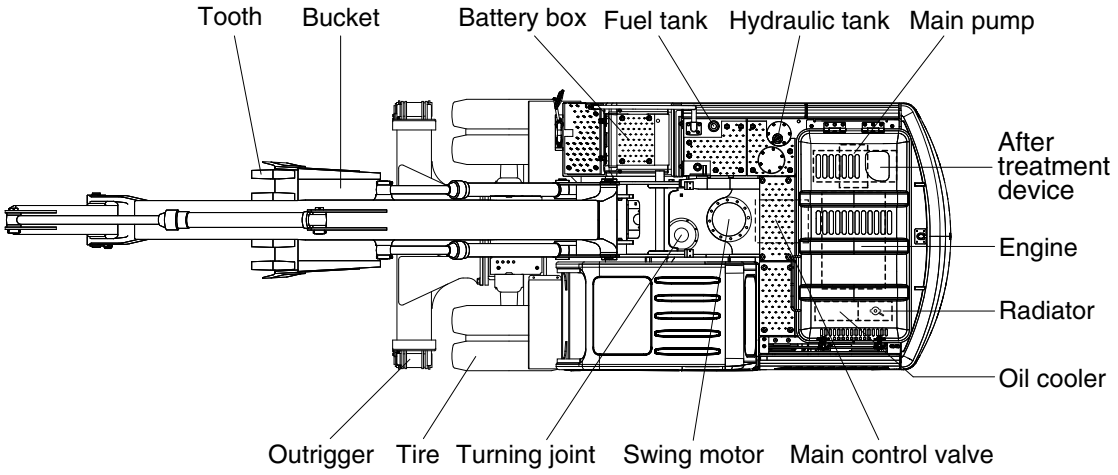
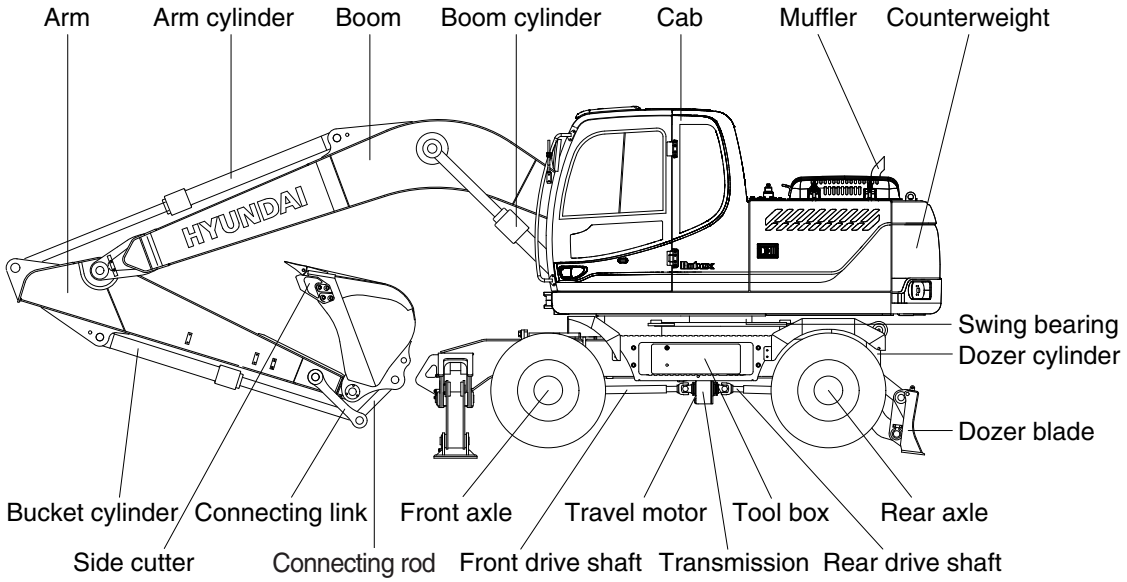
1. MAJOR COMPONENTS

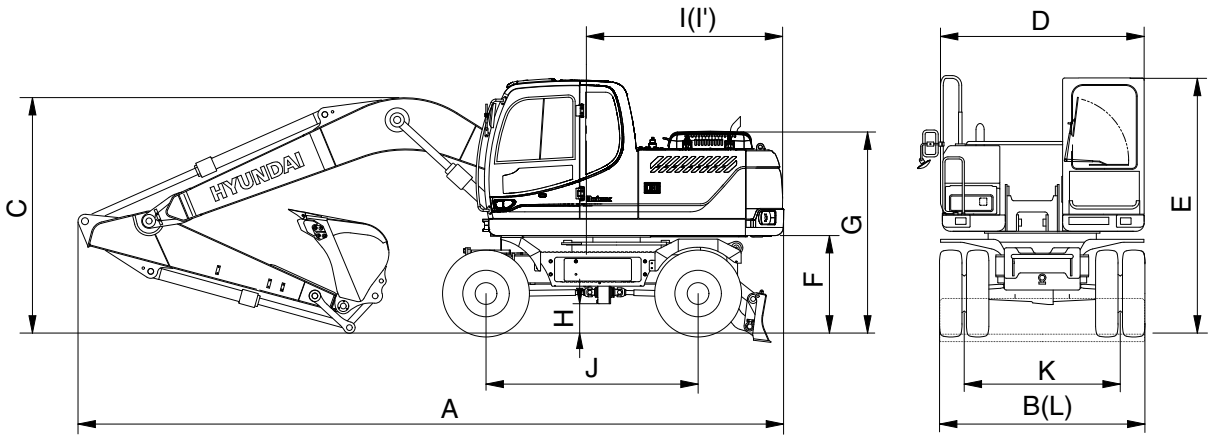




160W9A2SP01

2. SPECIFICATIONS

1) 5.0 m (16' 5") ONE PIECE BOOM, 2.2 m (7' 3") ARM AND REAR DOZER BLADE

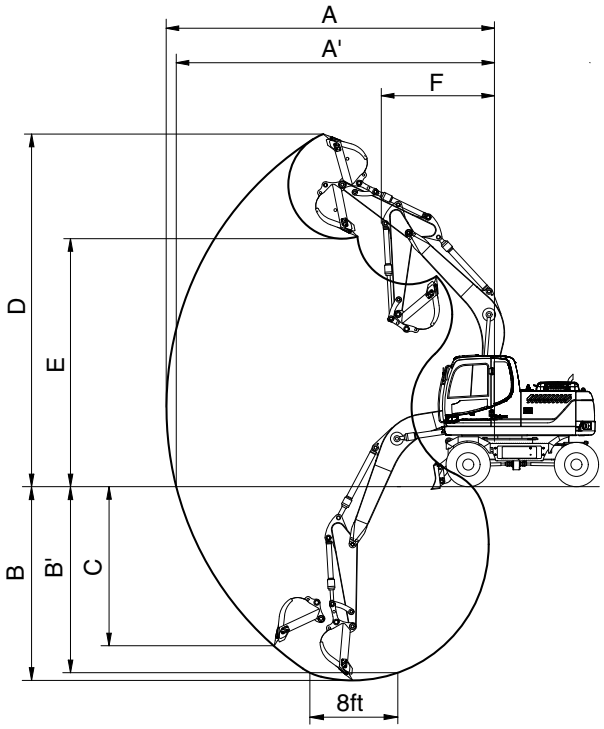


17W92SP02

Description		Unit	Specification
Operating weight		kg (lb)	16700 (36820)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	0.70 (0.92)
Overall length	A	mm (ft-in)	8480 (27' 10")
Overall width	B		2500 (8' 2")
Overall height	C		3120 (10' 3")
Upperstructure width	D		2475 (8' 1")
Cab height	E		3190 (10' 6")
Ground clearance of counterweight	F		1270 (4' 2")
Engine cover height	G		2610 (8' 7")
Minimum ground clearance	H		340 (1' 1")
Rear-end distance	I		2430 (8' 0")
Rear-end swing radius	I'		2430 (8' 0")
Wheel base	J		2600 (8' 6")
Tread	K		1914 (6' 3")
Dozer blade width	L		2500 (8' 2")
Travel speed	Low	km/hr (mph)	9.5 (5.9)
	High		36.6 (22.7)
	Creep		3.0 (1.9)
Swing speed		rpm	9.5
Gradeability		Degree (%)	30 (58)
Max traction force		kgf (lbf)	11000 (24250)

3. WORKING RANGE

1) 5.0 m (16' 5") MONO BOOM



17W92SP05

Description		2.2 m (7' 3") Arm	2.5 m (8' 2") Arm	3.1 m (10' 2") Arm
Max digging reach	A	8570 mm (28' 1")	8910 mm (29' 3")	9350 mm (30' 8")
Max digging reach on ground	A'	8360 mm (27' 5")	8690 mm (28' 6")	9160 mm (30' 1")
Max digging depth	B	5350 mm (17' 7")	5650 mm (18' 6")	6250 mm (20' 6")
Max digging depth (8 ft level)	B'	5120 mm (16' 10")	5450 mm (17' 11")	6060 mm (19' 11")
Max vertical wall digging depth	C	4740 mm (15' 7")	5260 mm (17' 3")	5410 mm (17' 9")
Max digging height	D	8850 mm (29' 0")	9150 mm (30' 0")	9130 mm (29' 11")
Max dumping height	E	6220 mm (20' 5")	6490 mm (21' 4")	6540 mm (21' 5")
Min swing radius	F	3140 mm (10' 4")	3170 mm (10' 5")	3560 mm (11' 8")
Bucket digging force	SAE	107.9 [117.1] kN	107.9 [117.1] kN	107.9 [117.1] kN
		11000 [11940] kgf	11000 [11940] kgf	11000 [11940] kgf
		24250 [26330] lbf	24250 [26330] lbf	24250 [26330] lbf
	ISO	124.5 [135.2] kN	124.5 [135.2] kN	124.5 [135.2] kN
		12700 [13790] kgf	12700 [13790] kgf	12700 [13790] kgf
		28000 [30400] lbf	28000 [30400] lbf	28000 [30400] lbf
Arm digging force	SAE	87.2 [94.7] kN	78.5 [85.2] kN	69.4 [75.3] kN
		8890 [9650] kgf	8000 [8690] kgf	7080 [7690] kgf
		19600 [21280] lbf	17640 [19150] lbf	15610 [16950] lbf
	ISO	91.1 [98.9] kN	81.7 [88.7] kN	71.9 [78.1] kN
		9290 [10090] kgf	8330 [9040] kgf	7330 [7960] kgf
		20480 [22240] lbf	18360 [19930] lbf	16160 [17550] lbf

[ ] : Power boost

4. WEIGHT

Item	R160W-9A	
	kg	lb
Upperstructure assembly	4445	9800
Main frame weld assembly	1320	2910
Engine assembly	520	1150
Fan clutch assembly	45	100
Main pump assembly	90	200
Main control valve assembly	135	300
Swing motor assembly	240	530
Hydraulic oil tank assembly	165	360
Fuel tank assembly	130	290
Counterweight	2650	5840
Cab assembly	500	1100
Lower frame weld assembly	1580	3480
Swing bearing	260	570
Travel motor assembly	80	176
Turning joint	120	265
Transmission assembly	135	298
Front axle assembly	655	1444
Rear axle assembly	534	1177
Front attachment assembly (5.0 m boom, 2.2 m arm, 0.70 m^3 SAE heaped bucket)	2965	6540
5.0 m boom assembly	1040	2290
2.2 m arm assembly	490	1080
0.70 m^3 SAE heaped bucket assembly	540	1190
Boom cylinder assembly	155 × 2EA	340 × 2EA
Arm cylinder assembly	180	400
Bucket cylinder assembly	125	260
Bucket control link assembly	120	265
Oscillating cylinder assembly	30	70
Dozer blade assembly (rear)	830	1830
Blade cylinder assembly	55 × 2EA	120 × 2EA
Front outrigger assembly	1000	2200
Rear outrigger assembly	1010	2230
Outrigger cylinder assembly	80	180

5. LIFTING CAPACITIES

1) ROBEX 160W-9A

(1) 5.0 m (16' 5") boom, 2.2 m (7' 3") arm equipped with 0.70 m³ (SAE heaped) bucket, rear dozer blade down and 2650 kg (5840 lb) counterweight.

- : Rating over-front
- : Rating over-side or 360 degree

Load point height		Load radius								At max. reach		
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		Capacity		Reach
												m (ft)
7.5 m (25.0 ft)	kg									*3780	3130	5.72
	lb									*8330	6900	(18.8)
6.0 m (20.0 ft)	kg							*2330	*2330	*3730	2120	7.01
	lb							*5140	*5140	*8220	4670	(23.0)
4.5 m (15.0 ft)	kg					*4730	4490	*4220	2720	*3770	1710	7.73
	lb					*10430	9900	*9300	6000	*8310	3770	(25.4)
3.0 m (10.0 ft)	kg			*9520	7830	*5990	4140	*4720	2590	3470	1520	8.07
	lb			*20990	17260	*13210	9130	*10410	5710	7650	3350	(26.5)
1.5 m (5.0 ft)	kg					*7180	3800	*5270	2440	3420	1480	8.08
	lb					*15830	8380	*11620	5380	7540	3260	(26.5)
Ground Line	kg			*9130	6850	*7750	3610	5450	2330	3630	1570	7.75
	lb			*20130	15100	*17090	7960	12020	5140	8000	3460	(25.4)
-1.5 m (-5.0 ft)	kg	*8620	*8620	*11230	6900	*7560	3570	*5400	2300	*4070	1850	7.05
	lb	*19000	*19000	*24760	15210	*16670	7870	*11900	5070	*8970	4080	(23.1)
-3.0 m (-10.0 ft)	kg	*12790	*12790	*9310	7080	*6410	3650			*3770	2630	5.78
	lb	*28200	*28200	*20530	15610	*14130	8050			*8310	5800	(19.0)

Note 1. Lifting capacity are based on SAE J1097 and ISO 10567.

2. Lifting capacity of the ROBEX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.

3. The load point is a hook located on the back of the bucket.

4. * indicates load limited by hydraulic capacity.

(2) 5.0 m (16' 5") boom, 2.5 m (8' 2") arm equipped with 0.70 m³ (SAE heaped) bucket, rear dozer blade down and 2650 kg (5840 lb) counterweight.

Load point height		Load radius										At max. reach		
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)		Capacity		Reach
														m (ft)
7.5 m (25.0 ft)	kg											*3460	2720	6.20
	lb											*7630	6000	(20.3)
6.0 m (20.0 ft)	kg							*2910	2810			*3140	1910	7.39
	lb							*6420	6190			*6920	4210	(24.2)
4.5 m (15.0 ft)	kg							*3960	2740			*3050	1560	8.07
	lb							*8730	6040			*6720	3440	(26.5)
3.0 m (10.0 ft)	kg			*8610	8040	*5620	4170	*4500	2590	*2190	1710	*3090	1390	8.40
	lb			*18980	17730	*12390	9190	*9920	5710	*4830	3770	*6810	3060	(27.6)
1.5 m (5.0 ft)	kg			*8340	7060	*6910	3800	*5100	2420	*2840	1640	3180	1350	8.40
	lb			*18390	15560	*15230	8380	*11240	5340	*6260	3620	7010	2980	(27.6)
Ground Line	kg			*8900	6780	*7630	3580	5420	2300			3360	1420	8.09
	lb			*19620	14950	*16820	7890	11950	5070			7410	3130	(26.5)
-1.5 m (-5.0 ft)	kg	*7680	*7680	*11530	6780	*7600	3500	5360	2250			*3840	1660	7.42
	lb	*16930	*16930	*25420	14950	*16760	7720	11820	4960			*8470	3660	(24.3)
-3.0 m (-10.0 ft)	kg	*11220	*11220	*9850	6930	*6700	3560					*3630	2270	6.25
	lb	*24740	*24740	*21720	15280	*14770	7850					*8000	5000	(20.5)
-4.5 m (-15.0 ft)	kg			*6360	*6360									
	lb			*14020	*14020									

(3) 5.0 m (16' 5") boom, 3.1 m (10' 2") arm equipped with 0.70 m³ (SAE heaped) bucket, rear dozer blade down and 2650 kg (5840 lb) counterweight.

Load point height		Load radius										At max. reach		
		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.0 m (25.0 ft)		Capacity		Reach
														m (ft)
7.5 m (25.0 ft)	kg											*3050	2290	6.83
	lb											*6720	5050	(22.4)
6.0 m (20.0 ft)	kg							*2790	*2790			*2900	1670	7.91
	lb							*6150	*6150			*6390	3680	(26.0)
4.5 m (15.0 ft)	kg							*3450	2770	*1820	1770	*2860	1370	8.55
	lb							*7610	6110	*4010	3900	*6310	3020	(28.1)
3.0 m (10.0 ft)	kg					*4900	4260	*4050	2600	*2840	1700	2930	1220	8.85
	lb					*10800	9390	*8930	5730	*6260	3750	6460	2690	(29.0)
1.5 m (5.0 ft)	kg			*10520	7300	*6350	3850	*4740	2410	*3530	1610	2870	1180	8.86
	lb			*23190	16090	*14000	8490	*10450	5310	*7780	3550	6330	2600	(29.1)
Ground Line	kg	*4970	*4970	*10050	6770	*7330	3560	*5270	2260	*3590	1540	3010	1230	8.57
	lb	*10960	*10960	*22160	14930	*16160	7850	*11620	4980	*7910	3400	6640	2710	(28.1)
-1.5 m (-5.0 ft)	kg	*7320	*7320	*11840	6660	*7610	3430	5290	2180			3400	1410	7.94
	lb	*16140	*16140	*26100	14680	*16780	7560	11660	4810			7500	3110	(26.0)
-3.0 m (-10.0 ft)	kg	*10010	*10010	*10700	6740	*7090	3430	*4980	2190			*3700	1850	6.88
	lb	*22070	*22070	*23590	14860	*15630	7560	*10980	4830			*8160	4080	(22.6)
-4.5 m (-15.0 ft)	kg	*13470	*13470	*8060	7010	*5310	3590							
	lb	*29700	*29700	*17770	15450	*11710	7910							

Note 1. Lifting capacity are based on SAE J1097 and ISO 10567.

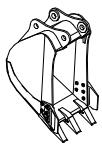
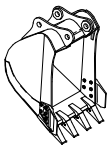
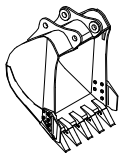
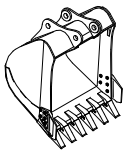
2. Lifting capacity of the ROBEX series does not exceed 75% of tipping load with the machine on firm, level ground or 87% of full hydraulic capacity.

3. The load point is a hook located on the back of the bucket.

4. * indicates load limited by hydraulic capacity.

6. BUCKET SELECTION GUIDE

1) GENERAL AND HEAVY DUTY BUCKET

			
0.39 m³ SAE heaped bucket	0.50 m³ SAE heaped bucket	0.64, ※0.70 m³ SAE heaped bucket	0.89 m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation		
					5.0 m (16' 5") Mono boom		
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.2 m arm (7' 3")	2.5 m arm (8' 2")	3.1 m arm (10' 2")
0.39 m³ (0.51 yd³)	0.34 m³ (0.44 yd³)	620 mm (24.4")	740 mm (29.1")	410 kg (900 lb)	○	○	○
0.50 m³ (0.65 yd³)	0.44 m³ (0.58 yd³)	760 mm (29.9")	880 mm (34.6")	470 kg (1040 lb)	○	○	○
0.64 m³ (0.84 yd³)	0.55 m³ (0.72 yd³)	920 mm (36.2")	1040 mm (40.9")	510 kg (1120 lb)	○	○	□
※0.70 m³ (0.92 yd³)	0.60 m³ (0.78 yd³)	990 mm (39.0")	1110 mm (43.7")	540 kg (1190 lb)	○	□	□
0.89 m³ (1.16 yd³)	0.77 m³ (1.01 yd³)	1220 mm (48.0")	1340 mm (52.8")	610 kg (1340 lb)	△	△	

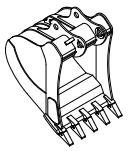
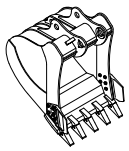
※ : Standard bucket

○ Applicable for materials with density of 2000 kg/m³ (3370 lb/yd³) or less

□ Applicable for materials with density of 1600 kg/m³ (2700 lb/yd³) or less

△ Applicable for materials with density of 1100 kg/m³ (1850 lb/yd³) or less

2) HEAVY DUTY BUCKET

	
◈ 0.69 m³ SAE heaped bucket	◈ 0.72, 0.87 m³ SAE heaped bucket

Capacity		Width		Weight	Recommendation		
					5.0 m (16' 5") Mono boom		
SAE heaped	CECE heaped	Without side cutter	With side cutter		2.2 m arm (7' 3")	2.5 m arm (8' 2")	3.1 m arm (10' 2")
◈0.69 m³ (0.90 yd³)	0.62 m³ (0.81 yd³)	990 mm (39.0")	-	700 kg (1540 lb)	□	□	△
◈0.72 m³ (0.94 yd³)	0.65 m³ (0.85 yd³)	910 mm (35.8")	985 mm (38.8")	620 kg (1370 lb)	□	□	△
◈0.87 m³ (1.18 yd³)	0.78 m³ (1.02 yd³)	1070 mm (42.1")	1140 mm (44.9")	650 kg (1430 lb)	△	△	

◈ : Heavy duty bucket

○ Applicable for materials with density of 2000 kg/m³ (3370 lb/yd³) or less

□ Applicable for materials with density of 1600 kg/m³ (2700 lb/yd³) or less

△ Applicable for materials with density of 1100 kg/m³ (1850 lb/yd³) or less

7. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Model	Cummins QSB 6.7
Type	4-cycle turbocharged diesel engine, low emission
Cooling method	Water cooling
Number of cylinders and arrangement	6 cylinders, in-line
Firing order	1-5-3-6-2-4
Combustion chamber type	Direct injection type
Cylinder bore × stroke	107 × 124 mm (4.2" × 4.9")
Piston displacement	6700 cc (409 cu in)
Compression ratio	17.3 : 1
Rated gross horse power (SAE J1995)	165 Hp (123 kW) at 2200 rpm
Maximum torque	74.7 kgf · m (540 lbf · ft) at 1500 rpm
Engine oil quantity	23.7 ℓ (6.3 U.S. gal)
Dry weight	520 kg (1145 lb)
High idling speed	2200 ± 50 rpm
Low idling speed	850 ± 100 rpm
Rated fuel consumption	167.0 g/Hp · hr at 2200 rpm
Starting motor	Nippon densor (24 V - 4.8 kW)
Alternator	Delco remy (24 V - 95 A)
Battery	2 × 12 V × 100 Ah

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 80 cc/rev
Maximum pressure	350 kgf/cm^2 (4980 psi) [380 kgf/cm^2 (5400 psi)]
Rated oil flow	2 × 172 ℓ /min (45.4 U.S. gpm / 37.8 U.K. gpm)
Rated speed	2150 rpm

[ ]: Power boost

3) GEAR PUMP

Item	Specification
Type	Fixed displacement gear pump single stage
Capacity	15cc/rev
Maximum pressure	40 kgf/cm^2 (570 psi)
Rated oil flow	32.3 ℓ /min (8.5 U.S. gpm/7.1 U.K. gpm)

4) MAIN CONTROL VALVE

Item	Specification
Type	11 spools two-block
Operating method	Hydraulic pilot system
Main relief valve pressure	350 kgf/cm^2 (4980 psi) [380 kgf/cm^2 (5400 psi)]
Overload relief valve pressure	400 kgf/cm^2 (5690 psi)

[ ]: Power boost

5) SWING MOTOR

Item	Specification	
	Type 1	Type 2
Type	Fixed displacement axial piston motor	
Capacity	117.8 cc/rev	142.8 cc/rev
Relief pressure	285 kgf/cm^2 (4050 psi)	
Braking system	Automatic, spring applied hydraulic released	
Braking torque	59 kgf · m (427 lbf · ft)	66.5 kgf · m (481 lbf · ft)
Brake release pressure	33~50 kgf/cm^2 (469~711 psi)	22.3~36.6 kgf/cm^2 (317~521 psi)
Reduction gear type	2 - stage planetary	

6) TRAVEL MOTOR

Item	Specification
Type	Variable displacement bent-axis axial piston motor
Relief pressure	380 kgf/cm^2 (5400 psi)
Counter balance valve	Applied
Capacity	140 cc/rev

7) POWER TRAIN

Item	Description		Specification
Transmission	Type		2 speed power shift transmission
	Gear ratio	1st	4.87
		2nd	1.20
	Clutch pressure		30~32 kgf/cm^2 (427~455 psi)
Parking brake	Type		Multi disc brake integrated in transmission
	Maximum braking torque		3044 kgf · m (22020 lbf · ft)
Axle	Type		4 wheel drive with differential
	Gear ratio		16.0
	Brake		Multi disc brake
	Brake pressure		80 kgf/cm^2 (1140 psi)
	Steering pressure		180 kgf/cm^2 (2560 psi)

8) CYLINDER

Item		Specification
Boom cylinder	Bore dia × Rod dia × Stroke	ø 115 × ø 80 × 1090 mm
	Cushion	Extend only
Arm cylinder	Bore dia × Rod dia × Stroke	ø 120 × ø 85 × 1355 mm
	Cushion	Extend and retract
Bucket cylinder	Bore dia × Rod dia × Stroke	ø 110 × ø 75 × 995 mm
	Cushion	Extend only
Dozer cylinder	Bore dia × Rod dia × Stroke	ø 110 × ø 65 × 235 mm
	Cushion	Extend only
Outrigger cylinder	Bore dia × Rod dia × Stroke	ø 125 × ø 75 × 475 mm
	Cushion	-
Adjust boom cylinder	Bore dia × Rod dia × Stroke	ø 115 × ø 80 × 960 mm
	Cushion	Extend only

9) BUCKET

Item	Capacity		Tooth quantity	Width	
	SAE heaped	CECE heaped		Without side cutter	With side cutter
R160W-9A	0.70 m^3 (0.92 yd^3)	0.60 m^3 (0.78 yd^3)	5	1060 mm (41.7")	1180 mm (46.5")
	0.39 m^3 (0.51 yd^3)	0.34 m^3 (0.44 yd^3)	3	620 mm (24.4")	740 mm (29.1")
	0.50 m^3 (0.65 yd^3)	0.44 m^3 (0.58 yd^3)	4	760 mm (29.9")	880 mm (34.6")
	0.64 m^3 (0.84 yd^3)	0.55 m^3 (0.72 yd^3)	5	920 mm (36.2")	1040 mm (40.9")
	0.89 m^3 (1.16 yd^3)	0.77 m^3 (1.01 yd^3)	6	1220 mm (48.0")	1340 mm (52.8")
	◈0.69 m^3 (0.90 yd^3)	0.62 m^3 (0.81 yd^3)	5	990 mm (39.0")	-
	◈0.72 m^3 (0.94 yd^3)	0.65 m^3 (0.85 yd^3)	5	910 mm (35.8")	985 mm (38.8")
	◈0.87 m^3 (1.18 yd^3)	0.78 m^3 (1.02 yd^3)	5	1070 mm (42.1")	1140 mm (44.9")

◈ : Heavy duty bucket

8. RECOMMENDED OILS

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

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature ˚C(˚F) -50 (-58) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86) 40 (104)
Engine oil pan	Engine oil	23.7 (6.3)	★SAE 5W-40 SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Transmission case		3.0 (0.79)	
Swing drive	Gear oil	5.0 (1.3)	★SAE 75W-90 SAE 85W-140
	Grease	1.2 (0.3)	★NLGI NO.1 NLGI NO.2
Front axle	Gear oil	Center : 10.5 (2.8) Hub : 2.5×2 (0.7×2)	SAE 85W-90 LSD or UTTO
Rear axle		Center : 12.5 (3.3) Hub : 2.5×2 (0.7×2)	
Hydraulic tank	Hydraulic oil	Tank: 125 (33.0) System: 210 (55.5)	★ISO VG 15 ISO VG 32 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel★1	270 (71.3)	★ASTM D975 NO.1 ASTM D975 NO.2
Fitting (Grease nipple)	Grease	As required	★NLGI NO.1 NLGI NO.2
Radiator (Reservoir tank)	Mixture of antifreeze and soft water★2	19.5 (5.2)	Ethylene glycol base permanent type (50 : 50) ★Ethylene glycol base permanent type (60 : 40)

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Materia
UTTO : Universal Tractor Transmission Oil

★1 : Ultra low sulfur diesel
- sulfur content ≤ 15 ppm

★2 : Soft water
City water or distilled water

★ : Cold region
Russia, CIS, Mongolia