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### **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.

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

BI57SF01





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



- 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.

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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. Stop the engine.
- Return each lever to NEUTRAL and apply the brake lock.
- 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.
- B1575F08



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



- 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.
- 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 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 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**



15P9GEN01

- 1 Seat
- 2 Steering wheel
- 3 Rear view mirror
- 4 Parking brake lever
- 5 Display
- 6 Head lamp switch
- 7 Start key switch

- 8 Head lamp
- 9 Front wheel
- 10 Rear wheel
- 11 Battery
- 12 Hook
- 13 Battery cover
- 14 Flasher lamp

- 15 Beacon switch
- 16 Hazard switch
- 17 Battery support
- 18 Emergency switch
- 19 Turtle mode switch

## 2. SPECIFICATIONS

# 1) 15P-9









Model			Unit	15P-9	40T-9
Capacity			kg	1500 (3310)	4000 (8820)
Travel apoed	Loaded		km/h (mph)	8 (5)	$\leftarrow$
Traver speed	Unloaded		km/h (mph)	10 (6.2)	$\leftarrow$
Min. turning radius		R	mm (in)	2143 (7' 0")	1573 (5' 2")
Overall length		А	mm (in)	2939 (9' 8")	2012 (6' 7")
Overall width		В	mm (in)	1100 (3' 7")	$\leftarrow$
Overall height		С	mm (in)	1430 (4' 8")	$\leftarrow$
Wheel base		D	mm (in)	1800 (5' 11")	1230 (4' 0")
Hook height		Н	mm	326/ 381	179/234/ 289/344
Weight (Unloaded)			kg (lb)	1247 (2749)	1236 (2725)
Drive motor			kW	4.0	$\leftarrow$
Wheel tread	Front		mm (in)	-	-
Wheel tread	Rear		mm (in)	900 (2' 11")	$\leftarrow$
Ground clearance			mm (in)	150 (5.9")	$\leftarrow$
Tiro	FR		-	ø 305 × 127	←
	RR		-	5.00-8-8PR	4.00-8

### 3. SPECIFICATION FOR MAJOR COMPONENTS

#### 1) DRIVE MOTOR CONTROLLER

Item	Unit	15P/40T-9
Model	-	ACE2 36-48V 300A
Туре	-	MOSFET
Current limit	А	300
Dimension	mm (in)	200×160×95 (7.9×6.3×3.7)
Operation temperature	°C	-40~80
Communication	-	CAN

#### 2) EPS CONTROLLER

ltem	Unit	15P/40T-9
Model	-	30DS-CR12-002
Туре	-	DC 48V
Current limit	А	25
Dimension	mm (in)	124×234×50
Operation temperature	°C	-20 ~ +60

### 3) DRIVE MOTOR

ltem	Unit	15P/40T-9
Model	-	AMBS 4001
Туре	-	AC
Rated voltage	Vac	30
Output	kW	4
Insulation class	-	F

#### 4) EPS MOTOR

Item	Unit	15P/40T-9
Model	-	30DS-HT01-002
Туре	-	DC
Rated voltage	Vac	48
Output	kW	0.3
Insulation class	-	F

### 5) DRIVE UNIT

ltem	Unit	15P/40T-9
Туре	-	Vertical
Max wheel load	kg (lb)	750 (1653)
Gear ratio	-	20.125
Weight without fluid	kg (lb)	100 (220)

## 6) WHEELS

Item		Unit	15P/40T-9
	Front	-	Cushion (std), Urethane, Non-marking
Туре	Rear	-	Pneumatic (15P-9, std), Solid (40T-9, std), Solid, Non-marking
Questitu	Front	-	1
Quantity	Rear	-	2
	Front	-	ø 305×127
Tire	Rear	-	5.00-8-8PR (15P-9) 4.00-8 (40T-9)
	Front	psi	-
	Rear	psi	114 (15P-9)

#### 7) STEERING

Item	Unit	15P/40T-9
Туре	-	Electric power steering
Steering angle	-	90° to both right and left angle, respectively

#### 8) SERVICE BRAKE

Item	Unit	15P/40T-9
Туре	-	Drum

### 9) PARKING BRAKE

ltem	Unit	15P/40T-9
Туре	-	Ratchet

### 10) BATTERY

ltem	Unit	15P/40T-9	
Voltage	V	48	
Capacity	AH/hr	230/5 (std) 280/5 (opt)	
Туре	-	VCI230 (std) VCF280 (opt)	
Dimension (W x L x H)	mm (in)	965×380×580 (38"×15"×22.8")	
Weight	kg (lb)	400 (880) (std) 470 (1040) (opt)	

### 11) CHARGER

ltem	Unit	15P/40T-9
Voltage	-	IUla
Capacity	V-AH/hr	48-201~230/5 (std) 48-280~365/5 (opt)
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

No.	Items		Size	kgf ∙ m	lbf ⋅ ft
1	Electric system	EPS motor assy	M 8×1.25	3.9±0.2	28.2±1.4
2	Drive unit mounting bolt		M16×2	29.7±3.0	215±21.7
3	Power	Drive motor mounting bolt	M 8×1.25	3.9±0.2	28.2±1.4
4	train	Rear axle mounting bolt, nut	M14×2.0	20.0±2.0	$145\!\pm\!14.4$
5	system	Stem Front wheel mounting bolt		20.0±1.5	145±10.8
6	Rear wheel mounting nut		M12×1.5	10.0±1.0	72.3±7.2
7	Others	ers Seat mounting nut		2.5±0.5	18.1±3.6

### 4. TIGHTENING TORQUE FOR MAJOR COMPONENTS

### **5. TORQUE CHART**

Use following table for unspecified torque.

## 1) BOLT AND NUT

### (1) Coarse thread

Delteine	Bolt size     8T       kg · m     lb · ft		10T			
Boil Size			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 2.7 ~ 4.1		19.5 ~ 29.7		
M10  imes 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 ~ 81.0	9.8 ~ 15.8	70.9 ~ 114		
M14 × 2.0	12.2 ~ 16.6	88.2 ~ 120	16.7 ~ 22.5	121 ~ 163		
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 ~ 344		
M20  imes 2.5	36.2 ~ 49.0	262 ~ 354	49.2 ~ 66.6	356 ~ 482		
$M22 \times 2.5$	48.3 ~ 63.3	349 ~ 458	65.8 ~ 98.0	476 ~ 709		
M24  imes 3.0	62.5 ~ 84.5	452 ~ 611	85.0 ~ 115	615 ~ 832		
M30 × 3.0	124 ~ 168	898 ~ 1214	169 ~ 229	1223 ~ 1656		
M36 × 4.0	174 ~ 236	1261 ~ 1704	250 ~ 310	1808 ~ 2242		

### (2) Fine thread

Bolt size	8	зт	10T		
BOIL SIZE	kg∙m	kg ⋅ m lb ⋅ ft		lb ⋅ ft	
M 8×1.0	2.2 ~ 3.4	15.9 ~ 24.6	3.0 ~ 4.4	21.7 ~ 31.8	
M10 × 1.2	4.5 ~ 6.7	32.5 ~ 48.5	5.9 ~ 8.9	42.7 ~ 64.4	
M12 × 1.25	7.8 ~ 11.6	56.4 ~ 83.9	10.6 ~ 16.0	76.7 ~ 116	
M14 × 1.5	13.3 ~ 18.1	96.2 ~ 131	17.9 ~ 24.1	130 ~ 174	
M16 × 1.5	19.9 ~ 26.9	144 ~ 195	26.6 ~ 36.0	192 ~ 260	
M18 × 1.5	28.6 ~ 43.6	207 ~ 315	38.4 ~ 52.0	278 ~ 376	
M20 × 1.5	40.0 ~ 54.0	289 ~ 391	53.4 ~ 72.2	386 ~ 522	
M22 × 1.5	52.7 ~ 71.3	381 ~ 516	70.7 ~ 95.7	511 ~ 692	
M24 × 2.0	67.9 ~ 91.9	491 ~ 665	90.9 ~ 123	658 ~ 890	
M30 × 2.0	137 ~ 185	990 ~ 1339	182 ~ 248	1314 ~ 1796	
M36 × 3.0	192 ~ 260	1390 ~ 1880	262 ~ 354	1894 ~ 2562	

### 6. RECOMMENDED LUBRICANTS

0		Capacity / (U.S. gal)							
point Kind of flu	Kind of fluid	15P-9 40T-9	-20 (-4)	-1( (14	) (3	) 1 2) (5	0 2 0) (6	0 30 8) (86	40 ) (104)
		16							
	Gear oil	(0.42)	SAE 80W-90/API GL-5					1	
Drive		(0.12)							
unit									
E	Brake fluid	-	Azolla ZS 32/ SAE 10W						
FDO		0.175							
EPS Actuator	Gear oil	0.175		ç	SAE 80	W-90/A	PI GL-	5	
Acidator		(0.05)							

### **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	Brake fluid	Every 1 year
2	Drive unit gear oil	Every 1 year
3	EPS motor gear oil	Every 1 year
4	Wheel bearing grease	Every 1 year