

# THE CLASS M2 DIESEL-ELECTRIC LOCOMOTIVES IN SRI LANKA – The “Canadian Warriors”

A Feature Article elaborated for a Technical Railway Exhibition and Seminar  
with Students from the Richmond Hill College, Galle, Sri Lanka, October 2014

by Dr. Frank Wingler, April 2014, revised August 2016

In 1954/55 the Canadian Government gifted under the “**COLOMBO PLAN AID -- FROM CANADA**” five sturdy A1A'-A1A' Diesel-electric Locomotives based on the General Motors EMD Multi-Purpose G8, G9 and G12 and build in the Canadian General Motors, Electric Motive Division workshop. The Government Ceylon Railways classified them as “**M2**”. “**M**” denotes a Main-Line Diesel Locomotive. The first Main Line Diesel Locomotive from 1953 has been the “**M1**”, build on GM-EMD-Technology in England by **BRUSH BAGNALL TRACTION Ltd.** in Loughborough, E; see technical Paper *The old Warrior Class M 1 Loco back on the Track* in <http://www.drwingler.com>; see also <http://www.ceylonrailway.com>.



Pict. 1: Class M2D, No. 629 “GALLE”, introduced 1966

The Class M2 Locomotives are regarded as the most successful Diesel Locos on SLR. By their distinguished far reaching typhoon sound of the horn one can make out the M2's over miles. This deep far reaching sound is the best defence against road-level-crossing accidents. The M2 Locomotives are also called “**THE CANADIAN WARRIORS**”.

The Mono-Cab M2 Locomotives are all rated at 1425 hp. No. 569 to 573 from 1954 to 1955 – named after the Canadian Provinces **ONTARIO, ALBERTA, SASKATCHEWAN, BRITISH COLUMBIA and QUEBEC** - as well as the later arrived Class M2A, No. 591 to 593 (1956) - **MANITOBA, NOVA SCOTIA and NEW BRUNSWICK** - , Class M2B, No. 594/95 (1958) – **PRINCE EDWARD ISLAND and NEWFUNDLAND** - and Class M2D, No. 628/29 (1966) – **KANKESANTHURAI and GALLE** - are of the type designed as “A1A'-A1A'”. “**A**” denotes **one driven axle**, “**1**” denotes **one non-driven idling axle** and the

symbol “ ’ ” marks the rotary frame or bogie. This means, the superstructure is mounted on two bogies, each bogie having three axles of which the two outer axles are motored whereas the centre axle is for carrying purpose in order to lower the axle-weight. With a lower axle-weight the stress on the track is less, but also the dispatchable tractive effort is reduced.

The axle-boxes have no passive radial steering as with the “**Flexi-Float**” bogies of the Henschel Locomotive M4, W1/3 and of the Alstom Locomotive M9. The wheel-base of the 6 axle M2 locomotives is 3.20 metre. The A1A’-A1A’ Locomotive have a tractive effort of about 140 kN. From the modern technology view point, the idling axle between the driven axles and the missing passive radial axle-steering increase the strain on the rails in tight curves and on points with short straight tongue rails, and it leads on the upcountry track with its curvatures of up to 17.5 degree or 100 metre radius tightness (unique in the world for broad gauge) to check rail-bolt spreading and gauge spreading. That is the reason, why the mentioned 6-axle locomotives cannot haul trains upcountry with its ruling gradient of 1 in 44 and the tight curvatures.

The latest arrived six axles Locomotives Class M2D from 1966, No. 628 (“**KANKESANTHURAI**”) and No. 629 (“**GALLE**”), are build in USA and have the bogie-frame, suspension and axle-box guidance designs of an EMD G16 C0’-C0’, but without a traction motor on the middle axle. They have the distinguished cooling-blower for the Dynamic Brake System at the Front-Nose; **see Pict. 1; above**. They were originally for cement trains at Kankesanthurai and Galle but are now incorporated in the general stock.

In order to meet the demands of gradients and curvatures of the up-country track two 4-axle locomotives with an axle load of 19.5 tonnes without the idling middle axle in the bogie frame, the Class M2C, of the notation B0’-B0’, No. 626 (“**MONTREAL**”) and No. 627 (“**VANCOUVER**”), had been delivered 1961. (“**B**” denotes two driven axles, the digit “**0**” means “**ZERO**” telling that each axle is individually driven, and thy symbol “ ’ ” tells about a bogie frame. The digit “**0**” for “**ZERO**” or for individually driven axles has nothing to do with the vowel “**O**!!!)!. The Class M2C and M2D Locomotives have the distinguished cooling-blower for the Dynamic Brake System on the Front-Nose:



Pict. 2: Class M2C, No. 626 “MONTREAL”, for the Upcountry Service, introduced 1961



The four-axle locomotives without idling axles have a shorter track friendly wheel-base, and with the higher axle-load of 19.5 tonnes they have a better adhesion to the rails and hence a higher dispatchable tractive effort of about 210 kN. The tight curvatures beyond Nawalapitiya of up to 17.5 Degree or 100 metre radius demand the restriction to four axles, and the ruling 1 in 44 gradient demands the higher tractive effort. Other suitable and up-country-track friendly locomotives are the German build Class W1/2/3 Diesel-hydraulic B'-B' Locomotives, the Hitachi build Diesel-electric B0'-B0' Class M5, the England build Diesel-electric B0'-B0' Class M7 and the Diesel-Electric B0'-B0' GM-EMD. Due to the shortage of those up-country track friendly locomotives the Henschel build Class M6 with an idling axle in a shorter 2.80 m bogie frame of A1A'-A1A' axle arrangement is used for up-country haulage, even if this tailor made Henschel Locomotive had been engineered only for flat-land runs in Sri Lanka. But the M6 is too long for the upcountry service, and with its idling axle it distorts the geometry of the tracks in the tight curvatures.

The M2 Locomotives with exception of No. 628 ("**KANKESANTHURAI**") and No. 629 ("**GALLE**") bear the names of Canadian Provinces on suggestion of a subordinate of the former GMR B.D. RAMPALA during his visit in Canada.

The Locomotive No. 571 ("**SASKATCHEWAN**") got destroyed by a bomb-blast in the war torn Northern Zone on 14<sup>th</sup> September 1985. No. 570 ("**ALBERTA**") got trapped in the War at Kankesanthurai. Engineers dismantled the Locomotive and brought the parts by ship to Colombo for reassembling; **see Pict. 3**:



Pict. 3: No 570, "**ALBERTA**" after Reassembling

On April 30<sup>th</sup> 2014 unfortunately the Class M2 No 570 got severely damaged at a train crash at Pothuhera; **Pict. 4**:





Pict. 4: Class M2 No 570 "*ALBERTA*" severely damaged at Pothuhera, April 2014

The Class M2 No. 591 ("*MANITOBA*") had been caught on December 26<sup>th</sup> 2004 by the Tsunami wave near Telwatte; **Pict 5**. The tumbled locomotive had been dismantled and the parts brought to the Ratmalana workshop.



Pict. 5: No 591, "*MANITOBA*" caught by the Tsunami on 26<sup>th</sup> December 2004

The Locomotive resurrected four years later, and on December 26<sup>th</sup> 2008 under the GMR Dr. T.L. Gunaruwan the rebuild locomotive with a special livery in remembrance had been put again into service hauling the commemorative Matara bound train No. 8050; **Pict. 6**:





Pict. 6: Rebuild Class M2, No 591, "*MANITOBA*" arrived again on 26<sup>th</sup> December 2008 with Train No. 8050 at Matara

In commemoration of this day Dr. F. Wingler has build a 1 in 87 scale model of No. 591, exhibited October 2014 at a Technical Railway Exhibition and Seminar with Students of the Richmond Hill College, Galle; **Pict. 7:**





Pict. 7: 1 in 87 Scale Model of the "TSUNAMI" Locomotive "*MANITOBA*" with its distinguished Livery

The basic points of the long-lasting and sturdy 79 tons heavy Class M2 Locomotives with 1425 hps two-stroke GM-EMD Diesel Engines are defined by GM on the G8/9/12/18 platform (over 4000 items build between 1954 and 1970) in order to produce a versatile, simple, economic, multi-gauge (Meter-, Standard and Broad-Gauge) and multi-purpose locomotive for the world marked, for branch and as well for main-line services.

With the GM-EMD M2-type Locomotives worldwide the death-bells of Steam Locomotives had been ringing. The locomotives had been released in a modified body with a reduced engine-output to increase longevity and durability. They have been delivered all over the world with A1A'-A1A', B0'-B0' as well C0'-C0' axle arrangements in Metre, Standard and Broad Gauge to Australia, New Zealand, Brazil, Argentina, Venezuela, Columbia, Mexico, Cuba, Chile, Peru, South Africa, Nigeria, Rhodesia (Zambia), Tanzania, Egypt, Algeria, Iran, Indonesia, South Korea, Hong Kong, Taiwan Pakistan, Sri Lanka, Israel, to the European Balkan-Railways: Bosnia, Croatia, Kosovo, Macedonia, Serbia, Slovenia (former Yugoslavian Countries), to Netherlands, Norway and Sweden. They have been build in USA, Canada as well under license in Australia. In many of those countries those Locomotives are still running after over 50 years.

In Croatia this Locomotive is called "**THE KENNEDY**" because it arrived in the 60-ties when J.F. Kennedy had been the President of USA. The GM-EMD Locomotives have been 2013 modernised and refurbished by the Locomotive Builder TŽV Gredelj in Croatia; see Pict. 7/8:





Pict. 7: "THE KENNEDY" G12 in Croatia



Pict. 8: Refurbished G12 with Cab Air-Conditioner, "THE KENNIDY" in Croatia

One should be aware, that GM-EDM, which is now in the hands of Caterpillar, does not build any more such a sturdy and light Multi-Purpose Locomotives for the developing world.

The following Picture Gallery shows images of EMD G12/16/18 Multi-Purpose Locomotives of worldwide Railways:



## PICTURE GALLERY



Rebuild Class M2, No. 581 "Tsunami" Locomotive *"MANITOBA"*



Class M2D, No. 628, *"KANKESANTHURAI"*





Copyright : Richard Gennis / Phantasrail Galleries 2008

Class M2C, No 626 "MONTREAL"



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Class M2 No 595, "NEWFUNDLAND"





Samiento Railway, Broad Gauge (1.676 m), near La Pampa, Distr. Buenos Aires, Argentina



EMD G12 on Meter Gauge, Argentina





EMD G12 on Metre Gauge in Argentina



Modified EMD G12 in Chile





EMD G18, Victoria Minas Railway; Brazil



EMD G12, on Metre Gauge, RFFSA, Brazil





EMD G12 in Double-Traction on Metre Gauge, FERRONOR, Brazil

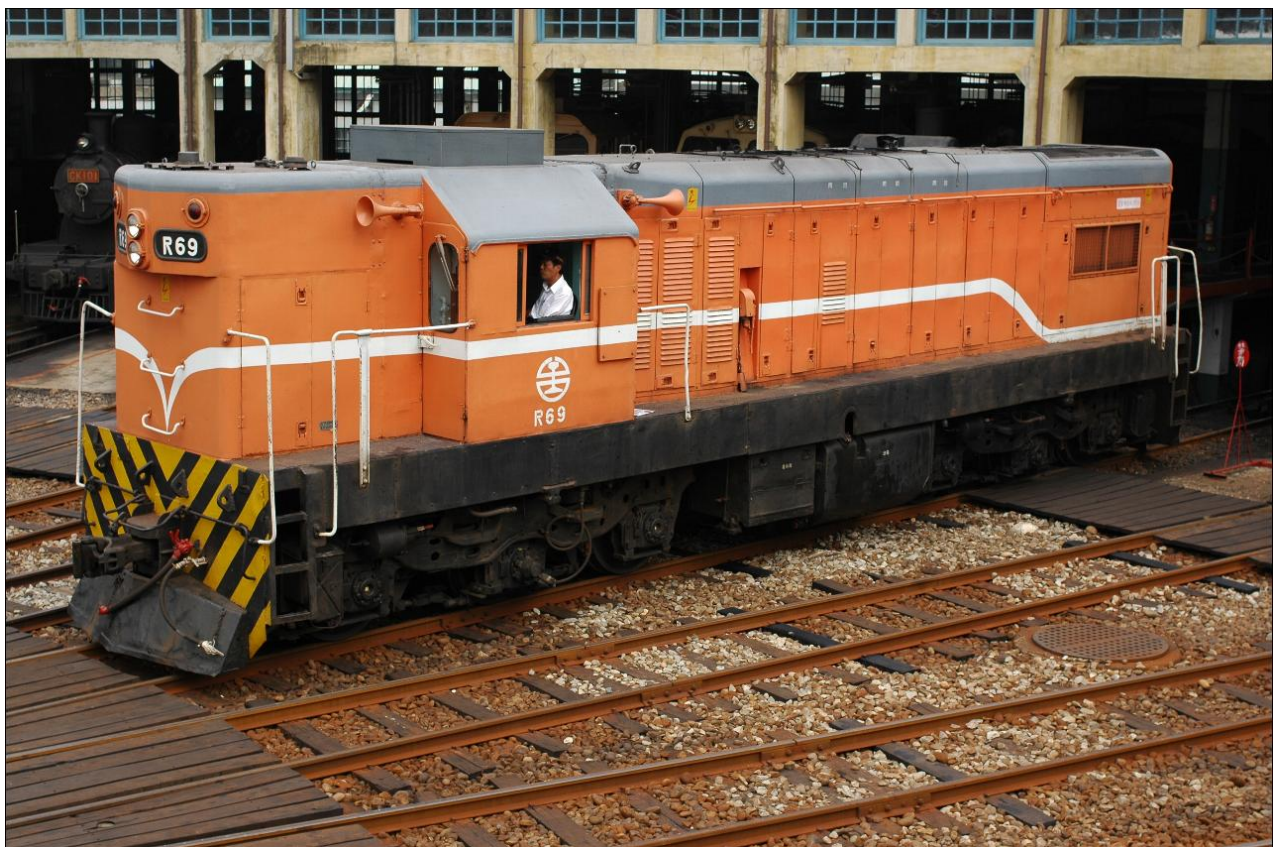


EMD G12 in Egypt





EMD G18, Canton Railways, Hong Kong with Cab Air-Conditioner



EMD G12 on Metre Gauge in Thailand





EMD G12 in Israel



Rehabilitated EMD P12; DA Class, on Metre Gauge in New Zealand near Stratford





EMD G16 in Kosovo



Refurbished EMD G12 in Sweden