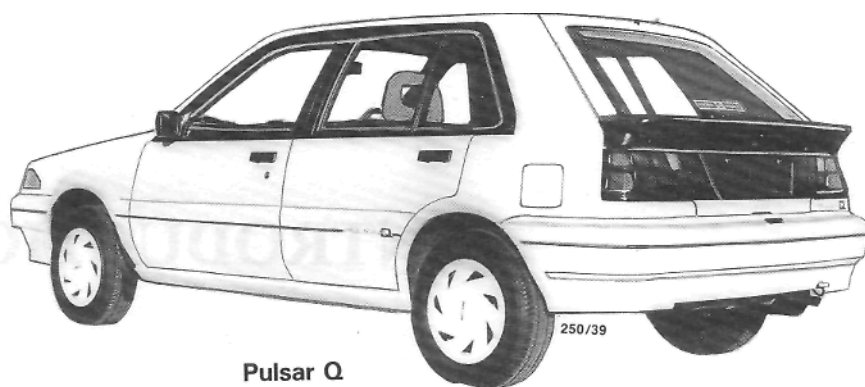


CONTENTS

INTRODUCTION.....	5	Fuel and engine management trouble shooting ...	82
VEHICLE IDENTIFICATION AND		Description.....	84
GENERAL SPECIFICATIONS	7	Service precautions and procedures	86
GENERAL INFORMATION	8	System diagnosis and adjustments.....	89
Tools and equipment	8	Fuel supply components	92
Safety	10	Air flow components.....	98
General repair procedures.....	11	Electronic components.....	104
LUBRICATION AND MAINTENANCE...	14	EMISSION CONTROL	117
Specifications.....	14	Introduction.....	117
How to grease and oil change	14	Crankcase ventilation system.....	117
Service schedule	17	Evaporate control system.....	117
WHEELS AND TYRES	21	Air preheat system — 1.6 liter engines	119
Specifications.....	21	Exhaust control system	120
How to change a road wheel	21	CLUTCH	121
Tire wear trouble shooting	22	Specifications.....	121
Care and maintenance	23	Clutch trouble shooting.....	121
ENGINE TUNE-UP.....	25	Description.....	122
Tune-up specifications	25	Clutch unit and release mechanism.....	123
Tune-up operations	25	Clutch pedal	124
ROADSIDE TROUBLE SHOOTING	32	Clutch cable.....	124
Trouble shooting.....	32	Clutch adjustments	125
To check ignition and electrical system	33	MANUAL TRANSAXLE AND	
To check fuel system	34	DRIVE SHAFTS	126
To check mechanical system	35	Specifications	126
ENGINE.....	37	Manual transaxle and drive shaft trouble shooting	126
Specifications	37	Description.....	128
Engine mechanical trouble shooting.....	39	Transaxle assembly.....	129
Description	41	Differential and final drive assembly	135
Engine and transaxle assembly	42	Gear lever assembly	136
Manifolds.....	44	Drive shafts	137
Camshaft, rocker arms and tappets.....	48	AUTOMATIC TRANSAXLE	140
Cylinder head	50	Specifications.....	140
Engine sump and oil pump pickup pipe.....	54	Automatic transaxle trouble shooting.....	140
Oil pump	55	Description.....	141
Pistons, connecting rods and cylinder bores	57	Transaxle fluid	141
Crankshaft and bearings.....	60	Brake band.....	142
Flywheel /drive plate.....	63	Kickdown cable	142
Engine mountings.....	64	Transaxle selector linkage	142
Exhaust system.....	66	Neutral safety switch.....	142
COOLING AND HEATING SYSTEMS....	68	Transaxle assembly	143
Specifications	68	STEERING	145
Cooling system trouble shooting	68	PART 1. STEERING TROUBLE SHOOTING....	145
Heater and air conditioner trouble shooting	69	Faults, causes and remedies.....	145
Description	70	PART 2. MANUAL STEERING.....	147
Radiator	70	Specifications.....	147
Cooling fan	73	Description.....	147
Thermostat.....	75	Steering wheel.....	147
Thermostat housing	76	Steering column.....	148
Water pump	76	Steering gear assembly	149
Welch plugs	76	PART 3. POWER STEERING	152
Heater unit, water valve and controls.....	77	Specifications.....	152
Blower fan	80	Description.....	152
Air conditioning	80	In car adjustments, checks and minor repairs.....	152
FUEL AND ENGINE MANAGEMENT ...	82	Steering wheel.....	153
Specifications	82	Steering column.....	153
		Power steering pump	153
		Power steering gear assembly.....	154

FRONT SUSPENSION	156	ELECTRICAL SYSTEM	190
Specifications.....	156	Specifications.....	190
Front suspension trouble shooting	156	Battery and charging system trouble shooting.....	190
Description	157	Battery and starting system trouble shooting	191
Steering knuckle.....	157	Lighting system trouble shooting	192
Suspension unit.....	159	Turn signal lamp trouble shooting	192
Control arm	161	Test equipment and some applications.....	193
Stabiliser bar	162	Battery.....	194
Suspension and steering angles	163	Alternator	196
		Starter motor	201
REAR SUSPENSION	164	Ignition system	206
Specifications	164	Steering wheel.....	206
Rear suspension trouble shooting	164	Switches and controls.....	206
Description	165	Instrument cluster.....	209
Rear hub	166	Blower fan.....	209
Suspension unit	167	Radio/cassette.....	209
Control arm	169	lamp units.....	210
Knuckle assembly.....	170	Windscreen wiper	213
Stabiliser bar	170	Fuses, fusible links and relays.....	215
Rear wheel alignment	171	Trailer wiring.....	216
		Wiring diagrams	218
BRAKES	172	BODY	225
Specifications.....	172	Windscreen and rear glass	225
Brakes trouble shooting	172	Front doors.....	225
Description	174	Rear doors.....	228
Master cylinder.....	175	Engine bonnet	231
Brake servo unit.....	177	Tailgate and lock — hatchback	231
Front brakes	178	Luggage compartment lid and lock — sedan	233
Rear disc brakes.....	181	Radiator grille.....	234
Rear drum brakes.....	184	Centre console.....	234
Handbrake cable and lever assembly	186	Dashboard.....	235
Brake adjustments	187	Scat belts	236
Brake pedal.....	187	Seats	236
Hydraulic system.....	188	Vehicle cleaning.....	237
		CONVERSION TABLES.....	238



Pulsar Q



Pulsar Q



Vector GL



Vector GL

VEHICLE IDENTIFICATION AND GENERAL SPECIFICATIONS

1. VEHICLE IDENTIFICATION

When purchasing spare parts or when registering or insuring a vehicle, it may be necessary to quote various vehicle identification codes. The location of these codes are as follows:

The Engine Number is stamped on the front face

of the engine block below No. 4 spark plug.

The Chassis Number is stamped on the bulkhead above and to the right of the brake booster.

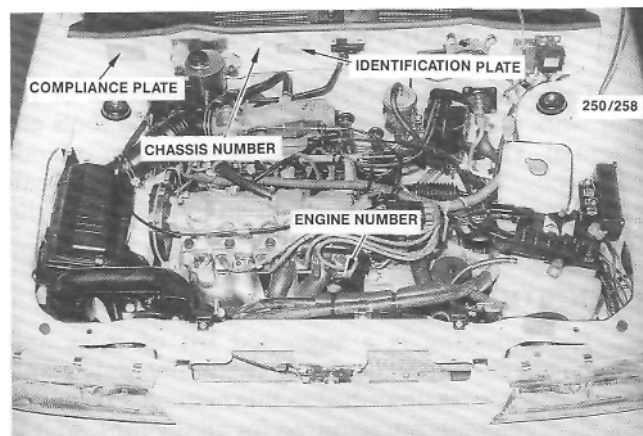
The Vehicle Identification Plate is located on the bulkhead to the left of the MAP sensor and contains codings relating to body style, engine capacity, model,

transaxle type, engine number, paint, trim and build date.

The Compliance Plate contains information on the vehicle make, model, month and year of manufacture, chassis number, seating, capacity and the Australian Design Rules (ADR) with which the vehicle complies. This plate is affixed to the bulkhead above and to the left of the brake booster.

The Tire Placard, which is located on the inside of the glove compartment, contains information on

the tire size, rim size, tire pressure and load ratings.



View of the engine compartment showing the location of various vehicle identification information.

Minimum ground clearance:

Nissan..... 128 mm

Holden..... 110 mm

Turning circle kerb to kerb..... 10.8 m

Fuel tank capacity:

Nissan..... 47 liters

Holden..... 50 liters

Towing capacity:

Without trailer brakes..... 400 kg

With trailer brakes..... 900 kg

*Fuel consumption:

	L/100km (City)	L/100km (Highway)
Manual transaxle	8.5	6.6
Automatic transaxle	9.0	7.2

2. GENERAL VEHICLE SPECIFICATIONS

Length:

Pulsar..... 4 030 mm

Astra hatchback..... 4 035 mm

Vector..... 4 215 mm

Astra sedan..... 4 255 mm

Width:

Nissan..... 1 640 mm

Holden..... 1 655 mm

Height..... 1 380 mm

Wheelbase..... 2 430 mm

Wheel track:

Front..... 1 435 mm

Rear..... 1 430 mm

*The fuel consumption information is based on tests made according to Australian Standard 2877. The actual fuel consumption will depend on many factors including driving habits, vehicle condition and equipment and the prevailing conditions.

LUBRICATION AND MAINTENANCE

SPECIFICATIONS

CAPACITY AND GRADE

Engine:

Lubricant..... 15W-50 SF

Sump capacity including filter 3.3 liters

Cooling system capacity..... 6.0 liters

Manual transaxle:

Lubricant..... 80W-90 GL-4

Capacity 2.7 liters

Automatic transaxle:

Lubricant..... Dexron II

Capacity 6.0 liters

Power steering:

Lubricant..... Dexron II

Capacity 1.0 liters

Manual steering lubricant..... Castrol EPLI grease

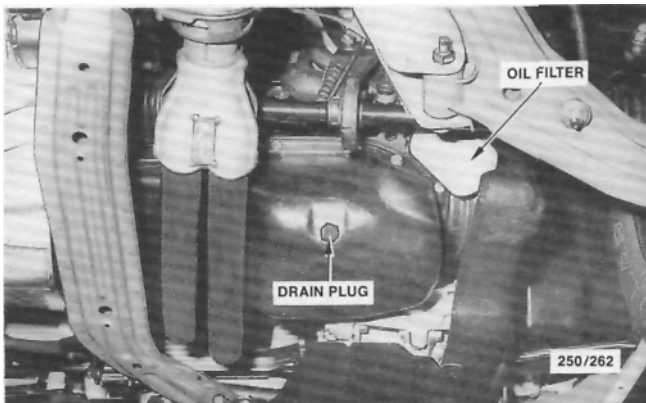
Brake fluid type Dot 4

1. HOW TO GREASE AND OIL CHANGE

(1) Run the front of the vehicle onto car ramps and stop the engine. Chock the front wheels.

(2) Raise the rear of the vehicle and place chassis stands under the rear jacking points.

NOTE: It is best if the vehicle is kept as level as possible to avoid false readings when checking the lubricant levels.



Location of the engine sump drain plug.

(3) Clean around the engine sump drain plug.

(4) Place a drain tin under the engine sump, remove the engine sump drain plug and allow the engine sump to completely drain.

*NOTE: It is best to drain the engine sump **with** the oil at operating temperature. However, if the oil is hot take care to avoid scalding.*

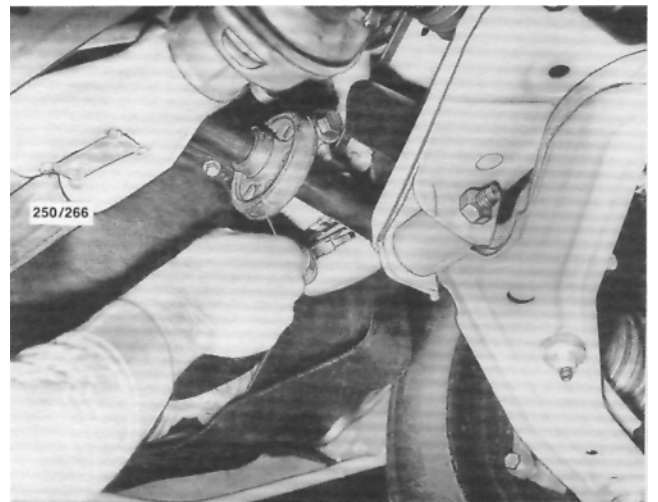
(5) Check that the sealing gasket on the sump plug is in a serviceable condition.

(6) When the engine sump has completely drained, install and firmly tighten the sump drain plug. Wipe around the plug after installation.

(7) Place the drain tin under the oil filler, remove the oil filter using a filter removal tool and allow the residual engine oil to drain. Smear the sealing ring of the new filter with engine oil and lighten the filter by hand as per the instructions supplied with the new filter.

NOTE: Before installing the new filter, ensure that the sealing gasket from the old filter has not adhered to the filter sealing surface on the engine.

(8) Remove the level checking plug from the



Removing the engine oil filter using a filter removal tool.

(1) With the distributor cap and leads removed as an assembly, test one lead at a time, connecting the meter probes at the spark plug end of the lead and at the corresponding terminal inside the cap. Resistance should be less than 15 000 ohms.

(2) If the resistance is more than 15 000 ohms remove the lead from the distributor cap and check the resistance in the lead only. The lead should be renewed if the resistance is still more than 15 000 ohms.

(3) High distributor cap resistance may be due to corrosion deposits on the cap terminals. These deposits should be removed with a small scraper or emery cloth.

Check the distributor cap for cracks or tracking between the high tension terminals on both the inside and outside of the cap. Renew the cap if cracks or tracking are evident.

Check the carbon brush in the centre of the distributor cap for evidence of arcing and renew as necessary.

Check the condition of the rotor and renew if arced excessively or cracked.

HOW TO CONNECT ELECTRICAL TEST EQUIPMENT

NOTE: Some types of tachometers, timing lights and ignition system analysers are not compatible with this type of electronic ignition system and may result in incorrect readings. It is therefore recommended that the manufacturer of the test equipment be consulted before using the equipment.

Do not allow the tachometer lead connector to short to earth as damage to the test equipment or ignition system may result.

Timing Light

(1) **Connect** the timing light to the engine following the instrument manufacturers instructions.

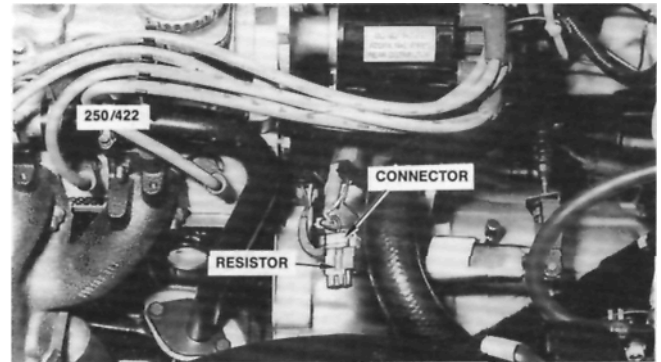
NOTE: Do not connect or disconnect the timing light with the engine running as voltage surges could damage the alternator. Do not allow the high tension leads to open circuit as damage to the ignition system could result.

(2) Where necessary, connect the power leads of the timing light to an external power source to prevent possible transient voltages in the timing light damaging the vehicle alternator.

Tachometer

(1) Ensure **that** the tachometer is compatible with the vehicle ignition system.

(2) Disconnect the resistor from the tachometer



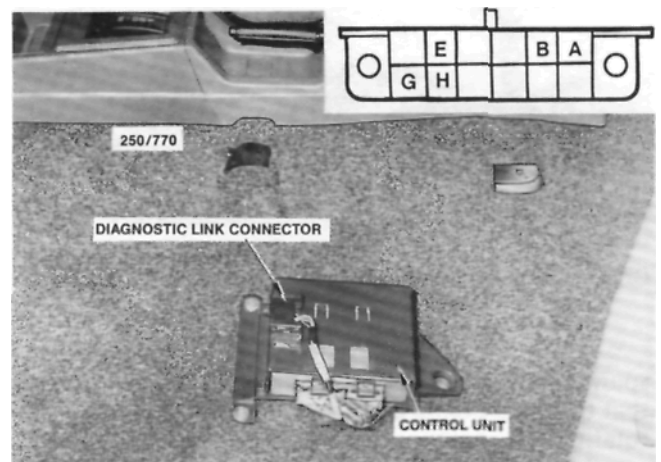
View showing the location of the tachometer pickup wiring connector with the resistor installed.

pick up wiring connector which is located on the ignition coil wiring harness, and connect the positive lead of an accurate tachometer to the brown wire terminal in the wiring connector.

(3) Connect the negative lead to a good earthing point.

TO CHECK AND ADJUST IGNITION TIMING

(1) Connect an accurate tachometer and timing light to the engine as previously described.



View showing the location of the diagnostic link connector. Passengers seat removed for clarity. Inset shows the diagnostic link connector terminal identification.

(2) Start the engine and allow it to reach normal operating temperature.

(3) Connect a jumper lead between terminals A and B on the diagnostic link connector.

(4) With the engine idling at the specified speed, check the ignition timing with the timing light.

Correct timing exists when the marks on the crankshaft pulley are aligned with the pointer on the inner timing cover.

ROADSIDE TROUBLE SHOOTING

CAUTION: *To prevent severe electrical shock extreme care must be taken when working on or near the electronic ignition system as dangerous high tension voltages are produced in both the primary and secondary circuits. See the text for precautionary notes.*

This section deals with the common causes of engine failure to start, as inevitably there will come a time when every driver will experience this problem and will therefore need to call upon his own resources to rectify the trouble. Roadside breakdowns other than engine failure can be identified by reference to the Trouble Shooting section on the particular component affected.

1. TROUBLE SHOOTING

Trouble shooting is only a process of elimination and provided the procedure is carried out correctly and systematically an accurate diagnosis of the trouble can be made in the minimum amount of time.

For an internal combustion engine to run there are three basic requirements, these are ignition, fuel and compression. There are other factors of course but as a rule an engine's failure to start can be attributed to a fault in one of these three systems.

Reports from field engineers of motoring organisations prove that the biggest percentage of engine breakdowns are in the order of ignition or electrical failure first, followed by fuel, with mechanical or compression failure the least common.

Should the engine fail to start, first check that there is adequate fuel in the tank and if so, carry out the following checking procedures in the order described.

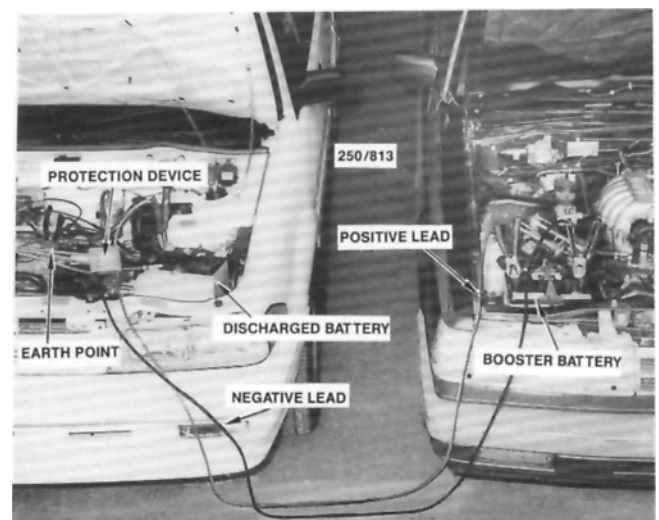
TO JUMP START A VEHICLE

NOTE: *Jump starting a vehicle can be dangerous if the procedure described below is not performed correctly. If any doubt exists, it is recommended that the services of a competent mechanic be obtained.*

The vehicles covered by this manual are equipped with complex electronic circuitry which can be damaged by voltage surges. These voltage surges can be generated when

jump starting, or being jump started by another vehicle. If available use jumper leads equipped with a surge protection device and follow the lead manufacturers instructions carefully, particularly regarding the connection and disconnection of the leads.

- (1) Ensure that the booster battery is 12 volts and the negative terminal is earthed.
- (2) Ensure that the vehicles are not touching and that the ignition and all accessories on both vehicles are switched Off.
- (3) Ensure that the transmissions on both vehicles are in Park or Neutral and the handbrakes are firmly applied.
- (4) Remove the vent caps from the battery and check the electrolyte level. Replenish with distilled water as necessary.



View showing the correct jumper lead connections for jump starting a vehicle. The leads shown are equipped with a surge protection device.

ENGINE

SPECIFICATIONS

ENGINE ASSEMBLY

Type.....	4cyl OHC
Models.....	1.6 liter, 1.8 liter
Capacity:	
1.6 liter	1 598 cc
1.8 liter	1 796 cc
Firing order.....	1-3-4-2
Bore:	
1.6 liter	80.0 mm
1.8 liter	84.8 mm
Stroke	79.5 mm
Maximum compression pressure variation between cylinders	100 kPa

NOTE: Specifications regarding engine tuning arc listed in the Engine Tune-up section.

CYLINDER BLOCK

Type.....	4 cyl in line
Material.....	Cast iron
Bore diameter:	
1.6 liter	79.995-80.065 in three groups
1.8 liter	84.755-84.905 in four groups
Bore taper limit	0.013 mm
Bore ovality limit	0.013 mm
Block face distortion limit	0.10 mm
Maximum height of piston above block face at top dead centre:	
1.6 liter	0.00 mm
1.8 liter	0.50 mm
Bore oversize.....	0.50 mm

CYLINDER HEAD

Type.....	One piece, cross flow
Material.....	Aluminum alloy
Distortion limit	0.025 mm
Machining limit	0.25 mm
Minimum overall height after machining:	
1.6 liter	95.50 mm
1.8 liter	94.80 mm
Valve seat angle.....	45 degrees

Valve seat contact width:

Inlet.....	1.0-1.5 mm
Exhaust	1.7-2.2 mm
Valve stem protrusion	18.4 mm from top of cylinder head
Valve guide height	12.2-12.5 mm from top of cylinder head

VALVES AND SPRINGS

Valve length	104.2 mm
Valve head diameter:	
1.6 liter —	
Inlet.....	36.0 mm
Exhaust	32.0 mm
1.8 liter -	
Inlet.....	41.8 mm
Exhaust	36.5 mm
Valve stem diameter:	
Inlet.....	6.998-7.012 mm
Exhaust	6.978-6.992 mm
Valve stem to guide clearance:	
Inlet.....	0.018-0.052 mm
Exhaust	0.038-0.072 mm
Oversize valve system availability	0.075, 0.150 and 0.250 mm
Valve face angle	44 degrees
Valve spring tension:	
Valve closed	300 N at 37.5 mm
Valve open.....	765 N at 26.5 mm

TAPPETS

Type	Hydraulic
Operating length	63.26 mm
Diameter	21.392-21.405mm
Leak down rate.....	2-10 seconds for 3.175 mm

PISTONS AND GUDGEON PINS

Piston type	Aluminum alloy
Diameter:	
1.6 liter	79.955-80.035 mm in 8 categories in increments of 0.01 mm
1.8 liter	84.725-84.885 mm in 16 categories in increments of 0.01 mm

COOLING AND HEATING SYSTEMS

SPECIFICATIONS

Coolant capacity	6.0 liters
Thermostat:	
Opening temperature.....	91 deg C
Fully open temperature	103 deg C
Cooling fan:	
Fan cut in temperature	100 deg C
Fan cut out temperature	95 deg C
Radiator cap opening pressure	78 -98 kPa

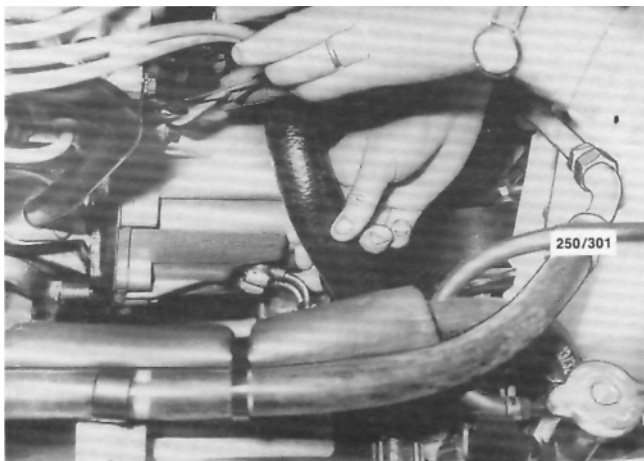
TORQUE WRENCH SETTINGS

Water pump retaining bolts	25 Nm
Thermostat housing bolts.....	15 Nm
Sender unit	10 Nm

1. COOLING SYSTEM TROUBLE SHOOTING

COOLANT LEAKAGE - EXTERNAL

- (1) Loose hose clips or faulty hoses: Tighten the hose clips or renew the faulty water hoses.
- (2) Leaking radiator core or tanks: Repair or renew the radiator.
- (3) Leaking heater core or hoses: Repair or



Checking the radiator hose for deterioration.

renew the heater core. Check the hose clips and hoses and renew if necessary.

(4) Leaks at the thermostat cover and/or water pump O rings. Renew the O rings.

(5) Worn or damaged water pump seal assembly: Renew the water pump.

(6) Worn or damaged water pump bearing assembly: Renew the water pump.

(7) Loose or rusted welch plugs; Renew the welch plugs.

(8) Faulty cylinder head gasket or loose cylinder head bolts: Renew the cylinder head gasket and correctly tighten the cylinder head bolts.

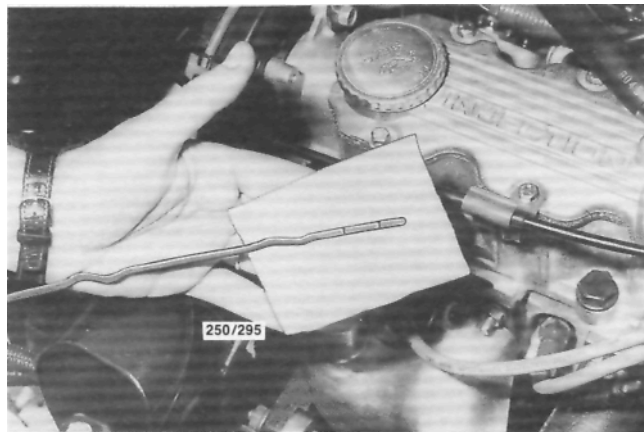
(9) External crack in the cylinder head or cylinder block: Repair or renew the faulty components.

NOTE: Check the system for external leakage by running the engine to operating temperature over a dry floor and checking for the leak source.

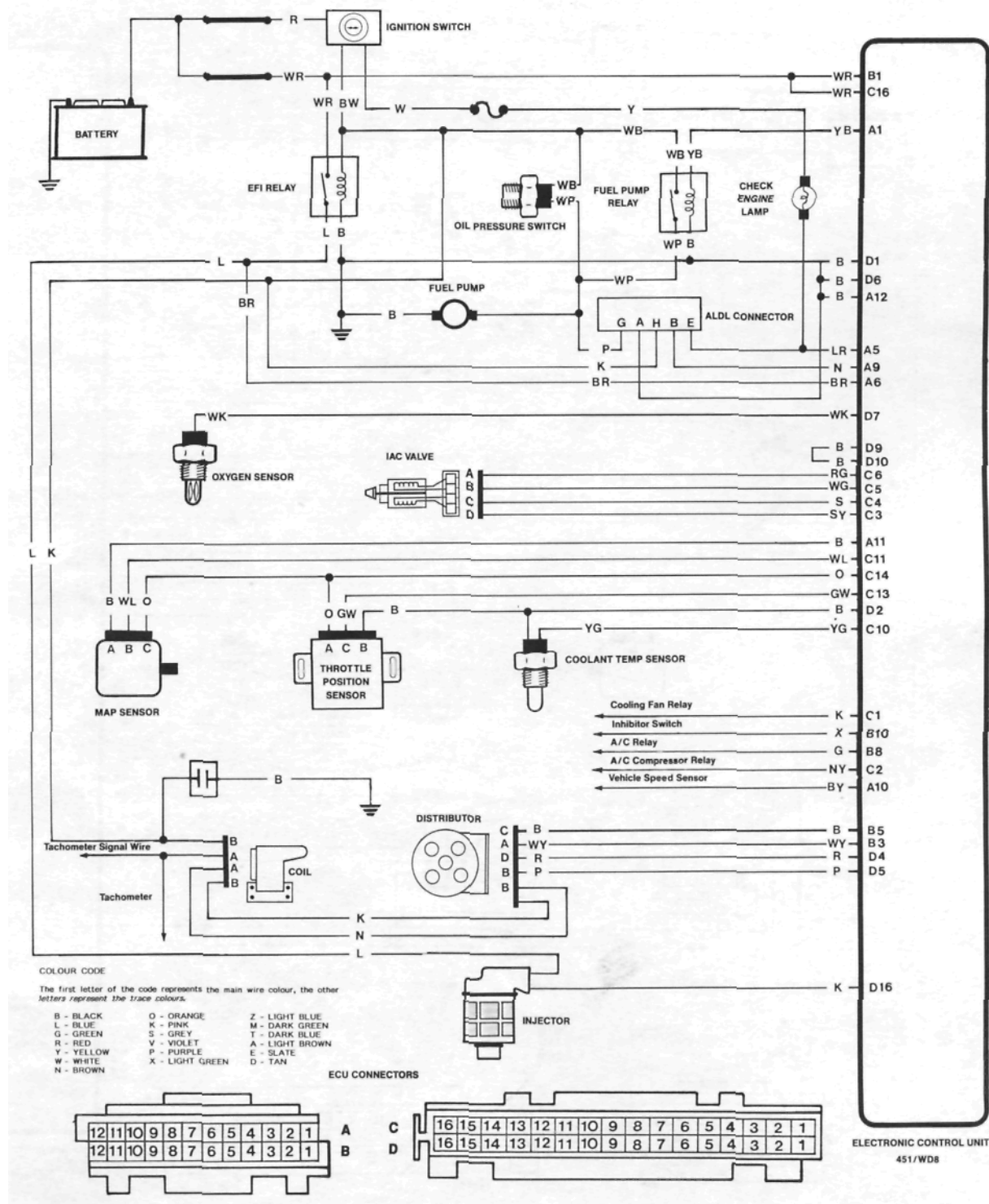
Check the vehicle interior below the heater core for moisture. If a rusted welch plug is found, it is a good practice to renew all the welch plugs.

COOLANT LEAKAGE - INTERNAL

- (1) Cylinder head gasket leak due to warped cylinder head or cylinder block gasket faces: Reface



Check the engine oil for level and dilution on the dipstick.



Fuel system wiring diagram for the 1.6 liter engine.

circuitry do not immerse it in cleaning solvent as this may result in irreparable damage.

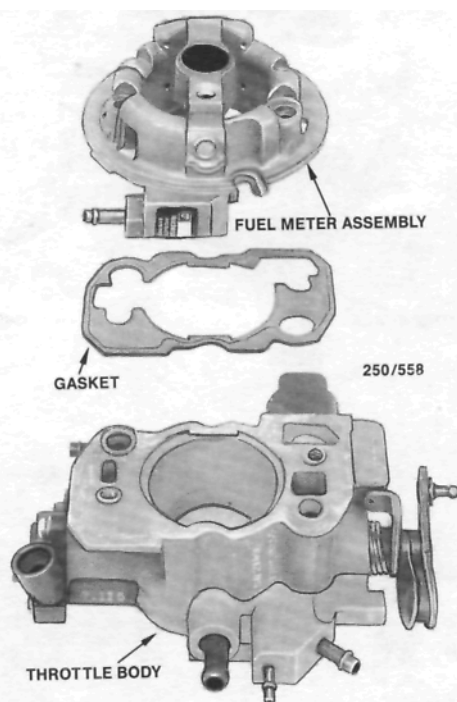
Installation is a reversal of the removal procedure with attention to the following points:

- (1) Lubricate the new O ring seals with automatic transmission fluid prior to installing them to the injector. If removed, ensure that the lower filter screen is installed.
- (2) Firmly push the injector into the throttle body assembly until it is fully seated, ensuring that the injector connection terminals face towards the rear of the vehicle.
- (3) Apply Loctite 262 to the injector retaining plate screw and tighten securely.
- (4) Start the engine and check for fuel leaks as previously described.
- (5) Install the air cleaner and tighten the retaining nuts securely.

FUEL METER ASSEMBLY - 1.6 LITRE ENGINE

To Remove and Install

- (1) Remove the injector as previously described.
- (2) Mark the fuel supply and return hoses, release the clamps and disconnect the hoses from the fuel meter assembly.
- (3) Remove the air cleaner assembly base gasket from the fuel meter assembly.
- (4) Remove the bolts and screws securing the fuel meter assembly to the throttle body and remove



View of the fuel meter assembly removed from the throttle body.

the fuel meter assembly. Remove and discard the gasket.

- (5) If necessary, remove the fuel pressure regulator as previously described.

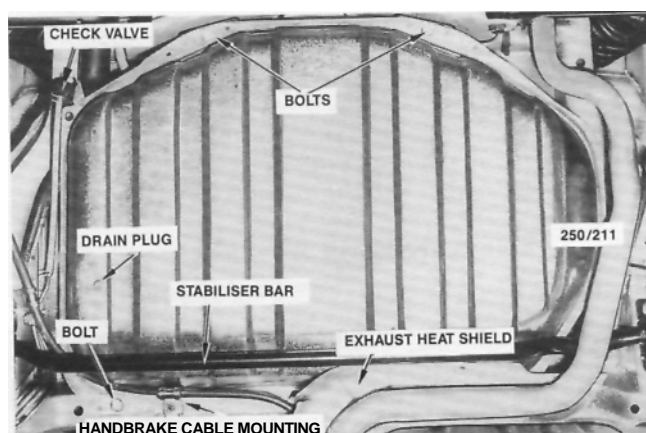
Installation is a reversal to the removal procedure with attention to the following points;

- (1) If removed, install the fuel pressure regulator as previously described.
- (2) Place a new gasket on the throttle body, aligning the holes in the gasket with those in the throttle body, ensuring that the idle air passage is not blocked.
- (3) Coat the fuel meter assembly retaining screws with Loctite 262 and tighten securely.
- (4) Install the fuel meter assembly retaining bolts and tighten to the specified torque.
- (5) Connect the fuel supply and return hoses and tighten the clamps securely.
- (6) Install the injector as previously described.
- (7) Start the engine and check for fuel leaks. Rectify as necessary.
- (8) Install the air cleaner assembly.

FUEL TANK

To Remove and Install

- (1) Depressurize the fuel system as previously described.
- (2) Disconnect the negative battery terminal.
- (3) Remove the fuel pump cover plate retaining screws, disconnect the wiring harness rubber grommet from the cover plate and remove the cover plate from the wiring harness.
- (4) Raise the rear of the vehicle and support it on chassis stands. Refer to the Wheels and Tires section if necessary.
- (5) Remove the fuel tank drain plug and drain the fuel into a petroleum resistant container.
- (6) Mark the fuel hoses and disconnect the hoses from the fuel pump.
- (7) Disconnect the hoses from the fuel filler neck pipe, the fuel check valve and the fuel tank breather pipe.



Installed view of the fuel tank.

EMISSION CONTROL

INTRODUCTION

To reduce the output level of the three primary automotive emissions, carbon monoxide (CO), hydrocarbons (HC) and oxides of nitrogen (NO_x), and thus comply with legislation on the maintenance of clean air, several different emission control systems are used in the Pulsar range of vehicles covered by this manual.

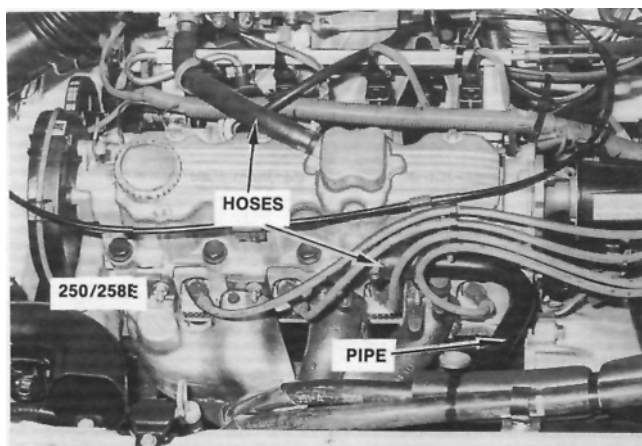
The systems will be discussed under the headings (1) Crankcase Ventilation System, (2) Evaporative Control System, (3) Air Preheat System — 1.6 Liter Engine and (4) Exhaust Control System.

1. CRANKCASE VENTILATION SYSTEM

DESCRIPTION

The crankcase ventilation system is of the closed type and is designed to prevent crankcase vapors being emitted into the atmosphere. Crankcase vapors are caused by gases escaping past the piston rings into the crankcase during the combustion process.

The crankcase vapors are collected in the camshaft housing from the crankcase via the various oil drain passages and the pipe from the side of the crankcase.



View of the engine ventilation hoses and pipe. 1.8 liter engine.

The crankcase vapors are then drawn into the engine via a branched hose connected to the camshaft housing oil baffle and the throttle body (1.8 liter engines) or inlet manifold (1.6 liter engines).

At idle speed, vapors are drawn through the small branch of the hose and into the engine.

As the engine speed increases, vapors are also drawn into the engine via the main hose.

TO SERVICE THE SYSTEM

(1) At intervals of 40 000 km, disconnect the small engine ventilation hose from the throttle body or inlet manifold and check that the metering orifice is not blocked.

If necessary, clean the orifice using compressed air and solvent.

(2) Disconnect all the engine ventilation hoses and check for blocking, collapsing and deterioration. Renew the hoses as necessary.

2. EVAPORATIVE CONTROL SYSTEM

Special Equipment Required:

To Test Purge Valve — Hand vacuum pump

DESCRIPTION

The evaporative control system reduces the amount of hydrocarbons emitted to the atmosphere through fuel evaporation.

The vehicles covered by this manual use an absorption regeneration system to reduce vapor loss. The system utilizes a canister of activated charcoal to trap and hold the fuel vapors until they can be fed into the induction system for burning in the combustion chambers.

The basic components of the evaporative control system are a fuel tank with a sealed filler cap, a charcoal canister with a purge control valve, a fuel check valve and pipes and hoses to connect the various components.

NOTE: The fuel tank filler cap is not vented to the atmosphere but is equipped with a one way relief valve to prevent a vacuum forming in the fuel tank.

AUTOMATIC TRANSAXLE

SPECIFICATIONS

Make.....JATCO RL3F01A
Type.....3 speed and reverse epicyclic gear
train with lock up torque converter
Operation.....Automatic hydraulic
Lubricant:
 Type.....Dexron IT
 Capacity.....6.3 liters

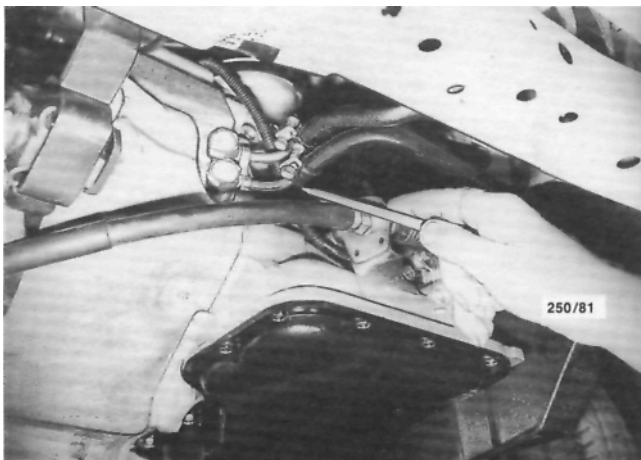
TORQUE WRENCH SETTINGS

Drive plate to crankshaft bolts	60 Nm
Drive plate to torque converter bolts	49 Nm
Convener housing to engine	22 Nm
Converter housing to transaxle	23 Nm
Transaxle sump to transaxle	7 Nm
Oil cooler pipe to transaxle	49 Nm
Selector shaft locknut	42 Nm
Transaxle filter bolts	12 Nm

1. AUTOMATIC TRANSAXLE TROUBLE SHOOTING

NO DRIVE IN D RANGE

- {1) Low fluid level in transaxle: Check the fluid level in the transaxle and top up if required.



Check the oil cooler hose connections for leaks if the fluid level is low.

- (2) Incorrectly adjusted selector cable: Check and adjust the selector cable as detailed.
- (3) Incorrect or contaminated transaxle fluid: Drain and refill with the recommend type and quantity of transaxle fluid.

NOTE: Check the possible causes in the order given.

NO REVERSE IN R RANGE

- (1) Low fluid level in transaxle: Check the fluid level and top up if required.
- (2) Incorrectly adjusted selector linkage: Check the condition of the selector cable, selector quadrant and selector arm for wear and damage. Adjust as required.



Check the drive shaft oil seals as a likely leak source.

SLIPPING OR ROUGH UPSHIFT

- (1) Incorrectly adjusted selector linkage: Check and adjust the selector linkage.
- (2) Low fluid level in transaxle: Check the fluid level and top up if required.

NO TRANSAXLE KICKDOWN

- (1) Incorrectly adjusted throttle cable: Check and adjust the cable as detailed in the Fuel and Engine Management section.

PART 2. MANUAL STEERING

SPECIFICATIONS

Steering gear type	Rack and pinion
Steering column type	Energy absorbing collapsible and tilt adjustable
Steering wheel free play (maximum)	35 mm
Linkage.....	Direct from rack ends to tie rods and steering knuckles
Turns lock to lock	3.6
Steering column length	534.7-537.3 mm
Steering gear lubricant.....	Castrol EPL 1 grease

TORQUE WRENCH SETTINGS

Steering wheel retaining nut	39 Nm
Steering gear to bulkhead mounting bolts	108 Nm
Tie rod to steering knuckle nut	98 Nm
Tie rod to tie rod end locknut	98 Nm
Tie rod ball housing to rack	88 Nm
Steering column to mounting bracket bolt	14 Nm
Steering column universal coupling joint pinch bolts	29 Nm

1. DESCRIPTION

The steering gear is a rack and pinion type which is mounted on the lower section of the engine compartment bulkhead by rubber mountings and brackets.

The design of this assembly requires a range of special tools to dismantle and assemble the steering gear. If the steering gear is found to have a fault which requires overhaul of the rack and pinion, it is recommended that this be performed by an authorized workshop or steering specialist.

However, the procedures for the removal and installation of the steering gear and the renewal of the tie rods, the tie rod ends and the rubber boots are fully covered in this section.

The rack and pinion assembly requires no lubrication during service.

The steering column is of the energy absorbing type designed to compress in the event of a severe front end collision. The energy absorbing units are the outer steering column, the tilt bracket and the steering shaft. All these units should be handled with extreme care if service operations are performed on the steering column assembly.

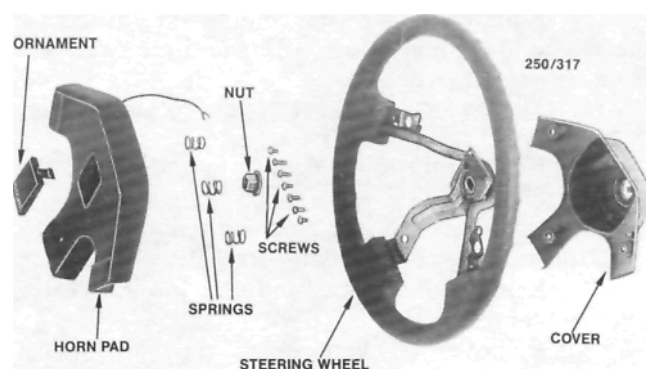
2. STEERING WHEEL

Special Equipment Required:

To Remove Steering Wheel - Steering wheel puller

TO REMOVE AND INSTAL

- (1) Disconnect the negative battery terminal.
- (2) Using a small screwdriver, carefully prise the centre ornament from the steering wheel.



View of the steering wheel removed from the vehicle.
Steering wheels may vary between models.

- (3) Remove the steering wheel retaining nut and mark the steering shaft and steering wheel hub in relation to each other as an aid to assembly.
- (4) Remove the steering wheel from the steering shaft.

NOTE: If the steering wheel will not separate from the steering shaft, loosen the horn pad retaining screws at the rear of the steering wheel and withdraw the horn pad after disconnecting the wire. A puller can now be used to pull the steering wheel from the steering shaft. Do not strike the end of the steering shaft as sharp blows can cause irreparable damage to the collapsible steering shaft.

- (5) If necessary the steering wheel can be dismantled as shown in the illustration.

Installation is a reversal of the removal procedure with attention to the following points:

- (1) Apply a light coat of multipurpose grease to the horn slip ring and the turn signal canceling pins.
- (2) Ensure that the marks on the steering wheel and steering shaft are aligned.
- (3) Tighten the steering wheel retaining nut to the specified torque.

REAR SUSPENSION

SPECIFICATIONS

Type.....	Independent MacPherson strut
Shock absorber.....	Oil filled, non-repairable
Maximum hub bearing end float	0.05 mm
Rear wheel alignment:	
Toe out	3 mm \pm 2 mm
Camber	- 1° \pm 45'

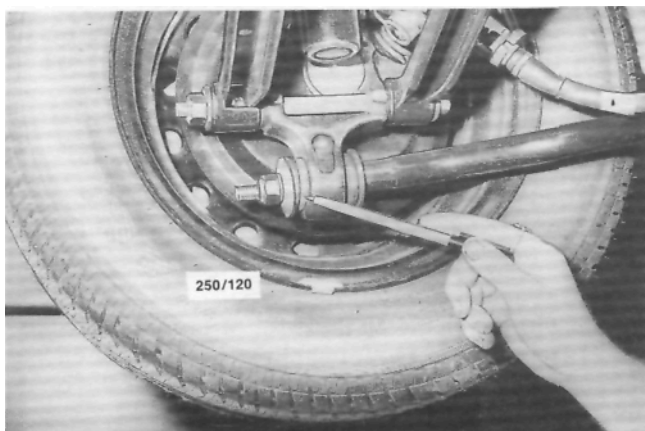
TORQUE WRENCH SETTINGS

Hub retaining nut	255 Nm
Suspension unit retaining nuts	29 Nm
Upper mounting retaining nut	72 Nm
Suspension unit to knuckle nuts	118 Nm
Control arms to knuckle nut	118 Nm
Control arms to crossmember nut	118 Nm
Stabiliser bar mounting bracket bolts	108 Nm
Stabiliser bar retaining nut.....	83 Nm
Backing plate bolts.....	45 Nm

1. REAR SUSPENSION TROUBLE SHOOTING

REAR END NOISE

(1) Defective suspension unit or mounting: Renew the faulty components.



Check the stabilizer bar bushes and mounting rubbers for wear and deterioration.

(2) Loose or worn control arm bushes or pivot bolts: Check and tighten or renew the worn components.

(3) Broken coil spring: Renew the coil spring, preferably in matching pairs.

(4) Worn rear hub bearing: Check and renew the hub bearing as necessary.

(5) Loose or worn stabilizer bar bushes: Check and tighten or renew the worn components.

NOTE: As a quick guide to suspension unit condition, bounce the vehicle up and down (one side at a time) and observe if the vehicle comes to rest in a single movement. If the vehicle bounces two or three times before coming to rest the suspension unit is suspect. If suspect, remove the suspension unit and check for fractures and leaks. If the suspension unit is found to be unserviceable, it is good practice to install two new suspension units as a matching pair.

To check the control arm bushes or pivot bolts, insert a lever between the suspect unit and its mounting and lever the unit back and forth checking for excessive movement.

Check the coil springs visually for breaks. If the spring is found to be unserviceable, it is good practice to install two new coil springs as a matching pair.

Rear hub bearing noise can be diagnosed by raising and supporting the rear of the vehicle, spinning one wheel at a time and listening for a rumbling noise.

POOR OR ERRATIC ROAD HOLDING ABILITY

(1) Low or uneven tire pressure: Inflate to the recommended pressures.

(2) Incorrect rear wheel alignment: Check and adjust the rear wheel alignment as necessary.

(3) Defective suspension unit: Renew the faulty suspension unit, preferably in pairs.

(4) Loose or broken stabilizer bar: Check and tighten or renew the faulty components.