Oil Gallery Jet
Inspect the oil gallery jet for clogging. Clean the oil gallery if necessary.


I837H1150030-01

Oil Pump Removal and Installation

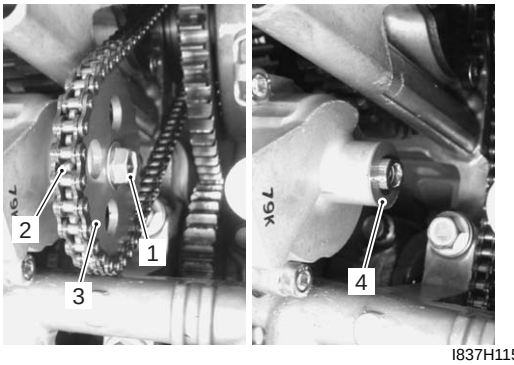
B838H21506011

NOTE

Be careful not to drop any parts into the crankcase.

Removal

1) Remove the oil pan, oil strainer and oil pressure regulator. Refer to “Oil Pan / Oil Strainer / Oil Pressure Regulator Removal and Installation (Page 1E-6)”.
2) Remove the oil pump driven gear bolt (1).
3) Remove the chain (2) with the oil pump driven gear (3).
4) Remove the washer (4).



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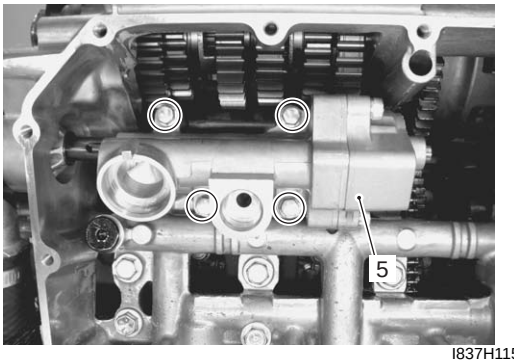
5) Remove the oil pump (5).



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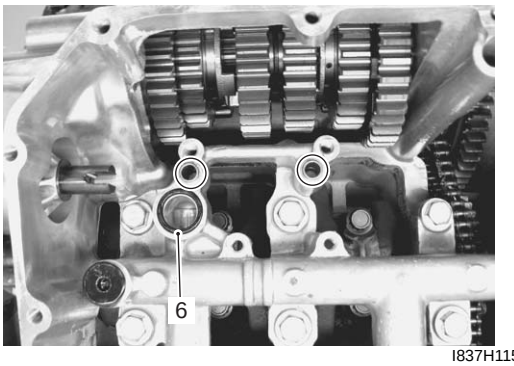
6) Remove the O-ring (6) and dowel pins.



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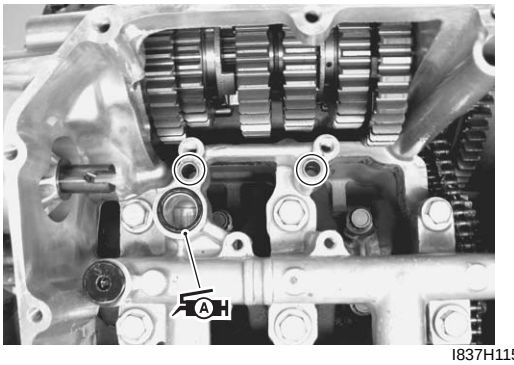
Installation

1) Apply grease to the O-ring and install the dowel pins.

⚠ CAUTION

Use a new O-ring to prevent oil leakage.

: Grease 99000–25010 (SUZUKI SUPER GREASE A or equivalent)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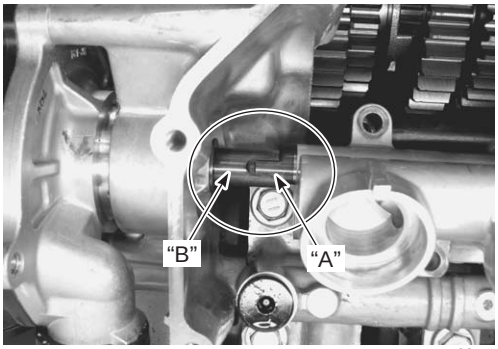
2) Install the oil pump.

NOTE

Set the oil pump shaft end “A” to the water pump shaft “B”.



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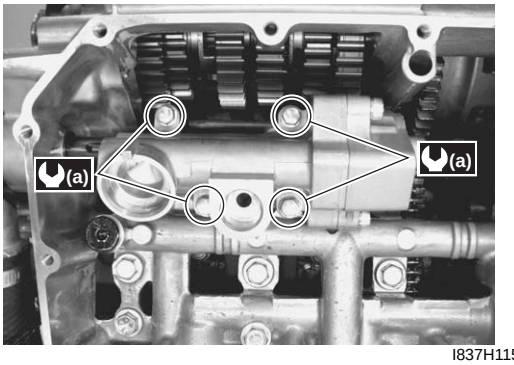
3) Tighten the oil pump mounting bolts to the specified torque.

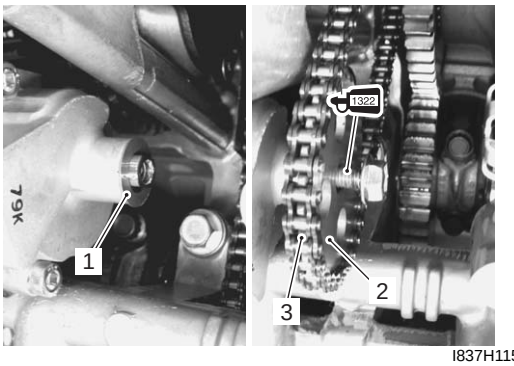
Tightening torque
Oil pump mounting bolt (a): 10 N·m (1.0 kgf-m, 7.0 lb-ft)



I837H1150036-02

4) Install the washer (1).
5) Install the oil pump driven gear (2) with the chain (3).
6) Apply a small quantity of thread lock to the oil pump driven gear bolt.

1322 : Thread lock cement 99000–32110 (THREAD LOCK CEMENT SUPER 1322 or equivalent)



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7) Install the oil pan, oil strainer and oil pressure regulator. Refer to “Oil Pan / Oil Strainer / Oil Pressure Regulator Removal and Installation (Page 1E-6)”.

Oil Pump Inspection

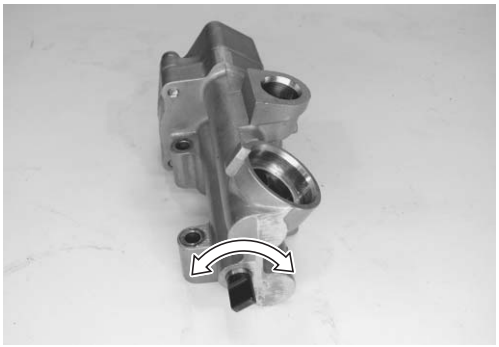
B838H21506012

Inspect the oil pump in the following procedures:

1) Remove the oil pump. Refer to “Oil Pump Removal and Installation (Page 1E-12)”.
2) Rotate the oil pump by hand and check that it moves smoothly. If it does not move smoothly, replace the oil pump assembly.

⚠ CAUTION

Do not attempt to disassemble the oil pump. The oil pump is available only as an assembly.



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3) Install the oil pump. Refer to “Oil Pump Removal and Installation (Page 1E-12)”.

Oil Pump Drive Gear Removal and Installation

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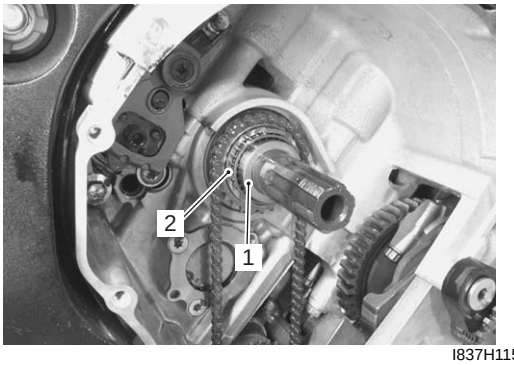
Removal

1) Remove the primary driven gear assembly. Refer to “Clutch Removal in Section 5C (Page 5C-5)”.
2) Remove the spacer (1) and bearing (2).



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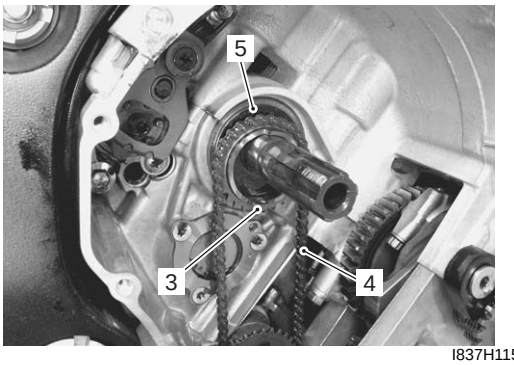
3) Remove the oil pump drive sprocket (3) and chain (4).
4) Remove the thrust washer (5).



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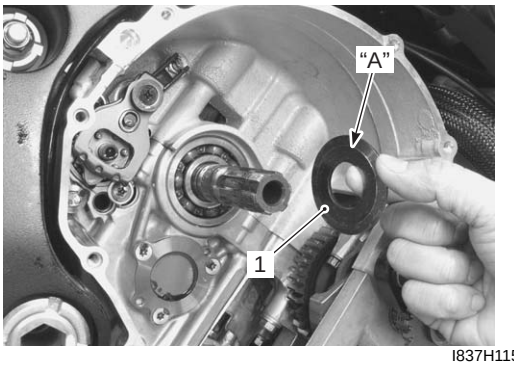
Installation
Installation is in the reverse order of removal. Pay attention to the following points:

- Install the thrust washer (1) to the countershaft.

NOTE

The chamfer side "A" of thrust washer should face the crankcase side.



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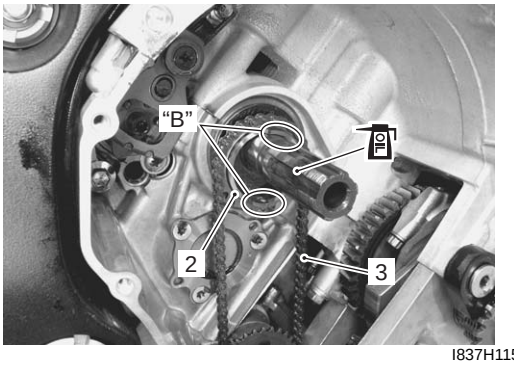
- Install the oil pump drive sprocket (2) to the countershaft.

NOTE

Teeth "B" on the sprocket must face the clutch side.

- Pass the chain (3) between the oil pump drive and driven sprockets.
- Apply engine oil to the countershaft.



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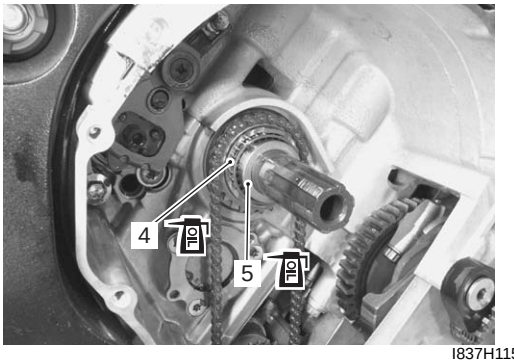
- Install the bearing (4) and spacer (5), and apply engine oil to them.



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- Install the clutch assembly. Refer to "Clutch Installation in Section 5C (Page 5C-7)".

Specifications

Service Data

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Oil Pump

Item	Standard	Limit
Oil pressure (at 60 °C, 140 °F)	100 – 400 kPa (1.0 – 4.0 kgf/cm^2, 14 – 57 psi) at 3 000 r/min	—

Oil

Item	Specification		Note
Engine oil type	SAE 10W-40, API SF/SG or SH/SJ with JASO MA		
Engine oil capacity	Change	2 200 ml (2.3/1.9 US/Imp qt)	
	Filter change	2 500 ml (2.6/2.2 US/Imp qt)	
	Overhaul	2 900 ml (3.1/2.6 US/Imp qt)	

Tightening Torque Specifications

B838H21507002

Fastening part	Tightening torque			Note
	N·m	kgf-m	lb-ft	
Main oil gallery plug (M16)	35	3.5	25.5	☞(Page 1E-6)
Oil cooler mounting bolt	10	1.0	7.0	☞(Page 1E-8)
Oil pressure switch	14	1.4	10.0	☞(Page 1E-9)
Oil pressure switch lead wire bolt	1.5	0.15	1.1	☞(Page 1E-9)
Piston cooling oil jet bolt	10	1.0	7.0	☞(Page 1E-10)
Oil gallery jet	27	2.7	19.5	☞(Page 1E-11)
Oil pump mounting bolt	10	1.0	7.0	☞(Page 1E-13)

Reference:
For the tightening torque of fastener not specified in this section, refer to “Tightening Torque List in Section 0C (Page 0C-9)”.

Special Tools and Equipment

Recommended Service Material

B838H21508001

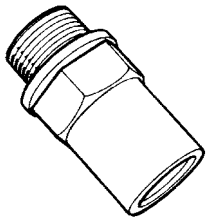
Material	SUZUKI recommended product or Specification		Note
Grease	SUZUKI SUPER GREASE A or equivalent	P/No.: 99000–25010	☞(Page 1E-6) / ☞(Page 1E-8) / ☞(Page 1E-12)
Thread lock cement	THREAD LOCK CEMENT SUPER 1303 or equivalent	P/No.: 99000–32030	☞(Page 1E-7)
	THREAD LOCK CEMENT SUPER 1322 or equivalent	P/No.: 99000–32110	☞(Page 1E-8) / ☞(Page 1E-10) / ☞(Page 1E-11) / ☞(Page 1E-13)

Special Tool

B838H21508002

09915–74521
Oil pressure gauge hose
☞(Page 1E-5)

09915–74540
Oil pressure gauge attachment
☞(Page 1E-5)



09915–77331
Meter (for high pressure)
☞(Page 1E-5)

Engine Cooling System

Precautions

Precautions for Engine Cooling System

B838H21600001

⚠ WARNING

- **You can be injured by boiling fluid or steam if you open the radiator cap when the engine is hot. After the engine cools, wrap a thick cloth around cap and carefully remove the cap by turning it a quarter turn to allow pressure to escape and then turn the cap all the way off.**
- **The engine must be cool before servicing the cooling system.**
- **Coolant is harmful:**
  - **If it comes in contact with skin or eyes, flush with water.**
  - **If swallowed accidentally, induce vomiting and call physician immediately.**
  - **Keep it away from children.**

Precautions for Engine Coolant

B838H21600002

Refer to “Engine Coolant Recommendation in Section 0A (Page 0A-5)”.

General Description

Engine Coolant Description

B838H21601001

⚠ CAUTION

- **Use a high quality ethylene glycol base anti-freeze, mixed with distilled water. Do not mix an alcohol base anti-freeze and different brands of anti-freeze.**
- **Do not put in more than 60% anti-freeze or less than 50%. (Refer to Fig. 1 and 2.)**

At the time of manufacture, the cooling system is filled with a 50:50 mixture of distilled water and ethylene glycol anti-freeze. This 50:50 mixture will provide the optimum corrosion protection and excellent heat protection, and will protect the cooling system from freezing at temperatures above –31 °C (–24 °F).
If the vehicle is to be exposed to temperatures below –31 °C (–24 °F), this mixing ratio should be increased up to 55% or 60% according to the figure.

Anti-freeze Proportioning Chart

Anti-freeze density	Freezing point
50%	–31 °C (–24 °F)
55%	–40 °C (–40 °F)
60%	–55 °C (–67 °F)

Fig. 1: Engine coolant density-freezing point curve

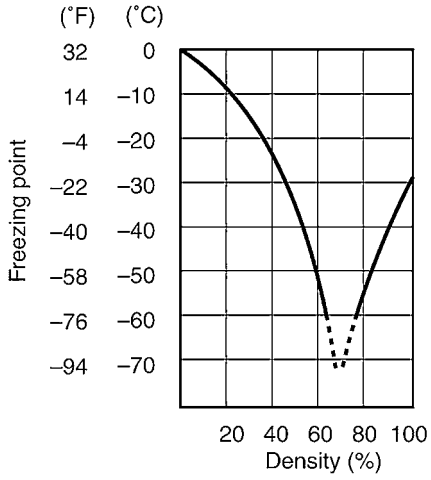


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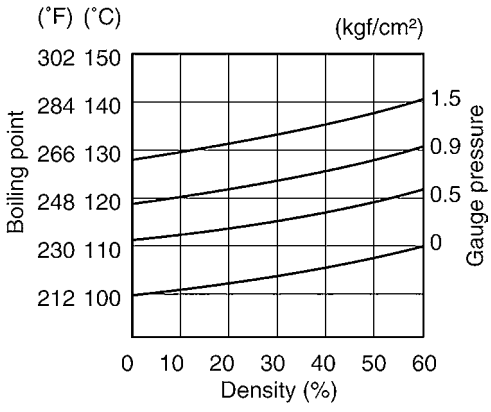
Fig. 2: Engine coolant density-boiling point curve



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Schematic and Routing Diagram

Cooling Circuit Diagram

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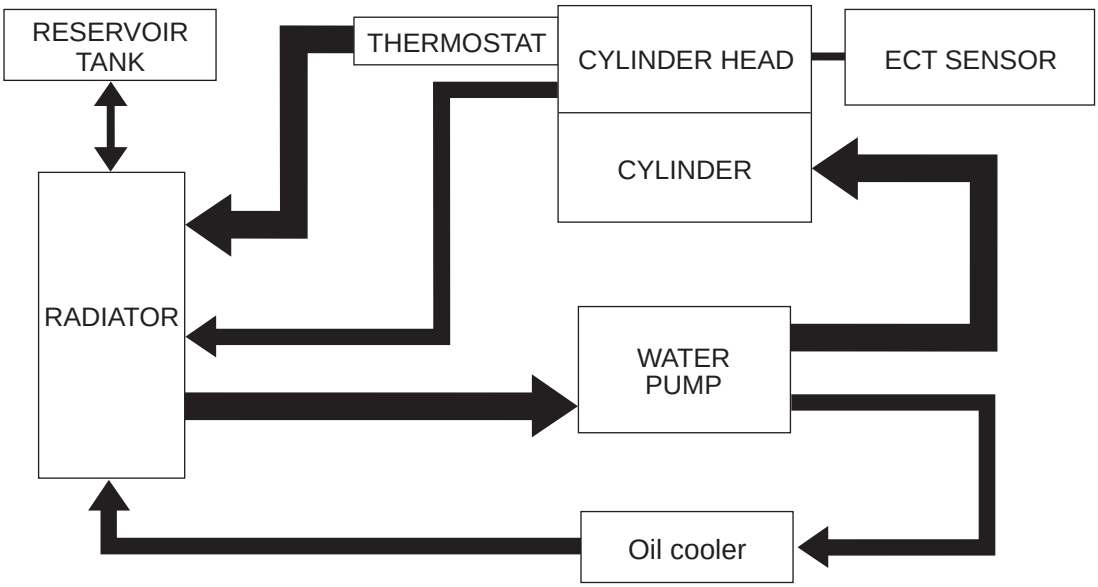

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Water Hose Routing Diagram

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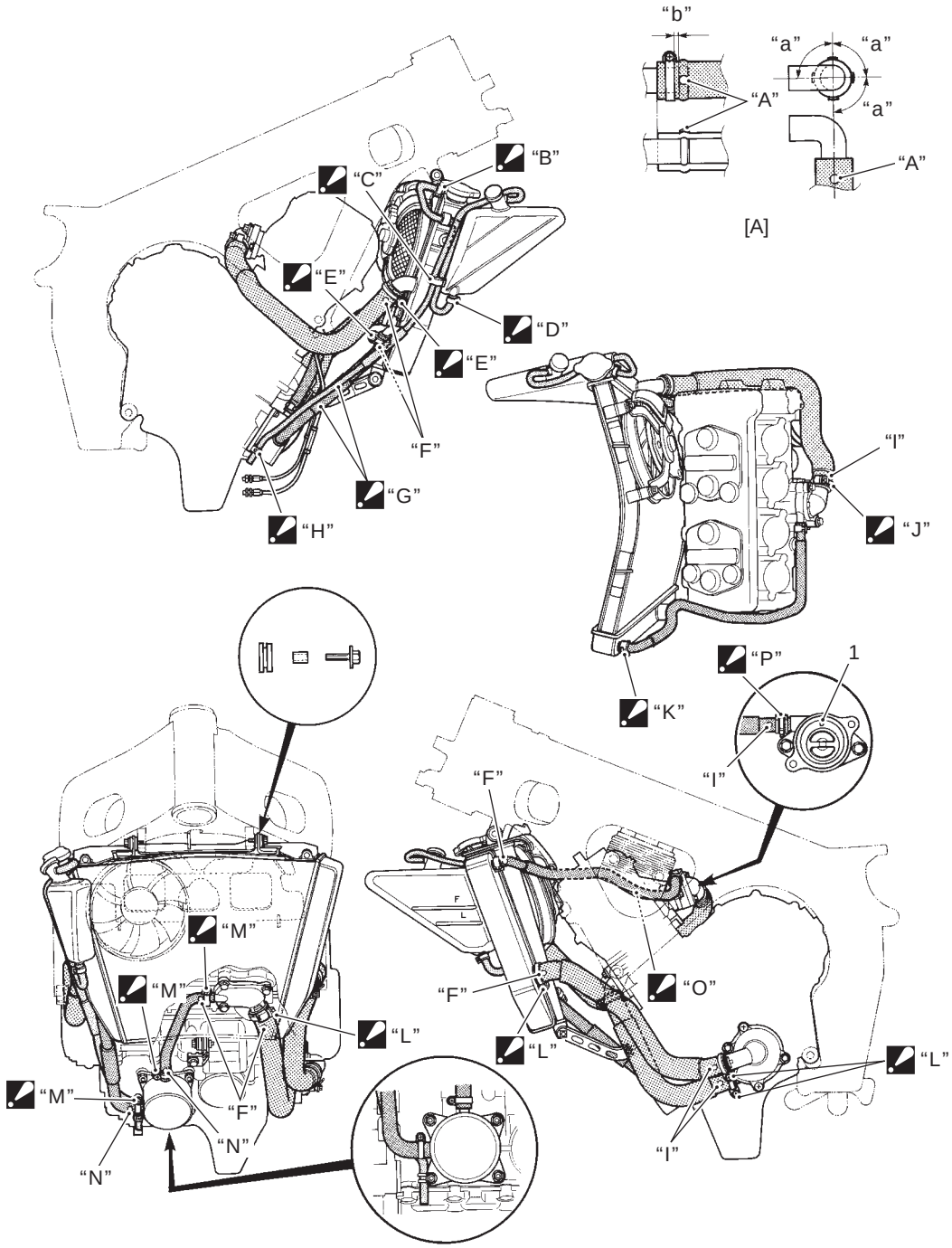

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1. Jiggle valve	"G": Pass the hoses outside the EXCV cables.	"N": Red marking
"A": Marking	"H": Clamp the reservoir overflow hose at the marking position.	"O": Pass the hose under the regulator/ rectifier bracket bolts.
"B": Clamp end should face downward.	"I": White marking	"P": Clamp end should face backward.
"C": Clamp the hoses at the marking position.	"J": Screw head should face backward.	"a": 90°
"D": Clamp end should face right side.	"K": Clamp end should face upward.	"b": Clearance
"E": Screw head should face right side.	"L": Screw head should face left side.	[A]: Outline of marking position
"F": Yellow marking	"M": Screw head should face forward.	

Diagnostic Information and Procedures

Engine Cooling Symptom Diagnosis

B838H21604001

Condition	Possible cause	Correction / Reference Item
Engine overheats	Not enough engine coolant.	*Add engine coolant.*
	Radiator core clogged with dirt or scale.	*Clean.*
	Faulty cooling fan.	*Repair or replace.*
	Defective cooling fan relay, or open-or-short circuited.	*Repair or replace.*
	Clogged water passage.	*Clean.*
	Air trapped in the cooling circuit.	*Bleed air.*
	Defective water pump.	*Replace.*
	Use of incorrect engine coolant.	*Replace.*
	Defective thermostat.	*Replace.*
	Defective ECT sensor.	*Replace.*
	Defective ECM.	*Replace.*
	Damaged ISC valve.	*Replace.*
	ISC bad learning.	*Reset learned value.*
Engine over cools	Defective cooling fan relay, or open-or-short circuited.	*Repair or replace.*
	Extremely cold weather.	*Put on radiator cover.*
	Defective thermostat.	*Replace.*
	Defective ECT sensor.	*Replace.*
	Defective ECM.	*Replace.*

Repair Instructions

Cooling Circuit Inspection

B838H21606001

⚠ WARNING

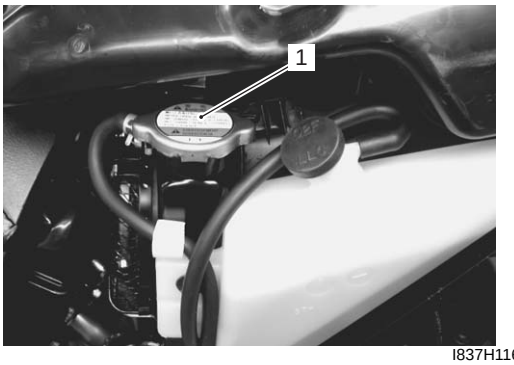
- **Do not open the radiator cap when the engine is hot, as you may be injured by escaping hot liquid or vapor.**
- **When removing the radiator cap tester, put a rag on the filler to prevent the engine coolant from spraying out.**

Inspect the cooling circuit in the following procedures:

1) Remove the right under cowling. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-11)”.
2) Remove the radiator cap (1) and connect the radiator tester (2) to the filler.
3) Pressurize the cooling system with 120 kPa (1.2 kgf/cm, 17.6 psi) of pressure, and then check if it holds the pressure for 10 seconds.

⚠ CAUTION

Do not exceed the radiator cap release pressure, or the radiator cap and subsequently the radiator, can be damaged.



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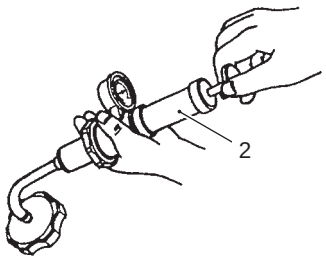

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4) After finishing the cooling circuit inspection, reinstall the removed parts.