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October 2018

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- NEW GREATER ANGLIA TRAINS REVEALED
- NEW 'P2' BECOMES 2-8-2

IET UPDATE

With new Hitachi IET trains now spreading their wings as far as Penzance, John Heaton FCILT, assesses their performance against the venerable HST125 – a train still proving to be a very hard act to follow.

IT IS mid-afternoon on a sultry summer Saturday at Swindon. Heat haze shimmers from the rails and the information screens struggle to keep pace with events. The soporific atmosphere brings a lazy tune into my head - Gershwin's Summertime from Porgy and Bess. How does it go?

Summertime and timekeeping ain't easy,
Engines failing; coolant temp'rature's high.
Hitachi's rich and the DfT ain't looking
So hush diesel engines, no need to try

No, that's not quite it.

Assorted members of the Railway Performance Society (RPS) form ad hoc discussion groups as train recorders arrive on inward trains and others leave for their next 'working'. Each year, usually in long hours of daylight, the RPS blitzes one section of line and tries to cover as many trains as possible during the day to obtain a freeze-frame of overall performance.

Sprightly ancestors

This year the choice was the Great Western Main Line from Reading to Bristol Temple Meads and Cardiff Central, although this article concentrates on the Reading to Swindon section. The combination of under-powered diesel IETs trying to keep pace with their sprightly ancestors was one area of interest, but no more so than how the youngsters could switch over to electric and leave their grandparents struggling in the wake of their after-burners. RPS magazine editor David Ashley subsequently compiles and analyses the logs, producing a booklet of the results for members.

Operations on the day were complicated by an engineering occupation between Didcot and Oxford, which meant many expresses were burdened with Fairford Air Show spectators in addition to holiday weekend Oxford tourists, who had to use replacement road transport to complete their far from hassle-free journey. Scheduling extra Didcot stops in the Paddington xx.00 departures helped spread the load.

Trains running non-stop through Didcot were normally changing to electric power in compliance with trackside signs at Moreton

Great Western nine-car, bi-mode Hitachi IET No. 800309 at Whiteball Summit on September 7, working 1C77, the 10.33 London Paddington-Paignton via Westbury. STEPHEN GINN

Two five-car Class 800 IET bi-mode sets, led by No. 800033 with 800015, approach Swindon on July 7 with the 11.00 Bristol Temple Meads-London Paddington train. DARREN FORD

Cutting, 1.75miles east of the station, but those booked to call were changing over the station, and these services often had to cope with a late start as well as inadequate acceleration being available under diesel power.

Of course, the Hitachi InterCity Express Trains (IETs) were never intended to undertake 125mph stretches of line under diesel power, or to run on their diesel engines for extensive periods, so it is hardly surprising there should have been a relatively high incidence of failures.

With 32 of the 36 Class 800/0 five-car units having been handed over, 24 were in service, a utilisation figure of 75%, but there were also four nine-car units operating, the equivalent of another eight five-car sets, by a stretch of statistical imagination arguably full utilisation.

Table 1 shows the best of the IET 2x5-car runs from Reading to Swindon, actually with a curtain-raiser run on the Friday afternoon, on electric to Moreton Cutting and then diesel. The HST run shown in the table was the best of the mass timing day. However, unchecked runs were few and far between.

TABLE 1: READING-SWINDON NON-STOP

Units/Power Cars		800036/800007			43164 /43086			800024/800009		
Load*		2x5/501/535			2+8/287/300/440			2x5/501/530		
Train		16.45 Padd-Swansea			07.45 Padd-Swansea			10.45 Padd-Swansea		
Date		July 13, 2018			July 14, 2018			July 14, 2018		
Recorder/Position		A Varley			D Sage			A Heaton		
Miles	**Timing Point**	**Sch**	**M S**	**M P H**	**Sch**	**M S**	**M P H**	**Sch**	**M S**	**M P H**
0.00	READING d	0	0 00	Pfm 9 2L	0	0 00	Pfm 9 13L	0	0 00	Pfm 9 1L
2.61	Tilehurst		2 42	101		3 22	87		3 09	73
5.54	Pangbourne		4 15	123		5 11	105/118		5 18	88
8.74	Goring	6	5 48	124	6	6 54	117	6	7 25	97
12.44	Cholsey	[1]	7 35	124	[1]	8 44	125	[1]	9 37	103
15.39	Moreton Cutting		9 01	120		10 10	118	(½)	11 19	105
17.14	DIDCOT PARKWAY	12	8 54	120	12	11 03	121	12½	12 18	107
19.00	Milton		10 50	119		11 58	124	[1]	13 21	107
20.48	Steventon		11 35	118		12 41	123/121		14 10	107
24.35	Wantage Road	15½	13 35	116	15½	14 34	125/123	17	16 21	107
27.84	Challow	17½	15 24	114	17½	16 16	125/123	19	18 19	106
30.54	Uffington	18½	16 49	114	18½	17 34	124	20	19 51	106
33.00	Knighton		18 07	113	[1]	18 46	123/126		21 15	106
35.46	Shrivenham		19 22	114		19 58	125		22 39	106
37.74	Marston East		20 39	sigs105		21 05	118		23 56	106
41.29	SWINDON a	25½	24 08		26½	24 00		27	27 20	

*= Vehicles/tare/gross/including power cars if applicable
[1] = 1min recovery. (½)= ½min pathing
Timings rounded to full seconds for clearer presentation
A Varley run was electric to Moreton Cutting and then diesel to Swindon
Other two runs were diesel throughout

Adverse gradients

The gains from electric running equalled the losses against the HST on diesel but, of course, the intermediate schedule was inaccurate. The 24min HST run represents an average start-to-stop speed of 103.2mph over the relatively short distance of 41.29miles, and the 24min 8sec of the IET was not far behind.

Currently, Great Western Railway has no gross schedules of 100mph or above. I have also tabulated a run on diesel throughout where the engines could make no impact whatsoever on the adverse gradients, some as savage as 1-in-754. Performance was 3min short of the sectional running times. Table 2 shows the fastest Down IET and HST runs with a Didcot stop.

Down trains normally had the advantage of punctual starts from Reading. There seemed to be no impediments between Paddington and Reading so most trains were arriving early, running under electric power on HST timings with 1min unused recovery time, presumably ignoring any driver advisory system information, and arriving with a couple of minutes in hand to assist punctual station dispatch.

One of the most impressive examples of IET electric performance now occurs immediately on departure from Reading where westbound trains accelerate up the 1-in-93 gradient onto the new flyover, race down the 1-in-85 ramp to Scours Lane and then through Tilehurst, 2.61miles in under 2½min, by now at a little more than 100mph and having already broken 'even time' with an average exceeding 62mph.

The contrast leaving Didcot is stark, IETs typically taking 7min and a little more than eight miles to struggle to 100mph, with no chance whatsoever of reaching the 125mph maximum permissible speed of both the units and the infrastructure. In round terms, the electric IET gains 1min on an HST from Reading to Goring and loses it on diesel by Uffington. The much-vaunted flying starts of diesel IETs are overtaken in actual speed terms before 60mph by a vigorous HST start, although it takes longer for the time element of the IETs advantage to be recouped, of course.

In the Up direction, Table 3 contains the best of the day's IET and HST Swindon to Reading non-stop runs. The extra stops for Oxford passengers meant there were only two non-stop IETs recorded, and the one shown in the table had the more difficult entry to platform 11 at Reading, which costs around ½min compared

TABLE 2: READING TO SWINDON (CALLING AT DIDCOT PARKWAY)

Units/Power Cars		800036/800020			43094/43186		
Load*		2x5/501/525			2+8/287/295/435		
Train		12.30 Padd-Bristol TM			06.30 Padd-Bristol TM		
Date		July 14, 2018			July 14, 2018		
Recorder/Position		A Heaton 1st of 10			I Umpleby		
Miles	**Timing Point**	**Sch**	**M S**	**M P H**	**Sch**	**M S**	**M P H**
0.00	READING d	0	0 00		0	0 00	
2.61	Tilehurst		2 27	101		3 10	87
5.54	Pangbourne		4 00	123		4 56	107
8.74	Goring	6	5 33	124	6	6 37	120
12.44	Cholsey	[1]	7 21	124	[1]	8 24	126
15.39	Moreton Cutting		8 50	114	(½)	9 49	122
17.14	DIDCOT P a	**13**	**10 59**		**13½**	**11 35**	
0.00	d	15	14 30		15	14 48	
1.86	Milton		2 24	72		2 34	76
3.34	Steventon		3 32	81		3 37	92
7.21	Wantage Road	6	6 07	97	6	5 52	113
10.70	Challow	8	8 13	104	8	7 39	121
13.40	Uffington	9	9 44	107	9	8 57	125
15.86	Knighton		11 06	109		10 08	123/120
18.32	Shrivenham		12 27	110		11 21	122/124
20.60	Marston East		13 44	105		12 28	123
24.15	SWINDON a	16	16 57		16	15 35	

Class 800s on electric to Didcot Parkway station stop, then diesel
[1]=1min recovery (½)=½min pathing
*=vehicles/tare/gross tonnes/ incl any power cars
Times rounded to the nearest second for clarity of publication

TABLE 3: SWINDON TO READING NON-STOP

Units/Power Cars		800029/800008			43131/43024		
Load*		2x5/501/540			2+8/287/315/455		
Train		09.21 Swan-Padd			16.29 Swan-Padd		
Date		July 14, 2018			July 14, 2018		
Recorder/Position		J Heaton 2nd of 10			A Varley 2/10		
Miles	**Timing Point**	**Sch**	**M S**	**M P H**	**Sch**	**M S**	**M P H**
0.00	SWINDON d	0	0 00	3L	0	0 00	T
3.55	Marston East		4 03	83		3 50	96
5.83	Shrivenham		5 34	94		5 08	111
8.29	Knighton		-			6 25	120
10.75	Uffington	8	8 31	108	8	7 38	123/122
13.45	Challow	9	9 59	112	9	8 57	124
16.94	Wantage Road	11	11 50	116	11	10 38	123
20.81	Steventon	[1]	13 49	118	[1]	12 37	113
22.29	Milton		14 34	118		13 23	115
24.15	DIDCOT P	15½	15 31	119	15½	14 20	122/123
25.90	Moreton Cutting	(½)	16 24	118/111	(½)	15 12	119
28.85	Cholsey		17 56	117/119		16 42	116/117
32.55	Goring	20	19 49	118/124	20	18 39	109
35.75	Pangbourne	[1]	21 24	123/124	[1]	20 31	97
38.68	Tilehurst		22 51	111 sigs		22 25	88
41.29	READING a	26½	26 33	Pfm 11	26½	25 40	

*=Vehicles/tare/gross tonnes/incl any power cars
Class 800s on diesel power to Moreton Cutting, then electric.
[1]=1min recovery (½)= ½min pathing
Times rounded to the nearest second for clearer publication

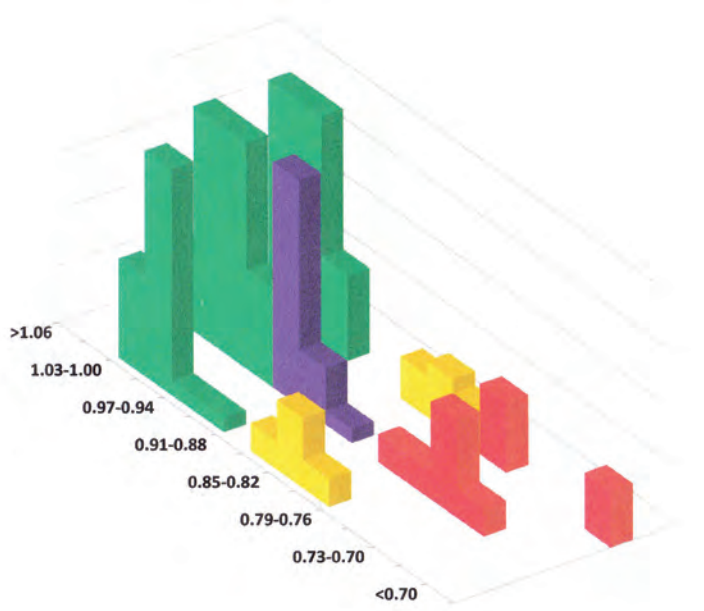

Figure 1. Traction power distributions for paired IET five-car sets (from front to rear): On service introduction in October 2017, over-winter 2017/18, and on the RPS mass timing day in July 2017. Green colouring denotes sets running as expected with 750hp engine settings, purple predominantly sets with an engine out and power augmentation, yellow sets with an engine out and no compensation, and red, those sets with apparent multiple engine issues.

Class 802 Hitachi AT300 bi-mode trains are fitted with more powerful 938hp engines as opposed to the 750hp units fitted to Class 800/0s. On July 13, set Nos. 802001 and 802002 pass the former site of Norton Fitzwarren station with a Laira to London Paddington driver-training run, passing No. 66593 with the high-output ballast cleaner. STEPHEN GINN

to platform 10. For the record, the RPS's fastest known Swindon to Reading IET time currently stands at 24min 53sec, with an all-diesel run from the first month of operation, contrasting with the 30-year-old HST record of 22min 56 sec that averaged a start-to-stop speed of 108mph.

Table 4 shows equivalent runs with Swindon to Reading trains that called at Didcot, the tabulated IET being a run with nine-car set No. 800304. It also shows the worst run of the day – the 14.00 Bristol Temple Meads-Paddington, which was in trouble climbing Dauntsey Bank and left Swindon 9min late, apparently on three engines, evidently with only three-quarters power being requested from the ones still inclined to perform.

Once it had been nursed to Didcot the set gained a new lease of life on electric running and covered the 17.14miles to Reading in 11min 6sec at a start-to-stop average of 92.6mph, reclaiming 3min of lost time against an HST schedule that included 2min recovery time.

RPS technical officer Dr David Stannard has investigated IET power outputs on the monitoring day. Previous modelling of prolonged accelerations above around 50 mph has suggested normal operation with constant rail traction powers is consistent with 750hp (560kW) engine settings as originally specified, although there could well be an additional short-power boost, initially utilising the full engine rating of 938hp (700kW).

Power augmentation

After the first few weeks of service there was evidence of such power augmentation when sets were operating with an engine 'out'. For instance, a six-engine 2x5 formation with one defective engine would be expected to deliver 83% of full power, but 92% appeared to be available in these conditions, corresponding to each of the remaining five engines, boosting their output to around 825hp.

In Figure 1, the derived rail traction powers determined for 2x5-car IETs operating on the RPS monitoring day are compared to those on introduction in October 2017 and in the November 2017-June 2018 period.

Dr Stannard's calculations use a normalised scale corresponding to 550 rail horsepower per engine (73% of 750bhp). The illustration demonstrates there has been no major change to the main traction power peaks and hence there is no evidence for actual delivery (at other than the lowest speeds) of the full 938hp (750kW) engine settings that sources often insist now applies. It would appear the output of higher-capacity engine settings are being reduced by software.

It would seem from the changes in distribution shape that currently there is no

The heavily engineered catenary at South Marston (east of Swindon) dominates the skyline as IET Nos. 800028 and 800016 head towards the capital with the 09.28 Swansea-Paddington and passes Nos. 800011 and 800006 with the 10.45 Paddington-Swansea service on May 17. Note the new palisade fencing. DARREN FORD

longer power augmentation to help maintain performance when there is an engine out. The reason for this is not known but it may perhaps be a temporary measure connected to the reported engine overheating problems suffered by the IETs in the early summer hot weather. At one stage apparently almost half of the fleet was seriously affected, and many services booked for 10-cars were provided with only one five-car set.

Low-power issues

The absence of single-set workings on the monitoring day, might have suggested the engine problems had been cured, but Figure 1 shows a new enhanced low power tail to the current power distribution. At least five of the 12 paired five-car sets (42%) in operation on MTD appeared to have suffered from engine low-power issues at some stage during the day. Sometimes only a small number of journey segments seemed to be affected so perhaps travelling fitters were fixing problems en route or drivers were forestalling further problems by easing power.

This may well have been the case with the poor 'three-engine' run in Table 4, the modelled power measuring only 38%, where 50% might reasonably have been expected. The lower figure would correspond with a 75% power selection for the functioning engines. This could have been the result of Control or Hitachi instructions of course, but there are 'web chat' suggestions some drivers are watching the coolant temperature on the train monitoring system and reducing power when it rises to 100°, whereas 77° is more typical. It is important this does not result in driving 'heads-down' reading the displays instead of exercising 'heads-up' vigilance. Most drivers, most of the time, can manage this, but anyone can be caught out, once in a lifetime, with a wrong combination of circumstances. Internet gossip has suggested the cause of overheating was attributed to a build up of particulate debris behind the charge air intercooler, which reduced the air-flow to the engine radiators. The power outputs determined for the four nine-car IETs in service on the monitoring day indicate engine settings similar to the five-car sets. Three had no apparent problems, but set No. 800304 consistently had only 92% power. If this was because of a defective engine then perhaps the excess figure compared with an expected 80% might indicate the Class 800/3s have been allowed to retain the compensatory settings that Class 800/0s once had.

Turning to punctuality, Table 5 shows the overall (HST and IET) figures for the day measured at the alighting points of RPS recorders, normally Reading on the Up and Bristol Temple Meads/Cardiff on the Down.

> "Electric youngsters leave their grandparent HSTs struggling in the wake of their after-burners"

The Public Performance Measure (PPM) target of 90% 'early or 0-9min 59sec late' was almost attained by a more generous RPS 'early or 0-10min late' 85% achievement, and the latter does not penalise cancellations or missed station calls. The most disappointing figure is the absolutely on time or early figure of just 29%. Up figures were slightly better than Down figures, the IETs having benefited from electric power on the final legs of their journey.

In terms of incidents, the early morning trains were affected by signalling problems in the Severn Tunnel, which resulted in the 04.52 Swansea-Paddington running non-stop from Bristol Parkway to the capital in 71min. Some smart 'stepping up' took place at Paddington and an extra HST from Bristol St Phillips Marsh depot plugged the gaps, with the exception of the 08.30 Paddington-Bristol Temple Meads being cancelled.

The arrangements eventually produced a surplus set that ran empty stock from Paddington to Temple Meads, arriving at 11.12, turning round to form the 11.00 back to Paddington, 20min late. All this resulted in the 09.30 from Paddington eventually being surplus at Bristol and it retired to Stoke Gifford via Swindon owing to the Filton Bank engineering work, blocking the direct route.

'Old school' expectation

In the afternoon, the imposition of a severe emergency speed restriction, without being able to give prior notice to drivers, at Farnham Road underbridge resulted in a backlog of trains receiving a caution just before Uffington, affecting trains that had left Paddington between 13.30 and 14.45. The time loss could have been reduced by using a handsignalman to relay messages faster, but I guess this is an 'old school' expectation and it was, after all, a Saturday afternoon with fewer staff around.

Difficult regulating problems were complicated by a Class 66 hauling Gresley 'A4' No. 60009 *Union of South Africa* from Southall to Bristol for the following day's 'Torbay Express'. Already running early, it was squeezed through to Swindon Down goods loop, possibly to clear a later path for the advancing Acton to Cardiff Tidal freight, making good time behind GBRf's No. 66750, but the 'A4' caused the 11.45 Paddington-Swansea to arrive at Swindon 4min late. However, the Gresley Pacific was a first for the RPS mass timing days. Imagine the scene on the platforms at Swindon if that had turned up 60 years ago!

Another complication to the day's operations came in the form of CrossCountry diversions caused by re-quadrification of Bristol Parkway to Bristol Temple Meads, resulting in the announcement of abnormal destinations such as ▶

Aberdeen. Having scrutinised operations on the Bristol/Cardiff axis in the RPS July event, there was the further expectation of Class 800/3s on summer Saturdays to Paignton, and a promised entry into service of the eagerly anticipated full 938hp-delivering Class 802s.

An August summer Saturday outing took me to Taunton for a rendezvous with the second passenger journey of a nine-car Class 800/3 to Devon. Information had suggested three Paddington to Paignton returns were likely, but on each of the first three Saturdays just one turned up, working the 08.18/08.35 Paddington-Paignton and 13.08 return, diversions and retimings applying on the first two weekends caused by Reading to Newbury electrification.

Saturday luggage

On August 11, the 08.18 from Paddington via Melksham suffered an 18min late start because the unit had been late from the depot, being worked by a different set from that planned. It was also now behind the 08.30 Paddington-Penzance, which had made better progress non-stop to Taunton from Reading via Bristol Temple Meads, resulting in 12min to fritter away for passengers, who had been forced to set off 36min earlier than otherwise necessary.

Exeter panel signallers made an early decision to re-platform the IET to 'Down main' platform 3 at Taunton so the copious amounts of Saturday luggage could be trundled through the subway in good time. It tends not to make much difference which platform is used for westbound departures, but the platform 3 exit is much straighter.

With the usual 'whoosh' expected of Class 800 diesel departures, the IET was on its way, but it had run out of enthusiasm by the time it reached 60mph and, to use a technical term, was noticeably short of puff by Bradford-on-Tone auto half-barriers, speed sticking at around 85mph on the 1-in-174 until the more favourable gradient through Wellington, where 90mph was all but reached.

Next came the 1-in-80 uphill stretch to Whiteball, which clearly daunted the newcomer, bringing speed down to 80mph at the tunnel mouth. For comparison purposes, a typical 2+8 formation HST does 100mph at Wellington and 93mph or so at the tunnel; a Class 220 'Voyager' with all engines working hits 100mph and 98mph. Figure 2 shows Dr David Stannard's computer plot of the Class 800/3 run to Whiteball, which corresponds perfectly with a 'normal' 1.0 output compared to a 2+8 HST.

I have not tabulated the runs between Exeter and Paignton and return as they were subject to checks, layovers for trains to pass and unfavourable platform selection.

Unrealistic timings

It was interesting to note the driver was working his first turn on these trains, despite having completed his training eight weeks earlier. To some extent this is inevitable when starting driver training as there is bound to be an imbalance between having enough drivers to run the service, but a limited number of opportunities during the introductory phase.

Despite this, delay was reduced from 13½min late leaving Exeter to 8min late, arriving at Paignton with 3min allowances and a net gain of 4min at stations. Signal checks cost 1min and unrealistic timings on the severe approach control approaches to Dawlish Warren and Newton Abbot the remainder.

Coming back eastwards, the train was within ½min of right time at all points to departure from Exeter, with the help of 2min of allowances and 2½min gained at stations where station dwell times are longer than during the week.

However, it was the Exeter St David's to Whiteball stretch that was going to provide the greatest interest. A well-maintained HST will normally accelerate to 100mph before Hele & Bradninch, being able to more-or-less maintain this speed with a driver attuned to both his machine and the road.

I had been assured all engines on the nine-car Class 800/3 were working and also they were all adjusted to provide 938hp (700kW) full output. When I raised an eyebrow or three and remarked there was little evidence of this, and the output seemed to be limited by the software, I was given a superbly diplomatic reply: "It's all contractual." Indeed it is.

In the Up direction the gradients to Whiteball summit are gentler than on the Down line, but the climb still finishes with two miles at 1-in-115. Table 6 shows the Exeter to Taunton IET compared to my last HST run between these stations, with Exeter driver Ingleton on the 'Golden Hind'.

TABLE 4: SWINDON TO READING (CALLING AT DIDCOT PARKWAY)

Power Cars		800304			43098/43139			800027/800026			
Load*		9/430/450			2+8/287/315/455			2x5/501/530			
Train		18.00 Bristol TM-Padd			06.23 Weston SM-Padd			14.00 Bristol TM-Padd			
Date		July 14, 2018			July 14, 2018			July 14, 2018			
Recorder/Position		D Ashley			I Umpleby			J Heaton			
Miles	**Timing Point**	**Sch**	**M S**	**M P H**	**Sch**	**M S**	**M P H**	**Sch**	**M S**	**M P H**
0.00	SWINDON a	0	0 00		0	0 00	T	0	0 00	9L
3.55	Marston East		3 56	84		3 55	99		4 54	68
5.83	Shrivenham		5 25	96		5 11	115		-	
8.29	Knighton		6 55	104		6 25	125		8 52	76
10.75	Uffington	8	8 18	111	8	7 36	122/120	8	10 45	81
13.45	Challow	9	9 45	114	9	8 57	121	9	12 43	83
16.94	Wantage Road	11	11 34	118	11	10 40	126	11	15 11	87
20.81	Steventon		13 32	120		12 35	116		17 50	89/90
22.29	Milton		14 17	110		13 23	104		18 50	85
24.15	DIDCOT P a	**16½**	**16 34**		**16½**	**15 40**		**16½**	**21 06**	
0.00	d	18½	17 57		18½	19 00		18½	22 59	
1.75	Moreton Cutting		1 46	90		2 19	79		1 49	91
4.70	Cholsey		3 27	119/120		4 11	108/118		3 27	120
8.40	Goring	6½	5 19	119	6½	6 07	115	6½	5 19	118/126
11.60	Pangbourne	[2]	6 53	124	[1]	7 43	124/125	[2]	6 53	124/125
14.53	Tilehurst		8 18	122		9 08	116		8 17	121
17.14	READING a	14	11 09		13	11 45		14	11 06	

*=Vehicles/tare/gross tonnes/incl any power cars
Class 800s on diesel power to Didcot Parkway station, then electric.
[x]=x min recovery (½)= ½min pathing
Times rounded to the nearest second for cleaer publication

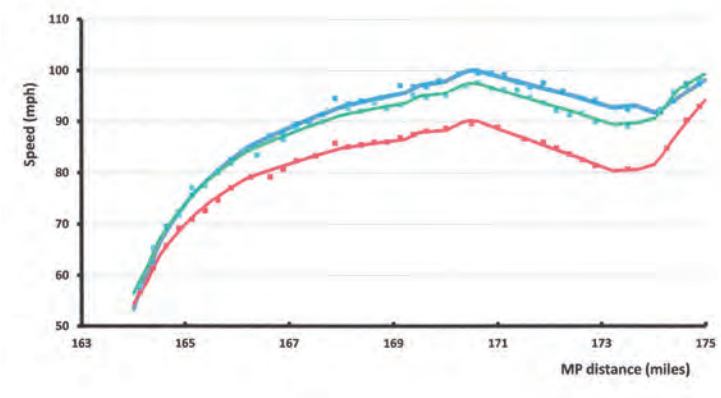

Figure 2. Comparative performances on the climb from Taunton to Whiteball of a 2+8 HST (blue data recorded by Frank Collins in August 2012 taken from the RPS public archive) and the two IETs runs referred to in the text (with the 800/3 in red and the 802s in green). Modelling reveals the HST was eased at about MP 173.75 and the 802 on the descent from MP 174.5. The 800/3 remained on full power.

Numbers of HST125s working to GWR destinations are noticeably dwindling as Class 800/802s spread their wings. On May 29, 2016, power car No. 43002 in the original InterCity125 livery calls at Didcot Parkway with a Bristol to Paddington service. DARREN FORD

Carrying 'Pride' branding, GWR Class 800 set No. 800008 passes Highworth Junction, near Swindon, with the 12.15 Paddington-Cardiff service on August 2. DARREN FORD

TABLE 5: RPS MEASURE OF MASS TIMING DAY PUNCTUALITY

	DOWN		UP		COMBINED	
	No	%	No	%	No	%
E	6	15	6	15	12	15
T	6	31	5	28	11	29
1-5	13	64	17	70	30	67
6-10	7	82	7	88	14	85
11-15	4	92	4	98	8	95
15+	3	100	1	100	4	100
Total	39		40		79	

TABLE 6: EXETER ST DAVID'S TO TAUNTON

Unit		800307			43015/43018		
Load*		9/430/445			2+8/287/300/440		
Train		13.08 Paignton-Padd			05.05 Penzance-Padd		
Date		August 4, 2018			June 26, 2018		
Recorder/Position		J Heaton			J Heaton		
Miles	Timing Point	Sch	M S	M P H	Sch	M S	M P H
0.00	EXETER S D d	0	0 00	½L	0	0 00	T
1.25	Cowley Bridge J	2½	2 25	48	2½	2 15	50tsr
3.70	Stoke Canon		4 44	78		4 25	86
8.39	Hele		7 58	96/97		7 21	100
12.55	Cullompton		10 39	91/88		9 57	95
14.80	Tiverton Jct	11½	12 10	90/93	11½	11 21	99
16.58	Tiverton Parkway	12½	13 19	92	12½	12 26	97/100
19.90	Whiteball	14½	15 33	83	14½	14 28	97
20.74	Whiteball TEP	(½)	16 09	85		14 59	100
23.65	Wellington		17 57	99		16 45	95/93
26.25	Bradford-on-Tone		19 31	100		18 24	94
27.84	Victory		20 32	90		19 25	94
29.15	Norton Fitzwarren	21	21 35	67	20½	20 18	79
30.76	TAUNTON a	23	23 53		22½	22 34	

*=vehicles/tare/gross tonnes/incl power cars

"With the usual 'whoosh' expected of Class 800 diesel departures, the IET was on its way, but it had run out of enthusiasm by the time it reached 60mph..."

The only reason for choosing this run is the fact it is my most recent. It was not particularly fast, having a 50mph temporary speed restriction early in the journey at Cowley Bridge Jct, where it could have been doing 65mph, and dissipating spare time down the bank from Whiteball to Taunton.

By contrast, the IET showed every pitch of the gradient changes, the three downhill portions before Whiteball at around MP178, 185 and 188 assisting the otherwise feeble acceleration, and took 79sec longer.

Unmuzzled 802s

Finally the long-anticipated, unmuzzled, full-power Class 802s arrived on the scene, units that are to match HST performance over the steep south Devon gradients, and will have to work on diesel all the way from Newbury to Penzance, often making a profuse number of station calls.

On August 20, two Class 802 five-car units on the 07.30 from Paddington arrived at Taunton 8½min late, announced as being caused by a special stop at Didcot vice a cancellation, incurred overtime on the HST allowance and left 9min late. The good news is it managed to keep the HST 8½min allowance to Whiteball by dint of a fast start out of the platform, and despite being some 4mph shy of a 2+8 HST performance from Wellington to Whiteball summit.

Later that day, I joined the 14.00 Penzance-Paddington at Plymouth, with the same two units. After emerging from Cornwall 7½min late, the attack on Hemerdon mirrored the Whiteball situation earlier in the day. A fast start to Lipson Jct put a few seconds in the bag and the Tavistock Jct 60mph permanent restriction was then obeyed before what seemed like a full power run at the bank.

The top speed was a disappointing 71½mph, some 5mph short of an HST, before falling to a minimum of 55mph, whereas an HST has to be eased to coast over the summit at the maximum permitted 60mph. The Class 802s' performance is also shown in Figure 2.

On this limited evidence it is likely the Class 802s with all engines running will be able to keep HST sectional running times, gaining a little on starting and losing it again at top speeds.

GWR suggests the use of automatic doors will save time at stations, but hard work will be needed to match any decrease in 'booked' times with actual ones.

The last publicity I saw claimed a saving of 14min from Paddington to Penzance from IET introduction, and it will be fascinating to see how this is to be achieved without a substantial reduction of recovery allowances. ■