

ALRV

ARTICULATED CANADIAN LIGHT RAIL VEHICLE

AUGUST 1982 (RFC)

Principal Specifications:

| | |
|--|----------------------------------|
| Fleet number (demonstrator) | TTC 4900 |
| Seating | 61 (62 without equipment locker) |
| Length over anti-climber | 23,064 mm (75'8") |
| Width over rub rails | 2,591 mm (8'6") |
| Height — to top of roof | 3,365 mm (11'0½") |
| to top of base | 3,710 mm (12'2½") |
| Truck centres | 7,620 mm (25'0") |
| Truck wheelbase | 1,829 mm (6'0") |
| Wheel diameter | 660 mm (26") |
| Track Gauge | 1,495 mm (4'10¾") |
| Minimum horizontal curve radius, coupled | 10,973 mm (36'0") |
| Minimum vertical curve radii — convex | 95 m (310') radius |
| — concave | 224 m (800') radius |
| Weight — Tare (W1) | 34,300 kg (75,600 lbs) |
| — Normal service (W4) | 45,325 kg (99,900 lbs) |
| (161 passgrs.) | |
| — Crush (W5) | 48,935 kg (107,850 lbs) |
| (214 passgrs.) | |
| Weight Distribution (W-1) | Front Truck — 37% |
| | Centre Truck — 29% |
| | Rear Truck — 34% |

Single end control.

Motor rating: Two monomotors 245 HP (1 hour rating) each (HP mode)

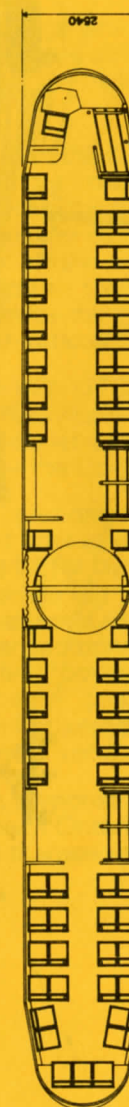
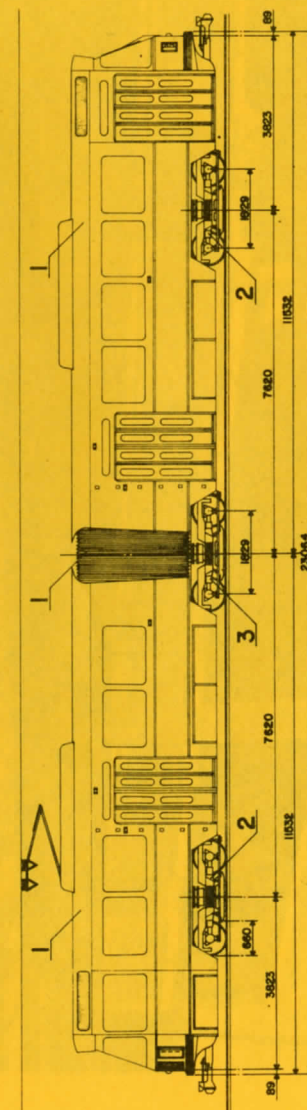
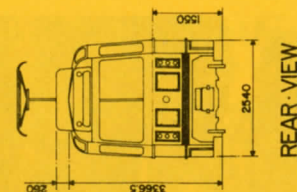
Initial acceleration rate: 1.33 m/s² (3.0 MPHPS)

Time to maximum speed: 50 MPH in 60 sec (LP mode)*

Braking rate: 1.56 m/s² (3.5 MPHPS) in service.
2.34 to 3.13 m/s² (5.25 to 7.0 MPHPS) In emergency

Jerk rate: 1.12 to 1.78 m/s³ (2.5 to 4 MPHPS²), depending on mode.

*As derated for TTC city service.



ALRV — The Articulated Canadian Light Rail Vehicle

In 1974, the Ontario (later Urban) Transportation Development Corporation (OTDC, later UTDC) embarked on the design of a four axle, rigid frame, light rail vehicle. In 1975, the Commission accepted the Corporation's offer to provide 200 of these Canadian Light Rail Vehicles (CLRV's).

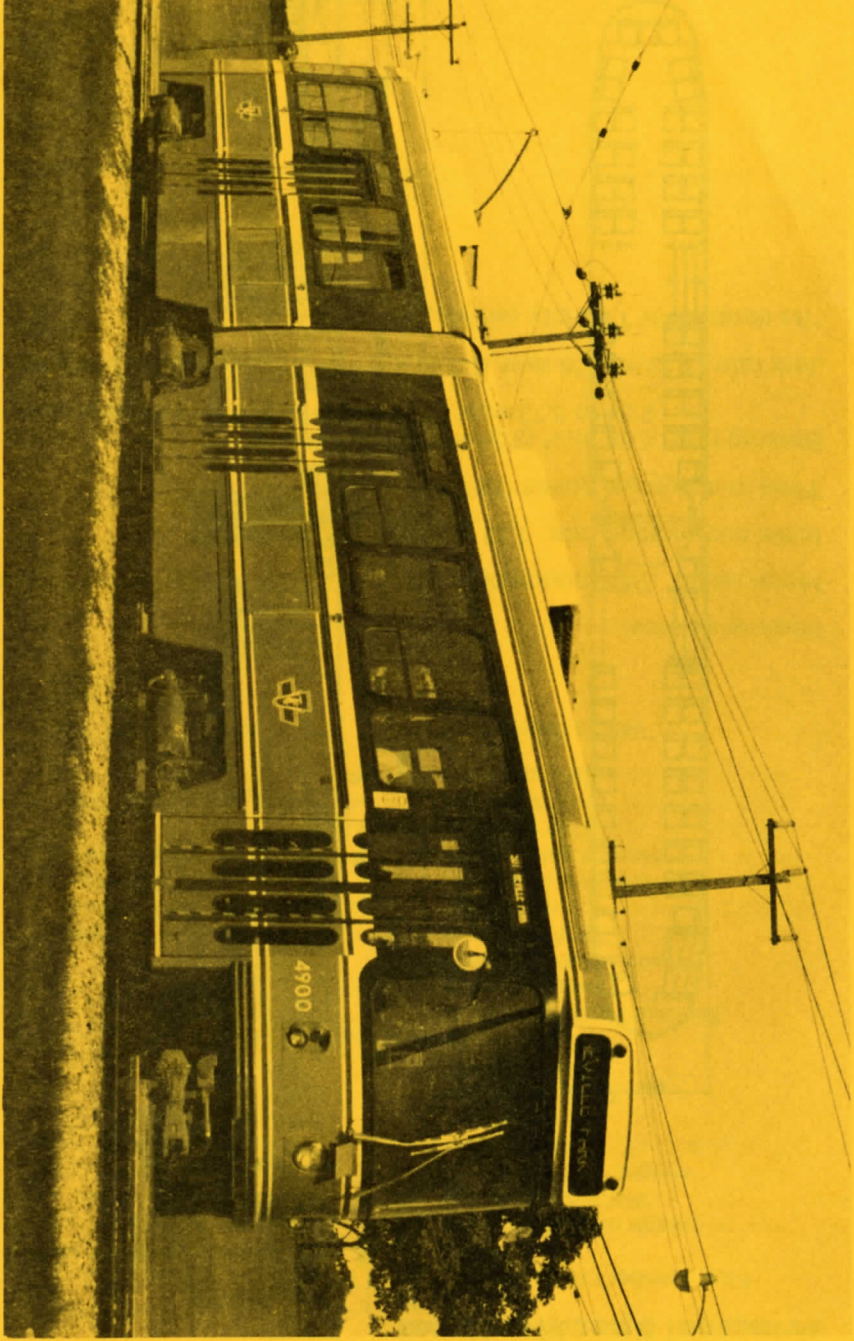
UTDC's concept of the CLRV was a modular design which could be "expanded" from a 50'8" four axle unit into larger 4 or 6 axle vehicles. Consequently the "original" CLRV was specified as the CLRV-4-1 (4 axle, 1st design).

The Swiss Industrial Company (SIG) was awarded the design contract by UTDC for the 200 CLRVs (CLRV-4-1); but concurrently they developed the first design for a 6 axle articulated car (the CLRV-6-1) which would be 75'8" long. It was felt that this modular expansion of the first contract would be an acceptable product for the world market, including the projected Scarborough Light Rail Transit (SLRT) system being formulated in Metropolitan Toronto. In essence the articulated CLRV-6-1 was two "three-quarter" 4 axle cars with articulation.

In November, 1976, the Commission's contract with UTDC was reduced from 200 to 196 CLRVs, in order that UTDC might use components to construct two 6 axle articulated cars which could (subsequently) be demonstrated and evaluated by the Commission.

As negotiations progressed, UTDC elected to build only a single prototype car, with certain sub-systems procured from other manufacturers (to provide a comparison with the CLRV components). This unit, designated the ALRV (Articulated Canadian Light Rail Vehicle) commenced manufacture in 1981, with assembly at UTDC's facility at Kingston, Ontario and featured an advanced concept of the articulation section. The completed vehicle was first "powered" on May 13, 1982 and commenced operation on a special 4'8½" (standard) gauge test track which provided minimum radius horizontal and vertical curves, maximum gradients, and high speed tangent sections.

In 1982, UTDC proposed that the Commission demonstrate and evaluate the car in co-operation with the Province of Ontario Ministry of Transportation and Communications (MTC) and themselves for a period of 3 months.



This prototype car was modified from its basic design for this purpose, including items such as:

- Gauge change to 4'10 1/2".
- Pantograph replaced by trolley pole.
- "On request" door system modified to TTC standard (operator and treadle control).
- Rheostatic electro-dynamic brake.
- However, it was agreed that some features would not be changed for demonstration purposes:
- Hand operated master controller (in place of foot controls).
- Electronic front destination sign.
- Passenger emergency switches.
- Upholstered type seat covering.
- Orange (instead of red) basic colour.

The prototype unit arrived on the Commission's property on August 3. During the next few days it was subjected to acceptance and system interface tests to qualify it to enter revenue service on Route 501 "Queen" on the morning of August 10. After four days' operation, it was transported by UTD to the Canadian National Exhibition for display with other modern transit vehicles from August 18th to September 6th. On its return it will be operated by the Commission in revenue service until December 2 to complete the demonstration.

Principal Features:

- BROWN BOVERI (CANADA) twin chopper control.
- WABCO pneumatic disc brake (air applied service brake and spring applied parking brake).
- Service braking: Blended, with continuous preference to rheostatic, with disc brake blended as required.
- Track braking: In 2 steps, supplemental to service brake.
- Load weighing: Rate maintenance in acceleration to W-4 loading and in braking to W-5 loading.
- Spin/Slide control (individual truck).
- Speed governor control: at 50 MPH.
- Rubber primary suspension, airbag secondary suspension.
- Elevated driver's position, with hand operated main controls, pushbutton auxiliary controls, system status indicators, and convenient circuit isolation and protection panel.
- Electrically heated windshield.
- Turn and 4-way hazard signals.
- Rear view mirrors, both sides.
- VAPOR forced air ventilation and heating, thermostatically controlled to respond to both ambient and interior temperatures, with both fresh air makeup, and heat. Continuous circulation.
- Standby storage preheat feature.
- Backlit fluorescent lighting, battery powered.
- Safety exit windows.
- 10" bottom step height.
- VAPOR pneumatically operated doors.
- Door interlocks for both power and brakes.
- DELLNER (Scharfenberg) coupler, with folding head.
- OTACO "Innovator" seats.

