TT

LOCOMOTIVE CORRESPONDENCE COURSE

ENGINEDRIVERS

LESSON 17

Da FAULT LOCATION AND CORRECTION :

In the first part of this lesson it is inteded to cover what action to take with faults that may occur on Da, Db locomotives. It should be remembered that what was said about circuits and fault finding in the Df, Dh lessons will still apply to these locomotives. When studying the faults refer to your circuits and try to learn what causes the fault and why. It should also be remembered that all locomotives are not fitted with the same equipment and when tracing faults ensure what equipment is fitted to the locomotive concerned.

UNUSUAL OPERATING PROBLEMS :

MECHANICAL PROBLEMS

1. Smoke coming out exhaust - operation can continue.
2. Oil coming out of exhaust - Stop engine.
3. Smoke in engineroom coming from engine - Stop engine but do not remove any inspection covers.
4. Governor low oil button trips continually - leave engine stopped.
5. Engine cooling system losing water rapidly - stop engine.
6. Unusual noises - investigate source stop engine or discontinue operation to prevent damage if noise is pronounced.
7. Engine cylinder test valves leaking - Stop engine and tighten valve.

   Do not allow engine to operate with leaking or blowing valve.
8. Safety valves popping on air compressor intercooler or main reservoir - operation can continue.
9. Engine overspeed stops engine repeatedly - Leave engine stopped.
10. Cylinder not firing - Stop engine.

ELECTRICAL PROBLEMS :

1. Ground relay trips continually - isolate unit.
2. Continuous wheel slip indication - isolate unit, stop locomotive and check to see that all wheels can rotate freely.
3. Generator flashover - isolate unit.

... ...

4. Fuses blowing or circuit breakers constantly tripping open - operation can continue. This however, depends on which circuit is involved.

   In some instances operation will not be possible and unit should be isolated and engine stopped.

5. Traction motor blower fan inoperative - isolate unit.

6. Unit fails to make forward transition - operation can continue.

All circuits breakers located on or in the electrical cabinet are of the 30 amp capacity except gauge lights, fuel pump and hot point which are rated at 15 amp.

The circuit breaker switches are ON (closed) when in the UP position and OFF (Open) when DOWN.

If a circuit breaker is overloaded and trips open, service may be restored by first placing the switch fully OFF, and then moving it to ON

CORRECTION OF FAULTS :

A. IF THE ENGINE DOES NOT ROTATE WHEN THE START BUTTON IS PRESSED CHECK :

1. That the control and fuel pump switch on the drivers control stand is ON.

2. That the isolation switch is in the start position

3. That the 400 amp fuse is inserted and intact.

4. That the main battery knife switch is closed.

5. That the control knife switch is closed, (if fitted).

6. That the transfer switch (if fitted) is in the correct position top left hand contacts making.

7. That the control circuit breaker is not tripped.

8. That the 100 amp battery charge fuse is inserted and intact (if fitted).

9. That the start button or switch contacts are not faulty.

10. That the battery is not flat, (try lights) and battery connections are secure.

11. If all are correct bar engine over as there may be an obstruction in the cylinders or engine may have seized.

... ...

B. IF THE ENGINE ROTATES BUT DOES NOT FIRE WHEN THE START BUTTON PRESSED

1. The engine turns with load blowing sounds - Shut relief valves.

2. The engine turns but does not turn over first compression :

(a) Has the engine been barred over (there may be water in the cylinders).

(b) Is the battery partially flat, rest the battery for 10 minutes and check water level in the battery if low, have it topped up.

3. Is the fuel pump running - if it is check :-

(a) Fuel supply in tank.

(b) Coupling between fuel pump and motor.

(c) Overspeed device is not tripped.

(d) That the low oil pressure button on the governor is in.

(e) That the return sight glass is full, if not and there is fuel oil in the 45lb sight glass then the engine mounted filter is blocked.

(f) That there are no suction leaks in fuel piping.

(g) That the suction filter is not blocked.

(h) That lubricating oil in engine sump and oil in governor is at the correct level.

4. If the fuel pump is not running check :

(a) That fuel pump circuit breaker is not tripped.

(b) That the electrical connections to fuel pump motor are secure.

(c) That the fuel pump contactor is closed and clean.

(d) That the fuel pump brushes are in good order.

C. ENGINE FIRES BUT DOES NOT KEEP RUNNING

1. Try another start but hold start button or switch longer.

2. Has the fuel system been primed (if fitted with prime switch).

3. Has the low oil pressure button come out on governor.

4. Has the fuel pump circuit breaker tripped.

5. Has the control circuit breaker tripped.

6. Has the overspeed device tripped after engine started.

... ...

7. Any fuel faults could be the cause.

8. On locomotives fitted with prime and start switch :

(a) Did the battery ammeter show a charge if not :

(b) Check that the 250 amp auxiliary generator fuse is intact.

(c) Check that the 30 amp auxiliary generator field fuse is intact.

9. If all seems correct use layshaft lever to over-ride governor as the oil may be cold causing high suction thus causing low pressure oil button to come out.

10. If engine stops after isolating switch is placed in RUN throttle lever is in the STOP position.

D. IF ENGINE GOES TO IDLE

1. On some locomotives with the fuel pipe lines in good order the engine may only go to idle even if the fuel pump motor has stopped so a check should be made to see if the fuel pump motor is running if it is not check the following :-

(a) Control circuit breaker is not tripped.

(b) Fuel pump circuit breaker is not tripped.

(c) Control and fuel pump switch on drivers panel has not been turned off.

(d) On locomotives fitted with a prime and Start switch : Check battery is on charge, if uncertain hold switch in prime position and if fuel pump then runs but stops when switch released check:

The 250 amp auxiliary generator fuse is intact.

The 30 amp auxiliary generator field fuse is intact.

If unable to regain a battery charge, hold switch in prime position to operate fuel pump so train can be worked clear of main line.

2. If the fuel pump is running check :

(a) Ground relay is not tripped.

(b) P.C. switch is not tripped.

(c) Engine run switch has not been turned off.

(d) That the cable to the governor is firmly connected.
(e) Isolation sw turned to start.

E. IF THE ENGINE STOPS AFTER OPERATING NORMALLY

1. Throttle may have been placed in STOP position with the isolation switch in RUN.

... ...

2. Low oil pressure button on governor may have come out.

3. Engine overspeed device may have tripped.

4. Ground relay may have tripped with throttle lever in notch 5 or 6.

5. Engine run switch on the driver's panel may have been moved to the OFF position with throttle lever in notch 5 or 6

6. P.C. switch may have been opened with throttle lever in notch 5 or 6.

7. Fuel pump circuit breaker may have tripped.

8. Control circuit breaker may have tripped.

9. Fuel tank may be empty.

10. Filters may be blocked check sight glasses.

11. On locomotives fitted with a prime and start switch, check 250 amp auxiliary generator fuse is intact and 30 amp auxiliary generator field fuse is intact.

12. If unable to rectify use prime switch.

13. The fuel pump motor may have become defective or the coupling between the motor and pump may have broken.

14. The control and fuel pump switch may have been placed in the OFF position.

15. Oil may be lost from governor through leaks.

F. IF THE ENGINE DOES NOT SPEED UP WHEN THE THROTTLE IS OPENED

1. The control and fuel pump switch may not have been turned on.

2. Control and fuel pump circuits breakers must be ON.

3. Isolation switch must be in the RUN position.

4. P.C. switch must not be tripped with the GF switch ON.

5. Ground relay must not be tripped.

6. Control knife switch in electrical cabinet must be closed (if fitted)

7. Cable to governor must be firmly connected.

8. If engine hunts check oil level in governor as governor may have been over-filled.

... ...

G. ENGINE SPEEDS UP BUT LOCOMOTIVE DOES NOT MOVE WHEN THROTTLE IS OPENED

1. If amps show on the driving ammeter check that all air and hand brakes are released.

2. If all brakes are released try again but advance the throttle lever to a higher notch and when train moves, reduce throttle so train can be stretched slowly.

3. If amps do not show on driving ammeter check :

(a) Reverse lever is in the direction of travel, selector lever in RUN (or No.1)

(b) If not locked and the reverser is in the centre position or in the incorrect direction of travel, check to see that the control air pressure is correct and the control air isolating cocks are open. If all are correct operate reverser manually by pressing magnet valve button for correct direction of travel : If magnet valve will not operate use locking bar to place reverser in direction required.

(c) See that the 80 amp battery field fuse is inserted and intact.

(d) See that the transfer switch is in the power position top right - hand contacts making, if not, check control air and cocks, if correct move transfer switch by hand by operating magnet valve manually. This switch can also be operated manually by the use of a spanner on the extension of the camshaft under the switch.
BK contactor stuck closed will prevent the transfer switch from throwing.

4. Check to see if BF contactor is closed, if not, check :

(a) Generator field switch is in the ON position.

(b) That the normally closed contacts of the wheel slip relays are closed. This only applies if locomotives are not fitted with wheel slip brake.

(c) That the normally closed interlocks of BK are closed, 1440 onwards. This contactor has often stuck closed after operating in dynamic brake.

(d) That the normally closed interlocks of GS1 and 2 are closed.

(e) That the normally open interlocks of SF are closed (if fitted).

(f) That the normally open interlocks of P12 and P34 are closed, this applies to locomotives Da 1440 onwards but not Dbs.

5. Locomotives 1440 onwards : Extra checks

(a) See that the EM contactors for the direction of travel are energised, if not, check :

(b) Local control circuit breaker is ON

... ...

(c) That the FOR or RER relay is energised depending on direction of travel.

(d) That the normally closed interlocks of the EM contactors concerned are closed, that is RVF12 and 34 or RVR 12 and 34.

(e) Check to see that P12 and P34 are energised and closed, if not, check :-
That RVF 12 and 34 or RVR 12 and 34 normally open interlocks are closed (depending on direction of travel)

BR normally closed contact is closed.

GS 1 and 2 normally closed interlock is closed

BKP 34 normally open interlock is closed.

6. Db Locomotives :

Remember on Db locomotives P12 and P34 are open until transition occurs but S1 series contactor must be closed for locomotive to move in the lower speed notches otherwise all faults are similar to Da locomotives.

H. BATTERY AMMETER SHOWS A DISCHARGE OR AN EXCESSIVE CHARGE

1. Excessive charge

(a) It will often be found that an excessive charge is shown only when the throttle lever is in the higher speed notches.

In this case trip the field circuit breaker or remove the field fuse but when the engine is in the lower speed notches or at idle reset the circuit breaker or replace fuse so that the battery will not be discharged.

If an excessive charge is shown all the time leave circuit breaker tripped or fuse removed but do not stop the engine and watch that the battery is not fully discharged.

(b) Often when an excessive charge is shown the voltage regulators mechanism is stuck and a LIGHT tap on the casing will free it.

2. No charge

Check :

(a) The 30 amp auxiliary generator field circuit breaker or fuse, which ever is fitted, is correct.

(b) The 250 amp auxiliary generator fuse is intact.

Note :

On locomotives fitted with a prime switch if either of the above fuses are blown the fuel pump will also be stopped.

... ...

(c) The 100 amp battery charge fuse is intact (if fitted).

(d) The battery charging contactor is closed, if not check :

(e) The RCR contacts are clean and closed.

(f) The main battery knife switch and auxiliary generator knife switch must be closed.

(g) In both cases book the defect and advise T.C.O.

(h) Do not stop the engine if battery is low.

Locomotives from 1462 onwards are fitted with a rectifier, so no battery charging contactor or RCR is fitted. Some earlier locomotives are also being fitted with a rectifier.

I. HOT ENGINE ALARM OPERATES

When this occurs a warning bell will ring on all locomotives and a warning light will show on unit effected.

1. Action

(a) Stop the train and place controls in normal positions brake applied.

(b) Place isolation switch at start.

(c) Check water level in water cooling tank.

(d) If water level low top up when engine temperature drops to 140°.

(e) Check for leaks in the system and rectify if possible.

2. If water level normal check :

(a) Cooling fan to see if it is working.

(b) Shutters to see if they are open.

(c) If shutters and fan not working check air cock which supplies air to fan clutch and shutter mechanism.

(d) If fan is defective prepare locomotive for towing.

(e) If shutters defective block open with a piece of wood.

3. If all the above are correct :-

(a) Place generator field switch to the OFF position and isolation switch on RUN.

(b) Increase engine speed by advancing throttle lever to the 4 or 5 notch to speed fan up.

(c) When engine cools, continue, but work in a lower power notch if overheating again takes place.

... ...

J. GROUND RELAY TRIPS

When this occurs a warning bell will operate on all locomotives and a warning light will show in the affected unit.

The affected unit will lose all power to the traction motors and the engine will return to idle but if the throttle lever is in notch 5 or 6 it will stop.

1. Action

(a) Place the throttle lever in IDLE and stop train if necessary.

(b) Turn isolation switch to START.

(c) Press ground relay reset button or operate switch whichever is fitted in the cab of the unit affected.

(d) Place isolation switch to RUN

(e) Notch up again carefully.

(f) If ground relay trips again reset and operate in a lower power notch.

(g) If ground relay continues to trip isolate unit and inform T.C.O. and wait for advice.

NOTE :

If the reset button or switch will not reset the ground relay, stop engine and open main battery switch. Remove cover from ground relay and reset by hand by pressing lightly on the end of the bottom oblong bar placed by the relay switch contacts. This only applies to locomotives fitted with the small ground relay.

Whenever a ground relay trips book the fact in the repair book as well as all the information required as shown on the notice placed in each driving cab.

K. LOW OIL PRESSURE BUTTON ON GOVERNOR OUT

When this occurs a warning bell will operate on all locomotives and the affected engine will stop.

1. Action

(a) This is caused by low oil pressure or high suction so if engine is cold, reset the button and try again as it is most likely caused by high suction.

If button again trips operate lay shaft lever to override governor but keep a check on the oil pressure.

2. If Engine Temperature Normal

(a) Stop train and take usual precautions.

(b) Reset button on governor by pushing inwards.

... ...

(c) Check oil level in engine oil sump.

(d) If oil level low check for leaks.

(e) If unable to rectify and no oil available, ring for assistance.

3. If oil level correct

(a) Restart enbine and check oil pressure.

(b) If oil pressure does not build up or engine shuts down by button coming out again after 40 seconds, ring for assistance.

(c) If oil is lost from the governor through leaks the engine will shut down but the low pressure oil button will not come out. If this occurs and the leaks can be rectified, oil can be obtained from the strainer box by removing cover off pressure pump strainers to fill governor.

L. P.C. SWITCH OPEN CAUSED BY LOW BRAKE PIPE PRESSURE

When this occurs the PCR will be de-energised and the PC light will show in the operating cab.

All engines in the consist will stop if throttle lever in notch 5 or 6 but otherwise they will return to idle.

Power will still be applied to traction motors.

1. Action

(a) Place throttle lever in idle and rectify fault such as burst hose.

(b) Place automatic brake valve handle in release to recharge brake pipe.

(c) See that light goes out when brake pipe recharged.

(d) Start engine if stopped.

M. BRAKE WARNING LIGHT ILLUMINATION

This is caused by the BWR being energised by excessive output from No.3 and 4 motors while operating as generators in dynamic brake.

1. Action

(a) When light comes up, pause and see if light goes out.

(b) If not reduce amperage until light goes out.

(c) To reduce, move controller back towards minimum braking position.

(d) If warning light persistently comes up, under no circumstances must it be allowed to stay on.

... ...

(e) The brake control lever must be advanced slowly and not moved past the point where the light is illuminated.

N. WHEEL SLIP LIGHT ILLUMINATED

1. When this occurs in power and the wheel slip brake is not fitted, a pair of wheels is slipping which will cause the normally closed contacts of the wheel slip relay to open.

This causes BF to open and power is lost to the traction motors.

The BF Opening causes the load regulator to move towards minimum field.

The time delay sand relay is energised and sand is applied to the rails.

2. If the locomotive is fitted with wheel-slip brake and slip takes place, power is not lost to traction motors and the load regulator does not move towards minimum field but the air brakes on the locomotive will apply until 15 p.s.i. brake cylinder pressure is reached and then the brakes will release.

1. Action

(a) If in a lower power notch no action should be necessary.
(b) If in a high power notch and continuous slip occurs.

(c) Reduce throttle until slip ceases and apply sand while notching up again.

(d) If wheel slip light does not go out locomotive must be stopped and wheels examined to see they are all turning .

2. In dynamic brake and light is illuminated it indicates one motor is giving a higher output than the others.

Action

(a) If not fitted with wheel slip brake make an application with the independent brake to stop locomotive surging away from train

(b) When light goes out release brake and allow dynamic brake to again take over.

(c) If light persistently comes up reduce the braking strength as it is most likely caused by wheel slide on a bad rail

(d) Do not advance brake strength up to same level again.

3. If fitted with wheelslip brake take the following action :

(a) Reduce the braking strength until light goes out.

(b) If light comes up persistently do not advance brake strength to the same level again.

4. If the wheel slip light comes up when the traction motor fields are shunted it may be caused by dirt on one set of FS contacts preventing one of the four motors from being shunted and thus causing an unbalance of current.

0. MAIN RESERVOIR PRESSURE WILL NOT BUILD UP

1. See that all air reservoir drain cocks are closed.

2. See that all coupling cocks on ends of units are closed.

3. See that the manual unload cock handle is in the load position.

4. Check drive shaft to compressor is intact.

... ...

5. See that no safety valves are stuck open.

6. Check for any air leaks around the locomotive.

MULTIPLE UNIT JUMPER TEST

After coupling up in multiple and it is required to test the jumper connection proceed as follows :-

1. After all controls on both locomotives have been set up correctly.

(a) On the lead locomotive turn isolation switch to START

(b) Turn the generator field switch to OFF position.

(c) Advance the throttle lever to notch 4 or 5 and check to see that the trailing engine responds to the throttle advance.

(d) Place throttle lever in idle and turn generator field switch ON.

(e) Release all brakes and place reverser lever in direction of travel.

(f) Advance throttle lever until trail unit pushes lead unit.

(g) Place throttle lever to idle and turn isolation switch to RUN.

(h) Advance throttle lever and check by ammeter that lead unit operates.

(i) This test can also be carried out on the road when it is suspected that the trailing unit is not operating correctly.

SAFETY :

It is the Enginedrivers duty to see that before any electrical equipment is interferred with, that the following precautions are taken.

(a) Only authorised members are permitted to attend to electrical equipment.

(b) Before touching high voltage equipment the engine must be shut down and the battery switch opened to ensure it is dead.

(c) Do not assume that the equipment is dead, always make sure.

(d) High voltage equipment is covered with suitable covers and shields which are painted a signal red or marked with the works 600V DANGER These covers must not be removed with the engine running and must be replaced before the engine is started.

(e) When it is desired to observe the operation of high voltage equipment while it is alive two authorised members must be present.

... ...

(f) The driver must ensure that no article he is helding or touching comes into contact with live equipment.

(g) He must also ensure the safety of all other persons under his control.

LOW VOLTAGE :

Before touching low voltage equipment ensure it is dead either by switching it off or by removing its fuse.

If this is not possible shut the engine down and open the battery isolating switch.

BATTERY SAFETY PRECAUTIONS :

(a) Isolate the battery before attending to the cells in any way.

(b) Never lay tools or any uninsulated material on top of a battery. The very high currents which flows when cell terminals are bridged by a piece of metal causes sparking, damages connectors and discharges one or more cells. As this is a short circuit the flash that may result could cause burns or damage to a persons eyes and may, in some circumstances, cause the battery to explode.

(c) Never bring naked lights or lighted cigarettes near the battery, or cause sparks either by breaking connections or by other means, while the current is flowing, as the gases given off by the battery during and after charging are explosive.

(d) Never allow the fluid contents of the battery to come in contact with hands, body or clothes, for it is corrosive and burns the area of contact.

PRECAUTIONS AGAINST CRANKCASE EXPLOSION :

Vapour is constantly given off from the lubricating oil and a small amount of gas escapes past the piston rings into the crankcase. The crankcase breather vents these gases to the atmosphere but the breather is designed to restrict the flow and keep the gases in the crankcase at a pressure slightly above atmospheric pressure. The crankcase gases are ordinarily too rich to support combustion, but if diluted with air they become highly inflammable and possibly explosive.

After stopping the diesel engine 15 to 20 minutes should be allowed to elapse before removing the crankcase doors, this will permit the temperature of any engine parts, which are abnormally hot, to fall.

Keep all naked lights of any description away from the engine and do not smoke near the engine.

After removing the doors, disperse the gases by the means of a non electric blower.

... ...

If an engine has stopped through a seizure or a suspected seizure, no attempt must be made to start the engine or bar it over until it has completely cooled down.

FIRE EXTINGUISHERS AND PRECAUTIONS :

The best protection against fire is cleanliness of equipment.

This applies to the engine, the underframe mounted equipment and bogies.

Diesel fuel by itself is not readily inflammable; for instance a lighted match will not ignite fuel oil in a clean saucer, but it would readily set fire to fuel oil spilt on blotting paper or any other substance which can act as a wick.

To minimize the risk of fire, never leave waste rags, or paper, lying round in the engine room.

Never use naked lights for inspection or other purposes around the power unit and allow smoking only in the cab.

Report any arcing in electrical machines.

Pay prompt attention to any overheating.

There are several types of fire extinguishers in use and the following is a brief description of the ones which you may have to use.

1. CARBON DIOXIDE (CO^2)

Carbon dioxide is a gas which is heavier than air, does not support combustion and is the most versatile of all extinguishing mediums. The main advantage of CO^2 extinguishers is that nothing complicated is required to set them in action, depressing the trigger starts the gas flowing immediately and when the trigger is released the valve snaps shut cutting off the flow, so that as little or as much of the CO^2 content can be used as is necessary. When the gas is compressed it liquifies and is kept in this form in cylinders at pressures of 850 to 1000 p.s.i.

When the trigger is depressed the gas discharges at a high rate and expands to about 450 times its compressed volume. This forms a smothering blanket over the fire, displacing the oxygen which is necessary for combustion. The swift reduction in pressure also tends to freeze the gas creating CO^2 "snow" which has a powerful cooling effect. These extinguishers are suitable for all types of fires but especially electrical fires because they can safely be used on all electrical equipment and leave no mess. Their full effectiveness is restricted to still air conditions, hence they are useful mainly indoors, and owing to the small quantity of gas available the hand portable ones are only effective for small fires.

2. SODA ACID

These should only be used on ordinary free burning combustibles such as paper, wood etc, never on oil or paint fires,

... ...

and only on electrical fires if the circuits are dead and CO^2 or dry power extinguishers are not available. Their charge consists of a mixture of bicarbonate of soda and water and a small sealed bottle of sulphuric acid. When the sulphuric acid is mixed with the other solution, normally by turning the extinguisher upside down, a foamy substance is generated and discharged out of the nozzle. There is no means of shutting the flow off so the extinguisher has to be completely emptied and then recharged. The foam generated by this extinguisher is highly corrosive and very messy. This is the main reason why its use on fires in electrical equipment should be avoided if possible.

3. FOAM EXTINGUISHERS

Can be used on free burning combustible type fires, those involving liquids and semi solids such as oil grease paint etc. but not on electrical fires.

As with the soda acid extinguisher they can act as a conductor if used on live electrical circuits and leave a mess which normally involves a major strip down of the equipment to remove it. Their action involves the bringing together of two solutions of foam powder and water which produce the foam when they are mixed together. The foam discharges out of the nozzle.and forms a blanket over the fire, thus smothering it by cutting off the supply of air. The extinguisher has to be completely emptied and refilled after use.

4. CARBON TETRACHLORIDE

Can be used on all types of fires but because the vapour given off is poisonous if inhaled, care must be taken in their use. They should not be used in a confined space. Because they are dangerous they are rapidly becoming obsolete and are being replaced with other extinguishers.

5. DRY POWER

These extinguishers consist of a tank of dry powder, usually sodium bicarbonate, which has been treated to keep it dry and free flowing. When used the powder is discharged from the nozzle by compressed gas, usually CO^2 from a small cartridge. The powder has a smothering effect on the fire and when heated gives off CO^2 which further acts as an extinguishing agent. All but the smallest sizes have a range of about 15 ft. They can be used on all types of fires and are probably more effective than a hand CO^2 extinguisher of comparable size. They are particularly superior to CO^2 extinguishers out of doors or in draughty circumstances. After use a considerable amount of residue remains on equipment, if dry this can be blown off with compressed air or removed with a brush. If oil or water are present it will usually be necessary to strip down and clean all equipment. Once the CO^2 cartridge has been released by pulling the trigger the pressure leaks away in a few hours, hence the extinguisher must be recharged even although only a small amount of power has been used.

... ...

Recharging can be done on site by adding a new charge of powder and renewing the CO^2 cartridge, so they are becoming more universally used as a good general purpose extinguisher.

There are other types of extinguishers used but a knowledge of those mentioned above will be of benefit should you have occasion to use an extinguisher.

Whenever you use an extinguisher, book it in the Loco.54D repair book to be recharged and report the fact to your Officer in Charge.

LIST OF QUESTIONS

1. State the action you would take if the engine would not rotate when the start button was pressed.

2. State the action you would take if the engine rotated but did not fire when the start button was pressed.

3. State the action you would take if the engine fires but fails to keep running.

4. State the reasons that would cause the engine to return to idle speed.

5. Give all the reasons you know that will cause the engine to stop after operating normally.

6. Give all the reasons you know that would prevent a Da locomotive from moving although the engine speeds up.

7. What action would you take with a fault in the battery charging circuit?

8. What action would you take and what indication would you get if an engine overheated ?

9. What indication would you get and what action would you take if the low oil pressure button on the governor moved out ?

10. What action would you take if the brake warning light was illuminated while operating in dynamic braking ?

11. How would you test the unit jumper after coupling up two locomotives to work in multiple ?

12. What precautions must an Enginedriver take before allowing electrical equipment to be interfered with ?

13. What precautions must be taken when attending to a battery ?

14. What precautions must be taken against crankcase explosions and why ?

15. Name the different types of fire extinguishers and state the types of fires they can be used on

16. What action should a driver take after using a fire extinguisher.

NEW ZEALAND GOVERNMENT RAILWAYS

SPECIAL OPERATING INSTRUCTIONS FOR Db LOCOMOTIVES

As the reversing contactors on Db locomotives are connected up to the motor fields in a different manner to those on Da locomotives the following instructions must be carried out when operating Db locomotives to avoid possibly serious damage to the locomotive, the train being hauled and in some cases personal injury.

ISOLATION SWITCH

The isolation switch must never be turned from the Run position to the Start position while the locomotive is moving. If for any reason the isolation switch has to be placed in the Start position the locomotive must first be brought to a Stop and then the switch placed in Start.

Unless the above action is observed the effect will be similar to throwing the reverser and notching up while still moving.

GROUND RELAY

If the ground relay trips the following action must be taken:-

Return the throttle to idle
Operate the reset switch
When the bell has stopped ringing and the light is extinguished notch up again

On no account must the isolation switch be placed in Start position.

If the engine stops through the throttle lever being left in notch 5 or 6, the locomotive must be brought to a stop before the isolation switch is placed in Start position to allow the engine to be restarted.

MULTIPLE UNIT OPERATION

When operating in multiple and a fault occurs which necessitates the isolation of one unit the following action must be carried out :-

TRAIL UNIT

Stop the train and shut down the diesel engine. Ensure all switches on the control stand are off.
Open the battery isolating switch.
Leave the isolation switch in the Start position.

On no account must the battery isolating switch be left closed.

LEAD UNIT

Stop the train and shut down the diesel engine.
Leave the isolation switch in the Start position.
Trip the local control circuit breaker.
Leave the battery isolating switch closed.
Operate the controls in the normal manner.
If the fault does not necessitate the shutting down of the diesel engine proceed as follows :-

P.T.O.

Stop the train.
Place isolation switch in Start position.
Trip the local control circuit breaker.
Operate the controls in the normal manner.

TOWING

If it is necessary to tow a Db locomotive with its engine running and the battery switch closed, the local control circuit breaker must be tripped before the locomotive is moved.

If the engine is shut down, then the battery isolating switch must be opened before towing is commenced.

This instruction applies to those cases where it is necessary to move a locomotive in the Depot as well as out on the main line. If this instruction is not observed serious flats on tyres and possible traction motor damage will occur to the towed locomotive.