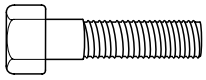
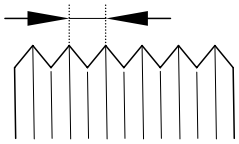
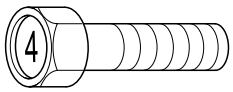
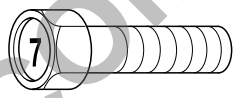
TIGHTENING TORQUE TABLE OF STANDARD PARTS

Bolt nominal diameter (mm)	Pitch (mm)	Torque (kg·m)	
		Head mark 4	Head mark 7
 L4GC205A	 L4GC206A	 L4GC207A	 L4GC208A
M5	0.8	0.3 ~ 0.4	0.5 ~ 0.6
M6	1.0	0.5 ~ 0.6	0.9 ~ 1.1
M8	1.25	1.2 ~ 1.5	2.0 ~ 2.5
M10	1.25	2.5 ~ 3.0	4.0 ~ 5.0
M12	1.25	3.5 ~ 4.5	6 ~ 8
M14	1.2	7.5 ~ 8.5	12 ~ 14
M16	1.5	11 ~ 13	18 ~ 21
M18	1.5	16 ~ 18	26 ~ 30
M20	1.5	22 ~ 25	36 ~ 42
M22	1.5	29 ~ 33	48 ~ 55
M24	1.5	37 ~ 42	61 ~ 70

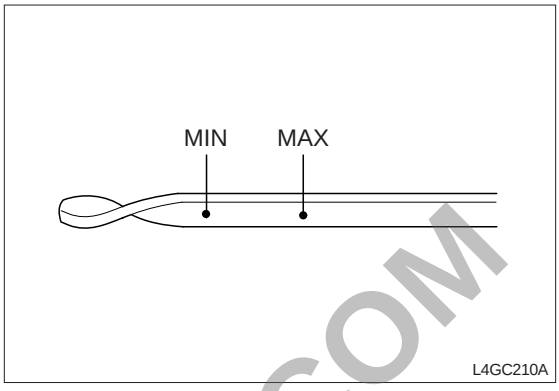
NOTE

- ***The torques shown in the table are standard values under the following conditions.***
  1. ***Nuts and bolt are made of steel bar and galvanized.***
  2. ***Galvanized plain steel washers are inserted.***
  3. ***All nuts, bolts, plain washers are dry.***
- ***The torques shown in the table are not applicable,***
  1. ***When spring washers, toothed washers and the like are inserted.***
  2. ***If plastic parts are fastened.***
  3. ***If oil is applied to threads and surfaces.***
- ***If you reduce the torques in the table to the percentage indicated below under the following conditions, it will be the standard value.***
  1. ***If spring washers are used : 85%***
  2. ***If threads and bearing surfaces are stained with oil: 85%***

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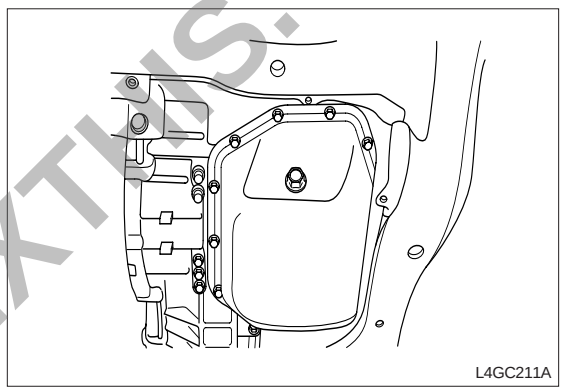
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CHECKING ENGINE OIL LEVEL



1. Check that the oil level is between "MIN" and "Max" marks on the engine oil level gauge.
2. If the oil level is below "MIN" mark, add oil until the level is within the specified ranges.
3. Check the engine for oil contamination and viscosity and replace if necessary.

REPLACING ENGINE OIL



1. When cooling the engine, warm up the engine up to the normal temperature.
2. Stop the engine.
3. After removing the oil filler cap, oil filter, and drain plug, drain the engine oil.
4. Tighten the drain plug to the specified torque(3.5~4.5kg·m).

   CAUTION
   When installing the drain plug, always use a new plug gasket.

5. Pour new engine oil to the oil filler.

Oil capacity (including filter)	4.0 ℓ

   CAUTION
   Over replenishing can happen oil saturation and overpressure.

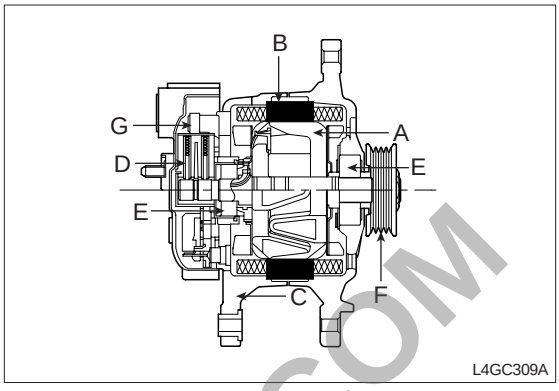
6. Close the oil filler cap.
7. Run the engine.
8. Stop the engine and after checking the oil level, add oil if necessary.

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CHARGING SYSTEM

GENERAL

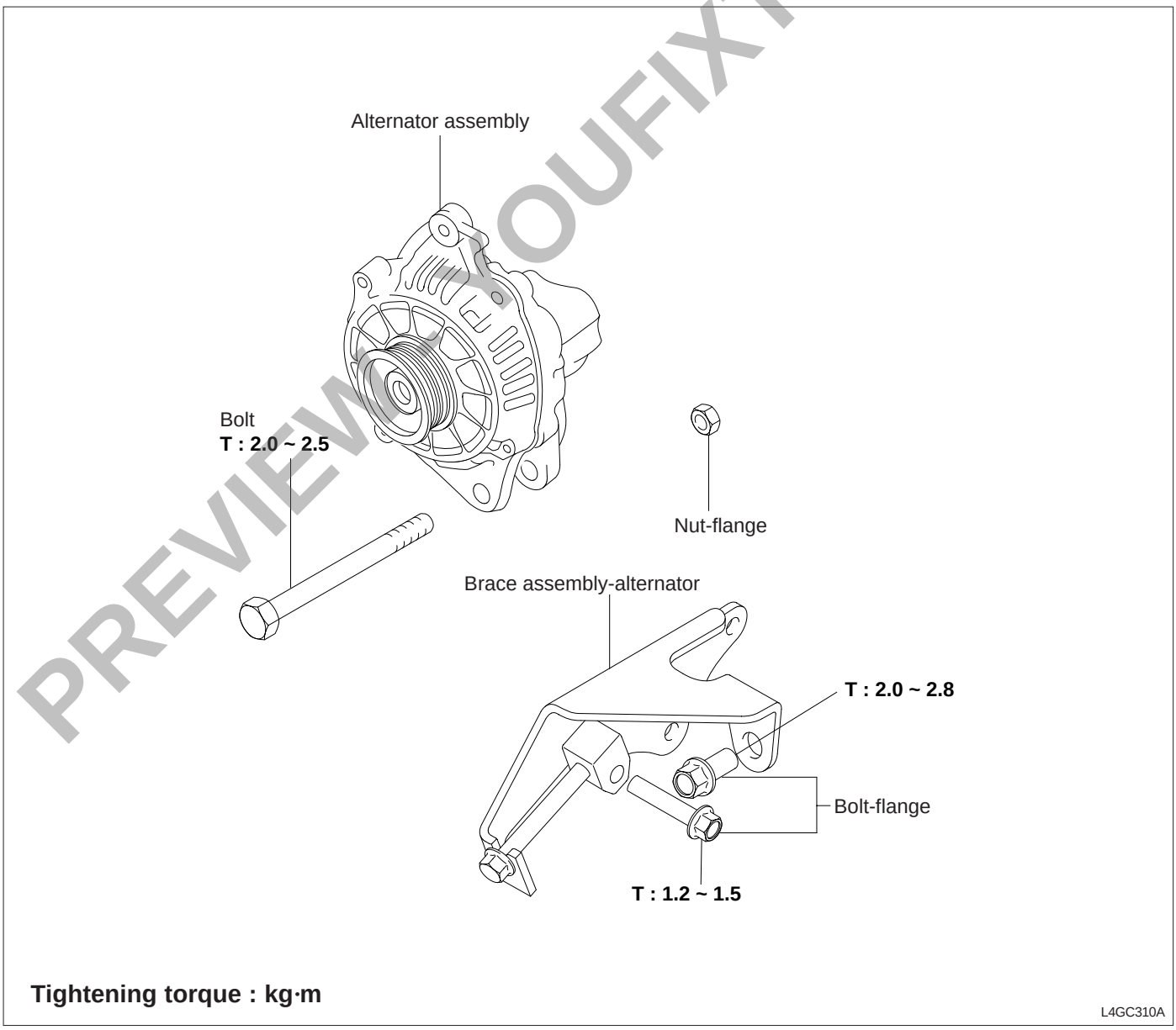


Charging system consists of battery, alternator with a built-in regulator, charging warning lamp and wire.

Because there are 6 diodes (3 (+) diodes, 3(-) diodes) built in alternator, AC current is rectified to DC current and DC current is detected in "B" terminal of alternator. Charging voltage from alternator is controlled by battery voltage detection unit.

Alternator consists of rotor, stator, rectifier, capacitor, brush, bearing, and V-ribbed pulley cover and Electronic voltage regulator is built in brush holder.

COMPONENTS



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TROUBLESHOOTING

Symptom	Possible cause	Remedy
Low compression	Cylinder head gasket damaged	Replace gasket
	Worn or damaged piston ring	Replace ring
	Worn piston or cylinder	Repair or replace piston and cylinder block
	Worn or damaged valve seat	Repair or replace valve and seat ring
Low oil pressure	Insufficient engine oil	Check engine oil level
	Oil pressure switch defective	Replace oil pressure switch
	Oil filter clogged	Install new filter
	Worn oil pump gear or cover	Replace
	Thin or diluted engine oil	Replace engine oil
	Oil relief valve clogged(Open)	Replace or inspect
	Excessive bearing clearance	Replace bearing
High oil pressure	Oil relief valve clogged(Closed)	Repair relief valve
Noisy valve	Thin or diluted engine oil	Replace engine oil
	Faulty HLA	Replace HLA
	Worn belt stem or valve guide	Replace belt stem or valve guide
Noisy connecting rod or timing belt	Insufficient engine oil	Check engine oil level
	Low oil pressure	Refer to “too low oil pressure”
	Thin or diluted engine oil	Replace engine oil
	Excessive bearing clearance	Replace bearing
Noisy timing belt	Incorrect belt tension	Correct belt tension
Low coolant level	Coolant leak from	
	Heater or radiator hose	Repair or replace parts
	Defective radiator cap	Retighten clamp or replace
	Thermostat housing	Replace gasket or housing
	Radiator	Replace
	Water pump	Replace parts
Radiator clogged	Foreign material into coolant	Replace coolant
Abnormally high coolant temperature	Thermostat defective	Replace parts
	Radiator cap defective	Replace parts
	Abnormal flow in cooling system	Clean or replace parts
	Loose or missing driving belt	Correct or replace
	Loose water pump	Replace
	Water temperature wiring defective	Repair or replace
	Cooling pan defective	Repair or replace
	Radiator or thermostat switch defective	Replace
	Inefficient coolant	Add coolant

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GENERAL

SPECIFICATIONS

Description	Specification	Limit
GENERAL		
Type	Series, DOHC	
Cylinder number	4	
Bore	82 mm	
Stroke	93.5 mm	
Displacement	1,975 cc	
Compression ratio	9.4	
Firing order	1 - 3 - 4 - 2	
RPM	700 ± 100 rpm	
Ignition timing	BTDC 8° ± 5 °	
Valve timing		
Intake		
Open	BTDC 2°	
Close	ABDC 16°	
Exhaust		
Open	BBDC 18°	
Close	ATDC 2°	
Valve over rap	4 °	
CYLINDER HEAD		
Flatness of gasket surface	0.03 mm or less	0.06 mm
Flatness of manifold mounting surface	0.15 mm or less	0.3 mm
Oversize of valve seat hole		
Intake		
0.3 OS	33.3 ~ 33.325 mm	0.2 mm
0.6 OS	33.6 ~ 33.625 mm	
Exhaust		
0.3 OS	28.8 ~ 28.821 mm	
0.6 OS	29.1 ~ 29.121 mm	
Oversize of valve guide hole		
0.05 OS	11.05 ~ 11.069 mm	
0.25 OS	11.25 ~ 11.268 mm	
0.50 OS	11.50 ~ 11.518 mm	
CAMSHAFT		
Cam height		
Intake	43 mm	42.9 mm
Exhaust	43 mm	42.9 mm
Journal O.D	Ø28	
Bearing oil clearance	0.02 ~ 0.061 mm	
End play	0.1 ~ 0.2 mm	

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TORQUE SPECIFICATIONS

Description	Standard (Kg·m)
Cylinder block	
Engine support bracket bolt and nut	3.5 ~ 5.0
Engine support bracket spare bolt	4.3 ~ 5.5
Oil pressure switch	1.3 ~ 1.5
Cylinder head	
Cylinder head bolt	
M10	2.5+(60°~ 65°) + (60°~ 65°)
M12	3.0+(60°~ 65°) + (60°~ 65°)
Intake manifold bolt and nut	1.6 ~ 2.3
Exhaust manifold nut	4.3 ~ 5.5
Cylinder head cover bolt	0.8 ~ 1.0
Camshaft bearing cap bolt	1.4 ~ 1.5
Rear plate bolt	0.8 ~ 1.0
Main moving	
Connecting rod cap nut	5.0 ~ 5.3
Crankshaft bearing cap bolt	2.7 ~ 3.3+(60°~ 65°)
Flywheel manual transmission bolt	12.0 ~ 13.0
Drive plate automatic transmission bolt	12.0 ~ 13.0
Timing belt	
Crankshaft pulley bolt	17 ~ 18
Camshaft sprocket bolt	10 ~ 12
Timing belt tensioner bolt	4.3 ~ 5.5
Timing belt idler bolt	4.3 ~ 5.5
Timing belt cover bolt	0.8 ~ 1.0
Front case bolt	2.0 ~ 2.7
Engine mounting	
Oil filter	1.2 ~ 1.6
Oil pan bolt	1.0 ~ 1.2
Oil pan drain plug	3.5 ~ 4.5
Oil screen	1.5 ~ 2.2
Oil seal case	1.0 ~ 1.2

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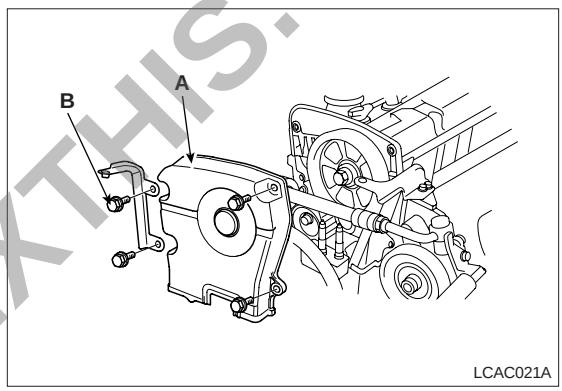
ADJUSTING TIMING BELT TENSION

Adjust the tension as the following order.

1. Turn the steering wheel completely counterclockwise.
2. While the engine oil pan is supported with a wooden block, raise the vehicle using a jack.

   CAUTION
   At this time carefully raise the vehicle not to overload parts.

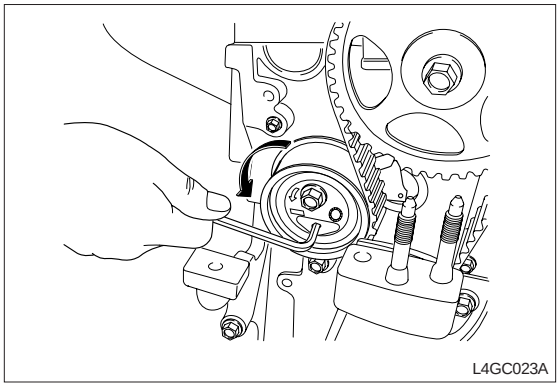
3. Remove the pan drive tension pulley.
4. Loosen the timing belt upper cover bolt(B) and disconnect the upper cover(A).



LCAC021A

5. As the illustration, insert the hex wrench to the adjuster groove and turn it counterclockwise to move the arm indicator in the middle of the base groove.

   CAUTION
   If it is turned in reverse direction, be sure that the tensioner may function abnormally.

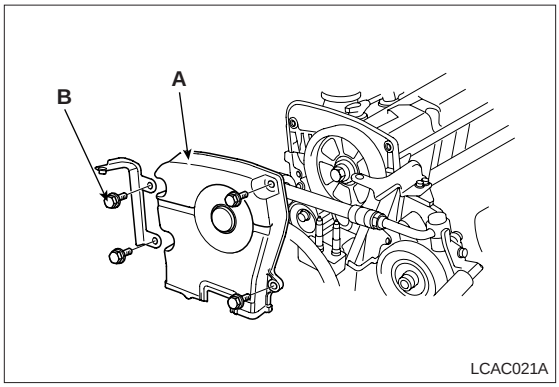

L4GC023A

6. Tighten the tensioner fixing bolt with the arm indicator fixed.

Tightening torque	2.3~2.9kgf·m

7. Rotate the crankshaft 2 turns clockwise and make sure the auto tensioner arm indicator is placed in the middle of the base groove.
8. If the arm indicator is out of the middle, loosen the bolt and repeat the previous procedure.
9. Install the timing belt upper cover(A) and tighten the bolt (B).

Tightening torque	0.8~1.0kg·m



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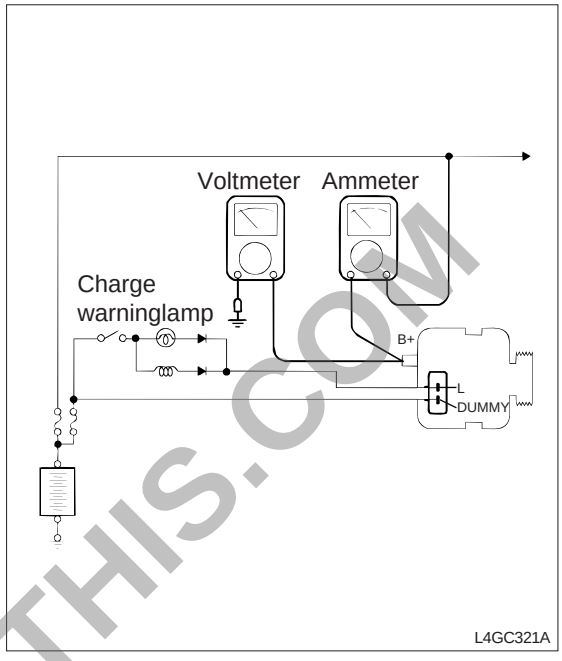
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5. Connect a DC ampere meter (0-100V) between "B" terminal and the disconnected output wire.
   Connect (+) lead wire to the terminal "B" and (-) lead wire to the disconnected output wire.

   NOTE
   Do not use clips or equivalent owing to high current and Use bolts and nuts to tighten each connecting part securely.

6. Connect a voltmeter(0-20V) between "B" terminal and the ground.
   Connect (+) lead wire to the alternator "B" terminal and (-) lead wire to the proper position.
7. Connect the engine tachometer and then battery ground cable.
8. Be sure that the hood is opened.



TEST

1. Be sure that voltmeter reading is identified with battery voltage.
   If voltmeter reading is 0V, it means short circuit of wire between "B" terminal and the battery (-) terminal, fusible link cut off or ground fault.
2. Turn the headlight ON and start the engine.
3. With the engine running at 2,500 rpm, turn ON the high beam headlights, place the heater blower switch at "HIGH" measure the maximum output current using a ammeter.

   NOTE
   This test should be done as soon as possible to measure the exact maximum current because output current drops rapidly after starting the engine.

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TROUBLESHOOTING

Charging system defect is almost caused by lack of pan belt tension and faulty function of wiring, connector, and voltage regulator.
One of most important thing during troubleshooting of charging system is determining the reason between overcharging and lack of charging. So, prior to inspection of alternator, check the battery for charging. Faulty alternator causes the following symptoms.

1. Faulty battery charging
   1) IC regulator fault(Short circuit)
   2) Field coil fault
   3) Main diode fault
   4) Auxiliary diode fault
   5) Stator coil fault
   6) Brush contact fault

2. Overcharging : IC regulator fault(Short circuit)
   Other faults such as voltage adjusting problem except above symptoms rarely happen.
   Refer to the following troubleshooting table.

Symptom	Possible cause	Remedy
With ignition switch ON, charging warning lamp does not illuminate	Fuse cut off	Replace
	Bulb burnt out	Replace
	Loose wiring connection	Retighten
	Bad connection of L-S terminals	Inspect and replace wiring, Replace voltage regulator
With the engine started, warning lamp is not turned off (Battery needs often charging)	Loose or worn drive belt	Correct or replace
	Fuse cut off	Replace
	Fuse link cut off	Replace
	Faulty voltage regulator or alternator	Inspect alternator
	Faulty wiring	Repair
	Corrosion or wear of battery cable	Repair or replace
Overcharged	Faulty voltage regulator (Charging warning lamp illuminates)	Replace
	Voltage detection wring fault	Replace
Battery is discharged	Loose or worn drive belt	Correct or replace
	Loose wiring connection	Retighten
	Short circuit	Repair
	Fusible link cut off	Replace
	Ground fault	Repair
	Faulty voltage regulator (Charging warning lamp illuminates)	Inspect alternator
	Battery out	Replace

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Description	Specification	Limit
VALVE		
Stem O.D		
Intake	5.965 ~ 5.980 mm	
Exhaust	5.950 ~ 5.965 mm	
Thickness of valve head (Margin)		
Intake	1.15 mm	0.8 mm
Exhaust	1.35 mm	1.0 mm
Valve stem to guide clearance		
Intake	0.02 ~ 0.05 mm	0.1 mm
Exhaust	0.035 ~ 0.065 mm	0.13 mm
VALVE GUIDE		
Length		
Installed size	Intake : 46, Exhaust : 54.5	
Over size	0.05, 0.25, 0.50	
VALVE SEAT		
Seat angle	45°	
Over size	0.3, 0.6	
VALVE SPRING		
Free length	48.86 mm	
Load	18.3kg/39 mm	
	40.0kg/30.5 mm	
Installed height	39 mm	
Out-of squareness	1.5 mm or less	3°
CYLINDER BLOCK		
Cylinder I.D	82.00 ~ 82.03 mm	
Out-of cylindricity of cylinder I.D	Less than 0.01 mm	
Cylinder block-to-piston clearance	0.02 ~ 0.04	
PISTON		
O.D	81.97 ~ 82.00 mm	
Over size	0.25, 0.50, 0.75, 1.00	
PISTON RING		
Side clearance		
No.1	0.04 ~ 0.08 mm	0.1 mm
No.2	0.03 ~ 0.07mm	0.1 mm
End gap		
No.1	0.23 ~ 0.38 mm	
No.2	0.33 ~ 0.48 mm	1.0 mm
Oil ring side rail	0.2 ~ 0.6 mm	1.0 mm
Over size	0.25, 0.50, 0.75, 1.00	1.0 mm
CONNECTING ROD		
Bend	0.05 mm or less	
Twist	0.10 mm or less	
Side clearance	0.100 ~ 0.250 mm	0.4 mm

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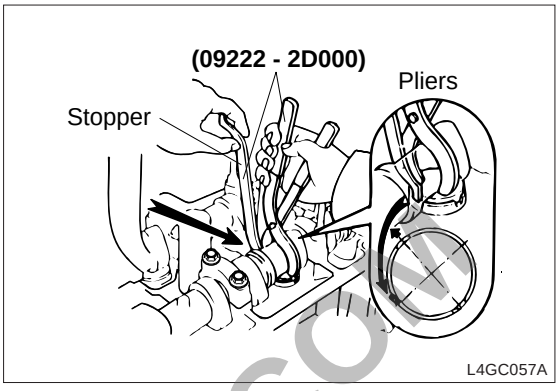
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Description	Standard (Kg·m)
Thermostat inlet fitting nut	1.5 ~ 2.0
Thermostat housing mounting nut	1.5 ~ 2.0
Water pump mounting bolt	2.0 ~ 2.7
Alternator brace bolt	2.0 ~ 2.7
Water temperature sensor	2.0 ~ 4.0
Alternator support bolt and nut	2.0 ~ 2.5
Water pump pulley	0.8 ~ 1.0
Intake manifold and cylinder head bolt	1.6 ~ 2.3
Intake manifold cover and intake manifold bolt	1.8 ~ 2.5
Throttle body and Surge tank nut	1.5 ~ 2.0
Exhaust manifold and cylinder head bolt	4.3 ~ 5.5
Exhaust manifold cover and intake manifold bolt	1.5 ~ 2.0
Oxygen sensor and intake manifold bolt	5.0 ~ 6.0
Water pipe bracket bolt	1.2 ~ 1.5
Chain guide	0.8 ~ 1.0
Starter bolt	2.7 ~ 3.4
Heater protector	1.5 ~ 2.0

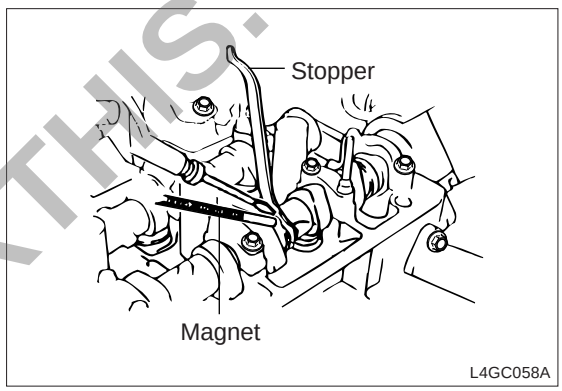
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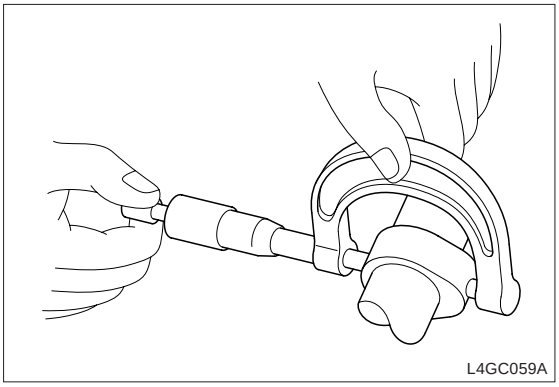
2) Using the special tool(09222-2D000), press the valve liter downward and install the stopper between the cam shaft and valve lifter.



3) Remove the adjusting shim using a small screwdriver and a magnet.



4) Using a micrometer, measure thickness of the removed shim.



5) Calculate thickness of new shim to be valve gap within the specified value.
T: Thickness of removed shim
A: Measured valve gap
N: Thickness of new shim
Intake : N=T+(A-0.20mm)
Exhaust : N=T+(A-0.28mm)

NOTE
There are 20 shims up to 2.0mm at intervals of 0.04mm.

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