



The EPB fleets

Background

The Southern Railway could not afford to simply write off the large fleets of steam-hauled suburban passenger rolling stock it had inherited from its constituent companies when it electrified most of its London suburban network in the 1920s and 1930s. Instead it mounted these bodies, many of them of recent construction, on new SR standard suburban electric underframes to provide the multiple unit fleets it needed.

Most of these fleets consisted of three-car motor units that could operate in multiple with each other at peak times. As traffic grew, and where platform lengths permitted, a 2-car trailer set would be sandwiched between two motor units to form eight-car trains. By the late 1930s a programme of platform lengthening enabled the Southern to move away from the operationally awkward trailer set arrangement by re-forming its three-car units to four cars but war intervened before the reformations could properly start.

In parallel with the transition to four-car units, the company started a programme of upgrading its suburban fleets with new bodywork. The Southern's Chief Mechanical Engineer, Oliver Bulleid, had a particular interest in workshop methods and, in particular, the use of jigs and welding for cost-effective component fabrication and in 1946 his team set up a production line at the Southern's Eastleigh works to build all-steel bodies that could be mounted on new or existing SR standard suburban electric multiple unit underframes.

Post-war shortages, especially of electrical equipment, disrupted production so although some entirely new all-steel units, designated 4 Sub, were produced between 1946 and 1948 the emphasis switched to building new all-steel trailers to be inserted temporarily into existing wooden-bodied 3-car motor units. Many of these all-steel trailers would later be incorporated into the 4 EPB fleet.

The EPB fleets

The Southern had pursued a design policy of backward-compatibility that ensured that suburban units with the latest English Electric equipment worked in multiple with the earlier Metropolitan Vickers units which in turn matched the original British Westinghouse equipped London & South Western stock, a distinct advantage with a mixed fleet and an operationally complex network.

However, after thirty years of standardisation it was time for a step change in technology and in 1951 BR launched the first of a new series of suburban electric multiple units designated 4 EPB. From a passenger point of view they were identical to the 4 Sub units that had preceded them but they incorporated several significant technical updates - buckeye couplings, electro-pneumatic brakes and motor generators to supply low voltage electricity for auxiliaries, lighting, control systems and emergency batteries - as well as changes to the driver's environment. These changes meant that the EPB fleet was not compatible with earlier stock but it established an interoperability standard for new suburban and main line fleets that would continue into the 1970s.



The Southern's programme of building new all-steel bodies on recovered and refurbished pre-war underframes and bogies still had a long way to go so the Eastleigh Works production line continued in operation until 1959, turning out 'new' EPB stock to the original 1946 Southern Railway design alongside wholly new BR standard EPB electric multiple units.

4 EPB

A total of 213 SR 4 EPB units were built in batches between 1951 and 1957. Typically the process involved stripping a 4-car suburban unit of its wooden bodywork, refurbishing the underframe and bogies, fitting new EPB-type underframe equipment and constructing new all-steel bodywork from fabricated components. In some cases the fourth car would be a post-war all-steel augmentation trailer, in which case the recently built car would simply be overhauled with brakes and control cabling modified to EPB standard.

4 EPB units, like the post-war all-steel 4 Subs that had preceded them, were formed of two driving motor coaches with a guard's van and an eight-bay saloon flanking a 10-bay saloon trailer and a 10-compartment trailer. (Units 5005, 5008 and 5220 inherited 9-compartment former augmentation trailers.)

The first batch, units 5001-5053, were delivered between December 1951 and October 1952. They were originally equipped with non-standard 9ft wheelbase 'Eastern' type motor bogies but in the 1960s they acquired Central-type motor bogies from scrapped pre-war suburban units.

Subsequent batches, numbered 5101 to 5260, were built between December 1953 and April 1957, and had the de-facto standard 'Central' type that is represented by Eastleigh Model Rail motor bogies.

The early batches, 5001-5053 and 5101-5137, perpetuated the high roofline of the 4 Sub units but with a lower rainstrip over the driving cab side window and guard's van doors whereas units 5138-5260 and the subsequent 2-car units all had a rainstrip just above the doors and the grey paint of the roof was carried down to this level, giving these units a more conventional appearance and one that better matched the BR standard EPB fleets.

2 Hap and 2 EPB

By 1957 all of the former 3-car motor units with pre-Grouping bodywork on SR standard underframes had been rebuilt as all-steel 4 Sub or 4 EPB units and attention switched to the 2 Nol fleet, 70 two-car units with London & South Western Railway bodywork then operating Waterloo-Windsor/Weybridge services and secondary routes in the Brighton area. The old bodywork was removed and new SR-style all-steel bodies constructed on the SR standard underframes.

36 of these 'new' units were destined for the Kent Coast electrification project and designated 2 Hap. The motor coach was similar to the 4 EPB motor coaches except that the eight-bay saloon was divided into two saloons of 4 bays and the guard's van was provided with a second periscope. The trailer comprised driving cab and vestibule, a third class coupé or half-compartment, four third class and three first class compartments and a lavatory, all linked by a side corridor.



A further 34 units, intended for the Waterloo-Windsor/Weybridge route, had the same motor coach as the 2 Haps but paired with a driving trailer with a four-bay and a five-bay saloon. These units were designated 2 EPB.

Deployment

4 EPB units operated suburban routes in all three London districts, East, Central and West. Peak loadings were particularly severe on Eastern section routes so platforms were extended and a fleet of BR standard 2 EPB units constructed to form ten car trains, typically formed of two SR-type 4 EPB units and a BR standard 2 EPB. From 1958, when the ten-car scheme was complete, EPBs monopolised inner suburban routes from Charing Cross and Cannon Street.

The 36 SR-type 2 Hap units were allocated to the Eastern section where they operated interchangeably with BR standard 2 Haps, displacing the 2 Hal fleet on routes to Gillingham and Maidstone (East and West) and operating local services on the newly electrified Kent Coast network. Some units were briefly transferred to the South Western division before, all 36 units transferred to Brighton in 1972, displacing 4 Cor units on Coastway services. Four years later their first class compartments were declassified and the units were allocated to Central Division suburban services until large scale withdrawals commenced in the 1980s.

The SR-type 2 EPB units were split between the Waterloo-Windsor/Weybridge route that had for so long been covered by their 2 Nol predecessors and Central Division operations to Caterham and Tattenham Corner. Windsor/Weybridge 2 EPBs migrated to the Central and Eastern Divisions in the 1970s, some operating North London Line services whilst based at Selhurst.

During the 1980s many SR-type 4 EPB and 2 EPB units were given an interior facelift and a number of additional 4 EPBs were created by pairing motor coaches from disbanded SR-type 2 Hap units with saloon trailers from withdrawn 4 Sub units. Extensive reformations also included replacing 4 EPB compartment trailers with saloon vehicles to improve passenger personal security.

SR-type 4 EPB and 2 EPB units remained in service on the South Eastern Division until the early 1990s when they were displaced by the new Networker fleet.



Unit and vehicle numbers

4 EPB (before extensive reformations and facelifting in the 1980s)

Date formed	Unit number	Motor brake third	Saloon trailer third	Compartment trailer third	Motor brake third	Withdrawn, disbanded or reformed
1953	5101	14201	15154	15179	14202	1985
1953	5102	14203	15155	15180	14204	1984
1954	5103	14205	15156	15181	14206	1971
1954	5104	14207	15157	15182	14208	1981
1954	5105	14209	15158	15183	14210	1988
1954	5106	14211	15234	15184	14212	1985
1954	5107	14213	15235	15185	14214	1985
1954	5108	14215	15236	15186	14216	1986
1954	5109	14217	15237	15187	14218	1986
1954	5110	14219	15238	15188	14220	1985
1954	5111	14221	15239	15189	14222	1988
1954	5112	14223	15240	15190	14224	1986
1954	5113	14225	15241	15191	14226	1969
1954	5114	14227	15242	15192	14228	1981
1954	5115	14229	15243	15193	14230	1988
1954	5116	14231	15244	15194	14232	1988
1954	5117	14233	15245	15195	14234	1988
1954	5118	14235	15246	15196	14236	1983
1954	5119	14237	15247	15197	14238	1988
1954	5120	14239	15248	15198	14240	1992
1954	5121	14241	15249	15199	14242	1988
1954	5122	14243	15250	15200	14244	1971
1954	5123	14245	15251	15201	14246	1985
1954	5124	14247	15252	15202	14248	1988
1954	5125	14249	15253	15203	14250	1985
1954	5126	14251	15254	15204	14252	1985
1954	5127	14253	15255	15205	14254	1985
1954	5128	14255	15256	15206	14256	1985
1954	5129	14257	15257	15207	14258	1988
1954	5130	14259	15258	15208	14260	1973
1954	5131	14261	15259	15209	14262	1981
1954	5132	14263	15260	15210	14264	1985
1954	5133	14265	15261	15211	14266	1976
1954	5134	14267	15262	15212	14268	1980



1954	5135	14269	15263	15213	14270	1986
1954	5136	14271	15264	15214	14272	1988
1954	5137	14273	15265	15215	14274	1970
1954	5138	14275	15266	15216	14276	1981
1954	5139	14277	15267	15217	14278	1980
1954	5140	14279	15268	15218	14280	1987
1954	5141	14281	15269	15219	14282	1961
1954	5142	14283	15270	15220	14284	1987
1954	5143	14285	15271	15221	14286	1970
1954	5144	14287	15272	15222	14288	1988
1954	5145	14289	15273	15223	14290	1988
1954	5146	14291	15274	15224	14292	1976
1954	5147	14293	15275	15225	14294	1988
1955	5148	14295	15276	15226	14296	1985
1955	5149	14297	15277	15227	14298	1980
1955	5150	14299	15278	15228	14300	1985
1955	5151	14301	15279	15229	14302	1988
1955	5152	14303	15280	15230	14304	1980
1955	5153	14305	15281	15231	14306	1985
1955	5154	14307	15282	15232	14308	1988
1955	5155	14309	15283	15233	14310	1985
1955	5156	14311	15334	15284	14312	1985
1955	5157	14313	15335	15285	14314	1980
1955	5158	14315	15336	15286	14316	1985
1955	5159	14317	15337	15287	14318	1988
1955	5160	14319	15338	15288	14320	1988
1955	5161	14321	15339	15289	14322	1983
1955	5162	14323	15340	15290	14324	1975
1955	5163	14325	15341	15291	14326	1985
1955	5164	14327	15342	15292	14328	1961
1955	5165	14329	15343	15293	14330	1985
1955	5166	14331	15344	15294	14332	1988
1955	5167	14333	15345	15295	14334	1970
1955	5168	14335	15346	15296	14336	1987
1955	5169	14337	15347	15297	14338	1985
1955	5170	14339	15348	15298	14340	1988
1955	5171	14341	15349	15299	14342	1988
1955	5172	14343	15350	15300	14344	1969
1955	5173	14345	15351	15301	14346	1980
1955	5174	14347	15352	15302	14348	1988
1955	5175	14349	15353	15303	14350	1983



1955	5176	14351	15354	15304	14352	1981
1955	5177	14353	15355	15305	14354	1988
1955	5178	14355	15356	15306	14356	1980
1955	5179	14357	15357	15307	14358	1988
1955	5180	14359	15358	15308	14360	1979
1955	5181	14361	15359	15309	14362	1985
1955	5182	14363	15360	15310	14364	1988
1955	5183	14365	15361	15311	14366	1988
1955	5184	14367	15362	15312	14368	1988
1955	5185	14369	15363	15313	14370	1980
1955	5186	14371	15364	15314	14372	1980
1955	5187	14373	15365	15315	14374	1987
1955	5188	14375	15366	15316	14376	1985
1955	5189	14377	15367	15317	14378	1985
1955	5190	14379	15368	15318	14380	1988
1955	5191	14381	15369	15319	14382	1985
1955	5192	14383	15370	15320	14384	1978
1955	5193	14385	15371	15321	14386	1988
1955	5194	14387	15372	15322	14388	1988
1955	5195	14389	15373	15323	14390	1988
1955	5196	14391	15374	15324	14392	1972
1955	5197	14393	15375	15325	14394	1988
1955	5198	14395	15376	15326	14396	1981
1955	5199	14397	15377	15327	14398	1982
1955	5200	14399	15378	15328	14400	1986
1956	5201	14401	15379	15329	14402	1984
1956	5202	14403	15380	15330	14404	1988
1956	5203	14405	15381	15331	14406	1978
1956	5204	14407	15382	15332	14408	1957
1956	5205	14409	15383	15333	14410	1982
1956	5206	14411	15394	15384	14412	1982
1956	5207	14413	15395	15385	14414	1988
1956	5208	14415	15396	15386	14416	1976
1956	5209	14417	15397	15387	14418	1988
1956	5210	14419	15398	15388	14420	1988
1956	5211	14421	15399	15389	14422	1981
1956	5212	14423	15400	15390	14424	1982
1956	5213	14425	15401	15391	14426	1988
1956	5214	14427	15402	15392	14428	1981
1956	5215	14429	15403	15393	14430	1982
1956	5216	14431	15404	15034	14432	984



1956	5217	14433	15405	15035	14434	1985
1956	5218	14435	15406	15036	14436	1981
1956	5219	14437	15407	15037	14438	1982
1956	5220	14439	15408	15038	14440	1973
1956	5221	14441	15409	15039	14442	1981
1956	5222	14443	15410	15040	14444	1981
1956	5223	14445	15411	15041	14446	1981
1956	5224	14447	15412	15042	14448	1981
1956	5225	14449	15413	15043	14450	1958
1956	5226	14451	15414	15044	14452	1985
1956	5227	14453	15415	15045	14454	1981
1956	5228	14455	15416	15046	14456	1981
1956	5229	14457	15417	15047	14458	1970
1956	5230	14459	15418	15048	14460	1985
1956	5231	14461	15419	15049	14462	1988
1956	5232	14463	15420	15050	14464	1981
1956	5233	14465	15421	15051	14466	1981
1956	5234	14467	15422	15052	14468	1981
1956	5235	14469	15423	15053	14470	1981
1956	5236	14471	15424	15054	14472	1982
1956	5237	14473	15425	15055	14474	1981
1956	5238	14475	15426	15056	14476	1981
1956	5239	14477	15427	15057	14478	1981
1956	5240	14479	15428	15058	14480	1972
1956	5241	14481	15429	15059	14482	1984
1956	5242	14483	15430	15060	14484	1988
1956	5243	14485	15431	15061	14486	1981
1956	5244	14487	15432	15062	14488	1982
1956	5245	14489	15433	15063	14490	1961
1956	5246	14491	15434	15064	14492	1972
1956	5247	14493	15435	15065	14494	1957
1956	5248	14495	15436	15066	14496	1972
1957	5249	14497	15437	15067	14498	1982
1957	5250	14499	15438	15068	14500	1981
1957	5251	14501	15439	15069	14502	1984
1957	5252	14503	15440	15070	14504	1983
1957	5253	14505	15441	15071	14506	1984
1957	5254	14507	15442	15072	14508	1971
1957	5255	14509	15443	15073	14510	1981
1957	5256	14511	15444	15074	14512	1981
1957	5257	14513	15445	15075	14514	1982



1957	5258	14515	15446	15076	14516	1985
1957	5259	14517	15447	15077	14518	1980
1957	5260	14519	15448	15078	14520	1985

2 HAP

Date formed	Unit number	Motor brake third	Driving trailer composite	Withdrawn, disbanded or reformed
1958	5601	14521	16001	1976
1958	5602	14522	16002	1977
1958	5603	14523	16003	1977
1958	5604	14524	16004	1983
1958	5605	14525	16005	1983
1958	5606	14526	16006	1983
1958	5607	14527	16007	1981
1958	5608	14528	16008	1981
1958	5609	14529	16009	1982
1958	5610	14530	16010	1982
1958	5611	14531	16011	1982
1958	5612	14532	16012	1982
1958	5613	14533	16013	1982
1958	5614	14534	16014	1982
1958	5615	14535	16015	1982
1958	5616	14536	16016	1983
1958	5617	14537	16017	1982
1958	5618	14538	16018	1980
1958	5619	14539	16019	1982
1958	5620	14540	16020	1982
1958	5621	14541	16021	1982
1958	5622	14542	16022	1980
1958	5623	14543	16023	1982
1958	5624	14544	16024	1967
1958	5625	14545	16025	1983
1958	5626	14546	16026	1983
1958	5627	14547	16027	1983
1958	5628	14548	16028	1982
1958	5629	14549	16029	1982
1958	5630	14550	16030	1982
1958	5631	14551	16031	1982



1958	5632	14552	16032	1982
1958	5633	14553	16033	1982
1958	5634	14554	16034	1982
1958	5635	14555	16035	1983
1958	5636	14556	16036	1976

2 EPB

Date formed	Unit number	Motor brake third	Driving trailer composite	Unit renumbered after facelift 1982-1985	Withdrawn or reformed
1959	5651	14557	16101	6333	1993
1959	5652	14558	16102	6313	1993
1959	5653	14559	16103	6316	1994
1959	5654	14560	16104	6324	1994
1959	5655	14561	16105	6320	1995
1959	5656	14562	16106	6309	1995
1959	5657	14563	16107	6334	1988 RF
1959	5658	14564	16108	6308	1995
1959	5659	14565	16109	6311	1994
1959	5660	14566	16110	6318	1994
1959	5661	14567	16111	6325	1994
1959	5662	14568	16112	6319	1994
1959	5663	14569	16113	6332	1995
1959	5664	14570	16114	6329	1986 RF
1959	5665	14571	16115	6306	1994
1959	5666	14572	16116	6327	1993
1959	5667	14573	16117	6307	1995
1959	5668	14574	16118	6310	1994
1959	5669	14575	16119	6322	1989 RF
1959	5670	14576	16120	6303	1993
1959	5671	14577	16121	6301	1994
1959	5672	14578	16122	6317	1993
1959	5673	14579	16123	6312	1994
1959	5674	14580	16124	6302	1994
1959	5675	14581	16125	6323	1994
1959	5676	14582	16126	6328	1994
1959	5677	14583	16127	6331	1995
1959	5678	14584	16128	6321	1984 RF
1959	5679	14585	16129	6326	1994



1959	5680	14586	16130	6314	1993
1959	5681	14587	16131	6305	1994
1959	5682	14588	16132	6330	1995
1959	5683	14589	16133	6304	1993
1959	5684	14590	16134	6315	1994