



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- Withdrawn July 1967 having run 794,391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

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
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EXAMINATION SCHEDULE FOR 4W/6W/8W STEAM LOCOMOTIVES
RUNNING ON BR LINES

PAGE	T/F/M NO.	7 YEARLY HEAVY MECHANICAL EXAMINATION - INDEX
63		General Remarks
65	4.01	Owners/Preservation Society Records.
66	4.02	Main Frames, Cross Slays, Stiffeners, Drackets, Horn Blocks, Horn Slays, 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, Bisset Trucks and Radial Axleboxes
75	4.09	Sanding Gear
76	4.10	Draw and Buffing Gear
77	4.11	Regulator, Main Steam Pipes, Slipperhealer, 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, Clark Boxes, Injectors
82	4.16	Water Tanks, Tender, Side, 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

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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
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
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
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
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			*	*	*	*	*



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

1. Visually examine safety valve assembly for any signs of leaks.
2. Remove locking taper & split pins and locking nuts.
3. Remove valve cap and unscrew top half of body assembly.
4. Remove muffle cap, adjusting disc, spring, cap, spring, spindle and valve.
5. Examine valve body/pillar for fractures, security and signs of wastage.
6. Examine spring caps for any damage or fractures.
7. Examine adjusting disc for any damage or fractures.
8. Examine muffle cap for any damage or fractures.
9. Examine valve cap for any damage or fractures.
10. Examine valves for any damage or fractures.
11. Examine base/seat for any damage or fractures.
12. Examine mating surfaces between valve and seat for any wear, signs of steam cutting or pitting.
13. 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.
14. Examine spindle for any damage, fractures, signs of wastage and that it is straight and true.
15. Examine spring for any defect or wastage.
16. Check free length of spring and that ends are square to axis.
17. Re-assemble complete assembly.
18. Test valves to Job DV201 in presence of competent person from notified body.

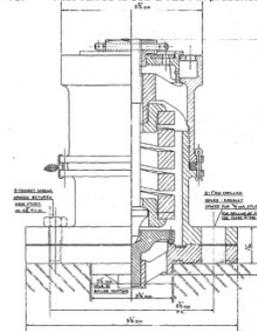


Fig. 1 – SR Standard Assembly

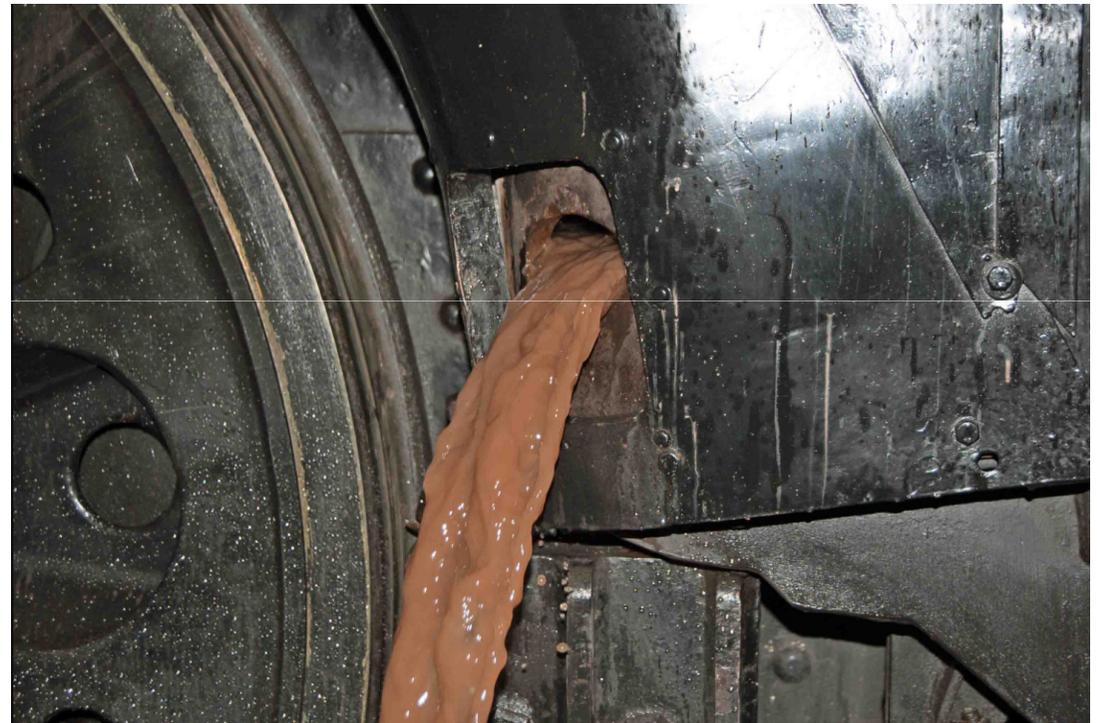
A-Pre fitness to run/Daily

- 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	
<small>Sheet 1 of 1</small>					
Item	Parts To Be Examined	Ints	Item	Parts To Be Examined	Ints
AC101	Air Compressor Inspection		HI101	Carriage Warning 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	Axebox 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			
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B-Boiler washout

- Max 20 days in steam between B exams
- Cold and hot boiler exam
- Mechanical exam
- Roughly 3-4 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	Ints	Comments/Condition	
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				
DB203	Post Boiler Washout & Inspection: Firebox Tubeplate Smokebox Tubeplate Washout Plugs Mudhole Doors Steam Manifold Gauge Frames 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			
WW201	Tender Water Gauge Inspection			
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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)



Planning a Raitour

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

Running a Railtour

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



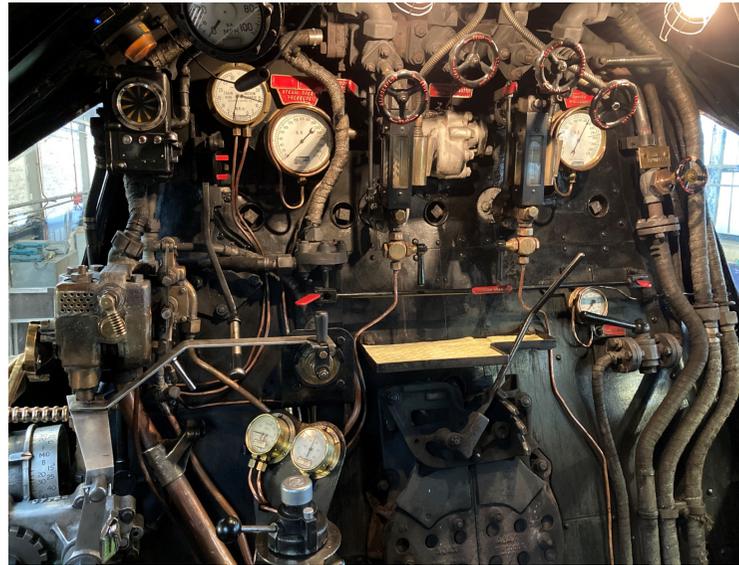
Two Days Before Tour

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



Day Before Tour

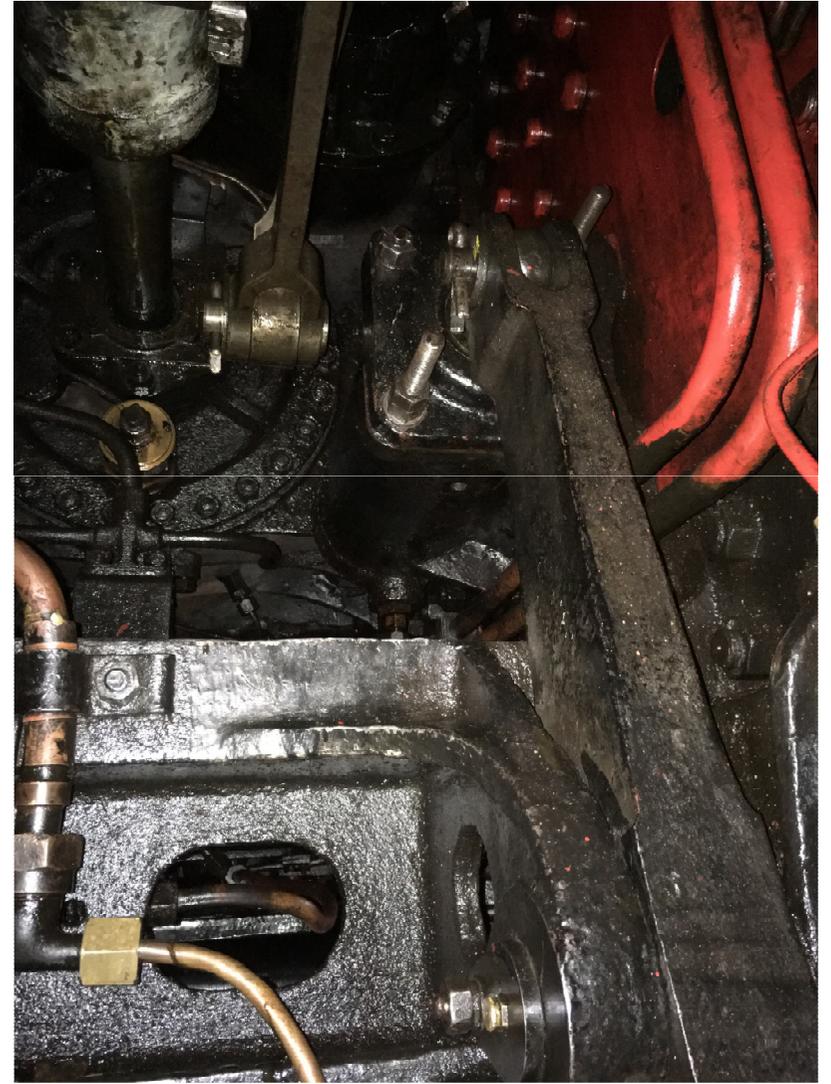
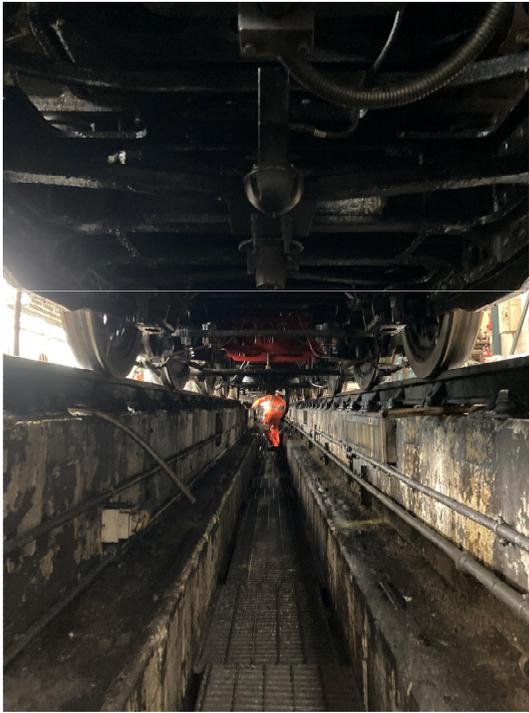
- FTR exam
- Loco Coaled
- Loco Fully oiled
- Any remaining cleaning completed
- Support crew meeting
- Bed the loco down for the night



Loco Coaled



Loco fully Oiled



FTR





Day of Tour

- Leave shed
- Collect stock in Battersea yard
- Drag to Victoria
- Support crew on platform to help passengers and public
- Water stop-coal brought forward
- Once tour finished support crew there to help public and passengers again



At Victoria



Water Stop



Back at Victoria



After Tour

- Stock dragged to Battersea
- Uncoupled and loco and support coach turn
- Boiler Blown Down
- Loco bedded down
- Major tasks left until Loco is cool (or cooler)



Any Questions?