

**Table 2D - Rolling Stock Minimum Requirements and Specifications - CVL Service Type**

Service Type: CVL		Min Req applies	Minimum Requirement Introduction Date*		*Where applicable, rolling stock is exempt from the early Minimum Requirement Introduction Date if it can be demonstrated that it will be replaced by new build rolling stock									
			If Not Exempt	If Exempt	Class 142	Class 143	Class 150/2	Class 150/9	Class 769	Class 153	Metro Vehicles	FLIRT Tri-Mode (3 car)	FLIRT Tri-Mode (4 car)	
Type and Route Information	1	Class	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	2	Type		N/A	N/A	DMU	DMU	DMU	DMU	Bi-Mode	DMU	EMU	Bi-mode fitted with batteries	Bi-mode fitted with batteries
	3	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	4	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	5	Lease Start Date		N/A	N/A	14/10/2018	14/10/2018	14/10/2018	14/10/2018	14/10/2018	14/10/2018	See R6.7	See R6.7	See R6.7
	6	Lease End Date		N/A	N/A	31/12/2019	31/12/2019	31/12/2023	31/12/2023	31/10/2022	31/10/2022	16/10/2033	16/10/2033	16/10/2033
	7	Number of units at the Start Date		N/A	N/A	15	15	36	0	5	8	0	0	0
	8	Number of units (max number used during term of Grant Agreement)		N/A	N/A	15	15	36	6	5	13	36	7	17
	9	Vehicles / Unit		N/A	N/A	2	2	2	3	4	1	3	3	4
	10	Specified Routes		N/A	N/A	CVL + Barry/Penarth	CVL + Barry/Penarth	CVL + Barry/Penarth	CVL + Barry/Penarth	CVL + Barry/Penarth	CVL + Barry/Penarth	Cardiff to Treherbert, Aberdare and Merthyr Tydfil	Coryton - Caerphilly - Cardiff - Penarth	Rhymney - Cardiff - Barry
Minimum Requirements	11	PRM / RVAR Compliant (* Mandatory compliance by December 31st 2019)	✓	31/12/2019	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	12	Seats aligned with windows		N/A	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	13	PRM Compliant Toilets		N/A	N/A	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
	14	CET Toilet		N/A	N/A	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
	15	Baby changing facilities		N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	16	Power Supply available at all seats	✓	31/10/2020	31/12/2023	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	17	Catering facilities		N/A	N/A	No	No	No	No	No	No	No	No	No
	18	Overhead racks throughout train for storing small items of luggage		N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	19	Facilities for storing large items of luggage within sight/proximity of passengers	✓	31/10/2020	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	20	Storage capacity for pushchairs / prams	✓	31/10/2020	31/12/2023	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	21	Dedicated cycle storage		N/A	N/A	No	No	No	No	No	Yes	No	No	No
	22	Flexible storage for cycles	✓	31/10/2020	31/12/2023	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	23	Vehicle will not affect mobile phone signal	✓	31/10/2020	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	24	Passenger Counting system	✓	31/10/2020	31/12/2023	No	No	Yes	Yes	No	No	Yes	Yes	Yes
	25	CCTV (passenger environment)	✓	31/10/2020	31/12/2023	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
	26	Wireless internet access	✓	31/10/2020	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	27	Air Conditioning System	✓	31/10/2020	31/12/2023	No	No	No	No	No	No	Yes	Yes	Yes
	28	Pacer removal from service	✓	30/09/2020	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	
30	Seat reservation		N/A	N/A	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
31	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	

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			If Not Exempt	If Exempt	Class 142	Class 143	Class 150/2	Class 150/9	Class 769	Class 153	Metro Vehicles	FLIRT Tri-Mode (3 car)	FLIRT Tri-Mode (4 car)
General Information	32	Vehicle Length in metres	N/A	N/A	15.55	15.11	20.06	20.06	19.83 (DTSO,DTCO), 19.92 (MSO, TSOL)	23.21	13.27 - 13.40	15.7 - 21.050	15.7 - 21.050
	33	Number of vehicles fitted with passenger counting system	N/A	N/A	0	0	18	3	0	0	108	21	68
	34	Year built	N/A	N/A	1985 - 1987	1985 - 1986	1987	1987	1987 / 1988 / 1990	1987 - 1988	2021 - 22	2022 - 23	2022 - 23
	35	Age at the Start Date	N/A	N/A	33 - 31	32 - 33	31	31	28 / 30 / 31	30 - 31	0	0	0
	36	Max speed in mph	N/A	N/A	75	75	75	75	100	75	62.5	75	75
	37	Vehicle range limiting factor	N/A	N/A	1500 km	1500 km	3300 km	3300 km	Not Available	3300 km	[REDACTED]	[REDACTED]	[REDACTED]
	38	Flexibility to deploy on other routes	N/A	N/A	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Flexible, will go on most routes	Subject to gauging and route compatibility assessment	Flexible, will go on many routes and short platforms	Limited routes availability	Flexible, will go on many routes	Flexible, will go on many routes
	39	Maximum operating length of train in metres	N/A	N/A	155	155	200.6	200.6	240	230	120	195	240
	40	Remote Fault-finding systems	N/A	N/A	No	No	KA fitting [REDACTED] fault finding system	KA fitting [REDACTED] fault finding system	Traction monitoring is fitted. remote monitoring is available as an option	KA fitting [REDACTED] fault finding system	[REDACTED] integrated diagnostic and visualisation system	[REDACTED] integrated diagnostic and visualisation system	[REDACTED] integrated diagnostic and visualisation system
	41	Vehicle and infrastructure monitoring systems	N/A	N/A	Vibration monitoring	Vibration monitoring	Vibration monitoring	Vibration monitoring	Vibration monitoring	Vibration monitoring	Yes - UGMS + plain line pattern recognition + OLE monitoring	Yes - UGMS + plain line pattern recognition + OLE monitoring	Yes - UGMS + plain line pattern recognition + OLE monitoring
	42	CCTV (forward facing)	N/A	N/A	No	No	No	No	Yes	No	Yes	Yes	Yes
	43	Acceleration rate in m/s <sup>2</sup>	N/A	N/A	0.48	0.48	0.66	0.66	0.36	0.61	[REDACTED]	[REDACTED]	[REDACTED]
	44	Deceleration rate in m/s <sup>2</sup>	N/A	N/A	Compliant to RGS braking standards	Compliant to RGS braking standards	0.7	0.7	0.9	0.7	[REDACTED]	[REDACTED]	[REDACTED]
	45	Engine Emission Standard	N/A	N/A	Pre emission standards	Pre emission standards	Pre emission standards	Pre emission standards	Stage III B	Pre emission standards	N/A	Stage III B	Stage III B
	46	Unit tare weight in tonnes	N/A	N/A	49.5	51.7	74	110.5 or 111.5 dependent on formation	163.1	41.2	[REDACTED]	[REDACTED]	[REDACTED]
	47	Unit fully laden weight in tonnes	N/A	N/A	65	67	95.14	140 - 144	202.3	49.18	[REDACTED]	[REDACTED]	[REDACTED]
	48	Diesel emission statement	N/A	N/A	• CO: 0.87 g/kWh • HC: 0.39 g/kWh • NOx: 10.07 g/kWh • PM: not known g/kWh	• CO: 0.87 g/kWh • HC: 0.39 g/kWh • NOx: 10.07 g/kWh • PM: Not known g/kWh	• CO: 0.84 g/kWh • HC: 0.14 g/kWh • NOx: 21.19 g/kWh • PM: 0.11 g/kWh	• CO: 0.84 g/kWh • HC: 0.14 g/kWh • NOx: 21.19 g/kWh • PM: 0.11 g/kWh	Not Available	• CO: 0.84 g/kWh • HC: 0.14 g/kWh • NOx: 21.19 g/kWh • PM: 0.11 g/kWh	[REDACTED]	[REDACTED]	[REDACTED]
	Capacity Information	49	Standard Class Fixed Seats	N/A	N/A	90	92	111	175	289	58	96	119
50		Standard Class Tip-Up Seats	N/A	N/A	12	12	7	11	0	4	31	22	30
51		Standard class seating layout (1+2, 2+2, 2+3, longitudinal, etc.)	N/A	N/A	2+2	2+2 high-back Chapman seating, mainly uni-directional	2+2 high-back Chapman seating, mainly uni-directional	2+2 high-back Chapman seating, mainly uni-directional	2+3	2+2 high backed Chapman seating.	2+2	2+2	2+2
52		First / Business Class Fixed Seats	N/A	N/A	0	0	0	0	0	0	0	0	0
53		First / Business class seating layout (1+2, 2+2, 2+3, longitudinal, etc.)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
54		Wheelchair Spaces per Unit	N/A	N/A	4	4	2	2	2	2	2	2	2
55		Standing Capacity	N/A	N/A	Assume 0.25sqm per standing passenger 109	Assume 0.25sqm per standing passenger 108	Assume 0.25sqm per standing passenger 173	Assume 0.25sqm per standing passenger 248	Assume 0.25sqm per standing passenger 269	Assume 0.25sqm per standing passenger 52	Assume 0.25sqm per standing passenger 128	Assume 0.25sqm per standing passenger 176	Assume 0.25sqm per standing passenger 234
56		Dedicated cycle storage spaces per unit	N/A	N/A	0	0	0	0	0	4	0	0	0
57		Flexible storage spaces for cycles per unit	N/A	N/A	4	4	2	2	2	0	6	6	9
58		Toilets per unit	N/A	N/A	1	1	1	1	2	1	0	1	1
59		Door position on vehicle (i.e. vehicle end doors or 1/3 and 2/3 positioned doors)	N/A	N/A	3 doors per vehicle. Twin-leaf inward pivoting (based on a bus door)	3 doors per vehicle. Twin-leaf inward pivoting (based on a bus door)	Bi-parting sliding doors at 1/3 and 2/3 position, cab-door sliding	Bi-parting sliding doors at 1/3 and 2/3 position, cab-door sliding	Pneumatically operated bi-parting sliding, 1/3 and 2/3 position	Single leaf sliding plug at vehicle ends	1300mm double leaf door In the centre of each section	1/3 and 2/3 position (Coaches 1/3) Central door (Coach 2)	1/3 and 2/3 position (Coaches 1/2/4) Central door (Coach 3)
60		Facilities for standing passengers	N/A	N/A	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles and grab poles provided	Seat back handles	Seat back handles, longitudinal handrail and straps	Seat back handles and grab poles provided	Seat back handles and grab poles provided
61		Number of fixed tables per vehicle	N/A	N/A	0	0	12 (5 DMSL + 7 DMS)	17 (5 DMSL + 7 DMS) or 19 (5 DMSL + 7 DMS + 7 DMS) dependent on formation	4 (prior to PRM conversion)	6 (DMSL)	4 (Car A 2, Car C2)	18 (Car A 8, Car B 2, Car C 8)	24 (Car A 8, Car B 2, Car C 6, Car D 8)
62		Number of folding tables per vehicle	N/A	N/A	0	0	20 / 32	20 / 32	10 / 10 / 6 / 6 (prior to PRM conversion)	24	16 / 24 / 16	4 / 26 / 4	4 / 26 / 12 / 4
63	Type of heating and ventilation fitted (air conditioning, pressure ventilation and body side heater, etc.)	N/A	N/A	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	Engine waste heat, ducted warm air. No air-con in cab. No air-con in saloon.	Cab Cooling, Saloon heating	Warm air, hot water radiators. No air-con in cab. No air-con in saloon.	HVAC system	HVAC system	HVAC system	
64	Floor covering (i.e. lino, carpet, etc.)	N/A	N/A	Polyflor Floor Covering	Polyflor Floor Covering	Polyflor Floor Covering	Polyflor Floor Covering	Lino	Carpet	Lino	Lino	Lino	
65	Door control system fitted	N/A	N/A	Guard control panel	Guard control panel	Guard control panel	Guard control panel	IFE door control is fitted	Guard control panel	Guard control panel/ Driver control	Guard control panel/ Driver control	Guard control panel/ Driver control	
66	GPS system fitted	N/A	N/A	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	KA fitting [REDACTED] GPS system	KA fitting Altitude GPS system	TL&M compliant GPS	TL&M compliant GPS	TL&M compliant GPS	

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			If Not Exempt	If Exempt	Class 142	Class 143	Class 150/2	Class 150/9	Class 769	Class 153	Metro Vehicles	FLIRT Tri-Mode (3 car)	FLIRT Tri-Mode (4 car)
68	Refurbishment - Start Date				14/10/2018	14/10/2018	14/10/2018	N/A	14/10/2018	01/06/2019	N/A	N/A	N/A
69	Refurbishment - End Date				31/08/2019	31/08/2019	07/09/2019	N/A	07/09/2019	28/10/2019	N/A	N/A	N/A
70	Refurbishment - Scope				Deep clean, powerpoints fitted	Deep clean, powerpoints fitted	PRM + Train wrap to rebrand, internal refurbishment, including seat cover replacement, grab pole repainting and floor covering replacement to match TFW branding, CCTV+Pax counting	N/A	Train wrap to rebrand, internal refurbishment, including seat cover replacement, grab pole repainting to match TFW branding	PRM + Train wrap to rebrand, internal refurbishment, including seat cover replacement, grab pole recoating, carpets/flooring renewal and seat power at bay locations	N/A	N/A	N/A
71	Provides level access with sliding gap filling step				No	No	No	No	No	No	Yes	Yes	Yes
72	930mm floor height				No	No	No	No	No	No	Yes	Yes	Yes
73	Passenger Assist Bluetooth Beacon fitted by 2020				N/A	N/A	Yes	Yes	Yes	Yes	By vehicle introduction date	By vehicle introduction date	By Vehicle introduction date
74	[REDACTED] PIS fitted				No	No	No	No	No	No	Yes	Yes	Yes
75	3-pin and USB power sockets at every seat				USB sockets to be fitted at selected locations in passenger saloon	USB sockets to be fitted at selected locations in passenger saloon	3-pin and USB sockets to be fitted at every seat	3-pin and USB sockets to be fitted at every seat	USB sockets to be fitted at every seat	3-pin to be fitted at bay seats	Yes	Yes	Yes
76	End gangways fitted				No	No	Yes	Yes	Yes	Yes	No	No	No
77	On-Train Data Recorder (OTDR) data harvester				To be fitted	To be fitted	To be fitted	To be fitted	To be fitted	To be fitted	N/A	N/A	N/A
78	Wheel Slip/ Slide Protection (WSP) system fitted				No	No	To be fitted	To be fitted	Yes	No	Yes	Yes	Yes
79	On Board Energy Storage (OBES) fitted				No	No	No	No	No	No	Yes	Yes	Yes
80	Twin Cat 7 ethernet backbones to enable gigabit transmission fitted				No	No	No	No	No	No	By vehicle introduction date	By vehicle introduction date	By vehicle introduction date
81	Driver Advisory System (DAS) to be fitted if not already installed				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
82	Selective Door Opening (SDO) fitted				No	No	No	No	No	No	No	No	No
83	ETCS fitted				No	No	No	No	No	No	No	No	No