
Vehicle Standards – Vehicle Services

Kateena Street, Regency Park 5010 PO Box 2526 Regency Park 5942

Phone 1300 882 248 Fax (08) 8348 9533

MODIFICATIONS TO PASSENGER CARS, CAR TYPE UTILITIES AND PANEL VANS

INTRODUCTION

Owners Responsibility

There are many ways in which modifications may affect the safety of a vehicle without the person carrying out the modifications realising that this has occurred. It is the intention of this Information Bulletin to provide a general guideline to the safety and legal requirements relating to light passenger vehicle modifications. Modifications, particularly in critical areas such as brakes, steering and suspension should only be carried out by persons experienced in such matters.

Engineering Reports

Transport SA may request a report prepared by a Chartered Professional Engineer be submitted for vehicles, which have been extensively modified to demonstrate that the vehicle's safety features and compliance with relevant Australian Design Rules have been retained.

If modifications are sufficiently complex to require an engineering report you are advised to contact the Institution of Engineers of Australia for assistance in choosing an engineer experienced in the discipline concerned. A list of engineers experienced in this type of work is included in Information Bulletin Number 30.

AUSTRALIAN DESIGN RULES

Australian Design Rules (ADRs) for Motor Vehicle Safety are incorporated in State Legislation under the Road Traffic Act 1961. If modifications to a vehicle are being considered it is important to establish the date of manufacture of the vehicle, so that it may be determined which rules may be affected.

There have been two editions of ADRs introduced. ADRs referred to as the "Second Edition" was introduced on the 1st January 1969 and ADRs referred to as the "Third Edition" were introduced on the 1st July 1988.

Vehicles complying with ADRs are fitted with a compliance plate that is usually located in the engine compartment.

This plate displays the month and year of manufacture of the vehicle and in the case of vehicles manufactured prior to 1st July 1988 the actual ADR numbers applicable to that vehicle.

The ADRs have been introduced progressively and this is why modification requirements depend on the month and year of manufacture of the vehicle.

The following lists provide the ADR numbers, corresponding subject and the date of implementation of each rule. The lists relate to passenger cars, car type utilities and panel vans only and not to forward control vehicles

(eg. Toyota HiAce, Mitsubishi L300 Vans) or multipurpose passenger cars (eg. Toyota Landcruiser, Nissan Patrol 4WD Station Wagons).

SECOND EDITION AUSTRALIAN DESIGN RULES

ADR	TITLE	DATE
1	Reversing Signal Lamps	1/1/72
2	Door Latches & Hinges	1/1/71
3	Seat Anchorages	1/1/71
3A	Seat Anchorages	1/1/77
4	Seat belts - front seats	1/1/69
4	Seat belts - rear seats	1/1/71
4A	Seat Belts - front & rear seats	1/1/74
4B	Seat Belts - front & rear seats	1/1/75
4C	Seat Belts - front & rear seats	1/1/76
4D	Seat Belts - front & rear seats	1/1/84
5A	Seat Belt Anchorage Points - front	1/1/69
5A	Seat Belt Anchorage Points - rear	1/1/71
5B	Seat Belt Anchorage Points - front & rear	1/1/75
6	Direction Turn Signal Lamps	1/1/73
7	Hydraulic Brake Hoses	1/1/70
8	Safety Glass	1/7/71
9	Standard Controls for Automatic Transmission	1/1/72
10A	Steering Columns	1/1/71
10B	Steering Columns	1/1/73
11	Internal Sun Visors	1/1/72
12	Glare Reduction in Field of View	1/1/73
14	Rear Vision Mirrors	1/1/72
15	Demisting of Windscreens	1/1/71
16	Windscreen Wipers and Washers	1/1/73
18	Location and Visibility of Instruments	1/1/73
18A	Location and Visibility of Instruments	1/1/81
20	Safety Rims	1/7/70
21	Instrument Panels	1/1/73
22	Head Restraints	1/1/72
22A	Head Restraints	1/1/75
23	New Pneumatic Passenger Car Tyres	1/1/74
23A	New Pneumatic Passenger Car Tyres	1/1/84
23B	New Pneumatic Passenger Car Tyres	1/1/86
24	Tyre Selection	1/1/73
24A	Tyre Selection	1/1/86
25	Anti-Theft Locks	1/1/72
25A	Anti-Theft Locks	1/1/78
26	Vehicle Engine Emission Control	1/1/72 #
27	Vehicle Engine Emission Control	1/1/74 #
27A	Vehicle Engine Emission Control	1/7/76
27B	Vehicle Engine Emission Control	1/1/82
27C	Vehicle Engine Emission Control	1/1/83
28	Motor Vehicle Noise	1/1/74
28A	Motor Vehicle Noise	1/1/81

29	Side Door Strength	1/1/77 #
30	Diesel Engine Exhaust Smoke Emissions	1/7/76
31	Hydraulic Brake Systems	1/1/77 #
34	Child Restraint Anchorages (except folding rear seats)	1/7/76 #
34A	Child Restraint Anchorages	1/1/85 #
35	Commercial Vehicle Braking Systems	1/1/79 *
37	Vehicle Emission Control	1/1/86

Apply only to cars and station sedans/wagons

* Applies only to car type utilities and panel vans

THIRD EDITION AUSTRALIAN DESIGN RULES

ADR	TITLE	DATE
1/...	Reversing Lamps	1/7/88
2/...	Side Door Latches & Hinges	1/7/88
3/...	Seat Anchorages	1/7/88
4/...	Seat Belts	1/7/88
5/...	Anchorages for Seat Belts & Child Restraints	1/7/88
6/...	Direction Indicator Lamps	1/7/88
7/...	Hydraulic Brake Hoses	1/7/88
8/...	Safety Glazing Material	1/7/88
10/...	Steering Column	1/7/88
11/...	Internal Sun Visors	1/7/88
12/...	Glare Reduction in Field of View	1/7/88
13/...	Installation of Lighting and Light-Signalling Devices on other than L-Group Vehicles	1/10/91 %
14/...	Rear Vision Mirrors	1/7/88
15/...	Demisting of Windscreen	1/7/88
16/...	Windscreen Wipers & Washers	1/7/88
18/...	Instrumentation	1/7/88
20/...	Safety Rims	1/7/88
21/...	Instrument Panel	1/7/88
22/...	Head Restraints	1/7/88
23/...	Passenger Car Tyres	1/7/88
24/...	Tyre & Rim Selection	1/7/88
25/...	Anti-Theft Lock	1/7/88
28/...	External Noise of Motor Vehicles	1/7/88
29/...	Side Door Strength	1/7/88
30/...	Diesel Engine Exhaust Smoke Emission	1/7/88
31/...	Hydraulic Brake Systems for Passenger Cars	1/7/88
34/...	Child Restraint Anchorages and Child Restraint Anchor Fittings	1/1/93
37/...	Emission Control for light Vehicles	1/7/88
42/...	General Safety Requirements	1/7/88
43/...	Vehicle Configuration & Marking	1/7/88
44/...	Specific Purpose Vehicle Requirements	1/7/88
45/...	Lighting & Light Signalling Devices Not Covered By ECE	1/10/91
46/...	Headlamps for other than L-Group Vehicles	1/10/91 %
47/...	Reflex Reflectors	1/10/91
48/...	Rear Registration Plate Illumination Devices for other than	

	L-Group Vehicles	1/10/91 %
49/...	Front & Rear Position (Side) Lamps, Stop Lamps & End-Outline Marker Lamps	1/10/91
50/...	Front Fog Lamps	1/10/91
51/...	Filament Globes	
52/...	Rear Fog Lamps	1/10/91
60/...	Centre High-Mounted Stop Lamps	1/7/89
61/...	Vehicle Marking	1/1/92
62/...	Mechanical Connections Between Vehicles	1/1/92
69/...	Full Frontal Impact Occupant Protection	1/7/95
70/...	Exhaust Emission Control for Diesel Engine Vehicles.	
	New Model Vehicle	1/1/95
	All Vehicles	1/1/96
71/...	Temporary Use Spare Tyres	1/7/97
72/...	Dynamic Side Impact Occupant Protection	
	New Model Vehicles	1/1/99
	All Vehicles	1/1/2004
73/...	Offset Frontal Impact Occupant Protection	
	New Model Vehicles < 2.5 tonnes GVM	1/1/2000
	All Vehicles < 2.5 tonnes GVM	1/1/2004

% (L Group vehicles are mopeds and motor cycle type vehicles)

The ADRs are complex in nature, generally performance based and compliance may not be able to be proven by visual examination. Vehicle manufacturers conduct laboratory testing and engineering analysis to establish compliance with ADRs.

Under the requirements of the Road Traffic Act a motor vehicle that was manufactured to comply with an ADR must comply with the ADR as in force when it was manufactured unless a *Certificate of Exemption* from the Regulations is issued. Engine changes for example may effect the emission control requirements of the ADRs.

Before consideration is given to an application to alter an item covered by ADRs Transport SA may require testing or presentation of an engineering report prepared by a Chartered Professional Engineer to demonstrate that compliance with ADRs has been maintained.

Where reasonable cause exists Transport SA may consider Exemption from certain requirements.

Modifications, which contravene the requirements of the Road Traffic Act and Regulations, require Exemption. The following requirements are the basis for the granting a Exemption from the Road Traffic Act and Regulations.

ENGINE CHANGES

General

The fitting of an alternative engine is a common modification carried out to passenger cars. The alternative engine may be fitted to replace one that is no longer serviceable, or to achieve an increase in capacity, power and/or torque.

Under the Road Traffic (Miscellaneous) Regulations 1999 the fitting of an engine of greater capacity than an engine available as an option for the vehicle, so as to exceed the efficient functioning capacity of the braking

system provided at the time of manufacture of the vehicle, is not permitted unless a *Certificate of Exemption* is issued by Transport SA.

Several factors are taken into account when considering an application to increase the engine capacity of a vehicle. Consideration is given to the weight of the engine, the power and torque output in relation to braking, strength of the vehicle, effect on steering/suspension components, and the effect on vehicle handling characteristics.

Transport SA does not specify an absolute maximum capacity, power and/or torque for engines that may be fitted to passenger vehicles, however, Category 1 and Category 2 Approved Engine Change Lists have been developed which specify some engine changes which are acceptable to Transport SA. For other than Category 1 modifications a *Statement of Requirements* is required from Transport SA prior to commencing modification of a vehicle.

A Transport SA Customer Service Centre must be notified of the new engine number for the vehicle to be correctly registered.

Category 1 Approved Engine Change List

The Category 1 Approved Engine Change List specifies acceptable alternative engines where no major mechanical changes to the vehicle, such as upgrading of the braking system are required. Engine changes to vehicles included on this list; require no prior approval or inspection.

Under the provisions of a Government Gazette Notice, engine changes undertaken in accordance with the requirements of Category 1 engine change list do not require a *Certificate of Exemption* to be issued.

Category 2 Approved Engine Change List

The Category 2 Approved Engine Change List specifies acceptable alternative engines where mechanical alterations and/or emission criteria may be applicable. Engine changes included in the Category 2 Approved Engine Change List will be acceptable to Transport SA providing modifications are undertaken in accordance with the *Statement of Requirements*. Category 2 modified vehicles will be required to be presented for a full roadworthiness inspection.

To obtain information on the vehicles included in the Category 1 and Category 2 Approved Engine Change Lists, please contact Vehicle Standards on 8348-9599.

ENGINE CHANGES COVERED BY AUTOMOTIVE INSTRUCTIONS

Transport SA has developed a series of Automotive Instructions to eliminate the necessity to obtain a *Statement of Requirements* for engine changes to some vehicles.

When an Automotive Instruction is used, lodging an Application to Modify a Motor Vehicle form or obtaining a *Statement of Requirements* is not required for the modification, however, an inspection of the vehicle may still be required on completion of the modification.

Upon selecting the appropriate Automotive Instruction for the make and model of vehicle, the modifier must;

- a. Verify that the intended modifications are as specified in the Automotive Instruction. If the intended modification is not as specified by the Automotive Instruction then an Application to Modify a Motor Vehicle form is to be submitted to Vehicle Standards so that the modification can be assessed.

- b. Where the Automotive Instruction includes the intended modification the engine change may then be undertaken in accordance with the Conditions of Modification and General Conditions as specified in the Instruction.
- c. On completion of the modifications the modifier is required to present the vehicle for an inspection, unless otherwise specified. To arrange for an inspection in the metropolitan area of Adelaide please ring 8348 9555, for country inspections please ring 8348 9600 or 1800 643 849.

When making a booking for inspection please quote the Modification Code listed on the Instruction for the engine fitted. A fee is payable for the inspection.

- d. Upon passing the vehicle inspection, a label will be attached to the vehicle identifying the modification and the Registrar of Motor Vehicles will be advised of the new engine number and capacity.

ENGINE CHANGES REQUIRING A STATEMENT OF REQUIREMENTS (SOR)

Engine changes, which are not specified in the Category 1 engine change list or Automotive Instruction, require a SOR to be issued and the vehicle inspected on completion of the modifications.

The SOR is issued to individual vehicles and the acceptance of a modification does not set a precedent.

It is important to realise that the SOR does not mean that the vehicle is acceptable to be driven on the road. It is only after the *Certificate of Exemption* has been issued that the vehicle is considered to comply with the requirements of The Road Traffic Act and Regulations.

Procedure to obtain a Statement of Requirements

- a. Contact Transport SA to obtain information as to the acceptability of the proposal and the appropriate application form.
- b. Complete and submit an Application to Modify a Motor Vehicle form together with any other relevant documents eg. Engineering reports in the case of extensively modified vehicles.
- c. If the proposal is acceptable, Transport SA will issue a SOR. If the proposal is not acceptable the applicant will be advised in writing.

If additional information is required before a SOR can be given further consideration, the applicant will be contacted either by telephone or in writing.

- d. Once the SOR is received the proposed alteration may be commenced. On completion of the alteration the applicant or the applicant's representative, may arrange a booking for an inspection. When making a booking for inspection please quote the reference listed on the SOR. A fee is payable for the inspection. Inspections can be arranged by telephoning Transport SA on 8348 9555 for metropolitan Adelaide bookings. For country inspection please ring 8348 9600 or 1800 643 849.
- e. At the allocated inspection time, the vehicle is to be presented for inspection with the SOR being handed to the inspecting officer.

- f. It is advised that the person presenting the vehicle arrive at least 10 minutes prior to the allocated time, so that the necessary paperwork can be checked and the inspection fee paid.
- g. If the vehicle fails the inspection, reinspection at a later date is required. A fee is payable for the inspection. After rectification of all faults the applicant, or the applicant's representative, may contact Transport SA and arrange a booking for reinspection.
- h. After the vehicle has passed inspection, the Registrar of Motor Vehicles will be advised of the new engine number and capacity and a *Certificate of Exemption* will be forwarded to the registered owner.

ENGINEERING REPORTS FOR ENGINE CHANGES

Engine changes not included in the Category 1 or Category 2 Approved Engine Change Lists may be acceptable, however in some instances it may not be possible for Transport SA to approve the proposed modification without an engineers report.

If the proposed engine change is not granted a SOR, the applicant will be given the option of providing an engineering report prepared by a Chartered Professional Engineer. The report must demonstrate, based upon accepted engineering principles that the vehicle can be safely driven on public roads and complies with the relevant ADRs.

The report may include results of testing as described in:-

- a. Engineering Instruction Number 3 - Lane Change Manoeuvre Test Procedures.
- b. Engineering Instruction Number 4 - Brake System Test Procedures.
- c. Engineering Instruction Number 8 - Torsional Rigidity and Beaming Stiffness Test Procedures.

Engineering Instruction Number 8 - is generally only required when the intended engine is substantially heavier or more powerful than the original engine.

The engineering report must also include a statement that the modified vehicle can be safely driven on public roads.

Acceptability of an engineering report for a particular modification shall *not* be taken as a precedent for subsequent, similarly or identically modified vehicles. An engineering report together with details of test results must be submitted for each vehicle.

On presentation of a satisfactory engineering report a SOR for the proposed modification will be issued.

On completion of the modification and confirmation by the engineer that the modifications have been undertaken in accordance with the report, the vehicle must be presented and pass a roadworthiness inspection.

Engine Modifications

There are no restrictions on normal reconditioning provided that the manufacturers recommended limits are not exceeded. However, where ADRs 27, 27A, 27B, 27C and 37 apply the vehicle is subject to emission standards and therefore modifications are restricted, as specified below.

EMISSION CONTROL REQUIREMENTS - FOR VEHICLES OPERATING ON PETROL

PASSENGER CARS

Evaporative Emissions

All vehicles built to comply with ADR 27A (1 July 1976) or later, must be fitted with a effective evaporative emission control system. A carbon canister must be fitted, operational and connected to the fuel tank and induction system.

Sealed Rocker Covers

All vehicles built to comply with ADR 27A or later, must be fitted with sealed engine rocker cover(s), regardless of engine fitted, which are vented via the engines induction system.

Positive Crankcase Ventilation (P.C.V.)

All vehicles manufactured on or after the 1 July 1970 must be fitted with an operational positive crankcase ventilation system.

Vehicles manufactured on or after the 1 January 1986 (ADR 37).

This category of vehicle may *only* be fitted with an ADR 37 complying engine (i.e. an engine designed to only operate on unleaded fuel), which incorporates all associated components. The fitting of an engine other than an original or optional engine would require approval from Transport SA.

No alterations to the engine's camshaft, inlet manifold, carburettor/fuel injectors, air cleaner or catalytic converter are permitted.

Vehicles manufactured on or after 1 April 1974 but prior to 1 January 1986. (ADR 27, 27A, 27B& 27C)

These vehicles may be fitted with pre-emission or emission engines.

The engine camshaft, inlet manifold, carburettor, air cleaner, air intake system and internal engine components, (apart from normal reconditioning processes), are not to be altered to increase the engines power and or torque by more than 5 percent above the manufacturers original power and torque specifications for that particular engine. All original equipment emission control components applicable to the engine are to be fitted and operate effectively.

If the engine has been reconditioned to a later Australian Design Rule specification, all emission control features applicable to the later Australian Design Rule engine must be fitted and operate effectively.

Vehicles manufactured on or after 1 January 1972 but prior to 1 April 1974. (ADR 26)

These vehicles can be fitted with pre-emission or emission engines.

Alternative carburettors, camshafts or other engine modifications are permitted provided that the exhaust emissions do not exceed the specified levels.

Vehicles manufactured prior to 1 January 1972.

No emission control requirements apart from Positive Crankcase Ventilation (PCV) on post July 1970 vehicles.

Fitting of ADR 37 engines in Pre January 1986 Vehicles

Engines originally manufactured to comply with ADR 37 or an equivalent overseas emission requirement, fitted to vehicles manufactured on or after July 1976, must remain unmodified and retain all associated original emission control equipment including the catalytic converter. In addition, the vehicle must operate on unleaded petrol and be fitted with a fuel filler, which has a diameter not less than 21.3mm and not more than 23.6mm.

PASSENGER CAR DERIVATIVES

i.e. Holden and Ford panel vans and utilities

The requirements for vehicles manufactured on or after the 1st July 1976 are identical to those for passenger cars. For vehicles manufactured prior to this date there are no requirements except for Positive Crankcase Ventilation (PCV).

ENGINE MANAGEMENT SYSTEMS

The engine management system (computer) of modern vehicles is an integral part of the emission control system. Re-calibrating the engine management system by either changing the chip, re-programming or replacing the unit with an aftermarket computer will result in non-compliance with the emission control ADR applicable to the vehicle. Testing a production vehicle for compliance with ADR emission control standards is a lengthy and expensive process and can only be undertaken in a laboratory that has the appropriate scientific testing equipment.

Modified vehicles that are being fitted with engines that use an engine management system, typically Japanese import engines, should be fitted with the engines standard engine management system including oxygen sensor and catalytic converter. Transport SA may consider the fitting of an aftermarket engine management system where an engine upgrade is occurring, however this will be conditional on an abbreviated ADR emission test being undertaken.

TURBOCHARGING / SUPERCHARGING

Due to the complexity of the ADRs after 1 July 1976 affected by the fitting of a turbocharger or supercharger to a naturally aspirated engine Transport SA requires the vehicle to be fitted with a Second Manufacturers ADR plate to demonstrate compliance with all ADRs.

Passenger cars manufactured prior to 1 January 1972 and passenger car derivatives (car type utilities and panel vans) manufactured prior to 1 July 1976, fitted with petrol engines, can be fitted with a turbocharger or supercharger without Transport SA approval.

Passenger cars manufactured on or after 1 January 1972 but prior to 1 January 1974, fitted with petrol engines, can be fitted with a turbocharger or supercharger without Transport SA approval subject to the following condition:

- The carbon monoxide exhaust emission output emitted by the engine does not exceed 4.5% when tested at the manufacturers recommended engine idle speed.

Turbo timers are not to be fitted to vehicles manufactured on or after 1 January 1972 (ADR 25 Anti-Theft Locks). ADR 25 requires that the normal function of the engine only occurs when the ignition lock is in the engine on position.

Alteration to the manufacturers boost pressure and or the induction system, including blow off valves, to passenger cars and passenger car derivatives manufactured on or after 1 July 1976 will not be granted approval by Transport SA as compliance with emission control ADRs cannot be ensured.

KIT CARS AND NEW CONSTRUCTION PASSENGER VEHICLES

All emission equipment originally fitted to the engine by the engine manufacturer must be retained. Evaporative Emission Control System incorporating sealed rocker covers and a PCV system must be fitted and operational. For vehicles manufactured prior to 1 July 1992 the engine must be one which was built to comply with ADR 27A, or later standard, and all original emission control equipment including the camshaft, inlet manifold carburettor and air cleaner, must be retained and operational.

For vehicles manufactured on or after 1 July, 1992, the engine must be one which was built to comply with ADR 37 and all original emission control equipment, including the camshaft, inlet manifold, carburettor, air cleaner and catalytic converter must be retained and operate effectively.

NEWLY BODIED AND REBODIED VEHICLES

If the engine fitted is identical in specification to one offered by the vehicle manufacturer for the donor floor pan or chassis no alterations are required.

An alternative engine may be fitted, however it must be one, which was built, to comply with ADR 27A or later ADR emission requirement and all associated emission control devices originally fitted to that engine must be retained and operational. This would also include an Evaporative Emission Control System. If the engine fitted was manufactured on or after 1 July 1970 a positive crankcase ventilation system must be fitted. The engine must not emit carbon monoxide (CO) and hydrocarbons (HC) in excess of the following when tested at manufacturers recommended engine idle speed.

Pre April 1974 engines 4.5% CO

April 1974 to June 1976 engines 4.5% CO & 250 parts per million HC

July 1976 or later engines 2.5% CO & 250 parts per million HC

STREET RODS

All emission equipment originally fitted to the engine by the engine manufacturer must be retained. This would also include an Evaporative Emission Control System.

If the engine being used was manufactured on or after 1/7/70 a positive crankcase ventilation system must be fitted. The engine fitted must not emit carbon monoxide (CO) and hydrocarbons (HC) in excess of the following when tested at manufacturers recommended engine idle speed.

Pre April 1974 engines 4.5% CO

April 1974 to June 1976 engines 4.5% CO & 250 parts per million HC

July 1976 or later engines 2.5% CO & 250 parts per million HC

If an unleaded petrol fuel engine is fitted, all emission control devices including catalytic converter, unleaded fuel filler restriction and unleaded fuel label must be incorporated.

"T" BUCKETS

"T" Buckets although generally treated, as new construction vehicles are not required to be fitted with ADR 37 specification engines, providing that unleaded fuel is used and appropriate size unleaded fuel filler restriction and unleaded fuel label are incorporated. All other emission requirements as listed above for Street Rods applies.

EMISSION LEVELS

On inspection of a vehicle modified by fitting a replacement engine an emission test report form must be presented to the inspector or the inspector must conduct an emission test, which establishes that the emission levels do not exceed:-

Vehicles manufactured between 1 Jan 1972 and 31 March 1974

Australian Design Rule - 26

Emission Levels Carbon Monoxide 4.5%

Vehicles manufactured between 1 April 1974 and 30 June 1976

Australian Design Rule - 27

Emission Levels Carbon Monoxide 4.5% Hydrocarbon 250 ppm.

Vehicles manufactured on or after 1 July 1976

Australian Design Rule - 27A 27B 27C and 37

Emission Levels Carbon Monoxide 2.5% Hydrocarbon 250 ppm.

EMISSION CONTROL REQUIREMENTS FOR VEHICLES OPERATING ON L.P. GAS OR PETROL AND L.P. GAS

Dual Fuel

Vehicles equipped to operate on Liquefied Petroleum Gas (LPG) as a dual fuel system (eg. the vehicle can operate on either petrol or LPG) must retain all original emission control equipment, except for the air cleaner, heated inlet air and associated equipment which may require modifications to facilitate the installation of the LPG intake system.

Single Fuel

Vehicles which are not required to comply with ADR 37 (pre 1986) which are running solely on LPG are not required to be fitted with emission control equipment, providing that the following requirements are met.

- a. That the vehicle exhaust emits less than 4.5% Carbon Monoxide at recommended engine idle speed.
- b. That sealed rocker covers and the Positive Crankcase Ventilation system is retained.
- c. Vehicles manufactured on or after 1st July 1976 the petrol pump, fuel tank, carburettor, fuel supply lines and any other associated equipment related to the petrol fuel system must be removed from the vehicle.

Vehicles built to comply with ADR 37, must retain all emission control equipment including the catalytic converter. As from 13 December 1993, vehicles originally designed to operate with a closed loop engine

management system shall be installed with a LPG closed loop management system which results in exhaust emission levels for LPG operation that are not inferior to the levels produced by the original vehicle system.

EXHAUST SYSTEMS AND NOISE

Replacement Exhaust Systems

Extractors and aftermarket exhaust systems may be fitted provided that the sound levels specified in the Road Traffic (Vehicle Standards) Rules 1999 are not exceeded. On vehicles required to comply with ADRs 26, 27 or 27A, extractors may be fitted provided that any emission control devices, which were originally fitted to the exhaust system, are re-connected and operative. Vehicles required to comply with ADR 37 or 37/.. may be fitted with extractors or after market exhaust systems provided that the catalytic converter is retained and any emission control equipment fitted to the original exhaust is incorporated in the replacement item.

Exhaust Outlets

For vehicles manufactured prior to July 1988 the requirements are not specific, however, vehicles submitted to Transport SA will be acceptable if:-

- a. The exhaust outlet exits beyond the last door or window opening on the side or rear of the vehicle;
- b. The exhaust outlet is as close as possible to the outer edge of the vehicle but not outside or underneath the vehicle;
- c. The exhaust system, if contactable, is adequately shielded and any sharp or hazardous projections are suitably treated.

For vehicles manufactured on or after 1st July 1988

The exhaust must exit to the rear or on the right hand side and extend at least 40 millimetres beyond the furthest outboard or rearmost joint of the floor pan that is not continuously welded or permanently sealed. No exhaust outlet is to extend beyond the perimeter of the vehicle when viewed in plan.

The exhaust outlet, if to the side of the vehicle, shall discharge to the right hand side of the vehicle and downwards at an angle to the horizontal of not less than 15 degrees and not more than 45 degrees.

The exhaust outlet, if to the rear, shall discharge at not less than 10 degrees above or 45 degrees below the horizontal.

Exhaust Noise

The exhaust systems on vehicles manufactured on or after 1st January, 1974 must at the time of first registration comply with ADR 28 - Motor Vehicle Noise.

In service all vehicles must comply with the Road Traffic (Vehicle Standards) Rules 1999 Part 10 Division 3 – Noise Emissions.

For passenger cars, derivatives and panel vans manufactured on or after 1 January 1983 the stationary noise level when tested must not exceed 90 dB(A).

Passenger cars, derivatives and panel vans manufactured before 1 January 1983 the stationary noise level when tested must not exceed 96 dB(A).

BRAKES

Brakes must not be altered in any way that would reduce the braking efficiency. This includes the fitting of smaller drums or discs and machining drums or discs beyond those limits set by the manufacturer. If brakes are upgraded eg. front brakes changed from drum to disc, it is essential that:

- (a) The correct master cylinder is fitted;
- (b) There is an adequate reservoir (disc brake systems usually require a larger reservoir);
- (c) Front to rear brake balance is compatible and does not result in excessive wheel lockup on one axle during moderate braking.
- (d) That all components of the braking system are compatible.

Transport SA approval is required before any alterations are carried out to the braking system of a passenger vehicle manufactured on or after 1 July 1977 (ADR 31) or a passenger car derivative manufactured on or after 1 January 1979 (ADR 35).

The fitting of alternative brakes may also alter wheel track dimensions, which in itself may not be illegal, however, it may cause confusion for enforcement bodies unless Transport SA has issued some formal acceptance of the modification.

WHEELS AND TYRES

All wheels and tyres fitted must comply with the Road Traffic (Miscellaneous) Regulations 1999.

The main points to note are:-

- (a) The wheel track must not be increased by more than 26mm beyond the maximum specified by the vehicle manufacturer. Maximum allowable tracks for individual vehicle models can be obtained from Transport SA. The wheel track is the distance measured across the vehicle from the centre-line of one tyre to the centre-line of the other tyre on the same axle.
- (b) The wheels and tyres must not foul the body, suspension or any part of the vehicle under any operating conditions and must not project beyond the bodywork, when the wheels are in the straight ahead position and viewed from above.
- (c) It is recommended that the tyres fitted to an axle of a vehicle must be of the same carcass construction. The tyre size designation of tyres fitted to an axle is required to be the same.
- (d) The tyres fitted must be suitable for the rim. The tyre retailer should have information about matching tyres and rims.
- (e) The load rating of the tyres must be adequate for the vehicle. ADR 24 vehicles (manufactured on or after 1/1/73) have this information listed on the tyre placard. The load rating of any tyre fitted must not be less than lowest load rating listed on the placard. For vehicles manufactured before 1/1/73 the tyres

must have a load carrying capacity equal to or greater than those supplied as standard equipment by the vehicle manufacturer.

- (f) Spacers are not permitted between the hub and wheel (unless originally fitted by the manufacturer)
- (g) If the wheels of a vehicle are retained by multiple nuts or set screws, not by splines and a single nut, then the wheel nuts must match the tapered holes in the wheel and the nuts must be engaged for their full depth of thread.
- (h) Wheels that have been widened by inserting a spacer band are not permitted.
- (i) Vehicles manufactured on or after 1 January 1973 (ADR 24) are not permitted to increase or decrease the diameter of the wheel by more than 50 mm than the largest or smallest wheel listed on the tyre placard.
- (j) The overall diameter of a wheel and tyre fitted to a vehicle manufactured on or after 1 January 1973 (ADR 24) must not be more than 15 mm greater than the largest tyre size listed on the tyre placard and not more than 15 mm less than the smallest tyre size listed on the placard. Specifications for overall tyre diameters are listed in the Tyre and Rim Standards Manual, issued by the Tyre and Rim Association of Australia.
- (k) Vehicles manufactured prior to 1 January 1973 are not required to comply with (i) and (j) above however consideration must be given to clearance of the tyres and wheels on suspension and body components.
- (l) Passenger cars manufactured on or after 1/7/88 must also comply with ADR 18/.. that stipulates that the speedometer must indicate the actual vehicle speed, for all speeds above 40 kilometres per hour to an accuracy of plus or minus 10 percent.

When selecting aftermarket wheel rims for a motor vehicle, ensure that the offset of the rim does not vary by more than 13mm from the original rim fitted by the vehicle manufacturer. This will ensure that the wheel track is not increased by more than 26mm beyond the maximum specified by the vehicle manufacturer. Transport SA has a list of maximum allowable wheel tracks for a large variety of vehicles and can be consulted to confirm if a wheel track is within acceptable limits.

Wheel rims fitted to passenger cars manufactured after 1st July 1985, which are not original equipment or an original equipment replacement by the vehicle manufacturer must be indelibly marked with the wheels nominal diameter, width and offset and with identification of the manufacturer of the wheel and the standard to which the wheel was manufactured. This should be checked before the wheels are purchased.

Tyres fitted to a vehicle must have a tread pattern at least 1.5 millimetres deep on all parts of the tyre that normally come into contact with the road surface. Tyres are manufactured with tread wear indicators that are located in the tyre grooves in at least four points around the circumference of the tyre. If the tread wear indicators are at the same level as the overall tread, or there is less than 1.5 millimetres of tread depth on the tyre, then the tyre is considered to be illegal.

Tyres fitted to passenger cars may not be treated by recutting or re-grooving of the tread unless the tyre is constructed to do so and marked as such.

SUSPENSION

A vehicle's suspension system has been designed for adequate strength and durability as well as its level of ride, comfort and handling. It is acceptable to fit upgraded springs, shock absorbers or anti-rollbars provided they are correctly fitted and suitable for the vehicle. Some vehicle manufacturers have optional suspension equipment available.

When lowering a vehicle body, either front or rear, the limiting factor is the clearance between the rubber bump stop and the corresponding metal stop. This dimension must not be reduced by more than one third of that specified by the manufacturer.

Transport SA has a list of acceptable suspension and eyebrow heights (the measurement from the centre of the wheel vertically upward to the edge of the mudguard) for most passenger vehicles and can be contacted to verify if the ride height of a vehicle is within acceptable limits.

Raising of the car is not recommended due to the cornering instability that may result. Often cars are raised because the owner wants to fit large wheels and tyres that would otherwise contact the mudguards. In these cases the wheels and tyres may themselves be illegal.

FULLY FLOATING REAR AXLE ASSEMBLIES

An engineering report prepared by a Chartered Professional Engineer is required by Transport SA addressing the fitment of a fully floating axle that alters the wheel track, suspension mounting position or braking components.

The report from the engineer is to address the following:

- Handling evaluation test in accordance with Transport SA Engineering Instruction 3 – *Lane Change Manoeuvre Test Procedures*, or a statement from the engineer that the handling of the vehicle has not deteriorated as a result of the axle change;
- A statement from the engineer that the vehicle's suspension is not affected by the fitment of the axle. Alternatively this may be satisfied by the handling test in accordance with Engineering Instruction 3.
- A statement from the engineer that the mounting of the rear suspension at both the axle and the body of the vehicle is to an acceptable standard.
- Details of the wheels and tyres to be used on the vehicle. To ensure compatibility the details required are for both front and rear road wheels and tyres. Tyre information must include size designation, speed and load rating. Wheel information must include width, diameter and offset. The width of the rims fitted must comply with requirements specified in the *National Code of Practice – Light Vehicle Modifications*, table LS1.
- The drum-to-drum / flange-to-flange measurement of the axle.
- The wheel track of the axle fitted with the nominated rims fitted.
- For vehicles manufactured on or after 1 January 1973 details and location of the revised tyre placard. The tyre placard must display all relevant details of the tyres and rims to be fitted to the vehicle.

Transport SA will not approve the fitting of fully floating rear axle assemblies where:

- Modifications to the outer mudguards have occurred to accommodate the wheels and tyres (tubbing);
- Structural modifications have occurred to the vehicle other than relocation of the rear suspension mounting points.

STEERING

Steering Columns and Steering Wheels

Passenger cars and derivatives manufactured on or after 1st January, 1971 have been fitted with steering wheels and steering columns which are designed to minimise injuries to the driver in vehicle collisions. The only steering wheel that may be used is the one recommended by the vehicle manufacturer as an approved part. Transport SA will consider the fitting of a non standard steering wheel provided an engineering report, prepared by a Chartered Professional Engineer is presented which is able to demonstrate that the replacement steering wheel meets the requirements of applicable ADRs for that vehicle.

Consideration will also be given for the fitment of steering wheels and adaptors that have been certified and stamped in accordance with ECE Regulation 12. It is recommended you contact Transport SA with details of the steering wheel, including any markings/stamping on the wheel and adaptor, to determine its suitability for your vehicle.

A non-standard steering wheel may be fitted to passenger cars and derivatives manufactured prior to 1971. Steering wheels, which are more than 26 millimetres smaller or larger than the original steering wheel, are not acceptable. Smaller steering wheels result in increased effort on the steering wheel that may have a detrimental effect on vehicle handling particularly in an emergency situation. When selecting a replacement steering wheel ensure that it is firmly padded and is constructed such that it will bend on impact with out splintering or cracking and that no parts of the wheel are loose or cracked.

Modified Steering Components

The welding or heating of axles, stub axles, steering arms and steering knuckle supports is not acceptable unless an engineering report prepared by a Chartered Professional Engineer is presented which demonstrates that the modifications are in accordance with Engineering Instruction Number 5 - Heating and Welding of Steering Components.

LEFT HAND DRIVE VEHICLES AND STEERING CONVERSIONS

The Road Traffic (Vehicle Standards) Rules 1999 requires that a motor vehicle with a GVM less than 4.5 tonnes must have be right-hand drive if the vehicle is less than 30 years old.

For the registration requirements for passenger cars 30 years of age or more please contact your local Customer Service Centre of Transport SA.

All vehicles converted from left hand drive to right hand drive must be converted in accordance with the National Code of Practice for Steering Conversions for Left Hand Drives, Vehicle Standards Bulletin (VSB) Number 4.

For all steering conversions an engineering report prepared by a Chartered Professional Engineer must be submitted which specifies that the requirements of VSB Number 4 have been met. A Statement of Requirements is required from Transport SA before a vehicle is presented for inspection.

Vehicles fitted with welded steering components must comply specifically with the requirements set out in VSB Number 4. Welded steering components that have been used in service, even for a number of years, is not a criteria for acceptance. In such circumstances, unless the original test data demonstrates compliance with the requirements of VSB 4, the component will not be accepted.

BODY AND CHASSIS ALTERATIONS

Extended Wheelbase Vehicles

The lengthening or shortening of a vehicle body is acceptable providing that an engineers report prepared by a Chartered Professional Engineer is presented which demonstrates that the modified vehicle;

- a) Continues to comply with all applicable ADRs
- b) That the vehicle meets with Transport SA;
 - i) Torsional Rigidity and Beaming Stiffness Test Procedures as outlined in Engineering Instruction Number 8
 - ii) Brake System Test Procedure as outlined in Engineering Instruction Number 4.

For additional information relating to extended wheelbase vehicle refer to Information Bulletin Number 47 and for Extra Long Stretch Limousines, i.e. vehicles with a increase in wheelbase more than 50% of the original wheelbase, refer to Automotive Circular 18.

Convertibles

The upper body structure or roof of a passenger car contributes significantly to the total strength of the body of a unit construction vehicle and its removal can seriously affect structural integrity of the original design of the vehicle.

There are no specific Regulations under the Road Traffic Act that makes it an offence to remove the roof or upper body structure of a motor vehicle. However, in the case of passenger cars and passenger car derivatives manufactured on or after 1st January 1969 the removal of a vehicles roof may interfere with the ADR 5A, 5B or 5/00, relating to the upper seat belt anchorages.

Consequently, passenger cars and derivatives manufactured on or after 1st January 1969 will only be acceptable to Transport SA if an engineering report prepared by a Chartered Professional Engineer is supplied.

The report must demonstrate that the modified vehicle continues to comply with all applicable ADRs, and that the vehicle meets with Transport SA Torsional Rigidity and Beaming Stiffness Test Procedures as outlined in Engineering Instruction Number 8.

In the case of passenger cars and derivatives manufactured prior to 1st January 1969 no approval or inspection of the modified vehicle is required, however, it is recommended that the services of a Chartered Professional Engineer are engaged to ensure that the integrity of the vehicle has not been compromised.

Bonnet Scoops

The fitting of a rearward opening bonnet scoop is permitted without specific approval or inspection providing that the following criteria can be met.

- a. Bonnet scoops manufactured from a plastic or fibreglass material may be fitted, providing that the hole in the original bonnet does not substantially reduce the strength or impact resistance of the bonnet and no rigid component, such as an air cleaner or carburettor protrudes beyond the original bonnet profile.
- b. Holes may be cut in the bonnet and the protrusion of an air cleaner or carburettor above the bonnet line but below the bonnet scoop providing that the bonnet scoop or raised bonnet section is manufactured from equivalent gauge mild steel compared with the original bonnet.
- c. If any bonnet reinforcing braces are cut or modified the design of the modified bonnet must be of equal strength to the original bonnet and any sharp edges created must be suitably treated.
- d. All edges and corners shall have a radius of not less than 5 millimetres and of general design and construction so as to reduce to a minimum the risk of bodily injury to any person.
- e. In addition, any bonnet scoop is unacceptable if it restricts the field of view of the driver under normal operating conditions. The field of view requirements are determined as follows:
 - With the drivers seat in the rearmost position, it shall be possible to see, unobstructed for the full width of the vehicle, a line drawn on the roadway 11 metres ahead of the "driver's eye position" when looking over the bonnet scoop. For the purpose of this requirement the "driver's eye position" shall lie at the bottom of the of the 95th percentile eye ellipse (reference ADR 15/01 clause 15.1.5.1).
 - Alternatively the "driver's eye position" can be taken as a point 750 millimetres above and 270 millimetres forward of the junction of the seat cushion and seat squab with the seat in the lowest and rearmost position.

The fitting of forward opening bonnet scoops, which have the potential to increase injuries to pedestrians in collisions, for example forward opening "letter box" style, are not acceptable.

Tilt Fronts

"Tilt front" is a term used to describe a type of forward pivoting integral engine bonnet, grille and front mudguard assembly for front engine vehicles. Examples of production vehicles fitted with this type of engine access are the Jaguar "E" Type and the Triumph Herald.

The fitting of a tilt front will be acceptable to Transport SA providing that:-

- a. The new body sections are designed and constructed with no dangerous or sharp projections so that in the event of an accident the risk of injury to pedestrians and cyclists is minimised.
- b. The new body sections do not obstruct the visibility of lamps fitted to the front of the vehicle and in particular the direction turn signal lamps or headlamps.

- c. The new body sections do not obstruct the field of view of the driver. The field of view requirements are determined as follows;
- With the drivers seat in the rearmost position, it shall be possible to see, unobstructed for the full width of the vehicle, a line drawn on the roadway 11 metres ahead of the "driver's eye position" when looking over the bonnet. For the purpose of this requirement the "driver's eye position" shall lie at the bottom of the of the 95th percentile eye ellipse (reference ADR 15/01 clause 15.1.5.1).
 - Alternatively the "driver's eye position" can be taken as a point 750 millimetres above and 270 millimetres forward of the junction of the seat cushion and seat squab with the seat in the lowest and rearmost position.
- d. All lights fitted meet the requirements of Road Traffic (Vehicle Standards) Rules 1999 and ADR 6 or 6/00
- e. The anchoring, hinge and latching mechanisms are durable and have sufficient strength to secure the hinged section. Transport SA may request a submission from a Chartered Professional Engineer if doubt exists concerning the strength of components.
- f. In the case of passenger cars and derivatives manufactured on or after 1st January 1969, an engineering report presented by a Chartered Professional Engineer would be required, which demonstrates that the vehicle continues to comply with Australian Design Rule requirements in addition to the above.

Wheel Tubs

The fitting of wheel tubs i.e. alterations to the inboard structure of the rear wheel housing, will be acceptable to Transport SA providing that:-

- a. It does not weaken the vehicle structure.
- b. There are no modifications to body structural members, chassis members or suspension mounting points.
Alterations may be permitted providing that an engineering report prepared by a Chartered Professional Engineer is submitted demonstrating that the original strength has not been decreased.
- c. There are no body modifications undertaken within 200mm of any seat anchorage or seat belt anchorage.
Alterations may be permitted providing that an engineering report prepared by a Chartered Professional Engineer is submitted demonstrating that the original strength has not been decreased.
- d. The wheels or tyres do not protrude beyond the bodywork of the vehicle when viewed from above.
- e. The wheels or tyres do not foul any part of the vehicles suspension, brake lines or bodywork for the full range of suspension movement.

Spoilers and Wheel Guard Flares

Cosmetic body modifications are permitted without Transport SA approval and inspection provided that they are carried out with regard to the safety of the driver and other road users. There must not be any sharp edges that could increase the severity of injuries to pedestrians.

The fitting of a rear spoiler that incorporates a brake light requires the original equipment high level brake light, where fitted, to be disconnected.

Sunroofs

The roof of a motor vehicle contributes to its overall strength and the removal of a section of the roof to install a sunroof may affect the structural strength of a motor vehicle.

For additional information relating to the installation specifications for sunroofs refer to Information Bulletin Number 16.

Roll Cages

Due to the increased risk of occupant injury in vehicle accidents the fitting of full roll cages are not permitted. However, the fitting of a roll cage rearward of the driver is permissible providing that:

- a. No part of the roll cage is contactable by vehicle occupants when positioned in their normal seating position.
- b. The roll cage is at least 150 millimetres rearward of the front seat occupants when the front seats are located in the most rearward adjusted position.
- c. All rear seats and seat belt assemblies fitted in the rear compartment are removed.
- d. The operation and effectiveness of the front seat belt assemblies is not affected in any way by the roll cage.
- e. That no person travels in the rear of the vehicle at any time.

Replacement Fuel Tanks

The fitting of replacement or additional fuel (petrol) tanks to vehicles manufactured prior July 1976 would not contravene the requirements of Road Traffic Act and Regulations providing that sufficient ground clearance is retained.

Refer to the clause below for details of ground clearance.

It is also a requirement of Transport SA that any petrol tank fitted to the vehicle is filled and vented externally.

For vehicles manufactured on or after 1st July 1976 the ADR requirements for Evaporative Emission Controls would have to be met. All fittings and devices fitted to the fuel tank by the vehicle manufacturer would have to be retained/duplicated and fully functional in the replacement fuel tank.

For vehicles manufactured on or after 1st July 1988, refer to specific requirements relating to ground clearance.

Ground Clearance

Under the Road Traffic (Vehicle Standards) Rules 1999 ground clearance of a vehicle, with at least 4 wheels, means the minimum distance to the ground from a point on the underside of the vehicle, except a point on a tyre, wheel, wheel hub, brake backing plate or flexible mudguard or mudflap of the vehicle.

A motor vehicle or combination must have a ground clearance of:

- a. For any point in the width of the vehicle which is within 1 metre fore and aft of any axle - 100 millimetres;
- b. For the midpoint between the two axles - 0.033 times the distance (in millimetres) between the two axles; and
- c. For any other point – at least the distance that allows the vehicle or combination to pass over a peak in the road with a gradient on either side of 1:15, if the wheels of 1 axle of the vehicle or combination are on the slope on one side of the peak and the wheels of the next axle are on the slope on the other side.

Mudguards

Mudguards must be fitted to all road wheels. They must deflect downwards any stones, mud, water or other substance thrown upwards by the rotation of the wheels and must cover the full width of the tyre when viewed from directly above. They must prevent direct contact with the upper half of the wheel in forward collisions and be designed to reduce the dangers to road users, due to contact with moving wheels. For vehicles manufactured on or after 1st July 1988, specific requirements relating to the design and construction are contained in ADR 42/.. For details relating to the requirements of ADR 42/.. refer to Information Bulletin Number 18a or contact the Vehicle Operations Sections.

Seats

Additional or replacement seats fitted to Australian Design Rule complying vehicles manufactured on or after 1 January 1971 (ADR 3) require approval from Transport SA. Modifications to seats, such as raising or lowering, will be considered where the strength of the seat and mountings is not affected.

Information Bulletin 11 *INSTALLATION OF ADDITIONAL SEATS AND SEAT BELTS* sets out the guidelines for the installation of seats and seat belts to ADR complying vehicles and those manufactured prior to the introduction of ADRs.

Seat Belts

Under the Road Traffic Act and Regulations seat belts were required in the drivers and one other front seating position as from 1 July 1964. ADRs applicable to seat belts for all front seating positions became mandatory as from 1st January 1969 and for all seating positions as from 1st January 1971.

The level of safety provided by seat belts must not be reduced. This means that seat belts must not be replaced by belts of a lesser standard. There is no objection to seats belts of a higher standard being fitted, however, it is recommended that Transport SA is contacted to gain advice to ensure that the belts are of the correct type and can be correctly fitted.

Harness Type Seat Belts

For passenger vehicles manufactured on or after 1/1/69 but prior to 1/1/75 the fitting of harness belts would only be considered on presentation of an engineering report prepared by a Chartered Professional Engineer which demonstrates continued compliance with ADR 5A - Seat Belt Anchorages.

The fitting of harness seat belts to passenger vehicles manufactured to comply with ADR 4B - Seat Belts, i.e. manufactured on or after 1/1/75, is usually not permitted.

Some manufacturers of harness seat belts have undertaken testing to the appropriate Standards and are marked accordingly. Appropriately Transport SA may accept marked harness seat belts in some vehicles providing the mounting of the harness is to an acceptable standard.

WINDSCREENS & WINDOWS

Any replacement glass fitted to a motor vehicle, including an interior partition, after June 1953 must comply with the same characteristics as material mentioned in any of the following standards:

- Australian Standard AS R1-1965 Safety Glass for Land Transport
- Australian Standard AS R1-1968 Safety Glass for Land Transport
- Australian Standard AS 2080-1977 Safety Glass for Vehicles
- British Standard BS 857:1967 Specification for Safety Glass for Land Transport
- British Standard BS 5282:1975 Road Vehicle Safety Glass
- British Standard BS AU178:1980 Road Vehicle Safety Glass
- Japanese Industrial Standard JIS R 3211-1979 Safety Glasses for Road Vehicles
- American National Standard ANSI Z26.1-1980 Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highway.

The section of the windscreen directly in front of the driver, (known as the primary vision area) must be free from scratches or chips.

INTERIOR FITTINGS

Instrument Panels

Manufacturers have been required by ADR 21 to provide crash padding for the instrument panel in vehicles manufactured on or after 1st January 1973. If any additional equipment such as gauges, switches, radio-cassette players etc. are installed they must not protrude beyond the dash padding or be mounted on top of the dash.

In addition, equipment should *not* be fitted in the under dash area which may increase lower limb injuries in the event of contact in a collision.

Interior Projections

Overhead consols and sunroof hinges can be hazardous projections. Sharp edges and projections must not be in a location that would increase the risk of injury.

Other Equipment

All other equipment inside the vehicle such as fire extinguishers, fans, venetian blinds, etc should be securely fastened. It is recommended that anchorage systems should be capable of withstanding a force equal to twenty times the mass of the equipment. Cargo barrier protection screens are now commercially available for many station wagon and light commercial vehicles and are highly recommended.

APPENDIX A

LIST OF CURRENT INFORMATION BULLETINS

NUMBER	BULLETIN
1	Passenger Cars and Motor Cycles Imported into Australia On or After 1st August 1989
2	Passenger Vehicle Track and Suspension Specifications (one page info to owner)
3	Modifications to Cars and Car Type Utilities and Panel Vans
6	Motorcycle Requirements
8	Boat Trailer Lighting Requirements
9	Trailer Lighting Requirements
10	Brakes on Trailers
11	Campervans and Mobile Homes
12	General Requirements For Left Hand Drive Vehicles
13	Surface Films For Motor Vehicles
16	Installation of Sunroofs in Passenger Cars
18	One-Off New Construction Passenger Vehicles
19	Modifications To Motor Vehicles Extract From Regulation 7.01
20	The Roadworthiness Inspection and My Car
21	Passenger Cars and Motor Cycles Imported into Australia Prior to 1st August 1989
22	Procedures to Obtain Registration For Personally Imported Passenger Cars and Motorcycles
26	Requirements For Veteran and Vintage passenger Vehicles
27	Passenger Car Lighting
28	Caravans and Motor homes
30	Chartered Professional Engineers
31	Second Edition Australian Design Rules For Passenger Cars
32	Exemption from Australian Design Rules For Three and Four Wheel Motor Cycles
35	Third Edition Australian Design Rules For Passenger Cars
39	Second Edition Design Rules For Vehicles Up To 4.5 Tonne Gross Vehicle Mass
40	Third Edition Australian Design Rules for Motorcycles
43	Towing Devices
44	Passenger Vehicle Track List
47	Extended Wheelbase Passenger Car Type Vehicles
48	Steering Conversions for Left Hand Drive Passenger Car Type Vehicles
60	Use of "Automotive Instructions" Relating to Engine Replacements in Passenger Cars
61	American Passenger Car Track List

APPENDIX B

LIST OF AUTOMOTIVE INSTRUCTIONS

NUMBER	VEHICLE
51	1948 Model FJ-FE-FC-FB-EK & EJ Holden - 1948 to 1963
52	EH-HD & HR Holden - 1963 to 1967
53	HQ & HJ Holden sedans and station wagons - 1971 to 1976
54	HX & HZ Holden sedans and station wagons and WB Statesman 1976 to 1985
55	HQ-HJ-HX-HZ-WB Holden panel van, utility and One Tonne -1971 to 1985
56	LH-LX and UC Holden Torana and Sunbird 1974 to 1979
57	Four cylinder Holden Commodore 1980 to 1983
58	Six and eight cylinder Holden Commodore - 1979 to 1991
59	Jaguar XJ6 & XJ12 Series I to III 1969 to 1987 Jaguar XJS - 1976 to 1990
61	Ford Falcon XK-XL-XM-XP 1960 to 1966
62	XR-XT Ford Falcon sedans and station wagons ZA-ZB Fairlane - 1966 to 1969
63	XW-XY & XA Ford Falcon sedans and station wagons ZC-ZD & ZF Fairlane - 1969 to 1973
64	XB-XC & XD Ford Falcon sedans and station wagons ZG-ZH & ZJ Fairlane -1973 to 1982
65	XB-XC-XD-XE and XF Ford Falcon panel van and utility - 1973 to 1991
66	XE-XF Ford Falcon sedans and station wagons ZK-ZL Fairlane - 1982 to 1988
67	HK-HG Holden all models - 1968 to 1971
68	Toyota Celica TA22, RA23 28, 40 & 60 - 1971 to 1983