Heavy-duty tow trucks

1. Dual tyres on the rear axle groups.
2. Suitable spacer bars and safety chains needed to secure the towed vehicle.
3. A flashing amber light.
4. Work lamps that are used during hours of darkness to illuminate the towing point.
5. A suitable light bar that conforms to the lighting requirements in ADR 13/06.
6. Three portable warning devices.
7. A fire extinguisher (min 4.5 l).
8. Class to be marked on the right-hand side. The class is described in the Table.
9. A class 4 tow truck must have a power operated winch and air brake couplings at the rear for connection to have control of the towed vehicle brakes.
10. The crane (which is defined as a machine for raising and lowering heavy weights) shall be in accordance with the requirements of Australian Standard 1418 “Rules for Cranes”, Part 1 (“1977 – General Requirements”) and Part 5 (1980 – “Mobile Cranes”) and be approved by the relevant authority supervising lifting appliances.

A summary of the requirements are:

1. The design of a tow truck must be certified by an authorised Accredited Vehicle Examiner (AVE).
2. The design of the tow truck crane must be in accordance with the relevant parts in AS 1418.1, AS 1418.2, AS 1418.11 and AS 1418.20 (which has now been superseded by AS 5400). These standards specify factors of safety for the crane, underlift, winch, steel rope and jib / hook.
3. Stability under towing is also a factor that needs to be considered. Tow trucks should be designed so that the front axle is not unweighted to less than 60 per cent of the on road weight when a load is lifted at the back with no trailer load. Note the heavy tow trucks operating under a type B permit can be eligible for a 7.0 tonne steer axle to assist with steering when towing.
4. There are no tow truck specific lighting requirements. Beacon lights and additional garment lights are acceptable assuming they are ADR approved types.
5. Reinforcement of the chassis rails will be needed at the lifting cross-member.
6. Air brake couplings are required on a heavy-duty tow truck to control the brakes on the towed vehicle.

As a guide the wheel underlift on a 10 tonne tilt-tray tow truck should not lift more than 1.8 – 2t. This is determined by point 3 above. A design factor of safety of 3 is appropriate so the underlift mechanism should be capable of lifting six tonnes in this example. AS 1418 and AS 5400 requirements:

- Some heavy-duty recovery vehicles have a crane that is used to recover and reposition the casualty truck. The work health and safety regulations state that mobile cranes with a SWL over 10t need to be design registered, and in some states be registered as plant equipment. However, tow trucks are exempt from the design and plant registration requirements. The design and construction of tow trucks with mobile cranes attached can still be considered as ‘plant’ and designers or installers of cranes and other equipment on tow trucks need to consider the following:
  1. Emergency stops must be fitted at all control stations.
  2. The capacity of the under or crane must not exceed the GVM or GCM of the towing vehicle. Any component that has the capacity to lift a load that can exceed these ratings needs to be marked down accordingly with a notice placed in a prominent position.
  3. Adequate safety factors must be applied (e.g. 4x for hydraulic hoists, 2.5x for other hydraulic equipment. Factors of Safety related to structures, cables and hoists should be a minimum of 3 as a general rule. See the table below showing how safety factors can be determined).
  4. Hydraulic equipment and controls shall comply with the relevant requirements in AS 1418.
  5. Hydraulic controls are to have operational illustrations.
  6. Pneumatic equipment and controls shall comply with the relevant requirements in AS 1418.

The recovery winch shall comply with EN14492-1 or SAE J706 and the information marked on recovery winches must be in SI units.

- Chains, ropes, webbing, hooks, and shackles to comply with nominated technical standards and to be marked accordingly (see the Table).

The force needed to pull each tonne of car weight up a 25o ramp assuming a factor of safety of six is 0.43 x 2.6t.