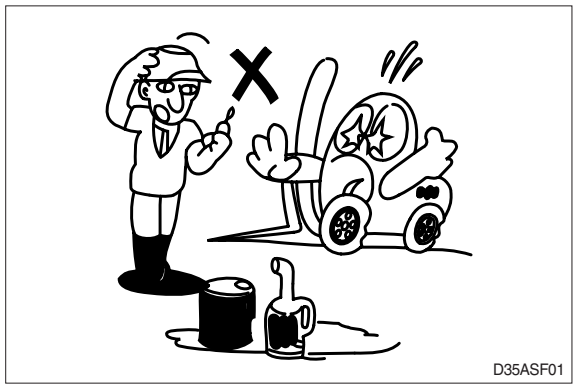
SECTION 1 GENERAL

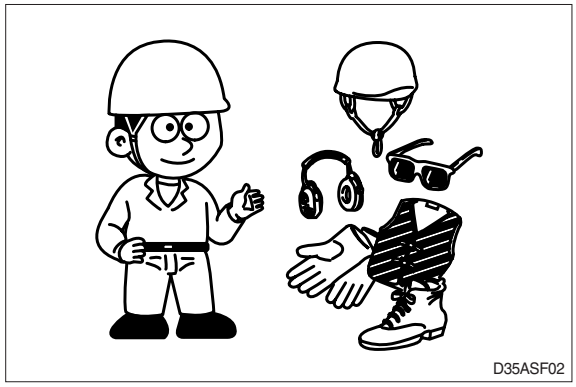
GROUP 1 SAFETY HINTS

Careless performing of the easy work may cause injuries.
Take care to always perform work safely, at least observing the following.

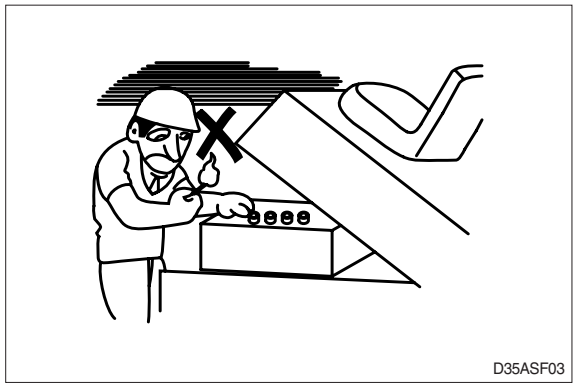
- Oil is a dangerous substance. Never handle oil, grease or oily clothes in places where there is any fire of flame.
  As preparation in case of fire, always know the location and directions for use of fire extinguishers and other fire fighting equipment.


D35ASF01

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


D35ASF02

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

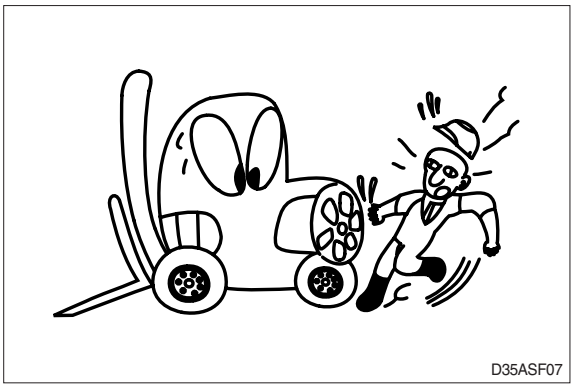

D35ASF03

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


D35ASF06

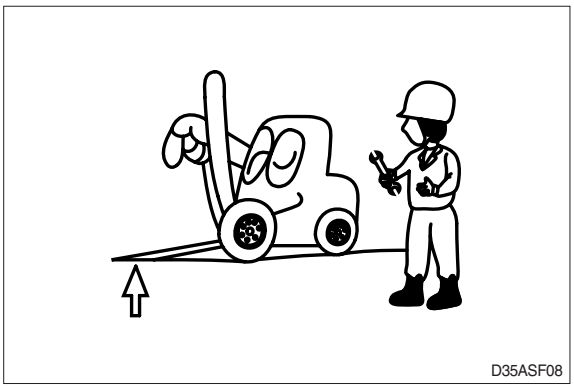
- Hand a caution sign in the operator's compartment (For example **Do not start** or **Maintenance in progress**).
  This will prevent anyone from starting or moving the machine by mistake.

⚠ **It is extremely dangerous to try to check the fan belt tension while he engine is running.**

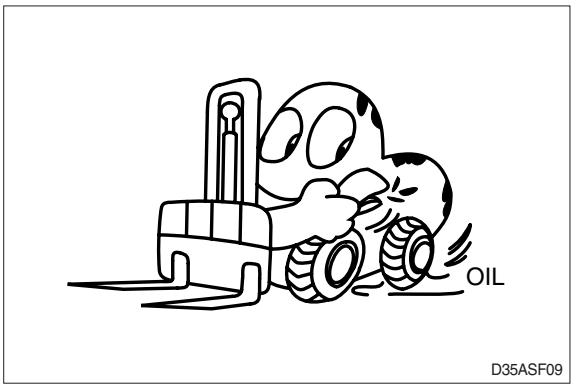

D35ASF07

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.

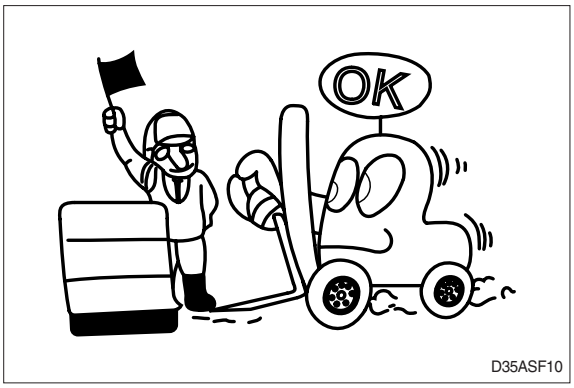

D35ASF08

- 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.



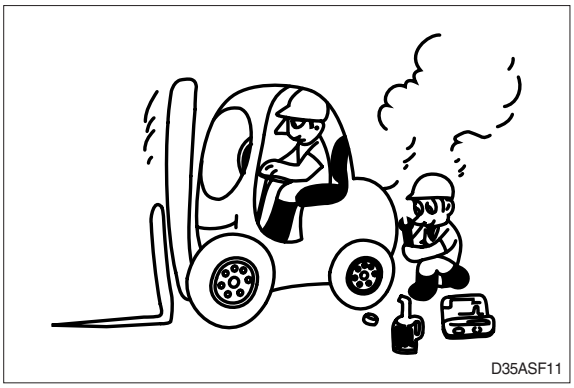
D35ASF09

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



D35ASF10

· Unless you have special instructions to the contrary, maintenance should always be carried out with the engine stopped. If maintenance is carried out with the engine 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.


D35ASF11

· 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.

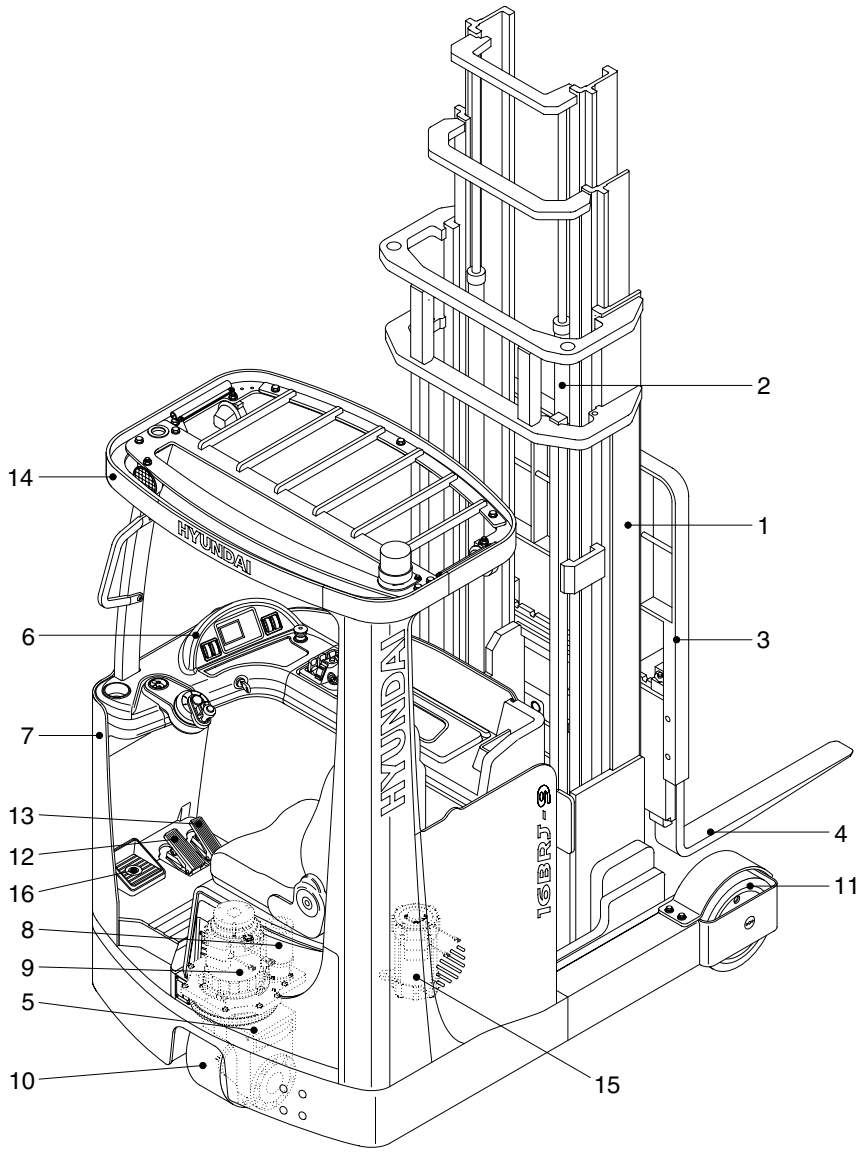
- Thoroughly clean the machine. In particular, be careful to clean the filler caps, grease fittings and the area around the dipsticks. Be careful not to let any dirt or dust into the system.
- Always use HYUNDAI Forklift genuine parts for replacement.
- Always use the grades of grease and oil recommended by HYUNDAI Forklift.
  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 40˚C.
- 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. Before removing the covers to inspect such cases, empty everything from your pockets. 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 to carry out it.

GROUP 2 SPECIFICATIONS

1. GENERAL LOCATIONS

Use the illustration below to locate components included in the PM procedures.

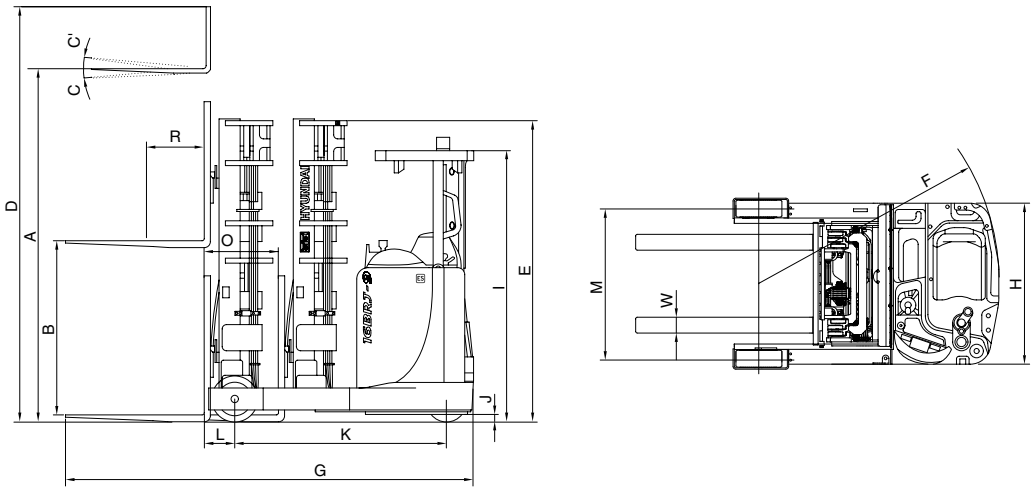


14BRJ9OM112

1	Mast	7	Frame	13	Accelerator pedal
2	Lift cylinder	8	EPS motor	14	Overhead guard
3	Carriage and backrest	9	Drive motor	15	Pump motor
4	Forks	10	Drive wheel	16	Deadman switch
5	Drive unit	11	Load wheel		
6	Dash board	12	Brake pedal		

2. SPECIFICATIONS

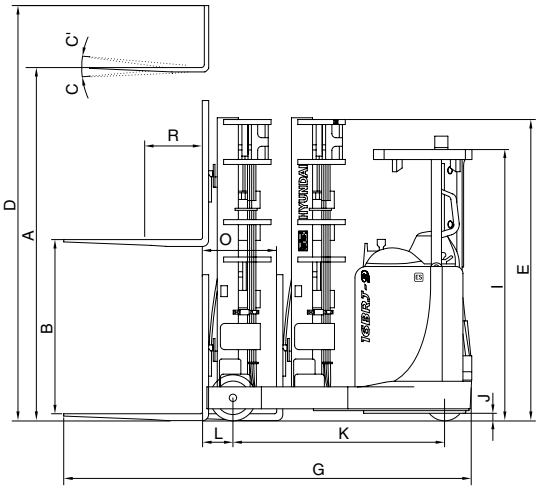
1) 14/16BRJ-9

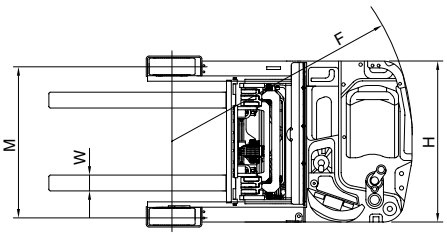


14BRJ9SP01

Model			Unit	14BRJ-9	16BRJ-9
Capacity			kg (lb)	1400	1600
Load center		R	mm (in)	600	←
Weight (Unloaded, with battery)			kg (lb)	2910	3010
Fork	Lifting height	A	mm (ft-in)	5306	←
	Free lift	B	mm (in)	1761	←
	Lifting speed (Unload/Load)		mm/sec	580/370	←
	Lowering speed (Unload/Load)		mm/sec	450/500	←
	L × W × T	L,W,T	mm (in)	1200 × 100 × 40	1200 × 100 × 40
Mast	Tilt angle (forward/backward)	C/C'	degree	2/5	←
	Max height	D	mm (ft-in)	5812	←
	Min height	E	mm (ft-in)	2348	←
Body	Travel speed (Unload)		km/h	14	←
	Gradeability (Unload/Load)		%	18/13	18/12
	Min turning radius (Outside)	F	mm (ft-in)	1638	1685
ETC	Max hydraulic pressure		kgf/cm^2	190	←
	Hydraulic oil tank		l (usgal)	Refer to page 7-23	←
Overall length		G	mm (ft-in)	2570	←
Overall width		H	mm (ft-in)	1270	←
Overhead guard height		I	mm (ft-in)	2135	←
Ground clearance (Mast)		J	mm (in)	91	←
Wheel base		K	mm (ft-in)	1410	1460
Wheel tread rear (Load)		M/M'	mm (ft-in)	1149	←

2) 20/25BRJ-9





14BRJ9SP01

Model			Unit	20BRJ-9	25BRJ-9
Capacity			kg (lb)	2000	2500
Load center		R	mm (in)	600	←
Weight (Unloaded, with battery)			kg (lb)	3400	3700
Fork	Lifting height	A	mm (ft-in)	5305	←
	Free lift	B	mm (in)	1717	←
	Lifting speed (Unload/Load)		mm/sec	470/300	←
	Lowering speed (Unload/Load)		mm/sec	450/500	←
	L × W × T	L,W,T	mm (in)	1200 × 100 × 45	1200 × 122 × 45
Mast	Tilt angle (forward/backward)	C/C'	degree	2/5	←
	Max height	D	mm (ft-in)	5974	←
	Min height	E	mm (ft-in)	2386	←
Body	Travel speed (Unload)		km/h	14	←
	Gradeability (Unload/Load)		%	19/12	18/11
	Min turning radius (Outside)	F	mm (ft-in)	1742	1885
ETC	Max hydraulic pressure		kgf/cm^2	190	←
	Hydraulic oil tank		l (usgal)	Refer to page 7-23	←
Overall length		G	mm (ft-in)	2655	←
Overall width		H	mm (ft-in)	1270	←
Overhead guard height		I	mm (ft-in)	2135	←
Ground clearance (Mast)		J	mm (in)	109	←
Wheel base		K	mm (ft-in)	1520	1670
Wheel tread rear (Load)		M/M'	mm (ft-in)	1155	1184

3. SPECIFICATION FOR MAJOR COMPONENTS

1) 14/16BRJ-9

(1) Controller

Item	Unit	Drive & Pump motor controller	EPS motor controller	Fingertip controller
Model	-	AC-2	EPS-AC0	Mhyrio CB
Type	-	MOSFET	←	←
Dimension	mm	200×250×147.5	180×144×64.8	197×82×73
Current limit	A	450A	45A	-
Communication	-	CAN	←	←

(2) Motor

Item	Unit	Traction	Pump	EPS
Model	-	AMBL 4001P	ABDD 4003P	G104087A
Type	-	AC	AC	AC
Rated voltage	Vac	30	30	23
Output	kW	7.5	14.0	0.4
Insulation	-	Class F	Class F	Class H

(3) Battery

Item	Unit	14BRJ-9	16BRJ-9
Rated voltage	V	48	←
Dimension (W×L×H)	mm	1223×283 (*353)×787	←
Min. Battery weight	kg	710 (*890)	←
Max. Battery weight	kg	790 (*990)	←
Connector (CE spec)	-	SBE 320	

* : Option

(4) Charger

Item	Unit	14BRJ-9	16BRJ-9
Type	-	Constant current, constant voltage	
Battery capacity for charge	V-AH	48-280~335	←
AC input	V	Triple phase 410	
		Single phase 220	
		Triple phase 220/380	
		Triple phase 440	
DC output	V	62±1	←
Charge time	hr	8±2	←
Connector (CE spec)	-	(SBE320)	(SBE 320)

(5) Gear pump

Item	Unit	Specification
Type	–	Fixed displacement gear pump
Capacity	cc/rev	19.6
Maximum operating pressure	bar	210
Rated speed (max/min)	rpm	3000/500

(6) Main control valve

Item	Unit	Specification
Type	-	3 spool, 4 spool
Operating method	-	Proportional
Main relief valve pressure	bar	14BRJ : 160 16BRJ : 170

(7) Drive unit

Item	Unit	Specification
Gear ratio	-	14.5
Oil quantity	l	2.2

(8) Wheels

Item	Specification
Type (Load / Drive /Caster)	Polyurethane
Quantity (Load / Drive /Caster)	2 / 1
Load wheel	ø 285 × 100
Drive wheel	ø 305 × 140

(9) Brakes

Item	Specification
Brakes (Service & Parking)	Service : Load wheels, electromagnetic brake Parking : Drive wheel, electromagnetic brake

2) 20/25BRJ-9

(1) CONTROLLER

Item	Unit	Drive & Pump motor controller	EPS motor controller	Fingertip controller
Model	-	AC-2	EPS-AC0	Mhyrio CB
Type	-	MOSFET	←	←
Dimension	mm	200×250×147.5	180×144×64.8	197×82×73
Current limit	A	450A	45A	-
Communication	-	CAN	←	←

(2) MOTOR

Item	Unit	Traction	Pump	EPS
Model	-	AMBL 4001P	ABDD 4003P	G104087A
Type	-	AC	AC	AC
Rated voltage	Vac	30	30	23
Output	kW	7.5	14.0	0.4
Insulation	-	Class F	Class F	Class H

(3) BATTERY

Item	Unit	20BRJ-9	25BRJ-9
Rated voltage	V	48	←
Dimension (W×L×H)	mm	1223×353 (*425)×787	←
Min. Battery weight	kg	890 (*1065)	←
Max. Battery weight	kg	990 (*1180)	←
Connector (CE spec)	-	SBE 320	

* : Option

(4) CHARGER

Item	Unit	20BRJ-9	25BRJ-9
Type	-	Constant current, constant voltage	
Battery capacity for charge	V-AH	48-450~520	←
AC input	V	Triple phase 410	
		Single phase 220	
		Triple phase 220/380	
		Triple phase 440	
DC output	V	62±1	←
Charge time	hr	8±2	←
Connector (CE spec)	-	(SBE320)	(SBE 320)

(5) GEAR PUMP

Item	Unit	Specification
Type	–	Fixed displacement gear pump
Capacity	cc/rev	19.6
Maximum operating pressure	bar	210
Rated speed (max/min)	rpm	3000/500

(6) MAIN CONTROL VALVE

Item	Unit	Specification
Type	-	3 spool, 4 spool
Operating method	-	Proportional
Main relief valve pressure	bar	20BRJ : 170 25BRJ : 190

(7) DRIVE UNIT

Item	Unit	Specification
Gear ratio	-	14.5
Oil quantity	ℓ	2.2

(8) WHEELS

Item		Specification
Type (Load / Drive /Caster)		Polyurethane
Quantity (Load / Drive /Caster)		2 / 1
Load wheel	20BRJ-9	ø 355 × 106
	25BRJ-9	ø 355 × 135
Drive wheel		ø 345 × 140

(9) BRAKES

Item	Specification
Brakes (Service & Parking)	Service : Load wheels, electromagnetic brake Parking : Drive wheel, electromagnetic brake

4. TIGHTENING TORQUE FOR MAJOR COMPONENTS

1) 14/16BRJ-9

NO	Items		Size	kgf · m	lbf · ft
1	Electric system	Hyd pump motor mounting bolt	M 8×1.25	2.5±0.5	18±3.6
2		Traction motor mounting bolt	M12×1.75	14.7±2.2	106±15.9
3	Hydraulic system	Hydraulic pump mounting bolt	M10×1.5	5±1	36±7.2
4		MCV mounting bolt, nut	M 8×1.25	2.5±0.5	18.1±3.6
5		Hydraulic oil tank mounting bolt	M 8×1.25	2.5±0.5	18.1±3.6
6	Power train system	Drive unit mounting bolt	M12×1.75	14.7±2.2	106±15.9
7		Load wheels mounting bolt	M 8×1.25	2.5±0.2	18±1.4
8		Drive wheel mounting nut	M14×1.5	15.7±2.3	113.6±16.6
9	Other	Seat mounting nut	M 8×1.25	2.5±0.5	18.1±3.6
10		Head guard mounting bolt	M10×1.5 M14×2	6.9±1.4 19.6±2.9	50±10 141.8±21

2) 20/25BRJ-9

NO	Items		Size	kgf · m	lbf · ft
1	Electric system	Hyd pump motor mounting bolt	M 8×1.25	2.5±0.5	18±3.6
2		Traction motor mounting bolt	M12×1.75	14.7±2.2	106±15.9
3	Hydraulic system	Hydraulic pump mounting bolt	M10×1.5	5±1	36±7.2
4		MCV mounting bolt, nut	M 8×1.25	2.5±0.5	18.1±3.6
5		Hydraulic oil tank mounting bolt	M 8×1.25	2.5±0.5	18.1±3.6
6	Power train system	Drive unit mounting bolt	M12×1.75	14.7±2.2	106±15.9
7		Load wheels mounting bolt	M 8×1.25	2.5±0.2	18±1.4
8		Drive wheel mounting nut	M14×1.5	15.7±2.3	113.6±16.6
9	Other	Seat mounting nut	M 8×1.25	2.5±0.5	18.1±3.6
10		Head guard mounting bolt	M10×1.5 M14×2	6.9±1.4 19.6±2.9	50±10 141.8±21

5. TORQUE CHART

Use following table for unspecified torque.

1) BOLT AND NUT

(1) Coarse thread

Bolt size	8T		10T	
	kg · m	lb · ft	kg · m	lb · ft
M 6 × 1.0	0.85 ~ 1.25	6.15 ~ 9.04	1.14 ~ 1.74	8.2 ~ 12.6
M 8 × 1.25	2.0 ~ 3.0	14.5 ~ 21.7	2.73 ~ 4.12	19.5 ~ 29.8
M10 × 1.5	4.0 ~ 6.0	28.9 ~ 43.4	5.5 ~ 8.3	39.8 ~ 60
M12 × 1.75	7.4 ~ 11.2	53.5 ~ 79.5	9.8 ~ 15.8	71 ~ 114
M14 × 2.0	12.2 ~ 16.6	88.2 ~ 120	16.7 ~ 22.5	121 ~ 167
M16 × 2.0	18.6 ~ 25.2	135 ~ 182	25.2 ~ 34.2	182 ~ 247
M18 × 2.5	25.8 ~ 35.0	187 ~ 253	35.1 ~ 47.5	254 ~ 343
M20 × 2.5	36.2 ~ 49.0	262 ~ 354	49.2 ~ 66.6	356 ~ 482
M22 × 2.5	48.3 ~ 63.3	350 ~ 457	65.8 ~ 98.0	476 ~ 709
M24 × 3.0	62.5 ~ 84.5	452 ~ 611	85.0 ~ 115	615 ~ 832
M30 × 3.0	124 ~ 168	898 ~ 1214	169 ~ 229	1223 ~ 1655
M36 × 4.0	174 ~ 236	1261 ~ 1703	250 ~ 310	1808 ~ 2242

(2) Fine thread

Bolt size	8T		10T	
	kg · m	lb · ft	kg · m	lb · ft
M 8 × 1.0	2.17 ~ 3.37	15.7 ~ 24.3	3.04 ~ 4.44	22.0 ~ 32.0
M10 × 1.25	4.46 ~ 6.66	32.3 ~ 48.2	5.93 ~ 8.93	42.9 ~ 64.6
M12 × 1.25	7.78 ~ 11.58	76.3 ~ 83.7	10.6 ~ 16.0	76.6 ~ 115
M14 × 1.5	13.3 ~ 18.1	96.2 ~ 130	17.9 ~ 24.1	130 ~ 174
M16 × 1.5	19.9 ~ 26.9	144 ~ 194	26.6 ~ 36.0	193 ~ 260
M18 × 1.5	28.6 ~ 43.6	207 ~ 315	38.4 ~ 52.0	278 ~ 376
M20 × 1.5	40.0 ~ 54.0	289 ~ 390	53.4 ~ 72.2	386 ~ 522
M22 × 1.5	52.7 ~ 71.3	381 ~ 515	70.7 ~ 95.7	512 ~ 692
M24 × 2.0	67.9 ~ 91.9	491 ~ 664	90.9 ~ 123	658 ~ 890
M30 × 2.0	137 ~ 185	990 ~ 1338	182 ~ 248	1314 ~ 1795
M36 × 3.0	192 ~ 260	1389 ~ 1879	262 ~ 354	1893 ~ 2561

2) PIPE AND HOSE (FLARE type)

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

3) PIPE AND HOSE (ORFS type)

Thread size	Width across flat (mm)	kgf · m	lbf · ft
9/16-18	19	4	28.9
11/16-16	22	5	36.2
13/16-16	27	9.5	68.7
1-3/16-12	36	18	130
1-7/16-12	41	21	152
1-11/16-12	50	35	253

4) FITTING

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

6. RECOMMENDED LUBRICANTS

Service point	Kind of fluid	Capacity ℓ (U.S. gal)		Ambient temperature °C (°F)
		14/16BRJ-9	20/25BRJ-9	-50 (-58) / -30 (-22) / -20 (-4) / -10 (14) / 0 (32) / 10 (50) / 20 (68) / 30 (86) / 40 (104)
Drive unit	Gear oil	2.2 (0.58)	3.3 (0.87)	SAE 80W-90
Hydraulic oil tank	Hydraulic oil	~TF 670 : 25 (6.6) TF 700~TF 800 : 28 (7.4) ~TF 850 : 32 (8.5)		ISO VG 15 ISO VG 22 ISO VG 46 ISO VG 68
Fitting (Grease nipple)	Grease	0.1 (0.03)	0.1 (0.03)	NLGI No.1 NLGI No.2

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	Hydraulic oil	Every 1 year
2	Gear oil	Every 1 year
3	Power steering hose	Every 1 year
4	Rubber parts of the power steering inside	Every 2 year
5	Cups and dust seals etc. of cylinder	Every 2 year
6	Lift chain	Every 2 year
7	Hydraulic equiprnent hose	Every 2 year