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QUICK REFERENCE INDEX

**NISSAN
 FRONTIER**
 MODEL D22 SERIES

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FOREWORD

This manual contains maintenance and repair procedures for the 2004 NISSAN FRONTIER.

In order to assure your safety and the efficient functioning of the vehicle, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the technician and the efficient functioning of the vehicle.

The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately. Service varies with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by NISSAN must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the service method selected.



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Technical Publications Department
Gardena, California



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Please describe any issues or problems in detail:

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QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH KA24DE ENGINE

2004

QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH KA24DE ENGINE

PFP:00027

Engine Tune-Up Data

ELS0000U

Engine		KA24DE
Classification		Gasoline
Cylinder arrangement		In-line 4
Displacement		2,389 cm ³ (145.78 cu in)
Bore and stroke		89 x 96 mm (3.50 x 3.78 in)
Valve arrangement		DOHC
Firing order		1-3-4-2
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		5
Compression ratio		9.2
Cap relief pressure	Standard kPa (kg/cm ² , psi)	78 - 98 (0.8 - 1.0, 11 - 14)
	Limit kPa (kg/cm ² , psi)	59 (0.6, 9)
Leakage test pressure kPa (kg/cm ² , psi)		157 (1.6, 23)
Oil drain plug tightening specification		29.4 - 39.2 N·m (3.0 - 4.0 kg·m, 21.69 - 28.91 lb-ft)

Idle Speed and Ignition Timing

Base idle speed*1 rpm	No-load*3 (in "P" or "N" position)	750±50
Target idle speed*2 rpm	No-load*3 (in "P" or "N" position)	800±50
Air conditioner: ON rpm	In "P" or "N" position	875 or more
Ignition timing*1	In "P" or "N" position	20°±2° BTDC

*1: Throttle position sensor harness connector disconnected or using CONSULT-II "WORK SUPPORT" mode

*2: Throttle position sensor harness connector connected

*3: Under the following conditions:

- Air conditioner switch: OFF
- Electrical load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Drive Belt Deflection and Tension

	Deflection adjustment Unit: mm (in)			Tension adjustment *1 Unit: N (kg, lb)		
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Generator	17 (0.67)	10 - 12 (0.39 - 0.47)	8 - 10 (0.31 - 0.39)	222.4 (22.7, 50)	355.8 - 444.8 (36.3 - 45.4, 80 - 100)	489.3 - 578.2 (49.9 - 59.0, 110 - 130)
Air conditioner compressor	16 (0.63)	10 - 12 (0.39 - 0.47)	8 - 10 (0.31 - 0.39)	200.2 (20.4, 45)	355.8 - 444.8 (36.3 - 45.4, 80 - 100)	489.3 - 578.2 (49.9 - 59.0, 110 - 130)
Power steering oil pump	17 (0.67)	10 - 13 (0.39 - 0.51)	8 - 10 (0.31 - 0.39)	222.4 (22.7, 50)	355.8 - 444.8 (36.3 - 45.4, 80 - 100)	489.3 - 578.2 (49.9 - 59.0, 110 - 130)
Applied pushing force	98 N (10 kg, 22 lb)			—		

*1: If belt tension gauge cannot be installed at check point shown, check belt tension at a different location on the belt.

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Spark Plugs (Double Platinum Tipped)

Make	NGK
Standard type	PFR5G-11
Cold type	PFR6G-11
Plug gap	Nominal 1.1 mm (0.043 in)
Spark plug tightening specification	20 - 29 N·m (2.0 - 3.0 kg-m, 14 - 22 ft-lb)

Wheel Bearing (Front)

ELS000QB

Wheel bearing axial end play	mm (in)	0 (0)	
Wheel bearing lock nut	Tightening torque	N·m (kg-m, ft-lb)	34 - 39 (3.5 - 4.0, 25 - 29)
	Return angle	degree	45° - 60°
Wheel bearing starting torque	At wheel hub bolt With new grease seal	N (kg, lb)	9.8 - 28.4 (1.0 - 2.9, 2.2 - 6.4)
	With used grease seal	N (kg, lb)	9.8 - 23.5 (1.0 - 2.4, 2.2 - 5.3)

Clutch Pedal

ELS000QC

Unit: mm (in)

Clearance between pedal stopper bracket and clutch interlock switch (with clutch pedal fully depressed.)	0.1 - 1.0 (0.004 - 0.039)
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*: Measured from surface of dash lower panel to pedal pad.

Front Wheel Alignment (Unladen*1)

ELS000Q7

Camber	Degree minute (Decimal degree)	Minimum	-0°05' (-0.08°)	
		Nominal	0°25' (0.42°)	
		Maximum	0°55' (0.92°)	
		Left and right difference	45' (0.75°) or less	
Caster	Degree minute (Decimal degree)	Minimum	0°06' (0.10°)	
		Nominal	0°36' (0.60°)	
		Maximum	1°06' (1.10°)	
		Left and right difference	45' (0.75°) or less	
Kingpin inclination	Degree minute (Decimal degree)	Minimum	8°35' (8.58°)	
		Nominal	9°05' (9.08°)	
		Maximum	9°35' (9.58°)	
Total toe-in	Distance mm (in)	Radial tire	Minimum	2 (0.08)
			Nominal	3 (0.12)
			Maximum	4 (0.16)
	Angle (left plus right) Degree minute (Decimal degree)	Radial tire	Minimum	11' (0.18°)
			Nominal	16' (0.27°)
			Maximum	20' (0.33°)
Wheel turning angle	Full turn*2	Inside Degree minute (Decimal degree)	Minimum	P225/70R15 31°48' (31.80°)
			Nominal	33°48' (33.80°)
			Maximum	33°48' (33.80°)
		Outside Degree minute (Decimal degree)	Minimum	28°36' (28.60°)
			Nominal	30°36' (30.60°)
			Maximum	30°36' (30.60°)
Vehicle posture	Lower arm pivot height	mm (in)	115 - 119 (4.53 - 4.69)	

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*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

*2: Wheel turning force (at circumference of steering wheel) of 98 to 147 N (10 to 15 kg, 22 to 33 lb) with engine idle.

Rear Wheel Alignment (Unladen*)

ELS000Q8

Camber Degree minute (decimal degree)		Minimum	-1°45' (-1.75°)
		Nominal	-1°00' (-1.00°)
		Maximum	-0°15' (-0.25°)
Total toe-in	Distance mm (in)	Minimum	-3 (-0.12)
		Nominal	1 (0.04)
		Maximum	5 (0.20)
	Angle (left plus right) Degree minute (decimal degree)	Minimum	-16' (-0.27°)
		Nominal	5'30" (0.09°)
		Maximum	26' (0.43°)

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

Brake

ELS000P4

Unit: mm (in)

Front brake	Brake model	CL28VD
	Cylinder bore diameter × number of pistons	42.8 (1.685) x 2
	Pad Length × width × thickness	146.6 x 48.5 x 10 (5.77 x 1.909 x 0.39)
	Rotor outer diameter × thickness	260 x 26 (10.2 x 1.02)
Rear brake	Brake model	LT26B
	Cylinder bore diameter	22.22 (7/8)
	Lining length × width × thickness	249.6 x 40 x 5.5 (9.83 x 1.57 x 0.217)
	Drum inner diameter	260.0 (10.23)
Master cylinder	Bore diameter	25.40 (1)
Brake booster	Booster model	M195T
	Diaphragm diameter	Pri: 205 (8.07) Sec: 180 (7.09)
Recommended brake fluid		DOT 3

Disc Brake - Repair Limits

Unit: mm (in)

Brake model		CL28VD
Pad	Wear limit minimum thickness	2.0 (0.079)
	Standard pad thickness	10 (0.39)
Rotor repair limit	Minimum thickness	24.0 (0.945)
Rotor runout	Maximum	0.07 (0.0028)
Rotor thickness variation	Maximum	0.02 (0.0008)

Drum Brake - Repair Limits

Unit: mm (in)

Brake model		LT26B
Lining wear limit	Minimum thickness	1.5 (0.059)
	Standard thickness	5.5 (0.217)
Drum repair limit	Maximum inner diameter	261.5 (10.30)
	Out-of-round limit	0.03 (0.0012)

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Refill Capacities

ELS000PA

			Capacity (Approximate)		
			US measure	Imp measure	Liter
Engine oil	Drain and Refill	With oil filter	3-3/4 qt	3-1/8 qt	3.5
		Without oil filter	3-1/2 qt	2-7/8 qt	3.3
	Dry engine (Engine overhaul)		4-1/2 qt	3-3/4 qt	4.1
Cooling system (With reservoir)		MT	7-3/4 qt	6-3/8 qt	7.3
		AT	7-1/2 qt	6-1/4 qt	7.1
Manual transmission gear oil (FS5W71C)			4-1/4 pt	3-1/2 pt	2.0
Differential carrier gear oil		C200	2-3/8 pt	2-1/4 pt	1.3
Automatic transmission fluid			8-3/8 qt	7 qt	7.9
Power steering fluid			30.4-33.8 fl oz	31.7-35.2 fl oz	0.9-1.0

QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH VG33E/ VG33ER ENGINES

2004

QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH VG33E/VG33ER ENGINES

PFP:00027

Engine Tune-Up Data

ELS0000P

Engine		VG33E/VG33ER
Classification		Gasoline
Cylinder arrangement		V-6
Displacement		3,275 cm ³ (199.84 cu in)
Bore and stroke		91.5 x 83 mm (3.602 x 3.27 in)
Valve arrangement		OHC
Firing order		1-2-3-4-5-6
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		4
Compression ratio	VG33E	8.9:1
	VG33ER	8.3:1
Cap relief pressure	Standard kPa (kg/cm ² , psi)	78 - 98 (0.8 - 1.0, 11 - 14)
	Limit kPa (kg/cm ² , psi)	59 (0.6, 9)
Leakage test pressure kPa (kg/cm ² , psi)		157 (1.6, 23)
Oil drain plug tightening specification		29 - 39 N·m (3.0 - 4.0 kg·m, 22 - 29 lb·ft)

Idle Speed and Ignition Timing - VG33E

Base idle speed*1	No-load*4 (in "P" or N" position)	700±50 rpm
Target idle speed*2	No-load*4 (in "P" or N" position)	750±50 rpm
Air conditioner: ON	In "P" or N" position	850 rpm or more
Ignition timing*3	In "P" or N" position	10°±2° BTDC
Throttle position sensor idle position		0.15 - 0.85V

*1: Throttle position sensor harness connector disconnected or using CONSULT-II "WORK SUPPORT" mode

*2: Throttle position sensor harness connector connected

*3: Throttle position sensor harness connector disconnected

*4: Under the following conditions:

- Air conditioner switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

Idle Speed and Ignition Timing - VG33ER

Base idle speed*1	No-load*4 (in "P" or N" position)	700±50 rpm
Target idle speed*2	No-load*4 (in "P" or N" position)	750±50 rpm
Air conditioner: ON	In "P" or N" position	850 rpm or more
Ignition timing*3	In "P" or N" position	10°±2° BTDC
Throttle position sensor idle position		0.15 - 0.85V

*1: Throttle position sensor harness connector disconnected or using CONSULT-II "WORK SUPPORT" mode

*2: Throttle position sensor harness connector connected

*3: Throttle position sensor harness connector disconnected

*4: Under the following conditions:

- Air conditioner switch: OFF
- Electric load: OFF (Lights, heater fan & rear window defogger)
- Steering wheel: Kept in straight-ahead position

QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH VG33E/ VG33ER ENGINES

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Drive Belt Deflection and Tension

	Deflection adjustment Unit: mm (in)			Tension adjustment *1 Unit: N (kg, lb)		
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Generator	11 (0.43)	7 - 8 (0.24 - 0.31)	6 - 7 (0.24 - 0.28)	226 (23, 51)	554.1 - 642.4 (56.5 - 65.5, 124.6 - 144.4)	671.8 - 760.0 (68.5 - 77.5, 151.0 - 170.9)
Air conditioner compressor - VG33E	18 (0.71)	12 - 13 (0.47 - 0.51)	10.5 - 11.5 (0.413 - 0.453)	196 (20, 44)	495.3 - 583.5 (50.5 - 59.5, 111.4 - 131.2)	603.1 - 691.4 (61.5 - 70.5, 135.6 - 155.5)
Air conditioner compressor and supercharger - VG33ER	16.5 (0.65)	9.5 - 10.5 (0.374 - 0.413)	8.5-9.5 (0.33 - 0.37)	294 (30 , 66)	730 - 818 (75.5 - 83.5, 166.5 - 184.1)	838 - 926 (85.5 - 94.5, 188.5 - 208.4)
Power steering oil pump	15 (0.59)	9.5 - 10.5 (0.374 - 0.413)	8 - 9 (0.31 - 0.35)	275 (28, 62)	554.1 - 642.4 (56.5 - 65.5, 124.6 - 144.4)	671.8 - 760.0 (68.5 - 77.5, 151.0 - 170.9)
Applied pushing force	98 N (10 kg, 22 lb)			—		

*1: If belt tension gauge cannot be installed at check point shown, check belt tension at a different location on the belt.

Spark plug (VG33E):

Description	NGK (Double Platinum Tipped)
Hot type	PFR4G-11
Standard type	PFR5G-11
Cold type	PFR6G-11
Plug gap	Nominal 1.1 mm (0.043 in)
Spark plug tightening specification	20 - 29 N-m (2.0 - 3.0 kg-m, 14 - 22 ft-lb)

Spark plug (VG33ER):

Description	NGK (Double Platinum Tipped)
Hot type	PFR5G-11
Standard type	PFR6G-11
Cold type	PFR7G-11
Plug gap	Nominal 1.1 mm (0.043 in)
Spark plug tightening specification	20 - 29 N-m (2.0 - 3.0 kg-m, 14 - 22 ft-lb)

Wheel Bearing (Front) 2WD MODELS

ELS000QD

Wheel bearing axial end play mm (in)		0 (0)
Wheel bearing lock nut	Tightening torque N-m (kg-m, ft-lb)	34 - 39 (3.5 - 4.0, 25 - 29)
	Return angle degree	45° - 60°
Wheel bearing starting torque	At wheel hub bolt With new grease seal N (kg, lb)	9.8 - 28.4 (1.0 - 2.9, 2.2 - 6.4)
	With used grease seal N (kg, lb)	9.8 - 23.5 (1.0 - 2.4, 2.2 - 5.3)

QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH VG33E/ VG33ER ENGINES

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4WD MODELS

Wheel bearing lock nut	Tightening torque N-m (kg-m, ft-lb)	78 - 98 (8 - 10, 58 - 72)
	Retightening torque after loosening wheel bearing lock nut N-m (kg-m, ft-lb)	0.5 - 1.5 (0.05 - 0.15, 0.4 - 1.1)
	Axial end play mm (in)	0 (0)
	Starting force at wheel hub bolt N (kg, lb)	A
	Turning angle degree	15° - 30°
	Starting force at wheel hub bolt N (kg, lb)	B
Wheel bearing preload at wheel hub bolt N (kg, lb)	B - A	7.06 - 20.99 (0.72 - 2.14, 1.59 - 4.72)

Clutch Pedal

ELS000QE

Unit: mm (in)

Clearance between pedal stopper bracket and clutch interlock switch (with clutch pedal fully depressed.)	0.1 - 1.0 (0.004 - 0.039)
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*: Measured from surface of dash lower panel to pedal pad.

Front Wheel Alignment (Unladen*1) 2WD MODELS

ELS000PR

Camber Degree minute (Decimal degree)	Minimum	0°03' (0.05°)			
	Nominal	0°33' (0.55°)			
	Maximum	1°03' (1.05°)			
	Left and right difference	45' (0.75°) or less			
Caster Degree minute (Decimal degree)	Minimum	2°04' (2.07°)			
	Nominal	2°34' (2.57°)			
	Maximum	3°04' (3.07°)			
	Left and right difference	45' (0.75°) or less			
Kingpin inclination Degree minute (Decimal degree)	Minimum	10°23' (10.38°)			
	Nominal	10°53' (10.88°)			
	Maximum	11°23' (11.38°)			
Total toe-in	Distance (A - B) mm (in)	Radial tire	Minimum	3 (0.12)	
		Radial tire	Nominal	4 (0.16)	
			Maximum	5 (0.20)	
	Angle (left plus right) Degree minute (Decimal degree)		Radial tire	Minimum	15' (0.25°)
		Radial tire	Nominal	20' (0.33°)	
			Maximum	25' (0.42°)	
Wheel turning angle	Full turn*2	Inside Degree minute (Decimal degree)		VG33E	VG33ER
			Minimum	31°00' (31.00°)	30°48' (30.80°)
			Nominal	33°00' (33.00°)	32°48' (32.80°)
		Outside Degree minute (Decimal degree)	Minimum	29°00' (29.00°)	28°42' (28.70°)
			Nominal	31°00' (31.00°)	30°42' (30.70°)
			Maximum	31°00' (31.00°)	30°42' (30.70°)
Vehicle posture	Lower arm pivot height (H) mm (in)	37.7 - 41.7 (1.484 - 1.642)			

*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

*2: Wheel turning force (at circumference of steering wheel) of 98 to 147 N (10 to 15 kg, 22 to 33 lb) with engine idle.

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4WD MODEL

		VG33E	VG33ER		
Camber Degree minute (Decimal degree)	Minimum		0°06' (0.10°)	0°03' (0.05°)	
	Nominal		0°36' (0.60°)	0°33' (0.55°)	
	Maximum		1°06' (1.10°)	1°03' (1.05°)	
	Left and right difference		45' (0.75°) or less		
Caster Degree minute (Decimal degree)	Minimum		1°40' (1.67°)	2°04' (2.07°)	
	Nominal		2°10' (2.17°)	2°34' (2.57°)	
	Maximum		2°40' (2.67°)	3°04' (3.07°)	
	Left and right difference		45' (0.75°) or less		
Kingpin inclination Degree minute (Decimal degree)	Minimum		10°18' (10.30°)		
	Nominal		10°48' (10.80°)		
	Maximum		11°18' (11.30°)		
Total toe-in	Distance (A – B) mm (in)	Radial tire	Minimum	3 (0.12)	
			Nominal	4 (0.16)	
			Maximum	5 (0.20)	
	Angle (left plus right) Degree minute (Decimal degree)	Radial tire	Minimum	15' (0.25°)	
			Nominal	20' (0.33°)	
			Maximum	25' (0.42°)	
Wheel turning angle	Full turn*2	Inside Degree minute (Decimal degree)	Minimum	31°00' (31.00°)	30°48' (30.80°)
			Nominal	33°00' (33.00°)	32°48' (32.80°)
			Maximum	33°00' (33.00°)	32°48' (32.80°)
		Outside Degree minute (Decimal degree)	Minimum	29°00' (29.00°)	28°42' (28.70°)
			Nominal	31°00' (31.00°)	30°42' (30.70°)
			Maximum	31°00' (31.00°)	30°42' (30.70°)
Vehicle posture	Lower arm pivot height (H) mm (in)		45.5 - 49.5 (1.791 - 1.949)	37.7 - 41.7 (1.484 - 1.642)	

*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

*2: Wheel turning force (at circumference of steering wheel) of 98 to 147 N (10 to 15 kg, 22 to 33 lb) with engine idle.

Rear Wheel Alignment (Unladen*)

ELS0000R

Camber Degree minute (decimal degree)	Minimum		-1°45' (-1.75°)
	Nominal		-1°00' (-1.00°)
	Maximum		-0°15' (-0.25°)
Total toe-in	Distance mm (in)	Minimum	-3 (-0.12)
		Nominal	1 (0.04)
		Maximum	5 (0.20)
	Angle (left plus right) Degree minute (decimal degree)	Minimum	-16' (-0.27°)
		Nominal	5'30" (0.09°)
		Maximum	26' (0.43°)

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH VG33E/ VG33ER ENGINES

2004

Brake

ELS000C9

Unit: mm (in)

Front brake	Brake model	CL33VD
	Cylinder bore diameter × number of pistons	46.4 (1.827) x 2
	Pad Length × width × thickness	132.0 x 52.5 x 11 (5.20 x 2.067 x 0.43)
	Rotor outer diameter × thickness	283 x 28 (11.4 x 1.10)
Rear brake	Brake model	LT30A
	Cylinder bore diameter	22.22 (7/8)
	Lining length × width × thickness	296 × 50 × 6.1 (11.65 × 1.97 × 0.240)
	Drum inner diameter	295.0 (11.61)
Master cylinder	Bore diameter	25.40 (1)
Brake booster	Booster model	M230t
	Diaphragm diameter	Pri: 230 (9.06) Sec: 230 (9.06)
Recommended brake fluid		DOT 3

Disc Brake - Repair Limits

Unit: mm (in)

Brake model		CL33VD
Pad	Wear limit minimum thickness	2.0 (0.079)
	Standard pad thickness	10 (0.39)
Rotor repair limit	Minimum thickness	26.0 (1.024)
Rotor runout	Maximum	0.07 (0.0028)
Rotor thickness variation	Maximum	0.02 (0.0008)

Drum Brake - Repair Limits

Unit: mm (in)

Brake model		LT30A
Lining wear limit	Minimum thickness	1.5 (0.059)
	Standard thickness	5.8 (0.228)
Drum repair limit	Maximum inner diameter	296.5 (11.67)
	Out-of-round limit	0.03 (0.0012)

Refill Capacities

ELS000QA

			Capacity (Approximate)		
			US measure	Imp measure	Liter
Engine oil	Drain and refill	With oil filter	3-1/2 qt	2-7/8 qt	3.3
		Without oil filter	3-1/8 qt	2-5/8 qt	3.0
	Dry engine (Engine overhaul)		4 qt	3-3/8 qt	3.8
Cooling system (With reservoir)			11-5/8 qt	9-5/8 qt	10.95
Manual transmission gear oil (FS5R30A)		2WD	5-7/8 pt	4-7/8 pt	2.8
		4WD	10-3/4 pt	9 pt	5.1
Transfer fluid (TX10A)			2-3/8 qt	2 qt	2.2
Differential carrier gear oil	Front (4WD) R200A		3-3/4 pt	3-1/8 pt	1.75
	Rear H233B		5-7/8 pt	4-7/8 pt	2.8

QUICK REFERENCE CHART: FRONTIER EQUIPPED WITH VG33E/ VG33ER ENGINES

2004

		Capacity (Approximate)		
		US measure	Imp measure	Liter
Automatic transmission fluid	2WD	8-3/4 qt	7-1/4 qt	8.3
	4WD	9 qt	7-1/2 qt	8.5
Power steering fluid		33.8-37.2 fl oz	35.2-38.7 fl oz	1.0-1.1