



भारत सरकार
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**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

**Recommended Instructions to haul
Dead Diesel & Electric Locomotives**

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CONTENTS

S.No.	DESCRIPTION	PAGE NO.
1.	Introduction	1
	Section-1	2-6
2.	General Instructions	2-6
2.1	Definition	2
2.2	Need for hauling dead locomotive	2
2.3	Basic requirements to be satisfied when hauling Dead Loco	2-3
2.4	Clearance of Block Section	3
2.5	Hauling of Dead Locomotive by Goods Train	3-5
2.6	Haulage of Dead Locomotive by mail/express/Passenger mixed Train	5-6
2.7	Haulage of dead electric loco on non-electrified section	6
	Section-2	7-15
3.	Instructions Concerning Brake System for Hauling Dead Locomotive	7-15
3.1	Hauling dead diesel/electric loco fitted with pure air /dual brake system	7-8
3.2	Hauling dead WAP5/WAG9 electric loco fitted with E-70 brake pipe control system and hauling dead locomotive fitted with IRAB-1 / 28 LAV-1 brake system by WAP5 / WAG9 locomotive.	9-13
3.3	Hauling dead WDG4 diesel loco fitted with Computer Controlled Brake System	14-15

**RECOMMENDED INSTRUCTIONS TO HAUL DEAD
DIESEL & ELECTRIC LOCOMOTIVES**

I. INTRODUCTION

Instructions for hauling dead diesel and electric locomotives have been issued earlier by Railway Board and RDSO. These instructions were given in the form of various letters and reports from time to time. However no consolidated instructions are available at present.

It is understood that different procedures are being adopted on Zonal Railways to haul dead locomotives. The existing instructions also do not fully cover the special features of the newly introduced diesel and electric locomotives. To address this problem and to develop uniform instructions to be followed on Indian Railways, various instructions issued by Railway Board and RDSO have been compiled and updated in this report.

The instructions are divided into two sections. In the first section, General Instructions are given, based on Railway Board's letter No. 77-M(L)/649/4 dated 27.4.77. Changes have been made as necessary to incorporate subsequent instructions and to fulfill requirements of change in traction from steam to diesel/electric

This Instruction Bulletin was first issued in this form in Oct., 2005 vide this office letter no. SD.DFM.A.4.7 dt 26/27.10.05. This revised version includes amendments made vide this office letter no. SD.DFM.A.4.7 dt 25.01.06. In addition, para 2.5 and 2.6 of Section-1 have been thoroughly revised for better understanding.

In the second section, instructions concerning the brake system are included so that the brakes on dead locomotives can be applied and released along with leading locomotive. These instructions are given for various combinations / types of locomotives.

SECTION -1

2. GENERAL INSTRUCTIONS

2.1 Definition: A locomotive which is not worked on its own power is defined as a dead locomotive.

2.2 Need for haulage of dead locomotive:

A locomotive may be required to be worked dead –

- i) To clear a block section and take the locomotive to its destination in case of failure or break down on the road;
- ii) For sending the locomotive to workshop/running shed for repairs and/or maintenance schedules.
- iii) To balance the loco from one division to another.

2.3 Basic requirements to be satisfied when hauling dead locomotive:

The conditions specified herein shall be complied with before haulage of a dead locomotive on any train.

2.3.1 As a result of attachment of dead locomotive(s), maximum permissible length and maximum permissible load of the train should not be exceeded.

2.3.2 In case the maximum permissible speed of the dead locomotive(s) is less than the maximum permissible speed of the train, suitable speed restriction shall be imposed on the train while attaching the dead locomotive(s).

2.3.3 As far as possible, brakes should apply on dead locomotive in synchronisation with working locomotive. Instructions to be followed while connecting dead locomotive to achieve above condition are given in Section-2 for various combinations/type of locomotives. In other cases, dead locomotive will be hauled as piped vehicle.

2.3.4 On a dead locomotive, all the circuit breakers and battery knife switch shall be off and such other steps taken to ensure that the dead locomotive cannot be started inadvertently.

2.3.5 On diesel/electric locomotives it should be ensured that reversor handle is placed in neutral position and removed.

For long distance movement of dead diesel-electric/electric locomotives, the traction motor brushes shall be lifted and properly secured.

2.3.6 The locomotive brakes shall be fully released. The brake pipe and main reservoir pressure shall be fully discharged or the vacuum fully destroyed. The MU2B valve shall be placed in trail/dead position.

2.3.7 The train driver shall be informed that he should work the train carefully as the dead locomotive is attached.

2.4 Clearance of block section:

2.4.1 When a locomotive working a train fails on the road, the dead locomotive shall be attached coupled to the relieving locomotive and the train worked to the next block station, where the dead locomotive shall normally be detached.

2.4.2 In case the dead locomotive is not detached from the train, as above, then the train will work as double/triple headed with the dead locomotive upto the destination or the nearest locomotive shed or as per instructions of control.

2.5 Hauling of dead locomotive by goods train

2.5.1 Dead loco brakes are functional, it is attached next to working locomotive(s) and MR & BC equalizing pipes are connected:

2.5.1.1 In case dead loco brakes are functional, it should be marshalled next to working locomotive(s), duly observing the conditions laid down in section – 2 (including connection of MR equalizing pipe and BC equalizing pipe of rear most working locomotive and dead locomotive(s)), so that brake power of the dead locomotive(s) can be utilized. Following combinations of working and dead locomotives are permitted.

Type of section	No. of working locos	No. of dead locos	Remarks
On all sections	1	1	-
On sections where double heading is permitted	2	1	See para 2.5.1.2 & 2.5.1.4
	2	2	See para 2.5.1.2, 2.5.1.3 & 2.5.1.4
On sections where triple heading is permitted	3	1	See para 2.5.1.2, 2.5.1.3 & 2.5.1.4

2.5.1.2 In case dead locomotive brakes are functional and double/triple heading is permitted, the dead locomotive can be attached next to working locomotives.

2.5.1.3 Maximum four locomotives (i.e. 2 working and 2 dead or 3 working and 1 dead) can be attached provided overall train length does not exceed the loop length from starter to fouling mark.

2.5.1.4 In all the above cases, restrictions on existing bridge spans of non-standard designs, sub-structures (pier, abutment and foundation) and bridges on curves have to be decided by the Railways.

2.5.2 Dead locomotive brakes are functional but it is not attached next to working locomotive(s) or MR and BC equalizing pipes are not connected:

In case the brakes of the dead locomotive are functional but it is not possible to attach it next to working locomotive(s) or it is not possible to connect MR

and BC equalizing pipes of rear most working locomotive and dead locomotives, the dead locomotive shall be treated as a piped vehicle and instructions in para 2.5.3 shall be applicable.

2.5.3 Dead locomotive brakes are not functional and it is hauled as a piped vehicle.

In case brakes are not functional on dead locomotive, it can be hauled as a piped vehicle. The conditions to be satisfied in these cases are given below:

- i) Only one dead locomotive is permitted to be hauled.
- ii) Preferably the dead locomotive should be attached with the train locomotive. In case it is not possible to attach dead locomotive to working locomotive, it shall be marshalled as follows:
 - a) If the dead locomotive is not placed next to the train locomotive, it may be marshalled anywhere on the goods train provided that the minimum distance between the dead loco and the train loco/banking loco (if any) shall be equal to the largest span of the bridge in the section where the dead locomotive is to be hauled. In this case, the following safety requirements from the point of view of brakes should be followed:
 - o Dual brake loco on vacuum train:

Vacuum train pipe of loco shall be connected with the vacuum train pipe of trailing stock and at least twenty fully vacuum braked -1-wheeler units shall be attached behind the dead locomotive.
 - o Dual brake loco/air brake loco on air braked train:

Brake pipe of dead locomotive shall be attached to brake pipe of the train and at least ten fully braked wagons shall be attached behind the dead locomotive.
 - b) In case dead locomotive is attached in rear of brake van, the instructions given in para 2.5.4 will be applicable.

2.5.4 When dead locomotive cannot work as a piped vehicle.

In case, it is not possible to work dead locomotive as a piped vehicle (for example pure air brake locomotive attached to a vacuum train, breakage of Brake Pipe/its angle cock or any other reason) the locomotive has to be attached at the rear of brake van and following conditions are to be satisfied:

- i) Only one dead locomotive is permitted to be hauled.
- ii) Such type of dead loco movement is permitted on gradients not steeper than 1 in 100.

- iii) Dead locomotive will be accompanied by a competent person not less than Asstt. Driver. This competent person should be provided with suitable equipment including walkie-talkie set, flags, detonators, etc. The Guard of the train to which the dead locomotive has been attached shall personally ensure that the dead locomotive is accompanied by such a competent person. It will be the duty and the responsibility of the competent person to switch on the flasher light and apply the handbrakes judiciously in case of run away occurring.

2.5.5 In case of dead diesel/electric locomotive fitted with the side coupling rods, it shall be ensured that all coupling rods are in position.

2.5.6 The basic requirements as enumerated in para 2.3 are satisfied.

2.6 Haulage of dead locomotive by mail/express/passenger /mixed train

A dead diesel/electric (passenger or mixed) locomotive may be attached to a mail/express/passenger/mixed train (except Rajdhani or Shatabdi Express) hauled by diesel/electric locomotive duly observing the conditions laid down in Section-2, provided the following conditions are satisfied: -

2.6.1 Dead loco brakes are functional and it is attached next to working locomotive(s) and MR and BC equalizing pipes are connected:

2.6.1.1 Only one dead diesel/electric locomotive is attached to train.

2.6.1.2 Dead locomotive may be attached at originating station or en-route provided that the brake of mail/express/passenger train/ mixed train (excluding dead locomotive) is at least 90% when dead locomotive is attached.

2.6.1.3 Running of double/triple headed diesel/electric locomotive is permitted on the section.

2.6.2 Dead locomotive brakes are not functional and it is hauled as a piped vehicle: ✓

2.6.2.1 Conditions given in para 2.6.1 are applicable.

2.6.2.2 In case dead locomotive is attached in rear of brake van/SLR, the instructions given in para 2.6.3 will be applicable.

2.6.3 When dead locomotive cannot work as a piped vehicle:

In case, it is not possible to work dead locomotive as a piped vehicle (for example pure air brake locomotive attached to a vacuum train, breakage of Brake Pipe/its angle cock or any other) the locomotive has to be attached at the rear of brake van / SLR and following conditions are to be satisfied:

- i) Only one dead locomotive is permitted to be hauled.

- ii) Such type of dead loco movement is permitted on gradients not steeper than 1 in 100.
- iii) Dead locomotive will be accompanied by a competent person not less than Asstt. Driver. This competent person should be provided with suitable equipment including walkie-talkie set, flags, detonators, etc. The Guard of the train to which the dead locomotive has been attached shall personally ensure that the dead locomotive is accompanied by such a competent person. It will be the duty and the responsibility of the competent person to switch on the flasher light and apply the handbrakes judiciously in case of run away occurring.

2.6.4 A certificate shall be issued by the Section Engineer / Loco Inspector / Power Controller / Driver of the failed loco that the dead locomotive is fit to run by passenger train in all respects from the safety point of view at the maximum permissible speed of the train.

2.6.5 The basic requirements as enumerated in para 2.3 are satisfied.

2.7 Haulage of dead electric locomotive on non-electrified section

When a dead electric loco is moved on a non-electrified section, special check shall be made regarding its infringement to the schedule of maximum moving dimensions. If there is any infringement to the schedule, the dead electric loco shall be considered as an ODC (Over Dimensional Consignment) and its movement shall be permitted in accordance with the extant rules governing such movements.

SECTION - 2

3. INSTRUCTIONS CONCERNING BRAKE SYSTEM FOR HAULING DEAD LOCOMOTIVE

These instructions give details of procedure to couple dead locomotive with light locomotive or with train so that brakes are applied on dead locomotive of different types.

3.1 Hauling dead diesel/electric locomotive fitted with Pure Air /Dual brake system

(For diesel locomotives - Ref. RDSO report No. MP-572/82 February 1982
(For electric locomotives - Ref. Misc. Report No. MP-Misc.45 July 1996))

A dead locomotive fitted with pure air brake/dual air brake system can be hauled both by pure air brake and dual air brake working locomotive. For hauling dead locomotive pneumatic connections between locomotive are to be made similar to MU operation so that brakes are applied on dead locomotive. Details of procedure of coupling dead locomotive are given below:

- 3.1.1 Drop down pantograph of dead loco (applies to Electric Loco only) and engage coupler.
- 3.1.2 Couple brake pipe, feed pipe, MR & BC equalising pipe and vacuum hose (for dual brake loco) between the coupled ends of locomotives.
- 3.1.3 When hauled by a light locomotive, on free ends of the coupled locomotives angle cocks of brake pipe, feed pipe and cutout cocks of MR and BC equalising pipe should be closed and vacuum hose should be kept on dummy.
- 3.1.4 If dead locomotive is attached behind the train locomotive of an air braked train, rear end / end coupled with train brake pipe and feed pipe of the dead locomotive should be connected to brake pipe and feed pipe of the train respectively (on single pipe train only brake pipe will be connected and angle cock of feed pipe shall be closed). On free end of working locomotive angle cocks of brake pipe, feed pipe and cutout cocks of MR and BC equalising pipe should be closed. For dual brake locomotive vacuum hoses shall be kept on dummy.
- 3.1.5 If dead locomotive is attached to a vacuum train, vacuum hose pipe of dead locomotive will be connected to vacuum hose pipe of the train and on free end of the working locomotive vacuum hose should be kept on dummy. On free end of working locomotive angle cocks of brake pipe, feed pipe and cutout cocks of MR and BC equalising pipe should be closed. On the rear end / end coupled with train angle cocks of brake pipe, feed pipe and cutout cocks of MR and BC equalising pipe of dead locomotive shall be closed.

- 3.1.6 Open BP & FP angle cocks and MR & BC equalising pipe cut out cocks between the coupled ends.
- 3.1.7 Open cutout cock of leading locomotive provided in port No.5 of A-9 auto brake valve of operative control stand.
- 3.1.8 Make emergency brake application through A-9 automatic brake valve, close cut out cock on in-operative control stand of working loco. Also close the cutout cocks provided in Port No.5 of A-9 valve on both control stand/cabs of dead locomotive.
- 3.1.9 Keep MU-2B valve in 'Lead' position on leading locomotive and in 'Trail'/'Dead' position on dead locomotive.
- 3.1.10 Open 1" brake pipe charging cut out cock on leading locomotive and close the same on trailing dead locomotive.
- 3.1.11 Remove the driver's auto. & independent brake valve handles from inoperative control stands on leading and trailing dead locomotives.
- 3.1.12 2" Cutout cock (for dual/vacuum brake loco) of dead locomotive should be closed.
- 3.1.13 Close isolating cock provided before H-5 & HB-5 relay air valve of dead locomotive. (in new built diesel locomotives these valves are replaced with RT-116 and RT-5 pressure switch).
- 3.1.14 In case of electric locomotive close emergency application isolating cock of dead locomotive.
- 3.1.15 Charge the brake system and apply & release the brakes. Brakes should apply and release brakes simultaneously on both the locomotives.
- 3.1.16 In case it is not possible to connect MR equalising and BC equalising pipes between dead and working locomotive similar to MU operation then dead locomotive shall be hauled as piped vehicle and pneumatic connections are to be done as under:-

1. On air braked train brake pipe and feed pipe of dead locomotive should be coupled with brake pipe and feed pipe of the train (on single pipe train only brake pipe shall be connected) and on coupled ends angle cock shall be kept open On free end of the working locomotive angle cocks should be closed.
2. In case the trailing stock is vacuum braked, only vacuum hose should be coupled between locomotives and between dead locomotive and train.

3.2 Hauling dead WAP5/WAG9 electric locomotive fitted with E-70 brake pipe control system and hauling dead locomotive fitted with IRAB-1/28 LAV-1 brake system by WAP5/WAG9 locomotive

These locomotives are fitted with electro pneumatic E-70 brake system. These locomotives in dead condition can be hauled both by locomotive fitted with IRAB-1 / 28 LAV-1 brake system and locomotive fitted with E-70 brake system. Direct (Independent) brake application will not take place on WAP5 / WAG9 locomotive hauled in dead condition.

The WAP5 / WAG9 locomotive can also haul dead locomotive fitted with IRAB-1 / 28 LAV-1 brake system. The direct brakes will operate on locomotives fitted with IRAB-1 / 28 LAV-1 brake system hauled in dead condition by a WAP5 / WAG9 locomotive.

3.2.1 Hauling dead WAP5/WAG9 electric locomotive fitted with E-70 brake pipe control system in a train

3.2.1.1 Switch off BLDJ and lower the pantograph of the loco to be sent as dead. Isolate the pantograph through panel isolating cock on pneumatic panel.

3.2.1.2 Switch off the CEL first by bringing BL switch to 'C' and then to 'OFF'. Switch off the "circuit breaker control circuit locomotive" (112.1) in SB2 panel.

3.2.1.3 Couple the dead loco in the train.

3.2.1.4 Put auto brake controller (A-9) in 'Neutral' position in both cabs of the dead locomotive.

3.2.1.5 Put the direct brake controller (SA-9) in 'Release' position in both cabs of the dead locomotive.

3.2.1.6 Drain the main reservoirs and auxiliary reservoir of the dead locomotive completely. After draining out, close the drain cocks of main reservoirs and auxiliary reservoir.

3.2.1.7 If loco brake in the dead locomotive have not got released, which can be verified by observing the BC pressure gauge, then release the same in the following steps:

- i) Manual handle of distributor valve at pneumatic panel should be operated manually to release control BC pressure. BC pressure shall automatically vent through D2 relay valve to release loco brakes.
- ii) In case residual BC pressure remains in brake cylinder line, the BC pressure should be released through bogie isolating cock of both

bogies. Make bogie isolating cocks in 'Normal' position after releasing the BC pressure.

3.2.1.8 In the dead locomotive, ensure isolating cock positions in the pneumatic panel as follows: (TOWED DEAD)

Isolating cock	47 (DEAD ENGINE)	74 (EMERGENCY /VIGILANCE)	136 (BRAKE FEED PIPE)	70 (E-70 BRAKE PIPE)
Position	OPEN	CLOSED	CLOSED	CLOSED

3.2.1.9 Connect BP pipe of the dead loco to the BP pipe of the working loco and open BP angle cock of both the locomotives. The auxiliary reservoir on dead locomotive will get charged from the BP supply of the working locomotive. Check the BP pressure gauge in the cab of dead locomotive. It should show the same pressure as that of the live locomotive (In case locos are to be attached on a train having twin pipe i.e both BP and FP then FP of both the locos should also be connected and its angle cock should be opened).

3.2.1.10 Release the parking brake by manually pressing the release push button of the latched solenoid on the pneumatic panel of the dead locomotive and lock it in position.

3.2.1.11 Check the condition of the parking brake gauge of the dead loco in the driver's cab – this should indicate 5.0 kg/cm².

3.2.1.12 Double check the release of parking brakes of dead loco by moving the parking brake unit by hand and observing the clearance between the brake blocks/pads and the wheels wheel discs.

3.2.1.13 Apply auto brake (A-9) in the working locomotive and check that loco brakes on both the locomotives are getting applied. Then release the auto brake in the working loco and check that loco brakes are getting released on both the locomotives. Rear locomotive (WAG9/WAP5 dead) takes about 1 minute to release.

3.2.1.14 As a final check, run the coupled locos for about 500 m and feel for any abnormal rise in temperature of the wheels of the dead loco and also check it at subsequent stops during journey.

3.2.1.15 Remember that in the dead locomotive, the loco brakes take about 1 minute to release after auto brake application from the live locomotive. Hence after every auto brake application and release, wait for adequate time (minimum 1 minute) for release of loco brakes in dead locomotive before resuming traction.

3.2.1.16 Escorts accompanying dead locomotive should never put BL key in position 'D' and also strictly avoid to energise the dead locomotive.

3.2.1.17 After reaching the destination, before detaching the working loco, apply parking brake on dead locomotive by manually pressing the 'APPLY' push button of the latched solenoid valve (30) on the pneumatic panel of the dead locomotive (it will be necessary to unlock the release push button first).

3.2.2 Hauling dead WAP5/WAG9 electric locomotive fitted with E-70 brake pipe control system when attached next to leading working locomotive

3.2.2.1 Switch off BLDJ and lower the pantograph of the loco to be sent as dead. Isolate the pantograph through panel isolating cock on pneumatic panel.

3.2.2.2 Switch off the C.E.L. first by bringing BL switch to 'C' and then to 'OFF'. Switch off the "circuit breaker control circuit locomotive" (112.1) in SB2 panel.

3.2.2.3 Couple the dead loco in rear of the working loco.

3.2.2.4 Put auto brake controller (A-9) in 'Neutral' position in both cabs of the dead locomotive.

3.2.2.5 Put the direct brake controller (SA-9) in 'Release' position in both cabs of the dead locomotive.

3.2.2.6 Drain the main reservoirs and auxiliary reservoir of the dead locomotive completely. After draining out, close the drain cocks of main reservoirs and auxiliary reservoir.

3.2.2.7 If loco brake in the dead locomotive have not got released, which can be verified by observing the BC pressure gauge, then release the same in the following steps:

i) Manual handle of distributor valve at pneumatic panel should be operated manually to release control BC pressure. BC pressure shall automatically vent through D2 relay valve to release loco brakes.

ii) In case residual BC pressure remains in brake cylinder line, the BC pressure should be released through bogie isolating cock of both bogies. Make bogie isolating cocks in 'Normal' position after releasing the BC pressure.

3.2.2.8 In the dead locomotive, ensure isolating cock positions in the pneumatic panel as follows: (TOWED DEAD)

Isolating cock	47 (DEAD ENGINE)	74 (EMERGENCY /VIGILANCE)	136 (BRAKE FEED PIPE)	70 (E-70 BRAKE PIPE)
Position	CLOSED	CLOSED	CLOSED	CLOSED

3.2.2.9 Connect BP and MREP pipes of the dead loco to the BP and MREP pipes of the working loco and open BP and MREP angle cocks of both the

locomotives. The auxiliary reservoir on dead locomotive will get charged from MREP supply of the working locomotive. Check the BP and MR pressure gauges in the cab of dead locomotive. It should show the same pressure as that of the live locomotive (In case locos are to be attached on a train having twin pipe i.e both BP and FP then FP of both the locos should also be connected and its angle cock should be opened).

- 3.2.2.10 Release the parking brake by manually pressing the release push button of the latched solenoid on the pneumatic panel of the dead locomotive and lock it in position.
- 3.2.2.11 Check the condition of the parking brake gauge of the dead loco in the driver's cab – this should indicate MR pressure
- 3.2.2.12 Double check the release of parking brakes of dead loco by moving the parking brake unit by hand and observing the clearance between the brake blocks/pads and the wheels wheel discs.
- 3.2.2.13 Apply auto brake (A-9) in the working locomotive and check that loco brakes on both the locomotives are getting applied. Then release the auto brake in the working loco and check that loco brakes are getting released on both the locomotives. Rear locomotive (WAG9/WAP5 dead) takes about 30 seconds to release.
- 3.2.2.14 As a final check, run the coupled locos for about 500 m and feel for any abnormal rise in temperature of the wheels of the dead loco and also check that subsequent stops during journey.
- 3.2.2.15 Remember that in the dead locomotive, the loco brakes take about 30 seconds to release after auto brake application from the live locomotive. Hence after every auto brake application and release, wait for adequate time (minimum 1 minute) for release of loco brakes in dead locomotive before resuming traction.
- 3.2.2.16 Escorts accompanying dead locomotive should never put BL key in position 'D' and also strictly avoid to energise the dead locomotive.
- 3.2.2.17 After reaching the destination, before detaching the working loco, apply parking brake on dead locomotive by manually pressing the 'APPLY' push button of the latched solenoid valve (30) on the pneumatic panel of the dead locomotive (it will be necessary to unlock the release push button first).

3.2.3 Hauling dead locomotive fitted with IRAB-1/28 LAV-1 brake system by WAP5/WAG9 locomotive

3.2.3.1 Set up the IRAB-1 / 28 LAV-1 locomotives for hauling dead in normal condition.

3.2.3.2 Connect BP, MREP and Direct Brake Pipe (DBP) / Brake Cylinder Equalising Pipe (BCEP) dead loco to the BP, MREP and direct brake pipe of the working loco and open BP, MREP and DBP angle cocks of both the locomotives. The auxiliary reservoir on dead locomotive will get charged from the MREP supply of the working locomotive. Check the BP and MR pressure gauge in the cab of dead locomotive. It should show the same pressure as that of the live locomotive (in case locos are to be attached with a train having twin pipe i.e both BP and FP then FP of both the locos should also be connected and its angle cock should be opened).

3.2.3.3 Double check the release of parking brakes /hand brakes of dead loco by moving the parking brake /hand brakes unit by hand and observing the clearance between the brake blocks/pads and the wheels wheel discs.

3.2.3.4 Apply auto brake (A-9) in the working locomotive and check that loco brakes on both the locomotives are getting applied. Then release the direct brake in the working loco and check that loco brakes are getting released on both the locomotives.

3.2.3.5 Apply direct brake (SA-9) in the working locomotive and check that loco brakes on both the locomotives are getting applied. Then release the direct brake in the working loco and check that loco brakes are getting released on both the locomotives.

3.2.3.6 As a final check, run the coupled locos for about 500 m and feel for any abnormal rise in temperature of the wheels of the dead loco and also check it at subsequent stops during journey.

3.2.3.7 After reaching the destination, before detaching the working loco, apply parking brake / hand brake on dead locomotive.

3.3 Hauling dead WDG4 diesel locomotives fitted with computerised control brake system (CCB)

These locomotives are fitted with computer controlled brake (CCB) system. These locomotives in dead condition can be hauled both by locomotive fitted with IRAB-1 / 28LAV-1 brake system and locomotive fitted with CCB brake system. To haul this locomotive in dead condition, following procedure should be followed:

- 3.3.1 If the locomotive is to be towed with all MU pipes connected to working loco, set up the brake system as under:-
- 1 Engage coupler.
 - 2 Ensure that Dead Engine Cutout Cock is closed.
 - 3 Couple BP, FP, BC & MR equalising pipes between coupled ends of locomotives.
 - 4 Open BP, FP angle cock and MR & BC equalising pipe cutout cock between coupled end of locomotives. Unused pipes' angle cocks/cutout cocks should be closed.
 - 5 Open the MREP end cocks.
 - 6 Keep Lead/trail switch off leading loco in 'Lead' position and of trailing dead locomotive in 'Trail/Dead' position.
 - 7 Keep automatic and direct brake valves of leading & trailing dead locomotive in 'Release' position.
 - 8 Follow the instructions given in para 3.3.3
 - 9 Apply and release automatic and direct brakes from leading loco and ensure that application and release are taking place simultaneously on both the locomotives.
- 3.3.2 If the dead WDG4 locomotive is to move inside the train consist, MR and BC equalising MU pipes not connected, set up the brake system in the dead loco as follows:
- 1 Engage coupler.
 - 2 Couple brake pipe between coupled ends of locomotive.
 - 3 Open brake pipe cutout cock between coupled ends of locomotives and the same at free end should be kept closed or connected with the train brake pipe.
 - 4 Open Dead Engine Cutout Cock.

5. Open MREP & BCEP end cocks.
6. Micro air brake circuit breaker in No.1 electrical control must be kept in 'OFF' position.
7. Keep automatic and direct brake valves of leading & trailing dead locomotive in 'Release' position.
8. Close emergency brake valve at both consoles.
9. Isolate all safety control devices.
10. Open main reservoir drain valves to drain main reservoir to approximately 1.4 kg/cm² (20 psi) or less.
11. Close MR drain valves.
12. Connect locomotive brake pipe to train brake pipe (if moving with train) and charge brake system. MR2 charges to a maximum of 1.8 kg/cm² (25 psi).
13. From the controlling locomotive make a 1.4 kg/cm² (20 psi) brake pipe reduction, then check for brake cylinder application on dead locomotive.
14. Follow the instructions given in para 3.3.3.

3.3.3 Below are the points to be followed in both the above cases:

1. Battery switch off dead loco must be closed and both control and computer control breakers must be ON (levers up) to provide locked wheel protection for locomotive.
2. TCC1 and TCC2 (Traction Control Converter) computer breakers must also be ON (Up) to detect an unpowered locked wheel and alert the operator.
3. All other circuit breakers be in OFF position (levers Dn).
4. Set all control switches in OFF position.
5. Remove starting fuse.
6. Set the throttle/dynamic brake handle in IDLE. Remove reverser (directional handle) from both controllers to lock the controls.
7. Install MU jumper cables on dead unit.
8. Ensure that hand brakes of leading and trailing locomotives are working and are released.
9. Ensure that bogie BC cut out cocks are open.