

# Footplate Experiences Between Waterloo and Plymouth

By J. L. FLUKER, M.A., M.B., M.R.C.P., D.P.H.

BY the kindness of Mr. O. V. Bulleid, Chief Mechanical Engineer, Southern Railway, I was privileged in 1946, to make some journeys on the footplate of the "Merchant Navy" and "West Country" classes of streamline Pacifics. The down journey was made on the 10.50 a.m. from Waterloo, and in the reverse direction on the 12 p.m. *ex-Plymouth Friary*.

On the 10.50 a.m. down, 4-6-2 No. 21C15, *Nederland Line* was in splendid condition and in the hands of her regular crew. The locomotive in consequence presented a praiseworthy example of cleanliness, and every fitting on the cab

was brightly polished. As is well known, the cabs of these engines are luxurious judged by ordinary footplate standards, and the sliding roof maintains an equable temperature, although responsible for a certain amount of dust. The smoothness of the riding is almost incredible, except in the electrified area, and it was generally possible to write in comparative comfort at speeds of 75 m.p.h. This particular engine was blowing off at about 270 lb., and throughout the trip pressure was maintained at about 260 lb.; the coal consumption did not appear to be heavy. Incidentally, the position of the regulator handle is rather misleading at first sight,

SOUTHERN RAILWAY. WATERLOO-SALISBURY. 10.50 a.m. APRIL 9, 1946  
 Engine "Merchant Navy" class 21C15. *Nederland Line*. Load 16 bogies, 516 tons tare and 560 tons gross  
 Driver A. Thorne; Fireman Stuckey (Nine Elms)

Miles		Min.	Sec.	m.p.h.	Cut-off (per cent.)	Steamchest and boiler pressures	
0.0	WATERLOO	0	00	—	75	260-80	260
1.5	Vauxhall	4	08	—	23	215	"
			p.w.s.	15	"	Nil	245
3.9	Clapham Junction	8	35	—	25	200	270
7.3	Wimbledon	12	57	—	20	160	265
12.0	Surbiton	17	55	62	"	145	260
13.3	Hampton Court Jc.	19	07	65	"	"	270
14.4	Esher	20	07	67	"	"	260
17.1	Walton	22	36	63½	"	160	"
19.1	Weybridge	24	33	61	"	"	"
21.7	Byfleet	26	52	66	"	155	"
			Sigs.			Nil	270
24.4	Woking	29	47	49	"	170	260
28.0	Brookwood	34	04	49	"	"	"
31.0	Milepost 31	37	45	49	"	"	"
33.2	Farnborough	40	10	62	"	160	270
36.5	Fleet	43	21	64	"	150	260
39.7	Winchfield	46	24	68	"	160	"
42.2	Hook	48	38	63/69	"	145	270
			Sigs. stop			Nil	"
47.8	Basingstoke	60	03	—	75	195	255
50.3	Worting Jc.	65	11	34	"	150	260
52.4	Oakley	68	35	44	"	140	270
55.6	Overton	72	31	57	23	130	"
59.3	Whitchurch	76	02	67	"	120	260
						30	"
61.1	Hurstbourne	77	42	72	"	125	"
62.5	Milepost 62½	—	—	70	"	10	255
						Nil	"
66.4	Andover Junction	82	02	73	"	140	"
69.8	Milepost 69½	—	—	67	"	"	260
71.5	" 71½	—	—	62	"	190	270
			Sigs.	49/46½	"	Nil	265
72.8	Grately	88	23	"	"	190	260
75.7	Amesbury Jc.	91	45	62	"	150	265
						Shut	"
78.3	Porton	94	13	70	"	10	"
82.7	Tunnel Jc.	98	13	Slack	"	Shut	"
83.8	SALISBURY	100	42	—	"	160	245

Net time, 89½ min.

and in all engines, when it appeared to be only about two-thirds open, the steamchest and boiler pressures were equal. Most of the drivers preferred to vary the power output by altering the regulator openings rather than the cut-off positions.

On the day in question the weather was glorious, the load of 560 tons substantial, and my only regret was the leisureliness of the 103-min. schedule to Salisbury—unjustified in view of the achievement of a net time of 89½ min. The start was troublesome and we slipped badly. Full forward gear was used and attempts to get under way with steamchest pressures of 260 lb., 140 lb., and 160 lb. failed owing to violent slipping: eventually we crept out of the terminus with only 80 lb. in the steamchest, which had been increased to 215 lb. by Vauxhall where the cut-off was brought back to 25 per cent. After a p.w.s. to 15 m.p.h., a steamchest pressure of 200 lb. was used as far as Wimbledon where the cut-off was fixed at 20 per cent., and the pressure was reduced first to 160 lb., and then to 145 lb. by Malden. Speed rose to 62 m.p.h. by Surbiton, and 67 m.p.h. at Esher and a modest increase to 160 lb. took us over the slight rise past Walton at 61, while at Byfleet the maximum was 66 m.p.h. At Woking, signals showing double yellow necessitated a speed reduction to 49 m.p.h., and a steamchest pressure of 170 lb. maintained this unvaryingly up the long 1 in 300 to milepost 31 and increased the rate to 62 m.p.h. by Farnborough. From here, roughly 150 lb. was needed for speeds of 68 at Fleet, 63 before and 69 beyond Hook, after which adverse signals brought us to a dead stand outside Basingstoke.

The re-start was again troublesome. We had stopped on a dead centre, and after setting back we slipped badly on three successive attempts to get on the move with 75 per cent. cut-off and steamchest pressures respectively of 215 lb., 190 lb. and 170 lb., the last of which eventually got us away. At Basingstoke, the cut-off was fixed at 23 per cent., but by Battledown the speed was only 34 m.p.h. Down the five miles of 1 in 550 from Overton to Whitchurch, 125 lb. of steam raised the speed to 67 m.p.h., and down the 1½ miles of 1 in 194 to Hurstbourne only 30 lb. sufficed for a maximum of 72 m.p.h. The modest rise to milepost 62½ was breasted at 70 m.p.h. with 125 lb.,

and Andover was passed at 73 with steam practically shut off. Following a reapplication of steam to 140 lb., speed was still 67 m.p.h. at milepost 69½ after two miles up at 1 in 220 and one down at 1 in 330, and after a further 1½ miles up at 1 in 264, the pressure was increased to 190 lb. for the 3 miles at 1 in 165. Yet when an adverse distant signal was sighted at Grateley, speed was still 62 m.p.h. Fortunately, all the other signals were off, so that speed was not reduced below 50 m.p.h., the final minimum being 46½ m.p.h. with 190 lb. of steam. Down Porton bank, with practically closed regulator, speed did not exceed 70 m.p.h. In the end, after a late start of ½ min., Salisbury was reached 1½ min. early, but the net time was only 89½ minutes. A more enthusiastic crew than Driver Thorne and Fireman Stuckey could hardly be imagined.

Nevertheless, the most memorable part of the trip was still in store, and was provided by 4-6-2 No. 21C3, *Royal Mail*, with Driver Lethbridge and Fireman Turner in charge. The load was now 15 bogies, 484 tons tare and 525 tons full. Starting with the full 75 per cent. cut-off and only 110 lb. of pressure, we got away without an atom of slip, if a little slowly. At milepost 85 at the top of the 1 in 115, where the speed was 23 m.p.h., cut-off was reduced to 30 per cent., and about two miles beyond Wilton to 25 per cent., while the steamchest pressure was increased from 200 lb. at Wilton to 230 lb. at Dinton, and 245 lb. at Tisbury. Speeds were 64 before and 60 m.p.h. after Dinton, and no less than 65 m.p.h. on the level beyond Tisbury. Finally, with 255 lb. of steam—boiler pressure was 265 lb.—we swept up the 1½ miles at 1 in 270, and 2 miles at 1 in 145 at the astounding minimum of 57 m.p.h. Once over the Summit, steamchest pressure was rapidly reduced to 80 lb., and cut-off to 20 per cent., but we dashed through Gillingham at 82 m.p.h.

With less than 70 lb. of steam, speed fell rapidly up the two miles at 1 in 300-100 to Buckhorn Tunnel, the minimum being 54 m.p.h., and did not exceed 69 at Abbey Ford. At Templecombe cut-off was increased to 25 per cent., and 230 lb. of steam was allowed, giving a minimum of 44 m.p.h. on the bank (2½ miles at 1 in 100-80). After Milborne Port, with 20 per cent. cut-off and 75 lb. of steam,

speeds were 75 m.p.h. at Sherborne and 64 at Yeovil, but a severe p.w.s. to 15 m.p.h. at Sutton Bingham cost at least  $4\frac{1}{2}$  min., and milepost 126 was passed at only 25 m.p.h. though with but 110 lb. of steam. At about milepost 128, steamchest pressure was increased to 245 lb., and at Crewkerne both steamchest and boiler pressures were 260 lb., the cut-off being changed to 25 per cent. This gave speeds of 65 m.p.h. before and 38 m.p.h. after the  $2\frac{3}{4}$  miles at 1 in 80 of Crewkerne bank.

From Hewish to Axminster, 18 per cent. cut-off and 120 lb. of steam produced 72 m.p.h. by Chard and 79 m.p.h. beyond Axminster. After  $1\frac{1}{2}$  miles up at 1 in 100

to Seaton Junction, speed was 65 m.p.h., cut-off was increased to 23 per cent. and steamchest pressure to 250 lb. in readiness for the  $4\frac{1}{2}$  miles at 1 in 80. At milepost 150 speed was 44 m.p.h. and the cut-off was increased to 26 per cent., and at post  $150\frac{1}{2}$  to 36 per cent. At milepost 151 speed was 36 m.p.h., and cut-off 40 per cent., and steamchest pressure 260 lb., while the engine was truly arousing the echoes. Speed settled down now to a steady 30 m.p.h., and only just before the summit did slipping reduce the rate to 28 m.p.h. Unfortunately, this continued on the 1 in 132 in the tunnel so that pressure had to be reduced to 200 lb., and speed fell to 26 m.p.h.

## SOUTHERN RAILWAY. SALISBURY-EXETER. 12.38 P.M. APRIL 9, 1946

Engine: "Merchant Navy" class No. 21C3, *Royal Mail*.

Salisbury to Sidmouth: 15 bogies, 484 tons tare and 525 tons full

Sidmouth to Exeter: 13 bogies, 420 tons tare and 455 tons gross

Driver Lethbridge; Fireman Turner. (Exmouth Junction)

Miles		Min.	Sec.	m.p.h.	(Cut-off per cent.)	Steamchest and boiler pressures
0.0	Salisbury ... ..	0	00	—	75	110 265
1.5	Milepost 85 ... ..	4	26	23	30	140 260
2.5	Wilton ... ..	6	38	—	—	200 250
8.2	Dinton ... ..	13	12	64	25	230
12.5	Tisbury ... ..	17	25	60/55	"	245 260
						255 265
17.5	Semley ... ..	22	15	57	20	30/120/80 245
21.6	Gillingham ... ..	25	57	82	"	68 250
23.9	Milepost 107 $\frac{1}{2}$ ... ..	27	55	54	"	70 "
26.2	— 109 $\frac{1}{2}$ ... ..	30	07	69	"	90 "
28.4	Templecombe ... ..	32	15	—	25	205 265
						230 270
30.0	Milepost 113 $\frac{1}{2}$ ... ..	34	13	44	"	"75 260
30.9	Milborne Port ... ..	35	22	54	20	"75 260
34.5	Sherborne ... ..	38	57	75	"	"70 "
39.1	Yeovil Junction ... ..	42	51	64	"	"70 "
						Shut 250
41.3	Sutton Bingham ... ..	47	05	15	"	110 270
42.5	Milepost 126 ... ..	49	50	25	"	" 260
46.5	— 130 ... ..	55	05	65	"	245 260
47.9	Crewkerne ... ..	56	24	54	25	260 260
						(Regulator $\frac{1}{2}$ open on quadrant.)
49.5	Milepost 133 ... ..	58	32	38	"	260 260
					18	90 240
55.9	Chard Junction ... ..	65	07	72	"	120
61.0	Axminster ... ..	69	13	79	"	" 250
64.2	Seaton Junction ... ..	71	56	65	23	250 265
66.5	Milepost 150 ... ..	74	16	44	26	250 260
					36	" 265
67.5	— 151 ... ..	75	51	36	40	260 265
68.5	— 152 ... ..	77	45	30	"	" 270
69.0	— 152 $\frac{1}{2}$ ... ..	78	47	28	"	240 "
70.0	— 153 $\frac{1}{2}$ ... ..	81	01	26	"	200 "
71.2	Honiton ... ..	82	41	—	"	190 250
					18	100
74.5	Milepost 158 ... ..	—	—	74	"	" 280
75.8	Sidmouth Junction ... ..	87	30	—	"	—
0.0	— ... ..	0	00	—	75	120 260
					45	160
1.7	Milepost 161 ... ..	p.w.s. 3	45	—	22	80 "
						200 "
3.7	Whimble ... ..	6	23	60	18	95 "
7.4	Broad Clisic ... ..	9	34	75	"	" 240
9.3	Pinhoe ... ..	11	10	64	"	140 "
11.1	Exmouth Jc. ... ..	12	57	—	"	200 220
						Sigs.
12.2	Exeter ... ..	15	31	—	"	Shut "

Net times,  $82\frac{1}{2} + 15\frac{1}{2} = 98$  min.

The final maximum before the Sidmouth stop was 74 m.p.h.—the brakes were just touched—and for this 100 lb. of steam and 18 per cent. cut-off sufficed. It was here that the safety valves were lifted for the one and only occasion on the whole trip. We were 3½ min. early. From Sidmouth, with 75 per cent. cut-off and 120 lb. steam we made an excellent start without slipping, and with 18 per cent. and 95 lb. the final maximum at Broad Clyst was 75 m.p.h., the Exeter arrival being 3½ min. early. When I stepped off the footplate, I felt that Driver Lethbridge had given me an unforgettable experience. From the foregoing it can be said without hesitation that, with these engines, a service on the lines of the "Silver Jubilee" or "Coronation" would be an easy matter, and I am convinced that their design and performances need not fear comparison with the leading types of any other British railway. Indeed, it may be long before they are surpassed.

West of Exeter, perhaps, the running may seem something of an anticlimax, and certainly except between Okehampton and Exeter, the route does not favour high-speed running. Nevertheless, the new "West Country" class should render both faster and heavier trains feasible. On this occasion, with a modest six-coach load of 205 tons gross, Driver W. R. Clarke and his mate, H. Passmore, achieved a net time of 34 min. from Exeter to Okehampton with ease, the schedule being 39 min. Starting in full forward gear with 85 lb. pressure, we got away well, pressure being increased to 180 lb. as far as Newton St. Cyres, the cut-off being fixed permanently at 28 per cent.

From there to Yeoford speed fluctuated between 49 and 53 m.p.h., and steamchest pressures between 100 and 125 lb. Up Bow bank, three miles at 1 in 97-132-80, the minimum was 38 m.p.h. with 140 lb. of steam, and 60 lb. produced 55 m.p.h. on the brief descent to Bow. Up the 1½ miles at 1 in 100-80 to North Tawton, the minimum with 160 lb. was 49 m.p.h., and 110 lb. gave a rapid acceleration down the mile at 1 in 80 past the station to 65 m.p.h. Up two miles at 1 in 77, speed fell to 48 m.p.h. with 155 lb., but there was a p.w.s. to 15 m.p.h. at Sampford Courtenay. From Okehampton, the load was reduced to three coaches of 100 tons gross, and nothing of note ensued. The time for the 16 miles from Tavistock to Devonport which brought us in 4½ min. early was 22 min. 15 sec. A quick finish with 62 m.p.h. at post 225½, 51 at St. Budeaux up ¾ mile at 1 in 75, and 55 at Ford was achieved with only 60-80 lb. steamchest pressure. There was ample time, therefore, to admire the magnificent moorland and river scenery, unsurpassed probably on any other line in England.

The up journey, made about three weeks earlier, was less fortunate. I shall not quickly forget the twinge of disappointment at Plymouth when I saw backing on to the train of 4 coaches (132 tons tare and 145 tons full) not the promised "West Country" Pacific but the ancient and grimy "Greyhound" No. 301 of Mr. Drummond's T9 class 4-4-0s. I recalled Mr. Cecil J. Allen's graphic description of a similar occasion at Salisbury in 1912 when he saw an engine of the same class, "diminutive" even for those days, backing on to the

SOUTHERN RAILWAY. EXETER-OKEHAMPTON. 2.51 p.m. FROM EXETER  
 Engine, "West Country" class No. 21C118, 6 bogies, 192 tons tare, 205 tons full  
 Driver, W. R. Clarke; Fireman H. Passmore (Exmouth Junction)

Miles		Min.	Sec.	m.p.h.	Cut-off (per cent.)	Steamchest and boiler pressures
0.0	Exeter	0	00	—	75	85 280
1.4	Cowley Bridge Jc.	3	10	—	28	180 270
4.3	Newton St. Cyres	7	02	51½	"	120 285
6.9	Credlton	10	08	49/53	"	100 270
					"	125 280
10.6	Yeoford	14	40	49/52	"	115 265
11.5	Coleford Jc.	15	53	47	"	140 260
				38	"	60 280
15.4	Bow	21	04	55	"	160 270
18.5	North Tawton	24	28	49	"	110 285
				65	"	155 270
21.3	Sampford Courtenay	27	51	48	"	Nil 285
				15	"	Nil 270
25.0	Okehampton	p.w.s. 36	12	—	"	190 245

Net time, 34 min.

train instead of the expected 4-6-0. Thirty-four years later, history repeated itself and after forty-five years these engines, which first established the great traditions of high-speed running over these lines, were still on first class work. Indeed, they were sharing the express duties between Plymouth and Exeter with the new "West Country" class—*quam mutatus ab illo!*—the Moguls being almost entirely displaced. Thus a speculation in the columns of *The Railway Magazine* in 1935 as to whether these engines would still be on first class work ten years later has been answered vigorously in the affirmative.

Driver Denning, with Fireman Kite, started from Devonport on 75 per cent. cut-off with the first port of the regulator full open, but by Ford cut-off was 15 per cent. and only two-fifths of the first port raised the speed to 62 m.p.h. by the Tamar's edge at milepost 225½. From here, apart from a ¼-mile strip down at the same inclination, the line climbs for 5½ miles at 1 in 75 to hundreds of feet above the Tamar and Tavey rivers. Tamerton Foliot (4.8 miles) was passed in 8 min. 10 sec. at 57 m.p.h. and then, still on only 15 per cent. cut-off with the first valve fully open, Bere Ferrers (6.7 miles) was passed in 10 min. 48 sec. at 36 m.p.h., and Bere Alston (9.5 miles) in 15 min. 45 sec. at 32 m.p.h. The short intermission for ¾-mile sharply down raised the speed to 50 m.p.h., and the next 1½ miles up at 1 in 75 to milepost 217½ were surmounted at a minimum of 45 m.p.h., the first valve again opened from half to full. Tavistock was reached in 25 min. 7 sec., as against 27 min. scheduled. Over the 16.3 miles from Tavistock to Okehampton, the difficult schedule of 27 min. was cut to 25 min. 49 sec., the main feature being the quick start of 10 min. 50 sec. to Yeoford (6.4 miles).

The start from Tavistock is for a mile at 1 in 75, and then, after an intermission on broken downgrades for a similar distance, there is a climb of 4 miles to Lydford, mainly at 1 in 75. For the first mile, 20 per cent. cut-off, after using 75 per cent. for the start, was needed with ¼ of the main regulator, after which 15 per cent., with the first valve fully open raised speed to 51 m.p.h., and Brentor (5.1 miles) was passed in 8 min. 41 sec. at 41 m.p.h., the final minimum before Lydford with the main regulator half

open being 36 m.p.h. As the train was well on time, nothing of note was achieved from here to Exeter, but perhaps space can be found for two fast trips from Okehampton to Exeter. On the first, "T9" 4-4-0 No. 703, with an identical load, passed Sampford Courtenay (3.7 miles) in 4 min. 45 sec. at 57 m.p.h., braked from 70 m.p.h., North Tawton (6.5 miles) in 7 min. 5 sec. with 79 before and 67 after, Bow (9.6 miles) in 9 min. 36 sec. with 81 before and 73 after, and then touched 77 m.p.h. before Coleford Junction (13.5 miles in 13 min.) there slacking to 35 m.p.h.; Yeoford (14.4) in 14 min. 24 sec., Crediton (18.1 miles) in 18 min. 22 sec., and Newton St. Cyres (20.7 miles) in 21 min. 4 sec., but then got delayed, net time to Exeter being 26½ mins.—25.0 miles. Final speeds were 60 before, 51 through, and 66 m.p.h. beyond Crediton.

On the second run "West Country" class No. 21C107 *Wadebridge* had 8 bogies, 260 tons tare and 280 tons full. Starting from Sampford Courtenay after a signal stop, we passed North Tawton (2.8 miles) in 4 min. 4 sec., with a fall from 70 m.p.h. to 60 up the mile at 1 in 80 through the station; Bow (5.9 miles) in 6 min. 43 sec. with 81 before and 70 afterwards, Coleford (9.8 miles) in 10 min. 24 sec. at 30 m.p.h. reduced from 75 m.p.h.; Yeoford (10.7 miles) in 11 min. 57 sec., Crediton (14.4 miles) in 15 min. 27 sec., with 68 before, 52 through and 61 after the station. Exeter (21.3 miles) was reached in 24 min. 59 sec., or 24 min. net.

Since the above was written "T9" 4-4-0 No. 717 with 5 bogies, 161 tons tare and 170 tons full, past Crediton (18.1 miles) in 18 min. 32 sec. from Okehampton with three maxima ranging from 75-77 m.p.h., so that it is clear that both the very old and the very new are responsible for some fast running in this somewhat secluded part of Devon.

To return to the footplate, on the 2.30 p.m. from Exeter, No. 21C2 *Union Castle* had a load of 12 bogies, 391 tons tare and 420 tons gross. The engine was in indifferent condition and the coal closely resembled clinker, so that despite all that the crew could do, the boiler pressure showed an alarming tendency to fall, especially up the long banks. For example, we started out of Sherborne on 75 per cent. cut-off without slipping

with a boiler pressure of 265 lb., and 260 lb. in the steamchest. By milepost 115½, speed was 23 m.p.h. only, cut-off 50 per cent. and boiler and steamchest pressures 210 and 195 lb. respectively. To aggravate matters there was a good deal of leaking on of the brakes during the earlier stages. Nevertheless, this was a most instructive experience which I would not like to have missed, and even in these conditions the free running of the engine on the downgrades was remarkable—15 per cent. cut-off and 35 and 80 lb. steamchest pressures producing maxima of 74 m.p.h. down Seaton and Crewkerne banks respectively. Exeter was left 6 min. late and Salisbury reached 21 minutes late.

From Salisbury, 4-6-2 No. 21C6, *Peninsular & Oriental*, was in the charge of Driver Bolt and Fireman Smith of Salisbury. Departure was 26 min. late and the time to Andover 26 min. 51 sec.—24½ min. net. Driver Bolt used 50 per cent. cut-off and 230 lb., and we started without much slipping, but signals were on at Tunnel Junction.

Nevertheless, with 220 lb. of steam and 26 per cent. cut-off, we recovered to 42 m.p.h. on the 1 in 140 of Porton bank, and after a further signal delay near Grateley, 125 lb. sufficed for a maximum of 70 m.p.h. Restarting on

75 per cent. cut-off, quickly brought back to 40 per cent., 150 lb. of steam raised the speed to 34 m.p.h. on the 1 in 178 to milepost 62½, and 220 lb. of steam and 24 per cent. maintained a steady 53-54 m.p.h. on the 1 in 194 from Hurstbourne up to Whitchurch.

After restarting from a signal stop at Oakley, 22 per cent. cut-off and 95 lb. of steam produced 66 m.p.h. beyond Basingstoke, and following a minimum of 63 at Hook, 120 lb. sufficed for a steady 71-72 m.p.h. on the level from Fleet to Farnborough. There was a bad p.w.s. to 15 m.p.h. at milepost 31, but after a recovery to 60 m.p.h. by Brookwood, for which 160 lb. was needed, a maximum of 75 m.p.h. below Byfleet was reached with 100 lb.; at Weybridge the minimum was 66 m.p.h. with 140 lb., and after Esher 73 m.p.h. was reached with 120 lb. Severe delays were then encountered. Passing times were Overton (10.8 miles) 18 min. 1 sec., Basingstoke (18.6 miles) 28 min. 53 sec., Farnborough (33.2 miles) 41 min. 56 sec., Woking (42.0 miles) 53 min. 38 sec., Walton (49.3 miles) 60 min., Wimbledon (59.1 miles) 71 min. 55 sec., Clapham Junction (62.5 miles) 78 min., and Waterloo (66.4 miles) 92 min. 11 sec.—37 min. late, but the net time was only 72½ minutes.