ASEA wins sub-contract for trams

A new era in Australian intra-city transport has been ushered in with the Melbourne and Metropolitan Tramways Board's recent order for 100 new trams.

These will replace some of the 700 vehicles already serving Melbourne metropolitan routes.

The contract for manufacture of the trams, worth more than $12,000,000, will be carried out by the Commonwealth Engineering, Dandenong, Vic., with ASEA Electric (Aust.) Pty. Ltd. as sub-contractor for the electrical equipment, which accounts for some $6 million of the total contract.

ASEA has had considerable experience in the design and construction of tramway equipment, and part of the sub-contract will be to supply Commonwealth Engineering with drawings of the ASEA-equipped trams used in the Gothenburg (Sweden) urban transport system, and also manufacturing drawings to assist in the production of the fabricated parts of the bogies.

ASEA will supply the entire control electrics and driving mechanisms for each tram, including four traction motors (each rated 52kW or 75 h.p.), gear boxes, disc brakes and track brakes.

Other ASEA-supplied equipment will include the contactor and electronic motor controls, driver's control panel, sanding control, speedometer, and the complete rubber suspension system.

The contactor control equipment will be supplied from ASEA's Lilydale factory and the traction motors from the company's Tottenham plant.

Acceleration control is via a potentiometer. An electronic device selects the correct number of contactors to short out the starting resistors, with an over-riding control of the acceleration rate.

The device incorporated wheel-slip control, where the speeds of both bogies are compared. Any difference, indicating wheel-slip, results in an automatic reduction of acceleration rate.

If the slip continues, deceleration may continue until power is removed entirely.

A similar process takes place to prevent wheel-slip during braking.

Rubber is used extensively in the suspension system. A sandwich of rubber and steel acts as a spring on each wheel, while on the wheels themselves, rubber inserts are placed between hub and rim.

Disc brakes mounted on the motor shaft ensure smooth and effective braking and eliminate the tyre wear experienced with shoe brakes.

The winter-time heating system derives from heat generated in the starting resistors, which is ducted to the tram interior. In summer, it is exhausted to atmosphere and in addition, forced draught cool air is provided by ventilation fans in the ducting system. Variable speed ceiling fans are also used to control ventilation.

All Melbourne trams can be driven from either end, and begin return journeys on a crossover from one track to another. European trams drive from one end only and return on a loop at each terminus.

The "double-drive" requirement, and also the need for trolley-pole collection of power, instead of pantographs as are usual in Europe, were important considerations in the design specifications.

The specifications also advised tenderers that the design should be compatible with the possible future placing of the tramways system underground.

The new vehicles will take tram travel to new levels of comfort, quietness, speed and efficiency for both passengers and crew, in line with detailed specifications drawn up by the MMTB, after board officials had inspected tramways throughout the world.

As a result, the new generation Melbourne trams will have these characteristics:

COMFORT:

* Central heating in winter and forced-draught ventilation in summer.
* Special electronic controls to give completely smooth acceleration and deceleration.
* All-round vision, with no window obstructions at eye-level and out-front view past the driver, as in buses.
* Foam rubber seating throughout.
* More room inside - maximum of 48 seated passengers and a total of 125 including standing passengers, in a vehicle longer than the present trams.
* Fluorescent lighting.
* Luggage racks.
* Windshield wipers, sunshields and blinds.
* Ticket tidies and ticket and change-issuing machines.

SAFETY:

* Safety glass on all windows.
* Sensitive edge doors to prevent injuries to passengers.
* Exit step switches to keep doors open while passenger is on the step.
* Vigilance and "dead man" control. The driver's foot must be on the "dead man" pedal to allow motors to operate.
* Three-way braking (a) dynamic, through motors generating and the power being absorbed in resistors; (b) spring-operated and electrically-released disc brakes; and (c) emergency brakes which bear on the track in an emergency stop.
* Flashing-light turn indicators, stop and tail lights and adjustable rear mirrors.
* Automatic pole retraction. If the pole comes off the overhead line, it automatically retracts to the roof, thus avoiding possible damage to the over-head system.

QUIETNESS:

* Resilient wheels, made up of metal and rubber "sandwich".
* Rubber springs throughout.
* Electric brakes - thus, no noisy air compressor.
* Sound insulation throughout body. Wheel slip control and automatic sanding to prevent skidding during braking or accelerating.
* Track brakes for emergency stops will avoid development of noise-producing "flat spots" on wheels.

The new trams will be capable of a speed of 45 m.p.h. (72.41 k.p.h.), compared with about 30 m.p.h (48.27 k.p.h.) for the existing MMTB vehicles.

The driver, who has armchair-type seating, controls speed and braking of the tram by two pedals, while a third is kept depressed as a " dead man" control.

Destination signs are changed automatically from the driver's control panel. Selection of the required sign and route number is by push-button control, which actuates a memory device. This selects the correct number and destination from a magazine of plates in each sign box.

Each tram is fitted with a public address system.