File Ref	GE All Class Locomotive C Examination			
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Annexure A

GE ALL CLASSES

B - Shedding Check list

1. INTRODUCTION

For the locomotive to operate in a safe and reliable condition, maintenance is done according to a set maintenance plan. Different types of maintenance interventions are design to the availability and reliability of locomotives. Routine maintenance require technical staff to carry out certain task which will improve reliability and maintain all safety factors pertaining to the locomotive. To assist the technical staff, a check list is used indicate each task to perform during specific maintenance program. The check list must be filled in the planning officer.

2. SCOPE

To provide documents that will indicate the minimum activities that require attention during schedule maintenance. The documents are designed in such a way that they are captured and recorded.

3. DEFINITIONS

Refer to the specific maintenance manual for meanings.

4. SAFETY REQUIREMENTS

Overalls	Safety shoes	Face shield
Safety glasses	Leather gloves	Local Instructions
PVC Overall	Personal lock	High Voltage Safety Regulations
Dust mask	Ear muffs / plugs	Stop watch

5. STANDARDS

All repairs are to be carried out in conjunction with the quality standards as specified in the original manufacturer's specification as per applicable locomotive maintenance manual or as instructed by the fleet Maintenance Engineering.

6. PROCEDURE

This check list is to be used in conjunction with all other relevant documentations issued hence study, investigate and correct defects booked by the driver. On locomotive fitted with Bright Star Sirius download faults logged history and analyze it.

REVIEWED
To accept this checklist as valid, after completing each part (the cover page)for each section must be signed by supervisor, engineer/technician and artisan/fitter.

CONDITION ASSESSMENT
In each section of this checklist any defects of components found must be recorded under the column **CONDITION** and corrective action must be written to repair defects accordingly. The overall condition of the system under the section being maintains must be summarize in the remarks.

REMARKS
Add comments at the end of section in terms of maintenance completion, readiness for services and its overall condition.

7. REFERENCES

Maintenance Manuals, Technical Specifications, Instructions, Procedures and other applicable documents.

Locomotive No:

Depot :

Date :

PART A

B EXAMINATION

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

SECTION A : DIESEL ENGINE			
MAINTANANCE TASK	CHECKED	CONDITION	
	YES/NO	RECORD DEFECTS	CORRECTIVE ACTION
1. Examine engine foundation bolts for tightness			
2. Check w edge blocks ,if moved			
3. **Open crankcase bar over and examine**			
3.1. Main bearing and conrod big end bearings			
3.2. Art rod joint bearings and clamp screws and end of pins			
3.3. Piston pins and skirts			
3.4. Cylinder liners			
3.5. Cam lobes and rollers and crosshead assemblies			
3.6. For w ater leaks			
3.7. For evidence of bearing material			
3.8. Camshaft bearings and section flange securing bolts			
3.9. Check if piston crown bolts are in place			
4. Remove tappet cover ,bar over and examine			
4.1. Valve spring keepers /valve rotators			
4.2. Valve springs			
4.3. Tappet adjusters			
4.4. Valves rockers			
4.5. Valve pushrods			
5. Ensure that tappet covers are secured			
6. **With engine running examine for leakage and attend**			
6.1. All lubes oil covers			
6.2. All lube oil joints and connections			
6.3. All air joints and connections			
6.4. All w ater joints and connections			
6.5. All fuel joints and connections			
6.6. Governor and governor gearbox			
6.7. Overspeed system			
7. Ensure that cylinder hold dow n bolts are intact			
8. Check engine oil level and top up if necessary. Record quantity added			
9. Check operation of butterfly piston (applicable classes only)			
10. Examine exhaust main section clamps for tightness and leakage and rectify			
11. Examine exhaust sections for gas leaks and rectify			
12. Examine exhaust manifold connections to cylinders and turbocharger for tightness and leakage and rectify			
13. Examine air seal pipe w here applicable			
14. Inspect rubber duct betw een filter and turbocharger			
15. Remove and clean oil feed pipes (steel and flexible)			
16. Decarbonize exhaust stack breather pipe			
17. Check w ater pump for oil and w ater leak at w eep hole			
18. Check engine governor oil level and top up if necessary			
19. Check fuel pressure			
20. Lubricate and check for freedom of movement on all governor to fuel pump linkage and shaft bearings			
21. Change out fuel oil filters if instructed by supervisor			
22. Clean primary fuel filter strainer element			

23. Inspect tw o-slope bias pipe for cracks and tightness			
24. Loosen all low pressure fuel line clamps are not w earing into pipe and re-tighten			
25. Inspect all low pressure flexible fuel pipes			
26. Check condition of high pressure fuel lines			
27. Check operation of overspeed governor and record r.p.m			
28. Check oil level of alternator/generator gearbox and top up if necessary. Record quantity added			
29. Examine idler shaft support on alternator/generator gearbox for oil leaks			

REMARKS:

SECTION B : MECHANICLLY AND ELECTRICAL DRIVEN BLOWERS ,FANS AND DIRT EXHUSTERS			
MAINTANANCE TASK	CHECKED	CONDITION	
	YES/NO	RECORD DEFECTS	CORRECTIVE ACTION
1. Visually examine blow er driveshaft couplings			
2. Check fan drive rubbers			
3. Check oil level of fan gearbox and top up if necessary			
4. Visually check cooling fan blades for cracks			
5. Examine dirt exhauster guards for condition and alignment			
6. Ensure that all dirt exhauster V-belts are presented ,properly fitted ,aligned in good condition and set to correct tension			
7. Lubricate dirt exhauster and equipment blow er bearings			
8. Listen to dirt exhauster for noise			
9. Lubricate fan gearbox vertical shaft bearings			
10. Inspect pressuring filter and box (engine shut dow n)			
11. Examine cooling fan guard bolts and mounting rubbers for tightness			
12. Examine flexible coupling betw een fan drive gearbox and compressor – exhauster			
13. Manually operate C1 and C2 and check fan louver operation.			
14. Ensure that all foreign material has been removed from radiator compartment			
15. **On pressurizing blower motor (33 class only)**			
15.1.Clean exterior and covers			
15.2.Back blow and clean interior			
15.3.Examine commutator ,leads ,brush gear ,risers and insulators			
15.4.Check brushes for free movement			
15.5.Check all brush pigtails and bolts for tightness			
15.6.Ensure all covers are properly secured			
15.7.Check all external connections for tightness			
15.8.Renew all brushes below 25mm			

REMARKS:

SECTION C : COMPERESSOR -EXHAUSTER			
MAINTANANCE TASK	CHECKED	CONDITION	
	YES/NO	RECORD DEFECTS	CORRECTIVE ACTION
1. Measure and record crankcase vacuum check if low er than 72 KPa			
2. Check that compressor-exhauster oil pressure indicator is out w ith engine running and in w hen shut down.			
3. Check compressor exhauster oil level top up if necessary .record quantity added.			
4. Drain intercooler.			
5. Ensure that compressor/exhauster compartment is clean.			
6. **Examine on flexible coupling between engine and compressor/exhauster**			
7. Clean outside of compressor/exhauster and ensure that cooling fins of cylinder and intercoolers are clean.			
8. Change out and de-carbonize all compressor exhauster and ensure that cooling fins of cylinders and intercoolers are clean.			
9. Examine compressor/ exhauster hold dow n bolts for tightness			
10. Examine compressor exhauster hold dow n bolts for tightness			
11. With engine running listen to compressor/exhauster for any abnormal noises			
12. Examine for ail leaks.			

REMARKS:

SECTION D :ELECTRICAL CONTROL EQUIPMENT			
MAINTANANCE TASK	CHECKED	CONDITION	
	YES/NO	RECORD DEFECTS	CORRECTIVE ACTION
1. Check that all cab electrical equipment is in order			
2. Check that at all instrument light are w orking			
3. Check that all instruments are w orking			
4. Check that the following lights are working			
4.1. Headlights ,dim and bright			
4.2. Marker lights			
4.3. All compartment lights			
4.4. Coupler lights			
4.5. Step lights (36-000 only)			
4.6. Check amber w arning lights if fitted (strobe)			
5. Check control circuits for ground and report to supervisor			
5.1. Negative to earth			
5.2. Positive to earth			
6. In auxiliary control compartment			
6.1. Vacuum clean thoroughly			
6.2. Examine the follow ing :			
a) Arch shunts			
b) Shunts			
c) Contact tips (clean w ith contact tip cleaner if required)			
d) Interlocks			
e) Relays and terminal boards			
f) Diodes ,resistors ,and rheostats			
g) Wiring and for loose connections			
h) Check that ground relays cut-out switch is sealed			
i) Do not remove any cards and ensure rheostats are sealed			
j) Air leaks			
6.3. Make complete dry sequence test (33,35 &36 class only)			
7. Remove high spots on edges only of cranking contactors			
8. On master controller			
8.1. Blow out completely			
8.2. Examine contacts and mechanism			
8.3. Re-glue rubber grommet if necessary			
8.4. Examine all w iring and terminal connections			
8.5. Examine sander pedal and vigilance pedals/push button w ith hose			
9. On control stand			
9.1. Vacuum clean thoroughly			
9.2. Examine all w iring and terminal board connections			
9.3. Remove instrument face plate and clean the back .if re-paint w ith white paint to ensure good reflection of instrument panel light			
10. Remove cab floor deck plates and examine cables and connections			
11. Check that cab heater motor is w orking			
12. Check load meter needle zeroing			
13. On Hump controller			
13.1.Blow out			
13.2.Examine all w iring			
13.3.Check for correct mechanical operation			

14. Check voltage regulator output for corrective value			
15. On hot plate			
15.1. Clean out below and above hot plate			
15.2. Examine switch and ensure knob is secure			
16. On cab heater motor and fan renew all brush below 13 mm			
17. Check for air leaks on all electrical equipment in nose compartment			
18. Open bustle box (applicable classes)			
18.1. Examine field shunting resistors for discoloration			
18.2. Wipe clean and vacuum			
18.3. Examine connection for tightness			
19. In main control compartment			
19.1. Vacuum clean thoroughly			
19.2. Examine wiring and for loose connections			
19.3. Ensure that CMP panel rheostats are sealed			
19.4. Examine all other electrical components including all contacts tips			
19.5. Operate reverser and BKT by depressing magnet valve armature and check for correct operation and air leaks			
19.6. Operate W.S.R.1 and W.S.R.2 manuals check if sander magnet valve de-energizes 5second after realizing relays			
20. Inspect the wiring and light fitting holders			
20.1. In engine compartment			
20.2. In generator compartment			
20.3. In instrument stand and cab			
20.4. In radiator compartment			
21. Examine governor cable ,plug (externally) and clamps			
22. Clean both head light boxes			
23. Examine MU jumper receptacle pins in season			
24. Examine MU jumper cable			
25. Examine SHV jumper receptacle pins in season			
26. Examine all wiring and terminal board connections in radiator and engine compartment			
27. Examine all power connections in radiator and engine compartment			
28. Inspect pressurizing blower resistor for condition and tightness of connections (applicable classes)			
29. Remove cover over TB3 and examine			
30. Energize all magnet valves and examine for air leaks .Change out if sluggish			
31. Test S.H.V circuits for flame out and remote blow down			
32. Check the following alarm circuits :			
32.1. Hot engine			
32.2. Low water pressure trip			
32.3. Low lube oil pressure trip			
32.4. Brake slide			
32.5. Alt. overload			
32.6. Crankcase over-pressure			
33. Operate emergency stop switch (MU stop and check that engine shuts down)			
34. Check operation of positioning relay (Applicable classes)			
35. Manually operate WT1 and WT2 to check cooling fan operation			
36. On eddy current clutch			
36.1. Blow and wipe clean on either side of each slipping as well as brush insulators			
36.2. Examine slip rings and brush gear renew all brushes below 13mm			
36.3. Examine all leads and connections			
36.4. Renew all brushes below 13mm			

37. Calibrate speedometer at 70 km /h according to w heel diameters and needle for zeroing			
38. Check that idle temperature function is operational			

REMARKS:

SECTION E : GENERATOR /ALTERNATOR AND DRIVE GEARBOX			
MAINTANANCE TASK	CHECKED	CONDITION	
	YES / NO	RECORD DEFECTS	CORRECTIVE ACTION
1. **On main alternator/ generator**			
1.1. Clean exterior and covers			
1.2. Back blow interior			
1.3. Examine slip rings /commutator			
1.4. Change polarity of slip rings on alternator			
1.5. Wipe off insulations betw een slip rings /stringbnand with dry cloth			
1.6. Lubricate using air method			
1.7. Check condition of stringband			
1.8. Clean insulatrirs w ith dry cloths			
1.9. Examine fields coils ,leads ,brush gear and insulators			
1.10. Renew all brushes below 40mm for 33 class, 35mm for 34 class, 32mm for 35 class 32 mm for 36 class.			
1.11. Check brushes for free movement			
1.12. Check all brush pigtails and bolts for tightness			
1.13. Ensure all covers are properly secured			
1.14. Check all external connections for tightness			
2. On exciter			
2.1. Clean exterior and covers			
2.2. Back blow interior			
2.3. Examine slip rings /commutator			
2.4. Renew all brushes below 28mm for 34 class, 28mm for 35 class, and 28mm for 36 class.			
2.5. Check brushes for free movement			
2.6. Check all brush pigtails and bolts for tightness			
2.7. Ensure all covers are properly secured and sealing			
2.8. Check all external connections for tightness			
2.9. Check that cooling air ducting is properly secured and sealing			
3. On auxiliary generator			
3.1. Clean exterior and covers			
3.2. Blow out interior			
3.3. Examine commutator, leads ,brush gear ,risers and insulators			
3.4. Renew all brushes below 28mm for 34 class 28mm for 35 class, 28mm for 36 class.			
3.5. Check brushes for free movement			
3.6. Check all brush pigtails and bolts for tightness			
3.7. Ensure all covers are properly secured and sealing			
3.8. Check all external connections for tightness			
3.9. Check that cooling air ducting is properly secured and sealing			
4. On resistor Blower Motor (applicable classes)			
4.1. Clean exterior and covers			
4.2. Bow out interior			
4.3. Clean insulatrirs w ith dry cloths			
4.4. Renew all brushes below 28mm			
4.5. Check all brush pigtails and bolts for tightness			
4.6. Ensure all covers are properly secured and sealing			
4.7. Check all external connections for tightness			
4.8. Check that cooling air ducting is properly secured and sealing			

5. Examine exterior of fuel transfer pump motor			
5.1. Examine commutator (only applicable to locomotives fitted with old style pump motors, not new brushless sealed units).			
5.2. Renew all brushes below 11mm (only applicable to locomotives fitted with old style pump motors, not new brushless sealed units.			
6. On resistor Blower Motor (only applicable classes) renew all brushes below 28mm.			
7. Inspect dynamic brake grids and ensure that all foreign and loose material is removed.			
8. On rectifires panel (applicable classes)			
8.1. Inspect all component and wiring			
8.2. Blow out			
9. Ensure compartment floor and drain main alternator is clean			
10. Check oil level of alternator /generator gearbox and top up if necessary record quantity added on recording sheet.			
11. Examine idler shaft support for oil leaks			

REMARKS:

SECTION F : MISCELANOUS ELECTRICAL EQUIPMENT AND AUXILIARY MOTORS			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. In battery box			
1.1. Inspect blocking,w ash batteries and clean comprtment			
1.2. Check that terminals are tight and properly protected			
1.3. Measure SG's and record on battery measurement form			
1.4. Top up w ater if necessary			
1.5. Check that drain is open and clean			
2. Fuel transfer pump motor			
2.1. Examine commutator (only applicable to locomotives fitted w ith old style pump motors , not renew brusheless sealed units)			
2.2. Fuel pump motors : Renew brushes below 11 mm ((only applicable to locomotives fitted w ith old style pump motors , not renew brusheless sealed units)			
3. Inspect dynamic brake grids and ensure that all foreign and loose material is remove			
4. Check dynamic brake grid louvers for free movement (applicable classes)			

REMARKS:

SECTION G : TRACTION MOTORS COMPLETE AND POWER WIRING			
MAINTANANCE TASK	CHECKED	CONDITION	
	YES / NO	RECORD DEFECTS	CORRECTIVE ACTION
1. Check power wiring for grounds or shorts and record if found			
1.1. On commencement			
1.2. After completion			
2. Seal ground relay cut-out switch			
3. On traction motor			
3.1. Clean exterior and covers			
3.2. Blow out interior			
3.3. Clean string band and insulators with dry cloth			
3.4. Examine commutator ,fields coils ,brush gear and insulators			
3.5. Examine all cables and ensure that are free			
3.6. Check all brush pigtails and bolts for tightness			
3.7. Renew all brushes below 40mm for 33 class ,38mm for 34 class ,35mm for 36 class			
3.8. Check all motor covers for proper fit and seal			
4. Check for condition and loose clamps ON below deck wiring			

REMARKS:

SECTION H : FILTERS AND LUBRICATION			
OPERATION	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Check engine oil level and top if necessary.			
2. Change out lube oil filters			
3. Check engine air filter indicator. If tripped change out filters (paper element engine air filters only)			
4. Examine and clean V-type screen			
5. On panel bath filter			
5.1. Check oil level			
5.2. If sludge accumulation is thicker than 12mm			
6. On locomotive fitted with Bright Star control system change out paper element filters in old battery compartment			
7. Examine panel bath filter doors sealing rubber for air leaks and softness			
8. Ensure that rubber seals properly when closing doors			

REMARKS:

SECTION I : AIR AND BRAKE			
OPERATION	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Check that all normally sealed cocks are sealed			
2. Check control air pressure			
3. Check fuel pressure gauge for fluctuation			
4. Examine all air and vacuum brake piping joints and connections for leakages and attend (above and below deck)			
5. Do complete A Type brake test			
6. Do complete A type dynamic and safety vigilance test for (applicable class /series)			
7. Do complete EBR brake test according to latest document RSE /TE /PRO/014 if loco is fitted with EBR brake system.			
8. Record cab vacuum with 10mm Watson disc			
8.1. VA-1 Realese 2 hole open			
8.2. VA-1 Realleased hole closed ..... min 58 KPa			
9. Do triton functional test according to document GE 51. 003			
10. Check that vigilance cut-out cock is open and sealed with correct seal			
11. Operate all MU pipe cocks and position them correctly			
12. Operate all MU flexible pipes examine pipes for condition ,alignment ,coupling dummies and rubbers			
13. Check that MU pipes dummies are on and secured			
14. On both automatic drain valves			
14.1. Open valve and drain all moisture from air system			
14.2. After all water is drain place valve in automatic position			
15. Check that automatic drain valve cycle correctly with CMV			
16. Remove and clean VA-1B spool valve			
17. Service GD 80 E filter (oil bath /paper element)			
18. Test operation of all sanding valves			
19. Check that all gauge name plates are in place			
20. On locomotive fitted with an air dryer and pre-filter			
20.1. Ensure that air dryer isolations cocks are set in the correct position for air dryer operation and ensure cocks are sealed			
20.2. Check the color of the humidity indicator card. If not blue change out elements and indicator			
20.3. Inspect condition of coalescing filter element in pre-filter and replace with a new filter element if required.			
20.4. Inspect condition and operation of prefilter drain valve clean /replace if required			
20.5. With dryer operating check that drain valve expel a short burst of air once a minute			
20.6. With dryer operating check that purge valves alternate expel air for one minute			

REMARKS:

SECTION J : BOGIES AND WHEELS			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Inspect suspension baring cap ,oil caps and drain plugs (feel for excessive heat and inspect locking w ires)			
2. Examine suspension w ick lubricator securing bolts and locking w ires for tightness			
3. Drain suspension bearing oil if contaminated and change out w ick			
4. Check gear lubricant (crater) level remove all obstruction from fill opening			
5. Check suspension bearing lubricant level on all traction motors and add oil if necessary .record quantity added in measurement form			
6. Inspect motor nose suspension bracket and rubber			
7. Change out all brake blocks w here required and ensure that brake cylinder travel is in accordance w ith block thickness (34 and 35)			
8. Ensure that brake cylinder piston travel of 65mm minimum (new block fitted) and 170mm maximum 36 class			
9. Check that brake rigging locking devices are correctly positioned and secured			
10. Inspect brake gear ,brake shoes and brake blocks for w ear and flanging			
11. Check all gear case for cracks			
12. Examine friction device for free movement			
13. On traction motor air duct inspect the rubber bellow s for proper sealing and alignment			
14. Check condition of all sanders pipes ,sand traps ,hoses ,nozzles and ensure proper alignment			
15. Examine complete bogie for defects (e.g. ,pins ,springs ,snubbers,,wear plates ,clearances ,bearings ,dust guards ,bolts and for cracks)			
16. Inspect all axle box assemblies and liners			
17. Examine pedestal guide w ear plates ,bolts and axle dust guards for tightness			
18. Check bolsters Teflon w ear plates ,bolts ,tie bar bolts and axle dust guards for tightness			
19. Add oil to both bogie centers and check oil cup alignment (do not over fill)			
20. Examine all w heels for flats and cracks ,loose tyres and flange w ear			
21. Tap all w heels and listen for loose tyre			
22. Gauge and examine w heels for wear and record on separate form			
23. Examine inter bogie control bushes and pins			

REMARKS:

SECTION K: MISCELLANEOUS ABOVE DECK EUIPMENT			
MAINTANANCE TASK	CHECKED	CONDITION	
	YES/NO	RECORD DEFECTS	CORRECTIVE ACTION
1. Check w ater level and top up if necessary			
2. Check that all w indow wipers are w orking and check w iper travel			
3. Check that horn is w orking			
4. Check horn handles and cables for condition			
5. Lubricate all louver hinge pins and linkages w ith dry lubricant			
6. Visually examine radiator for damage ,loose fins and w ater leaks			
7. Visually inspect cooling fan shroud and guards			
8. Examine all w ater joints and piping securing clamps (not engine)			
9. Ensure that all foreign material has been removed from radiator compartment			
10. Examine flexible connections at radiator w ater inlet			
11. Check that expansion tank pressure cap seals are good condition and that cap is sealing properly			
12. Examine lube oil cooler and all lube oil piping joints ,connections and securing clamps for tightness and leakage (not engine)			
13. Check operation of louver piston and seal cock			
14. Check that all cab mechanical equipment is in order			
15. Inspect rubber tubing at ends of equipment blow er drain pipes for condition and that cap is sealing properly			
16. Check that engine ,alternator compartment overboard drains holes and are clear			
17. Examine entire superstructure and drivers cab for loose and missing bolts ,nuts fittings ,defective latches and canopies			
18. Lubricate all door and car body hinges w ith diesel			
19. Check that all cab w indows are clean and free of cracks and replace if necessary			
20. Check that all cab w indows are clean and free of cracks and replace if necessary			
21. Ensure that both fire extinguishers are sealed and shake to loosen pow der			
22. Remove pow der fire extinguishers and shake to loosen pow der			
23. Check that both fire extinguishers have not exceeded their expirer date			
24. Examine all air connections for leaks and attend			
25. Open emergency tool box			
25.1. Check that all equipment are present			
25.2. Check that emergency chain nuts are free and oiled			
25.3. Reseal toolbox			
26. On cab doors			
26.1. Examine and test operation of both locks w ith the doors in the open and closed position			
26.2. Check condition of door stop and lubricate			
26.3. Check that cab doors seal properly			
27. Examine sliding w indows and stoppers			
28. Check that radio is properly secured if fitted			
29. Check operation of hand brake			
30. Examine MU jumper boxes			
31. Operate all MU flexible pipes examine pipes for condition ,alignment ,coupling dummies and rubbers			

SECTION L : MISCELLANEOUS BELOW DECK ITEMS			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Drain oil w aste tank			
2. Check operation of both couplers and condition of liners			
3. On both buffers ,measure and record on recording sheet			
3.1. Heights			
3.2. Gauge knuckles			
3.3. Gauge knuckle opening			
4. Inspect all lube and fuel oil joints and connections for leaks and attend			
5. Operate emergency fuel trip from all three position			
6. Examine pilot for condition and rail clearance			
7. Check condition of exhauster pipe below platform			

REMARKS:

Locomotive No:

Depot :

Date :

PART B

BATTREY EXAMINTION

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

1. **NOTE:** **Take level of ALL cells and measure SG of all cells.**
2. **Cells are numbers consecutively from no. 1 on which positive terminal is mounted to no. 32 on which the negative terminal is mounted.**

Battery Serial No.	Date Stamp	Cell No.	Water Level	Water Added	Spec Grav	Cell No.	Water Level	Water Added	Spec Grav
1		1				17			
2		2				18			
3		3				19			
4		4				20			
5		5				21			
6		6				22			
7		7				23			
8		8				24			
		9				25			
		10				26			
		11				27			
		12				28			
		13				29			
		14				30			
		15				31			
		16				32			

REMARKS

Locomotive No:

Depot :

Date :

PART C

A TYPE BRAKE TEST
FOR
LOCOMOTIVE EQUIPED WITH 28-LAV-1 BRAKE SYSTEM

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

A TYPE BRAKE TEST			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Check that the M.R to B.P. cut-out cock (dead loco fixture) is sealed closed.			
2. Check the 28VB cut-out cock betw een M.R and filter and filter (34-000) and M.R. and M.R. (35-000&36-000) is sealed open			
3. Check that 28VB cut-out cock is sealed open.			
4. Check that B.C. cut-out cocks are sealed open.			
5. Set breaks systems for leading position.			
6. Fit test gauges to M.R.; V.P.B. and B.P.			
7. Fit leak test pipe to VA1 interlock valve exhaust.			
8. Let engine run at idle speed.			
9. Check the gauges in drivers cab corresponds with test gauges.			
10. Check that the A.C.P.S. cuts in and out at correct settings. In 900 KPa out 970 KPa.			
11. Do the follow ing :			
11.1 Break seal and close C.M.V. cut-out and check that 1040 KPa safety valve opens at correct settings as indicated on test gauge. NOTE: lap nut must be tightened in place.			
11.2 Adjust safety valve with holes fully open, then lock the adjusting ring. Permit the safety valve to operate several times and note that if function properly			
11.3 Safely valve blow s off with pressure differential of 70-105 KPa. NOTE: under no circumstances must the pressure on the test gauge rise above 1040 KPa after the safety valve opens			
11.4 Open C.M.V. cut-out cock and seal.			
12. Adjust H.S.4 vacuum control gauge to register 68 KPa.			
13. With all M.U. cocks closed check that 68 KPa is created in V.B.P. if not, adjust H.S.4 control valve			
14. Check that B.P. and E.R pressures are 480 KPa.			
15. Fit 3 mm test disc on one of the vacuum flexible pipes.			
16. Wait for three (3) minutes and check that train pipe vacuum does not drop below 64 KPa.			
17. After the system has been fully charged:			
17.1 Make a minimum reduction and check that the proper reductions are obtained in:			
a) Equalizing reservoir			
b) Brake pipe			
c) Vacuum train pipe			
17.2 Make a 70 KPa equalizing reduction and check the follow ing the follow ing after 3 minutes			
a) Brake pipe reduction -70 KPa			
b) Train pipe vacuum reduction -38 KPa and it does not fluctuates			
c) Brake cylinder pressure = 170 KPa (+/-20 KPa)			
17.3 Make a further 20 KPa equalizing reservoir reduction (total of 90 KPa) and ensure that train pipe vacuum follow ed suit.			
18. Do the follow ing :			
18.1 Continue the reduction to the full service application and check that approximately 345 KPa brake cylinder is registered			
18.2 Release brake cylinder pressure with independent quick release and check that it can be fully released w ithin 9-9 sec. NOTE time			
19. Release brake, re-charge system and check that train pipe vacuum does not hunt and then do the follow ing :			
19.1 Make full automatic applications and observe:			
a) Train pipe vacuum = 0 w ithin 7 seconds			

b) Brake cylinder pressure builds up to approximately 320 KPa w ithin 20 seconds			
c) All brake cylinders responded currently			
19.2 Release automatic brake in 3 stages and check that :			
a) Brake cylinder pressure drops and laps accordingly			
b) Train pipe vacuum increases and laps accordingly			
c) All brake cylinders responded correctly.			
20. Make a full automatic service application and :			
20.1 With the independent handle, release BC pressure in three stages. Ensure that pressure is lapped at every stage			
20.2 Check that brake cylinder pressure does not build it up again after finally releasing the independent handle			
20.3 Make an independent service application checking that it graduates correctly to the correct full service brake cylinder pressure			
20.4 Depress the independent handle and check that BC pressure does not leak off			
20.5 Graduate this application off in three stages and ensure BC does not built up again in release position			
20.6 Release the automatic application and re-charge system			
21. Make an emergency application and :			
21.1 Listen that No.8 vent valve functions			
21.2 Check that BP, E Res and VBP falls to zero immediately			
21.3 Check that BC pressure is correct			
21.4 Class 36 Only) recharge system w ith fast rate valve in fast position and make an emergency brake application, observe that :			
a) Equalizing reservoir gauge reduces to zero w ithin 4-5 seconds			
b) Re-charges to 480 KPa w ithin +/- 2 seconds			
22. Make independent quick release and check that BC pressure drops to 100 KPa or less			
23. Release independent handle and check that BC emergency pressure is again restored			
24. Release brakes and ensure that :			
24.1 The double check valve to HS4 has operated by looking at the HS4 gauge needle for movement			
24.2 Air pressure from VA1B interlock valve and ceases after approximately 4 minutes. Note actual time taken			
25. Replace the 3 mm test disc w ith a 14 mm test disc. Make a full service automatic reduction return handle to running and w ait for 4 min			
25.1 Feel that air does not leak trough VA1B interlock valve			
25.2 Note the difference between the vacuum reservoir and train pipe vacuum readings			
25.3 Increase vacuum control air pressure to 180 KPa and keep at the value for 1 ½ minutes. When the vacuum needle must split			
25.4 Decrease vacuum control air pressure to the original valve and check that the difference between the vacuum reservoir and the train pipe vacuum remains approximately 36-40 KPa			
25.5 Remove 14 mm disc and fit Watson disc. Record vacuum brake pipe reading….KPa (minimum allow able 58 KPa or 17" Hg vac)			
25.6 Press suppression button for at least 5 seconds			
25.7 After releasing suppression button check that :			
a) The vacuum readings return to the valve registered in (e)			
b) This happens approximately 1 minute after releasing the button			
25.8 Remove the Watson disc and replace vacuum pipe on dummy			
26. With automatic brake handle in release position. Open emergency air vacuum valve and ensure that VPB vacuum is destroyed and brake pipe pressure reduces approximately 190 KPa. Close emergency vacuum/air valve			
27. Make a full independent brake application and open the brake cylinders equalizing pipe to atmosphere			

27.1 Check that that air blow s from pipe			
27.2 Open main air equalizing pipe to atmosphere and check that brake cylinder equalizing blow stop entirely w ith brakes applied and w ithout loss of main reservoir pressure (Max.allow able leak-less than 20 KPa per minute)			
28. Release independent brake and close the brake cylinder and main air reservoir equalizing pipes			
29. Make a 70 KPa reduction and set MU2B to rail and replace 26C cut-off valve in OFF position			
29.1 Put automatic brake handle in pressure position and check that air does not escape through VA1B interlock valve			
29.2 Make a full automatic brake application and ensure that the automatic brake handle has no control over brake pipe pressure			
29.3 Operate emergency brake valve and check that brake cylinder pressure builds up			
29.4 Open main reservoir equalizing end cock and check that brake cylinder pressure now builds up			
29.5 Open brake cylinder equalizing end check that it does not blow			
29.6 Close vacuum branch cut out cock and check that automatic handle is again inoperative for brake cylinder pressure			
30. Return locomotive to normal end and then set MU2B to trail. s			
31. Make a full independent application and check that brake cylinder pressure builds up normally.			
32. Move independent handle to off position and check that brake cylinder pressure leak off does not exceed 20 KPa in 3 minute			
33. Set locomotive for lead and HS4 to 64 KPa			
34. Remove and replace both brake handles, check that action is normal and examine the handles for condition			
35. Sw itch of diesel engine			
36. Open main air reservoir equalizing pipe and test that test gauge MR air pressure drops at a rate of 280 KPa in ½ minutes after initial drop, w hile the MR gauge in the driver cab remains constant. (max allow able leak-less than 20 KPa per minutes.)			
37. Ensure that :			
37.1 CMV cut out cock is sealed open			
37.2 BC cut out cock is sealed open			
37.3 HS4 cut out cock is sealed open			
38. Close all end cocks all subject all flexible rubber MU end pipes to full shop pressure. Examine for condition and air leaks			
39. Set brake control knob to off			
39.1 Make 70 KPa equalizing reservoir reduction w ith automatic handle and move handle back halfw ay to the minimum position			
39.2 Check that brake pipe pressure leaks off at a rate of 70 KPa per minute			
39.3 Check that equalizing reservoir remains stationary for 30 minutes			
39.4 Check that on automatic emergency destroys equalizing reservoir pressure			
40. Return brake valve control knob to normal and recharge system			
41. If 26C w as changed out, do the follow ing in addition to the above			
41.1 Fit test gauge w ith 7mm orifice on No.1 end brake pipe			
41.2 Set locomotive brake for lead			
41.3 Throttle handle to notch 4			
41.4 Charge brake system			
41.5 After 1 minute check that :			
a) Equalizing reservoir gauge = 480 KPa			
b) Cab brake pipe gauge betw een 414 and 480 KPa			
c) Main reservoir gauge is not less than 830 KPa			
41.6 Note test gauge pressure			
41.7 If less than 414 KPa advice supervisor			
41.8 Repeat test at No.2 end of locomotive and note test gauge pressure			

Locomotive No:

Depot :

Date :

PART D

A TYPE SEFTY VIGILANCE FOR LOCOMOTIVE EQUIPED WITH 28-LAV-1 BRAKE SYSTEM

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

A TYPE SAFETY VIGILANCE TEST			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Close control circuit breaker			
2. Place engine control sw itch in "RUN"			
3. Insert the reverser handle and leave it in the "OFF" position			
4. Set up the locomotive for normal lead unit operation			
5. Ensure that the independent brake is applied and the automatic brake brake handle is in the "RELEASE " position			
6.			
7. Ensure no penalty condition exists and that all gauges are normal			
8. Place the throttle handle in "NOTCH 2"position (N.B. Ensure no load Meter response w ith engine rpm increase)			
9. Depress safety pedal and release independent brake			
10. Release the safety pedal and simultaneously start stopwatch. Check			
10.1.4 seconds time delay-no sound			
10.2.Next 4 seconds-whistle sounds			
10.3.Total 8 seconds – penalty application occurs and safety control light Comes on			
10.4.The engine speed returns idle			
10.5.The equalizing reservoir pressure, vacuum brake pipe vacuum and brake pipe pressure reductions as well as w ell as the brake cylinder cylinder pressure build up are in accordance with the values for full for a full service automatic brake application			
11. Move the throttle handle to the "NEUTRAL"/IDLE "position and then to the "NOTCH 2"position, and ensure that there is still no throttle response			
12. Close the throttle, operate the safety pedal, move the automatic brake handle to the "SUSPENSION" position and ensure that there is still no throttle response			
13. Ensure that the brakes release and that the safety control light does not come on again			
14. Remove and replace foot pedal, starting stop w atch as foot is pressed dow n. leave foot on pedal all the w ay and check that:			
14.1.After 70 seconds time delay- Sonalert w ill sound			
14.2.After 74 seconds- whistle also sound			
14.3.At 78 seconds- penalty application occurs, and safety control light comes on			
14.4.Move automatic brake handle to the "SUSPENSION "position. When Safety control light goes off, move automatic brake handle to "RELEASE" position and check that penalty application is released			
15. Remove foot from safety pedal and replace just after w histle sounds. Cycle should be restored w ithout penalty application.			
16. Hold the safety pedal depressed and check that:			
16.1.After 70 seconds time delay- Sonalert w ill sound			
16.2.The sonalert stop sounding if the safety pedal is released and depressed again as soon as sonalert sound			
16.3.The cycle should restored w ithout penalty and all sound stopped			
17. Hold the safety pedal depressed and check that:			
17.1.After 70 seconds time delay- Sonalert w ill sound			
17.2.After 74 seconds – w histle also sound			
17.3.The w arning whistle and sonalert stop sounding if the safety pedal is released and depressed again as soon as the w histle starts blowing			
17.4.The cycle should be restored w ithout penalty and all sound stopped			
18. Release the safety pedal. Move to the "b" side of the cab and depress the assistant"s" push button as soon as the w arning whistle starts blow. The w histle should now stop blowing			
19. Hold push button dow n and check that the sonalert sounds after 70 seconds. When the push button is released the sonalert sound should stop			
20. Release push button dow n and set up the locomotive controls for normal trail unit operation and:			
20.1.Ensure that the safety control light comes on and that the vigilance system			

is nullified			
20.2. Move the throttle handle to the NOTCH 2 position and ensure that there is no throttle response			
20.3. Return that throttle to the NEUTRAL/IDLE position			
21. Set the locomotive up for normal lead unit operation and operate the safety pedal. The safety control light should now go off			
22. Ensure Vigilance Control Panel and Vigilance cut-out cock are sealed with special seals			

REMARKS:

Locomotive No:

Depot :

Date :

PART E

A TYPE DYNAMIC BRAKE TEST FOR LOCOMOTIVE EQUIPED WITH 28-LAV-1 BRAKE SYSTEM

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

A TYPE DYMANIC BRAKE TEST			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Check that voltage regulates at 73V ±0.5V at idle and notch8. If adjustment required advise supervisor			
2. Couple A.V.O. meter on 0- 100 Volt scale across 24 w ire positive at TBB terminal A (34 class) and G (35 class), and battery knife switch negative			
3. Close control sw itch breaker			
4. Throw reverser handle to "FORWARD " or " REVERSE",. Move selector handle smoothly from "B" maximum dynamic braking position and check that A.V.O. meter pointer graduates smoothly from 0-±73 volts			
5. Return selector handle and reverser handle to "NEUTRAL" and sw itch EC to "RUN"			
6. Throw reverser key to "FORWARD" or "REVERSE" and note that			
6.1. BKR picks up instantaneously			
6.2. BKCR1 picks up and engine RPM increase (time delay per applicable class)			
7. Throw reserver key to mid position and note that after 5 seconds BKR drops out. (Note: MBTD timing must be accurately checked with stop watch			
8. Throw reverser key to forward or reverse			
8.1. Release independent brake			
8.2. Move automatic brake handle to " FULL SERVICE" position and check that brake cylinder pressure builds to 320 KPa to 350KPa			
8.3. Move selector handle to "B" and check that brake cylinder pressure drops to zero and AF contactor is energized			
8.4. Move automatic brake handle to "EMERGENCY" position and check that:			
a) Brake cylinder pressure builds up to 420KPa (60p.s.i.) and brake pipe pressure drops to zero			
b) Engine speed returns to idle			
c) AF contactor drops out			
9. Set the locomotive up for normal lead unit operation			
10. Record detail of defects and/or mal-functions found and corrective action taken			

REMARKS:

Locomotive No:

Depot :

Date :

PART F

RECORDING SHEET

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

FUEL EXAMINATIONS			
SECTION	DESCRIPTION OF ITEM		QUANTITY ADDED/ RENEWED/RECORDED
1. Engine	Diesel engine lube oil added before starting		Liters
	Diesel engine oil added after starting		Liters
	Over speed governor trip value		rpm
2. Fuel equipment & governor	Main governor oil, qty added		Liters
3. Blowers, fans & Dirt exhauster	Eddy current clutch gearbox		Liters
4. Electrical rotating machines	Alternator gearbox oil added		Liters
	Generator gearbox oil		Liters
5. Compressor exhauster	Compressor exhauster crankcase oil,		Liters
	Compressor –exhauster crankcase vacuum		KPa
6. Transition frequency	Pick UP		Cycles/second
	Drop UOT		Cycles/second
7. Brakes warning	**Pick up volts of brake warning relay**		Volts
8. Cab vacuum with 10mm Watson disc	VA-1 Released 2 hole		KPa
	VA-1 Released 2 hole closed		KPa
9. Power wiring grounds	On commencement		
	On completion		
10. Electrical control equipment	Head Lights, qty renewed		
	Marker lights qty renewed		
	Coupler lights qty renewed		
	Compartment lights qty renewed		
11. Miscellaneous above deck	Cooling water added (Yes/No)		
12. Miscellaneous below deck	Brake blocks, qty renewed		
13. N3 Buffer	Measure heights (Max.915mm, Min.845mm)	No 1 End	
		No 2 End	
	Gauge knuckles opening	No 1 End	
	Gauge knuckles	No 2 End	
14. Bogies and wheels	**Suspension bearing oil added**		
	Traction motor gear case lubricant,		
15. Electrical rotating equipment & drive gearboxes	Dynamic blower motor brushes, qty renewed		
	Traction generator brushes, qty renewed		
	Exciter generator, qty renewed		
	Fuel pump motor brushes, qty renewed		
	Auxiliary generator brushes, qty renewed		
16. Traction motors and power wiring	Traction motor no. 1 brushes, qty renewed		
	Traction motor no. 2 brushes, qty renewed		
	Traction motor no. 3 brushes, qty renewed		
	Traction motor no.4 brushes, qty renewed		
	Traction motor no. 5 brushes, qty renewed		
	Traction motor no. 6 brushes, qty renewed		

Locomotive No:

Depot :

Date :

PART G

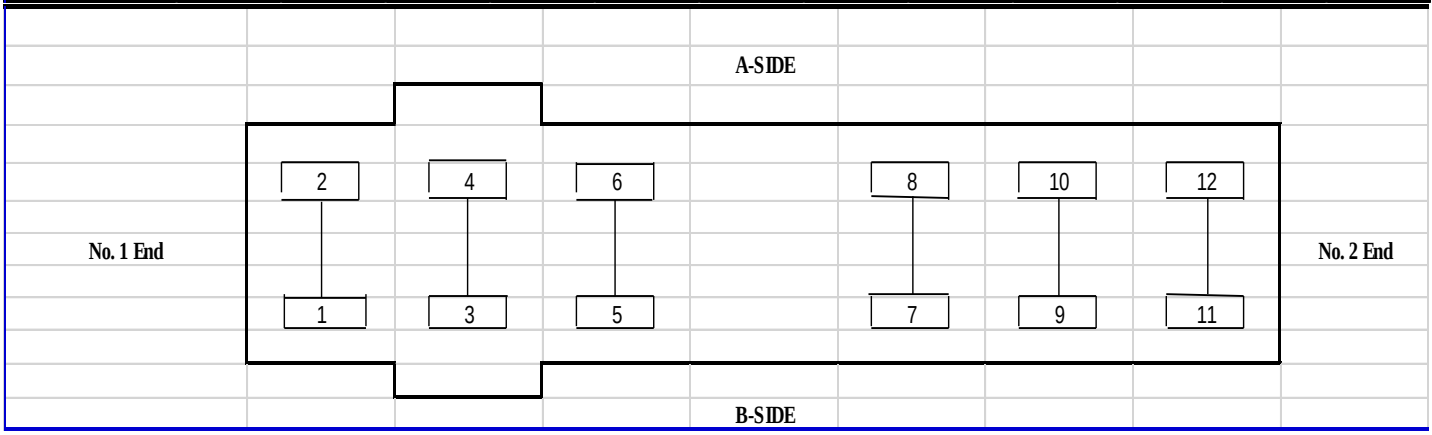
WHEEL WEAR INSPECTION

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

Bogie no 1 _____ Bogie no 2 _____

Wheels: Measurements

	1	2	3	4	5	6	7	8	9	10	11	12
TAP TEST												
FLANGE TOE RADIUS												
HOLLOW WEAR												
FLANGE HEIGHT												
FLANGE THICKNESS												
DIAMETER												



REMARKS:

Locomotive No:

Depot :

Date :

PART H

RADIAO SYSTEM TEST PROCEDURE

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

RADIO SYSTEM TEST			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
1. Visual check UHF (White) and VHF (Black) antennas on roof for any damages.			
2. Check for obvious defects e.g TDU cable			
3. Switch on/close the battery knife switch			
4. Check voltage on the volt-meter to be greater than 55V			
5. Check TDU if is powered and if yes wait for 3 min			
6. Switch off the battery circuit breakers			
7. Check the TDU if is still switched on ,if on go to next step			
8. If TDU is off, check all 3 fuses (2 fuses on triton power wiring and 1 in the triton box) and if the Triton is marked with orange dot the indicate IPS.			
9. If triton is not marked with orange dot change the triton. A Triton Version 8 is identified the new firmware date (TU031109)			
10. If TDU display No Response press # and enter 6 digit employees No : then # followed by 16 digit train No : and # to proceed			
11. Press * and use up and down arrow key to get to get to viewed TDU info menu and then press #			
12. Check for loco no (six digits) and software version 8 ,if the software version is 5 press * and select End of Trip menu and press # and wait for three minutes			
13. If there is GPRS the TDU will load software version 8 if not then it will remain version 5.			
14. Press * and use up and down arrow key to get to Technician Mode and press.			
15. Use up and down arrow key to reach STSSA msg and press #, wait for few minutes to observes.			
16. Check for GPS, GPRS, OBCU for Y or N status, wait for 10-15min for OBCU to be Y.			
17. Check for GPS and GPRS for y status for 15 min as this is area and network dependent. If all Y ,then do an End of trip by pressing *twice and use the arrow keys to get End of Trip menu and then press#			
18. If no power to Triton Test for at least 55V ON power cable and power plug.			
19. If there is power greater than 55 V on power cable and power plug.			
20. If there is no power trace the voltage supply from the power cable and replace TRITON			
21. Check battery voltage on terminal pick ip points as per triton installation manuals			
22. Go back to no 10 then follow the steps until no .17			
23. Test completed			
24. Check Triton (and antennas) are functional check that STSSA message contains OBCU, Y GPS,Y GPRS,Y			
25. Check OBC icon ,check that all icons (Ethernet ,GPRS,DAQ ,GPS and Brake) are all Off (not displaying)			
26. Check functions display correctly on OBC screen			
26.1 OBC indicates when loco key is in reverse			
26.2 OBC indicates forwards movement			
26.3 OBC indicates idle			
26.4 OBC indicates notch position from 1 to 8			
26.5 Correct brake pipe pressure indicated			
26.6 If loco automatic brake handle is applied in full services ,brake pipe pressure drops by 140 -160 KPa			
26.7 If in mapped area then map must be displayed			

27. Perform OBC artisan Brake test Press F1 – Vigilance penalty brake activates, w histle blow s high engine revs indicate DB still active press F2 –Cuts dynamic brake and engine revs drop.			
28. Communication check (in Artisan Test Function). Check that all 3 buttons under 'COMMUNICATION test are green)			

REMARKS:

Locomotive No:

Depot :

Date :

PART I

FUELING INSPECTION

Reviewed by:	Name	Signature	Date
Supervisor :	……	……	……
Eng/Tech :	……	……	……
Fitter :	……	……	……

FUELING INSPECTION			
MAINTANANCE TASK	CHECKED	CONDITION	
		RECORD DEFECTS	CORRECTIVE ACTION
WITH ENGINE RUNNING			
1. Take lube oil samples and test for			
1.1 Viscosity			
1.2 Water			
2. Check engine lube oil level and if oil added record quantity			
3. Check governor oil level and top up if required			
4. Do thorough examination (see ,feel ,hear-inspect) and rectify			
5. Check that compressor-exhauster oil pressure indicator is out			
6. Check that compressor-exhauster oil level and add oil if required			
7. In the drivers cab check the following :			
7.1 All cab electrical equipment is in order			
7.2 All instrument lights are w orking			
7.3 All w indow wipers are working			
7.4 All instruments are w orking			
7.5 Cab heater is w orking			
7.6 Horn is w orking			
7.7 Seats are in good condition			
8. Check that w heel slip system is operating correctly by trigger switch on w heel Slip panel			
9. Check that all cab w indows are clean and free of cracks			
10. Check that the following lights are working and repair if required			
10.1 Headlights ,dim and bright			
10.2 Coupler lights			
10.3 Step lights (36-000 only)			
10.4 All compartment lights			
10.5 Marker lights			
10.6 Check amber w arnings lights if fitted			
11. Check that both fire extinguishers are sealed ,secured and in good condition			
12. Check that vigilance cut-out cock is open and sealed w ith correct seal			
13. Do complete fueling air /dynamic brake and safety vigilance applicable class /series			
14. Test operation of all sanding valves			
15. Check w ater level and top if required			
16. Check for fuel ,oil and w ater leaks and rectify			
17. Check engine air filter indicator if tripped. If tripped change out filters(paper element engine air filters only)			
18. On both automatic drain valves:			
18.1 Open valve and drain all moisture from air system			
18.2 After all w ater is drain place valve in automatic position			
19. Record cab vacuum w ith 10 mm Watson disc			
19.1 VA- 1Release 2 hole open			
19.2 VA – 1Realeased 2 hole closed ----------(min 58 KPa)			
BELOW DECK			
19.3 Inspect suspension bearing caps ,oil cups & drain plugs (feel for excessive heat and inspect locking w ires)			
19.4 Inspect axle center dust guards and flanges dust guards			

19.5 Change out all brake blocks below limits and inspect flanging and record quantity change out			
19.6 Examine all w heels for flats and cracks ,loose tyres and flange w ear			
19.7 On bogies do a thorough examination and rectify all defects founds			
19.8 Check that brake cylinder cut-out cocks are open and sealed			
19.9 Drain oil w aste tank			

REMARKS: