheels)			2x/2	2x/2	
	3.5	Track width, front	b10		mm	890	890
	3.6	Track width, rear	b11		mm	870	870
Basic Dimensions	4.1	Tilt of mast/fork carriage forward/backward	α / β	deg	5/8	5/8	
	4.2	Height, mast lowered	h1	mm	2020	2020	
	4.3	Free lift	h2	mm	120	120	
	4.4	Lift height	h3	mm	3000	3000	
	4.5	Height, mast extended	h4	mm	4040	4040	
	4.6	Height of overhead guard	h6	mm	2050	2050	
	4.7	Seat height	h7	mm	1005	1005	
	4.8	Coupling height	h10	mm	270	270	
	4.9	Overall length	l1	mm	3195	3195	
	4.10	Length to face of forks	l2	mm	2125	2125	
	4.11	Overall width	b1	mm	1050	1050	
	4.12	Fork dimensions	s/e/l	mm	40/100/1000	40/100/1000	
	4.13	ISO2328, frame/type A, B			2A	2A	
	4.14	Fork carriage width	b3	mm	1044	1044	
4.15	Ground clearance, below mast	m1	mm	85/90	85/90		
4.16	Ground clearance, center of wheelbase	m2	mm	85/90	85/90		
4.17	Aisle width for pallets 1000x1200 crossways	Ast	mm	3480	3480		
4.18	Aisle width for pallets 800x1200 lengthways	Ast	mm	3680	3680		
4.19	Turning radius	Wa	mm	1860	1860		
4.20	Inward turning radius	b13	mm	537	537		
Performance Data	5.1	Travel speed, with/without load		Km/h	16/16	16/16	
	5.2	Lift speed, with/without load		mm/s	420/450	420/450	
	5.3	Lowering speed, with/without load		mm/s	520/480	520/480	
	5.4	Max.drawbar pull, S2=5min, with/without load		KN	10.0/9.5	10.0/9.5	
	5.5	Max.gradeability, S2=5min, with/without load		%	20/20	20/20	
	5.6	Service brake			6.0/5.0	6.0/5.0	
	5.7	Service brake			Mech./Hydr.	Mech./Hydr.	
Drive	6.1	Drive motor rating, S2=60min		kW	8.5	8.5	
	6.2	Lift motor rating at S3=15%ED		kW	16	16	
	6.3	Battery voltage, nominal capacity			80/270	80/270	
	6.4	Battery weight		Mpa	650	650	
Others	7.1	Type of drive control			AC	AC	
	7.2	Operating pressure for hydraulic system		MPb	≤ 16	≤ 18	
	7.3	Sound level at the driver's ear		dB(A)	≤ 75	≤ 75	
	7.4	Towing coupling, type			PIN	PIN	

3. Technical Drawing (Dual Drive)



3 Technical Specifications (Dual Drive)

Identification	1.1	Manufacturer			BYD	BYD
	1.2	Model			ECB16S-B	ECB18S-B
	1.3	Drive			Electric	Electric
	1.4	Operator type			Seat	Seat
	1.5	Loading capacity	Q	kg	1600	1800
	1.6	Load center	c	mm	500	500
	1.7	Axle centre to fork face	x	mm	370	370
	1.8	Wheelbase	y	mm	1400	1400
Weight	2.1	Service weight		kg	3150	3150
	2.2	Axle load, with load, front/rear		kg	3985/765	4312/788
	2.3	Axle load, without load, front/rear		kg	1390/1760	1393/1907
Wheel	3.1	Service weight		kg	SE	SE
	3.2	Axle load, with load, front/rear		kg	18x7-8	18x7-8
	3.3	Axle load, without load, front/rear		kg	15x4.5-8	140/55-9
	3.4	Wheels, number front/rear (X=driven wheels)			2x/2	2x/2
	3.5	Track width, front	b10		900	900
	3.6	Track width, rear	b11		900	900
Basic Dimensions	4.1	Tilt of mast/fork carriage forward/backward	α / β	deg	5/7	5/7
	4.2	Height, mast lowered	h1	mm	2020	2020
	4.3	Free lift	h2	mm	120	120
	4.4	Lift height	h3	mm	3000	3000
	4.5	Height, mast extended	h4	mm	4040	4040
	4.6	Height of overhead guard	h6	mm	2050	2050
	4.7	Seat height	h7	mm	990	990
	4.8	Coupling height	h10	mm	250	250
	4.9	Overall length	l1	mm	3145	3145
	4.10	Length to face of forks	l2	mm	2075	2075
	4.11	Overall width	b1	mm	1060	1060
	4.12	Fork dimensions	s/e/l	mm	40/100/1000	40/100/1000
	4.13	ISO2328, frame/type A, B			2A	2A
	4.14	Fork carriage width	b3	mm	1040	1040
4.15	Ground clearance, below mast	m1	mm	95/100	95/100	
4.16	Ground clearance, center of wheelbase	m2	mm	85/90	85/90	
4.17	Aisle width for pallets 1000x1200 crossways	Ast	mm	3400	3400	
4.18	Aisle width for pallets 800x1200 lengthways	Ast	mm	3590	3590	
4.19	Turning radius	Wa	mm	1820	1820	
4.20	Inward turning radius	b13	mm	433	433	
Performance Data	5.1	Travel speed, with/without load		Km/h	16/16	16/16
	5.2	Lift speed, with/without load		mm/s	420/480	420/480
	5.3	Lowering speed, with/without load		mm/s	480/460	480/460
	5.4	Max.drawbar pull, S2=5min, with/without load		KN	9/8	9/8
	5.5	Max.gradeability, S2=5min, with/without load		%	20/20	20/20
	5.6	Service brake			4.5/4	4.5/4
	5.7	Service brake			Mech./Hydr.	Mech./Hydr.
Drive	6.1	Drive motor rating, S2=60min		kW	5Kwx2	5Kwx2
	6.2	Lift motor rating at S3=15%ED		kW	16	16
	6.3	Battery voltage, nominal capacity			80/270	80/270
	6.4	Battery weight		Mpa	650	650
	7.1	Type of drive control			AC	AC
	7.2	Operating pressure for hydraulic system		MPa	≤ 16	≤ 18
	7.3	Sound level at the driver's ear		dB(A)	≤ 75	≤ 75
	7.4	Towing coupling, type			PIN	PIN

1. Mast Specifications (Single Drive)

		2-Stage Standard Mast				2-Stage Free Lift Mast			3-Stage Free Lift Mast					
Lift height	h3	3000	3500	4000	4500	3000	3500	4000	4500	4800	5000	5500	6000	6500
Fork height	h23	3040	3540	4040	4540	3040	3540	4040	4540	4840	5040	5540	6040	6540
Height, mast lowered	h1	2020	2270	2570	2820	2027	2277	2577	2102	2202	2252	2402	2672	2872
Load backrest height	h8	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Height, mast extended (without load backrest)	h4	3610	4110	4610	5110	3670	4170	4670	5160	5460	5660	6160	6660	7160
Height, mast extended (with load backrest)	h4	4040	4540	5040	5540	4040	4540	5040	5540	5840	6040	6540	7040	7540
Free lift (without load backrest)	h2	125	125	125	125	1431	1681	1981	1506	1606	1656	1806	2076	2256
Free lift (with load backrest)	h2	125	125	125	125	835	1085	1385	1062	1162	1212	1362	1632	1812
Mast/fork carriage tilt, forward/rearward	α / β	5/8	5/8	5/8	5/5	5/8	5/8	5/8	5/5	5/5	5/5	5/3	5/3	5/3
Axle centre to fork face	x	420	420	420	420	420	420	420	431	431	431	431	431	431

2. Mast Specifications (Dual Drive)

		2-Stage Standard Mast				2-Stage Free Lift Mast			3-Stage Free Lift Mast					
Lift height	h3	3000	3500	4000	4500	3000	3500	4000	4500	4800	5000	5500	6000	6500
Fork height	h23	3040	3540	4040	4540	3040	3540	4040	4540	4840	5040	5540	6040	6540
Height, mast lowered	h1	2020	2260	2510	2809	2027	2320	2570	2045	2153	2245	2445	2645	2845
Load backrest height	h8	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Height, mast extended (without load backrest)	h4	3625	4125	4625	5125	3605	4105	4605	5130	5430	5630	6130	6630	7130
Height, mast extended (with load backrest)	h4	4040	4540	5040	5540	4040	4540	5040	5540	5840	6040	6540	7040	7540
Free lift (without load backrest)	h2	120	120	120	120	1415	1715	1965	1415	1606	1615	1815	2015	2215
Free lift (with load backrest)	h2	120	120	120	120	970	1270	1520	1995	1162	1195	1395	1595	1795
Mast/fork carriage tilt, forward/rearward	α / β	5/7	5/7	5/7	5/5	5/7	5/7	5/7	5/5	5/5	5/5	5/3	5/3	5/3
Axle centre to fork face	x	365	365	365	365	365	365	365	385	385	385	385	385	385

2. Battery Specifications

		1.6/1.8t
Battery voltage, nominal capacity	V/Ah	80/270
Battery weight	kg	650

Working Environment

Temperature: -10 ~ 40°C

Gradeability: $\leq 20\%$

Others: no flammable gas, no flammable dust and no volatile flammable liquid

Caution

(1) Do not use this forklift outdoors in thunderstorm.

(2) In the case of light rain, a forklift shall not be used outdoors unless equipped with a roof guard or driver cab. Rain could enter the forklift causing damage to electrical components. Do not use this forklift outdoors in a heavy rain.

Contact with your BYD local dealer if the forklift is intended to be used in the following environments:

- (1) in places where explosives are stored;
- (2) in dusty areas;
- (3) in ports or water front with corrosive salt hazards;
- (4) in chemical factories with acid and other chemical hazards;
- (5) in potential explosive environments with dust or other explosive gas;

NAMEPLATE AND DECALS

Forklift Nameplate

CE		Electric Counterbalance Forklift (Iron-Phosphate Battery)	
Type	<input type="text"/>	Service weight including battery	<input type="text"/>
Serial No.	<input type="text"/>	Net weight(w/o battery)	<input type="text"/>
Year of manufacture	<input type="text"/>	Battery weight(min.)	<input type="text"/>
Rated capacity	<input type="text"/>	Battery weight(max.)	<input type="text"/>
Max.lift height	<input type="text"/>	Battery voltage	<input type="text"/>
Wheel size,front	<input type="text"/>	License No.	<input type="text"/>
Wheel size,rear	<input type="text"/>	Part No.	<input type="text"/>
BYD BYD (SHAOGUAN) CO., LTD.			
Add.: No.1, BYD Road, Zhenjiang Industrial Park, Shaoguan, Guangdong, China			

Note

- (1) The nameplate is placed on the front of the forklift.
- (2) After receiving the forklift, check the information on the nameplate and confirm if it complies with the one you've ordered.

Caution

(1) Every forklift might have different specification. Check the nameplate before operation to confirm the forklift specification.

(2) When transporting the load, it should not exceed the rated loading capacity of the forklift. Check and confirm the load of the forklift.

Loading Capacity Chart

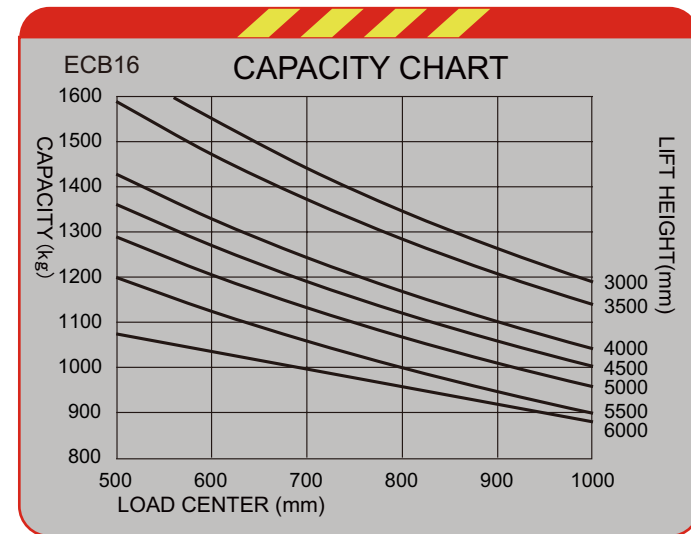
When the load center exceeds the rated one, the loading capacity of the forklift is reduced. The Loading capacity chart indicates the maximum loading capacity the forklift has corresponding to the different load center.

Suppose the cargo has the load center of 600 mm and the expected lifting height is 4500mm.

- (1) Draw the vertical line at the coordinate of load center of 600 mm and find the crossing point of this vertical line and the curve line of lift height of 4500 mm. .
- (2) The ordinate on the Y-axis of the crossing point reads 1300kg, which is the permissible maximum lifting load. .

Following the same reasoning, you can calculate the loading capacity in the case of other load center and lifting height. .

If you want to increase the lifting height, decrease the load center (more reasonable packaging) and weight of the cargo.



Caution

- (1) Forklift specification varies depending on customer requirements. Refer to the load capacity chart for confirmation on the maximum allowed load.
- (2) The load capacity chart reflects only compact, well palletized and evenly centered loads within the load limit. Otherwise the stability of the forklift and the rigidity of the related parts will be impaired.

Battery Nameplate



Note

- (1) The battery nameplate is placed on the battery.
- (2) After receiving the forklift, check the information on the nameplate and confirm if it complies with the one you've ordered.

Other Decals

Please pay attention to notes or warning decals and signs before using.

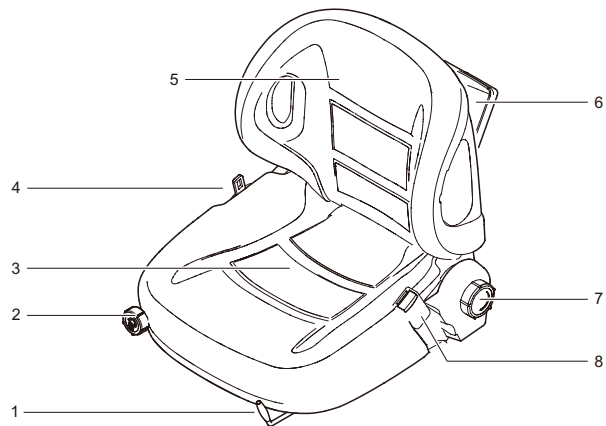
OPERATING

This chapter explains how to operate BYD electric forklift correctly.

SEAT

Basic Seat (A type)

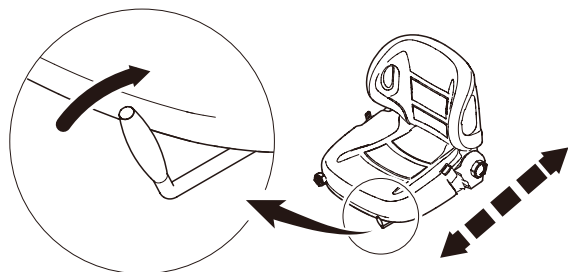
1. Appearance



No.	Name	No.	Name	No.	Name
1	Seat Adjusting Handle	4	Seat Belt Retractor	7	Backrest Adjustment Button
2	Weight Adjustment Button	5	Backrest	8	Seat Belt Buckle
3	Cushion	6	Document Box		

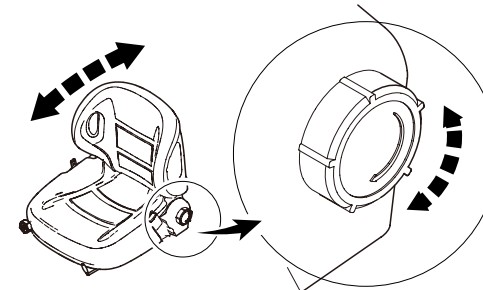
2. Adjustment of lateral position of seat

- (1) Pull up the recess of the lever. Move the seat forward and/or backward to find the right seat position.
- (2) Return the lever to its folded position and the seat has been adjusted.



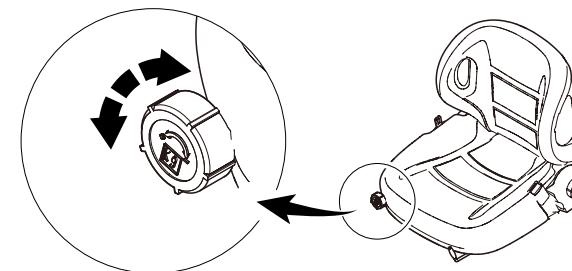
3. Backrest adjustment

Rotate the adjusting knob to tilt the backrest forward or backward.



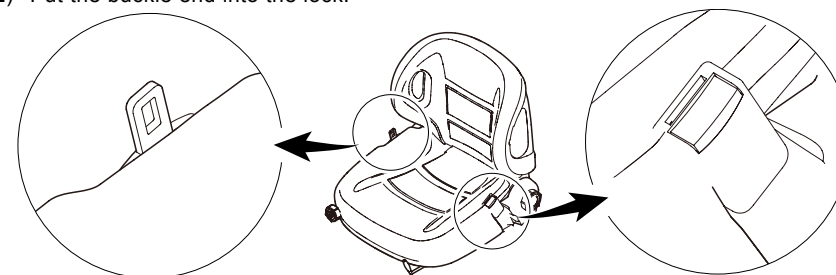
4. Weight adjustment

The lever position indicates the adjusted user's weight by means of the symbols. Press the lever for seat weight adjustment up or down.



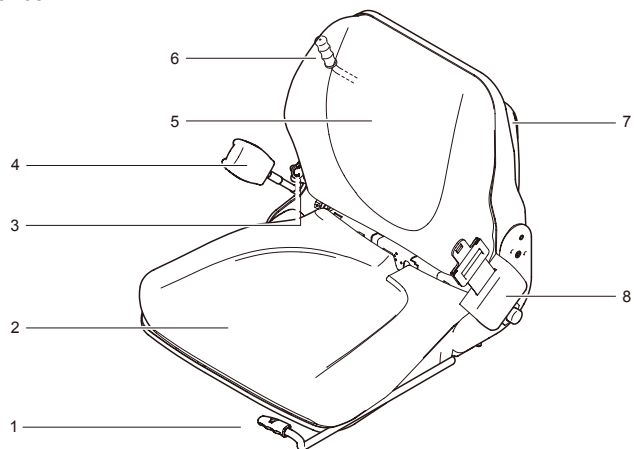
5. Seat belt

- (1) Pull out the seat belt from the retractor.
- (2) Put the buckle end into the lock.



Basic Seat (B type)

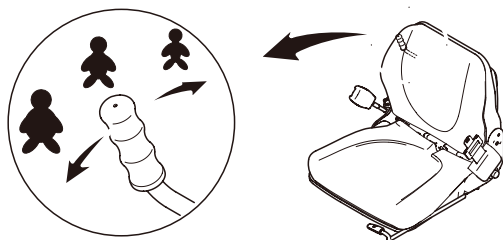
1. Appearance



No.	Name	No.	Name	No.	Name
1	Seat Adjusting Handle	4	Seat Belt Retractor	7	Seat Document Box
2	Cushion	5	Backrest	8	Seat Belt Buckle
3	Backrest Adjusting Handle	6	Weight Adjustment Lever		

2. Weight adjustment

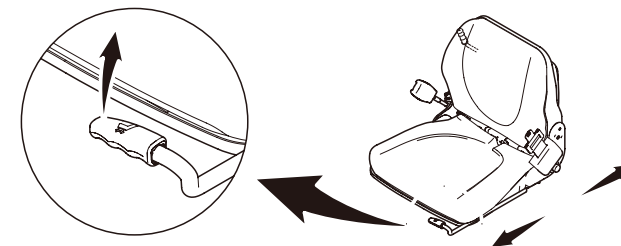
The lever position indicates the adjusted user's weight by means of the symbols. Press the lever for seat weight adjustment up or down.



3. Adjustment of lateral position of seat

Pull up the recess of the lever. Move the seat forward and/or backward to find the right seat position.

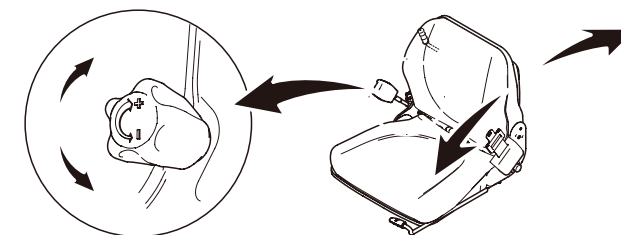
Return the lever to its folded position and the seat has been adjusted.



4. Backrest adjustment

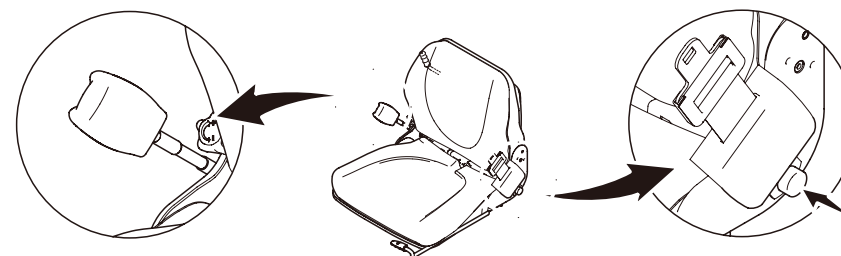
Turning the adjustment knob to "+", the backrest can be moved backwards.

By turning the knob to "-", it can be moved forwards.



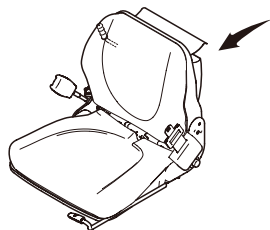
5. Seat belt

Press the button of the retractor, to pull the seat belt out. Insert the end of seat belt into the buckle. Then release the button of the retractor.



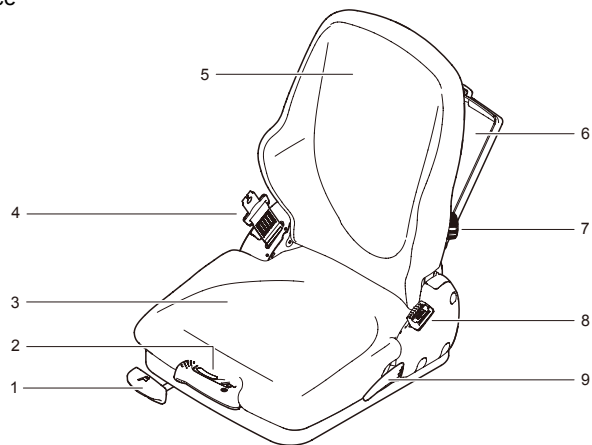
6. Seat Document Box

There is a document box on the rear side of seat, which could store documents, work gloves and other flat goods..



Comfort Seat

1. Appearance

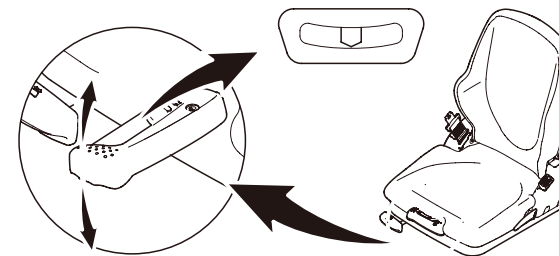


No.	Name	No.	Name	No.	Name
1	Seat Adjusting Handle	4	Seat Belt Retractor	7	Lumbar Support Adjusting Handle
2	Weight Adjustment Lever	5	Backrest	8	Seat Belt Buckle
3	Cushion	6	Seat Document Box	9	Backrest Adjusting Handle

2. Weight adjustment

Fold out the weight adjustment lever completely, hold it at the front and move it upwards or downwards (10 movements from minimum to maximum). Before every new movement, bring the lever back to the starting position (audible locking sound).

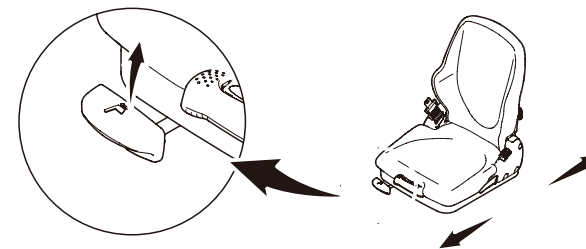
The driver's weight has been set correctly, when the arrow is in the middle of the viewing window. With the operator weight setting completed, fold the handle fully to the initial locked position.



3. Adjustment of lateral position of seat

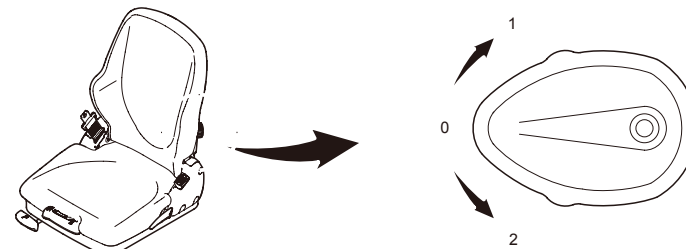
Pull up the recess of the lever. Move the seat forward and/or backward to find the right seat position.

Return the lever to its folded position and the seat has been adjusted.



4. Lumbar support adjustment

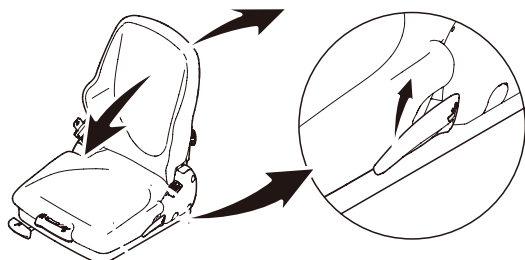
Lumbar support can be adjusted to improve ride comfort of the operator. Rotating the adjusting lever upward can increase the bending extent of the upper portion of the backrest. Rotating the adjusting handle downward can increase the bending extent of the lower portion of the backrest.



5. Backrest adjustment

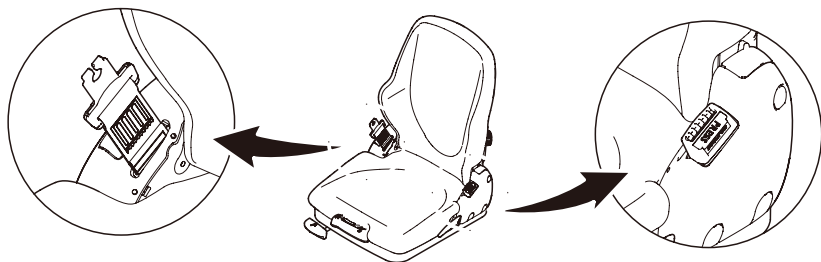
Raise the lock handle, then adjust the backrest angle. While adjusting the backrest angle, ensure that the backrest is not blocked.

Release the locking lever to lock the backrest.



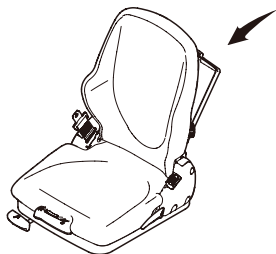
6. Seat belt

Pull out the seat belt from the retractor, and then put the buckle end into the lock.



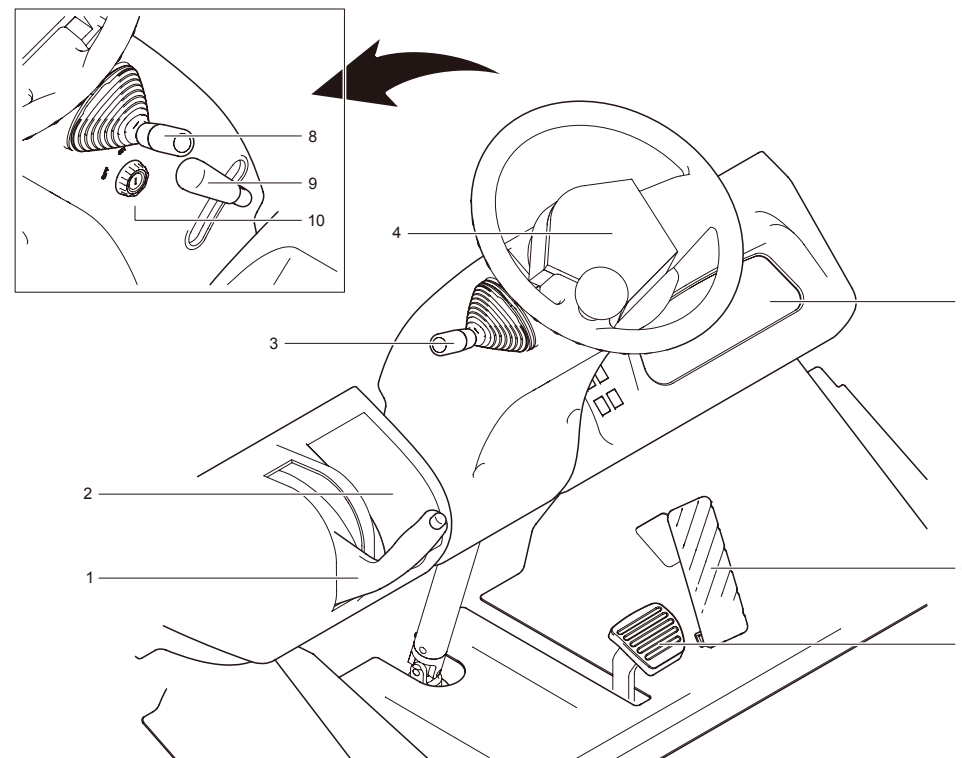
7. Seat Document Box

There is a document box on the rear side of seat, which could store documents, work gloves and other flat goods.



STARTUP AND CONTROL

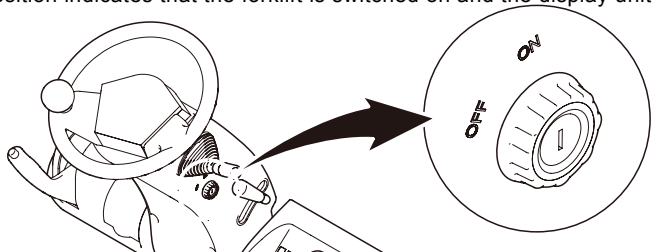
Using Area Overview



No.	Name	No.	Name	No.	Name
1	Handbrake Switch	5	LCD Display	9	Steering Wheel Adjusting Lever
2	Reserved Switch	6	Acceleration Pedal	10	Key Switch
3	Gear Adjustment Lever	7	Brake Pedal		
4	Steering Wheel	8	Lights Control lever		

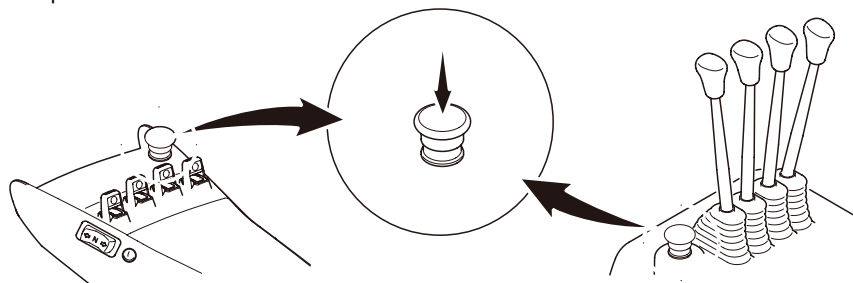
Key Switch

- (1) OFF: position indicates that the power is cut off and allows entering and removing the key.
- (2) ON: position indicates that the forklift is switched on and the display unit is lit.



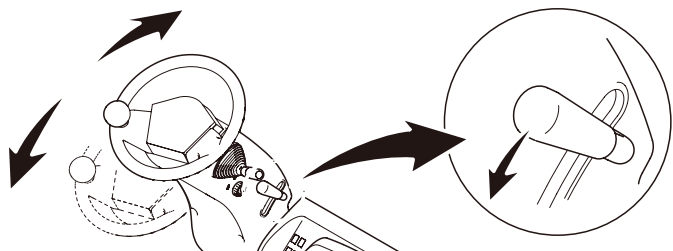
Emergency Disconnect Switch

Press down the emergency disconnect switch to shut off the power. Rotate and pull up it to resume the power.



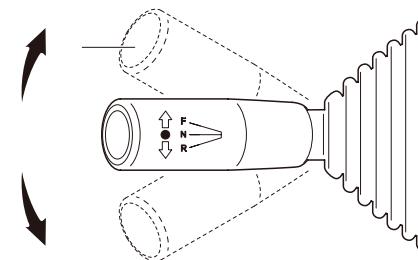
Steering Wheel Tilt Adjusting

- (1) Release the steering wheel stop lever and adjust the angle of steering wheel.
- (2) Raise the adjusting lever to lock the steering wheel. Attempt to move the steering wheel to check that operates without slack.

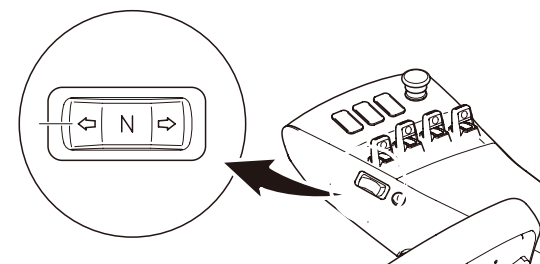


Gear

- 1. Gear adjustment lever



- 2. Gear switch



- 3. Descriptions

No.	Name	Descriptions
1	Forward	With the forward position selected, depressing the accelerator pedal makes the forklift travel forward.
2	Stop	With the stop position selected, the forklift cannot travel.
3	Reverse	With the reverse position selected, the brake lamps come on, and the buzzer sounds, and depressing the accelerator pedal makes the forklift travel backward.

Note

The display unit in the instrument panel will show the sign of travel direction corresponding to the direction the operator has chosen.

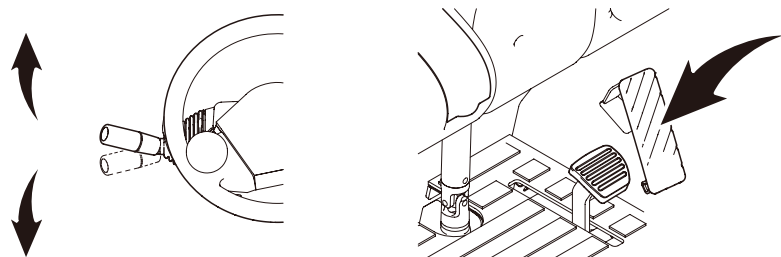
Travel, Steering and Braking

- 1. Travel

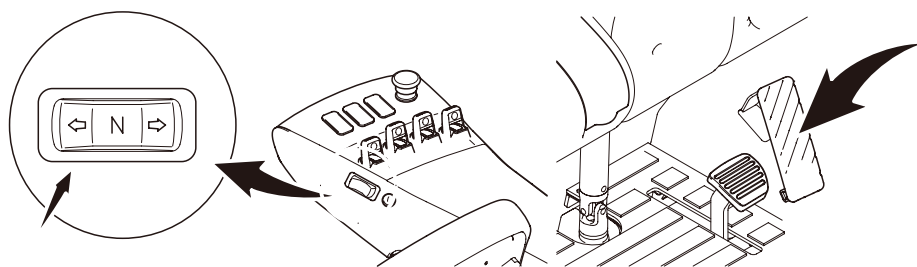
Set the vehicle at the Forward gear. Depress the accelerator pedal, then the forklift travel forward.

Set the vehicle at the Reverse gear. Depress the accelerator pedal, then the forklift travel backward.

- (1) Standard

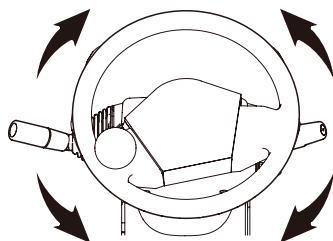


(2) Comfort



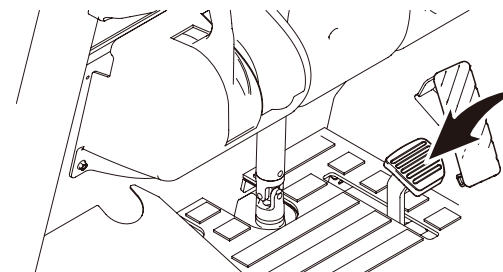
2. Steering

When travelling, turn the steering wheel right or left to steer.



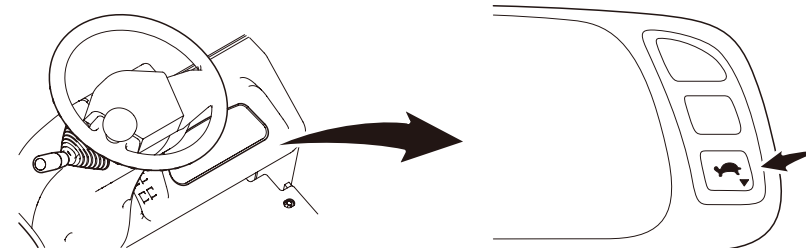
3. Braking

Depress the brake pedal to brake.



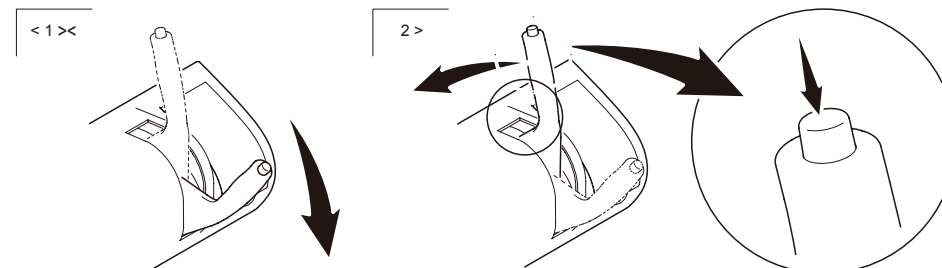
Low Speed Mode

Press the low speed control on the display to go into low speed mode.



Parking

- (1) After bringing the forklift to a stop with the service brake, hold the hand brake lever and pull it towards your body to apply the parking brake.
- (2) To release the hand brake, press down the unlock button on the top of the hand brake lever and push it back to release the parking brake.

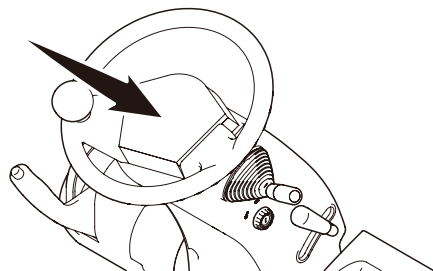


Caution

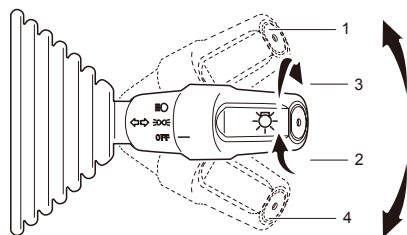
To park the forklift on a slope, depress the service brake pedal first to stabilize the forklift and then apply the handbrake.

Horn

Press the horn button to send audible warning.



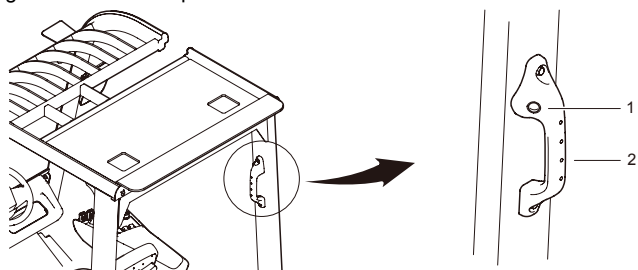
Light



No.	Name	Descriptions
1	Left turning light	Pull the stalk forward.
2	Clearance light	Turn the switch clockwise to the first stop.
3	Working light	Turn the switch clockwise to the second stop.
4	Right turning light	Pull the stalk backward.

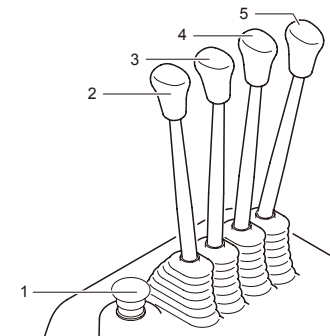
Note

When the turning indicator is switched on, it would return automatically to original position when changing direction is completed.



No.	Name	No.	Name
1	Rear Handle Button	1	Rear Handle

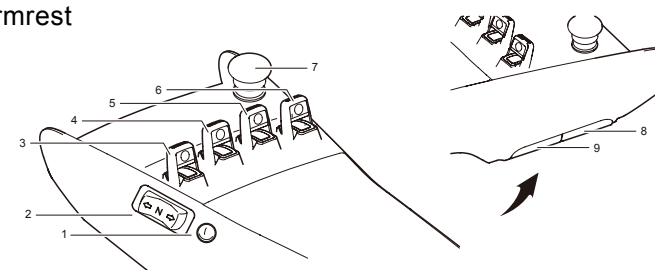
Mechanical Levers



No.	Name	Descriptions
1	Emergency disconnect switch	Press down the emergency disconnect switch to shut off the power. Rotate and pull up it to resume the power.
2	Lift	Push the lever forward to lower the fork, pull the lever backward to lift the for.
3	Tilt	Push the lever forward to tilt the mast forward, pull the lever backward to tilt the mast backward.
4	Control lever for third function	It is generally used to control the side shifter. Push the control lever forward to move the side shifter to left. Push the control lever backward to move the side shifter to right.
5	Fourth function control lever	Its function depends on the attachment in use.

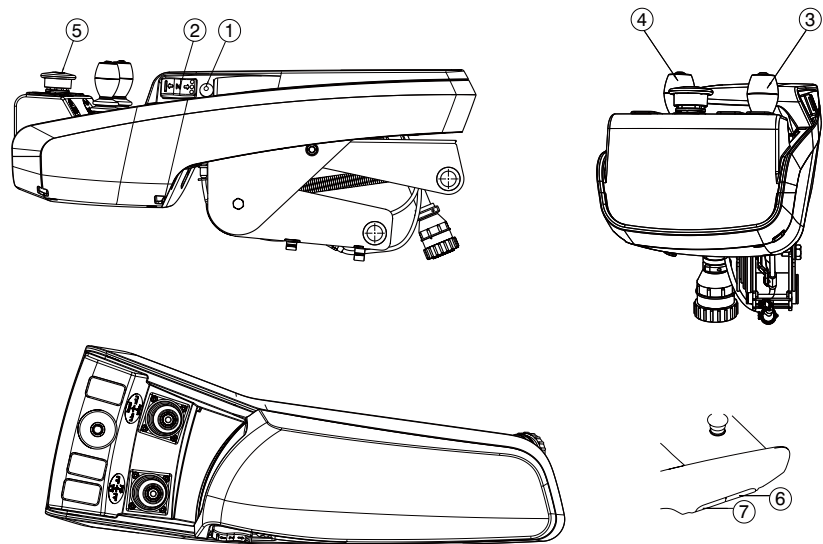
Multi-function Armrest

1.Fingertip Armrest



No.	Name	Descriptions
1	Horn button	Press the horn button to send audible warning.
2	Gear switch	Used for the forklift to travel forward, stop, or travel backward.
3	Lift	Push the button forward to lower the fork, pull the button backward to lift the fork.
4	Tilt	Push the button forward to tilt the mast forward, pull the button backward to tilt the mast backward.
5	Side shift	It is generally used to control the side shifter. Push the button forward to shift leftward, pull the button backward to shift rightward.
6	Other attachments	Its function depends on the attachment in use.
7	Emergency disconnect switch	Press down the emergency disconnect switch to shut off the power. Rotate and pull up it to resume the power.
8	Front-rear position adjusting switch	Adjusts the front-rear position of the multi-function armrest.
9	Up-down position adjusting switch	Adjusts the up-down position of the multi-function armrest.

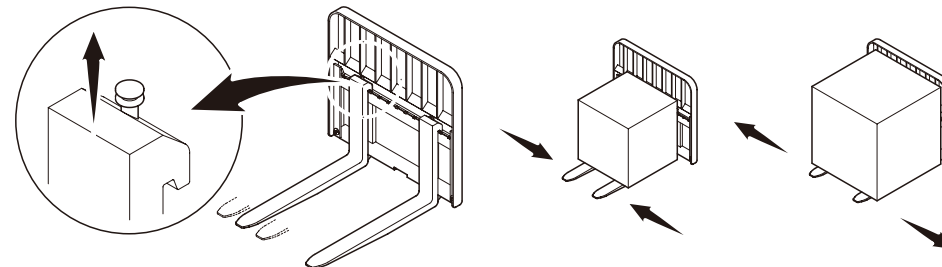
2.Double-rocker armrest



No.	Name	Descriptions
1	Horn button	Press down horn button, horn works and send out audible warning.
2	Gear switch	Used for the forklift to travel forward, stop, or travel backward.
3	1st Control handle for lift and tilt	Press the 1st Joystick leftward to lift, rightward to lower; Press the joystick forward to tilt forward, backward to tilt backward.
4	2nd Control handle for Side shift and 4th function	3rd hydraulic function is generally used to control the side shifter. Press the joystick leftward to shift leftward, press the joystick rightward to shift rightward; The 4th function depends on the attachment in use.
5	Emergency disconnect switch	Press down the emergency disconnect switch to shut off the power. Rotate and pull up it to resume the power.
6	Front-rear position adjusting switch	Adjusts the front-rear position of the multi-function armrest.
7	Up-down position adjusting switch	Adjusts the up-down position of the multi-function armrest.

Adjusting Spacing between Forks

Pull out the locating pin of the fork. Move the fork to the desired spacing.

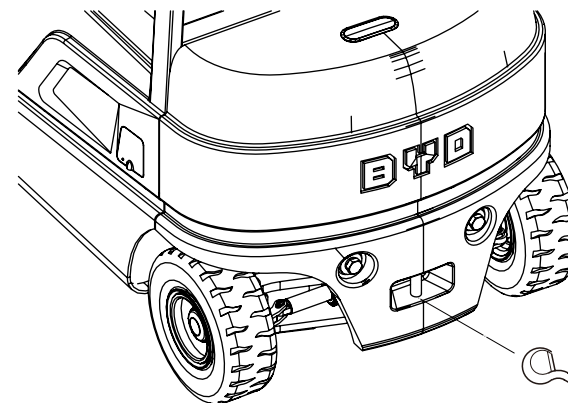


Caution

The two forks shall have the equal distance to the forklift center line.

Tow Pin

Pull up the tow pin, insert the tiller of the trailer and insert the tow pin through the tiller.

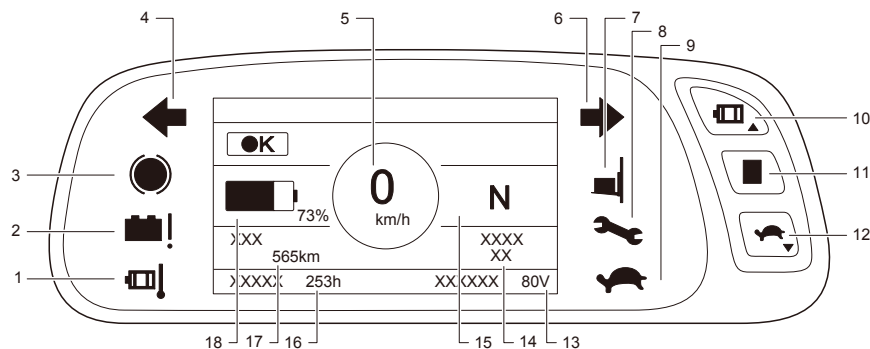


Caution

- (1) The tow pin can only be used for towing light duty trailers within the factory.
- (2) Before towing the load, check that the route is clean and flat and your vision is not obstructed.

DISPLAY

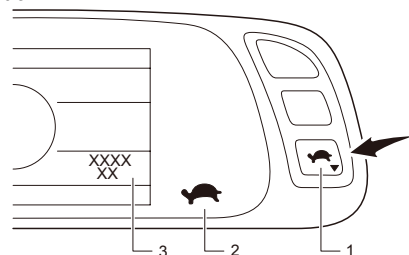
Display Appearance



No.	Name	No.	Name	No.	Name
1	Motor Overheating Warning Indicator	7	Overload Indicator (provided in high standard forklift)	13	Voltage Message
2	Battery Error Warning Indicator	8	Checking and Diagnosis Indicator	14	Speed Mode
3	Parking Indicator	9	Speed Mode ON Indicator	15	Gear
4	Left Turning Light	10	Enter	16	Total Working Hours
5	Warning Message	11	Functions	17	Odometer
6	Right Turning Light	12	Speed Mode Control Switch	18	Battery Message

Display Using

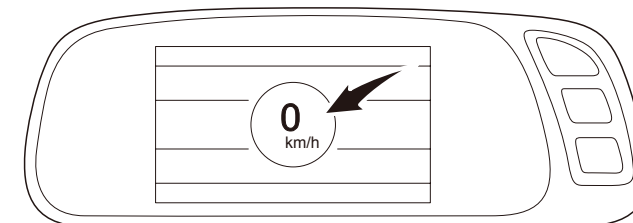
1. Speed mode selection



No.	Name	Descriptions
1	Speed Mode Control Switch	Press the Speed Mode Control Switch to change the speed setting which including high, low and OFF (without speed mode control). Press the Speed Mode Control Switch for 2 seconds and the indicator will be lit. Pressing the Speed Mode Control Switch will allow you to choose from the 3 speed settings including high, middle, low and OFF (without speed mode control), and this speed mode will be default speed mode when key on.
2	Speed Mode ON Indicator	
3	Speed Mode	

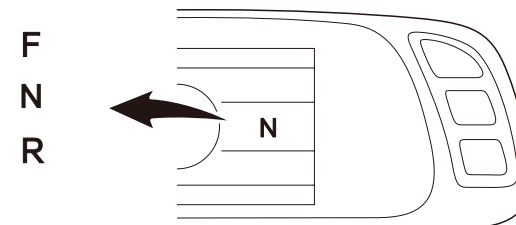
2. Warning message

The current speed or other work message is indicated in the display.



3. Gear

Gear letter of the forklift is shown on the display, which may be F (forward), N (neutral), or R (reverse).

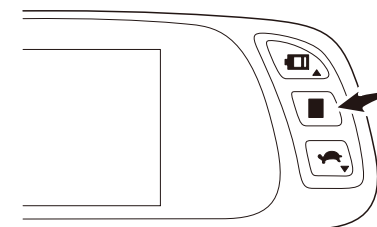


4. Display setting

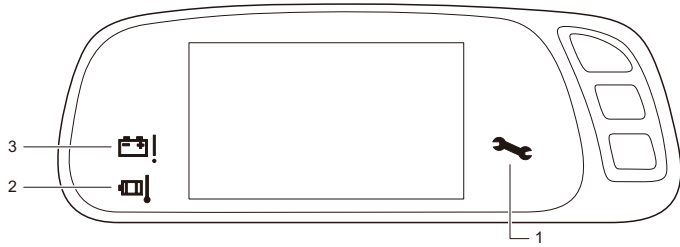
Press the middle button at the right to enter into the Setting.

Set time, unit, background light and language.

- (1) Upper button: Moving the cursor up. Increasing the value of digit and number. .
- (2) Middle button: Pressing this button to enter the Setting window. Select and enter the sub-menu. Select and confirm the digit and number.
- (3) Lower button: Moving the cursor down. Decreasing the value of digit and number.



5. Indicators



No.	Name	Descriptions
1	Error Indicator	Indicator related to error, which appears in the case of error.
2	Overheating Indicator	Indicator related to the temperature, which appears when some components are overheated.
3	Battery Failure Indicator	Indicator related to the battery, which appears in the case of low battery and battery failure.

6. Trouble-shooting Methods

The following table contains all the error messages that could be shown in the multifunction display. Please refer to the trouble shooting method for solution when the following error occurs.

After taking the recommended measures, contact the service personnel if the error message reappears and repeats more than 3 times.

	Warning message	Solution
Drive	LOGIC FAILURE #1	If the battery is low, charge the battery. If battery charge is normal, restart the forklift.
	D LOGIC FAILURE #3	Restart the forklift.
	VMN LOW/VMN HIGH	Restart the forklift.
	MASTER KO	Restart the forklift.
	STBY I HIGH	Restart the forklift.
	ENCODER ERROR	Restart the forklift.
	INCORRECT START	Return the gear switch to Stop and restart the forklift
	CAP CHARGE	Restart the forklift.
Lift	THERMIC SENSOR KO	Restart the forklift.
	LOGIC FAILURE #1	If the battery is low, charge the battery. If battery charge is normal, restart the forklift.
	LOGIC FAILURE #3	If load exceeds the rated capacity, stop lifting. Otherwise restart the forklift.
	VMN LOW/VMN HIGH	Restart the forklift.
	ENCODER ERROR	Restart the forklift.
	THERMIC SENSOR KO	Restart the forklift.
Acceleration	STBY I HIGH	Restart the forklift.
	PUMP KO	Move the control lever to the initial position and restart the forklift.
Others	VACC NOT OK	Check if the accelerator will return normally and restart the forklift
	PEDAL WIRE KO	Restart the forklift.
	CONTACTOR OPEN	Restart the forklift.
	AUX OUTPUT KO	Restart the forklift.
Battery	FORWARD+BACKWARD	Switch off the forklift, return the lever to Stop position and restart the forklift
	NO CAN MESSAGE #3	Restart the forklift.
Temperature	WRONG SET BATTERY	Restart the forklift.
	HIGH TEMPERATURE	Shut down the forklift for 5 minutes and restart it
	HIGH MOTOR TEMPERATURE	Shut down the forklift for 5 minutes and restart it
	HIGH TEMPERATURE	Shut down the forklift for 5 minutes and restart it
	HIGH MOTOR TEMPERATURE	Shut down the forklift for 5 minutes and restart it

TRANSPORTING LOADS

Loading

1. Load on the ground
 - (1) Drive the forklift carefully up to the load and brake the forklift to a stop.
 - (2) Tilt the mast forward and lower the forks.
 - (3) Insert the forks under the load.
 - (4) Raise the forks above the ground and tilt the mast backwards.
 - (5) When transporting, drive with caution, pay attention to the route condition and to the people ahead and maintain a proper driving speed. Transport the load to the designated place.
2. Load on the high shelf
 - (1) Drive the forklift carefully up to the load and brake the forklift to a stop.
 - (2) Set the mast in the vertical position and raise the forks to the bottom of the load.
 - (3) Insert the forks under the load.
 - (4) Raise the load until it has left the shelf completely.
 - (5) Set the driving direction to reverse and release the brake.
 - (6) Reverse the forklift with caution at a low speed until the forklift leaves the stacking area.
 - (7) Lower the forks above the ground and tilt the mast backwards.
 - (8) When transporting, drive with caution, pay attention to the route condition and to the people ahead and maintain a proper driving speed. Transport the load to the designated place.

Danger

- (1) When approaching the load, do not travel at high speed to avoid crashing.
- (2) Do not stay beneath the raised load.

Caution

- (1) When transporting the load, the load should be securely fastened on a pallet with the gravity center well centered.
- (2) If the front mast is tilted backwards, the forks might damage the load or might not enter fully under the load and cause danger.

Note

Before starting the forklift, pull up the emergency disconnect switch.

Travel

- (1) When travelling, make sure that the load is well centered on the forks.
- (2) After the load is placed on the forks, keep the mast tilted backwards and raise the forks above the floor.
- (3) During the travelling, do not tilt the mast forward or try raising the forks to avoid the danger of forklift nose over and losing stability.
- (4) If the stacked loads are high and affect the operator's visibility of the route ahead, operate the forklift in reverse except when the forklift is climbing the slope or inclines.

Warning

- (1) When driving the forklift on a slope, keep the forks always facing the uphill direction and downhill direction in contrast and drive in turtle speed mode.
- (2) Do not cross or turn around on a slope.

Caution

- (1) Have a second person as lookout if the visibility of the operator is reduced.
- (2) Do not depress the brake pedal with a lot of force, since excessive force might cause damage to the braking system.

Unloading

- (1) Drive the forklift carefully up to the stacking destination and decelerate when approaching.
- (2) Raise the forks to the proper height.
- (3) Drive the forks and load into the shelf.
- (4) Set the mast in the vertical position and lower the forks to the proper height until they get separated from the forks.
- (5) Slowly remove the forks from the bottom of the load.
- (6) After driving the forks out, raise them and start the next.

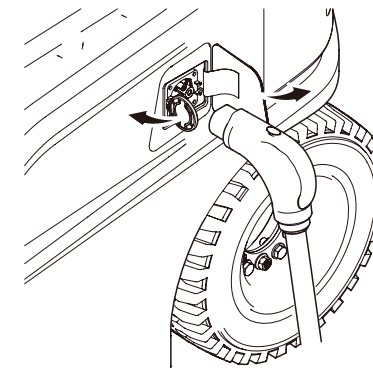
Exiting

- (1) Lower the forks fully after unloading.
- (2) Apply the parking brake.
- (3) Turn the key anticlockwise to OFF position and take it out.
- (4) Press the emergency disconnect switch, release the seat belt and exit.

BATTERY

Charging

Open the charge port, and then connect the charger connector. Follow the user manual of the charger to charge the forklift.



Note

- (1) If the charge port cover is opened, traction is forbidden; close the charge port cover first, and then traction is allow.
- (2) The environment temperature influences the charging time, it's suggested the forklift be charged at normal temperature.

TRANSPORTATION AND STORAGE

This chapter explains how to transport and store the forklift.

TRANSPORTING AND UNLOADING

1. Hoisting

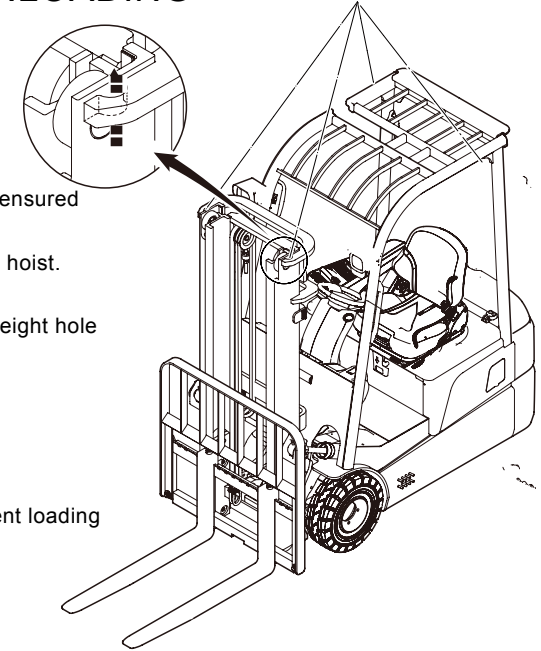
Danger

(1) During the hoisting process, it must be ensured that no one is within the working range of the hoist.

(2) It is strictly forbidden to use a counterweight hole for hoisting..

Warning

Use only a hoisting equipment with sufficient loading capacity..



2. Driving into the Transport vehicle

Drive the forklift into the transport vehicle on turtle speed mode..

Caution

- (1) Have a supervisor or a second person on site as a lookout..
- (2) Make sure that the ground is strong enough to avoid the transport vehicle sinking into the floor.
- (3) Secure the transport vehicle with fixed block.
- (4) During loading and unloading, constantly check the rigidity and the stability of the ramp.

Transporting

- (1) Use a transport truck or a low flatbed truck to transport the forklift.
- (2) During transportation, the handbrake must be applied. Secure the wheels with wedges to ensure that the forklift will not slip during transporting.

Unloading

1. Driving the forklift out of the transport vehicle

Drive the forklift out of the transport vehicle on turtle speed mode.

DECOMMISSIONING AND RESTORING

Decommissioning

Clean and remove the dust on the forklift components and conduct the following procedures:

- (1) Check forklift for oil leakage and other abnormal components. If yes, repair the forklift first.
- (2) Fully lift and lower the forks and tilt masts several times. Operate the attachment several times if there is an attachment.
- (3) Lower the forks to a supporting surface so that the lifting chains will no longer be tensioned.
- (4) Apply paint to all areas where paint layer comes off.
- (5) Check the hydraulic oil level and add if necessary.
- (6) Lubricate all the components.
- (7) Take off the key and make sure that forklift is disconnected from the battery power and press down the emergency disconnect switch. Battery status of charge should be around 50% to avoid over-discharge or full charge for long-term storage.
- (8) Lubricate the inside part of the hydraulic cylinders monthly by lifting/lowering the forks and tilting mast several times. Operate the attachment several times if there is an attachment.

Caution

- (1) When storing the forklift, place the forklift on a shelf so that the wheels are off the ground to protect the wheels and wheel bearings.
- (2) Do not cover the forklift with a plastic cover, which will cause water vapor to condense and to accumulate.
- (3) Ask your BYD dealer for advice if the forklift needs to be decommissioned for more than 6 months.

Restoring

Clean and remove the dust on the forklift components and conduct the following procedures:

- (1) Lubricate all the components.
- (2) Fully lift and lower the forks and tilt masts several times. Operate the attachment some times if there is an attachment.
- (3) Check the status of charge of the traction battery.
- (4) Check the gear oil. Replace it if necessary.
- (5) Check the hydraulic oil. Replace it if necessary.

Caution

The operator should repeatedly check the performance of the forklift brake when operating it for the first time after the forklift has been restored to service.

MAINTENANCE

This chapter explains how to maintain the forklift.

DAILY MAINTENANCE

Period and Items

Daily (or every 8 hours) and weekly (or every 40 hours) for daily inspection items, whichever comes first. If the forklift works less than 8 hours per day, conduct the inspection and checks on a daily basis. If daily working hours exceed 8 hours, conduct the inspection and checks every 8 hours.

Inspection checklist:

No.	Item	1 day	1 week
		8 hours	40 hours
1	Exterior	Check	
2	Wheel	Clean and tighten	Clean and tighten
3	Mast	Check	
4	Hydraulic System	Check	
5	Seat	Check	
6	Display	Check	
7	Warning Equipments	Check	
8	Brake	Check	Check
9	Travel, Steering and Control	Check	
10	Electric System	Check	
11	Counterweight	Check	
12	Clean	Clean	
13	Others	Check	

Note

- (1) Check before operating the forklift.
- (2) Before conducting the daily inspection, recheck for any fault and fault found earlier.

Content Description

1. Exterior

- (1) Check the forklift body for damage and deformation.
- (2) Check the floor where the forklift is parked for oil leakage.
- (3) Check whether nameplate, loading capacity chart and warning decals and signs are complete.

Note

If oil leakage occurs, confirm the location of the oil leakage and contact the BYD after sales service.

2. Wheel

- (1) Check on a daily basis if the wheel fasteners are secured or loose. Fasten them if they are loose.
- (2) Take out debris embedded in the tire.
- (3) If the four tires are unevenly worn, or the tires are found damaged, or the rims are bent, then replace the tires.

3. Mast

- (1) Check the cylinders, oil pipes, and hoses for oil leakage.
- (2) Check the working equipment for deformation and damage. Check if the bolts are securely fastened.

Note

If oil leakage occurs, confirm the location of the oil leakage and contact the BYD after sales service.

4. Hydraulic System

- (1) Check the hydraulic oil level in the oil tank.
- (2) Check the state of the filter indicator.

5. Seat

- (1) Pull the seat belt fully out and check for fraying.
- (2) Check the locking device (belt buckle) of the seat belt, and check if the retractor functions properly.
- (3) Check if the seat can be adjusted forward and backward, and if the back rest angle and seat suspension can be adjusted.

Danger

In the case of seat belt failure, stop operating the forklift and replace the seat belt.

6. Display

- (1) Check if the battery voltage and status of charger displayed are correct.
- (2) Check if any error/fault indication appears on the display.
- (3) Set the direction control switch to the “FORWARD”, “STOP”, and “REVERSE” positions respectively, to see whether the corresponding symbols appear on the display.
- (4) Check if the turning indicator signs appear when the turning indicator is activated.
- (5) Check if the 3 control buttons on the display functions properly.

7. Warning Equipments

- (1) Check if working lights work properly.
- (2) Check if turning lights work properly.
- (3) Set the gear switch to “Reverse” and check if reversing lights work and reversing beeper sounds.
- (4) Press horn button to see if it works.
- (5) Check if other warning equipments work properly.

8. Brake

- (1) Fully depress and then release the braking pedal and check if there is any abnormality.
- (2) Feel whether the parking brake reliably engages. If not, determine how much operating force is needed to have the parking brake reliable engage. Check the parking brake for excessive wear.
- (3) Check the braking fluid level.

9. Travel, Steering and Control

- (1) Turn the steering wheel clockwise and anti-clockwise and check if the steering is smooth.
- (2) Operate the mechanical levers and check if lifting and tilting are smooth.
- (3) Depress the acceleration pedal to see if the forklift can accelerate normally.
- (4) Check for abnormal sounds during forklift operation.

10. Electric System

- (1) Check the electrical wiring of the forklift.
- (2) Check fuse and relay.
- (3) Check main controller.

11. Counterweight

- (1) Check whether the fixing bolts of the counterweight come loose.
- (2) Check the tow pin.

12. Clean

- (1) Clean the forklift.

13. Others

- (1) Check if there are others problems.

REGULAR MAINTENANCE

Period and Items

Period for regular inspection and maintenance, whichever comes first. For example, if the forklift works less than 250 hours in 6 weeks, conduct the following inspection and checks every 6 weeks, otherwise conduct the following inspection and checks every 250 hours. Perform the maintenance service accordingly.

Category	Item	6 (weeks)	3	6	12	Months
		250	500	1000	2000	Hours
Chassis System	Brake Fluid	Replacement				
	Gear Oil (Dual drive)	1st Replacement	Replacement			
Mast	Chains Adjustment	Check				
	Chains Lubrication	Lubrication				
	Mast Cleaning	Clean				
	Mast Clearance Adjustment	Adjustment				
	Mast and Relevant Device Lubrication	Lubrication				
Hydraulic System	Hydraulic Oil	Replacement				
	Return Filter Element Replacement	1st Replacement	Replacement			
	High Pressure Element Replacement	1st Replacement	Replacement			
	Return Filter and Air Filter Replacement	Replacement				
Electric System	Electrical System	Check				
Others	Torque Inspection on Critical Fasteners	Check				

Note

If the working environment is harsh, the maintenance interval should be reduced, and advice from BYD after sales personnel should be sought.

Content Description

1. Chassis System

- (1) Lubricate drive axle.
- (2) Replace the brake fluid.
- (3) Replace the gear oil.

2. Mast

- (1) Check the tension the lift chains, adjust them if necessary.
- (2) Lubricate the chains
- (3) Clean the mast.

3. Hydraulic System

- (1) Replace the hydraulic oil periodically.
- (2) Replace the return filter.
- (3) Replace the high pressure filter element.
- (4) Replace the air filter.

4. Electric System

- (1) Check the electrical wiring of the forklift.
- (2) Check fuse and relay.
- (3) Check main controller.

5. Others

Check torque on critical fasteners.

CONSUMABLE ITEMS

Type and Parameters of Consumable Items

Single drive type

Item	Category	Volume Needed	Model
Gear Oil	Gear Oil	4.2	SAE 80W/API GL-4/UTTO
Hydraulic Oil	Hydraulic Oil	20L	API GL-4, GL-4 (75W-90)
Braking System	Brake Fluid	As Needed	DOT4
Mast and Relevant De-vice Lubrication	Lithium lubrication grease	As Needed	EP2
Lift Chains Lubrication	Machine Oil	As Needed	20#(Winter), 40#(Other Seasons)

Dual drive type

Item	Category	Volume Needed	Model
Gear Oil	Gear Oil	$(0.55-0.56) \times 2$	SAE 80W/API GL-4/UTTO
Hydraulic Oil	Hydraulic Oil	20L	ISO VG46 ($\leq 46^\circ$), ISO VG68 ($\leq 68^\circ$)
Braking System	Brake Fluid	As Needed	DOT4
Mast and Relevant De-vice Lubrication	Lithium lubrication grease	As Needed	EP2
Lift Chains Lubrication	Machine Oil	As Needed	20#(Winter), 40#(Other Seasons)

Note

The given volumes are maximum values and take the actual volume as need according to requirement.

BEFORE MAINTENANCE

Preparation before Maintenance

Before maintaining the forklift, drive it on the solid flat ground. Lower the forks to the lowest position. Put the control lever or control switch to original position. Stop the motor operation. Press the emergency disconnect switch. Apply the parking brake. Put wedge blocks under the wheels to prevent unexpected movement.

Dealing with the Faulty Forklift

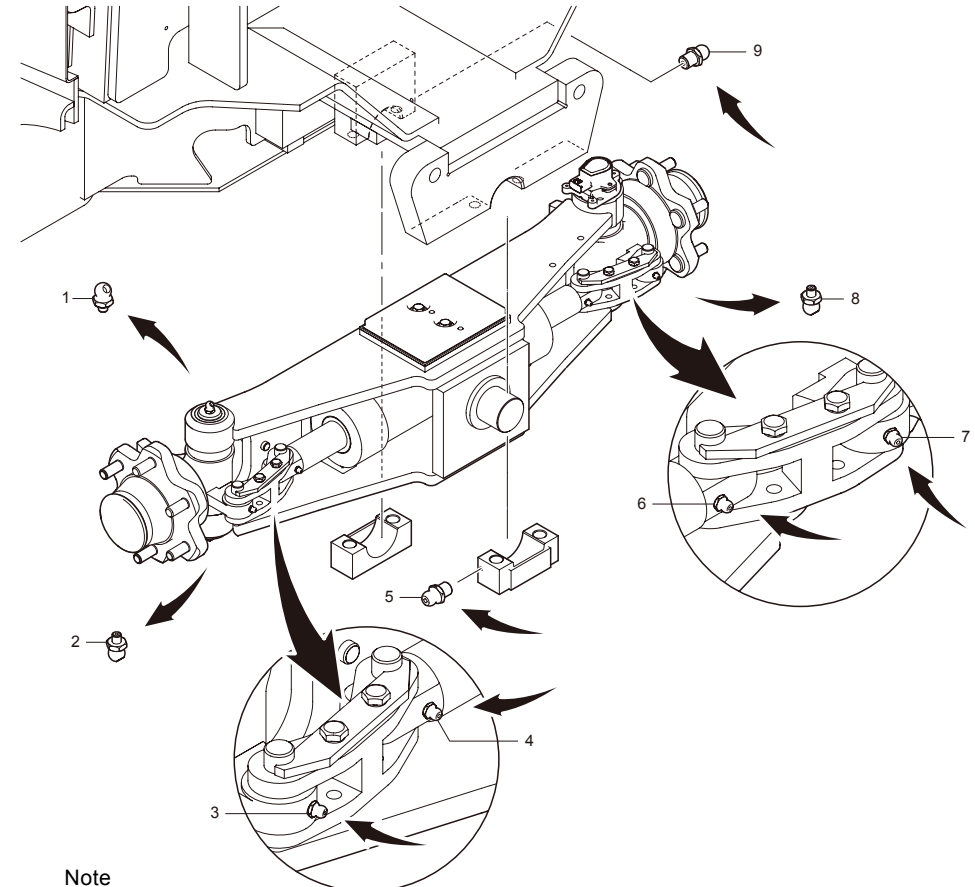
- (1) Apply the parking brake. Put wedge blocks under the wheels to prevent unexpected movement.
- (2) When necessary, raise the forks. Using a chain, lock the fork carriage to prevent unexpected fall.
- (3) Using a forklift that has the same or large capacity, tow the faulty forklift.
- (4) Check the fixing bolts of the counterweight of the faulty forklift for looseness. Using a rugged towing means, connect the faulty forklift to the towing forklift.
- (5) In the process of towing, a driver shall sit in the faulty forklift who controls its movement direction.
- (6) Rotate the steering wheel to original position. Remove the wedge blocks. Release the parking brake of the faulty forklift.
- (7) Carefully and slowly tow the faulty forklift, the driver in the forklift shall control the movement direction of the faulty forklift.
- (8) With the faulty forklift towed to the designated place, fully lower its forks, rotate its steering wheel to original position, apply its parking brake, put wedge blocks under its wheels, and switch off its power supply.

Chassis System Maintenance

Steering Axle Lubrication

Lubricate the components of the steering axle with lubricating grease through the nozzle in the steering axle.

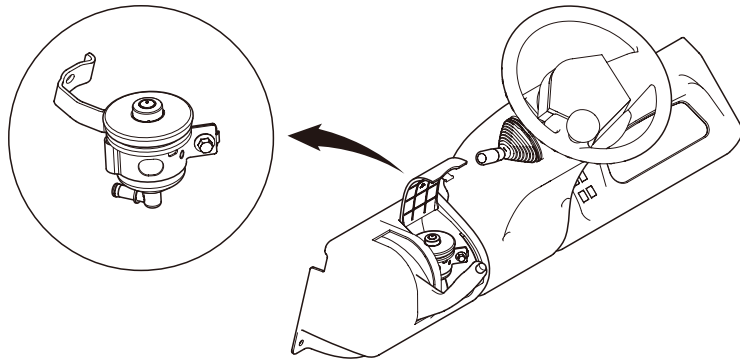
Add grease via the nozzle until grease overflows.

Note

- (1) If the forklift is used in dusty environment, add grease once a week. This can extend the service life of the bearings.
- (2) The method of increasing grease application times but decreasing grease amount applied each time is better than the method of decreasing grease application times but increasing great amount applied each time.

Braking Fluid Inspection

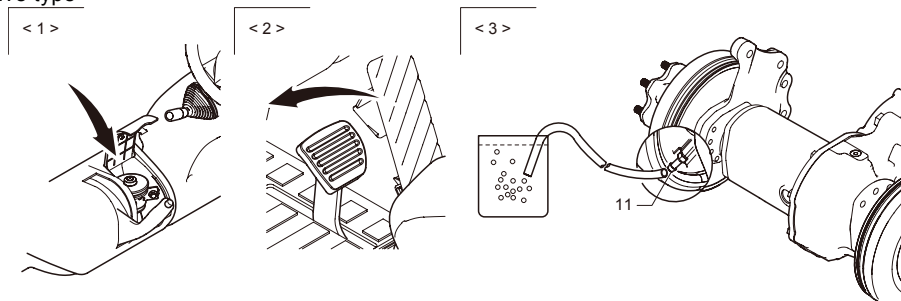
Add brake oil into the brake oil reservoir.



Braking System Bleeding

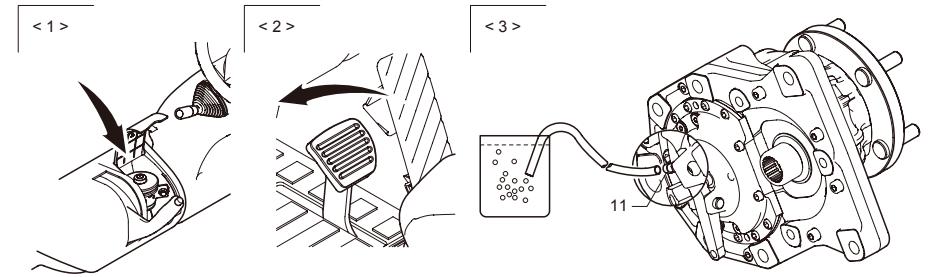
- (1) Run the forklift until the driving axle gets lightly heated. Park the forklift on a level floor, apply the hand brake, switch off the forklift, remove the key and press down the emergency disconnect switch.
- (2) Add brake oil into the brake oil reservoir..
- (3) Clean the surrounding area around the braking oil drain plug, connect it to a container. Loosen the braking fluid drain plug.
- (4) Depress the service brake pedal.
- (5) Repeat the action of adding the brake fluid and press the pedal until there aren't any bubbles in the container. Tighten the drain fluid plug and add braking fluid to 2/3 of the braking reservoir..

1.Single drive type



CODE	PART NAME	QTY	INFORMATION
11	FLUID DRAIN PLUG	1	20Nm

2.Dual drive type

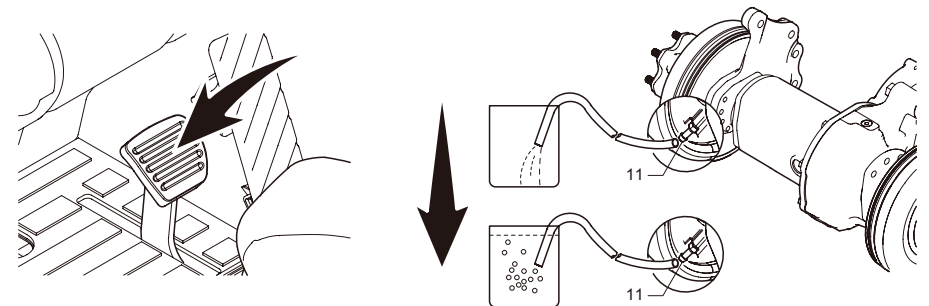


CODE	PART NAME	QTY	INFORMATION
11	FLUID DRAIN PLUG	1	20Nm

Braking Fluid Replacement

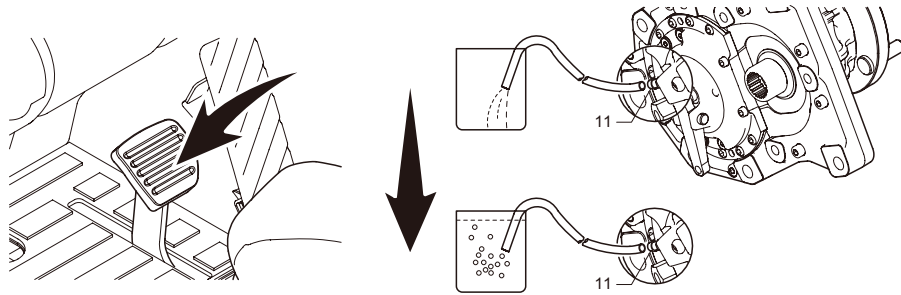
Run the forklift until the driving axle gets lightly heated. Park the forklift on a level floor, apply the hand brake, switch off the forklift, remove the key and press down the emergency disconnect switch.

- (1) Clean the surrounding area around the braking oil drain plug, connect it to a container. Loosen the braking fluid drain plug.
- (2) Depress the brake pedal and drain all the braking fluid.
- (3) Add new braking fluid, bleed the braking system and then tighten the drain fluid plug and add braking fluid to 2/3 of the braking reservoir.



CODE	PART NAME	QTY	INFORMATION
11	FLUID DRAIN PLUG	1	20Nm

2. Dual drive type

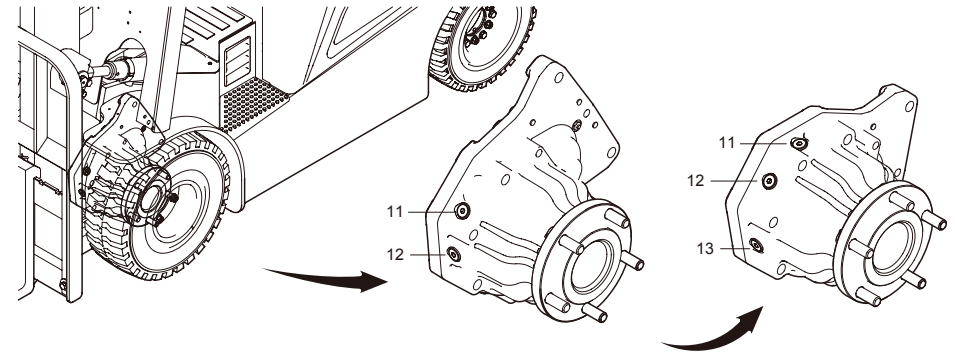


CODE	PART NAME	QTY	INFORMATION
11	FLUID DRAIN PLUG	1	20Nm

Gear Oil Replacement

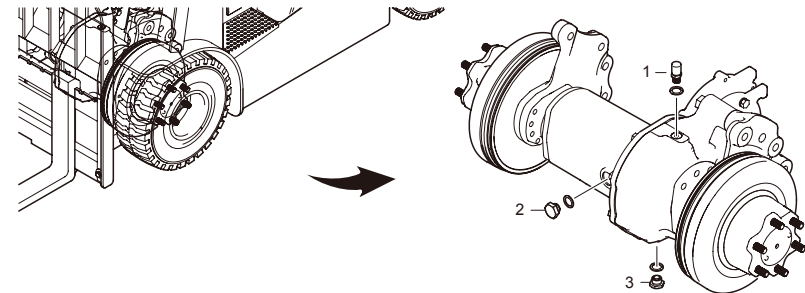
1. Gear Oil Replacement (Dual Drive)

- (1) Run the forklift until the driving axle gets lightly heated. Park the forklift on a level floor, apply the hand brake, switch off the forklift, remove the key and press down the emergency disconnect switch.
- (2) Using a jack, raise the forklift. Put wedge blocks under other wheels to prevent unexpected movement and remove the wheel.
- (3) Clean the surrounding areas around the "Oil drain plug", "Oil filler plug" and "Oil dipstick plug". Place a container below the "Oil drain plug".
- (4) Remove "Oil drain plug", "Oil filler plug" and "Oil dipstick plug" and drain all the gear oil.
- (5) Put the "Oil drain plug" back on and tighten it.
- (6) Add the gear oil through oil filler hole until the gear oil overflows out of "Oil dipstick plug".
- (7) Tighten both "Oil dipstick plug" and "Oil filler plug".
- (8) Refit the wheel and replace the gear oil in the gear box on the other side.



CODE	PART NAME	QTY	INFORMATION
11	OIL DRAIN PLUG	1	20Nm
12	OIL FILLER PLUG	1	20Nm
13	OIL DIPSTICK PLUG	1	20Nm

2. Gear Oil Replacement (Single Drive)



CODE	PART NAME	QTY	INFORMATION
1	OIL DRAIN PLUG	1	
2	OIL DIPSTICK PLUG	1	60Nm
3	OIL FILLER PLUG	1	20Nm

Caution

- (1) Make sure that the gear oil reaches the lower edge of the oil dipstick plug.
- (2) Gear oil with specified type is allowed to use.
- (3) The working temperature of gear box cannot exceed 120° C.

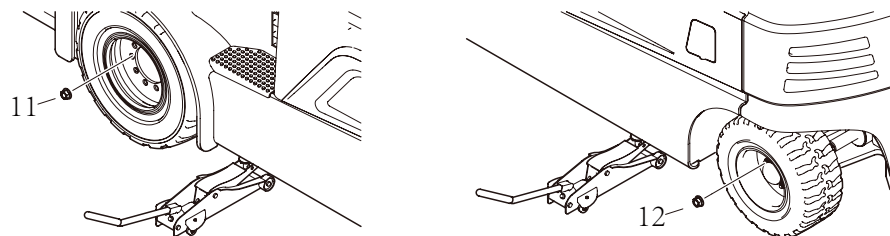
Wheel Removal and Installation

Note

For the three-point supported model, if replacing the rear wheel, you must first rotate the wheel so that it faces rearward for easy removal.

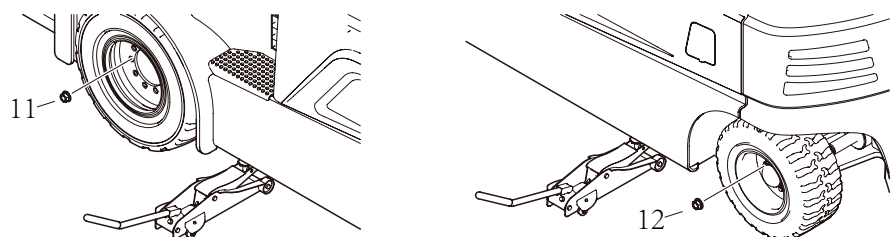
- (1) Park the forklift on the level floor, apply the handbrake, switch off the forklift, remove the key and press down the emergency disconnect switch.
- (2) Jack up the forklift until the tires are off the ground and loosen the wheel nuts.
- (3) Remove the wheel nuts and wheels.
- (4) Follow the reverse procedures to install the wheels back on.

1. Dual drive type



CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
11	NUT M14	10	130Nm	12	NUT M12	12	80Nm

2. Single drive type



CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
11	NUT M12	16	80Nm	12	NUT M12	12	80Nm

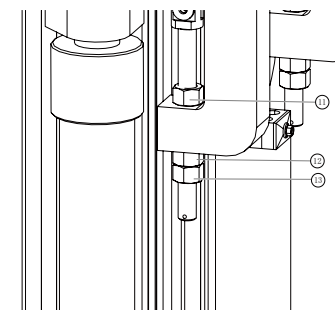
MAST MAINTENANCE

2-stage Standard Mast Chain Adjustment

The 2-stage standard mast has a main lift chain set that is needed to be adjusted.

No.	Chain	Adjustment purpose	Requirement
1	Main lift chain	Fork-to-ground clearance	10~20 mm

1. Fork-to-ground clearance adjustment
 - (1) Tilt the mast to be on the vertical position, and then fully lower the mast.
 - (2) Loosen the upper nut (that some masts have) and the lower nut.
 - (3) Screw the middle nut to adjust the chain until it meet the requirement.
 - (4) Tighten the upper and lower nuts.



CODE	PART NAME	QTY	INFOR-MATION
11	NUT	1	150Nm
12	NUT	1	150Nm
13	NUT	1	150Nm

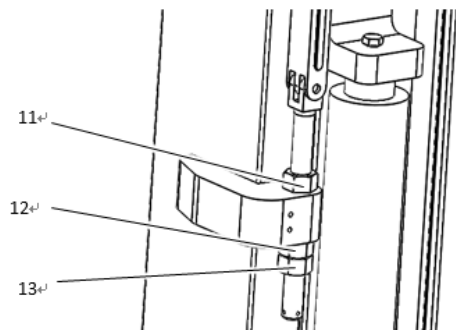
3-stage Free Lift Mast Chain Adjustment

The 3-stage free list mast has a main lift chain set and a free lift chain set that are needed to be adjusted.

No.	Chain	Adjustment purpose	Requirement
1	Main lift chain	Inner mast bottom height	≤ 2 mm
2	Free lift chain	Fork-to-ground clearance	10~20 mm

1. Inner mast bottom height adjustment

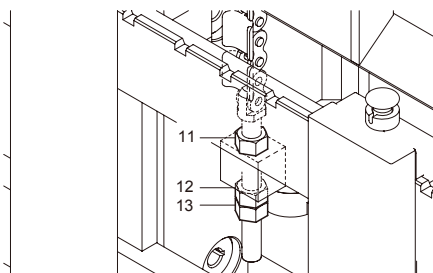
- (1) Tilt the mast to be on the vertical position, and then fully lower the mast.
- (2) Loosen the upper nut (that some masts have) and the lower nut.
- (3) Screw the middle nut to adjust the chain until it meet the requirement.
- (4) Tighten the upper and



CODE	PART NAME	QTY	INFOR-MATION
11	NUT	1	150Nm
12	NUT	1	150Nm
13	NUT	1	150Nm

2. Fork-to-ground clearance adjustment

- (1) Tilt the mast to be on the vertical position, and then fully lower the mast.
- (2) Loosen the upper nut (that some masts have) and the lower nut.
- (3) Screw the middle nut to adjust the chain until it meet the requirement.
- (4) Tighten the upper and lower nuts.



CODE	PART NAME	QTY	INFOR-MATION
11	NUT	1	150Nm

12	NUT	1	150Nm
13	NUT	1	150Nm

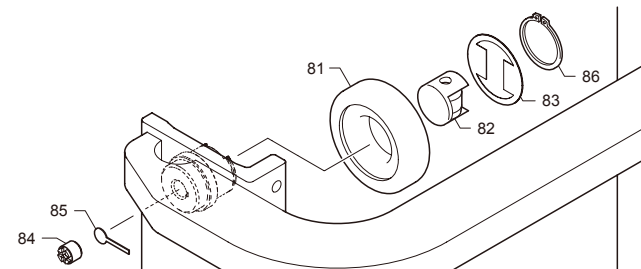
Mast Cleaning

Take out debris between the roller and the channel of the mast.

Mast Clearance Adjustment

1.General Description

A circlip locks the mast roller, bearing, and the dust protection that are installed on the mast or the carriage stub. The bearing is used to adjust the clearance of the mast and carriage by the adjusting screw, which is installed on the other side of the stub. Adjusting screw is secured by a secure pin.



2. 2-Stage Mast and Carriage Roller Description

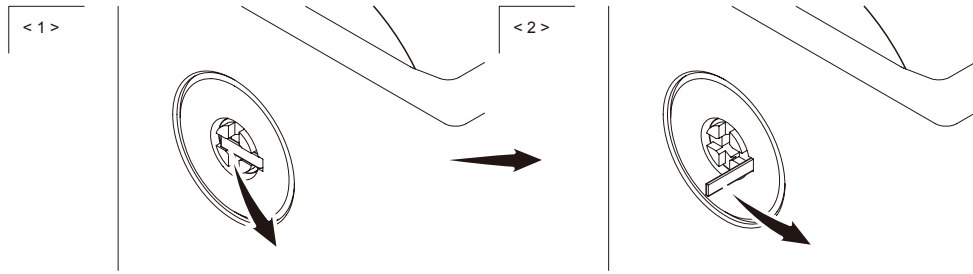
In the 2-stage mast, 2 mast rollers are installed on the top side of the outer mast, 2 mast rollers are installed on the bottom side of the inner mast, and 6 mast rollers are installed on the carriage. Being different from others, the upper 2 mast rollers of the carriage are installed by roller protections and bolts.

3. 3-Stage Mast and Carriage Roller Description

In the 3-stage mast, 2 mast rollers are installed on the top side of the outer mast, 4 mast rollers are installed on both sides of the middle mast, 2 mast rollers are installed on the bottom side of the inner mast, and 6 mast rollers are installed on the carriage. Being different from others, the upper 2 mast rollers of the carriage are installed by roller protections and bolts.

4. Carriage and Mast Clearance Adjustment

- (1) Lift the mast to expose the position of the adjusting screw.
- (2) Bend the secure pin to expose the adjusting screw.
- (3) Use the screw to adjust the clearance.
- (4) After adjustment, bend the secure pin to secure the adjustment screw.



5. Order of adjusting 2-stage mast and carriage clearance

- (1) Clearance between the outer mast and the inner mast
- (2) Clearance between the inner mast and the carriage.

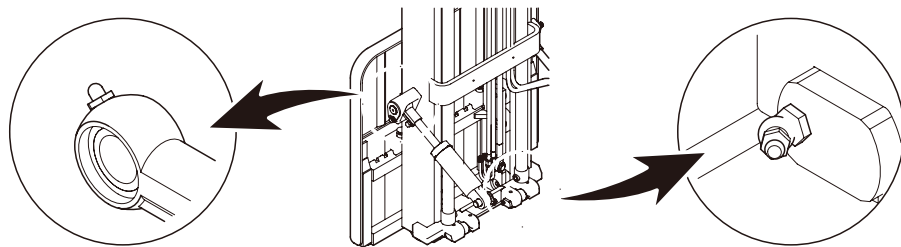
6. Order of adjusting 3-stage mast and carriage clearance

- (1) Clearance between the outer mast and the middle mast
- (2) Clearance between the middle mast and the inner mast.
- (3) Clearance between the inner mast and the carriage

Mast Lubrication

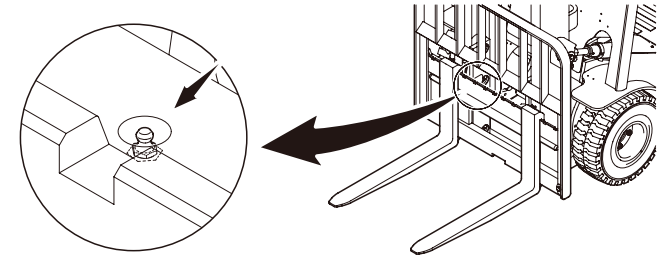
1. Tilt Rotating Pin Lubrication

- (1) Identify the lubrication nozzles of the tilt cylinders and the mast mounting
Add lubricating oil via the nozzles.
- (2) Fully lubricate the axis by tilting the mast forward and backward several times.



2. Lubrication of side shifter

Identify the lubrication nozzles of side shifters. Add lubricating oil through the nozzles until fresh lubricating oil overflows.



3. Mast Channel Lubrication

Lubricate the mast channel with lubricating grease.

Chains Lubrication

Clean the surface of chains and lubricate with machine oil.

Ensure the lubricating oil has reached the gaps of the chain links. With the lubrication procedure completed, lift and lower the mast for several times.

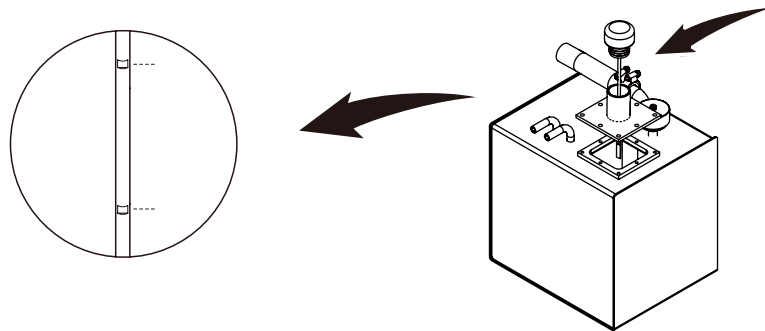
Hydraulic System Maintenance

Hydraulic Oil Level Inspection

Park the forklift on the level floor, fully lower the forks and apply the handbrake, switch off the forklift, remove the key and press down the emergency disconnect switch.

1. Check with oil dipstick

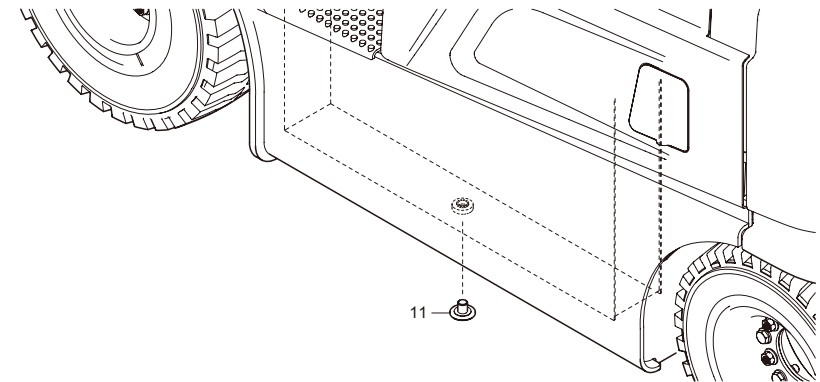
- (1) Pull out the oil dipstick, use the clean cloth to wipe the oil on it, and then insert it back.
- (2) Pull out the oil dipstick again, and then see if the oil level is between two marks.
- (3) If the oil level is under the lower mark, open the oil cap and refill the oil.

Caution

- (1) While adding oil, be careful to prevent dust and water from entering the oil tank.
- (2) Do not mix different types of hydraulic oil.
- (3) When disposing the waste oil, keep people away and do not pour it into the sewer or onto the ground.
- (4) Using unauthorized hydraulic oil might cause damage to hydraulic system. Use hydraulic oil in accordance with the requirements. If you need to switch to other types of hydraulic oils, contact with the BYD forklift after sales service people.

Hydraulic Oil Replacement

- (1) Drive the forklift to the maintenance ditch, fully lower the forks, apply the handbrake, switch off the forklift, remove the key and press down the emergency disconnect switch.
- (2) Place a container below the oil drain of the tank. Unplug the oil drains plug at the bottom of the oil tank and drain the hydraulic oil.
- (3) Make sure that the seal ring of plug is complete and intact and replace it if necessary.
- (4) Refit the drain plug. Add a small amount of fresh hydraulic oil to check for leakage. When necessary, refit or replace the drain plug.
- (5) Add hydraulic oil into the oil tank until the oil appears in the gauge.
- (6) Remove hydraulic oil from the oil tank exterior, forklift underside, and work area.



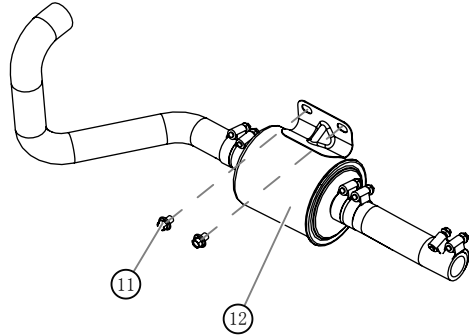
CODE	PART NAME	QTY	INFORMATION
11	PLUG	1	45 Nm

Caution

- (1) While adding oil, be careful to prevent dust and water from entering the oil tank.
- (2) Do not mix different types of hydraulic oil.
- (3) When disposing the waste oil, keep people away and do not pour it into the sewer or onto the ground.
- (4) Using unauthorized hydraulic oil might cause damage to hydraulic system. Use only authorized hydraulic oil. If you need to switch to other types of hydraulic oils, contact with the BYD forklift after sales service people.

Return Filter Replacement

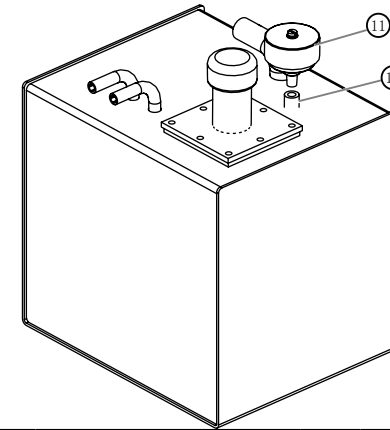
- (1) Place a clean cloth around the return oil filter.
- (2) Disconnect the hoses from both ends of the return oil filter.
- (3) Unscrew the mounting bolt and remove the return filter.
- (4) Replace the return oil filter with a new one. Tighten the mounting bolts. Connect the hoses to the new filter.
- (5) Operate the hydraulic system to check if there is any leakage..



CODE	PART NAME	QTY	INFOR-MATION
11	BOLT M8	2	
12	RETURN FILTER	1	

Air Filter Replacement

- Unscrew the cap of the air filter, check the air filter, replace it if necessary.
- (2) Open the cover of new air filter, install the cover after tightening with bolts.



CODE	PART NAME	QTY	INFOR-MATION
11	AIR FILTER	1	
12	STEEL PIPE	1	

ELECTRIC SYSTEM MAINTENANCE

Warning

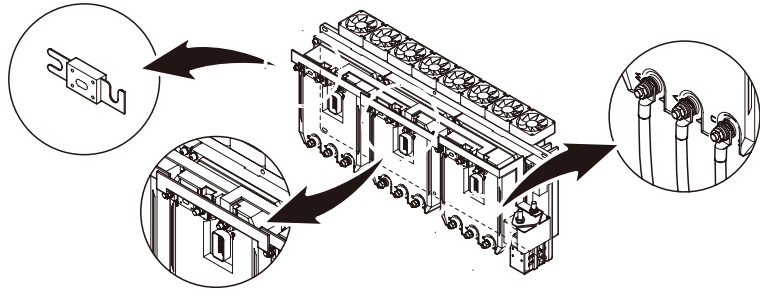
Disconnect the battery before checking the electric system.

Electrical Wiring Inspection

- (1) Check connectors and tighten the loose parts.
- (2) Check electrical connectors for abnormality (for example, sign of burning).
- (3) Check the connection jackets for looseness. Reinstall them if loose.

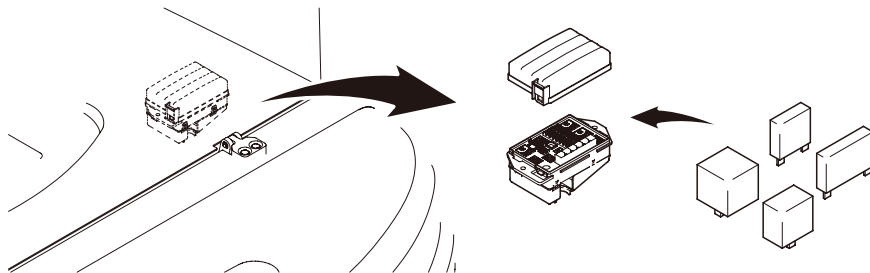
Main Controller Inspection

- (1) Check connectors of main controller and tighten the loose parts.
- (2) Check fuses of main controller and replace them if necessary.
- (3) Check whether the copper busbar of the main controller is burnt. If so, replace it.



Fuse and Relay Inspection

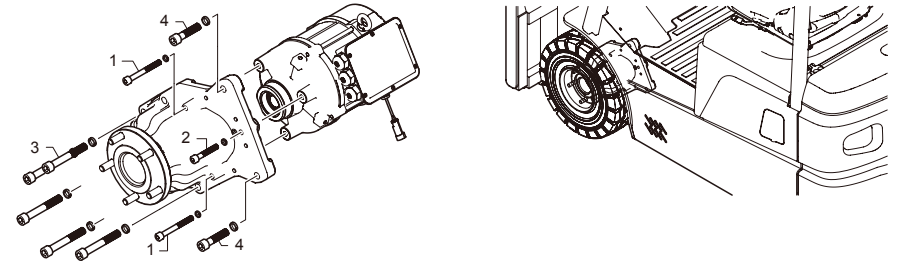
Check if fuse and relay work properly and replace them if necessary.



TORQUE INSPECTION ON CRITICAL FASTENERS

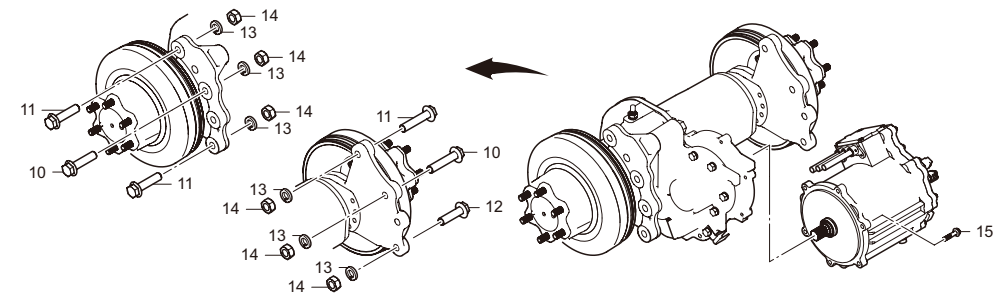
Drive Axle and Motor

1. Dual drive type



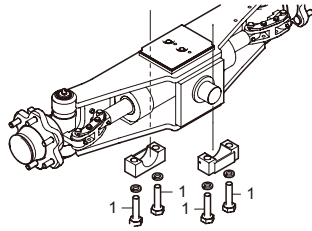
CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
1	SCREW M10×90	1	50Nm	3	SCREW M14×100	1	130Nm
2	SCREW M10×60	1	50Nm	4	SCREW M14×60	1	130Nm

2. Single drive type



CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
10	BOLT M18×80	2	250Nm	13	SPRING WASHER M18	6	
11	BOLT M18×80	3	250Nm	14	NUT M18	6	
12	BOLT M18×60	1	250Nm	15	BOLT M10×40	6	50Nm

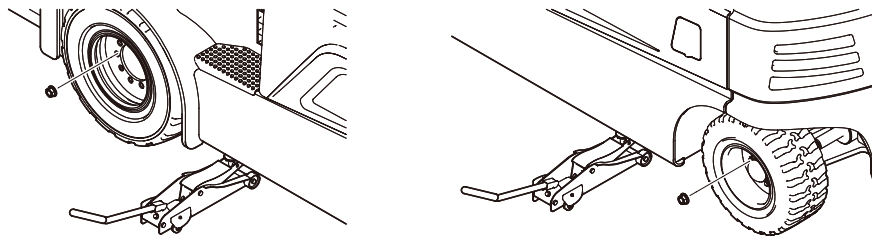
Steering Axle



CODE	PART NAME	QTY	INFOR-MATION
1	BOLT M16×70	4	200Nm

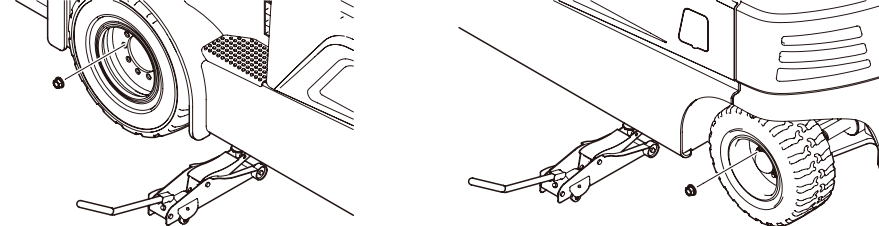
Wheel

1. Dual drive type



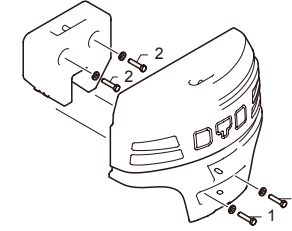
CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
11	NUT M14	10	130Nm	12	NUT M12	12	80Nm

2. Single drive type



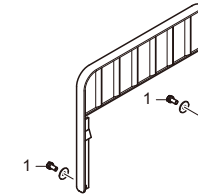
CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
11	NUT M12	16	80Nm	12	NUT M12	12	80Nm

Counterweight



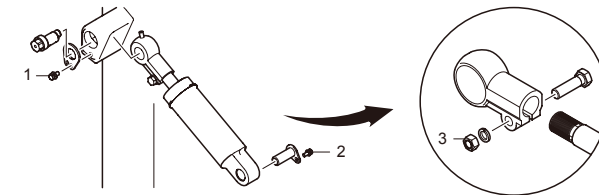
CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
1	BOLT M24×110	2	600Nm	2	BOLT M24×110	2	600Nm

Load Backrest



CODE	PART NAME	QTY	INFOR-MATION
1	BOLT ASSY M14×30	2	120Nm

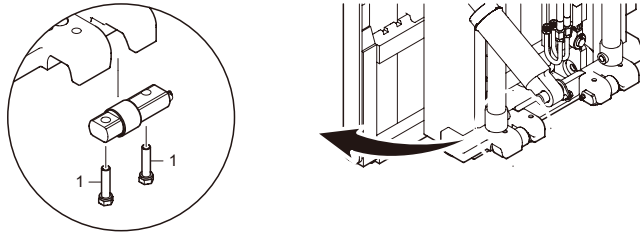
Tilt Cylinder



CODE	PART NAME	QTY	INFOR-MATION	CODE	PART NAME	QTY	INFOR-MATION
1	BOLT ASSY M12×25	4	60 Nm	3	NUT M14	1	120Nm
2	BOLT ASSY M10×20	1	20 Nm				

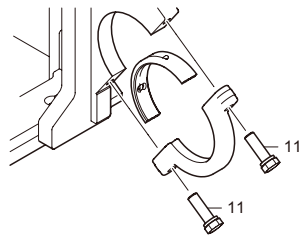
Mast

1. Dual Drive



CODE	PART NAME	QTY	INFOR-MATION
1	BOLT ASSY M14×60	4	130Nm

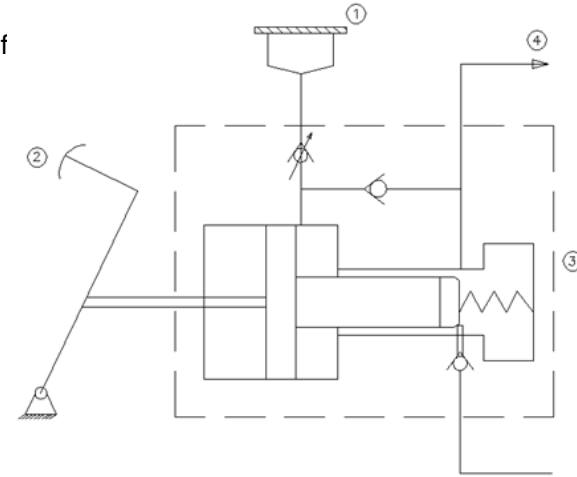
2. Single Drive



CODE	PART NAME	QTY	INFOR-MATION
1	BOLT ASSY M14×45	4	130Nm

SCHEMATICS

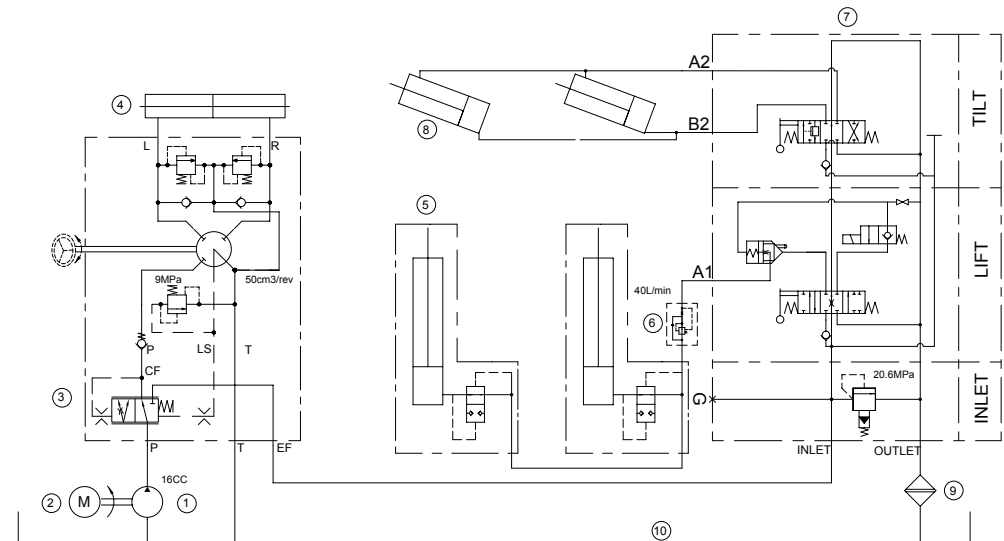
Schematic of



No.	Name	No.	Name
1	Braking Fluid Reservoir	3	Brake Master Cylinder
2	Brake Pedal	4	Oil Drain

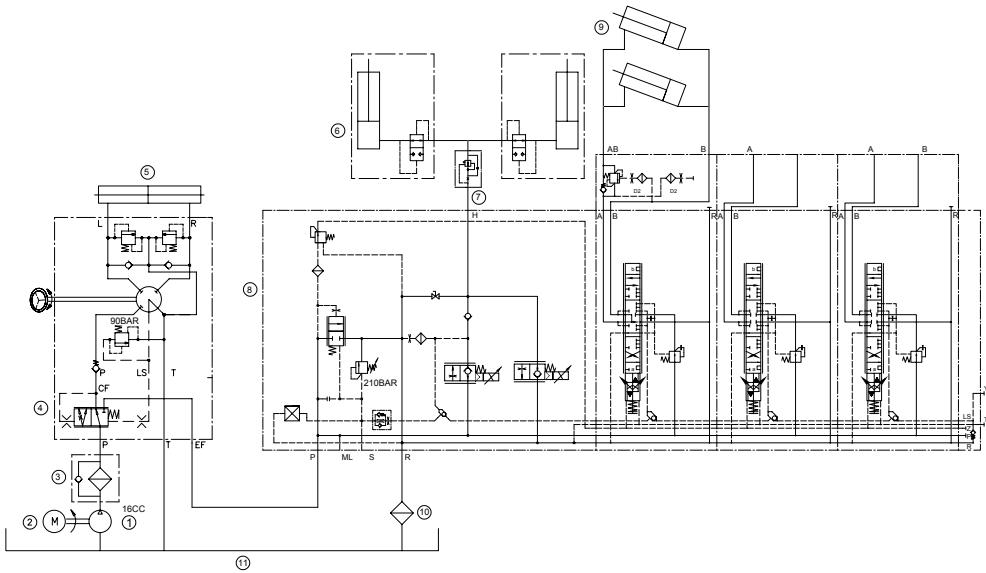
Hydraulic Schematic

1. Manual valve



No.	Name	No.	Name	No.	Name
1	Hydraulic Oil Pump	5	Lift Cylinder	9	Filter
2	Oil Pump Motor	6	Speed Limiting Valve	10	Hydraulic Oil Tank
3	Hydraulic Steering Control Unit	7	Multi-way Valve		

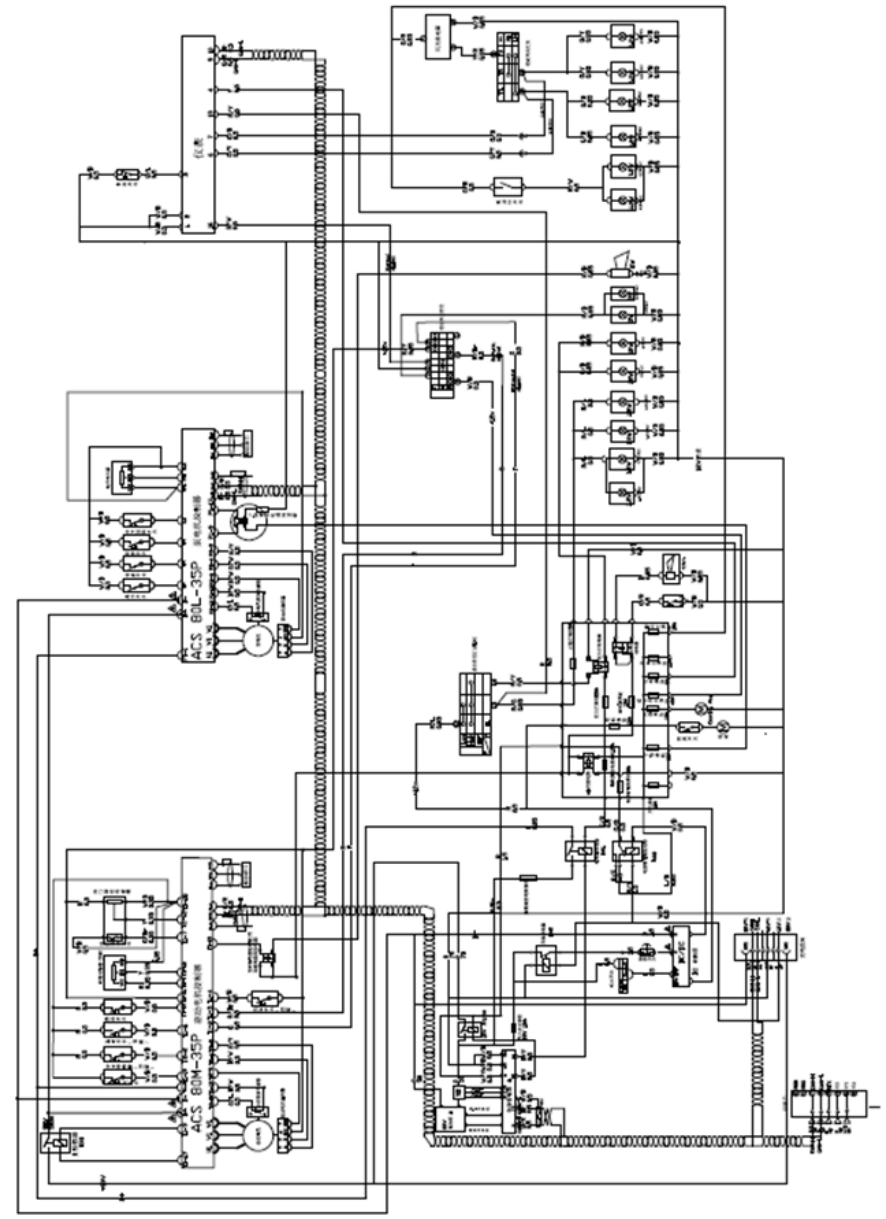
2. Electro-hydro proportional valve



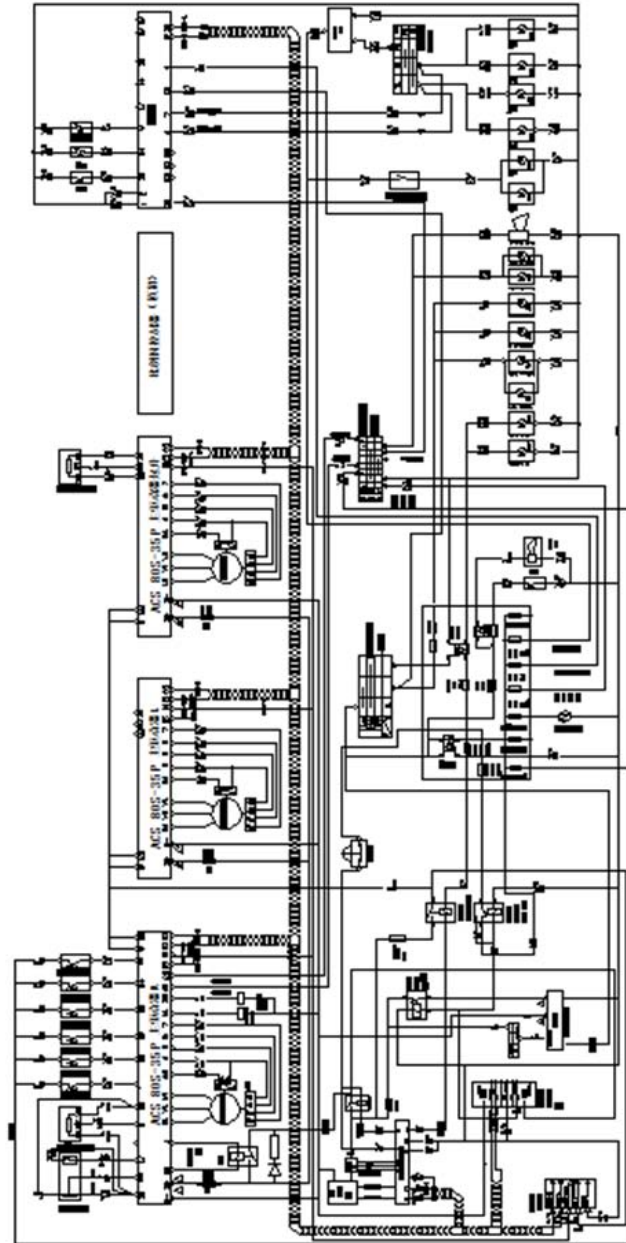
No.	Name	No.	Name	No.	Name
1	Hydraulic Oil Pump	5	Steering Cylinder	9	Tilt Cylinder
2	Oil Pump Motor	6	Lift Cylinder	10	Return Filter
3	High Pressure Filter	7	Speed Limiting Valve		Hydraulic Oil Tank
4	Hydraulic Steering Control Unit	8	Electro-hydro Proportional Valve		

Schematic of Electrical System

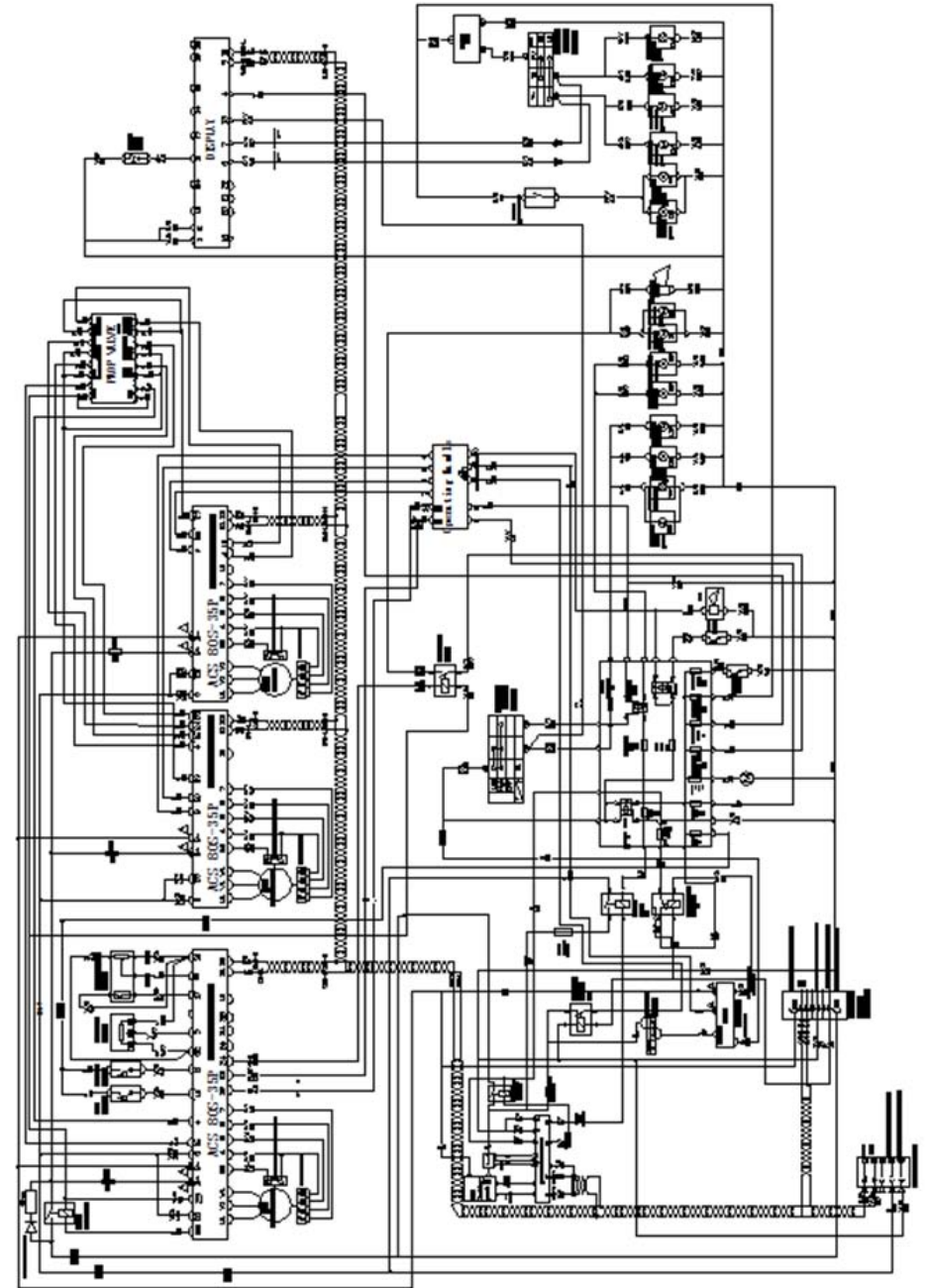
1. Manual single drive



2. Manual dual drive



3. Electro-hydro proportional valve for dual drive



OTHER INFORMATION

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Importer: BYD Motors Inc.

Address: 1800 South Figueroa Street, Los Angeles, CA, 90015
Tel: 213-748-3980 Fax: 213-748-3945
E-mail: FORKLIFTSERVICE@BYD.COM

Importer: BYD do Brasil

Address: Av. Antonio Boscato, 230 Terminal Intermodal de Cargas – TIC, CEP 13069-119 CAMPINAS - SP
Tel: +55193514-2551
E-mail: FORKLIFTSERVICE@BYD.COM

Importer: BYD JAPAN CO.,LTD.

Address: The fifth Yasuda Bldg.5F,2-20-3 Tsuya-cho, Kanagawa-ku, Yokohama-shi,Kanagawa-ken,221-0835,Janpan
Tel: 81-45-290-6550 Fax: 81-45-319-1506

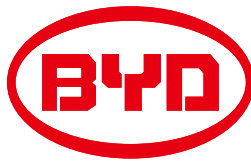
Importer: BYD Auto Industry Company Limited

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