

BRITISH RAILWAYS



# DRIVER'S MANUAL

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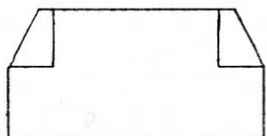
ASSISTANCE PROCEDURES INVOLVING  
DIESEL MULTIPLE UNIT TRAINS  
WITH MECHANICAL TRANSMISSION,  
EXCEPTING CLASS 126  
(WHITE CIRCLE) CARS

BR.33056/49  
ISSUE 1

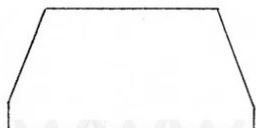
## CONTENTS

The contents of this book are shown diagrammatically below. Each diagram depicts a failed train and the locomotive or train which is provided to assist it.

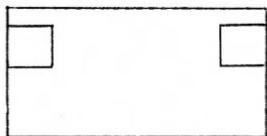
### SYMBOLS AND ABBREVIATIONS



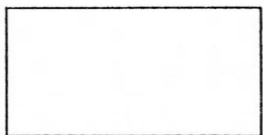
Electric, electro-diesel or diesel locomotive



Diesel multiple unit train (D.M.U.)



Electric multiple unit train or Diesel electric multiple unit train with E.P. brakes



Train of coaches, wagons or other trailing vehicles

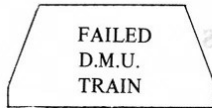
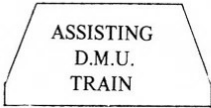
V B P	.....	Vacuum brake pipe
H V P	.....	High vacuum pipe
M R P	.....	Main reservoir pipe

# TRAIN FORMATION

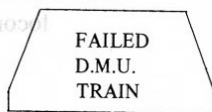
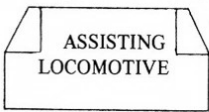
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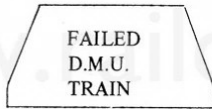
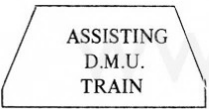
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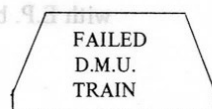
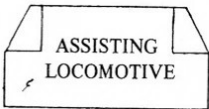
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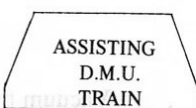
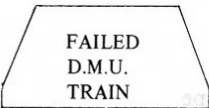


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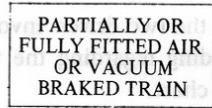
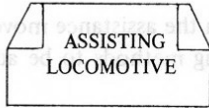
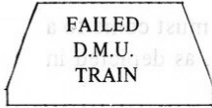
## ASSISTANCE FROM THE REAR



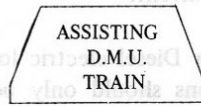
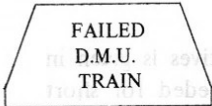
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# TRAIN FORMATION

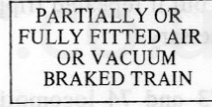
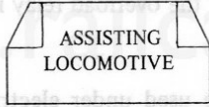
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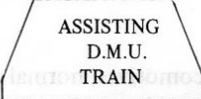
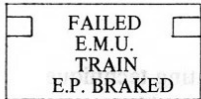
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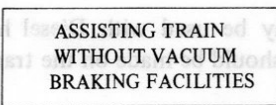
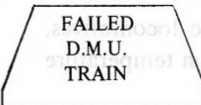
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## GENERAL INSTRUCTIONS

When assistance is being given in accordance with the diagrams listed above, the speed of the combined train must be regulated to enable it to be stopped at signals and stations, having regard to the brake power available and all other circumstances.

Before moving, the two drivers involved in the assistance movement must come to a clear understanding regarding the working methods to be adopted, as depicted in the appropriate chart.

## LOADING CONDITIONS FOR ASSISTING LOCOMOTIVES

Whenever a train is assisted by any of the methods described in this booklet, care must be taken to avoid excessive traction current.

The main generator continuous rating for Diesel electric locomotives is given in BR.33056/10 and these current conditions should only be exceeded for short periods, as in normal accelerating technique. If a train cannot be started in accordance with the above method, further assistance must be obtained.

When assistance is given by class 71 locomotives normal accelerating technique should be used, but if repeated tripping of the overload relay is experienced, further assistance is necessary.

When classes 73 and 74 locomotives are used under electric conditions, normal accelerating technique should be used. If repeated tripping of the overload relay is experienced, an attempt should be made to provide assistance by changing to Diesel conditions, because this will give finer current control. If trains cannot be assisted by using the locomotive under Diesel conditions, due to tripping of the overload relay, further assistance is required.

When assistance is given by A.C. electric locomotives, normal accelerating technique should be used and the traction current should only be allowed to 'peak' into the red band of the driving ammeters momentarily. If the needles remain in the red band during acceleration, the power must be notched back until they revert into the yellow band.

Normal accelerating technique may be used with Diesel hydraulic locomotives, when assisting, but frequent checks should be made on the transmission temperature warning light.



When any locomotive is used to assist a failed train, extreme care must be taken to avoid wheel slip, especially at standstill conditions, in which rail burns are caused.

### **LOADING CONDITIONS FOR ASSISTING ELECTRIC MULTIPLE UNIT TRAINS**

1. The power handle must not be moved beyond the SERIES or NOTCH 2 position.
2. If it is impossible to assist the train at a speed of more than 10 m.p.h. the driver must shut off power after 3 minutes and no attempt must be made to assist the train again for a further 10 minutes.
3. If speeds above 10 m.p.h. can be attained, power can be applied for 5 minutes out of any period of 10 minutes.
4. If a speed of 20 m.p.h. can be attained and maintained, the SERIES or NOTCH 2 position may be held continuously.

In all cases where multiple unit trains are required to assist, it is advisable to use as many units as possible (subject to current limit index on the Southern Region), but a 2,3 or 4 car unit will be capable of assisting light trains or locomotives only.

An electric multiple unit train must not be used to assist a train of greater weight than its own weight.

### **LOADING CONDITIONS FOR ASSISTING DIESEL ELECTRIC MULTIPLE UNITS (SOUTHERN REGION)**

When providing assistance, the power controller should be moved in such a way that the traction current will not exceed 600 amps. for more than 2 minutes i.e. when moving the combined train from rest.

Notch 7 should not be used for more than two minutes when in a driving trailer, if the speed will not rise to 25 m.p.h. within this period. If a lower speed than this is required, it must be maintained by moving the power controller back to notch 6 or below. If the combined train cannot be moved under these conditions, further assistance must be obtained.

### **LOADING CONDITIONS FOR ASSISTING DIESEL MULTIPLE UNIT TRAINS WITH MECHANICAL TRANSMISSION**

The loading conditions for diesel multiple unit trains, which are used for assisting purposes, are based on the total number of engines in working order, the total weight of the two (i.e. failed and assisting) trains and the ruling gradient.



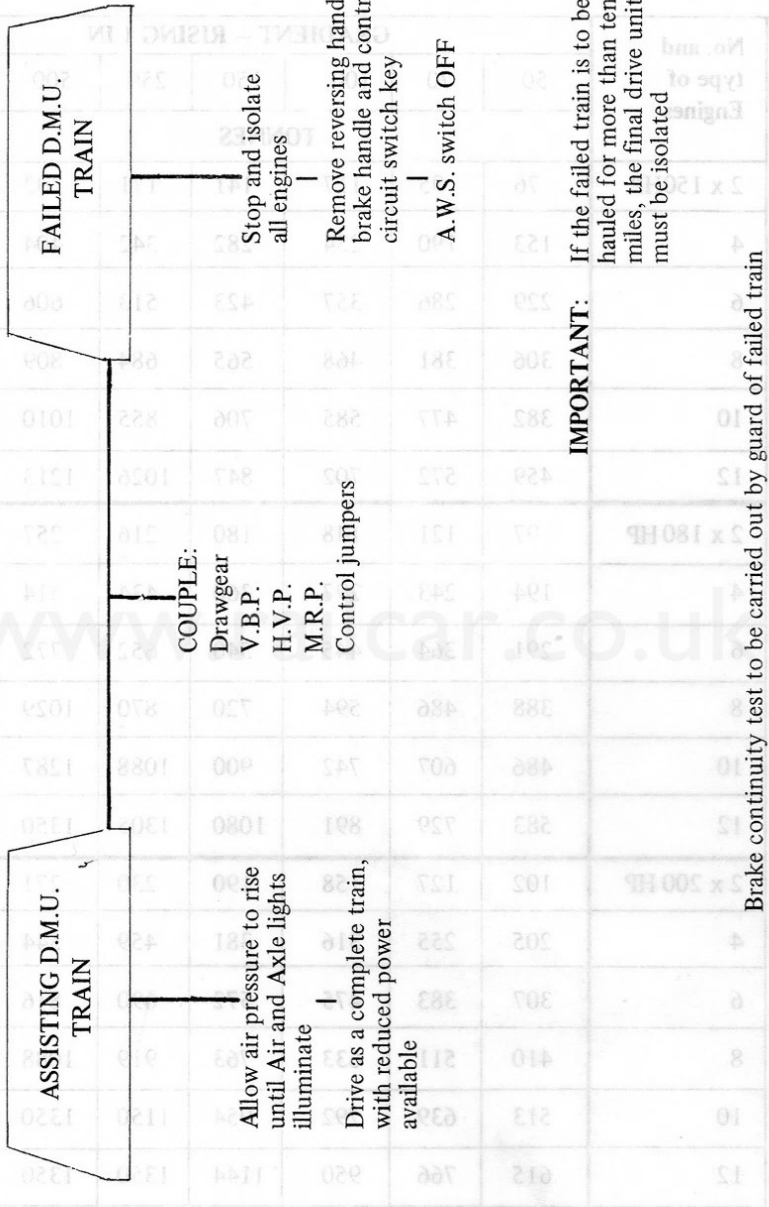
**D.M.U. TRAINS – TOTAL WEIGHT (TONNES TARE) THAT CAN BE  
STARTED ON VARIOUS GRADIENTS**

No. and type of Engines	GRADIENT – RISING 1 IN						
	50	70	100	150	250	500	LEVEL
	TONNES						
2 x 150HP	76	95	117	141	171	202	247
4	153	190	234	282	342	404	445
6	229	286	357	423	513	606	742
8	306	381	468	565	684	809	990
10	382	477	585	706	855	1010	1237
12	459	572	702	847	1026	1213	1350
2 x 180 HP	97	121	148	180	216	257	315
4	194	243	297	360	434	514	630
6	291	364	445	540	652	772	945
8	388	486	594	720	870	1029	1260
10	486	607	742	900	1088	1287	1350
12	583	729	891	1080	1305	1350	1350
2 x 200 HP	102	127	158	190	230	271	333
4	205	255	316	381	459	544	666
6	307	383	475	572	690	816	999
8	410	511	633	763	919	1088	1332
10	513	639	792	954	1150	1350	1350
12	615	766	950	1144	1350	1350	1350



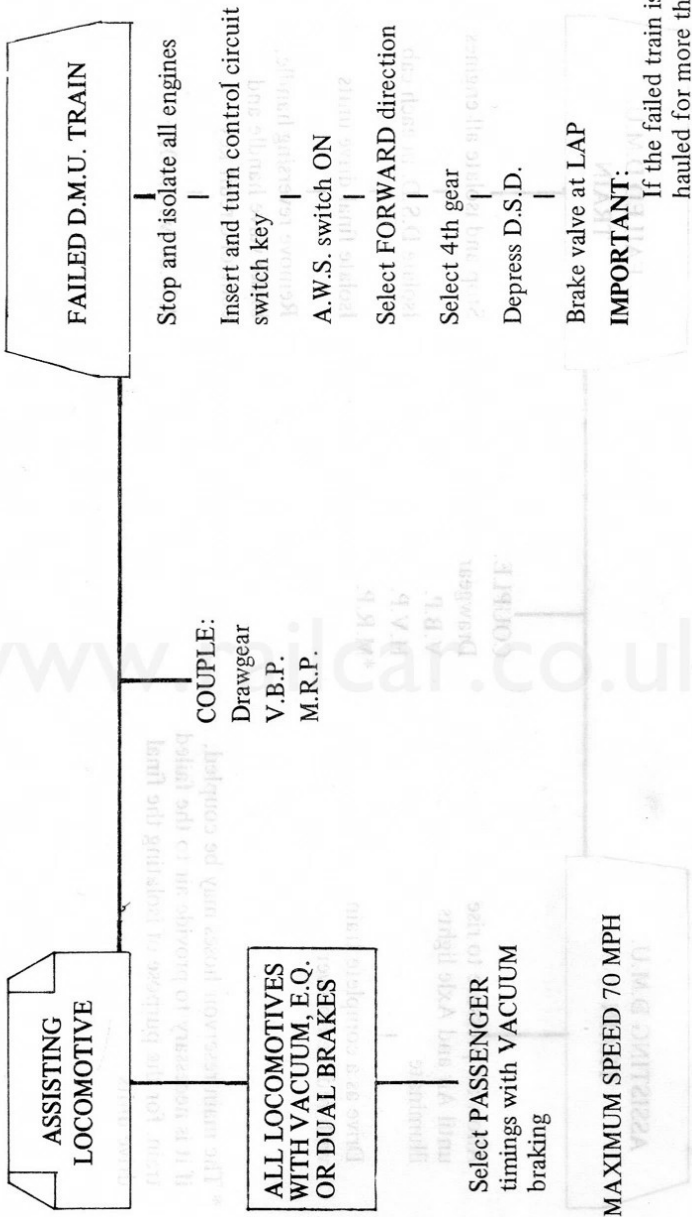
### ASSISTANCE FROM THE FRONT

Failed train WITHOUT train control circuit defects and control circuit fuse (No.6) intact



# ASSISTANCE FROM THE FRONT

Failed train **WITHOUT** train control circuit defects and control circuit fuse (No.6) intact



**ASSISTING  
LOCOMOTIVE**

**ALL LOCOMOTIVES  
WITH VACUUM, E.Q.  
OR DUAL BRAKES**

**Select PASSENGER**  
timings with **VACUUM**  
braking

**MAXIMUM SPEED 70 MPH**

**FAILED D.M.U. TRAIN**

- Stop and isolate all engines
- Insert and turn control circuit switch key
- A.W.S. switch ON
- Select FORWARD direction
- Select 4th gear
- Depress D.S.D.
- Brake valve at LAP

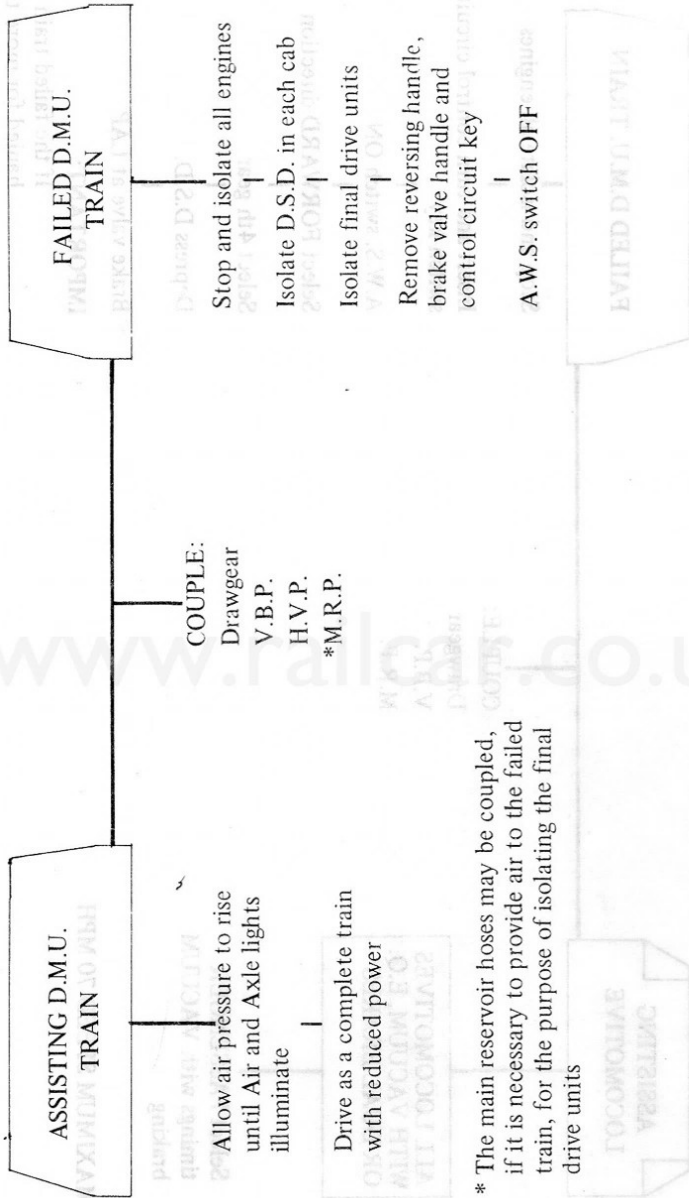
### IMPORTANT:

If the failed train is to be hauled for more than ten miles, the final drive units must be isolated

Brake continuity test to be carried out by driver of failed train in conjunction with guard of assisting train

## ASSISTANCE FROM THE FRONT

Failed train WITH train control circuits defects and/or control circuit fuse (No.6) ruptured

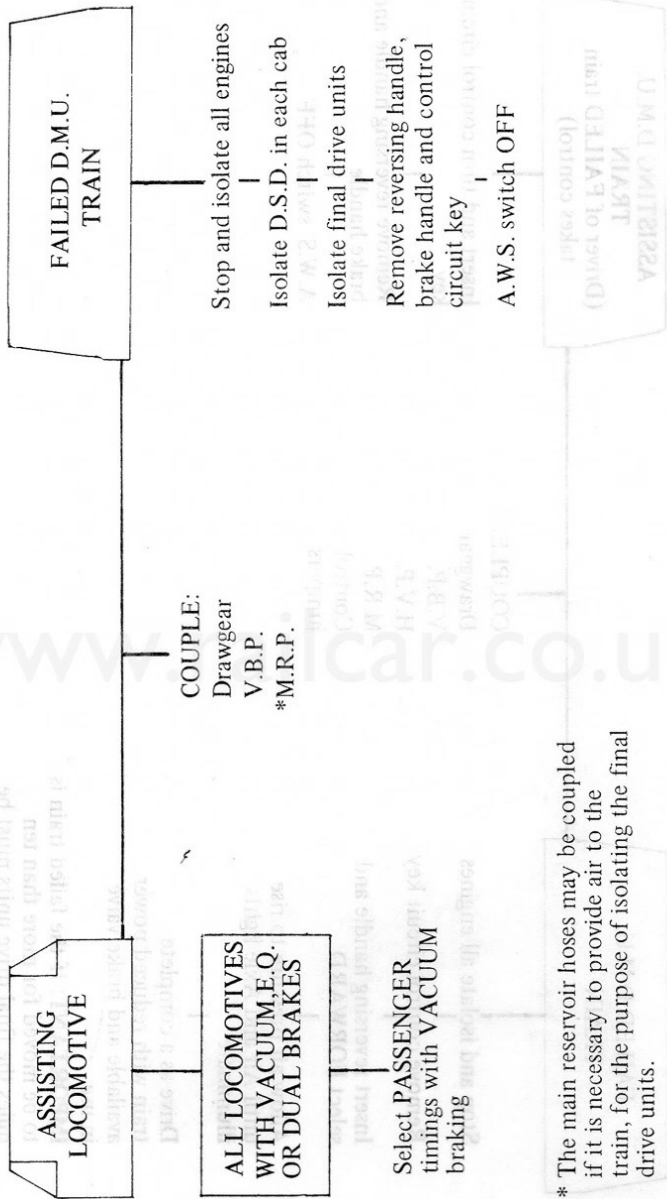


\* The main reservoir hoses may be coupled, if it is necessary to provide air to the failed train, for the purpose of isolating the final drive units

Brake continuity test to be carried out by driver of failed train in conjunction with guard of assisting train

## ASSISTANCE FROM THE FRONT

Failed train WITH train control circuit defects and/or control circuit fuse (No.6) ruptured



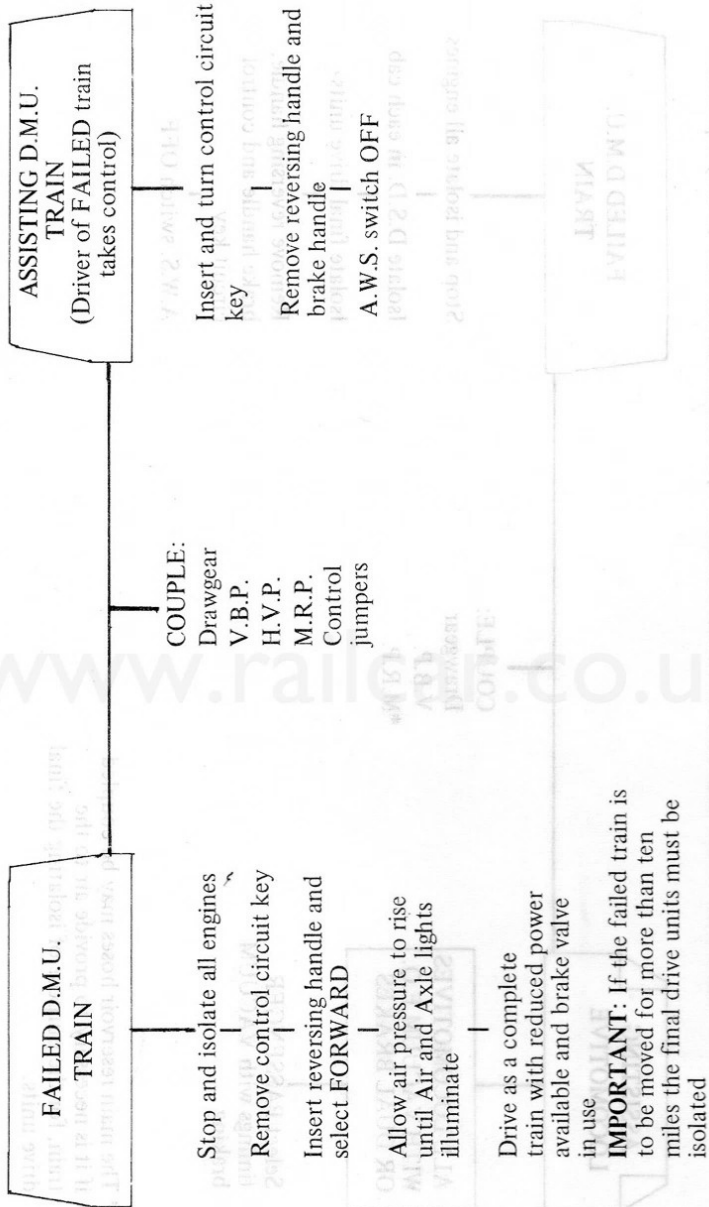
\* The main reservoir hoses may be coupled if it is necessary to provide air to the train, for the purpose of isolating the final drive units.

MAXIMUM SPEED 70 MPH

Brake continuity test to be carried out by guard of failed train

## ASSISTANCE FROM THE REAR

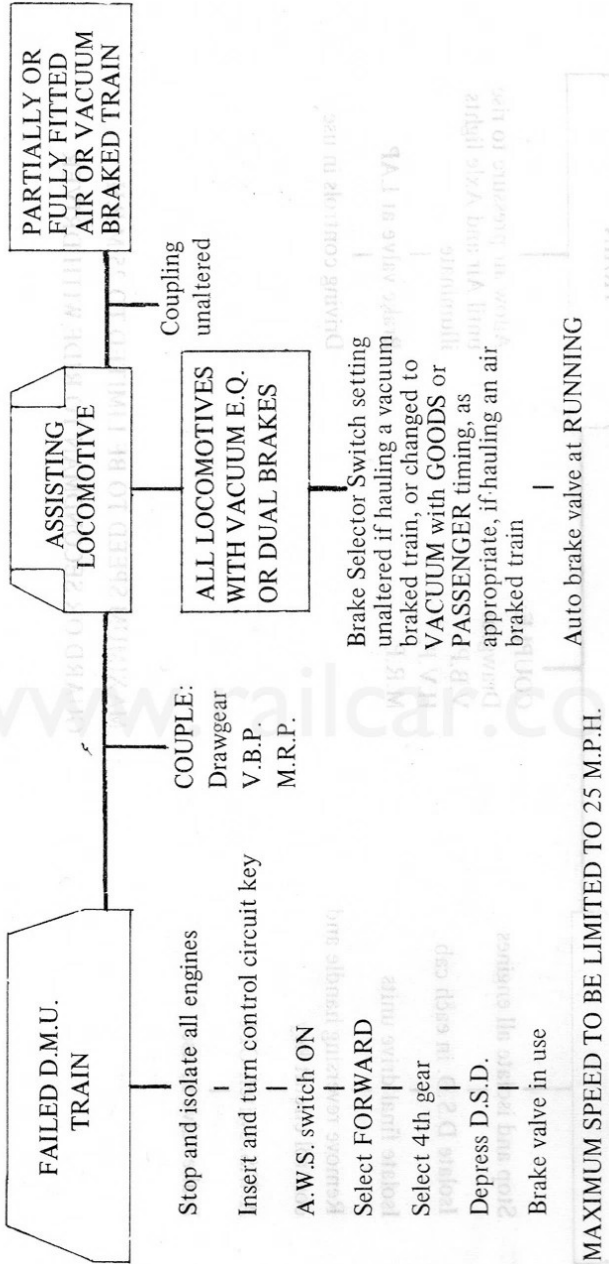
Failed train WITHOUT train control circuit defects and control circuit fuse (No.6) intact



Brake continuity test to be carried out by driver of assisting train

## ASSISTANCE FROM THE REAR

Failed train WITHOUT train control circuit defects and control circuit fuse (No.6) intact



**MAXIMUM SPEED TO BE LIMITED TO 25 M.P.H.**

Brake continuity test to be carried out by driver of failed train

Service braking to be carried out by driver of assisting locomotive

Emergency braking can be carried out by driver of failed train

(a) On both trains if assisting train is vacuum braked

(b) On failed train and assisting locomotive if its train is air braked

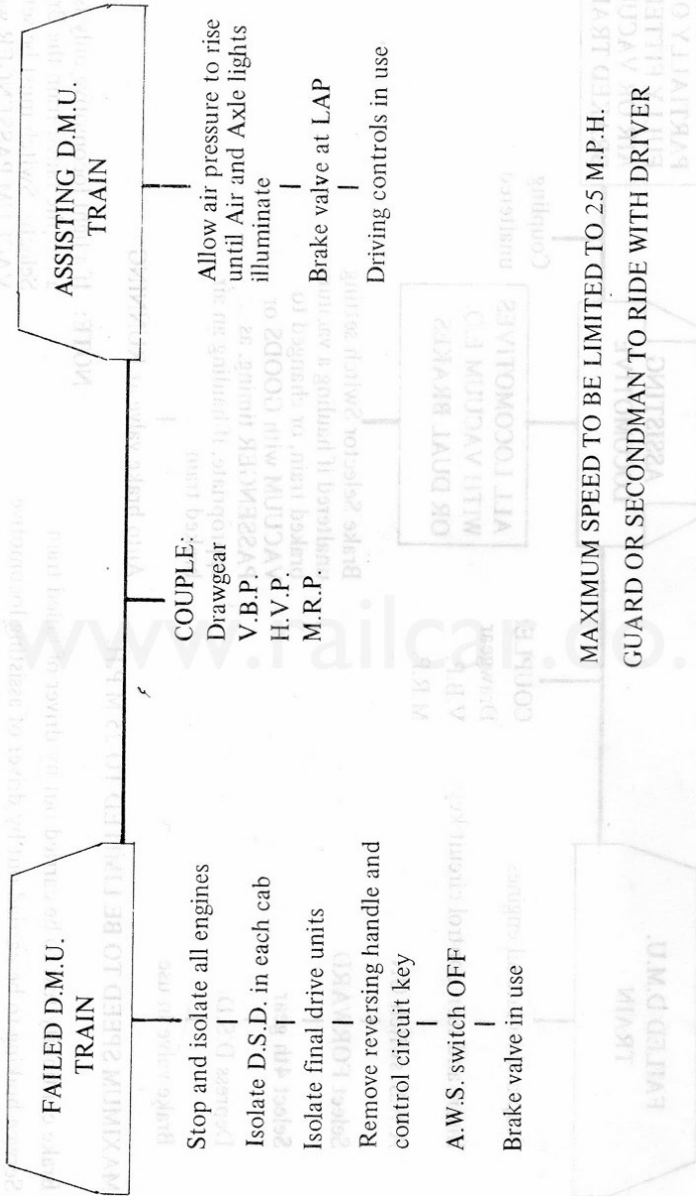
Auto brake valve at RUNNING

**NOTE:** If a light locomotive only is used to assist the failed train the Brake Selector Switch must be set for VACUUM PASSENGER working



## ASSISTANCE FROM THE REAR

Failed train WITH train control circuit defects and/or control circuit fuse (No.6) ruptured

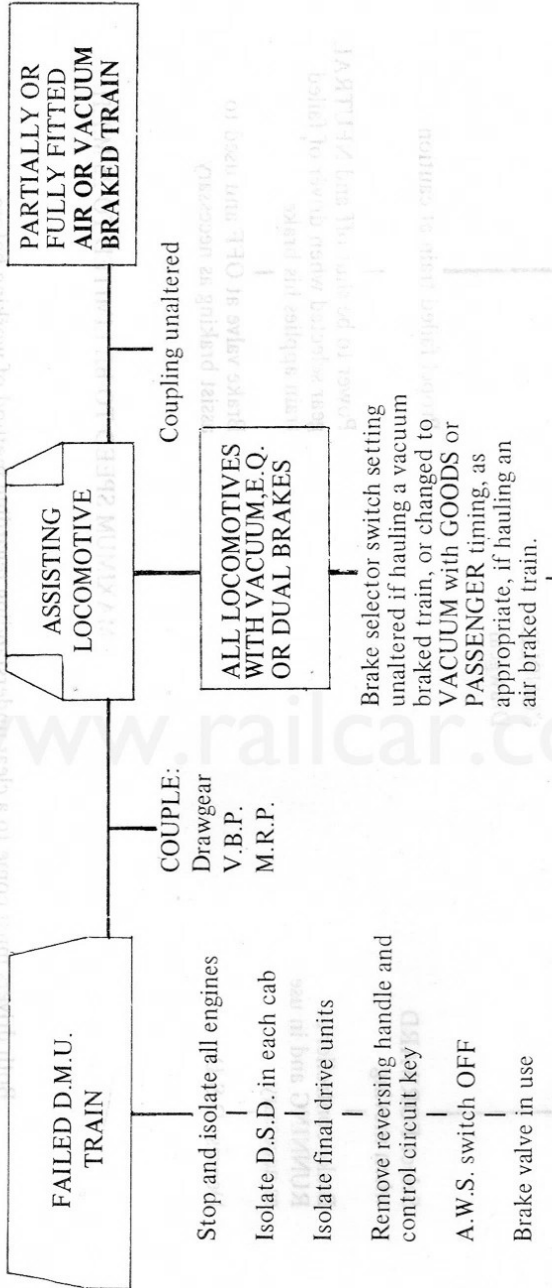


Brake continuity test to be carried out by driver of assisting train

Service braking can be carried out on both trains by driver of failed train.  
Driver of assisting train can make emergency applications.

## ASSISTANCE FROM THE REAR

Failed train WITH train control circuit defects and control circuit fuse (No.6) ruptured

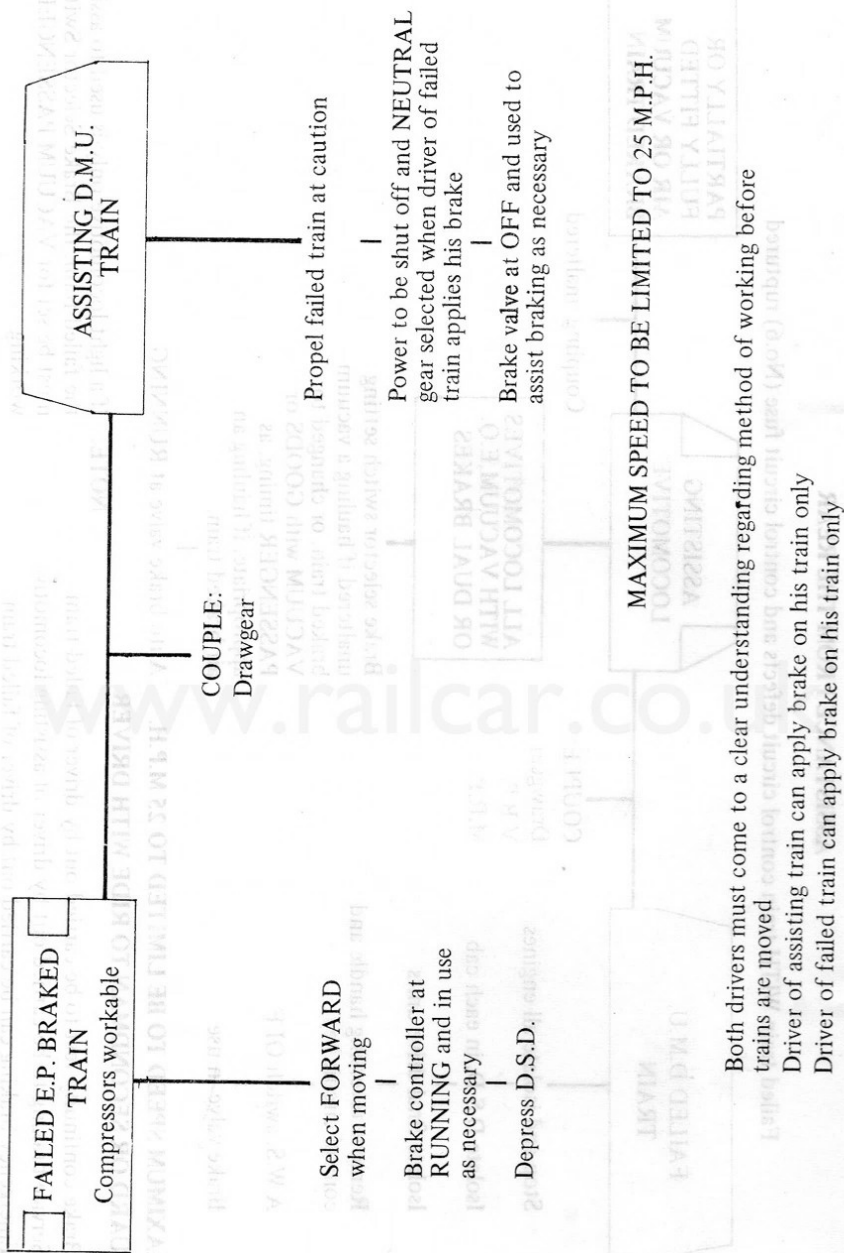


**MAXIMUM SPEED TO BE LIMITED TO 25 M.P.H. GUARD OR SECONDMAN TO RIDE WITH DRIVER**

- Brake continuity test to be carried out by driver of failed train
- Service braking to be carried out by driver of assisting locomotive
- Emergency braking can be carried out by driver of failed train:-
  - (a) On both trains if assisting train is vacuum braked
  - (b) On failed train and assisting locomotive if its train is air braked

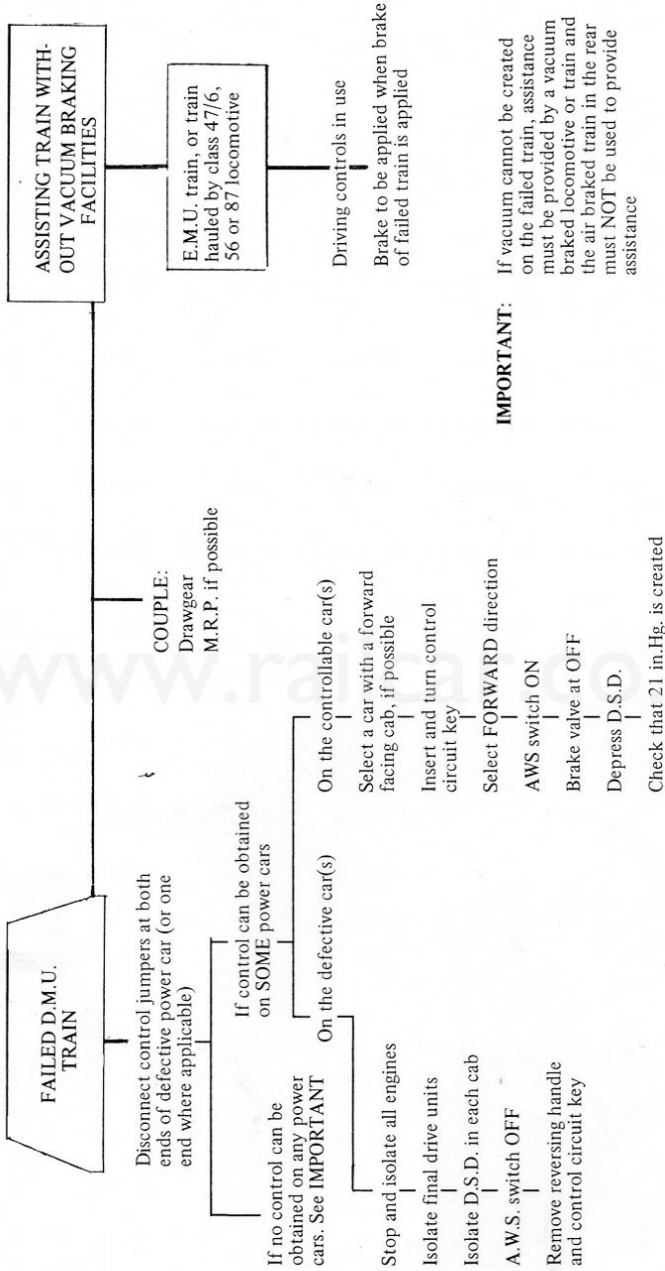
**NOTE:** If a light locomotive only is used to assist the failed train, the Brake Selector Switch must be set for VACUUM PASSENGER working

## ASSISTANCE FROM THE REAR



## ASSISTANCE FROM THE REAR

Failed train WITH train control defects and/or control circuit fuse (No.6) ruptured



**IMPORTANT:**

If vacuum cannot be created on the failed train, assistance must be provided by a vacuum braked locomotive or train and the air braked train in the rear must NOT be used to provide assistance

Guard to ride in leading cab, but no buzzer codes can be given to driver

Both drivers and guard of failed train must come to a clear understanding regarding method of working before trains are moved. Movement must be made at extreme caution for purpose of clearing the line only

Driver (or guard) of failed train can apply brakes on his train only

Driver of assisting train can apply brakes on his train only