

LUBRICATION AND MAINTENANCE

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NOTE :

For the Scheduled Maintenance part of other areas except North America, please refer to a '91 OWNER'S MANUAL.

SCHEDULED MAINTENANCE TABLE

SCHEDULED MAINTENANCE TABLE

RECOMMENDED CUSTOMER MAINTENANCE (FOR U.S.A.)

The following maintenance services must be performed to assure good emission control and performance. Keep receipts for all vehicle emission services to protect your emission warranty.

Where both mileage and time are shown, the frequency of service is determined by whichever occurs first.

R : REPLACE

I : INSPECT, AFTER INSPECTION, CLEAN, LUBRICATE, ADJUST, REPAIR OR REPLACE IF NECESSARY

NO	DESCRIPTION	MILES X 1000	7.5	15	22.5	30	37.5	45	52.5	60
		KILOMETER X 1000	12	24	36	48	60	72	84	96
		MONTHS	5	10	20	30	40	50	60	70
EMISSION CONTROL ITEMS										
1	ENGINE OIL AND FILTER		R	R	R	R	R	R	R	R
2	FUEL FILTER								R	
3	FUEL LINES AND CONNECTIONS								I	
4	VACUUM, CRANKCASE VENTILATION HOSES								I	
5	FUEL HOSE, VAPOR HOSE & FUEL FILLER CAP								I	
6	AIR CLEANER FILTER					R				R
GENERAL ITEMS										
1	DRIVE BELT (WATER PUMP AND ALTERNATOR)					I				I
2	ENGINE COOLANT					R				R
3	TIMING BELT									R
4	MANUAL TRANSAXLE OIL					I				I
5	AUTO TRANSAXLE OIL			I		R		I		R
6	BRAKE FLUID					R				R
7	BRAKE HOSES, LINES			I		I		I		I
8	REAR BRAKE DRUMS/LININGS/PARKING BRAKE					I				I
9	BRAKE PADS, CALIPERS, ROTORS			I		I		I		I
10	EXHAUST PIPE CONNECTIONS, MUFFLER & SUSPENSION BOLTS					I				I
11	STEERING GEAR RACK, LINKAGE & BOOTS					I				I
12	WHEEL BEARING GREASE					I				I
13	DRIVESHAFTS & BOOTS			I		I		I		I

SCHEDULED MAINTENANCE TABLE

MAINTENANCE UNDER SEVERE USAGE CONDITIONS

The following items must be serviced more frequently on vehicles normally used under severe driving conditions. Refer to the chart below for the appropriate maintenance intervals.

I : INSPECT, CORRECT OR REPLACE IF NECESSARY

R : REPLACE

MAINTENANCE ITEM	MAINTENANCE OPERATION	MAINTENANCE INTERVALS	DRIVING CONDITION
ENGINE OIL AND FILTER	R	Every 3,000 miles (4,800 km) or 3 months	A, B, C, F, H
AIR CLEANER FILTER	R	More frequently	C, E
BRAKE PADS, CALIPERS, ROTORS	I	More frequently	C, D, G, H
REAR BRAKE DRUMS/LININGS	I	More frequently	C, D, G, H
STEERING GEAR RACK LINKAGE & BOOTS	I	Every 7,500 miles (12,000 km) or 6 months	C, D, E, F
DRIVESHAFT & BOOTS	I	Every 7,500 miles (12,000 km) or 6 months	C, E, F

SEVERE DRIVING CONDITIONS

A-Repeated short distance driving

B-Extensive idling

C-Driving in dusty conditions

D-Driving in areas using salt or other corrosive materials or in very cold weather

E-Driving in sandy areas

F-More than 50% driving in heavy city traffic during hot weather above 90°F (32°C)

G-Driving in mountainous areas

H-Towing a trailer

SCHEDULED MAINTENANCE TABLE

SCHEDULED MAINTENANCE TABLE

RECOMMENDED CUSTOMER MAINTENANCE (FOR CANADA)

The following maintenance services must be performed to assure good emission control and performance. Keep receipts for all vehicle emission services to protect your emission warranty.

Where both mileage and time are shown, the frequency of service is determined by whichever occurs first.

R : REPLACE

I : INSPECT AND, AFTER INSPECTION, CLEAN, ADJUST, REPAIR OR REPLACE IF NECESSARY

NO	DESCRIPTION	KILOMETER X 1000	12	24	36	48	60	72	84	96
		MILES X 1000	7.5	15	22.5	30	37.5	45	52.5	60
EMISSION CONTROL ITEMS										
1	ENGINE OIL AND FILTER (or every 6 months)		R	R	R	R	R	R	R	R
2	FUEL FILTER								R	
3	FUEL LINES AND CONNECTIONS								I	
4	VACUUM, CRANKCASE VENTILATION HOSES								R	
5	FUEL HOSE, VAPOR HOSE & FUEL FILLER CAP								R	
6	AIR CLEANER FILTER					R				R
GENERAL ITEMS										
1	DRIVE BELT (FOR WATER PUMP, ALTERNATOR AND P/S)					I				I
2	ENGINE COOLANT (or every 2 years)					R				R
3	TIMING BELT									R
4	MANUAL TRANSAXLE OIL					I				I
5	AUTO TRANSAXLE FLUID			I		R		I		R
6	BRAKE HOSES, LINES			I		I		I		I
7	BRAKE FLUID (or every 2 years)					R				R
8	REAR BRAKE DRUMS/LININGS/PARKING BRAKE					I				I
9	BRAKE PADS, CALIPERS, ROTORS			I		I		I		I
10	EXHAUST PIPE CONNECTIONS, MUFFLER & SUSPENSION BOLTS					I				I
11	STEERING GEAR RACK, LINKAGE & BOOTS					I				I
12	WHEEL BEARING GREASE			I		I		I		I
13	DRIVESHAFTS & BOOTS					I				I

SCHEDULED MAINTENANCE TABLE

MAINTENANCE UNDER SEVERE USAGE CONDITIONS

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I : INSPECT, CORRECT OR REPLACE IF NECESSARY

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MAINTENANCE ITEM	MAINTENANCE OPERATION	MAINTENANCE INTERVALS	DRIVING CONDITION
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CLEANER FILTER	R	More frequently	C, E
BRAKE PADS, CALIPERS, ROTORS	I	More frequently	C, D, G, H
REAR BRAKE DRUMS/LININGS	I	More frequently	C, D, G, H
STEERING GEAR RACK LINKAGE & BOOTS	I	Every 7,500 miles (12,000 km) or 6 months	C, D, E, F
DRIVESHAFT & BOOTS	I	Every 7,500 miles (12,000 km) or 6 months	C, E, F

SEVERE DRIVING CONDITIONS

A-Repeated short distance driving

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D-Driving in areas using salt or other corrosive materials or in very cold weather

E-Driving in sandy areas

F-More than 50% driving in heavy city traffic during hot weather above 90°F (32°C)

G-Driving in mountainous areas

H-Towing a trailer

RECOMMENDED LUBRICANTS AND CAPACITIES

RECOMMENDED LUBRICANTS AND CAPACITIES

RECOMMENDED LUBRICANTS

Parts	Specifications	Remarks
Engine oil	API classification SF or SF/CC, SG (For U.S.A. & CANADA) API classification SE or ABOVE (For Australia, EC) API classification SD or ABOVE (Except above area)	For further details, refer to SAE viscosity number
Manual transaxle	Hypoid gear oil, SAE 75W-85W	
Automatic transaxle	GENUINE HYUNDAI ATF AUTOMATIC TRANSMISSION FLUID, MOPAR ATF PLUS TYPE 7176, OR DIAMOND ATF SP	*MOPAR ATF PLUS TYPE 7176 is recommended lubricant.
Brake	Brake fluid DOT 3 or equivalent	
Power steering	ATF DEXRON®II	
Wheel bearing	SAE J310a Multipurpose grease NLGI grade #2 or equivalent	
Coolant	Ethylene glycol base for Al radiator	
Transaxle linkage, parking brake cable mechanism, hood lock and hook, door latch, seat adjuster, tailgate latch	SAE J310a Multipurpose grease NLGI grade #2 or equivalent	
Door hinges	Engine oil	
Pedal bearing, strut insulator bearing	SAE J310a Chassis grease NLGI grade #0 or equivalent	

LUBRICANTS CAPACITIES

Description	Capacities	Remarks
Engine oil		
Oil pan	4.0 lit (4.18 U.S. qts., 3.53 Imp.qts.)	
Oil filter	0.3 lit (0.315 U.S. qts., 0.260 Imp.qts.)	
Total	4.3 lit (4.50 U.S. qts., 3.80 Imp.qts.)	
Cooling system	8.6 lit (9.1 U.S. qts., 7.6 Imp.qts.)	
Automatic transaxle	5.8 lit (6.1 U.S. qts., 5.1 Imp.qts.)	
Power steering	0.9 lit (0.951 U.S. qts., 0.792 Imp.qts.)	

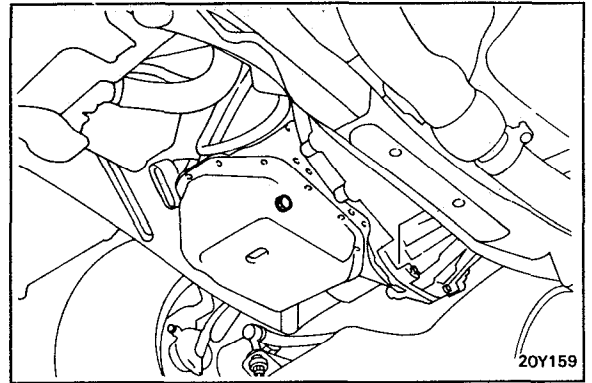
MAINTENANCE SERVICE

CHANGING THE ENGINE OIL

1. Warm up the engine.
2. Remove the filler cap (on the rocker cover), and drain the engine oil (with the drain plug removed).
3. Tighten the drain plug.

Tightening torque

Drain plug . . . 34-44 Nm (350450 kg.cm, 25-33 lb.ft)



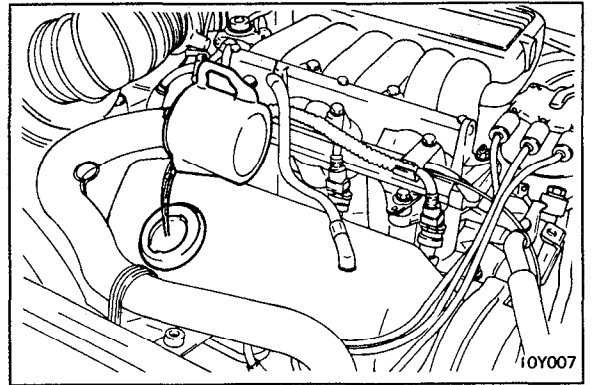
4. Fill the crankcase with fresh oil through the filler port.

Dry fill..... 4.3 lit (4.50 U.S.qts., 3.80 Imp.qts.)

Drain and Refill

Without oil filter; 3.7 lit (3.8 U.S.qts., 3.27 Imp.qts.)

With oil filter; 4.0 lit (4.18 U.S.qts., 3.53 Imp.qts.)



5. Pull the dipstick out in order to check the oil level.
6. Install the filler plug.
7. Recheck the level of the engine oil after a road test.

Recommended engine oil

API SF, SF/CC or SG (For U.S.A. or CANADA)

SAE 20W-20, 20W-40, 20W-50 (ABOVE 32°F or 0°C)

10W-30, 10W-40, 10W-50 (ABOVE -10°F or -23°C)

5W-20, 5W-30, 5W-40 (BELOW 60°F OR 16°C)

API SE or ABOVE (For Australia, EC, General area)

SAE 20W-40, 20W-50 (ABOVE 14°F or -10°C)

15W-40, 15W-50 (ABOVE 5°F or -15°C)

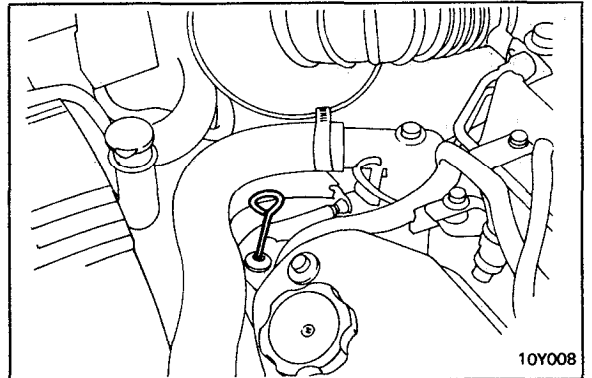
10W-30 (ABOVE -13°F or -25°C, BELOW 104°F or 40°C)

10W-40, 10W-50 (ABOVE -13°F or -25°C)

5W-40 (BELOW 68°F or 20°C)

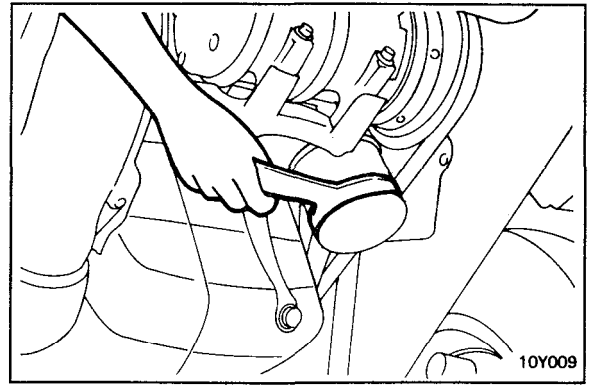
5W-30 (BELOW 50°F or 10°C)

5W-20 (BELOW 14°F or -10°C)

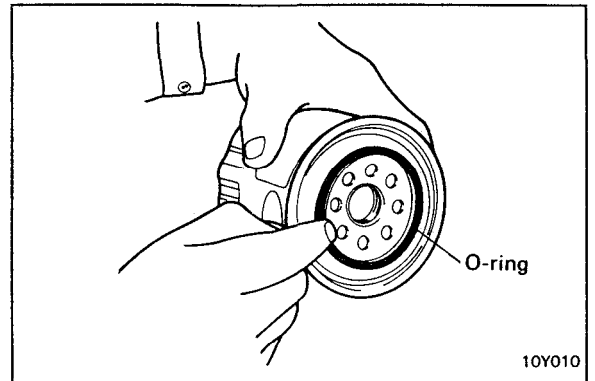


REPLACEMENT OF THE ENGINE OIL FILTER

1. Replace the oil filter at the time of every oil change.
2. Use a filter wrench (available commercially) to remove the oil filter.
3. Drain the oil in the filter.

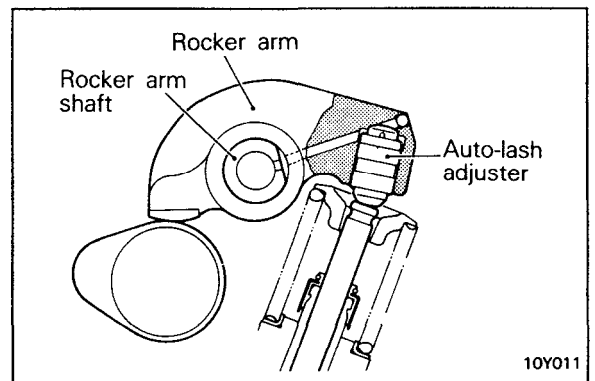


4. Lightly coat the O-ring (1) of the new oil filter with engine oil, and install the filter by completely turning it by hand.



VALVE CLEARANCE (Check and adjust as required)

As the intake and exhaust valves are equipped with auto-lash adjustment mechanisms, there is no need for valve clearance adjustment. The proper functioning of the auto-lash mechanism may be determined by checking for tappet noise. When there is tappet noise or any unusual noise, check the auto-lash by removing it.

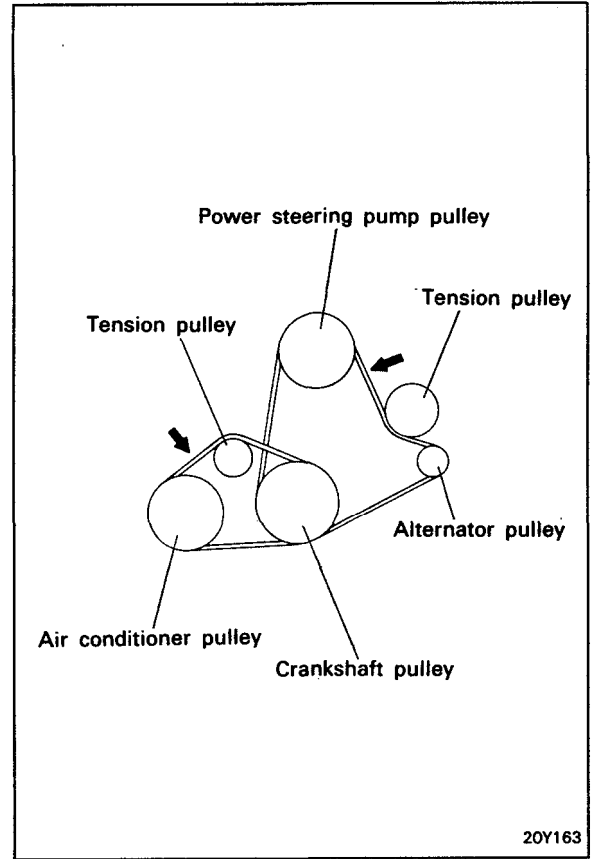


CHECKING AND ADJUSTMENT OF V-BELT TENSION

Apply 100 N (22 lbs.) force to the belt back midway between the pulleys as shown in the illustration, measure the amount of sag. Measure tension with a tension gauge.

Standard value:

Items		New	Used	Inspection
Alternator and P/S pump	Deflection mm (in.)	4.0—5.0 (0.157—0.197)	7.0 (0.276)	6.0—9.0 (0.236—0.354)
	Tension Kg (lb)	70—90 (154—198)	50 (110)	35—60 (77—132)
A/C compressor	Deflection mm (in.)	—	—	4.5—5.5 (0.177—0.216)



REPLACEMENT OF THE AIR FILTER

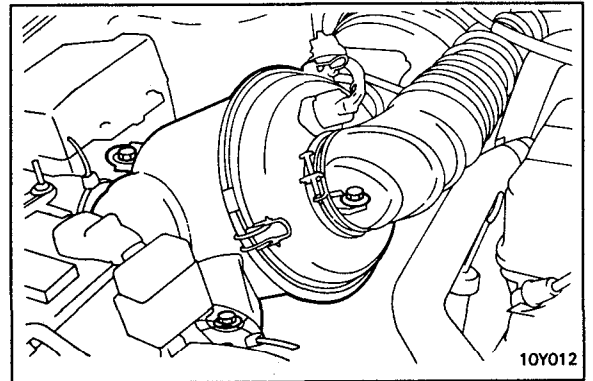
The air filter will become dirty during use and the filtering effect will be substantially reduced. Replace with a new one.

1. Remove the air intake hose and air duct.
2. Disconnect the connector for the air-flow sensor from the air filter cover.
3. Disconnect the air filter cover clip.
4. Remove the air filter cover.

CAUTION

The air filter cover should be removed carefully because it includes the air-flow sensor.

5. Remove the air filter element.
6. Set a new air filter element and clamp the air filter cover.



COOLING SYSTEM

Check the cooling system for damaged hoses, loose or seeping connections, or other possible causes of coolant leaks.

Antifreeze

The engine cooling system is provided with a mixture of 50% ethylene glycol anti-freeze and 50% water at the time of manufacture.

Since the cylinder head and water pump body are made of aluminum alloy casting, be sure to use a 30 to 60% ethylene glycol antifreeze coolant to provide corrosion protection and freezing prevention.

CAUTION

If the concentration of the antifreeze is below 30%, the anticorrosion property will be adversely affected. In addition, if the concentration is above 60%, both the antifreezing and engine cooling properties will decrease, adversely affecting the engine. For these reasons, be sure to maintain the concentration level within the specified range.

Measurement of Antifreeze Concentration

Run the engine until coolant is fully mixed. Drain some coolant (antifreeze), and measure temperature and specific gravity of the coolant. Determine concentration and safe working temperature. If the coolant is short of antifreeze, add antifreeze up to a concentration of 50%.

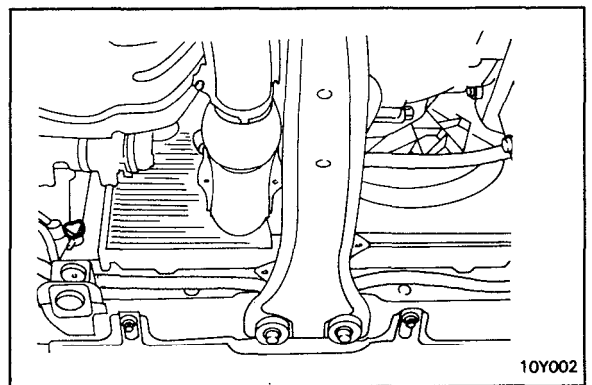
Replacement of the Coolant

1. Set the temperature control level to the hot position.
2. Remove the radiator cap,

CAUTION

Remove cap slowly as the system is pressurized and the coolant may be hot.

3. Loosen the drain plug to drain the coolant.
4. Drain the coolant from the reserve tank.
5. After draining the coolant, tighten the drain plug securely.
6. Supply the coolant into the radiator until it is filled up to its filler neck.
7. Supply the coolant into the reserve tank.
8. After warming the engine until the thermostat opens, remove the radiator cap and check the coolant level.
9. Supply the coolant into the radiator until it is filled up to its filler neck, and install the radiator cap securely.
10. Fill the reserve tank with coolant up to the "FULL" line.

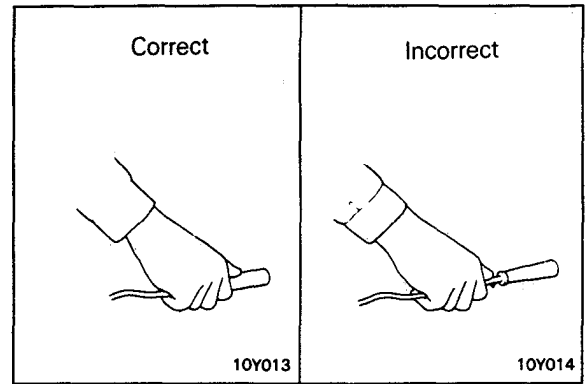


REPLACEMENT OF IGNITION CABLES

The ignition cables should be replaced periodically with new ones. After replacing, make sure that the ignition cables and terminals are properly connected and fully seated.

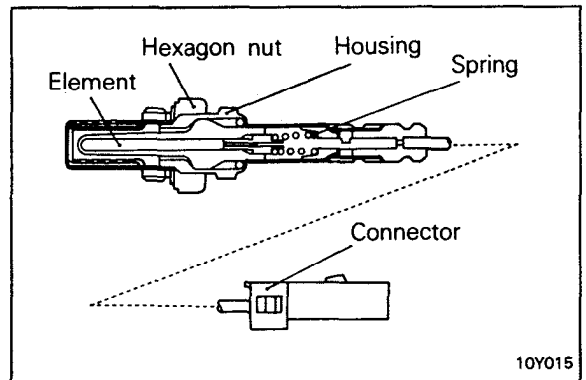
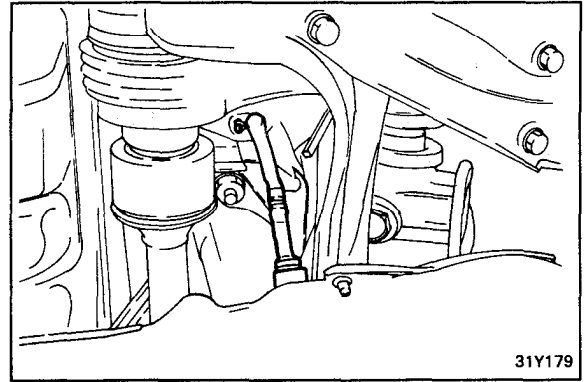
NOTE

When disconnecting an ignition cable be sure to hold cable cap. If the cable is disconnected by pulling on the cable alone an open circuit might result.



REPLACEMENT OXYGEN SENSOR

The oxygen sensor is a device which controls the fuel mixture. If the oxygen sensor is damaged, the exhaust-gas cleaning effect as well as driveability deteriorates. Therefore, it should be replaced periodically with a new one.



FUEL SYSTEM

Tank, Lines And Connections

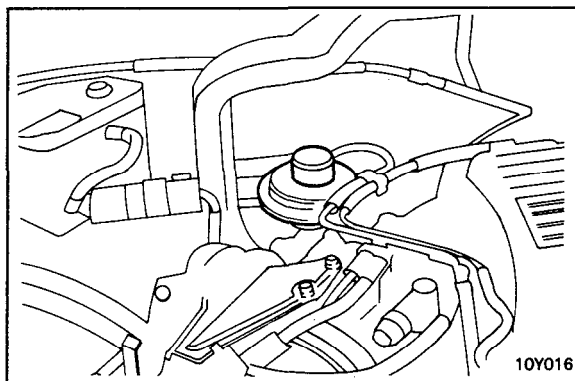
1. Check for damage or leakage in the fuel lines and connections.
2. Inspect the surface or fuel hoses for heat and mechanical damage. Hard and brittle rubber, cracking, checking, tears, cuts, abrasions and excessive swelling indicate deterioration of the rubber.
3. If the fabric casing of the rubber hose is cracked or worn, the hoses should be changed.

Fuel Filter

The fuel filter should be replaced regularly because its performance is reduced by dirt and water collected over an extended period of use. Replace as required.

CAUTION

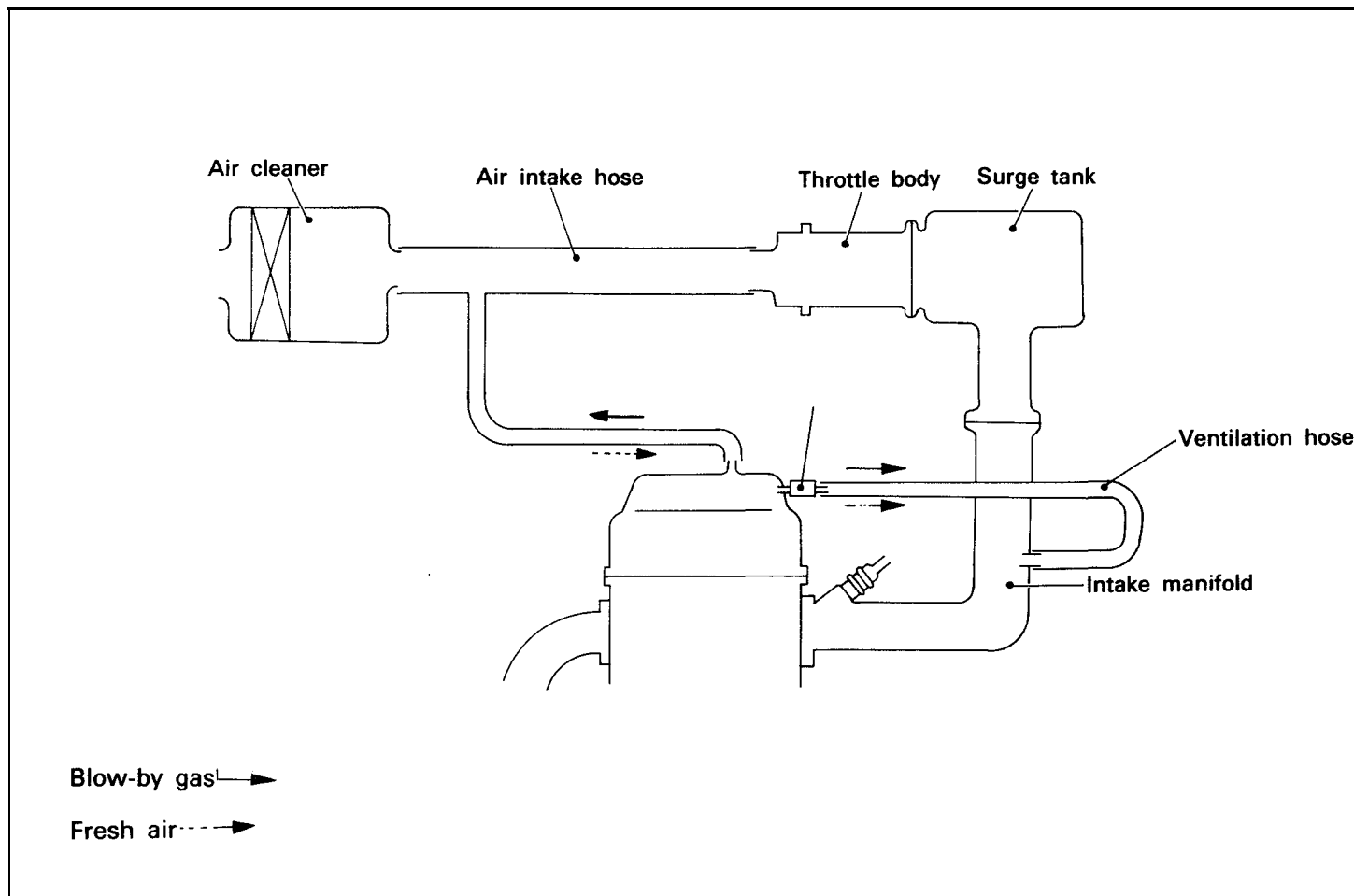
Before replacing the fuel filter, remove the residual pressure in the fuel line.



CRANKCASE EMISSION CONTROL SYSTEM (PCV valve)

The crankcase ventilation system must be kept clean to maintain good engine performance.

Periodic servicing is required to remove combustion products from the PCV valve.

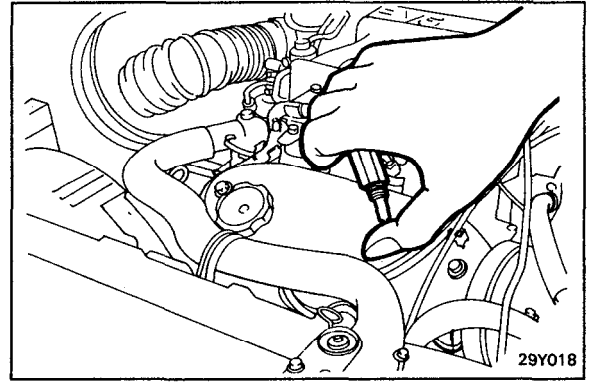


1. Disconnect the ventilation hose from the positive crankcase ventilation (PCV) valve. Then, remove PCV valve from the rocker cover and reconnect it to the ventilation hose.
2. Idle the engine and put a finger to the open end of PCV valve to make sure that intake manifold vacuum is felt on the finger.

NOTE

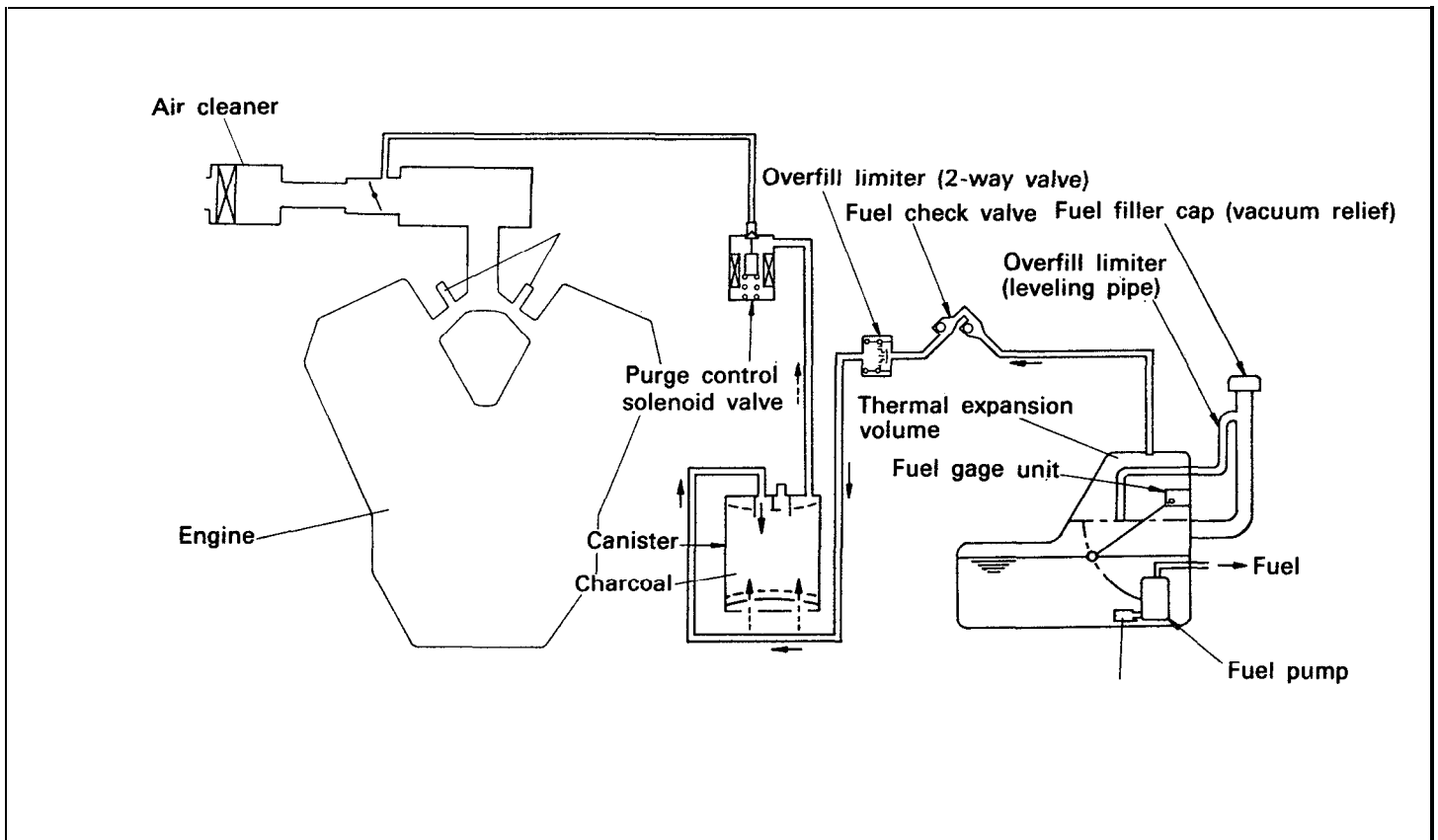
At this time, the plunger inside the PCV valve moves back and forth.

3. If vacuum is no felt on finger, clean the PCV valve and ventilation hose in cleaning solvent or replace if necessary.



EVAPORATIVE EMISSION CONTROL SYSTEM

1. If the fuel-vapor vent line is clogged or damaged, a fuel-vapor mixture escapes into the atmosphere causing excessive emissions. Disconnect the line at both ends, and blow it clean with compressed air. Remove the filler cap from the filler pipe and check to see if there is evidence that the packing makes improper contact to the filler pipe.
2. The overfill limiter (2-way valve) installed on the vapor line between the canister inlet and fuel tank outlet should be checked for correct operation.



CANISTER (Replace)

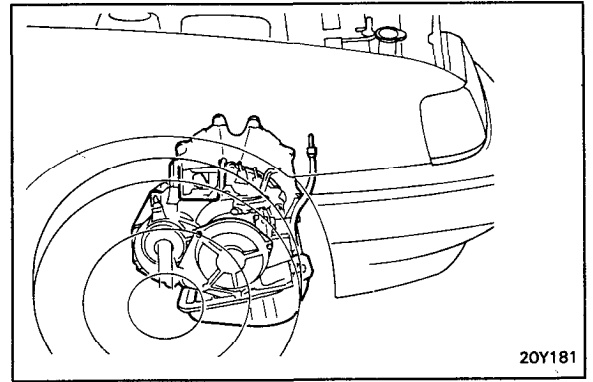
If or when the canister filter becomes clogged, the purge air volume will decrease and consequently, If or when the canister filter becomes clogged, the purge air volume will decrease and consequently, the canister capacity will be replaced.

AUTOMATIC TRANSAXLE (Change fluid)

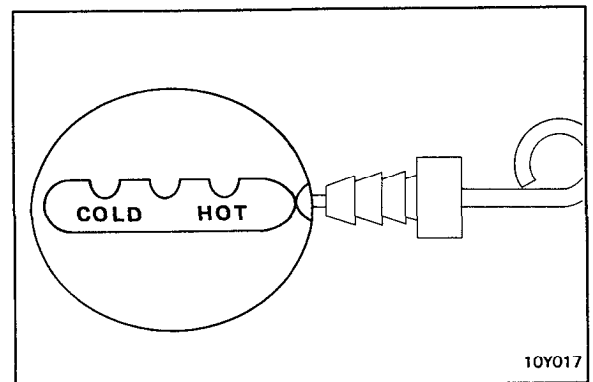
Drain the fluid and check whether there is any evidence of contamination.

Replenish with new fluid after the cause of any contamination has been corrected.

1. Remove drain plug at differential bottom to let fluid drain.
2. Place a drain container with large opening under the transaxle oil pan.
3. Loosen oil pan bolts and tap pan at one corner to break it loose allowing fluid to drain, then remove oil pan.
4. Check the oil filter for clogging and damage and replace if necessary.
5. Clean drain plug and tighten drain plug with gasket to 30-35 Nm (300-350 kg.cm, 22-25 lb.ft).
6. Clean both gasket surfaces of transaxle case and oil pan.
7. Install oil pan with new gasket and tighten oil pan bolts to 10-12 Nm (100-120 kg.cm, 7.5-9 lb.ft).
8. Pour 4 liters (4.2 U.S.qts., 3.5 Imp.qts.) of ATF into case through dipstick hole. [Total quantity of ATF required is approx. 5.8 liters (6.1 U.S.qts., 5.1 Imp.qts.). Actually however, approx. 4.5 liters (4.8 U.S.qts., 4.0 Imp.qts.) of fluid can be replaced because rest of fluid remains in torque converter.]
9. Start engine and allow to idle for at least two minutes. Then, with parking brake on, move selector lever momentarily to each position., ending in "N" Neutral position.
10. Add sufficient ATF to bring fluid level to lower mark. Recheck fluid level after transaxle is at normal operating temperature. Fluid level should be shown upper and lower marks of "HOT" range. Insert dipstick fully to prevent dirt from entering transaxle.



20Y181



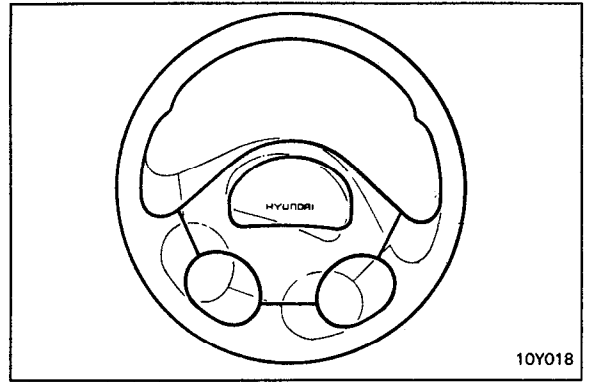
10Y017

INSPECT STEERING LINKAGE

1. Check steering wheel freeplay.

Maximum steering wheel freeplay.. . . 30 mm (1.181 in.)

2. Check steering linkage for looseness and damage as follows.
 - 1) Tie rod ends do not have excessive play.
 - 2) Dust seals and boots are not damaged.
 - 3) Boot clamps are not loose.



POWER STEERING OIL PUMP BELT (Check and service as required)

1. Inspect the belt for evidence of cuts and cracks. Replace, if necessary.
2. Check belt for proper tension. If necessary, adjust the belt tension (Refer to page 10-9).

POWER STEERING FLUID LEVEL (Inspect fluid level)

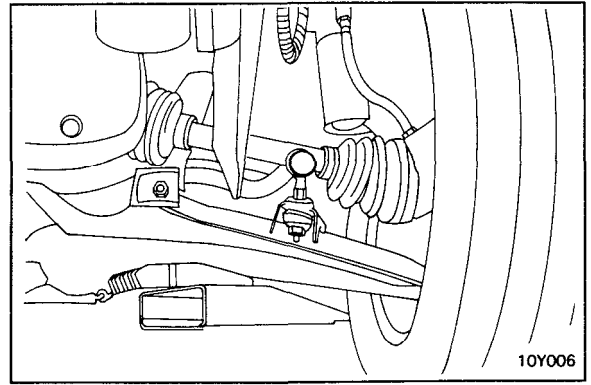
1. Park the vehicle on a flat, level surface, start the engine, and then turn the steering wheel several times to raise the temperature of the fluid to approximately 50°C (122°F).
2. With the vehicle still idling, turn the wheel all the way to the left and right several times.
Check the fluid in the oil reservoir for foaming, check the fluid level, and replenish the fluid in the oil reservoir through the oil filter if necessary.

POWER STEERING HOSES (Check for deterioration or leaks)

1. Check the hose connections for fluid leaks.
2. The power steering hoses should be replaced if there are severe surface cracking, pulling, scuffing or worn steps. Deterioration of the hoses could cause premature failure.

BALL JOINT AND STEERING LINKAGE SEALS, STEERING AND DRIVE SHAFT BOOTS

1. These components, which are permanently lubricated at the factory, do not require periodic lubrication. Damaged seals and boots should be replaced to prevent leakage or contamination of the grease.
2. Inspect the dust cover and boots for proper sealing leakage and damage. Replace them if defective.



**REAR WHEEL BEARINGS
(Inspect for grease leaks)**

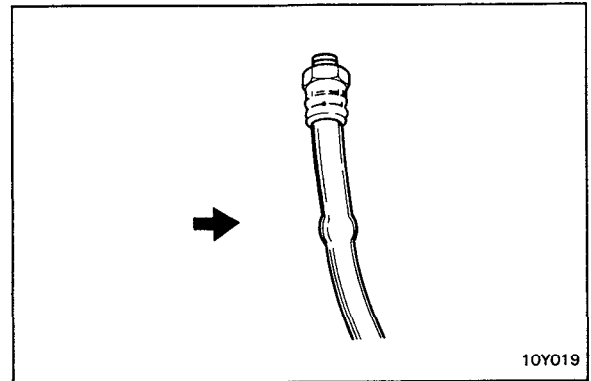
Inspect for evidence of grease leakage around the hub cap and the back of the hub. If there is leakage of grease, remove the hub and inspect its oil seal for damage. Clean the grease off the hub and bearing and repack with specified new grease.

Specified grease :

Multipurpose grease SAE J310a. NLGI No.2

INSPECT BRAKE LINE

1. Check all brake pipes and hoses for damage, wear, cracks, corrosion, leaks, bends, twists.
2. Check all clamps for tightness.
3. Check that the lines are clear of sharp edges, moving parts and the exhaust system.



FRONT DISC BRAKE PADS

Check for fluid contamination and wear. Replace complete set of pads if defective.

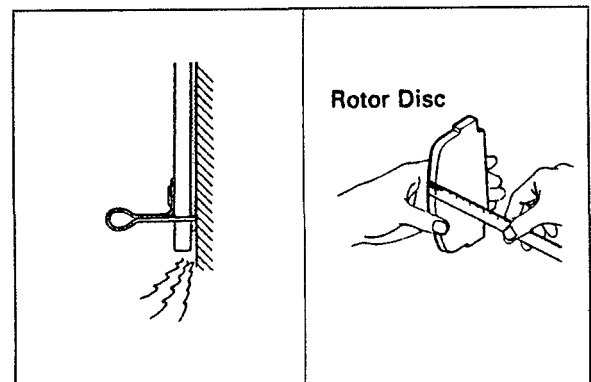
NOTE:

If a squealing or scraping noise occurs from the brake during driving, check the pad wear indicator contacting the disc, the brake pad should be replaced.

CAUTION

The pads for the right and left wheels should be replaced at the same time. Never “split” or intermix brake pad sets. All pads must be replaced as a complete set.

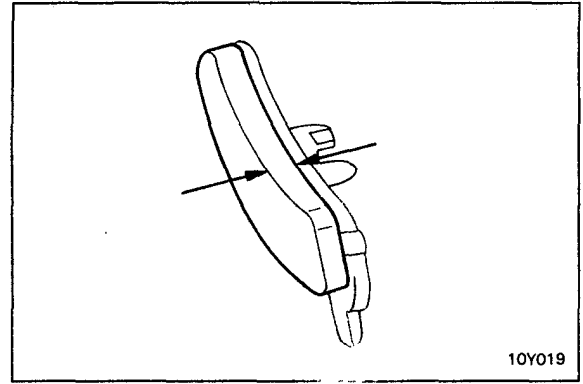
Thickness of pad lining “A” [Limit] 2.0 mm (0.079 in.)



REAR DISC BRAKE PADS

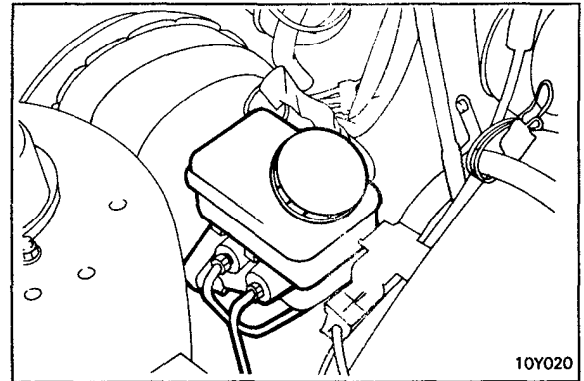
1. Remove the wheel and tire.
Detach the caliper assembly from the backing plate and inspect the pad for excessive wear.
2. All pads must be replaced as a complete set.

Thickness of pad lining [limit]. 0.8 mm (0.031 in.)



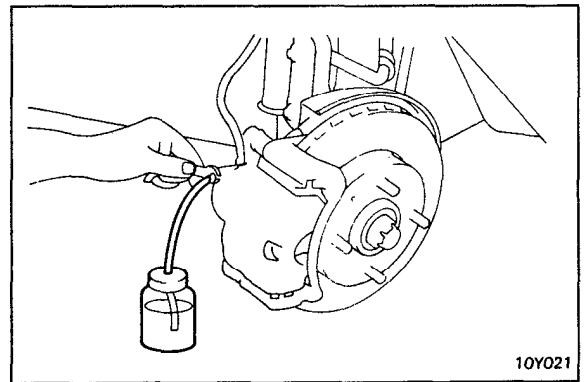
CHECKING THE BRAKE FLUID LEVEL

1. Visually check the level of the brake fluid in the reserve tank of the master cylinder.
2. The level should be between the "MAX" and "MIN" marks.
3. If the level is lower than the "MIN" marks, add fresh brake fluid up to the "MAX" mark.



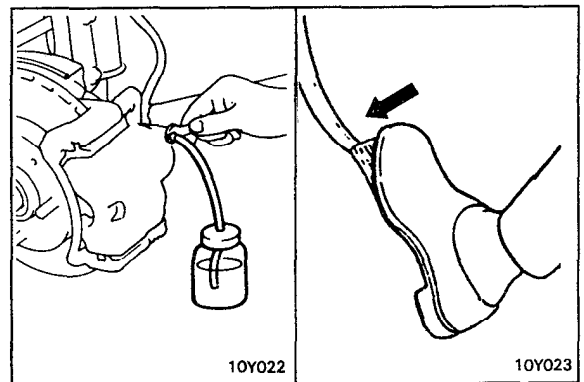
CHANGING OF THE BRAKE FLUID

1. Refer to page 58-5 for air-bleeding procedures.
2. Connect a vinyl tube to the bleeder screw of each wheel cylinder. Put the other end of the vinyl tube in a vessel for receiving the brake fluid.



3. Depress the brake pedal a few times. Then loosen the bleeder (with the brake pedal still depressed), and tighten it after the brake fluid stops flowing.
4. Repeat the above operation until to air bubbles are in the brake fluid.
5. Repeat these steps for the other cylinders.
6. Add fresh brake fluid up to the "MAX" level in the reserve tank.

Brake fluid.. DOT 3 or equivalent



CHECKING OF THE TIRE INFLATION PRESSURE

Check the Tire inflation Pressures as Follows.

TIRE INFLATION PRESSURE (Check with Tires Cool)

Tire size	Front	Rear
P185/70 R 14 P195/70 R 14 (Al wheel)	207 kPa (30 psi)	207 kPa (30 psi)
T125/70 D 15 (Temporary)	414 kPa (60 psi)	414 kPa (60 psi)

ROAD: TEST

Drive the vehicle and check for abnormal conditions.

1. Check for oil, fluid, fuel, water and exhaust gas leaks.
2. Check free play of clutch pedal and brake pedal.
3. Check operation of brake-booster.
4. Check operation of service brake and parking brake systems.
5. Check stroke of parking brake lever.
6. Check driveability of engine.
7. Check condition of instruments, gauges, indicators, exterior lamps, heater and ventilators.
8. Check abnormal noise of each part.

