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# 1989 Mazda RX-7 Factory Service Manual

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97UTDX-001



## A. MEASUREMENTS

Item		Specification	
Overall length	mm (in)	4,315 (169.9) 4,310 (169.7) (With license plate holder)	
Overall width	mm (in)	1,690 (66.5)	
Overall height	mm (in)	1,265 (49.8)	
Wheelbase	mm (in)	2,430 (95.7)	
Tread	mm (in)	Front	1,450 (57.1)
		Rear	1,440 (56.7)

## C. ENGINE

Item			Engine model	RE 13B (TURBO)	RE 13B (NON-TURBO)	
Type			Rotary engine			
Displacement			cc (cu in)	654x2 (40.0x2)		
Number of rotors and arrangement			2 rotors, longitudinal			
Combustion chamber type			Bathtub			
Compression ratio				9.0:1	9.7:1	
Port timing	Intake	Open	Primary	45° ATDC	32° ATDC	
			Secondary	32° ATDC		
			Auxiliary	—	45° ATDC	
		Close	Primary	50° ABDC	40° ABDC	
			Secondary	50° ABDC	30° ABDC	
			Auxiliary	—	80° ABDC	
	Exhaust	Open	75° BBDC			
		Close	48° ATDC			
Compression pressure			kPa (kg/cm <sup>2</sup> , psi)-rpm	589 (6.0, 85)-250		
Maximum difference between chambers			147 (1.5, 21)-250			
Side housing (Front, intermediate and rear housing)	Distortion limit		mm (in)	0.04 (0.0016)		
	Side seal wear limit		mm (in)	0.10 (0.0039)		
	Side seal wear limit, overlapping oil seal wear		mm (in)	0.01 (0.0004)		
	Side seal wear limit, outside oil seal wear		mm (in)	0.10 (0.0039)		
	Oil seal wear limit		mm (in)	0.02 (0.0008)		
	Rotor housing		Width	mm (in)	79.970—80.010 (3.1484—3.1500)	
		Maximum width difference	mm (in)	0.06 (0.0024)		
Rotor	Width (Apex)		mm (in)	79.800—79.850 (3.1417—3.1437)		
	Clearance of side housing to rotor	mm (in)	Standard	0.12—0.21 (0.0047—0.0083)		
			Min.	0.10 (0.0039)		
	Diameter of corner seal groove		mm (in)	11.000—11.018 (0.4331—0.4338)		
	Width of side seal groove		mm (in)	0.714—0.739 (0.0281—0.0291)		
	Width of apex seal groove		mm (in)	1.995—2.012 (0.0785—0.0792)		
Apex seal and spring	Width		mm (in)	1.910—1.939 (0.0752—0.0763)		
	Height (upper and lower)	mm (in)	Standard	8.0 (0.315)		
			Min.	6.5(0.256)—Refer to ENGINE INSPECTION section		
	Clearance of apex seal and rotor groove	mm (in)	Standard	0.041—0.091 (0.0016—0.0036)	0.052—0.092 (0.0020—0.0036)	
			Max.	0.15 (0.0059)		
	Spring free height	Long	mm	Standard	6.25 (0.246)	
				Min.	4.6 (0.181)	
		Short	mm	Standard	3.3 (0.130)	
Min.				1.7 (0.067)—Refer to ENGINE INSPECTION section		

Item		Engine model		RE 13B (TURBO)	RE 13B (NON-TURBO)
Side seal and spring	Thickness	mm (in)		0.661—0.686 (0.0260—0.0270)	
	Clearance of side seal to rotor groove	mm (in)	Standard	0.028—0.078 (0.0011—0.0031)	
			Max.	0.10 (0.0039)	
	Height	mm (in)		2.85—3.15 (0.1122—0.1240)	
	Protrusion min.	mm (in)		0.50 (0.020)	
	Clearance of side seal to corner seal	mm (in)	Standard	0.05—0.15 (0.0020—0.0059)	
Max.			0.40 (0.016)		
Corner seal and spring	Outer diameter	mm (in)		10.990—11.014 (0.4327—0.4336)	
	Height	mm (in)		6.8—7.0 (0.268—0.276)	
	Protrusion min.	mm (in)		0.50 (0.020)	
Rotor oil seal and spring	Height	mm (in)		5.6—5.8 (0.220—0.228)	
	Oil seal lip width max.	mm (in)		0.50 (0.020)	
	Protrusion min.	mm (in)		0.50 (0.020)	
Main bearing	Inner diameter	mm (in)		43.025—43.050 (1.6939—1.6949)	
Rotor bearing	Inner diameter	mm (in)		74.025—74.050 (2.9144—2.9153)	
Eccentric shaft	Runout max.	mm (in)		0.12 (0.0047)	
	End play	mm (in)	Standard	0.040—0.070 (0.0016—0.0028)	
			Limit	0.09 (0.0035)	
	Main journal diameter	mm (in)		42.970—42.985 (1.6917—1.6923)	
	Clearance of main journal	mm (in)	Standard	0.040—0.080 (0.0016—0.0031)	
			Limit	0.10 (0.0039)	
	Rotor journal diameter	mm (in)		73.970—73.985 (2.9122—2.9128)	
Clearance of rotor journal	mm (in)	Standard	0.040—0.080 (0.0016—0.0031)		
		Limit	0.10 (0.0039)		
Drive belt deflection at 98 N (10 kg, 22 lb) mm (in)	Alternator	Used	14—17 (0.55—0.67)		
	Air pump	Used	11—13 (0.43—0.51)		
	A/C compressor	Used	8—9 (0.31—0.35)		
	P/S pump	Used	14.0—16.0 (0.55—0.63)		

## D. LUBRICATING SYSTEM

Item		Engine model		RE 13B (TURBO)	RE 13B (NON-TURBO)
Lubrication system				Forced-fed	
Oil pump	Type			Trochoid	
	Lobe clearance of outer rotor to inner rotor	mm (in)	Standard	0.03—0.12 (0.0012—0.0047)	
			Max.	0.15 (0.0059)	
	Clearance of outer rotor to pump body	mm (in)	Standard	0.20—0.25 (0.0079—0.098)	
			Max.	0.30 (0.0118)	
End float	mm (in)	Standard	0.03—0.13 (0.0012—0.0051)		
		Max.	0.15 (0.0059)		
Pressure control valve	Relief pressure	kPa (kg/cm <sup>2</sup> , psi)		1,079 (11.0, 156)	
Oil cooler	Type			Air-cooled, with bypass valve	
	Relief temperature	°C (°F)		60—65 (140—149) or below	
	Relief pressure dif.	kPa (kg/cm <sup>2</sup> , psi)		349 (3.56, 50) at 60°C (140°F)	
	Bypass valve protrusion	mm (in)		5 (0.2) or more	

Item		Engine model	RE 13B (TURBO)	RE 13B (NON-TURBO)
Regulator valve	Relief pressure	kPa (kg/cm <sup>2</sup> , psi)	490 (5.0, 71)	
Oil filter	Type		Full flow, paper element	
	Relief pressure dif.	kPa (kg/cm <sup>2</sup> , psi)	98 (1.0, 14)	
Eccentric shaft bypass valve	Relief temperature	°C (°F)	60 (140) or below	
	Protrusion	mm (in)	6 (0.24) or more	
Engine oil	Capacity liters (US qt, Imp qt)	Total (dry engine)	5.8 (6.1, 5.1)	
		Oil pan	4.4 (4.7, 3.9)	
		Oil cooler	0.85 (0.90, 0.75)	
		Oil filter	0.19 (0.20, 0.17).....Factory installed 0.17 (0.18, 0.15).....Service parts	
	Classification		API service "Fuel efficient" SF (Mineral only)	
	-10°C (15°F) or over		20W-40, 20W-50	
	-25-30°C (-10-85°F)		10W-30	
	-25°C (-10°F) or over		10W-40, 10W-50	
0°C (32°F) or below		5W-30		

## E. COOLING SYSTEM

Item		Engine model	RE 13B (TURBO)	RE 13B (NON-TURBO)	
Cooling method			Water-cooled, forced circulation		
Water pump	Type		Centrifugal impeller		
	Pulley ratio (Speed)		1:1.22		
Thermostat	Type		Wax, bottom bypass		
	Opening temperature	°C (°F)	80.5-83.5 (177-182)		
	Full-open temperature	°C (°F)	95 (203)		
	Full-open lift min.	mm (in)	8-10 (0.31-0.39)		
Radiator	Type		Corrugated fin		
Coolant filler cap	Relief pressure	kPa (kg/cm <sup>2</sup> , psi)	74-103 (0.75-1.05, 11-15)		
Cooling fan	Cooling fan		Thermo-modulated		
	Number of blades		10		
	Outer diameter	mm (in)	390 (15.35)		
Electric cooling fan	Type		Electrical		
	Capacity	W	90		
	Number of blades		5		
	Outer diameter	mm (in)	255 (10.04)		
Drive belt deflection at 98 N (10 kg, 22 lb) mm (in)	Alternator	Used	14-17 (0.55-0.67)		
	Air pump	Used	11-13 (0.43-0.51)		
Coolant	Capacity	liters (US qt, Imp qt)	8.7 (9.2, 7.7)	7.3 (7.7, 6.4)	
Antifreeze solution	Protection	Mixture	Mixture percentage %		
			Water	Antifreeze	Specific gravity at 20°C (68°F)
		Above -16°C (3°F)	65	35	1.054
		Above -26°C (-15°F)	55	45	1.066
Above -40°C (-40°)	45	55	1.078		

**F1. FUEL AND EMISSION CONTROL SYSTEMS (EGI)**

Item			Specification
Fuel tank capacity		liters (US gal, Imp gal)	70 (18.5, 15.4)
Fuel filter	Type	Low pressure	Nylon 6 (164 and 45 mesh)
		High pressure	Filter paper
Fuel pump	Type		Impeller (intank)
	Output pressure	kPa (kg/cm <sup>2</sup> , psi)	441—588 (4.5—6.0, 64.0—85.3)
Pressure regulator	Type		Diaphragm
	Regulated pressure	kPa (kg/cm <sup>2</sup> , psi)	235—275 (2.4—2.8, 34.1—39.8)
Throttle body	Type		Horizontal-draft (2 stages, 3 barrel)
	Throat diameter	Primary mm (in)	45 (1.772)
		Secondary mm (in)	45 (1.772)x2
Water thermo valve operation temp.		°C (°F)	M/T; 67—77 (153—171) or more A/T; 60—70 (140—158) or more
Air cleaner	Element type		Long life wet
Accelerator cable	Deflection	mm (in)	1—3 (0.04—0.12)
Idle speed (Test connector grounded)			rpm 750 ± 25 (A/T; in N range)
Dashpot	Adjustment speed	rpm	2,700—3,100
Injector (Primary and secondary)	Drive		Voltage drive
	Injection volume	cc (cu in)/15 sec.	111—118 (6.8—7.2)
	Resistance	Ω	12—16
Airflow meter	Resistance	E2 ↔ Vs Ω	200—400 (Closed ↔ Open; 20°C (68°F))
		E2 ↔ Vc Ω	200—1,000 (Closed; 20°C (68°F))
			20—800 (Open; 20°C (68°F))
Water thermo-sensor	Resistance	-20°C (-4°F) kΩ	16.2 ± 1.6
		20°C (68°F) kΩ	2.5 ± 0.2
		80°C (176°F) kΩ	0.3 ± 0.1
Heat hazard sensor	Operation temperature	°C (°F)	105—115 (221—239)
Intake air therosensor	Airflow meter	-20°C (-4°F) Ω	10,000—20,000
		0°C (32°F) Ω	4,000—7,000
		20°C (68°F) Ω	2,000—3,000
		40°C (104°F) Ω	900—1,300
		60°C (140°F) Ω	400—700
	Dynamic chamber	25°C (77°F) kΩ	33 ± 4
	85°C (185°F) kΩ	3.5 ± 0.4	
Throttle sensor (Full range)	Resistance	Ⓓ—Ⓔ kΩ	Idle position; 0.6—0.9 Full open; 3.4—5.1
		Ⓓ—Ⓕ kΩ	4.0—6.0
Throttle sensor (Narrow range)	Resistance	Ⓐ—Ⓑ kΩ	Idle position; 0.8—1.2 Full open; 4.0—6.0
		Ⓑ—Ⓒ kΩ	4.0—6.0
Solenoid valve (BAC)	Resistance	Ω	10.7—12.3
Solenoid valve (AWS)	Resistance	Ω	9.3—11.3
Circuit opening relay	Resistance	STA ↔ E1 Ω	21—43
		B ↔ Fc Ω	109—226
Sub-zero starting assist fluid			Anti-freeze 90% water 10%

## F2. FUEL AND EMISSION CONTROL SYSTEMS (EGI TURBO)

Item			Specification
Fuel tank capacity		liters (US gal, Imp gal)	70 (18.5, 15.4)
Fuel filter	Type	Low pressure	Nylon 6 (164 and 45 mesh)
		High pressure	Filter paper
Fuel pump	Type		Impeller (intank)
	Output pressure	kPa (kg/cm <sup>2</sup> , psi)	490—637 (5.0—6.5, 71.1—92.4)
Pressure regulator	Type		Diaphragm
	Regulated pressure	kPa (kg/cm <sup>2</sup> , psi)	235—275 (2.4—2.8, 34.1—39.8)
Throttle body	Type		Horizontal-draft (2 stage, 3 barrel)
	Throat diameter	Primary mm (in)	45 (1.772)
		Secondary mm (in)	45 (1.772)x2
Water thermo valve operation temp.	°C (°F)	55—65 (131—149) or more	
Air cleaner	Element type		Long life wet
Accelerator cable	Deflection	mm (in)	1—3 (0.04—0.12)
Idle speed (Test connector grounded)		rpm	750 ± 25
Dashpot	Adjustment (Throttle sensor (narrow range) resistance (A)—(B))	kΩ	1.8—3.8
Injector (Primary and secondary)	Drive		Voltage drive
	Injection volume	cc (cu in)/15 sec.	133—142 (8.1—8.7)
	Resistance	Ω	12—16
Airflow meter	Resistance	E2 ↔ Vs Ω	200—400 (Closed ↔ Open; 20°C (68°F))
		E2 ↔ Vc Ω	200—1,000 (Closed; 20°C (68°F))
			20—800 (Open; 20°C (68°F))
Water thermo-sensor	Resistance	−20°C (−4°F) kΩ	16.2 ± 1.6
		20°C (68°F) kΩ	2.5 ± 0.2
		80°C (176°F) kΩ	0.3 ± 0.1
Heat hazard sensor	Operation temperature	°C (°F)	105—115 (221—239)
Intake air thermosensor	Airflow meter	−20°C (−4°F) Ω	10,000—20,000
		0°C (32°F) Ω	4,000—7,000
		20°C (68°F) Ω	2,000—3,000
		40°C (104°F) Ω	900—1,300
		60°C (140°F) Ω	400—700
	Engine (Intake air pipe)	20°C (68°F) kΩ	33 ± 4
		85°C (185°F) kΩ	3.5 ± 0.4
Throttle sensor (Full range)	Resistance	(D)—(E) kΩ	Idle position; 0.6—0.9 Full open; 3.4—5.1
		(D)—(F) kΩ	4.0—6.0
Throttle sensor (Narrow range)	Resistance	(A)—(B) kΩ	Idle position; 0.8—1.2 Full open; 4.0—6.0
		(B)—(C) kΩ	4.0—6.0
Solenoid valve (BAC)	Resistance	Ω	10.7—12.3
Solenoid valve (AWS)	Resistance	Ω	9.3—11.3
Solenoid valve (ASV)	Resistance	Ω	16.5—23.5
Circuit opening relay	Resistance	STA ↔ E1 Ω	21—43
		B ↔ Fc Ω	109—226
Turbocharger	Type		Water cooled
	Lubrication		Engine oil
	Boost pressure	kPa (kg/cm <sup>2</sup> , psi)	57.0 (0.58, 8.25)



Item		Specification
Waste gate valve		Incorporated with turbocharger
Intercooler	Type	Air cooled
Knock control system knocking frequency kHz		3.5 ± 0.3
Fuel pump resistor relay	Resistance	a—b Ω
		c—d Ω
		e—f Ω
Sub-zero starting assist fluid		Anti-freeze 90% water 10%

**G. ENGINE ELECTRICAL SYSTEM**

Item	Model	M/T (EGI)	A/T (EGI)	M/T (EGI TURBO)		
<b>Charging system</b>						
Battery	Type	Maintenance free, 55D23L, 65D23L (65D23L: Coldproof area)				
	Voltage	V	12			
	Capacity	Ah	55 (65D23L) 60 (55D23L)			
	Specific gravity at 20°C (68°F)	Recharge	at	1.230		
		Fully charged		1.280		
Charging current	A	55D23L: Max. 6 65D23L; Max. 5.5				
Alternator	Type	A/C type				
	Voltage-capacity	V-A	12-80			
	Pulley ratio		1:2.03			
	Load test	Current	A	Min. 60		
		Speed	rpm	2,500		
	Regulated voltage	V	14.1—14.7			
	Brush	Number		2		
		Length mm (in)	Standard	16.5 (0.650)		
			Limit	8 (0.315)		
		Spring force	N (kg, lb)	2.9—4.3 (0.3—0.44, 0.66—0.97)		
<b>Starter system</b>						
Starter	Output	kW	1.2	2.0	1.2	
	Free running test	Voltage	V	11.0		
		Current	A	Max. 90		
		Speed	rpm	Min. 3,000		
	Lock test	Voltage	V	4		
		Current	A	Min. 780	Min. 980	Min. 780
		Torque	Nm (m·kg, ft·lb)	Min. 17.6 (1.79, 13.0)	Min. 22.5 (2.29, 16.6)	Min. 17.6 (1.79, 13.0)
	Brush	Number		4		
		Length mm (in)	Standard	17.5 (0.689)		
			Limit	10.0 (0.394)		
		Spring force	N (kg, lb)	14—23 (1.4—2.4, 3.1—5.2)		
	Mica depth mm (in)	Standard	0.5—0.8 (0.02—0.03)			
		Limit	0.2 (0.008)			
	Pinion gap (magnetic clutch engaged)	mm (in)	0.5—2.0 (0.02—0.08)			
Operation of magnetic switch		Max. 8V				
<b>Electronic spark advance (ESA) control system</b>						
Crank angle sensor	Resistance	G①—G② Ω	110—210			
		Ne①—Ne② Ω	110—210			

# TD TECHNICAL DATA

Item	Model	M/T (EGI)	A/T (EGI)	M/T (EGI TURBO)
<b>Ignition system</b>				
Ignition timing	Leading	ATDC	5° ± 1° (Test connector grounded)	
	Trailing	ATDC	20° ± 2° (Test connector grounded)	
Timing mark location		Eccentric shaft pulley		
Spark plug	Type	NGK	Trailing: BUR9EQ, Leading: BUR7EQ	
	Gap	mm (in)	1.4 (0.056)	
Ignition coil	Resistance	Primary Ω	0.2—1.0	
High-tension lead	Resistance	Ω/1 m (3.28 ft)	16,000	
Drive belt	Deflection at 98 N (10 kg, 22 lb)	mm (in)	New	12—15 (0.47—0.59)
			Used	14—17 (0.55—0.67)

## H. CLUTCH

Item	Specification	Specification		
		Turbo model	Non-Turbo model	
Clutch pedal	Pedal ratio	6.35:1		
	Stroke	mm (in)	135 (5.31)	
	Height (With carpet)	mm (in)	183—193 (7.20—7.60)	
	Pedal free play	mm (in)	0.6—3.0 (0.02—0.12)	
	Disengagement height	mm (in)	54 (2.13)	
Clutch cover	Set load	N (kg, lb)	6,867 (700, 1,540)      5,199 (530, 1,166)	
Clutch disc	Facing (outer)	mm (in)	230 (9.06)      225 (8.86)	
	Facing (inner)	mm (in)	155 (6.10)      150 (5.91)	
	Thickness	Pressure plate side	mm (in)	3.2 (0.13)      3.2 (0.13)
		Flywheel side	mm (in)	3.2 (0.13)      3.2 (0.13)
	Run-out limit	mm (in)	0.7 (0.028)	
Wear limit	mm (in)	0.3 (0.012)		
Master cylinder	Bore	mm (in)	15.87 (0.625)	
Release cylinder	Bore	mm (in)	19.05 (0.750)	

## J1, J2. MANUAL TRANSMISSION

Item	Specification	Specification	
		Turbo model	Non-Turbo model
Gear ratio	1st	3.483	3.475
	2nd	2.015	2.002
	3rd	1.391	1.366
	4th	1.000	
	5th	0.719	0.697 0.756*
	Reverse	3.288	3.493
Oil capacity	liters (US qt, Imp qt)	2.5 (2.6, 2.2)	2.5 (2.6, 2.2)
Mainshaft	Max. permissible run-out	mm (in)	0.03 (0.0012)
	Clearance between mainshaft and gear (or bush)	Wear limit mm (in)	0.15 (0.006)
Reverse idle gear	Clearance between reverse idle gear bushing and shaft	Wear limit mm (in)	0.15 (0.006)
Shift fork and rod	Clearance between shift fork and clutch sleeve	Wear limit mm (in)	0.5 (0.020)
	Clearance between shift rod gate and control lever	Wear limit mm (in)	0.8 (0.031)
Synchronizer ring	Clearance between synchronizer ring and side of gear when fitted		
	Standard	mm (in)	1.5 (0.059)
	Wear limit	mm (in)	0.8 (0.031)
Lubricant	Above 10°C (50°F)	API Service GL-4 or GL-5 SAE80W-90	
	All seasons	API Service GL-4 or GL-5 SAE75W-90	

\* With viscous limited slip differential

**K. AUTOMATIC TRANSMISSION**

Item		Model	N4A-EL
Gear ratio	1st		2.841
	2nd		1.541
	3rd		1.000
	OD (4th)		0.720
	Reverse		2.400
Automatic transmission fluid (ATF)	Type		Dexron-II or M-III
	Capacity	liters (US qt, Imp qt)	7.3 (7.7, 6.4)
Oil pump	Body clearance mm (in)	Standard	0.02—0.04 (0.0008—0.0016)
		Maximum	0.08 (0.0031)
	Tip clearance mm (in)	Standard	0.14—0.21 (0.0055—0.0083)
		Maximum	0.25 (0.0098)
	Side clearance mm (in)	Standard	0.05—0.20 (0.0020—0.0079)
		Maximum	0.25 (0.0098)
Drum support	Seal ring and groove clearance mm (in)	Standard	0.04—0.16 (0.0016—0.0063)
		Maximum	0.40 (0.016)
Direct clutch	Side plate clearance	mm (in)	0.2 (0.008)
	Side plate size	mm (in)	0.4 (0.016), 0.6 (0.024), 0.8 (0.031), 1.0 (0.039), 1.2 (0.047)
	End play	mm (in)	0.5—0.8 (0.020—0.031)
	Bearing race size	mm (in)	0.8 (0.031), 1.0 (0.039), 1.2 (0.047), 1.4 (0.055), 1.6 (0.063), 1.8 (0.071), 2.0 (0.079), 2.2 (0.087)
OD planetary gear unit	Pinion clearance mm (in)	Standard	0.2—0.7 (0.008—0.028)
		Maximum	0.8 (0.031)
	Total end play	mm (in)	0.25—0.50 (0.010—0.020)
Front clutch	Retaining plate clearance	mm (in)	0.9—1.1 (0.035—0.043)
		mm (in)	5.0 (0.197), 5.2 (0.205), 5.4 (0.213), 5.6 (0.220), 5.8 (0.228), 6.0 (0.236), 6.2 (0.244)
	End play	mm (in)	0.5—0.8 (0.020—0.031)
	Bearing race size	mm (in)	0.8 (0.031), 1.0 (0.039), 1.2 (0.047), 1.4 (0.055), 1.6 (0.063), 1.8 (0.071), 2.0 (0.079), 2.2 (0.087)
Rear clutch	Retaining plate clearance mm (in)	Maximum	0.8—1.0 (0.031—0.039)
		mm (in)	0.25—0.50 (0.010—0.020)
	Bearing race size	mm (in)	1.2 (0.047), 1.4 (0.055), 1.6 (0.063), 1.8 (0.071), 2.0 (0.079), 2.2 (0.087)
Front planetary gear unit	Pinion clearance mm (in)	Standard	0.2—0.7 (0.008—0.028)
		Maximum	0.8 (0.031)
Rear planetary gear unit	Pinion clearance mm (in)	Standard	0.2—0.7 (0.008—0.028)
		Maximum	0.8 (0.031)
Low and reverse brake	Retaining plate clearance	mm (in)	0.8—1.05 (0.031—0.041)
	Retaining plate size	mm (in)	11.8 (0.465), 12.0 (0.472), 12.2 (0.480), 12.4 (0.488), 12.6 (0.496), 12.8 (0.504)
Oil distributor	Seal ring to groove clearance mm (in)	Standard	0.04—0.16 (0.002—0.006)
		Maximum	0.40 (0.016)

# TD TECHNICAL DATA

Item		Model	N4A-EL		
Valve spring specification		Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
Control valve	Pressure regulator	11.7 (0.461)	43.0 (1.693)	15.0	1.2 (0.047)
	1-2 shift	7.4 (0.291)	26.4 (1.039)	11.6	0.7 (0.028)
	2-3 shift	7.4 (0.291)	57.6 (2.268)	26.0	0.9 (0.035)
	3-4 shift	7.5 (0.295)	40.2 (1.583)	17.0	0.8 (0.031)
	Throttle backup	8.3 (0.327)	18.3 (0.720)	7.5	0.8 (0.031)
	Backup control	8.5 (0.335)	21.3 (0.839)	9.25	0.9 (0.035)
	N-R reducing	7.4 (0.291)	14.5 (0.571)	7.0	0.6 (0.024)
	Pressure modifier	9.2 (0.362)	19.8 (0.780)	7.3	0.7 (0.028)
	3-2 control	5.5 (0.217)	39.5 (1.555)	24.4	0.65 (0.026)
	Throttle relief	7.4 (0.291)	38.2 (1.504)	17.0	1.1 (0.043)
	Orifice check	5.0 (0.197)	15.5 (0.610)	12.0	0.23 (0.009)
	1-2 reducing	9.5 (0.374)	19.5 (0.768)	7.6	0.9 (0.035)
	1-2 accumulator	10.3 (0.406)	62.6 (2.465)	24.0	1.4 (0.055)
	N-R/2-3 accumulator	8.7 (0.343)	75.8 (2.984)	30.0	1.1 (0.043)
	N-D accumulator	9.3 (0.366)	43.4 (1.709)	24.0	1.4 (0.055)
Throttle relief (ball)	6.5 (0.256)	26.8 (1.055)	16.0	0.9 (0.035)	
Oil pump	Lockup control	5.45 (0.215)	25.7 (1.012)	16.5	0.65 (0.026)
Drum support	OD accumulator	16.0 (0.630)	40.4 (1.590)	9.8	2.6 (0.102)
Band servo	OD	28.0 (1.102)	48.0 (1.890)	7.0	3.5 (0.138)
	2nd	28.25 (1.112)	35.0 (1.378)	—	3.5 (0.138)
Direct, front, and rear clutches		8.0 (0.315)	30.5 (1.201)	14.5	1.3 (0.051)
Low and reverse brake		—	5.3–6.2 (0.209–0.244)	—	—
Parking rod		7.2 (0.283)	32.0 (1.260)	14.0	0.7 (0.028)
<b>Shift point (except convertible)</b>					
Mode	Range	Throttle condition (Throttle sensor voltage)	Shift	Turbine speed (rpm)	Vehicle speed km/h (mph)
Normal	D	Fully opened (4.3 volt)	D1→D2	5,780–6,350	60–66 (37–41)
			D2→D3	5,800–6,210	111–119 (69–74)
			D3→OD	5,250–5,590	155–165 (96–102)
		Half throttle (2.6 volt)	D1→D2	3,950–4,520	41–47 (25–29)
			D2→D3	3,970–4,390	76–84 (47–52)
			Lockup ON (D3)	3,290–3,490	97–103 (60–64)
			D3→OD	3,860–4,130	114–122 (71–76)
			Lockup ON (OD)	3,860–4,130	114–122 (71–76)
			Lockup OFF (OD)	2,100–2,290	86–94 (53–58)
	Kickdown	OD→D3	2,100–2,290	86–94 (53–58)	
		D3→D2	1,390–1,660	41–49 (25–30)	
		OD→D3	3,540–3,780	145–155 (90–96)	
	S	Fully opened (4.3 volt)	D3→D2	3,420–3,690	101–109 (63–68)
			D2→D1	2,190–2,510	42–48 (26–30)
			S1→S2	5,780–6,350	60–66 (37–41)
		Half throttle (2.6 volt)	S2→S3	5,800–6,210	111–119 (69–74)
			S3→S2	3,460–3,660	102–108 (63–67)
			S2→S1	2,190–2,510	42–48 (26–30)
S1→S2			3,950–4,520	41–47 (25–29)	
S2→S3			3,970–4,390	76–84 (47–52)	
S3→S2			1,420–1,630	42–48 (26–30)	
L	Fully opened (4.3 volt)	L1→L2	5,780–6,350	60–66 (37–41)	
		L2→L1	2,190–2,510	42–48 (26–30)	
	Half throttle (2.6 volt)	L1→L2	4,040–4,620	42–48 (26–30)	
Hold	D	—	D2→D3	890–1,200	17–23 (11–14)
			D3→D2	200–470	6–14 (4–9)
			OD→D3	3,830–3,980	157–163 (97–101)
	S	Fully closed (0.8 volt)	S3→S2	3,800–4,000	112–118 (69–73)
	L	L2→L1	2,350–2,660	45–51 (28–32)	

Item		Model	N4A-EL		
Shift point (convertible)					
Mode	Range	Throttle condition (Throttle sensor voltage)	Shift	Turbine speed (rpm)	Vehicle speed km/h (mph)
Normal	D	Fully opened (4.3 volt)	D1→D2	5,960—6,560	59—65 (37—40)
			D2→D3	5,910—6,350	108—116 (67—72)
			D3→OD	5,330—5,690	150—160 (93—99)
		Half throttle (2.6 volt)	D1→D2	4,040—4,640	40—46 (25—29)
			D2→D3	4,050—4,490	74—82 (46—51)
			Lockup ON (D3)	3,450—3,660	97—103 (60—64)
			D3→OD	3,910—4,190	110—118 (68—73)
			Lockup ON (OD)	2,810—3,020	110—118 (68—73)
			Lockup OFF (OD)	2,120—2,330	83—91 (51—56)
			OD→D3	2,120—2,330	83—91 (51—56)
		Kickdown	D3→D2	1,460—1,740	41—49 (25—30)
			OD→D3	3,530—3,790	138—148 (86—92)
	D3→D2		3,410—3,700	96—104 (60—64)	
	S	Fully opened (4.3 volt)	D2→D1	2,190—2,520	40—46 (25—29)
			S1→S2	5,960—6,560	59—65 (37—40)
			S2→S3	5,910—6,350	108—116 (67—72)
			S3→S2	3,450—3,660	97—103 (60—64)
		Half throttle (2.6 volt)	S2→S1	2,190—2,520	40—46 (25—29)
			S1→S2	4,040—4,640	40—46 (25—29)
			S2→S3	4,110—4,440	75—81 (47—50)
S3→S2			1,460—1,740	41—49 (25—30)	
L1→L2			5,960—6,560	59—65 (37—40)	
L	Fully opened (4.3 volt)	L2→L1	2,190—2,520	40—46 (25—29)	
	Half throttle (2.6 volt)	L1→L2	4,040—4,640	40—46 (25—29)	
Hold	D	—	D2→D3	930—1,260	17—23 (11—14)
			D3→D2	210—500	6—14 (4—9)
			OD→D3	3,840—3,990	150—156 (93—97)
	S	Fully closed (0.8 volt)	S3→S2	3,800—4,020	107—113 (66—70)
	L		L2→L1	2,350—2,680	43—49 (27—30)

# TD TECHNICAL DATA

Item		Model	N4A-EL
Line pressure	Shift position	Engine speed	750 ± 25
	R range kPa (kg/cm <sup>2</sup> , psi)	Idle	638—736 (6.5—7.5, 92—107)
		Stall	1,864—2,060 (19.0—21.0, 270—299)
	D (Normal) range kPa (kg/cm <sup>2</sup> , psi)	Idle	294—392 (3.0—4.0, 43—57)
		Stall	883—1,079 (9.0—11.0, 128—156)
	S (Normal) range kPa (kg/cm <sup>2</sup> , psi)	Idle	294—392 (3.0—4.0, 43—57)
		Stall	883—1,079 (9.0—11.0, 128—156)
	S (Hold) range kPa (kg/cm <sup>2</sup> , psi)	Idle	294—392 (3.0—4.0, 43—57)
Stall		638—834 (6.5—8.5, 92—121)	
L range kPa (kg/cm <sup>2</sup> , psi)	Idle	294—392 (3.0—4.0, 43—57)	
	Stall	883—1,079 (9.0—11.0, 128—156)	
Engine stall speed		rpm	1,900—2,100
Vacuum diaphragm	Clearance between body and throttle valve mm (in)		Adjusting rod length mm (in)
	Below 27.30 (1.0748)		29.0 (1.14)
	27.30—27.80 (1.0748—1.0945)		29.5 (1.16)
	27.80—28.30 (1.0945—1.1142)		30.0 (1.18)
	28.30—28.80 (1.1142—1.1339)		30.5 (1.20)
	28.80 (1.1339) or over		31.0 (1.22)
Time lag	N ↔ D (Normal)	sec.	0.5—0.6
	N ↔ D (Hold)	sec.	0.5—0.6
	N ↔ R	sec.	0.75—0.85

## L. PROPELLER SHAFT

Item	Specification
Max. permissible run-out mm (in)	0.4 (0.016)

## M. FRONT AND REAR AXLES

Item		Specification	
		Turbo model	Non-Turbo model
Reduction ratio M/T		4.1	4.1, 4.3 (Viscous L.S.D.)
Reduction ratio A/T (convertible)		—	3.909 (4.1)
Backlash of ring gear and pinion mm (in)		0.09—0.11 (0.0035—0.0043)	
Pinion bearing preload (without pinion oil seal) N·m (in·lb)		1.3—1.8 (11.3—15.6)	
Backlash at side gear and pinion gear mm (in)		0—0.1 (0—0.004)	
Front wheel bearing end play		0 (0)	
Rear wheel bearing end play mm (in)		0—0.1 (0—0.004)	
Lubricant	Standard diff.	Above -18°C (0°F)	API Service GL-5 SAE90
		Below -18°C (0°F)	API Service GL-5 SAE80W
	Viscous L.S.D.	Above -18°C (0°F)	API Service GL-5 SAE90
		Below -18°C (0°F)	API Service GL-5 SAE80W
Oil capacity	Standard diff. liters (US qt, Imp qt)	—	1.3 (1.4, 1.1)
	Viscous L.S.D. liters (US qt, Imp qt)	1.4 (1.5, 1.2)	1.3 (1.4, 1.1)
"L" (case spread) mm (in)		204.43—204.50 (8.048—8.051)	185.43—185.50 (7.300—7.303)

Viscous L.S.D.: Viscous Limited Slip Differential

**N. STEERING SYSTEM**

Item	Type	Engine speed sensing power steering		Electronically controlled power steering
<b>Steering wheel</b>				
Outer diameter	mm (in)	380 (15.0)		
Free play	mm (in)	5—20 (0.20—0.79)		
Wheel effort	N (kg, lb)	36 (3.7, 8.1) or less	13.7—20.6 (1.4—2.1, 3.1—4.6)	
Lock-to-lock	turns	2.70	3.09	
<b>Steering Shaft</b>				
Shaft type		Collapsible		
Joint type		2-cross joint		
Tilt stroke	mm (in)	35 (1.38)		
<b>Power steering system</b>				
Gear type		Rack and pinion		
Gear ratio		∞ (infinite)		
Rack stroke	mm (in)	144 (5.67)		
Power steering fluid		ATF DEXRON-II or M-III		
Fluid capacity	liter (Us qt, Imp qt)	0.8 (0.85, 0.70)		
Fluid pressure	kPa (kg/cm <sup>2</sup> , psi)	7,848—8,339 (80—85, 1,137—1,209)		

**P. BRAKING SYSTEM**

Item			NON-TURBO		TURBO	
			Type A*	Type B*		
Brake pedal	Height (with carpet)	mm (in)	184—189 (7.24—7.44)			
	Free play	mm (in)	4—7 (0.16—0.28)			
	Reserve travel (without carpet, clearance when pedal is depressed at 58.9 N (6.0 kg, 13.2 lb))	mm (in)	100 (3.94) min.			
Master cylinder	Type		Tandem (with level sensor)			
	Bore	mm (in)	22.22 (0.875)	23.81 (0.937)		
	Fluid type		SAE J1703 or FMVSS116 DOT-3			
Front brakes (Disc)	Type		Ventilated disc, single-piston caliper	Ventilated disc, four piston caliper		
	Thickness of pad	mm (in)	Standard	9 (0.35)	11 (0.43)	
			Limit	2 (0.08)	2 (0.08)	
	Thickness of disc plate	mm (in)	Standard	22 (0.87)		
			Limit	20 (0.79)		
	Disc plate runout	mm (in)	0.1 (0.004) max.			
Wheel cylinder bore	mm (in)	50.8 (2.00)	36.12 (1.42)			
Rear brake (Disc)	Type		Solid disc	Ventilated disc		
	Thickness of pad	mm (in)	Standard	8 (0.31)		
			Limit	1 (0.04)		
	Thickness of disc plate	mm (in)	Standard	10 (0.39)	20 (0.79)	
			Limit	8 (0.31)	18 (0.71)	
	Disc plate runout	mm (in)	0.1 (0.004) max.			
Wheel cylinder bore	mm (in)	34.93 (1.375)				
Parking brake	Lever notches [Pulled at 98 N (10 kg, 22 lb)]		5—7			

Type A\*: Standard suspension models

Type B\*: Sport suspension, Auto Adjusting Suspension (AAS), or convertible top models

# TD TECHNICAL DATA

Item		NON-TURBO		TURBO
		Type A*	Type B*	
Power brake unit	Type	Single diaphragm		Tandem diaphragm
	Diameter mm (in)	238 (9.37)		188&215 (7.40&8.46)
	Push rod-to-piston clearance mm (in)	When vacuum applied to the unit is approx. 500 mmHg (19.7 inHg) 0.1—0.3 mm (0.004—0.012 in)		
	Fluid pressure per treading force when 500 mmHg (19.7 inHg) vacuum applied kPa (kg/cm <sup>2</sup> , psi)/N (kg, lb)	7,063 (72, 1,024)	8,339 (85, 1,209)	
Rear wheel hydraulic control system	Type	PBV		
	Bend portion (Master cylinder pressure) kPa (kg/cm <sup>2</sup> , psi)	2,943 (30, 427)		

Type A\*: Standard suspension models

Type B\*: Sport suspension, Auto Adjusting Suspension (AAS), or convertible top models

## Q. WHEELS AND TIRES

Item		Type	Standard			Temporary spare	
Wheel	Size		6JJx15	6-1/2JJx15	7JJx16	4Tx15	4Tx16
	Offset mm (in)		40 (1.57)			30 (1.18)	
	Pitch circle diameter mm (in)		114.3 (4.5)				
	Material		Steel	Aluminum		Steel	Aluminum
Tire	Size		205/60R15 89H	*205/60VR15	*205/55R16 88V	T135/70D15	T135/70D16
	Air pressure kPa (kg/cm <sup>2</sup> , psi)		216 (2.2, 32)			415 (4.2, 60)	
Wheel and tire	Runout limit mm (in)	Horizontal	2.0 (0.08)				
		Vertical	2.0 (0.08)				
	Maximum unbalance (at rim edge) g (oz)		9 (0.31)		8 (0.28)	—	

\*Indicates directional tires



**R. SUSPENSION**  
**Front Suspension**

Item		Type	Sport suspension		Standard suspension		
			Left side	Right side	Left side	Right side	
Suspension type			Strut				
Stabilizer	Type		Torsion bar				
	Diameter	mm (in)	24 (0.94)				
Shock absorbers			Cylindrical, double-acting				
Coil springs	Identification mark color		Green	Gray	Red	Light green	
	Wire diameter	mm (in)	12.2 (0.48)	12.0 (0.47)	12.0 (0.47)	12.0 (0.47)	
	Coil diameter	Top	mm (in)	147.2 (5.80)	147.0 (5.79)	147.0 (5.79)	147.0 (5.79)
		Bottom	mm (in)	69.8 (2.75)	70.0 (2.76)	70.0 (2.76)	70.0 (2.76)
	Free length	mm (in)	346.5 (13.64)	336.5 (13.23)	355.5 (14.00)	348.5 (13.72)	
Coil number		4.29	4.08	4.41	4.41		
Front wheel alignment (*Unladen)	Total toe-in	mm (in)	3 ± 3 (0.12 ± 0.12)				
		degree	0°18' ± 18'				
	Maximum steering angle	Inner	36° ± 2°				
		Outer	32° ± 2°				
	Camber angle		0°20' ± 30'				
	Caster angle		4°40' ± 45'				
Kingpin angle		13°45'					

**Rear Suspension**

Item		Type	Sport suspension	Standard suspension	
			Normal body	Convertible top	
Suspension type			Multilink semi-trailing		
Stabilizer	Type		Torsion bar		
	Diameter	mm (in)	14 (0.55)	12 (0.47)	
Shock absorbers			Cylindrical, double-acting		
Coil springs	Identification mark color		Purple	Orange	
	Wire diameter	mm (in)	10.1 (0.40)	10.3 (0.41)	
	Coil diameter	mm (in)	84.4 (3.32)	84.2 (3.31)	
	Free length	mm (in)	385.0 (15.16)	372.5 (14.67)	
	Coil number		9.62	9.43	
Rear wheel alignment (*Unladen)	Total toe-in	mm (in)	3 ± 3 (0.12 ± 0.12)		
		degree	0°18' ± 18'		
	Camber angle		-0°44' ± 30'		

\*Fuel tank full; radiator coolant and engine oil at specified level, and spare tire, jack, and tools in designated position

## T. BODY ELECTRICAL SYSTEM

Item		Specification (W) (BULB TRADE NO.)
Front exterior lights	Headlight (Halogen)	65/35 (HP6054, H6054)
	Turn signal/Parking light	27/8 (1157)
	Front fog light (For U.S.A.)	55
	Daytime running light (For Canada)	55
	Side marker light	3.8 (194)
Rear exterior lights	Back-up light	27 (1156)
	License plate light	7.5 (89)
	Stop/Tail light	27/8 (1157)
	High mounted stop light	27 (1156)
	Turn signal light	27 (1156)
	Side marker light	3.8 (194)

Item		Specification (W) and Bulb trade number
Interior lights	Interior light	10
	Glove compartment light	3.4 (158)
	Courtesy light	
	Luggage compartment light	5
Map light		
Warning lights	Overheat exhaust system	1.4
	Add coolant	
	Washer level	
	Alternator	
	Front doors	
	Engine oil level	
	Check	
	Brake	
	Anti-lock	
	Seat belt	
	Rear glass hatch	
	Cooling fan	
	Fuel	
Indicator	Shift up	3.4 (158)
	Hazard	
	High beam	
	Turn signal	3.4
	Security light	
	Cooling fan (In meter unit)	
Illumination lights	Main	1.4
	Cruise	
	O/D OFF	
	Automatic selector	
Cigarette lighter		
Door key	1.4	
	Ignition key	3.4
	Meter	

**U. HEATING AND AIR CONDITIONING SYSTEMS**

Item		Specifications
Refrigerant amount		800 g (28.2 oz)
Compressor oil amount cc (cu in)	Nippondenso compressor	60—100 (3.7—6.1)
	Sanden compressor	135 (8.2)
Refrigerant normal pressure at 25°C (77°F) kPa (kg/cm <sup>2</sup> , psi)		Low pressure: 98—167 (1.0—1.7, 14—24) High pressure: 1,030—1,324 (10.5—13.5, 149—192)

**STANDARD BOLT AND NUT TIGHTENING TORQUE**

Diameter mm (in)	Pitch mm (in)	4T			6T			8T		
		N·m	m·kg	ft·lb	N·m	m·kg	ft·lb	N·m	m·kg	ft·lb
6 (0.236)	1 (0.039)	4.2—6.2	0.43—0.63	3.1—4.6	6.9—9.8	0.7—1.0	5.0—7.2	7.8—11.8	0.8—1.2	5.8—8.8
8 (0.315)	1.25 (0.049)	9.8—14.7	1.0—1.5	7.2—10.8	16—23	1.6—2.3	12—17	18—26	1.8—2.7	13—20
10 (0.394)	1.25 (0.049)	20—28	2.0—2.9	14—21	31—46	3.2—4.1	23—34	36—54	3.7—5.5	27—40
12 (0.472)	1.5 (0.059)	34—50	3.5—5.1	25—37	55—80	5.6—8.2	41—59	63—93	6.4—9.5	46—69
14 (0.551)	1.5 (0.059)	—	—	—	75—103	7.7—10.5	56—76	102—137	10—14	75—101
16 (0.630)	1.5 (0.059)	—	—	—	116—157	12—16	85—116	156—211	16—22	115—156
18 (0.709)	1.5 (0.059)	—	—	—	167—225	17—23	123—166	221—299	23—31	163—221
20 (0.787)	1.5 (0.059)	—	—	—	231—314	24—32	171—231	308—417	31—43	227—307
22 (0.866)	1.5 (0.059)	—	—	—	314—423	32—43	231—312	417—564	43—58	307—416
24 (0.945)	1.5 (0.059)	—	—	—	475—546	41—56	298—403	536—726	55—74	396—536