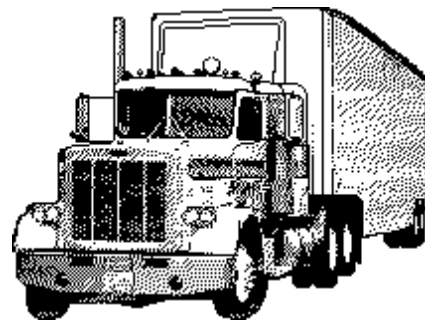
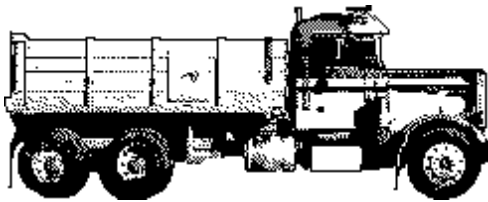


Section M

**FUEL SYSTEMS**



**HEAVY VEHICLE MODIFICATIONS**

## 1. SCOPE

This Section relates to the fitting of modified fuel systems to heavy vehicles.

## 2. GENERAL INFORMATION

As a vehicle's fuel system is potentially dangerous, it is necessary for a commercial vehicle's fuel system to comply with the requirements and safety standards as outlined in this Section.

ADR's 17 and 17/.. are applicable to goods carrying vehicles with GVM greater than 4.5 tonnes and is the basis for this Section.

## 3. ADR's AFFECTED

ADR 17, 17/..	<i>Fuel System;</i>
ADR 36, 36A, 36/..	<i>Exhaust Emission Control;</i>
ADR 43/..	<i>Vehicle Configuration &amp; Marking;</i>
ADR 58/..	<i>Requirements for Omnibuses .</i>
ADR 70/..	Exhaust Emission Control for Diesel Engined Vehicles

## 4. AFFECTING MODIFICATIONS

Any modification to the fuel system, that results in the vehicle being different from the vehicle range offered by the original manufacturer, is subject to this Section.

The following modifications may be performed under this Section, providing compliance with ADR's 17 or 17/.. are maintained and the performance of the component is not impaired:

- Shortening of fuel tank.
- Removal of baffles.
- Conversion of fuel tank into a multi-compartment tank e.g. hydraulic oil and fuel.

Modifications that are **not** allowed under this Code, unless full recertification of the tank design has been performed and documented, include:

- Relocation of filler neck.
- Lengthening of fuel tanks.
- Changing shape of tank i.e. cutouts to suit footstep etc.

## 5. GENERAL REQUIREMENTS

**5.1 All Vehicles**

When performing modifications on a vehicle and which affects the fuel system, the modified vehicle's fuel system and tanks must satisfy the following:

**HEAVY VEHICLE MODIFICATIONS**

- All replacement and additional fuel tanks must comply with ADR's 17 or 17/.. (applicable only to goods carrying vehicles with a GVM over 4.5 tonnes and manufactured on or after 1 July 1975).
- No fuel tank is allowed to be mounted forward of the front axle (applicable to goods carrying vehicles only).
- All fuel tanks must be securely installed. It is recommended that the original manufacturer's mounting brackets be used.
- The departure angle of the vehicle must not be jeopardised by the installation of a fuel tank.
- With regard to ground clearance:
  - Vehicles built to comply with the 3rd Edition ADR's must continue to satisfy the requirements of ADR 43/..;
  - Vehicles built prior to the introduction of 3rd Edition ADR's must satisfy the requirements of either ADR 43/.. or the registration requirements of the State or Territory in which the vehicle was modified.
- Fuel system components must not constitute the widest part of the vehicle (not including rear vision mirrors).
- No component of the fuel system should be in close proximity of the exhaust system or electrical components. Fuel lines should not be located directly above the exhaust system or electrical system.
- All fuel lines and connectors should be of the correct size, type and have compatible thread forms.
- The fuel system must be free from leaks.
- All fuel lines and filters must be suitably secured.
- Fuel fillers, breathers or overflow pipes must not be located inside the cabin.
- Fuel return lines should be connected to the same fuel tank from which the engine is drawing its fuel.

Note: Care must be taken to ensure that the engine manufacturer's requirements for inlet fuel temperature are met. Failure to observe any requirement may result in a reduction in engine performance or engine damage.

**5.2 Petrol Engined Vehicles**

If the vehicle has a petrol engine and was originally manufactured to comply with ADR 36 or 36/.., then all the fuel system evaporative controls must be retained to prevent excessive fuel emissions from entering the atmosphere.

**HEAVY VEHICLE MODIFICATIONS**

## 6. FUEL TANKS

All goods vehicles, with a GVM over 4.5 tonnes and manufactured on or after 1 July 1975, must comply with ADR 17 or 17/.. *Fuel Systems*. This Design Rule specifies both location and strength requirements of fuel tanks for commercial vehicles. Hence, all additional or replacement fuel tanks must comply with ADR 17 or 17/... Some of the requirements of this ADR are:

- Each fuel tank must be fitted with a safety vent or fusible plug.
- No fuel tank drain fittings (but not fuel cross-over pipes and relative fittings) shall extend by more than 20mm beyond the surface of the fuel tank on which they are fitted, or a plane tangential to at least three points on the fuel tank which are located within 75mm of the centre line of the fittings.
- Each full fuel tank must have at least 5% air space for expansion.
- Each fuel tank must withstand an internal pressure of 150% of the safety vent design pressure.
- Each fuel tank must be capable of satisfying the drop test requirements.

## 7. RECORDING

Appendix M1 attached:

- Summarises the scope of modification work that may be certified under this Modification Code.
- Includes a checklist of ADR's which may have been affected by the modification and which should be analysed to determine whether they, too, require re-certification.
- Includes a checklist appropriate to Modification Code M1 that should be completed.

It is suggested that analysis work records, sketches and other vehicle data, together with copies of the Calculation Sheet and completed Checklists, be retained by the Certifying Officer for at least the period specified in Part A of the National Code of Practice.

**HEAVY VEHICLE MODIFICATIONS**  
**Appendix M1**

**Modification Code M1**

**FUEL SYSTEM ALTERATIONS**

Modifications that are covered under this Modification Code are:

1. Fitting of additional fuel tank.
2. Fitting of alternative fuel tank.
3. Repositioning of fuel tank.
4. Removal of auxiliary fuel tank.
5. Repositioning of fuel lines.
6. Fitting of alternative fuel lines.

Modifications that are **not** covered under this Modification Code, unless full recertification of the tank has been performed and documented, are:

1. Relocation of filler neck.
2. Lengthening or shortening of fuel tanks.
3. Removal of baffles.
4. Changing shape of tank i.e. cutouts to suit footstep etc.
5. Conversion of fuel tank into a multi-compartment tank i.e. oil and fuel.

**NOTE: The modified vehicle/modifications must continue to comply with all applicable ADR's, Australian Standards or Regulations/Acts.**

Outlined below are areas of the vehicle that may have been affected by the modifications and that may require recertification, testing and/or data to show compliance for the modified vehicle.

<b>DETAIL</b>	<b>REQUIREMENTS</b>
Repositioning Existing Tank	Good Engineering Practice
Fit Additional Tank: - vehicle over 4.5T GVM	ADR 17, 17/..
- other vehicle	Good Engineering Practice
Fillers	ADR 17, 17/.. and 41/..
Filler Position	ADR 58/..
Emission Requirements (Petrol)	ADR 36, 36A, 36/..

HEAVY VEHICLE MODIFICATIONS

Checklist M1

FUEL SYSTEM ALTERATIONS

(Y=Yes N=No)
delete if not applicable

1.0 Fuel Tank

- 1.1 Do all the fuel tanks installed on the vehicle satisfy the requirements of ADR 17 or 17/.. (only applicable to goods vehicles over 4.5 tonnes GVM and manufactured on or after 1 July 1975)?
1.2 Is the fuel tank securely mounted?
1.3 If the fuel tank(s) has been modified, has it been a modification permitted by this National Code of Practice?

2.0 Fuel Lines

- 2.1 Are all the fuel lines and connectors of the correct size, type and thread form?
2.2 Are all fuel lines and filters securely mounted?

3.0 General

- 3.1 Do all components of the fuel system fall within the widest part of the vehicle?
3.2 Is the fuel system free from leaks?
3.3 Is the fuel filler, breather or overflow pipe located outside the cabin?
3.4 Are all components of the fuel system well clear of the exhaust and electrical system?
3.5 Is satisfactory ground clearance provided for all fuel system components?
3.6 Is the quality of workmanship to a satisfactory standard?

NOTE: If the answer to any relevant question is "NO", the modification is not acceptable.

Make:.....

Model:..... Year of Manufacture:.....

Vehicle Chassis No/VIN: .....

Vehicle Modifier: .....

Examined by: .....

Company (if applicable):.....

Certifying Officer No:..... Modification Certificate No:.....

Modification Plate No:.....

**HEAVY VEHICLE MODIFICATIONS**

Signed:..... Date:.....