LOS ANGELES COUNTY

METROPOLITAN TRANSPORTATION AUTHORITY

LIGHT RAIL VEHICLE

P2550

RUNNING
MAINTENANCE
AND
SERVICE MANUAL

SECTION 99
Abbreviations, Acronyms,
Symbols, Definitions, and
Measurements





SECTION 99

ABBREVIATIONS,

ACRONYMS, SYMBOLS,

DEFINITIONS, AND

MEASURMENTS





TABLE OF CONTENTS

Section/ Para	Title	Page
99-I-01	INTRODUCTION	1
99-I-02	List of Abbreviations, Acronyms and Symbols	2
99-I-03	List of Definitions	9
99-I-04	List of Measurement Units and Symbols	10



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SECTION 99

ABBREVIATIONS, ACRONYMS, SYMBOLS, DEFINITIONS, AND MEASUREMENTS

99-I-01 INTRODUCTION

Each section of the Running Maintenance and Service Manual contains tables of the abbreviations, acronyms, symbols, definitions, and measurements used within that section. In contrast, the tables that follow comprise a comprehensive list of all Abbreviations, Acronyms, Definitions, Symbols, and Measurements used throughout this manual, regardless of the section in which they appear.

The Running Maintenance and Service Manual fills several 3-ring binders when printed. We recommend including a copy of this comprehensive list of abbreviations, acronyms, symbols, definitions, and measurements at the end of each binder.

The following list are provided:

- Abbreviations, Acronyms, and Symbols
- Definitions
- Measurements



99-I-02 LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS

Abbreviation / Acronym / Symbol	Meaning
A/H	Ampere Per Hour
AADS	Automatic Announcement & Display System
AB	AnsaldoBreda
AC	Alternate Current
AC/DC	Alternate Current - Direct Current Converter
ACU	Air Compressor Unit
ADA	American with Disabilities Act
ADU	Aspect Display Unit
AF	Audio Frequency
AGC	Automatic Gain Control
Al	Analogue Input
ALM	Power Supply
AMV	Application Msgnet Valve
APS	Auxiliary Power Supply
ASM	Adaptive Switching Mean (Filter)
ASME	American Society of Mechanical Engineers
ASSY	Assembly
ASU	Air Supply Unit
ATP	Automatic Train Protection
BA	Brake Assurance
BC	Brake Cylinder
BCF	Breda Costruzioni Ferroviarie
BCU	Brake Control Unit
BECU	
	Brake Electronic Control Unit
BHP	Pressure Switch, High Pressure Board Inside
BI BLP	
	Pressure Switch, Low Pressure
BMP	Pressure Switch, Modulation Pressure
BRAS	Return Air Sensor
BRK	Brake
C	Coast
C/L	Centerline
CAN	Controller Area Network
CB	Circuit Breaker
CCF	Charging Filter Contactor
CCH	Communication Control Head
CCI	Cab to Cab Intercom
CCU	Communication Control Unit
Cd	Cadmium
CEMIPS	Conductive EMI Protection System
CL	Center Line
CM	Coast Motoring
CMC	Control and Maintenance Center
CMF	Contactor Motor Fan
CMF	Inverter Fan Contactor



Abbreviation / Acronym / Symbol	Meaning	
COAST	Coast Mode	
COMM	Communication	
СР	Contactor Propulsion	
CPM	Cycles Per Minute	
CPU	Central Processing Unit	
CRC	Cyclic Redundancy Check (Checksum)	
CS	Crew Switch	
CSV	Coupling Solenoid Valve	
CV	Check Valve	
DC	Direct Current	
DC/AC	Direct Current - Alternate Current Converter	
DC/DC	Direct Current - Direct Current Converter	
DCS	Door Close Switch	
DCU	Door Control Unit	
DCV	Double Check Valve	
DI	Digital Input	
DIA	Diameter	
DIP	Dual In Line Package	
DLS	Door Locked Switch	
DOL	Door Open Light	
DOS	Door Out of Service (indicator)	
DPRAM	Dual-Ported Random Access Memory	
DSP	Digital Signal Processor	
DTE	Diagnostic Test Equipment	
DV	Dump Valve (Anti-Skid)	
DVE	Discharge Vibration Eliminator	
EB	Emergency Brake	
EBCV	Electric, Brake Cutoff Valve	
ECU	Electronic Control Unit	
ED	Emergency Device	
EDRS	Emergency Device Reset Switch	
EDU	Emi Detector Unit	
EED	Exterior Emergency Device	
EEPROM	Electrically Erasable Programmable Read Only Memory	
ELE	Electronic	
EMI	Electro Magnetic Interference	
EMV	Emergency Valve	
ER	Event Recorder	
ESD	Electrostatic Discharge	
ESRA	Electronic System for Railway Applications	
EXP	Expansion Valve	
EXT	Exterior	
FCF	Fuse Charging Filter	
FD	Filter Drier	
FIDI	Fully Isolated Digital Input	
FIFO	First In First Out	
Fig./fig	Figure	



Abbreviation / Acronym / Symbol	Meaning
FIR	Finite Impulse Response
FLT	Air Filter
FM	Function Module
FPGA	Field Programmable Gate Array
FRP	Fiber Reinforced Polymer
FSB	Full Service Brake
FSK	Frequency Shift Key
FWD	Forward
GPS	Global Positioning System
GTW	Gateway
H-CML	Heavy Consumable Material List
H-CMS	Heavy Corrective Maintenance Sheet
нст	Harmonic Current Transducer
HP	High Pressure
H-PMM	Heavy Preventive Maintenance Matrix
H-PMR	Heavy Preventive Maintenance Report
H-PMS	Heavy Preventive Maintenance Sheet
HRMM	Heavy Repair & Maintenance Manual
HRSB	High Rate Service Brake
HSCB	High Speed Circuit Breaker
HSCMOS	High Speed Complementary Metal-Oxide Semiconductor
H-TESTL	Heavy Test Equipment, Tools & Special Tools List
HV	High Voltage
HVAC	Heating, Ventilation & Air Conditioning
HVDS	High Voltage Distribution System
HW	Hardware
I/O	Input / Output
IC	Integrated Circuit
ICS	Integrated Circuits
ID	Identification (number)
IDU	Integrated Diagnostic Unit
IDU_A	Integrated Diagnostic Unit of the 'A' body section
IDU_B	Integrated Diagnostic Unit of the 'B' body section
IED	Interior Emergency Device
IGBT	Isolated Gate Bipolar Transistor
INT	Interior
IP	Ingress Protection Rating
IPC	Illustrated Parts Catalog
ISO	International Standardization Organization
IWD	Integrated Wiring Diagrams
КО	Out of Service
L/R	Left / Right
LACMTA	Los Angeles County Metropolitan Transportation Authority
LBA	LonWorks Bus Adaptor
LED	Low Emission Diode
LH	Left Hand
LH/RH	Left Hand / Right Hand



Abbreviation / Acronym / Symbol	Meaning
LLV	Load Limiting Valve
LOD	Lock Out Device
LON	Local Operating Network
LP	Low Pressure
LPF	Low-Pass Filter
LRU	Lowest Replaceable Unit
LRV	Light Railway Vehicle
LV	Low Voltage
LVDC	Low Voltage Direct Current
LVDS	Low Voltage Distribution System
LVPD	Low Voltage Power Distribution
LVPS	Low Voltage Power Supply
LVTL	Low Voltage Train Line
M	Motoring
MAS	Maximum Allowable Speed
MB	Mega Bytes
MBL	Metro Blue Line
MC	Master Controller
MCSV	Mechanical Coupler Solenoid Valve
MDS	Monitoring and Diagnostic System
ME	Motor truck total Effort
MFR	Manufacturer
MGDL	Pasadena Gold Line
MGL	Metro Green Line
MIC	Microphone
MMI	Man-Machine Interface
MoT	Master of Train
MoV	Master of Vehicle
MPB	Momentary Push-button
MR	Main Reservoir
MRCO	Main Reservoir Cutout Cock
MRP	Main Reservoir Pipe
MTA	Metropolitan Transportation Authority
MTBF	Mean Time Between Failure
MV	Medium Voltage
MVB	Multifunction Vehicle Bus
MVBC	MVB Controller
MVDS	Medium Voltage Distribution System
MVPD	Medium Voltage Power Distribution
N	Newton
N/A	Not Applicable
NC	Normally Closed
Ni	Nickel
NO	Normally Open
NVRAM	Non Volatile Random Access Memory
O/C	Open/Close
ocs	Overhead Catenary System



Abbreviation / Acronym / Symbol	Meaning
OK	Working
P/N	Part Number
P/U	Pressure Transducer
PA	Public Announcement
para(s)	Paragraph(s)
PB	Push Button
PC	Printed Circuit
PC	Personal Computer
PCA	Driving Control Processor
PCB	Printed Circuit Board
PGL	Pasadena Gold Line
PIC	Passenger Intercom
PIS	Passenger Information System
PS	Power Supply
PS	Pressure Switch
PTT	Push To Talk (Button)
PTU	Portable Test Unit
PVID	Permanent Vehicle Identification
PWM	Pulse width Modulation
Qty	Quantity
R/R	Removal and Replacement for Refurbishment
RAM	Random Access Memory
R-C	Resistor - Capacitor
RCF	Filter Charging Resistor
R-CML	Running Consumable Material List
R-CMS	Running Corrective Maintenance Sheet
REB	Emergency Brake Relay
RES	Reservoir
REV	Reverse
RH	Right Hand
RLV	Relay Valve
RMF	Inverter Fan Supply Contactor
RMS	Root Mean Square
RMSM	Running Maintenance and Servicing Manual
ROC	Railway Operating Center
ROM	Read Only Memory
R-PMM	Running Preventive Maintenance Matrix
R-PMR	Running Preventive Maintenance Report
R-PMS	Running Preventive Maintenance Sheet
RSCEB	Slide Controlled Emergency Brake Relay
RTC	Real Time Clock
R-TESTL	Running Test Equipment & Special Tools List
SAM	Software for Analysis Maintenance
SB	Service Brake
SCEB	Slide Controlled Emergency Brake
SCPM	Safety Critical Preventive Maintenance
SGT	Schunk Graphite Technology



Abbreviation / Acronym / Symbol	Meaning	
SR	Supply Reservoir	
SRV	Safety Relief Valve	
SUC	Start Up Circuit	
SUPP	Support	
SVE	Suction Vibration Eliminator	
SVM	Space Vector Modulation	
SW	Software	
SWT	Switch, A/C Unit AUTO-OFF-TEST	
SYS	System	
T.o.R	Top of Rail	
T.S	Transfer Switch	
TA	Current Transducer (from "A" Module to "A" Motors phase)	
TAL1	Positive Current Transducer	
TAL2	Negative Current Transducer	
ТВ	Current Transducer (from "B" Module to "B" Motors phase)	
TBD	To Be Defined	
TBS	To Be Supplied	
TC	Current Transducer(from "C" Module to "C" Motors phase)	
TCH	Current Transducer(from "Chopper" Module to Braking	
TCMS	Train Control and Monitoring System	
TCN	Train Communication Network	
TCU	Traction Control Unit	
TCU_A	Traction Control Unit of the 'A' body section	
TCU_B	Traction Control Unit of the 'B' body section	
TE	Trailer (center) truck Effort	
THD	Total Harmonic Distortion	
TL	Train or vehicle Line	
TLE	Trailer (center) truck Limited Effort	
TOC	Table Of Content	
TOM	Train On board Memory	
TOR	Top Of Rail	
TP	Test Fitting	
TRK	Track	
TTEM	Tools & Test Equipment Manual	
TVF	Transducer Voltage Filter	
TWC	Train-to-Wayside Communication	
UC	Unit Control	
UCSV	Uncoupling Solenoid Valve	
US&S	Union Switch & Signal, Inc.	
USB	Universal Serial Bus	
VAC	Voltage Alternate Current	
VDC	Voltage Direct Current	
VHDL	VHSIC Hardware Description Language (for FPGA)	
VHF	Very High Frequency	
VNC	Vehicle Network Controller	
VVVF	Variable Voltage Variable Frequency	
V-zero	Velocity = Zero	

Running Maintenance and Service Manual – Section 99



Abbreviation / Acronym / Symbol	Meaning
(V)	Vented
W/	With
W/O	Without
WD	WatchDog
WTB	Wired Train Bus
YLL	Solenoid Valve, Liquid Line
D/Y	Triangle - Star Transformer



99-I-03 LIST DEFINITIONS

Term	Definition	
'A' body section	The section of an articulated vehicle containing the pantograph	
'B' body section	The section of an articulated vehicle not containing the pantograph	
AW0	Empty car operating weight	
AW1	Full seated load plus AW0	
AW2	Standees at 4 persons per square meter plus AW1	
AW3	Standees at 6 persons per square meter plus AW1	
AW4	Standees at 8 persons per square meter plus AW1	
Front door	The door close to the Operator's Cab	
Rear door	The door close to the Articulation Section	
MC Handle	Master Controller Handle	
"A" Cab (or Cab A)	Operator Cab in the A body section	
"B" Cab (or Cab B)	Operator Cab in the B body section	
LC filter	Filter made up of Inductance and capacity	
Rear door	The door close to the Articulation Section	
RLC filter	Filter made up of Resistance, Inductance and Capacity	
Sine-wave	Sinusoidal wave	
H	Parallel	
Center Door	Door close to the Articulation Section	
Front Door	Door Close to the Operator's Cab	
Max	Maximum	
Min	Minimum	
LC filter	Filter made up of Inductance and capacity	
RLC filter	Filter made up of Resistance, Inductance and Capacity	
Pin-out	Relationship between Pin number and carried Signal	
Non Vital Relay	The Non-Vital Relay is used in applications where fail-safe operation is not required. It provides no protection against welded contacts and no feedback indication if such a failure occurs.	
Safety Relay	The operation of the Safety Relay depends on the forced operation of the relays inner contacts. If either of the inner contacts become welded, the normally closed outer contacts remain open. Using the back contacts as a feedback, provides a check that inner contacts have not welded. The Safety Relay differs from the Vital Relay in that the possibility still exists for the inner relay contacts to weld. However, unlike the Non-Vital Relay, a failure due to welded contacts is detectable.	
Vital Relay	The Vital Relay is used in vital applications where fail-safe operation is required. Such applications include propulsion, braking, and door opening. The Vital Relay uses gravity for contact break and special contact materials to prevent contacts from welding.	
Component	(IEEE Std. 610.12-1993) One of the parts that make up a system. A component may be hardware or software and may be subdivided into other components.	

99-I-04 LIST OF SYMBOLS

Measurement	Definition	Meaning
°C	Celsius degree	(Temperature)
°F	Fahrenheit degree	(Temperature)
Α	Ampere	(Current)
AC	Alternate Current	(Current)
cfm	Cubic feet per minute	(Volume)
dB	Decibel	(Pressure)
DC	Direct Current	(Current)
F	Farad	(Capacity)
ft	Foot	(Length)
Ft-lb	Foot-Pound	Foot-Pound
g	Gram	(Weight)
gal	Gallon	(Volume)
Н	Henry	(Inductance)
Hz	Hertz	(Frequency)
in	Inch	(Length)
kg	Kilogram - approx 2.205 pounds	(Weight)
kHz	Kilo Hertz	(Frequency)
km	Kilometer - approx 0.621 miles	(Length)
Km/h	Kilometers per hour	(Velocity)
kN	Kilo-Newton - approx 224.809 pounds	(force)
kVA	Kilo-Volt-Ampere	(Power)
kW	Kilo-Watt	(Power)
kΩ	Kilo Ohm	(Resistance)
ī	Liter	Liter
lb	Pound	(Weight)
lb-ft	Pound force	(Force)
Lbs/ft	Pound/Foot	(Force)
lps	Liters per Second	(Volume)
m	Meter - approx 3.28 feet	(Length)
mH	Milli Henry	(Inductance)
mm	Millimeter - approx 0.0394 inches	(Length)
mph	Miles per hour	(Velocity)
mphps	Mile Per Hour Per Second	(Acceleration)
ms	Milli second	(Time)
mΩ	Milli Ohm	(Resistance)
N	Newton	(Force)
Nm	Newton-Meter	(Torque)
Pa	Pascal	(Pressure)
PSI	Pounds per Square Inch	Pounds per Square Inch
PSIG	Pounds per Square Inch Gauge	(Pressure)
rms	Root Mean Square Voltage	(Tension)
rpm	Revolution per Minute	(Frequency)
S	Seconds	(Time)
V	Volt	(Tension)
Vac	Volt Alternating Current	(Tension)
Vd	Differential Voltage	(Tension)
Vdc	Volt Direct Current	(Tension)
		, ,
Vin	Input Voltage	(Tension)



Running Maintenance and Service Manual – Section 99

Measurement	Definition	Meaning
Vm	Common Voltage	(Tension)
Vpp	Peak to Peak Voltage	(Tension)
W	Watt	(Power)
Ω	Ohm	(Resistance)