2007
Mazda3
MAZDASPEED3
Mazda5
Mazda6
MAZDASPEED6
Mazda MX-5
Mazda RX-8

Service Highlights

FOREWORD

This manual explains components, system operations and functions for the Mazda3, MAZDASPEED3, Mazda5, Mazda6, MAZDASPEED6, Mazda MX-5, Mazda RX-8.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing.
As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Mazda dealers.
This manual should be kept up-to-date.

Mazda Motor Corporation reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

Mazda Motor Corporation
HIROSHIMA, JAPAN

APPLICATION:
This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN),and related materials shown on the following page.

Mazda3
MAZDASPEED3

Mazda5

Mazda6
MAZDASPEED6

Mazda MX-5

Mazda RX-8

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Mazda RX-8

CONTENTS

ENGINE

01
SECTION

01-00 OUTLINE

ENGINE ABBREVIATIONS

id010000100100

ABDC	After Bottom Dead Center
A/C	Air Conditioner
APV	Auxiliary Port Valve
ATDC	After Top Dead Center
BBDC	Before Bottom Dead Center
BTDC	Before Top Dead Center
CCM	Comprehensive Component Monitor
CSERS	Cold Start Emission Reduction Strategy
EX	Exhaust
DC	Drive Cycle
FP1	Front Primary 1
IN	Intake
KOEO	Key On Engine Off
KOER	Key On Engine Running
L/F	Leading Front
L/R	Leading Rear
MT	Manual Transmission
RP1	Rear Primary 1
SSV	Secondary Shutter Valve
SW	Switch
T/F	Trailing Front
T/R	Trailing Rear
VDI	Variable Dynamic Effect Intake
VFAD	Variable Fresh Air Duct

ENGINE SPECIFICATIONS

id010000113300

Item					Specification			
					2007MY		2006MY	
					13B-MSP (Standard power)	13B-MSP (High power)	13B-MSP (Standard power)	13B-MSP (High power)
MECHANICAL								
Engine type					Rotary		←	
Rotor arrangement and number					In-line 2-rotor, longitudinal		←	
Combustion chamber type					Bathtub		←	
Displacement (ml {cc, cu in})					654 {654, 40.0}×2		←	
Compression ratio					10.0		←	
Compression pressure (kPa {kgf/cm^2, psi} [rpm])					830 {8.5, 120}[250]		←	
Port timing	IN	Open	Primary port	ATDC	3°		←	
			Secondary port		12°		←	
			Auxiliary port		–	38°	←	
		Close	Primary port	ABDC	60°	65°	←	
			Secondary port		45°	36°	←	
			Auxiliary port		–	80°	←	
	EX	Open		BBDC	40°	50°	←	
		Close		BTDC	3°		←	
LUBRICATION SYSTEM								
Type					Force-fed type		←	
Oil pump	Type				Trochoid gear		←	
	Relief valve opening pressure (approx. quantity) (kPa {kgf/cm^2, psi})				441—490 {4.5—5.0, 64.0—71.0}		←	
Oil filter	Type				Full-flow		←	
	Relief valve opening pressure (approx. quantity) (kPa {kgf/cm^2, psi})				78—118 {0.8—1.2, 11.4—17.1}		←	
Oil pressure (approx. quantity) [oil temperature 100°C {212°F}] (kPa {kgf/cm^2, psi} [rpm])					350 {3.57, 50.8} [3,000]		←	
Oil capacity (approx. quantity) (L {US qt, Imp qt})	Oil replacement				3.3 {3.5, 2.9}		←	
	Oil and oil filter replacement				3.5 {3.7, 3.1}		←	
	Engine overhaul				4.7 {5.0, 4.1}		←	
	Total (dry engine)				5.7 {6.0, 5.0}	6.4 {6.7, 5.6}	←	
COOLING SYSTEM								
Type					Water-cooled, forced circulation		←	
Coolant capacity (L {US qt, Imp qt})					9.8 {10.4, 8.6}		←	
Water pump					Centrifugal, V-ribbed belt-driven		←	
Thermostat	Type				Wax		←	
	Opening temperature (°C {F°})				80—84 {176—183}		←	
	Full-open temperature (°C {F°})				95 {203}		←	
	Full-open lift (mm {in})				8.5 {0.33} or more		←	
Radiator	Type				Corrugated fin		←	
Cooling system cap	Cap valve opening pressure (kPa {kgf/cm^2, psi})				73.3—103.3 {0.748—1.053, 10.63—14.98}		←	
							←	
Cooling fan	Type				Electronic		←	
	Number of blades				Cooling fan No.1: 5, Cooling fan No.2: 7		←	
	Outer diameter (mm {in})				300 {11.8}		←	

Item			Specification			
			2007MY		2006MY	
			13B-MSP (Standard power)	13B-MSP (High power)	13B-MSP (Standard power)	13B-MSP (High power)
FUEL SYSTEM						
Injector	Type		Multiple hole design		←	
	Type of fuel delivery		Top-feed		←	
	Type of drive		Electronic		←	
Pressure regulator control pressure	(kPa {kgf/cm^2, psi})		Approx. 390 {3.98, 56.6}		←	
Fuel pump type			Electric		←	
Fuel tank capacity (approx. quantity)	(L {US gal, Imp gal})		60 {15.9, 13.2}		←	
Fuel type			Unleaded premium (unleaded high-octane) gasoline		←	
EMISSION SYSTEM						
AIR system			Air pump, air control valve		←	
Catalyst type			Three-way catalyst (monolithic)		←	
EVAP control system			Canister design		←	
PCV system			Closed design		←	
CHARGING SYSTEM					←	
Battery	Voltage (V)		12		←	
	Type and capacity (5 hour rate) (A·h)		50D20L (40), 55D23L (48) 75D23L (52), 75D26L (52)		←	
Generator	Out-put (V–A)		12—100		←	
	Regulated voltage (V)		Controlled by PCM		←	
	Self diagnosis function				←	
IGNITION SYSTEM						
Ignition system	Type		Distributorless Ignition (DLI)		←	
	Spark advance		Electronic		←	
	Firing order		When idling: T/F-L/F-T/R-L/R Except for idling: L/F-T/F-L/R-T/R (Independent ignition control)		←	
Spark plug	Type	Leading side	N3H5 18 110 (RE7C-L)[*1], N3Y8 18 110 (RE7C-L)[*1], N3Y9 18 110 (RE6C-L)[*2]		←	
		Trailing side	N3H1 18 110C (RE9B-T)[*1], N3Y1 18 110 (RE9B-T)[*1]		←	
STARTING SYSTEM						
Starter	Type		Coaxial reduction		←	
	Output (kW)		2.0		←	
CONTROL SYSTEM						
Neutral switch (MT)			ON/OFF		←	
CPP switch (MT)			ON/OFF		←	
SSV switch			ON/OFF		←	
APV position sensor			–	Hall element	←	
ECT sensor			Thermistor		←	
IAT sensor			Thermistor		←	
TP sensor			Hall element		←	
APP sensor			Hall element		←	

Item	Specification			
	2007MY		2006MY	
	13B-MSP (Standard power)	13B-MSP (High power)	13B-MSP (Standard power)	13B-MSP (High power)
MAF sensor (Inside MAF)	Hot-wire		←	
Front HO2S	Zirconia element (all range air/fuel ratio sensor)		←	
Rear HO2S	Zirconia element (Stoichiometric air/fuel ratio sensor)		←	
BARO sensor	Piezoelectric element		←	
KS	Piezoelectric element		←	
Eccentric shaft position sensor	Magnetic pickup		←	
Metering oil pump switch	ON/OFF		←	
Brake switch	ON/OFF		←	
Throttle valve actuator	DC motor		←	
APV motor	–	DC motor	←	
Fuel injector (primary 1)	Multiple hole type (12 holes)		←	
Fuel injector (secondary)	Multiple hole type (4 holes)		←	
Fuel injector (primary 2)	–	Multiple hole type (4 holes)	←	
Stepping motor (in metering oil pump)	Stepping motor		←	

*1 : Standard equipment
*2 : Hot type plug: Available only for customers who often drive their car at very low speed which causes the plugs to foul easily.

Engine oil specification

Item	U.S.A. and CANADA	Except U.S.A. and CANADA
Engine oil grade	(ILSAC)	(ILSAC) API SL or ILSAC
Engine oil viscosity	5W-20	

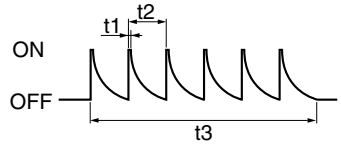
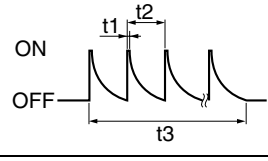
BODY & ACCESSORIES

09
SECTION

09-22 INSTRUMENTATION/DRIVER INFO.

INSTRUMENT CLUSTER SPECIFICATIONS

id092200101100

Item		Specification
Warning/indicator alarms		
Seat belt warning alarm	Sound frequency (Hz)	1,000
	Sound cycle	WHEN IGNITION SWITCH TURNED ON  t1: approx. 0.05 s t2: approx. 1 s t3: approx. 6 s WHILE VEHICLE DRIVING (VEHICLE SPEED 20 km/h {12.4 mph} OR MORE)  t1: approx. 0.05 s t2: approx. 1 s t3: approx. 31 s