



# SECTION 5 TIGHTENING TORQUE AND METHOD FOR MAIN BOLTS AND NUTS

For tightening torque of the main bolts and nuts of WD615 series engines, see Table 2-4, and for that of strengthening bolts, see Table 2-5.

Table 2-4 Tightening torque and Method for main bolts and nuts

Name of bolts	Tightening specifications		Torque after tightening		Exte n s i o n (mm ) use)	Time perm n use)
	Tightening torque (Nm)	Angle of t u r n (degree)	Mini Torque (N.m)	Max.e (Nm)		
Main bearing bolt	250 + 25	2×90°±	260	380	0.6	3
Cylinder head main bolt	200±10	5	120	160	~	2
Cylinder head secondary bolt	90±10	°	170	250	1	1
Connecting rod bolt	120	2×90°±	230	280	.	2
Flywheel bolt	60±20	5	110	140	0	2
Flywheel casing bolt	40±10	°			0.4	
Oil pump idle gear shaft bolt	60±5	90°±5°			~	
Timing intermediate gear shaft bolt	180±20	2×90°±			1	
Camshaft gear fixing bolt	32	5			.	
Camshaft gear fixing bolt	30±3	°			0	
Exhaust pipe bolt	100±10	120±5°			0.3±	
Rocker arm support	60±5	90°			0	
Crankshaft pulley fixing bolt	25	90°			.	
Injection pump fixing bolt					1	
					5	
					0.2±	
					0	
					.	
					0.1±	
					0	
					.	
					1	
					5	



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Surface state ( $\mu$ total)		Zinc plating 0.125				Surface finish 0.14			
Strength grade	Original	6G	8G	10K	12K	6	8G	10K	12K
	New W	6,9	8,9	10,9	12,9	6,	8,9	10,9	12,9
	Measuring dimensions	Metric common thread							
	M4		2.7	3.8	4.6		2.9	4.1	4.9
	M5		5.5	8	9.5		6.9	8.5	10
	M6		9.5	13	16		10	14	17
	M8		23	32	39		25	35	41
	M10		46	64	77		49	69	83
	M12		80	110	135		86	120	148.5
	M14		125	180	215		135	190	230
	M16		195	275	330		210	295	355
	M18		270	390	455		290	405	485
	M20		385	540	650		410	580	690
	M22		510	720	870		550	780	930
	M24		660	930	1100		710	1000	1200



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	M27		980	1400	1650		1050	1500	1800
	M30		1350	1850	2250		1450	2000	2400
	Metric fine thread								
	M8×1		25	35	42		27	38	45
	M10×1.25		49	68	82		52	73	88
	M12×1.25		88	125	150		95	135	160
	M12×1.5		83	115	140		90	125	150
	M14×1.5		140	195	235		150	210	250
	M16×1.5		210	295	350		225	315	380
	M18×1.5		305	425	510		325	460	550
	M20×1.5		425	600	720		460	640	770
	M22×1.5		570	800	960		610	860	1050
	M24×2		720	1000	1200		780	1100	1300
	M27×2		1050	1500	1800		1150	1600	1950
	M30×2		1450	2050	2500		1600	2250	2700

$\mu$  total: refers to the total friction coefficient of the contact surface of the thread of bolt or nut.

Caution: The tightening torque for bolts or nuts chrome plated or copper plated is lower than that of the bolts or nuts zinc plated by 25%. The tightening torque of the selflocking nuts should be higher than the values given above.

The tightening torque to screw the studbolt into the base material is half of the above value.