

Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
	<b>Acceleration and Braking</b>																		
Intercity, Regional, Commuter	Acceleration	Passenger Cars	Specification	Specification Compliance	P-2001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Acceleration	Passenger Cars	Specification	Specification Compliance	P-2001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Acceleration	Passenger Cars	Specification	Specification Compliance	P-2001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Acceleration Acceptance	Locomotive, EMU's,DMU's	Qualification	Specification Compliance	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Acceleration Effect-On Car	Passenger Cars	Specification	Noise/Vibration	PN-2001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Acceleration Effect-On Car	Passenger Cars	Specification	Noise/Vibration	PN-2001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Acceleration Effect-On Car	Passenger Cars	Specification	Noise/Vibration	PN-2001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Adhesion-Deceleration	Passenger Cars	Specification	Specification Compliance	A-3021-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Adhesion-Deceleration	Passenger Cars	Specification	Specification Compliance	A-3021-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Adhesion-Deceleration	Passenger Cars	Specification	Specification Compliance	A-3021-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Air brake tests	Locomotive, EMU's,DMU's	Specification	Specification Compliance	19.3.15.1	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>				Japan Ministerial Standards 2012	2/26/2018
Intercity, Regional, Commuter	Blended brake test	Locomotive, EMU's,DMU's	Specification	Specification Compliance	19.3.15.2	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center or Revenue Track	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>	<a href="#">APTA PR-E-RP-014-99</a>			GM/TT0169, 0170, 0171, 2044	2/26/2018
Intercity, Regional, Commuter	Brake Capacity Tests	Passenger Cars	Specification	Specification Compliance	19.5.4.4	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Brake Component Fatigue Tests	Passenger Cars	Specification	Specification Compliance	19.5.4.2	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Brake control operation	Passenger Cars	Specification	Signaling and Train Control	APTA SS-M-011-99	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>		2/26/2018
Intercity, Regional, Commuter	Brake Pad and Shoe Force Tests	Passenger Cars	Specification	Specification Compliance	19.5.4.1	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Brake Test	Locomotive, EMU's,DMU's	Specification	Specification Compliance	19.3.9	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Deceleration Effect-On Car	Passenger Cars	Specification	Noise/Vibration	PN-3001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Heavy Rail, Subways, Metros	Deceleration Effect-On Car	Passenger Cars	Specification	Noise/Vibration	PN-3001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Light Rail/Street Car	Deceleration Effect-On Car	Passenger Cars	Specification	Noise/Vibration	PN-3001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Intercity, Regional, Commuter	Deceleration-Blended Braking	Passenger Cars	Specification	Specification Compliance	P-3001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Heavy Rail, Subways, Metros	Deceleration-Blended Braking	Passenger Cars	Specification	Specification Compliance	P-3001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Light Rail/Street Car	Deceleration-Blended Braking	Passenger Cars	Specification	Specification Compliance	P-3001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Intercity, Regional, Commuter	Deceleration-Dynamic Braking	Passenger Cars	Specification	Specification Compliance	P-3003-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Heavy Rail, Subways, Metros	Deceleration-Dynamic Braking	Passenger Cars	Specification	Specification Compliance	P-3003-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Light Rail/Street Car	Deceleration-Dynamic Braking	Passenger Cars	Specification	Specification Compliance	P-3003-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Intercity, Regional, Commuter	Deceleration-Emergency Braking	Passenger Cars	Specification	Specification Compliance	P-3004-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Heavy Rail, Subways, Metros	Deceleration-Emergency Braking	Passenger Cars	Specification	Specification Compliance	P-3004-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Light Rail/Street Car	Deceleration-Emergency Braking	Passenger Cars	Specification	Specification Compliance	P-3004-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Intercity, Regional, Commuter	Deceleration-Service Friction	Passenger Cars	Specification	Specification Compliance	P-3002-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Heavy Rail, Subways, Metros	Deceleration-Service Friction	Passenger Cars	Specification	Specification Compliance	P-3002-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Light Rail/Street Car	Deceleration-Service Friction	Passenger Cars	Specification	Specification Compliance	P-3002-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				Japan Ministerial Standards 2012	10/1/2016
Intercity, Regional, Commuter	Drift Test (traction resistance)	Passenger Cars	Specification	Specification Compliance	P-4001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Drift Test (traction resistance)	Passenger Cars	Specification	Specification Compliance	P-4001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Drift Test (traction resistance)	Passenger Cars	Specification	Specification Compliance	P-4001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Duty Cycle-Friction Brakes	Passenger Cars	Specification	Specification Compliance	P-5001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Duty Cycle-Friction Brakes	Passenger Cars	Specification	Specification Compliance	P-5001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Duty Cycle-Friction Brakes	Passenger Cars	Specification	Specification Compliance	P-5001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Friction Brake Performance Test	Passenger Cars	Specification	Component Performance	19.5.14.2.8	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018
Intercity, Regional, Commuter	Friction Brake System Endurance Tests	Passenger Cars	Specification	Specification Compliance	19.5.4.3	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018
Intercity, Regional, Commuter	Hand Brake Operation	Passenger Cars	Specification	Specification Compliance	19.6.4.2	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02		Japan Ministerial Standards 2012	2/26/2018
Intercity, Regional, Commuter	Handbrake Tests	Passenger Cars	Specification	Specification Compliance	19.5.4.5 per APTA SS-M-006-98	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02		GM/RT2000, Japan Ministerial Standards 2012	2/26/2018
Intercity, Regional, Commuter	Locomotive and air brake control	Passenger Cars	Specification	Signaling and Train Control	16.6.13.6	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018
Intercity, Regional, Commuter	Single Car Air Brake and Pneumatic System Operation	Passenger Cars	Specification	Specification Compliance	APTA SS-M-005-98 and AAR 5471	<125 mph	Other	Yes	Operational Safety	Test Track	Builder Facility or Test Center	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02	APTA PR-M-S-005-98, Rev. 2.1		2/26/2018
Intercity, Regional, Commuter	Spin/Slide-Acceleration	Passenger Cars	Specification	Specification Compliance	P-2011-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Spin/Slide-Acceleration	Passenger Cars	Specification	Specification Compliance	P-2011-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Spin/Slide-Acceleration	Passenger Cars	Specification	Specification Compliance	P-2011-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Spin/Slide-Deceleration	Passenger Cars	Specification	Specification Compliance	P-3011-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Spin/Slide-Deceleration	Passenger Cars	Specification	Specification Compliance	P-3011-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Spin/Slide-Deceleration	Passenger Cars	Specification	Specification Compliance	P-3011-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
<b>Clearances</b>																			
Intercity, Regional, Commuter	Clearance Diagram Compliance Tests	Passenger Cars	Specification	Specification Compliance	19.6.14.1.2	<125 mph	Other	Yes	Operational Safety	None (diagram)	Builder	No	Individual cars require fixture modification - fabrication	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02		GM/RT2149	2/26/2018
Heavy Rail, Subways, Metros	Clearance Diagram Compliance Tests	Passenger Cars	Specification	Specification Compliance	Agency Specified	<125 mph	Other	No	Operational Safety	None (diagram)	Builder	No	Individual cars require fixture modification - fabrication	Specified by RFP				GM/RT2149	10/1/2016
Light Rail/Street Car	Clearance Diagram Compliance Tests	Passenger Cars	Specification	Specification Compliance	Agency Specified	<125 mph	Other	No	Operational Safety	None (diagram)	Builder	No	Individual cars require fixture modification - fabrication	Specified by RFP				GM/RT2149	10/1/2016
Intercity, Regional, Commuter	Clearance Test	Locomotive, EMU's,DMU's	Specification	Specification Compliance	19.3.6	<125 mph	Other	Yes	Operational Safety	Test Track or Rail Facility	Test Center, Builder Facility, or Revenue Track	No	Individual cars require fixture modification - fabrication	Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10				GM/RT2149	2/26/2018
Heavy Rail, Subways, Metros	Clearance Test	Locomotive, EMU's,DMU's	Specification	Specification Compliance	Agency Specified	<125 mph	Other	No	Operational Safety	Test Track or Rail Facility	Test Center, Builder Facility, or Revenue Track	No	Individual cars require fixture modification - fabrication	Specified by RFP				GM/RT2149	10/1/2016
Light Rail/Street Car	Clearance Test	Locomotive, EMU's,DMU's	Specification	Specification Compliance	Agency Specified	<125 mph	Other	No	Operational Safety	Test Track or Rail Facility	Test Center, Builder Facility, or Revenue Track	No	Individual cars require fixture modification - fabrication	Specified by RFP				GM/RT2149	10/1/2016
<b>Communications</b>																			



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Intercity, Regional, Commuter	Cab indicator operation	Passenger Cars	Specification	Signaling and Train Control	19.6.13.8	<125 mph	Other	Yes	Operational Safety	N/A	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Event recorder performance	Passenger Cars	Specification	Signaling and Train Control	19.6.13.3	<125 mph	Other	Yes	Operational Safety	N/A	Builder Facility or Test Center	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Event recorder-video performance	Passenger Cars	Specification	Signaling and Train Control	19.3.13.4	<125 mph	Other	Yes	Operational Safety	N/A	Builder Facility or Test Center	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Headlight and crossing light tests	Passenger Cars	Specification	Signaling and Train Control	19.6.13.14 per 49CFR Section 229.125	<125 mph	Other	Yes	Operational Safety	N/A	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Headlights, Misc. Light Adjustment	Locomotive, EMU's,DMU's	Specification	Specification Compliance	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	N/A	Test Center, Builder Facility, or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Horn and bell operation	Passenger Cars	Specification	Signaling and Train Control	19.6.13.12	<125 mph	Other	Yes	Operational Safety	Rail Facility	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Horn Test per 49CFR 229.129	Locomotive, EMU's,DMU's	Specification	Specification Compliance	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Rail Facility	Test Center, Builder Facility, or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	MU and COMM trainline function operation	Passenger Cars	Specification	Signaling and Train Control	19.6.13.9	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Positive Train Control (PTC) and/or Automatic Train Control (ATC) if equipped	Locomotive, EMU's,DMU's	Specification	Signaling and Train Control	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Test Track	Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Positive train control system	Passenger Cars	Specification	Signaling and Train Control	19.6.13.5	<125 mph	Other	Yes	Operational Safety	Test Track	Revenue Track	No	Tests are still being developed. Testing procedures are being developed under specific RFPs (e.g. CalTrans)	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Radio Frequency Interference	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	PSI-6001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Radio Frequency Interference	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	PSI-6001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Radio Frequency Interference	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	PSI-6001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Speedometer/overspeed performance	Passenger Cars	Specification	Signaling and Train Control	19.6.13.2	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Train Speed Control Test	Locomotive, EMU's,DMU's	Specification	Signaling and Train Control	19.3.20	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center or Revenue Track	No	Test Location Specified by owner / agency	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Trainline Tests	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.5.10.2	<125 mph	Other	Yes	Operational Safety	Test Track	Builder	No	Test Location Specified by owner / agency	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
<b>Compatibility</b>																			
Intercity, Regional, Commuter	Cab Car Compatibility with the Locomotive	Locomotive, EMU's,DMU's	Specification	Specification Compliance	Table 19-1: Test Matrix	<125 mph	Other	Yes	Reliability	Test Track	Test Center or Revenue Track	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Functionality Tests of all equipment	Passenger Cars	Specification	Specification Compliance	19.7.2	<125 mph	Other	Yes	Reliability	Test Track	Revenue Track	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Parking brake tests	Locomotive, EMU's,DMU's	Specification	Specification Compliance	19.3.15.3	<125 mph	Other	Yes	Operational Safety	Test Track	Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Locomotive Sequence Test	Locomotive, EMU's,DMU's	Specification	Specification Compliance	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Test Track	Builder Facility or Test Center	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Locomotive Sequence Tests	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	19.3.14	<125 mph	Other	Yes	Operational Safety	Test Track	Builder Facility or Test Center	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Pilot Train Compatibility with Existing Amtrak Bilevel Cars	Passenger Cars	Qualification	Specification	19.5.14.2.2	<125 mph	Other	Yes	Operational Safety	(California Car, Superliner, Surfliner)	Revenue Track	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Post Delivery Testing of Pilot Train with Other Equipment	Passenger Cars	Specification and Qualification	Endurance/Revenue Service	19.8.	<125 mph	Other	Yes	Reliability	Test Track	Revenue Track	No	Post test infers testing to be on agency property	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	480V HEP trainline	Passenger Cars	Specification	Signaling and Train Control	19.6.10.5.1	<125 mph	Other	Yes	Reliability	Test Track	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Locomotive Electrical Test	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	Table 19-1: Test Matrix	<125 mph	Other	Yes	Reliability	Test Track	Builder Facility or Test Center	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Locomotive Electrical Tests	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	19.3.11	<125 mph	Other	Yes	Reliability	Test Track	Builder Facility or Test Center	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Electrical Load/Phase Balance/Power Factor	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.5.10.1	<125 mph	Other	Yes	Reliability	Test Track	Builder	No	Usually performed by builder at assembly location	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Intercity, Regional, Commuter	EMI/EMC	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	Table 19-1: Test Matrix	<125 mph	Other	Yes	Reliability	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	EMI/EMC	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.5.9.3 per APTA SS-E-010-98	<125 mph	Other	Yes	Reliability	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Locomotive Auxiliary Tests	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	19.3.13	<125 mph	Other	Yes	Reliability	Test Track	Builder Facility or Test Center	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Locomotive Propulsion Tests	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	19.3.12	<125 mph	Other	Yes	Reliability	Test Track	Builder Facility or Test Center	No	Test Specific on location to be performed	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Propulsion Test	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	Table 19-1: Test Matrix	<125 mph	Other	Yes	Reliability	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Head End Power (HEP) Test	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	19.3.16	<125 mph	Other	Yes	Reliability	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	HEP Test per APTA RP-E-011-98	Locomotive, EMU's,DMU's	Specification	Electrical & Propulsion Performance and Compatibility	Table 19-1: Test Matrix	<125 mph	Other	Yes	Reliability	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Power Consumption	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	PC-5011-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification may be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Power Consumption	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	PC-5011-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification may be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Power Consumption	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	PC-5011-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification may be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
<b>Crashworthiness</b>																			
Intercity, Regional, Commuter	Allowable stresses	Passenger Cars	Specification	Structural Integrity	19.5.2.1	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Loading Fixture required	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>		EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Colliding Equipment Override	All	Specification	Structural Integrity	RSAC Paragraph 3.3	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternatively Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Colliding Equipment Override	All	Specification	Structural Integrity	RSAC Paragraph 3.3	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternatively Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Light Rail/Street Car	Collision Post (Collision Wall) and Corner Post Loads Test	All	Specification	Structural Integrity	RT-1-2015 10.3.4	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification may be purchased by user	<a href="#">ASME RT-1-2015 Safety Standard for Structural Requirements for Light Rail Vehicles</a>	<a href="#">ASME RT-1-2009 Safety Standard for Structural Requirements for Light Rail Vehicles</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Collision Post Test	Locomotive, EMU's,DMU's	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	Other	Yes	Structural Safety	Rail Facility	Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>	<a href="#">APTA PR-CS-S-034-99, Rev. 2</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Collision with Conventional Equipment	All	Specification	Structural Integrity	RSAC Paragraph 3.1	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternatively Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Collision with Conventional Equipment	All	Specification	Structural Integrity	RSAC Paragraph 3.1	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	Yes	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternatively Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Compression load test at the draft stop	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Compression Loads	All	Specification	Structural Integrity	RT-2-2008 10.3.3	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	Yes	Specification may be purchased by user	<a href="#">ASME RT-2-2014 Safety Standard for Structural Requirements for Heavy Rail Vehicles</a>				EN 15227:2008+A1:2010	2/26/2018
Light Rail/Street Car	Compression Loads	All	Specification	Structural Integrity	RT-1-2015 10.3.3	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	Yes	Specification may be purchased by user	<a href="#">ASME RT-1-2015 Safety Standard for Structural Requirements for Light Rail Vehicles</a>	<a href="#">ASME RT-1-2009 Safety Standard for Structural Requirements for Light Rail Vehicles</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Connected Equipment Override	All	Specification	Structural Integrity	RSAC Paragraph 3.4	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternatively Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Connected Equipment Override	All	Specification	Structural Integrity	RSAC Paragraph 3.4	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternatively Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Corner post elastic-plastic test	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	APTA	Yes	Structural Safety	Rail Facility	Builder	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Intercity, Regional, Commuter	Corner post longitudinal load test	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	APTA	Yes	Structural Safety	Rail Facility	Builder	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Corner Post Test	Locomotive, EMU's, DMU's	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	APTA	Yes	Structural Safety	Rail Facility	Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>	<a href="#">APTA PR-CS-S-034-99, Rev. 2</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Corner Post Transverse Load Test	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	APTA	Yes	Structural Safety	Rail Facility	Builder	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Complete coupler, draft gear, radial connector, yoke, coupler carrier and uncoupling mechanism	Passenger Cars	Specification	Structural Integrity	19.5.3 per FRA & APTA regs	<125 mph	APTA & FRA	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Coupler Energy Absorbed Test	Locomotive, EMU's, DMU's	Specification	Structural Integrity	19.5.1	<125 mph	Other	Yes	Structural Safety	Rail Facility	Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Coupler Energy Absorbed Test	Passenger Cars	Specification	Structural Integrity	Table 19-1 CEM System Test Matrix (6.9)	<125 mph	Other	Yes	Structural Safety	Rail Facility	Test Center	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>				EN 15227:2008+A1:2010, GM/RT2102	2/26/2018



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Intercity, Regional, Commuter	Coupler Initiation Load*	Locomotive, EMU's,DMU's	Specification	Structural Integrity	19.5.1	<125 mph	Other	Yes	Structural Safety	Rail Facility	Test Center	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Coupler Initiation Load*	Passenger Cars	Specification	Structural Integrity	Table 19-1 CEM System Test Matrix (6.9)	<125 mph	Other	Yes	Structural Safety	Rail Facility	Test Center	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>				EN 15227:2008+A1:2010, GM/RT2102	2/26/2018
Heavy Rail, Subways, Metros	Coupling Impact Test	All	Specification	Structural Integrity	RT-2-2008 10.5	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification may be purchased by user	<a href="#">ASME RT-2-2014 Safety Standard for Structural Requirements for Heavy Rail Vehicles</a>				EN 15227:2008+A1:2010	2/26/2018
Light Rail/Street Car	Coupling Impact Test	All	Specification	Structural Integrity	RT-1-2015 10.5	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification may be purchased by user	<a href="#">ASME RT-1-2015 Safety Standard for Structural Requirements for Light Rail Vehicles</a>	<a href="#">ASME RT-1-2009 Safety Standard for Structural Requirements for Light Rail Vehicles</a>			EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Collision Post (Collision Wall) and Corner Post Loads Test: Elastic Design Loads	All	Specification	Structural Integrity	RT-2-2008 10.3.4	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification may be purchased by user	<a href="#">ASME RT-2-2014 Safety Standard for Structural Requirements for Heavy Rail Vehicles</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Collision post elastic-plastic test	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	APTA	Yes	Structural Safety	Rail Facility	Builder	No	Individual cars require fixture modification - fabrication	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Collision Post Loads: Elastic-Plastic Design Loads Test	All	Specification	Structural Integrity	RT-2-2008 10.3.5	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification may be purchased by user	<a href="#">ASME RT-2-2014 Safety Standard for Structural Requirements for Heavy Rail Vehicles</a>					2/26/2018
Intercity, Regional, Commuter	Roof Integrity	All	Specification	Structural Integrity	RSAC Paragraph 3.8	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No		<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>	<a href="#">Rolling Contact Fatigue: A Comprehensive Review</a>			EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Roof Integrity	All	Specification	Structural Integrity	RSAC Paragraph 3.8	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Crash energy management	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010, GM/RT2100	2/26/2018
Heavy Rail, Subways, Metros	Crash Energy Management Tests	All	Specification	Structural Integrity	RT-2-2008 10.4	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification may be purchased by user	<a href="#">ASME RT-2-2014 Safety Standard for Structural Requirements for Heavy Rail Vehicles</a>				EN 15227:2008+A1:2010	2/26/2018
Light Rail/Street Car	Crash Energy Management Tests	All	Specification	Structural Integrity	RT-1-2015 10.4	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification may be purchased by user	<a href="#">ASME RT-1-2015 Safety Standard for Structural Requirements for Light Rail Vehicles</a>	<a href="#">ASME RT-1-2009 Safety Standard for Structural Requirements for Light Rail Vehicles</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Diagonal jacking test	Passenger Cars	Specification	Structural Integrity	19.5.1.9	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>		EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	End sill compression load test	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	End Structure Integrity of Cab End	All	Specification	Structural Integrity	RSAC Paragraph 3.6	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No		<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	End Structure Integrity of Cab End	All	Specification	Structural Integrity	RSAC Paragraph 3.6	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	End Structure Integrity of Non-cab End	All	Specification	Structural Integrity	RSAC Paragraph 3.7	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No		<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	End Structure Integrity of Non-cab End	All	Specification	Structural Integrity	RSAC Paragraph 3.7	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>	<a href="#">Passenger Train Braking Model Development – Phase I</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Interior Fixture Attachment	All	Specification	Structural Integrity	RSAC Paragraph 3.11	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Usually performed by builder at assembly location	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>	<a href="#">Railroad Industry Modal Profile: An Outline of the Railroad Industry Workforce Trends, Challenges, and Opportunities</a>	<a href="#">APTA PR-CS-S-006-98, Rev 1</a>	<a href="#">APTA PR-CS-S-034-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Interior Fixture Attachment	All	Specification	Structural Integrity	RSAC Paragraph 3.11	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>	<a href="#">Fatigue Crack Growth and Fracture Behavior of Bainitic Rail Steels</a>	<a href="#">APTA PR-CS-S-006-98, Rev 1</a>	<a href="#">APTA PR-CS-S-034-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Locomotive Carbody Compression Test	Locomotive, EMU's,DMU's	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Loading Fixture required	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>	<a href="#">APTA PR-CS-S-034-99, Rev. 2</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Occupant Protection Features	All	Specification	Structural Integrity	RSAC Paragraph 3.12	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Specific Instrumentation per vehicle type	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>	<a href="#">APTA PR-CS-S-016-99, Rev. 2</a>	<a href="#">APTA PR-CS-S-011-99</a>		EN 15227:2008+A1:2010	2/26/2018



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Heavy Rail, Subways, Metros	Occupant Protection Features	All	Specification	Structural Integrity	RSAC Paragraph 3.12	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>	<a href="#">APTA PR-CS-S-016-99, Rev. 2</a>	<a href="#">APTA PR-CS-S-011-99</a>		EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Occupied Volume Integrity	All	Specification	Structural Integrity	RSAC Paragraph 3.2	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Specific Instrumentation per vehicle type	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Occupied Volume Integrity	All	Specification	Structural Integrity	RSAC Paragraph 3.2	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Proof Load Tests	All	Specification	Structural Integrity	RT-2-2008 10.3	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification my be purchased by user	<a href="#">ASME RT-2-2014 Safety Standard for Structural Requirements for Heavy Rail Vehicles</a>				EN 15227:2008+A1:2010	2/26/2018
Light Rail/Street Car	Proof Load Tests	All	Specification	Structural Integrity	RT-1-2015 10.3	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification my be purchased by user	<a href="#">ASME RT-1-2015 Safety Standard for Structural Requirements for Light Rail Vehicles</a>	<a href="#">ASME RT-1-2009 Safety Standard for Structural Requirements for Light Rail Vehicles</a>			EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Side Structure Integrity	All	Specification	Structural Integrity	RSAC Paragraph 3.9	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Loading Fixture required	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Side Structure Integrity	All	Specification	Structural Integrity	RSAC Paragraph 3.9	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	<a href="#">Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Structural Absorber Energy Absorption	Passenger Cars	Specification	Structural Integrity	Table 19-1 CEM System Test Matrix (4.21.4 & 4.21.5)	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Structures-Acceleration	Passenger Cars	Specification	Structural Integrity	S-2001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Test Location Specified by owner / agency	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Structures-Acceleration	Passenger Cars	Specification	Structural Integrity	S-2001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Structures-Acceleration	Passenger Cars	Specification	Structural Integrity	S-2001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Structures-Constant Velocity	Passenger Cars	Specification	Structural Integrity	S-1001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Test Location Specified by owner / agency	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Structures-Constant Velocity	Passenger Cars	Specification	Structural Integrity	S-1001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Structures-Constant Velocity	Passenger Cars	Specification	Structural Integrity	S-1001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Structures-Deceleration	Passenger Cars	Specification	Structural Integrity	S-3001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Test Location Specified by owner / agency	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Structures-Deceleration	Passenger Cars	Specification	Structural Integrity	S-3001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Structures-Deceleration	Passenger Cars	Specification	Structural Integrity	S-3001-TT	All	Other	No	Structural Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Trigger, Frangible Element, Fuse 4.21.4 & 4.21.5	Passenger Cars	Specification	Structural Integrity	Table 19-1 CEM System Test Matrix (4.21.4 & 4.21.5)	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>				EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Vertical load test	Passenger Cars	Specification	Structural Integrity	APTA Standard SS-C&S-034-99	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Testing requires specific fixturing with load actuation	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-011-99, Rev. 2</a>	EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Vertical Load Test	All	Specification	Structural Integrity	RT-2-2008 10.3.2	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification my be purchased by user	<a href="#">ASME RT-2-2014 Safety Standard for Structural Requirements for Heavy Rail Vehicles</a>				EN 15227:2008+A1:2010	2/26/2018
Light Rail/Street Car	Vertical Load Test	All	Specification	Structural Integrity	RT-1-2015 10.3.2	All	Other	No	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Specification my be purchased by user	<a href="#">ASME RT-1-2015 Safety Standard for Structural Requirements for Light Rail Vehicles</a>	<a href="#">ASME RT-1-2009 Safety Standard for Structural Requirements for Light Rail Vehicles</a>			EN 15227:2008+A1:2010	2/26/2018
<b>Doors</b>																			
Intercity, Regional, Commuter	Door safety systems	Passenger Cars	Specification	Specification Compliance	19.6.5.1	<125 mph	Other	Yes	Operational Safety	800 cycles	Builder	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
<b>Electrical Safety</b>																			
Intercity, Regional, Commuter	Battery and battery charger operation	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.6.10.2.1	<125 mph	Other	Yes	Reliability	Test Track or Rail Facility	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018
Intercity, Regional, Commuter	Battery and battery charger operation	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.6.10.2.4	<125 mph	Other	Yes	Reliability	Test Track or Rail Facility	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked	
Intercity, Regional, Commuter	Battery and Battery Charger Tests	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.5.10.3	<125 mph	Other	Yes	Reliability	Test Track or Rail Facility	Builder	No	Test Specific on location to be performed	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018	
Intercity, Regional, Commuter	Electrical apparatus tests	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.6.10.1	<125 mph	Other	Yes	Reliability	Test Track or Rail Facility	Builder	No	Usually performed by builder at assembly location	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018	
Intercity, Regional, Commuter	Battery capacity	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.6.10.2.2	<125 mph	Other	Yes	Reliability	Test Track or Rail Facility	Builder	No	Test Specific on location to be performed	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018	
Intercity, Regional, Commuter	Battery/Battery Charger Performance	Passenger Cars	Specification	Electrical & Propulsion Performance and Compatibility	19.6.10.2.3	<125 mph	Other	Yes	Reliability	Test Track or Rail Facility	Builder	No	Test Specific on location to be performed	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018	
	<b>Emissions</b>																			
Intercity, Regional, Commuter	Emissions	Locomotive, EMU's, DMU's	Specification	Specification Compliance	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Rail Facility	Builder	No	TTC currently not capable of emissions testing - facilities required	Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10						2/26/2018
	<b>In-Service Requirements</b>																			
Intercity, Regional, Commuter	Pilot Train Testing	Passenger Cars	Specification	Endurance/Revenue Service	19.5.14.2.1	<125 mph	Other	Yes	Operational Safety	Test Track	Revenue Track	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02		EN14363:2005 (E), GM/RT2000	2/26/2018	
Intercity, Regional, Commuter	Reliability and Post-Delivery Tests	Passenger Cars	Specification	Endurance/Revenue Service	19.9	<125 mph	Other	Yes	Operational Safety	Test Track	Revenue Track	No	Post test infers testing to be on agency property	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018	
Intercity, Regional, Commuter	Current Collection Systems - Measurement of Total Mean Uplift Force	All	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Intercity, Regional, Commuter	Current Collection Systems - Measurement of Total Contact Force	All	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Intercity, Regional, Commuter	Current Collection Systems - Measurement of Displacement	All	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Intercity, Regional, Commuter	Current Collection Systems - Measurement of Arching	All	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Light Rail/Street Car	Current Collection Systems - Measurement of Total Mean Uplift Force	Passenger Cars	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Light Rail/Street Car	Current Collection Systems - Measurement of Total Contact Force	Passenger Cars	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Light Rail/Street Car	Current Collection Systems - Measurement of Displacement	Passenger Cars	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Light Rail/Street Car	Current Collection Systems - Measurement of Arching	Passenger Cars	Specification	Component Performance	EN 50317	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	EN 50317						2/26/2018
Intercity, Regional, Commuter	Simulated Revenue Service	Passenger Cars	Qualification	Endurance/Revenue Service	RS-5001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14						10/1/2016
Heavy Rail, Subways, Metros	Simulated Revenue Service	Passenger Cars	Qualification	Endurance/Revenue Service	RS-5001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14						10/1/2016
Light Rail/Street Car	Simulated Revenue Service	Passenger Cars	Qualification	Endurance/Revenue Service	RS-5001-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14						10/1/2016
	<b>Lifecycle/Maintenance Intervals</b>																			
Intercity, Regional, Commuter	Truck Frame Fatigue Test	Passenger Cars	Specification	Structural Integrity	APTA RP-M-009-98	<125 mph	APTA	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Fatigue Testing requires specific fixturing with load actuation	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02		APTA PR-M-RP-009-98		2/26/2018
Intercity, Regional, Commuter	Truck Frame Load Test	Passenger Cars	Specification	Structural Integrity	19.5.2.3	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Testing requires specific fixturing with load actuation	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02				2/26/2018
Intercity, Regional, Commuter	Truck Frame Overload Test	Passenger Cars	Specification	Structural Integrity	19.5.2.4	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Testing requires specific fixturing with load actuation	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02				2/26/2018
	<b>Materials</b>																			
Intercity, Regional, Commuter	Radiography inspection of critical welds on first production truck and other primary structural members	All	Specification	Structural Integrity	Agency Specified	All	RFP	No	Structural Safety	Rail Facility	Builder	No	TTC has capabilities for radiography but there are limitations due to size and thickness of material be scanned	Specified by RFP	ASTM E 94					10/1/2016



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Heavy Rail, Subways, Metros	Radiography inspection of critical welds on first production truck and other primary structural members	All	Specification	Structural Integrity	Agency Specified	All	RFP	No	Structural Safety	Rail Facility	Builder	No	TTC has capabilities for radiography but there are limitations due to size and thickness of material be scanned	Specified by RFP	<a href="#">ASTM E 94</a>				10/1/2016
Light Rail/Street Car	Radiography inspection of critical welds on first production truck and other primary structural members	All	Specification	Structural Integrity	Agency Specified	All	RFP	No	Structural Safety	Rail Facility	Builder	No	TTC has capabilities for radiography but there are limitations due to size and thickness of material be scanned	Specified by RFP	<a href="#">ASTM E 94</a>				10/1/2016
Intercity, Regional, Commuter	Fluid Entry Inhibition	All	Specification	Structural Integrity	RSAC Paragraph 3.5	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	TTC does not have facility to perform fluid integrity testing					EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Fluid Entry Inhibition	All	Specification	Structural Integrity	RSAC Paragraph 3.5	<125 mph	FRA	Yes	Structural Safety	Test Track	Builder Facility or Test Center	No	Still in draft form					EN 15227:2008+A1:2010	2/26/2018
Intercity, Regional, Commuter	Material Certification	Locomotive, EMU's,DMU's	Specification	Specification Compliance	19.6	<125 mph	Other	Yes	Operational Safety	N/A	Test Center or Revenue Track	No	If certain degree curves required - installation required	<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Smoke and Flame Components per 49CFR 238.103	Locomotive, EMU's,DMU's	Specification	Specification Compliance	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Facility that tests flammability	Builder	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
<b>Noise and Vibration</b>																			
Intercity, Regional, Commuter	Effect of Speed-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Effect of Speed-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Effect of Speed-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Effect of Car Speed-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-1001-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Effect of Car Speed-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-1001-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Effect of Car Speed-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-1001-TT	All	Other	No	Reliability	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Effect of Track Section-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1101-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Effect of Track Section-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1101-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Effect of Track Section-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1101-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Equipment Noise Survey-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-0001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Equipment Noise Survey-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-0001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Equipment Noise Survey-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-0001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Interior Noise Survey	Passenger Cars	Specification	Noise/Vibration	PN-1301-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Interior Noise Survey	Passenger Cars	Specification	Noise/Vibration	PN-1301-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Interior Noise Survey	Passenger Cars	Specification	Noise/Vibration	PN-1301-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Ride Quality	All	Specification and Qualification	Vehicle Dynamics	ISO 2631-1 Second Edition 1997-05-01	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	International Standards Organization				EN14363:2005 (E), GM/RT2000; BS 6841; ENV 12299)	10/1/2016
Light Rail/Street Car	Ride Quality	All	Specification and Qualification	Vehicle Dynamics	ISO 2631-1 Second Edition 1997-05-01	All	Other	No	Passenger Satisfaction	Test Track	Revenue Track	No	Specification my be purchased by user	International Standards Organization				EN14363:2005 (E), GM/RT2000; BS 6841; ENV 12299)	10/1/2016
Intercity, Regional, Commuter	Ride Quality Tests	All	Specification and Qualification	Vehicle Dynamics	ISO 2631	All	Other	Yes	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>		EN14363:2005 (E), GM/RT2000; BS 6841; ENV 12299)	2/26/2018
Intercity, Regional, Commuter	Ride Roughness-Acceleration	Passenger Cars	Specification	Vehicle Dynamics	R-2001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Ride Roughness-Acceleration	Passenger Cars	Specification	Vehicle Dynamics	R-2001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Light Rail/Street Car	Ride Roughness-Acceleration	Passenger Cars	Specification	Vehicle Dynamics	R-2001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Ride Roughness-Component Induced Vibration	Passenger Cars	Specification	Vehicle Dynamics	R-0010-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				GM/RT2160	10/1/2016
Heavy Rail, Subways, Metros	Ride Roughness-Component Induced Vibration	Passenger Cars	Specification	Vehicle Dynamics	R-0010-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				GM/RT2160	10/1/2016
Light Rail/Street Car	Ride Roughness-Component Induced Vibration	Passenger Cars	Specification	Vehicle Dynamics	R-0010-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14				GM/RT2160	10/1/2016
Intercity, Regional, Commuter	Ride Roughness-Deceleration	Passenger Cars	Specification	Vehicle Dynamics	R-3001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Ride Roughness-Deceleration	Passenger Cars	Specification	Vehicle Dynamics	R-3001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Ride Roughness-Deceleration	Passenger Cars	Specification	Vehicle Dynamics	R-3001-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Ride Roughness-Worst Speeds	Passenger Cars	Specification	Vehicle Dynamics	R-1101-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Ride Roughness-Worst Speeds	Passenger Cars	Specification	Vehicle Dynamics	R-1101-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Ride Roughness-Worst Speeds	Passenger Cars	Specification	Vehicle Dynamics	R-1101-TT	All	Other	No	Passenger Satisfaction	Test Track	Test Center or Revenue Track	No	ISO Standard has replaced this	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Screech Loop Survey-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1201-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user - Screech loop is 150' radius - vehicle must accommodate	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Screech Loop Survey-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1201-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Screech Loop Survey-On Car	Passenger Cars	Specification	Noise/Vibration	PN-1201-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Screech Loop Survey-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-1201-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user - Screech loop is 150' radius - vehicle must accommodate	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Screech Loop Survey-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-1201-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Screech Loop Survey-Wayside	Passenger Cars	Specification	Noise/Vibration	CN-1201-TT	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Sound Level Test	Locomotive, EMU's, DMU's	Specification	Noise/Vibration	19.3.7 as per 49CFR Section 229.121	<125 mph	Other	Yes	Passenger Satisfaction	Test Track or Rail Facility	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018
Intercity, Regional, Commuter	Noise and Vibration Tests	Passenger Cars	Specification	Noise/Vibration	19.5.14.2.7 per ANSI Standard S1.4 Type2	>90 mph	Other	Yes	Passenger Satisfaction	Test Track or Rail Facility	Builder Facility or Test Center	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>		UIC - Railway Noise in Europe, <a href="http://www.env.go.jp/en/air/noise/railway.html">http://www.env.go.jp/en/air/noise/railway.html</a>	2/26/2018
	<b>Track Geometry/Vehicle Response</b>																		
Intercity, Regional, Commuter	Dynamic Shake Test	Passenger Cars	Specification	Vehicle Dynamics	R-0001-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Dynamic Shake Test	Passenger Cars	Specification	Vehicle Dynamics	R-0001-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Dynamic Shake Test	Passenger Cars	Specification	Vehicle Dynamics	R-0001-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Dynamic Shake Test-Lateral	Passenger Cars	Specification	Vehicle Dynamics	R-0002-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Dynamic Shake Test-Lateral	Passenger Cars	Specification	Vehicle Dynamics	R-0002-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Dynamic Shake Test-Lateral	Passenger Cars	Specification	Vehicle Dynamics	R-0002-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Intercity, Regional, Commuter	Dynamic Shake Test-Longitudinal	Passenger Cars	Specification	Vehicle Dynamics	R-0003-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Heavy Rail, Subways, Metros	Dynamic Shake Test-Longitudinal	Passenger Cars	Specification	Vehicle Dynamics	R-0003-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016
Light Rail/Street Car	Dynamic Shake Test-Longitudinal	Passenger Cars	Specification	Vehicle Dynamics	R-0003-XX	All	Other	No	Operational Safety	Test Track	Test Center or Revenue Track	No	Specification my be purchased by user	UMTA-MA-06-0025-75-14					10/1/2016



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked
Intercity, Regional, Commuter	High-speed Testing/Vehicle Qualification	All	Qualification	Vehicle Dynamics	49CFR 213.345	<125 mph	Other	Yes	Operational Safety	125 mph, instrumented car, IWS	Test Center or Revenue Track	No	TTC test track capable to 160 mph - IWS fabrication for specific cars	Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018
Intercity, Regional, Commuter	Locomotive Track Test	Locomotive, EMU's,DMU's	Specification	Vehicle Dynamics	19.3.8	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center	No		Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10					2/26/2018
Intercity, Regional, Commuter	Locomotive Track Test Acceptance	Locomotive, EMU's,DMU's	Qualification	Vehicle Dynamics	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center	No	Usually performed by builder at assembly location	Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10					2/26/2018
Intercity, Regional, Commuter	Minimally Compliant Analytical Track (MCAT)	All	Qualification	Vehicle Dynamics	49CFR213.345 (proposed)	Class 6 Track or 6 inches of cant deficiency	FRA	Yes	Operational Safety	None (simulations)	N/A	No	MCAT requires simulation of vehicle. TTCI capable of performing simulations	Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations					2/26/2018
Heavy Rail, Subways, Metros	Minimally Compliant Analytical Track (MCAT)	All	Qualification	Vehicle Dynamics	49CFR213.345 (proposed)	Class 6 Track or 6 inches of cant deficiency	FRA	No	Operational Safety	None (simulations)	N/A	Yes		Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations					2/26/2018
Light Rail/Street Car	Minimally Compliant Analytical Track (MCAT)	All	Qualification	Vehicle Dynamics	49CFR213.345 (proposed)	Class 6 Track or 6 inches of cant deficiency	FRA	No	Operational Safety	None (simulations)	N/A	Yes	MCAT requires simulation of vehicle. TTCI capable of performing simulations	Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations					2/26/2018
Intercity, Regional, Commuter	On Board Acceleration	All	Qualification	Vehicle Dynamics	49CFR213.333 j	>125mph	FRA	Yes	Operational Safety	Revenue Track	Test Center or Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Intercity, Regional, Commuter	On Board Acceleration	All	Qualification	Vehicle Dynamics	49CFR213.333 k	>110mph	FRA	Yes	Operational Safety	Revenue Track	Test Center or Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Intercity, Regional, Commuter	On Board Acceleration	All	Qualification	Vehicle Dynamics	49CFR213.333 l	>125mph	FRA	Yes	Operational Safety	Revenue Track	Test Center or Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Heavy Rail, Subways, Metros	On Board Acceleration	All	Qualification	Vehicle Dynamics	49CFR213.333 j	>125 mph	FRA	No	Operational Safety	Revenue Track	Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Heavy Rail, Subways, Metros	On Board Acceleration	All	Ongoing Monitoring	Vehicle Dynamics	49CFR213.333 k	>125 mph	FRA	No	Operational Safety	Revenue Track	Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Heavy Rail, Subways, Metros	On Board Acceleration	All	Ongoing Monitoring	Vehicle Dynamics	49CFR213.333 l	>125 mph	FRA	No	Operational Safety	Revenue Track	Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Light Rail/Street Car	On Board Acceleration	All	Ongoing Monitoring	Vehicle Dynamics	49CFR213.333 j	>125mph	FRA	No	Operational Safety	Revenue Track	Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Light Rail/Street Car	On Board Acceleration	All	Ongoing Monitoring	Vehicle Dynamics	49CFR213.333 k	>110mph	FRA	No	Operational Safety	Revenue Track	Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Light Rail/Street Car	On Board Acceleration	All	Ongoing Monitoring	Vehicle Dynamics	49CFR213.333 l	>125mph	FRA	No	Operational Safety	Revenue Track	Revenue Track	No		Electronic Code of Federal Regulations, Automated vehicle-based inspection systems				EN14363:2005 (E), GM/RT2000	2/26/2018
Intercity, Regional, Commuter	Roll Angle Tests	Passenger Cars	Specification	Vehicle Dynamics	19.5.14.1 per 49CFR 213.57	<125 mph	Other	Yes	Operational Safety	Test Track or Rail Facility	Builder	No		Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20	Specification for Single-Level Passenger Rail Car, 2011-02-15	Specification for Trainset, 2011-08-02			2/26/2018
Heavy Rail, Subways, Metros	Static Lean	All	Specification and Qualification	Vehicle Dynamics & Vehicle Dynamics Modeling	49CFR213.57	All	FRA	No	Operational Safety	Rail Facility	Builder Facility or Test Center	No		Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations				GM/RT2000, GM/RC2641, EN14363:2005 (E)	2/26/2018
Light Rail/Street Car	Static Lean	All	Specification and Qualification	Vehicle Dynamics & Vehicle Dynamics Modeling	49CFR213.57	All	FRA	No	Operational Safety	Rail Facility	Builder Facility or Test Center	No		Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations				EN14363:2005 (E), GM/RT2000	2/26/2018
Intercity, Regional, Commuter	Static Lean-Proposed (Clearance)	All	Specification and Qualification	Vehicle Dynamics & Vehicle Dynamics Modeling	49CFR213.57	All	FRA	Yes	Operational Safety	Rail Facility	Builder Facility or Test Center	No		Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations				GM/RT2000, GM/RC2641, EN14363:2005 (E)	2/26/2018
Intercity, Regional, Commuter	Static Roll Stability 49CFR 213.329	Locomotive, EMU's,DMU's	Specification	Vehicle Dynamics	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Rail Facility	Builder Facility or Test Center	No		Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10					2/26/2018
Intercity, Regional, Commuter	Twisted Track Twist	Passenger Cars	Specification	Vehicle Dynamics	EN 14363	All	Other	No	Operational Safety	Rail Facility	Builder Facility or Test Center	No	Specification my be purchased by user	EN 14363					2/26/2018
Heavy Rail, Subways, Metros	Twisted Track Twist	Passenger Cars	Specification	Vehicle Dynamics	EN 14363	All	Other	No	Operational Safety	Rail Facility	Builder Facility or Test Center	No	Specification my be purchased by user	EN 14363					2/26/2018
Light Rail/Street Car	Twisted Track Twist	Passenger Cars	Specification	Vehicle Dynamics	EN 14363	All	Other	No	Operational Safety	Rail Facility	Builder Facility or Test Center	No	Specification my be purchased by user	EN 14363					2/26/2018
Intercity, Regional, Commuter	Truck Attachment	All	Specification	Structural Integrity	RSAC Paragraph 3.10	<125 mph	FRA	Yes	Operational Safety	Test Track	Builder Facility or Test Center	No		Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service				EN 15227:2008+A1:2010	2/26/2018
Heavy Rail, Subways, Metros	Truck Attachment	All	Specification	Structural Integrity	RSAC Paragraph 3.10	<125 mph	FRA	No	Operational Safety	Test Track	Builder Facility or Test Center	No	Still in draft form	Technical Criteria and Procedures for Evaluating the Crashworthiness and Occupant Protection Performance of Alternately Designed Passenger Rail Equipment for Use in Tier I Service				EN 15227:2008+A1:2010	2/26/2018



Mode	Name of Test	Vehicle Type	Step in Build Process	Test Type	Specification	Operational Information	Regulatory or Voluntary Standard (APTA, FRA, RFP, Other)	Is Test Required by FRA for Operation in Specified Mode?	Testing Categorization (Safety, Reliability, or Passenger Satisfaction)	Facility Requirements	Proposed Location	Would Test need to be modified to apply to specified mode? (Test was originally written for other mode)	Comments	Source/Reference 1	Source Reference 2	Source Reference 3	Source Reference 4	Similar International Standard	Date Specification and Link Checked	
Heavy Rail, Subways, Metros	Truck Equalization	All	Specification and Qualification	Vehicle Dynamics & Vehicle Dynamics Modeling	APTA SS-M-014-06 Wheel Load Equalization	All	APTA	No	Operational Safety	Test Track or Rail Facility	Test Center, Builder Facility, or Revenue Track	No		<a href="#">Wheel Load Equalization of Passenger Railroad Rolling Stock</a>				EN14363:2005 (E), GM/RT2000, GM/RC2641, GM/RT2000	2/26/2018	
Light Rail/Street Car	Truck Equalization	All	Specification and Qualification	Vehicle Dynamics & Vehicle Dynamics Modeling	APTA SS-M-014-06 Wheel Load Equalization	All	APTA	No	Operational Safety	Test Track or Rail Facility	Test Center, Builder Facility, or Revenue Track	No		<a href="#">Wheel Load Equalization of Passenger Railroad Rolling Stock</a>				EN14363:2005 (E), GM/RT2000, GM/RC2641, GM/RT2000	2/26/2018	
Intercity, Regional, Commuter	Truck Equalization Test	All	Specification	Vehicle Dynamics	APTA SS-M-014-06	<125 mph	APTA	Yes	Operational Safety	Rail Facility	Builder Facility or Test Center	No	Wheel loading / unloading fixturing required	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>	<a href="#">APTA PR-M-S-014-06, Rev. 1</a>	EN14363:2005 (E), GM/RT2000, GM/RC2641, GM/RT2000	2/26/2018	
Intercity, Regional, Commuter	Truck Primary Suspension Tests	Passenger Cars	Specification	Structural Integrity	19.5.2.6	<125 mph	Other	Yes	Structural Safety	Rail Facility	Builder Facility or Test Center	No	Testing requires specific fixturing with load actuation	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018	
Intercity, Regional, Commuter	Truck, Coupler and Cable Curving Test	Locomotive, EMU's, DMU's	Specification	Vehicle Dynamics	Table 19-1: Test Matrix	<125 mph	Other	Yes	Operational Safety	Rail Facility	Test Center or Revenue Track	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018	
Heavy Rail, Subways, Metros	Vehicle Qualification	All	Qualification	Vehicle Dynamics	49CFR213.345	<125 mph	FRA	No	Operational Safety	Test Track	Revenue Track	No	Dependent upon required specifications	<a href="#">Electronic Code of Federal Regulations, Automated vehicle-based inspection systems</a>					2/26/2018	
Light Rail/Street Car	Vehicle Qualification	All	Qualification	Vehicle Dynamics	49CFR213.345	<125 mph	FRA	No	Operational Safety	Test Track	Test Center or Revenue Track	No		<a href="#">Electronic Code of Federal Regulations, Automated vehicle-based inspection systems</a>					2/26/2018	
Intercity, Regional, Commuter	Vehicle/track system qualification	All	Qualification	Vehicle Dynamics	49CFR213.345	Class 6 Track or 5 inches of cant deficiency	FRA	Yes	Operational Safety	Revenue Track	Test Center or Revenue Track	No	IWS specific to the vehicle for 213.345 testing	<a href="#">Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations</a>					2/26/2018	
Heavy Rail, Subways, Metros	Vehicle/track system qualification	All	Qualification	Vehicle Dynamics	49CFR213.345	Class 6 Track of 5 inches of cant deficiency	FRA	No	Operational Safety	Revenue Track	Revenue Track	No	Dependent upon required specifications	<a href="#">Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations</a>					2/26/2018	
Light Rail/Street Car	Vehicle/track system qualification	All	Qualification	Vehicle Dynamics	49CFR213.345	Class 6 Track of 5 inches of cant deficiency	FRA	No	Operational Safety	Revenue Track	Test Center or Revenue Track	No		<a href="#">Vehicle/Track Interaction Safety Standards; High-Speed and High Cant Deficiency Operations</a>					2/26/2018	
Intercity, Regional, Commuter	Wheel Slip/Slide System Test	Locomotive, EMU's, DMU's	Specification	Specification Compliance	19.3.10	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center	No		<a href="#">Specification for Diesel-Electric Passenger Locomotives, Rev A, 2012-07-10</a>					2/26/2018	
Intercity, Regional, Commuter	Wheelslide Control System Operation	Passenger Cars	Specification	Specification Compliance	19.6.4.3	<125 mph	Other	Yes	Operational Safety	Test Track	Test Center	No		<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018	
	<b>Weight</b>																			
Intercity, Regional, Commuter	Car Weight	Passenger Cars	Specification	Specification Compliance	19.6.14.1.1	<125 mph	Other	Yes	Reliability	Weigh Station in Track	Builder	No	Test Specific on location to be performed	<a href="#">Specification for Bi-Level Passenger Rail Car, Rev C.1, 2012-09-20</a>	<a href="#">Specification for Single-Level Passenger Rail Car, 2011-02-15</a>	<a href="#">Specification for Trainset, 2011-08-02</a>			2/26/2018	