Edition: February 2004
Revision: March 2005
Publication No. SM5E-1L31U2

NISSAN ALTIMA

MODEL L31 SERIES

QUICK REFERENCE INDEX

FOREWORD

This manual contains maintenance and repair procedures for the 2005 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)

PFP:00000

Engine Tune-Up Data

ELS0012S

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 x 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, 181.3)
	Minimum	1,060 (10.8, 153.7)
	Differential limit between cylinders	100 (1.0, 14)
Idle speed rpm No-load *1, A/T (in P or N position), M/T (in neutral position)		700 ± 50
Ignition timing (BTDC at idle speed)		15° ± 5°
Radiator cap relief pressure kPa (kg/cm^2 , psi)	Standard	78 – 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, and rear window defogger)
- Steering wheel: kept in straight-ahead position

Drive Belt Deflection and Tension

Tension of drive belts	Auto adjustment by auto-tensioner

Spark Plugs (Double Platinum Tipped)

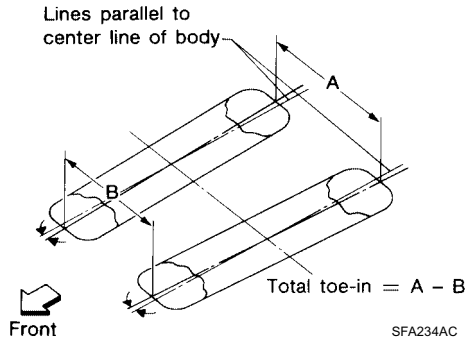
Make		NGK
Type	Standard	PLFR5A-11
	Hot	PLFR4A-11
	Cold	PLFR6A-11
Plug gap (nominal)		1.1 mm (0.043 in)

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

2005

Front Wheel Alignment (Unladen*1)

ELS001FB



Tire size			215/60R16
Model			Base / S
Camber Degree minute (Decimal degree)		Minimum	–1°00′ (–1.00°)
		Nominal	–0°15′ (–0.25°)
		Maximum	0°30′ (0.50°)
		Left and right difference	0° 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	0° 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, right) Degree minute (Decimal degree)	Minimum	–0° 4′ (–0.07°)
		Nominal	0° 2′ (0.03°)
		Maximum	0° 8′ (0.13°)
Wheel turning angle Full turn*2	Inside Degree minute (Decimal degree)	Minimum	34°30′ (34.5°)
		Nominal	38°00′ (38.0°)
		Maximum	39°00′ (39.0°)
	Outside Degree minute (Decimal degree)	Nominal	30°30′ (30.5°)

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

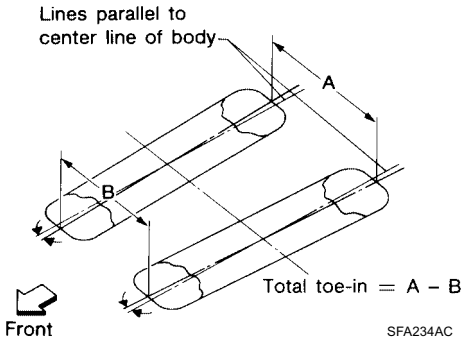
*2: With power steering, wheel turning force (at circumference of steering wheel) of 98 - 147 N (10 - 15 kg, 22 - 33 lb) with engine at idle.

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

2005

Rear Wheel Alignment (Unladen*)

ELS001FC



Tire size			215/60R16
Model			Base / S
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)
	Distance difference between RH and LH side mm (in)	Minimum	–2 (–0.08)
		Nominal	0 (0)
		Maximum	2 (0.08)
	Angle (left plus right) Degree minute (Decimal degree)	Minimum	0° 6′ (0.10°)
		Nominal	0° 10′ (0.17°)
		Maximum	0° 14′ (0.23°)

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

Brake

ELS0012V

Unit: mm (in)

Front brake	Brake model		CLZ25VD disc brake
	Cylinder bore diameter		57.2 (2.25)
	Pad Length × width × thickness		125.6 × 46 × 11 (4.94 × 1.81 × 0.43)
	Rotor outer diameter × thickness		296 × 24 (11.7 × 0.94)
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 (11.5 × 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. 16)

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

2005

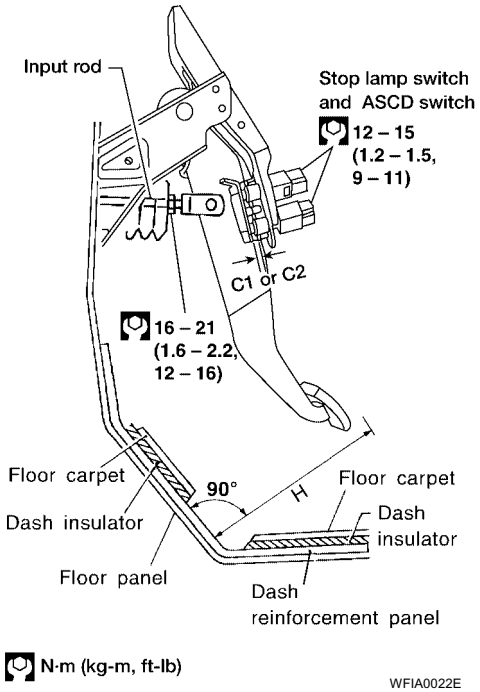
Disc Brake - Repair Limits

Unit: mm (in)

Brake model		CLZ25VD (Front)	AD9V (Rear)
Pad wear limit	Minimum thickness	2.0 (0.079)	1.5 (0.059)
Rotor repair limit	Maximum runout	0.07 (0.0028)	0.07 (0.0028)
	Minimum thickness	22.0 (0.866)	8.0 (0.31)
	Maximum thickness variation (at least 8 positions)	0.015 (0.0006)	

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 "C1 or C2" 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

ELS0012W

Description		Capacity (Approximate)		
		Liter	US measure	Imp measure
Fuel		75.6	20 gal	16 5/8 gal
Engine oil Drain and refill	With oil filter change	4.2	4 1/2 qt	3 3/4 qt
	Without oil filter change	4.0	4 1/4 qt	3 1/2 qt
Dry engine (engine overhaul)		4.6	4 7/8 qt	4 qt
Cooling system	With reservoir	7.6	2 gal	1 5/8 gal
Manual transaxle fluid (MTF)		2.2	2 3/8 qt	2 qt
Automatic transaxle (4A/T) fluid (ATF)		9.2	9 3/4 qt	8 1/8 qt
Power steering fluid (PSF)		1.0	2 1/8 pt	1 3/4 pt
Air conditioning system refrigerant		0.50 ± 0.025 kg	1.10 ± 0.055 lb	1.10 ± 0.055 lb
Air conditioning system lubricant		150 m ℓ	5.03 fl oz	5.01 fl oz

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

PFP:00000

Engine Tune-Up Data

ELS0012X

Cylinder arrangement		V-6
Displacement cm^3 (in^3)		3,498 (213.45)
Bore and stroke mm (in)		95.5 x 81.4 (3.76 x 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, A/T (in P or N position), M/T (in neutral position)	A/T	675 ± 50
	M/T	625 ± 50
Ignition timing (BTDC at idle speed)		15° ± 5°
Radiator cap relief pressure kPa (kg/cm^2, psi)	Standard	78 - 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)

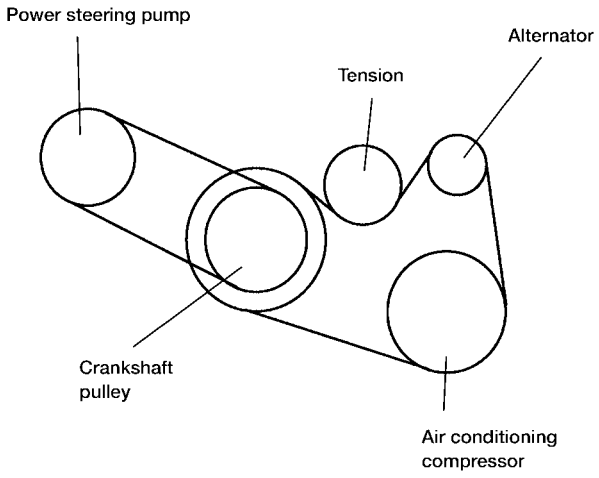
*1: Under the following conditions:

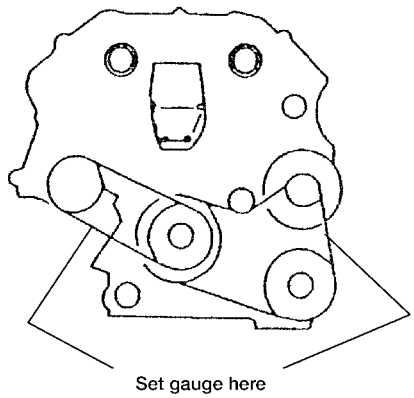
- Air conditioner switch: OFF
- Electric load: OFF (lights, heater fan and rear window defogger)
- Steering wheel: kept in straight-ahead position

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

2005

Drive Belt Deflection and Tension





LBIA0076E

	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 and air conditioning compressor	7 (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 pump	11 (0.43)	7.3 - 8 (0.29 - 0.30)	6.5 - 7.2 (0.26 - 0.28)	196 (20, 44)	495 - 583 (50.5 - 59.5, 111 - 131)	603 - 691 (61.5 - 70.5, 135.6 - 155.4)
Applied pushing force	98 N (10 kg, 22 lb)			—		

*: If belt tension gauge cannot be installed at check points shown, check drive belt tension at different location on the belt.

Spark Plugs (Double Platinum Tipped)

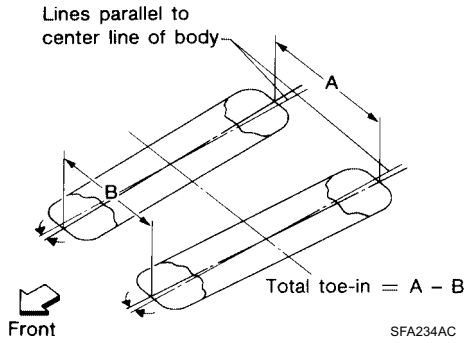
Make		NGK
Type	Standard	PLFR5A-11
	Hot	PLFR4A-11
	Cold	PLFR6A-11
Gap (nominal)		1.1 mm (0.043 in)

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

2005

Front Wheel Alignment (Unladen*1)

ELS001FG



Tire size			215/60R16	215/55R17	225/45R18
Model			SL	SE	SE-R
Camber Degree minute (Decimal degree)		Minimum	–1°00′ (–1.00°)		
		Nominal	–0°15′ (–0.25°)		
		Maximum	0°30′ (0.50°)		
		Left and right difference	0° 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	0° 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, right) Degree minute (Decimal degree)	Minimum	–0° 4′ (–0.07°)		
		Nominal	0° 2′ (0.03°)		
		Maximum	0° 8′ (0.13°)		
Wheel turning angle Full turn*2	Inside Degree minute (Decimal degree)	Minimum	34°30′ (34.5°)	32°00′ (32.0°)	32°00′ (32.0°)
		Nominal	38°00′ (38.0°)	35°30′ (35.5°)	35°30′ (35.5°)
		Maximum	39°00′ (39.0°)	36°30′ (36.5°)	36°30′ (36.5°)
	Outside Degree minute (Decimal degree)	Nominal	30°30′ (30.5°)	29°00′ (29.0°)	29°00′ (29.0°)

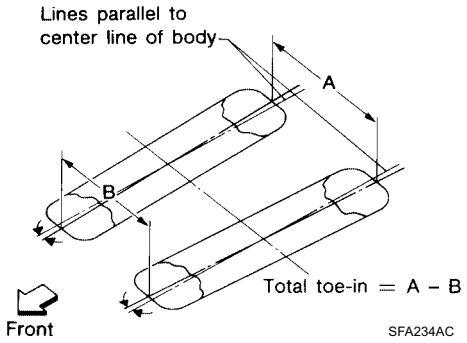
*1: Fuel, engine coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

*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.

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

Rear Wheel Alignment (Unladen*)

ELS001FH



Tire size			215/60R16 (SL) 215/55R17 (SE)	225/45R18
Model			SL / SE	SE-R
Camber Degree minute (Decimal degree)		Minimum	–0° 2′ (–0.03°)	–0° 13′ (–0.22°)
		Nominal	–0° 32′ (–0.53°)	–0° 43′ (–0.72°)
		Maximum	–1° 2′ (–1.03°)	–1° 13′ (–1.22°)
Total toe-in	Distance (A – B) mm (in)	Minimum	2.4 (0.09)	2.3 (0.09)
		Nominal	3.9 (0.15)	3.8 (0.15)
		Maximum	5.4 (0.21)	5.3 (0.21)
	Distance difference between RH and LH side mm (in)	Minimum	–2 (–0.08)	
		Nominal	0 (0)	
		Maximum	2 (0.08)	
	Angle (left plus right) Degree minute (Decimal degree)	Minimum	0° 6′ (0.10°)	
		Nominal	0° 10′ (0.17°)	
		Maximum	0° 14′ (0.23°)	

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

Brake

ELS001FI

Unit: mm (in)

Front brake	Brake model		CLZ25VD disc brake	CLZ25VE disc brake
	Cylinder bore diameter		57.2 (2.25)	
	Pad Length × width × thickness		125.6 × 46 × 11 (4.94 × 1.81 × 0.43)	111.0 × 62.5 × 9.5 (4.37 × 2.46 × 0.37)
	Rotor outer diameter × thickness		296 × 24 (11.7 × 0.94)	320 × 28 (12.6 × 1.10)
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 (11.5 × 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)

2005

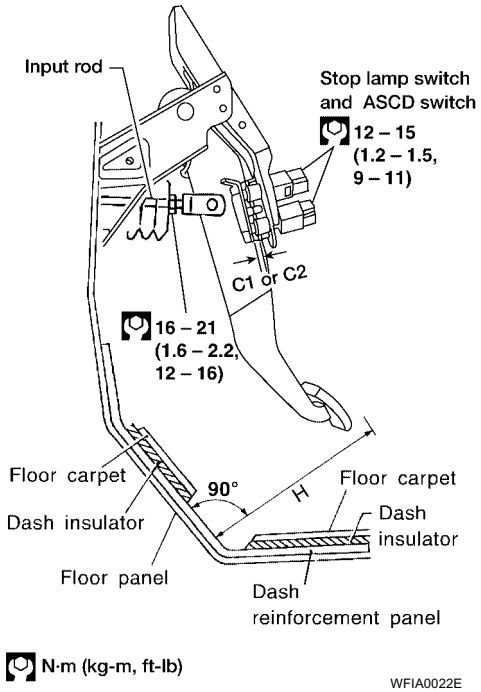
Disc Brake - Repair Limits

Unit: mm (in)

Brake model		CLZ25VD	CLZ25VE	AD9V
Pad wear limit	Minimum thickness	2.0 (0.079)	2.0 (0.079)	1.5 (0.059)
Rotor repair limit	Maximum runout	0.07 (0.0028)	0.07 (0.0028)	0.07 (0.0028)
	Minimum thickness	22.0 (0.866)	26.0 (1.02)	8.0 (0.31)
	Maximum thickness variation (at least 8 positions)	0.015 (0.0006)		

Brake Pedal

Unit: mm (in)



Free height “H”*	M/T	164.1 - 174.1 (6.46 - 6.85)
	A/T	173.1 - 183.1 (6.81 - 7.21)
Clearance “C1 or C2” 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

ELS00131

Description		Capacity (Approximate)		
		Liter	US measure	Imp measure
Fuel		75.6	20 gal	16 5/8 gal
Engine oil Drain and refill	With oil filter change	4.2	4 1/2 qt	3 3/4 qt
	Without oil filter change	4.0	4 1/4 qt	3 1/2 qt
Dry engine (engine overhaul)		4.6	4 7/8 qt	4 qt
Cooling system	With reservoir	8.2	2 1/8 gal	1 3/4 gal
Manual transaxle fluid (MTF)		2.2	2 3/8 qt	2 qt
Automatic transaxle (5A/T) fluid (ATF)		7.3	7 3/4 qt	6 3/8 qt
Power steering fluid (PSF)		1.0	2 1/8 pt	1 3/4 pt
Air conditioning system refrigerant		0.50 ± 0.025 kg	1.10 ± 0.055 lb	1.10 ± 0.055 lb
Air conditioning system lubricant		150 m ℓ	5.03 fl oz	5.01 fl oz