

3VZ-E ENGINE STARTING SYSTEM

Starter	Rated voltage and output power No-load characteristic Current rpm	12 V, 1.0 kW		12 V, 1.4 kW, 1.6 kW	
				90 A or less	
		3,000 rpm or more at 11.5 V		3,500 rpm or more at 11.5 V	
Brush length	STD	13.5 mm	0.531 in.	15.5 mm	0.610 in.
	Limit	8.5 mm	0.335 in.	10.0 mm	0.394 in.
Commutator Outer diameter	STD	30 mm	1.18 in.	←	
	Limit	29 mm	1.14 in.	←	
Undercut depth	Limit	0.6 mm	0.024 in.	←	
	Limit	0.2 mm	0.008 in.	←	
Circle runout		0.05 mm	0.0020 in.	←	
Spring installed load		18 - 24 N (1,785-2,415 gf, 3.9-5.3 lbf)		←	
	Limit	12 N (1.2 kgf, 2.6 lbf)		←	

CHARGING SYSTEM

Battery specific gravity When fully charged at 20°C (68°F)	5 5D 2 3R 80D26R	1.25 - 1.27 1.27 - 1.29	
Alternator	Rated output ampere Brush exposed length Rotor coil resistance Slip ring diameter	STD Limit STD Limit	60 A 10.5 mm 1.5 mm 2.8 - 3.0 Ω 14.2 - 14.4 mm 12.8 mm 0.413 in. 0.059 in. 0.559 - 0.567 in. 0.504 in.
Alternator regulator	Regulator voltage	at 25°C (77°F) at 115°C (239°F)	13.9 - 15.1 V 13.5 - 14.3 V

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