

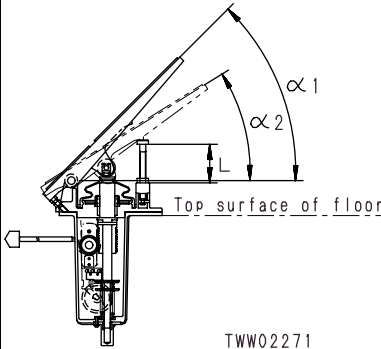
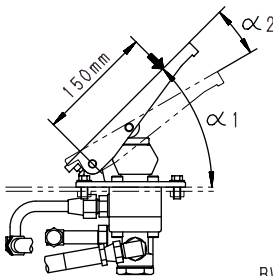
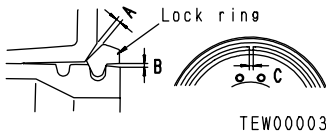
STANDARD VALUE TABLE FOR ENGINE

Machine Model			WA470-5, WA480-5		
Engine			SAA6D125E-3		
Item	Measurement Conditions		Unit	Standard Value For New Machine	Service Limit Value
Engine speed	High idling		rpm	2,170 ⁺²⁰ ₋₈₀	2,170 ⁺²⁰ ₋₈₀
	Low idling			750 ⁺⁵⁰ ₀	750 ⁺⁵⁰ ₀
	Rated speed			2,000	—
Air supply	At rated output		kPa {mmHg}	Min. 79.8 {Min. 600}	60 {450}
Exhaust gas color	At sudden acceleration At high idling		Bosch index	Max. 4.5 Max. 1.0	6.5
Exhaust temperature (Turbocharger inlet temperature)	Whole speed range (Ambient temperature 20 °C)		°C	Max. 650	700
Valve clearance	Intake valve Exhaust valve		mm	0.33 0.71	— —
Compression pressure (SAE oil)	Oil temperature: 40 ~ 60 °C		MPa {kg/cm ² }	Min. 2.9 {Min. 30}	—
	(Engine speed)		(rpm)	(150 ~ 200)	
Blow-by pressure (SAE oil)	(Water temperature: Operating range) At rated output		kPa {mmH ₂ O}	Max. 0.98 {Max. 100}	1.96 {200}
Oil pressure	(Water temperature: Operating range)		kPa {kg/cm ² }	392 ~ 588 {4.0 ~ 6.0}	206 {2.1}
	At high idling (SAE30)			343 ~ 539 {3.5 ~ 5.5}	176 {1.8}
	At high idling (SAE10W)			Min. 147 {Min. 1.5}	69 {0.7}
	At low idling (SAE30)			Min. 98 {Min. 1.0}	69 {0.7}
Oil temperature	At low idling (SAE10W)		°C	90 ~ 120	Min. 120
	Whole speed range (Inside oil pan)				
Belt tension	Deflection when pressed with a finger force of approx. 58.8 N {approx. 6 kg}.	Alternator - crankshaft pulley	mm	13	—
	Deflection when pressed with a finger force of approx. 98 N {approx. 10 kg}.	Air conditioner - crankshaft pulley		16 ~ 20	—

STANDARD VALUE TABLE FOR CHASSIS

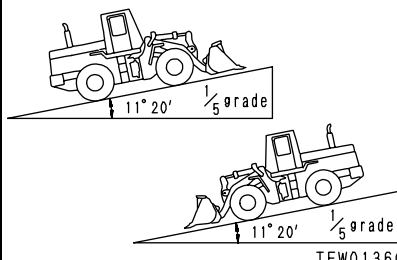
The * mark shows the value before the detent.

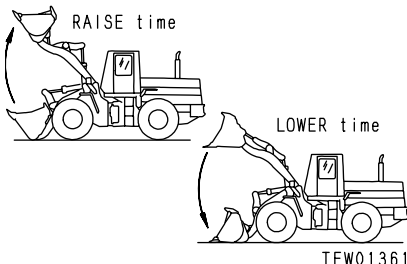
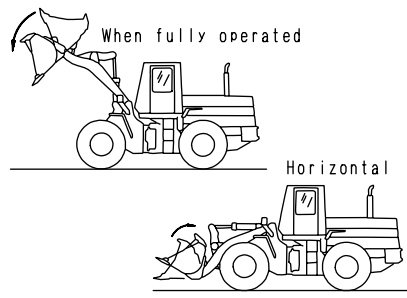
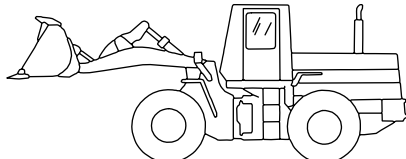
Machine Model					WA470-5, WA480-5		
Category	Item		Measurement Conditions	Unit	Standard Value For New Machine		Service Limit Value
Directional lever	Operating effort	N - FORWARD, REVERSE	• Engine Stopped • Measure at center of lever knob	N {kg}	5.9 ^{+4.9} _{-3.0}	{0.6 ^{+0.5} _{-0.3} }	Max. 16.7 {1.7}
	Travel	N - FORWARD, REVERSE		mm	35 ± 10		35 ± 20
Speed lever	Operating effort	1st ~ 2nd	• Engine stopped • Measure at center of lever knob	N {kg}	5.9 ^{+4.9} _{-3.0}	{0.6 ^{+0.5} _{-0.3} }	Max. 16.7 {1.7}
		2nd ~ 3rd			5.9 ^{+4.9} _{-3.0}	{0.6 ^{+0.5} _{-0.3} }	Max. 16.7 {1.7}
		3rd ~ 4th			5.9 ^{+4.9} _{-3.0}	{0.6 ^{+0.5} _{-0.3} }	Max. 16.7 {1.7}
	Travel	1st ~ 2nd		mm	35 ± 10		35 ± 20
		2nd ~ 3rd			35 ± 10		35 ± 20
		3rd ~ 4th			35 ± 10		35 ± 20
Working equipment control lever	Operating effort	Boom	• Engine speed: Low idling • Hydraulic oil temperature: 45 ~ 55 °C	N {kg}	Max. 12.8 {1.3} *		Max. 19.6 {2.0} *
					Max. 14.7 {1.5}		Max. 22.6 {2.3}
					Max. 12.8 {1.3} *		Max. 19.6 {2.0} *
					—		—
					Max. 15.7 {1.6}		Max. 23.5 {2.4}
					Max. 14.7 {1.5}		Max. 22.6 {2.3}
		Bucket			Max. 17.7 {1.8}		Max. 26.5 {2.7}
					Max. 12.8 {1.3} *		Max. 19.6 {2.0} *
					Max. 14.7 {1.5}		Max. 22.6 {2.3}
	Travel	Boom	• Engine speed: Low idling • Hydraulic oil temperature: 45 ~ 55 °C	mm	43 ± 9 *		43 ± 18 *
					43 ± 9 *		43 ± 18 *
					50 ± 9		50 ± 18
		Bucket			50 ± 9		50 ± 18
					43 ± 9 *		43 ± 18 *
	Steering wheel	Play		• Engine stopped • Machine facing straight to front	mm	Max. 20	
Operating effort		• Flat, horizontal, straight, dry paved road surface • Engine speed: Low idling (Bucket empty)	N {kg}	6.9 ~ 12.6 {0.7 ~ 1.3}		Max. 19.6 {2.0}	
Turning speed (Not including play)		• Engine speed: High idling • Left lock - right lock	Turns	3.6 ± 0.4		3.6 ± 0.4	
Operating time		Low idling	• Engine speed: Low idling • Hydraulic oil temperature: 45 ~ 55 °C	Sec.	3.6 ~ 4.4		Max. 6.0
		High idling			3.2 ~ 3.8		Max. 5.2
			P mode			3.4 ~ 4.0	
			N mode				

Machine Model				WA470-5, WA480-5		
Category	Item		Measurement Condition	Unit	Standard Value For New Machine	Service Limit Value
Accelerator pedal	Operating effort		Engine started 	N {kg}	53.9 ~ 73.6 {5.5 ~ 7.5}	Max. 107.9 {11.0}
	Operating angle	Neutral ($\alpha 1$)		deg.	48	—
		Neutral ($\alpha 2$)			35 ± 1	—
	Stopper height (L)			mm	56 ± 5	—
Brake pedal	Operating effort		- Engine speed: Low idling - Hydraulic oil temperature: 45 ~ 55 °C 	N {kg}	294 ± 29.4 {30 ± 3}	Max. 421.4 {43}
	Operating angle	Neutral ($\alpha 1$)		deg.	45	—
		Neutral ($\alpha 2$)			15^{+1}_0	—
	Play			mm	5 ± 0.5	—
Tire	Fitting of wheel lock ring	A	Tire inflation pressure: Specified pressure 	mm	Max. 2.5	—
		B			Max. 4.0	—
	Clearance of wheel lock ring	C			$2 \sim 10$	—

Machine Model					WA470-5, WA480-5					
Category	Item		Measurement Conditions		Unit	Standard Value For New Machine		Service Limit Value		
Engine speed	Torque converter stall		• Engine water temperature: Operating range	N mode	rpm	WA470-5	WA480-5	WA470-5	WA480-5	
				• Torque converter oil temperature: 60 ~ 80 °C		P mode	1,770 ± 100	1,900 ± 100	1,770 ± 200	1,900 ± 200
	Hydraulic stall		• Hydraulic oil temperature: 45 ~ 55 °C	N mode		1,800 ± 100	1,950 ± 100	1,800 ± 200	1,950 ± 200	
				P mode		2,020 ± 100	2,020 ± 100	2,020 ± 200	2,020 ± 200	
	Torque converter stall + hydraulic stall			N mode		1,530 ± 100	1,610 ± 100	1,530 ± 200	1,610 ± 200	
				P mode		1,665 ± 100	1,670 ± 100	1,665 ± 200	1,670 ± 200	
	Transmission, torque converter	Main relief valve	Low idling	• Torque converter oil temperature: 60 ~ 80 °C • Engine: Rated speed		MPa {kg/cm ² }	2.78 ± 0.2 {28.3 ± 2}		←	
			Rated speed				2.93 ± 0.2 {29.9 ± 2}		←	
Torque converter relief (Inlet port) pressure			Max. 0.93 {Max. 9.5}		←					
Torque converter outlet port oil pressure			0.59 ± 0.05 {6.0 ± 0.5}		←					
ECMV output (Clutch) oil pressure		1st, 2nd, 3rd, 4th	• Torque converter oil temperature: 60 ~ 80 °C • Engine: Rated speed • Manual switch ON	2.31 ± 0.15 {23.5 ± 1.5}			←			
		F - R		2.06 ± 0.15 {21.0 ± 1.5}			←			
		Lock-up		2.31 ± 0.15 {23.5 ± 1.5}			←			
Steering		Steering relief pressure		• Hydraulic oil temperature: 45 ~ 55 °C • Engine speed: High idling	MPa {kg/cm ² }		20.6 ± 0.49 {210 ± 5}		20.6 ^{+0.49} _{-1.27} {210 ⁺⁵ ₋₁₃ }	
Accumulator	Charge cut-in pressure		• Engine speed: Low idling • Hydraulic oil temperature: 45 ~ 55 °C	MPa {kg/cm ² }	5.9 ^{+0.5} ₀ {60 ⁺⁵ ₀ }		5.9 ^{+0.98} _{-0.5} {60 ⁺¹⁰ ₋₅ }			
	Charge cut-out pressure		• Point where brake oil pressure warning lamp goes out • Point where oil pressure is going up and then starts to go down		9.8 ^{+0.98} ₀ {100 ⁺¹⁰ ₀ }		9.8 ^{+1.5} _{-0.5} {100 ⁺¹⁵ ₋₅ }			

Machine Model					WA470-5, WA480-5				
Category	Item	Measurement Conditions			Unit	Standard Value For New Machine		Service Limit Value	
Power train	Travel speed (Bucket empty)				km/h	WA470-5	WA480-5	WA470-5	WA480-5
		FORWARD	P mode	1st		6.3 ± 0.3	6.3 ± 0.3	6.3 ± 0.45	6.3 ± 0.45
				2nd		12.1 ± 0.6	12.1 ± 0.6	12.1 ± 0.9	12.1 ± 0.9
				3rd		21.7 ± 1.1	21.6 ± 1.1	21.7 ± 1.7	21.6 ± 1.7
				4th		34.9 ± 1.7	34.3 ± 1.7	34.9 ± 2.6	34.3 ± 2.6
			N mode	1st		5.4 ± 0.3	5.7 ± 0.3	5.4 ± 0.45	5.7 ± 0.45
				2nd		10.2 ± 0.5	11.0 ± 0.6	10.2 ± 0.75	11.0 ± 0.9
				3rd		18.5 ± 0.9	20.0 ± 1.0	18.5 ± 1.4	20.0 ± 1.5
				4th		29.2 ± 1.5	32.0 ± 1.6	29.2 ± 2.3	32.0 ± 2.4
		REVERSE	P mode	1st		6.7 ± 0.3	6.6 ± 0.3	6.7 ± 0.45	6.6 ± 0.45
				2nd		12.8 ± 0.6	12.8 ± 0.6	12.8 ± 0.9	12.8 ± 0.9
				3rd		23.0 ± 1.2	22.8 ± 1.1	23.0 ± 1.8	22.8 ± 1.7
				4th		36.0 ± 1.8	35.8 ± 1.8	36.0 ± 2.7	35.8 ± 2.7
			N mode	1st		5.6 ± 0.3	6.1 ± 0.3	5.6 ± 0.45	6.1 ± 0.45
				2nd		10.9 ± 0.5	11.7 ± 0.6	10.9 ± 0.75	11.7 ± 0.9
				3rd		19.7 ± 1.0	21.3 ± 1.1	19.7 ± 1.5	21.3 ± 1.7
				4th		30.1 ± 1.5	34.1 ± 1.7	30.1 ± 2.3	34.1 ± 2.6
Wheel brake	Brake oil pressure	• Hydraulic oil temperature: 45 ~ 55 °C			MPa ₂ {kg/cm ² }	5.1 ± 0.49 {52 ± 5}		5.1 ± 0.98 {52 ± 10}	
	Drop in brake pressure	• Engine stopped • Keep brake pedal depressed at 4.9 MPa {50 kg/cm ² } and measure drop in oil pressure after 5 min.				Max. 0.49 {5.0}		Max. 0.49 {5.0}	
	Performance	• Tire inflation pressure: Specified pressure • Flat, horizontal, straight, dry paved road surface • Speed when applying brake: 20 km/h, braking delay: Within 0.1 sec. • Brake pedal operating effort: Specified operating effort (294 ± 29.4 N {30 ± 3 kg}) • Measure braking distance			m	Max. 5		Max. 5	
	Disc wear	• Oil pressure: 4.9 MPa {50 kg/cm ² } • Pedal depressed fully			mm	Shaft protrusion 0		Shaft protrusion reaches wear limit position (2.4 mm)	

Machine model				WA470-5, WA480-5		
Category	Item		Measurement Conditions	Unit	Standard Value For New Machine	Service Limit Value
Parking brake	Parking brake inlet pressure		- Torque converter oil temperature: 60 ~ 80 °C - Engine speed: Low idling	MPa {kg/cm ² }	Min. 2.27 {Min. 23.1}	Min. 2.27 {Min. 23.1}
	Performance		- Tire inflation pressure: Specified pressure - Flat paved road with 1/5 (11° 20') grade - Dry, paved road surface - Machine at operating condition 	—	Holds in position	Holds in position
	Disc thickness			mm	3.2 ± 0.08	2.97
PPC	PPC valve basic pressure		- Hydraulic oil temperature: 45 ~ 55 °C - Engine speed: High idling	MPa {kg/cm ² }	3.72 ^{+0.2} ₀ {38 ⁺² ₀ }	3.72 ^{+0.2} _{-0.2} {38 ⁺² ₋₂ }
	PPC valve output pressure	Boom RAISE, FLOAT; Bucket DUMP, TILT	- Hydraulic oil temperature: 45 ~ 55 °C - Engine speed: High idling - Control lever operated fully		3.72 ^{+0.1} _{-0.1} {38 ⁺¹ ₋₁ }	3.72 ^{+0.1} _{-0.2} {38 ⁺¹ ₋₂ }
		Boom LOWER				2.2 ± 0.25 {22.5 ± 2.5}

Machine Model				WA470-5, WA480-5					
Category	Item		Measurement Conditions	Unit	Standard Value For New Machine		Service Limit Value		
Work equipment	Work equipment relief pressure		- Hydraulic oil temperature: 45 ~ 55 °C - Engine speed: High idling	MPa {kg/cm ² }	20.6 ± 0.49 {210 ± 5}		20.6 ^{+0.49} _{-1.27} {210 ⁺⁵ ₋₁₃ }		
	Work equipment speed	Boom RAISE	- Hydraulic oil temperature: 45 ~ 55 °C - Engine speed: High idling - No load	N mode	WA470-5	WA480-5	WA470-5	WA480-5	
				P mode	6.7 ± 0.5	6.8 ± 0.5	Max. 8.6	Max. 8.8	
		Boom LOWER	 TEW01361	N mode	5.8 ± 0.5	6.3 ± 0.5	Max. 7.6	Max. 8.2	
						4.3 ± 0.5	4.1 ± 0.5	Max. 5.8	Max. 5.5
						3.7 ± 0.5	3.8 ± 0.5	Max. 5.0	Max. 5.2
		Bucket tilt-back	When fully operated	- Hydraulic oil temperature: 45 ~ 55 °C - Engine speed: High idling - No load	N mode	1.6 ± 0.3	1.7 ± 0.3	Max. 2.3	Max. 2.4
					P mode	1.4 ± 0.3	1.6 ± 0.3	Max. 2.0	Max. 2.3
			Bucket horizontal (Above ground)	 TEW01362	N mode	1.4 ± 0.3	1.6 ± 0.3	Max. 2.0	Max. 2.3
						P mode	1.2 ± 0.3	1.5 ± 0.3	Max. 1.8
	Hydraulic drift	Retraction of boom cylinder rod	- Hydraulic oil temperature: 45 ~ 55 °C - Leave for 5 minutes after stopping engine then measure for next 15 minutes - Bucket empty, boom, bucket horizontal Work equipment posture	mm	Max. 30		Max. 36		
		Retraction of bucket cylinder rod	 TEW01363		Max. 20		Max. 24		

Machine Model				WA470-5, WA480-5	
Category	Item	Measurement Conditions	Unit	Standard Value For New Machine	Service Limit Value
Oil pressure drive fan	Max. fan speed	• Engine speed: High idling • Engine water temperature: Min. 95 °C • Hydraulic oil temperature: Min. 95 °C • Torque converter oil temperature: Min. 105 °C	rpm	1,400 ± 100	1,400 ± 200
	Min. fan speed	• Engine speed: Low idling • Engine water temperature: Max. 40 °C • Hydraulic oil temperature: Max. 40 °C • Torque converter oil temperature: Max. 40 °C		240 ± 50	240 ± 100