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NISSAN ALTIMA HYBRID MODEL HL32 SERIES

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GI General Information

EM Engine Mechanical

LU Engine Lubrication System

CO Engine Cooling System

EC Engine Control System

FL Fuel System

EX Exhaust System

STR Starting System

ACC Accelerator Control System

HBC Hybrid Control System

HBB Hybrid Battery System

HBR Hybrid Brake System

CL Clutch System

TM Transaxle & Transmission

DLN Driveline

FAX Front Axle

RAX Rear Axle

FSU Front Suspension

RSU Rear Suspension

SCS Suspension Control System

WT Road Wheels & Tires

BR Brake System

PB Parking Brake System

BRC Brake Control System

ST Steering System

STC Steering Control System

SB Seat Belt

SBC Seat Belt Control System

SRS SRS Airbag

SRC SRS Airbag Control System

VTL Ventilation System

HA Heater & Air Conditioning System

HAC Heater & Air Conditioning Control System

INT Interior

IP Instrument Panel

SE Seat

ADP Automatic Drive Positioner

DLK Door & Lock

SEC Security Control System

GW Glass & Window System

PWC Power Window Control System

RF Roof

EXT Exterior

BRM Body Repair Manual

MIR Mirrors

EXL Exterior Lighting System

INL Interior Lighting System

WW Wiper & Washer

DEF Defogger

HRN Horn

PWO Power Outlet

BCS Body Control System

LAN LAN System

PCS Power Control System

CHG Charging System

PG Power Supply, Ground & Circuit Elements

MWI Meter, Warning Lamp & Indicator

WCS Warning Chime System

SN Sonar System

AV Audio, Visual & Navigation System

CCS Cruise Control System

MA Maintenance

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FOREWORD

This manual contains maintenance and repair procedure for the 2009 NISSAN ALTIMA HYBRID.

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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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.*

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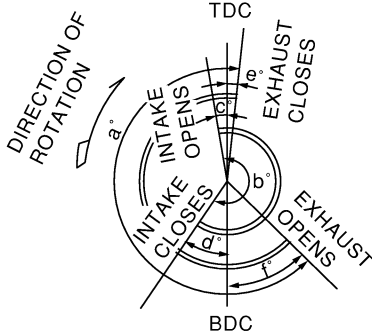
QUICK REFERENCE CHART: ALTIMA HYBRID

Engine Tune-up Data

INFOID:000000003351824

GENERAL SPECIFICATIONS

Cylinder arrangement		In-line 4
Displacement cm^3 (in ³)		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 (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)

Valve timing	 PBIC0187E	
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Unit: degree

a	b	c	d	e	f
220°	232°	-41°	93°	10°	30°

SPARK PLUG

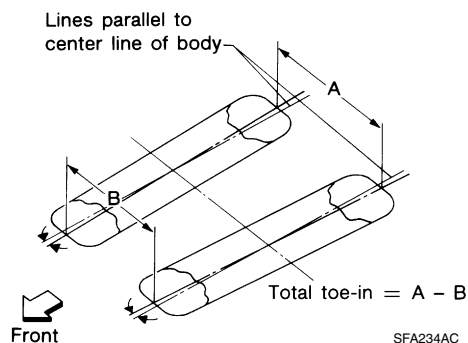
Unit: mm (in)

Make		NGK
Type	Standard	DILKAR6A-11
Gap (nominal)		1.1 (0.043)

Front Wheel Alignment

INFOID:000000003351823

Camber ★ Decimal degree	LH	Minimum	– 1.15°
		Nominal	– 0.40°
		Maximum	0.35°
	RH	Minimum	– 1.40°
		Nominal	– 0.65°
		Maximum	0.10°
	Left and right difference		0.75°
Caster ★ Decimal degree	Minimum		4.25°
	Nominal		5.00°
	Maximum		5.75°
	Left and right difference		0.75°
Kingpin offset ★ Decimal degree	Minimum		11.80°
	Nominal		12.55°
	Maximum		13.30°



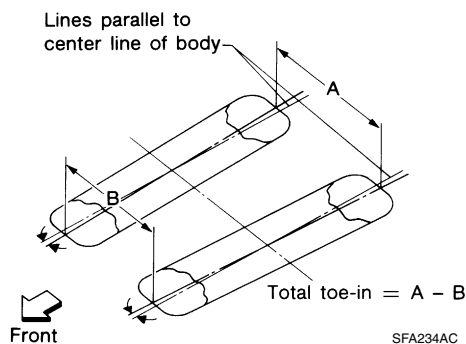
Total toe-in ★	Distance (A - B)	Minimum	0 mm (0 in)
		Nominal	1 mm (0.04 in)
		Maximum	2 mm (0.08 in)

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

Rear Wheel Alignment (Unladen*)

INFOID:000000003351821

Camber Degree minute (Decimal degree)	Minimum	–0° 45' (–0.749°)
	Nominal	–0° 15' (–0.249°)
	Maximum	–0° 15' (0.251°)



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2009

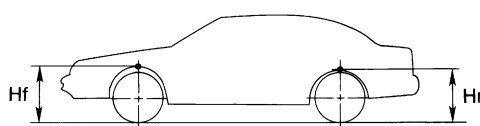
Total toe-in	Distance (A – B) mm (in)		2.4 (0.09)
	Distance difference between RH and LH side mm (in)	Minimum	–2 (–0.08)
		Nominal	0 (0)
		Maximum	2 (0.08)
	Angle (left plus right) Degree minute (decimal degree)		0° 6′ (0.109°)

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

Wheel Height

INFOID:0000000003351822

Unit: mm (in)



SFA818A

Destination	USA	Canada
Tire size	215/60R16	215/60R16
Front (Hf)*	727 (28.62)	727 (28.62)
Rear (Hr)*	718 (28.27)	719 (28.31)

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

Brake Specifications

INFOID:0000000003351817

Unit: mm (in)

Front brake	Cylinder bore diameter (each)	57.2 (2.25)
	Pad length × width × thickness	132 × 50 × 11 (5.20 × 1.969 × 0.433)
	Rotor outer diameter × thickness	296 × 26 (11.65 × 1.024)
Rear brake	Cylinder bore diameter	34.93 (1.375)
	Pad length × width × thickness	83.0 × 31.9 × 8.5 (3.268 × 1.256 × 0.335)
	Rotor outer diameter × thickness	292 × 9 (11.50 × 0.35)
Recommended brake fluid		DOT 3

Brake Pedal

INFOID:0000000003351818

Brake pedal height (from dash lower panel top surface)	190.7 - 202.7 mm (7.51 - 7.98 in)
Depressed pedal height [under a force of 490 N (50 kg-f, 110 lb-f) with engine running]	60.7 - 72.7 mm (2.39 - 2.86 in)
Clearance between stopper rubber and threaded end of the stop lamp switch and brake switch	0.74 - 1.96 mm (0.0291 - 0.0772 in)
Pedal play	3 - 11 mm (0.12 - 0.43 in)

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Front Disc Brake

INFOID:000000003351819

Brake pad	Standard thickness (new)	11.0 mm (0.433 in)
	Repair limit thickness	2.0 mm (0.079 in)
Disc rotor	Standard thickness (new)	26.0 mm (1.024 in)
	Repair limit thickness	24.0 mm (0.945 in)
	Thickness variation (measured at 8 positions)	0.015 mm (0.0006 in)
	Maximum runout (with it attached to the vehicle)	0.035 mm (0.0014 in)

Rear Disc Brake

INFOID:000000003351820

Brake pad	Standard thickness (new)	8.5 mm (0.335 in)
	Repair limit thickness	1.0 mm (0.039 in)
Disc rotor	Standard thickness (new)	9.0 mm (0.354 in)
	Repair limit thickness	8.0 mm (0.315 in)
	Thickness variation (measured at 8 positions)	0.015 mm (0.0006 in)
	Maximum runout (with it attached to the vehicle)	0.05 mm (0.002 in)

Fluids and Lubricants

INFOID:000000003351816

Description		Capacity (Approximate)		
		US measure	Imp measure	Liter
Fuel		20 gal	16-5/8 gal	75.6
Engine oil Drain and refill	With oil filter change	4-7/8 qt	4 qt	4.6
	Without oil filter change	4-1/2 qt	3-3/4 qt	4.3
Dry engine (Overhaul)		5-3/4 qt	4-3/4 qt	5.4
Engine cooling system with reservoir tank		2 gal	1-3/4 gal	7.7
Inverter coolant with reservoir tank		3/4 gal	7/8 gal	3.2
HEV transaxle fluid		4-3/8 qt	3-5/8 qt	4.1
Brake fluid		—	—	—
Brake grease		—	—	—
Brake pad plate grease		—	—	—
HEV transaxle grease		—	—	—
Multi-purpose grease		—	—	—
Air conditioning system refrigerant		1.10 ± 0.055 lb	0.50 ± 0.025 kg	0.50 ± 0.025 kg
Air conditioning system oil		4.06 fl oz	4.22 fl oz	120 m ℓ