

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

2004 ENGINES

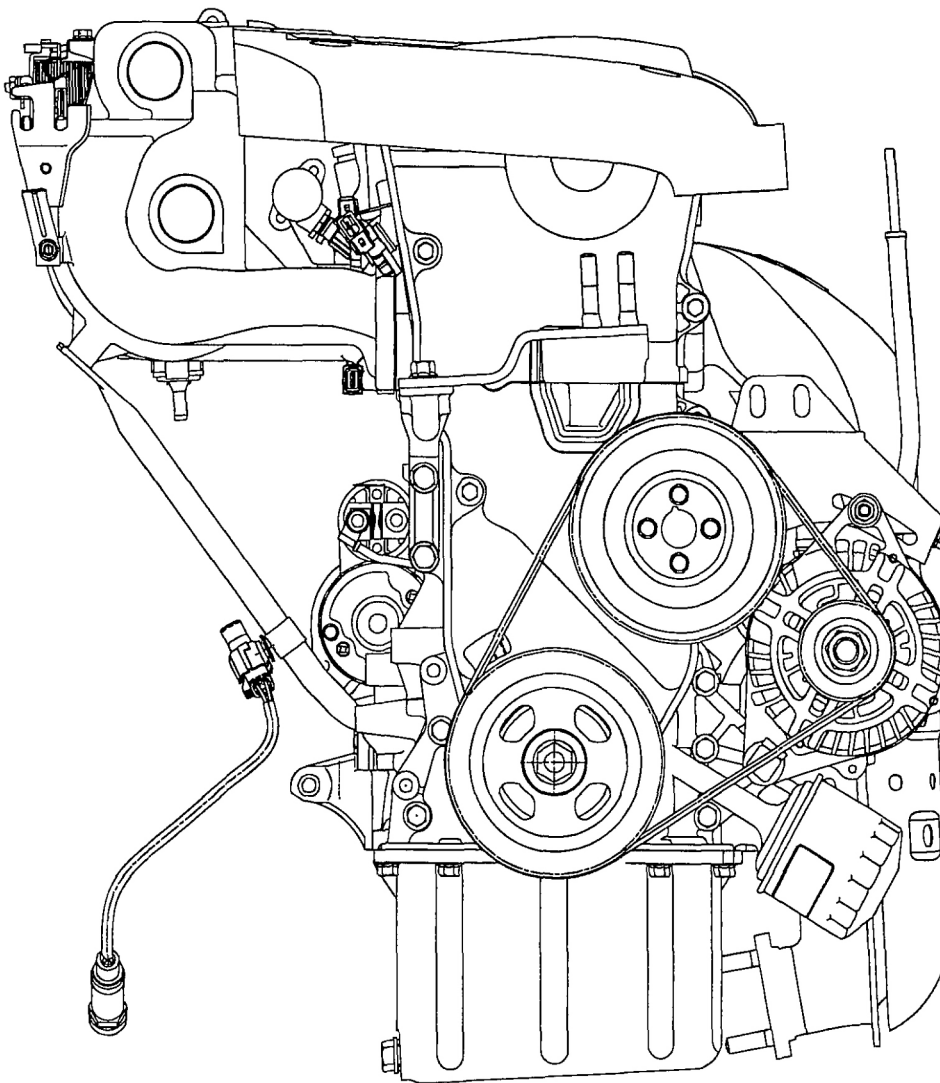
2.0L 4-Cylinder - Tiburon

GENERAL

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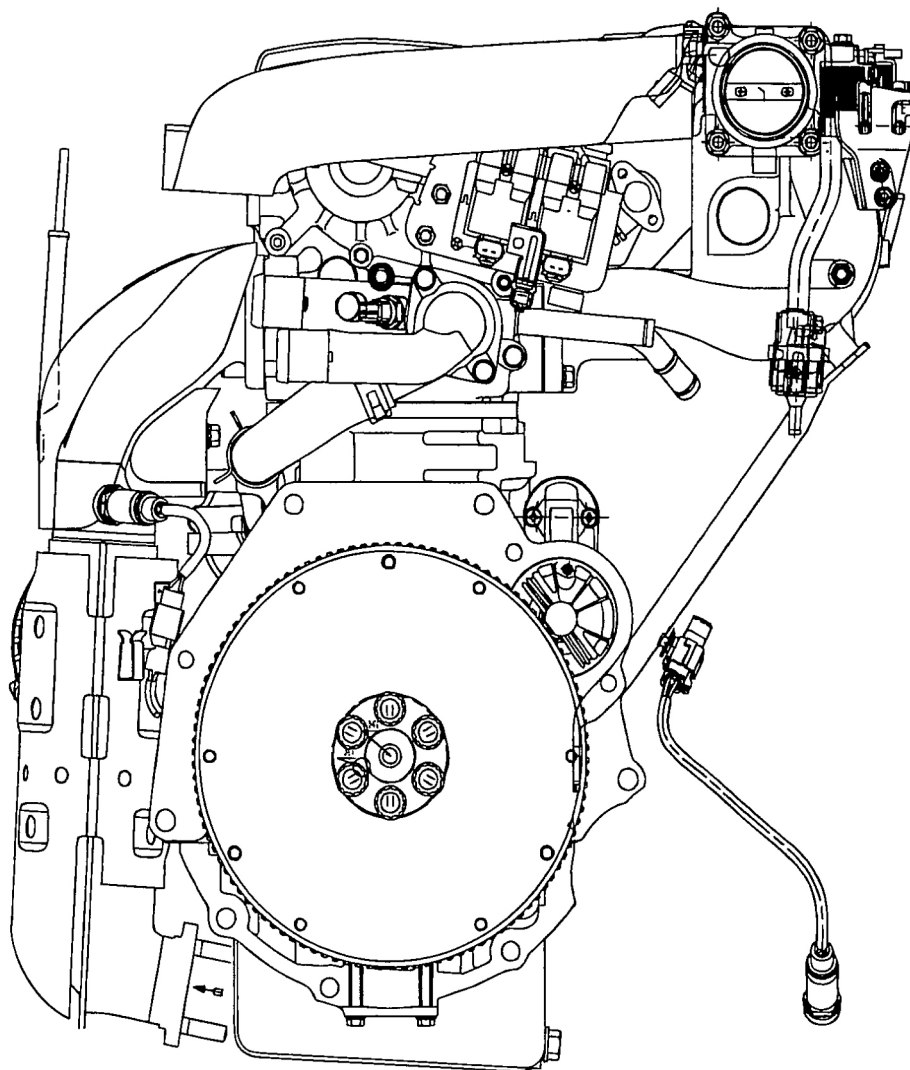
BETA ENGINE APPEARANCE

FRONT VIEW



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Fig. 1: Front View
Courtesy of HYUNDAI MOTOR CO.

REAR VIEW

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Fig. 2: Rear View

Courtesy of HYUNDAI MOTOR CO.

SPECIFICATIONS**Engine Specifications**

Description	Specification	Limit
General		
Type	In-line, Double overhead Camshaft	
Number of cylinder	4	
Bore	82 mm (3.228 in.)	

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Stroke	93.5 mm (3.681 in.)	
Total displacement	1975cc (120.52 cu.in.)	
Compression ratio	10.1	
Firing order	1-3-4-2	
Valve timing(W/0-CVVT)		
Intake valve		
Opens (BTDC)	9°	
Close (ABDC)	43°	
Exhaust valve		
Opens (BBDC)	50°	
Close (ATDC)	6°	
Valve timing (W-CVVT)		
Intake valve		
Opens (ATDC)	11°	
Closes (ABDC)	59°	
Exhaust		
Opens (BBDC)	42°	
Close (ATDC)	6	
Valve		
Valve length		
Intake	114.34 mm (4.5016 in.)	
Exhaust	116.8 mm (4.5984 in.)	
Stem O.D.		
Intake	5.965 ~ 5.98 mm (0.2348 ~ 0.2354 in.)	
Exhaust	5.950 ~ 5.965 mm (0.2343 ~ 0.2348 in.)	
Face angle thickness of valve head (Margin)		
Intake	1.15 mm (0.0452 in.)	0.8 mm (0.031 in.)
Exhaust	1.35 mm (0.0531 in.)	1.0 mm (0.039 in.)
Valve stem to valve guide clearance		
Intake	0.02 ~ 0.05 mm (0.0008 ~ 0.0019 in.)	0.10 mm(0.0039 in.)
Exhaust	0.035 ~ 0.065 mm (0.0014 ~ 0.0026 in.)	0.13 mm(0.0051 in.)
Valve guide		
Intake	46 mm (1.811 in.)	
Exhaust	54.5 mm (2.146 in.)	
Service oversize	0.025, 0.25, 0.50 mm (0.002, 0.010, 0.020 in.) oversize	
Valve seat		
Width of seat contact		

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Intake	1.1 ~ 1.5 mm (0.043 ~ 0.059 in.)	
Exhaust	1.3 ~ 1.7 mm (0.051 ~ 0.066 in.)	
Seat angle	45°	
Oversize	0.3, 0.6 mm (0.012, 0.024 in.) oversize	
Valve spring		
Free length	48.86 mm (1.9236 in.)	
Load	18.3kg / 39 mm, 40.0kg / 30.5 mm	
Installed height	39 mm (1.5344 in.)	
Squareness	1.5° or less	
Valve clearance (cold)		
Intake	0.20 mm (0.0079 in.)	0.12 ~ 0.28 mm (0.0047 ~ 0.0110 in.)
Exhaust	0.28 mm (0.0110 in.)	0.20 ~ 0.38 mm (0.0079 ~ 0.0150 in.)
Hot [80°C (176°F)]: only for reference		
Intake	0.29 mm (0.0114 in.)	
Exhaust	0.34 mm (0.0134 in.)	
Cylinder head		
Flatness of gasket surface	Max. 0.03 mm (0.0012 in.)	0.06 mm (0.0024 in.)
Flatness of manifold mounting surface	Max. 0.15 mm (0.0110 in.)	Max. 0.03 mm (0.0118 in.)
Oversize rework dimensions valve seat hole		
Intake		
0.3 mm (0.012 in.) O.S.	33.300 ~ 33.325 mm (1.3110 ~ 1.3120 in.)	
0.6 mm (0.024 in.) O.S.	33.600 ~ 33.625 mm (1.3228 ~ 1.3238 in.)	
Exhaust		
0.3 mm (0.012 in.) O.S.	28.800 ~ 28.821 mm (1.1338 ~ 1.1346 in.)	
0.6 mm (0.024 in.) O.S.	29.100 ~ 29.121 mm (1.1456 ~ 1.14665 in.)	
Oversize rework dimensions of valve guide hole (both intake and exhaust)		
0.05 mm (0.002 in.) O.S.	11.05 ~ 11.068 mm (0.435 ~ 0.4357 in.)	
0.25 mm (0.010 in.) O.S.	11.25 ~ 11.268 mm (0.443 ~ 0.4436 in.)	
0.50 mm (0.020 in.) O.S.	11.50 ~ 11.518 mm (0.453 ~ 0.4535 in.)	
Cylinder block		

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Cylinder bore	82.00 ~ 82.03 mm (3.2289 ~ 3.2295 in.)	
Out-of-round taper of cylinder bore	Less than 0.01 mm (0.0004 in.)	
Clearance with piston (To set limits to new parts)	0.02 ~ 0.04 mm (0.0008 ~ 0.0016 in.)	
Piston		
O.D. (To set limits to new parts)	81.97 ~ 82.00 mm (3.2271 ~ 3.2283 in.)	
Service oversize	0.25, 0.50 mm (0.010, 0.020 in.) oversize	
Piston ring		
Side clearance		
No. 1	0.04 ~ 0.08 mm (0.0015 ~ 0.0031 in.)	0.1 mm (0.004 in.)
No. 2	0.03 ~ 0.07 mm (0.0012 ~ 0.0027 in.)	
End gap		
No. 1	0.23 ~ 0.38 mm (0.0090 ~ 0.0149 in.)	1 mm (0.039 in.)
No. 2	0.33 ~ 0.48 mm (0.0130 ~ 0.0189 in.)	1 mm (0.039 in.)
Oil ring side rail	0.20 ~ 0.60 mm (0.0078 ~ 0.0236 in.)	1 mm (0.039 in.)
Service oversize	0.25, 0.50 mm (0.010, 0.020 in.) oversize	
Connecting rod bearing		
Bend	0.05 mm (0.0020 in.) or less	
Twist	0.1 mm (0.004 in.) or less	
Connecting rod big end to crankshaft side clearance	0.100 ~ 0.250 mm (0.0039 ~ 0.0098 in.)	0.04 mm (0.0157 in.)
Connecting rod bearing		
Oil clearance (To set limits to new parts)	0.024 ~ 0.044 mm (0.0009 ~ 0.0017 in.)	
Undersize	0.25, 0.50, 0.75 mm (0.01, 0.20, 0.03 in.)	
Camshaft (W/O-CVVT)		
Cam lobe height		
Intake	44.820 mm (1.7646 in.)	44.720 mm (1.7606 in.)
Exhaust	44.720 mm (1.7606 in.)	44.620 mm (1.7567 in.)
Camshaft (W-CVVT)		
Cam lobe height		
Intake	44.618 mm (1.7566 in.)	44.518 mm (1.7527 in.)
Exhaust	44.518 mm (1.7527 in.)	44.418 mm (1.7487 in.)

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Journal O.D.	28 mm (1.1023 in.)	
Bearing oil clearance	0.02 ~ 0.061 mm (0.0008 ~ 0.0024 in.)	0.1 mm (0.0039 in.)
End play	0.1 ~ 0.2 mm (0.004 ~ 0.008 in.)	
Crankshaft		
Pin O.D.	45 mm (1.77 in.)	
Journal O.D.	57 mm (2.244 in.)	
Bend	0.03 mm (0.0012 in.) or less	
Out-of-round, taper of journal and pin	0.01 mm (0.0004 in.) or less	
End play	0.06 ~ 0.260 mm (0.0023 ~ 0.010 in.)	0.30 mm (0.0118 in.)
Undersize rework dimension of pin		
0.25 mm (0.010 in.)	44.725 ~ 44.740 mm (1.7608 ~ 1.7614 in.)	
0.50 mm (0.020 in.)	44.475 ~ 44.490 mm (1.7509 ~ 1.7516 in.)	
0.75 mm (0.030 in.)	44.225 ~ 44.250 mm (1.7411 ~ 1.7517 in.)	
Undersize rework dimension of journal		
0.25 mm (0.010 in.)	56.727 ~ 56.742 mm (2.2333 ~ 2.2339 in.)	
0.50 mm (0.020 in.)	56.477 ~ 56.492 mm (2.2235 ~ 2.2240 in.)	
0.75 mm (0.030 in.)	56.227 ~ 56.242 mm (2.2136 ~ 2.2142 in.)	
Flywheel		
Runout	0.1 mm (0.0039 in.)	0.13 mm (0.0051 in.)
Cooling method	Water-cooled, pressurized, Forced circulation with electrical	
Coolant		
Quantity	6 liter (6.3U.S qts., 5.2 Imp. qts)	
Radiator		
Type	Pressurized corrugated fin type	
Radiator cap		
Main valve opening pressure	83 ~ 110 kpa (12 ~ 16psi, 0.83 ~ 1.1 kg/cm ²)	
Vacuum valve opening temperature	-7 kpa (-1.00 psi, -0.07 kg/cm ²)	
Thermostat		
Type	Wax pellet type with jiggle valve	
Valve opening temperature	82°C (177°F)	

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Full-opening temperature	95°F (201°F)	
Coolant pump	Centrifugal type impeller	
Driver belt		
Type	V-ribbed belt	
Engine coolant temperature sensor		
Type	Heat-sensitive thermistor type	
Resistance	2.31 ~ 2.59Kohms at 20°C (68°F)	
Oil pump		
Clearance between outer circumference and front case	0.120 ~ 0.185 mm (0.0047 ~ 0.0073 in.)	
Front clearance	0.025 ~ 0.069 mm (0.0009 ~ 0.0027 in.)	
Side clearance		
Inner gear	0.04 ~ 0.085 mm (0.0016 ~ 0.0033 in.)	
Outer gear	0.04 ~ 0.09 mm (0.0016 ~ 0.0035 in.)	
Engine oil pressure at 15 rpm [Oil temperature is 90 to 110°C (194 ~ 230°F)]	245KPa (2.5kg/cm ² , 35.5psi)	
Relief spring		
Free height	43.8 mm (1.724 in.)	
Load	3.7kg at 40.1 mm (3.15lb/1.578 in.)	
Air cleaner		
Type	Dry type	
Element	Unwoven cloth type	
Exhaust pipe		
Muffler	Expansion resonance type	
Suspension system	Rubber hanger	

SERVICE STANDARDS

Standard value	
Antifreeze	Mixture ratio of anti-freeze in coolant
ETHYLENE GLOYCOL BASE FOR ALUMINUM	50%

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Fig. 3: Coolant Specifications
Courtesy of HYUNDAI MOTOR CO.

TIGHTENING TORQUE

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TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Alternator Brace Bolt	15-20 (20-27)
Camshaft Bearing Cap Bolt	10-11 (14-15)
Camshaft Sprocket Bolt	74-89 (100-120)
Connecting Rod Cap Nut	37-39 (50-53)
Coolant Inlet Fitting Nuts	11-15 (15-20)
Coolant Pump Bolt	15-20 (20-27)
Coolant Temperature Sensor	15-30 (20-40)
Crankshaft Bearing Cap Bolt	
Step 1	20-24 (27-33)
Step 2	Tighten An Additional 60-65 Degrees
Crankshaft Pulley Bolt	125-133 (170-180)
CVVT Unit-To-Exhaust Camshaft Bolt	49-58 (66-78)
Cylinder Head Bolt ⁽¹⁾	
M10	
Step 1	18 (25)
Step 2	Tighten An Additional 60-65 Degrees
Step 3	Tighten An Additional 60-65 Degrees
M12	
Step 1	22 (30)
Step 2	Tighten An Additional 60-65 Degrees
Step 3	Tighten An Additional 60-65 Degrees
Engine Mounts	
Front Engine Support Bracket Bolt & Nut	25-37 (35-50)
Front Roll Stopper Bracket Bolt	51-66 (70-90)
Front Roll Stopper Bracket-To-Center Member Bolts	30-37 (40-50)
Front Roll Stopper Insulator Nut	37-48 (50-65)
Rear Engine Stopper Bracket Bolt	25-37 (35-50)
Rear Roll Stopper Bracket Bolt	51-66 (70-90)
Rear Roll Stopper Bracket-To-Center Member Bolt	30-37 (40-50)
Rear Roll Stopper Insulator Nut	37-48 (50-65)
Right Mounting Bracket-To-Engine Nuts & Bolts	37-48 (50-65)
Right Mounting Insulator Nut (Large)	66-81 (90-110)
Right Mounting Insulator Nut (Small)	33-44 (45-60)
Transaxle Insulator Bracket-To-Side Member Bolts	30-37 (40-50)
Transaxle Mount Insulator Nut	66-81 (90-110)

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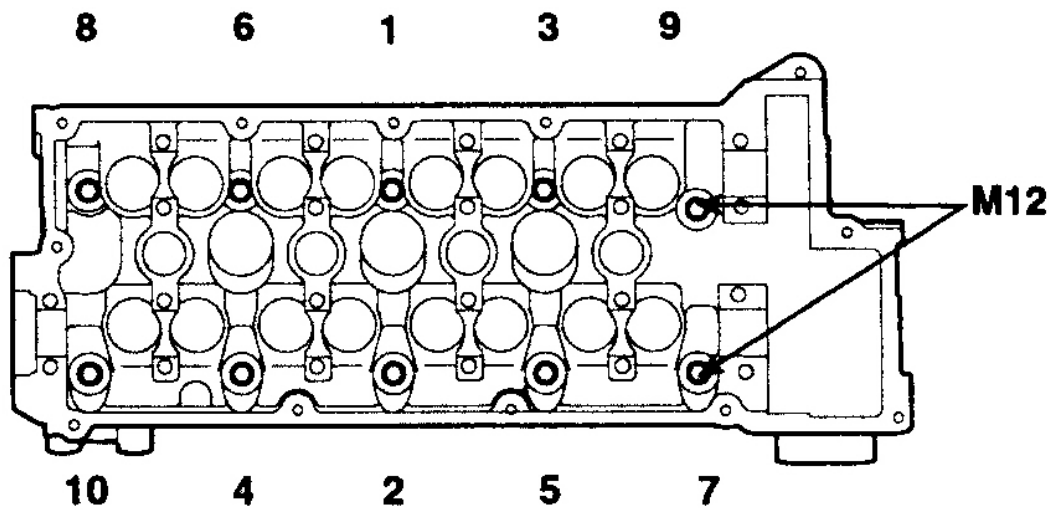
Exhaust Components

Exhaust Manifold Cover-To-Exhaust Manifold Bolts	11-14 (15-20)
Exhaust Manifold-To-Cylinder Head Nut	32-40 (43-55)
Exhaust Pipe-To-Manifold Nut	22-30 (30-40)
Front Exhaust Pipe Bracket Bolts	22-30 (30-40)
Front Exhaust Pipe-To-Catalytic Converter Bolts	29-43 (40-60)
Flexplate-To-Crankshaft Bolt	89-96 (120-130)
Flywheel-To-Crankshaft Bolt	89-96 (120-130)
Front Case Bolts	15-20 (20-27)
Heat Protector Bolts	11-15 (15-20)
Intake Manifold Bracket Bolts	13-18 (18-25)
Intake Manifold Nuts	13-18 (18-25)
Intake Manifold-To-Cylinder Head Nuts & Bolts	12-17 (16-23)
OCV Filter	30-38 (41-51)
Oil Drain Plug	30-33 (40-45)
Oil Filter	9-12 (12-16)
Oil Screen Bolt	11-16 (15-22)
Oxygen Sensors	36-43 (50-60)
Thermostat Housing	11-15 (15-20)
Throttle Body-To-Surge Tank Nuts	11-15 (15-20)
Timing Belt Idler Bolt	31-40 (43-55)
Timing Belt Tensioner Bolt	31-40 (43-55)
INCH Lbs. (N.m)	
Air Cleaner Body Mounting Bolts	71-89 (8-10)
Alternator Lock Bolt	106-133 (12-15)
Coolant Pump Pulley Bolts	71-89 (8-10)
Cylinder Head Cover Bolts	71-89 (8-10)
Engine Cover	27-35 (4-6)
Main Muffler Hanger Support Bracket Bolts	89-133 (10-15)
Oil Control Valve Bolt	89-106 (10-12)
Oil Pan Bolt	89-106 (10-12)
Oil Pressure Switch	115-133 (13-15)
Rear Plate Bolts	71-89 (8-10)
Resonator Mounting Bolts	27-35 (4-6)
Timing Belt Cover Bolt	71-89 (8-10)
Water Pipe Bracket Bolts	106-133 (12-15)

(1) Tighten cylinder head bolts in sequence with engine cold. See **Fig. 4**.

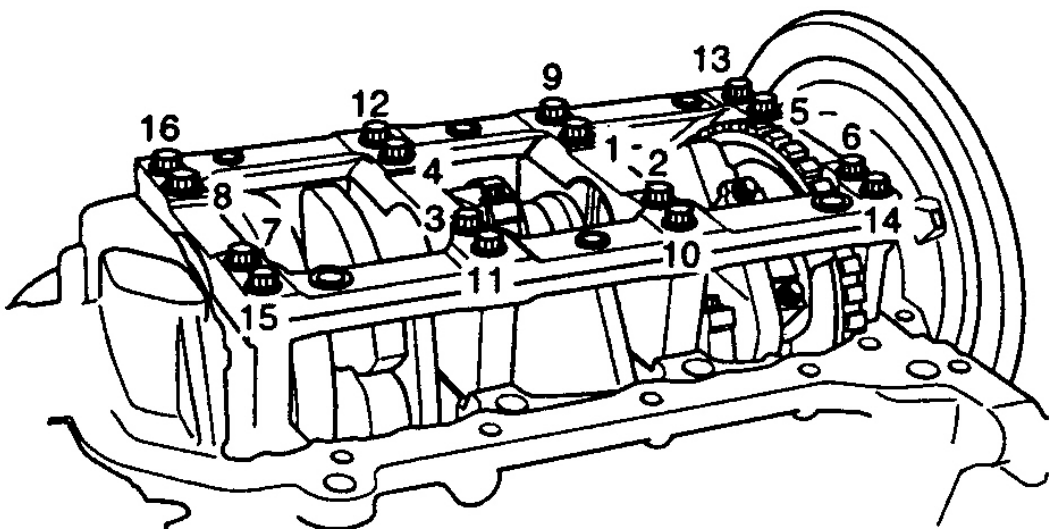
() Tighten in sequence. See **Fig. 5**.

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Fig. 4: Cylinder Head Bolt Tightening Sequence
Courtesy of HYUNDAI MOTOR CO.



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Fig. 5: Main Bearing Cap Tightening Sequence
Courtesy of HYUNDAI MOTOR CO.

MAINTENANCE

CHECKING ENGINE OIL

1. Position the vehicle on a level surface.
2. Warm up the engine.

NOTE: If the vehicle has been out of service for a prolonged period of time, warm up the engine for approximately 20 minutes.

3. Turn off the engine, and wait 2 or 3 minutes, then check the oil level.
4. Check that the engine oil level is within the level range indicated on the oil dipstick. If the oil level is found to have fallen to the lower limit (the "L" mark), refill to the "F" mark.

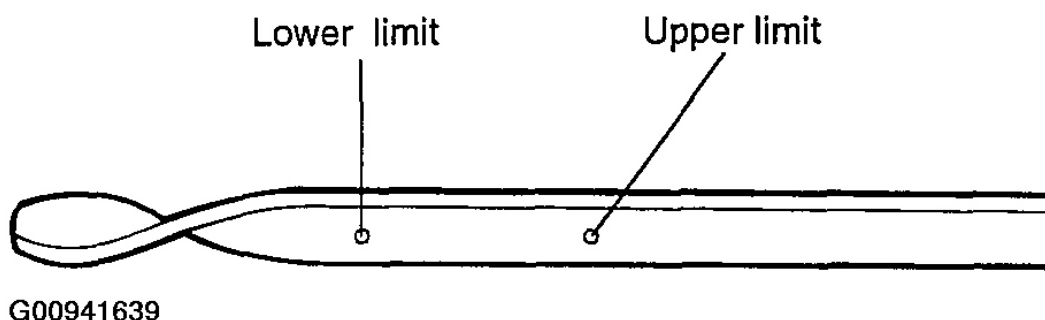


Fig. 6: Identifying Dipstick Marks
Courtesy of HYUNDAI MOTOR CO.

NOTE: When refilling, use the same type of engine oil.

5. Check that the oil is not dirty or contaminated with coolant or gasoline, and that it has the proper viscosity.

CHANGING ENGINE OIL

CAUTION: Be careful not to burn yourself, as the engine oil is hot.

1. Run the engine until it reaches normal operating temperature.
2. Turn off the engine.
3. Remove the oil filler cap and the drain plug (on the oil pan). Drain the engine oil.
4. Install and tighten the drain plug to the specified torque.

Tightening torque

Drain plug : 40 ~ 45 Nm (400 ~ 450 kg.cm, 30 ~ 33 lb.ft)

5. Fill the crankcase with fresh engine oil through the oil filler cap opening.

Capacity

Drain and refill

Without oil filter : 3.55 liter (3.75 U.S.qts., 3.1 Imp.qts.)

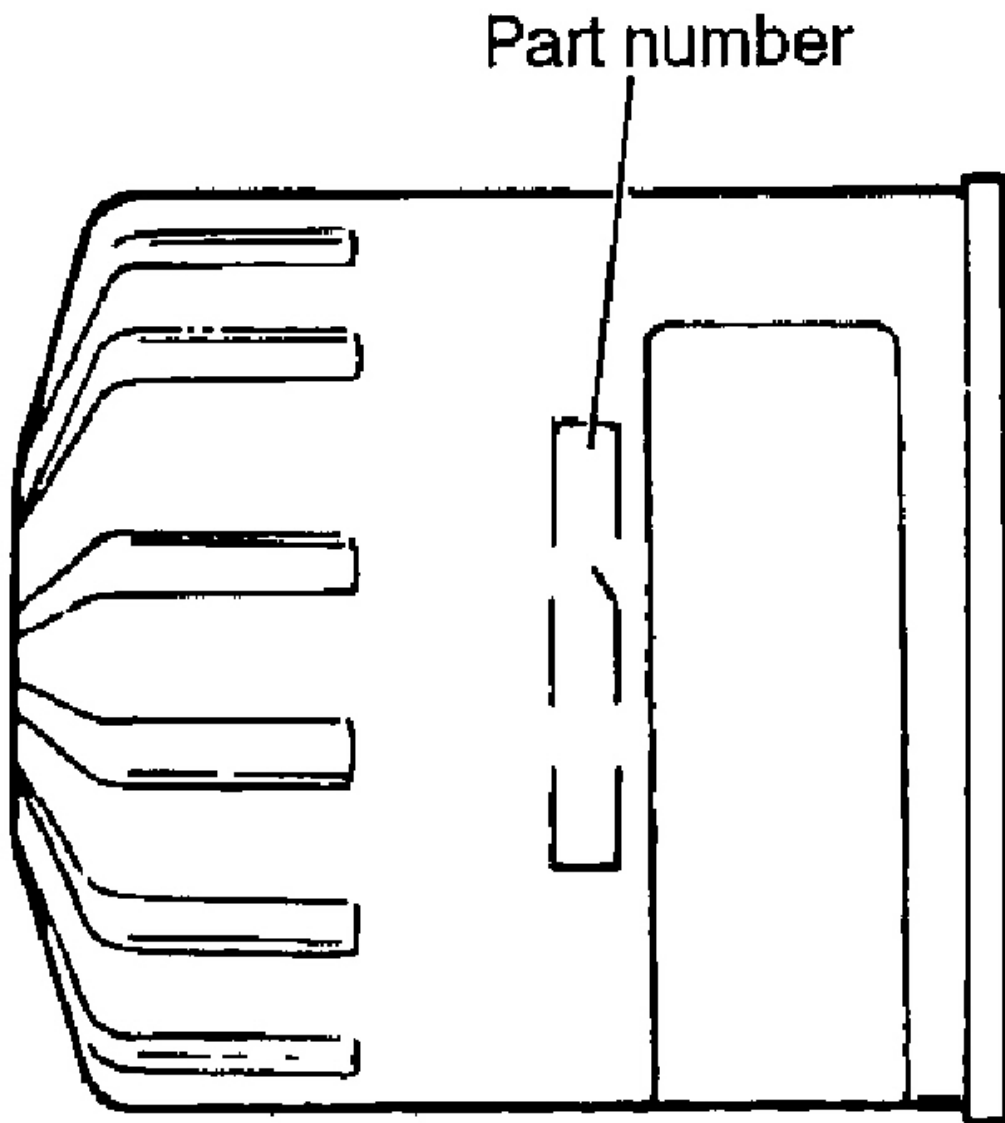
With oil filter : 3.85 liter (4.1 U.S.qts., 3.4 Imp.qts.)

CAUTION: Do not overfill the crankcase. This will cause oil aeration and loss of oil pressure.

6. Install the oil filler cap.
7. Start and run the engine.
8. Turn off the engine and then check the oil level. Add oil if necessary.

FILTER SELECTION

All Hyundai engines are equipped with a high quality, disposable oil filter. This filter is recommended as a replacement filter on all vehicles. The quality of replacement filters varies considerably. Only high quality filters should be used to assure the most efficient service. Make sure that the rubber gasket from the old oil filter is completely removed from the contact surface on the engine block or front case before installing the new filter.



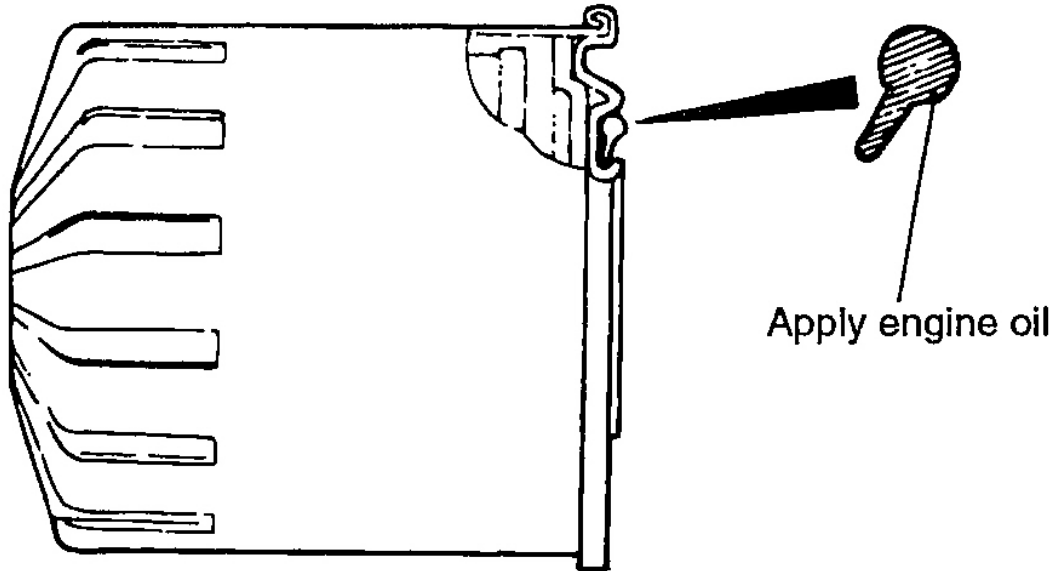
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Fig. 7: Locating Oil Filter Part Number
Courtesy of HYUNDAI MOTOR CO.

PROCEDURE FOR REPLACING THE OIL FILTER

CAUTION: Be careful not to burn yourself, as the engine and engine oil are hot.

1. Use a filter wrench to remove the oil filter.
2. Before installing the new oil filter on the engine, apply clean engine oil to the surface of the rubber gasket.



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Fig. 8: Applying Engine Oil-To-Oil Filter Gasket
Courtesy of HYUNDAI MOTOR CO.

3. Tighten the oil filter to the specified torque.

Tightening torque

Oil filter : 12 ~ 16 Nm (120 ~ 160 kg.cm, 9 ~ 12 lb.ft)

4. Run the engine to check for engine oil leaks.
5. After turning off the engine, check the oil level and add oil as necessary.

SELECTION OF ENGINE OIL

Recommended API classification: SH OR ABOVE

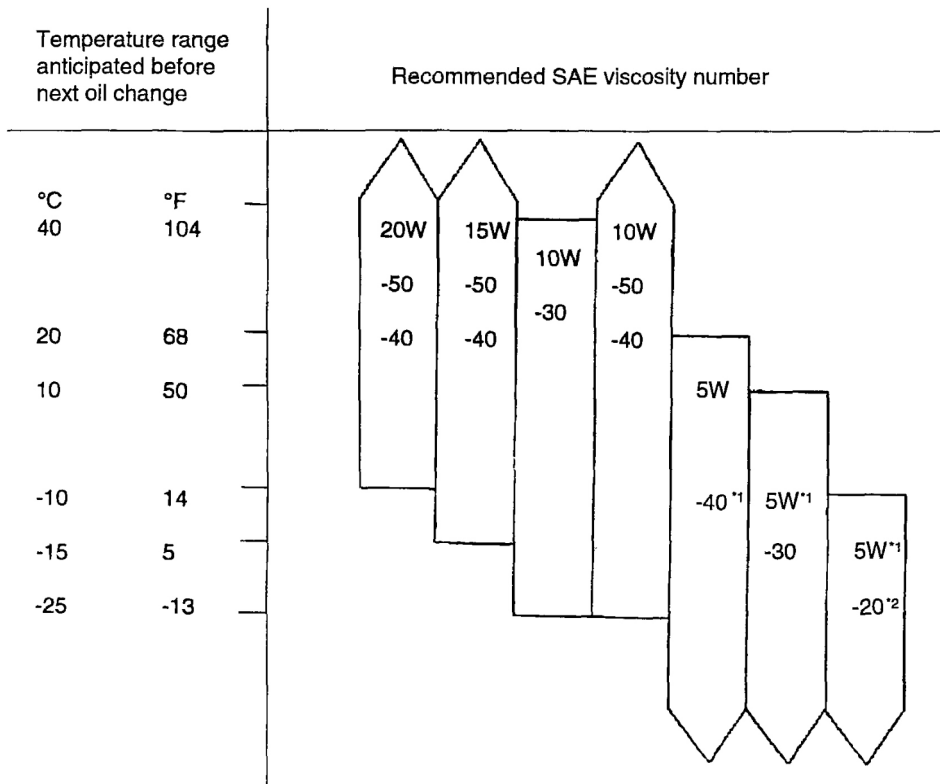
Recommended SAE viscosity grades :

W/O - CVVT

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W/O - CVVT



*1 Restricted by driving condition and environment.

*2 Not recommended for sustained high speed vehicle operation

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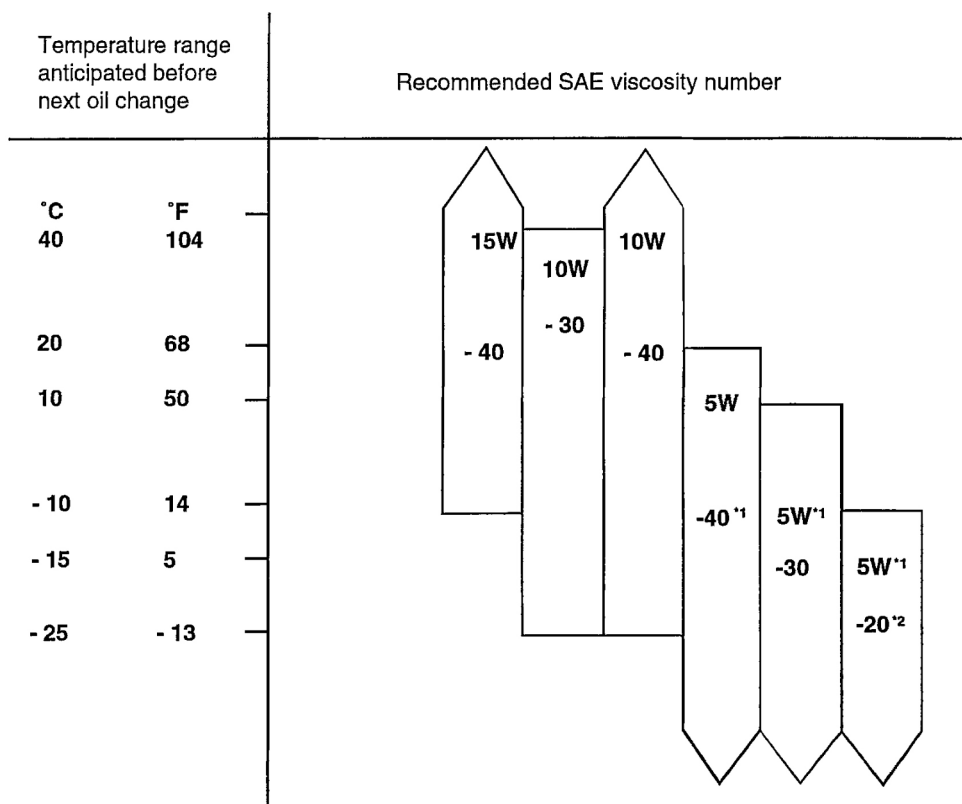
Fig. 9: Selection Of Engine Oil (W/O - CVVT)
 Courtesy of HYUNDAI MOTOR CO.

W - CVVT

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W - CVVT



*1 Restricted by driving condition and environment.

*2 Not recommended for sustained high speed vehicle operation

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Fig. 10: Selection Of Engine Oil (W - CVVT)

Courtesy of HYUNDAI MOTOR CO.

NOTE: For best performance and maximum protection of all types of operation, select only those lubricants which:

1. Satisfy the requirements of the API classification.
2. Have proper SAE grade number for expected ambient temperature range.

Lubricants that do not have both an SAE grade number and an API service classification on the container should not be used.

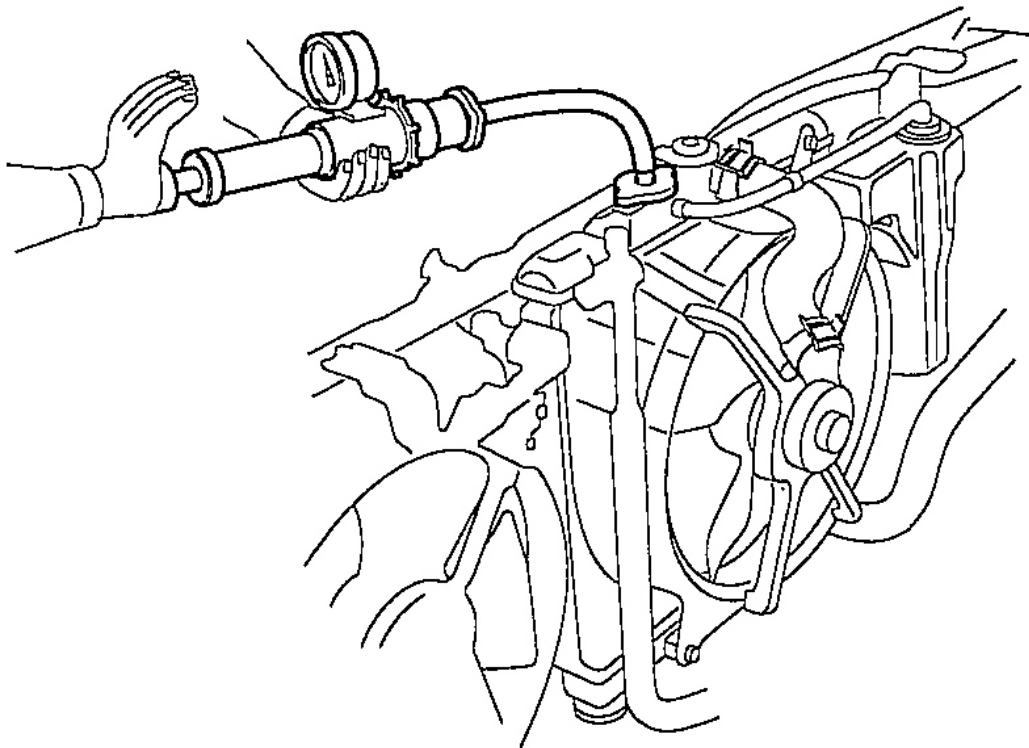
CHECKING COOLANT LEAK

1. Loosen the radiator cap.
2. Confirm that the coolant level is up to the filler neck.

3. Install a radiator cap tester to the radiator filler neck and apply 140 KPa (1.4 kg/cm² , 20psi) pressure. Hold it for two minutes in that condition, while checking for leakage from the radiator, hoses or connections.

NOTE:

1. Radiator coolant may be extremely hot. Do not open the system because hot, or scalding water could gush out causing personal injury. Allow the vehicle to cool before servicing this system.
 2. Be sure to clean away any moisture from the places checked completely.
 3. When the tester is removed, be careful not to spill any coolant from it.
 4. Be careful, when installing and removing the tester and when testing, not to deform the filler neck of the radiator.
4. If there is leakage, repair or replace with the appropriate part.



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Fig. 11: Checking For Coolant Leak
Courtesy of HYUNDAI MOTOR CO.

RADIATOR CAP PRESSURE TEST

1. Use an adapter to attach the cap to the tester.
2. Increase the pressure until the gauge stops moving.

Main valve opening pressure :

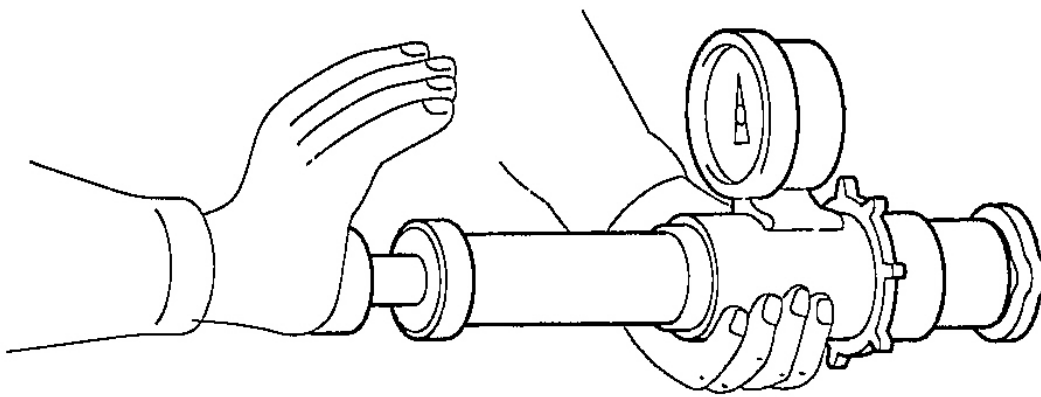
83 ~ 110 kPa (0.83 ~ 1.1 kg/cm² , 12 ~ 16 psi)

Vacuum valve opening pressure :

-7 kPa (-0.07 kg/cm² , -1.0 psi)

3. Check that the pressure level is maintained at or above the limit.
4. Replace the radiator cap if the reading does not remain at or above the limit.

NOTE: Be sure that the cap is clean before testing, since rust or other foreign material on the cap seal will cause an incorrect reading.

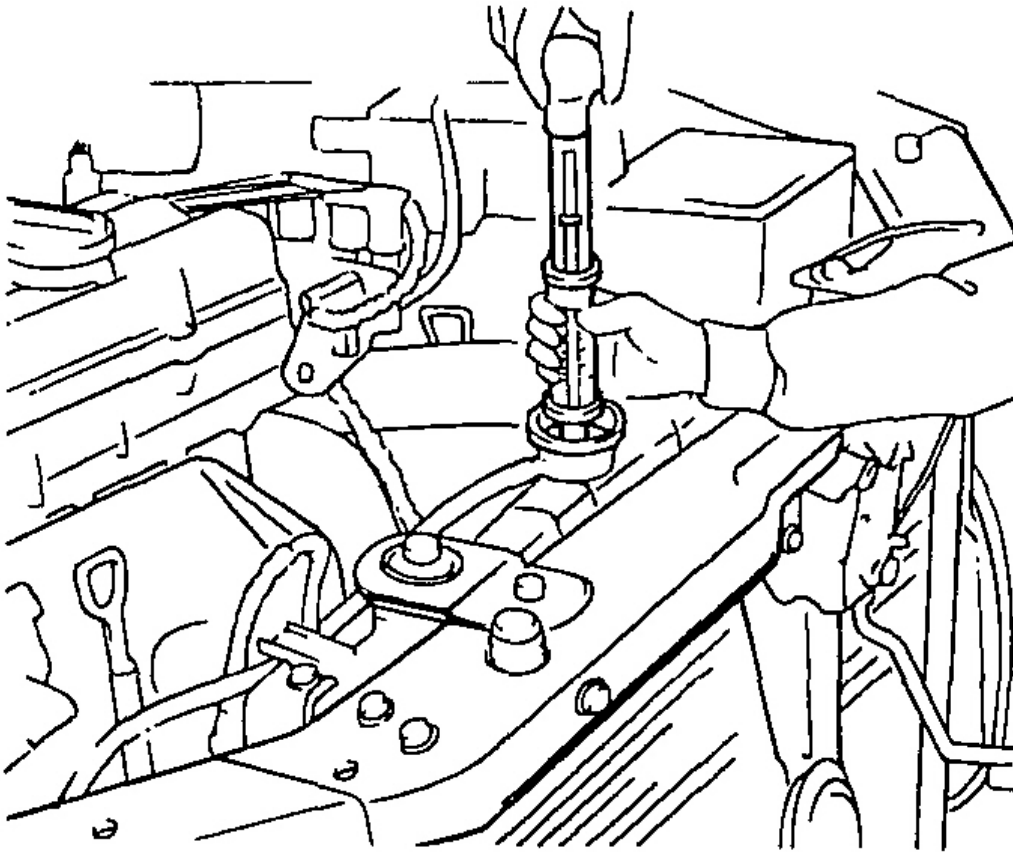


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Fig. 12: Testing Radiator Cap
Courtesy of HYUNDAI MOTOR CO.

SPECIFIC GRAVITY TEST

1. Measure the specific gravity of the coolant with a hydrometer.
2. Measure the coolant temperature and calculate the concentration from the relation between the specific gravity and temperature, using the following table for reference.



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Fig. 13: Testing Coolant Gravity
Courtesy of HYUNDAI MOTOR CO.

RELATION BETWEEN COOLANT CONCENTRATION AND SPECIFIC GRAVITY

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Coolant temperature °C(°F) and specific gravity					Freezing temperature °C (°F)	Safe operating temperature °C(°F)	Coolant concentration (specific volume)
10 (50)	20 (68)	30 (86)	40 (104)	50 (122)			
1.504	1.050	1.046	1.042	1.036	-16 (3.2)	-11 (12.2)	30%
1.063	1.058	1.054	1.049	1.044	-20 (-4)	-15 (5)	35%
1.071	1.067	1.062	1.057	1.052	-25 (-13)	-20 (-4)	40%
1.079	1.074	1.069	1.064	1.058	-30 (-22)	-25 (-13)	45%
1.087	1.082	1.076	1.070	1.064	-36 (-32.8)	-31 (-23.8)	50%
1.095	1.090	1.084	1.077	1.070	-42 (-44)	-37 (-35)	55%
1.103	1.098	1.092	1.084	1.076	-50 (-58)	-45 (-49)	60%

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Fig. 14: Relation Between Coolant Concentration & Specific Gravity Table
Courtesy of HYUNDAI MOTOR CO.

Example

The safe operating temperature is -15°C (5°F) when the measured specific gravity is 1.058 at coolant temperature of 20°C (68°F)

NOTE:

- If the concentration of the coolant is below 30%, its anti-corrosion properties will be adversely affected.
- If the concentration is above 60%, both the anti-freeze and engine cooling property will decrease, affecting the engine adversely. For these reasons, be sure to maintain the concentration level within the specified range
- Do not use together with another brand's product.

RECOMMENDED COOLANT

Antifreeze	Mixture ratio of anti freeze in coolant
ETHYLENE GLYCOL BASE FOR ALUMINUM	50% [Except tropical areas] 40% [Tropical areas]

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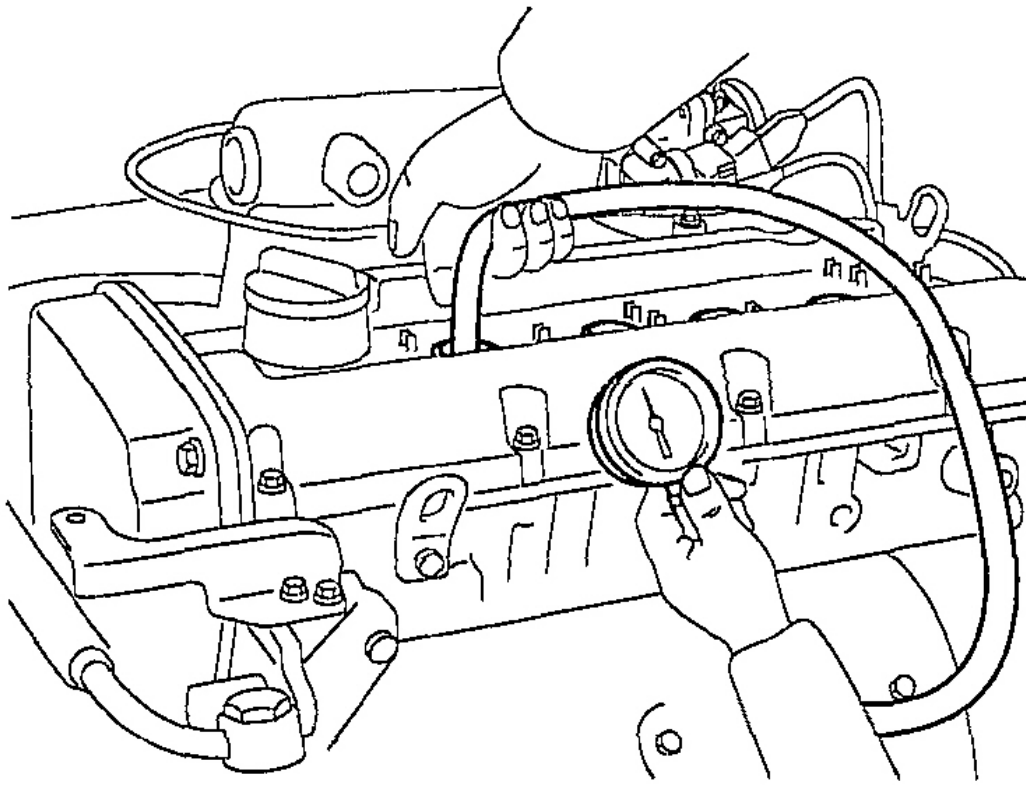
Fig. 15: Recommended Coolant
Courtesy of HYUNDAI MOTOR CO.

CHECKING COMPRESSION PRESSURE

1. Before checking engine compression, check the engine oil level. Also check that the starter motor and battery are all in normal operating condition.
2. Start the engine and wait until engine coolant temperature reaches 80 ~ 95°C (176 ~ 205°F).
3. Turn off engine and disconnect the spark plug cables.

4. Remove the spark plugs.
5. Crank the engine to remove any foreign material in the cylinders.
6. Insert the compression gauge into the spark plug hole.
7. Depress the accelerator pedal to open the throttle fully.
8. Crank the engine and read the gauge.

Standard value : 1500kpa (15Kg/cm² , 218 psi) Limit : 1400kpa (14Kg/cm² , 203 psi)



G00941649

Fig. 16: Checking Compression Pressure
Courtesy of HYUNDAI MOTOR CO.

9. Repeat steps 6 to 8 over all cylinders, ensuring that the pressure differential for each of the cylinders is within the specified limit.

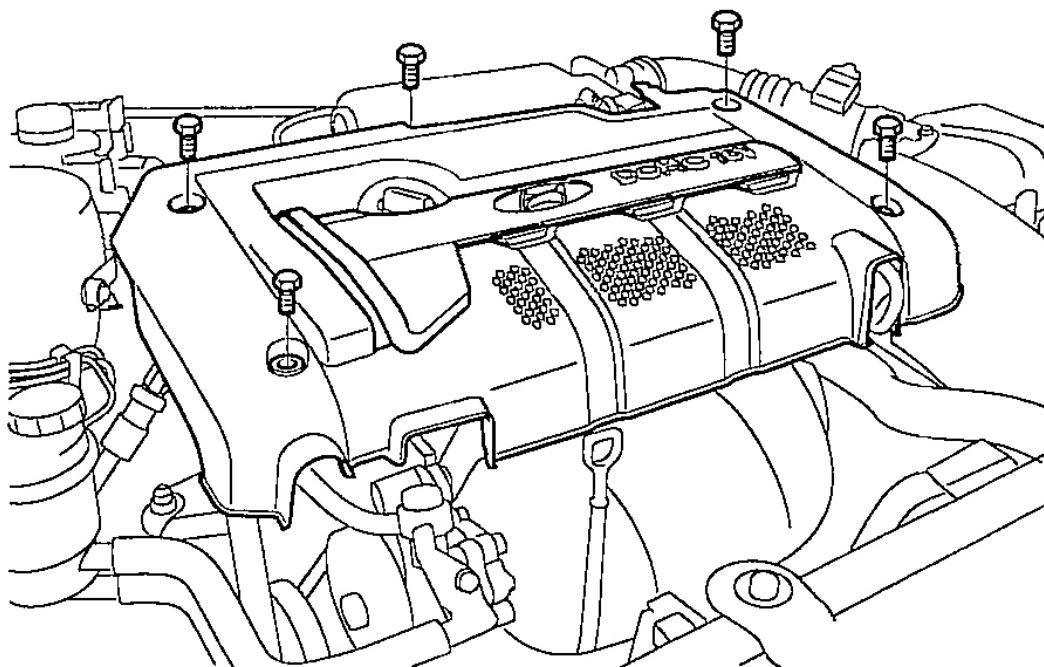
Limit Max. 100 kPa (1.0 kg/cm² , 14 psi) between cylinder

10. If a cylinder's compression or pressure differential is outside the specification, add a small amount of oil through the spark plug hole, and repeat steps 6 to 9.
 1. If the addition of oil makes the compression to rise, it is likely that there may be wear between the piston ring and cylinder wall
 2. If compression remains the same, valve seizure, poor valve seating or a compression leak from the cylinder head gasket are all possible causes.

Tightening torque Spark plug : 20 ~ 30 Nm (200 ~ 300 kg.cm, 14 ~ 22 lb.ft)

TIMING BELT TENSION ADJUSTMENT

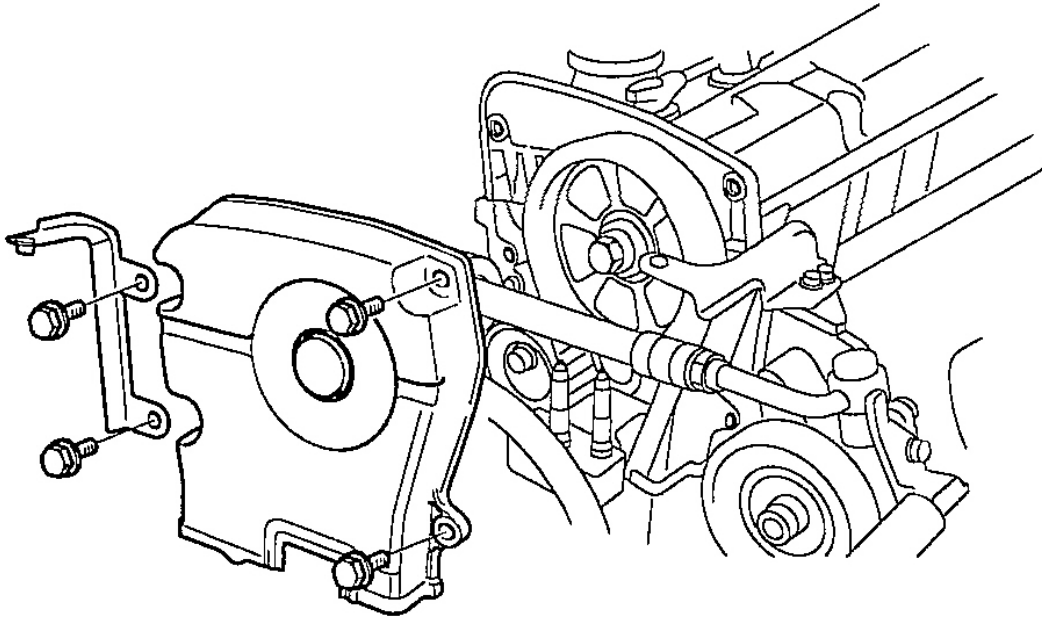
1. Remove the engine cover.



G00941650

Fig. 17: Removing Engine Cover
Courtesy of HYUNDAI MOTOR CO.

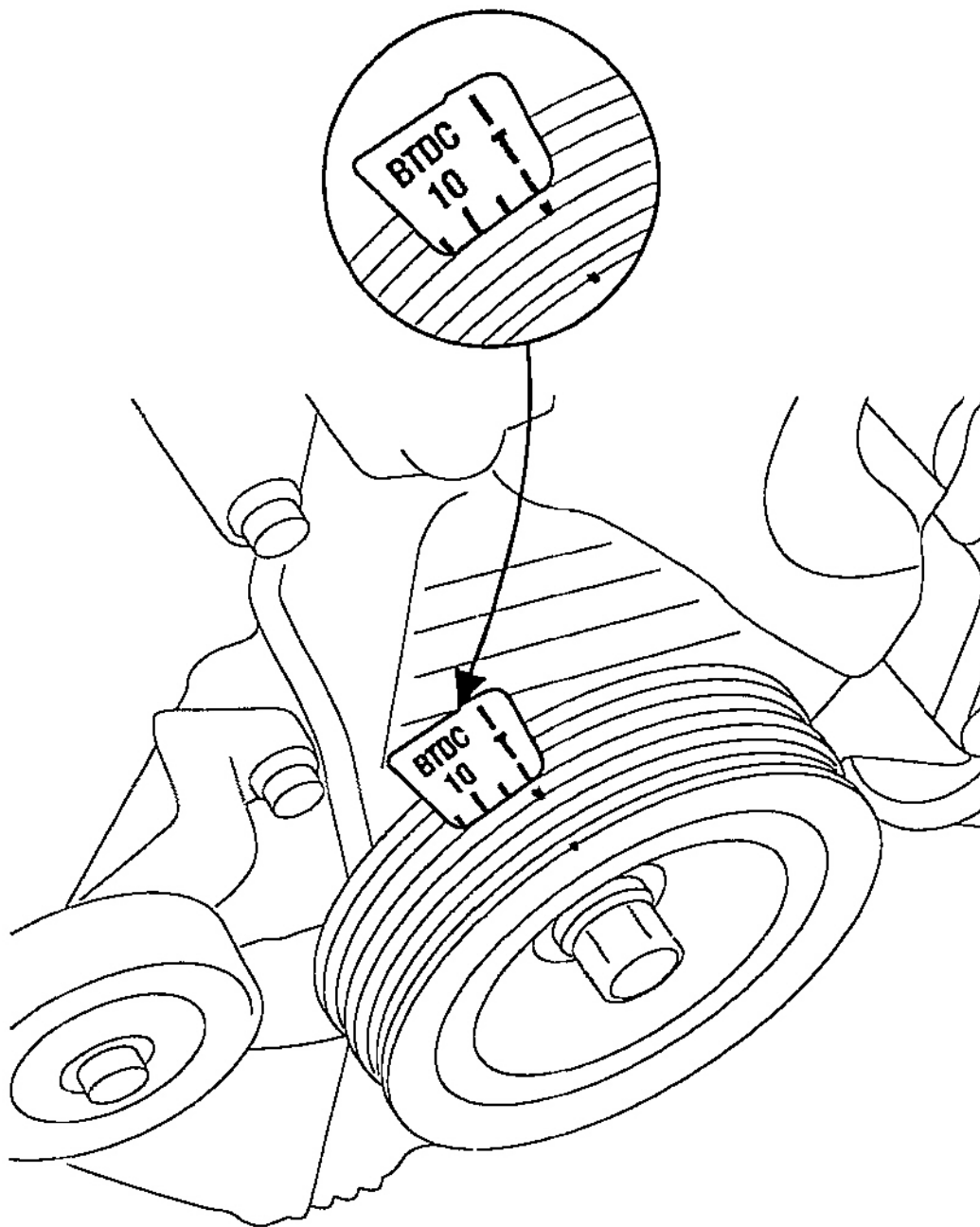
2. Remove RH front wheel
3. Remove the 4 bolts and timing belt upper cover.



G00941651

Fig. 18: Removing Timing Belt Upper Cover
Courtesy of HYUNDAI MOTOR CO.

4. Turn the crankshaft pulley and align its groove with timing mark "T" of the timing belt cover.

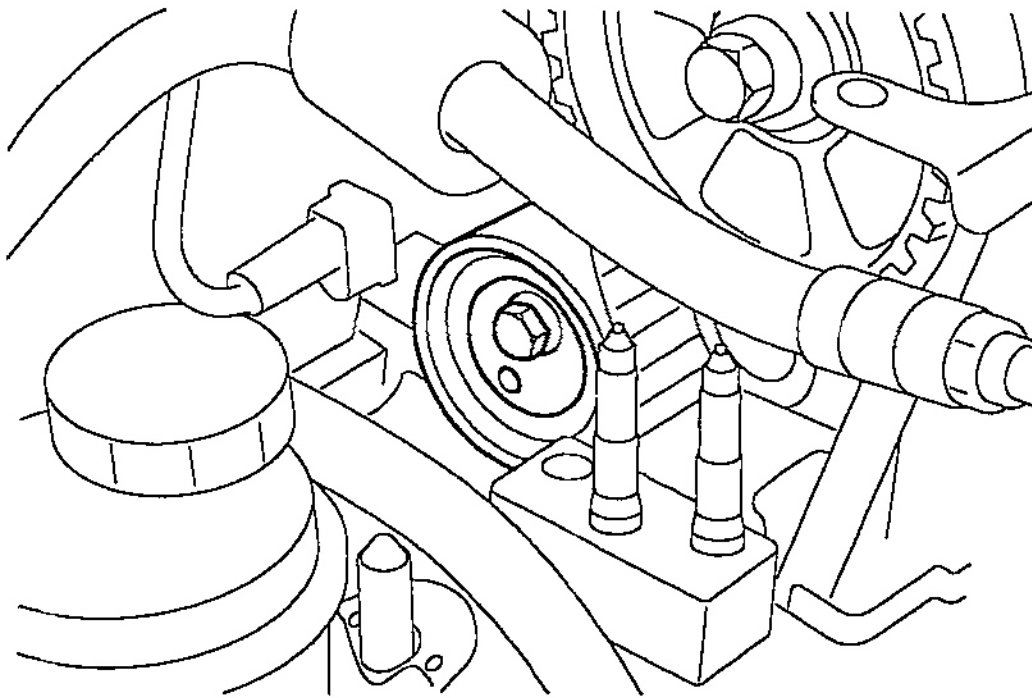


G00941652

Fig. 19: Turning Crankshaft Pulley & Aligning Its Groove With Timing Mark "T" Of Timing Belt Cover

Courtesy of HYUNDAI MOTOR CO.

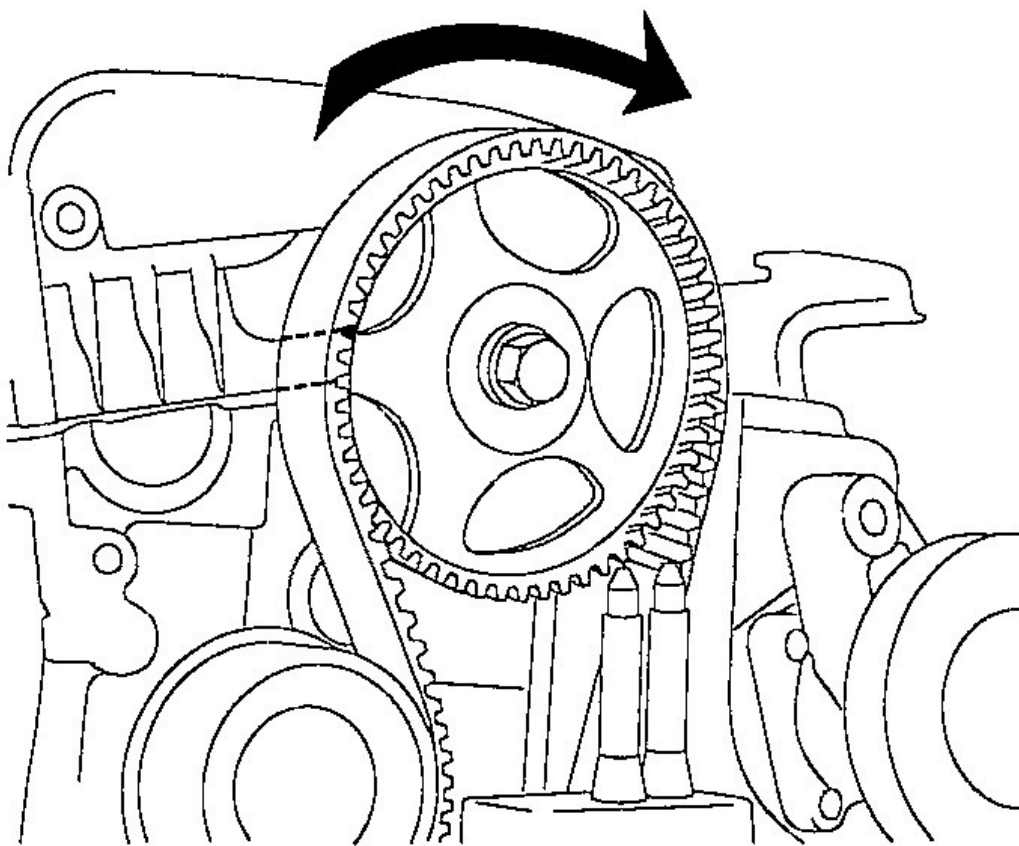
5. Temporarily loosen tensioner pulley by center bolt.



G00941653

Fig. 20: Loosening Tensioner Pulley By Center Bolt
Courtesy of HYUNDAI MOTOR CO.

6. Timing belt tension adjusting.
 1. Rotate crankshaft in regular direction (clockwise view from front) through angle equivalent to two teeth (18°) of the camshaft sprocket.



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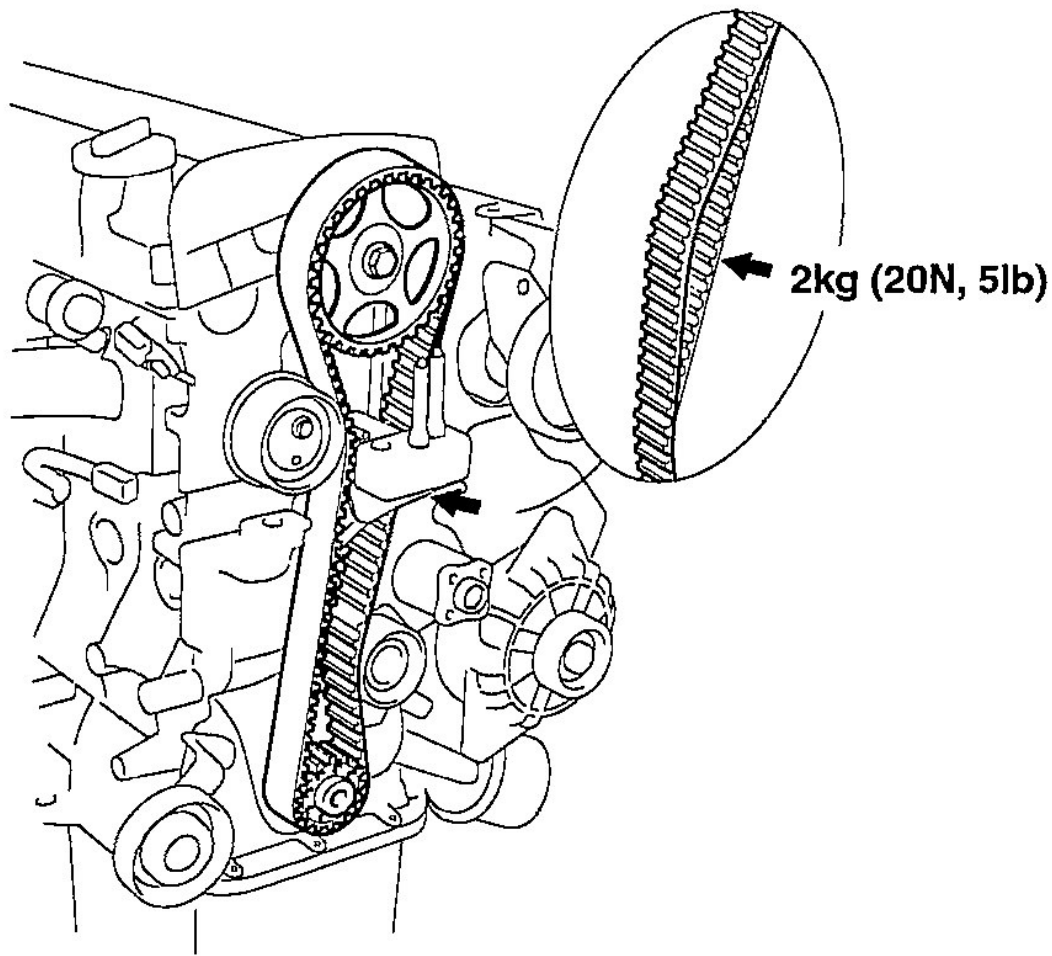
Fig. 21: Adjusting Timing Belt Tension
Courtesy of HYUNDAI MOTOR CO.

2. Give tension to timing belt rotating tensioner in arrow direction tool and set timing belt not to give slack to tensioner side.
3. Tightening tensioner bolt.

Tightening torque

Tensioner bolt : 43 ~ 55Nm (430 ~ 550kg.cm, 32 ~ 40lbf.ft)

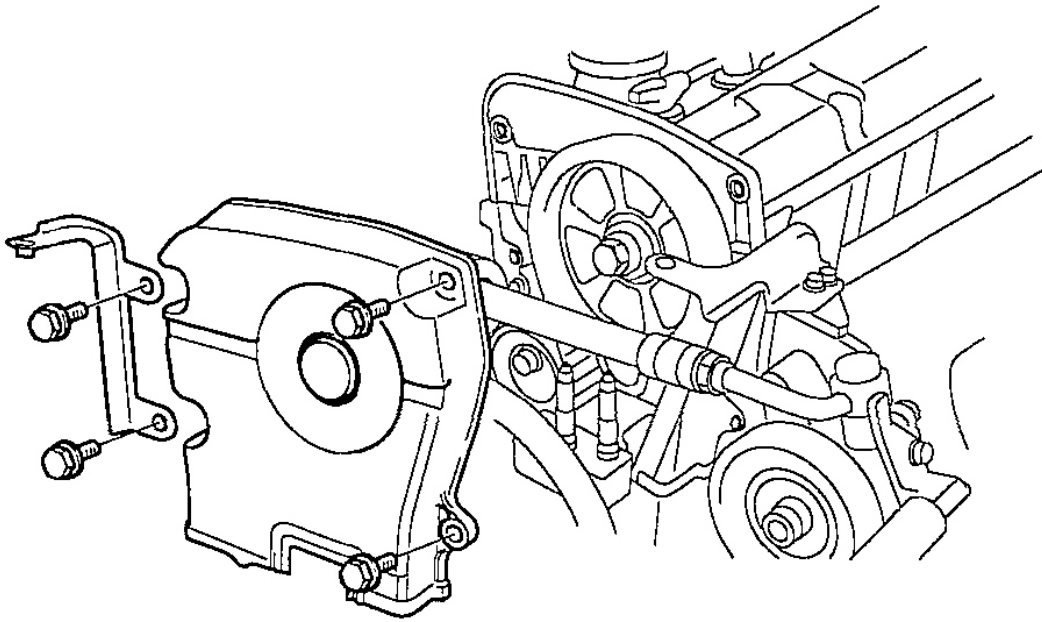
4. Recheck the belt tension, when the tension side of timing belt is pushed horizontally with a moderate force [approx. 2kg (20N, 5lb)], the timing belt cog end segs in approx. 4 ~ 6mm (0.16 ~ 0.24in.).



G00941655

Fig. 22: Checking Timing Belt Tension
Courtesy of HYUNDAI MOTOR CO.

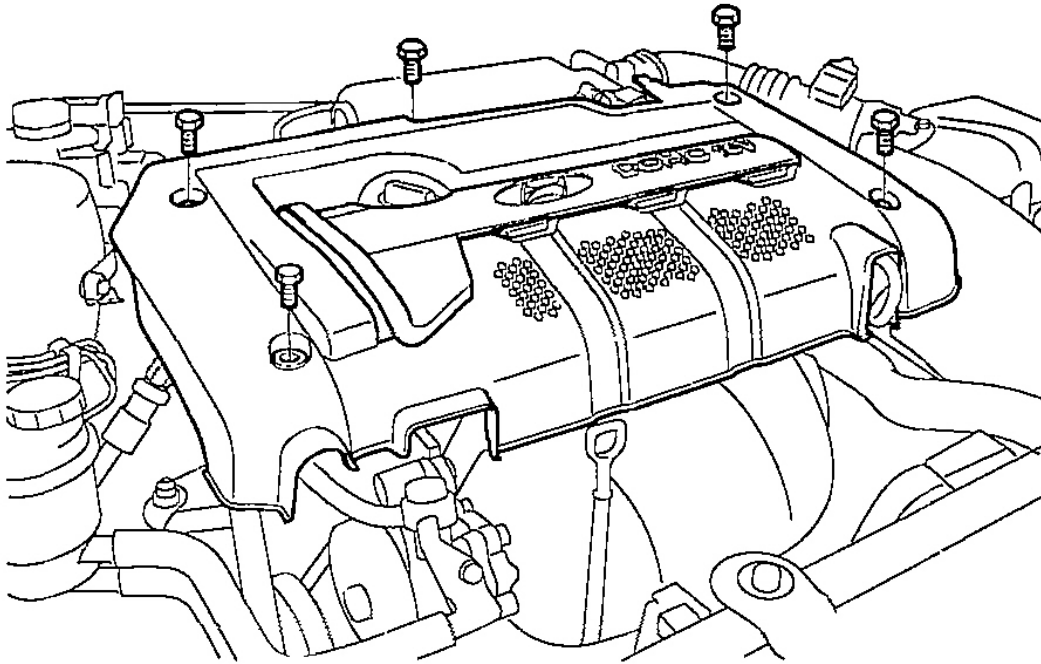
7. Turn the crankshaft two turns in the operating direction (clockwise) and realign crankshaft sprocket and camshaft sprocket timing mark.
8. Install the timing belt upper cover with 4bolts.



G00941656

Fig. 23: Installing Timing Belt Upper Cover
Courtesy of HYUNDAI MOTOR CO.

9. Install RH front wheel.
10. Install engine cover with 5 bolts.



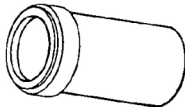
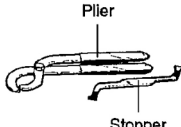
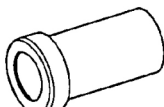
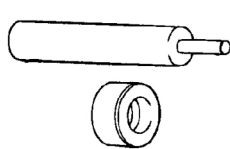
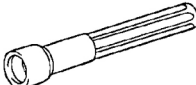
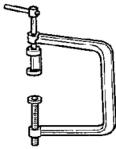
G00941657

Fig. 24: Installing Engine Cover
Courtesy of HYUNDAI MOTOR CO.

SPECIAL TOOLS

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

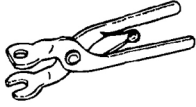
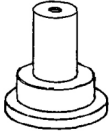
Tool (Number and name)	Illustration	Use
Crankshaft front oil seal installer (09214-33000)		Installation of the front oil seal
Valve clearance adjust tool set (09220-2D000)	 Plier Stopper	Removal and installation of the tappet shim
Camshaft oil seal installer (09221-21000)		Installation of the camshaft oil seal
Valve guide installer (09221-3F100 A/B)		Removal and installation of the valve guide
Valve stem oil seal installer (09222-22001)		Installation of the valve stem oil seal
Valve spring compressor & adaptor (09222-28000, 09222-28100)		Removal and installation of the intake or exhaust valve

G00941658

Fig. 25: Identifying Special Tools (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

Tool (Number and name)	Illustration	Use
Valve stem seal remover (09222-29000)		Remove of the valve stem seal
Crankshaft rear oil seal installer (09231-21000)		1. Installation of the engine rear oil seal. 2. Installation of the crankshaft rear oil seal.

G00941659

Fig. 26: Identifying Special Tools (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

TROUBLESHOOTING

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

Symptom	Probable cause	Remedy
Low compression	Blown cylinder head gasket Worn or damaged piston rings Worn piston or cylinder Worn or damaged valve seat	Replace gasket Replace rings Repair or replace the piston and/or cylinder block Repair or replace the valve and/or seat ring
Low oil pressure	Low engine oil level Faulty oil pressure switch Clogged oil filter Worn oil pump gears or cover Thin or diluted engine oil Oil relief valve stuck (open) Excessive bearing clearance	Check engine oil level Replace Replace Replace Change and find out cause Repair Replace
High oil pressure	Oil relief valve stuck (closed)	Repair
Excessive engine vibration	Loose engine roll stopper (front, rear) Loose transaxle mount bracket Loose engine mount bracket Loose center member Broken transaxle mount insulator Broken engine mount insulator Broken engine roll stopper insulator	Retighten Retighten Retighten Retighten Replace Replace Replace
Noisy valves	Thin or diluted engine oil (Low oil pressure) Worn or damaged valve or stem or valve guide Incorrect valve clearance	Change Replace Adjust valve clearance
Connecting rod and main bearing noise	Insufficient oil supply Thin or diluted engine oil Excessive bearing clearance	Check engine oil level Change and find out cause Replace
Timing belt level	Incorrect belt tension	Adjust belt tension
Low coolant level	Leakage of coolant 1. Heater or radiator hose 2. Faulty radiator cap 3. Thermostat housing 4. Radiator 5. Engine coolant pump	Repair or replace parts Tighten or replace clamps Replace the gasket or housing Repair or replace Replace parts
Clogged radiator	Foreign material in coolant	Replace coolant
Abnormally high coolant temperature	Faulty thermostat Faulty radiator cap Restricted flow in cooling system Loose or missing driver belt Faulty water pump Faulty temperature sensor or wiring Faulty electric fan Insufficient coolant	Replace parts Replace parts Clear restriction or replace parts Adjust or replace Replace Repair or replace Repair or replace Refill coolant
Abnormally low coolant temperature	Faulty thermostat Faulty temperature sensor or wiring	Replace Repair or replace
Inoperative electrical cooling fan	Faulty temperature sensor, Electrical moto, Radiator fan relay, Wiring, Fuse	Replace or repair

G00941660

Fig. 27: Troubleshooting (1 Of 2)

Courtesy of HYUNDAI MOTOR CO.

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

Symptom	Probable cause	Remedy
Exhaust gas leakage	Loose connections Broken pipe or muffler	Retighten Repair or replace
Abnormal noise	Detach baffle plate in muffler Broken rubber hanger Pipe or muffler contacting vehicle body Broken pipe or muffler	Replace Repalce Correct Repair or replace

G00941661

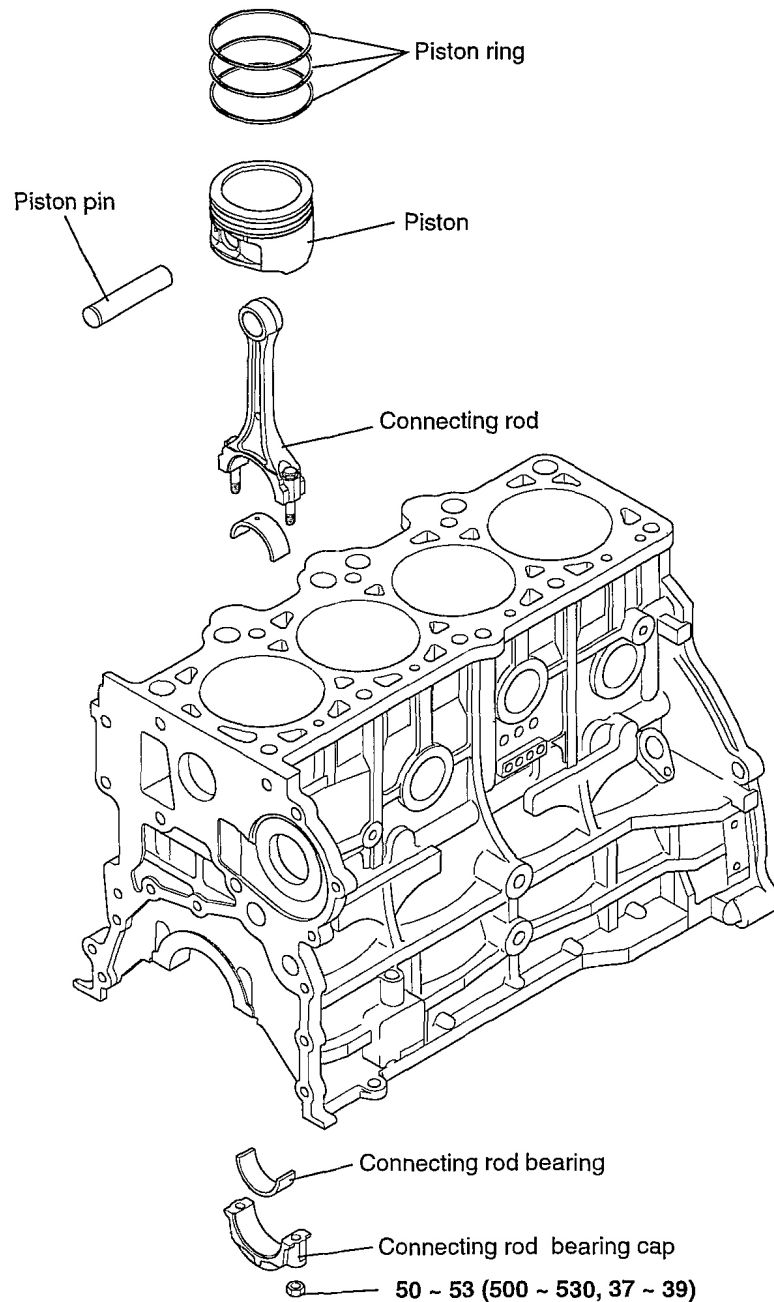
Fig. 28: Troubleshooting (2 Of 2)

Courtesy of HYUNDAI MOTOR CO.

ENGINE BLOCK

ENGINE BLOCK

COMPONENTS



TORQUE : Nm (kgf.cm, lbf.ft)

G00941662

Fig. 29: Locating Engine Block Components
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Remove the cylinder head, timing belt, front case, flywheel, pistons and crankshaft.

2. Remove the oil pressure switch.

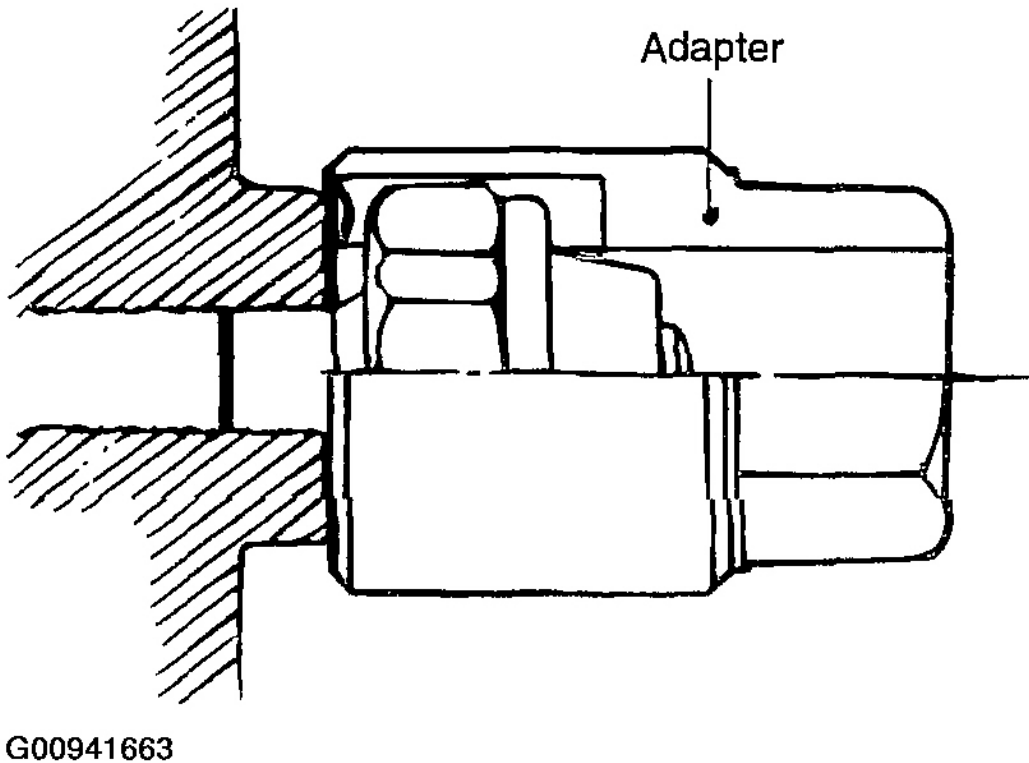


Fig. 30: Removing Oil Pressure Switch
Courtesy of HYUNDAI MOTOR CO.

INSPECTION

CYLINDER BLOCK

1. Check the engine block for scores, rust and corrosion. Also check for cracks or any other defects. Replace the block if defective.
2. Using a straight edge and feeler gauge, check the top surface of the block for warpage. Make sure that the surface is free from gasket chips or other foreign material.

Standard : 0.03 mm (0.0012 in.) or less

Limit : 0.05 mm (0.0020 in.) or less

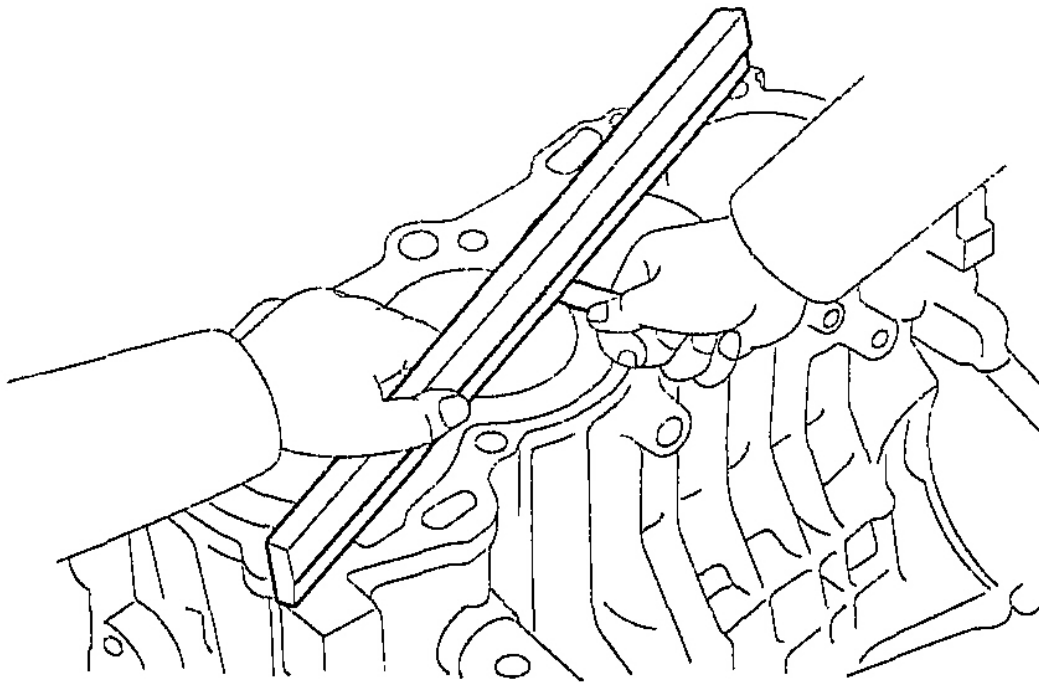
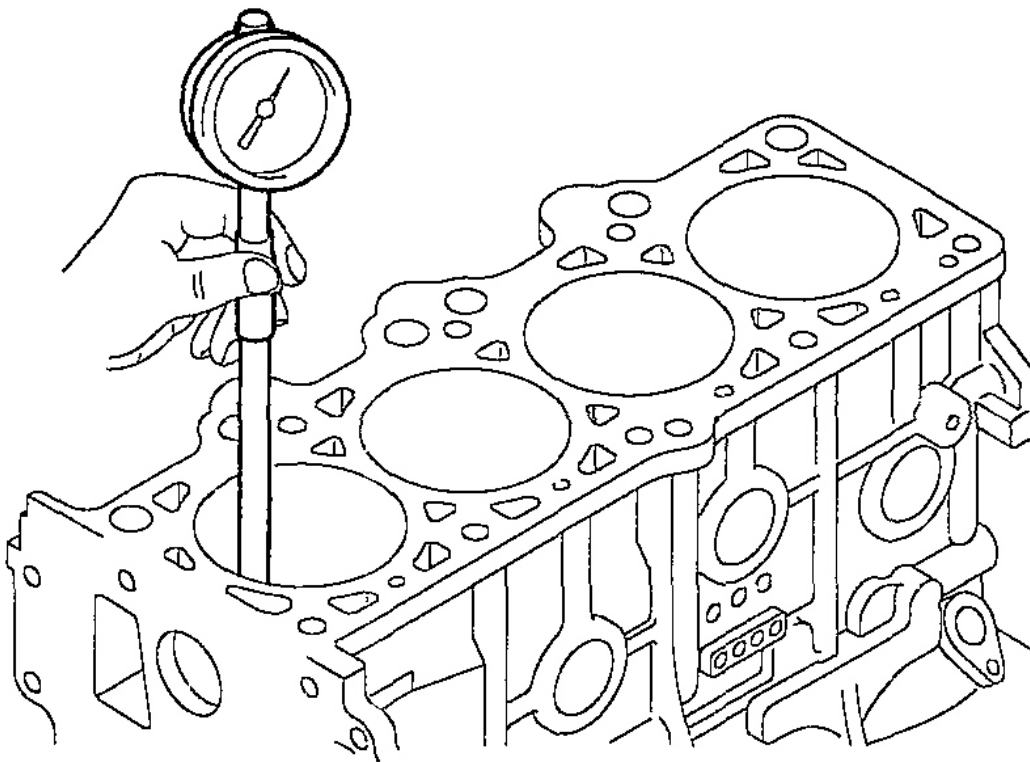
**G00941664**

Fig. 31: Checking Top Surface Of Block For Warpage
Courtesy of HYUNDAI MOTOR CO.

3. Measure the cylinder bore with a cylinder gauge at three levels. If the cylinder bores show more than the specified out-of round or taper, or if the cylinder walls are badly scuffed or scored, the cylinder block should be rebored and honed. Now oversize pistons and rings must be fitted. The value of measuring points are as shown.

Cylinder I.D : 82 mm (3.228 in.)

Cylinder I.D taper : 0.01 mm (0.0004 in.) or less



G00941665

Fig. 32: Measuring Cylinder Bore With A Cylinder Gauge
 Courtesy of HYUNDAI MOTOR CO.

4. If a cylinder ridge exists, cut away with a ridge reamer.
5. Oversize pistons are available in four sizes.

Piston service size and mark mm (in.)

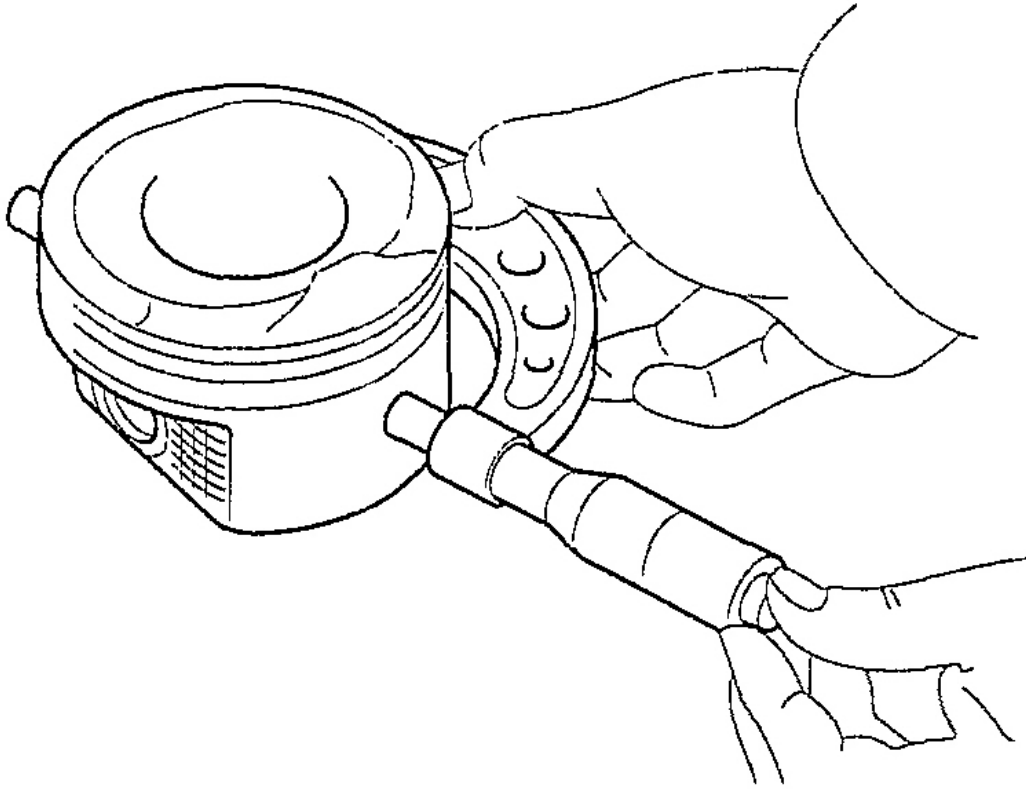
0.25 (0.010) O.S. : 0.25

0.50 (0.020) O.S. : 0.50

6. When boring the cylinder bore to the oversize, maintain the specified clearance between the oversize piston and the bore, and make sure that all pistons used are the same oversize.
7. The standard measurement of the piston outside diameter is taken 47 mm (1.85 in.) from the top land of the piston.

Piston-to-cylinder clearance (To set limits to new parts)

0.02 - 0.04 mm (0.0008 - 0.0016 in.)



G00941666

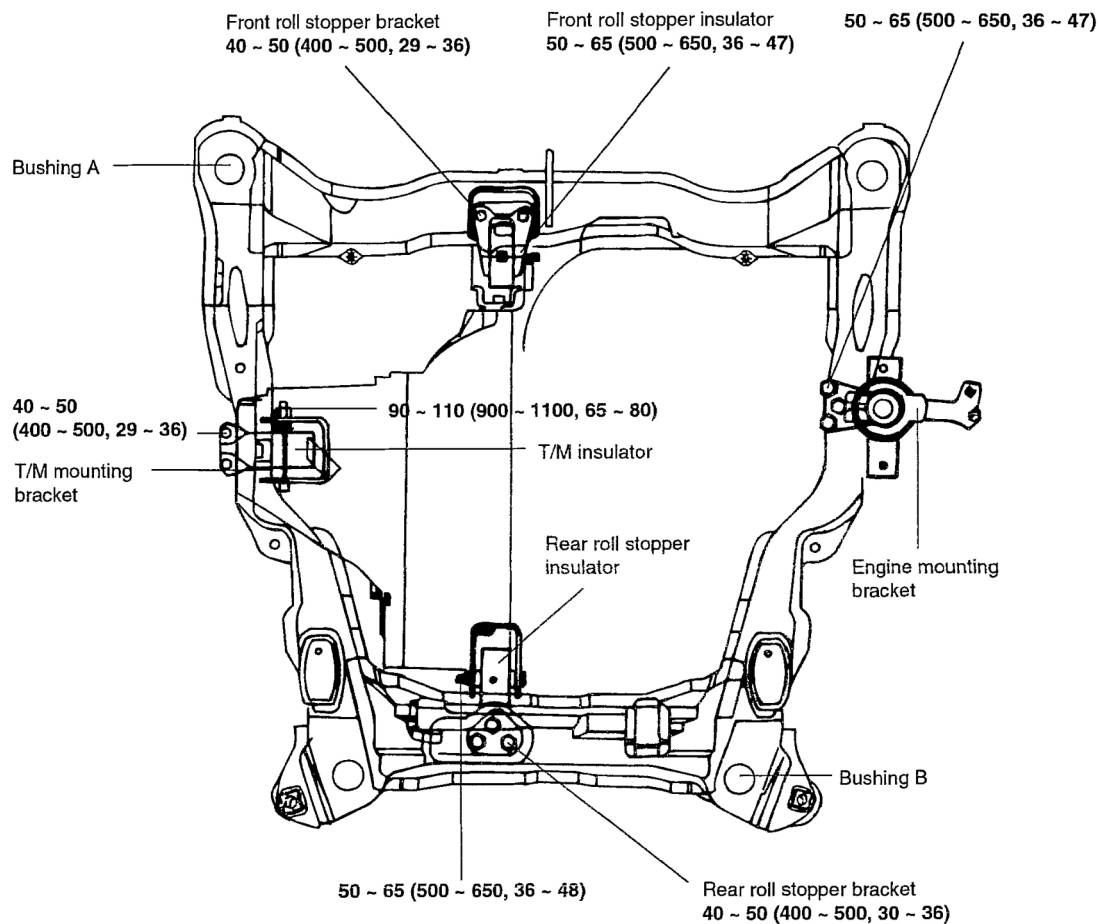
Fig. 33: Measuring Piston Outside Diameter
Courtesy of HYUNDAI MOTOR CO.

ENGINE MOUNTS

ENGINE MOUNTING

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon



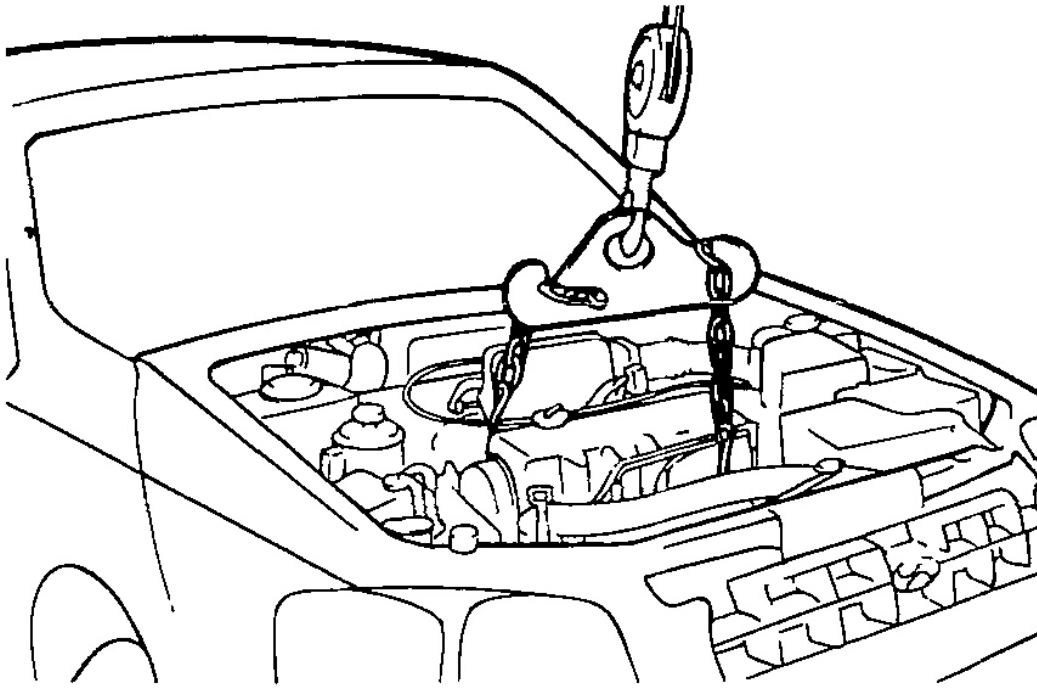
TORQUE : Nm (kg.cm, lb.ft)

G00941667

Fig. 34: Locating Engine Mounts
Courtesy of HYUNDAI MOTOR CO.

REMOVAL

1. Attach an engine hoist to the engine hooks, and raise the engine just enough so that there is no pressure on the insulators.

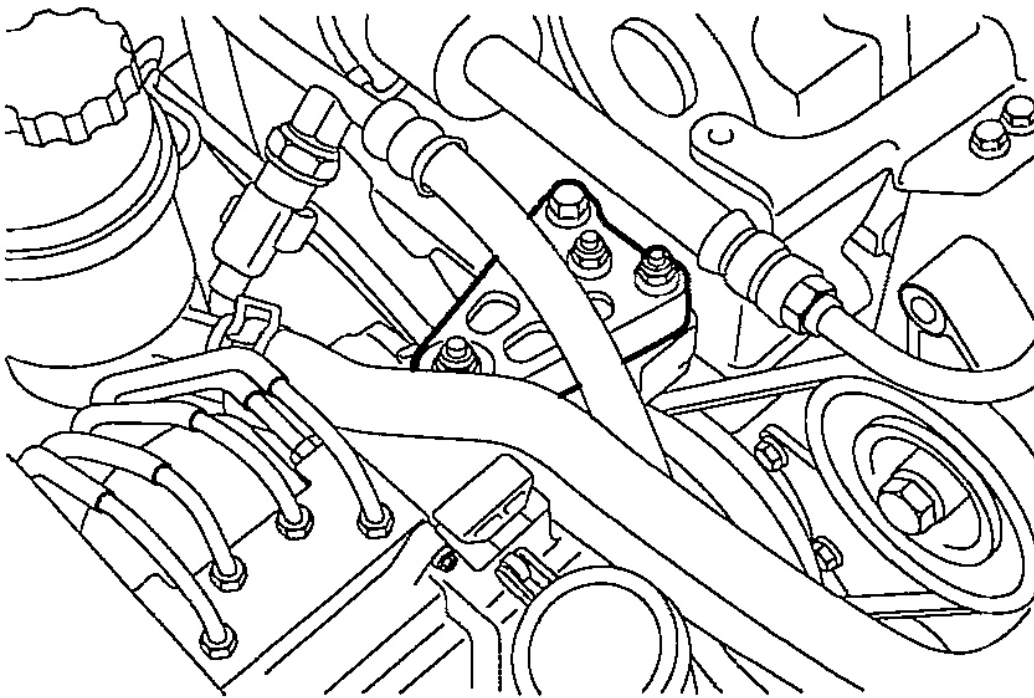


G00941668

Fig. 35: Attaching Engine Hoist To Engine Hooks
Courtesy of HYUNDAI MOTOR CO.

ENGINE MOUNTING

1. Remove the engine mounting insulator bolts.
2. Remove the engine mounting bracket from the engine.

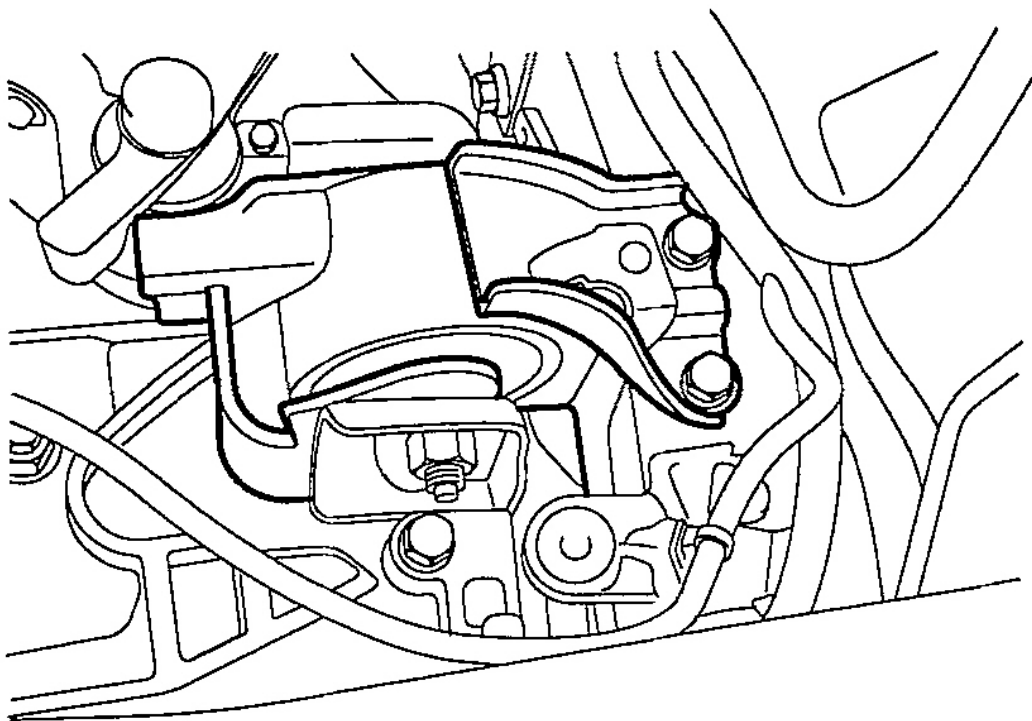


G00941669

Fig. 36: Locating Engine Mounting Bracket
Courtesy of HYUNDAI MOTOR CO.

TRANSMISSION MOUNTING

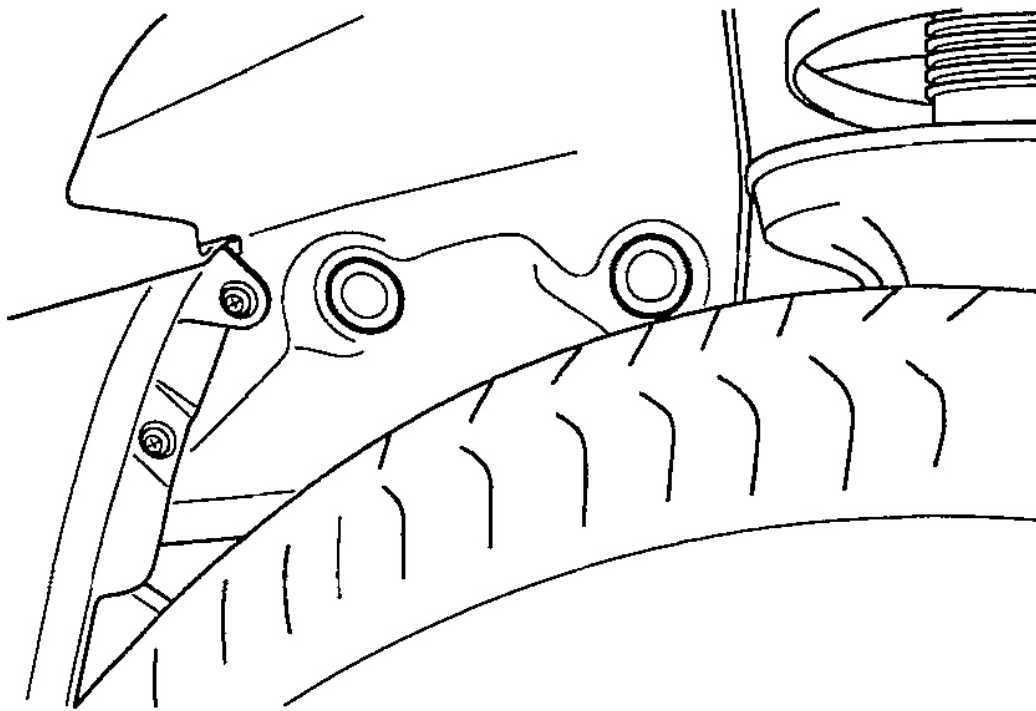
1. For vehicles with a 5-speed manual transmission, remove the select control valve.
2. Remove the transmission mounting bolt.



G00941670

Fig. 37: Locating Transmission Mounting
Courtesy of HYUNDAI MOTOR CO.

3. Detach the cap from inside the right fender shield. Remove the transmission mounting bolts.
4. Remove the transmission bracket.

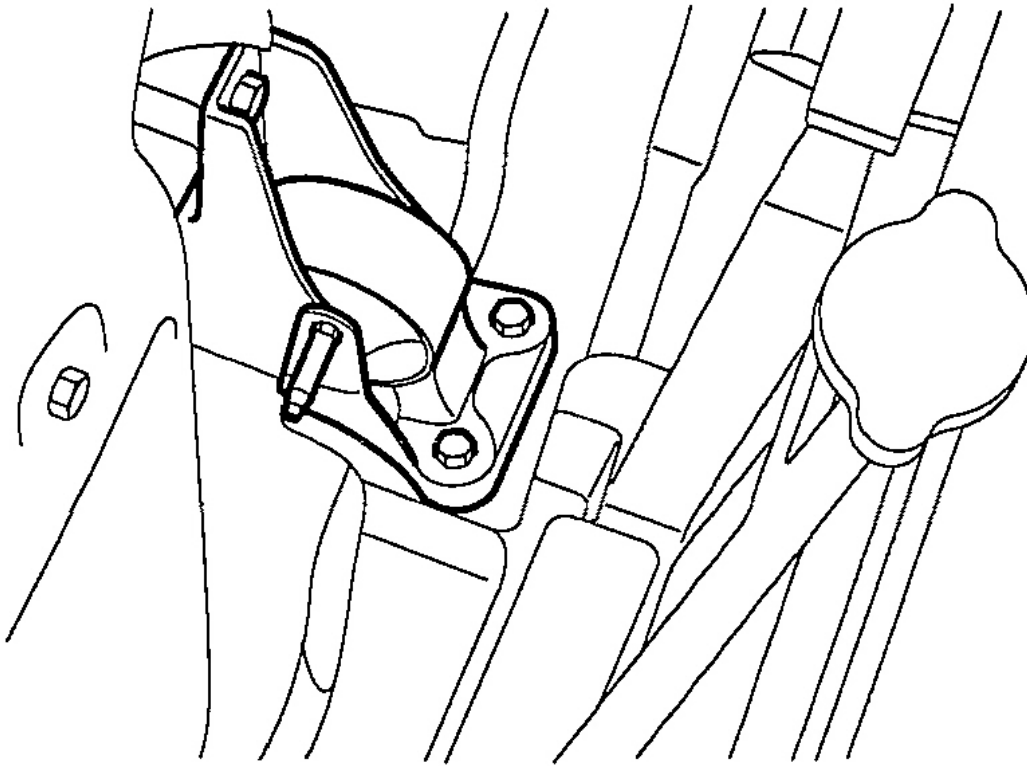


G00941671

Fig. 38: Removing Transmission Bracket
Courtesy of HYUNDAI MOTOR CO.

FRONT ROLL STOPPER

1. Remove the front roll stopper bracket from the subframe.

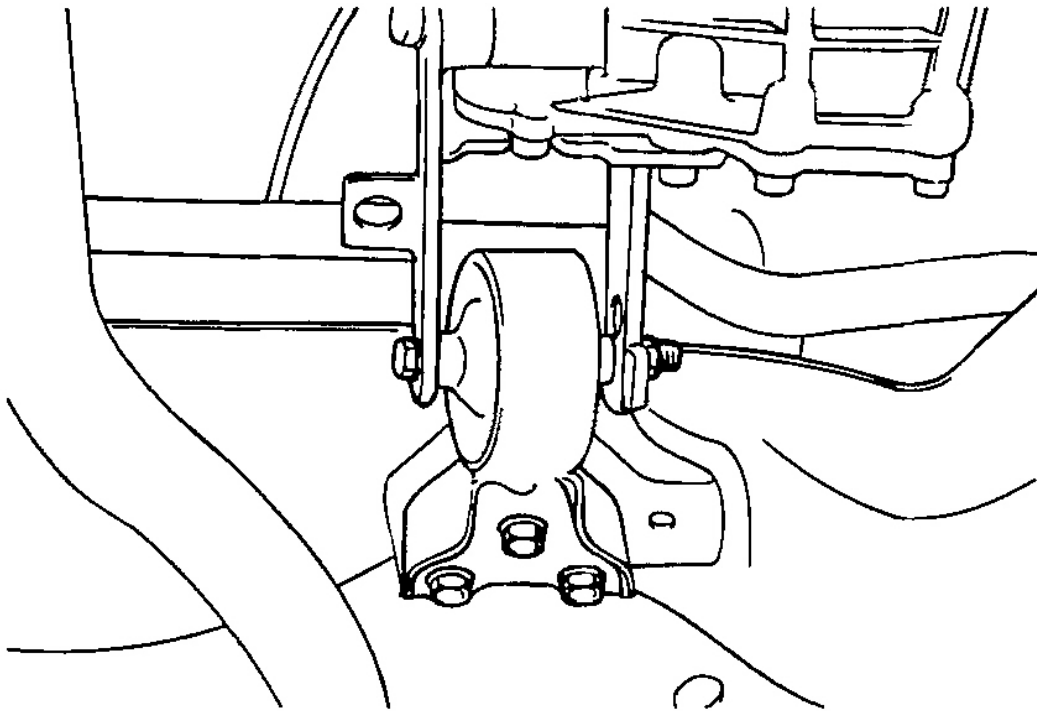


G00941672

Fig. 39: Removing Front Roll Stopper Bracket From Subframe
Courtesy of HYUNDAI MOTOR CO.

REAR ROLL STOPPER

1. Remove the rear roll stopper from the subframe.



G00941673

Fig. 40: Removing Rear Roll Stopper From Subframe
Courtesy of HYUNDAI MOTOR CO.

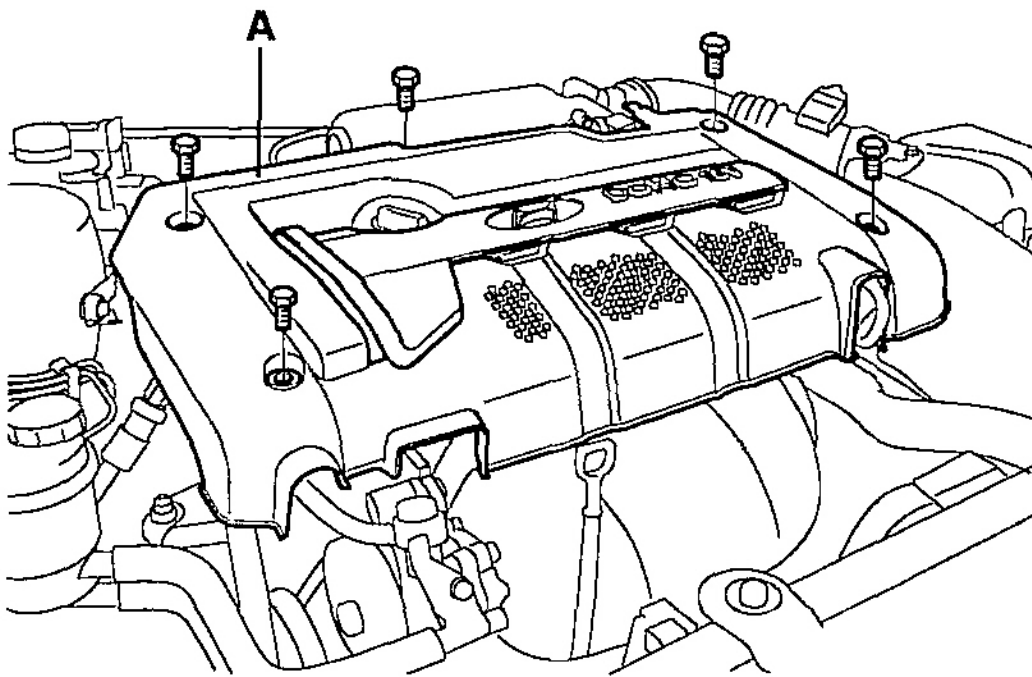
ENGINE AND TRANSAXLE ASSEMBLY

REMOVAL

- CAUTION:**
- Use fender covers to avoid damaging painted surfaces.
 - To avoid damage, unplug the wiring connectors carefully while holding the connector portion.

- NOTE:**
- Mark all wiring and hoses to avoid misconnection.
 - Inspection the timing belt before removing the cylinder head.
 - Turn the crankshaft pulley so that the No. 1 piston is at top dead center.

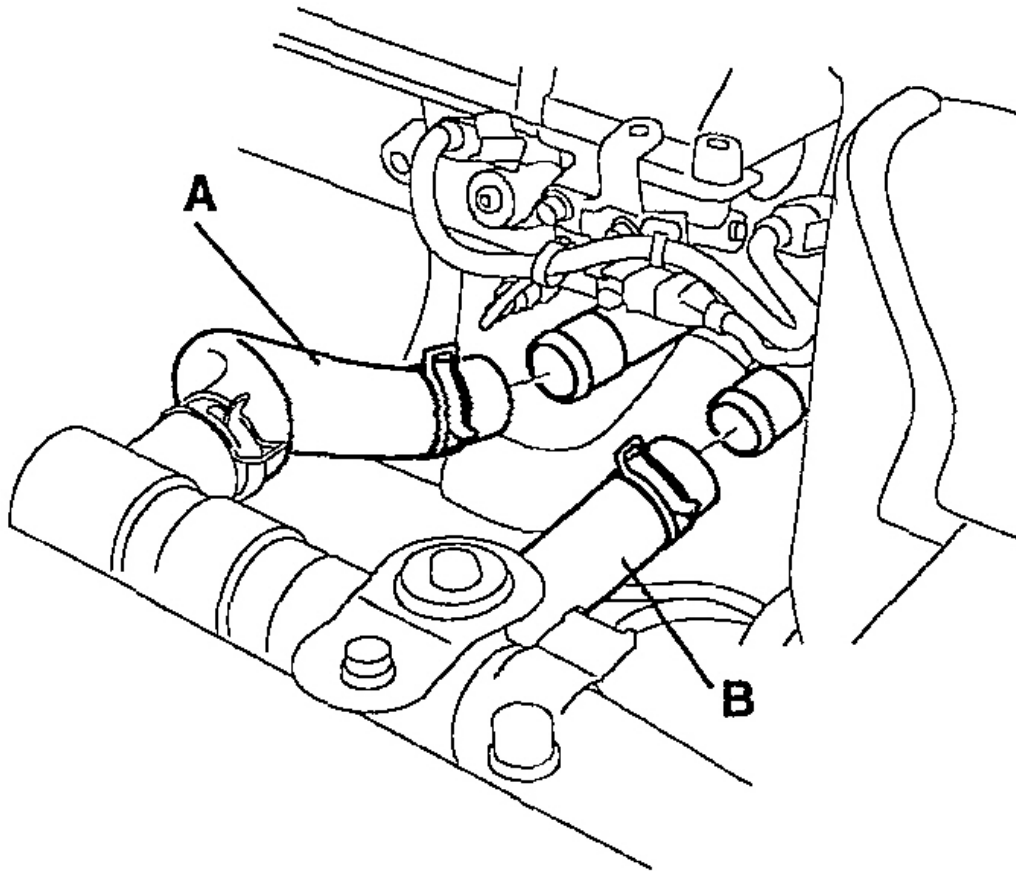
1. Disconnect the negative terminal from the battery.
2. Remove the engine cover.



G00941675

Fig. 41: Removing Engine Cover
Courtesy of HYUNDAI MOTOR CO.

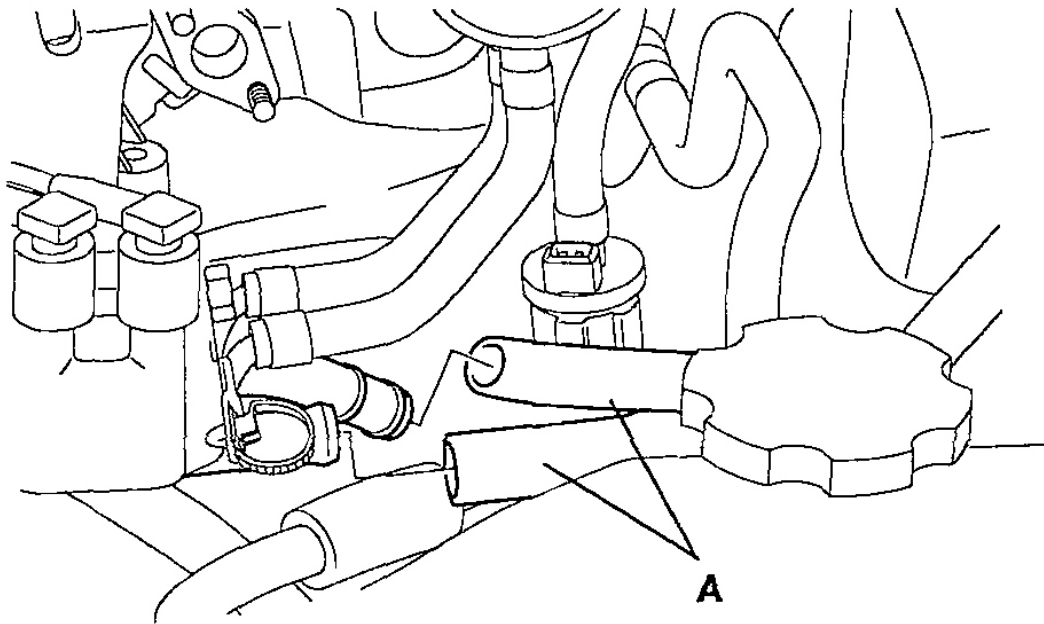
3. Drain the engine coolant. Remove the radiator cap to speed draining.
4. Remove the intake air hose and air cleaner assembly.
 1. Disconnect the AFS connector.
 2. Disconnect the breather hose from air cleaner hose.
 3. Remove the intake air hose and air cleaner.
5. Remove the upper radiator hose (A) and lower radiator hose (B).



G00941676

Fig. 42: Removing Upper Radiator Hose & Lower Radiator Hose
Courtesy of HYUNDAI MOTOR CO.

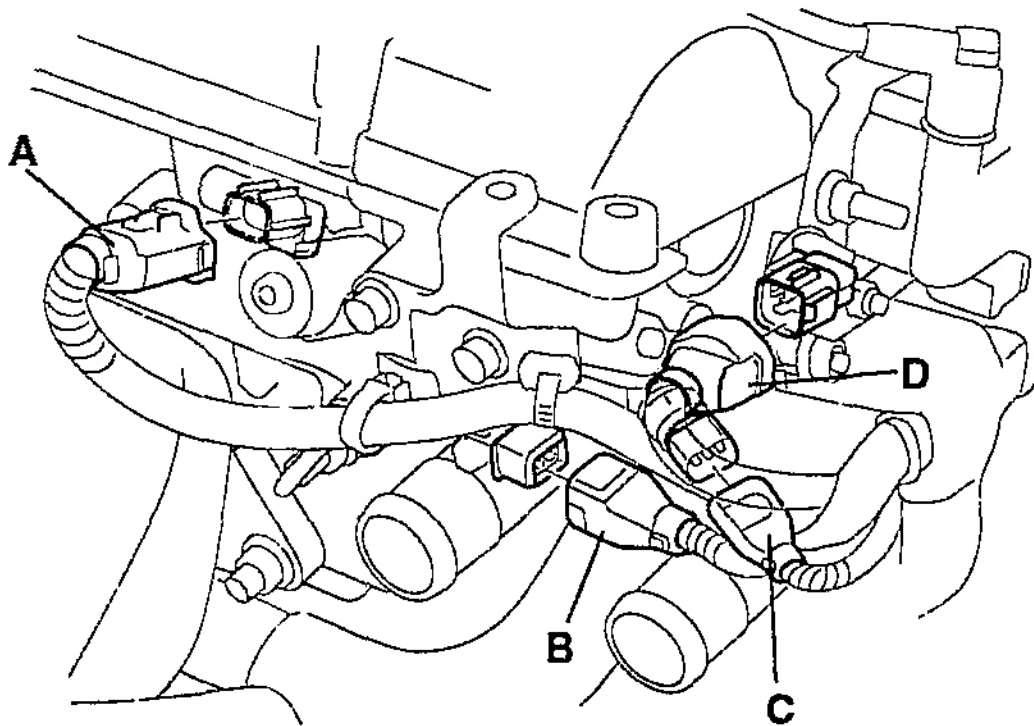
6. Remove the heater hoses (A).



G00941677

Fig. 43: Removing Heater Hoses
Courtesy of HYUNDAI MOTOR CO.

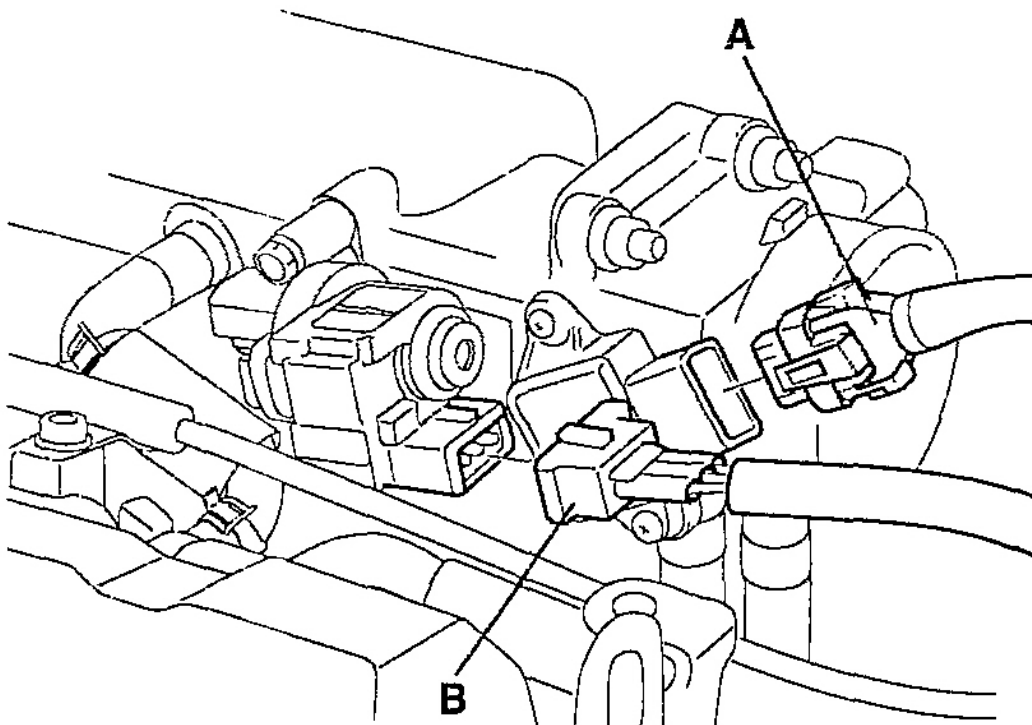
7. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.
 1. OCV (Oil Control Valve) connector (A).
 2. Oil temperature sensor connector (B).
 3. ECT (Engine Coolant Temperature) sensor (C) connector.
 4. Ignition coil connector (D).



G00941678

Fig. 44: Locating OCV, Oil Temperature Sensor, ECT & Ignition Coil Connectors
Courtesy of HYUNDAI MOTOR CO.

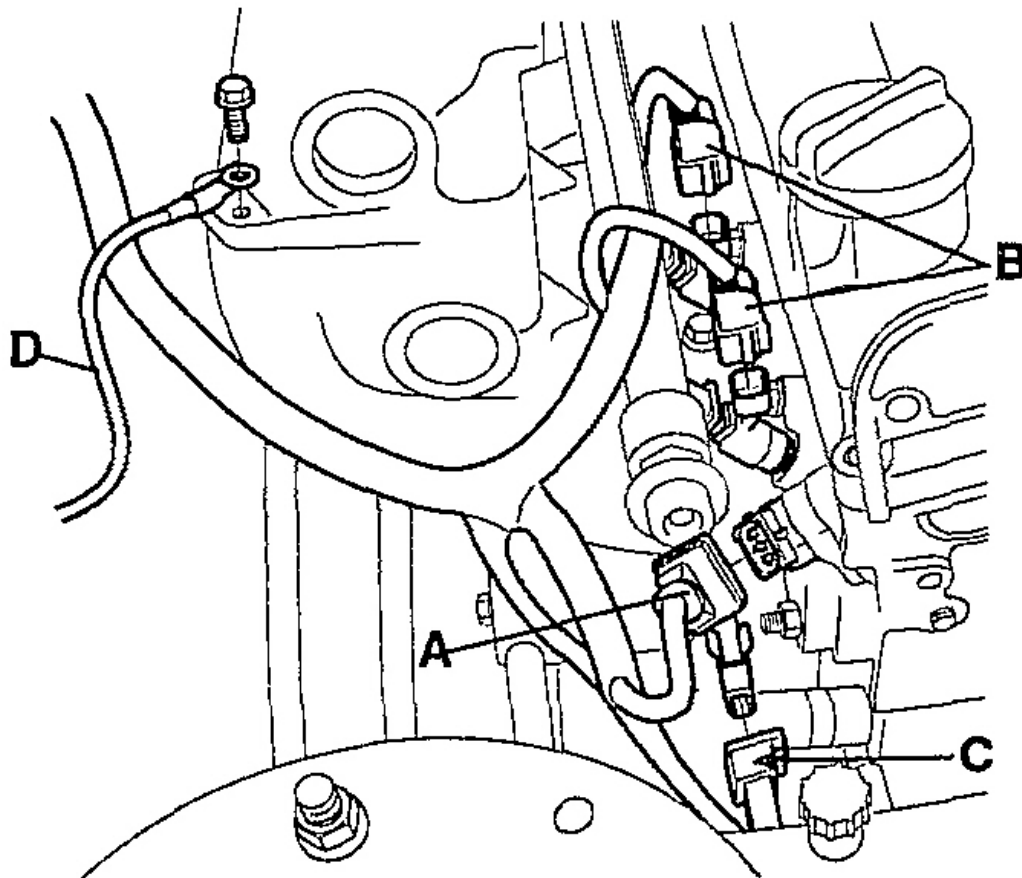
5. TPS (Throttle Position Sensor) connector (A).
6. ISA (Idle Speed Actuator) connector (B).



G00941679

Fig. 45: Locating TPS & ISA Connectors
Courtesy of HYUNDAI MOTOR CO.

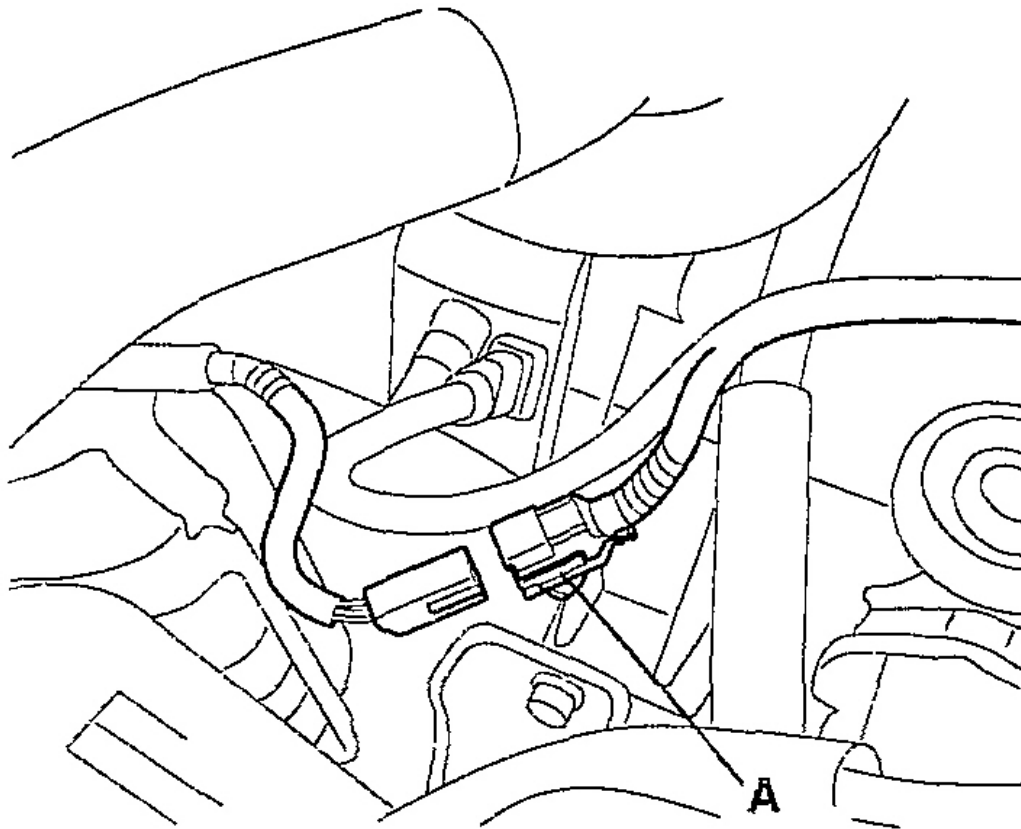
7. CMP (Camshaft Position Sensor) connector (A).
8. Four fuel injector connectors (B).
9. Knock sensor connector (C).
10. Disconnect ground cable (D) from the intake manifold.



G00941680

Fig. 46: Locating CMP, Fuel Injector, Knock Sensor Connectors & Ground Cable
Courtesy of HYUNDAI MOTOR CO.

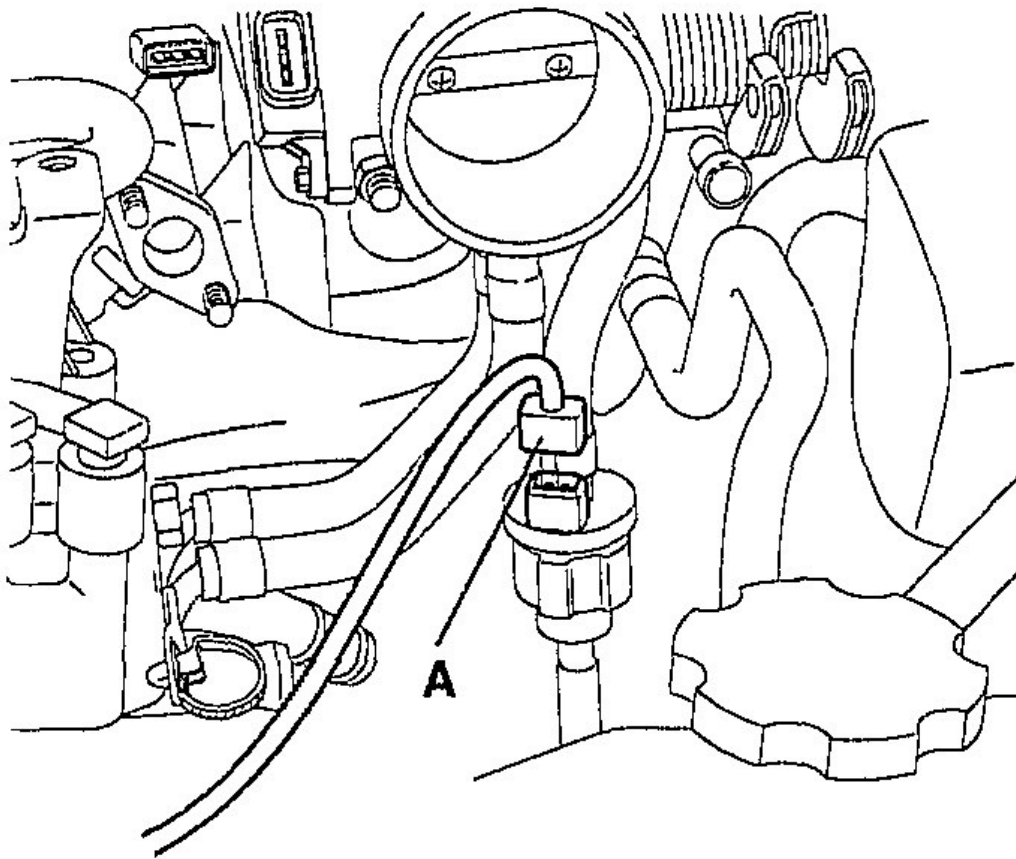
11. Front heated oxygen sensor (A) connector.



G00941681

Fig. 47: Locating Front Heated Oxygen Sensor Connector
Courtesy of HYUNDAI MOTOR CO.

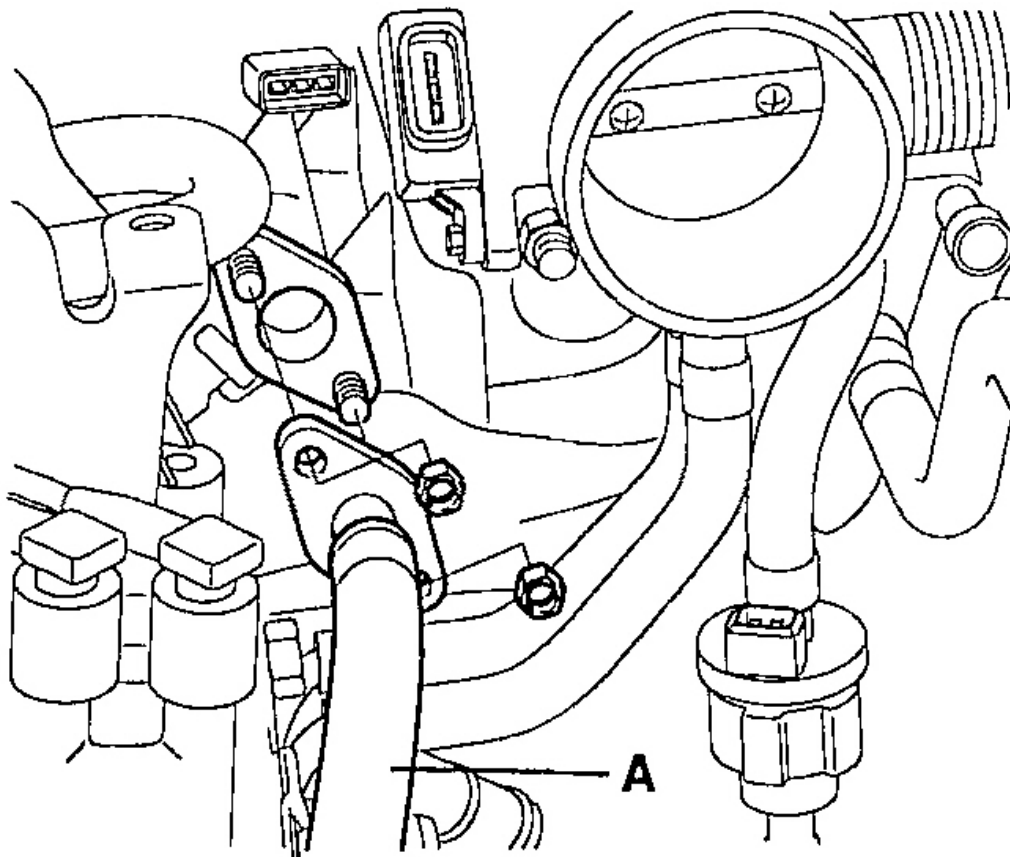
12. PSCV (Purge Control Solenoid Valve) (A) connector.



G00941682

Fig. 48: PSCV (Purge Control Solenoid Valve) Connector
Courtesy of HYUNDAI MOTOR CO.

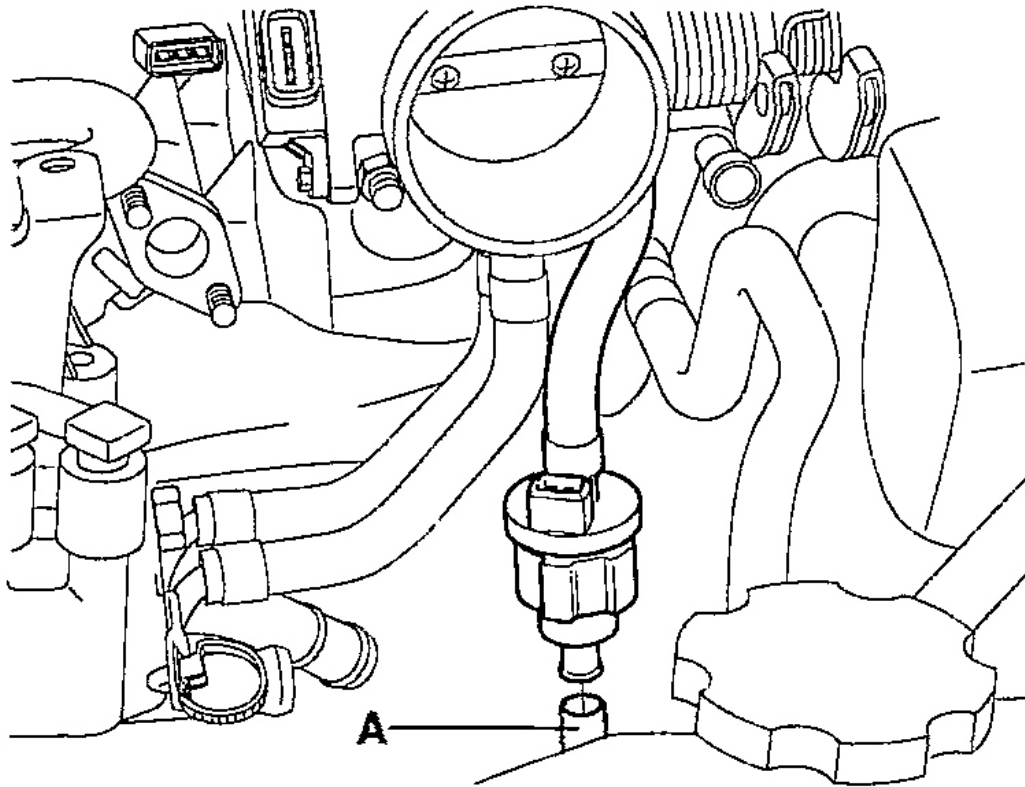
8. Remove the fuel inlet from delivery pipe (A).



G00941683

Fig. 49: Removing Fuel Inlet From Delivery Pipe
Courtesy of HYUNDAI MOTOR CO.

9. Remove the PCSV hose (A).



G00941684

Fig. 50: Remove PCSV Hose
Courtesy of HYUNDAI MOTOR CO.

10. Remove the brake booster vacuum hose (A).

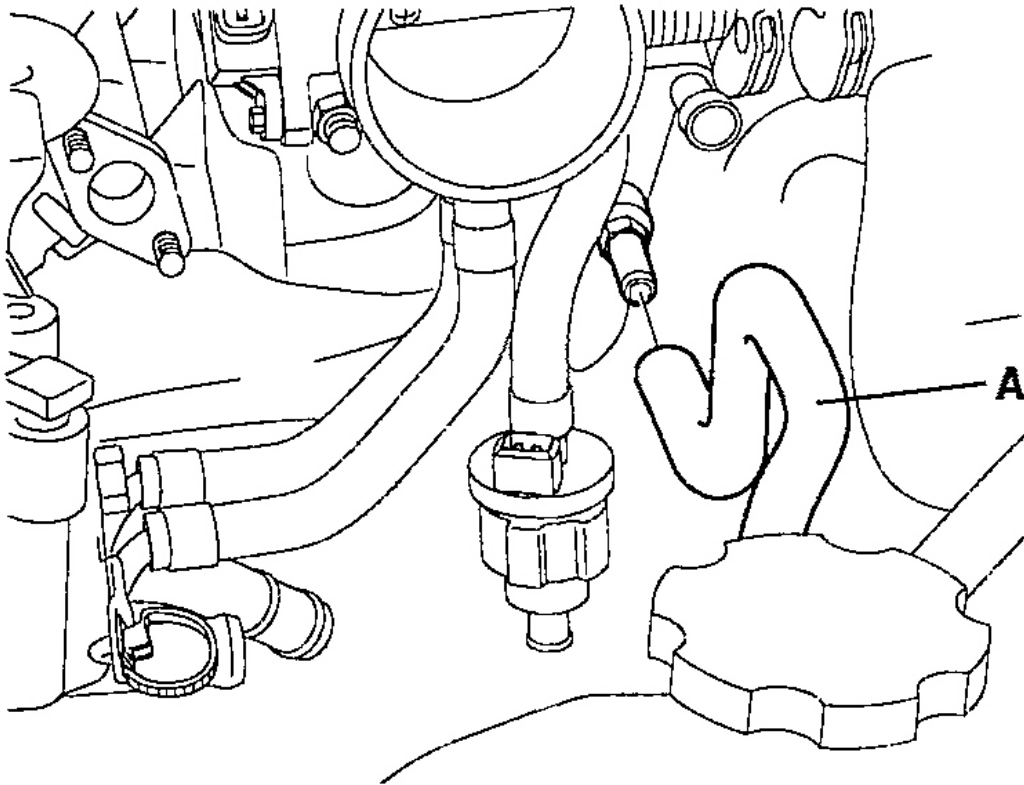
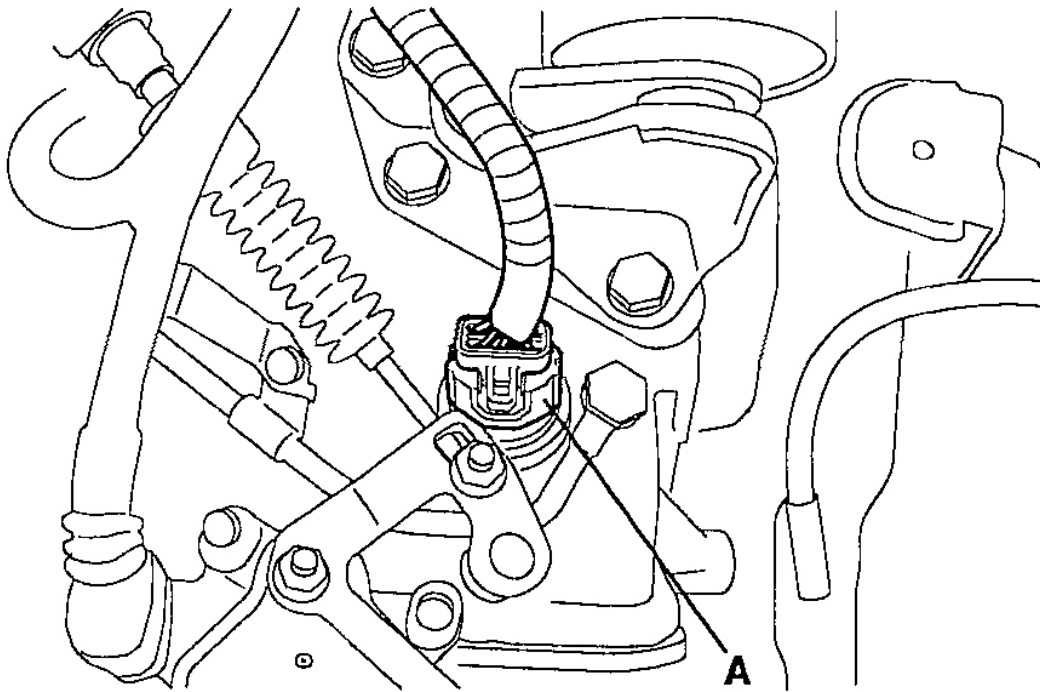
**G00941685**

Fig. 51: Removing Brake Booster Vacuum Hose
Courtesy of HYUNDAI MOTOR CO.

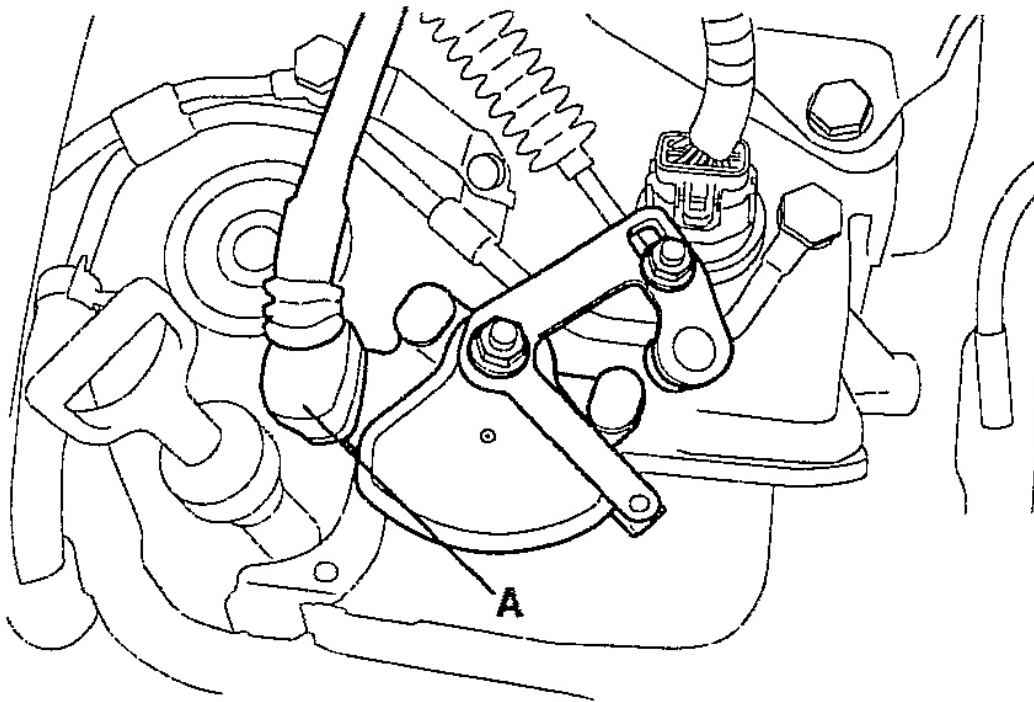
11. Remove the accelerator cable by loosening the lock nut, then slip the cable end out of the throttle linkage.
12. Remove the power steering pump.
13. Disconnect the inhibitor switch and solenoid valve connector (A).



G00941686

Fig. 52: Locating Inhibitor Switch & Solenoid Valve Connector
Courtesy of HYUNDAI MOTOR CO.

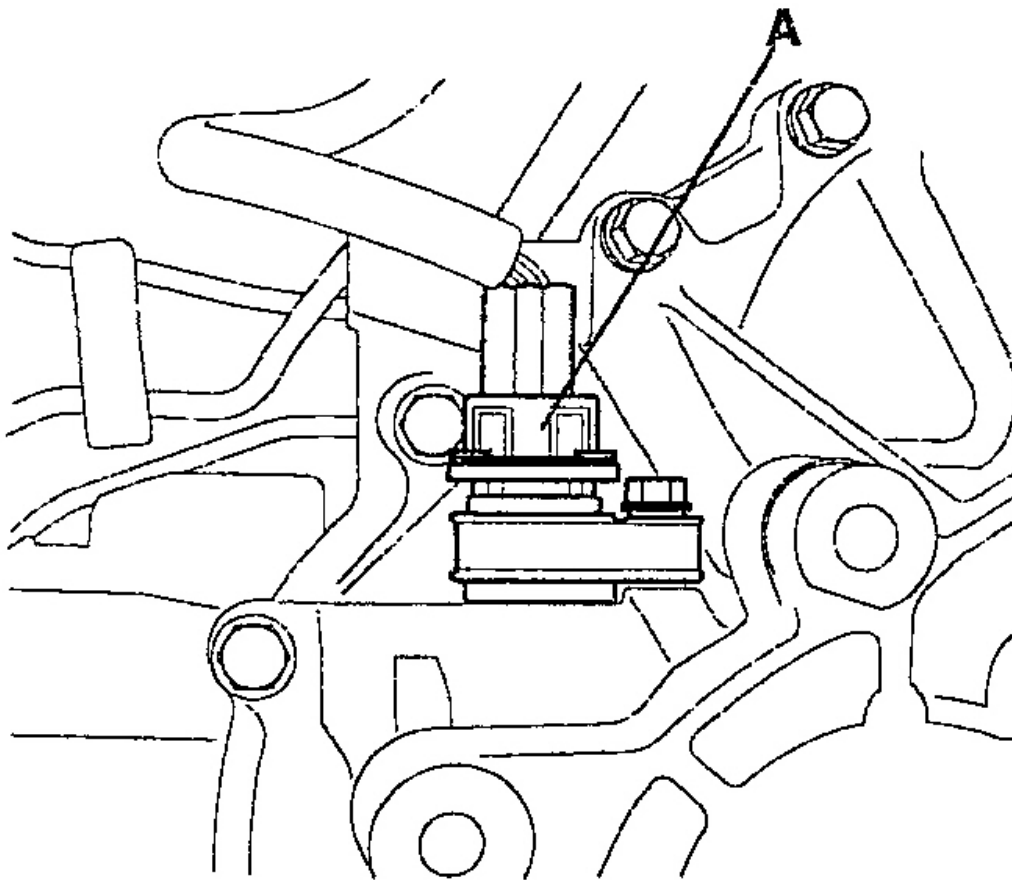
14. Remove the transaxle range switch connector (A).



G00941687

Fig. 53: Locating Transaxle Range Switch Connector
Courtesy of HYUNDAI MOTOR CO.

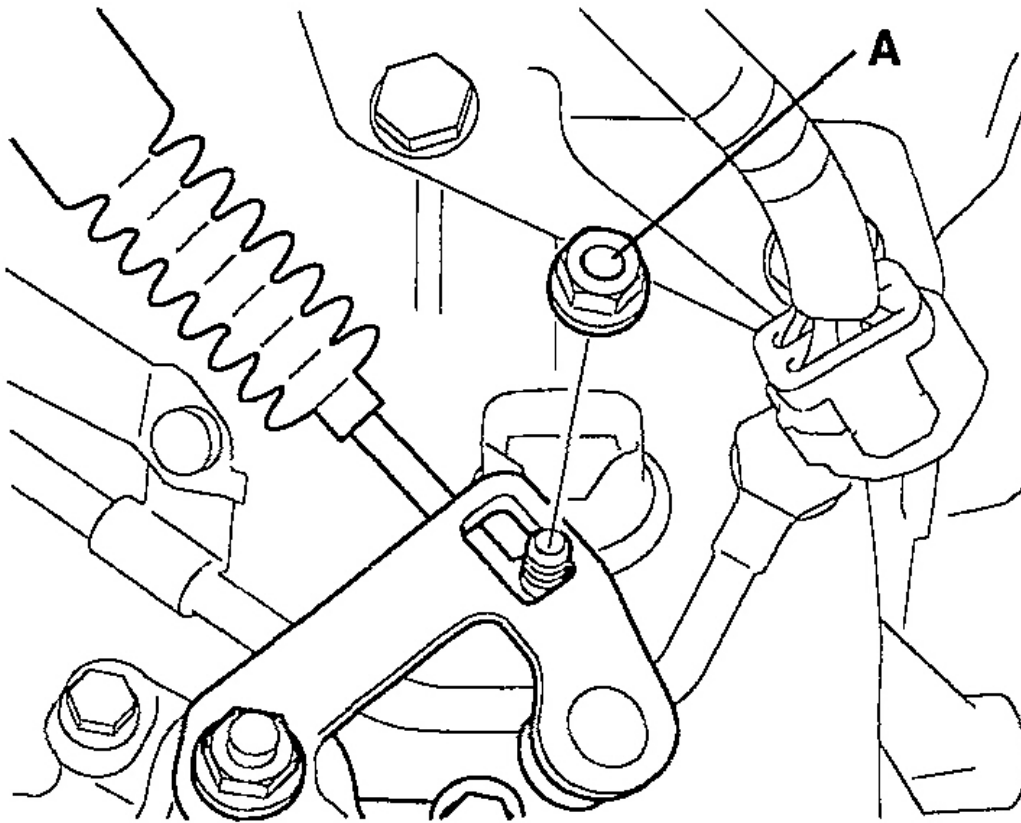
15. Remove the vehicle speed sensor connector (A).



G00941688

Fig. 54: Locating Vehicle Speed Sensor Connector
Courtesy of HYUNDAI MOTOR CO.

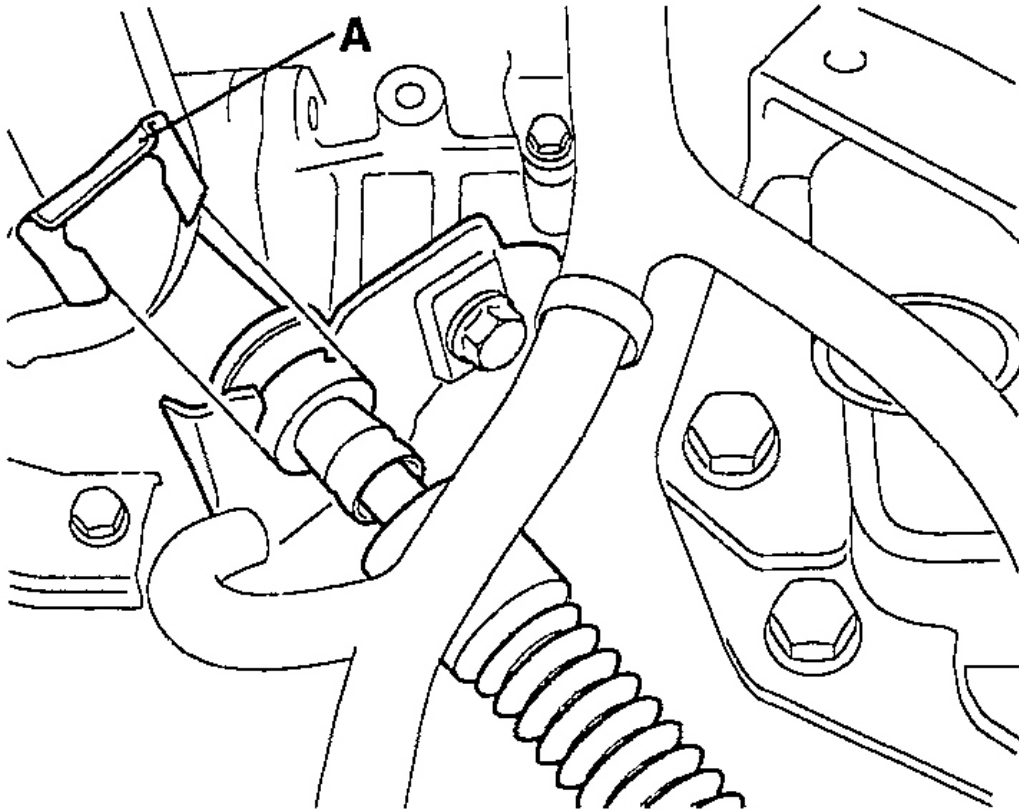
16. Remove the control cable transaxle range switch nut (A).



G00941689

Fig. 55: Removing Control Cable Transaxle Range Switch Nut
Courtesy of HYUNDAI MOTOR CO.

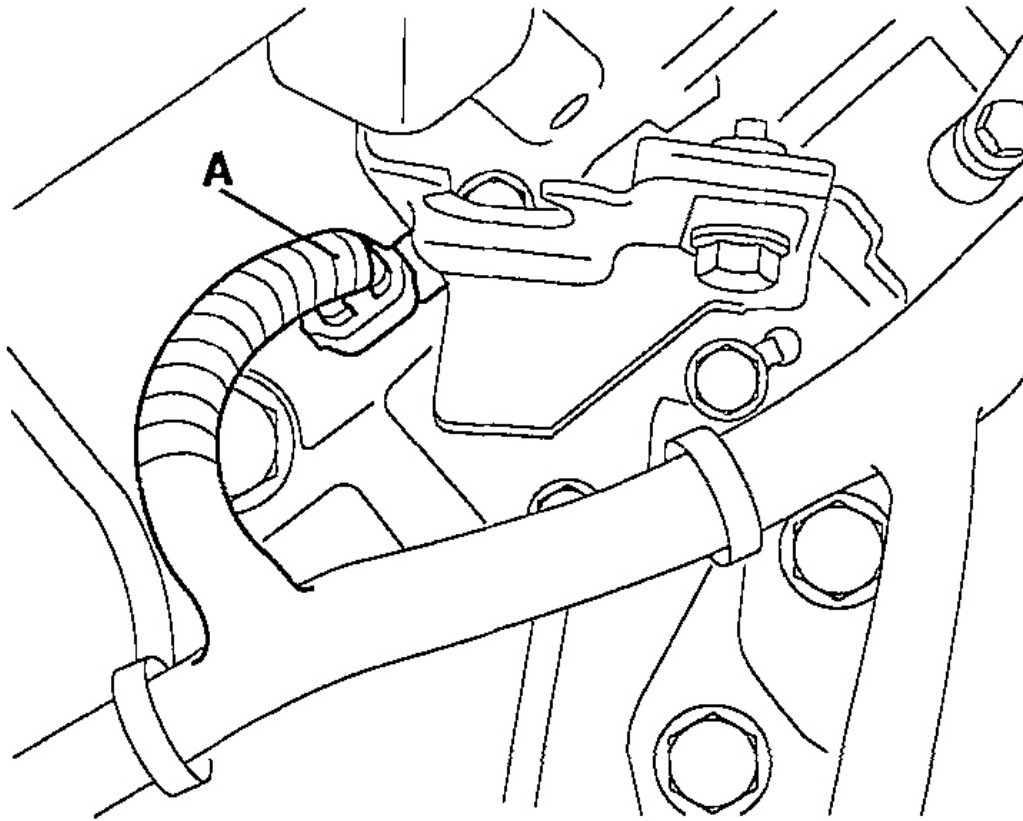
17. Remove the clip (A) of the control cable.



G00941690

Fig. 56: Removing Clip Of Control Cable
Courtesy of HYUNDAI MOTOR CO.

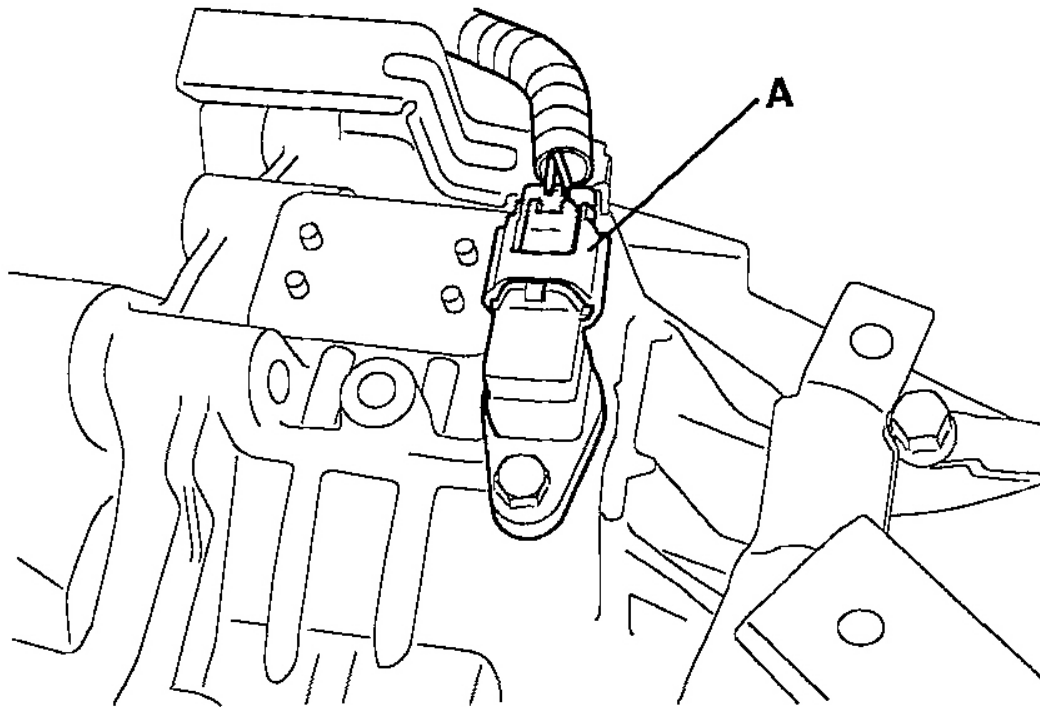
18. Remove the input shaft speed sensor connector (A).



G00941691

Fig. 57: Removing Input Shaft Speed Sensor Connector
Courtesy of HYUNDAI MOTOR CO.

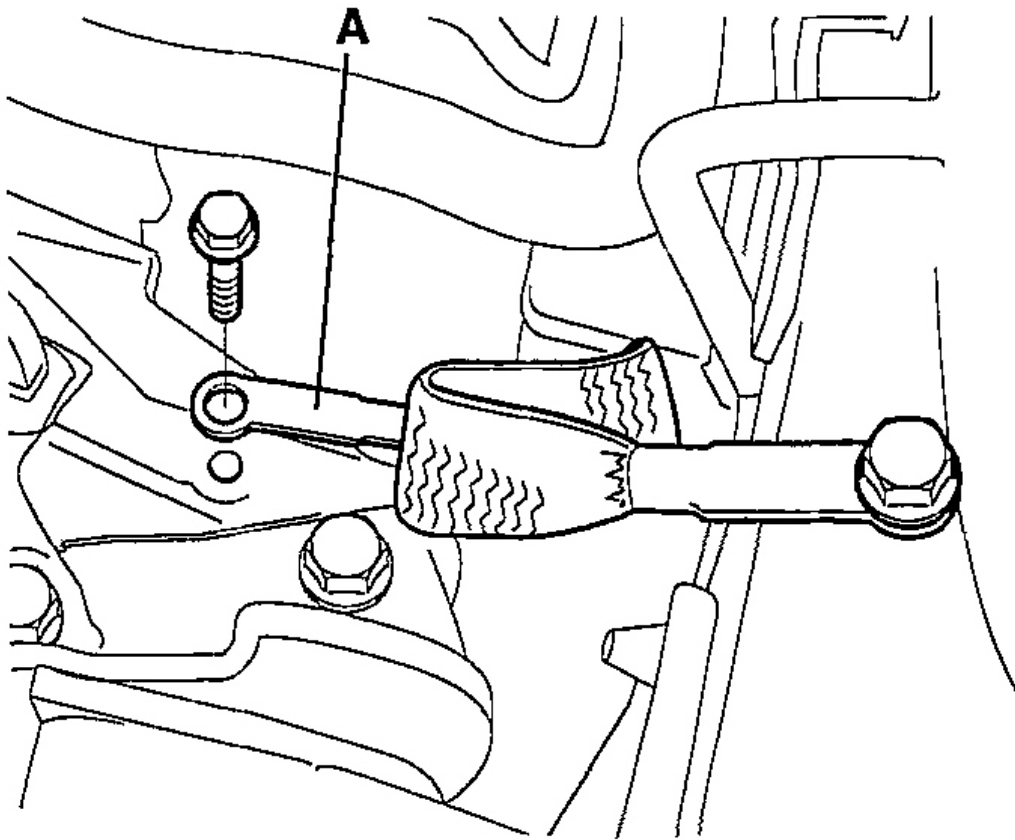
19. Remove the output shaft speed sensor connector (A).



G00941692

Fig. 58: Removing Output Shaft Speed Sensor Connector
Courtesy of HYUNDAI MOTOR CO.

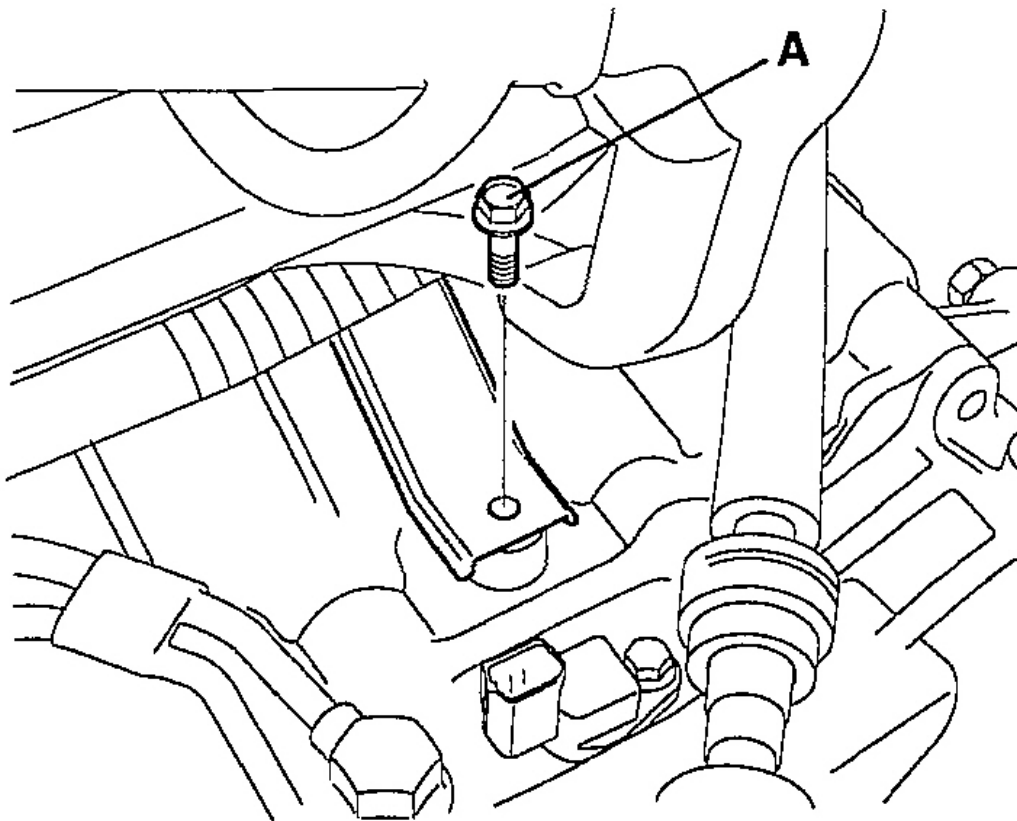
20. Remove the transaxle ground cable (A).



G00941693

Fig. 59: Removing Transaxle Ground Cable
Courtesy of HYUNDAI MOTOR CO.

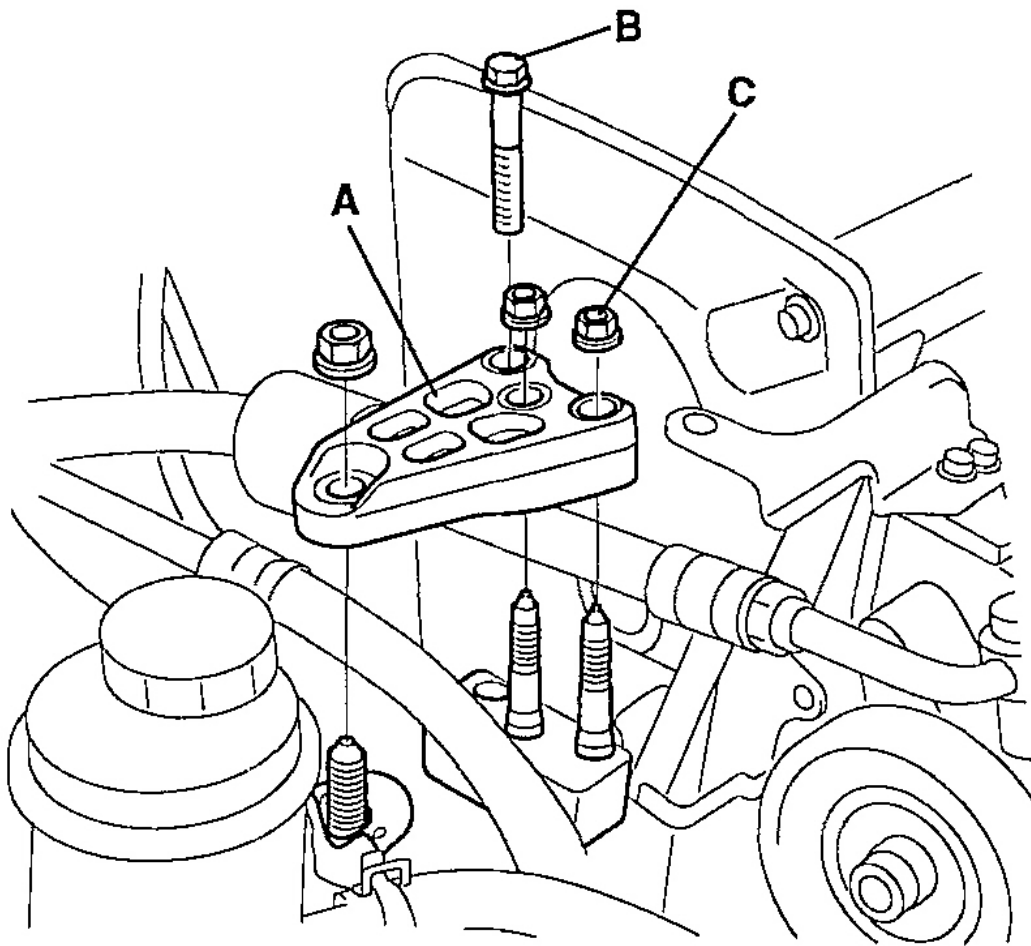
21. Remove the start motor cable mounting bolt (A).



G00941694

Fig. 60: Removing Start Motor Cable Mounting Bolt
Courtesy of HYUNDAI MOTOR CO.

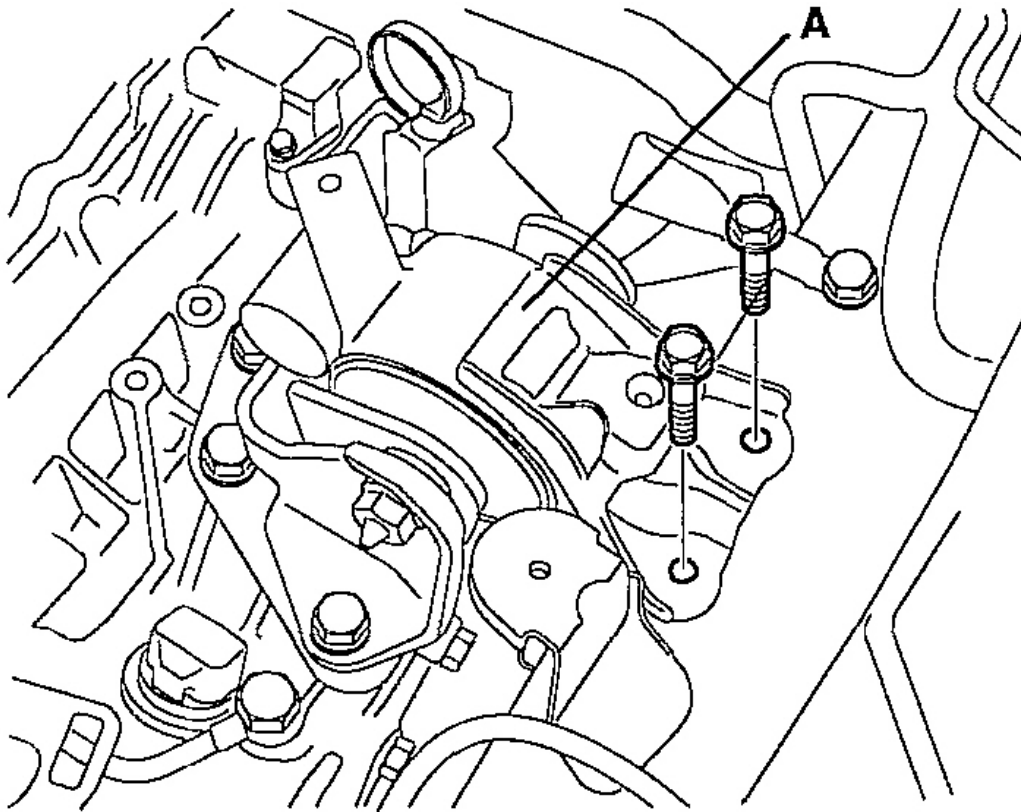
22. Remove the starting motor connector.
23. Remove the alternator connector.
24. Install the SST (09200-38001), the engine support fixture and the adapter, on the engine and transaxle assembly.
25. Remove the engine mounting bracket (A).



G00941695

Fig. 61: Removing Engine Mounting Bracket
Courtesy of HYUNDAI MOTOR CO.

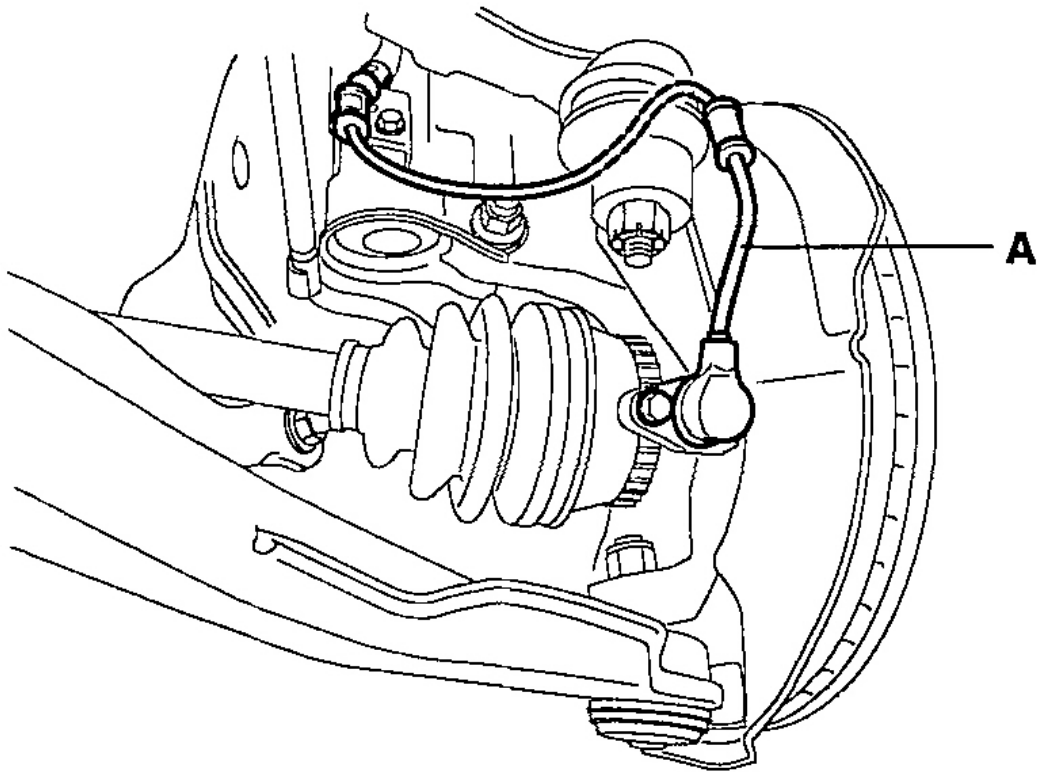
26. Remove the transaxle mounting bracket (A).



G00941696

Fig. 62: Removing Transaxle Mounting Bracket
Courtesy of HYUNDAI MOTOR CO.

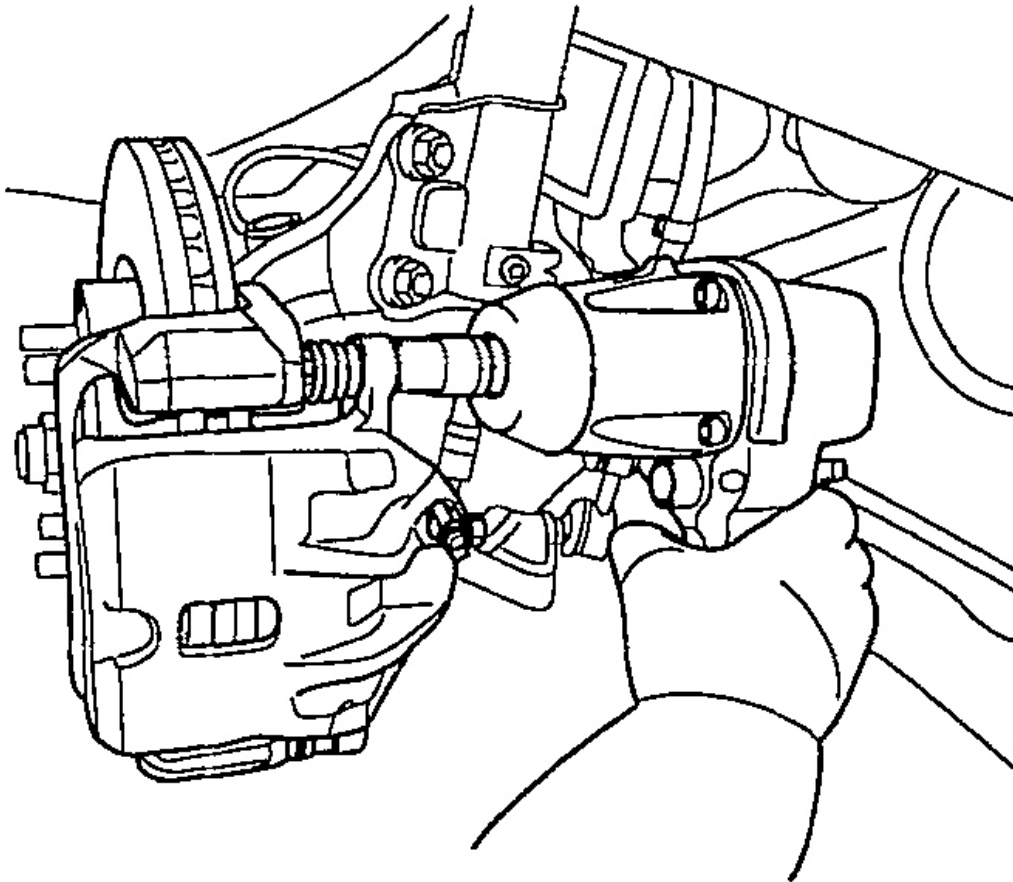
27. Remove the front tires.
28. Remove the ABS wheel speed sensor (A).



G00941697

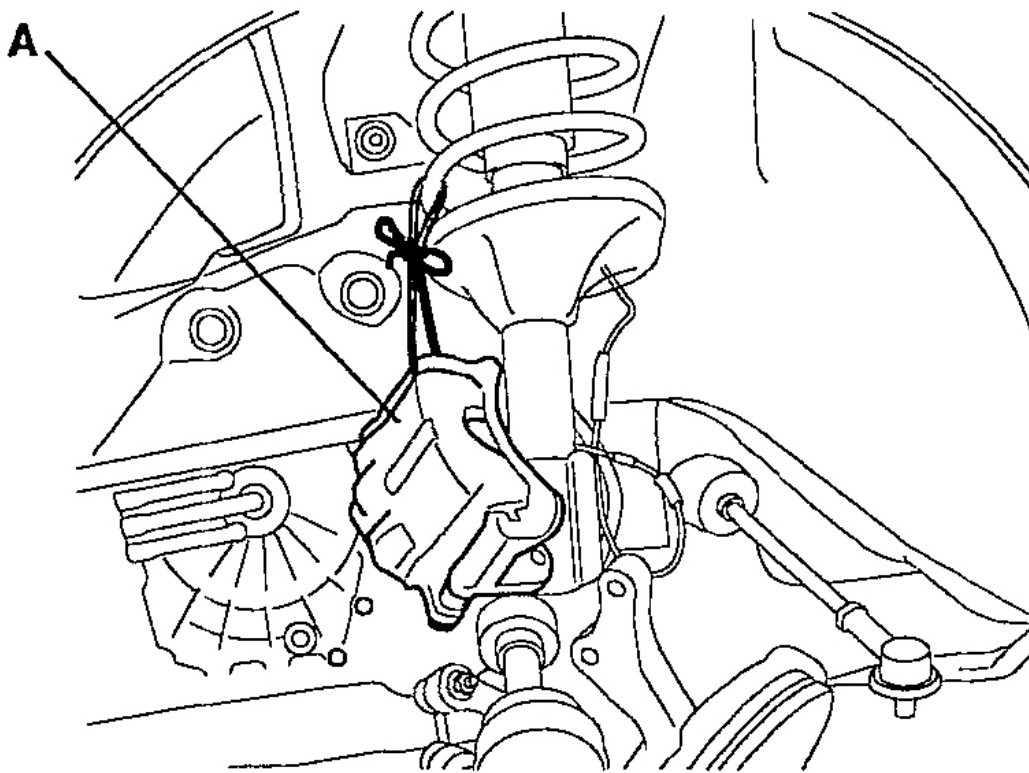
Fig. 63: Removing ABS Wheel Speed Sensor
Courtesy of HYUNDAI MOTOR CO.

29. Remove the caliper and hang the caliper assembly (A).



G00941698

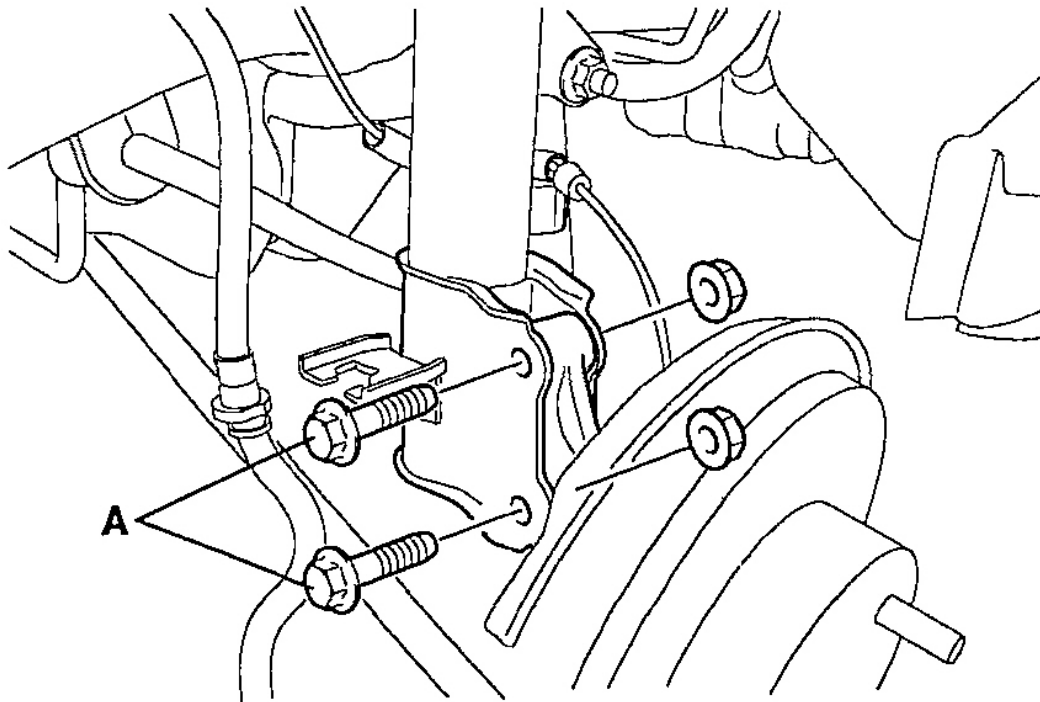
Fig. 64: Removing Caliper
Courtesy of HYUNDAI MOTOR CO.



G00941699

Fig. 65: Hanging Caliper With A Wire
Courtesy of HYUNDAI MOTOR CO.

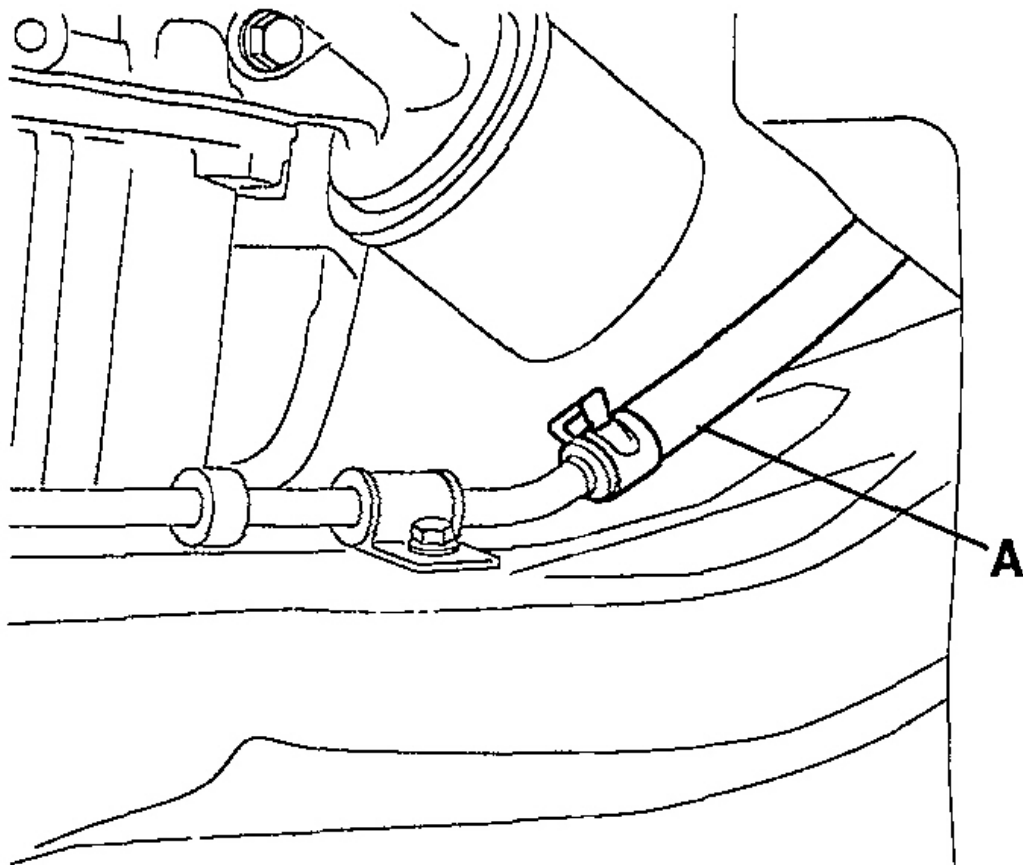
30. Remove the knuckle mounting bolts (A).



G00941700

Fig. 66: Removing Knuckle Mounting Bolts
Courtesy of HYUNDAI MOTOR CO.

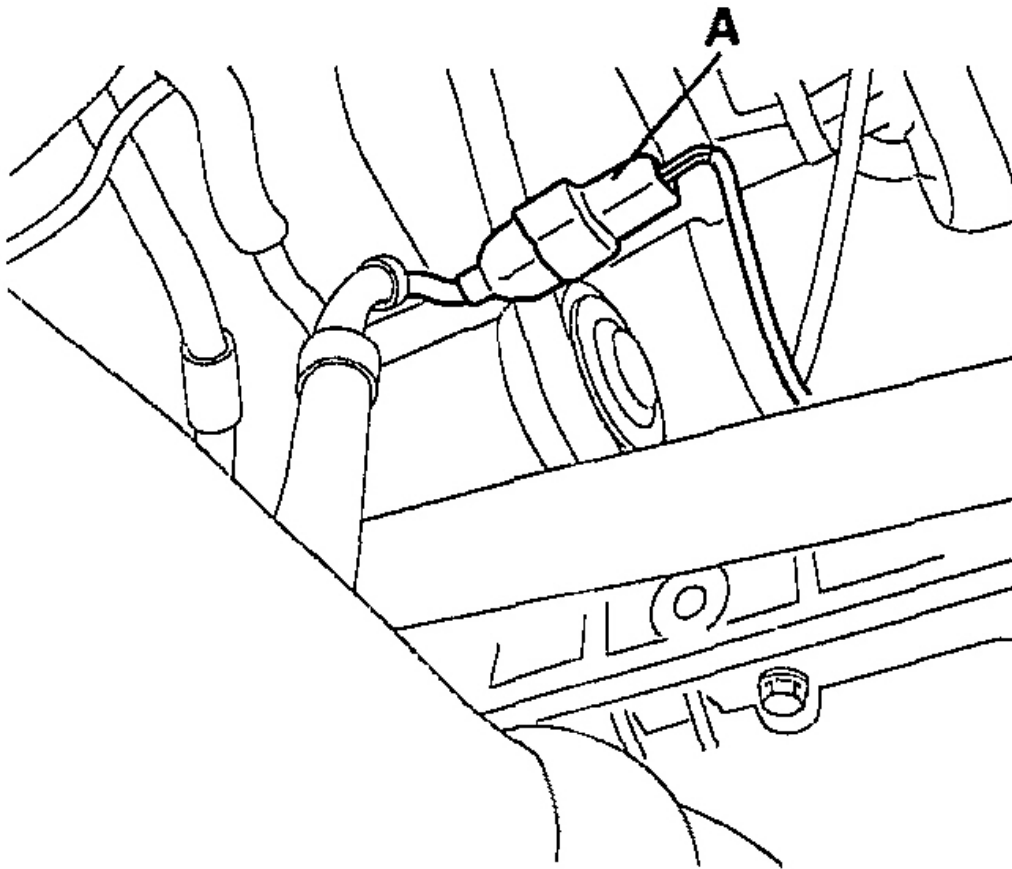
31. Remove the power steering return hose (A) and drain the power steering oil.



G00941701

Fig. 67: Removing Power Steering Return Hose
Courtesy of HYUNDAI MOTOR CO.

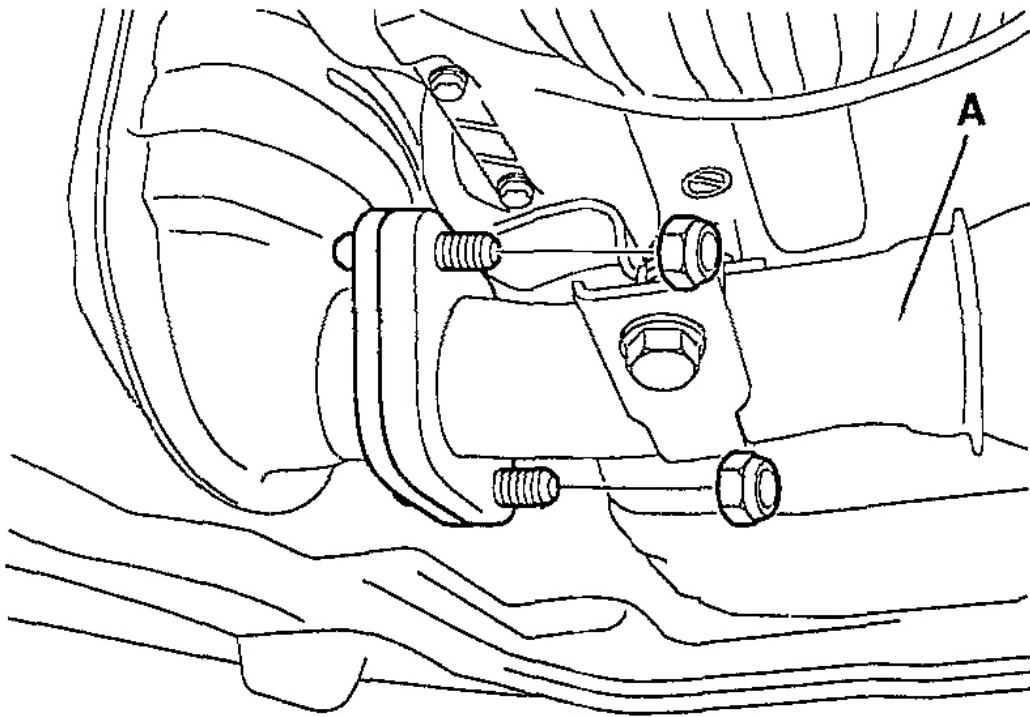
32. Disconnect the rear oxygen sensor connector (A).



G00941702

Fig. 68: Disconnecting Rear Oxygen Sensor Connector
Courtesy of HYUNDAI MOTOR CO.

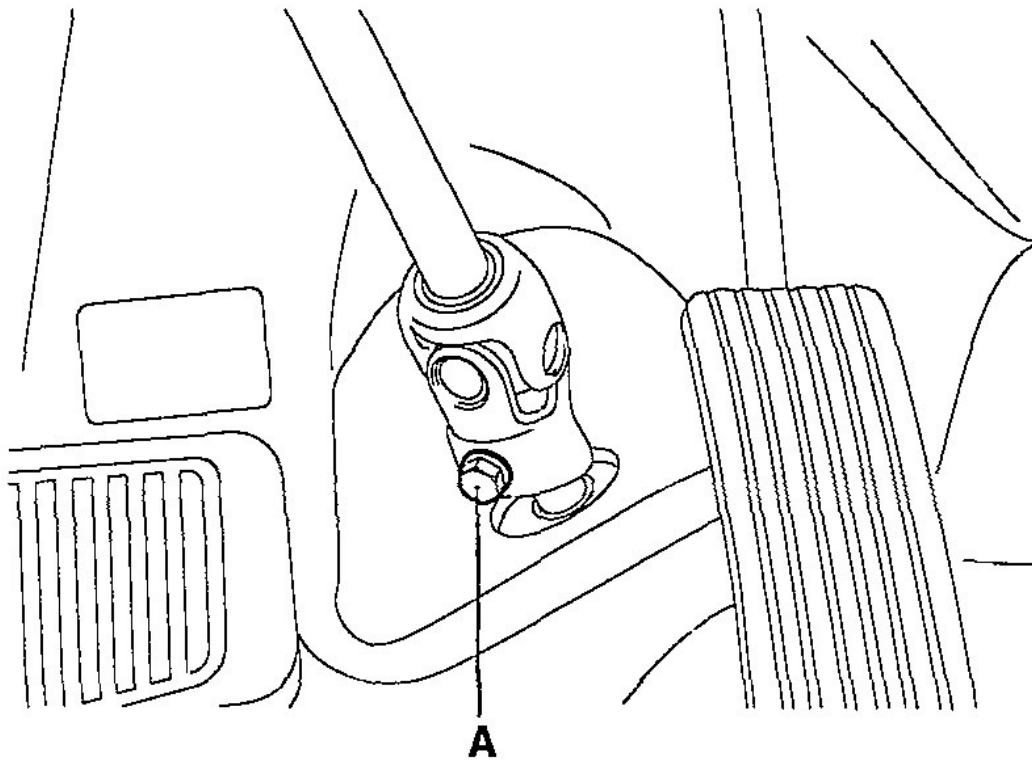
33. Remove the front muffler (A).



G00941703

Fig. 69: Locating Front Muffler
Courtesy of HYUNDAI MOTOR CO.

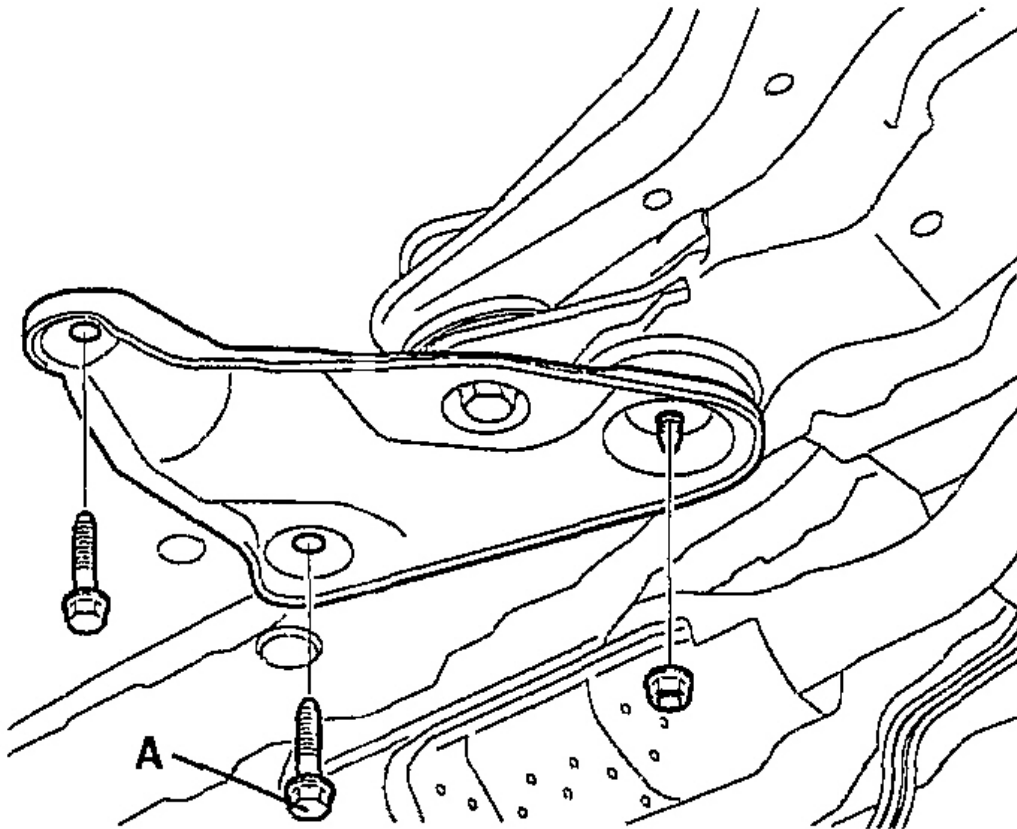
34. Remove the steering u-joint mounting bolt (A).



G00941704

Fig. 70: Removing Steering U-Joint Mounting Bolt
Courtesy of HYUNDAI MOTOR CO.

35. Remove the sub frame bolts (A).



G00941705

Fig. 71: Removing Sub Frame Bolts (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.

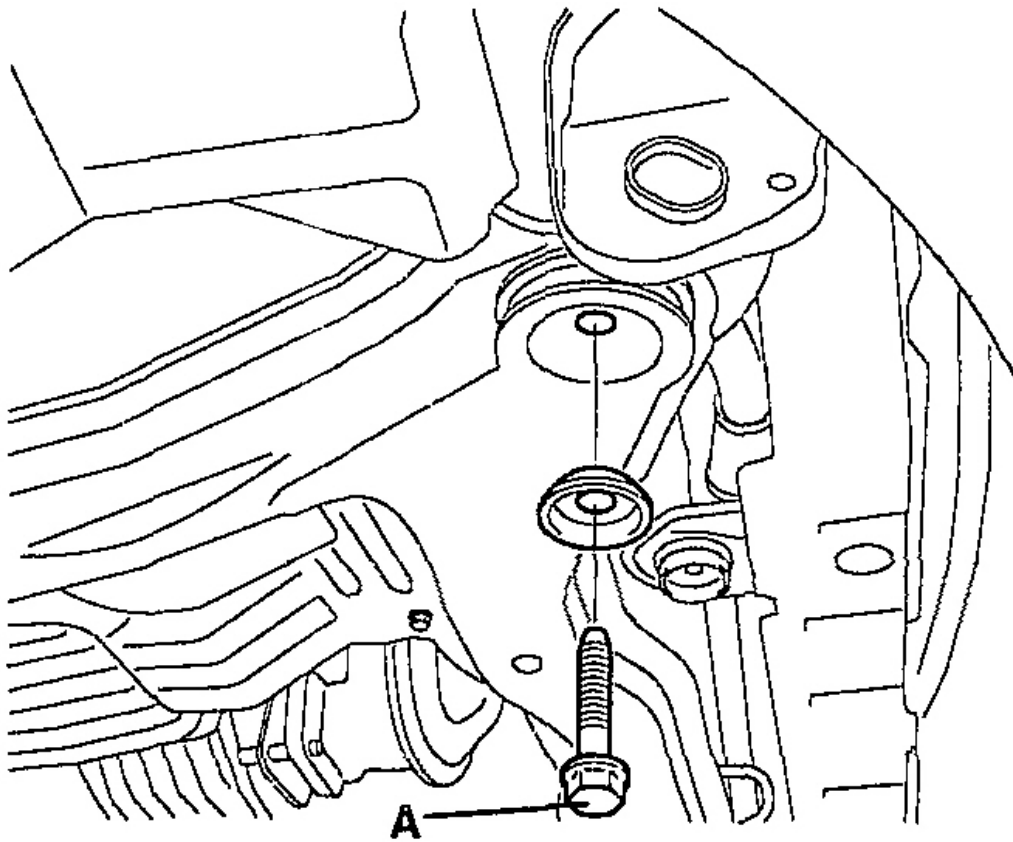
**G00941706**

Fig. 72: Removing Sub Frame Bolts (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

36. Remove the engine support fixture and the adapter.
37. Jack up the vehicle.

INSTALLATION

Installation is in the reverse order of removal.

Perform the following:

- Adjust the shift cable.
- Adjust the throttle cable.
- Refill the engine with engine oil.

- Refill the transaxle with fluid.
- Refill the radiator with engine coolant.
- Bleed air from the cooling system with the heater valve open.
- Clean the battery posts and cable terminals with sandpaper assemble them, then apply grease to prevent corrosion.
- Inspect for fuel leakage.

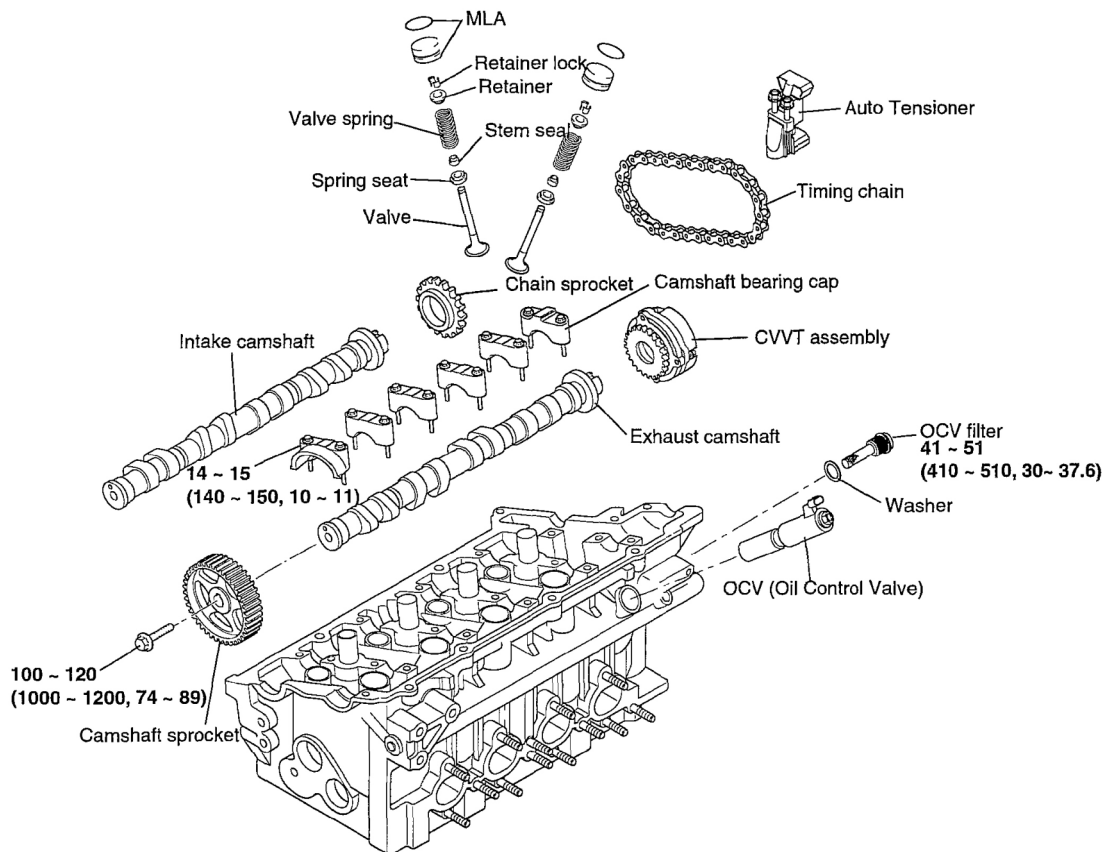
After assembling the fuel line, turn on the ignition switch (do not operate the starter) so that the fuel pump runs for approximately two seconds and fuel line pressurizes.

Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.

MAIN MOVING SYSTEM

CAMSHAFT

COMPONENTS



TORQUE : Nm (kgf.cm, lbf.ft)

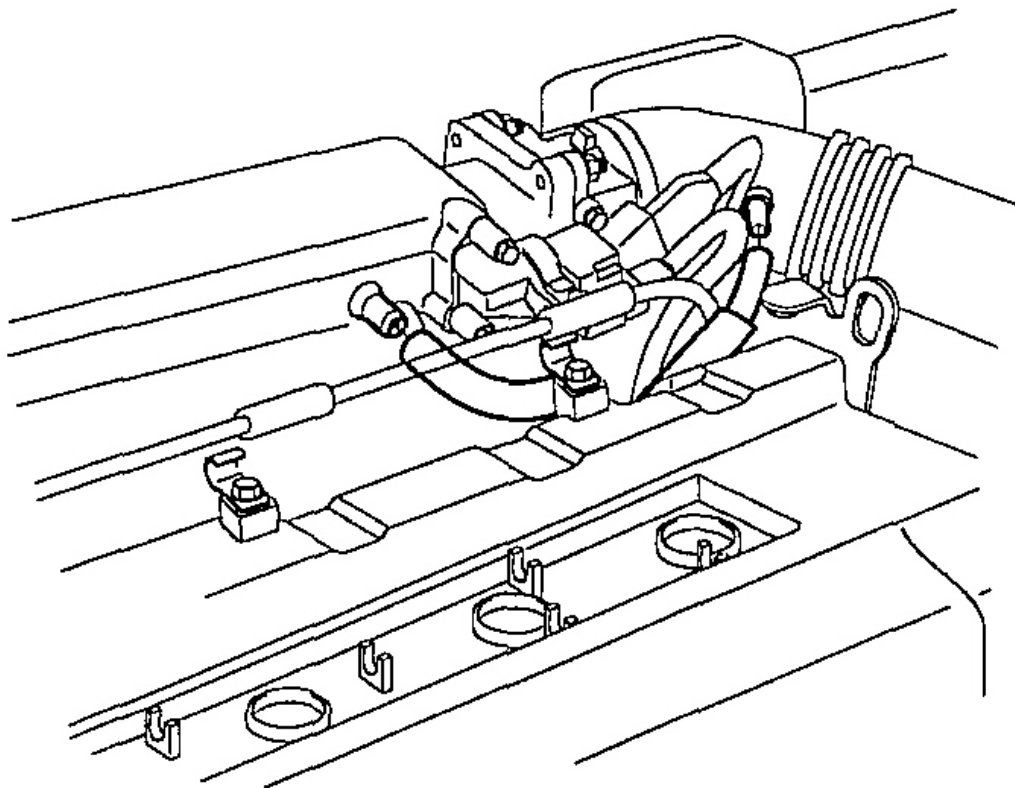
G00941707

Fig. 73: Identifying Camshaft Components

Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Disconnect the breather hose and the P.C.V. hose.

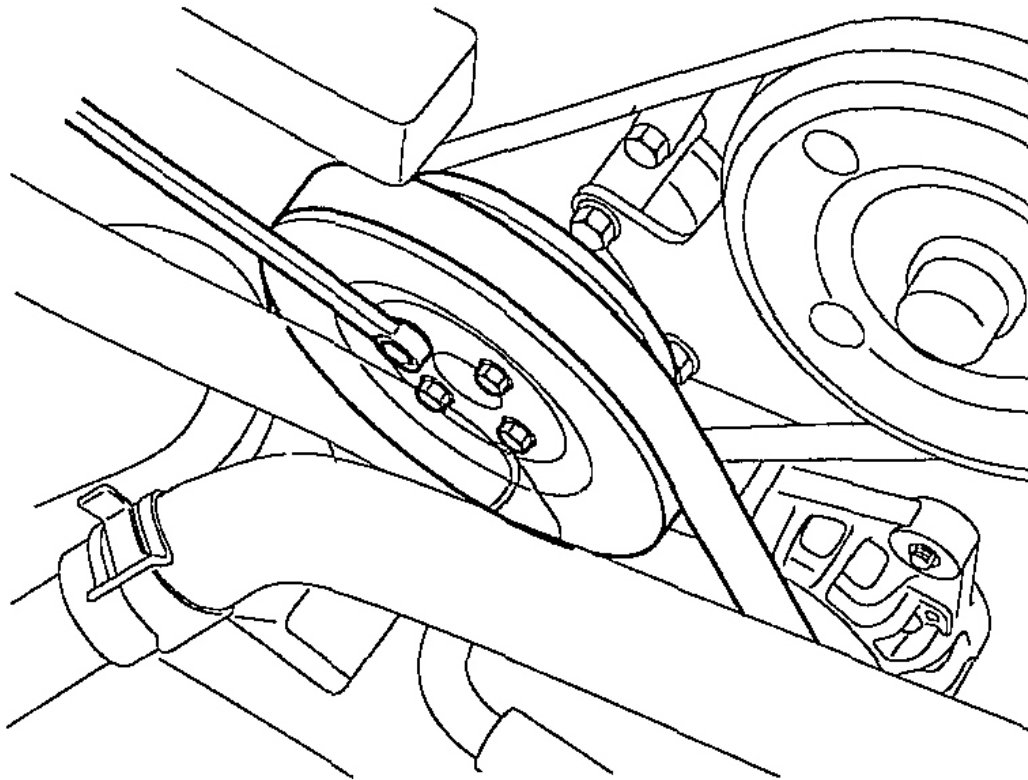


G00941708

Fig. 74: Disconnecting Breather Hose & P.C.V. Hose

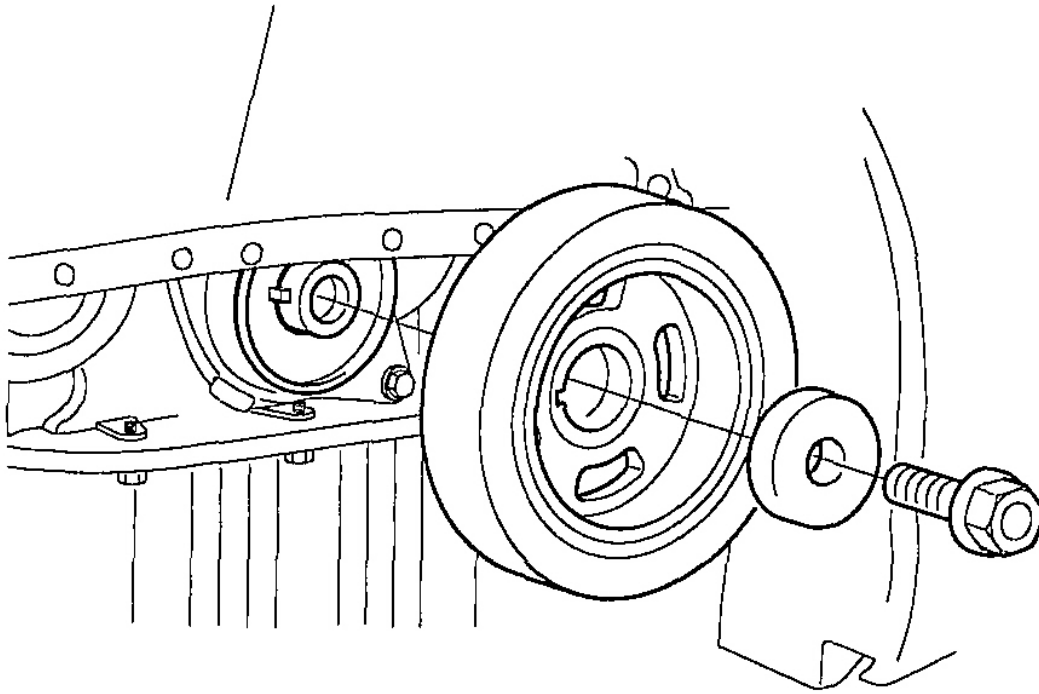
Courtesy of HYUNDAI MOTOR CO.

2. Remove the coolant pump pulley and crankshaft pulley.



G00941709

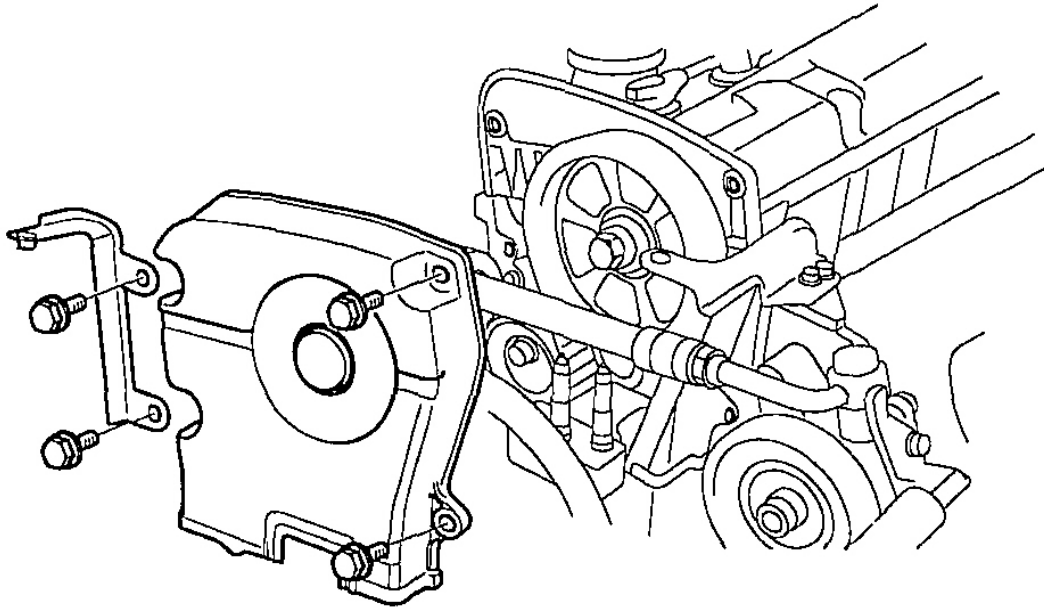
Fig. 75: Removing Coolant Pump Pulley
Courtesy of HYUNDAI MOTOR CO.



G00941710

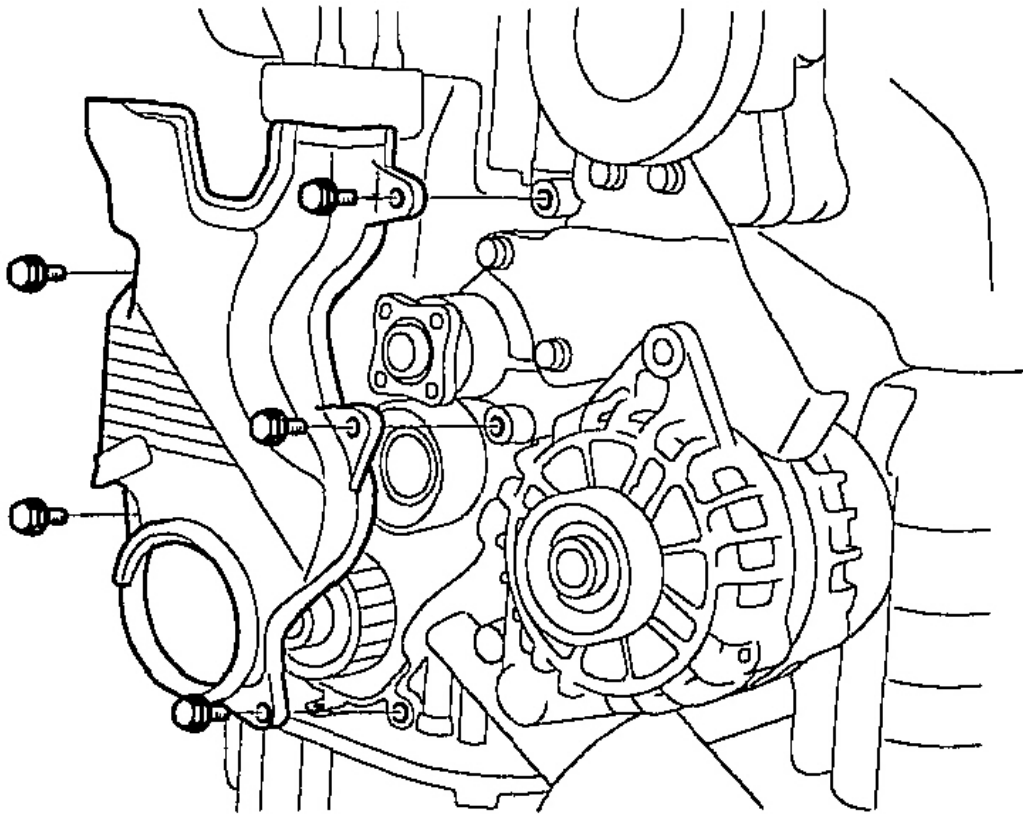
Fig. 76: Removing Crankshaft Pulley
Courtesy of HYUNDAI MOTOR CO.

3. Remove the timing belt cover.



G00941711

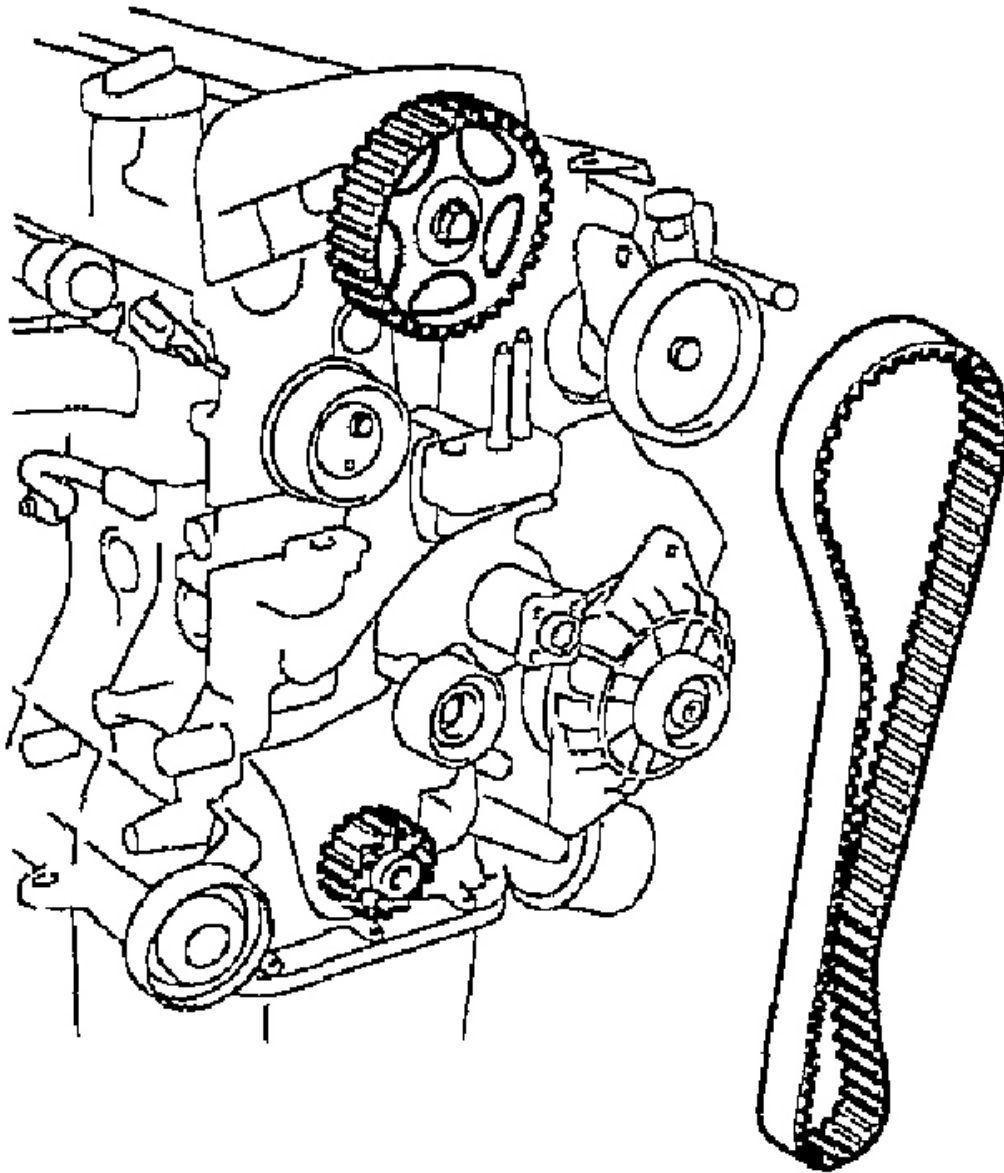
Fig. 77: Removing Timing Belt Cover (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.



G00941712

Fig. 78: Removing Timing Belt Cover (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

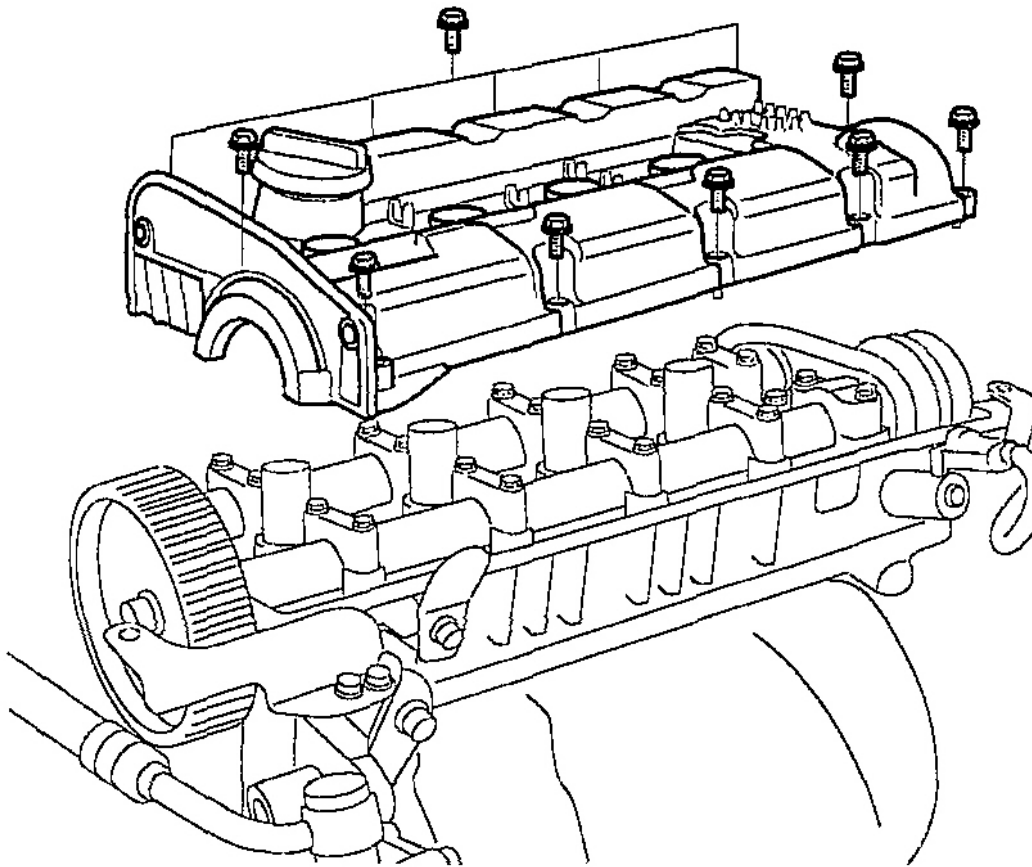
4. Loosen the timing belt tensioner pulley and temporarily secure it.
5. Remove the timing belt from the camshaft sprocket.



G00941714

Fig. 79: Removing Timing Belt From Camshaft Sprocket
Courtesy of HYUNDAI MOTOR CO.

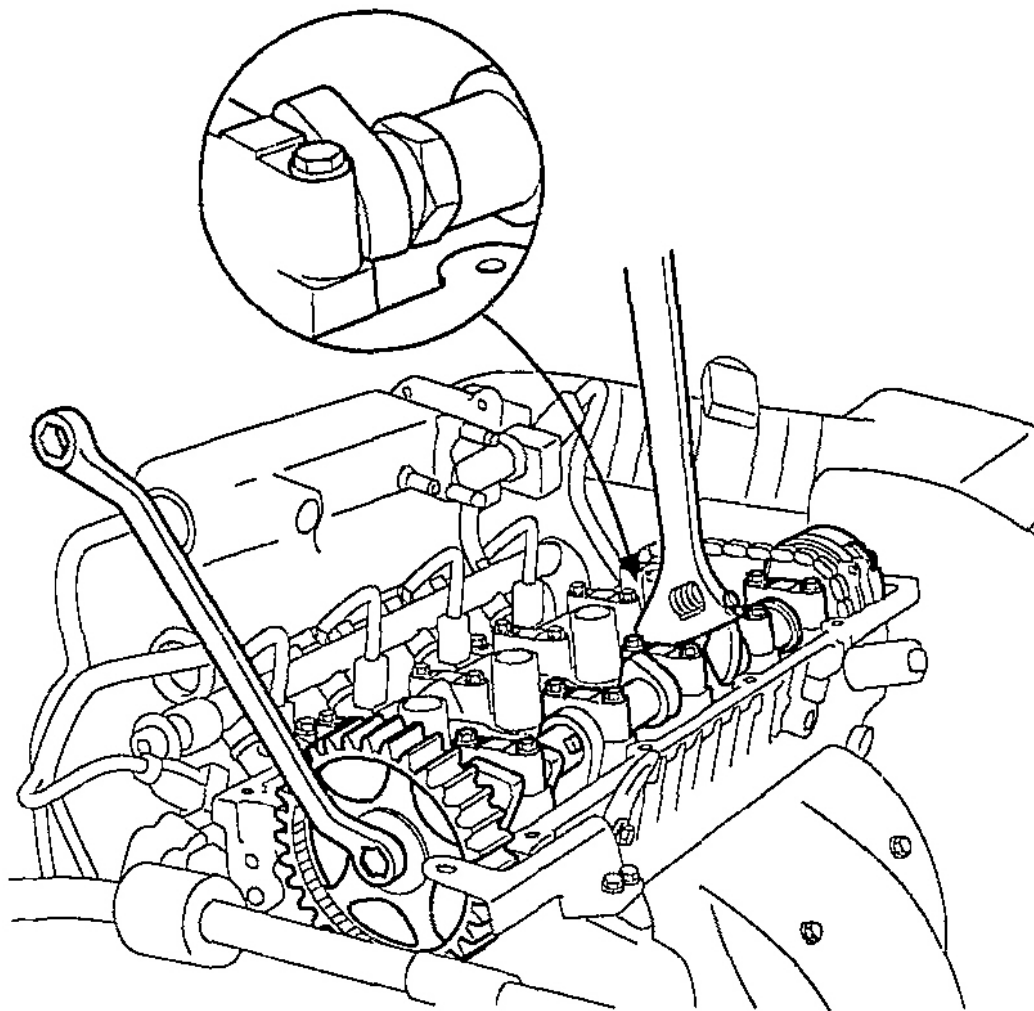
6. Remove the ignition coil assembly.
7. Loosen the cylinder head cover bolts and then remove the cylinder head cover.



G00941715

Fig. 80: Removing Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

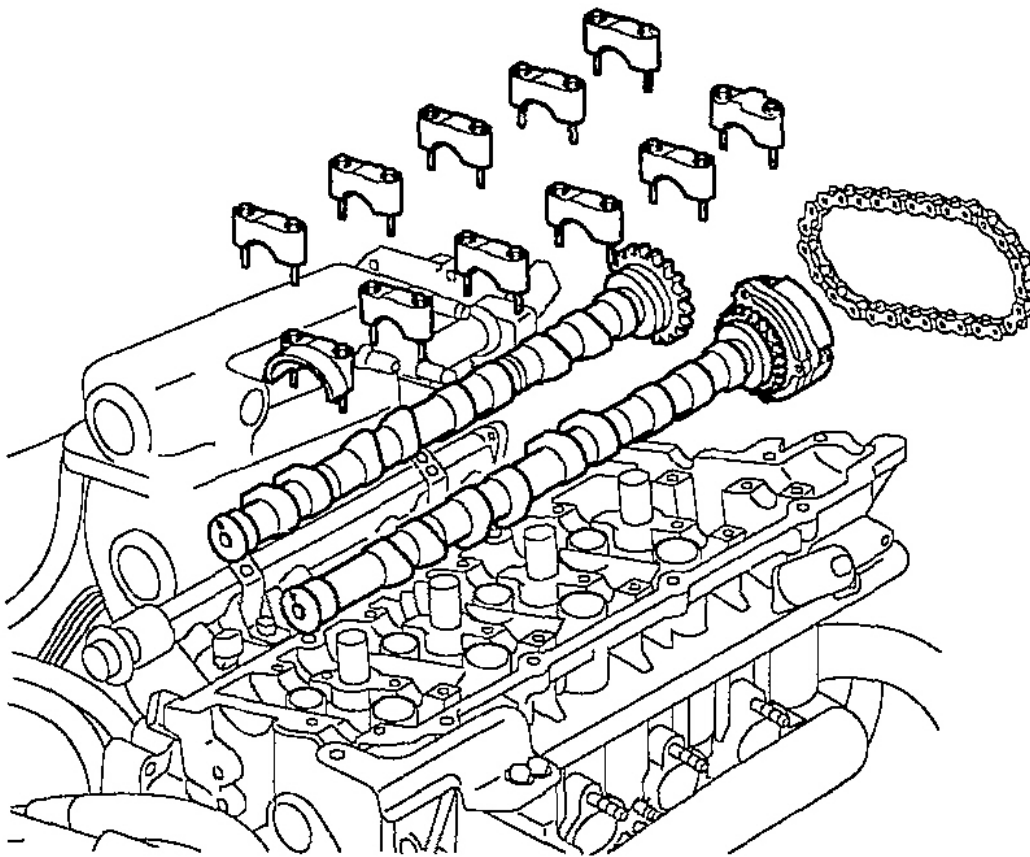
8. Remove the camshaft sprocket.



G00941716

Fig. 81: Removing Camshaft Sprocket
Courtesy of HYUNDAI MOTOR CO.

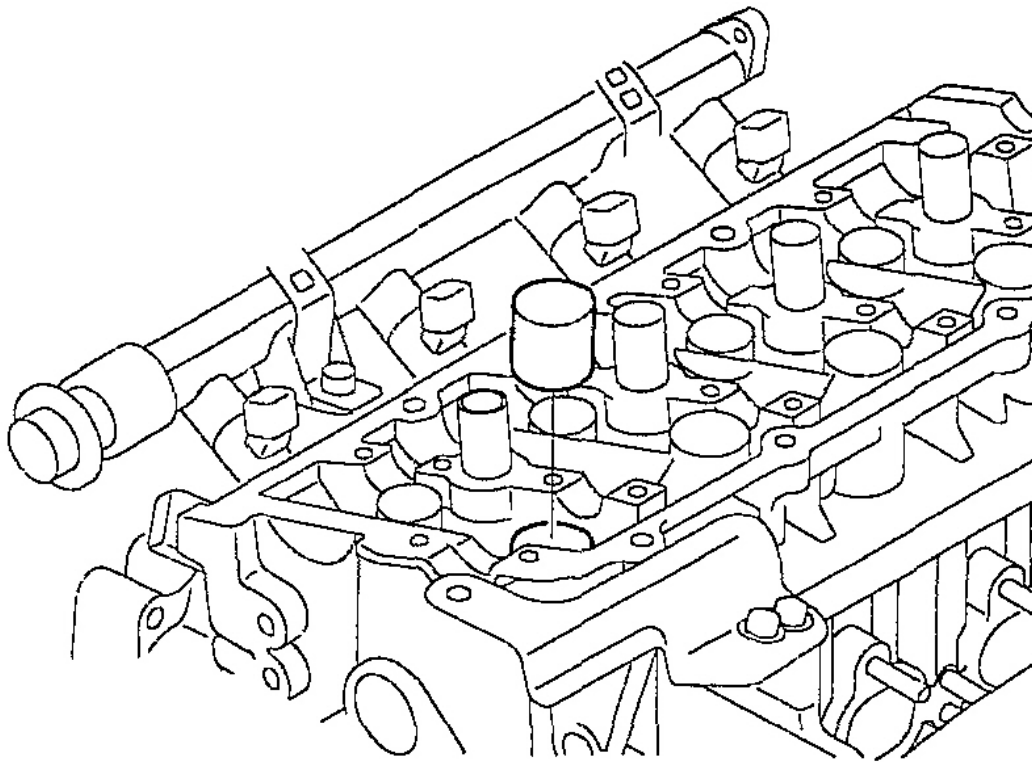
9. Remove the camshaft bearing caps and timing chain.



G00941717

Fig. 82: Removing Camshaft Bearing Caps & Timing Chain
Courtesy of HYUNDAI MOTOR CO.

10. Remove the camshaft.
11. Remove the mechanical tappets and shims.

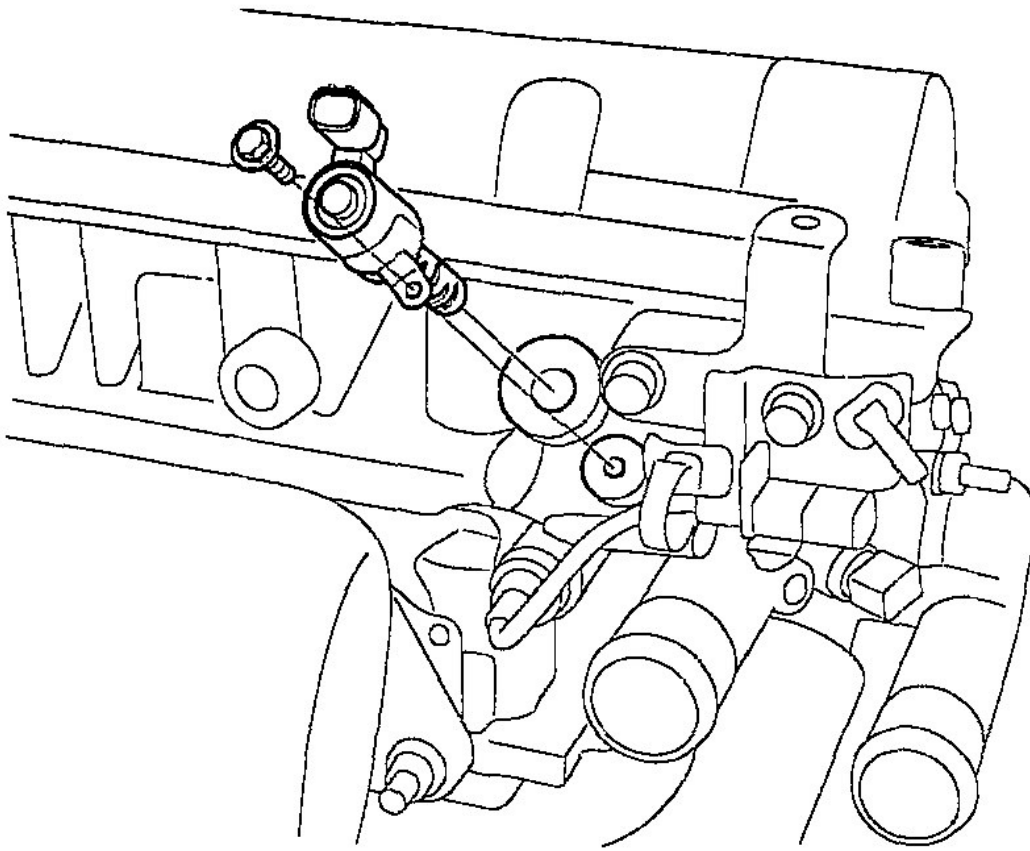


G00941718

Fig. 83: Removing Mechanical Tappets & Shims
Courtesy of HYUNDAI MOTOR CO.

NOTE: Arrange the mechanical tapets and shims in correct order.

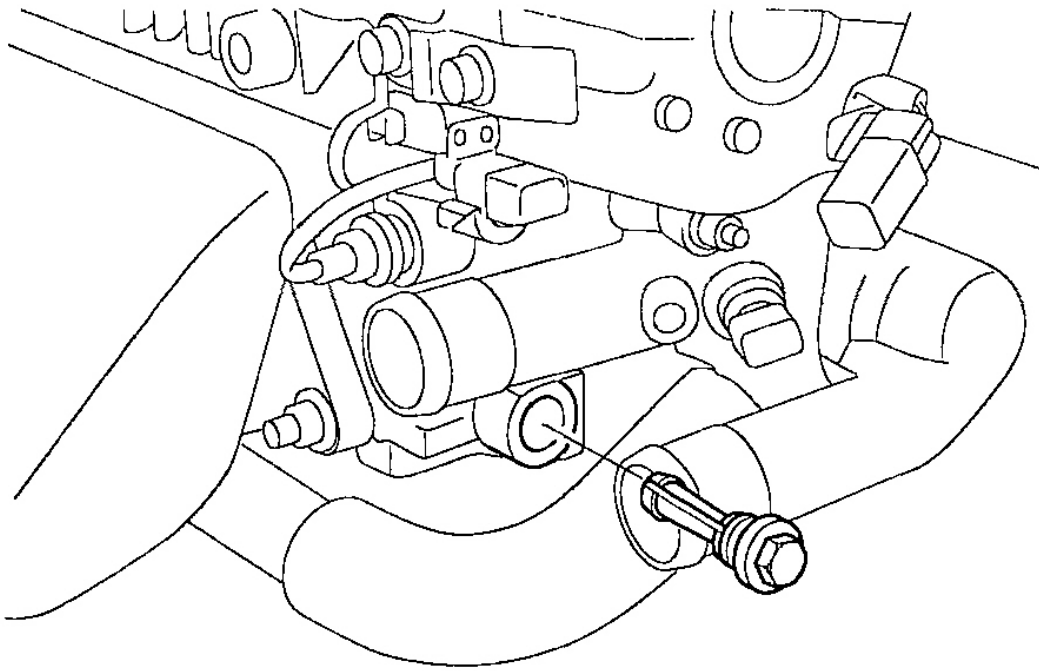
12. Remove the OCV (Oil control valve).



G00941719

Fig. 84: Removing OCV
Courtesy of HYUNDAI MOTOR CO.

13. Remove the OCV filter

**G00941720****Fig. 85: Removing OCV Filter****Courtesy of HYUNDAI MOTOR CO.****INSPECTION**

1. Check the camshaft journals for wear. If the journals are badly worn, replace the camshaft.
2. Check the cam lobes for damage. If the lobe is damaged or worn excessively, replace the camshaft.

Cam height

W/O - CVVT

[Standard value]

Intake : 44.820 mm (1.7646 in.)

Exhaust : 44.720 mm (1.7606 in.)

[Limit]

Intake : 44.720 mm (1.7606 in.)

Exhaust : 44.620 mm (1.7567 in.)

W - CVVT

[Standard value]

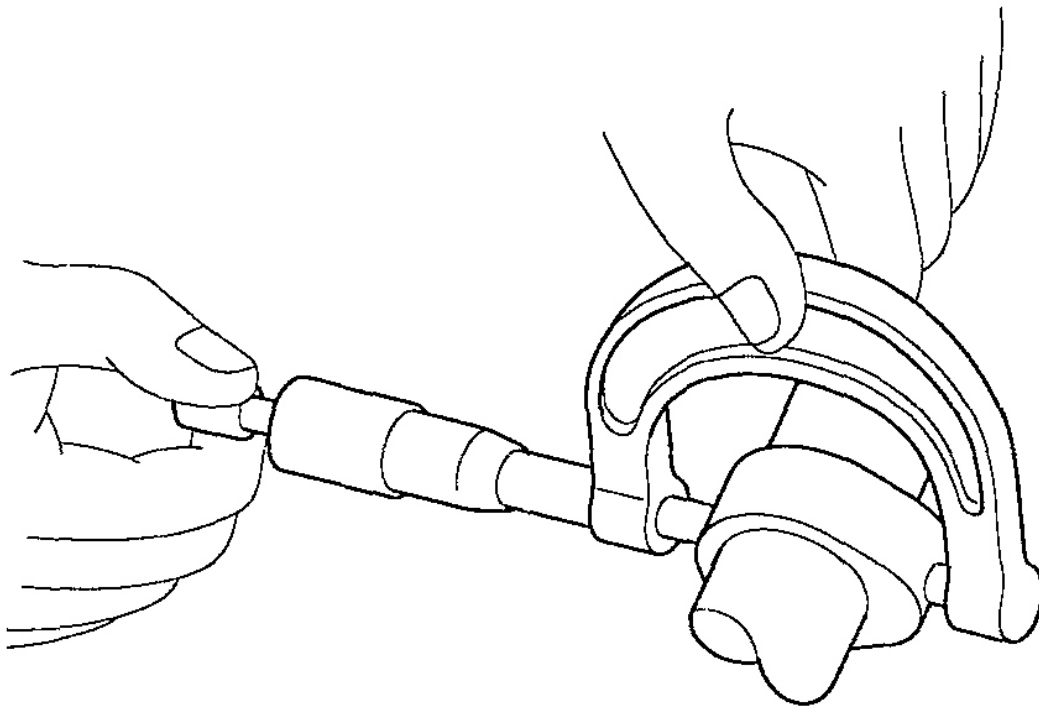
Intake : 44.618mm (1.7566in.)

Exhaust : 44.518mm (1.7527in.)

[Limit]

Intake : 44.518mm (1.7527in.)

Exhaust : 44.418mm (1.7587in.)



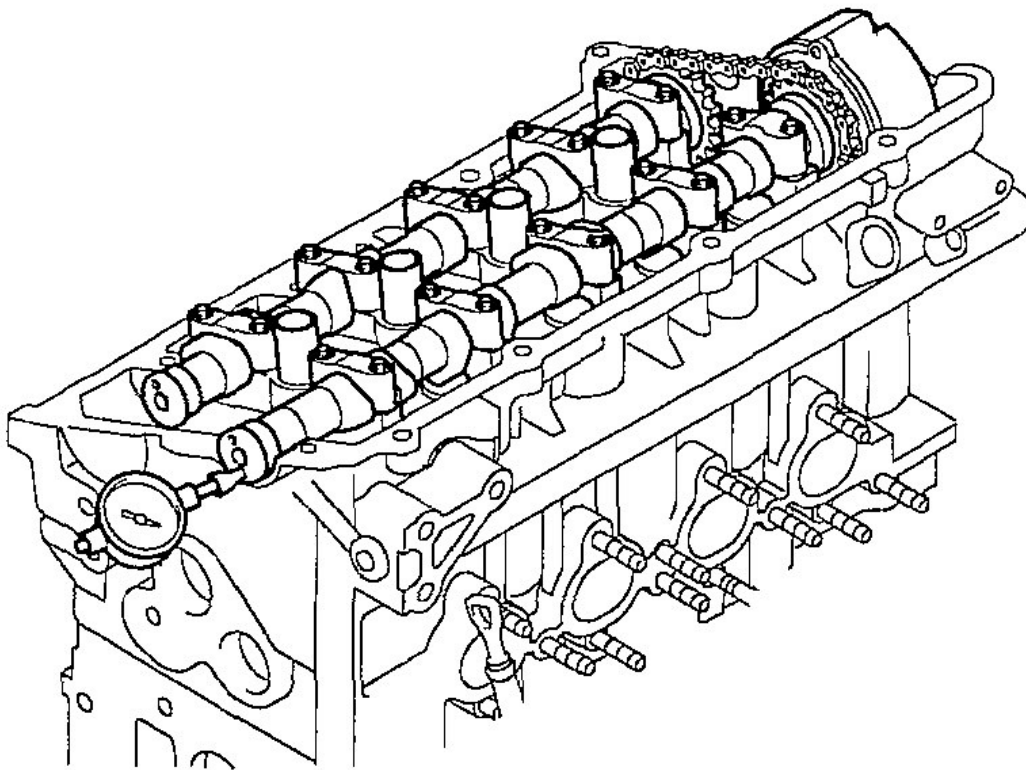
G00941721

Fig. 86: Checking Cam Lobes For Damage
Courtesy of HYUNDAI MOTOR CO.

3. Check the cam surface for abnormal wear or damage, and replace if necessary.
4. Check each bearing for damage. If the bearing surface is excessively damaged, replace the cylinder head

assembly or camshaft bearing cap, as necessary.

Camshaft end play : 0.1 ~ 0.2 mm (0.004 ~ 0.0008 in.)

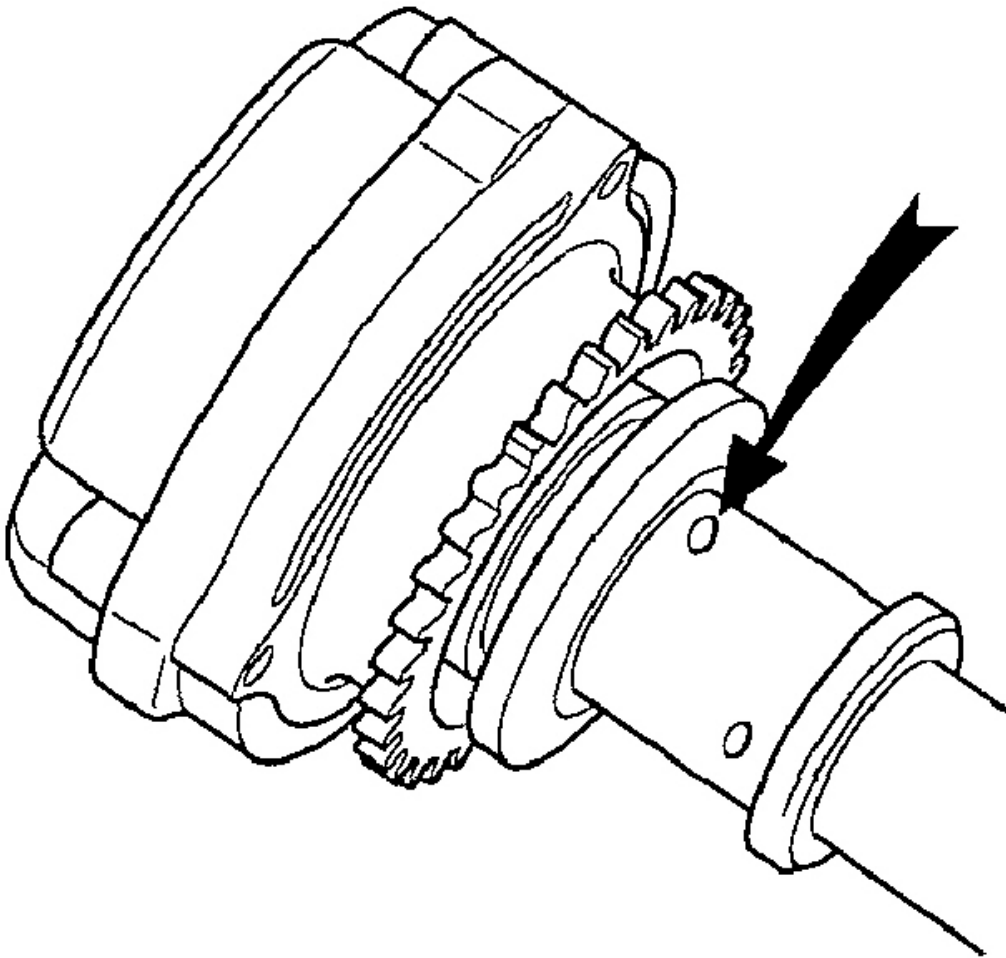


G00941722

Fig. 87: Check Cam Bearings For Damage
Courtesy of HYUNDAI MOTOR CO.

CVVT ASSEMBLY

1. Inspect CVVT assembly.
 1. Check that the CVVT assembly will not turn.
 2. Apply vinyl tape to all the parts except the one indicated by the arrow in the illustration.



G00941723

Fig. 88: Locating Non Tape Area
Courtesy of HYUNDAI MOTOR CO.

3. Wind tape around tip of the air gun and apply air of approx. 100kpa (1kgf/cm² , 14psi) to the port of the camshaft. (Perform this order to release the lock pin for the maximum delay angle locking.)

NOTE: When the oil splashes, wipe it off with a shop rag and the likes.

4. Under the condition of (3), turn the CVVT assembly to the advance angle side (the arrow marked direction in the illustration) with your hand. Depending on the air pressure, the CVVT assembly will turn to the advance side without applying force by hand. Also, under the condition that the pressure can be

hardly applied because of the air leakage from the port, there may be case that the lock pin could be hardly released.

5. Except the position where the lock pin meets at the maximum delay angle, let the CVVT assembly turn back and forth and check the movable range and that there is disturbance.

Standard : Movable smoothly in the range about 20°

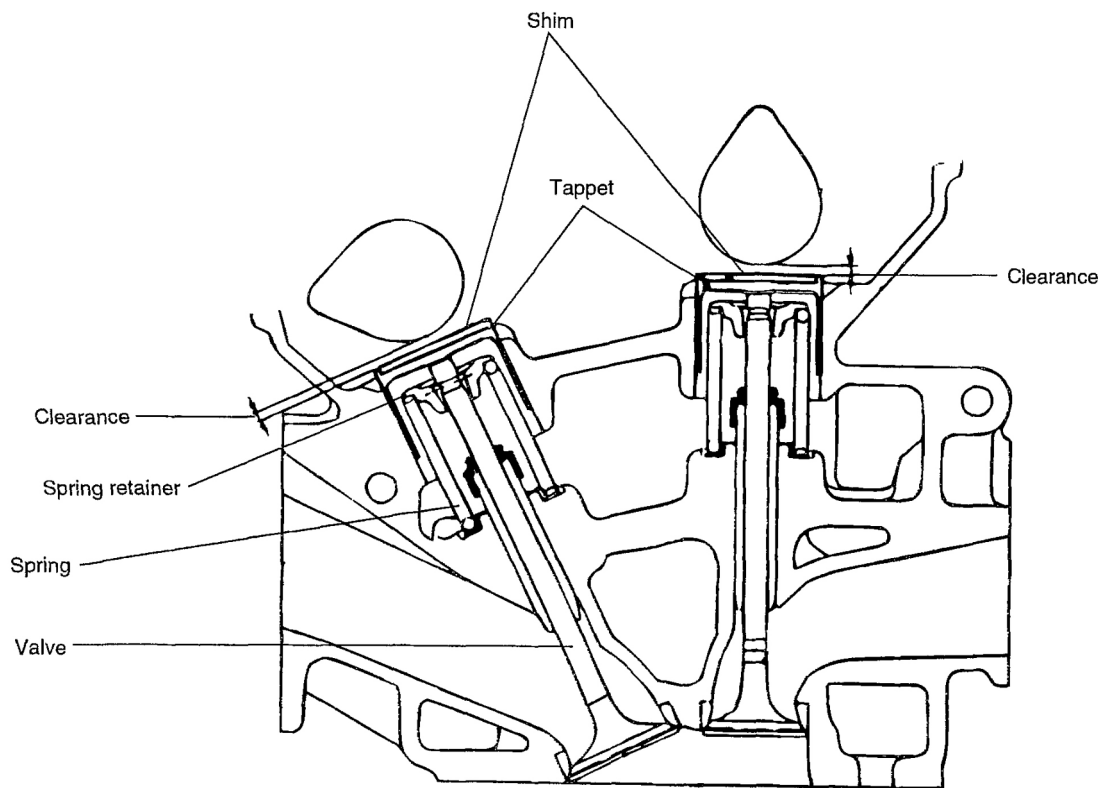
6. Turn the CVVT assembly with your hand lock it at the maximum delay angle position.

CAMSHAFT OIL SEAL

1. Check the lips for wear. If the lip threads are worn, replace.
2. Check the oil seal lip contacting surface of the camshaft. If it is worn, replace the camshaft.

MLA (MECHANICAL LASH ADJUSTER)

VALVE CLEARANCE INSPECTION AND ADJUSTMENT



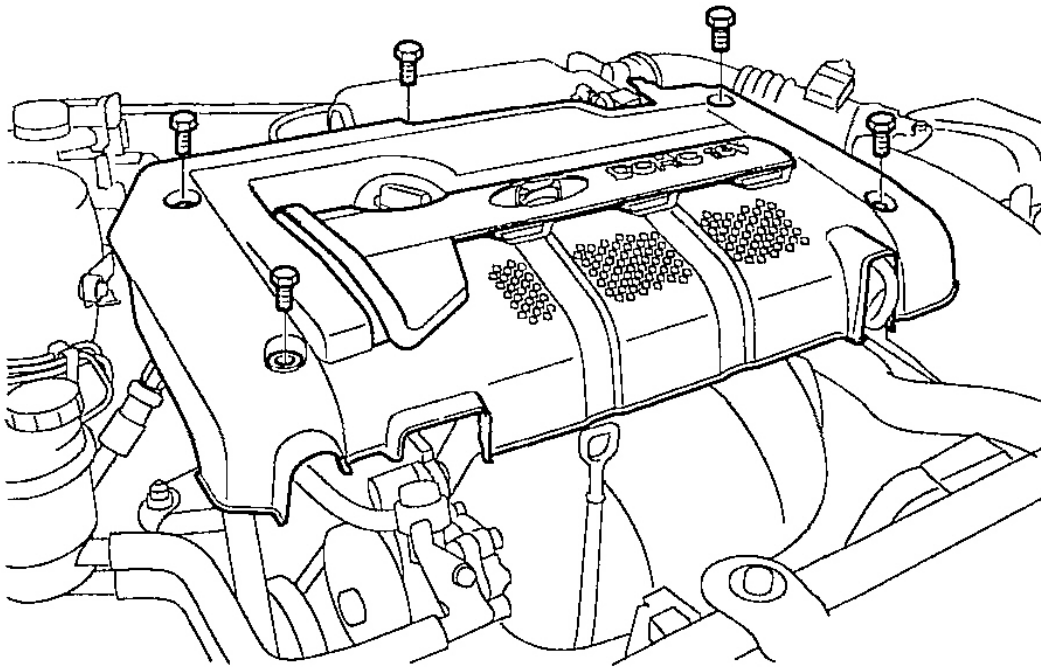
G00941724

Fig. 89: Inspecting Valve Clearance
Courtesy of HYUNDAI MOTOR CO.

NOTE: Inspect and adjust the valve clearance when the engine is cold (Engine coolant

temperature : 20°C) and cylinder head is installed on the cylinder block.

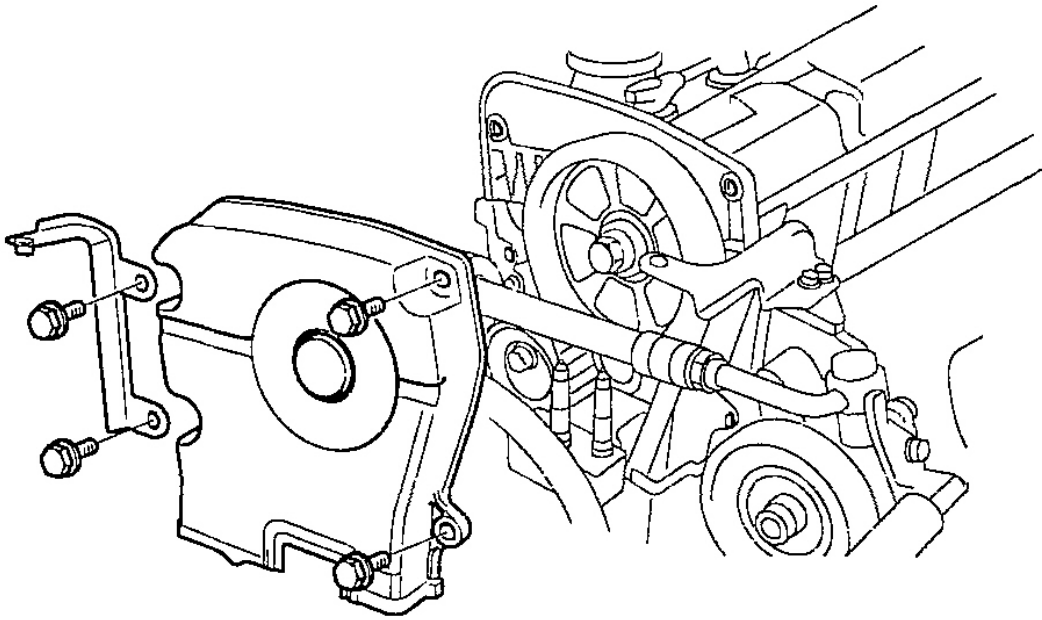
1. Remove the engine cover.



G00941725

Fig. 90: Removing Engine Cover
Courtesy of HYUNDAI MOTOR CO.

2. Remove the upper timing belt cover.



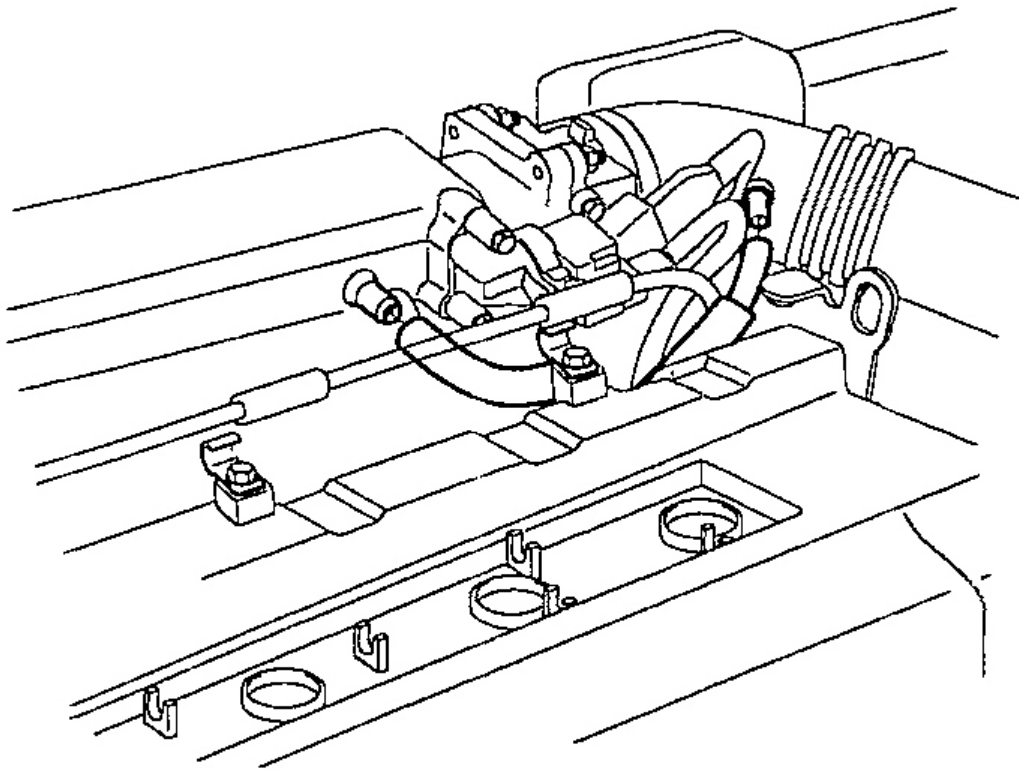
G00941726

Fig. 91: Removing Upper Timing Belt Cover
Courtesy of HYUNDAI MOTOR CO.

- a. Loosen the upper timing belt cover bolts and then remove the cover.
3. Remove the cylinder head cover.
 - a. Disconnect the spark plug cables and do not pull on the spark plug cables by force.

NOTE: **Pulling on or bending the cables may damage the conductor inside.**

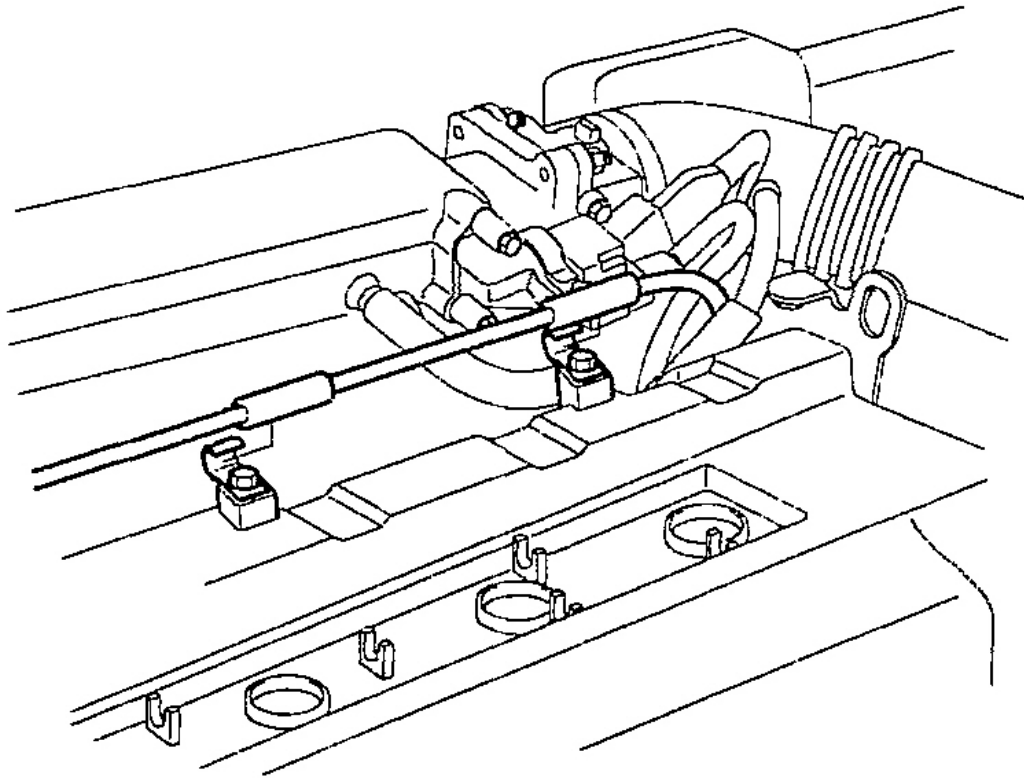
- b. Disconnect the P.C.V. hose and the breather hose from the cylinder head cover.



G00941727

Fig. 92: Disconnecting P.C.V. Hose & Breather Hose From Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

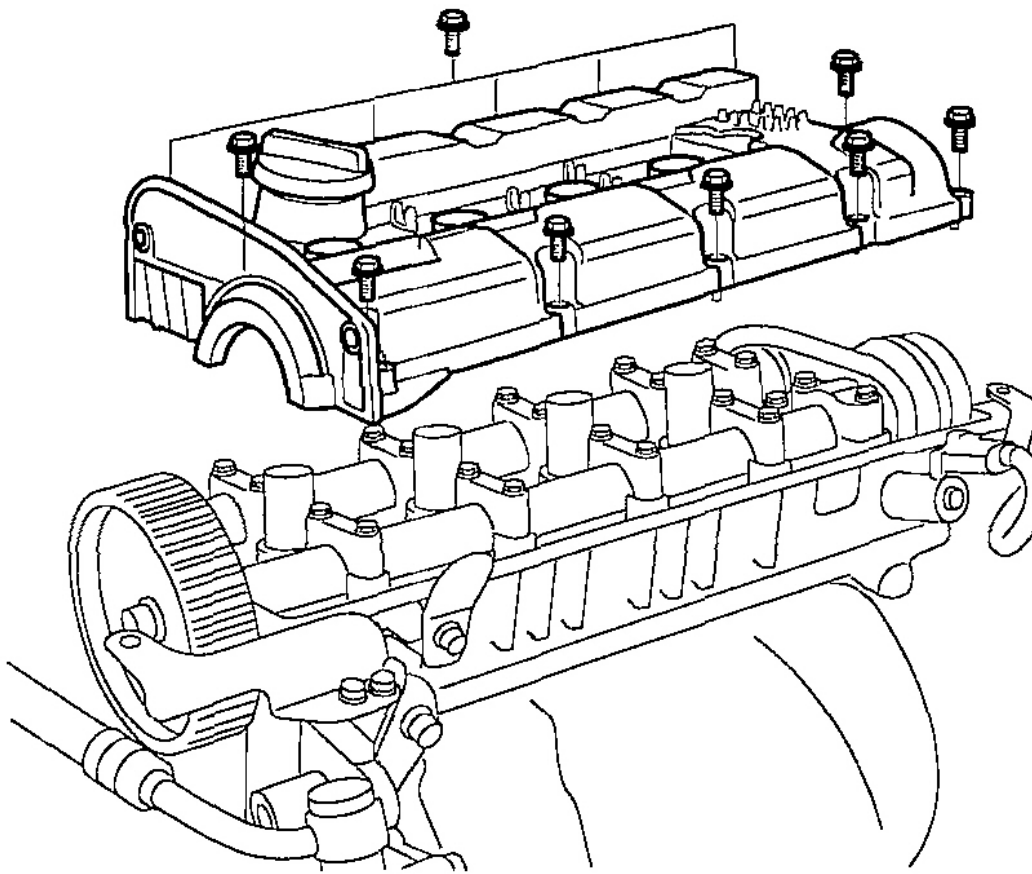
- c. Disconnect the accelerator cable from the cylinder head cover.



G00941728

Fig. 93: Disconnecting Accelerator Cable From Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

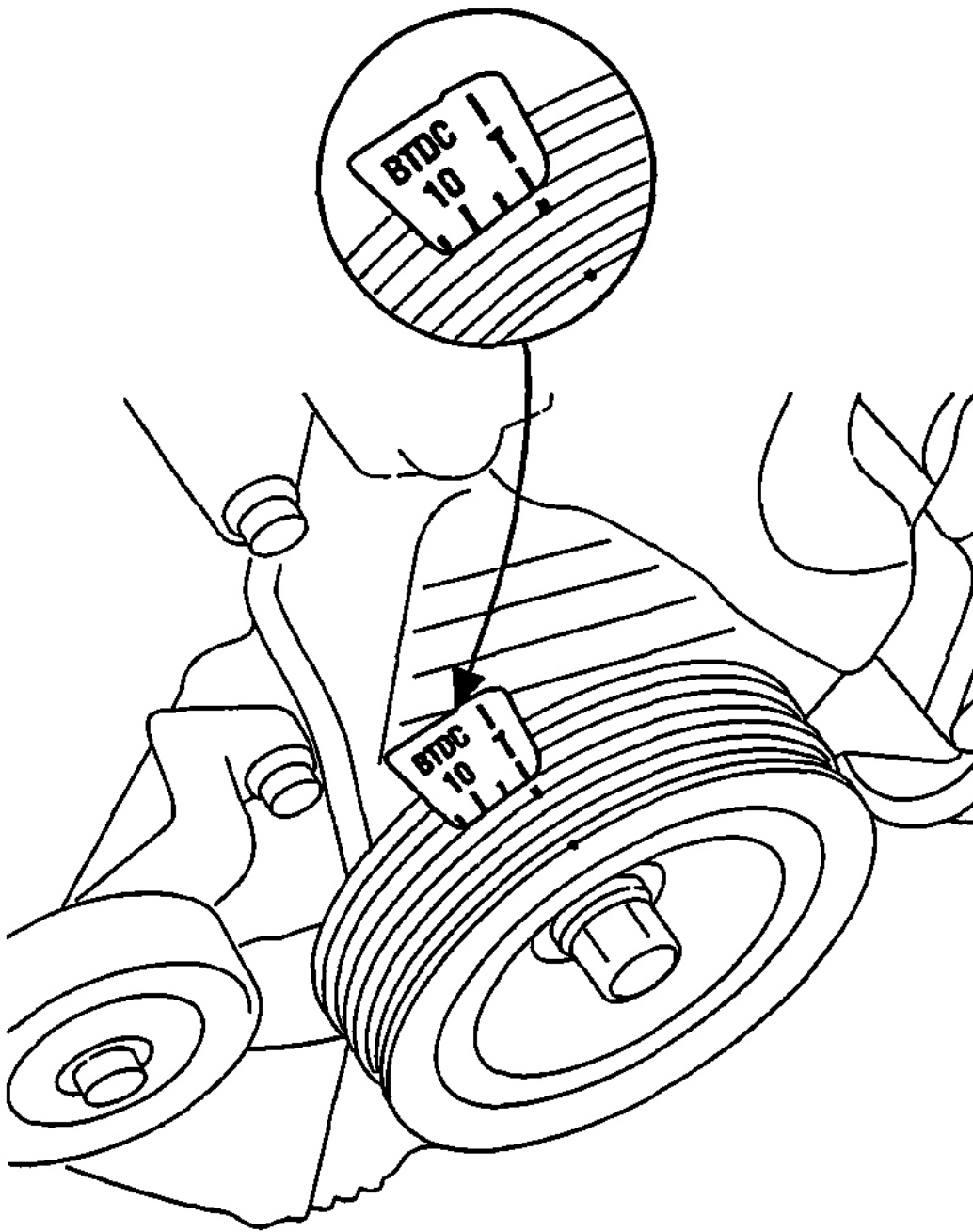
- d. Loosen the cylinder head cover bolts and then remove the cover and gasket.



G00941729

Fig. 94: Removing Cylinder Head Cover & Gasket
Courtesy of HYUNDAI MOTOR CO.

4. Set No. 1 cylinder to TDC/ compression.
 - a. Turn the crankshaft pulley and align its groove with the timing mark "T" of the lower timing belt cover.



G00941730

Fig. 95: Turning Crankshaft Pulley & Aligning Its Groove With Timing Mark "T" Of Lower Timing Belt Cover

Courtesy of HYUNDAI MOTOR CO.

- b. Check that the hole of the camshaft timing pulley is aligned with the timing mark of the bearing cap. If not, turn the crankshaft one revolution (360°)

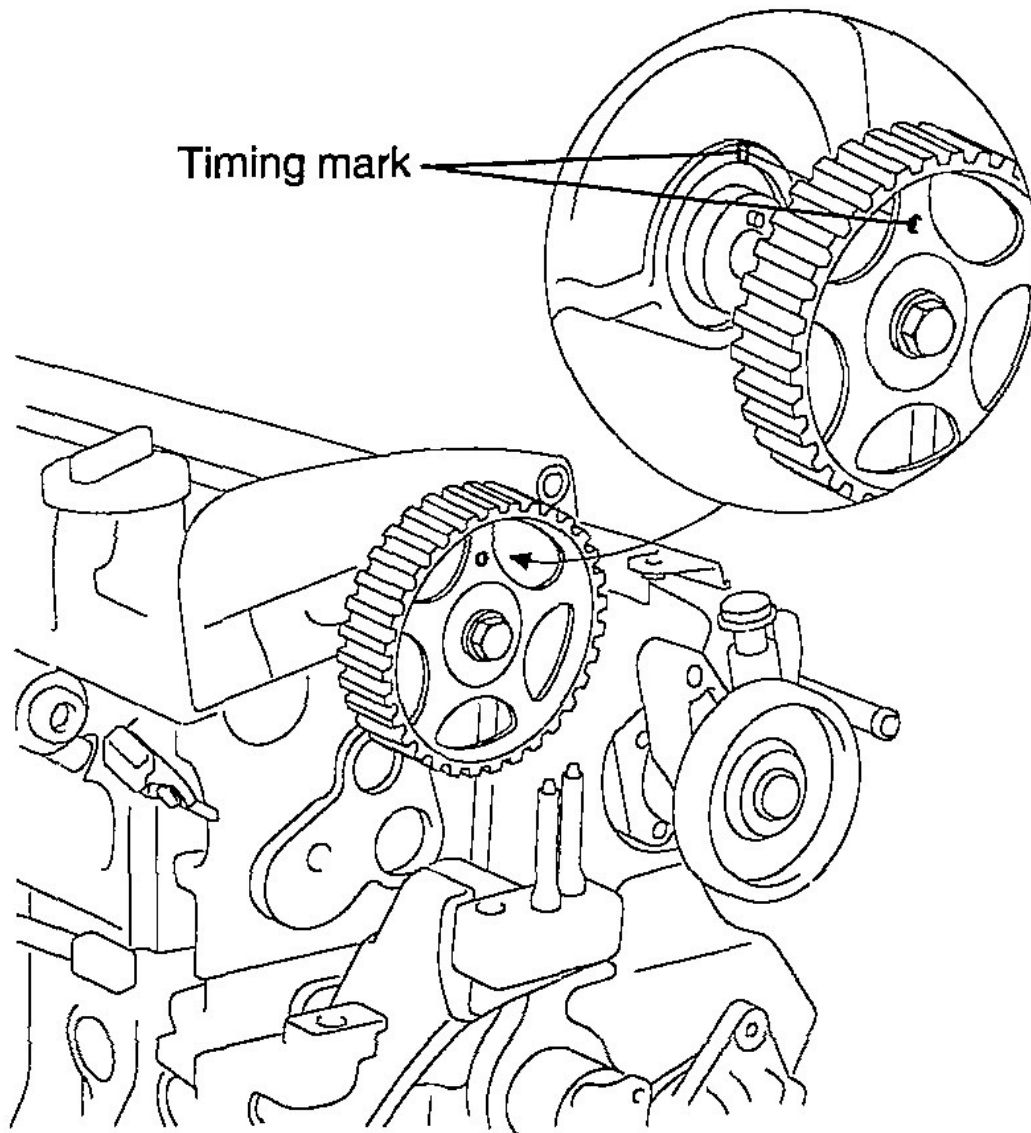
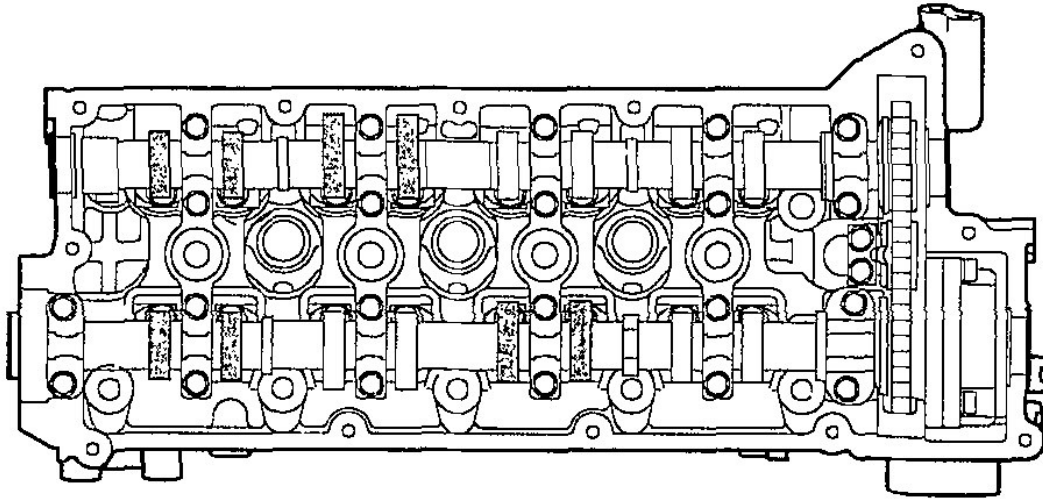
**G00941731**

Fig. 96: Checking That Hole Of Camshaft Timing Pulley Is Aligned With Timing Mark Of Bearing Cap

Courtesy of HYUNDAI MOTOR CO.

5. Inspect the valve clearance.

- a. Check only the valves indicated as shown. [No.1 cylinder : TDC/Compression] measure the valve clearance



G00941732

Fig. 97: Inspecting Valve Clearance
Courtesy of HYUNDAI MOTOR CO.

- Using a thickness gauge, measure the clearance between the tappet shim and the base circle of camshaft.
- Record the out-of-specification valve clearance measurements. They will be used later to determine the required replacement adjusting shim.

Valve clearance

[Specification]

Engine coolant temperature : 20°C (68°F)

Intake : 0.20mm (0.0079 in.)

Exhaust : 0.28mm (0.0110 in.)

Engine coolant temperature : 80°C (176°F)

Intake : 0.29mm (0.0114in.)

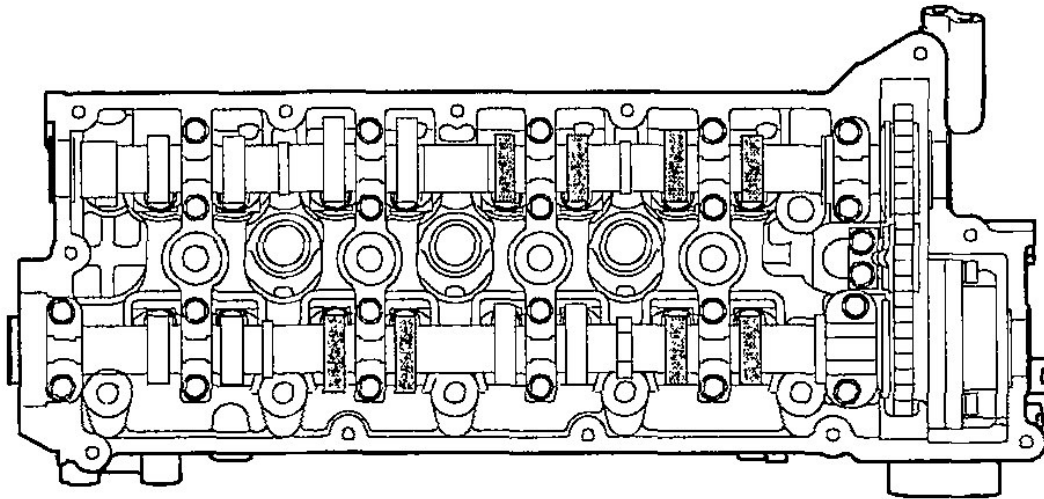
Exhaust : 0.34mm (0.0134in.)

Limit

Intake : 0.12 ~ 0.28 mm (0.0047 ~ 0.0110 in.)

Exhaust : 0.20 ~ 0.38 mm (0.0079 ~ 0.0150 in.)

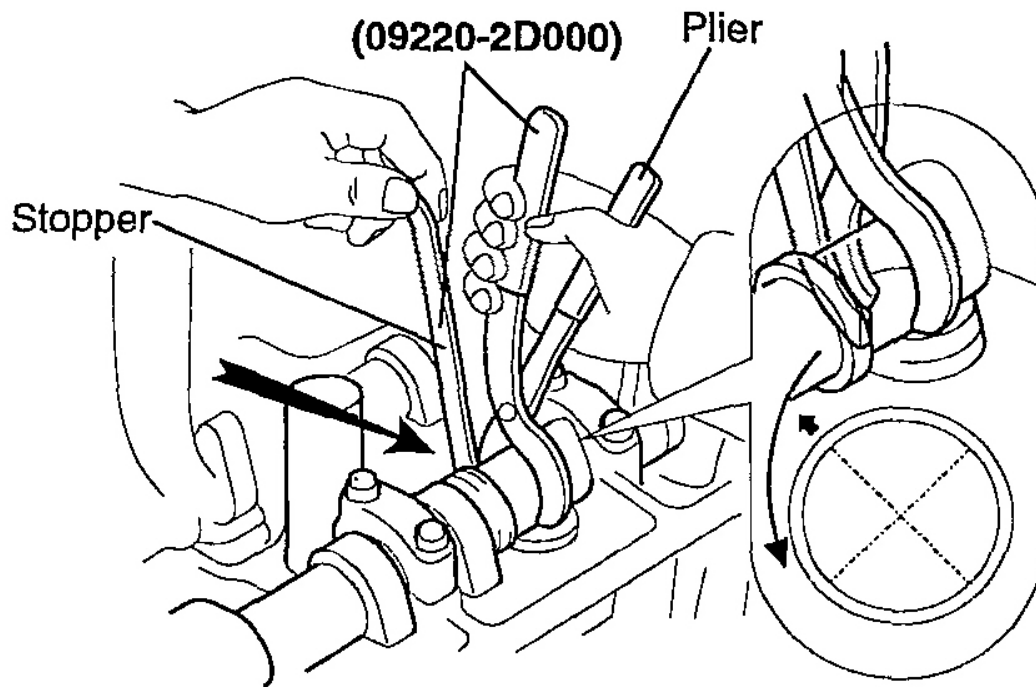
- b. Turn the crankshaft pulley one revolution (360°) and align the groove with timing mark "T" of the lower timing belt cover.
- c. Check only the valves indicated as shown. [NO. 4 cylinder : TDC/compression]. Measure the valve clearance. (See procedure in step (6))



G00941733

Fig. 98: Checking Valve Clearance
Courtesy of HYUNDAI MOTOR CO.

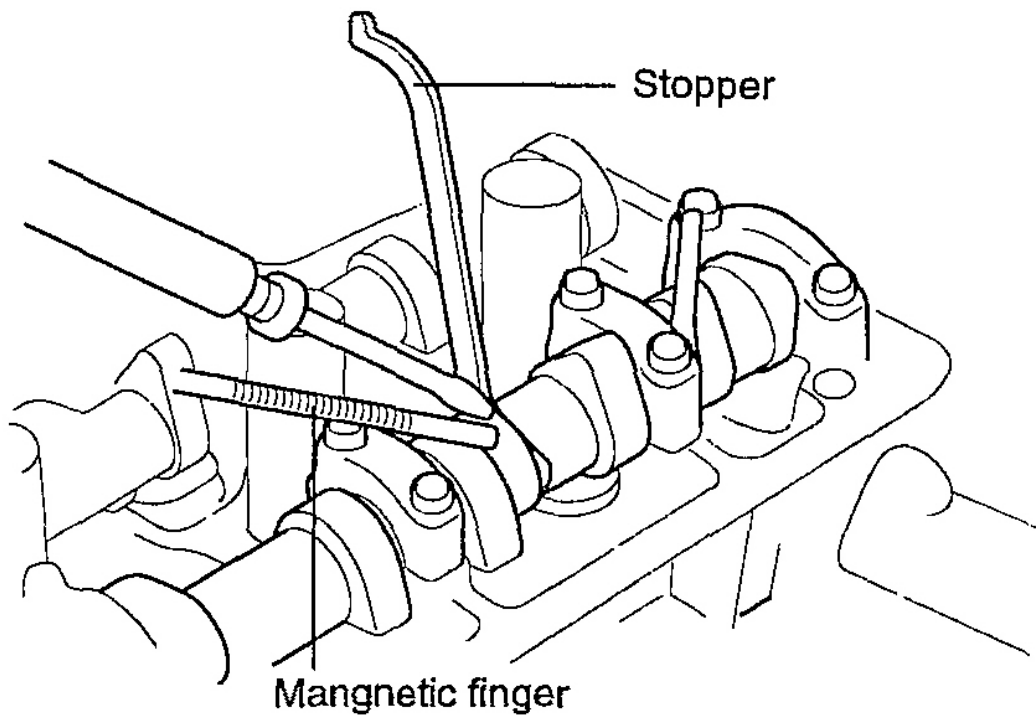
6. Adjust the intake and exhaust valve clearance.
 - a. Turn the crankshaft so that the cam lobe of the camshaft on the adjusting valve is upward.
 - b. Using the special tool (09220-2D000), press down the valve lifter and place the stopper between the camshaft and valve lifter and remove the special tool.



G00941734

Fig. 99: Adjusting Intake & Exhaust Valve Clearance
Courtesy of HYUNDAI MOTOR CO.

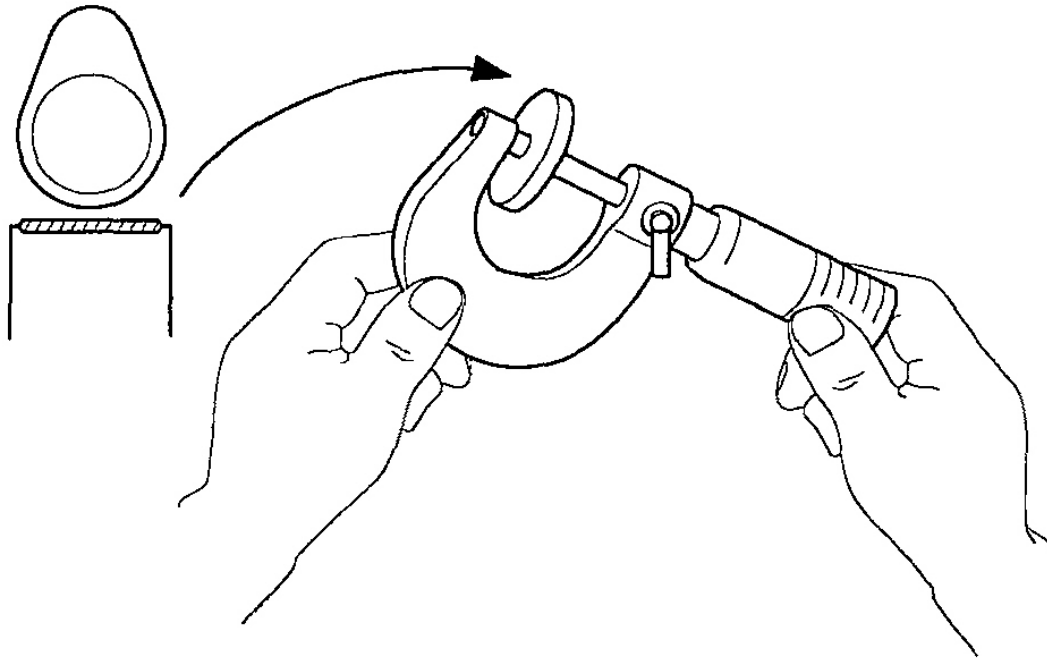
- c. Remove the adjusting shim with a small screw driver and magnet.



G00941735

Fig. 100: Removing Adjusting Shim With A Small Screw Driver & Magnet
Courtesy of HYUNDAI MOTOR CO.

- d. Measure the thickness of the removed shim using a micrometer.



G00941736

Fig. 101: Measuring Thickness Of Removed Shim Using A Micrometer
Courtesy of HYUNDAI MOTOR CO.

- e. Calculate the thickness of a new shim so that the valve clearance comes within the specified value.

Valve clearance (Engine coolant temperature : 20°C)

T : Thickness of removed shim

A : Measured valve clearance

N : Thickness of new shim

Intake : $N = T + [A - 0.20 \text{ mm (0.0079 in.)}]$

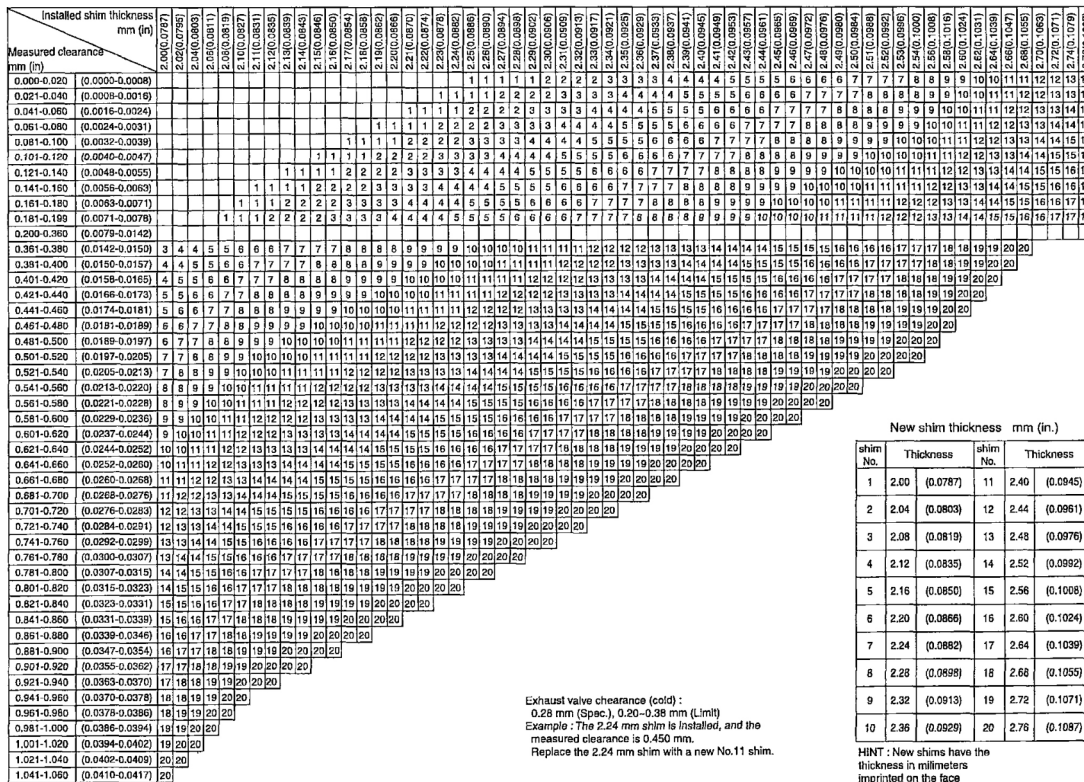
Exhaust : $N = T + [A - 0.28 \text{ mm (0.0110 in.)}]$

- f. Select a new shim with a thickness as close as possible to the calculated value. See **Fig. 102** or **Fig. 103**.

NOTE: Shims are available in 20 size increments of 0.04 mm (0.0016 in.) from 2.00 mm (0.079 in.) to 2.76 mm (0.1087 in.)

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon



G00718964

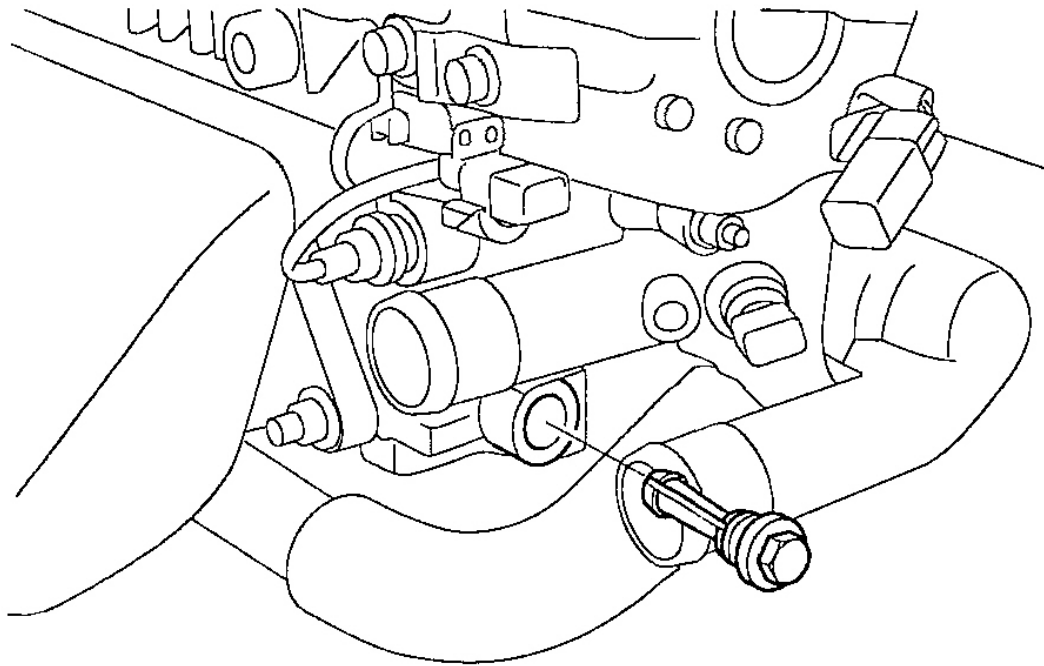
Fig. 103: Adjusting Shim Selection Chart (Exhaust)
 Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

1. Install OCV filter.

Tightening torque

41 ~ 51Nm (410 ~ 510kgf.cm, 30 ~ 37lbf.ft)



G00941737

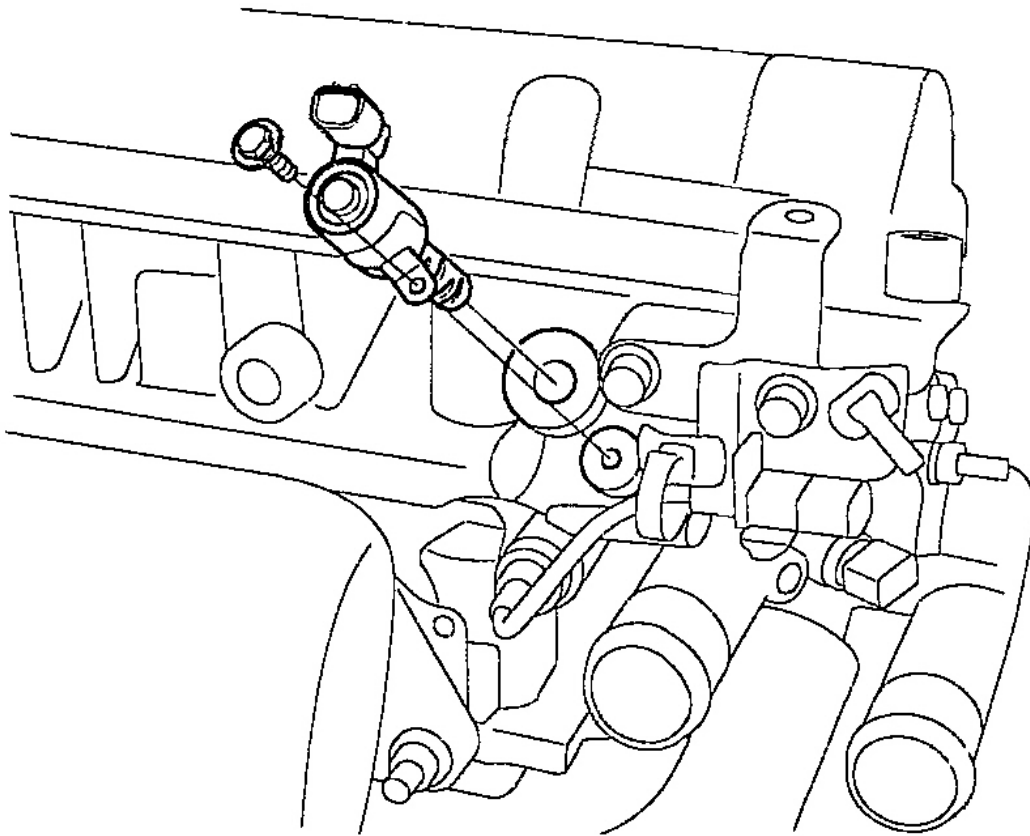
Fig. 104: Installing OCV Filter
Courtesy of HYUNDAI MOTOR CO.

NOTE: Always use a new OCV filter gasket keep clean the OCV filter.

2. Install OCV.

Tightening torque

10 ~ 12Nm (100 ~ 120kgf.cm. 7.3 ~ 8.816lbf.ft)



G00941738

Fig. 105: Installing OCV

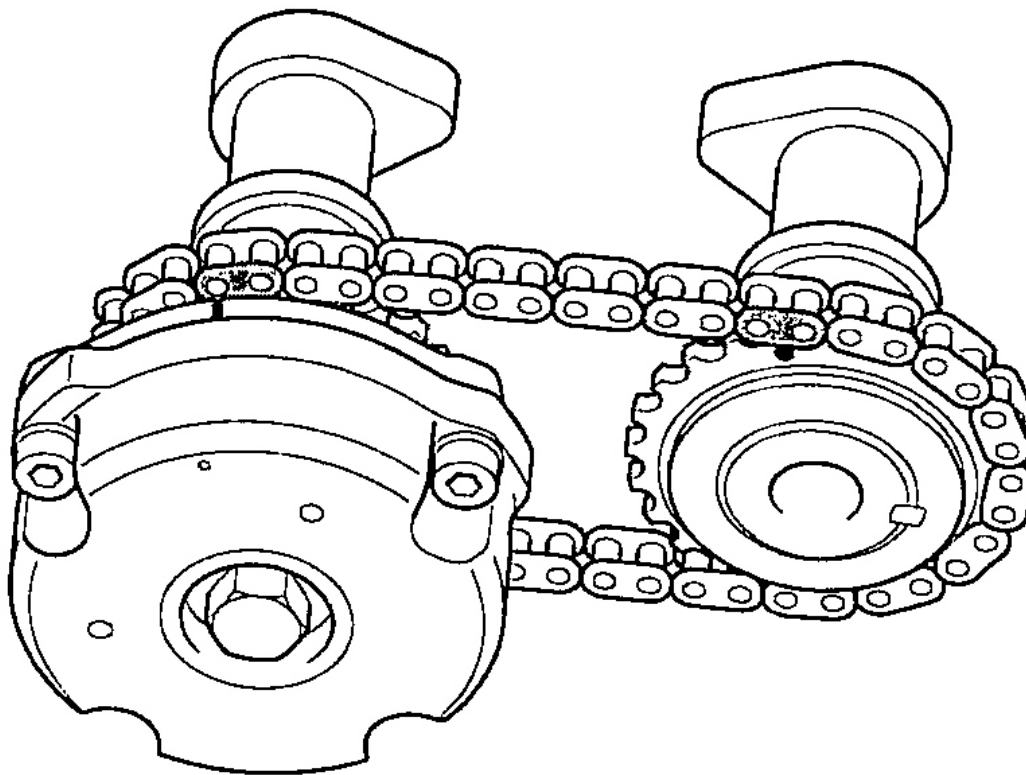
Courtesy of HYUNDAI MOTOR CO.

CAUTION:

- Do not reuse the OCV when dropped.
- Keep clean the OCV.
- Do not hold the OCV sleeve during servicing.
- When the OCV is installed on the engine, do not move the engine with holding the OCV yoke.

3. Install the camshaft.

1. Align the camshaft timing chain with the intake timing chain sprocket as shown.



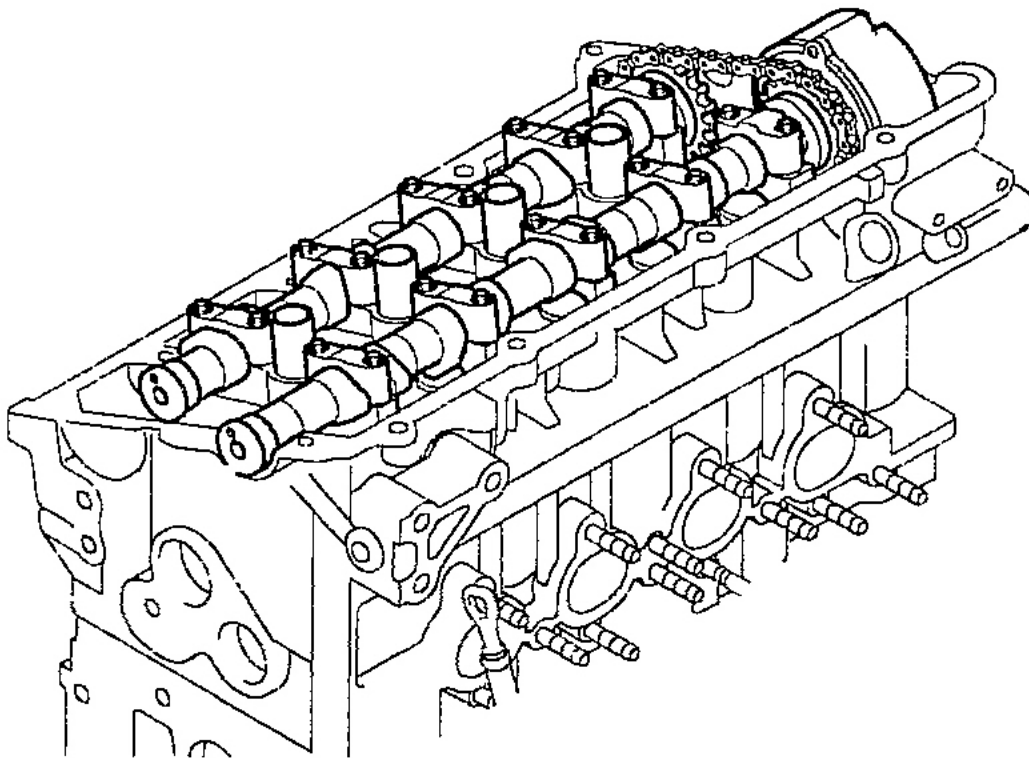
G00941739

Fig. 106: Aligning Camshaft Timing Chain With Intake Timing Chain Sprocket
Courtesy of HYUNDAI MOTOR CO.

2. Install the camshafts and bearing caps.

Tightening torque

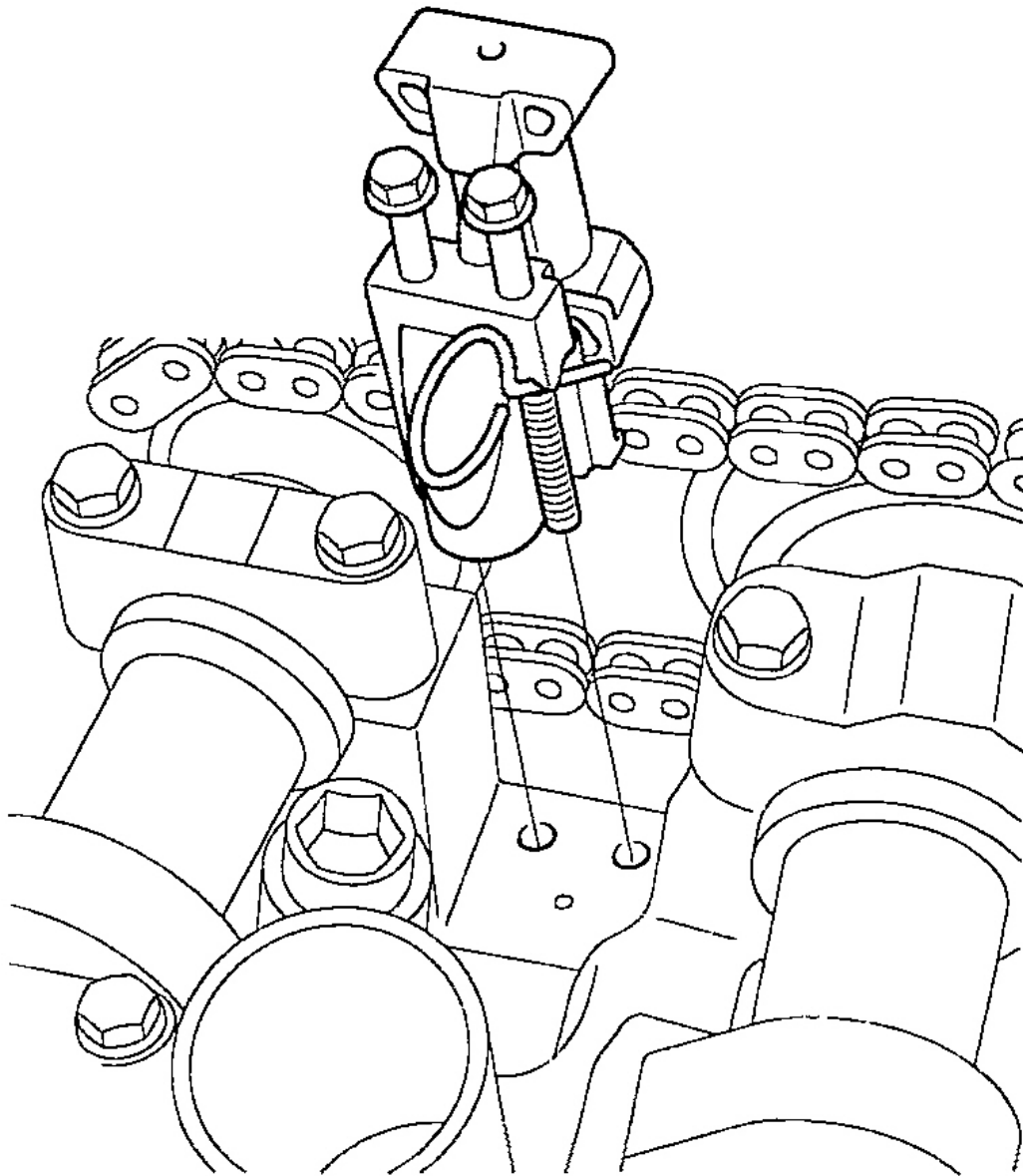
14 ~ 15Nm (140 ~ 150kgf.cm, 10 ~ 11lbf.ft)



G00941740

Fig. 107: Installing Camshafts & Bearing Caps
Courtesy of HYUNDAI MOTOR CO.

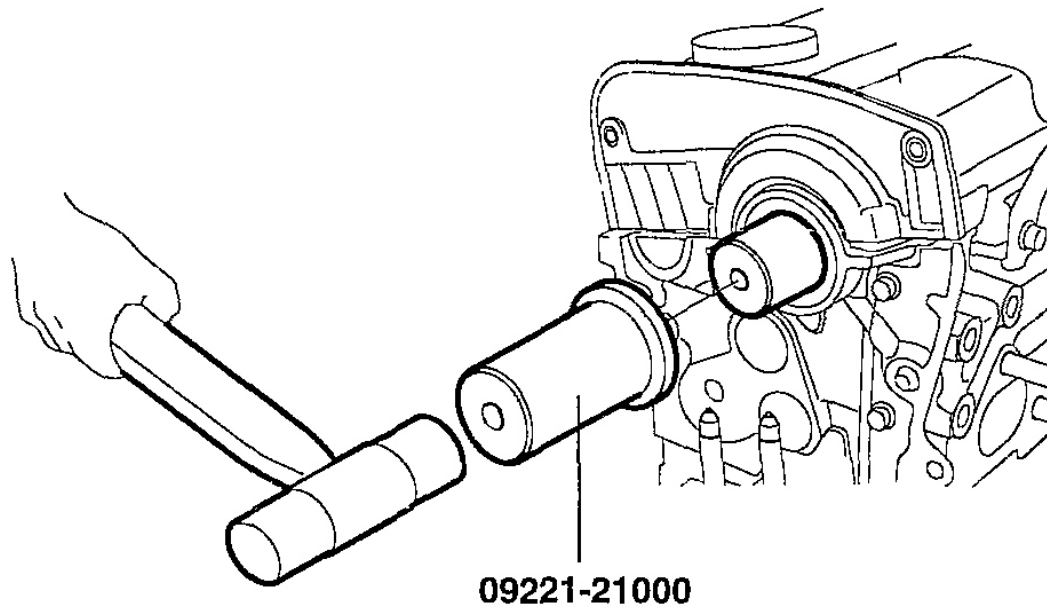
3. Install the timing chain auto tensioner.



G00941741

Fig. 108: Installing Timing Chain Auto Tensioner
Courtesy of HYUNDAI MOTOR CO.

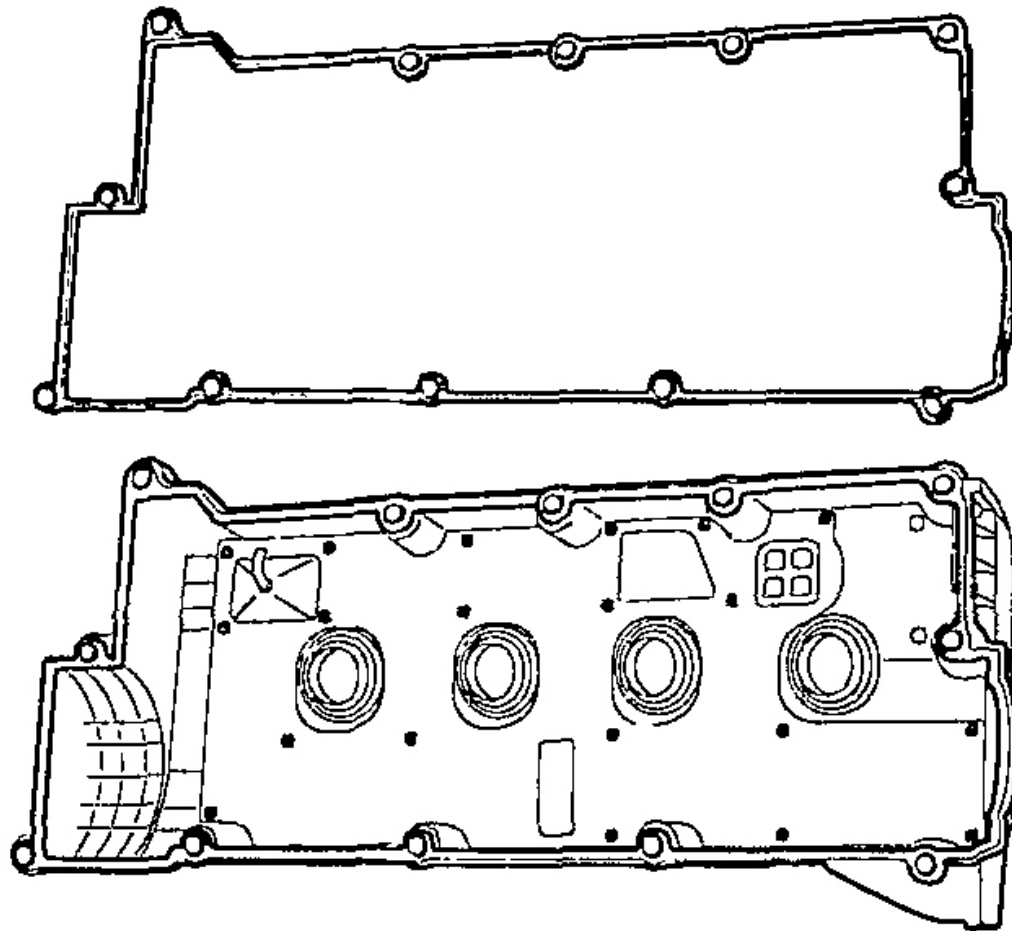
4. Remove the auto tensioners stopper pin.
4. Check and adjust valve clearance.
5. Using the SST (09221-21000), install the camshaft bearing oil seal.



G00941742

Fig. 109: Installing Camshaft Bearing Oil Seal
Courtesy of HYUNDAI MOTOR CO.

6. Install the camshaft sprocket.
7. Install the timing belt.
8. Install the cylinder head cover.
 1. Install the cylinder head cover gasket in the groove of the cylinder head cover.



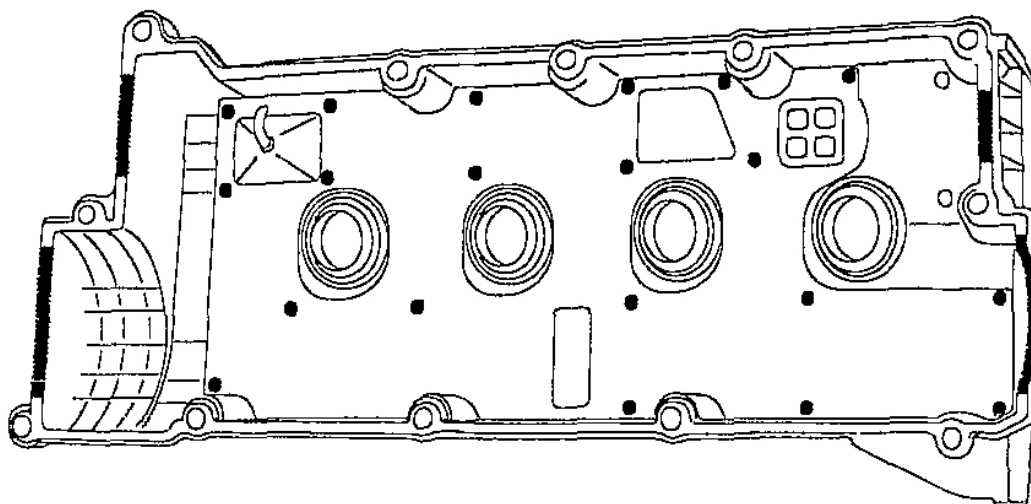
G00941743

Fig. 110: Installing Cylinder Head Cover Gasket In Groove Of Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

NOTE:

- Before installing the head cover gasket, thoroughly clean the head cover gasket and the groove.
- When installing, make sure the head cover gasket is seated securely in the corners of the recesses with no gap.

2. Apply liquid gasket to the head cover gasket at the corners of the recess.



G00941744

Fig. 111: Applying Liquid Gasket To Head Cover Gasket At Corners Of Recess
Courtesy of HYUNDAI MOTOR CO.

NOTE:

- Use liquid gasket, loctite No. 5999.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- After assembly, wait at least 30 minutes before filling the engine with oil.

3. Install the cylinder head cover with the 12 bolts. Uniformly tighten the bolts in several passes.

Tightening torque

8 ~ 10Nm (80 ~ 100kgf.cm, 6 ~ 7.4lbf.ft)

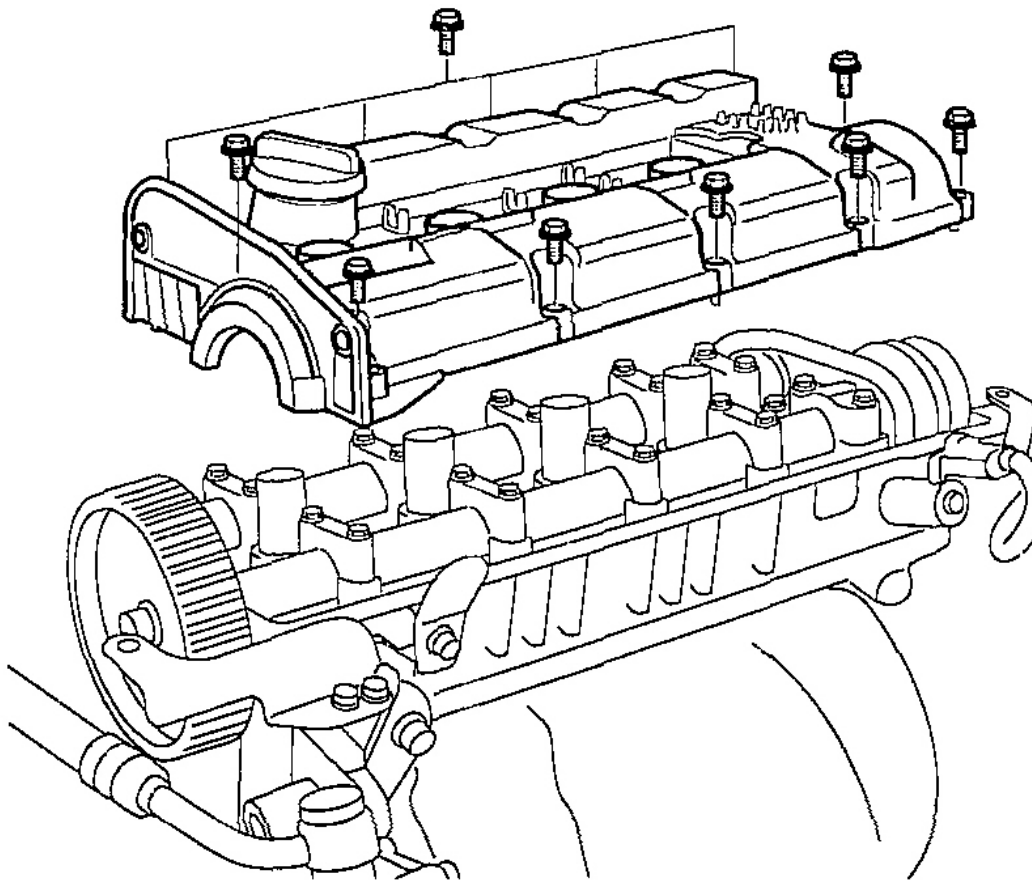
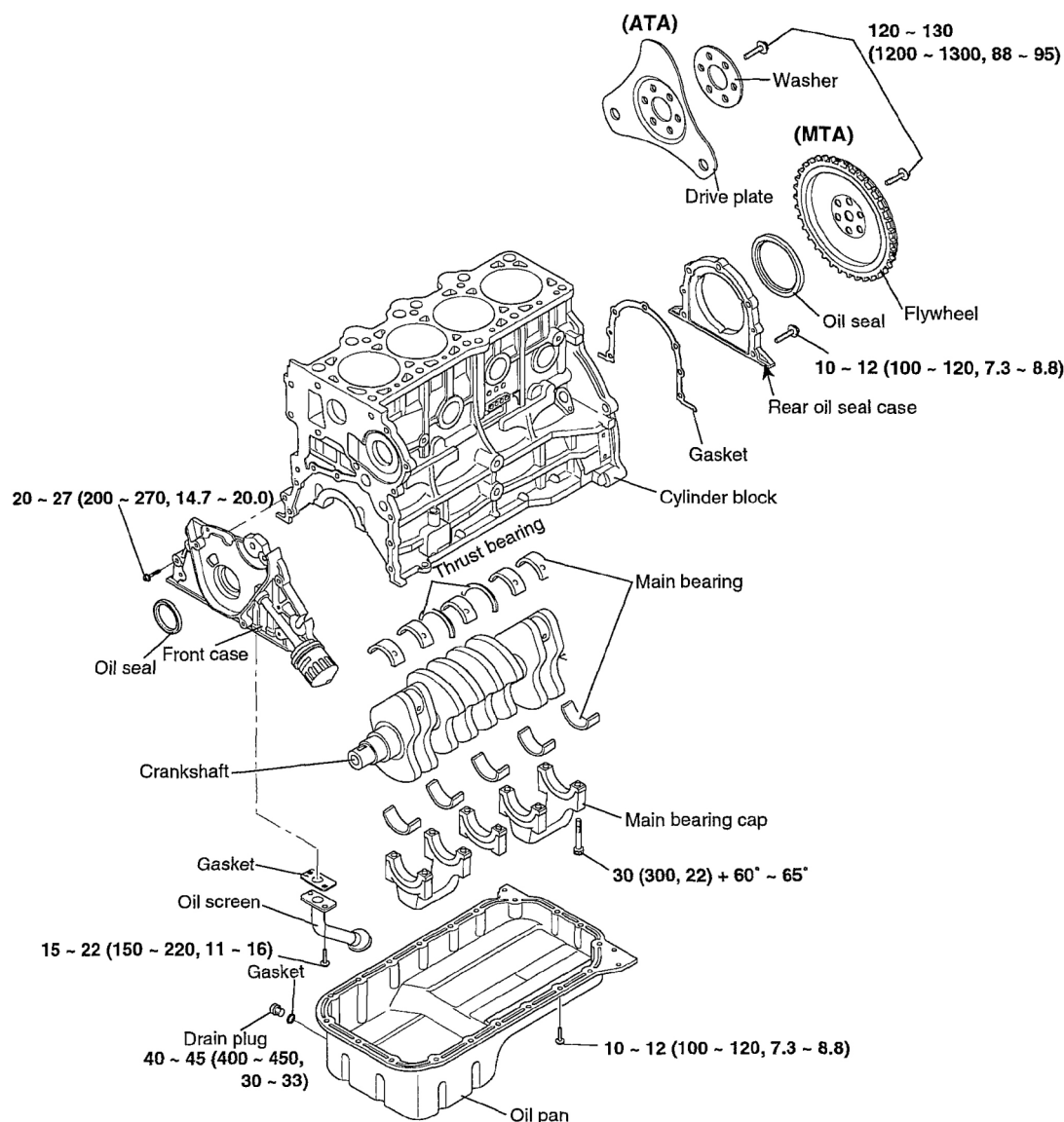
**G00941745**

Fig. 112: Installing Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

9. Connect the accelerator cable.
10. Connect the PCV hose and the breather hose to the cylinder head cover.
11. Connect the spark plug cables to the spark plugs.
12. Install the upper timing belt cover with the four bolts.
13. Install the engine cover.

CRANKSHAFT

COMPONENTS



TORQUE : Nm (kgf.cm, lbf.ft)

G00941746

Fig. 113: Exploded View Of Crankshaft Components
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Remove the **TIMING BELT**, **FRONT CASE**, **FLYWHEEL**, **CYLINDER HEAD ASSEMBLY** and **OIL PAN**.
2. Remove the rear plate and the rear oil seal.
3. Remove the connecting rod caps.

NOTE: Put the main bearing caps in order of their original position and direction

for easier reassembly.

4. Remove the main bearing caps and remove crankshaft. Keep the bearings in order by cap number.
5. Remove the crankshaft position sensor wheel.

INSPECTION

1. Check the crankshaft journals and pins for damage, uneven wear and crack. Also check oil holes for clogging. Correct or replace any defective part.
2. Inspect the crankshaft journal for taper and out-of-round.

Standard value

Crankshaft journal O.D. : 57 mm (2.2440 in.)

Crankshaft pin O.D. : 45 mm (1.7717 in.)

Crankshaft journal, pin out-of-round and taper

0.01 mm : (0.0004 in.) or less

MAIN BEARINGS AND CONNECTING ROD BEARINGS

Visually inspect each bearing for peeling, melting, seizure and improper contact. Replace the defective bearings.

OIL CLEARANCE MEASUREMENT

1. Measure the diameter of crankshaft journal and pin.
2. Measure the diameter of crankshaft bore and connecting rod bore.
3. Measure the thickness of crankshaft bearing and connecting rod bearing.
4. Measure the clearance by the value that subtract the diameter of journal and pin and the thickness of bearing from the diameter of bore.

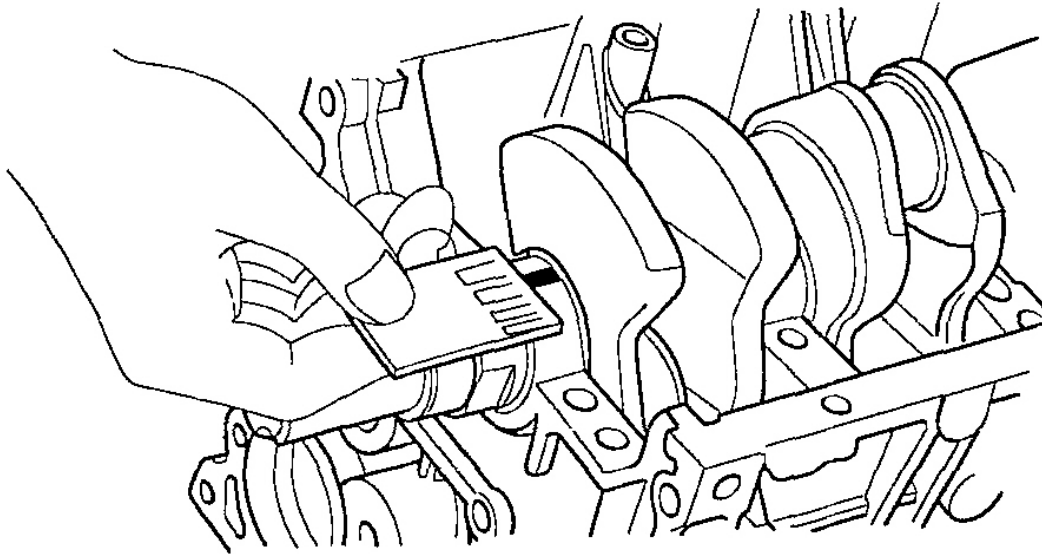
Main bearing oil clearance :

0.028 ~ 0.046 mm (0.0011 ~ 0.0018 in.)

Connecting rod bearing oil clearance :

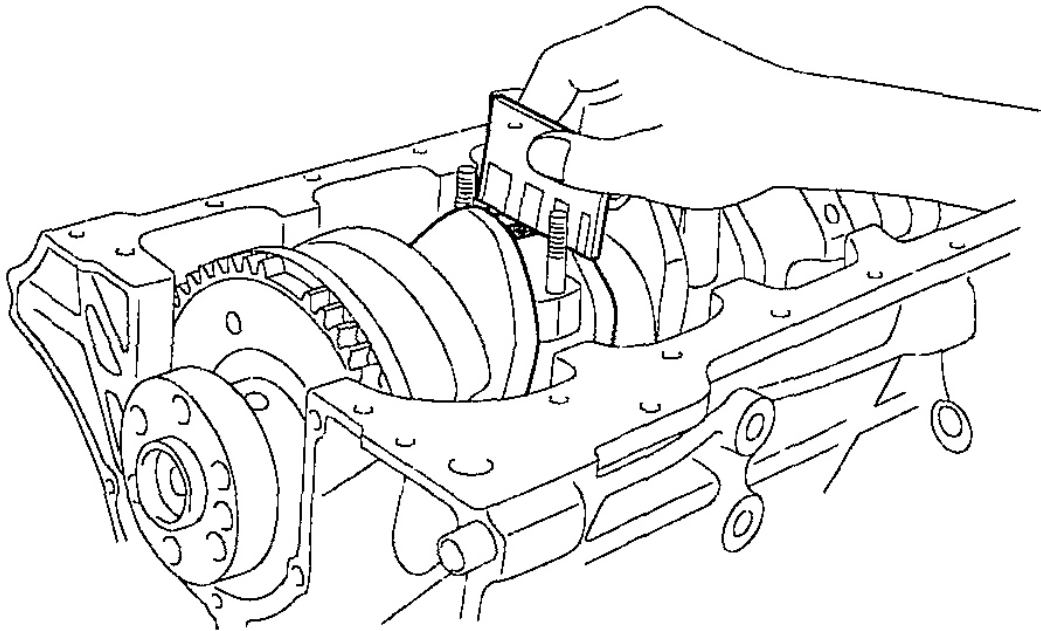
(To set limits to new parts)

0.024 ~ 0.042 mm (0.0009 ~ 0.0017 in.)



G00941747

Fig. 114: Measuring Thickness Of Crankshaft Bearings & Connecting Rod Bearings (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.



G00941748

Fig. 115: Measuring Thickness Of Crankshaft Bearings & Connecting Rod Bearings (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

OIL SEAL

Check front and rear oil seals for damage or worn lips. Replace any defective seal.

BEARING CAPS

After installing the bearing caps, make sure that the crankshaft turns smoothly and the end play is correct. If the end play exceeds the service limit, replace the crankshaft bearing.

Standard value : 0.06 ~ 0.26 mm (0.0023 ~ 0.010 in.)

Limit : 0.30 mm (0.0118 in.)

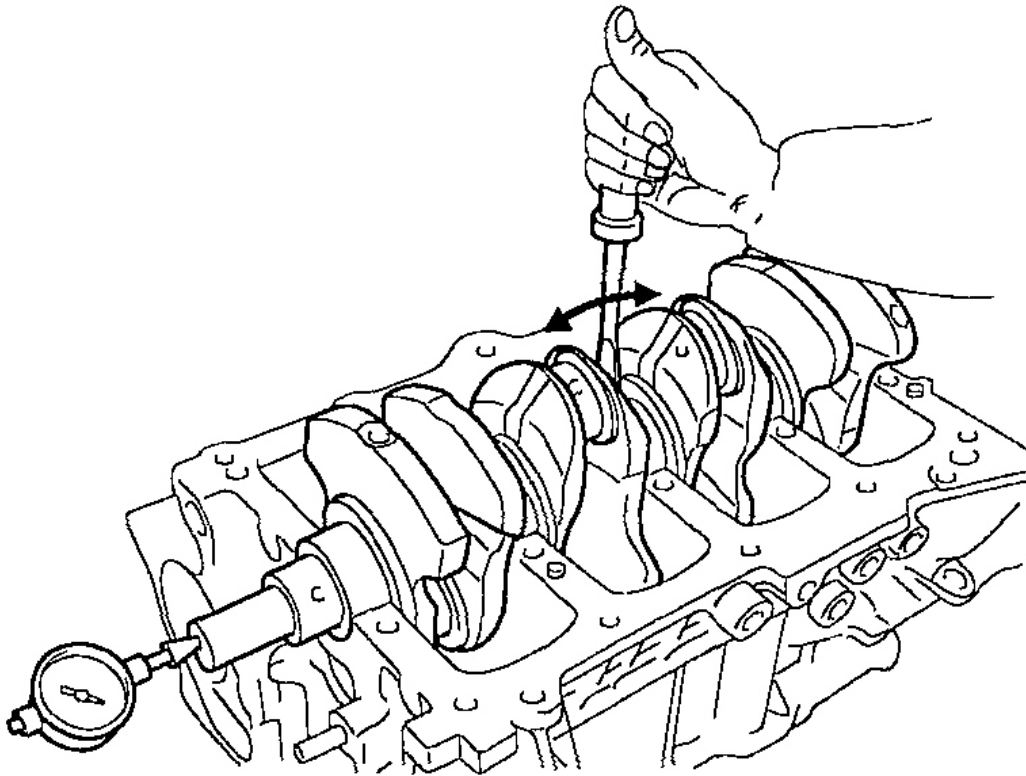
**G00941749**

Fig. 116: Inspecting Bearing Caps
Courtesy of HYUNDAI MOTOR CO.

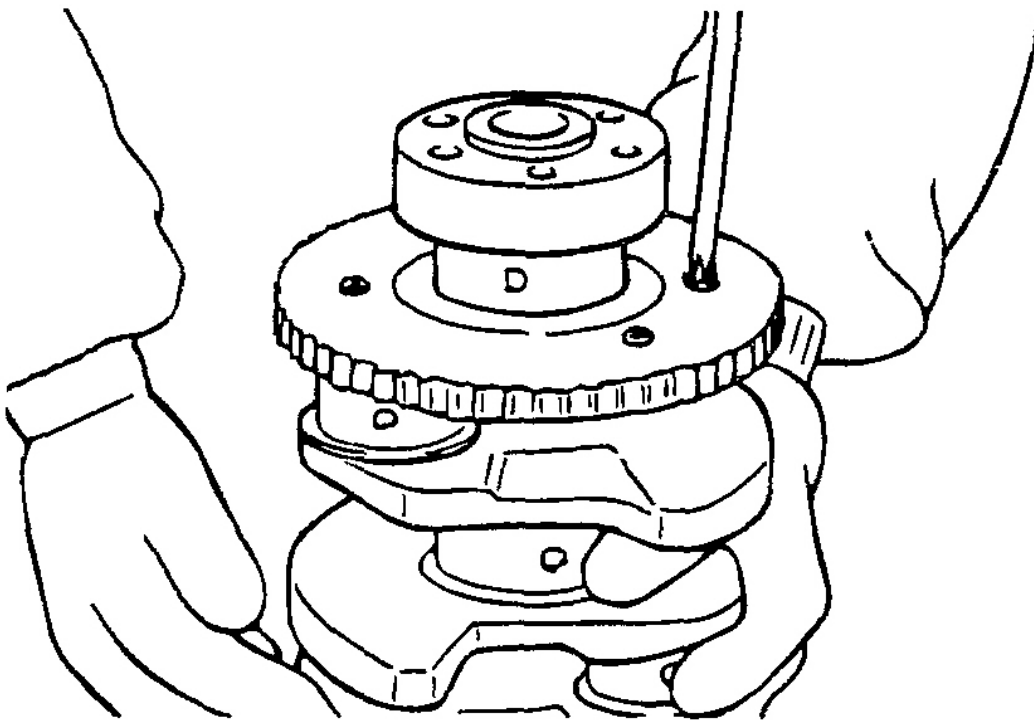
SENSOR WHEEL

1. Remove the crankshaft sensor wheel.
2. Check the crankshaft sensor wheel for damage, crack and wear. Replace if necessary.
3. Check the clearance between crankshaft sensor wheel and crank position sensor with a depth gauge.

Standard value

Clearance between crankshaft sensor wheel and crank position sensor :

0.5 ~ 1.1mm (0.020 ~ 0.043in.)



G00941750

Fig. 117: Checking Clearance Between Crankshaft Sensor Wheel & Crank Position Sensor
Courtesy of HYUNDAI MOTOR CO.

NOTE:

- Measure the depth of the top of the sensor wheel tooth and the cylinder block mounting surface.
- Measure the difference between sensor length and depth.
- Sensor length is the distance between the end of sensor and inner point of contacting face.

REASSEMBLY

1. Install the upper main bearing inserts in the cylinder block. **When reusing the main bearing, remember to install them by referring to the location marks made when disassembling.**
2. Install the crankshaft. Apply engine oil to the journals.
3. Install bearing caps and tighten the cap bolts to the specified torque in the sequence of the center, No.2, No.4 front and rear caps. Cap bolts should be tightened evenly in from 2 to 3 stages before they are tightened to the specified torque. The caps should be installed with the arrow mark directed toward the crank pulley side of engine. Cap numbers must be correct.

Tightening torque

Main bearing cap bolt :

27 ~ 33 Nm (270 ~ 330 kg.cm, 20 ~ 24lb.ft) + (60° ~ 65°)

Connecting rod cap bolt :

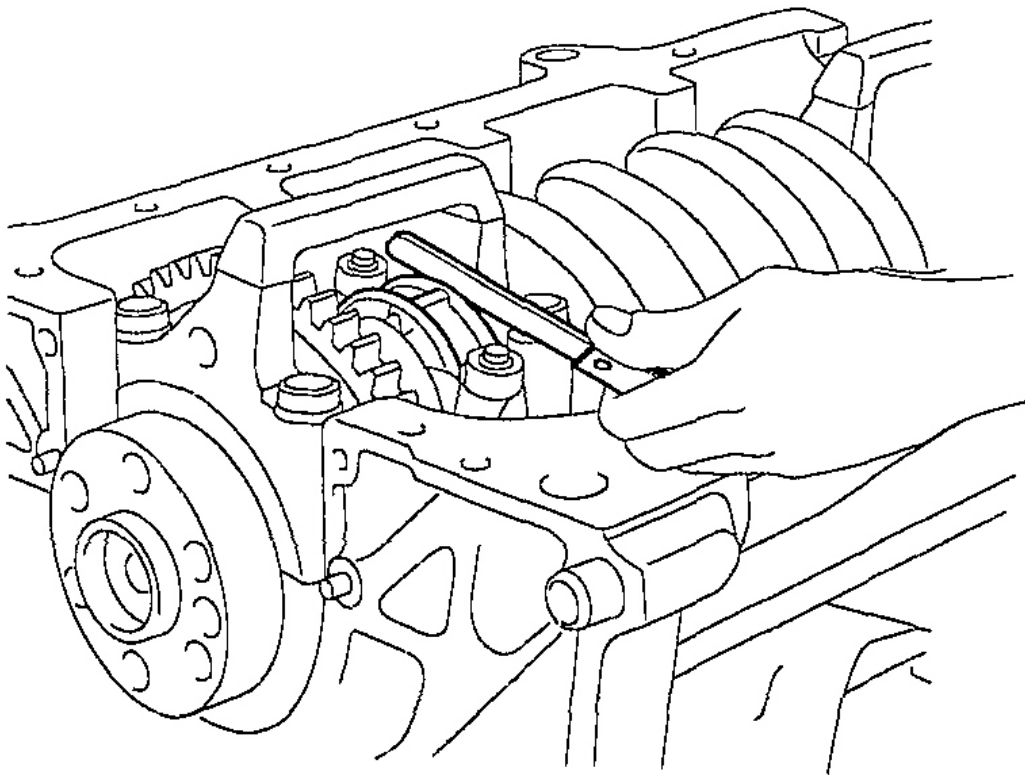
50 ~ 53 Nm (500 ~ 530 kg.cm, 37 ~ 39 lb.ft)

4. Make certain that the crankshaft turns freely and has the proper clearance between the center main bearing thrust flange and the connecting rod big end bearing.

Standard value

Connecting rod end play :

0.10 ~ 0.25 mm (0.0039 ~ 0.0098 in.)

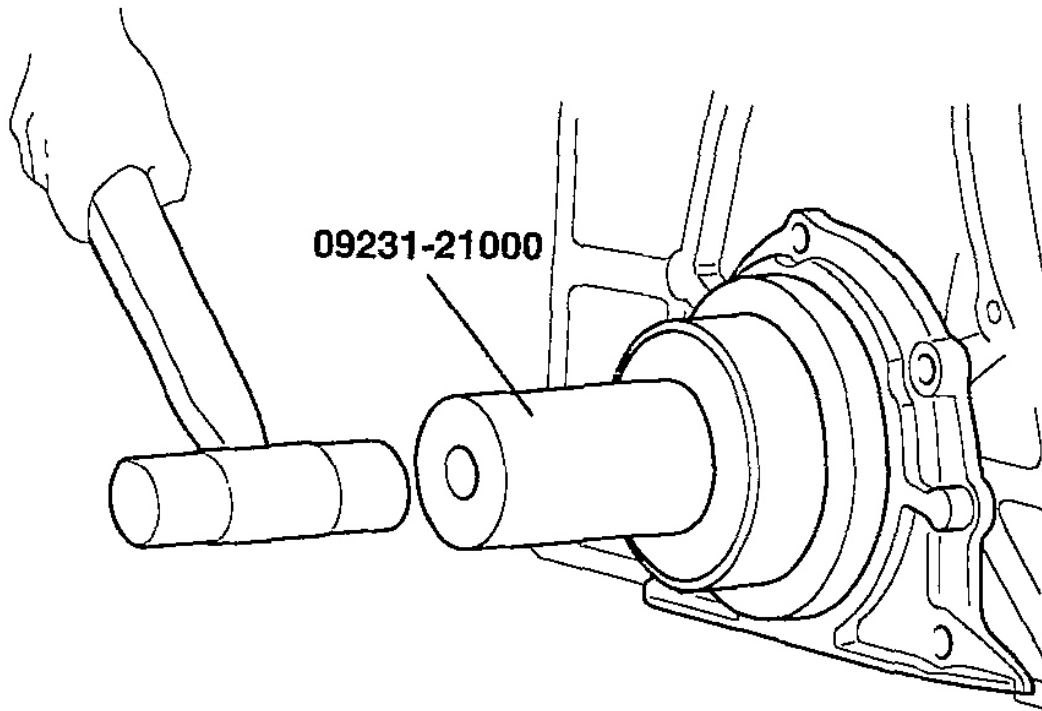


G00941751

Fig. 118: Checking Clearance Between Center Main Bearing Thrust Flange & Connecting Rod Big End Bearing

Courtesy of HYUNDAI MOTOR CO.

5. Using the special tool, crankshaft rear oil seal installer (09231 - 21000) as shown, install the oil seal in the crankshaft rear oil seal case. Press fit the oil seal being careful not to align it wrong.



G00941752

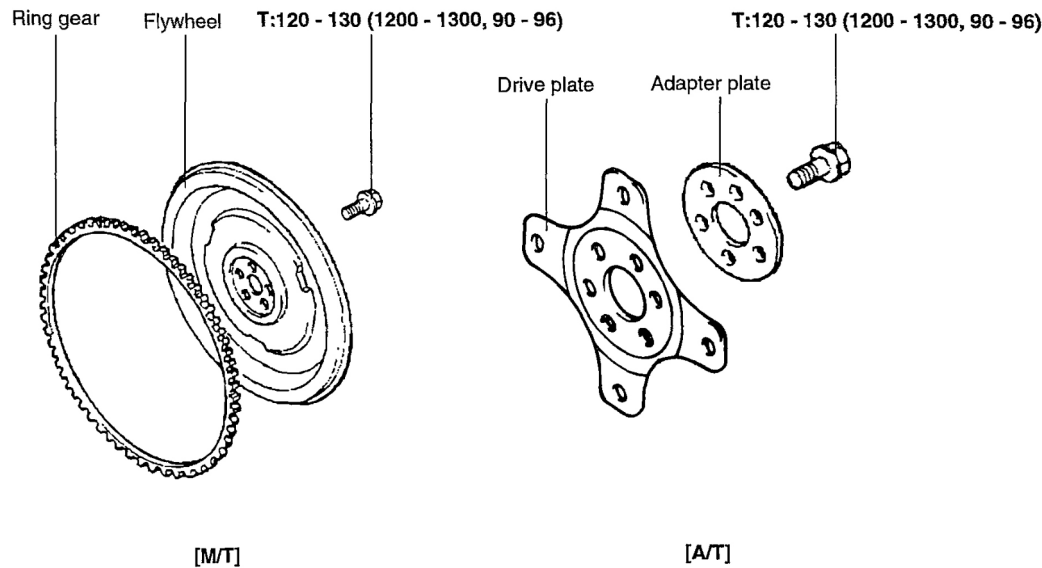
Fig. 119: Installing Oil Seal In Crankshaft Rear Oil Seal Case

Courtesy of HYUNDAI MOTOR CO.

6. Install the rear plate and tighten the bolts.
7. Install the connecting rod caps.
8. Install the **FLYWHEEL**, **FRONT CASE**, **OIL PAN** and **TIMING BELT**.

FLYWHEEL

COMPONENTS



TORQUE : Nm (kg.cm, lb.ft)

G00941753

Fig. 120: Identifying Fly Wheel Components
Courtesy of HYUNDAI MOTOR CO.

M/T : Manual Transmission Vehicles

A/T : Automatic Transmission Vehicles

DISASSEMBLY

1. Remove the transmission and clutch.
2. Remove the flywheel.

INSPECTION

1. Check the clutch disc contacting surface of the flywheel for damage and wear. Replace the flywheel if excessively damaged or worn.
2. Check the clutch disc contacting surface of the flywheel for runout.

Standard value

Flywheel run-out : 0.1 mm (0.004 in.)

3. Check the ring gear for damage, crack and wear, and replace if necessary.

REASSEMBLY

Install the flywheel assembly and tighten the bolts to the specified torque.

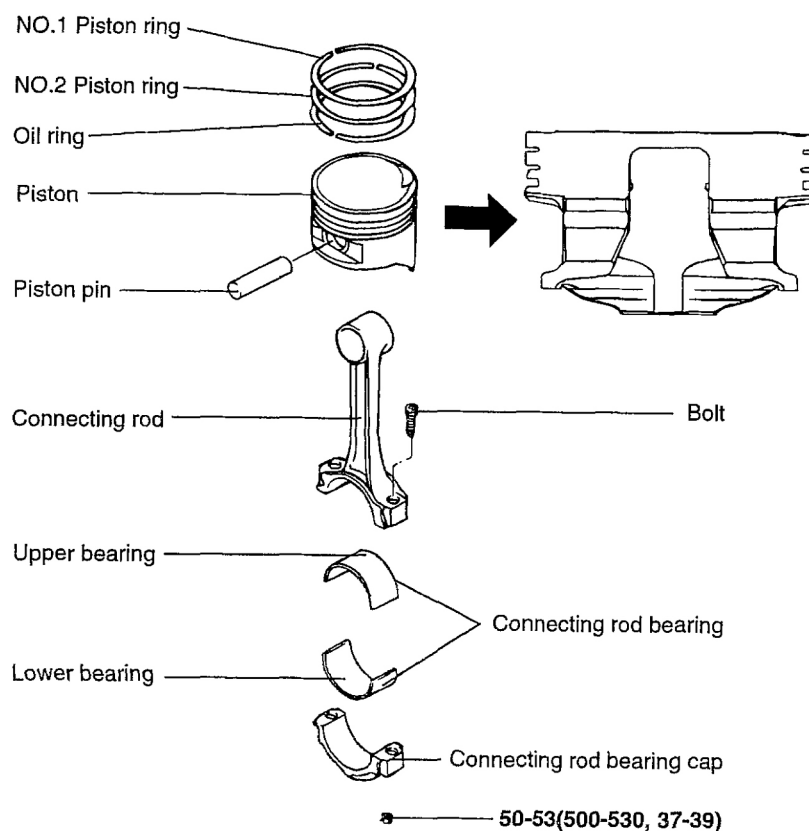
Tightening torque

Flywheel bolt :

120 ~ 130 Nm (1200 ~ 1300 kg.cm, 90 ~ 96 lb.ft)

PISTON

COMPONENTS



TORQUE : Nm (kg.cm, lb.ft)

G00941754

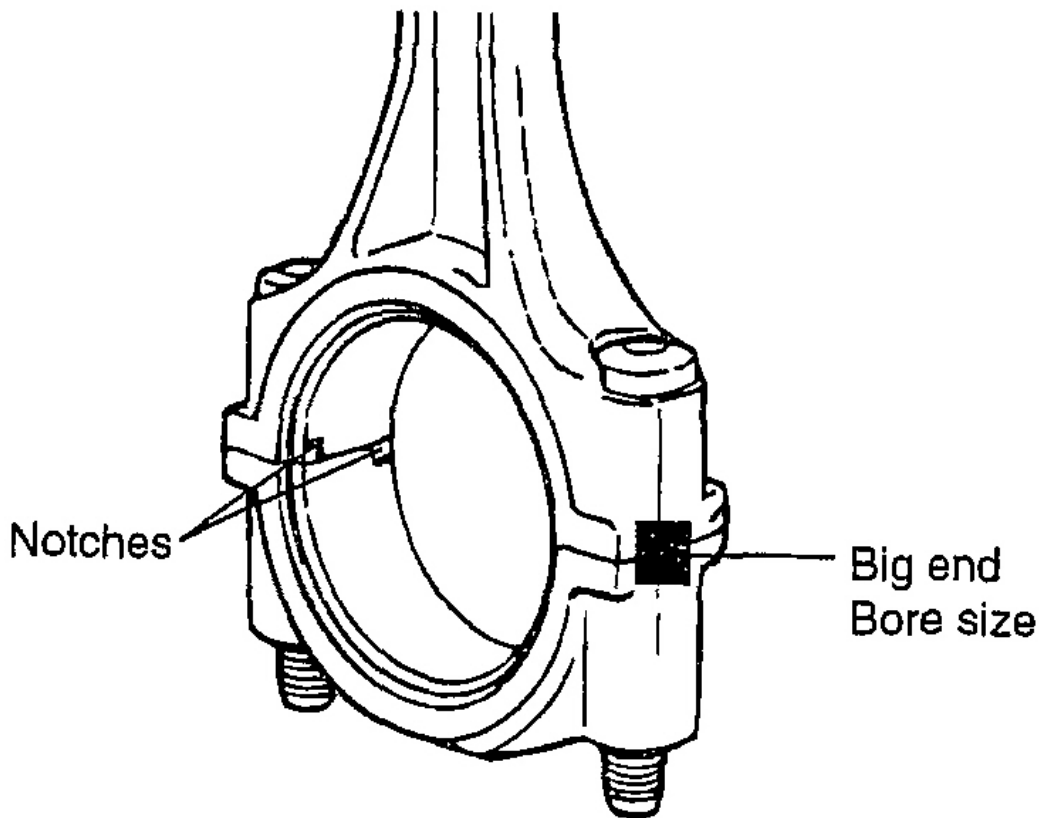
Fig. 121: Exploded View Of Piston
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

CONNECTING ROD CAP

CAUTION: Keep the bearings in order with their corresponding connecting rods (according to cylinder numbers) for proper reassembly.

1. Remove the connecting rod cap bolts, then remove the caps and the big end lower bearing.
2. Push each piston connecting rod assembly toward the top of the cylinder.

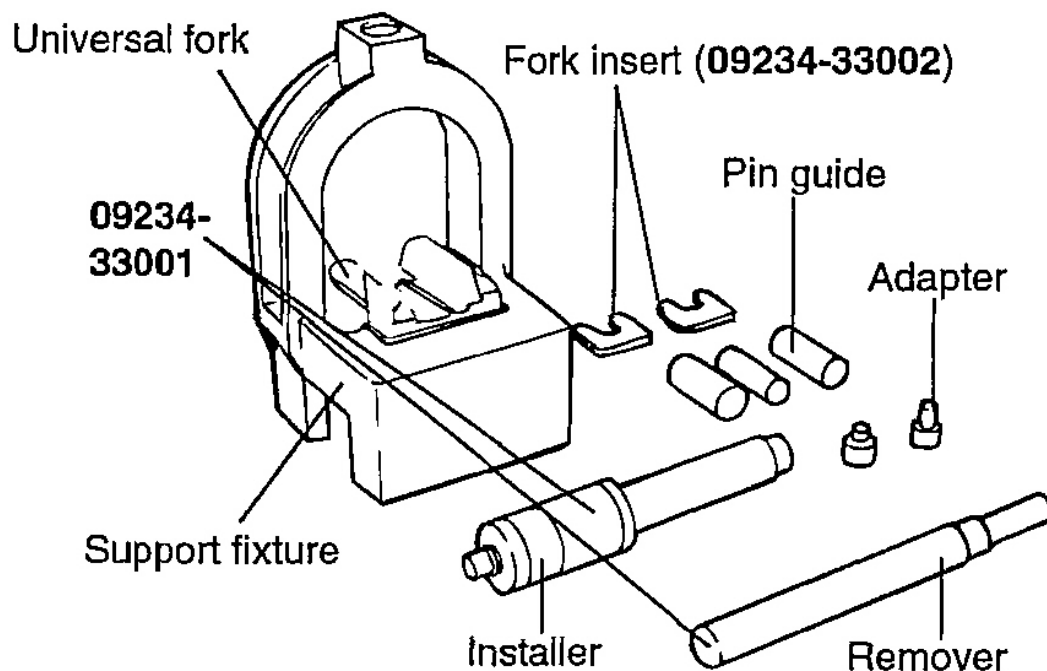


G00941755

Fig. 122: Identifying Connecting Rod Cap
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY AND REASSEMBLY OF THE PISTON PIN

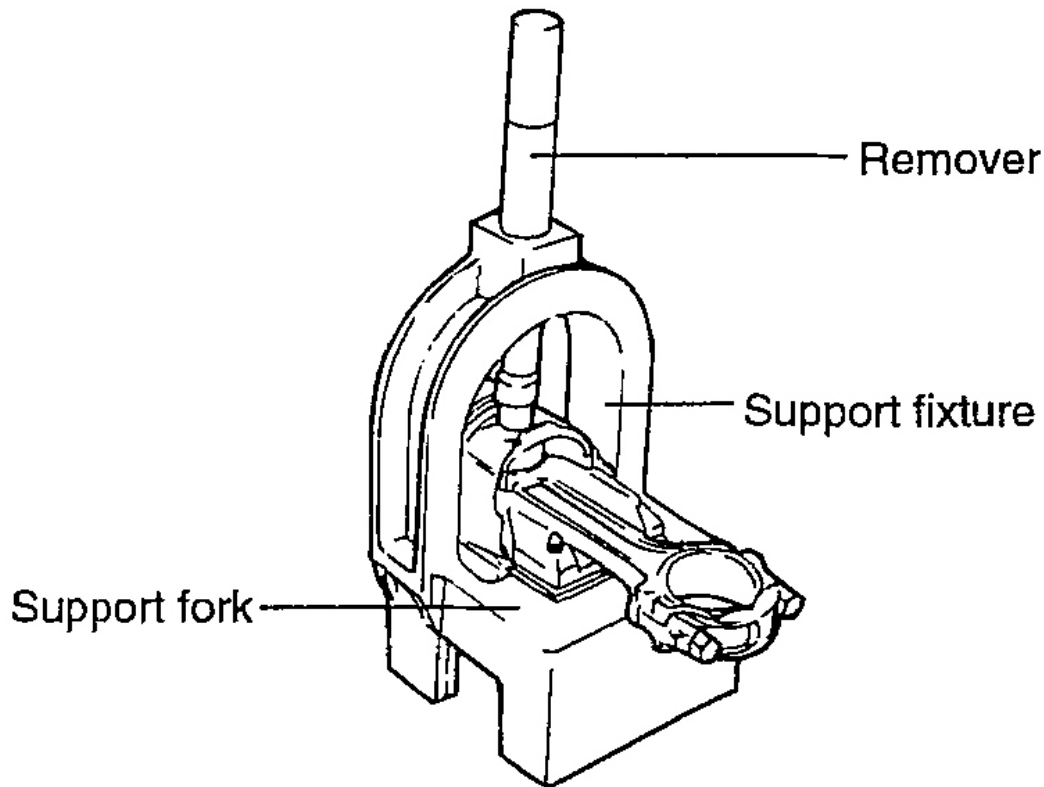
1. Using the special tools (09234-33001) and (09234-33002), disassemble and reassemble the piston and connecting rod.



G00941756

Fig. 123: Identifying Special Tools (09234-33001 & 09234-33002)
Courtesy of HYUNDAI MOTOR CO.

2. The piston pin is press fit into the rod little end, and the piston floats on the pin.
3. The tool consists of a support fixture with fork inserts, guides, adapters, an installer and a remover. The piston is supported in the support fixture while the pin is being installed or removed. Guides help position the pin as it is installed or removed, while the rod is supported by fork inserts.
4. To remove the pin from the piston, place the piston in the support fixture with the rod resting on the fork inserts. Pass the remove tool through the top of the support fixture and use it to press out the pin.

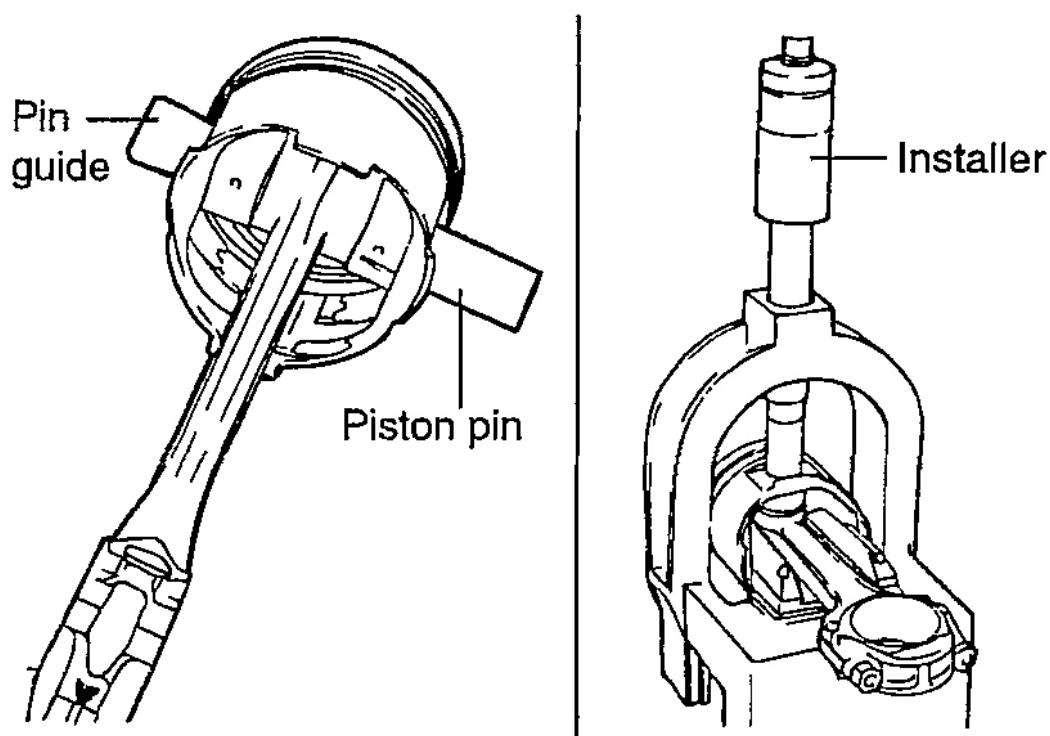


G00941757

Fig. 124: Removing Piston Pin
Courtesy of HYUNDAI MOTOR CO.

5. To install a new pin, the proper fork inserts must be in place to support the rod.
6. Position the rod inside the piston. Insert the proper pin guide through one side of the piston and through the rod. Hand tap the pin guide so it is held by the piston. Insert the new pin into the piston from the other side and set the assembly into the support fixture with the pin guide facing down.

NOTE: The pin guide should be centered on the connecting rod through the piston. If assembled correctly, the pin guide will sit exactly under the center of the hole in the tool's arch, and rest evenly on the fork inserts. If the wrong size pin guide is used, the piston and pin will not line up with the support fixture.

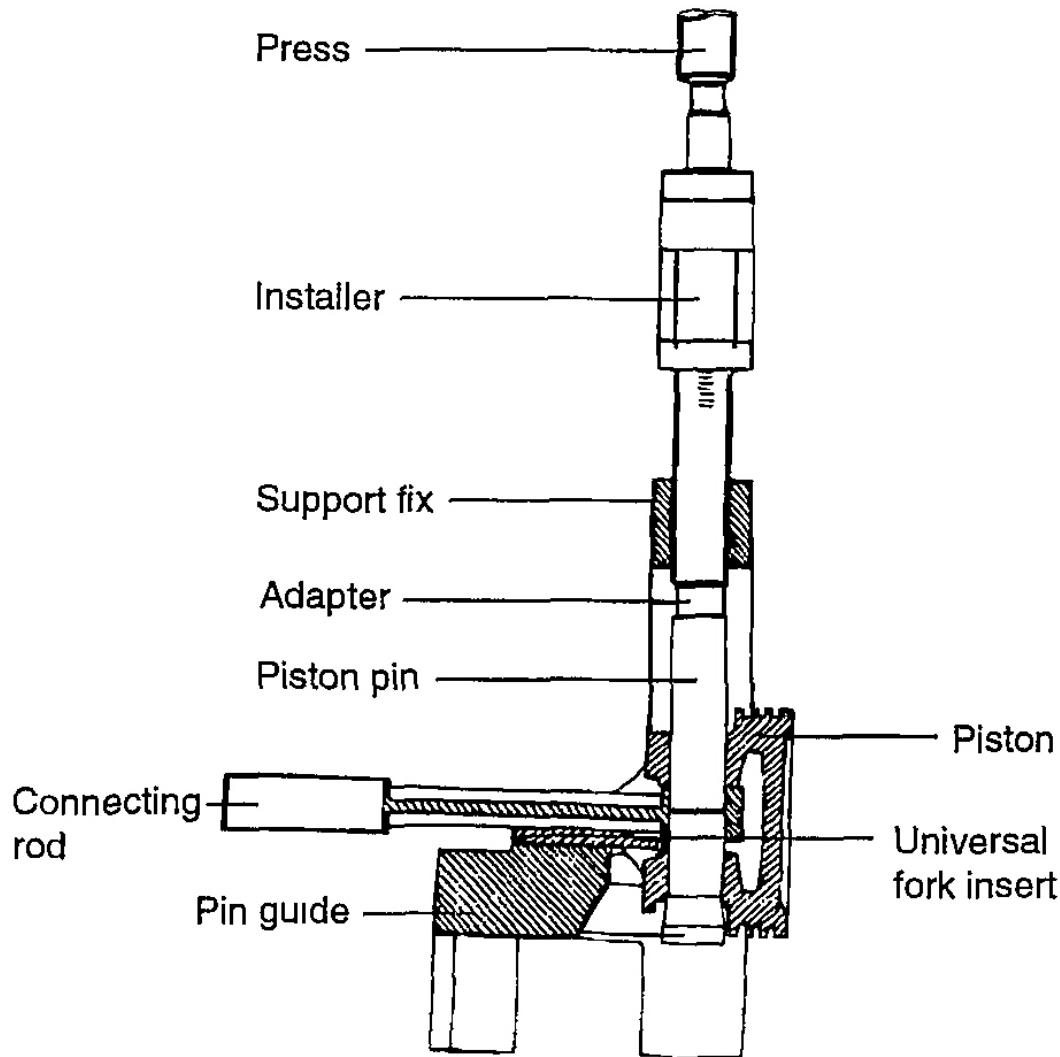


G00941758

Fig. 125: Identifying Piston Pin Guide & Installer
Courtesy of HYUNDAI MOTOR CO.

7. Insert the installer tool through the hole in the arch of the support fixture and use a hydraulic press to force the piston pin through the rod little end. Continue pressing until the pin guide falls free and the installer tool seats against the top of the arch.

CAUTION: Do not exceed 350 ~ 1350 kgf of force when the installing tool seats against the top of the arch.



G00941759

Fig. 126: Installing Piston Pin
Courtesy of HYUNDAI MOTOR CO.

INSPECTION

PISTONS AND PISTON PINS

1. Check each piston for scuffing, scoring, wear and other defects. Replace any piston that is defective.
2. Check each piston ring for breakage, damage and abnormal wear. Replace the defective rings. When the piston requires replacement, its rings should also be replaced.
3. Check that the piston pin fits in the piston pin hole. Replace any piston and pin assembly that is defective. The piston pin must be smoothly pressed by hand into the pin hole (at room temperature)

PISTONS RINGS

1. Measure the piston ring side clearance. If the measured value exceeds the service limit, insert a new ring in the ring groove to measure the side clearance. If the clearance still exceeds the service limit, replace the piston and rings together. If it is less than the service limit, replace only the piston rings only.

Piston ring side clearance

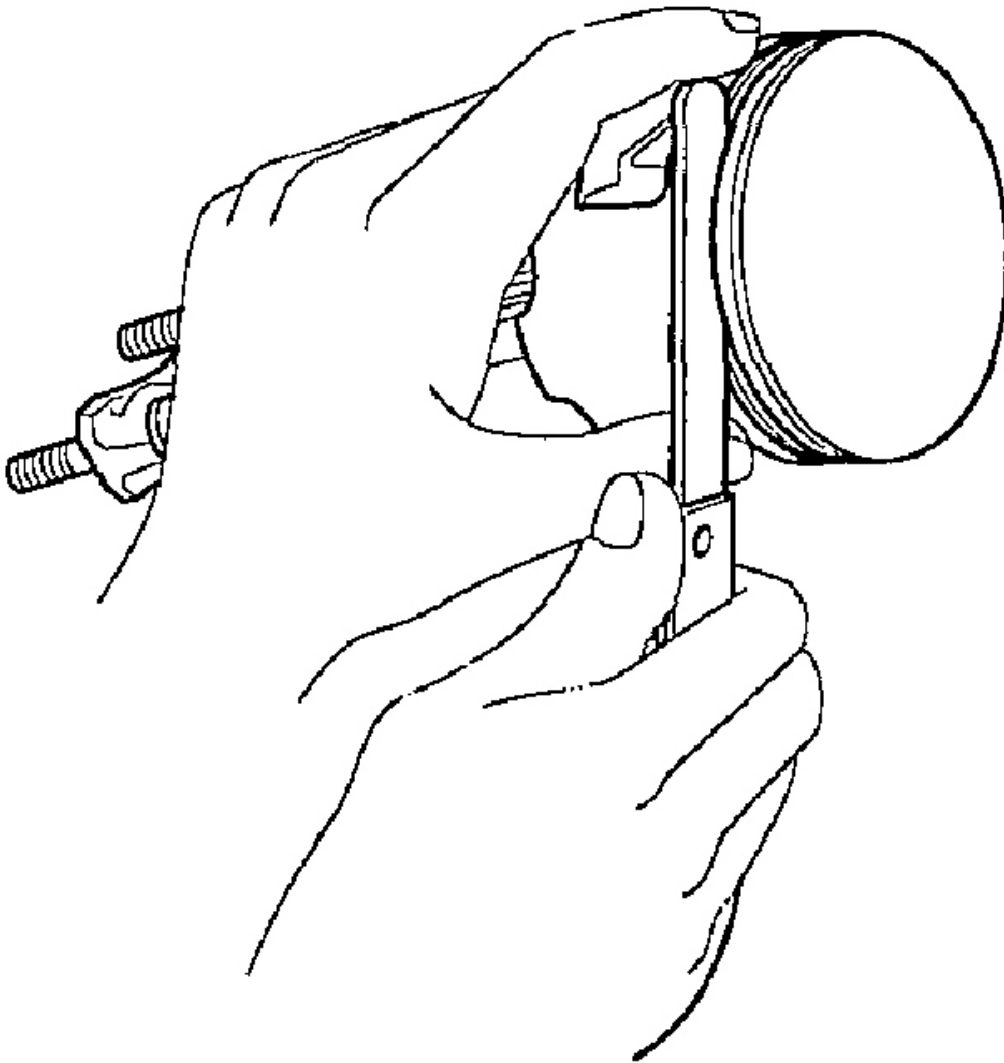
No. 1 : 0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in.)

No. 2 : 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in.)

Limit

No. 1 : 0.1 mm (0.004 in.)

No. 2 : 0.1 mm (0.004 in.)



G00941760

Fig. 127: Measuring Piston Ring Side Clearance
Courtesy of HYUNDAI MOTOR CO.

2. To measure the piston ring end gap, insert a piston ring into the cylinder bore. Position the ring at right angles to the cylinder wall by gently pressing it down with a piston. Measure the gap with a feeler gauge. If the gap exceeds the service limit, replace the piston ring.

Piston ring end gap

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

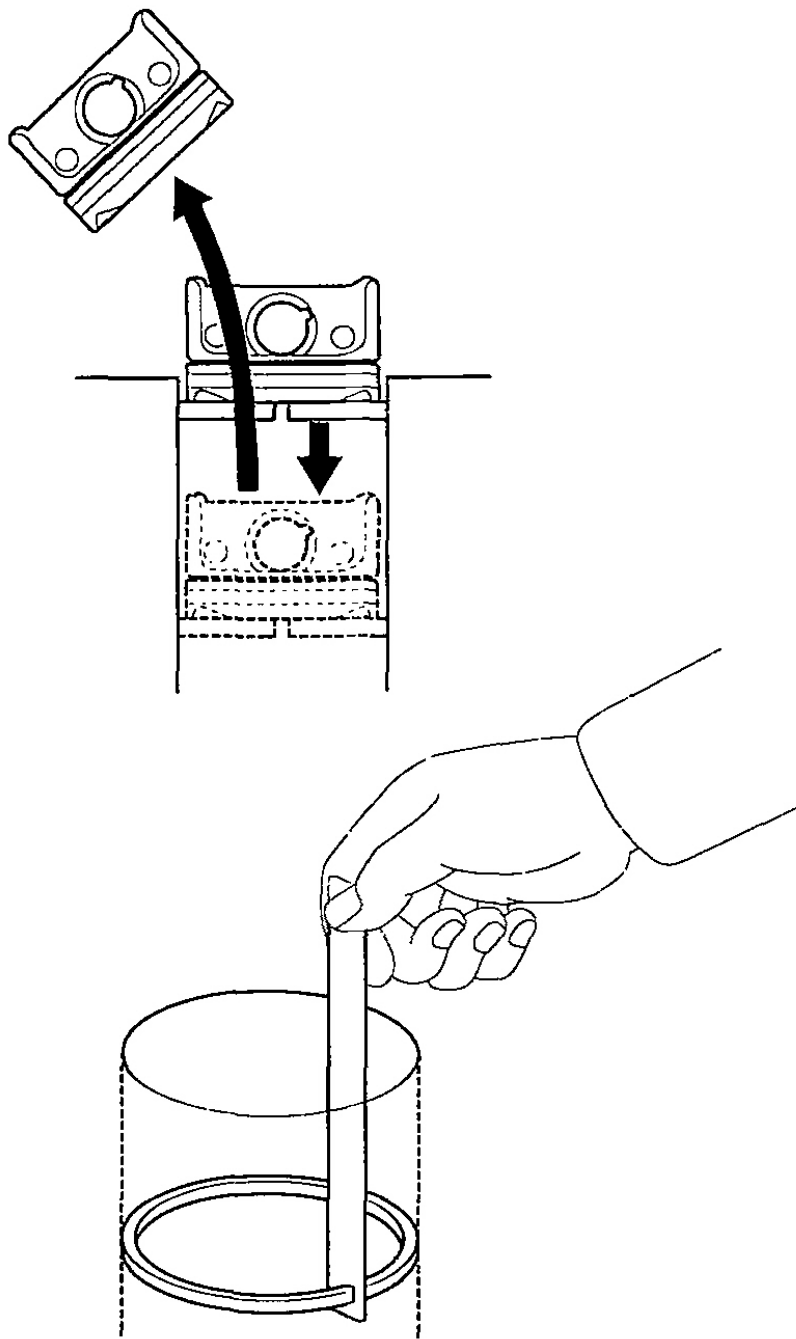
[Standard]

No. 1 : 0.23 ~ 0.38 mm (0.0091 ~ 0.0150 in.)

No. 2 : 0.33 ~ 0.48 mm (0.0130 ~ 0.0189 in.)

[Limit]

No. 1, 2 oil ring : 1.0 mm (0.039 in.)



G00941761

Fig. 128: Measuring Piston Ring End Cap
Courtesy of HYUNDAI MOTOR CO.

3. When replacing the ring without correcting the cylinder bore, check the gap with the ring situated at the low part of cylinder that is less worn-out.

Standard	None
0.25mm (0.010in.) O.S.	25
0.50mm (0.020in.) O.S.	50

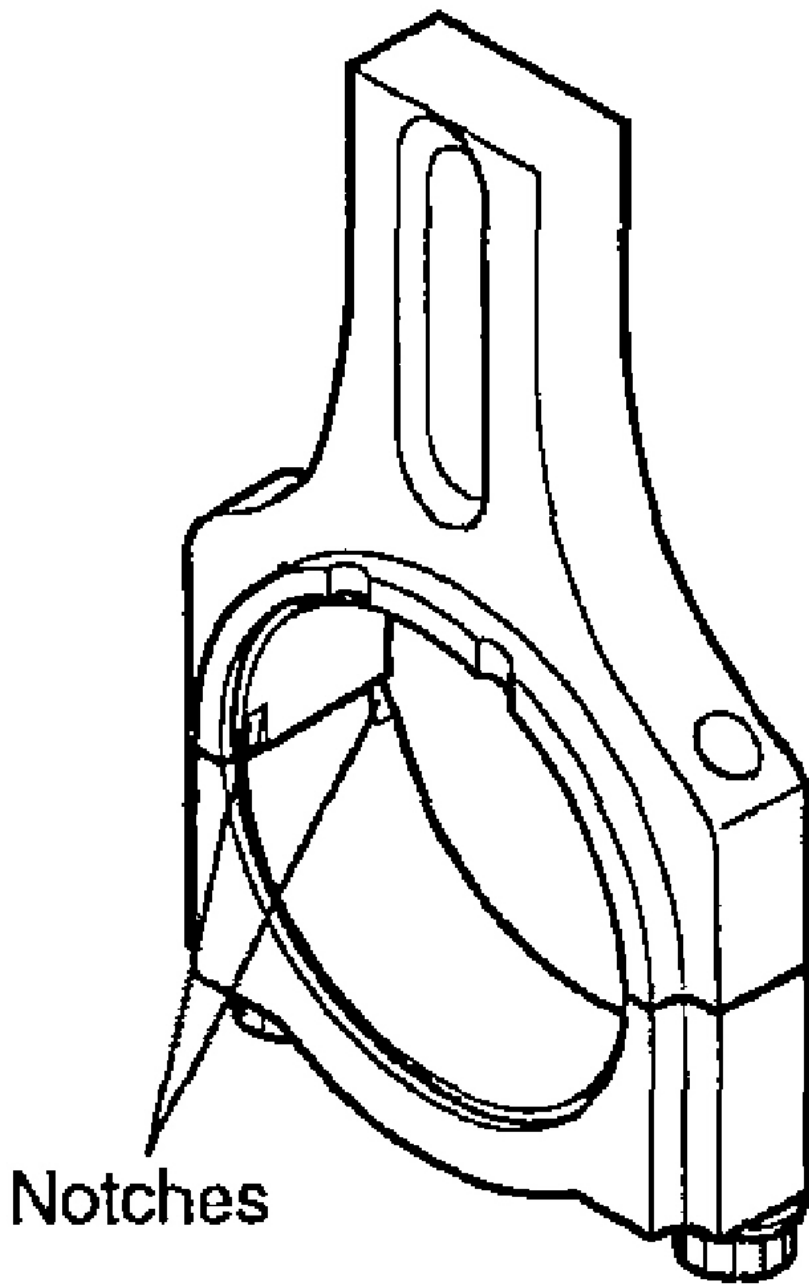
G00941762

Fig. 129: Piston Ring Service Size & Mark Table
Courtesy of HYUNDAI MOTOR CO.

NOTE: The mark can be found on the upper side of the ring next to the end.

CONNECTING RODS

1. When the connecting rod cap is installed, make sure that the cylinder numbers match. (marked on rod end cap at disassembly) When a new connecting rod is installed, make sure that the notches holding the bearing in place are on the same side.
2. Replace the connecting rod if it is damaged at either end of the thrust faces. If it has a stratified wear in, or if the surface of the inside diameter of the small end is severely rough, replace the rod.

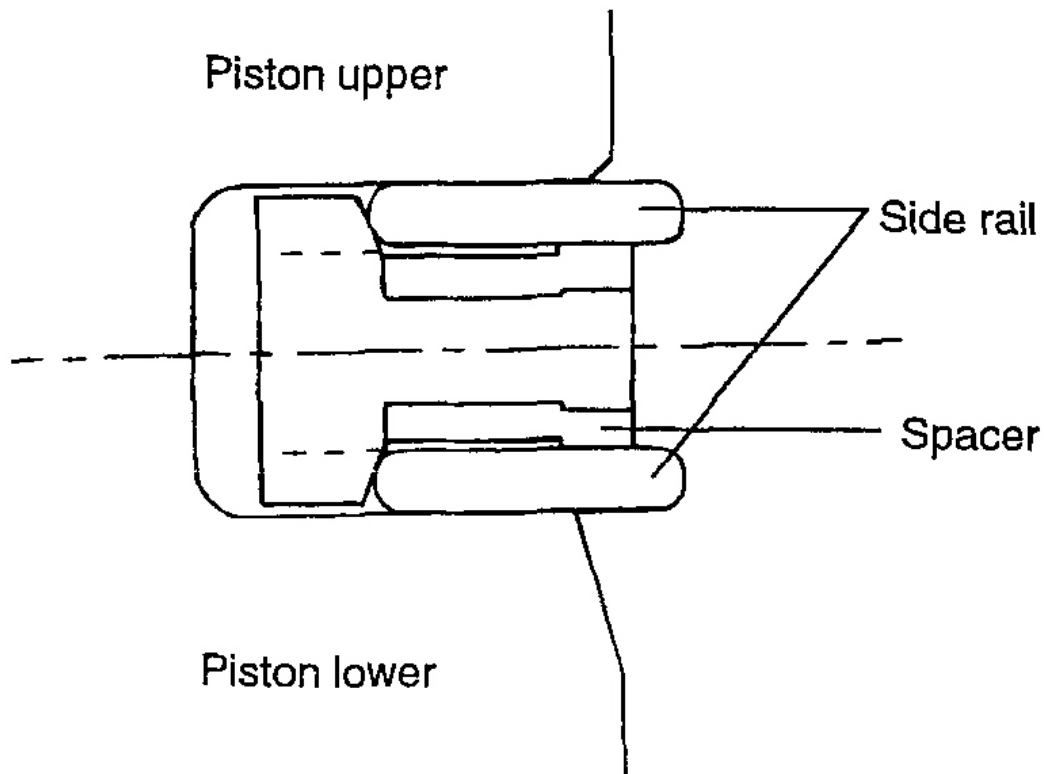


G00941763

Fig. 130: Inspecting Connecting Rods
Courtesy of HYUNDAI MOTOR CO.

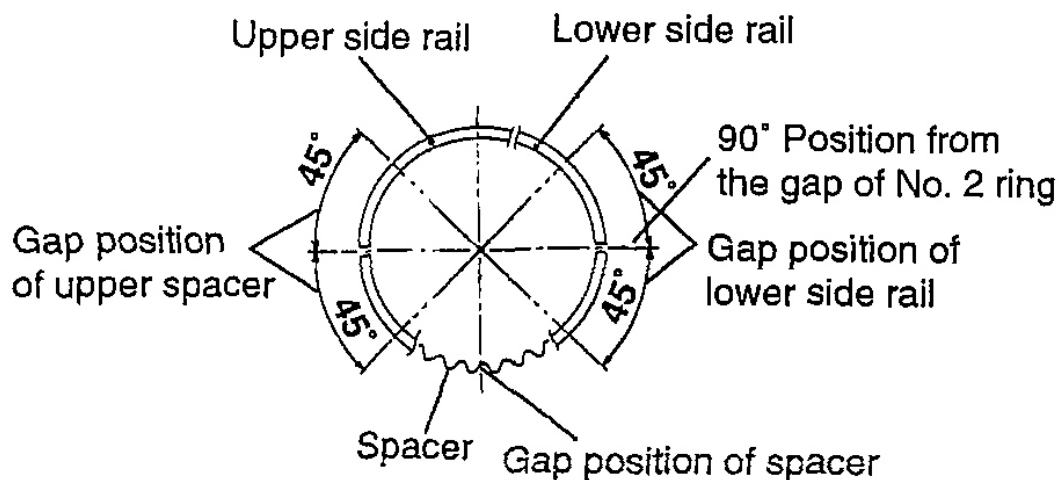
REASSEMBLY

1. Install the spacer.



G00941764

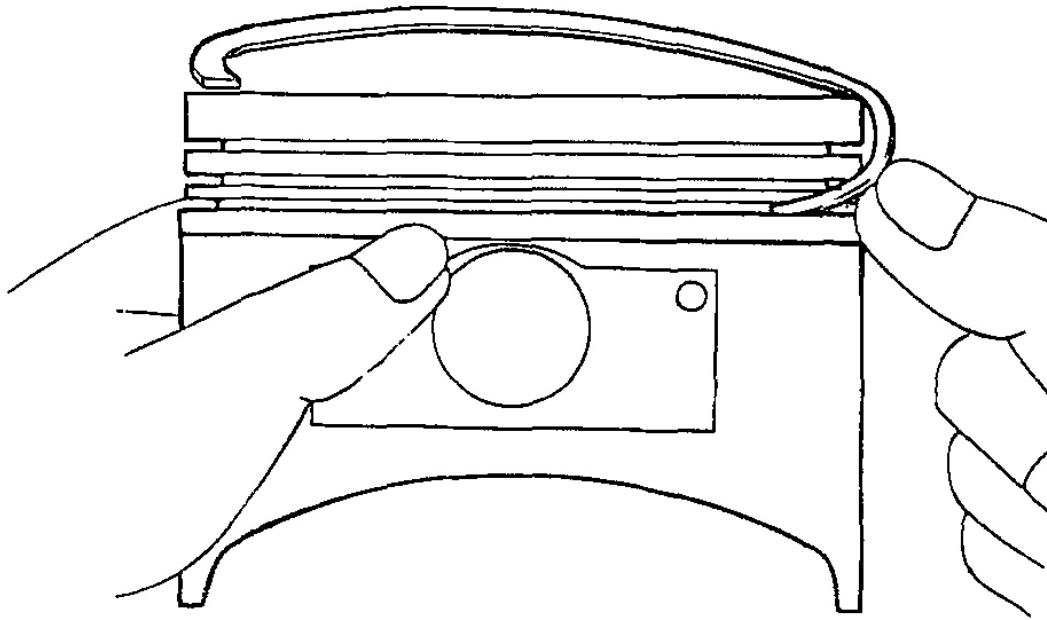
Fig. 131: Installing Spacer (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.



G00941765

Fig. 132: Installing Spacer (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

2. Install the upper side rail. To install the side rail, first put one end of the side rail between the piston ring groove and spacer, hold it firmly, and press down with a finger on the portion to be inserted into the groove (as illustrated).

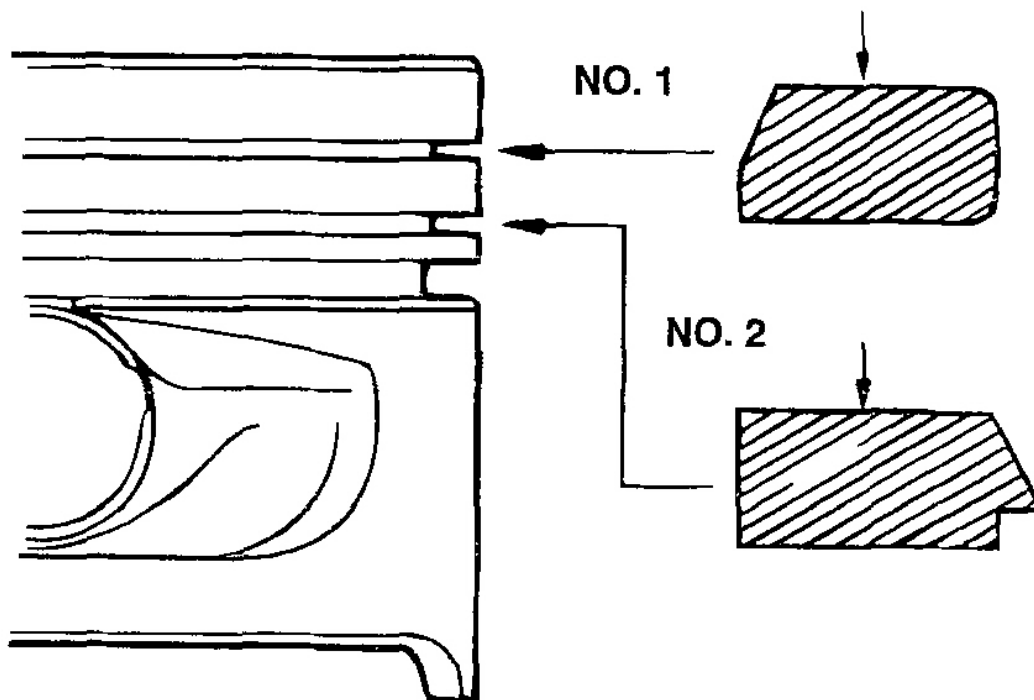


G00941766

Fig. 133: Installing Upper Side Rail
Courtesy of HYUNDAI MOTOR CO.

CAUTION: Do not use a piston ring expander when installing side rail.

3. Install the lower side rail using the same procedure described in Step 2.
4. Apply engine oil around the piston and piston grooves.
5. Using a piston ring expander, install the No.2 piston ring.
6. Install the No. 1 piston ring.



G00941767

Fig. 134: Installing No. 1 Piston Ring
Courtesy of HYUNDAI MOTOR CO.

7. Position each piston ring end gap as far away from its neighboring gaps as possible. Make sure that the gaps are not positioned in the thrust and pin directions.
8. Hold the piston rings firmly with a piston ring compressor as they are inserted into cylinder.

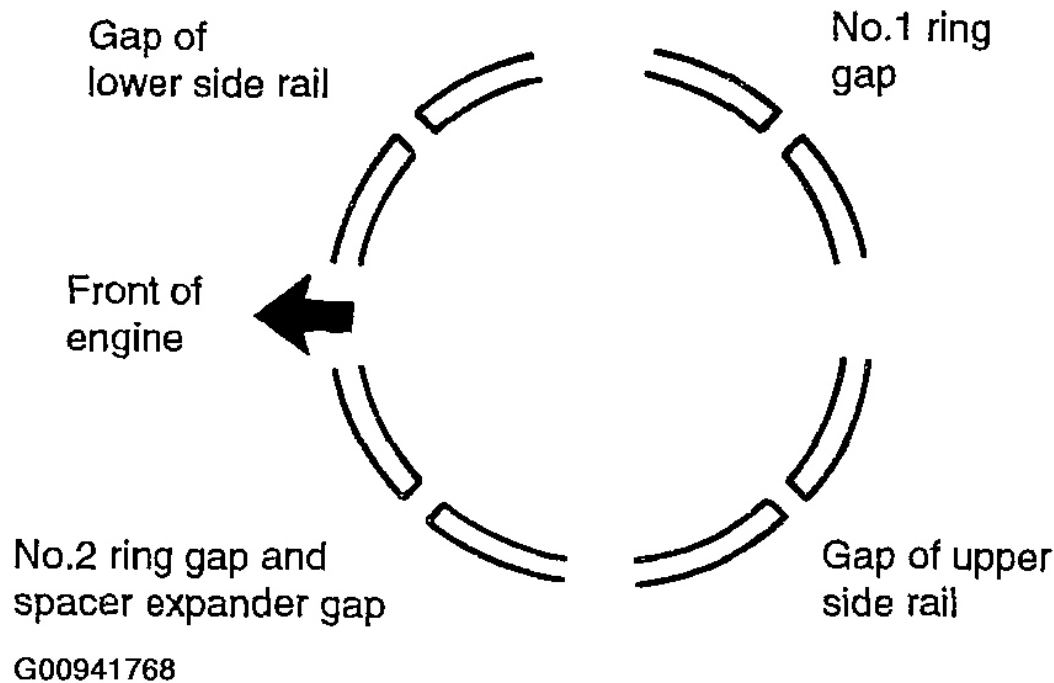


Fig. 135: Identifying Ring Gap Position
Courtesy of HYUNDAI MOTOR CO.

9. Install the upper main bearings in the cylinder block.
10. Install the lower main bearings in the main bearing caps.
11. Make sure that the front mark of the piston and the front mark (identification mark) of the connecting rod are directed toward the front of the engine.
12. When a new connecting rod is installed, make sure that the notches for holding the bearing in place are on the same side.
13. When assembling, bolts should be fastened by the angle - torque controlled method as the following.
 1. Apply oil to the thread of nuts and spot areas.
 2. Tighten the connecting rod bolt.

Tightening torque

Connecting rod cap nut :

50 ~ 53 Nm (500 ~ 530 kg.cm, 36 ~ 39 lb.ft)

CAUTION: After removing the connecting rod bolt, do not use it again.
When using a new bolt, do not tighten the bolt more than 3 times.

14. Check the connecting rod side clearance.

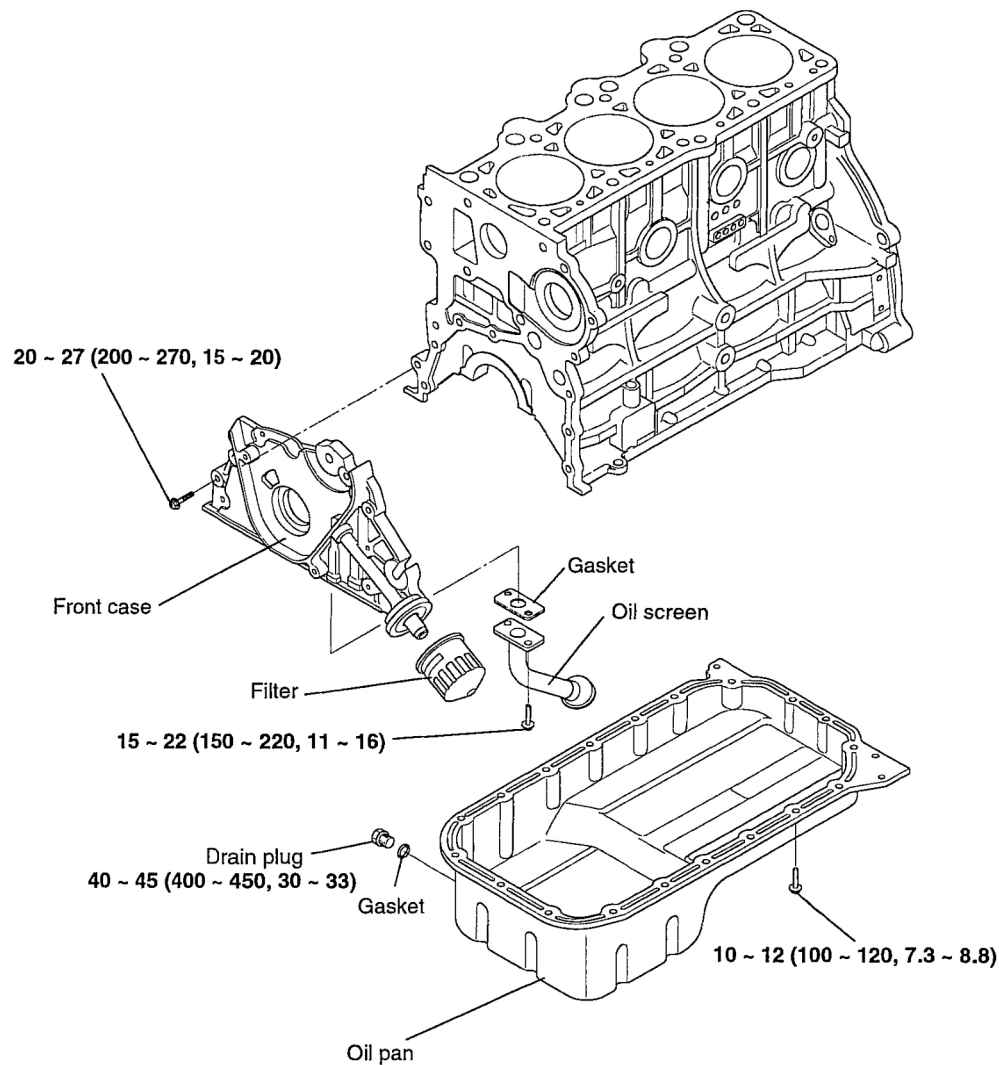
Connecting rod side clearance

Standard : 0.10 ~ 0.25 mm (0.0039 ~ 0.0098 in.)

Limit : 0.4 mm (0.0157 in.)

15. Install the oil screen.
16. Install the oil pan.
17. Install the cylinder head.

LUBRICATION SYSTEM**OIL PUMP****COMPONENT**



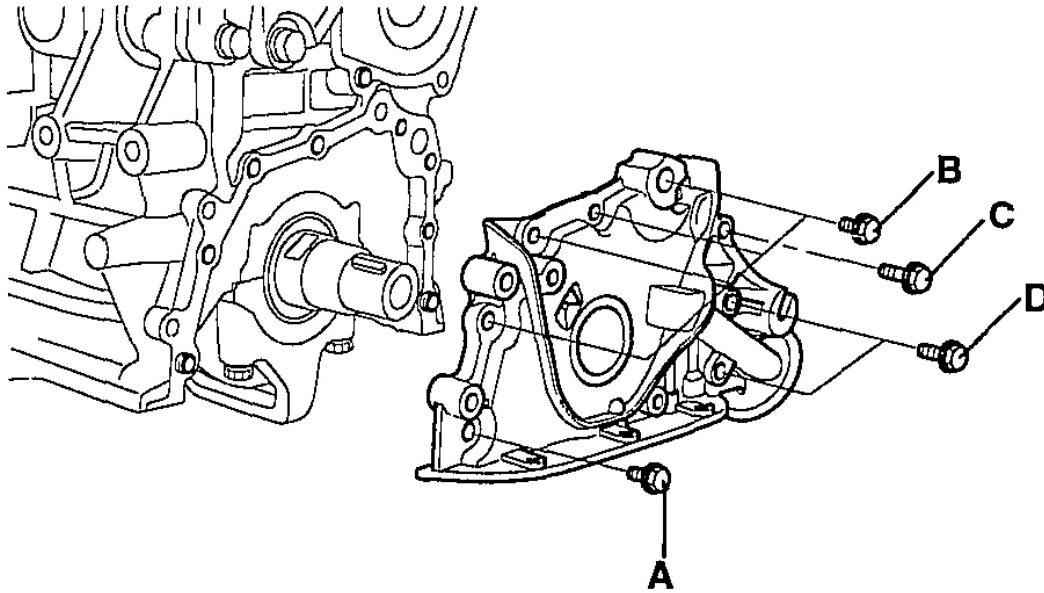
TORQUE : Nm (kgf.cm, lbf.ft)

G00941780

Fig. 136: Identifying Lubrication System Components
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

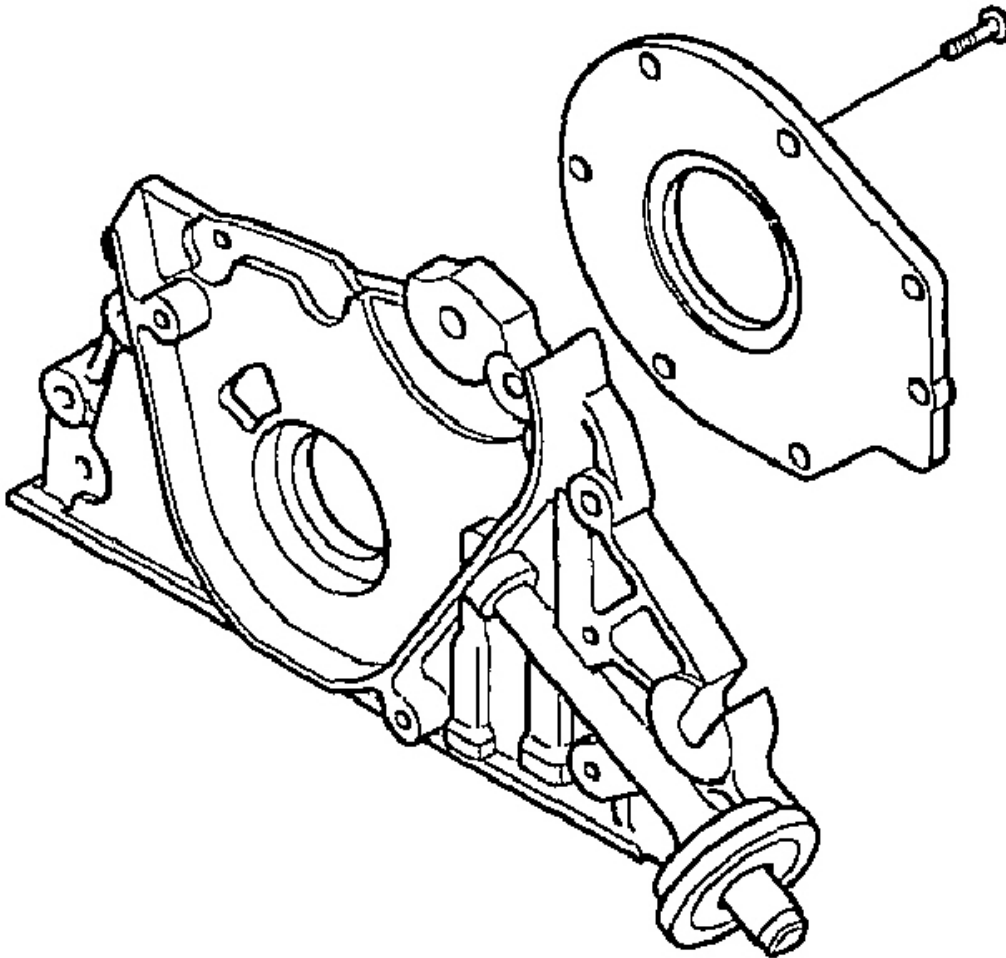
1. Remove the timing belt.
2. Remove all the oil pan bolts.
3. Remove the oil pan.
4. Remove the oil screen.
5. Remove the front case assembly.



G00941781

Fig. 137: Removing Front Case Assembly
Courtesy of HYUNDAI MOTOR CO.

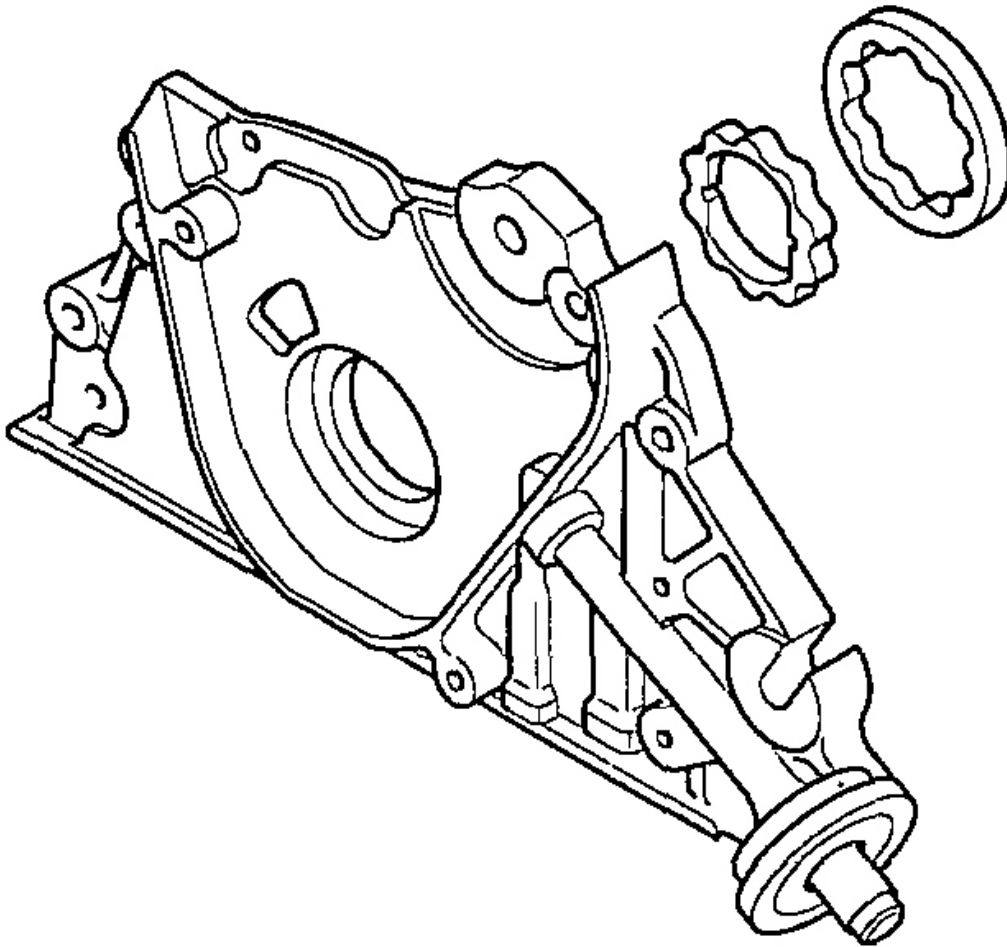
6. Remove the oil pump cover.



G00941782

Fig. 138: Removing Oil Pump Cover
Courtesy of HYUNDAI MOTOR CO.

7. Remove the inner and outer gears from the front case. The matching marks on the inner and outer gears indicate the direction of installation.



G00941783

Fig. 139: Removing Inner & Outer Gears From Front Case
Courtesy of HYUNDAI MOTOR CO.

INSPECTION

FRONT CASE

1. Check the front case for cracks or damage. Replace as necessary.
2. Check the front oil seal for worn or damaged lips. Replace if defective.

OIL PAN AND OIL SCREEN

1. Check the oil pan for failure, damage or cracks. Replace if defective.
2. Check the oil screen for failure, damage and cracks and replace if defective.

FRONT CASE AND OIL PUMP COVER

Check the surfaces contacting gears for damage or worn.

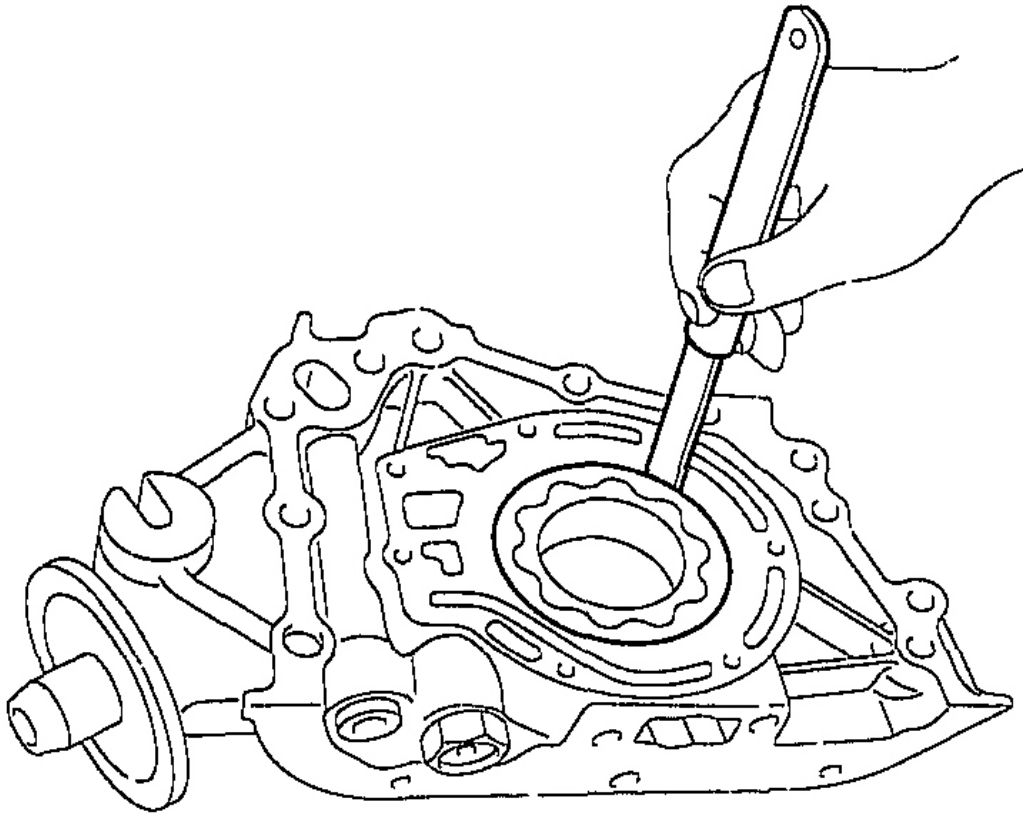
OIL PUMP GEARS

1. Check the gear tooth surfaces for wear or damage.
2. Measure the clearance between the outer gear and the front case.

Body clearance		0.12 ~ 0.185mm (0.0047 ~ 0.0073in.)
Tip clearance		0.025 ~ 0.069mm (0.0010 ~ 0.0027in.)
Side clearance	Outer gear	0.04 ~ 0.09mm (0.0016 ~ 0.0035in.)
	Inner gear	0.04 ~ 0.085mm (0.0016 ~ 0.0033in.)

G00941784

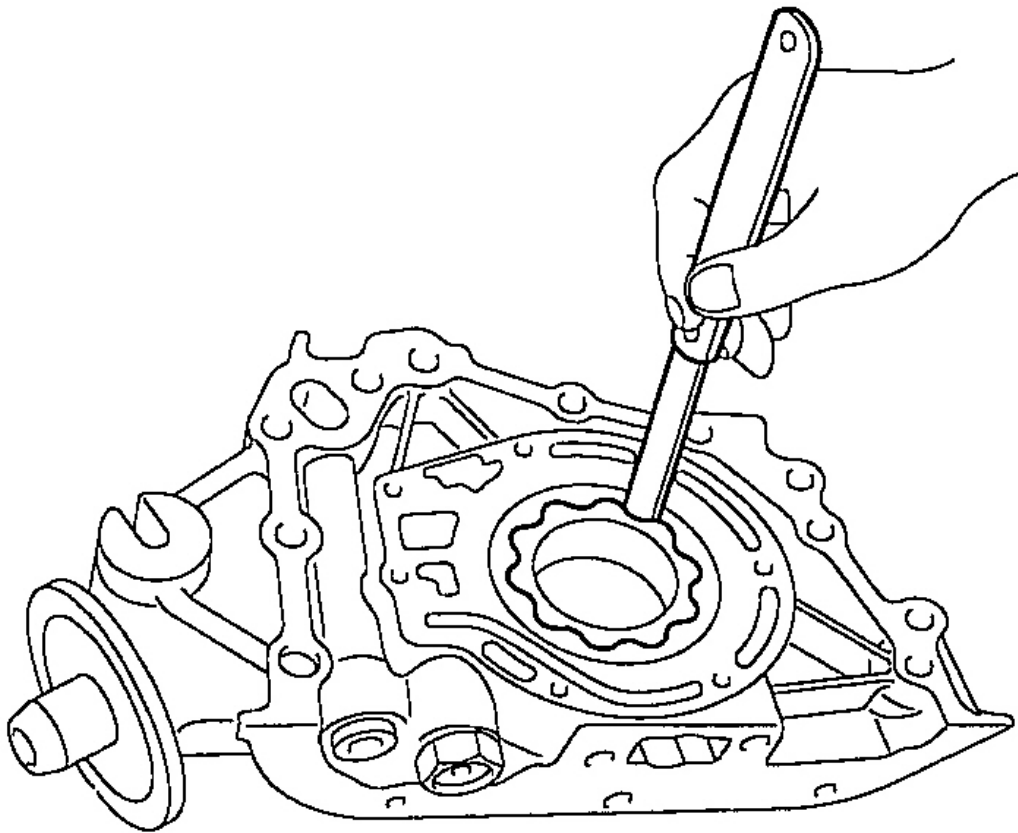
Fig. 140: Oil Pump Gears Specification Table
Courtesy of HYUNDAI MOTOR CO.



G00941785

Fig. 141: Measuring Clearance Between Outer Gear & Front Case
Courtesy of HYUNDAI MOTOR CO.

3. Check the tip clearance on the pump rotor.



G00941786

Fig. 142: Checking Tip Clearance On Pump Rotor (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.

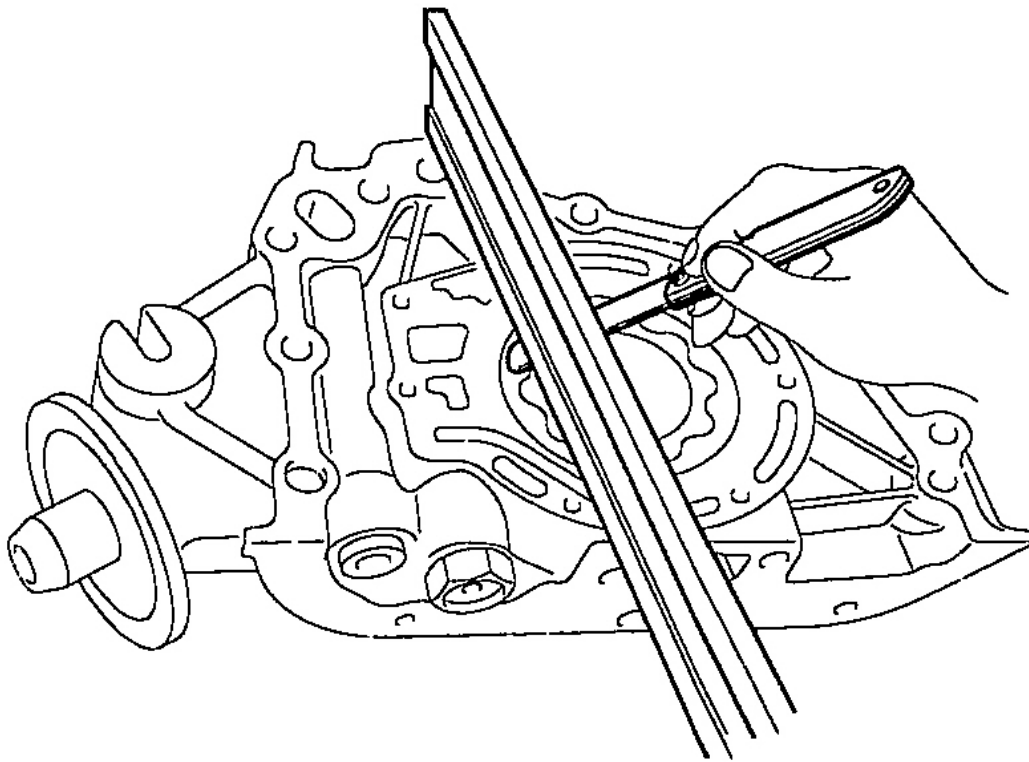
**G00941787**

Fig. 143: Checking Tip Clearance On Pump Rotor (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

RELIEF VALVE AND SPRING

1. Check sliding condition of the relief valve inserted in the front case.
2. Inspect for a distorted or broken relief valve spring.

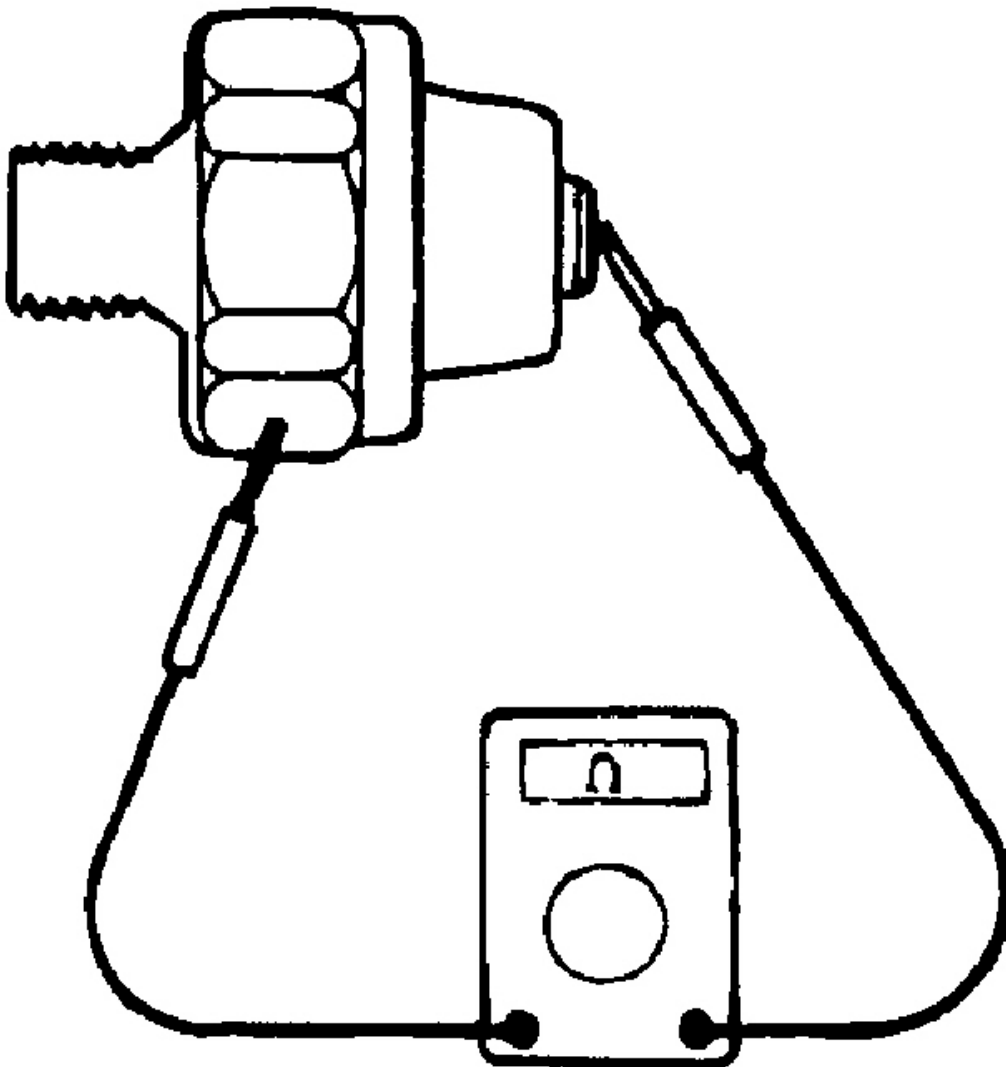
Standard value

Free height : 43.8 mm (1.724 in.)

Load : 3.7 kg/40.1 mm (8.14 lb/1.579 in.)

OIL PRESSURE SWITCH

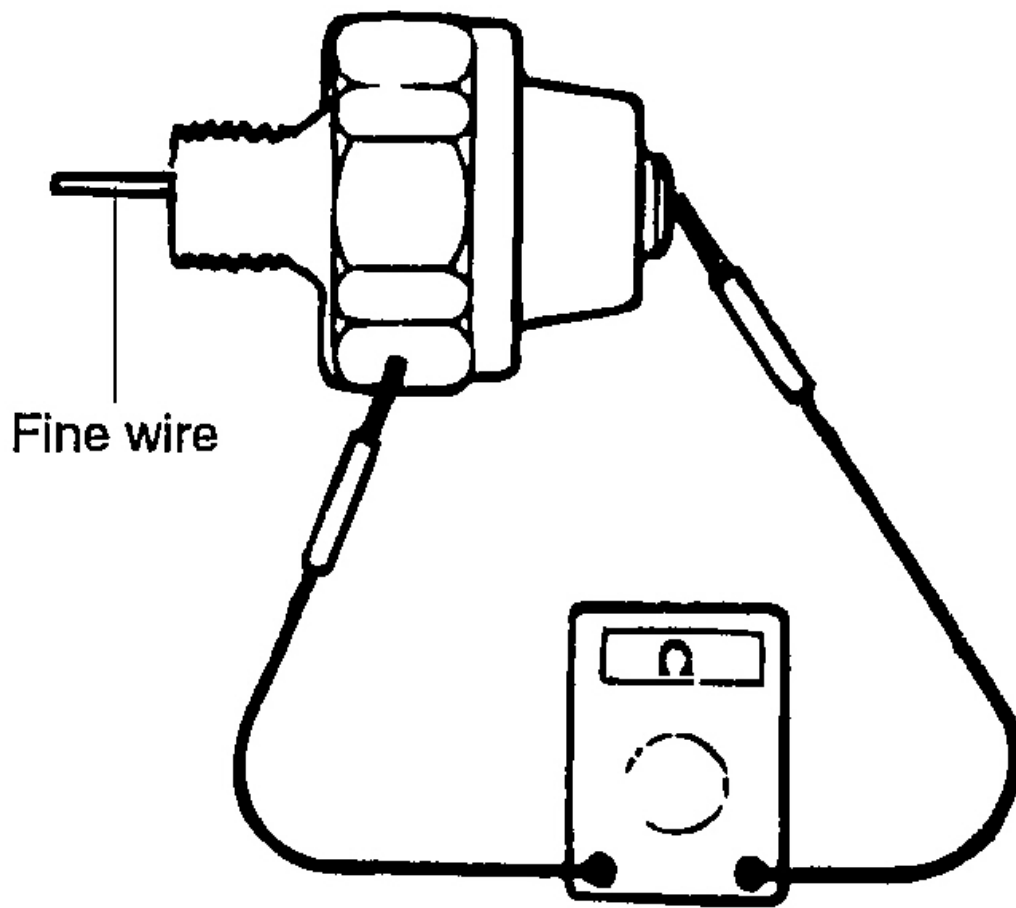
1. Use an ohmmeter to check the continuity between the terminal and the body. If there is no continuity, replace the oil pressure switch.



G00941788

Fig. 144: Checking Continuity Between Oil Pressure Switch Terminal & Body
Courtesy of HYUNDAI MOTOR CO.

2. Check the continuity between the terminal and the body when the fine wire is pushed. If there is continuity even when the fine wire is pushed, replace the switch.



G00941789

Fig. 145: Checking Continuity Between Terminal & Body Of Oil Pressure Switch When Fine Wire Is Pushed In

Courtesy of HYUNDAI MOTOR CO.

3. If there is no continuity when a 50 kPa (7 psi) vacuum is applied through the oil hole, the switch is operating properly.
4. Check for an air leaks, the diaphragm is broken. Replace the switch.

REASSEMBLY

1. Install the outer and inner gears into the front case. Make sure that the inner and outer gears are installed in the same direction as shown.
2. Install the oil pump cover and tighten the bolts to the specified torque. After the bolts have been

tightened, check to ensure that the gear turns smoothly.

Tightening torque

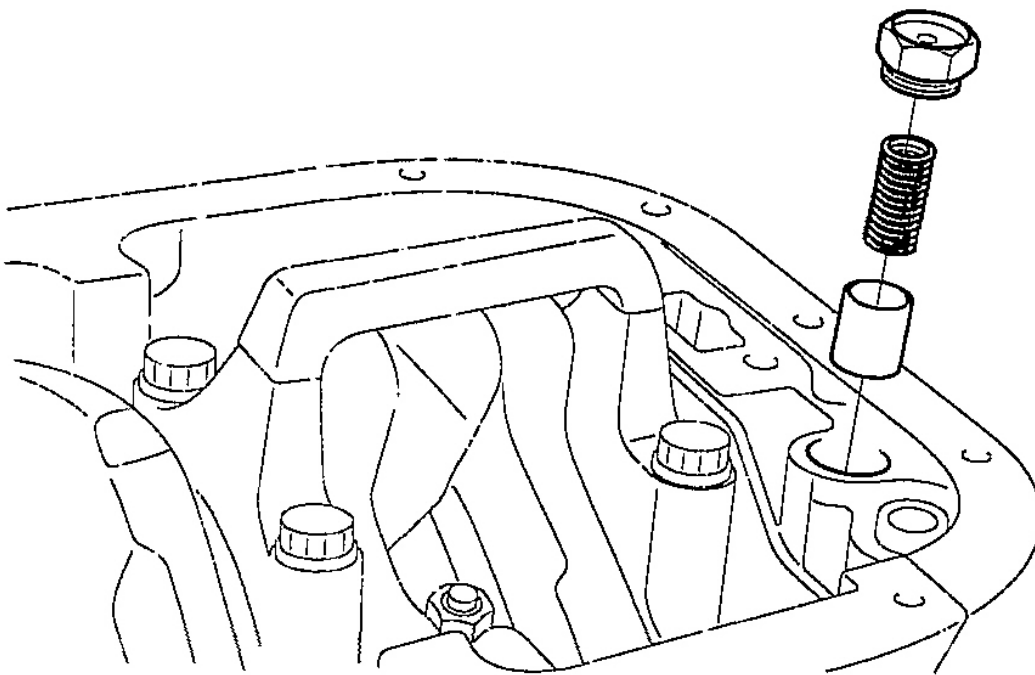
Oil pump cover bolt : 6 ~ 9Nm (60 ~ 90kg.cm, 4 ~ 7lb.ft)

3. Install the relief valve and spring. Tighten the plug to the specified torque. Apply engine oil to the relief valve.

Tightening torque

Relief valve plug :

40 ~ 50Nm (400 ~ 500 kg.cm, 30 ~ 37 lb.ft)



G00941790

Fig. 146: Installing Relief Valve & Spring
Courtesy of HYUNDAI MOTOR CO.

FRONT CASE

1. Install the front case assembly with a new gasket, and tighten the bolts to the specified torque.

Length

A : 25mm (0.98 in.)

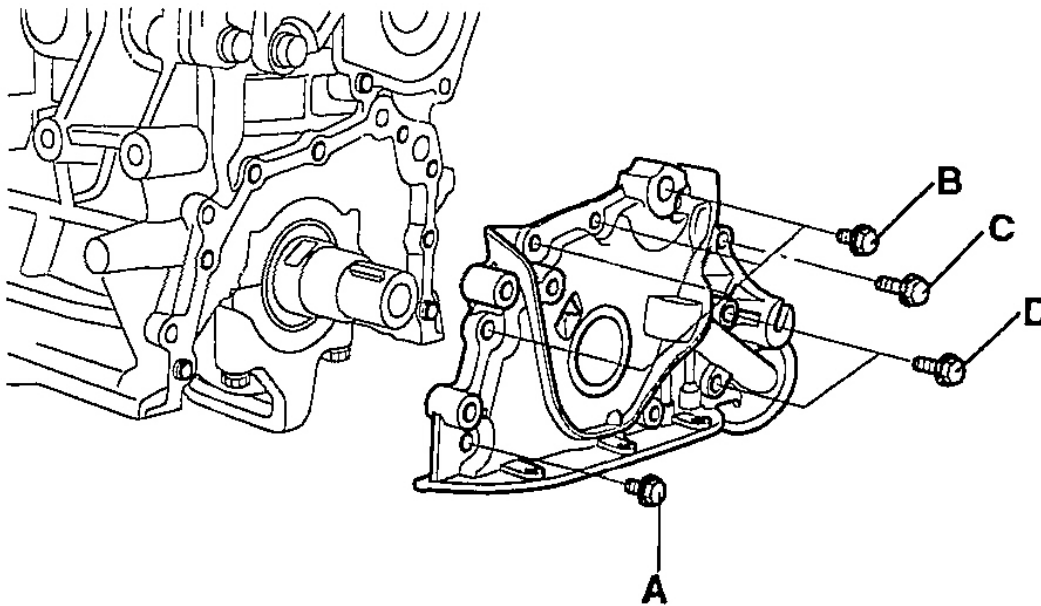
B : 20mm (0.79 in.)

C : 45mm (1.77 in.)

D : 38mm (1.50 in.)

Tightening torque

20 ~ 27 Nm (200 ~ 270 kg.cm, 15 ~ 20 lb.ft)



G00941791

Fig. 147: Installing Front Case Assembly
Courtesy of HYUNDAI MOTOR CO.

OIL SEAL

1. Using the special tool, Crankshaft oil seal guide, install the oil seal.
2. Using the special tool, Crankshaft front oil seal installer (09214-33000), install the oil seal.

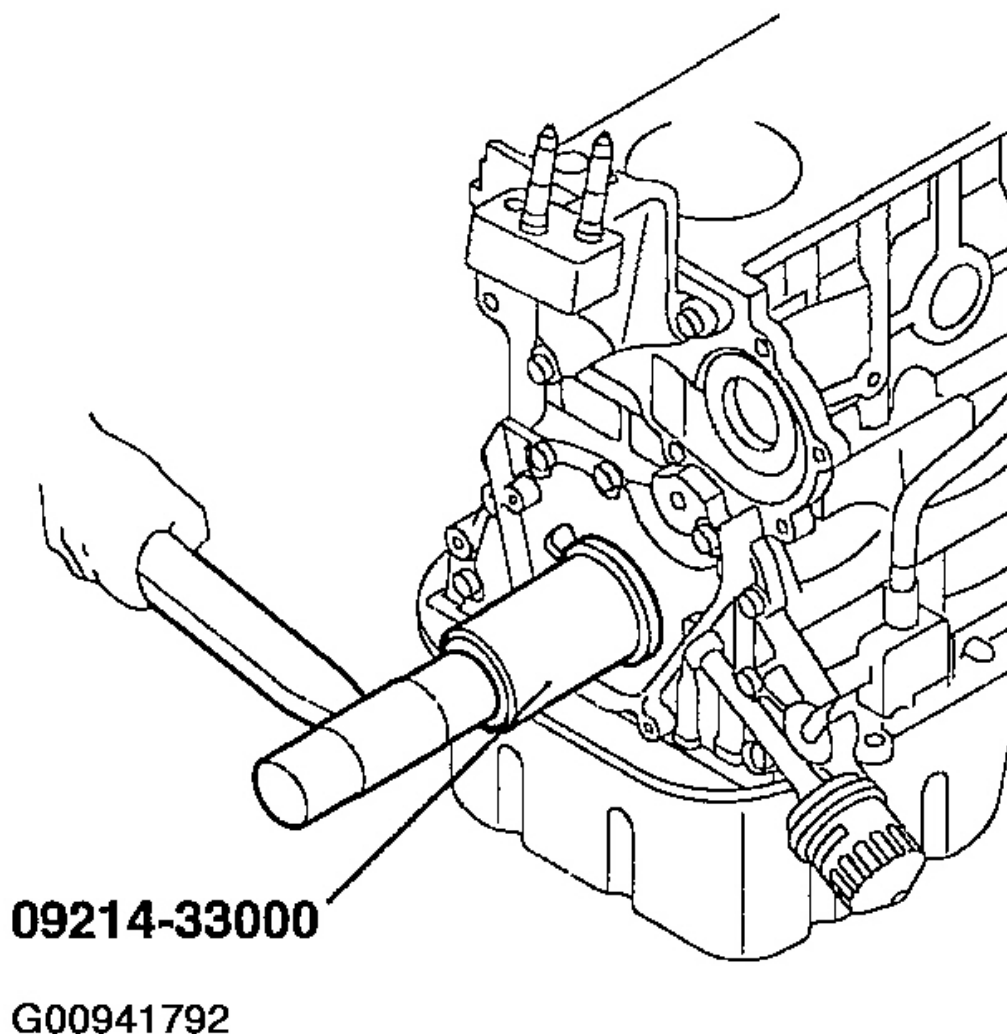
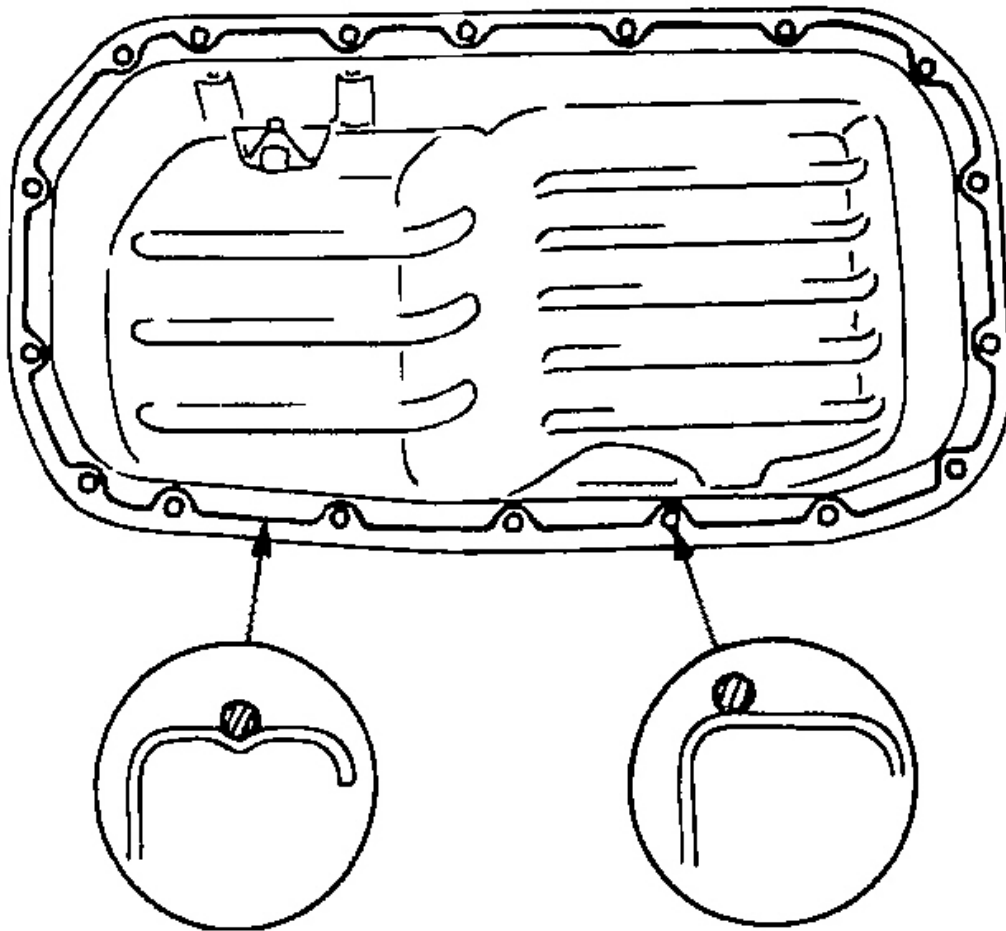


Fig. 148: Installing Crankshaft Front Oil Seal
Courtesy of HYUNDAI MOTOR CO.

3. Install the oil screen.
4. Clean both gasket surfaces of the oil pan and the cylinder block.
5. Apply sealant into the groove of the oil pan flange as shown.

CAUTION:

- Apply sealant approx. 4mm (0.16 in.) in thickness.
- After application of sealant, do not exceed 15 minutes before installing the oil pan.



G00941793

Fig. 149: Applying Sealant Into Groove Of Oil Pan Flange
Courtesy of HYUNDAI MOTOR CO.

6. Install the oil pan and tighten the bolts to the specified torque.

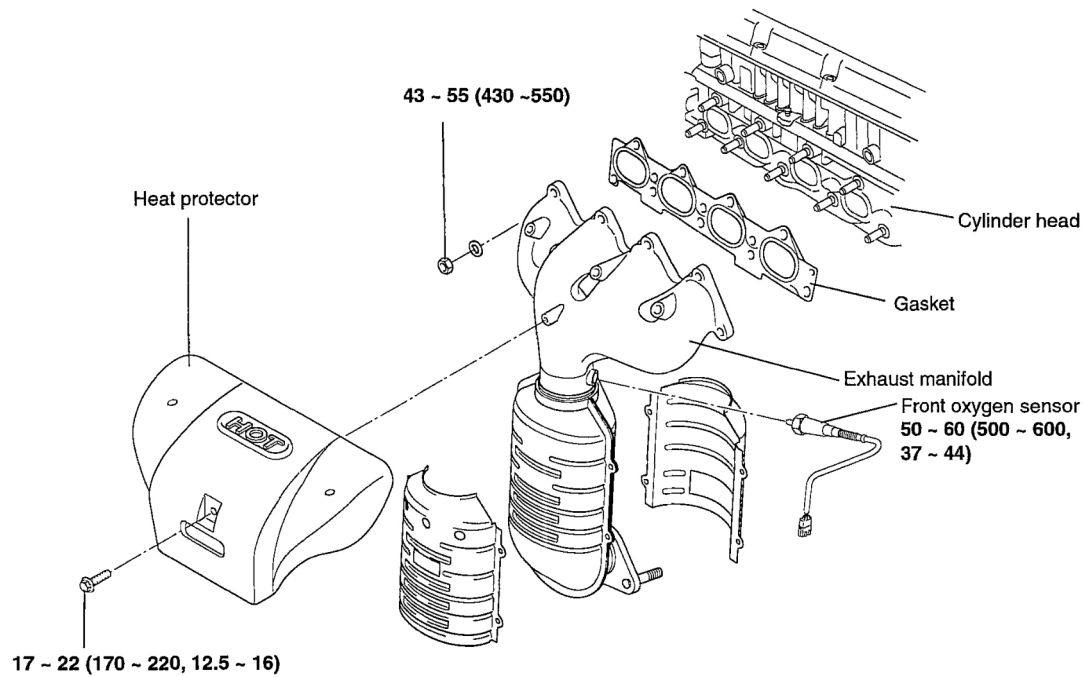
Tightening torque

Oil pan bolt : 10 ~ 12Nm (100 ~ 120kg.cm, 7 ~ 9lb.ft)

INTAKE AND EXHAUST SYSTEM

EXHAUST MANIFOLD

COMPONENTS



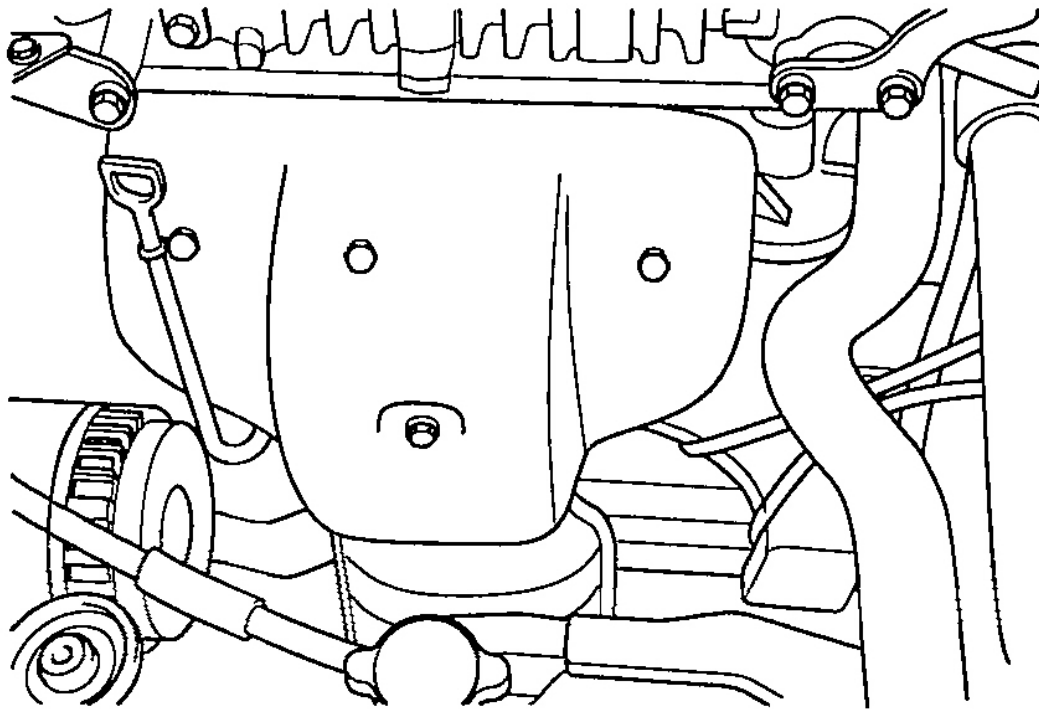
TORQUE : Nm (kgf.cm, lb.ft)

G00941794

Fig. 150: Identifying Exhaust System Components
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Remove the exhaust manifold heat protector.



G00941795

Fig. 151: Removing Exhaust Manifold Heat Protector
Courtesy of HYUNDAI MOTOR CO.

2. Remove the exhaust manifold assembly from the cylinder head.
3. Remove the exhaust manifold gasket.

INSPECTION

1. Check for damage or cracking.
2. Check for damage or cracking of welding between exhaust manifold and converter.

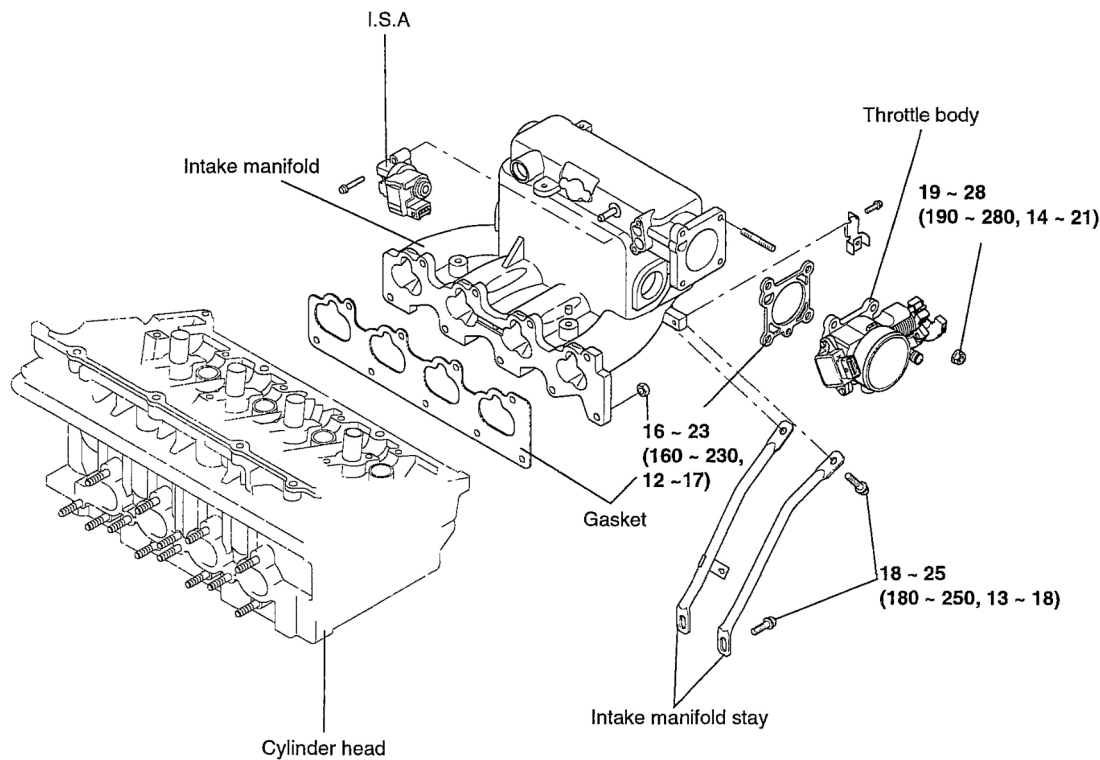
REASSEMBLY

Install the exhaust manifold in the reverse order of removal.

CAUTION: Replace the exhaust manifold gasket and lock nut when reassembling.

INTAKE MANIFOLD

COMPONENTS



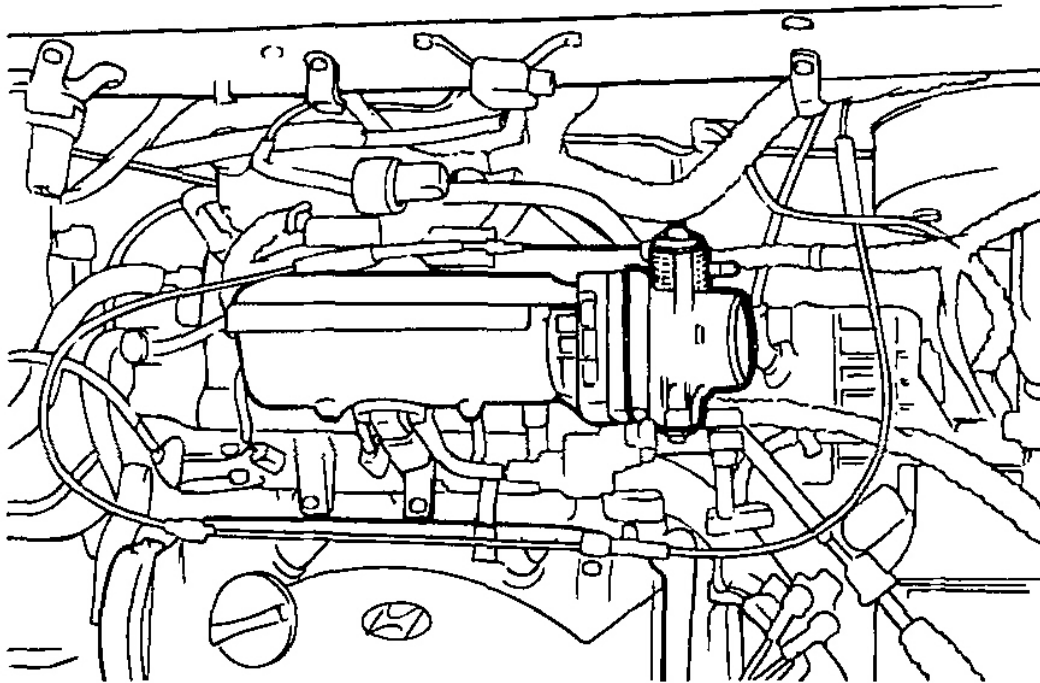
TORQUE : Nm (kgf.cm, lbf.ft)

G00941796

Fig. 152: Identifying Intake Manifold Components
 Courtesy of HYUNDAI MOTOR CO.

REMOVAL

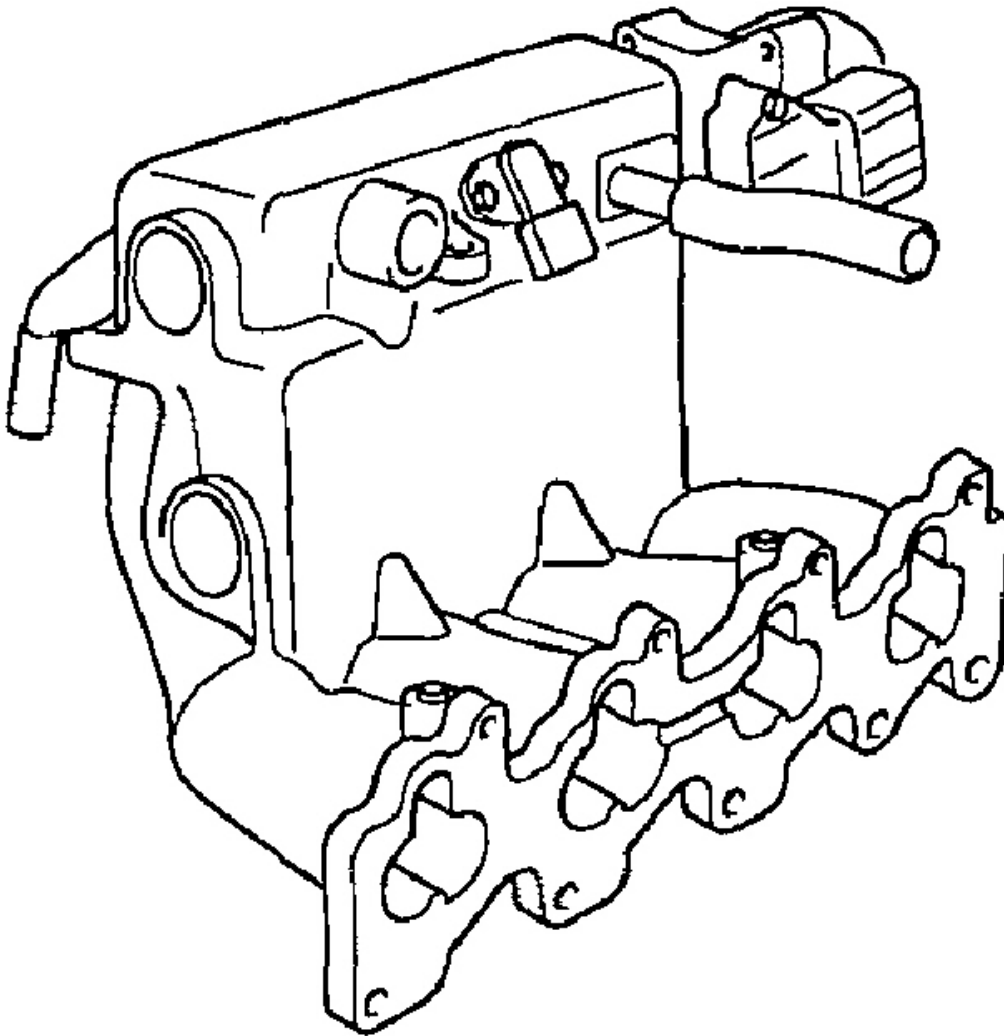
1. Remove the engine cover.
2. Remove the intake air hose connected to the throttle body.
3. Remove the accelerator cable.
4. Remove the P.C.V. hose and brake booster vacuum hoses.
5. Disconnect the vacuum hose connections, ISA and TPS connector.



G00941798

Fig. 153: Disconnecting ISA & TPS Vacuum Hose Connections
Courtesy of HYUNDAI MOTOR CO.

6. Disconnect the high pressure fuel hose connection after relieving pressure in the fuel rail to prevent fuel from spilling.
7. Remove the intake manifold.
8. Remove the intake manifold assembly and gasket.



G00941799

Fig. 154: Removing Intake Manifold Assembly & Gasket
Courtesy of HYUNDAI MOTOR CO.

9. Disconnect the fuel injector harness connector.
10. Remove the delivery pipe with the fuel injectors.

CAUTION: Be careful not to drop the injectors when removing the delivery pipe.

INSPECTION

Check the parts for damage or cracking.

AIR HOSE

Check for damage or cracking of any part.

INSTALLATION

1. Replace the intake manifold gasket and install the intake manifold.

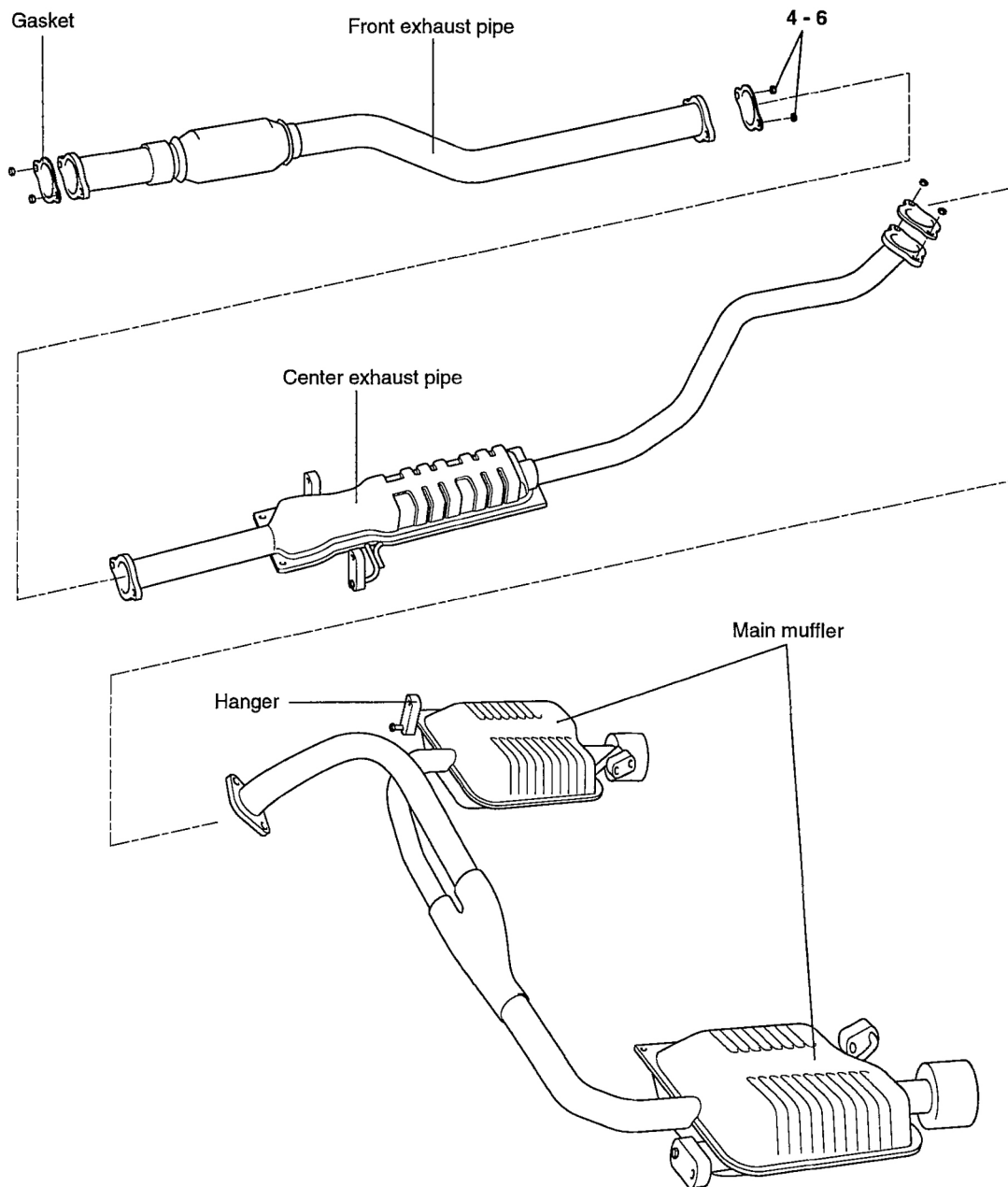
CAUTION: Be careful not to drop the injectors when removing the delivery pipe.

2. Install the delivery pipe with the fuel injectors.
3. Connect the fuel injector harness connector.
4. Install the intake manifold stay.
5. Connect the high pressure fuel hose connection.
6. Install the P.C.V hose and brake booster vacuum hose.
7. Install the intake air hose to the throttle body.
8. Install the accelerator cable.
9. Connect the ISA and TPS wire harness connector.

MUFFLER**COMPONENTS**

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon



G00941800

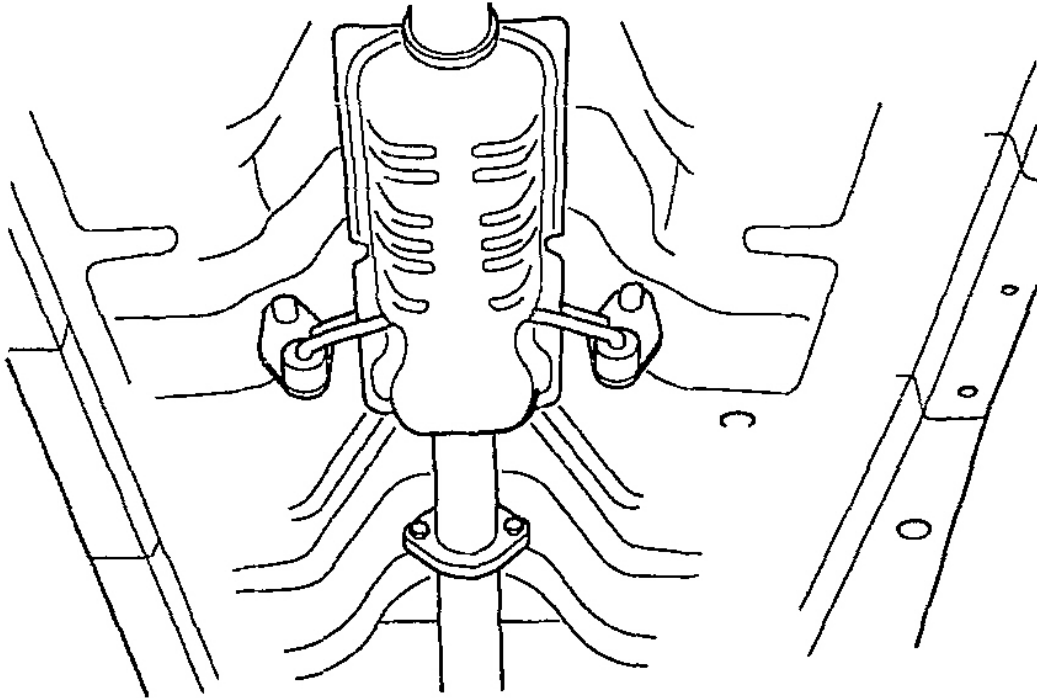
Fig. 155: Locating Muffler Components
Courtesy of HYUNDAI MOTOR CO.

REMOVAL

MAIN MUFFLER

CAUTION: Before removing or inspecting the exhaust system, ensure that the exhaust system is cool.

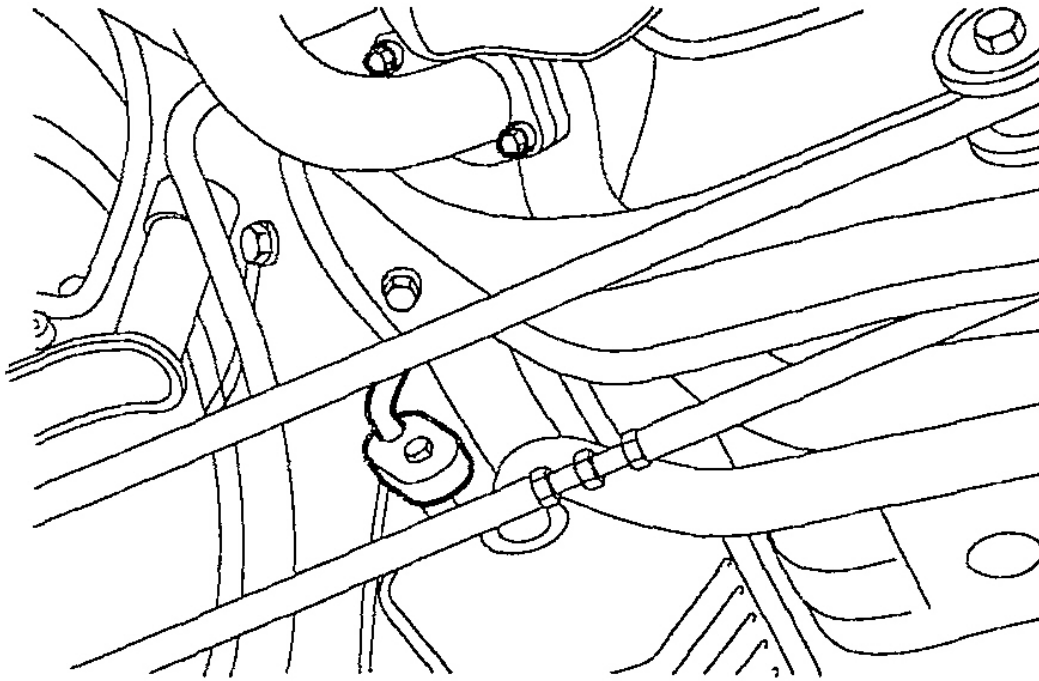
1. Disconnect the main muffler from the center muffler.



G00941801

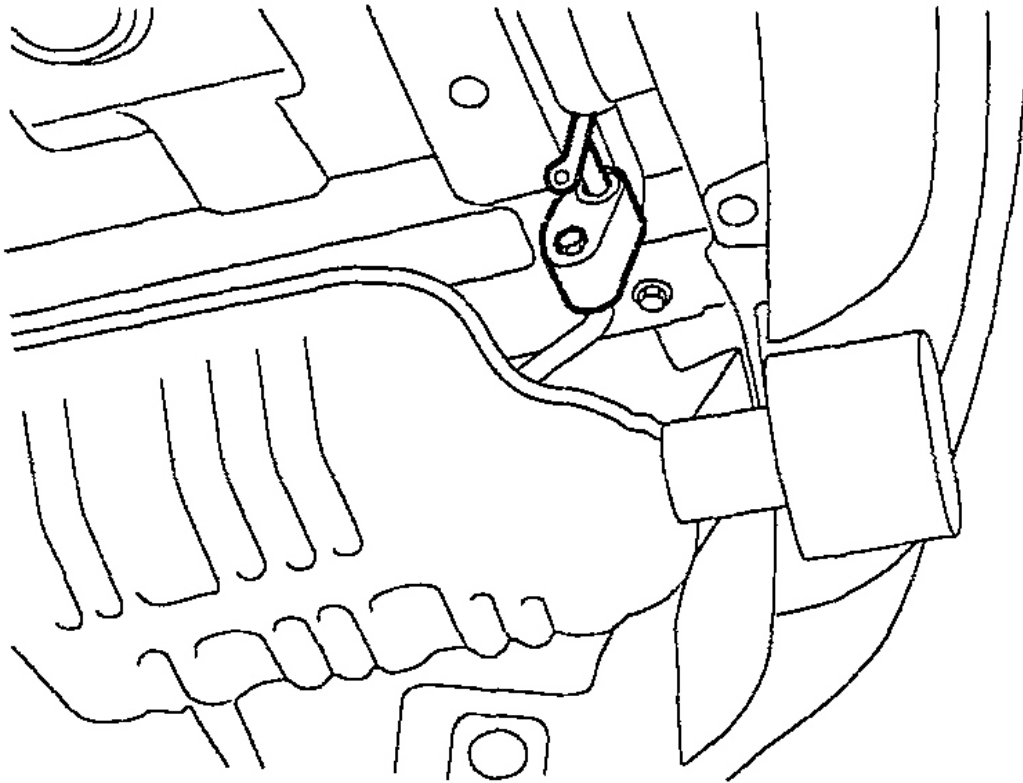
Fig. 156: Disconnecting Main Muffler From Center Muffler
Courtesy of HYUNDAI MOTOR CO.

2. Remove the rubber hangers and remove the main muffler.



G00941802

Fig. 157: Locating Rubber Hangers (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.

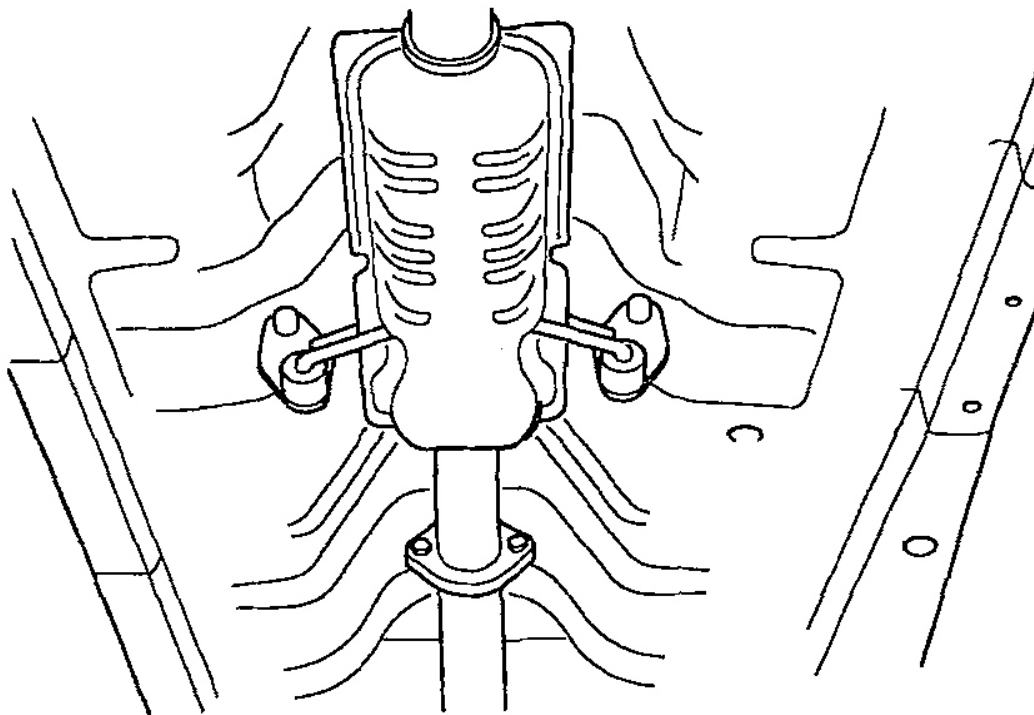


G00941803

Fig. 158: Locating Rubber Hangers (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

CENTER MUFFLER

1. Remove the center muffler assembly from the main muffler and front exhaust pipe.



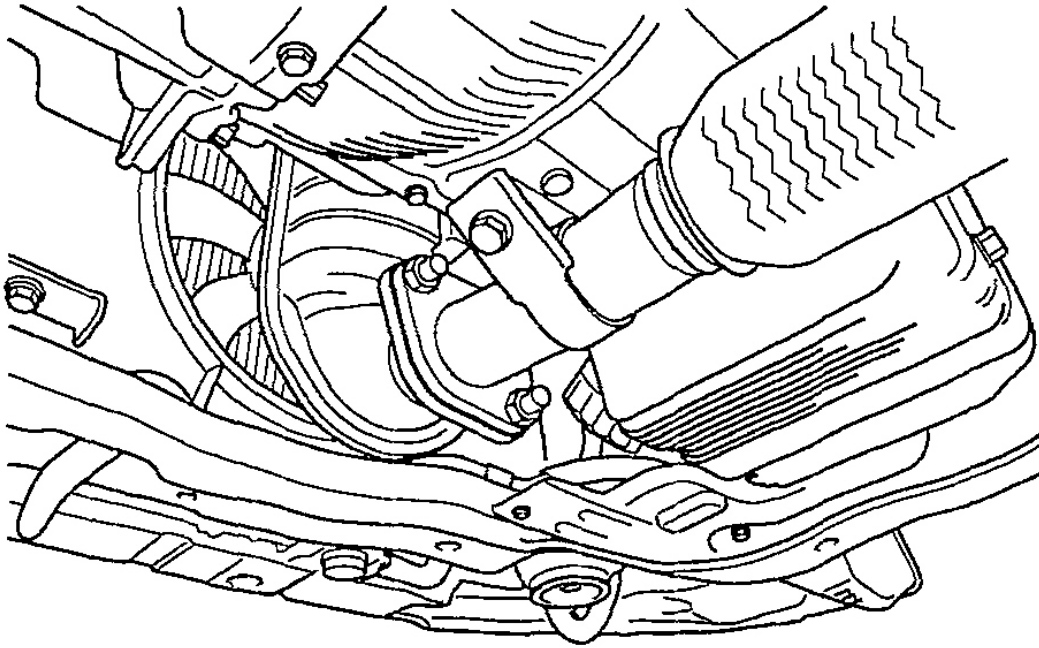
G00941804

Fig. 159: Locating Center Muffler
Courtesy of HYUNDAI MOTOR CO.

2. Remove the rubber hanger, then remove the center muffler.

FRONT EXHAUST PIPE

1. Remove the front exhaust pipe clamp bolts. and remove the front exhaust pipe nuts from the catalytic converter.
2. Remove the front exhaust pipe and center muffler bolt



G00941805

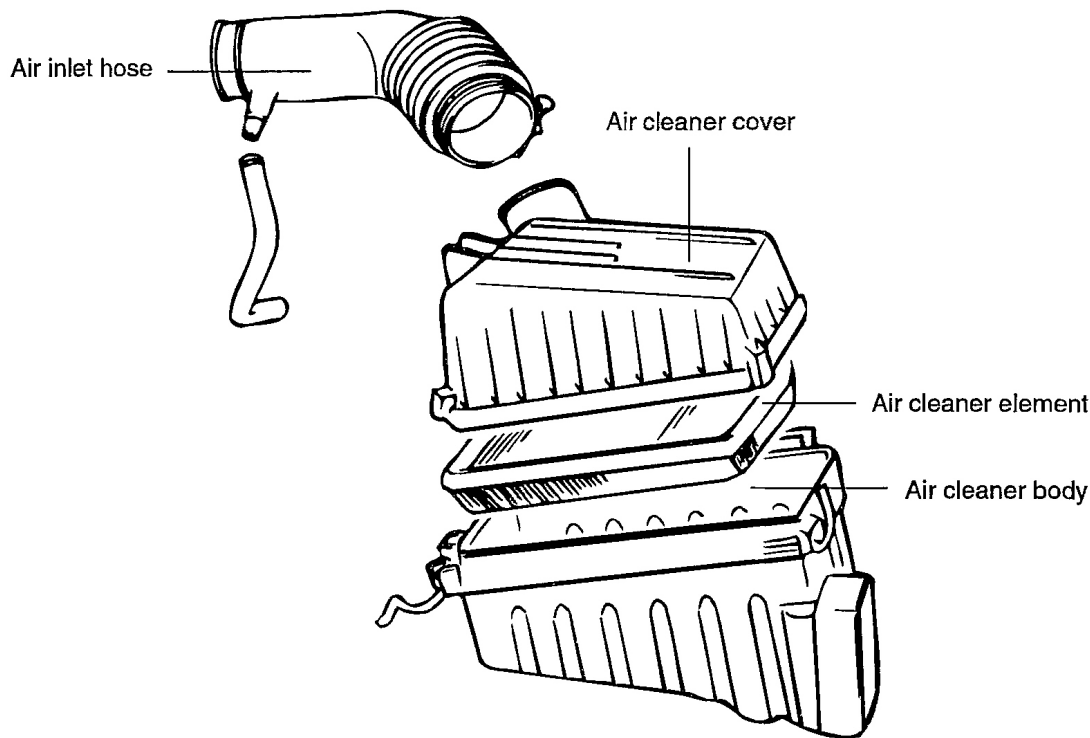
Fig. 160: Locating Front Exhaust Pipe
Courtesy of HYUNDAI MOTOR CO.

INSTALLATION

1. Temporarily install the front exhaust pipe, the center exhaust pipe, and the main muffler, in that order.
2. Tighten the parts securely. Make sure there is no interference with any body components.

AIR CLEANER (ACL)

COMPONENTS



TORQUE : Nm (kg.cm, lb.ft)

G00941806

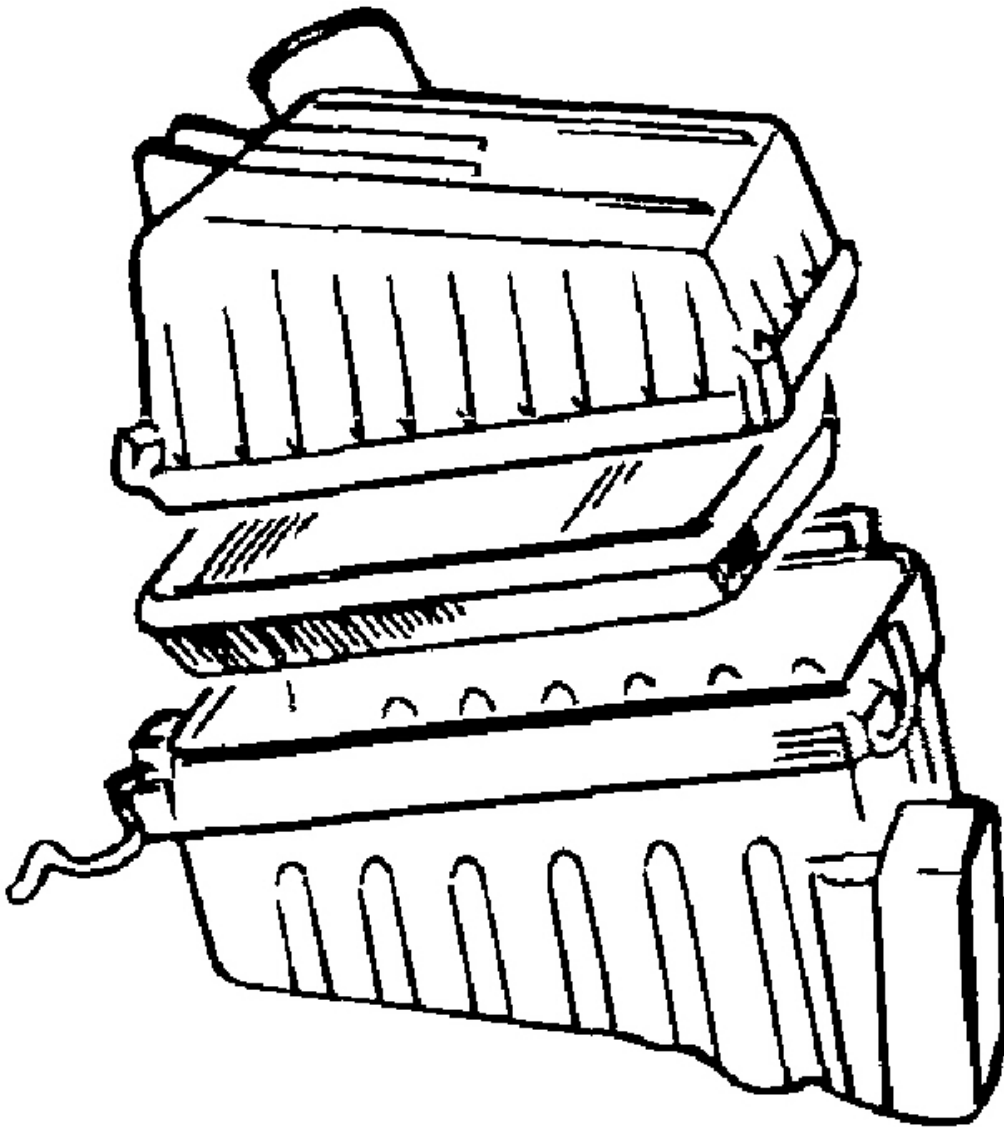
Fig. 161: Identifying Air Cleaner Components
Courtesy of HYUNDAI MOTOR CO.

REMOVAL

1. Remove the air duct connected to the air cleaner.
2. Disconnect the intake air temperature sensor harness.
3. Remove the air intake hose at the air cleaner side.
4. Remove the air cleaner cover and filter.
5. Remove the air cleaner mounting bolts and remove the air cleaner.

INSPECTION

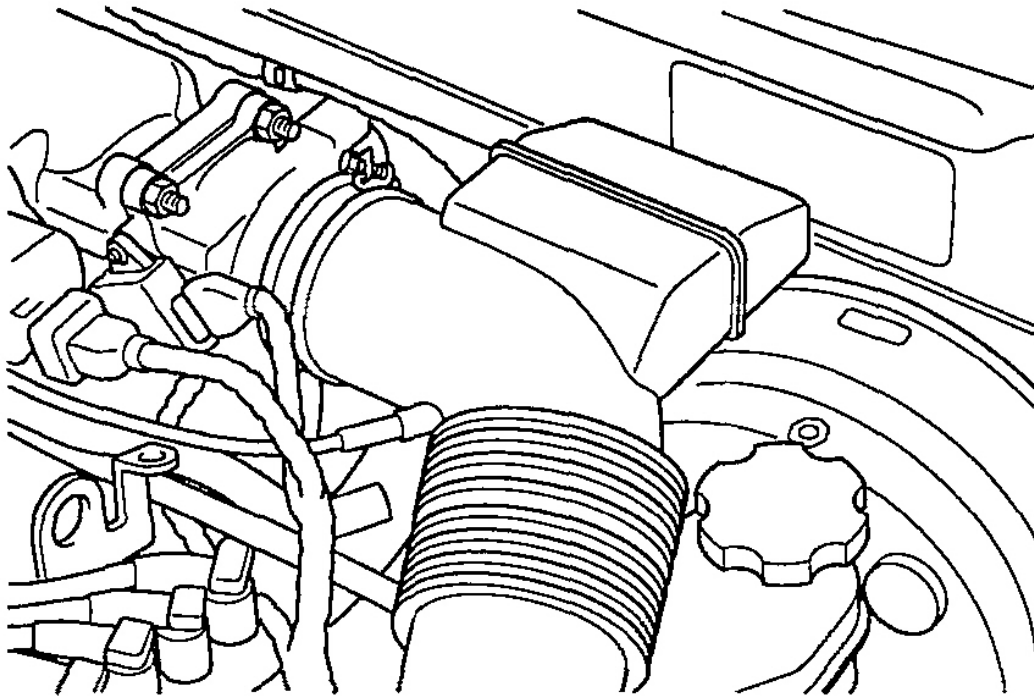
1. Check the air cleaner body, cover, or filter for distortion, corrosion or damage.
2. Check the air duct for damage.



G00941808

Fig. 162: Checking Air Duct For Damage
Courtesy of HYUNDAI MOTOR CO.

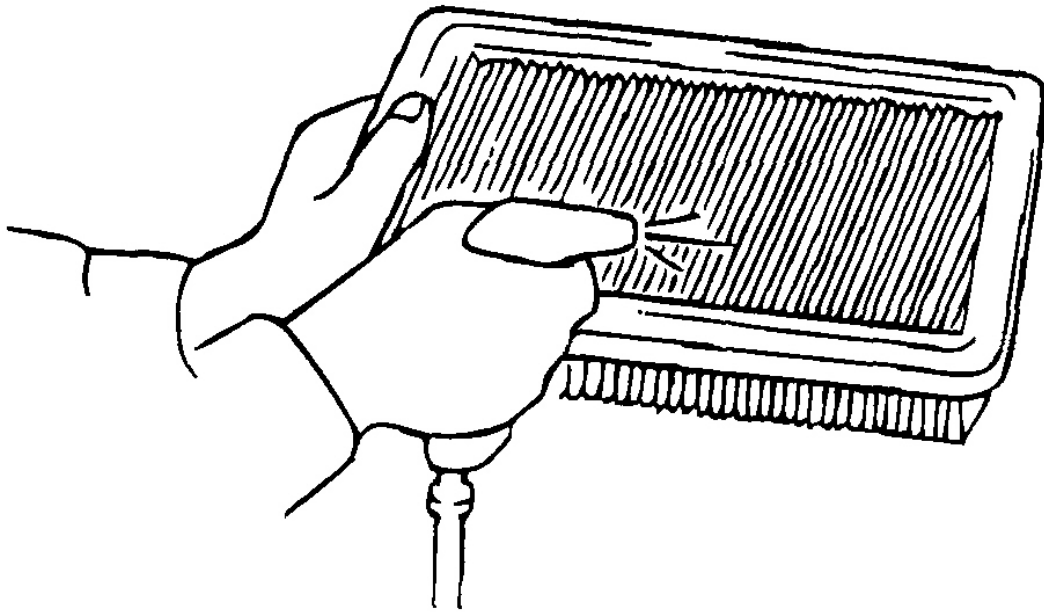
3. Check the resonator for distortion or damage.



G00941809

Fig. 163: Checking Resonator For Distortion Or Damage
Courtesy of HYUNDAI MOTOR CO.

4. Check the air cleaner filter for restriction, contamination or damage. If the filter is slightly restricted, remove the dust and other contaminants by blowing compressed air from the upper side through the filter.



G00941810

Fig. 164: Checking Air Cleaner Filter For Restriction, Contamination Or Damage
Courtesy of HYUNDAI MOTOR CO.

5. Check the air cleaner housing for restrictions, contamination or damage.

INSTALLATION

Install the air cleaner assembly following the reverse order of removal.

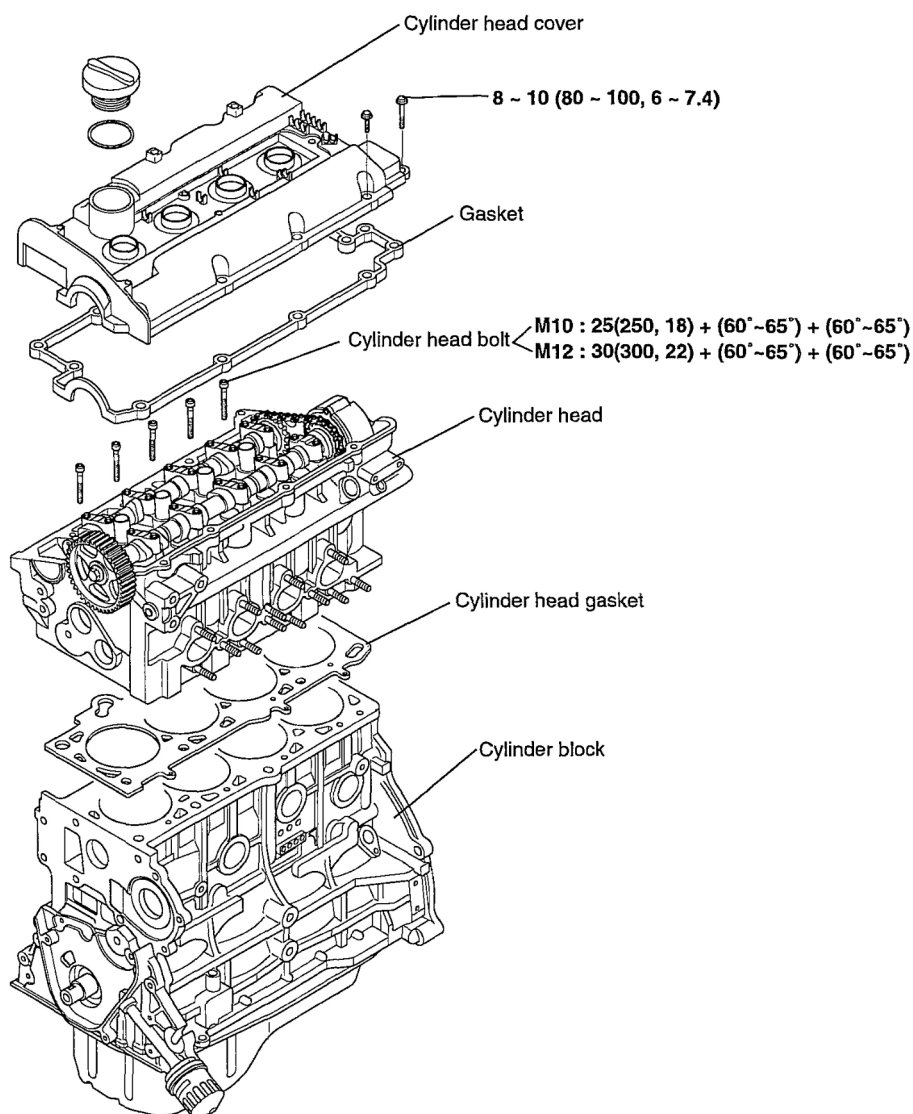
CYLINDER HEAD ASSEMBLY

CYLINDER HEAD

COMPONENTS

2004 Hyundai Tiburon GT

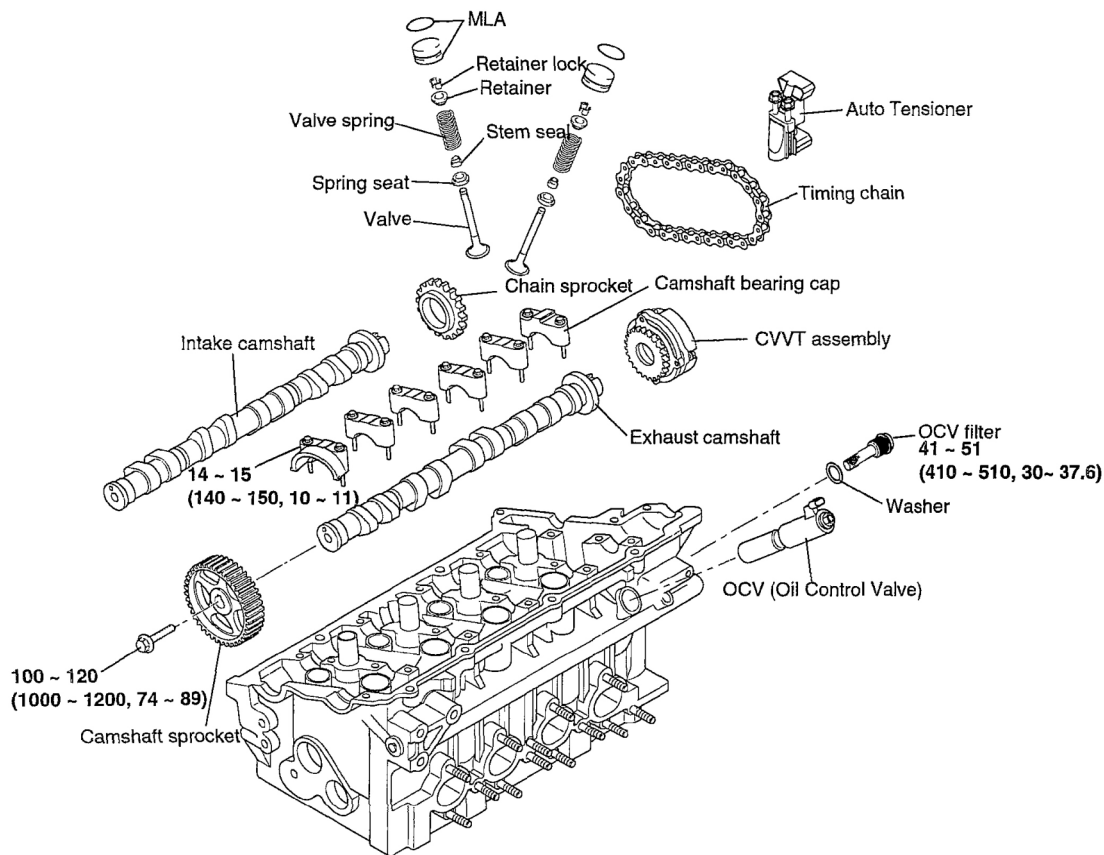
2004 ENGINES 2.0L 4-Cylinder - Tiburon



TORQUE : Nm (kgf.cm, lbf.ft)

G00941811

Fig. 165: Identifying Cylinder Head Components (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.



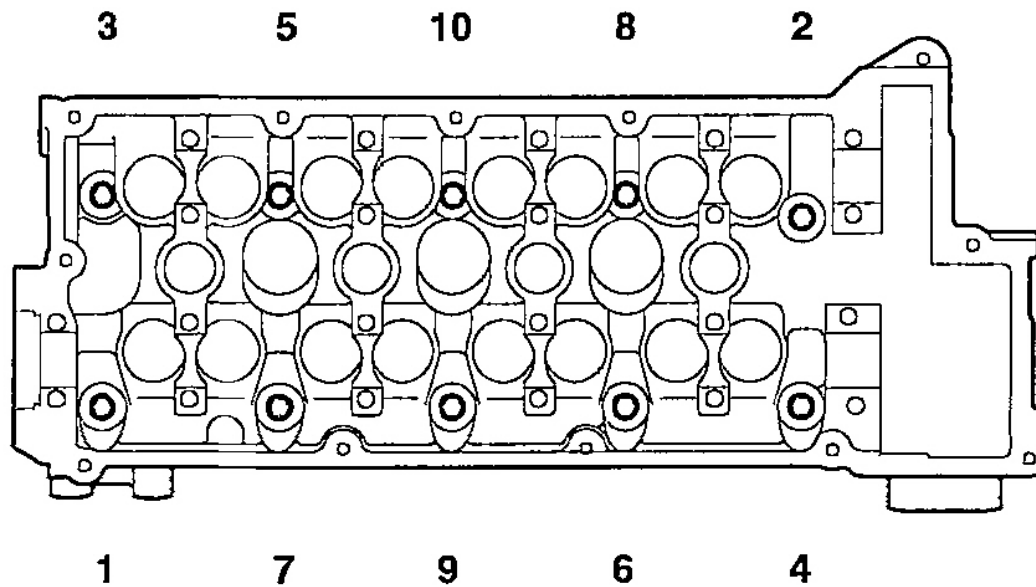
TORQUE : Nm (kgf.cm, lbf.ft)

G00941812

Fig. 166: Identifying Cylinder Head Components (2 Of 2)
 Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

1. Using remove the cylinder head bolts in the order shown in the illustration.



G00941813

Fig. 167: Removing Cylinder Head

Courtesy of HYUNDAI MOTOR CO.

2. Using the special tool (09222-28000, 09222-28100), remove the valve spring retainer lock. Next remove the spring retainer, valve spring, spring seat and valve.

NOTE: **Arrange these parts so that they can be reinstalled in their original positions.**

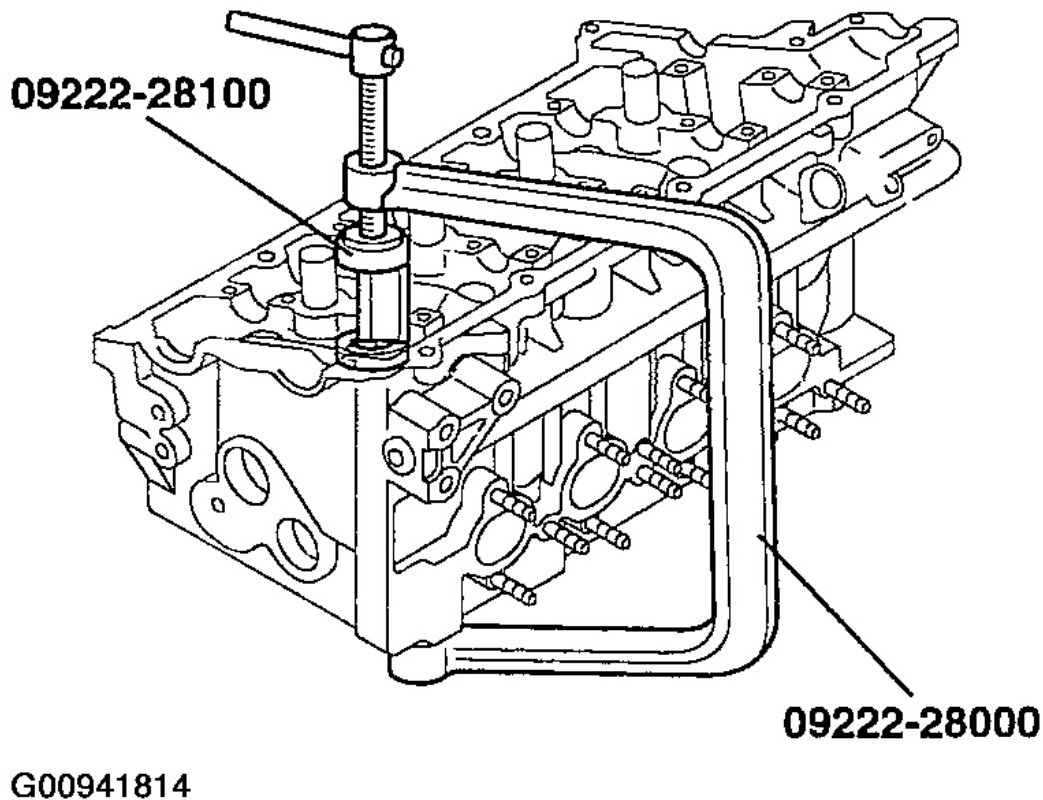


Fig. 168: Removing Valve Spring Retainer Lock
Courtesy of HYUNDAI MOTOR CO.

3. Remove the valve stem seals with pliers.

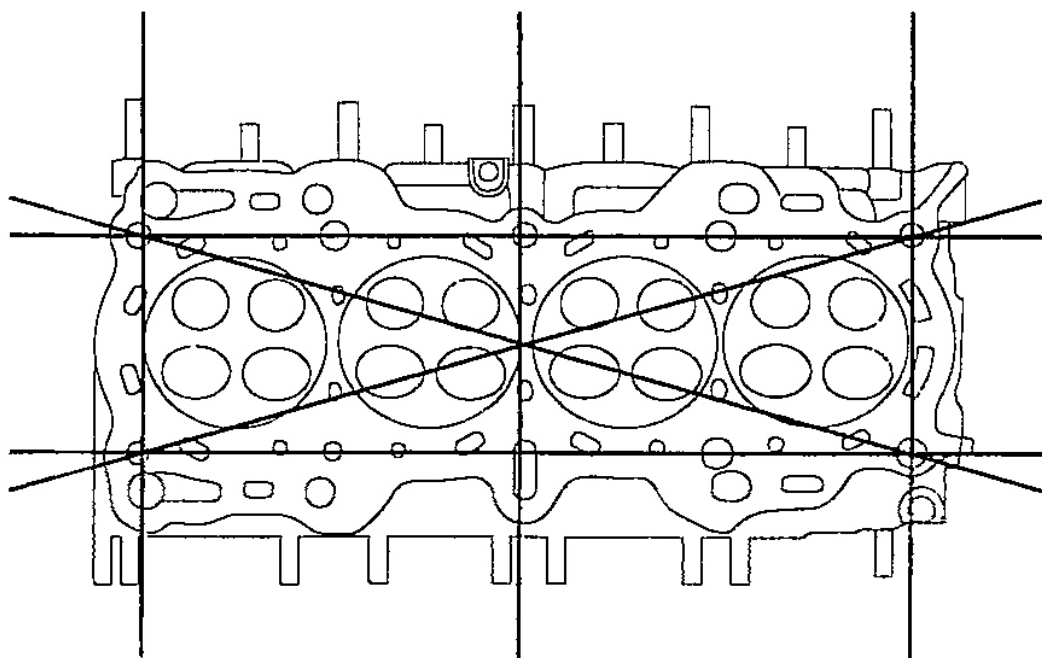
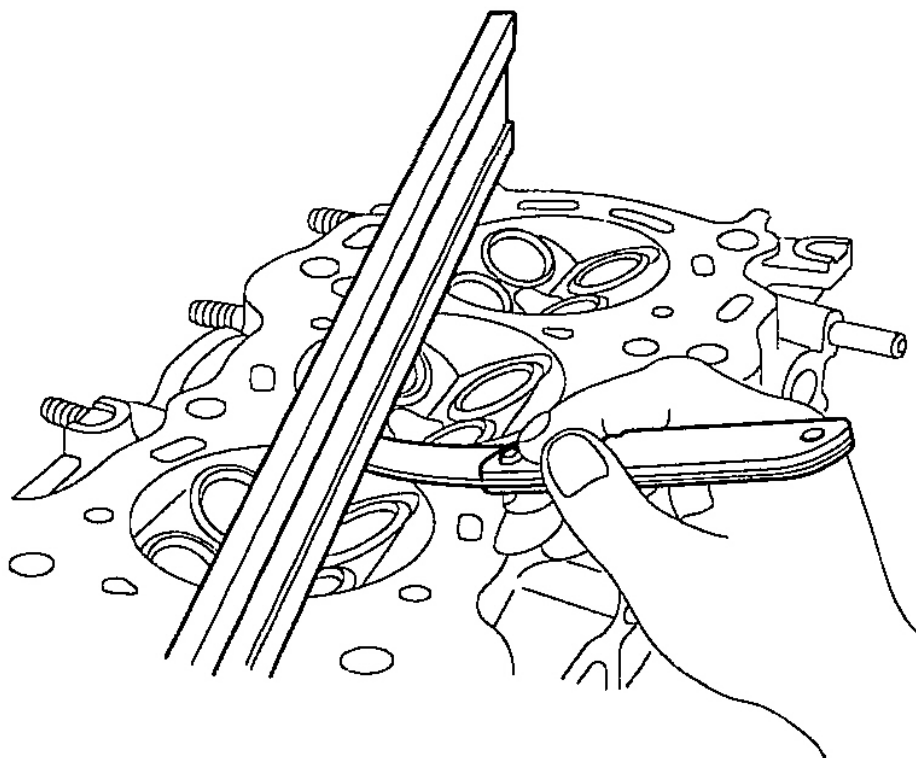
NOTE: Do not reuse the valve stem seals.

INSPECTION

1. Check the cylinder head for crack, damage and coolant leakage. If cracked replace the cylinder head.
2. Remove scale, sealing compound and carbon deposits completely. After cleaning the oil passages, apply compressed air to verify that the passages are not clogged.
3. Check the cylinder head surface for flatness in the direction as shown in the illustration. If flatness exceeds the service limit in any direction, either replace the cylinder head or machine the cylinder head matching surface lightly.

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon



G00941815

Fig. 169: Checking Cylinder Head Surface For Flatness
Courtesy of HYUNDAI MOTOR CO.

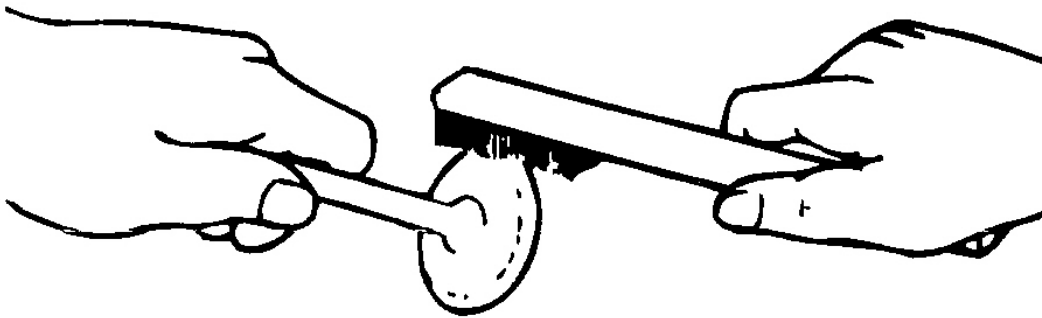
Flatness of cylinder head gasket surface

Standard : Less than 0.03mm (0.012in.)

Limit : 0.06mm (0.0024in.)

VALVES

1. Using a wire brush, clean the valve thoroughly.



G00941816

Fig. 170: Cleaning Valves
Courtesy of HYUNDAI MOTOR CO.

2. Check each valve for wear, damage and distortion of the head and the stem. Replace if necessary. If stem end, hollowed out or worn, resurface as necessary. This correction must be limited to a minimum. Also resurface the valve face.

Replace the valve if the margin has decreased to less than the service limit.

Margin

[Standard]

Intake : 1.15mm (0.0453in.)

Exhaust : 1.35mm (0.0531 in.)

[Limit]

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

Intake : 0.8mm (0.0315in.)

Exhaust : 1.0mm (0.040in.)

VALVE SPRING

1. Check the free height of each valve spring. If they exceed the service limit, replace the springs.
2. Using a square, test the squareness of each spring. If a spring is excessively out-of-square, replace it.

Valve spring

[Standard]

Free height : 48.86mm (1.9236in.)

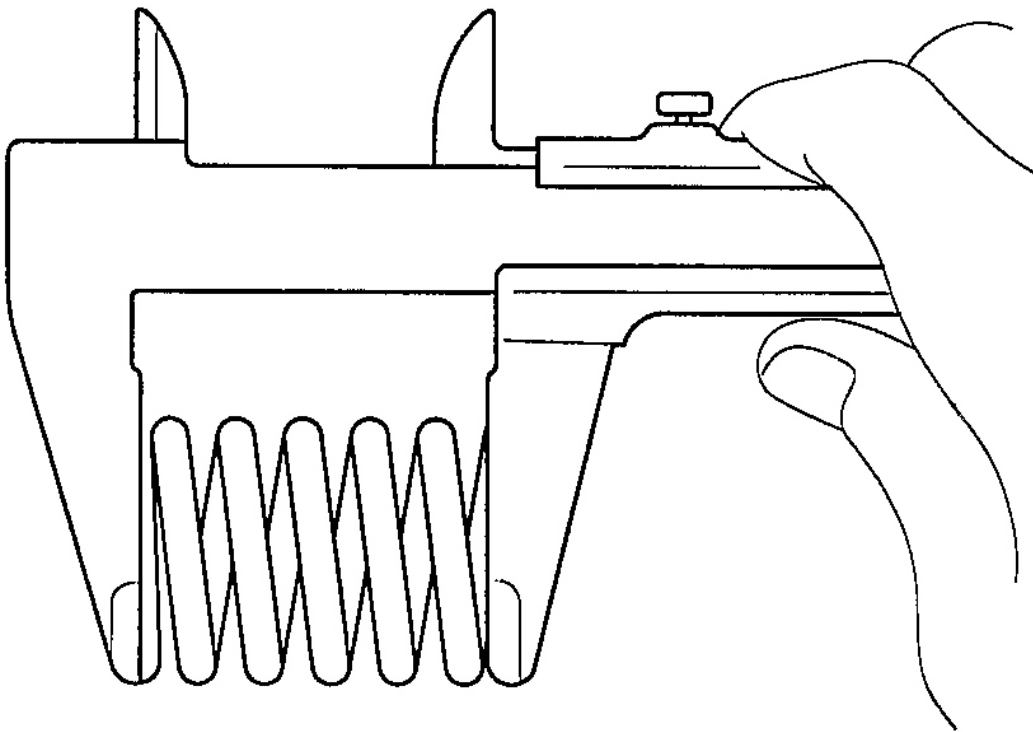
Load : 18.3kg/39mm (40.0kg/30.5mm)

Out-of-square : 1.5° or less

[Limit]

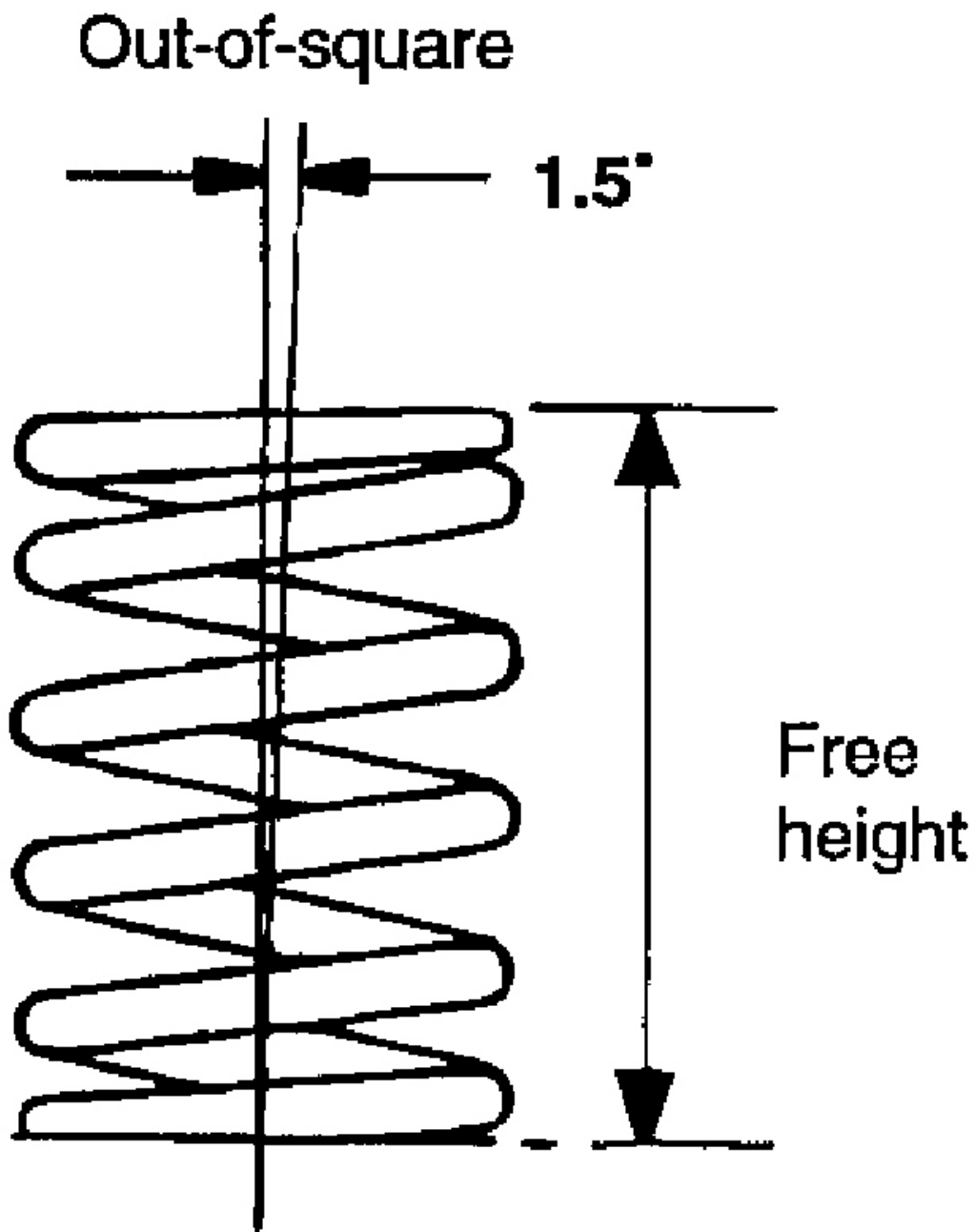
Free height : -1.0mm (-0.0394in.)

Out-of-square : 3°



G00941817

Fig. 171: Testing Squareness Of Spring (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.



G00941818

Fig. 172: Testing Squareness Of Spring (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

VALVE GUIDE

Check the valve stem-to-guide clearance. If the clearance exceeds the service limit, replace the valve guide.

Valve stem-to-guide clearance

[Standard]

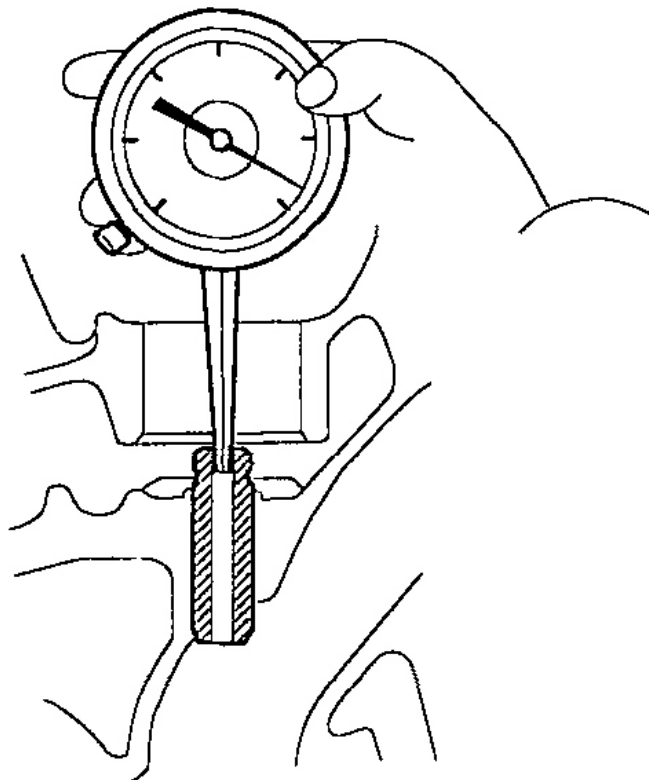
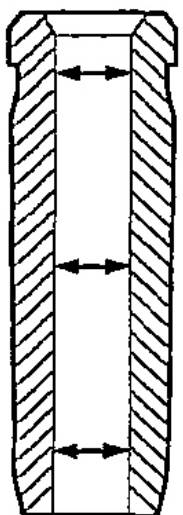
Intake : 0.02 ~ 0.05mm (0.0008 ~ 0.0020in.)

Exhaust : 0.035 ~ 0.065mm (0.0014 ~ 0.0026in.)

[Limit]

Intake : 0.1mm (0.0040in.)

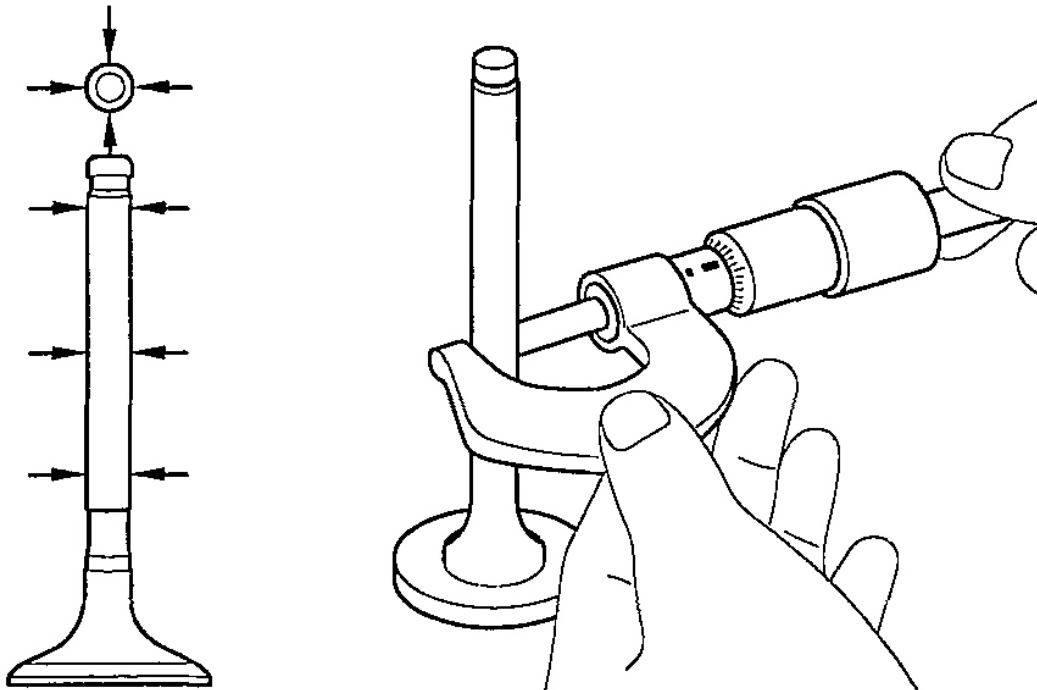
Exhaust : 0.13mm (0.0051 in.)



G00941819

Fig. 173: Checking Valve Stem-To-Guide Clearance (1 Of 2)

Courtesy of HYUNDAI MOTOR CO.



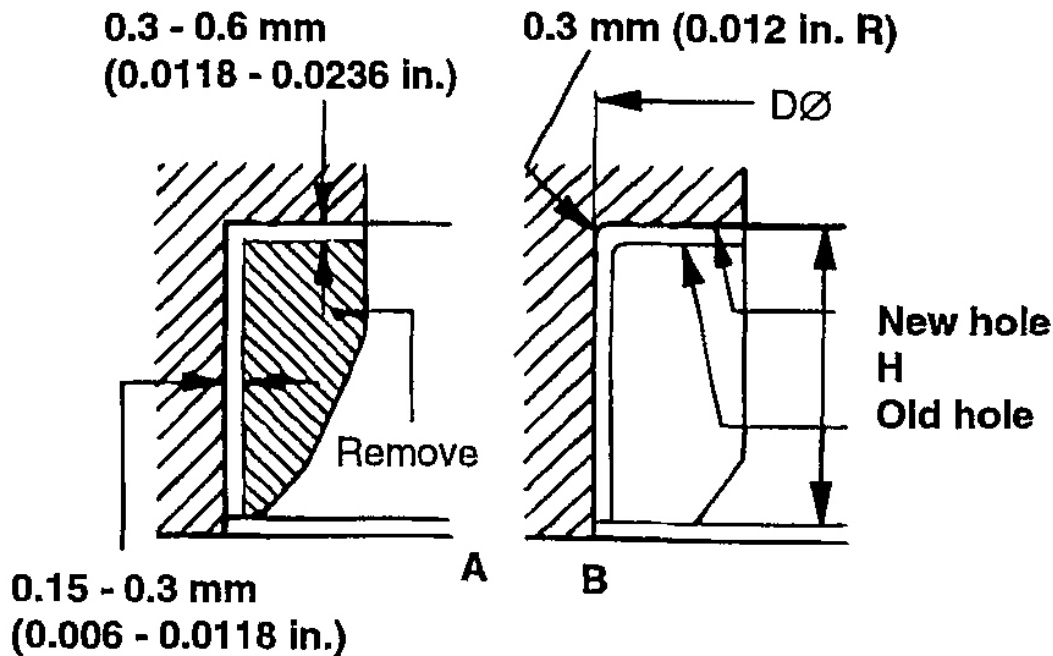
G00941820

Fig. 174: Checking Valve Stem-To-Guide Clearance (2 Of 2)

Courtesy of HYUNDAI MOTOR CO.

REPLACING THE VALVE SEAT RING

1. Cut away the inner face of the valve seat to reduce the wall thickness.



G00941821

Fig. 175: Replacing Valve Seat Ring
Courtesy of HYUNDAI MOTOR CO.

2. Enlarge the diameter of the valve seat so that it matches the specified oversize hole diameter of the new valve seat ring.
3. Heat the cylinder head to about 250°C (480°F) and press-fit an oversize seat ring for the bore in the cylinder head.
4. Using lapping compound, lap the valve to the new seat.

Valve seat contact width

Intake : 1.1 ~ 1.5mm (0.0433 ~ 0.0590in.)

Exhaust : 1.3 ~ 1.7mm (0.0512 ~ 0.0670in.)

VALVE SEAT INSERT OVERSIZES

2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

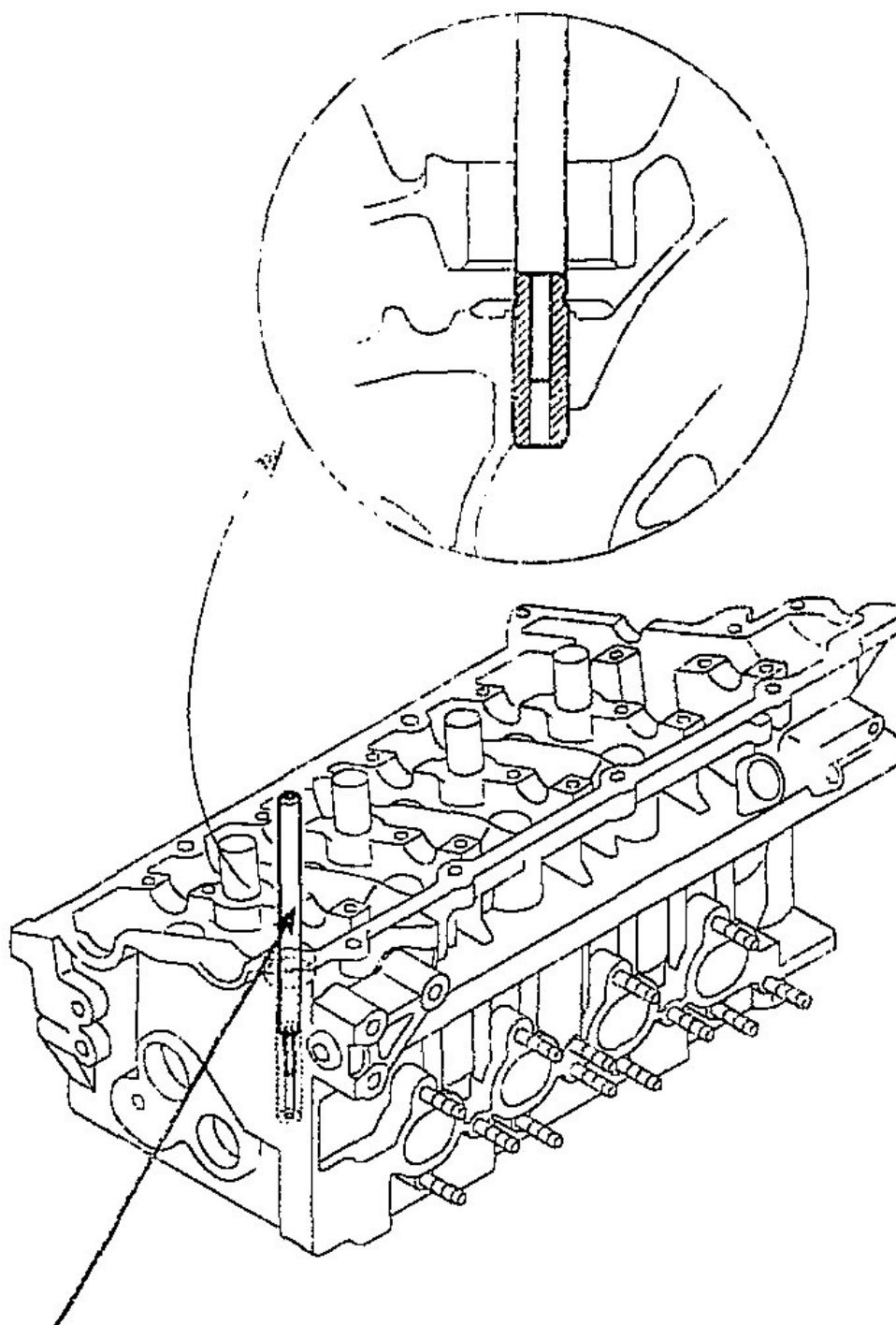
Description	Size mm (in.)	Size mark	Seat ring height H mm(in.)	Oversize hole diameter I.D. mm(in.)
Intake valve Seat ring	0.3 (0.012) O.S.	30	7.5 ~ 7.7 (0.296 ~ 0.303)	33.300 ~ 33.325 (1.3110 ~ 1.3120)
	0.6 (0.024) O.S.	60	7.8 ~ 8.0 (0.307 ~ 0.315)	33.600 ~ 33.625 (1.1339 ~ 1.1347)
Exhaust valve Seat ring	0.3 (0.012) O.S.	30	7.9 ~ 8.1 (0.311 ~ 0.319)	28.800 ~ 28.821 (1.1339 ~ 1.1347)
	0.6 (0.024) O.S.	60	8.2 ~ 8.4 (0.323 ~ 0.331)	29.100 ~ 29.121 (1.1457 ~ 1.1465)

G00941822

Fig. 176: Valve Seat Insert Oversizes Table
Courtesy of HYUNDAI MOTOR CO.

REPLACING VALVE GUIDE

1. Using the special tool (09221-3F100 A/B), with draw the old valve guide toward the bottom of cylinder head.
2. Recondition the valve guide hole so that it can match the newly press-fitted oversize valve guide.



09221-3F100A

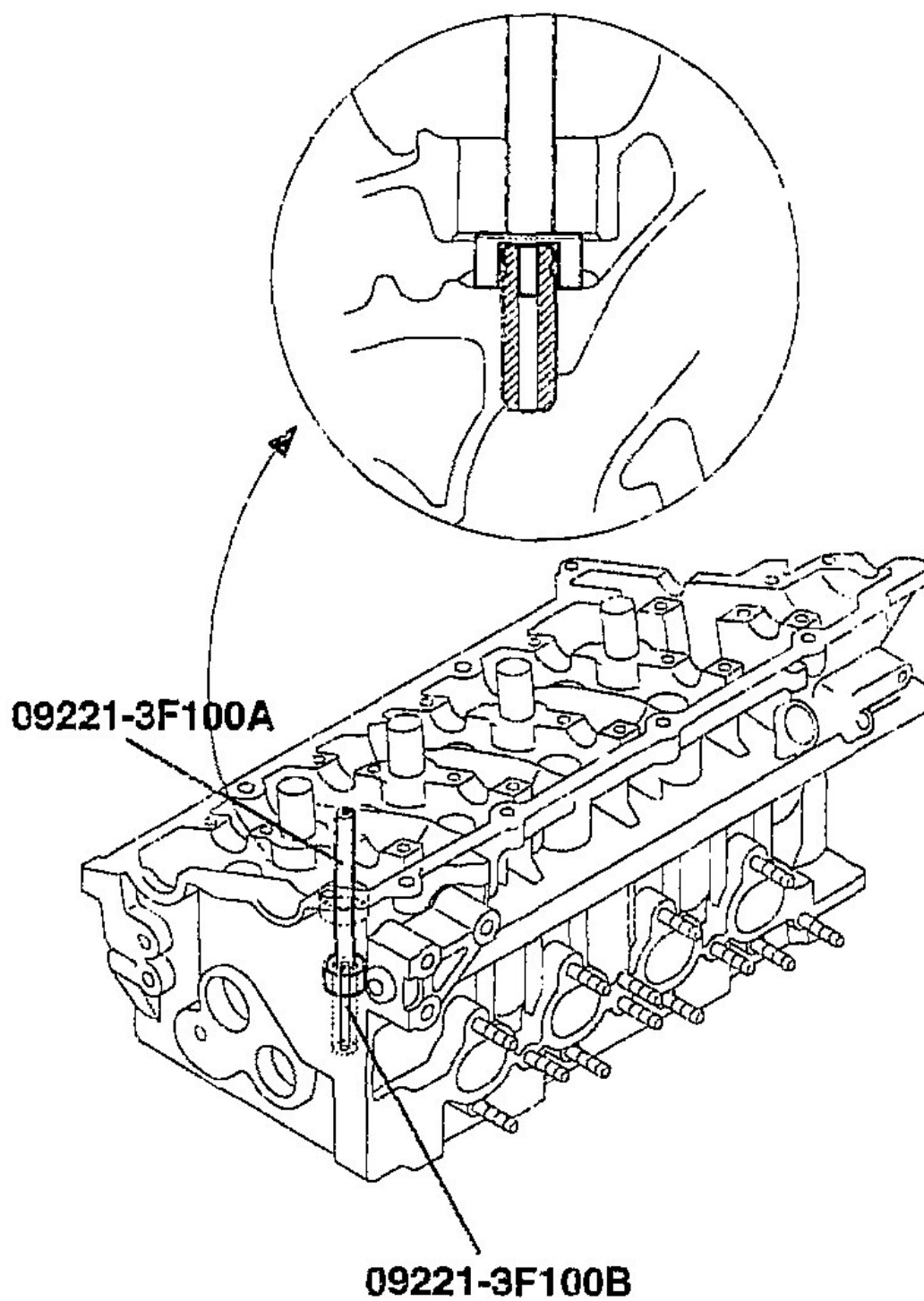
G00941823

Fig. 177: Reconditioning Valve Guide Hole So That It Can Match Newly Press-Fitted Oversize Valve Guide**Courtesy of HYUNDAI MOTOR CO.**

3. Using the special tool (09221-3F100 A/B), press-fit the valve guide. The valve guide must be press-fitted from the upper side of the cylinder head. Keep in mind that the intake and exhaust valve guides are different in length.

2004 Hyundai Tiburon GT

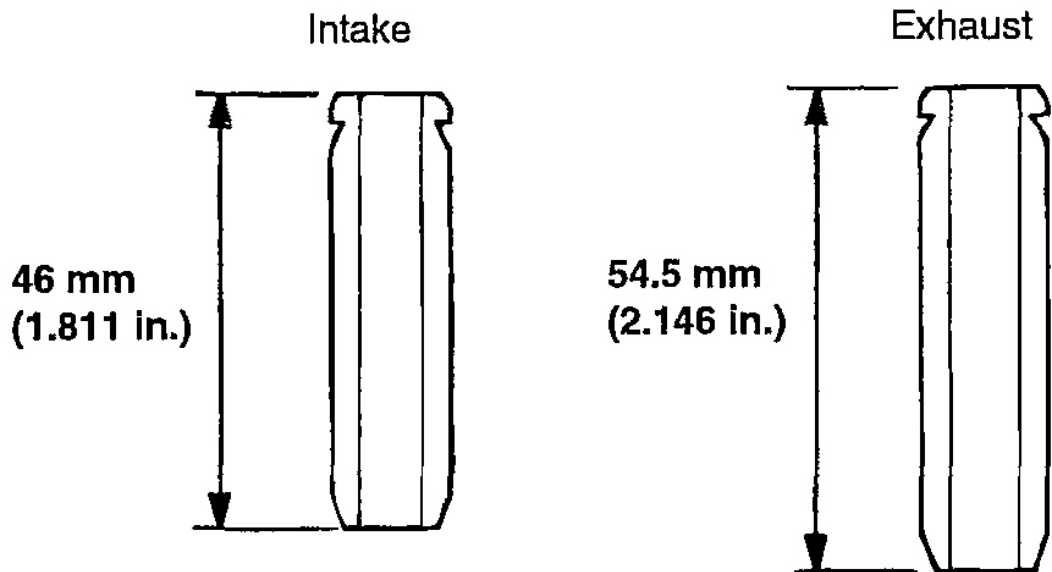
2004 ENGINES 2.0L 4-Cylinder - Tiburon



G00941824

Fig. 178: Press-Fitting Valve Guide
Courtesy of HYUNDAI MOTOR CO.

NOTE: Do not install a valve guide unless it is oversize.



G00941825

Fig. 179: Identifying Intake & Exhaust Valve Guide Length
Courtesy of HYUNDAI MOTOR CO.

4. After the valve guide is press-fitted, insert a new valve and check for proper stem-to-guide clearance.
5. After the valve guide is replaced, check that the valve is seated properly. Recondition the valve seats as necessary.

VALVE GUIDE OVERSIZES

Over size mm (in.)	Size mark	Over size valve Guide hole size mm (in.)
0.05 (0.002)	5	11.05 ~ 11.068 (0.4350 ~ 0.4357)
0.25 (0.010)	25	11.25 ~ 11.268 (0.4429 ~ 0.4436)
0.50 (0.020)	50	11.50 ~ 11.518 (0.4528 ~ 0.4535)

G00941826

Fig. 180: Valve Guide Oversizes Table
 Courtesy of HYUNDAI MOTOR CO.

REASSEMBLY

NOTE:

1. Clean each part before assembly.
2. Apply engine oil to the sliding and rotating parts.

1. Install the spring seats.

Using a special tool (09222-22001), tap the seal in position lightly.

NOTE:

- Do not reuse old valve stem seals.
 - Incorrect installation of the seal could result in oil leakage past the valve guides.
2. Apply engine oil to each valve. Insert the valve into the valve guide. Avoid pushing the valve into the seal by force. After inserting the valve, check that it moves smoothly.

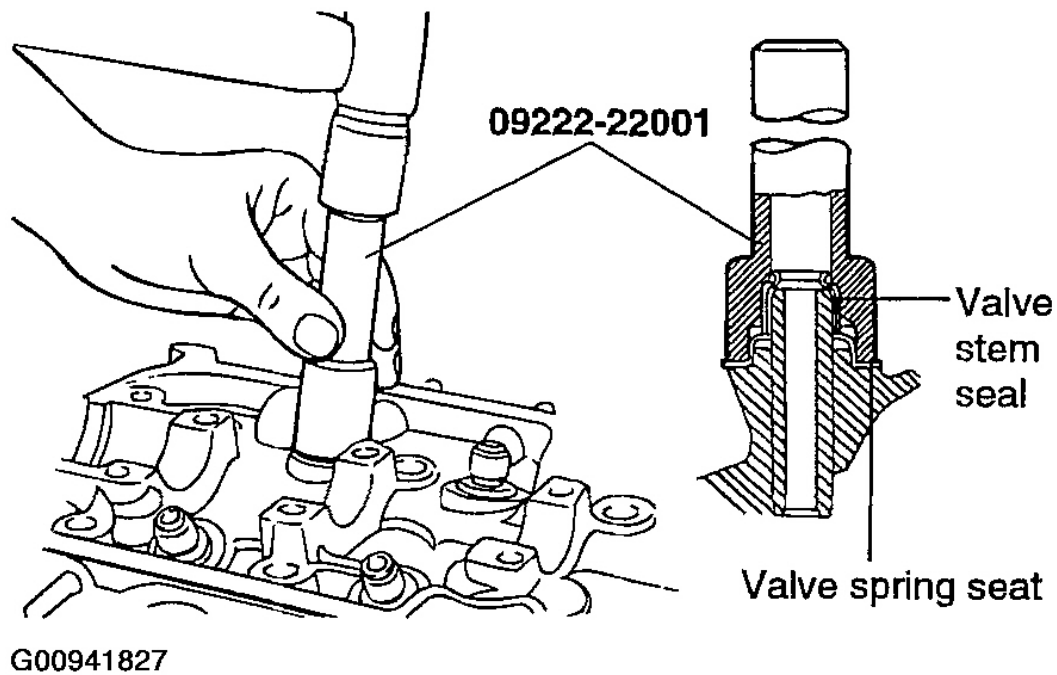
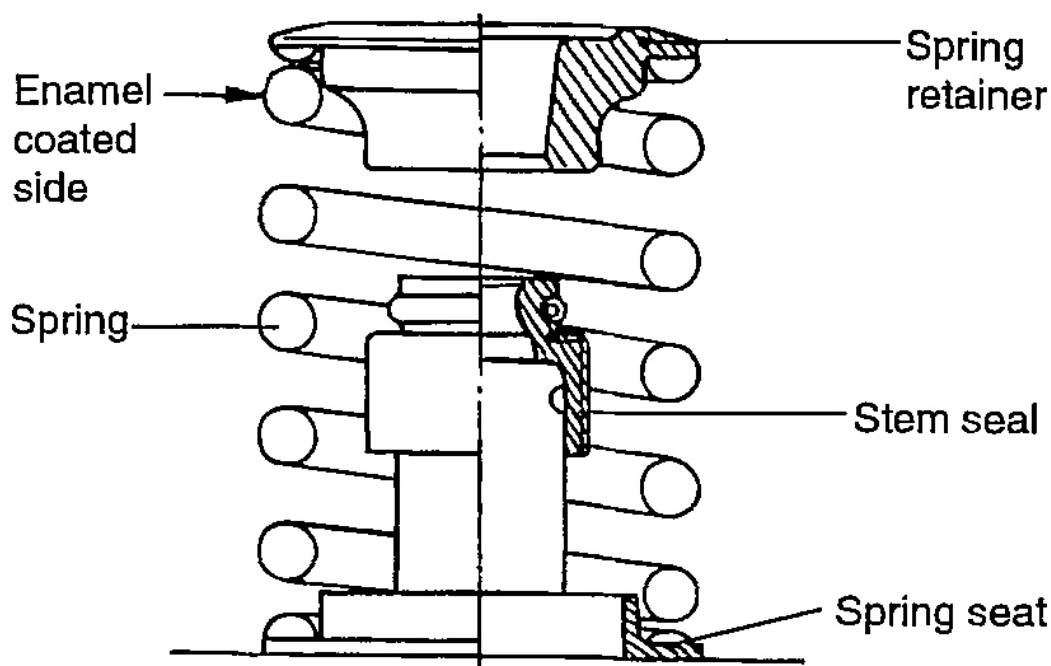


Fig. 181: Inserting Valve Into Valve Guide
Courtesy of HYUNDAI MOTOR CO.

3. Place valve springs so that the side coated with enamel faces toward the valve spring retainer and then install the retainer.



G00941828

Fig. 182: Placing Valve Springs So That Side Coated With Enamel Faces Toward Valve Spring Retainer

Courtesy of HYUNDAI MOTOR CO.

4. Using the special tool (09222-28000, 09222-28100), compress the spring and install the retainer locks. After install the valves, ensure that the retainer locks are correctly in place before releasing the valve spring compressor.

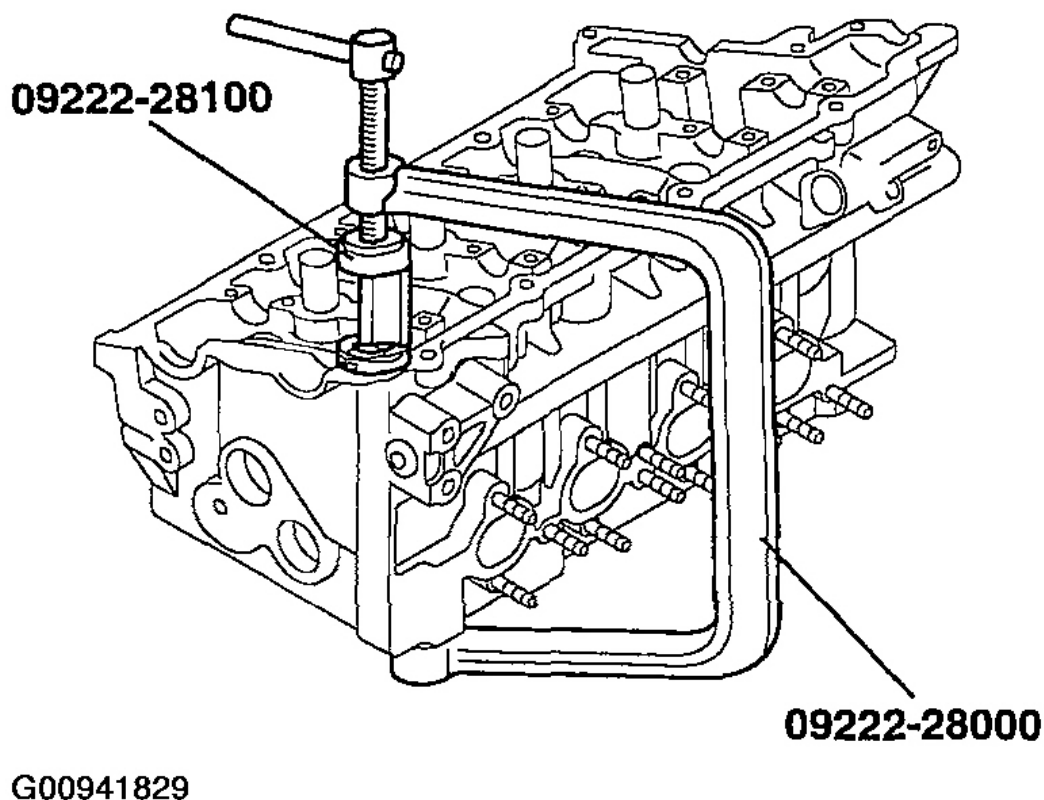
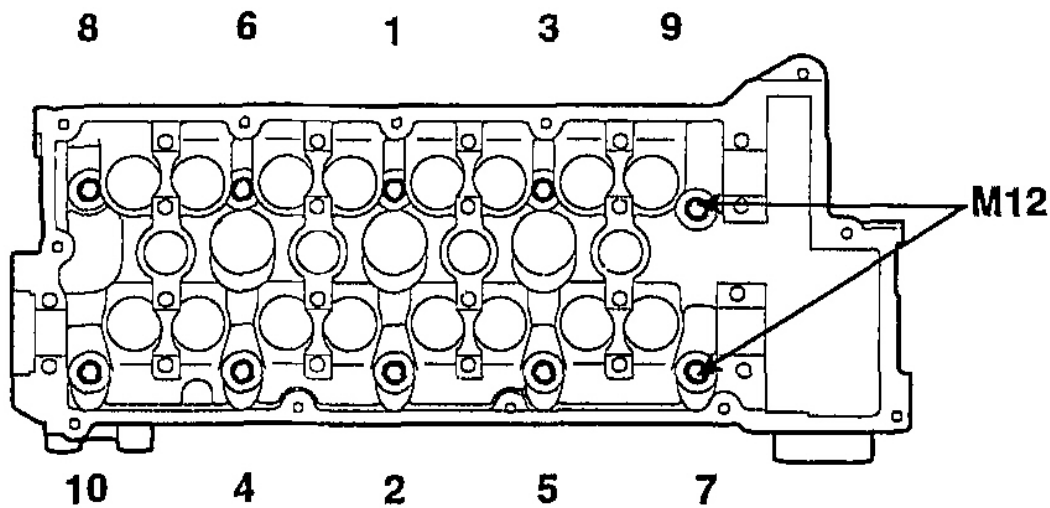


Fig. 183: Compressing Spring & Installing Retainer Locks Using Special Tool (09222-28000, 09222-28100)

Courtesy of HYUNDAI MOTOR CO.

NOTE: When the spring is compressed, check that the valve stem seal is not pressed against the bottom of the retainer.

5. Clean both gasket surfaces of the cylinder block and cylinder head.
6. Verify the identification marks on the cylinder head gasket.
7. Install the gasket so that the surface with the identification mark faces toward the cylinder head.
8. Tighten the bolts to the specified torque in the sequence shown below.



G00941830

Fig. 184: Identifying Head Bolt Tightening Sequence

Courtesy of HYUNDAI MOTOR CO.

Cylinder head bolt

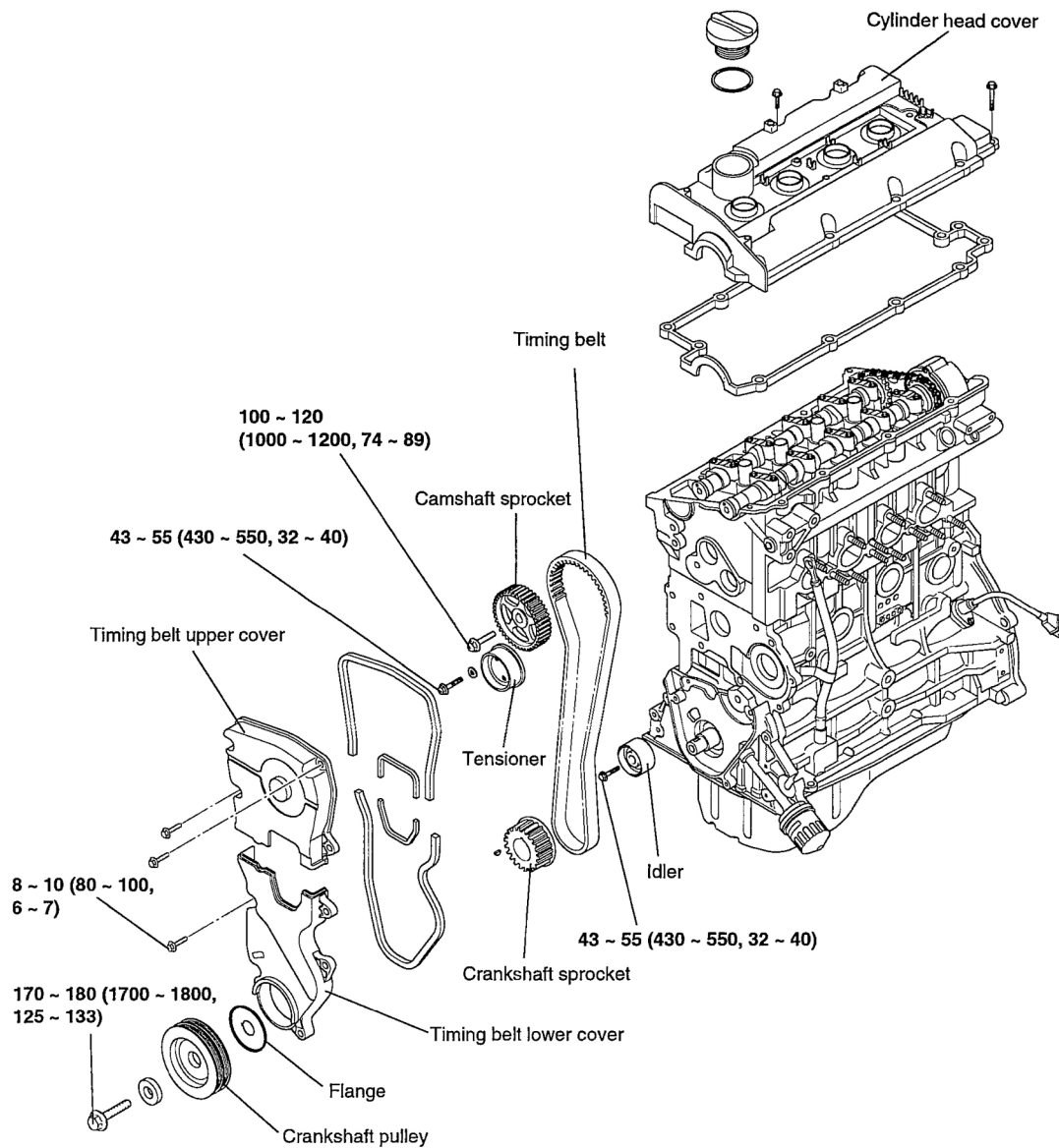
M10 : 25Nm (250kg.cm, 18lb.ft) + (60° ~ 65°) + (60° ~ 65°)

M12 : 30Nm (300kg.cm, 22lb.ft) + (60° ~ 65°) + (60° ~ 65°)

TIMING SYSTEM

TIMING BELT

COMPONENTS



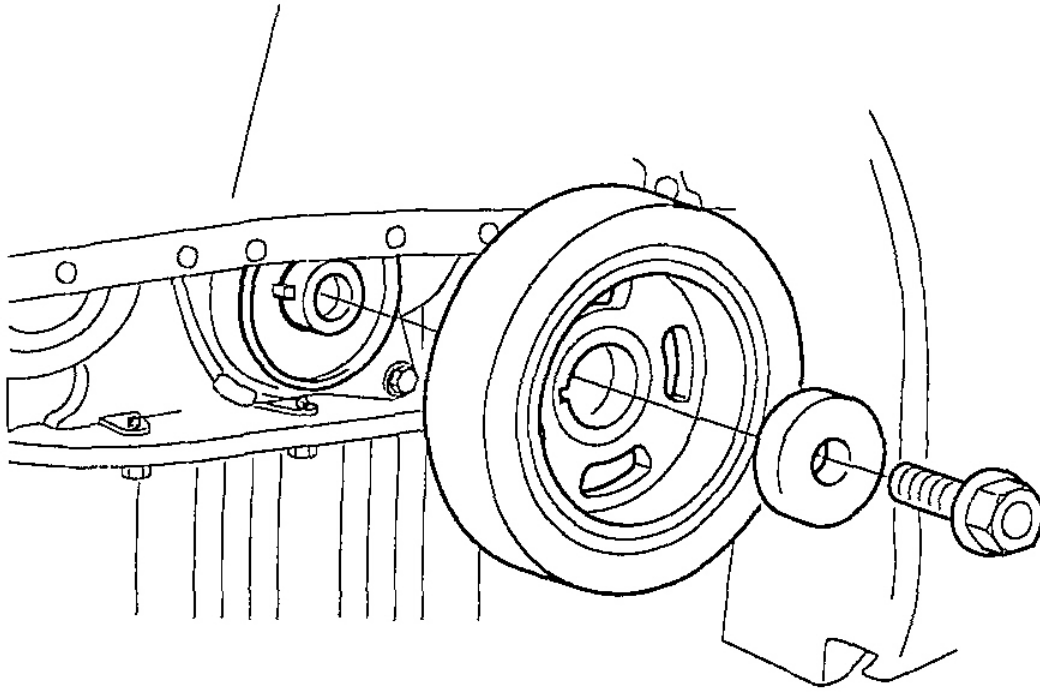
TORQUE : Nm (kgf.cm, lbf.ft)

G00941831

Fig. 185: Identifying timing System components
Courtesy of HYUNDAI MOTOR CO.

DISASSEMBLY

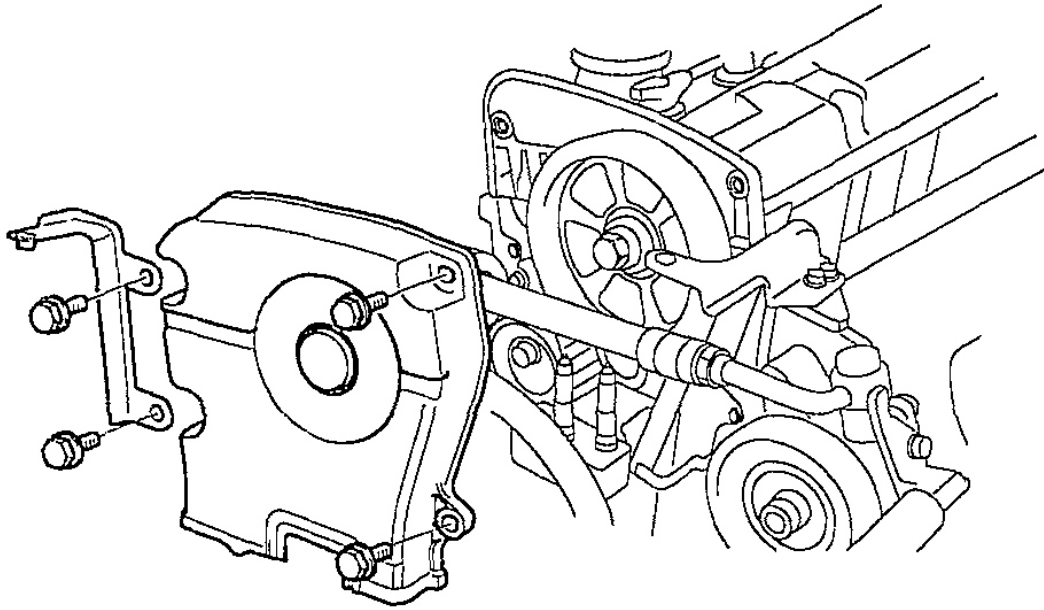
1. Remove the alternator belt.
2. Remove the coolant pump pulley.
3. Remove the power steering belt and airconditioner belt.
4. Remove the crankshaft pulley.



G00941832

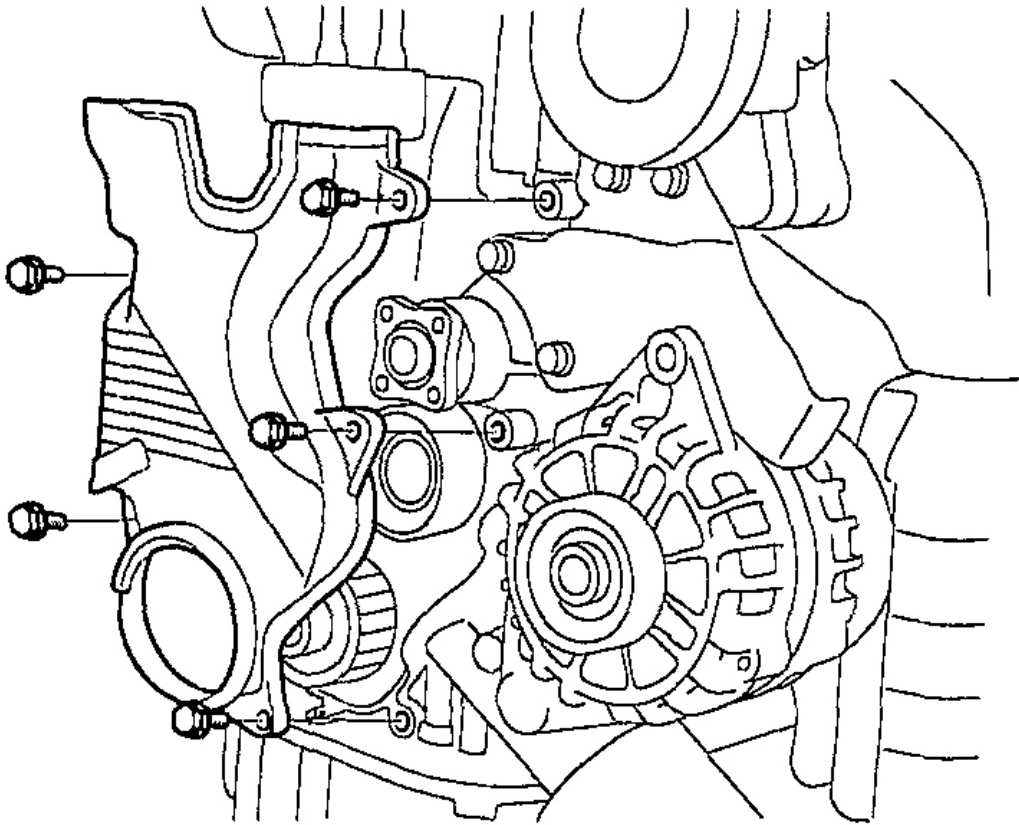
Fig. 186: Removing Crankshaft Pulley
Courtesy of HYUNDAI MOTOR CO.

5. Remove the timing belt cover.



G00941833

Fig. 187: Removing Timing Belt Cover (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.



G00941834

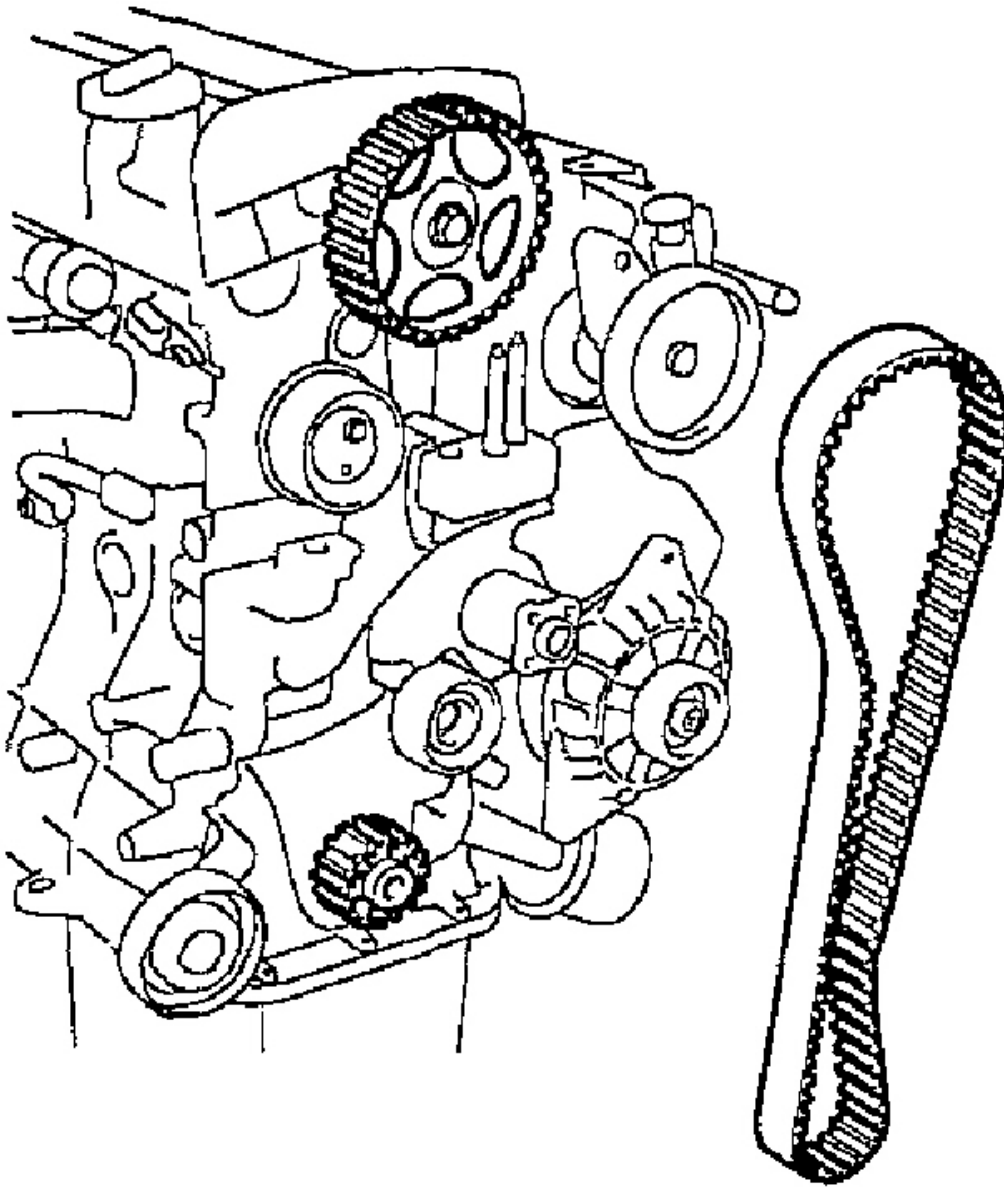
Fig. 188: Removing Timing Belt Cover (2 Of 2)

Courtesy of HYUNDAI MOTOR CO.

6. Remove the timing belt tensioner pulley.

NOTE: If the timing belt is reused, make an arrow indicating the turning direction (or the front of the engine) to make sure that the belt is reinstalled in the same direction as before.

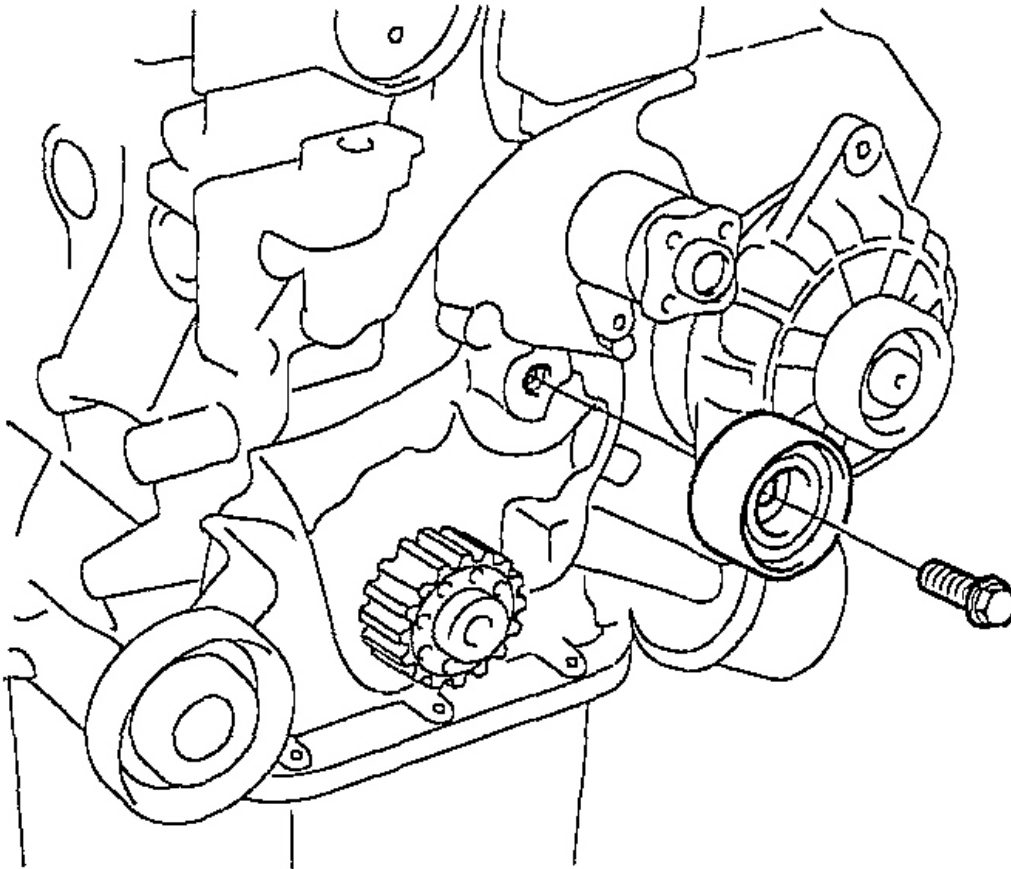
7. Remove the timing belt.



G00941836

Fig. 189: Removing Timing Belt
Courtesy of HYUNDAI MOTOR CO.

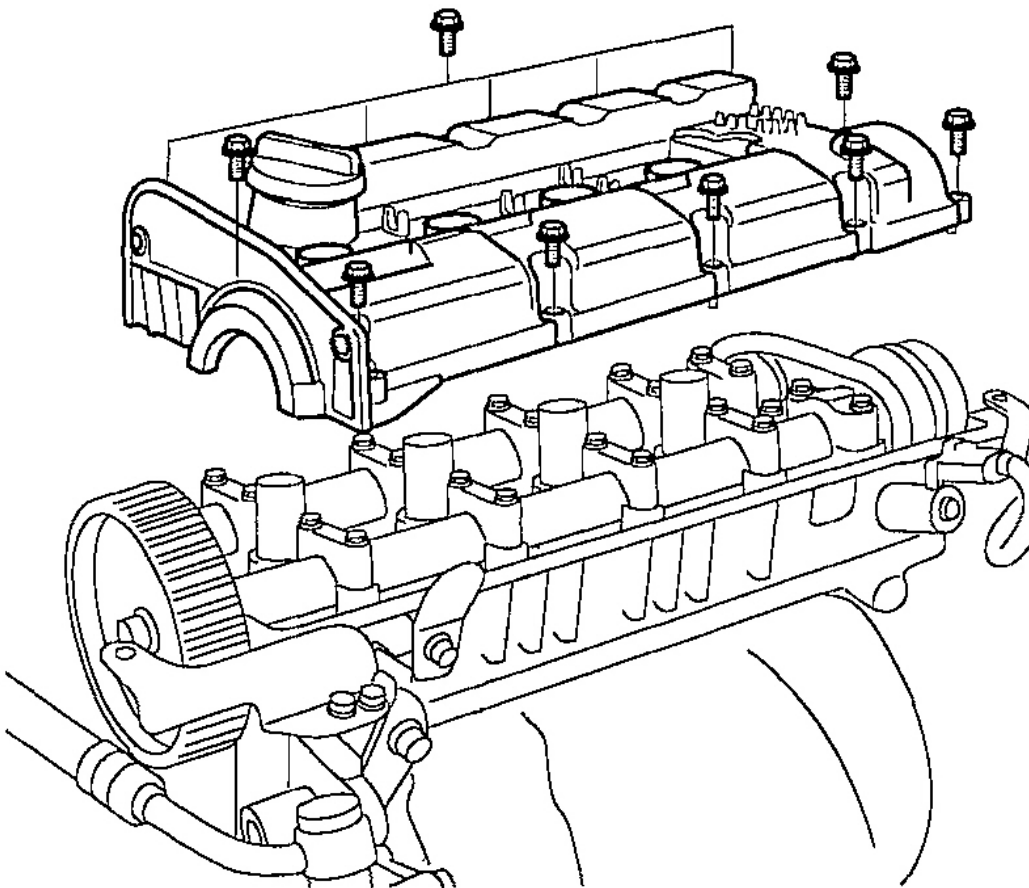
8. Remove the idler pulley.



G00941837

Fig. 190: Removing Idler Pulley
Courtesy of HYUNDAI MOTOR CO.

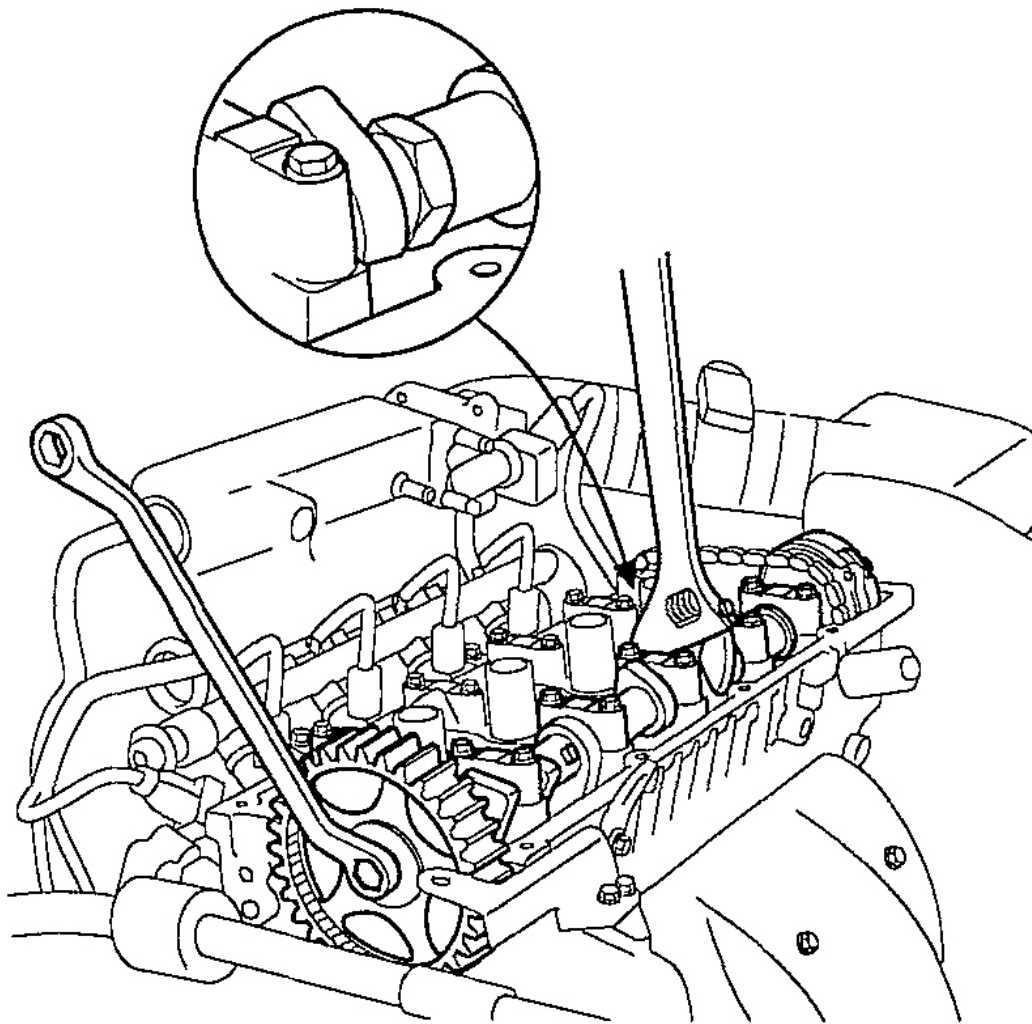
9. Remove the cylinder head cover.



G00941838

Fig. 191: Removing Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

10. Remove the camshaft sprocket.

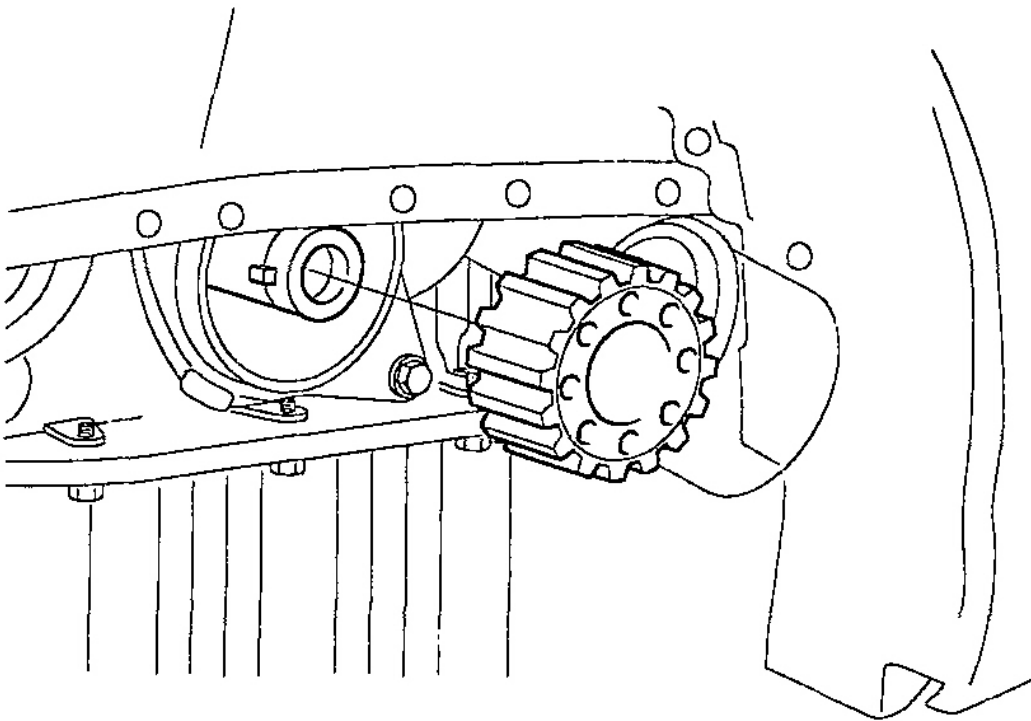


G00941839

Fig. 192: Removing Camshaft Sprocket
Courtesy of HYUNDAI MOTOR CO.

NOTE: Be careful not to damage the cylinder head with the wrench.

11. Remove the crankshaft sprocket from crankshaft.



G00941840

Fig. 193: Removing Crankshaft Sprocket From Crankshaft
Courtesy of HYUNDAI MOTOR CO.

INSPECTION

SPROCKETS,

1. Check the camshaft sprocket, crankshaft sprocket, tensioner pulley, and idler pulley for abnormal wear, cracks, or damage. Replace as necessary.
2. Inspect the tensioner pulley and the idler pulley for easy and smooth rotation and check for play or noise. Replace as necessary.
3. Replace the pulley if there is a grease leak from its bearing.

TIMING BELT

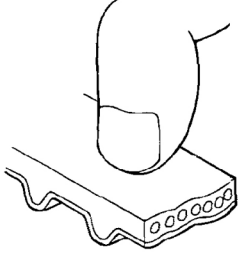
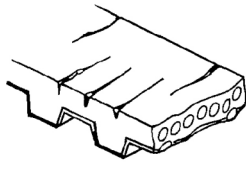
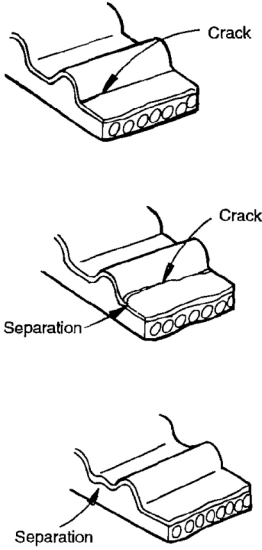
1. Check the belt for oil or dust deposits. Replace, if necessary.

Small deposits should be wiped away with a dry cloth or paper. Do not clean with solvent.

2. When the engine is overhauled or belt tension adjusted, check the belt carefully. If any of the following flaws are evident, replace the belt.

NOTE:

- Do not bend, twist or turn the timing belt inside out.
- Do not allow the timing belt to come into contact with oil, water and steam.

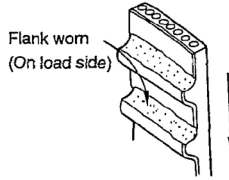
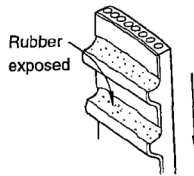
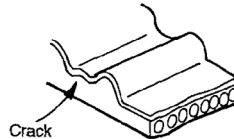
Description	Flaw conditions
1. Hard back surface of rubber	Back surface is glossy, non-elastic and so hard that, when your fingernail is pressed into it, no mark is produced. 
2. Cracked back surface of rubber	
3. Cracked or separating canvas	

G00941843

Fig. 194: Inspecting Timing Belt (1 Of 3)
Courtesy of HYUNDAI MOTOR CO.

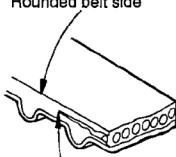
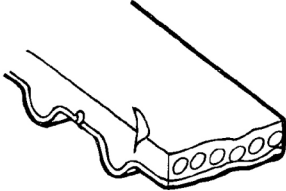
2004 Hyundai Tiburon GT

2004 ENGINES 2.0L 4-Cylinder - Tiburon

Description	Flaw conditions
4. Badly worn teeth (initial stage)	Tooth flank shows canvas on the load side (Fluffy canvas fibers, rubber changed into white color and unclear canvas texture) Flank worn (On load side) 
5. Badly worn teeth (last stage)	Tooth flank worn and rubber exposed on load side (tooth width reduced) Rubber exposed 
6. Cracked tooth bottom	
7. Missing tooth	Tooth missing and canvas fiber exposed 

G00941844

Fig. 195: Inspecting Timing Belt (2 Of 3)
Courtesy of HYUNDAI MOTOR CO.

Description	Flaw conditions
8. Badly worn side of belt  NOTE Normal belt should have precisely cut side as if cut by a sharp knife.	Rounded belt side  Abnormal wear (Fluffy canvas fiber)
9. Cracked side of belt	

G00941845

Fig. 196: Inspecting Timing Belt (3 Of 3)
Courtesy of HYUNDAI MOTOR CO.

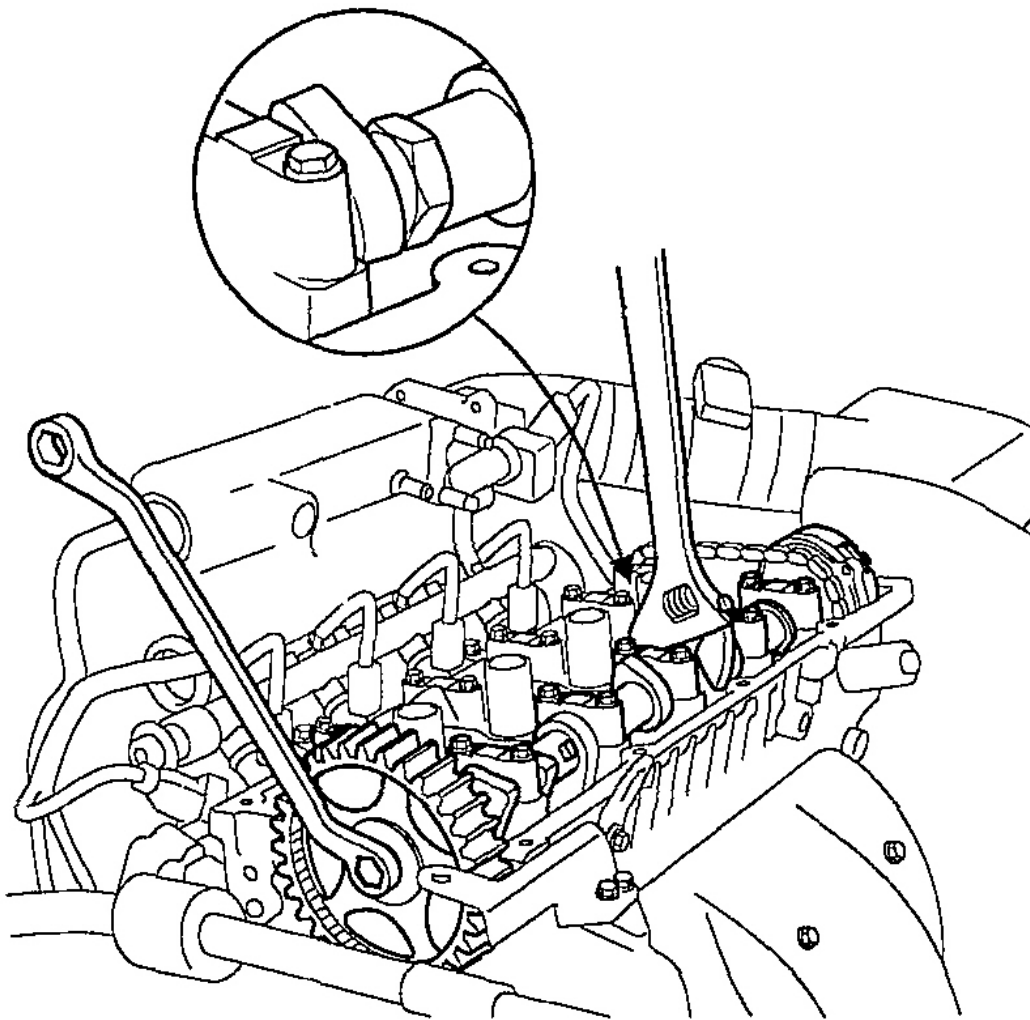
REASSEMBLY

1. Install the camshaft sprocket and tighten the bolt to the specified torque
 1. Temporarily install the camshaft sprocket bolt.
 2. Hold the hexagonal head wrench portion of the camshaft with a wrench, and tighten the camshaft sprocket bolt.

Tightening torque

Camshaft sprocket bolt

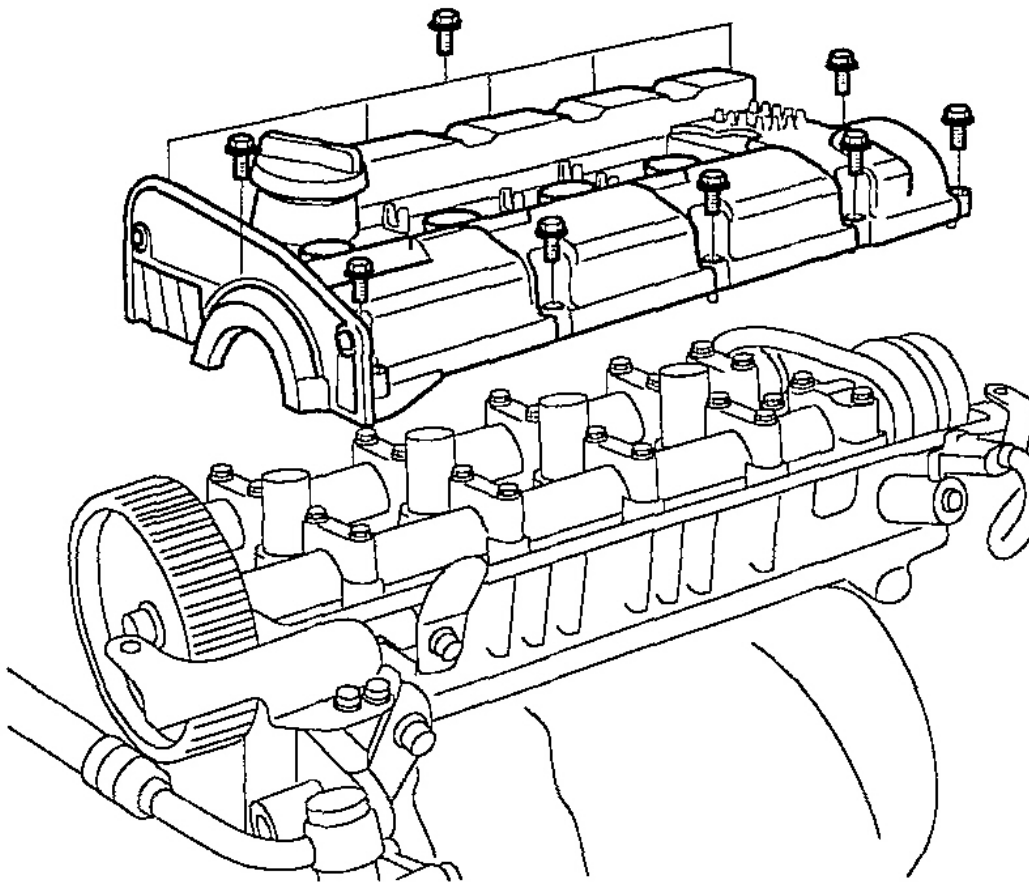
100 ~ 120Nm (1000 ~ 1200kgf.cm, 74 ~ 89lbf.ft)



G00941846

Fig. 197: Installing Camshaft Sprocket Bolt
Courtesy of HYUNDAI MOTOR CO.

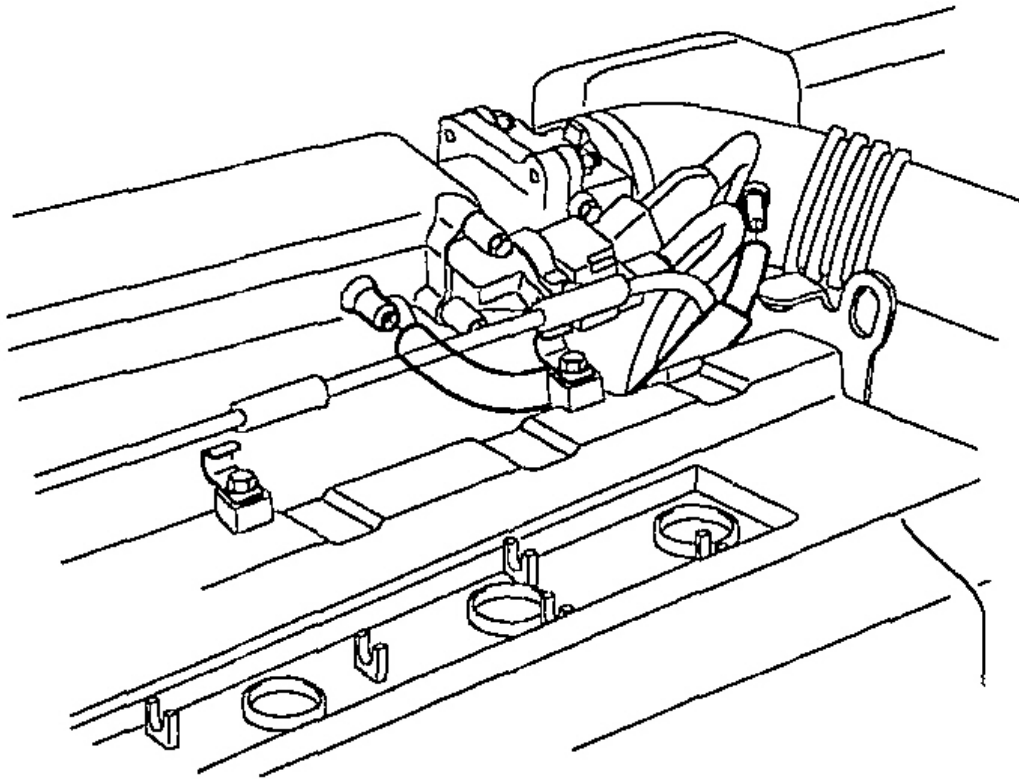
2. Install cylinder head cover.
 1. Install cylinder head cover and 12 bolts.



G00941847

Fig. 198: Installing Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

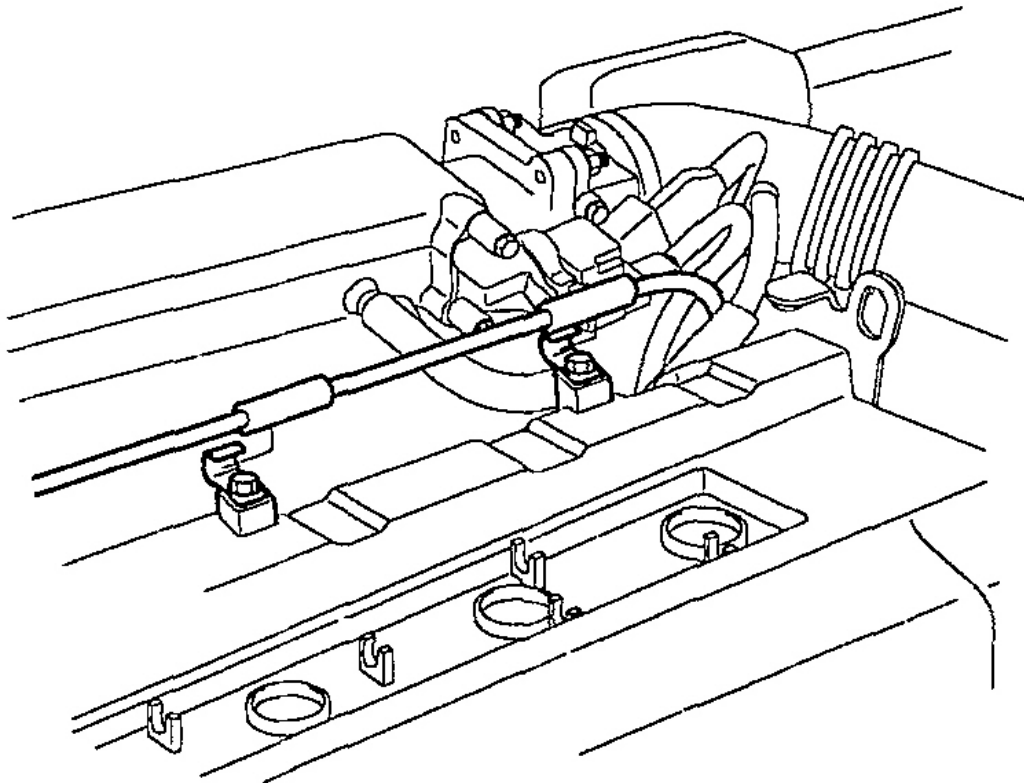
2. Install the PCV hose and breather hose.



G00941848

Fig. 199: Installing PCV Hose & Breather Hose
Courtesy of HYUNDAI MOTOR CO.

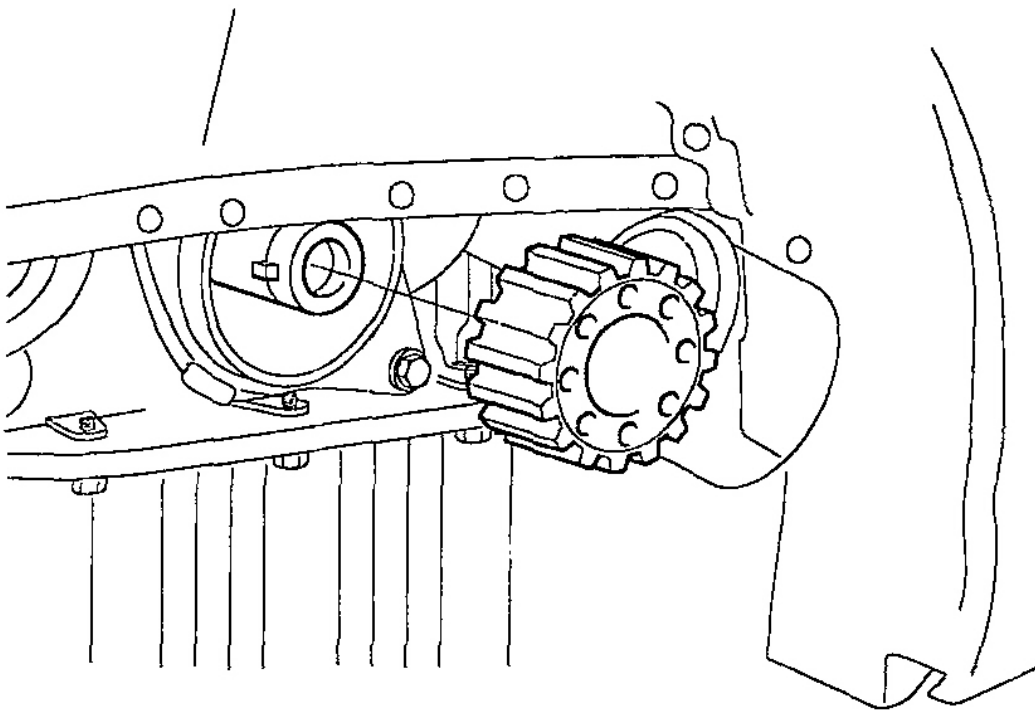
3. Install the accelerator cable from the cylinder head cover.



G00941849

Fig. 200: Installing Accelerator Cable To Cylinder Head Cover
Courtesy of HYUNDAI MOTOR CO.

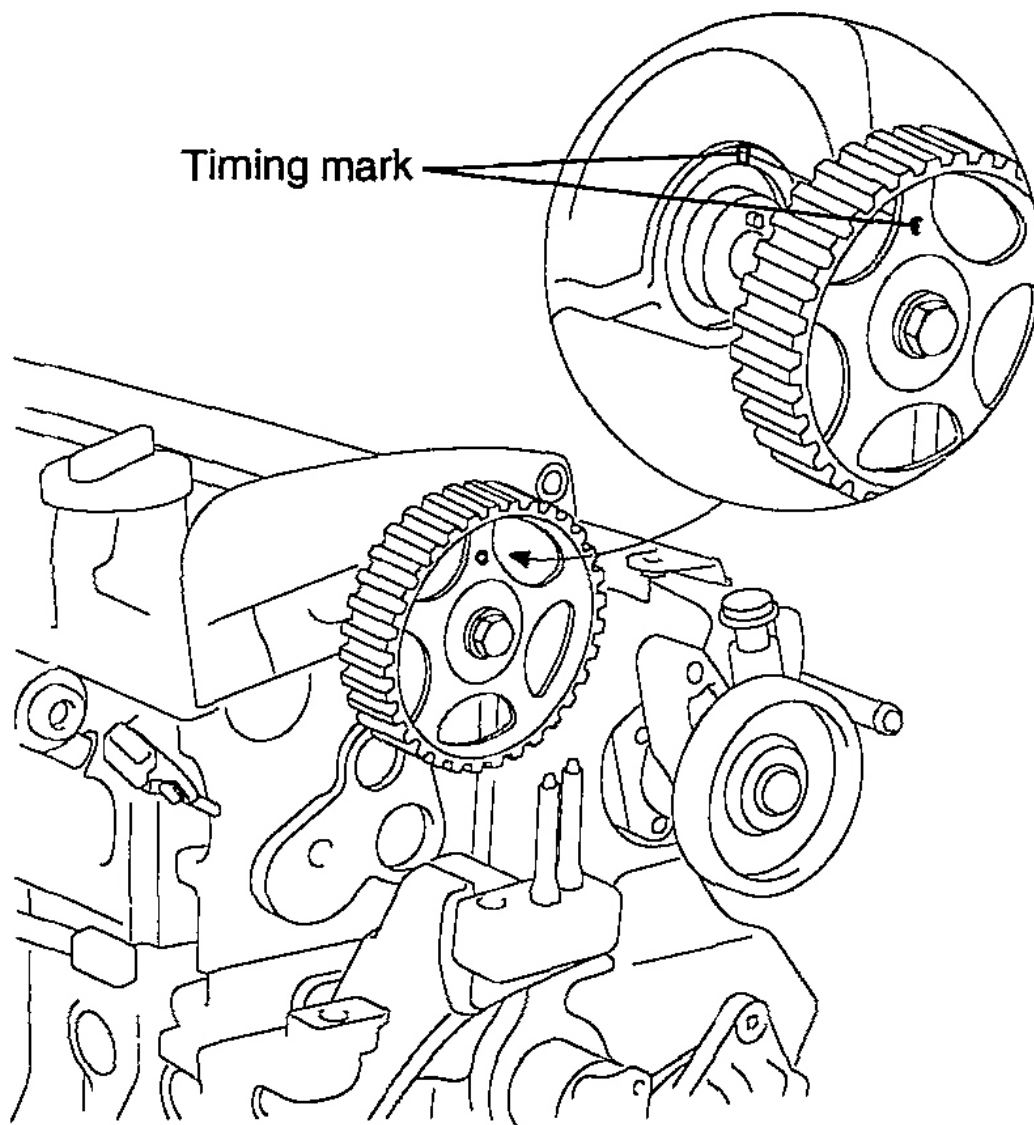
4. Install the spark plug cable.
3. Install the crankshaft sprocket.



G00941850

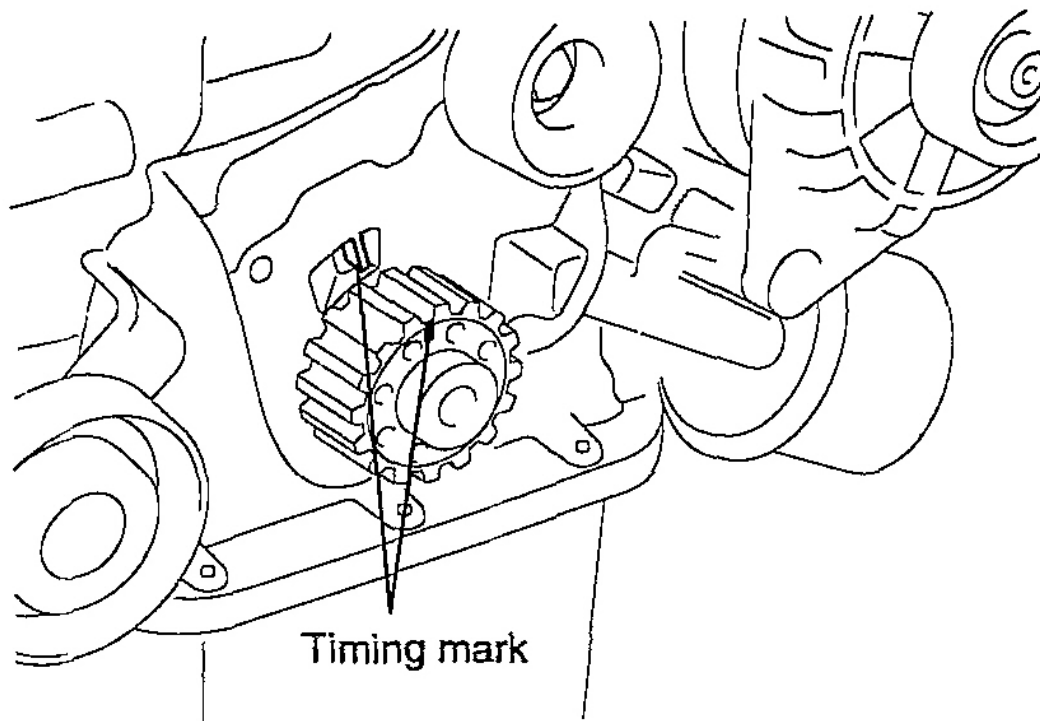
Fig. 201: Installing Crankshaft Sprocket
Courtesy of HYUNDAI MOTOR CO.

4. Align the timing marks of the camshaft sprocket and crankshaft sprocket with the No. 1 piston placed at top dead center and its compression stroke.



G00941851

Fig. 202: Aligning Timing Marks Of Camshaft Sprocket & Crankshaft Sprocket (1 Of 2)
Courtesy of HYUNDAI MOTOR CO.



G00941852

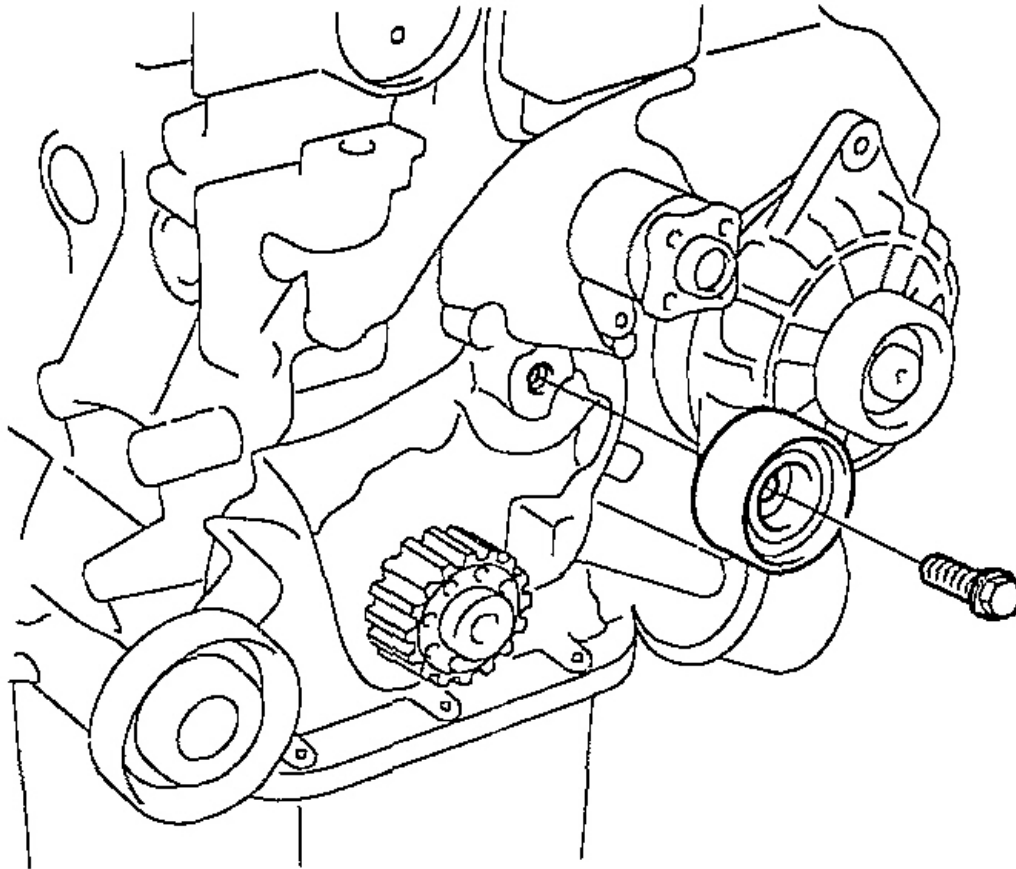
Fig. 203: Aligning Timing Marks Of Camshaft Sprocket & Crankshaft Sprocket (2 Of 2)
Courtesy of HYUNDAI MOTOR CO.

5. Install the idler pulley and tighten the bolt to the specified torque.

Tightening torque

Idler pulley bolt:

43 ~ 55Nm (430 ~ 550 kgf.cm, 32 ~ 40lbf.ft)



G00941853

Fig. 204: Installing Idler Pulley
Courtesy of HYUNDAI MOTOR CO.

6. Temporarily install the timing belt tensioner with plain washer.

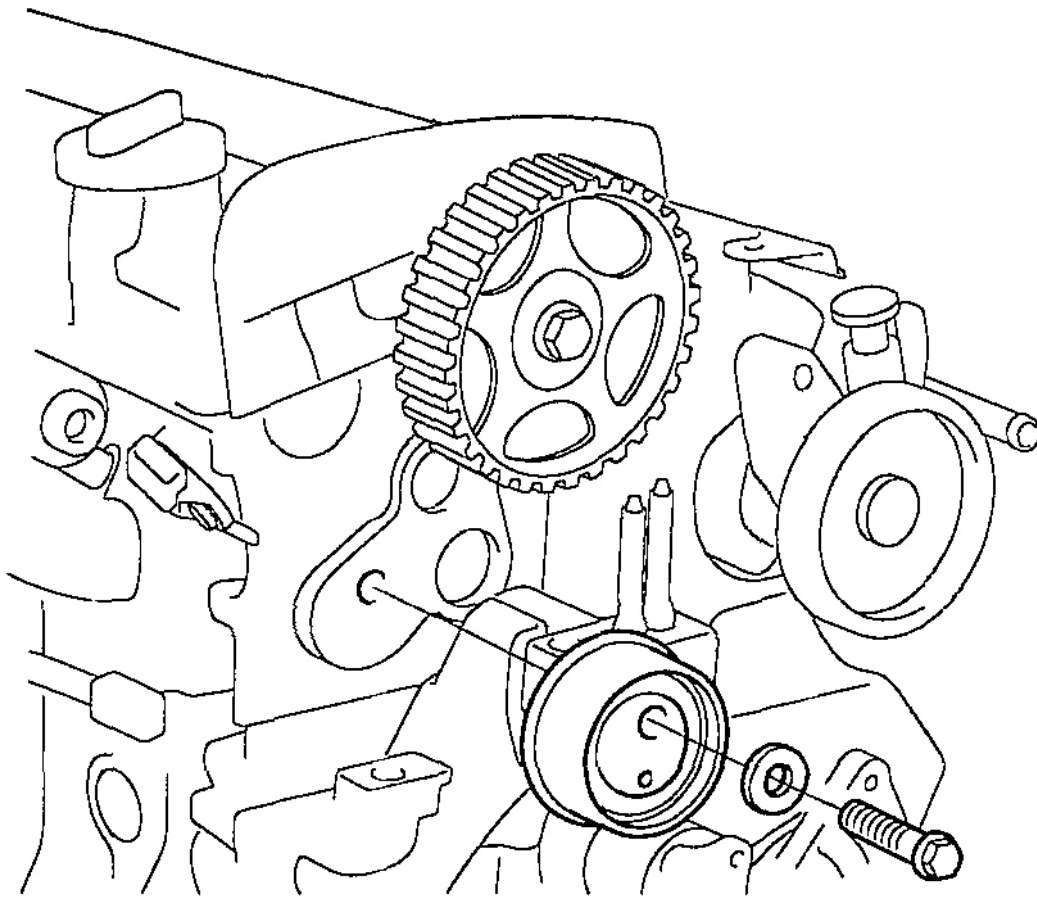
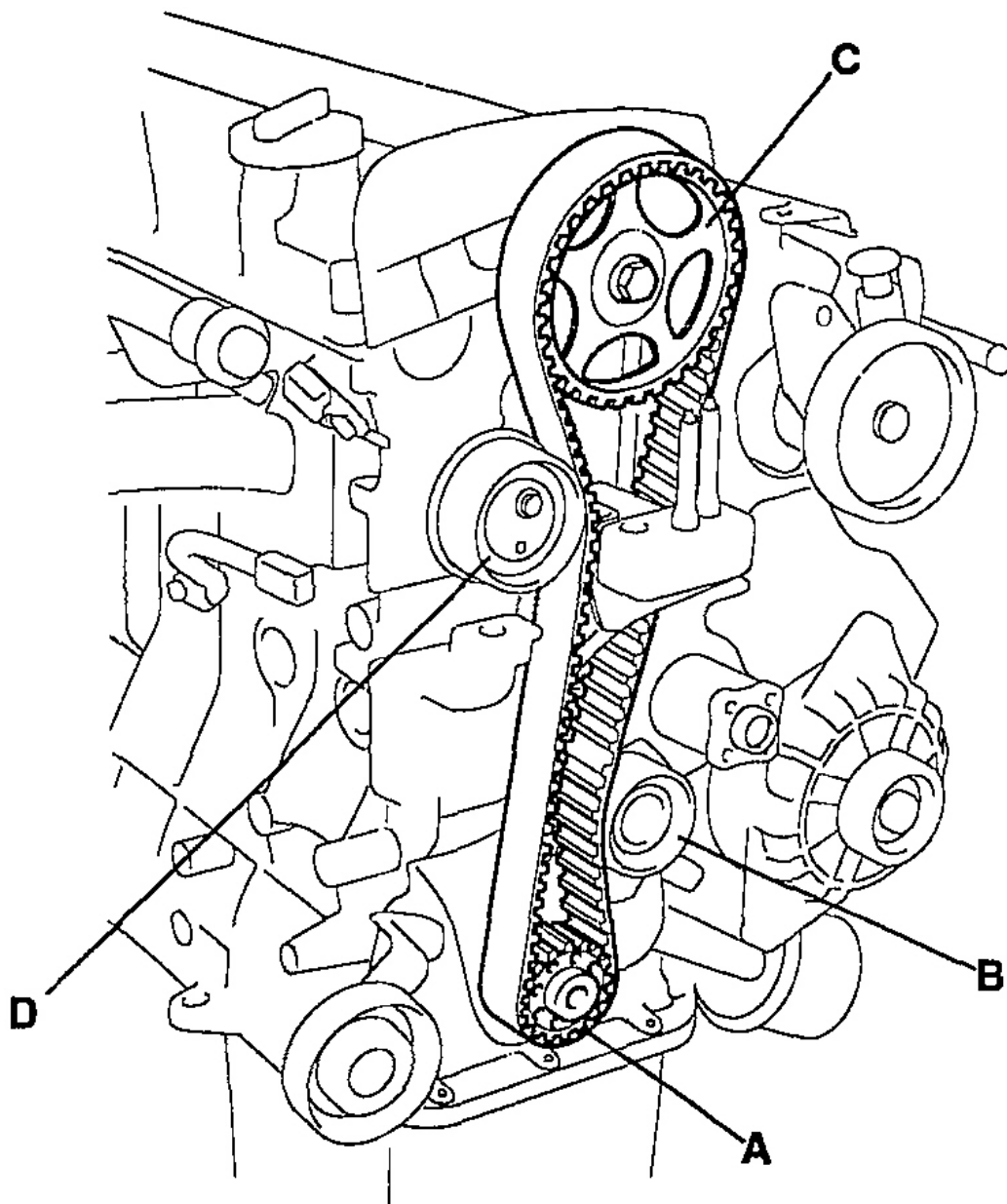
**G00941854**

Fig. 205: Installing Timing Belt Tensioner With Plain Washer
Courtesy of HYUNDAI MOTOR CO.

7. Install Belt so as not to give slack at each center of shaft. Do as following procedures when installing timing belt.

Crankshaft sprocket(A) ~ Idler pulley(B) ~ Camshaft sprocket(C) ~ Timing belt tensioner(D).

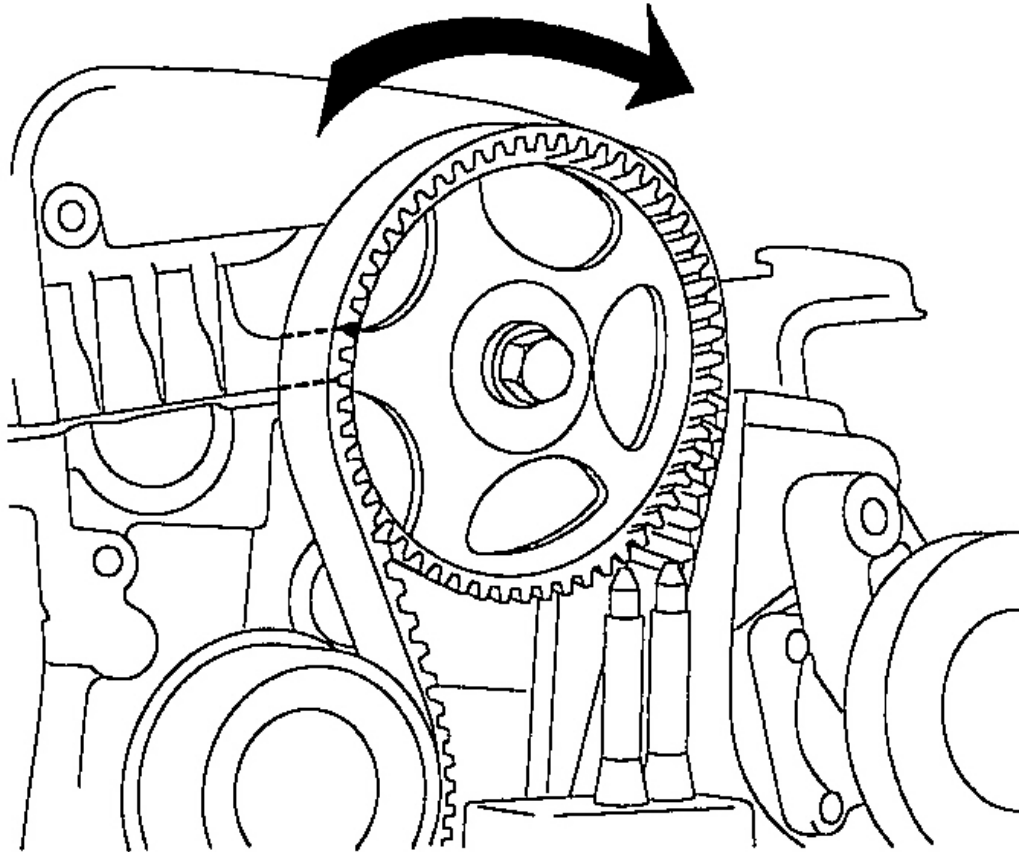


G00941855

Fig. 206: Locating Crankshaft sprocket, Idler pulley, Camshaft sprocket & Timing belt tensioner
Courtesy of HYUNDAI MOTOR CO.

8. Temporarily fasten tensioner pulley by center bolt to add force at belt.
9. Timing belt tension adjusting.

1. Rotate crankshaft in regular direction (clockwise view from front) through angle equivalent to two teeth (18°) of camshaft sprocket.



G00941856

Fig. 207: Rotating Crankshaft
Courtesy of HYUNDAI MOTOR CO.

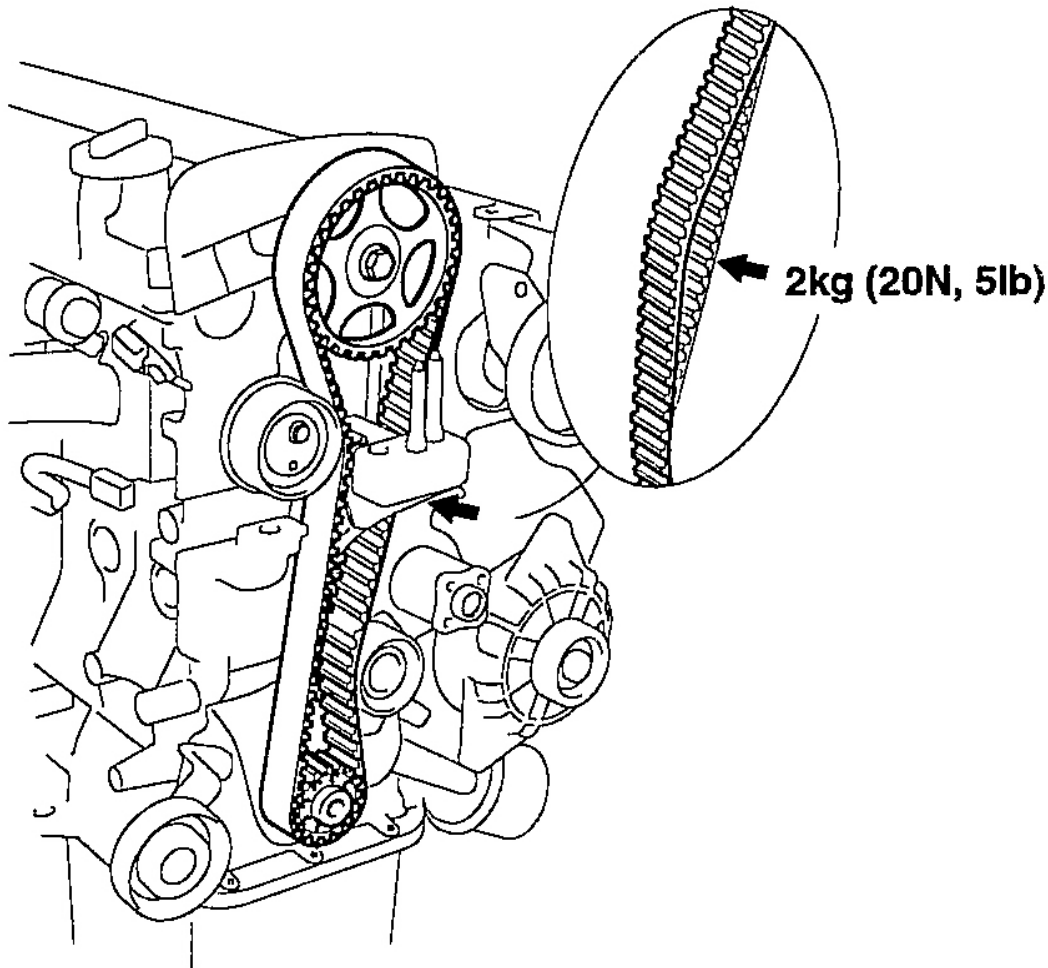
2. Give tension to timing belt by rotating tensioner in arrow direction with tool and set timing belt not to give slack to tension side
3. Tightening tensioner bolt.

Tightening torque

Tensioner bolt : 43 ~ 55Nm (430 ~ 550kgf.cm, 32 ~ 40lbf.ft)

4. Recheck the belt tension. When the tension side of timing belt is pushed horizontally with a

moderate force [approx. 2kg (20N, 5lb)], the timing belt cog end sags in approx. 4 ~ 6mm (0.16 ~ 0.24in.).



G00941857

Fig. 208: Checking Timing Belt Tension
Courtesy of HYUNDAI MOTOR CO.

10. Turn the crankshaft two turns in the operating direction (clockwise) and realign crankshaft sprocket and camshaft sprocket timing mark.
11. Install the timing belt lower cover with 5 bolts.

Tightening torque

Timing belt cover bolt : 8 ~ 10Nm (80 ~ 100kg.cm, 6 ~ 71lbf.ft)

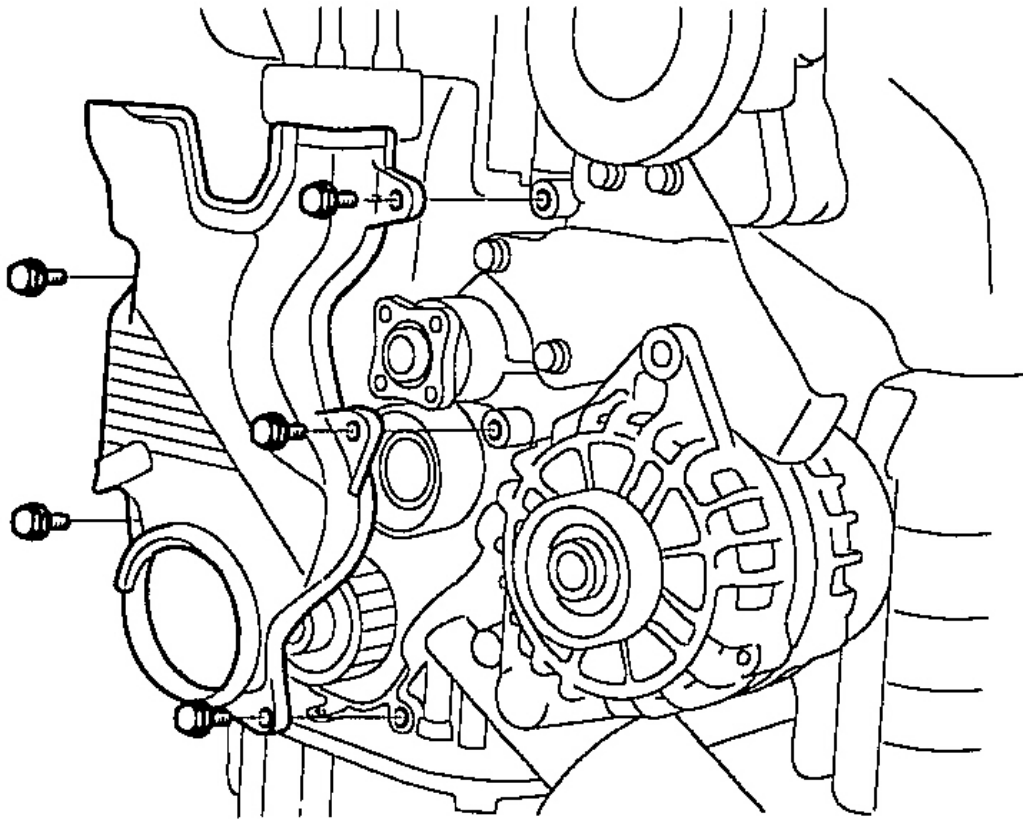
**G00941858**

Fig. 209: Installing Timing Belt Lower Cover
Courtesy of HYUNDAI MOTOR CO.

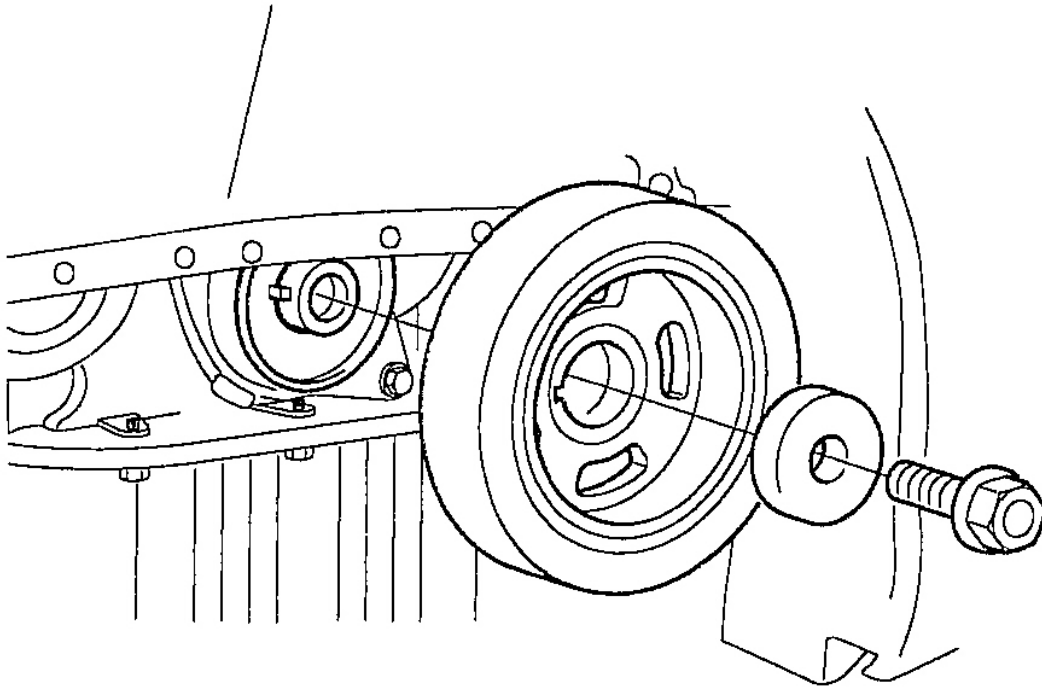
12. Install the flange and crankshaft pulley.

Make sure that crankshaft sprocket pin fits the small hole in the pulley.

Tightening torque

Crankshaft pulley bolt:

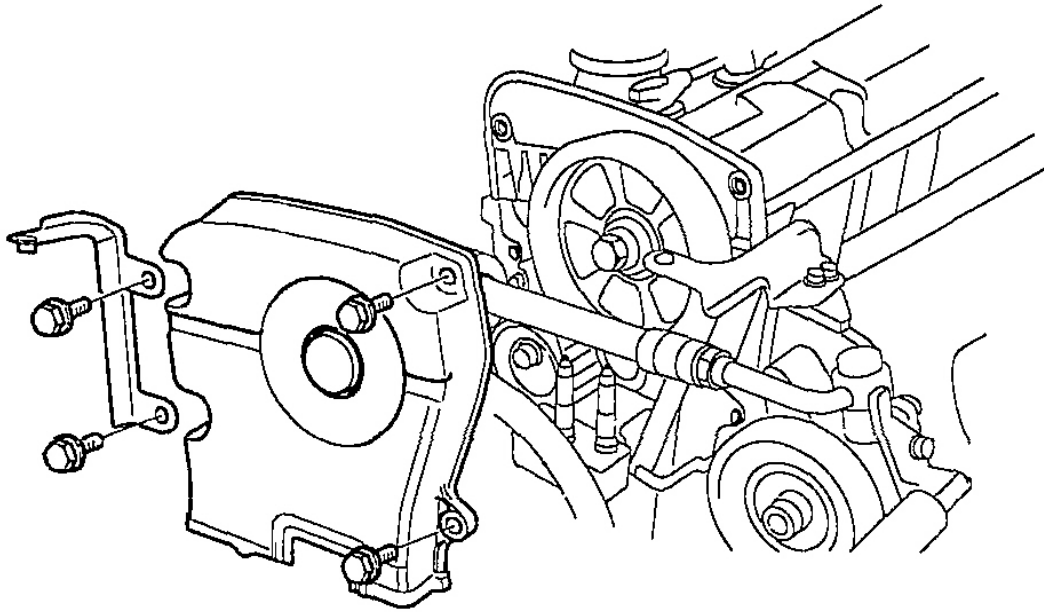
170 ~ 180Nm (1700 ~ 1800kgf.cm, 125 ~ 133lbf.ft)



G00941859

Fig. 210: Installing Flange & Crankshaft Pulley
Courtesy of HYUNDAI MOTOR CO.

13. Install the timing belt upper cover with 4bolts.



G00941860

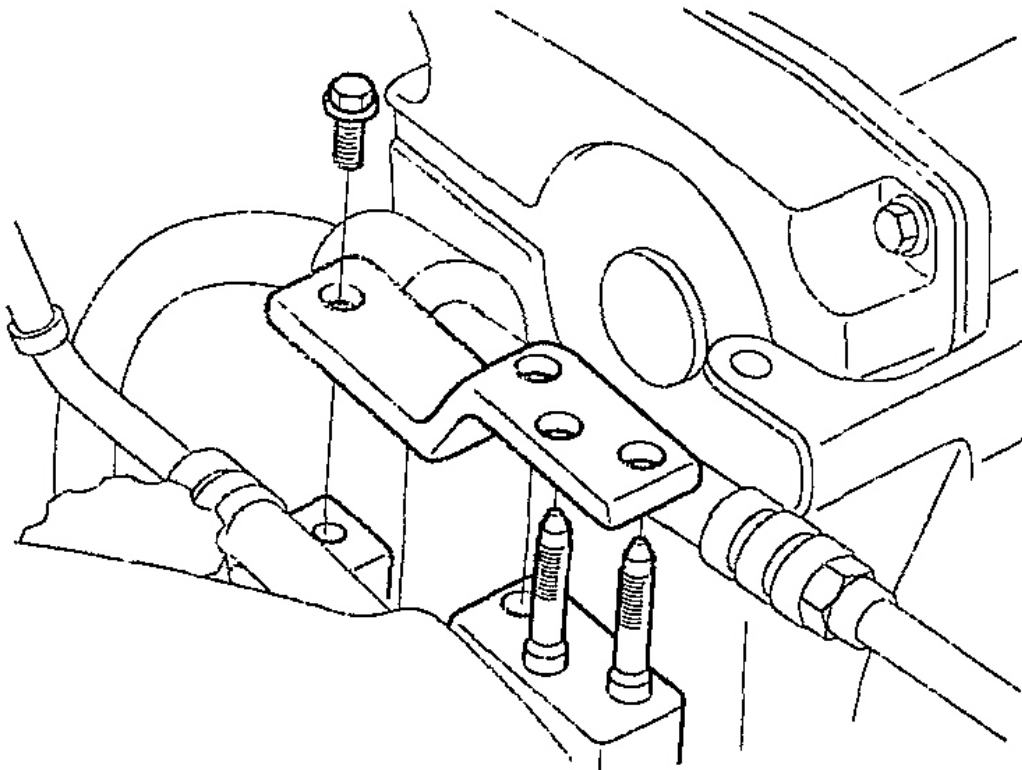
Fig. 211: Installing Timing Belt Upper Cover
Courtesy of HYUNDAI MOTOR CO.

14. Install the coolant pump pulley with 4bolts.
15. Install power steering belt.
16. Install air compressor belt.
17. Install alternator belt
18. Install the engine mount bracket.
 1. Install the stay plate with bolt.

Tightening torque

Stay plate bolt:

43 ~ 55Nm (430 ~ 550kgf.cm, 32 ~ 40lbf.ft)



G00941861

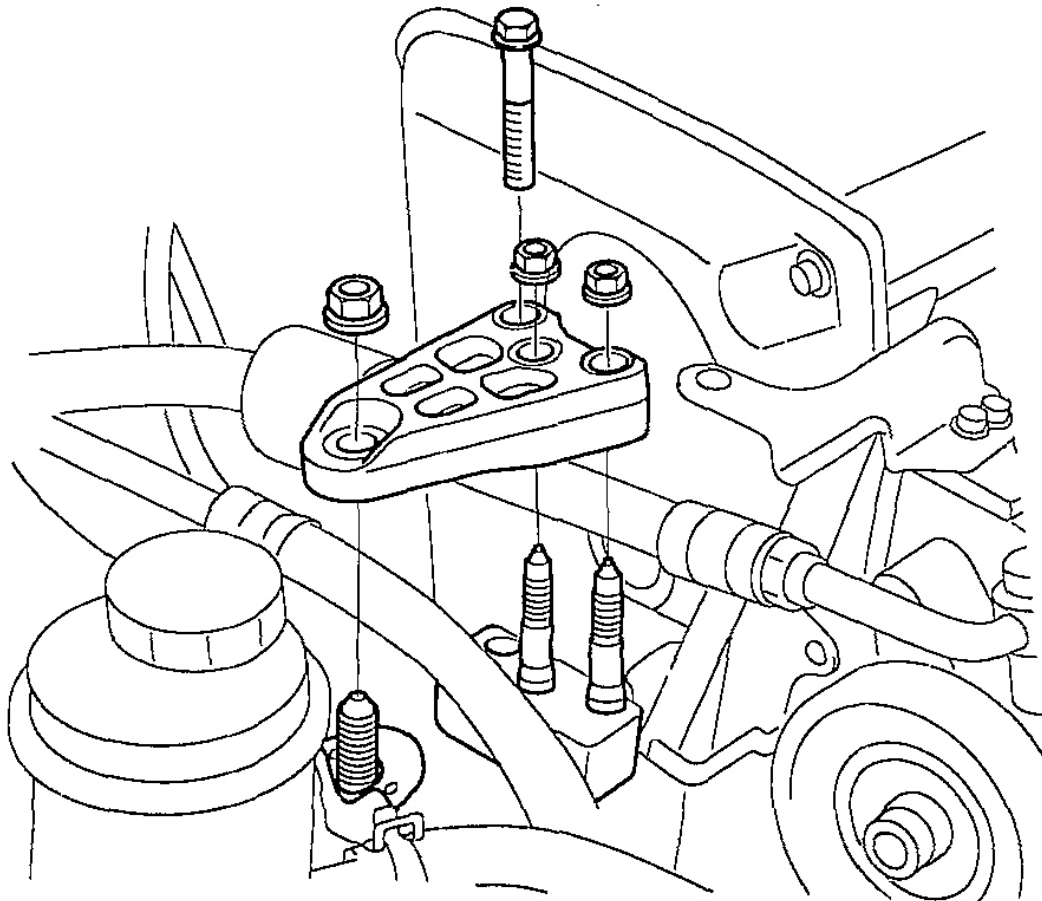
Fig. 212: Installing Engine Mount Bracket
Courtesy of HYUNDAI MOTOR CO.

2. Install engine mount bracket with 3 nuts and bolt.

Tightening torque

17mm nut: 60 ~ 80Nm (600 ~ 800kgf.cm, 44 ~ 59lb.ft)

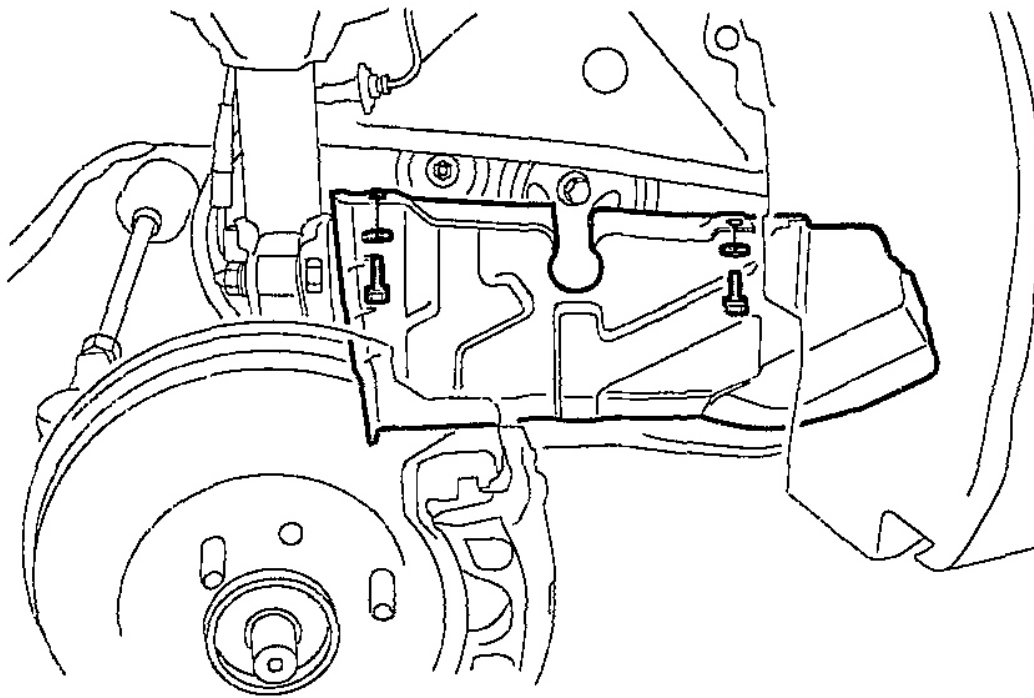
14mm nut: 50 ~ 65Nm (500 ~ 650kgf.cm, 37 ~ 48lb.ft)



G00941862

Fig. 213: Installing Engine Mount Bracket With Three Nuts & Bolt
Courtesy of HYUNDAI MOTOR CO.

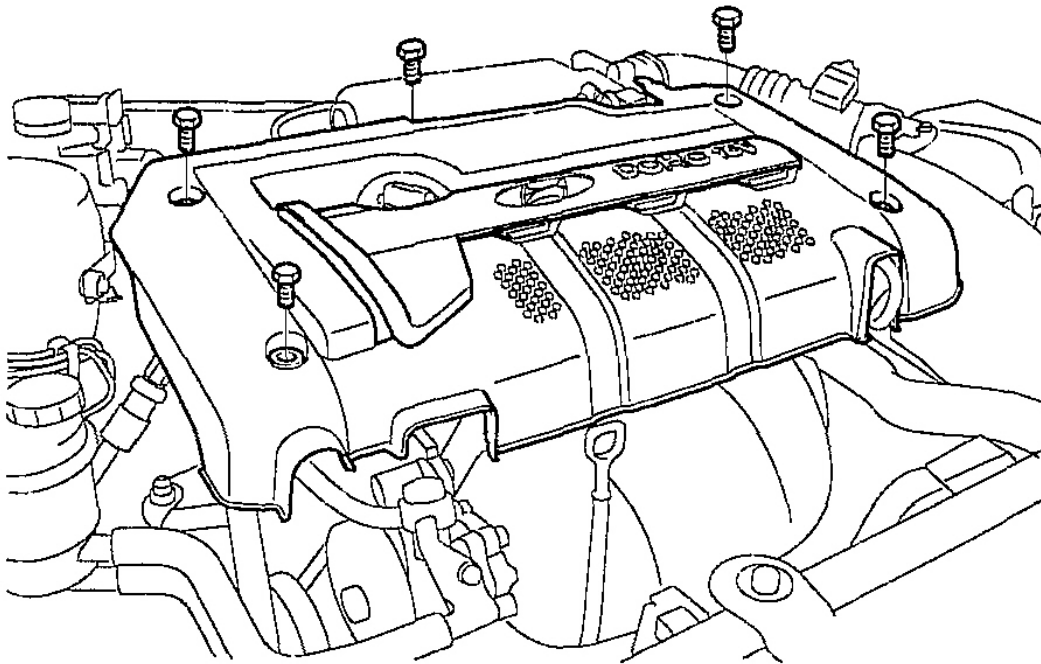
19. Install RH side cover with 2 bolts.



G00941863

Fig. 214: Installing Right Side Cover
Courtesy of HYUNDAI MOTOR CO.

20. Install RH front wheel.
21. Install engine cover with 5 bolts.



G00941864

Fig. 215: Installing Engine Cover
Courtesy of HYUNDAI MOTOR CO.