SECTION 1 GENERAL

GROUP 1 SAFETY HINTS

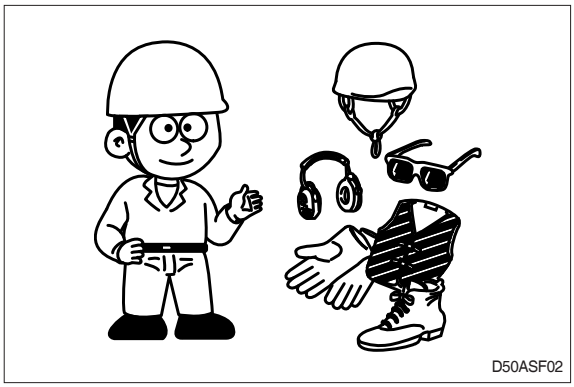
Careless performing of the easy work may cause injuries

Take care to always perform work safely, at least observing the following.

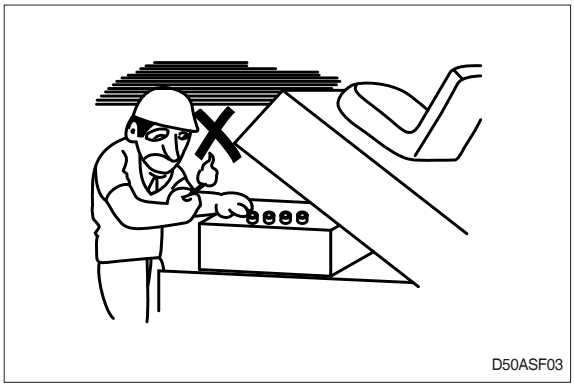
- Oil is a dangerous substance. Never handle oil, grease or oily clothes in places where there is any fire of flame.
  As preparation in case of fire, always know the location and directions for use of fire extinguishers and other fire fighting equipment.


D50ASF01

- Wear well-fitting helmet, safety shoes and working clothes. When drilling, grinding or hammering, always wear protective goggles.
  Always wear safety clothes properly so that they do not catch on protruding parts of truck.
  Do not wear oily clothes.
  When checking, always release battery plug.


D50ASF02

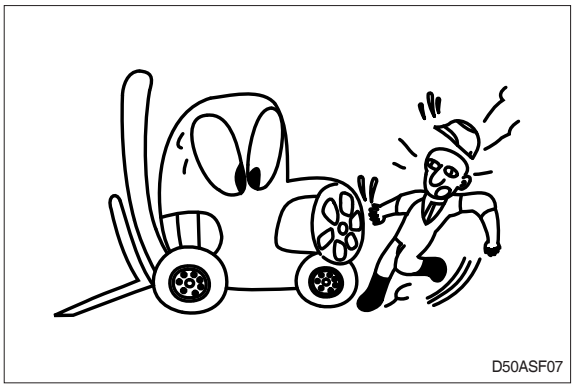
- Flames should never be used instead of lamps. Never use a naked flame to check leaks or the level of oil or electrolyte.


D50ASF03

- When working on top of the machine, be careful not to lose your balance and fall.

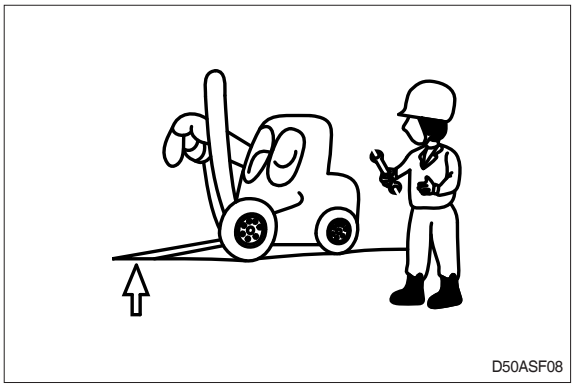

D50ASF06

· Place a caution sign in the operator's compartment
(For example Do not start or Maintenance in progress).
This will prevent anyone from starting or moving the machine by mistake.

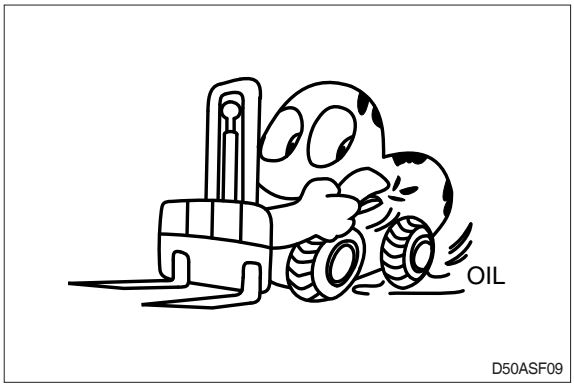

D50ASF07

When inspecting running parts or near such parts, always stop the machine first.
Before checking or servicing accumulator or piping, depress brake pedal repeatedly to release pressure.

· Park the machine on firm, flat ground.
Lower the fork to the ground and stop the engine.
Return each lever to NEUTRAL and apply the brake lock.

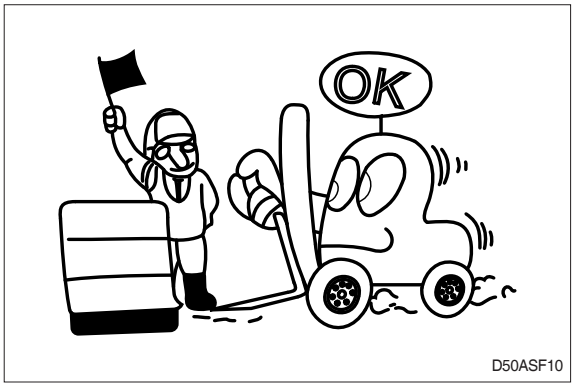

D50ASF08

· Immediately remove any oil or grease on the floor of the operator's compartment, or on the handrail. It is very dangerous if someone slips while on the machine.



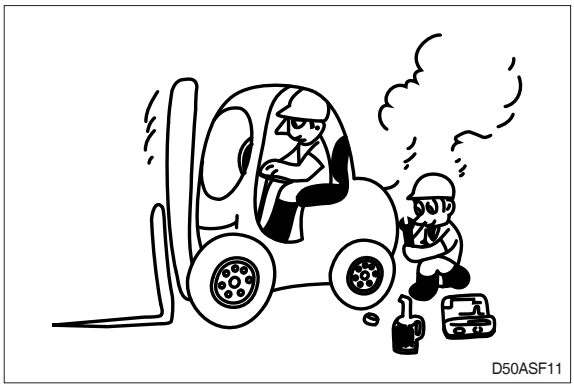
D50ASF09

· When working with others, choose a group leader and work according to his instructions. Do not perform any maintenance beyond the agreed work



D50ASF10

· Always remember that the hydraulic oil circuit is under pressure. When feeding or draining the oil or carrying out inspection and maintenance, release the pressure first.

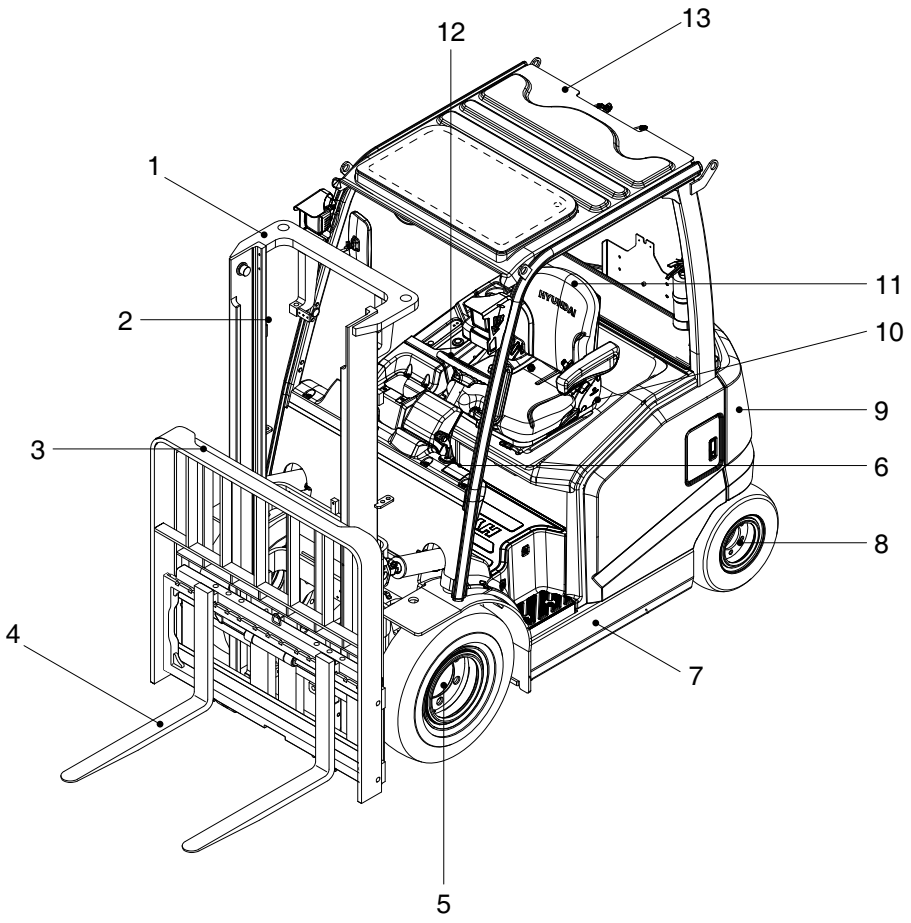

D50ASF11

· Unless you have special instructions to the contrary, maintenance should always be carried out with the machine stopped. If maintenance is carried out with the machine running, there must be two men present : one sitting in the operator's seat and the other one performing the maintenance. In such a case, never touch any moving part.
· Thoroughly clean the machine. In particular, be careful to clean the filler caps, grease fittings and the area around the dipsticks. Be careful not to let any dirt or dust into the system.
· Always use HYUNDAI Forklift genuine parts for replacement.
· Always use the grades of grease and oil recommended by HYUNDAI.
· Choose the viscosity specified for the ambient temperature.
· Always use pure oil or grease, and be sure to use clean containers.
· When checking or changing the oil, do it in a place free of dust, and prevent any dirt from getting into the oil.
· Before draining the oil, warm it up to a temperature of 30 to 40C.
· After replacing oil, filter element or strainer, bleed the air from circuit.
· When the strainer is located in the oil filler, the strainer must not be removed while adding oil
· When changing the oil filter, check the drained oil and filter for any signs of excessive metal particles or other foreign materials.
· When removing parts containing O-ring, gaskets or seals, clean the mounting surface and replace with new sealing parts.
· After injecting grease, always wipe off the oil grease that was forced out.
· Do not handle electrical equipment while wearing wet places, as this can cause electric shock.
· During maintenance do not allow any unauthorized person to stand near the machine.
· Be sure you fully understand the contents of the operation. It is important to prepare necessary tools and parts and to keep the operating area clean.
· When checking an open gear case there is a risk of dropping things in. Empty everything from your pockets before removing the covers to inspect such cases. Be particularly careful to remove wrenches and nuts
· Way to use dipstick
  Push the dipstick fully into the guide, and then pull out.

  Carrying out other difficult maintenance work carelessly can cause unexpected accidents.. If you consider the maintenance is too difficult, always request the HYUNDAI Forklift distributor for help.

GROUP 2 SPECIFICATIONS

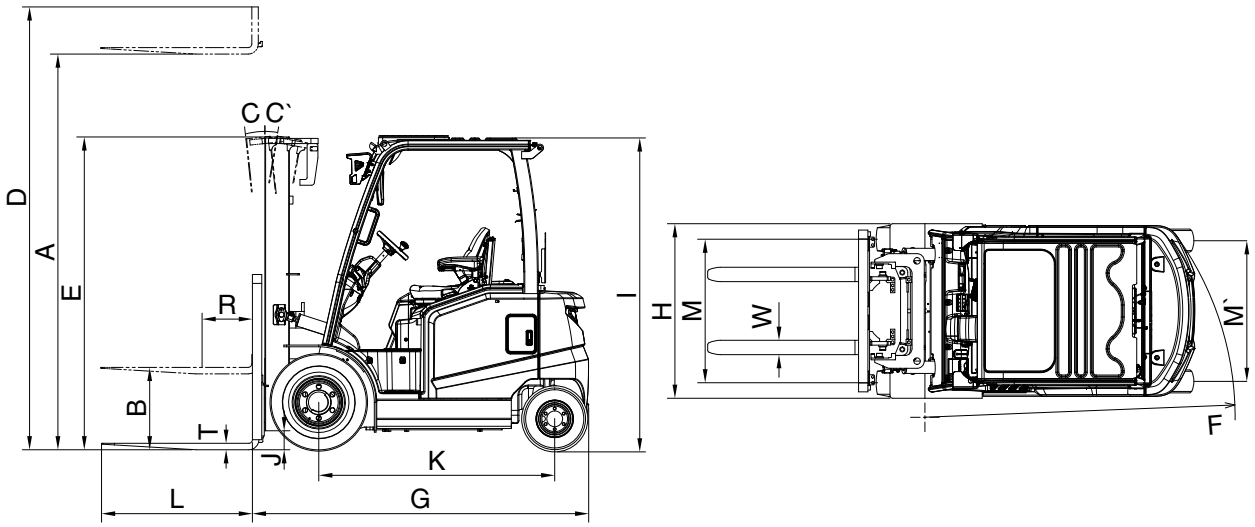
1. GENERAL LOCATIONS



25BX7PM01

1	Mast	6	Dash board	11	Seat
2	Lift cylinder	7	Frame	12	Steering wheel
3	Carriage and backrest	8	Steering axle	13	Overhead guard
4	Fork	9	Counterweight		
5	Drive axle	10	Battery cover		

2. SPECIFICATIONS



25BX8SP01

Model			Unit	25B-9X	30B-9X	32B-9X	35B-9X
Capacity			kg	2500	3000	3200	3500
Load center		R	mm	500	←	←	←
Weight			kg	4604	5043	5242	5486
Fork	Lifting height	A	mm	3300	←	←	←
	Free lift	B	mm	155	←	←	←
	Lifting speed [Load/Unload]		mm/sec	360/600	320/600	300/500	270/500
	Lowering speed [Load/Unload]		mm/sec	550/500	←	510/480	←
	Length × Width × Thickness	L×W×T	mm	1050×100×45	1050×122×45	←	←
Mast	Tilt angle forward/backward	C/C'	degree	6/10	←	←	←
	Max height	D	mm	4485	←	←	←
	Min height	E	mm	2182	←	2252	←
Body	Travel speed [Unload/Load]		km/h	16/17	←	←	←
	Gradeability [Load]		%	24	15.5	14.5	12.5
	Min turning radius [Outside]	F	mm	1940	2150	2165	2205
ETC	Max hydraulic pressure		kgf/cm^2	190	210	190	210
	Hydraulic oil tank		l	33	←	←	←
Overall length		G	mm	2349	←	2460	2505
Overall width		H	mm	1229	←	←	←
Overhead guard height		I	mm	2187	←	←	←
Ground clearance (Mast)		J	mm	135	←	←	←
Wheel base		K	mm	1572	1642	←	←
Wheel tread front/Rear		M/M'	mm	1005/980	←	←	←

2. SPECIFICATION FOR MAJOR COMPONENTS

1) CONTROLLER

Model	Unit	Traction motor controller	Pump motor controller
Model	-	CURTIS 1236SE-5621	←
Type	-	AC	←
Current limit	A	600A	←
Communication	-	CAN	←

2) MOTOR

Model	Unit	Traction motor controller	Pump motor controller
Type	-	ASRH4001	AMSR4001
Rated voltage	Vac	30	30
Output	kW	14	15
Insulator	-	FGrade	FGrade

3) BATTERY

Model	Unit	25B-X	30/32/35B-X
Type	-	Leadacid	←
Rated voltage	V	48	←
Capacity	AH/hr	600/5	700/5
Electrolyte	-	Wet	←
Size (W×L×H)	mm	984×466×744	984×536×744
Connector	-	SB 350	←
Weight	kg	1000	1150

LITHIUM-ION BATTERY (OPTION)

Model	Unit	25B-9X	30/32/35B-9X
Rated voltage	V	51.2	←
Capacity	AH	500	600
Size (W×L×H)	mm	984×466×750	984×536×750
Weight	kg	1000	1150
Connector	-	DIN 320	←

4) CHARGER

Model	Unit	Specification
Type	-	Constant current, constant voltage
Battery capacity for charge	V-AH	48V/660~740
AC input	V	Triple phase 410
		Single phase 220
		Triple phase 220/380
		Triple phase 440
DC output	V	64±1
Charge time	hr	6±2
Connector	-	SB 350 or SR 350

LITHIUM-ION BATTERY CHARGER (OPTION)

Model	Unit	25B-X	30/32/35B-X
Battery capacity for charge	V-AH	51.2-500	51.2-600
AC input	V	Triple phase 400	←
DC output	V	58.8	←
Charge time	hr	2	←
Connector	-	DIN 320	←

5) GEAR PUMP

Model	Unit	Specification
Type	-	Gear type hydraulic pump
Capacity	cc/rev	25.2
Max operating pressure	bar	250
Speed(max/min)	rpm	3000/100

6) MAIN CONTROL VALVE

Model	Unit	Specification
Type	-	3, 4 spool
Operating method	-	Mechanical
Main relief valve pressure	bar	210
Secondary relief valve pressure	bar	165

7) DRIVE AXLE

Model	Unit	Specification
Max. axle load	kg	9000
Max. input speed	rpm	4000
Gear ratio	-	24.34
Weight without fluid	kg	190
Oil quantity	l	7.0

8) WHEELS

Model	Specification
Type (front/rear)	Solid (option: Non-marking, pneumatic)
Quantity (front/rear)	2/2
Front-drive	8.15-15 (16PR)
Rear-steering	18×7-8 (16PR)

9) BRAKES & STEERING

Model		Specification
Brakes	Travel	Front wheel, hydraulic, wet disc brake
	Parking	Mechanical
Steering	Type	Hydraulic steering

3. TIGHTENING TORQUE FOR MAJOR COMPONENTS . TIGHTENING TORQUE FOR MAJOR COMPONENTS

No.	Model		Size	kgf·m
1	Electric system	Hydraulic pump motor mounting bolt	M8 × 1.25	3.4 ± 0.7
2		Traction motor mounting bolt	M10 × 1.5	6.9 ± 1.4
3	Hydraulic system	Hydraulic pump mounting bolt	M10 × 1.5	6.9 ± 1.4
4		MCV mounting bolt, nut	M8 × 1.25	2.5 ± 0.5
5		Steering unit mounting bolt	M10 × 1.5	4.0 ± 0.5
6		Priority valve mounting bolt	M6 × 1.0	1.0 ± 0.5
7		Tilt cylinder; rod-end bolt, nut	M12 × 1.75	9.5 ± 0.5
8		Tilt cylinder pin; mounting bolt	M10 × 1.5	6.9 ± 0.5
9	Power train system	Drive axle mounting bolt, nut	M20 × 2.5	55.5 ± 2.5
10		Steering axle mounting bolt, nut	M20 × 2.5	62 ± 3.0
11		Front wheel mounting nut	M20 × 1.5	40 ± 10
12		Rear wheel mounting nut	M14 × 1.5	23 ± 1.0
13	ETC	Counterweight mounting bolt	M24 × 3.0	199 ± 15
14		Mast mounting bolt	M16 × 2.0	24.5 ± 2.5
15		Operator's seat mounting nut	M8 × 1.25	3.4 ± 0.7
16		Head guard mounting bolt (front)	M12 × 1.75	12.8 ± 3
17		Head guard mounting bolt (rear)	M16 × 2.0	29.7 ± 4.5

4. TORQUE CHART

Use following table for unspecified torque

1) BOLT AND NUT

(1) Coarse thread

Bolt size	8.8T	10.9T	12.9T
	kgf·m	kgf·m	kgf·m
M 6 × 1.0	0.8 ~ 1.2	1.2 ~ 1.8	1.5 ~ 2.1
M 8 × 1.25	2.0 ~ 3.0	2.8 ~ 4.2	3.4 ~ 5.0
M10 × 1.5	4.0 ~ 6.0	5.6 ~ 8.4	6.8 ~ 10.0
M12 × 1.75	6.8 ~ 10.2	9.6 ~ 14.4	12.3 ~ 16.5
M14 × 2.0	10.9 ~ 16.3	16.3 ~ 21.9	19.5 ~ 26.3
M16 × 2.0	17.9 ~ 24.1	25.1 ~ 33.9	30.2 ~ 40.8
M18 × 2.5	24.8 ~ 33.4	34.8 ~ 47.0	41.8 ~ 56.4
M20 × 2.5	34.9 ~ 47.1	49.1 ~ 66.3	58.9 ~ 79.5
M22 × 2.5	46.8 ~ 63.2	65.8 ~ 88.8	78.9 ~ 106
M24 × 3.0	60.2 ~ 81.4	84.6 ~ 114	102 ~ 137
M30 × 3.5	120 ~161	168 ~ 227	202 ~ 272

(2) Fine thread

Bolt size	8.8T	10.9T	12.9T
	kgf·m	kgf·m	kgf·m
M 8 × 1.0	2.1 ~ 3.1	3.0 ~ 4.4	3.6 ~ 5.4
M10 × 1.25	4.2 ~ 6.2	5.9 ~ 8.7	7.0 ~ 10.4
M12 × 1.25	7.3 ~ 10.9	10.3 ~ 15.3	13.1 ~ 17.7
M14 × 1.5	12.4 ~ 16.6	17.4 ~ 23.4	20.8 ~ 28.0
M16 × 1.5	18.7 ~ 25.3	26.3 ~ 35.5	31.6 ~ 42.6
M18 × 1.5	27.1 ~ 36.5	38.0 ~ 51.4	45.7 ~ 61.7
M20 × 1.5	37.7 ~ 50.9	53.1 ~ 71.7	63.6 ~ 86.0
M22 × 1.5	51.2 ~ 69.2	72.0 ~ 97.2	86.4 ~ 116
M24 × 2.0	64.1 ~ 86.5	90.1 ~ 121	108 ~ 146
M30 × 2.0	129 ~ 174	181 ~ 245	217 ~ 294

2) PIPE AND HOSE (FLARE TYPE)

Thread (PF)	Hex. across flat (mm)	kgf · m
1/4"	19	4
3/8"	22	5
1/2"	27	9.5
3/4"	36	18
1"	41	21
1-1/4"	50	35

3) PIPE AND HOSE (ORFS TYPE)

Thread (UNF)	Hex. across flat (mm)	kgf · m
9/16-18	19	3
11/16-16	22	5
13/16-16	24	7
1-14	30	12
1-3/16-12	36	18
1-7/16-12	41	23
1-11/16-12	50	28
2-12	58	32

4) FITTING

Thread	Hex. across flat (mm)	kgf · m
1/4"	17	2
3/8"	19	3
1/2"	22	4
	24	6
5/8"	27	10
	30	12
3/4"	32	15
	36	18
1"	41	23
1-1/4"	50	28
1-1/2"	55	32

5) BAND CLAMP

Tag. No.	Hose size (㎜)	Band width (㎜)	kgf·m
S20-15	8 ~ 14	9	0.3
S20-17	11 ~ 17		
S20-22	13 ~ 20		0.35
S20-25	15 ~ 24		
S20-28	19 ~ 28		
S20-32	22 ~ 32	12	
S20-40	26 ~ 38	9	0.42
S20-45	32 ~ 44		

6) BAND CLAMP (IDEAL, FLEX-GEAR TYPE)

Tag. No.	Hose size (㎜)	Band width (㎜)	kgf·m
41-212	32 ~ 54	15.9	1.1
41-262	45 ~ 67		
41-312	57 ~ 79		
41-362	40 ~ 92		
41-412	83 ~ 105		
41-462	95 ~ 117		
41-512	108 ~ 130		

5. WRENCH AND SPANEER CHART

No.	Wrench & Spanner			Specification			Pipe and Hose	
	inch		mm	UNF/UN	M	PF/G	ORFS (UNF/UN)	FLARE (PF)
1	-	0.050	1.3	-	-	-	-	-
2	-	0.059	1.5	-	-	-	-	-
3	1/16	0.063	1.6	-	-	-	-	-
4	5/64	0.078	2	-	-	-	-	-
5	3/32	0.094	2.4	-	-	-	-	-
6	-	0.098	2.5	-	-	-	-	-
7	7/64	0.109	2.8	-	-	-	-	-
8	-	0.118	3	-	-	-	-	-
9	1/8	0.125	3.2	-	-	-	-	-
10	9/64	0.141	3.5	-	-	-	-	-
11	5/32	0.156	4	-	-	-	-	-
12	-	0.177	4.5	-	-	-	-	-
13	3/16	0.188	4.8	-	-	-	-	-
14	-	0.197	5	-	-	-	-	-
15	13/64	0.203	5.2	-	-	-	-	-
16	7/32	0.219	5.5	-	-	-	-	-
17	15/64	0.234	6	-	-	-	-	-
18	1/4	0.250	6.4	-	-	-	-	-
19	17/64	0.266	6.8	-	-	-	-	-
20	9/32	0.281	7	-	-	-	-	-
21	5/16	0.313	8	-	-	-	-	-
22	11/32	0.344	8.7	-	-	-	-	-
23	-	0.354	9	-	-	-	-	-
24	3/8	0.375	9.5	-	-	-	-	-
25	-	0.394	10	-	-	-	-	-
26	-	-	11	-	-	-	-	-
27	7/16	0.438	11.1	-	-	-	-	-
28	15/32	0.469	12	-	-	-	-	-
29	1/2	0.500	12.7	-	-	-	-	-
30	-	-	13	-	-	-	-	-
31	17/32	0.53	13.5	-	-	-	-	-
32	-	0.55	14	7/16-20	-	-	-	-
33	9/16	0.56	14.3	-	-	-	-	-
34	19/32	0.59	15	-	-	-	-	-
35	5/8	0.63	15.9	-	-	-	-	-
36	-	-	16	-	-	-	-	-
37	21/32	0.66	16.7	-	-	-	-	-

No.	Wrench & Spanner			Specification			Pipe and Hose	
	inch		mm	UNF/UN	M	PF/G	ORFS (UNF/UN)	FLARE (PF)
38	-	-	17	-	M12	-	-	-
39	11/16	0.69	17.5	-	-	-	-	-
40	-	-	18	-	-	-	-	-
41	3/4	0.75	19	9/16-18	M14	G1/4	9/16-18	PF1/4
42	25/32	0.78	19.8	-	-	-	-	-
43	-	-	20	-	-	-	-	-
44	13/16	0.81	20.6	-	-	-	-	-
45	-	-	21	-	-	-	-	-
46	-	-	22	-	M16	G3/8	11/16-16	PF3/8
47	7/8	0.88	22.2	-	-	-	-	-
48	29/32	0.91	23	-	-	-	-	-
49	15/16	0.94	23.8	-	-	-	-	-
50	-	-	24	3/4-16	M18	-	13/16-16	-
51	31/32	0.97	26.4	-	-	-	-	-
52	-	-	25	-	-	-	-	-
53	1	1.00	25.4	-	-	-	-	-
54	-	-	26	-	-	-	-	-
55	1 1/16	1.06	27	7/8-14	M22	G1/2	-	PF1/2
56	-	-	28	-	-	-	-	-
57	1 1/8	1.13	28.6	-	-	-	-	-
58	-	-	29	-	-	-	-	-
59	-	-	30	-	-	-	1-14	-
60	1 3/16	1.19	30.2	-	-	-	-	-
61	-	-	31	-	-	-	-	-
62	1 1/4	1.25	31.8	-	-	-	-	-
63	-	-	32	1-1/16-12	M24	G3/4	-	-
64	-	-	33	-	-	-	-	-
65	1 5/16	1.31	33.3	-	-	-	-	-
66	-	-	34	-	-	-	-	-
67	1 3/8	1.38	35	-	-	-	-	-
68	-	-	36	1-3/16-12	M27	G3/4	1-3/16-12	PF3/4
69	1 7/16	1.44	37	-	-	-	-	-
70	1 1/2	1.50	38	-	-	-	-	-
71	-	-	39	-	-	-	-	-
72	1 9/16	1.56	39.7	-	-	-	-	-
73	-	-	40	-	-	-	-	-
74	-	-	41	1-5/16-12	M33	G1	1-7/16-12	PF1
75	1 5/8	1.63	41.3	-	-	-	-	-

No.	Wrench & Spanner			Specification			Pipe and Hose	
	inch		mm	UNF/UN	M	PF/G	ORFS (UNF/UN)	FLARE (PF)
76	1 11/16	1.69	43	-	-	-	-	-
77	1 3/4	1.75	44	-	-	-	-	-
78	1 13/16	1.81	46	-	-	-	-	-
79	1 7/8	1.88	47.6	-	-	-	-	-
80	-	-	48	-	-	-	1-11/16-12	-
81	1 15/16	1.94	49.2	-	-	-	-	-
82	-	-	50	1-5/8-12	-	G1-1/4	-	PF1-1/4
83	2	2.00	50.8	-	-	-	-	-
84	-	-	51	-	-	-	-	-
85	2 1/8	2.13	54	-	-	-	-	-
86	-	-	55	1-7-8-12	-	G1-1/2	-	PF1-1/2
87	-	-	57	-	-	-	2-12	-
88	2 1/4	2.25	57.2	-	-	-	-	-
89	-	-	60	-	-	-	-	-

6. RECOMMENDED LUBRICANTS

Use only oils listed below or equivalent.
Do not mix different brand oil.

Service point	Kind of fluid	Capacity l	Ambient temperature ˚C -50 -30 -20 -10 0 10 20 30 40 (-58) (-22) (-4) (14) (32) (50) (68) (86) (104)
Axle	Gear oil	7.0	ATF DEXRON 3
Hydraulic oil tank	Hydraulic oil	33	★ISO VG 15 ISO VG 32 ISO VG 46 ISO VG 68
Brake system	Brake oil	0.5	★Hyd.OIL ISO VG10 (AZOLLA ZS10) Hyd. OIL ISO VG32 (AZOLLA ZS32)
Fitting (Grease nipple)	Grease	0.1	★NLGI No.1 NLGI No.2

· ATF : Automatic Transmission Fluid
· ISO : International Organization for Standardization
· NLGI : National Lubricating Grease Institute
★ : Cold region (Russia, CIS, Mongolia)

GROUP 3 PERIODIC REPLACEMENT

For operation safety, never fail to perform periodic maintenance or make periodic replacement of the consumable parts listed in the following. These parts may deteriorate in time and are susceptible to wear.

It is difficult to estimate the degree of wear at time of periodic maintenance; therefore, even if no apparent wear is found, always replace with new parts within the prescribed period of replacement (Or earlier if trouble is found).
Note that periodic replacement has nothing to do with guarantee service.

※ Replacement of consumable service parts is not covered under warranty.

No.	Description	Period of replacement
1	Master cylinder and wheel cylinder caps dust seals	Every 1 years
2	Lift cylinder hose	Every 1 years (harsh operation) Every 2 years (normal operation)
3	Tilt cylinder hos	
4	Side shift cylinder hose	
5	Brake hose or tube	
6	Hydraulic pump hose	Every 2 years
7	Pwer steering hose	
8	Coolant hose and clamp	
9	0 Packing, seal, and O-ring of steering cylinder	Every 2 years (harsh operation) Every 4 years (normal operation)
10	Lift chain	
11	Brake oil tank tube	
12	Hydraulic pump seal kit	Every 3 years
13	Pressure sensor	Every 5 years
14	Mast accumulator (piston type)	Every 10 years

※ Replace the O-ring and gasket at the same time when replacing the hose.
※ Replace clamp at the same time if the hose clamp is cracked when checking and replacing hose.
※ Normal operation
- Eight hour material handling, mostly in buildings or in clean, open air on clean paved surfaces

※ Harsh operation
- All harsh working environment
- Long term heavy load operation
- High and low temperature working environment
- Sudden change in temperature
- Dusty or sandy working environment
- Highly corrosive chemical working environment
- Damp working environment