

A large steam locomotive, numbered 35028, is shown in a workshop or factory setting. The locomotive is dark-colored with a red buffer beam and is positioned on tracks. The background features a high ceiling with a grid of skylights and industrial structures. The text "Running on the Mainline with Clan Line" is overlaid in a large, black, sans-serif font.

Running on the Mainline with Clan Line

Alex Powell

Introduction



- Built December 1948
- Early life spent on eastern section
- Rebuilt October 1959 having run 401,005 miles
- Withdrawn July 1967 having run 794,391
- 3 Locos suggested
- 35028 was second choice



Standards and Regulations


- 4 Page document
- Many not related to engineering
- Main ones of note:
 - RIS-2004-RST – Rail Vehicle maintenance
 - RIS-0775-CCS – AWS&TPWS Application Requirements
 - RIS-2766-RST – Rail Industry Standard for Wheelsets
 - RIS-2003-RST – Heritage Loco Certification for the Mainline
 - RIS-2646-RST – Axle Bearing Maintenance
 - RIS-261-RST – Rail Industry Standard for Driving Cabs
 - RIS-2472-RST – Data Recorders on Trains

A large black steam locomotive, numbered 35028, is positioned on tracks inside a large industrial workshop. The locomotive is facing right and has its side door open. It features a prominent smokestack and various mechanical components. The workshop has a high ceiling with a grid of skylights and structural beams. The floor is a reddish-brown color. The text "Maintenance and Overhaul" is overlaid in the center of the image.

Maintenance and Overhaul

Maintenance Plan

- Based off RIS-2004-RST – Rail Vehicle maintenance
- RIS based of BR documents MT276 and MP11
- Sets out maintenance for the loco
- A,B,C and D examinations specified

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Locomotive Maintenance Plan		
35028		
Clan Line		
PURPOSE:	This document details the standards of maintenance including the criteria for inspection and the periodicity of maintenance of those components and systems that ensure continuous conformance with the Mandatory Requirements as defined by Railway Group Standard GM/RT 2004.	
SCOPE:	Locomotive 35028 Clanline (98828)	
IMPLEMENTATION:	January 2016	
APPROVAL AND AUTHORISATION		
Signature _____ Job Title _____		
Author:	_____	Engineering Team D. Easson
Approved by:	_____	Engineering Team R. Gretton
Authorised by:	_____	Chief Mechanical Engineer C. Ellick
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EXAMINATION SCHEDULE FOR PRESERVED STEAM LOCOMOTIVES RUNNING ON BR LINES		
PAGE	ITEM NO.	7 YEARLY HEAVY MECHANICAL EXAMINATION - INDEX
63		General Remarks
65	4.01	Owners/Preservation Society Records.
66	4.02	Main Frames, Cross Stays, Stiffeners, Brackets, Horn Blocks, Horn Stays, Boiler Keys or Steadying Brackets, Expansion Angle, Liners
67	4.03	Cylinders, Valves, Pistons, Cylinder drain cocks and Gear.
70	4.04	Valve Motion, Reversing Gear, Coupling and Connecting Rods, Crossheads and Slidebars.
71	4.05	Springs and Spring Gear.
72	4.06	Axleboxes, underkeeps.
73	4.07	Brakegear and Associated Fittings.
74	4.08	Bogies, Pony Trucks, Bissel Trucks and Radial Axleboxes
75	4.09	Sanding Gear
76	4.10	Draw and Buffing Gear
77	4.11	Regulator, Main Steam Pipes, Superheater, Header and Elements, Blast Pipe and other Smokebox fittings.
78	4.12	Cab and Fittings.
79	4.13	Wheels, Tyres and Axles.
80	4.14	Lubricators, Atomisers and Associated Gear.
81	4.15	Boiler Fittings, Steam Valves, Clack Boxes, Injectors
82	4.16	Water Tanks, Tender, Slide, Saddle or Pannier
83	4.17	Coal Bunker
84	4.18	Tender Frame Dragbox and Coal Pusher
85	4.19	Copper, Iron and Steel Pipes.
86	4.20	Ancillary Fittings.
87	4.21	Steam Test
2306/11721/62		

Exam	Description	Frequency	Tolerance	Minimum Depot Level
A	Daily 'Pre - FTR' Exam	Prior to every trip	Each exam is valid for one day's running	L1
B	Washout Examination	Boiler Washout at 15 days (or 6 months)	A maximum of 20 days in steam.	L3
C	Boiler & Mechanical Examination	6 Monthly	+/- 1 Month.	L3
D	Annual Examination	12 Months	+/- 1 Month.	L3
E	Bi-Annual Examination	24 Month Jobs	+/- 1 Month.	L3
F	Tri-Annual Examination	36 Month Jobs	+/- 1 Month.	L3
G	Intermediate Overhaul	5 Years	+/- 6 Months.	L4
W	Winterisation	Seasonal	As Required	L1

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10 Years	Full Overhaul	10 Years	Not to exceed 10 years.	L5
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I Jobs – Cab Interior, Fittings & Controls

Job Description	Job No.	Examination Code							
		A	B	C	D	E	F	G	S
Cab Pressure Gauges Inspection	IG301					*	*	*	*
Gauge Calibration	IGA101					*	*	*	*
Cab Controls Inspection	IV101	*							
Cab Controls Examination	IV301			*	*	*	*	*	*
Cab Reversing Mechanism Inspection	IV302			*	*	*	*	*	*
Cab Interior Inspection	IX101	*		*	*	*	*	*	*

L Jobs - Lubrication

Job Description	Job No.	Examination Code							
		A	B	C	D	E	F	G	S
Lubrication Inspection	LS101	*							
Steam Brake Lubrication	LS102	*							
Lubrication System Inspection	LS201		*	*	*	*	*	*	*
Mechanical Lubricator Examination	LS501						*	*	*

P Jobs – Valves, Pistons & Cylinders

Job Description	Job No.	Examination Code							
		A	B	C	D	E	F	G	S
Cylinder Drain Cocks & Gear Inspection	PV201	*							
Cylinder Drain Cocks & Gear Examination	PV301			*	*	*	*	*	*
Cylinder Examination	PV302			*	*	*	*	*	*
Steam Chest Drains Inspection	PV303			*	*	*	*	*	*
Piston Valve Examine	PV402						*	*	
Piston Examine	PV501								*
Cylinder Relief Valves Examination	PV502								*
Anti Vacuum Valve Examination	PV503								*
Piston & Valve Steam Test	PZ101	*		*	*	*	*	*	*

S Jobs – Safety Systems

Job Description	Job No.	Examination Code							
		A	B	C	D	E	F	G	S
AWS & TPWS Equipment Inspection	SR101	*		*					
AWS/TPWS Receiver Height Check	SR401				*	*	*	*	*
AWS/TPWS Receiver Assembly & Cable Check	SR402				*	*	*	*	*
AWS/TPWS Cab Equipment Check	SR403				*	*	*	*	*
AWS/TPWS Seal Check	SS101	*		*	*	*	*	*	*
AWS & TPWS Functional Inspection	SZ101	*		*					
AWS & TPWS Full System Test	SZ401				*	*	*	*	*

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Job No: **DV401**
Job Title: **Safety Valves Examination.**

Safety Condition: 1

SCHEDULED WORK

Note: Check examination records for notes of lifting & closing pressures to ascertain if any defects may have arisen since the last exam.

"Ross Pop" Pattern Safety Valve

- Visually examine safety valve assembly for any signs of leaks.
- Remove locking taper & split pins and locking nuts.
- Remove valve cap and unscrew top half of body assembly.
- Remove muffle cap, adjusting disc, spring, cap, spring, spindle and valve.
- Examine valve body/pillar for fractures, security and signs of wastage.
- Examine spring caps for any damage or fractures.
- Examine adjusting disc for any damage or fractures.
- Examine muffle cap for any damage or fractures.
- Examine valve cap for any damage or fractures.
- Examine valves for any damage or fractures.
- Examine base/seat for any damage or fractures.
- Examine mating surfaces between valve and seat for any wear, signs of steam cutting or pitting.
- Measure seat area on body, seat and recess on valve to ensure it is within tolerance. Refer to SR Drawing W.7795/E35720 for dimensions where applicable.
- Examine spindle for any damage, fractures, signs of wastage and that it is straight and true.
- Examine spring for any defect or wastage.
- Check free length of spring and that ends are square to axis.
- Re-assemble complete assembly.
- Test valves to Job DV201 in presence of competent person from notified body.

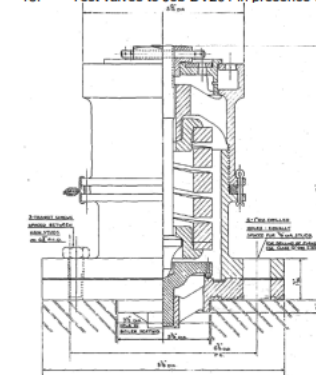


Fig. 1 – SR Standard Assembly


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A-Pre fitness to run/Daily

- Completed by society member before official FTR

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A2.0 Record Cards

A2.1 A Exam – Fitness to Run Examination

LOCOMOTIVE – "A" EXAM PRE FITNESS TO RUN EXAMINATION				
Examiner:		Location		
Date:		Locomotive Number	35028	
Sheet 1 of 1				
Item	Parts To Be Examined	Intls	Item	Parts To Be Examined
AC101	Air Compressor Inspection		HI101	Carriage Warming Equipment Inspection
AS101	Sanding Inspection		IV101	Cab Controls Inspection
BB101	Brake Block Inspection		IX101	Cab Interior Inspection
BM101	Brake Gear Inspection		LS101	Lubrication Inspection & motion grease
BP101	Headstock Flexible Pipe Examination		LS102	Steam Brake Lubrication
BP102	Intermediate Flexible Pipe Examination		PV201	Cylinder Drain Cock Inspection
BW101	Vacuum Ejector Functional Inspection		PZ101	Piston & Valve Steam Test
BZ101	Air Brake Functional Inspection		SR101	AWS & TPWS Equipment Inspection
BZ102	Vacuum & Steam Brake Functional Inspection		SS101	AWS/TPWS Seal Check
CW101	Cab Window Inspection		SS101	Security Seal No.
DA101	Ashpan & Damper Inspection		SZ101	AWS & TPWS Functional Inspection
DB101	Boiler & Firebox Inspection		TR101	Motion & Valve Gear Inspection
DI101	Injector Functional Inspection		UA101	Axlebox Inspection
DS101	Smokebox Inspection		UB101	Drawgear & Buffers Inspection
DV101	Safety Valves Test		UF101	General Inspection
EP5018	GSM-R Train Radio Battery Charge		UF102	Lifeguards Check
EP101	GSM-R Power Up & Echo Test		US101	Spring & Spring Hanger Inspection
EL101	Lighting Inspection		UW101	Wheels & Tyres Inspection
EO101	Speedometer Inspection		WT101	Tender Tank Inspection
EV101	OTMR Equipment Inspection		XY101	Maintenance Records Inspection
			ZX101	Emergency Equipment Inspection
Defects Found / Reported			Action Taken	
DEFECTS & RECTIFICATION WORK MUST BE RECORDED ON THE UNSCHEDULED MAINTENANCE SHEETS				
Signed Off By		Date		

B-Boiler washout

- Max 20 days in steam between B exams
- Cold and hot boiler exam
- Mechanical exam
- Roughly 2-3 times a year




Water Treatment


- Quick aside
- 1 Litre per 1000 gallons of tender water (tannin and sodium carbonate)
- More or less depending on tanker water source
- Also based on regular boiler water testing



C-Sixth monthly exam

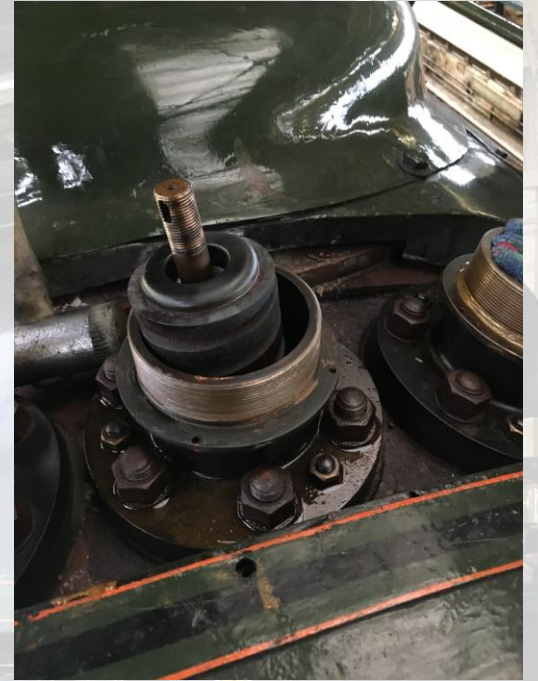
- Within six months of annual exam
- More thorough mechanical exam than B

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A2.3 C Exam – 6 Monthly Examination					
LOCOMOTIVE "C" EXAM 6 MONTHLY EXAMINATION					
Examiner:		Location			
Date:		Locomotive Number 35028			
Where repairs are required, record on the defect section and record on the unscheduled maintenance sheet					
Part 1 – To be carried out with locomotive OUT OF STEAM					
Item	Parts To Be Examined	Intls			
DA201	Ashpan & Damper Inspection: Damper Doors Ashpan/Hopper Doors				
DB201	Boiler Washout: Gauge Frames	pH Level: TDS Level:			
DB202	Boiler Inspection: Crown Plate Door Plate Firebox Shoulders Firebox Wrapper Side Plates Stays Foundation Ring Firebox Tubeplate Smokebox Tubeplate Boiler Barrel				
DB204	Mud Hole Doors Washout plug holes				
DE201	Spark Arresting Equipment				
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Part 2 – To be carried out with locomotive IN STEAM					
	Post Boiler Washout & Inspection: Firebox Tubeplate Smokebox Tubeplate Washout Plugs Mudhole Doors Steam Manifold Gauge Frames				
DB203	Shut Off Cocks				
DI101	Injector Functional Inspection				
DV201	Safety Valves Reset (as required)				
HI201	Carriage Warming Equipment Inspections & Test				
LS201	Lubrication Inspection & Re – Grease				
PZ101	Piston & Valve Steam Test				
WV201	Tender Water Gauge Inspection				
<table border="1"> <tr> <td>MNLPS / LMPLN / 001</td> <td>Issue 01 / Revision 00</td> <td>January 2016</td> </tr> </table>			MNLPS / LMPLN / 001	Issue 01 / Revision 00	January 2016
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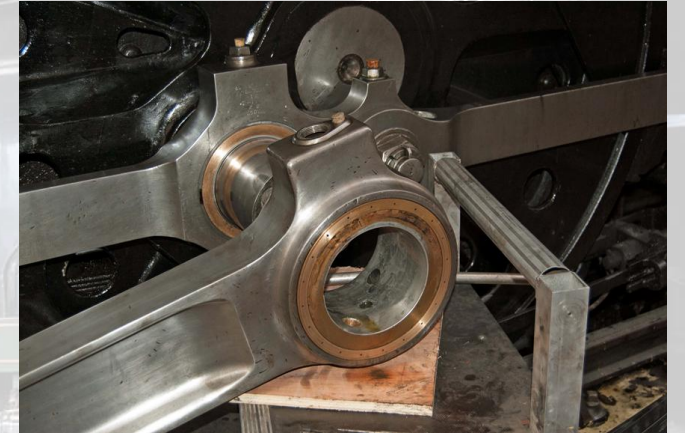
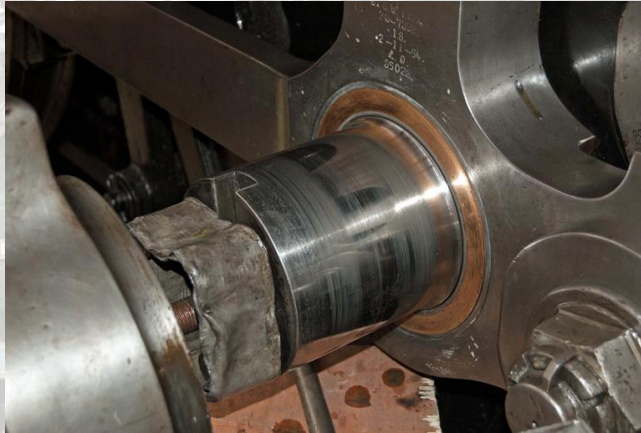
D-Annual Exam

- Complete B and C exams
- Also recalibration of all Gauges and safety systems
- Resetting of safety valves



General Maintenance

- Any preventative maintenance
- Occasional in service improvements
- Any Tyre Turning

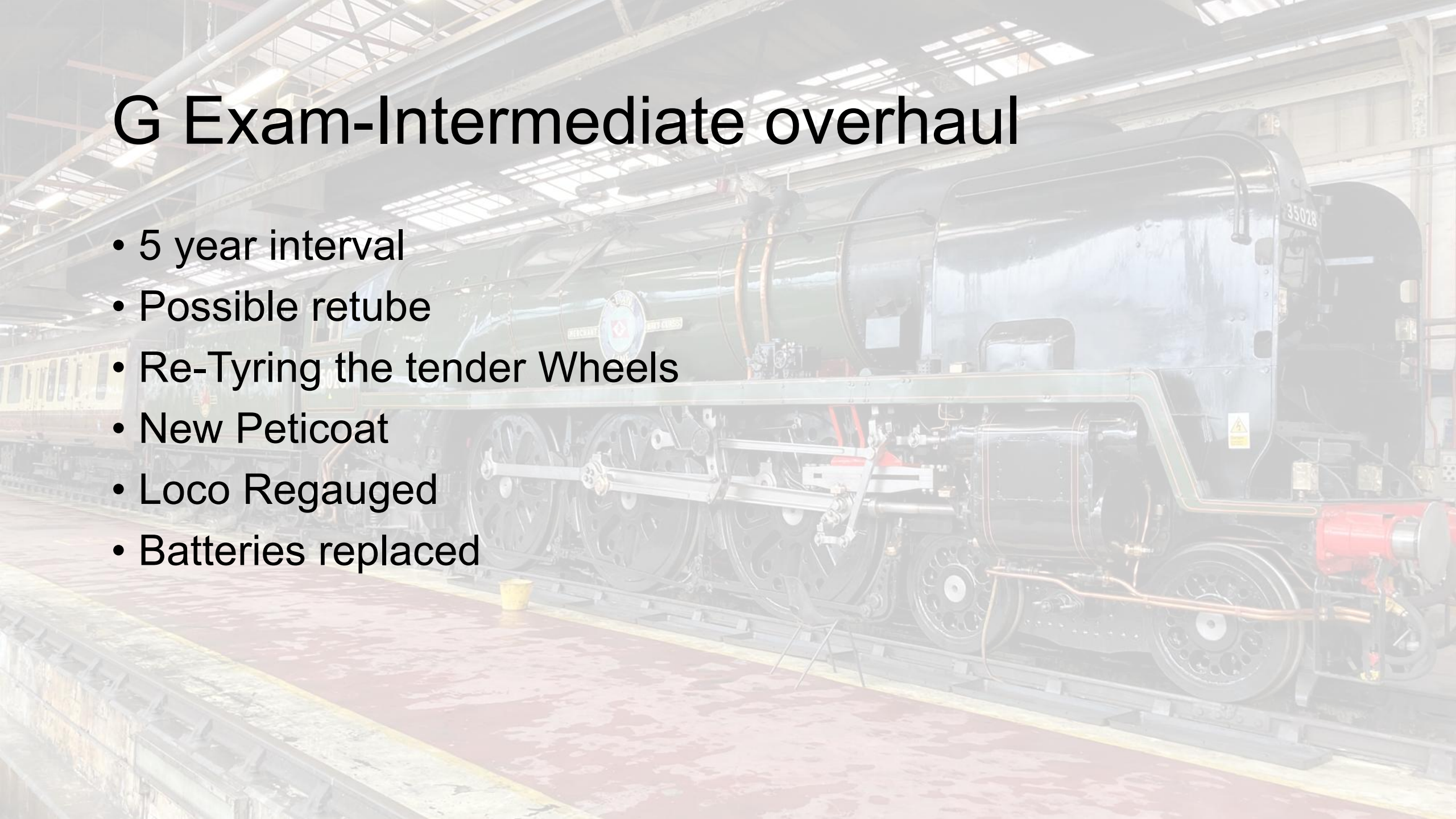


Overhauls



G Exam-Intermediate overhaul

- 5 year interval
- Possible retube
- Re-Tyring the tender Wheels
- New Peticcoat
- Loco Regauged
- Batteries replaced



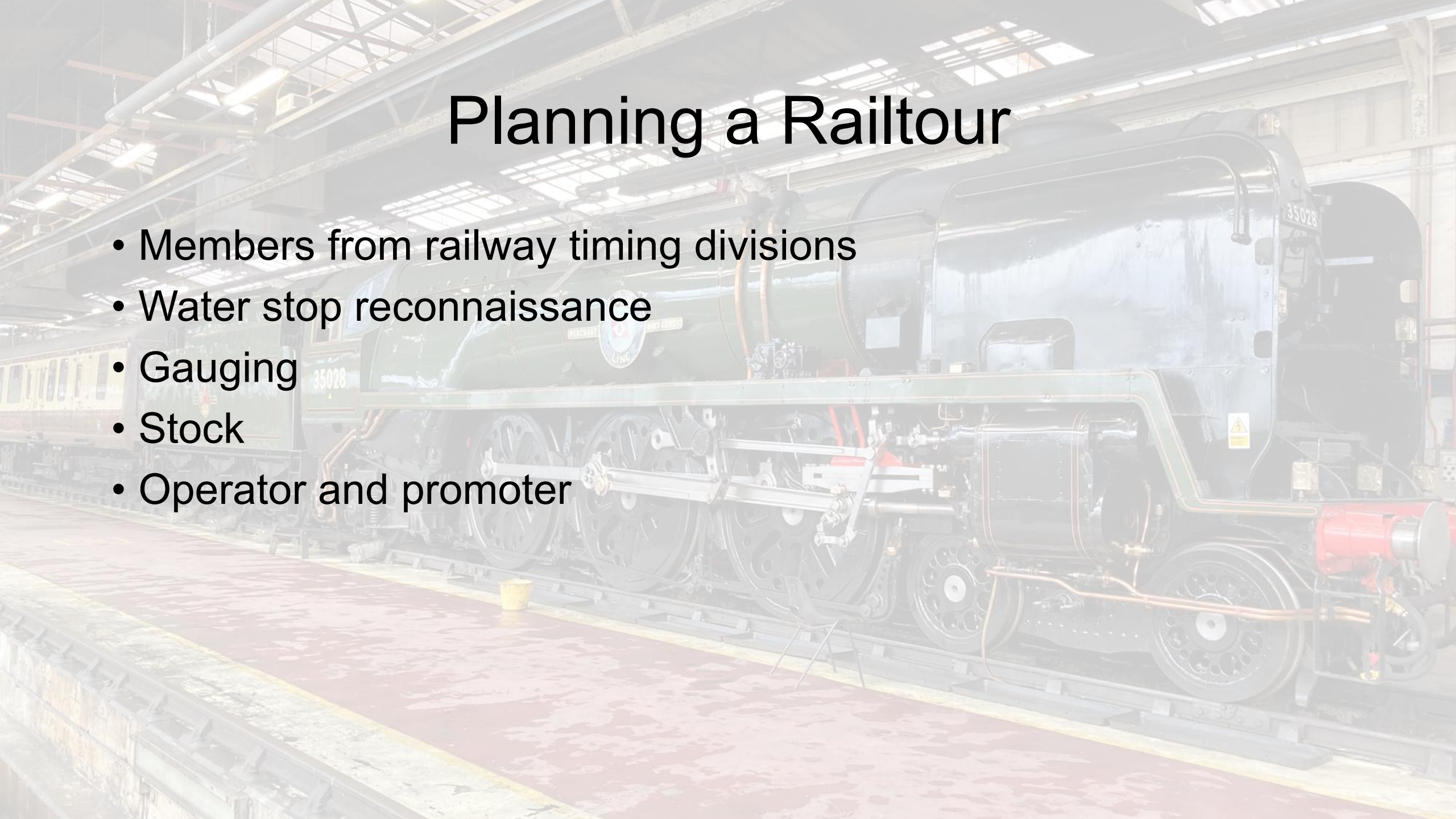
10 year general/major overhaul

- Complete boiler overhaul (removal from frames)
- Complete overhaul of mechanical components
- Tyres
- Safety systems
- Any major modifications (e.g. Air compressor and braking)
- Possible upgrades (ECTS)



Planning a Raitour

- Members from railway timing divisions
- Water stop reconnaissance
- Gauging
- Stock
- Operator and promoter





Running a Raitour

Before Tour

- Support Crew organised roughly 6 weeks before
- Cleaning ALWAYS going on
- High Standards to keep
- Any A-Exam checks that can be done cold



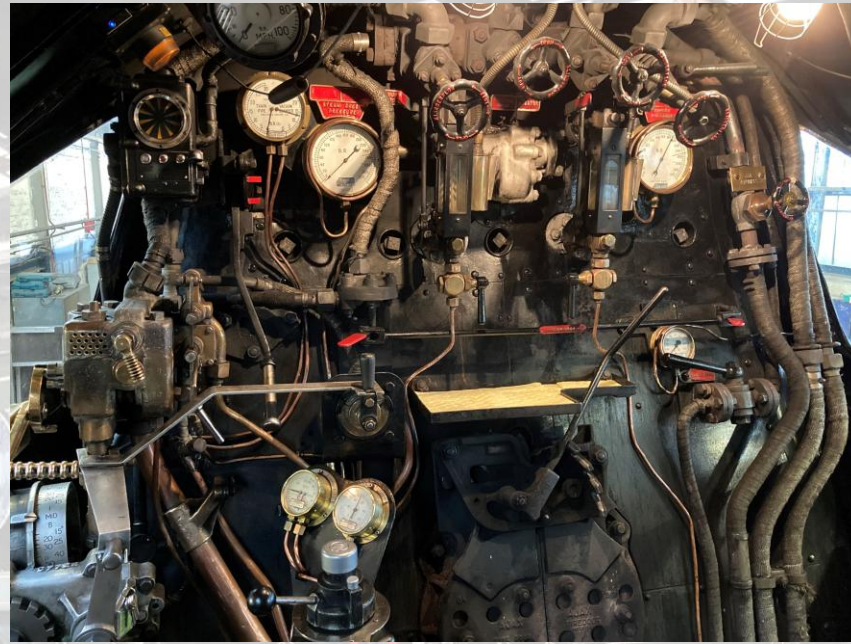
Two Days Before Tour

- Fire Lit Late afternoon/Evening
- 12 hours to reach 10psi



Day Before Tour

- FTR exam
- Loco Coaled
- Loco Fully oiled
- Any remaining cleaning completed
- Support crew meeting
- Bed the loco down for the night



Loco Coaled



Loco fully Oiled

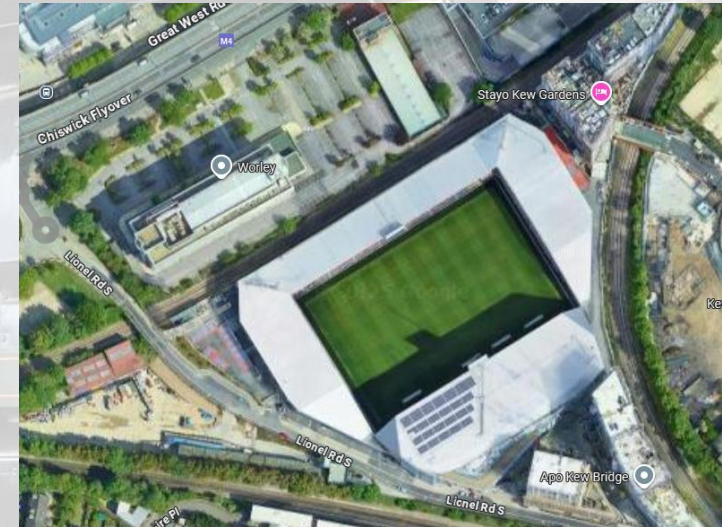


FTR



Changes since 2021

- Moved from Surrey Hills to Kent Circular
- Lengthens tour for Belmond
- Better for the Loco
- Better for Passengers
- Slightly earlier start





A Typical Kent GOAT Tour

Morning of the Tour

- Up at 6:30 (earlier if prepping fire)
- Bacon butties for Breakfast
- Any final prep and cleaning
- Slowly Building up fire
- Trimmings in and lubricators primed
- Hand over to DB Crew at 0900
- Roll out of Shed
- Diesel takes stock out to Battersea yard
- Couple up and pull stock out
- Towed to Victoria



At Victoria

- On the platform in Smock Coats, Shirt and Tie
- Answer questions
- Footplate visitors
- Pictures
- Protect passengers and enthusiasts



Out on the run

- Out Via the Chatham Mainline
- Footplate rep, managing the loco
- Rest of support crew relax and enjoy the journey
- Lunch Provided by society member (very important)



Out on the run - Outward

- Out Via the Chatham Mainline
- Start via Catford loop
- Then Climb up to Sole Street
- Then across the downs through Rochester, Chatham and Gillingham



Image courtesy of Thomas Mcpherson

Water Stop

- Pull Coal Forward
- Deal with the fire if necessary
- Take Water (3-4000 gallons)
- Treat water (Sodium Carbonate and Tannin)
- On the platform answering questions
- Keeping people away from tender and hose



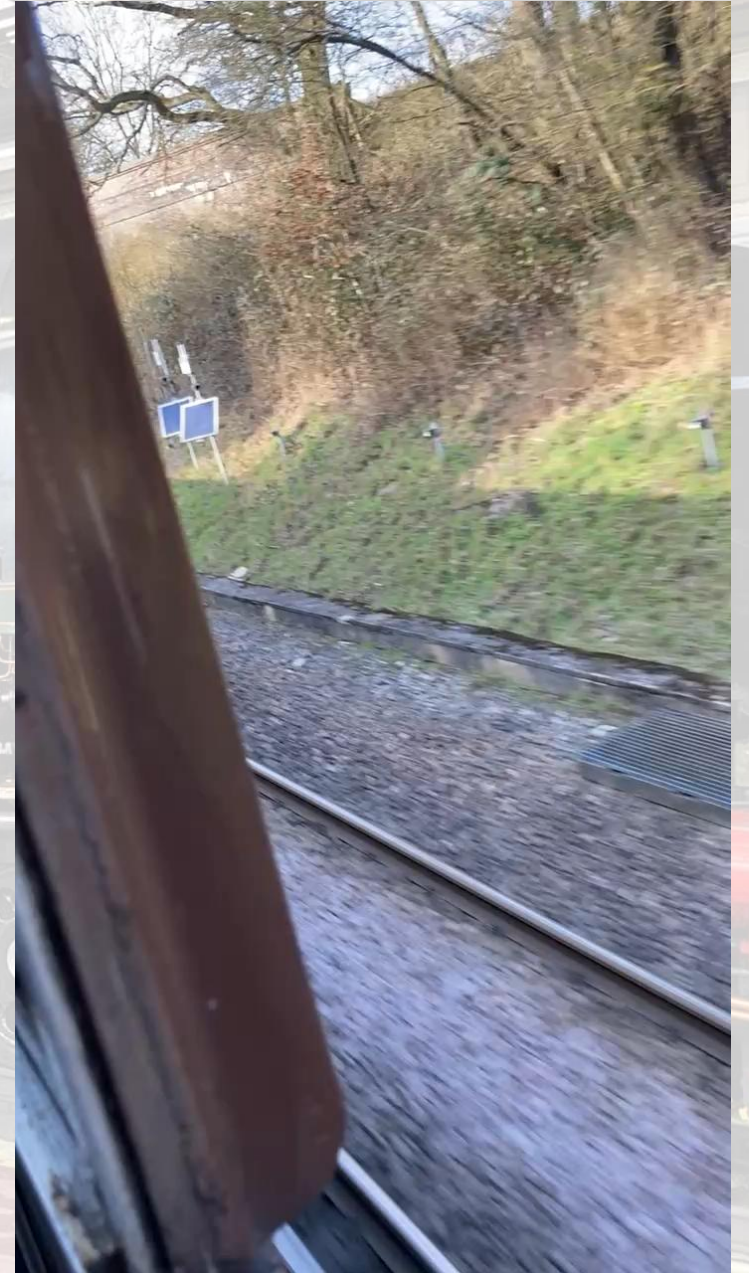
Out on the run - Return

- Return Via the Southeastern Mainline
- Start gently through tunnel and round curves
- Stay in 60% to 30 mph
- Climb along the bottom of the cliffs and up through Folkstone
- Footplate rep is pulling coal forward regularly from Ashford (may also fire)
- Firing little and often
- Normally stop on 1 yellow at Tonbridge (need a clear rune at the bank)



Out on the run - Return

- Good climb up through Hildenborough and Sevenoaks tunnel
- Firing stops at Petts Wood Junction
- Begin running things down
- Start to pull fire back out from under the arch around Shortlands Junction
- Gentle steaming on the way in
- Fill the boiler to cool things down
- Pause on Grosvenor bridge if early
- Hand over to new footplate rep on arrival



Back at Victoria

- Next Footplate rep takes over
- Tea and Snacks for the Crew
- Footplate Visitors
- On the platform in Smock Coats to answer questions
- Diesel arrives, couples and conducts a brake test



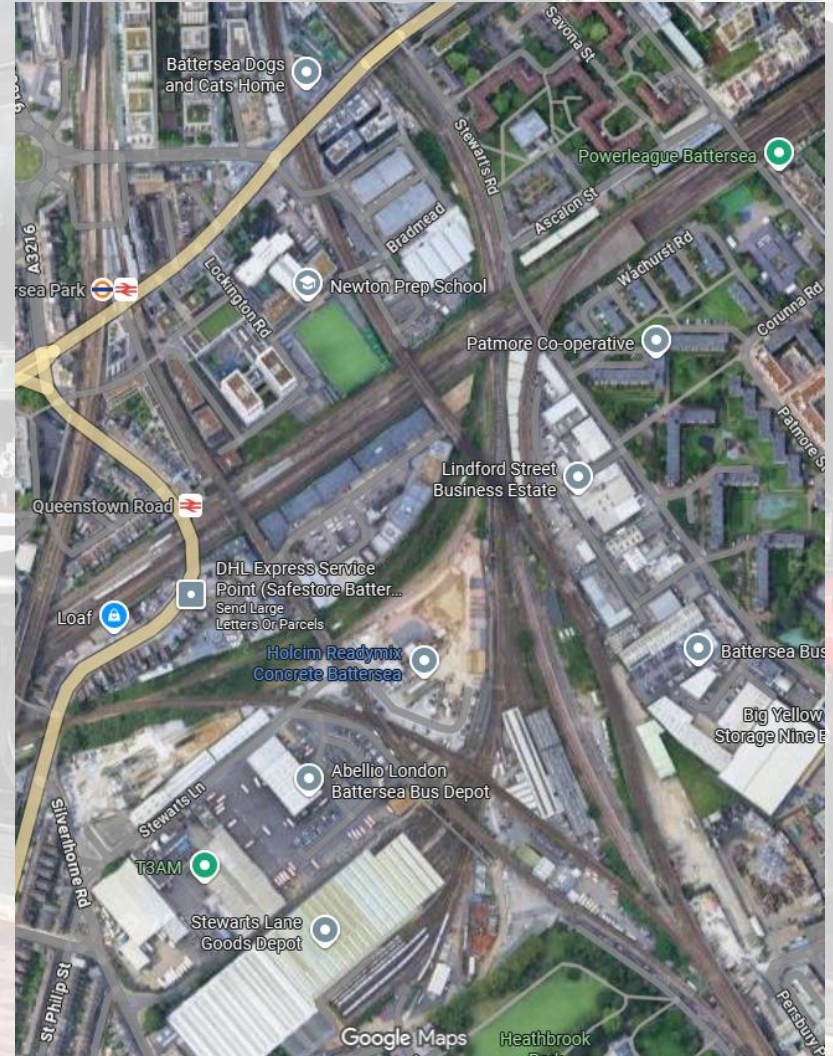
Back At Victoria



Image taken from: 'SR Merchant Navy 35028 'Clan Line' HAULING The 'British Pullman' Through London - 21/08/25 (4K)' by Steam4Max
<https://www.youtube.com/watch?v=HSyBneNx-5s>
Accessed 20/9/25

Empty Stock and Turning Move

- TPWS isolated
- Some steam to keep things ticking over
- Once out from under the roof liven fire up. Keep it thin and bright
- Shunt stock in
- Turn on the Triangle
- Firing to bright spots
- Slowly filling boiler up to keep the loco quiet



Blowdown

- Arrive shed with thin bright fire
- $\frac{3}{4}$ glass and 225-240 psi
- Blow down $\frac{1}{2}$ a glass
- May put an injector on to enable a longer blowdown depending on boiler testing and conditions



End of Tour

- Roll into shed
- Fill boiler 'out of sight'
- Remove all trimmings
- Pull fire back
- Remove whistle and headboard
- Bed Loco down
- Head home



Differences for a Longer Tour



Longer Tours

- Generally, an earlier start
- Can be as early as 3am
- Light engine move to stock
- Support crew might be split
- Multiple water stops
- Servicing and turning at end point

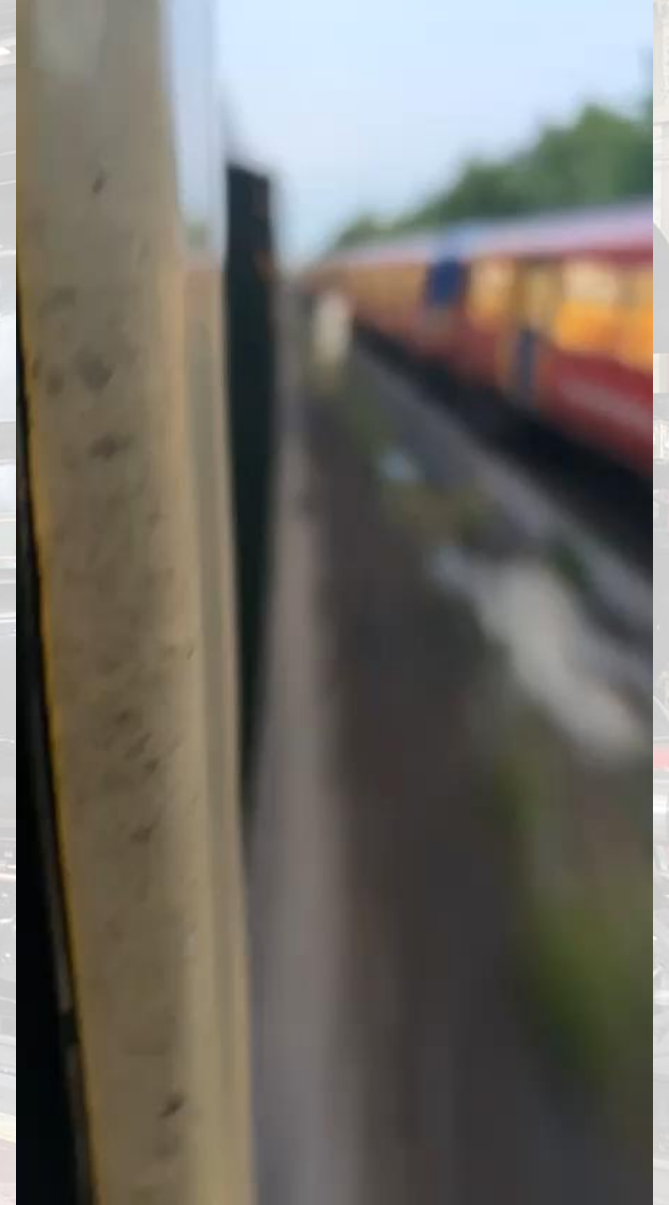


Longer Tours

- Potentially rebuild the fire
- On display for the public
- Much Longer empty stock move at the end
- Might not get back till well past Midnight
- Some jobs might not get done till the following day



Why We Do it!





Any Questions?