SERVICE MANUAL

MATIZ (MY2003)

FOREWORD

This manual includes procedure for maintenance, adjustment, service operation and removal and installation of components.

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of manual approval.

The right is reserved to make changes at any time without notice.

DAEWOO MOTOR CO., LTD.
INCHON, KOREA

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SECTION 1A

GENERAL ENGINE INFORMATION

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DESCRIPTION AND SYSTEMOPERATION

CLEANLINESS AND CARE

An automobile engine is a combination of many machined, honed, polished and lapped surfaces with tolerances that are measured in the ten–thousandths of an inch. When any internal engine parts are serviced, care and cleanliness are important. A liberal coating of engine oil should be applied to friction areas during assembly, to protect and lubricate the surfaces on initial operation. Proper cleaning and protection of machined surfaces and friction areas is part of the repair procedure. This is considered standard shop practice even if not specifically stated.

Whenever valve train components are removed for service, they should be kept in order. They should be installed in the same locations, and with the same mating surfaces, as when they were removed. Battery cables should be disconnected before any major work is performed on the engine. Failure to disconnect cables may result in damage to wire harness or other electrical parts.

ON-ENGINE SERVICE

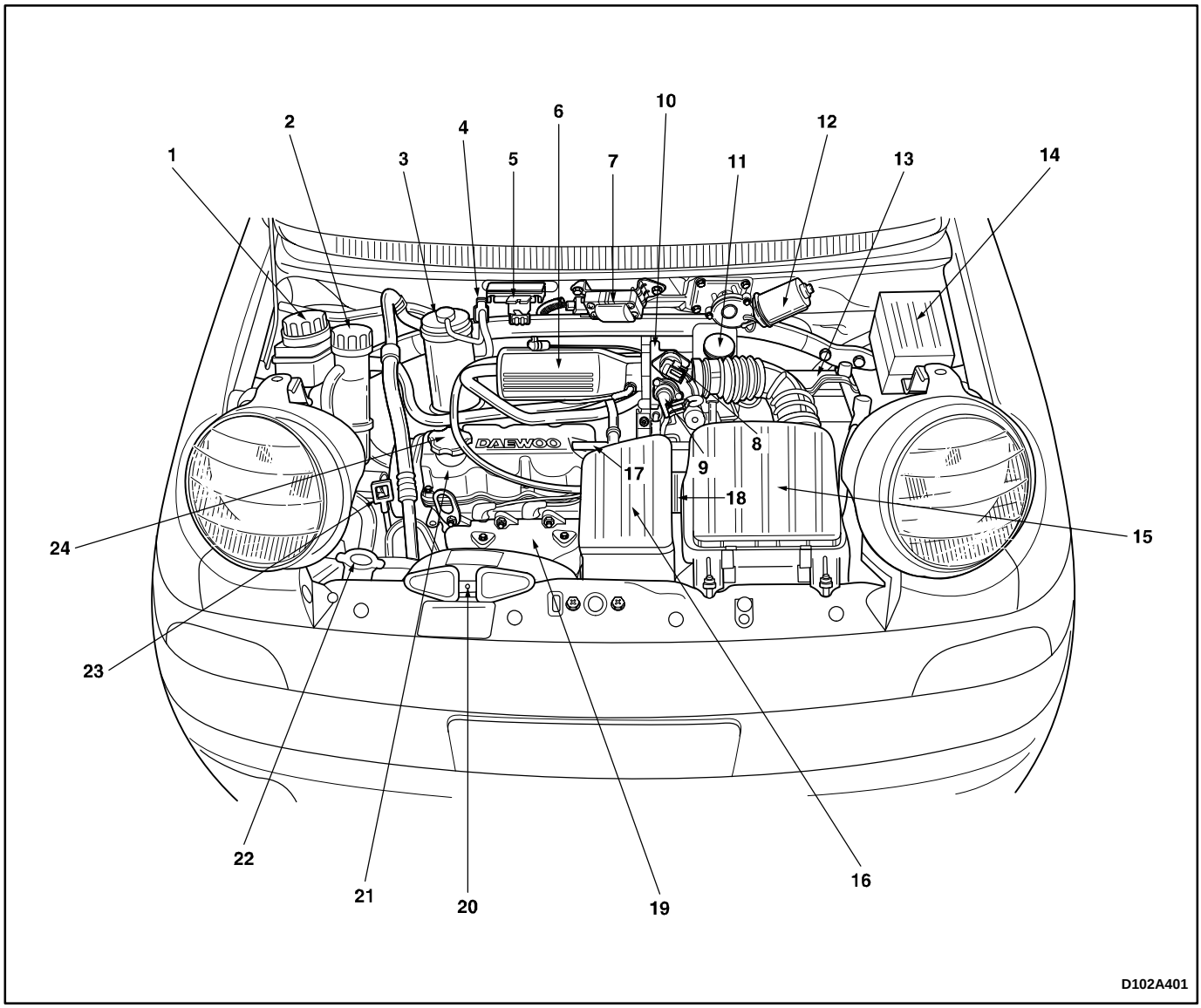
Caution: Disconnect the negative battery cable before removing or installing any electrical unit, or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in B unless otherwise noted.

Notice: Any time the air cleaner is removed, the intake opening should be covered. This will protect against accidental entrance of foreign material, which could follow the intake passage into the cylinder and cause extensive damage when the engine is started.

COMPONENT LOCATOR

ENGINE COMPARTMENT (TYPICAL)

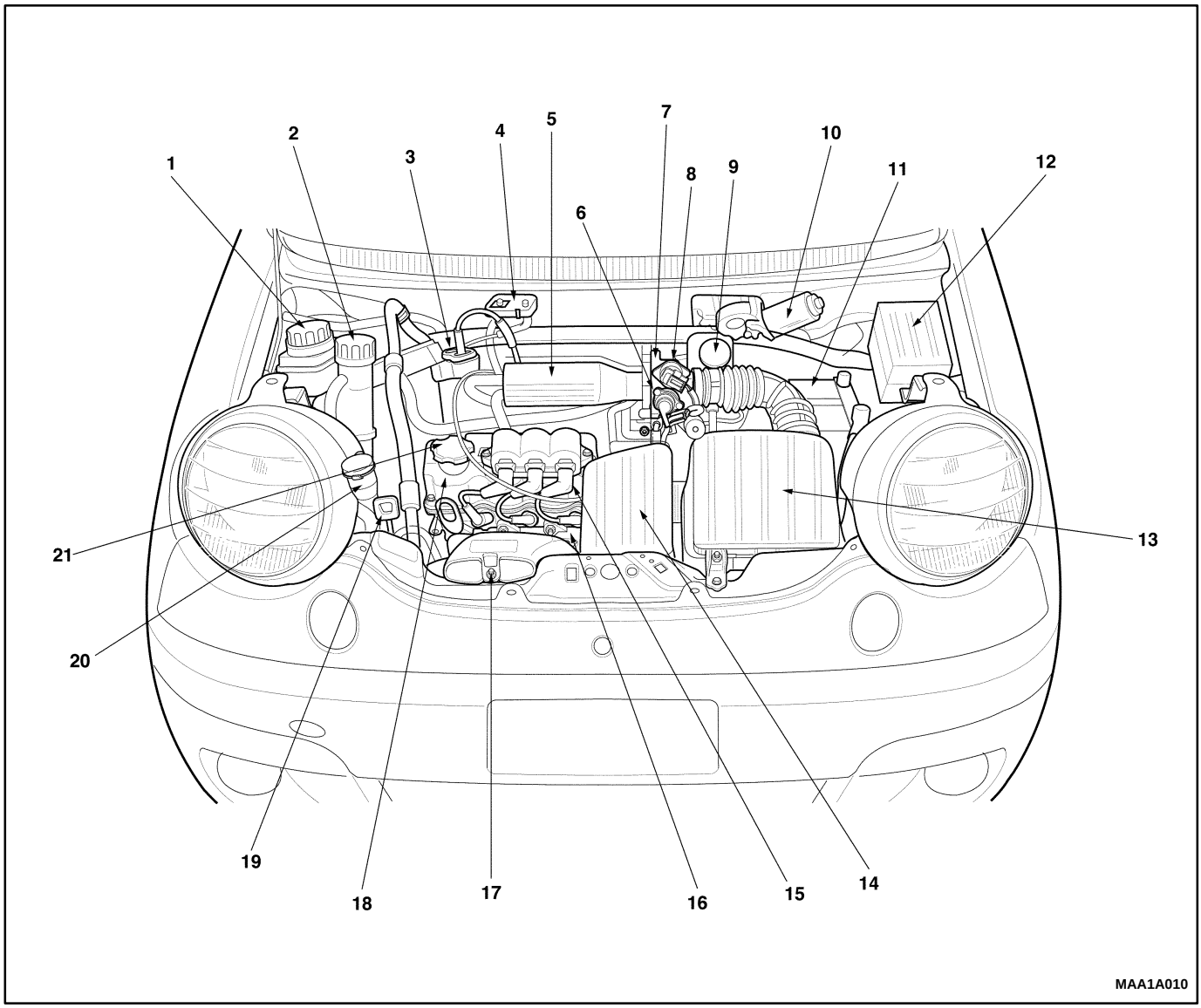
(Left–Hand Drive Shown, Right–Hand Drive Similar)



1 Power Steering Oil Reservoir
2 Coolant Reservoir
3 Canister
4 Canister Solenoid
5 Manifold Absolute Pressure (MAP) Sensor
6 Intake Manifold
7 Ignition Coil
8 Idle Air Control (IAC) Valve
9 Throttle Position (TP) Sensor
10 Throttle Body
11 Brake Fluid Reservoir
12 Wiper Motor
13 Battery
14 Fuse Box
15 Air Cleaner Housing
16 Resonator
17 PCV Hose
18 Distributor
19 Exhaust Manifold
20 Snorkel
21 Engine
22 Washer Fluid Reservoir
23 Oil Level Gauge
24 Oil Filler Cap

ENGINE COMPARTMENT (EURO III)

(Left–Hand Drive Shown, Right–Hand Drive Similar)



1 Power Steering Oil Reservoir
2 Coolant Reservoir
3 Canister Purge Solenoid
4 Manifold Absolute Pressure (MAP) Sensor
5 Intake Manifold
6 Throttle Position (TP) Sensor
7 Throttle Body
8 Idle Air Control (IAC) Valve
9 Brake Fluid Reservoir
10 Wiper Motor
11 Battery
12 Fuse Box
13 Air Cleaner Housing
14 Resonator
15 Electronic Ignition System Ignition Coil
16 Exhaust Manifold
17 Snorkel
18 Engine
20 Washer Fluid Reservoir
19 Oil Level Gauge
21 Oil Filler Cap

DIAGNOSTIC INFORMATION PROCEDURE

GENERAL DIAGNOSIS

Condition		Probable cause	Correction
Hard Starting (With normal cranking)	Malfunction of Ignition System	● Faulty fuse.	● Replace the fuse.
		● Faulty spark plug.	● Clean, adjust the plug gap or replace.
		● Electric leakage at the high tension cable.	● Replace the cable.
		● Poor connection of the high tension cable or lead wires.	● Replace the cable or wires.
		● Worn distributor cap or accumulated carbon in the distributor cap.	● Replace or clean the distributor cap.
		● Damaged distributor rotor or cap.	● Replace the rotor or the cap.
		● Improper ignition timing.	● Adjust the ignition timing.
		● Faulty ignition coil.	● Replace the ignition coil.
	Malfunction of Fuel System	● Lock of fuel in the fuel tank.	● Feed the fuel.
		● Dirty or clogged fuel filter.	● Replace the filter.
		● Clogged fuel pipe.	● Clean the fuel pipe.
		● Malfunction of the fuel pump.	● Replace the fuel pump.
		● Malfunction of the fuel injector.	● Replace the injector.
		● The foreign material in the fuel tank.	● Clean the fuel tank.
	Decline of Compression Pressure	● Poor tightening spark plug.	● Tighten to the specified torque.
		● Cracked cylinder head gasket.	● Replace the gasket.
		● Inadequate the valve clearance.	● Adjust the clearance.
		● Leakage of the valve clearance.	● Repair the valve.
		● Interference of the valve stem.	● Replace the valve or the valve guide.
		● Low elasticity or damage of the valve spring.	● Replace the valve spring.
		● Abnormal interference of pistons and cylinders.	● Replace the piston ring.
		● Excessive wear of pistons, rings, or cylinders.	● Replace the ring or the piston and boring or replace the cylinder.

GENERAL DIAGNOSIS (Cont'd)

Condition		Probable cause	Correction
Hard Starting (With normal cranking)	Others	● Broken timing belt.	● Replace the belt.
		● Malfunction of Positive Crankcase Ventilation (PCV) valve.	● Check and replace Positive Crankcase Ventilation (PCV) valve if needed.
		● Loosening, damage or leakage of the vacuum hose.	● Connect the hose correctly or replace it.
		● Leakage of intake system.	● Replace intake system.
Lack of Engine Power	Decline of Compression Pressure	● Refer to "Page 1A–5".	● Refer to "Page 1A–5".
	Malfunction of Ignition System	● Improper ignition timing.	● Adjust the ignition timing.
		● Faulty spark plug.	● Adjust or replace the spark plug.
		● Malfunction of the distributor.	● Repair or replace the distributor. Check the rotor.
		● Electric leakage or poor connection of the high tension cable.	● Connect the cable correctly or replace it.
	Malfunction of Fuel System	● Clogged fuel pipe.	● Clean the pipe.
		● Clogged or contaminated fuel filter.	● Replace the filter.
	Others	● Clogged exhaust system.	● Check and repair the system.
		● Clogged or contaminated air cleaner element.	● Clean or replace the air cleaner element.
		● Leak of the intake manifold gasket.	● Replace the gasket.
		● Dragging brakes.	● Repair or replace the brakes.
		● Slipping clutch.	● Adjust or replace the clutch.
Rough Engine Idling	Decline of Compression Pressure	● Refer to "Page 1A–5".	● Refer to "Page 1A–5".
	Malfunction of Fuel System	● Clogged fuel pipe.	● Clean the pipe.
		● Clogged or contaminated fuel filter.	● Replace the filter.
		● Malfunction of the fuel pressure regulator.	● Replace the regulator.
	Malfunction of Ignition System	● Malfunction of the spark plug.	● Adjust or replace the spark plug.
		● Electric leakage or poor connection of the high tension cable.	● Connect the cable correctly or replace it.
		● Worn distributor cap terminal or accumulated carbon in the distributor cap.	● Replace or clean the distributor cap.

GENERAL DIAGNOSIS (Cont'd)

Condition		Probable cause	Correction
Rough Engine Idling	Malfunction of Ignition System	● Loosening or damage of the distributor rotor or cap.	● Replace the rotor or cap.
		● Poor ignition timing.	● Adjust the ignition timing.
		● Malfunction of the ignition coil.	● Replace the ignition coil.
	Others	● Clogged or contaminated air cleaner element.	● Clean or replace the air cleaner element.
		● Leak of the intake manifold gasket.	● Replace the gasket.
		● Malfunction of Positive Crankcase Ventilation (PCV) valve.	● Check the valve or replace it if needed.
		● Poor connection or damage or leakage of the vacuum hose.	● Connect the hose correctly or replace it.
Engine Hesitate (Upon pressing accelerating pedal, the engine makes delayed response. This situation is remarkable when cruising or starting.)	Decline of Compression Pressure	● Refer to "Page 1A–5".	● Refer to "Page 1A–5".
	Malfunction of Ignition System	● Poor ignition timing.	● Adjust the ignition timing.
		● Poor spark plug or poor adjustment of the plug gap.	● Replace the plug or adjust the gap.
		● Electric leakage or poor connection of the high tension cable.	● Connect the cable correctly or replace it.
	Others	● Malfunction of the air cleaner system.	● Clean or replace the air cleaner system.
		● Leak of the intake manifold gasket.	● Replace the gasket.
Engine Surging (Engine power makes fluctuation in a fixed speed and speed changes without operating the accelerating pedal.)	Decline of Compression Pressure	● Refer to "Page 1A–5".	● Refer to "Page 1A–5".
	Malfunction of Fuel System	● Clogged fuel pipe.	● Clean the pipe.
		● Clogged or contaminated fuel filter.	● Replace the filter.
		● Malfunction of the fuel pressure regulator.	● Replace the fuel pressure regulator.
	Malfunction of Ignition System	● Malfunction of the spark plug.	● Adjust or replace the spark plug.
		● Electric leakage or poor connection of the high tension cable.	● Connect the cable correctly or replace it.
		● Worn distributor cap terminal or accumulated carbon in the distributor cap.	● Clean or replace the distributor cap.
		● Loosening or damage of the distributor rotor or the cap.	● Replace the distributor rotor or the cap.
		● Poor ignition timing.	● Adjust the ignition timing.

GENERAL DIAGNOSIS (Cont'd)

Condition		Probable cause	Correction
Engine Surging (Engine power makes fluctuation in a fixed speed and speed changes without operating the accelerating pedal.)	Others	● Leak of the intake manifold gasket.	● Clean or replace the gasket.
		● Leakage of the vacuum hose.	● Connect the hose correctly or replace it.
Excessive Detonation (According to the opening range of throttle valve, knocking sound of metallic is made with abnormal explosion.)	Overheated Engine	● Refer to "Overheat" in this page.	● Refer to "Overheat" in this page.
	Malfunction of Ignition System	● Abnormal spark plug.	● Replace the spark plug.
		● Poor ignition timing.	● Adjust the ignition timing.
		● Electric leakage or poor connection of the high tension cable.	● Connect the cable correctly or replace it.
	Malfunction of Fuel System	● Clogged or contaminated fuel filter and fuel pipe.	● Clean or replace the fuel filter and the fuel pipe.
	Others	● Leak of the intake manifold gasket.	● Replace the gasket.
		● Excessive carbon deposit due to abnormal combustion.	● Remove the carbon.
Overheat	Malfunction of Cooling System	● Lack of coolant.	● Refill coolant.
		● Malfunction of the thermostat.	● Replace the thermostat.
		● Malfunction of the cooling fan.	● Check or replace the cooling fan.
		● Poor water pump performance.	● Replace the pump.
		● Clogged or leaky radiator.	● Clean, repair or replace the radiator.
	Malfunction of Lubrication System	● Poor engine oil.	● Replace engine oil with the specified one.
		● Blocking oil filter or strainer.	● Clean or replace the oil filter or the strainer.
		● Lack of engine oil.	● Refill oil.
		● Poor oil pump performance.	● Replace or repair the pump.
		● Leakage of oil.	● Repair.
	Other	● Damaged cylinder head gasket.	● Replace the gasket.
Poor Fuel Consumption	Decline of Compression Pressure	● Refer to "Page 1A–5".	● Refer to "Page 1A–5".
	Malfunction of Fuel System	● Leakage of the fuel tank or the fuel pipe.	● Repair or replace the fuel tank or the fuel pipe.

GENERAL DIAGNOSIS (Cont'd)

Condition		Probable cause	Correction
Poor Fuel Consumption	Malfunction of Ignition System	● Improper ignition timing.	● Adjust the ignition timing.
		● Abnormal spark plug (Excessive carbon deposit, inadequate gap, burnt electrode).	● Replace the plug.
		● Electric leakage or poor connection of the high tension cable.	● Connect the cable normally or replace it.
	Malfunction of Cooling System	● Malfunction of the thermostat.	● Replace the thermostat.
	Others	● Improperly installed valve.	● Repair or replace the valve.
		● Slipping clutch.	● Repair or replace the clutch.
		● Low pressure of tires.	● Adjust the pressure of tires.
Excessive Consumption of Engine Oil	Leakage of Engine Oil	● Loosened oil drain plug.	● Tighten the plug.
		● Loosened oil pan bolt.	● Tighten the bolt.
		● Loosened oil filter.	● Tighten the filter.
		● Loosened oil pressure switch.	● Tighten the switch.
		● Leakage of camshaft front oil seal.	● Replace the seal.
		● Leakage of crankshaft front oil seal.	● Replace the seal.
		● Leakage at the cylinder head cover gasket.	● Replace the gasket.
		● Damage of the cylinder head gasket.	● Replace the gasket.
	Oil Mixing in Combustion Chamber	● Stuck piston ring.	● Remove carbon and replace the ring.
		● Worn piston or cylinder.	● Replace the piston or the cylinder.
		● Worn piston ring or ring groove.	● Replace the piston or ring.
		● Inadequate position of the piston ring cutting part.	● Adjust the position.
		● Abrasion or damage of the valve system.	● Replace the valve system.
Low Oil Pressure	Malfunction of Lubrication System	● Inadequate oil viscosity.	● Replace with the specified one.
		● Loosening of the oil pressure switch.	● Tighten the switch.
		● Lack of engine oil.	● Refill oil.
		● Blocking oil strainer.	● Clean the strainer.

GENERAL DIAGNOSIS (Cont'd)

Condition		Probable cause	Correction
Low Oil Pressure	Malfunction of Lubrication System	● Lowered function of the oil pump.	● Replace the pump.
		● Abrasion or damage of the oil pump relief valve.	● Replace the valve.
Engine Noise	Valve Noise	● Inadequate valve clearance.	● Adjust the valve clearance.
		● Abrasion of valve stem or guide.	● Replace the valve stem or the guide.
		● Weak valve spring.	● Replace the spring.
	Piston, Ring, Cylinder Noise	● Abrasion of the piston, the ring or the cylinder.	● Boring the cylinder or replace the piston, the ring or the cylinder.
	Connecting Rod Noise	● Abrasion of the connecting rod bearing.	● Replace the bearing.
		● Loosened the connecting rod nut.	● Tighten to the specified torque.
	Crankshaft Noise	● Abrasion of the crankshaft bearing.	● Replace the bearing.
		● Abrasion of the crankshaft journal.	● Grind or replace the crankshaft journal.
		● Loosened bearing cap bolt.	● Tighten to the specified torque.
		● Excessive clearance of the crankshaft thrust bearing.	● Adjust or replace.
		● Low oil pressure.	● Refer to "Low Oil Pressure" in this section.