

Edition: September 2002
Revision: May 2004
Publication No. SM3E-1L31U2

NISSAN ALTIMA

MODEL L31 SERIES

QUICK REFERENCE INDEX

A GENERAL INFORMATION	GI General Information
B ENGINE	EM Engine Mechanical
	LU Engine Lubrication System
	CO Engine Cooling System
	EC Engine Control System
	FL Fuel System
	EX Exhaust System
	ACC Accelerator Control System
C TRANSMISSION/ TRANSAXLE	CL Clutch
	MT Manual Transaxle
	AT Automatic Transaxle
D DRIVELINE/AXLE	FAX Front Axle
	RAX Rear Axle
E SUSPENSION	FSU Front Suspension
	RSU Rear Suspension
	WT Road Wheels & Tires
F BRAKES	BR Brake System
	PB Parking Brake System
	BRC Brake Control System
G STEERING	PS Power Steering System
H RESTRAINTS	SB Seat Belts
	SRS Supplemental Restraint System (SRS)
I BODY	BL Body, Lock & Security System
	GW Glasses, Window System & Mirrors
	RF Roof
	EI Exterior & Interior
	IP Instrument Panel
	SE Seat
J AIR CONDITIONER	ATC Automatic Air Conditioner
	MTC Manual Air Conditioner
K ELECTRICAL	SC Starting & Charging System
	LT Lighting System
	DI Driver Information System
	WW Wiper, Washer & Horn
	BCS Body Control System
	LAN LAN System
	AV Audio Visual & Telephone System
	ACS Auto Cruise Control System
	PG Power Supply, Ground & Circuit Elements
L MAINTENANCE	MA Maintenance
M INDEX	IDX Alphabetical Index

A

B

C

D

E

F

G

H

I

J

K

L

M

FOREWORD

This manual contains maintenance and repair procedures for the 2003 NISSAN ALTIMA.

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.



NISSAN NORTH AMERICA, INC.
Technical Publications Department
• Gardena, California



PLEASE HELP MAKE THIS SERVICE MANUAL BETTER!

Your comments are important to NISSAN and will help us to improve our Service Manuals.
Use this form to report any issues or comments you may have regarding our Service Manuals.
Please print this form and type or write your comments below. Mail or fax to:

Nissan North America, Inc.
Technical Service Information
39001 Sunrise Drive, P.O. Box 9200
Farmington Hills, MI USA 48331
FAX: (248) 488-3910

SERVICE MANUAL: Model: _____ Year: _____

PUBLICATION NO. (Refer to Quick Reference Index): _____

Please describe any Service Manual issues or problems in detail:

Page number(s) _____ *Note: Please include a copy of each page, marked with your comments.*

Are the trouble diagnosis procedures logical and easy to use? (circle your answer) YES NO

If no, what page number(s)? _____ *Note: Please include a copy of each page, marked with your comments.*

Please describe the issue or problem in detail: _____

Is the organization of the manual clear and easy to follow? (circle your answer) YES NO

Please comment: _____

What information should be included in NISSAN Service Manuals to better support you in servicing or repairing customer vehicles?

DATE: _____ YOUR NAME: _____ POSITION: _____

DEALER: _____ DEALER NO.: _____ ADDRESS: _____

CITY: _____ STATE/PROV./COUNTRY: _____ ZIP/POSTAL CODE: _____

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 2.5L, QR ENGINE)

2003

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 2.5L, QR ENGINE)

PFP:00000

Engine Tune-Up Data

ELS000ME

Cylinder arrangement		In-line 4
Displacement cm ³ (cu in)		2,488 (151.82)
Bore and stroke mm (in)		89.0 x 100 (3.50 - 3.94)
Valve arrangement		DOHC
Firing order		1-3-4-2
Number of piston rings	Compression	2
	Oil	1
Compression ratio		9.5:1
Compression pressure kPa (kg/cm ² , psi) / 250 rpm	Standard	1,250 (12.8, 182)
	Minimum	1,060 (10.8, 154)
	Differential limit between cylinders	98 (1.0, 14)
Idle speed A/T (in neutral) rpm		700 ± 50
Ignition timing (BTDC at idle speed)		15° ± 5°
CO% at idle		0.3 – 9.5% and engine runs smoothly
Radiator cap relief pressure kPa (kg/cm ² , psi)	Standard	79 – 98 (0.8 – 1.0, 11 – 14)
	Limit	59 (0.6, 9)
Cooling system leakage testing pressure kPa (kg/cm ² , psi)		157 (1.6, 23)

Drive Belt Deflection and Tension

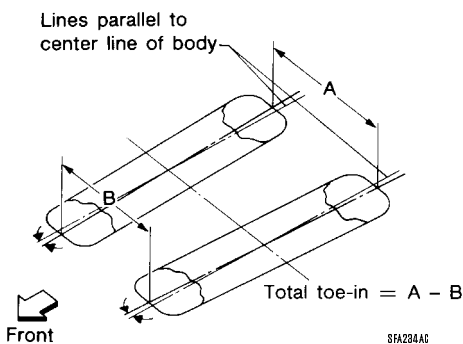
Tension of drive belts	Auto adjustment by auto-tensioner
------------------------	-----------------------------------

Spark Plugs (Double Platinum Tipped)

Type	Standard	PLFR5A-11
	Hot	PLFR4A-11
	Cold	PLFR6A-11
Plug gap		Nominal: 1.1 mm (0.043 in)

Front Wheel Alignment (Unladen*1)

ELS000MF



Tire size		205/65R16	215/55R17
Camber Degree minute (Decimal degree)	Minimum	-1°00' (-1.00°)	
	Nominal	-0°15' (-0.25°)	
	Maximum	0°30' (0.50°)	
	Left and right difference	45' (0.75°) or less	

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 2.5L, QR ENGINE)

2003

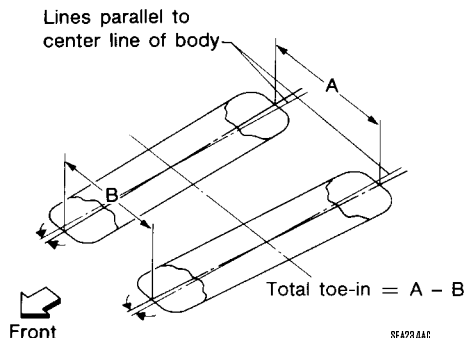
Caster Degree minute (Decimal degree)		Minimum	2°05' (2.08°)	
		Nominal	2°50' (2.83°)	
		Maximum	3°35' (3.58°)	
		Left and right difference	45' (0.75°) or less	
Kingpin inclination Degree minute (Decimal degree)		Minimum	13°50' (13.83°)	
		Nominal	14°35' (14.58°)	
		Maximum	15°20' (15.33°)	
Total toe-in	Distance (A – B) mm (in)	Minimum	–0.5 (–0.02)	
		Nominal	0.5 (0.02)	
		Maximum	1.5 (0.06)	
	Angle (left plus right) Degree minute (Decimal degree)	Minimum	–4' (–0.07°)	
		Nominal	2' (0.03°)	
		Maximum	8' (0.13°)	
Wheel turning angle Full turn*2	Inside Degree minute (Decimal degree)	Minimum	34°30' (34.5°)	32°00' (32.0°)
		Nominal	38°00' (38.0°)	35°30' (35.5°)
		Maximum	39°00' (39.0°)	36°30' (36.5°)
	Outside Degree minute (Decimal degree)	Nominal	30°30' (30.5°)	29°00' (29.0°)

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

*2: On power steering models, 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*)

ELS000MG



Camber Degree minute (Decimal degree)		Minimum	–0°04' (–0.07°)	
		Nominal	–0°34' (–0.57°)	
		Maximum	0°64' (–1.07°)	
Total toe-in	Distance (A – B) mm (in)	Minimum	2.4 (0.09)	
		Nominal	3.9 (0.15)	
		Maximum	5.4 (0.21)	
	Angle (left plus right) Degree minute (Decimal degree)	Minimum	6' (0.1°)	
		Nominal	10' (0.167°)	
		Maximum	14' (0.233°)	

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

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 2.5L, QR ENGINE)

2003

Brake

ELS000MH

Unit: mm (in)

Front brake	Brake model		CLZ25VD disc brake
	Cylinder bore diameter		57.2 (2.252)
	Pad Length × width × thickness		125.6 × 46 × 11 (4.94 × 1.81 × 0.43)
	Rotor outer diameter × thickness		296 × 26 (11.65 × 1.02)
Rear brake	Brake model		AD9V disc brake
	Cylinder bore diameter		34.9 (1.3740)
	Pad Length × width × thickness		89.1 × 39.5 × 10 (3.508 × 1.555 × 0.31)
	Rotor outer diameter × thickness		292 × 9 (11.50 × 0.35)
Master cylinder	Cylinder bore diameter		23.81 (15/16)
Control valve	Screw in type		30 × 0.4 (1.18 × 0.02)
Brake booster	Booster model		M215T
	Diaphragm diameter	Primary	230 (9.06)
		Secondary	205 (8.07)
Recommended brake fluid			Genuine NISSAN Super Heavy Duty Brake Fluid or equivalent, DOT 3 (US FMVSS No. 116)

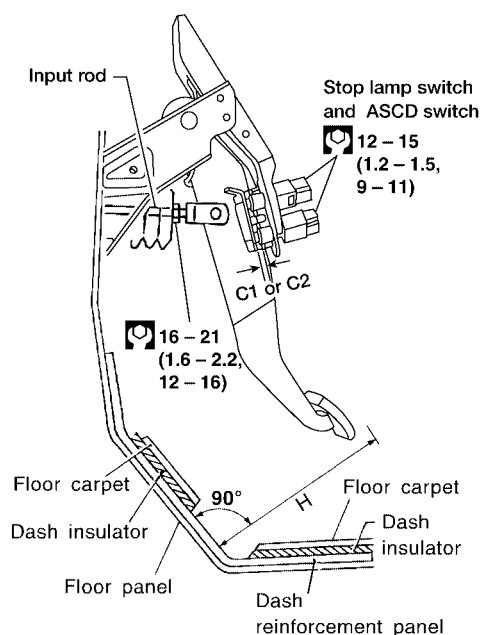
Disc Brake - Repair Limits

Unit: mm (in)

Brake model		CLZ25VD (Front)	AD9V (Rear)
Pad wear limit	Minimum thickness	2.0 (0.079)	1.5 (0.059)
	Maximum runout	0.07 (0.0028)	0.07 (0.0028)
Rotor repair limit	Minimum thickness	22.0 (0.866)	8.0 (0.31)

Brake Pedal

Unit: mm (in)



N-m (kg-m, ft-lb)

WFA0022E

Free height "H"*	M/T	164.1 - 174.1 (6.46 - 6.85)
	A/T	173.1 - 183.1 (6.81 - 7.21)
Clearance "C" between pedal stopper and threaded end of stop lamp switch or ASCD switch		0.74 - 1.96 (0.0291 - 0.0772)

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 2.5L, QR ENGINE)

2003

*: Measured from surface of dash reinforcement panel to surface of pedal pad

Refill Capacities

ELS000MI

Engine Coolant Capacity (Approximate)

Unit: ℓ (US qt, Imp qt)

Drain and refill (without reservoir)	6.9 (7 1/4, 6 1/8)
Reservoir tank (at MAX level)	0.7 (3/4, 5/8)

Engine Oil Capacity (Approximate)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.2 (4 1/2, 3 3/4)
	Without oil filter change	4.0 (4 1/4, 3 1/2)
Dry engine (engine overhaul)		4.6 (4 7/8, 4)

Miscellaneous Capacity (Approximate)

System description		Metric measurement	US measurement	Imp measure
Fuel tank		75.5 ℓ	20 gal	16 5/8 gal
Power steering system		1.0 ℓ	2 1/8 pt	1 3/4 pt
Transaxle	M/T (RS5F51A)	2.3 ℓ	2 3/8 qt	2 qt
	A/T (RE4F04B)	9.2 ℓ	9 3/4 qt	8 1/8 qt
Air conditioning system	Refrigerant	0.475 - 0.525 kg	1.045 - 1.155 lb	1.045 - 1.155 lb
	Compressor oil	150 m ℓ	5.01 fl oz	5.03 fl oz

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 3.5L, VQ ENGINE)

2003

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 3.5L, VQ ENGINE)

PFP:00027

Engine Tune-Up Data

ELS000M3

Cylinder arrangement		V-6
Displacement cm ³ (cu in)		3,498 (213.45)
Bore and stroke mm (in)		95.5 x 81.4 (3.76 - 3.205)
Valve arrangement		DOHC
Firing order		1-2-3-4-5-6
Number of piston rings	Compression	2
	Oil	1
Number of main bearings		4
Compression ratio		10.0:1
Compression pressure kPa (kg/cm ² , psi) / 250 rpm	Standard	1,275 (13.0, 185)
	Minimum	981 (10.0, 142)
	Differential limit between cylinders	98 (1.0, 14)
Idle speed rpm No-load*1 (in "P" or N" position)		700 ± 50
Ignition timing (BTDC at idle speed)		15° ± 5°
CO% at idle		0.7 – 9.9% and engine runs smoothly
Radiator cap relief pressure kPa (kg/cm ² , psi)	Standard	79 – 98 (0.8 – 1.0, 11 – 14)
	Limit	59 (0.6, 9)
Cooling system leakage testing pressure kPa (kg/cm ² , psi)		157 (1.6, 23)

*1: 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: ALTIMA (EQUIPPED WITH 3.5L, VQ ENGINE)

2003

Drive Belt Deflection and Tension

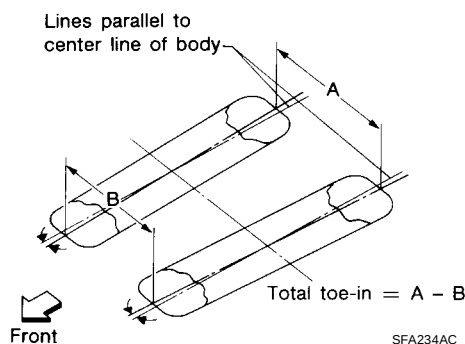
	Deflection adjustment		Unit: mm (in)	Tension adjustment		Unit: N (kg, lb)
	Used belt		New belt	Used belt		New belt
	Limit	After adjustment		Limit	After adjustment	
Alternator, Air conditioner compressor	7.0 (0.28)	4.2 - 4.6 (0.17 - 0.18)	3.7 - 4.1 (0.15 - 0.16)	294 (30, 66)	730 - 818 (74.5 - 83.5, 164 - 184)	838 - 926 (85.5 - 94.5, 188 - 208)
Power steering oil pump	11.0 (0.43)	7.3 - 8.0 (0.29 - 0.32)	6.5 - 7.2 (0.26 - 0.28)	196 (20, 44)	495 - 583 (50.5 - 59.5, 111.3 - 131.1)	603 - 691 (61.5 - 70.5, 135.6 - 155.4)

Spark Plugs (Double Platinum Tipped)

Type	Standard	PLFR5A-11
	Hot	PLFR4A-11
	Cold	PLFR6A-11
Plug gap		Nominal: 1.1 mm (0.043 in)

Front Wheel Alignment (Unladen*1)

ELS000MK



Tire size		205/65R16	215/55R17
Camber Degree minute (Decimal degree)	Minimum	-1°00' (-1.00°)	
	Nominal	-0°15' (-0.25°)	
	Maximum	0°30' (0.50°)	
	Left and right difference	45' (0.75°) or less	
Caster Degree minute (Decimal degree)	Minimum	2°05' (2.08°)	
	Nominal	2°50' (2.83°)	
	Maximum	3°35' (3.58°)	
	Left and right difference	45' (0.75°) or less	
Kingpin inclination Degree minute (Decimal degree)	Minimum	13°50' (13.83°)	
	Nominal	14°35' (14.58°)	
	Maximum	15°20' (15.33°)	
Total toe-in	Distance (A - B) mm (in)	Minimum	-0.5 (-0.02)
		Nominal	0.5 (0.02)
		Maximum	1.5 (0.06)
	Angle (left plus right) Degree minute (Decimal degree)	Minimum	-4' (-0.07°)
		Nominal	2' (0.03°)
		Maximum	8' (0.13°)

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 3.5L, VQ ENGINE)

2003

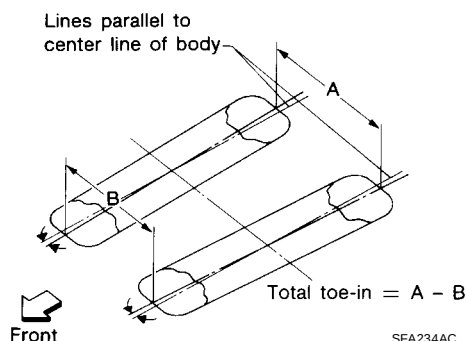
Wheel turning angle Full turn*2	Inside Degree minute (Decimal degree)	Minimum	34°30' (34.5°)	32°00' (32.0°)
		Nominal	38°00' (38.0°)	35°30' (35.5°)
		Maximum	39°00' (39.0°)	36°30' (36.5°)
	Outside Degree minute (Decimal degree)	Nominal	30°30' (30.5°)	29°00' (29.0°)

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

*2: On power steering models, 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*)

ELS000ML



Camber Degree minute (Decimal degree)		Minimum	-0°10' (-0.17°)
		Nominal	-0°40' (-0.67°)
		Maximum	-0°70' (-1.17°)
Total toe-in	Distance (A - B) mm (in)	Minimum	2.5 (0.10)
		Nominal	4.0 (0.16)
		Maximum	5.5 (0.22)
Angle (left plus right) Degree minute (Decimal degree)		Minimum	6' (0.1°)
		Nominal	10' (0.167°)
		Maximum	14' (0.233°)

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

Brake

ELS000MM

Unit: mm (in)

Front brake	Brake model		CLZ25VD disc brake
	Cylinder bore diameter		57.2 (2.252)
	Pad Length × width × thickness		125.6 × 46 × 11 (4.94 × 1.81 × 0.43)
	Rotor outer diameter × thickness		296 × 26 (11.65 × 1.02)
Rear brake	Brake model		AD9V disc brake
	Cylinder bore diameter		34.9 (1.3740)
	Pad Length × width × thickness		89.1 × 39.5 × 10 (3.508 × 1.555 × 0.31)
	Rotor outer diameter × thickness		292 × 9 (11.50 × 0.35)
Master cylinder	Cylinder bore diameter		23.81 (15/16)
Control valve	Screw in type		30 × 0.4 (1.18 × 0.02)
Brake booster	Booster model		M215T
	Diaphragm diameter	Primary	230 (9.06)
		Secondary	205 (8.07)
Recommended brake fluid			Genuine NISSAN Super Heavy Duty Brake Fluid or equivalent, DOT 3 (US FMVSS No. 116)

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 3.5L, VQ ENGINE)

2003

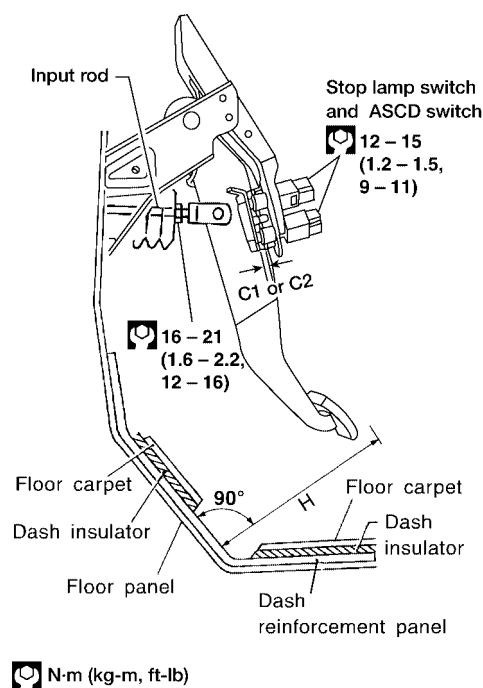
Disc Brake - Repair Limits

Unit: mm (in)

Brake model		CLZ25VD (Front)	AD9V (Rear)
Pad wear limit	Minimum thickness	2.0 (0.079)	1.5 (0.059)
	Maximum runout	0.07 (0.0028)	0.07 (0.0028)
Rotor repair limit	Minimum thickness	22.0 (0.866)	8.0 (0.31)

Brake Pedal

Unit: mm (in)



WFIA0022E

Free height "H"*	M/T	164.1 - 174.1 (6.46 - 6.85)
	A/T	173.1 - 183.1 (6.81 - 7.21)
Clearance "C" between pedal stopper and threaded end of stop lamp switch or ASCD switch		0.74 - 1.96 (0.0291 - 0.0772)

*: Measured from surface of dash reinforcement panel to surface of pedal pad

Refill Capacities

ELS000MN

Engine Coolant Capacity (Approximate)

Unit: ℓ (US qt, Imp qt)

Drain and refill (without reservoir)	7.5 (7 7/8, 6 5/8)
Reservoir tank (at MAX level)	0.7 (3/4, 5/8)

Engine Oil Capacity (Approximate)

Unit: ℓ (US qt, Imp qt)

Drain and refill	With oil filter change	4.0 (4 1/4, 3 1/2)
	Without oil filter change	3.7 (3 7/8, 3 1/4)
Dry engine (engine overhaul)		5.0 (5 1/4, 4 3/8)

Miscellaneous Capacity (Approximate)

System description	Metric measurement	US measurement	Imp measurement
Fuel tank	75.5 ℓ	20 gal	16 5/8 gal
Power steering system	1.0 ℓ	2 1/8 pt	1 3/4 pt

QUICK REFERENCE CHART: ALTIMA (EQUIPPED WITH 3.5L, VQ ENGINE)

2003

Transaxle	M/T (RS5F51A)	2.3 ℓ	2 3/8 qt	2 qt
	A/T (RE4F04B)	9.2 ℓ	9 3/4 qt	8 1/8 qt
Air conditioning system	Refrigerant	0.475 - 0.525 kg	1.045 - 1.155 lb	1.045 - 1.155 lb
	Compressor oil	150 mℓ	5.01 fl oz	5.03 fl oz