

STEAM on the MAIN LINE

Overhead “Not for them [his grandchildren] the unforgettable sounds, sights and smells compounded of hot oil and coal dust, of steam locomotives in service. Nor will they know the feel of riding on the footplate of a ‘Duchess’ Pacific or even a Caley 0-6-0” Rowland C. Bond 1970

These words were written in an introduction to Campbell Highet’s book “Scottish Locomotive History”. The two Engineers started their stint, as part of their apprenticeship, in the Derby foundry together in 1920. How incredible that in 2010 Mr. Bond, were he alive, might ride on both a Duchess and a Caley 0-6-0.

During the last thirty years the number of steam locomotives available for Main Line operation at any particular time has not changed significantly. Some locomotives have consistently figured in steam operation since British Railways rescinded the total steam ban early in the 1970’s, two such are Pacific’s A4 Class No. 60007 “Sir Nigel Gresley” and Merchant Navy No.35028 “Clan Line.”

There have been some additions to the potential fleet over the thirty years since, perhaps most significant is A1 Class No.60163 “Tornado” built at Meiningen/Darlington and successfully commissioned in 2008. Several of the locomotives currently operating with a seven year Main Line boiler certificate were recovered from Dai Woodham’s scrap yard at Barry in South Wales, notably the King Class 4-6-0 No.6024 and the Battle of Britain Class 4-6-2 No.34067..

Overhead

(1) Main Line Steam 2010

Penzance to Wick, Pwhelli to Cromer

c, 500 trains per annum,

over 100 in August

c.30 locomotives

GWR 26.6%, LMS 26.6%, LNER 20%, SR 13.3%, BR 13.3%

The requirements for operating steam locomotives on the Main Line have undoubtedly become more stringent. The improvements in measuring equipment, the increased awareness [some might say obsession] with Health and Safety, on board monitoring [particularly OTMR] and a stringent “fitness to run” examination before use. The result is a small fleet of locomotives arguably maintained to a level never previously attained in the UK.

Whilst the number of locomotives passed for the Main Line may not have changed radically the area of steam operation has grown: anywhere between Penzance and Thurso, There are regular scheduled services run eg Fort William - Mallaig, York – Wakefield - Scarborough, Bristol – Paignton and Machynlleth - Portmadoc - Pwllheli. The previous steam ban in Southern England over routes electrified by third rail was gradually removed in the Nineties; there are now more steam departures from Victoria than any other London Terminus. The only possible negative in some areas is a reduced loading gauge mainly due to modern deep ballasting techniques. .

Perhaps the most significant change has been raising the overall speed limit from 60 to 75 miles per hour for locomotives with six feet two inches diameter driving wheels or more. This has not only enhanced performance aspects but enabled additional steam paths to be found on many routes. The somewhat arbitrary speed limit does have some strange results eg amongst the four mixed traffic Class 5 4-6-0's: the LNER B1's and BR Standard are permitted to travel at 75 mph, whereas the LMS Stanier and the GWR Hall's are limited to 60 mph.

(2) Summer regular services

Fort William to Mallaig
Scarborough Spa Express
Shakespeare
Machynlleth to Pwllheli
Bristol to Paignton

(3) Frequent routes

Fife Circle
Settle and Carlisle
Kings Cross to York
Kent Circular
Surrey Hills

(4) Fort William - Mallaig

Very scenic
Two locos
Typically: Class 4MT/5MT/8F - 2-6-0, 4-6-0 & 2-8-0
Six/seven coaches
Hills !

[As a comparator the “standard” adopted by the late Professor Tuplin ie Equivalent Drawbar Horse Power (EDHP) per square foot of fire grate is used in the performance appendices. There are limitations to this approach, eg if the boiler evaporative area to fire grate area ratio for instance is dissimilar between two different Classes of locomotive or even within a Class. .

Two examples: The total evaporative area [tubes, superheater and fire box] for a Gresley designed A4 Class 4-6-2 is 3325.2 square feet with a fire grate area of 41.25 square feet. The comparative figures for a Peppercorn A1 Class 4-6-2 are 3141 and 50 sq.ft. Similarly a Great Western Swindon standard No.2 boiler, as fitted inter alia to the 51xx Class 2-6-2 and 56xx Class 0-6-2 Class Tank's has a total evaporative area of 1348.95 sq.ft with a grate area of 20.4 sq ft. The equivalent figures for the Swindon No.4 boiler carried by the 42xx 2-8-0 Tank's and the 43xx 2-6-0's are 1670.15 and 20.6 sq.ft.]

Appendix [I] Fort William – Mallaig [the “original” timetabled Main Line steam service post 1946] includes four logs, three of these with the regular timetabled steam service..The three at twelve yearly intervals show similar timekeeping performance. The fourth, a late running RTC special, indicates perhaps the influence a body of “enthusiasts” as passengers .bring.

(5) “Scarborough Spa Express” .

Route change 2010

Loco pool [WCRC]; Stanier 5, Jubilee, Royal Scot, Class 4-6-0's Class 8F 2-8-0

Past: “City of Truro” 4-4-0 to “Evening Star” 2-10-0

Eleven/Twelve coaches

75 mph running, some hills.

Appendix[II] outlines five performances from 2008 climbing from Leeds to Garforth and five from 2010 over the initial start from Wakefield Westgate.. The ten runs feature eight different locomotives from six separate Classes. EDHP/ sq.ft firegrate figures are in the range 35-45. The outstanding performance, by some margin, was that of No.45407 timed by Michael Pierrepoint when 40 mph was attained on the 1/122 with a Gross load of 425 tons.

(6) “Shakespeare” Birmingham to Stratford upon Avon.

Two return trips on Sundays

Loco Pool: Tyseley : Hall/Castle Class 4-6-0's

Eight coaches

Start from Stratford interesting

One direction tender first.

Mr Mike Nottley has produced various logs on this service in his articles in “Steam Railway”

{7) Machynlleth to Pwllheli

Scenic [some days to Portmadoc only]

Locos: 2010 Stanier 5 Class 4-8-0, 2009 BR Class 4MT 2-6-0

Eight coaches 2010

Many speed restrictions

One direction tender first

Mr Nottley included a log North from Barmouth in Steam Railway October 2010.

(8) Bristol Temple Meads to Paignton

**Locos 2010 : A1 Class “Tornado”, “Duke of Gloucester, 4-6-2, King Class 4-6-0
Eleven/twelve coaches
75 mph running
Climbing to Whiteball
Financially ?**

Appendix [III] comprises two Up runs twixt Exeter St. Davids and Taunton, in 2010, by 8P Class 4-6-2 No.71000 with 414 tons Gross and A1 Class 4-6-2 No.60163 with 469 total Gross. Number 71000 made what is believed to be the quickest start to stop time post 1968 with steam, indeed it may be the quickest ever with such a load. .Number 60163 with an additional coach made identical times as far as Hele and Bradninch before the Regulator was closed at MP181¼, the reason is not known. Both runs were of a very high quality. The Down run behind No.71000 was excellent, although not a record. .

(9) Settle and Carlisle

**Pr’s and paths now less, “Fellsman”, big hills
Kings Cross to York
Very tight schedules, available path’s, Pacific’s
75 mph uphill and down
Kent circle, Loco variety, 75 mph and hills**

Appendix [IV] compares current [2008-10] and past performance [1934-65] over three routes, Redhill- Guildford, Waterloo – Basingstoke and Peterborough – Grantham..

It is most unlikely that an A4 Class 4-6-2 ever ran over the Redhill Reading Section pre 1967. Until the end of scheduled steam in 1965 the route had for many years been the preserve of the ubiquitous Maunsell moguls. Bulleid light Pacific’s were rare visitors and subjected to a 60 mph speed limit. The stage I Kent electrification and the introduction of diesel multiple units to the Hastings service in the late Fifties led to the transfer of some Schools Class 4-4-0’s to the Central section. The two logs behind Schools No.30920 and the one behind U Class 2-6-0 No.31628 [Appendix 1V page 1] probably represent the apogee of performance over the Redhill Guildford section, particularly climbing the 1/96 west of Deepdene/Dorking. [EDHP/sq.ft fire grate 39, 46 and 45].

The performance of West Country Class 4-6-2 No. 34067 “Tangmere” [42] and A4 No.60007 [51] were at a high level. The Preserved runs stopped at Shalford to take water [time for support crews to additionally “check the loco over”]

The Waterloo to Basingstoke route with its generally adverse gradient has always been a proving ground for the Bulleid Pacific’s. Merchant Navy Class 4-6-2 No.35028 “Clan Line” last May easily took 8¼ minutes out of a 55 minute schedule over this stretch.

[The “Atlantic Coast Express” after its final acceleration was expected to pass Worting Junction in 50 minutes; the Bournemouth two hours trains were allowed 52 ie. $47\frac{3}{4}$ and $49\frac{3}{4}$ minutes to pass Basingstoke]

“Clan Line” [App IV p.3] averaged 71.0 mph over the adverse 28.9 miles from Hampton Court Junction to Hook, with EDHP of c 1500 at MP31 [31] and a maximum of 76 miles per hour. The two comparison logs from the 1960’s behind the smaller Rebuilt West Country 4-6-2’s, selected because the maximum speed was within the current limit, gave comparison figures of 70.0 and 69.0mph average, c. 1,550 and 1360 EDHP at MP31 [41 and 35] and maxima of 74 and 75 mph.. This emphasises the larger “Clan Line” was being driven well within its limits. The three logs [App.1V p.4], one behind a rebuilt Battle of Britain, two behind Merchant Navy’s indicate the performance level possible when trains ran up to the 85 mph line speed extant pre the Bournemouth electrification in 1967. Average speeds were 74, 79 and $81\frac{1}{2}$ mph; EDHP’s at MP31 c.1,400, 1,800 and 1,800 [36, 37 and 38] and maxima 83, 82 and 88 mph..

If it were deemed necessary to equal the best power outputs of the past, 75 mph maintained up to MP31 by “Clan Line” would achieve this but 21 minutes over the Hampton Court Junction section is unobtainable without excessive speeding.

The Peterborough Grantham section has always, performance wise, been of great interest, Whilst the high speeds of the past descending from Stoke Summit, in the Up direction are no longer possible, the high power outputs in the Down direction climbing towards Stoke very much are within the 75 mph era.

The three performances [App IV p.5 logs I, II & III] recorded during the last two years, two behind newly constructed A1Class 4-6-2 No.60163 “Tornado” and one behind A4 Class 4-6-2 No.60007, “Sir Nigel Gresley”, were by any criteria, outstanding. The average EDHP’s over the 15.3 miles from Tallington to Stoke summit were approximately 2,100 [42 and 43 for 60163, 51 for 60007].The maximum figures attained were approximately 2,600 for the A1 and 2,400 for the A4. The performances by 60148 [IV] in 1953 and by 60022 [V] in 1963 were at the time considered exceptional, with EDHP figures over the 15.3 miles of 2000 and 2050, [39 and 49]. If the claimed sustained speeds for the A4 were accurate the maximum EDHP was c.2450. [This gives the very high figure of 59, although the total evaporation area vs fire grate area for an A4 favours the calculation]

Log V1 behind A4 Class 4-6-2 No.60007 in 1962 is appended because it may be the ultimate start to stop steam hauled time between Peterborough and Grantham. This was achieved by a very fast start with 85 mph attained at Tallington.. The average EDHP over the 15.3 miles with this comparatively light train was c.1650. Pre WWII A4’s occasionally reached 90 mph at Tallington after the 20 mph slow passage of Peterborough station when hauling one of the “Streamliners”.

Logs VII, VIII and IX encompass the dynamometer trial with P1 Class 2-8-2 No.2001 “Cock of the North”, an exceptional 1938 loading on the 10.00 ex Kings Cross, “The Flying Scotsman” and an even heavier war-time train [40, 45 and 47].

The very high power outputs being achieved with current Preserved Main Line steam locomotives between Tallington and Stoke begs the question: Why were such outputs seldom achieved either pre or post WWII. ?

Numbers X and XI provide details of locomotive working between Peterborough and Grantham in the 1950’s with A3 and A4 Class 4-6-2’s comfortably maintaining schedule with 400 plus ton trains. The average EDHP’s between Tallington and Stoke were c.1350 and 1550 [33 and 37½]. Both locomotives were worked with the Regulator full open [RFO] and the cut off gradually extended from 17 percent at Tallington to 25 percent at Corby Glen for the A3 and from 12 to 20 percent for the A4. Boiler pressure was held around 210 psi on the A3 and 230 psi on the A4s. The A4 data includes both boiler and steam chest pressures. Whilst the apparent zero pressure drop between boiler and steam chest probably reflects the limitations of the two gauges, it serves to indicate the efficacy of the A4 front end design.

Locomotives were seldom driven with cut off’s extended beyond 25 percent with RFO, other than when starting on the ECML during the steam era. One exception was the well known performance recorded from the footplate by P.J.Coster in 1957 with Driver Hailstone, A4 Class 4-6-2 No.60014 and 505 tons. The 27 miles from Huntington to Hitchin, against the grade, were run in 19 minutes 33 seconds and the minimum speed at Stevenage after 4½ miles at 1/200 was 74 mph. Mr. Coster wrote in the SLS Journal in 1967. “It is doubtful if a higher sustained or maximum power output has ever been recorded by any British steam engine with a single chimney.....The skill and endurance of Fireman J.Law cannot be too highly praised.” Boiler pressure was maintained at 250 psi throughout, steam chest pressure was 245 to 250 [ie the regulator was full open] and the cut off extended from 22 percent at Huntingdon, in increments, to 32 percent at Hitchin and eventually 35 percent over the final 3.3 miles at 1/200 to Knebworth.

Mr Nottley, [Appendix 1V p7] in a recent article in “Steam Railway”, recounted how he observed from the footplate an ascent of Stoke with A1 Class 4-6-2 No.60163 when the apparent intent was to reproduce the Dynamometer trial of the past when, to meet an engineers requirement, an A1 was driven on full Regulator and 45 percent up to Stoke in the Down direction and onwards to Corby Glen.

It appears that 45 percent working is now not uncommon with 60163 at higher speeds. On this particular day 45 percent was maintained from Essendine to Corby Glen. Special permission was given on this occasion to go to 53 percent, which was employed over the last mile to Stoke Summit, passed at 70 mph.

There is little doubt that preserved steam locomotives are driven on average far harder over certain stretches of line than perhaps ever before; apart from Stoke summit, published records suggest this is the case over Shap, Beattock, Wellington and even possibly the South Devon banks, [See **Appendix [A]**]

STEAM on PRESERVED RAILWAYS.

(10) Preserved/Heritage lines

c. 330 miles standard gauge (still increasing).

5 longest lines 78 miles, 20 locos minimum to maintain service

c. 400 ex Main Line Locos [not all in service]

GWR 34%, LMS 22%, SR 21%, BR 12%, LNER 11 %

Plus industrial and narrow gauge

The different ratios for locos in preservation vs those on the Main Line will be noted, Whereas only a comparatively small number of ex LNER locos have survived a high percentage of these have featured in Main Line operation. Conversely the Southern whilst featuring well overall has currently only three locos on the Main Line.

(11) Preserved/Heritage Railways

Limitations: 25 mph

Short

Class 8P locos plus eight coaches

Interest : Locomotive variety, Service intensity

Gradients

Class 4P locos plus eight coaches.

(12) West Somerset Railway

22³/₄ miles long, ruling gradient 1/65, connects with Main West of England line

Can accommodate 13 coach trains. Peak 4 trains [one DMU],

North Yorkshire Moors Railway

17³/₄ miles long, ruling gradient 1/49, Peak 4 trains [one DMU]

Also runs into Whitby, 24 miles from Pickering and Whitby to Battersby

Appendix [V] includes a time keeping run on the North Yorkshire Moors with K4 Class 2-6-0 No.61994. The overall time was 95 minutes 2 seconds [schedule 100 minutes] with 22¹/₂ minutes spent at the four intermediate stops.

King Class 4-6-0 No.6024 was scheduled non stop over the full length of the West Somerset Railway which involved token exchange and passing two trains at Bishops Lydeard, token exchange at Crowcombe, exchange and passing a train at both Williton and Blue Anchor. 28xx Class 2-8-0 No.3850 left Bishops Lydeard 15 minutes late and was only 40 seconds late at Minehead. Much of the regained time was due to smart station working, there were few passengers !

Appendix [VI] illustrates typical performance required on the uphill sections to maintain the peak Gold timetable on the West Somerset Railway during August 2010..Station times are regularly exceeded due to passenger loadings and their unfamiliarity with railways in general and slam door in particular..51xx Class 2-6-2 Tank No.4160 developed EDHP's between 800 and 900 ie c 43 EDHP/sq.ft firegrate. Despite the speed limitations of the Preserved Railways many require consistent performance seven days a week from their locomotive fleet.

LOCOMOTIVE POWER

(13) Horse power calculations

EDHP = WDAG [loco plus train] + WDAR [train]

Example : Train 460 tons, loco plus tender 140 tons

WDAG = 600 x 2240 x V [speed ft/sec] divided by Gradient x 550

WDAR = 460 x R [resistance lbs/ton] x V [speed in ft/sec] divided by 550

**70mph up 1/250:[600x2240x70x88 / 60x550x250] + [460x10.5x70x88 / 60x550]
= 860 + 772 = 1632**

**34mph up 1/85 : [600x2240x34x88 / 60x550x85] + [460x4.8x34x88 / 60x550]
= 1433 + 200 = 1633**

Whilst these two scenarios represent a similar power output [EDHP] the potential errors are different eg 1/85 could be 1/85.49 or 1/84.51 ie plus or minus .057%
1/250 could be 1/250.49 or 1/249.51 ie plus or minus 0.20%

Similarly the two scenarios utilise a value of R for Mark1 stock with negligible wind, with a headwind of 7.5mph the values of R are 5.5 and 11.8 lbs/ton,

Whilst with current GPS technology we can accept recorded speeds [arguably within 0.2%] the assessment of the gross weight of locomotive and train requires many assumptions eg number and weight of passengers, luggage, coal, water etc. The actual gross train weight and wind speeds are the likely source of greatest error.

Any power calculation based on observations within the train will be subject to errors. It is suggested that an assessment of likely errors should be made and the final figure quoted accordingly eg within the range 1600-1650 [or 1625 plus or minus 25].

Although errors are theoretically cumulative, that possibility is remote. Perhaps pragmatism suggests we should aim for one Standard Deviation ie as an approximation, 60% of the sum of the errors.

Appendix [A]

Following the Paper presented after the RPS AGM this year “Preserved Steam. Should we take it seriously?” David Burton wrote the following:

“Mention has been made here and there of how things are no longer the same as when steam was paramount, but to assist my thoughts I have made my own list of changes over time for better or for worse,

NOW: Every main line steam is a special.

THEN: We relied on daily services in the ordinary course of life [Occasional trial and demonstration runs were open to the very few]

NOW; Coal comes from foreign lands and frequently is unsuitable

THEN: Locomotives were designed with UK coal in mind [GWR Kings were to use Welsh Dry Steam coal from Machen No.3 pit]

NOW: Fuel is consumed freely irrespective of cost. Photographs often show engines “blowing off” at locations where the demand for steam should be low

THEN: Coal and water were not consumed unnecessarily because it incurred hard work for a fireman whose energy would be conserved until required

NOW: Crews have relatively little experience, particularly of the variations between and even within locomotive classes

THEN: Skills were acquired over a lifetime career

NOW: Locos are sometimes “flogged” and may be cover long distances even on successive days.

THEN: The day’s mileage was shorter and driving was more sensitive, taking into consideration that tomorrow would bring another day’s work.

NOW: Locos are restricted to 60 or 75mph. There can be no anticipation that an unusually high speed may be attained.

THEN: Speed was limited to that which was necessary to keep time, so a late running service might bring some excitement.

NOW: Lengthy stops must be organised to take on water, giving opportunity for the fireman to rest while a su[[ort crew tidies the fire and takes the coal forward in the tender.

THEN: Opportunities were only available at station stops, and without assistance. Water troughs along the way enabled replenishment.

NOW: In relation to the volume of special trains operating, failures are regular despite it being argued that maintenance may be of a higher standard than ever.

THEN: Daily care by experienced depot staff ensured few breakdowns.

NOW: Line side fires are too frequent [due of course to allowing vegetation to go wild rather than locomotive faults]. But after the train has passed there can be considerable disruption to other trains and their passengers, calls on fire brigades and damage to farmers' land.

THEN: Lineside vegetation was burnt annually.

NOW: Much improved track and alignment assist easier running

THEN: Bull-head rails in chairs, jointed track, timber sleepers. Remember slowing for curves at Offord and Cullompton.?

The above notes are to illustrate how the scene is DIFFERENT.

Use of the word "preserved" is largely untrue because most locos now running on the main lines were condemned and have been resurrected from graveyards at vast expense using bits and pieces from others. It would be more honest to call it the "New Steam Era"

Finally, let us beware of sensationalist journalism. Occasionally a magazine comes my way which include a description of a run with an inadequate log but with a commentary using numerous superlatives, leaving me with a feeling that all I enjoyed in the 1950's was rubbish. But of course colourful words sell the3 magazine.

David Burton 20th September 2010 "

Appendix [B]

The following was prepared by Peter Thrussel to stimulate discussion

"Objective: To record [the finest] steam performance as accurately as possible.

Constituents: [Not necessarily fully definitive]: Locomotive, load, gradient, weather condition, passing times and speeds, power output

Load: A key factor in calculating accurate power output

How do we/should we calculate the weight of the train in the best possible way ?

Elements to consider

Rolling stock

- End plates if in existence
- Comparisons with similar vehicles
- Personal records
- www.martinimber.co.uk

People

- Now many people are in the train
- How much do we weigh ? Are we really 13 to the ton ?
- Older people weigh more ?
- What about our luggage ?
- Catering staff ?
- Stewards
- Support crew
- Footplate

Other supplies

- Food and drink for the dining classes and buffet
- Tools, spares and coal in the support coach

Other considerations

- Coal and water carried by the locomotive
- Bittern's second tender, 5043's extra water supply for 'Bristolian' "

Peter Thrussel 29/10/2010

RPS Steam Seminar (I)

Fort William – Mallaig – Glenfinnan to Arisaig

| | Date | 18/5/84 | | 12/9/96 | | 9/9/2008 | | 1/9/2007 | |
|-------|------------|-----------|----|------------|----|-----------|----|-----------|----|
| | Loco | (4)5407 | | 75014 | | 76079 | | 61994 | |
| | Load | 6/200/220 | | 6/216/230 | | 6/222/240 | | 7/255/265 | |
| Miles | Rec | M.J.Rowe | | M.J.Rowe | | A.Smeaton | | A.Smeaton | |
| 00.00 | Glenfinn'n | 00-00 | | 00-00 | | 00-00 | | 00-00 | |
| 00.28 | MP15 | 01-55 | | 02-05 slip | | - | | - | |
| 00.78 | MP15½ | 03-30 | | 04-26 | | 04-42 | 18 | 03-10 | 20 |
| 1.78 | MP16 | 04-40 | | 06-00 | | 05-57 | 30 | 04-19 | 33 |
| 2.78 | MP17 | 06-50 | 30 | 07-57 | 33 | 08-24 * | 33 | 06-41 * | 31 |
| 9.11 | Lochail't | 21-20 | | 21-53 | | 20-41 | | 18-11 | |
| 11.28 | MP26 | 26-15 | 25 | 26-10 | | - | | - | |
| 12.78 | MP27½ | 28-30 | | 29-05 | | 28-17 | 21 | 24-39 | 30 |
| 13.28 | MP28 | 29-46 | | 31-10 | | 29-48 | 18 | 25-46 | 24 |
| 13.53 | MP28¼ | 30-28 | 21 | 32-05 | 16 | 31-58 ** | 9 | 27-06 ** | 19 |
| 13.89 | Beasdale | 31-33 | | 33-18 | | | | 27-24 | |
| 17.28 | Arisaig | 39-05 | | 40-07 | | 39-35 | | 34-07 | |

* Mile Post 17¼ ** Mile Post 28½

Locos : 5407 LMS Stanier Class 5 4-6-0 [I]
 75014 BR Standard Class 4 4-6-0 [II]
 76079 BR Standard Class 4 2-6-0 [III]
 61994 LNER K4 Class 5 2-6-0 [IV]

Runs [I] [II] & [III] were made on the service train. [IV] with an RTC special

Gradients: Glenfinnan – MP17¼

MP 15 1/50
 MP 15½ 1/70, 1/50, 1/250, 1/45
 MP 16 1/200, Level, 1/60, 1/100, 1/60. 1/100, Level
 MP 17¼ 1/20, Level, 1/60

MP27½ – Beasdale 1/48

5407 was driven on the 1st valve with 45% cut off out of Glenfinnan and on the 2nd valve with 30% up to Beasdale.

75014 slipped on leaving Glenfinnan on a very wet rail, and then was driven with the Regulator Full Open and 50%

M.J.Rowe. 22/09/2010

RPS Steam Seminar (II)

Scarborough Spa Express – Leeds start to East Garforth pass

| | Date | 29/6/08 | | 29/7/08 | | 06/8/08 | | 21/8/08 | | 28/8/08 | |
|------|-------|---------|----|---------|----|---------|----|---------|----|---------|----|
| | Loco | 34067 | | 5690 | | 48151 | | 70013 | | 45231 | |
| | Load | 12 | | 11 | | 11 | | 11 | | 11 | |
| | Tons | 439/455 | | 402/415 | | 402/415 | | 402/420 | | 402/415 | |
| m.ch | Rec | M.N | | M.N | | M.N | | M.N | | M.N | |
| 0.00 | Leeds | 00-00 | | 00-00 | | 00-00 | | 00-00 | | 00-00 | |
| 1.03 | Tun | 3-40 | 38 | 3-44 | 36 | 3-31 | 31 | 3-37 | 34 | 4-12 | 33 |
| 1.47 | MP19 | 4-29 | 42 | 4-37 | 37 | 4-26 | 37 | 4-26 | 43 | 5-10 | 37 |
| 2.47 | MP18 | 5-50 | 45 | 6-08 | 39 | 6-02 | 37 | 5-45 | 47 | 6-47 | 38 |
| 3.47 | MP17 | 7-08 | 47 | 7-38 | 40 | 7-40 | 36 | 6-57 | 49 | 8-26 | 37 |
| 4.36 | Gate | 8-14 | 47 | 8-54 | 41 | 9-06 | 37 | 7-59 | 51 | 9-49 | 37 |
| 5.50 | M'ton | 9-42 | 49 | 10-35 | 44 | 10-58 | 39 | 9-21 | 53 | 11-41 | 39 |
| 6.47 | MP14 | 10-49 | 57 | 11-48 | 51 | 12-18 | 47 | 10-28 | 52 | 13-01 | 48 |
| 7.24 | G'fth | 11-37 | 55 | 12-37 | 54 | 13-11 | 50 | 11-16 | 55 | 13-52 | 52 |
| 7.71 | E.Gf | 12-15 | 55 | 13-14 | 57 | 13-52 | | 11-52 | 60 | 14-31 | 54 |

Wakefield Westgate start – Mile Post 179

| | Date | 28/7/10 | | 28/7/10 | | 04/8/10 | | 17/8/10 | | 24/8/10 | |
|------|--------|---------|----|---------|----|---------|----|---------|----|---------|----|
| | Loco | 45407 | | 45407 | | 45407 | | 46115 | | 44932 | |
| | Load | 11 | | 11 | | 12 | | 12 | | 12 | |
| | Tons | 401/25 | | 401/25 | | 438/70 | | 437/70 | | 441/70 | |
| m.ch | Rec | M.N | | M.P | | M.N | | M.N | | M.N | |
| 0.00 | W.W | 00-00 | | 00-00 | | 00-00 | | 00-00 | | 00-00 | |
| 0.55 | MP176½ | 3-10 | 22 | 3-06 | 24 | 3-17 | 20 | 3-32 | 21 | 3-26 | 21 |
| 1.15 | MP177 | 4-23 | 27 | 4-13 | 29 | 4-36 | 26 | 4-45 | 28 | 4-48 | 24 |
| 1.55 | MP177½ | 5-28 | 28 | 5-17 | 30 | 5-48 | 26 | 5-51 | 27 | 6-02 | 26 |
| 2.15 | MP178 | 6-29 | 30 | 6-09 | 33 | 6-53 | 27 | 6-51 | 32 | 7-12 | 27 |
| 2.41 | O'wood | 7-07 | 32 | 6-44 | 36 | 7-36 | 31 | 7-27 | 37 | - | 29 |
| 2.55 | MP178½ | 7-27 | 35 | 7-02 | 40 | 7-55 | 35 | 7-46 | 36 | 8-14 | 30 |
| 3.15 | MP179 | 8-21 | 34 | 7-47 | 39 | 8-49 | 34 | 8-36 | 36 | 9-13 | 30 |

Recorders M.N = Mike Nottley
M.P. = Michael Pierrepoint

Acknowledgement Steam Railway Magazine. Issues 354, 379 and 380

Scarborough Spa Express [cont'd]

| | | | | |
|---------|---------------------|-----------------|-----------|-------|
| Locos : | 44932, 45231, 45407 | LMS Stanier | Class 5MT | 4-6-0 |
| | 48151 | LMS Stanier | Class 8F | 2-8-0 |
| | [4]5690 | LMS Jubilee | Class 6P | 4-6-0 |
| | 46115 | LMS Royal Scot | Class 7P | 4-6-0 |
| | 34067 | SR West Country | Class 7P | 4-6-2 |
| | 70013 | BR Britannia | Class 7P | 4-6-2 |

Gradients;

Leeds- Garforth

| | |
|-------------|-------|
| MP19 | 1/232 |
| MP18 | 1/153 |
| MP17 | 1/162 |
| Cross Gates | 1/160 |
| MP14 | Level |

Wakefield Westgate - MP179

| | |
|--------------|-------|
| WW- MP177¾ | 1/100 |
| MP177¾ - 178 | 1/280 |
| MP178 - 179 | 1/122 |

Power Outputs : Equivalent Drawbar Horse Power [EDHP]

Leeds to Garforth: On 1/160 at Cross Gates

| | | | | | |
|-------|---------|-------------|----------|--------------|------------|
| 34067 | 29/6/08 | 1,480-1,520 | EDHP, 39 | EDHP / sq.ft | firegrate. |
| 5690 | 29/7/08 | 1,200-1,240 | " , 41 | " / | " " |
| 48151 | 06/8/08 | 1,010-1,050 | " , 36 | " / | " " |
| 70013 | 21/8/08 | 1,480-1,520 | " , 36 | " ? | " " |
| 45231 | 28/8/08 | 990-1,030 | " , 35 | " / | " " |

Wakefield Westgate to MP179: On 1/100 at MP 177½ and [1/122 at MP 179]

| | | | | | | | |
|-------|---------|-------------|----------|-------------|-----------|---------------|------|
| 45407 | 28/7/10 | 1,040-1,080 | EDHP, 38 | EDHP/sq.ft, | firegrate | [1,080-1,120] | [38] |
| 45407 | 28/7/10 | 1,120-1,160 | " , 40 | " " | " " | [1,280-1,320] | [45] |
| 45407 | 08/8/10 | 1,050-1,090 | " , 37 | " " | " " | [1,140-1,180] | [40] |
| 46115 | 17/8/10 | 1,260-1,300 | " , 41 | " " | " " | [1,290-1,330] | [42] |
| 44932 | 24/8/10 | 1,050-1,090 | " , 37 | " " | " " | [1,040-1,080] | [37] |

M.J.Rowe 27/09/2010

RPS Steam Seminar (III)

“Torbay Express” – Taunton – Exeter St. Davids

| | | | | | | | | | |
|-------|------------|---------|------|-------|-------|------------|-------|------|--------|
| | Date | 25/7/10 | | | | 19/09/10 | | | |
| | Loco | 71000 | | | | 71000 | | | |
| | Load | 11 | | | | 11 | | | |
| | Tons | 395/420 | | | | 395/414 | | | |
| m.ch | Rec | MW | mph | grad | m.ch | N & PW | | mph | grad |
| 00.00 | Taunton | 00-00 | 11L | Level | 00.00 | Exeter S.D | 00-00 | RT | 1/515 |
| 01.53 | Norton F | 4-12 | 53 | 1/724 | 1.20 | Cowley Jt | 2-55 | 48 | 1/300 |
| 2.52 | Victory S | 5-31 | 61 | 1/369 | 3.56 | Stoke Can. | 5-28 | 66 | 1/310R |
| 3.68 | MP167 | 6-25 | 63 | 1/203 | 8.31 | Hele & B | 9-26 | 76 | 1/292R |
| 4.68 | MP168 | 7-21 | 65½ | 1/174 | 12.72 | MP181 | 13-10 | 74½ | 1/155R |
| 5.68 | MP169 | 8-16 | 65 | 1/174 | 13.72 | MP180 | 13-51 | 69 | 1/155R |
| 6.68 | MP170 | 9-10 | 67 | 1/170 | 14.12 | MP179¾ | 14-04 | 68½ | 1/155R |
| 7.07 | Wellingt.n | 9-23 | 67½ | Level | 14.52 | MP179¼ | 14-30 | 68½ | 1/155R |
| 7.68 | MP171 | 10-03 | 68 | 1/90 | 15.32 | MP178½ | 15-08 | 75 | 1/207F |
| 8.68 | MP172 | 11-00 | 61 | 1/86 | 16.44 | Tiverton P | 16-03 | 73 | 1/216 |
| 9.68 | MP173 | 12-03 | 54 | 1/80 | 17.72 | MP176 | 17-11 | 71 | 1/115 |
| 10.01 | Tunnel in | 12-15 | 54 | 1/127 | 18.72 | MP175 | 18-03 | 67 | 1/115 |
| 10.51 | Tunn'l out | 12-56 | 52½ | 1/203 | 19.12 | MP174¾ | 18-17 | 67 | 1/115 |
| 12.68 | MP176 | 14-58 | 79½ | | 19.32 | MP174½ | 18-30 | 65 | 1/115 |
| 12.68 | Tiverton P | 16.12 | 46* | | 19.52 | MP174¼ | 18-44 | 64 | 1/115 |
| 17.68 | MP181 | 19-40 | 81 | | 19.72 | MP174 | 18-58 | 65 | 1/115 |
| 19.68 | MP183 | 21-11 | 75½ | | 20.09 | Tunnel ent | 19-10 | 65 | 1/212 |
| 22.29 | Hele & B | 23-06 | 83 | | 23.53 | Wellingt'n | 22-01 | 73½ | |
| 27.68 | MP191 | 27-15 | 75½ | | 28.08 | Victory S | 25-36 | 69½ | |
| 29.40 | Cowley Jt | 28-46 | 49 | | 29.12 | Norton F | 26-46 | 52½ | |
| 30.60 | Exeter SD | 31-31 | stop | | 30.60 | Taunton | 29-58 | stop | |

- psr for Tiverton Parkway platform.

Recorders: MW – Michael Wilson, NW – Nigel Wilson, PW – Philip Wilson

Loco: 71000 BR Class 8P 4-6-2 “Duke of Gloucester”

Power: Equivalent Drawbar Horsepower [EDHP]

Down: Average Norton Fitzwarren – Tunnel Ent 1775-1875 EDHP average
 MP169 1940-1980 EDHP, “
 MP173 2000-2100. EDHP “

Up MP179¼ 2180-2220 EDHP “
 MP174 2400-2500 EDHP “

M.J.Rowe 28/09/2010

Torbay Express cont'd

| | | | | |
|----------|-------------------|--------|-------|------------------------------------|
| Date | 26/09/2010 | | | |
| Loco | 60163 | | | |
| Load | 12 | | | |
| Tons | 436/469 | | | |
| Recorder | N.Wilson | actual | mph | |
| 00.00 | Exeter St Davids | 00-00 | RT | 71000 on 19/09/2010 00-00 |
| 1.20 | Cowley Jct., | 2-55 | (47) | 2-55 (47) |
| 3.56 | Stoke Cannon | 5-26 | (66) | 5-28 (66) |
| 8.31 | Hele & Bradninch | 9-27 | (75) | 9-26 (76) |
| 12.72 | MP181 | 13-12 | (63½) | easy at MP181¼ |
| 13.72 | MP180 | 14-11 | (60) | Regulator reopened MP180½ |
| 14.12 | MP179¾ | - | - | |
| 14.52 | MP179¼ | 14-56 | (62) | |
| 15.32 | MP178½ | 15-37 | (68) | |
| 16.44 | Tiverton Parkway | 16-40 | (68½) | |
| 17.72 | MP176 | 17-48 | (68) | |
| 18.72 | MP175 | 18-42 | (65) | |
| 19.12 | MP174¾ | 18-56 | (65) | |
| 19.32 | MP174½ | 19-10 | (64) | |
| 19.52 | MP174¼ | 19-24 | (63½) | |
| 19.72 | MP174 | 19-39 | (63) | |
| 20.09 | Tunnel Entrance | 19-51 | (65) | |
| 23.53 | Wellington | 22-43 | (72) | |
| 28.08 | Victory Siding | 26-08 | (71) | |
| 29.12 | Norton Fitzwarren | 27-30 | (41) | brakes before, yellow plus feather |
| 30.60 | Taunton | 31-19 | stop | |

Loco: 60163 LNER A1 Class 4-6-2 No.60163

EDHP at MP179¼ 2180-2220HP

at MP174 2500-2600HP

Note identical starts. Driver R.Cottrell with 71000, F.Lewis with 60163.

M.J.Rowe 12/10/2010

RPS Steam Seminar (1V) - Redhill – Shalford - Guildford

| | I | | II | | III | |
|-------------------|------------|----------------|------------|----------------|---------------|----------------|
| Date | 24/07/1961 | | 29/08/1961 | | Aug Sat 1961 | |
| Loco | 30920 | | 30920 | | 31628 | |
| Load Tons | 12/396/430 | | 12/383/420 | | 11/361/375 | |
| Recorder | M J Rowe | | M J Rowe | | Norman Harvey | |
| Mil Ch | Sch | Actual | Sch | Actual | Sch | Actual |
| 00-0 Redhill | (0) | 00-00 | (0) | 00-00 | (0) | 00-00 |
| 01.0 MP 23 ½ | | (26) | | (22) | | |
| 01.8 Reigate | | 05-08 (36)(62) | | 06-58 (32)(59) | | 05-25 (30)(56) |
| 04.6 Betchworth | | 08-36 (53) | | 10-31 (54) | | 09-00 (50) |
| 07.2 Deepdene | | 11-14 (63) | | 13-11 (68) | | 11-23 (70) |
| 07.9 Dorking Town | (14) | 12-01 (56) | (14) | 13-50 (62) | (12) | 12-03 (65) |
| 11.1 MP 33 ¾ | | 17-06 (30) | | 17-49 (37½) | | (36) |
| 12.6 Gomshall | | 19-09 (61)(56) | | 19-39 (62)(58) | | 18-10 (62)(56) |
| 16.6 Chilworth | | 23-06 (64) | | 23-41 (64) | | 21-55 (70)(74) |
| 18.4 Shalford | | 24-53 | | 25-33 | | 23-27 |
| | | sigs stop | | sigs | | sig stop |
| 19.1 Shalford Jct | (32) | 29-29 | (32) | 27-13 | (29) | 28-00 |
| 20.3 Guildford | (35) | 32-10 | (35) | 29-56 | (32) | 30-55 |

| | IV | | V | | VI | |
|-------------------|------------|----------------|------------|----------------|--------------|-----------------|
| Date | 10/12/2009 | | 11/12/2008 | | 05/03/1967 | |
| Loco | 34067 | | 60007 | | 34087R | |
| Load Tons | 11/370/395 | | 11/373/405 | | 8/264/275 | |
| Recorder | M Nottley | | M Nottley | | A.G.S.Davies | |
| Mil Ch | Sch | Actual | Sch | Actual | Sch | Actual |
| 00-0 Redhill | (0) | 00-00 | (0) | 00-00 | | |
| 01.0 MP 23½ | | (29) | | (23½) | | |
| 01.8 Reigate | | 04-57 (38½) | (5) | 05-17 (35)(65) | | |
| | | (49) | | | | |
| | | Sigs (24) | | | | |
| 04.6 Betchworth | | 10-02 (31½) | | 08-24 (60) | (0) | 00-00 |
| 07.2 Deepdene | | 13-19 (60) | | 10-47 (66) | | 03-45 (67) |
| 07.9 Dorking Town | | 14-02 (59) | | 11-27 (63) | | 04-28 (57) |
| 11.1 MP 33¾ | | 17-52 (44) * | | 15-08 (48½) * | | 08-45 (41) ** |
| 12.6 Gomshall | (19) | 19-33 (64)(66) | | 16-37 (61½) | | 10-22 (68) |
| | | (57) | | | | |
| 16.6 Chilworth | | 23-27 (61) | | 20-29 | (16) | 14-15 (60) sigs |
| 18.4 Shalford | (27) | 26-56 stop | (26) | 24-23 stop | | 18-00 sigs |
| 20.3 Guildford | | | | | (25) | 23-15 stop |

*

Adjusted from quoted times at MP 34

**

Time at summit, between MPs 33¾ and 34

Page 2 - Redhill-Shalford-Guildford continued

| | |
|--------|--|
| I & II | Weekday South Coast (Margate and Hastings) to Birkenhead |
| III | Saturday South Coast to Wolverhampton |
| IV & V | Steam Dreams "Cathedrals Express" |
| VI | "End of Steam" Special |

| | | |
|-------------|-------|---|
| Locomotives | 30920 | School Class 4-4-0, with Lemaitre exhaust & double chimney |
| | 31628 | U Class 2-6-0 with outside steam pipes and improved front end |
| | 34067 | Air smoothed Battle of Britain Class 4-6-2 |
| | 60007 | A4 Class 4-6-2 |
| | 34087 | Rebuilt Battle of Britain Class 4-6-2 |

Deepdene to MP 33 ¾ Gradient rising from Deepdene, with level section through Dorking Town (later renamed Dorking West) to MP 31¾ then 1/96 onwards to MP 33¾

| Speeds on Climb | | | | |
|-----------------|--------------|----------|----------|----------|
| Log No | I | II | IV | V |
| Loco | 30920 | 30920 | 34067 | 60007 |
| Load Gross | 430 Tons | 420 Tons | 395 Tons | 405 Tons |
| Deepdene MP33 ¾ | 5mins 52secs | 4-38 | 4-33 | 4-21 |
| Average Speed | 40.3 mph | 50.1 | 51.9 | 54.3 |

| Actual Speeds | | | | |
|------------------|------------|-------------|-------------|-------------|
| Deepdene | (63) | (68) | (63) | (66) |
| Dorking Town | (56) | (62) | (56) | (63) |
| MP 31 | | | (56) | (60) |
| MP 32 | (42) | (50) | (53) | (54) |
| MP 33 | (35) | (43) | (48½) | (50½)(48½) |
| MP 33 ¾ | (30½) | (37½) | (44) | (49½) |
| Max EDHP | 1050-1,150 | 1,250-1,350 | 1,550-1,650 | 2,050-2,150 |
| EDHP/sq.ft grate | 39 | 46 | 42 | 51 |

Despite no intermediate speeds best estimate:

| | | |
|-------------------------|-------------------------------|-----------------------|
| U No. 31628 | EDHP in the range 1,075-1,175 | EDHP/sq.ft grate - 45 |
| Battle of Britain 34087 | EDHP in the range 1,100-1,200 | EDHP/sq;ft grate - 30 |

Acknowledgements: Mr Nottley's two logs were published in Steam Railway Nos 358 and 372. Norman Harvey gave the writer a copy in the 1960s, published Railway World March 1962. Mr AGS Davies's log is in the RPS Database.

| RPS Steam Seminar | | Waterloo - Basingstoke | | | | | |
|----------------------|--------|---|-----------------|------------|----------------|------------|----------------|
| | | I | | II | | III | |
| Date | | 23/05/2009 | | 29/08/1963 | | 11/03/1965 | |
| Loco | | 35028R | | 34044R | | 34012R | |
| Load Tons | | 12/426/460 | | 13/416/445 | | 11/365/395 | |
| Recorder | | A. Rawlings | | M J Rowe | | M J Rowe | |
| Mil Ch | | Sch | Actual | Sch | Actual | Sch | Actual |
| 00-0 Waterloo | (0) | | 00-00 | (0) | 00-00 | (0) | 00-00 |
| 01.3 Vauxhall | | | 05-10 (34)(51) | | 03-51 | | 03-32 |
| 03.9 Clapham Jct | (9) | | 08-39 (49) | (7) | 08-32 (46) | (7) | 07-36 |
| 07.3 Wimbledon | | | 12-17 (61) | (11 ½) | 12-09 (58) | | 11-58 (55) |
| 03.9 New Malden | | | 14-39 (67) | | 14-50 (62) | | 14-38 (60) |
| 12.0 Surbiton | | | 16-38 (70) | | 16-55 (66) | | 16-47 (65) |
| 13.3 Hampton Crt Jct | (20 ½) | | 17-43 (73)(75) | | 18-05 (67) | (18) | 17-59 (69) |
| 17.1 Walton | | | 20-47 (73)(71) | | (70) | | 21-12 (71) |
| 19.1 Weybridge | | | 22-29 (73)(76) | | 22-58 (74) | | 22-54 (75) |
| 21.7 W Byfleet | | | 24-38 (73) | | | | 25-02 (72) |
| 24.4 Woking | | | 26-47 (70) | (28) | 27-18 (72) | | 27-13 (67) |
| 28.0 Brookwood | | | 30-01 (65) | | 30-33 (66) | | 30-33 (65) |
| 31.0 MP 31 | | | 32-55 (63) | | 33-18 (65) | | 33-20 (64) |
| 33.2 Farnborough | | | 34-58 (73)(76) | | 35-15 (70) | | 35-26 (69) |
| 36.5 Fleet | | | 37-27 (75) | | 38-04 (71) | | 38-17 (74) |
| 39.8 Winchfield | | | 40-10 (71) | | 40-51 (72) | | 41-03 (75) |
| 42.2 Hook | | | 42-09 (73)(76) | | 42-51 (71) | | 43-06 (72)(75) |
| 47.0 MP47 | | | | | 47-07 (71) | | 47-08 |
| 47.8 Basingstoke | (55) | | 46-45 (65) Pass | | 48-21 pws (21) | (55) | 48-37 stop |
| I | | "Eastleigh Centenarian" to Eastleigh via Andover and Laverstock Curve | | | | | |
| II | | 15.30 Waterloo – Bournemouth - Weymouth | | | | | |
| III | | 18.00 Waterloo - Salisbury | | | | | |

Locomotives: 35028 Rebuilt Merchant Navy Class 4-6-2
34044 & 34012 Rebuilt West County Class 4-6-2

Hampton Court Junction pass to Hook pass, 28.9 miles

| Log No | Time | Average Speed | Max Speed | EDHP at MP31 | EDHP per sq ft grate |
|--------|------------------|---------------|-----------|--------------|----------------------|
| I | 24 mins 26 secs | 71.0 mph | 76 mph | 1450-1550 | 31 |
| II | 24 mins 46 secs | 70.0 mph | 74 mph | 1510-1610 | 41 |
| III | 25 mins 07 secs* | 69.0 mph | 75 mph | 1310-1410 | 35 |

Acknowledgements: A Rawlings, Journal of Merchant Navy Locomotive Preservation Society

age 4 – Waterloo – Basingstoke continued

| | IV | | V | | VI | |
|----------------------|------------|-----------------------------------|-------------|-------------------------|-------------|-----------------|
| Date | 03/06/1965 | | 12/02/1959 | | 04/06/1965 | |
| Loco | 34056R | | 35030R | | 35005R | |
| Load Tons | 11/368/395 | | 11/368/? | | 11/368/392 | |
| Recorder | M J Rowe | | G F Bloxham | | M D Barrett | |
| Mil Ch | Sch | Actual | Sch | Actual | Sch | Actual |
| 00-0 Waterloo | (0) | 00-00 | (0) | 00-00 | (0) | 00-00 |
| 01.3 Vauxhall | | 03-14 | | 03-26 | | |
| 03.9 Clapham Jct | (7) | 07-04 | (7) | 06-55 (38½) | (7) | 06-20 (41) |
| 07.3 Wimbledon | | 11-13 (55) | | 11-13 (60) | | 10-08 (60) |
| 03.9 New Malden | | 13-40 (68) | | 13-38 (66) | | 12-33 (64) |
| 12.0 Surbiton | | 15-43 (71) | | 15-36 (69) | | 14-30 (73) |
| 13.3 Hampton CRT Jct | (18) | 16-48 (72)(79) | (18) | 16-35 (75) | (18) | 15-40 (77) |
| 17.1 Walton | | 19-46 (76)(75) | | 19-27 (82)(79) | | 18-20 (82)(80) |
| 19.1 Weybridge | | 21-21 (78)(80) | | 20-59 (80) | | |
| 21.7 W Byfleet | | 23-23 (73) sigs | | 22-50 (82) | | 21-42 (83) |
| 24.4 Woking | (28) | 26-06 (48) | (28) | 24-53 (75) | (28) | 23-40 (78)(77) |
| 28.0 Brookwood | | 30-02 (59½) | | 27-44 (75) | | 26-31 (79)(75) |
| 31.0 MP 31 | | 33-03 (63) | | 30-03 (75) | | 28-52 (76) |
| 33.2 Farnborough | | 35-05 (72) | | 31-47 (80) | | 30-31 (80)(79) |
| 36.5 Fleet | | 37-47 (78) | | 34-15 (80) | | 32-53 (84)(88) |
| 39.8 Winchfield | | 40-17 (83)(78) | | 36-48 (78)(73) eased | | 35-13 (85) |
| 42.2 Hook | | 42-09 (79)(77) | | 38-40 (73)(76) | | 36-56 (84) |
| 47.0 MP 47 | | 46-04 (83) max | | | | sigs |
| 47.8 Basingstoke | (56) | 47-37 stop | | 43-10 (69½) pass | | 41-48 (36) pass |
| IV | 18.00 | Waterloo - Salisbury | | | | |
| V & VI | 10.30 | Waterloo – Bournemouth - Weymouth | | | | |

Locomotives: 34056 Rebuilt Battle of Britain Class 4-6-2
35005 & 35030 Rebuilt Merchant Navy Class 4-6-2

Hampton Court Jct pass to Hook pass 28.9 miles

| Log No | Time | Average Speed | | Max Speed | EDHP at MP31 | EDHP per sq ft grate |
|--------|-----------------|---------------|---------|-----------|--------------|----------------------|
| | | Actual | Net | | | |
| IV | 25 mins 21 secs | 23½ mins | 68 mph | 74 | 83 mph | 1340-1440 36 |
| V | 22 mins 05 secs | 22 mins | 78½ mph | 79 | 82 mph | 1740-1840 37 |
| VI | 21 mins 16 secs | 21¼ mins | 81½ mph | 81½ | 88 mph | 1770-1870 38 |

Possibly the fastest recorded steam hauled time between Hampton Court Junction and Hook is 20-58 on 15/05/1965 with Merchant Navy No. 35005 with 10/330/350 driven by Gordon Hooper. Maximum speeds were 88 mph at Weybridge and 90 mph at Hook, minimum 75 at MP31. The full log is in DW Winkworth's "Bulleid Pacifics", page 198.

| RPS Steam Seminar Peterborough - Grantham | | | |
|---|----------------|-----------------|-------------|
| | I | II | III |
| Date | 23/05/2009 | 16/05/2009 | 05/07/2008 |
| Loco | 60163 | 60163 | 60007 |
| Load Tons | 13/465/510 | 13/465/505 | 13/471/510 |
| Recorder | B I Natham | M Notley | M Notley |
| 00-0 Peterborough | 00-00 start | 00-00 (38) | 00-00 (49) |
| 08.4 Tallington | 10-06 (75) | 08-04 (75) | 07-36 (78) |
| 12.2 Essendine | 31-21 (72) | 11-28 (74)(76) | 10-59 (73) |
| 15.8 Little Bytham | 16-17 (75)(71) | 13-52 (73) | 12-21 (75) |
| 20.7 Corby Glen | 20-13 (74) | 17-51 (75) | 17-24 (73) |
| MP 98 | 20-55 (72) | 18-36 (73) | 18-10 (72) |
| MP 99 | 21-45 (71) | 19-25 (72) | 19-00 (71) |
| 23.7 Stoke Summit | 22-42 (71) | 20-19 (71) sigs | 19-56 (69½) |
| 29.1 Grantham | 29-19 | 44-14 | 38-01 |

| | IV | V | VI |
|--------------------|----------------|----------------|--------------|
| Date | RM 1953 | RM1964 | 11/1962/RM63 |
| Loco | 60148 | 60022 | 60007 |
| Load Tons | 13/428/460 | 11/390/415 | 9/310/320 |
| Recorder | "Adam of Usk" | M N Bland | P G Martin |
| 00-0 Peterborough | 00-00 start | 00-00 (20) | 00-00 Start |
| 08.4 Tallington | 10-46 (73)(78) | 11-11 (69) | 09-17 (76) |
| 12.2 Essendine | 13-47 (74)(76) | 14-16 (78) | 12-11 (85) |
| 15.8 Little Bytham | 16-38 (73)(70) | 16-58 (82)(80) | 14-50 (81) |
| 20.7 Corby Glen | 20-42 (73) | 20-54 (82) | 18-37 (78) |
| 23.7 Stoke Summit | 23-17 (63½) | 22-51 (78) | 20-59 (74) |
| 29.1 Grantham | 28-44 | 27-39 | 26-06 |

| | VII | VIII | IX |
|--------------------|-------------|-------------------------|----------------|
| Date | 19/06/1934 | Railway Gazette 1939 | RM1943 WWII |
| Loco | 2001 | 4490 | 4902 |
| Load Tons | 20/649/651 | 17/593/635 | 19/608/660 |
| Recorder | Dynamometer | C J Allen | - |
| 00-0 Peterborough | 00-00 start | 00-00 (20) | 00-00 (25) |
| 08.4 Tallington | 11-29 (62) | 09-55 (66) | 10-22 |
| 12.2 Essendine | 15-05 (60) | 13-27 (62) | 13-45 |
| 15.8 Little Bytham | 16-38 (61) | 16-54 (60) | 17-10 |
| 20.7 Corby Glen | 23-37 (60) | 22-12 (53) | 22-20 |
| 23.7 Stoke Summit | 26-47 (56) | 25-40 (48) | 26-00 |
| 29.1 Grantham | 33-00 | 32-23 | 33-10 |

Page 6 – Peterborough – Grantham continued Tallington – Stoke Summit

I SLS Fifty years after, Golden Jubilee Celebration, 8.18 ex Kings X
 IV 17.35 Kings X - Newcastle
 V 14.00 Kings X - Newcastle
 VI 08.10 ex Kings X [following day D1501]
 VIII 10.00 Kings X - Edinburgh

Locomotives: 60148 & 60163 Peppercorn A1 Class 4-6-2
 60007, 4490 (later 60011), 60022, 4902 (later 60033) Gresley A4 Class 4-6-2
 All fitted with Kylchap Exhaust System except 4490
 2001 Gresley P Class 2-8-2 “Cock of the North”

| Tallington – Stoke Summit | | | | | |
|---------------------------|-------|-----------------|----------|--------------|----------------------|
| Log | Loco | Time | Av Speed | Average EDHP | EDHP per sq ft grate |
| I | 60163 | 12 mins 36 secs | 72.9 mph | 2050 - 2150 | 42 |
| II | 60163 | 12 mins 15 secs | 74.9 mph | 2120 - 2220 | 43 |
| III | 60007 | 12 mins 20 secs | 74.4 mph | 2070 - 2170 | 51 |
| IV | 60148 | 12 mins 31 secs | 74.3 mph | 1920 - 2020 | 39 |
| V | 60022 | 11 mins 40 secs | 78.7 mph | 1990 - 2090 | 49 |
| VI | 60007 | 11 mins 42 secs | 78.5 mph | 1600 - 1700 | 40 |
| VII | 2001 | 15 mins 18 secs | 60.0 mph | 1930 - 2030 | 40 |
| VIII | 4490 | 15 mins 45 secs | 58.3 mph | 1800 - 1900 | 45 |
| IX | 4902 | 15 mins 38 secs | 58.7 mph | 1880 - 1980 | 47 |

I & II If 71 mph maintained on 1/178 to Summit, maximum EDHP c. 2600

III Speed fell on the 1/178 from 72 to 69½ mph, maximum EDHP c. 2400

V The recorder claimed 80 mph maintained on 1/200 past Little Bytham and 78 mph on final 1/178 to Stoke Summit. Maximum EDHPs c. 2400 and c. 2450

VII Dynamometer trial: maximum pull measured at the Drawbar 6.1 tons on the 1/178 at 57 mph, DBHP 2,090 (if 57 mph and 6.1 tons exact 2076). EDHP approx 2400.
 Number 2001 driven on Full Regulator with cut-off extended from 15 to 20% at MP 89¾, 20 to 25% at MP 94 and 25 to 30% at MP 95¾. Boiler pressure maintained at 200-210 psi.

VIII Driver Dalrymple and his Fireman were working the “Flying Scotsman” from Kings Cross to Newcastle. Scheduled times Kings X to Grantham, Grantham to York and York to Newcastle were 110, 83 and 90 minutes respectively. Actual times were 107-55, 84-55 (83 net) and 86-00. The run was made at the time of the Munich uncertainty and three extra coaches were added to the already heavy set at Kings X.

Acknowledgements: Railway Magazine, Railway Gazette and Steam Railway

| RPS Steam Seminar | | Engine Working – Tallington to Stoke Summit | | | | | | | | | |
|-------------------|-------|---|-----|-----|----|-------|-------------|------|-----|-----|----|
| | | X | | | | | XI | | | | |
| Date | | May 1959 | | | | | Early 1950s | | | | |
| Loco | | 60046 | | | | | 60021 | | | | |
| Load Tons | | 12/382/405 | | | | | 12/412/435 | | | | |
| Recorder | | R I Nelson | | | | | R I Nelson | | | | |
| | Time | mph | BP | Reg | % | Time | mph | BP | SCP | Reg | % |
| Peterborough | 00-00 | | | | | 00-00 | (20) | | | | |
| Wennington Jct | Pws | (12) | | | | | | | | | |
| Tallington | 14-08 | (62) | 210 | RFO | 17 | 09-31 | (70) | 230 | 230 | RFO | 12 |
| Essendine | 17-47 | (61) | 210 | RFO | 17 | 12-47 | (68) | 235 | 235 | RFO | 15 |
| MP 90 | 19-06 | (64) | 215 | RFO | 19 | 15-58 | (70) | 235 | 235 | RFO | 18 |
| Little Bytham | 21-13 | (61) | 210 | RFO | 21 | 17-53 | (68) | 230 | 230 | RFO | 18 |
| MP 95 | 24-03 | (58) | 210 | RFO | 23 | 18-29 | (61) | 227 | 227 | RFO | 18 |
| Corby Glen | 26-09 | (63) | 220 | RFO | 25 | 20-29 | (66) | 230 | 230 | RFO | 20 |
| Stoke | 29-02 | (61½) | 205 | RFO | 15 | 23-21 | (61) | 225 | 155 | 3/8 | 10 |
| Grantham | 34-19 | stop | | | | 29-01 | (25) | sigs | | | |

BP - boiler pressure; SCP - steam chest pressure; Reg – regulator opening; RFO- full, % percent cut off

X – 60046 Gresley A3 Class 4-6-2 fitted with Kylchap exhaust. 10.20 Kings Cross Grantham, scheduled 79 minutes to first stop at Peterborough, actual time 76-44. 35 minutes to next stop at Grantham. Average EDHP Tallington to Stoke 1300 – 1400.

X1 – 60021 Gresley A4 Class 4-6-2. 10.00 Kings Cross – Edinburgh “Flying Scotsman”. First stop Newcastle, scheduled 281 minutes, actual 279-29 Net 245 minutes. Average EDHP Tallington to Stoke 1500 – 1600.

Date: 26/09/2009 Loco: 60163 A1 Class 4-6-2 Load tons: 13/464/490. Recorder: M Nottley details abstracted from written account in Steam Railway Number 368.

| | Speed | BP | Reg | % | Comments |
|------------|-------|-----|-----|----|--|
| Essendine | (50) | | RFO | 45 | Recovering from a tsr (20) |
| MP 92 | (62) | 235 | RFO | 45 | Boiler pressure on 1/200 between MP 91 & MP 95 |
| MP 93 | (63) | 235 | RFO | 45 | steady at 235/240 psi |
| MP 94 | (64) | 235 | RFO | 45 | |
| MP 95 | (65) | 235 | RFO | 45 | |
| Corby Glen | (71½) | 235 | RFO | 45 | “As a rule Tornado is not worked past 45% (cut off) at |
| MP 98 | (71½) | 230 | RFO | 50 | higher speeds”... “permission ... this could be |
| MP 99 | (71) | 230 | RFO | 53 | exceeded for a short duration” |
| MP 100 | (70) | 230 | RFO | 53 | |

EDHP at MP 95 (end of 1/200), 65 mph, still accelerating? 2050 – 2150

EDHP at MP 100 (end of 1/178) MP 100, 70 mph, still decelerating, 2350 - 2450

Acknowledgements: RI Nelson Footplate Survey Ian Allan 1979 p.24; Norman McKillop’s “Enginemen Elite”

RPS Steam Seminar (V)

North Yorkshire Moors Railway:- Whitby - Pickering Recorder I.Umpleby
 14.00 Whitby – Pickering; 22/08/2008; Loco 61994: Load 7: Tons 241/260

| mch | location | sch | actual | stn - stn | mph |
|-------|-----------|----------|----------------|-------------|--------------------------|
| 00.00 | Whitby | 14.00 | 14.02.22 | 00.00 | (26) |
| 1.28 | Ruswarp | | | 3-49/3-56 | (0) level x#ng |
| 5.59 | MP | | | 15-30 | (26)(13*)(31)(28)(20) |
| | G. frame | | | 16/47/17-51 | |
| 6.21 | Grosmont | 14.20/30 | 14.21.32/29.48 | 19-10 | stop |
| 6.59 | MP | | | 2-27 | (23) gradient1/49 |
| 7.59 | MP | | | 5-34 | (16) 1/49 |
| 8.59 | MP | | | 8-56 | (20) 1/49 |
| 9.49 | Goatland | 14.50 | 14.41.56/49.59 | 12-08 | stop |
| 13.59 | MP | | | 10-30 | (27)(25)(31)(25)(29) |
| 15.00 | Newton D | 15.03 | 15.04.43/05.12 | 14-44 | stop |
| 18.16 | Levisham | 15.20 | 15.14.42/19.55 | 9.30 | (32)(23)(25)(21) |
| 24.03 | Pickering | 15.40 | 15.37.24 | 17-29 | (21)(29)(26)(16)(31)(11) |

West Somerset Railway: - Norton Fitzwarren [Allerford Jct.] - Minehead

| | Date0 | | 4/10/09 | | | 15/6/10 | | |
|-------|-----------|----|------------|----------|-------|-------------|----------|-------|
| | Train | | 12.05 | | | 16.15 | | |
| | Loco | | 6024 | | | 3850 | | |
| | Load | | 7 | | | 7 | | |
| | Tons | | 245/270 | | | 245/248 | | |
| m.ch | Rec | sc | M.J.R. | mph | sch | M.J.R | mph | grade |
| 00.00 | Allerford | 0 | 00-00 | 1ML | | | | |
| 1.20 | MP167 | | 4-10 | (25)(20) | | | | 75R |
| | BL O/H | | 6-40/13-10 | | | | | 85R |
| 2.40 | B.Lyd'd | 12 | 15-10 | (6) ** | 0 | 00-00 | | 85R |
| 3.20 | MP169 | | 17-52 | (26) | | 2-35 | (26)(27) | 101R |
| 5.20 | MP171 | | 22-47 | (25) | | 7-16 | (26) | 80R |
| 6.30 | Crowc'be | 22 | 25-50 | (6) * | 13/14 | 10-31/10-45 | | 80R |
| 9.04 | Stog'ber | | 32-53 | (23)(26) | 22 | 18-13/18-32 | | 68F |
| 12.26 | Willon | 38 | 41-28 | (5) ** | 30/38 | 27-15/28-14 | | 84F |
| | Doniford | | 44-08 | (15) psr | 41 | 30-52 | | 145F |
| 14.04 | Watchet | | 46-52 | (13)(27) | 45 | 32-48/35-15 | | 145F |
| 16.31 | Washford | | 52-30 | (20)(25) | 54 | 41-36/41-42 | (28)(26) | 74R |
| 18.54 | Blue A | 58 | 60-23 | (5) ** | 60/61 | 48-24/48-55 | | 65F |
| 21.41 | Dunster | | 65-40 | (5) psr | 68 | 54-15/55-04 | | 81F |
| 22.11 | Mineh'd | 73 | 71-30 | | 75 | 60-40 | | 213F |

* slow to exchange token

** slow to exchange token and pass Up train

Locos : 61994 LNER K4 2-6-0, 6024 GWR "King" 4-6-0, 3850 GWR 2-8-0

M.J.Rowe 29/09/10

RPS Steam Seminar (VI)

GWR 51xx 2-6-2 Tank No.4160 on West Somerset Railway August 2010

| | | | | | |
|-------------------|-----------|--------------|-----------|------------------|-----------|
| Date | 09/08 | 09/08 | 12/08 | 12/08 | 15/08 |
| Train ex Minehead | 10.15 | 15.00 | 10.15 | 15.00 | 15.00 |
| Load | 6/208/215 | 7/239/260 | 6/208/215 | 8/274/295 | 7/237/245 |
| Recorder | M.J.Rowe | M.J.Rowe | M.J.Rowe | M.J.Rowe | J.Heaton |
| Blue Anchor | 00-00 | 00-00 | 00-00 | 00-00 | 00-00 |
| bottom 1/65 | (32) | (30) | (29) | (29) | (30) |
| top 1/65 | (25) | (25) | (26) | (27) | (27) |
| Washford | 6-15 | 6-17 | 6-17 | 6-58 | 6-26 |
| Williton | 00-00 | 00-00 | 00-00 | 00-00 | 00-00 |
| on 1/92 | (29) | (30) | (30) | (30½) | (27) |
| Stogumber | 8-28 | 8-38 | 8-41 | 8-37 | 8-36 |
| Stogumber | 00-00 | 00-00 * | 00-00 | 00-00 | 00-00 |
| on 1/92 | | (30) | (30) | (29) | (26) |
| Crowcombe | 7-30 | 8-45 | 7-25 | 8-14 ** | 7-58 |
| | | * slow start | | ** slow entrance | |

| | | | | | |
|----------|-------------|----------------|-----------|-----------|-----------|
| Distance | Date | 21/08/10 | 21/08/10 | 23/08/10 | 23/08/10 |
| | Train | 10.15 | 15.00 | 10.15 | 15.00 |
| | Load | 7/237/245 | 7/237/255 | 7/237/255 | 7/237/250 |
| Miles/ch | Recorder | M.J.Rowe | M.J.Rowe | M.J.Rowe | M.J.Rowe |
| 0.00 | Blue Anchor | 00-00 | 00-00 | 00-00 | 00-00 |
| | bottom 1/65 | (26) | (34) | (32) | (30) |
| | top 1/65 | (25) * | (29) | (26) | (25) |
| 2.26 | Washford | 7-06 | 5-58 | 6-17 | 5-59 |
| 0-00 | Williton | 00-00 | 00-00 | 00-00 | 00-00 |
| | on 1/92 | | | (29) | (32) |
| 3.22 | Stogumber | 8-27 | 8-45 | 8-55 | 7-42 |
| 0-00 | Stogumber | 00-00 | 00-00 | 00-00 | 00-00 |
| | on 1/92 | Other wise | (30) | (29) | (25) |
| 2.54 | Crowcombe | engaged !! | 7-38 | 7-59 | 8-17 |
| | | * slip on 1/65 | | | |

John Heaton's log was with GPS and showed 27-28 mph maintained on the 1/65 before Washford. An Equivalent Drawbar Horsepower [EDHP] in the range 850-890.

MJR timings taken whilst on duty, normally bottom and top quarters on the 1/65, the four quarters on the 1/92 before the Stogumber stop and the last two before Crowcombe. During 14 years travelling behind 4160 the sustained 30½ mph on the 1/92 before braking for Stogumber with 295 tons was power wise the best ever on that stretch with a 51xx Class 2-6-2 Tank [EDHP 820-850]. Two days later when 32 mph was sustained with 255 tons the EDHP was 760-780..

Starts out of Bishops Lydeard are normally gentle, particularly if the loco is beginning its day there. On the 12.30 departure, after an 11.33 arrival, [ie the loco has been standing for an hour] matters are also taken easily for the first five minutes for fear of tearing the fire apart. Train duties are such that start to stop times only are noted.. The 16.55 departure often sees greater activity from the footplate crew, the loco has been at BL for less than 30 minutes and as it happens train duties are less.

Bishops Lydeard to Crowcombe times during August with 4160



| | | | | | | |
|---------|--------|-----------|------------------|-------|-----------|---------------|
| 09/08. | 12.30 | 7/239/260 | 12 mins-34 secs. | 16.55 | 7/239/242 | 12mins-52secs |
| 12/08 . | 12-30 | 6/208/230 | 12 -54 | 16.55 | 8/274/276 | 10 -40 |
| 21/08 | 12.30 | 7/237/260 | 10 -58 | 16-55 | 7/247/240 | 10 -21 |
| 23/08 | 12.30. | 7/237/255 | 11 -05 | 16-55 | 7/237/240 | 10 -33 |

Details for two of these

| | Date | 12/08 | 21/08 |
|----------|-----------------------|------------------------|-----------------|
| | Train | 16.55 | 16.55 |
| | Load | 8/274/276 | 7/237/240 |
| miles/ch | Recorder | M.J.Rowe | M.J.Rowe |
| 0.00 | Bishops Lydeard | 00-00 | 00-00 |
| 0.60 | MP169 | 3-49 (23) | 3-01 |
| | Quarters before MP171 | (29)(30)(31)(29) | |
| 2.60 | MP171 | 8-00 (30) | 7-48 (28) |
| 3.75 | Crowcombe | 10-40 stop | 10-21 stop |
| | | RFO and 40% from MP170 | Very good start |

Gradients: from Bishops Lydeard [MP168¼]

MP168¼ : 1/101 to MP169½ then brief 1/354 before 1/80 to MP170¾
1/99 to MP171 and 1/81 onwards to MP172 [just before Crowcombe station]

On the 12th 4160 developed 860-900 EDHP. ie 43 EDHP / sq foot fire grate

4160 has had a good August 2010. It is in its sixth year of its ten years between major overhauls. Last winter it was given an intermediate including considerable attention to valves and pistons. It is considered to be in the best condition it has been in Preservation and perhaps ever.

M.J.Rowe 30/08/2010

