

DIESEL MULTIPLE - UNIT TRAIN
PREVENTION OF CONTRA-ROTATION

This additional instruction to W.R. Drivers should be read in conjunction with the following instructions relating to D.M.U. trains with mechanical transmission and 'Blue Square' coupling cedes.

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Sectional Appendices Bristol (P.125)
Reading (P.69)
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Drivers Manual BR.33056/2 Driving Instructions

/9 Preparation and
Disposal Duties

/13 Fault Finding Data.

This instruction should be kept with
BR.33056/13.

93/TL/302
MOVEMENTS MANAGER
PADDINGTON

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CONTRA-ROTATION D.M.U. TRAINS

PREVENTION OF CONTRA-ROTATION

1.0. DESCRIPTION

Contra-rotation of engine occurs when one final drive fails to change direction and when the set is moved in the new direction, the engine associated with the defective final drive will be rotated in reverse. Thirty-seven engines in 1974 have become seized due to contra-rotation on the W.R.

Since the engine oil pump does not function in reverse the engine quickly seizes, consequently the fluid flywheel rapidly overheats.

2.0. SYMPTOMS

The symptoms occur within a few miles of reversing and are :

- (a) the air/axle light is generally not illuminated. Contra-rotation can occur with an air/axle light illuminated when a sliding dog or fork fractures.
- (b) the set feels sluggish and slows down when changing gear, and an engine light extinguishes.
- (c) the passengers or guard reports smoke or heat.
- (d) the firebell rings.

3.0 ACTION

3.1 No Fire

If contra-rotation is suspected, if possible stop immediately or proceed at 5 m.p.h. to the protection of signals and ascertain which fluid flywheel feels excessively hot. Isolate that engine and final drive.

3.2 Firebell sounds or fire is reported

Stop the train and deal with the fire as per Rule M-7, and isolate the engine and final drive before proceeding. The set must be taken out of service as soon as possible.

3.3 Unable to isolate the Final Drive correctly as instructed

If after carrying out the isolating procedure, it is found that the cardan shaft cannot be turned by hand, it must be assumed that the sliding dog or fork is fractured.

- a) if wheels rotate, clear section at 5 m.p.h. and request maintenance staff.
- b) if there is evidence of the wheels being locked, e.g. extreme heat and flats, do not move the set, but request maintenance staff.

4.0 PREVENTION OF ENGINE CONTRA-ROTATION AND DAMAGED FINAL DRIVE SLIDING DOGS

4.1 Air/Axle Lights

Set must not be moved without an air/axle light unless 4.6 applies or both engines and final drives of a power car are isolated.

4.2 Starting Engines

Local starts must be made if the air pressure has dropped below 60 p.s.i. (was 75 p.s.i. until February 1975) and when the air pressure has built up to 60 p.s.i. (with no revving from the cab) the engines must be STOPPED before the reversing handle is inserted.

4.3 Changing Ends

Before changing ends, stopping engines, or stabling, the next known direction must be selected, the air/axle lights checked ensuring lights go out and then come on again and the C.I.S. key removed BEFORE the reversing handle is removed.

NOTE: If the reversing handle is removed before the C.I.S. key, there is a risk that a sliding dog will be in mid-position.

4.4 Shutting Down of Engines

Engines must be shut down as per BR.33056/2.

However, if BOTH of the following apply, it is permissible to shut all engines down and restart the engines on one side only to maintain air pressure :

- (a) the set is stabled in a double-sided bay or against 3rd rail electrified lines.
- (b) there is a bad air leak on the set.

4.5 Sets entering Traffic with Engines Isolated

- (a) D.M.U. trains must not in any circumstances leave a maintenance depot or servicing point with one final drive of a power car isolated.
- (b) It is in order for power cars to enter service with one engine isolated provided maintenance staff have decided that because the transmission components are in good order, it will not be necessary to isolate the associated final drive. The Driver will therefore retain the air/axle light for the remaining engine and transmission of that car.

The Drivers' repair book will be specially endorsed "No.1 (or No.2 as appropriate) engine isolated both final drives engaged".

- (c) If, when reversing a train in this condition, i.e. engine only isolated, and the associated air/axle light does not re-illuminate the following "inching-in" procedure must be adopted:-

1. Engage first gear.
2. Release the brake.
3. "Inch" the set forward, with engines idling, whilst observing the air/axle light, which should then illuminate.
4. If found necessary to "inch" set forward on rising gradient minimum revs necessary should be used.

IF THE AIR/AXLE LIGHT FAILED TO ILLUMINATE AFTER CARRYING OUT THE ABOVE PROCEDURE, THEN BOTH ENGINES AND FINAL DRIVES OF THE AFFECTED POWER CAR MUST BE ISOLATED.

4.6 Drivers' Action when an Engine fails in Traffic

4.6.1 When it is necessary for a driver to isolate an engine because it has failed in traffic, he must isolate the associated Final Drive in every case in accordance with the Drivers' Manual BR.33056/13.

4.6.2 When a driver isolates a final drive, he will lose the Air/axle light for the remaining final drive and special precautions must be taken as follows:-

(a) Request the services of maintenance staff who will attend as a matter of urgency, and provided the transmission components are in good order, de-isolate the final drive, endorse the repair book and the driver will observe 4.5 (c) above.

If maintenance staff are not prepared to de-isolate the final drive the remaining engine and final drive must be isolated and the set taken out of service unless it is part of a 6 - or 9 - car set.

(b) In order to provide a service until maintenance staff can examine the set, it may continue in service as an emergency arrangement without an air/axle light provided each time the set is reversed the driver examines the pointer of the final drive which is operating without an air/axle light.

4.6 (continued)

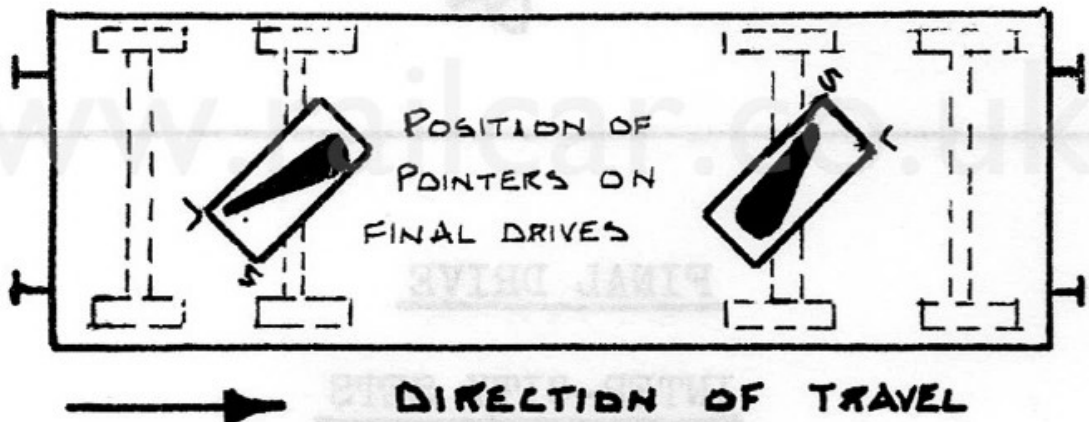
FINAL DRIVE

The driver should obtain the services of the guard in clearing passengers and lift the appropriate floor panel (above the inner wheels) with a carriage key and examine the position of the final drive pointer.

The pointer only moves a small amount its position should be :

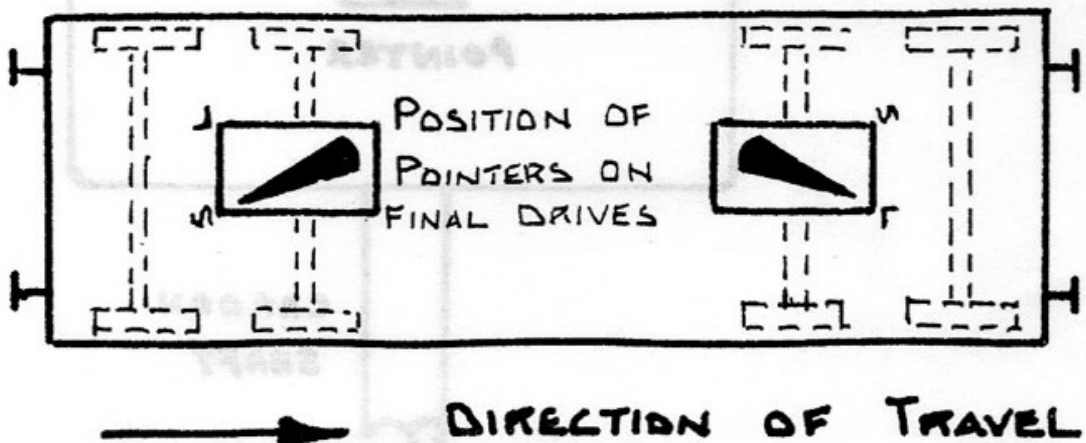
(i) Suburban and Cross Country Sets

The indicator should be pointing in the opposite direction to the direction selected (i.e. towards the tail lamp).



(ii) Inter-City Sets

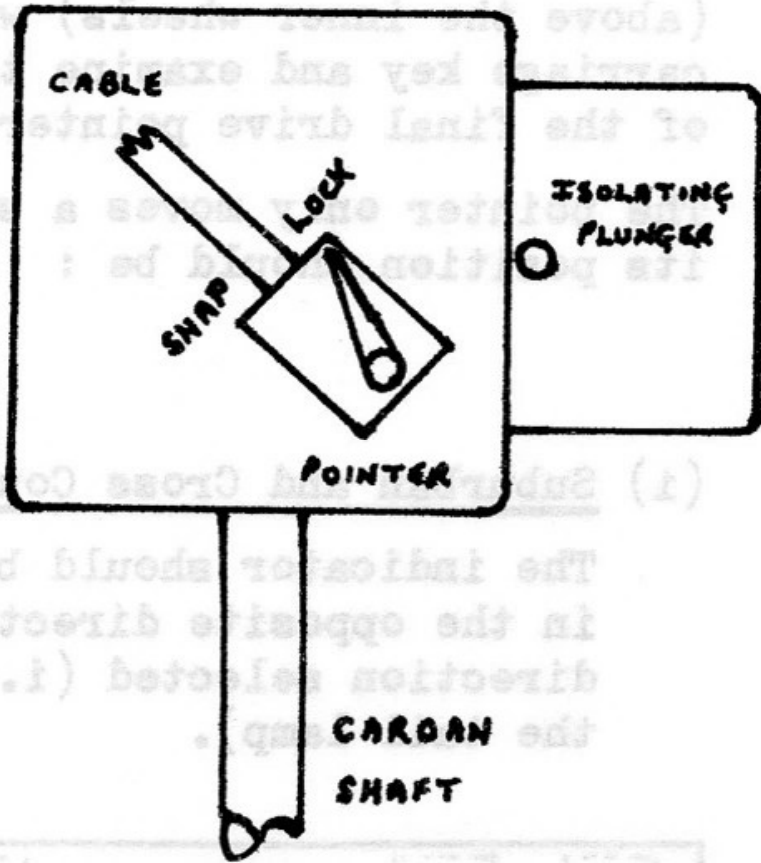
The indicator should point to the right-hand side when looking in the direction selected.



FINAL DRIVE

(continued) 2.4

SUBURBAN AND CROSS COUNTRY SETS



FINAL DRIVE

INTER-CITY SETS

