HORNBY RAILWAYS

In any correspondence please quote Ref. No.

PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE

Locomotive Operation and Maintenance

Introduction

Hornby locomotives and their electric motors are precision built and, treated with reasonable care, will work well for a number of years. Whilst there are many varieties of locomotive whose differences are described in this leaflet, there are common points to be observed in their use and handling.

1. **NEVER CONNECT A LOCOMOTIVE DIRECT TO THE MAINS SUPPLY.** Locomotives are designed to operate from 12 volts D.C. which is obtained from A.C. Mains via a suitable Power Controller or dry batteries.
2. Current consumption varies between approx. ·2 and ·6 amps depending upon type of locomotive, load and gradient. There will be a current surge on starting.
3. Half-wave rectified current, marked ☐ on the power switch of the Hornby R.900 Power Controller, may be used to improve control at slow speeds but should not be used for prolonged periods as it tends to cause over-heating.
4. Operating current is picked up through the wheels on one side of the locomotive or tender and returned through the other side. It is therefore essential that track and wheel rims are kept clean *(See page 4).*
5. Mechanisms should be examined from time to time and any hair or fluff *(e.g. from carpets)* removed with tweezers.
6. Where Magnadhesion *(see page 4)* is fitted ensure that this has not caused pins or other metal objects to cling to the chassis or wheels.
7. Locomotives are lubricated at the factory. The lubricant may dry out in storage and the lubricating instructions should always be followed *(see page 4).*

Hints on Running

If a locomotive does not respond to the control, check the following:-

a. That all connections have been made correctly and that the power supply is on.

b. That each section of track is making good connection with its adjacent sections and that the rail surfaces are clean.

c. That the power connecting clip is making good contact.

d. That instructions on Lubrication and Maintenance have been correctly carried out.

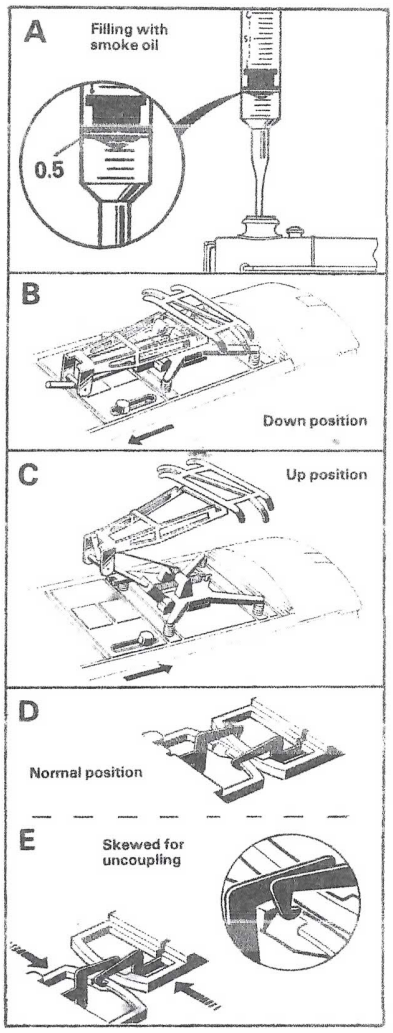
1. Smoke

Smoke generators are fitted in the 4-4-0 locomotives R.376, R.378, R.380 and R.392. These comprise a heating element in a container within the body which vaporises special oil introduced down through the chimney. Smoke is only produced when the model is moving. A sachet of oil is supplied with each model. Snip the corner off this and squeeze the contents into a small bottle with a screw top lid. Label the bottle.

Smoke oil is quite harmless but is not intended for drinking. A syringe with nozzle is included for charging the generator with oil.

Draw up oil from the bottle. Insert the nozzle vertically into the locomotive chimney approx. ½" *(Diag. A)* and squeeze 0.5 ml *(½ millilitre)* of oil ***slowly*** into it. When re-charging with oil stop the model for about 20 secs. to allow the element to cool down.

Constant running with smoke can create a smoky atmosphere in a small room—realistic but it is a good idea to have a window open. Additional sachets of oil are available from stockists, reference R.521. Smoke works equally well with Zero 1 control. A locomotive will not smoke if stationary.



2. Pantograph

The pantograph *(overhead electrical pick-up apparatus)* on the roof of locomotive R.360 is spring loaded and may be set "up" or "down". There are four alternative methods of operating the model depending upon the layout power supply:

(a) If layout has no overhead catenary system, run model with pantograph "down" and slide-switch knob moved away from pantograph *(Diag. B).*

(b) If layout has non-operational catenary system, run model with pantograph "up" and slide-switch knob moved away from pantograph.

(c) If layout has operational catenary system, run model with pantograph "up" and slide-switch knob moved towards pantograph *(Diag. C).*

(d) If the layout is Zero 1 powered the current should be collected from the track rails only. In this case refer to the Locomotive Module fitting leaflet. The pantograph can be in the "up" position if desired.

Catenary wires, if fitted, should be 73 mm. (2⅞") above the surface of the running rails.

If running from an overhead supply it may be necessary to turn a locomotive round, depending on the way the overhead supply is wired.

3. Hand Uncoupling

An innovation during 1981/82 will be modifications to the coupling bars of most Hornby locomotives and rolling stock. An angled "nick" will appear on the bar immediately below where the hook lies. When two engaged couplings have this feature they may be pulled apart by hand by slightly skewing the bogies or chassis to the right when viewed from above *(Diag. E).* This modification does not affect the normal operation of the couplings. *(British Patent Application Number 8020093).*

4. Locomotive-Tender Sprung Drawbar Connections

Because of the tight radius curves that '00' gauge models have to negotiate it has not been practicable to couple a locomotive and tender together as closely as on prototype trains. With the sprung drawbar fitted to some new models close coupling is achieved on straight track and the elasticity of the spring allows sufficient separation when running round curves or through 'S' bends.

Maintenance

There are four types of mechanism fitted to Hornby electric locomotives. To identify your model check the current Catalogue to establish the 'R' number, then pick out from the list here the appropriate type.
Follow the maintenance instructions overleaf.

Type 1	**Silver Motor**	**R.057, R.099, R.333, R.779**
Type 2	**X.03 motor**	**R.055, R.059, R.165, R.300, R.301, R.302, R.313, R.315, R.354, R.374, R.396, R.780, R.852**
Type 5	**Ringfield motor**	**R.033, R.053, R.303, R.305, R.307, R.309, R.311, R.317, R.318, R.320, R.326, R.327, R.328, R.335, R.337, R.338, R.349, R.360, R.368, R.369, R.370 (HST), R.372, R.376, R.378, R.398, R.768, R.778, R.842**
Type 6	**Ringfield motor**	**R.380, R.392**

HORNBY RAILWAYS

Locomotive Lubrication and Maintenance Chart

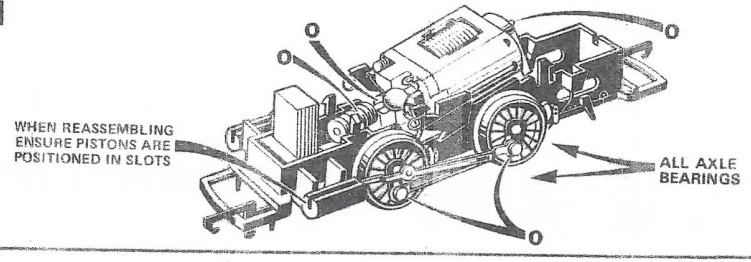
Type 1

Before lubricating read the instructions on page 4.
Use a drop of light machine oil on each point marked O.

If ordering replacement motor specify colour of worm gear on motor shaft.

Model No.	*To remove body*	*Lubricate*
R.057, R.099, R.333, R.779	Insert blade at front underside between body and chassis and lever body off.	Motor bearings, axle bearings and coupling rod fixings *(Diag. 1a).*

1



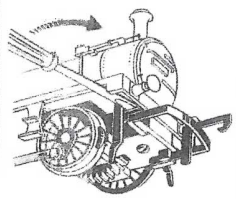
Type 2

Before lubricating read the instructions on page 4.
Use a drop of light machine oil on each point marked O.

If ordering replacement motor specify colour of worm gear on motor shaft.

Model No.	*To remove body*	*Lubricate*	*Brush replacement*	*Special instructions*
R.300	Undo screw on left side of body.	**On all models:** Motor bearings, axle bearings and coupling rod fixings *(Diag. 2b).*	**Do not remove motor from chassis.** *Diagram 2d* is to clarify motor parts referred to. Release spring pressure from brush arm and withdraw brush with tweezers. Replacement brush part No. **X.67**, two required *(Diag. 2e).* **Ensure insulating sleeve on brush spring is positioned correctly** *(Diag. 2d).*	**Do not remove motor from chassis.** It is necessary from time to time to clean the slots between the segments of the commutator, use a pin as illustrated *(Diags. 2d & 2f).* Ensure insulating sleeve on brush spring is positioned correctly *(Diag. 2d).* Check that collector arms are making good contacts with inside faces of wheels *(See diagram 2g or 2h).*
R.165, R.354, R.780	Insert blade into slot in front buffer beam and lever body off.			
R.059, R.301, R.302, R.315, R.396	Insert blade at front underside between body and chassis and lever body off *(Diag. 2a).*			
R.313, R.852	Undo screw at cab end.	As **above, plus** valve gear rivets and bogie axle bearings *(Diag. 2c).*		
R.374	Undo screw at front.			
R.055	Undo screw on underside of coal.			

2a



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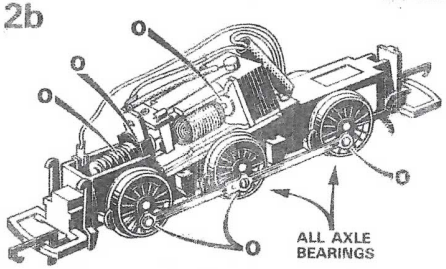

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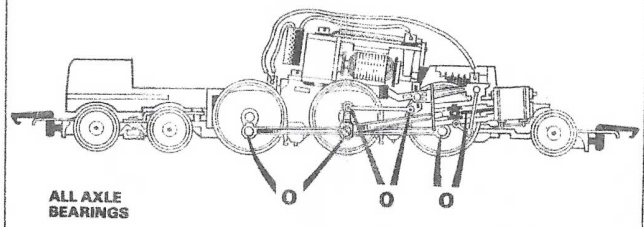

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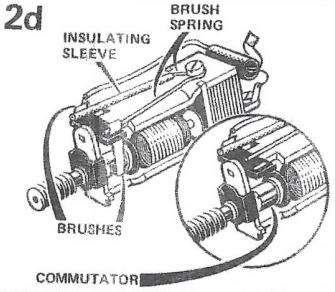

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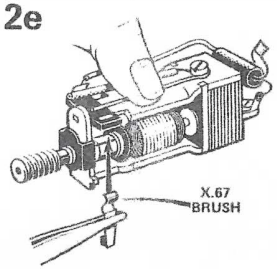

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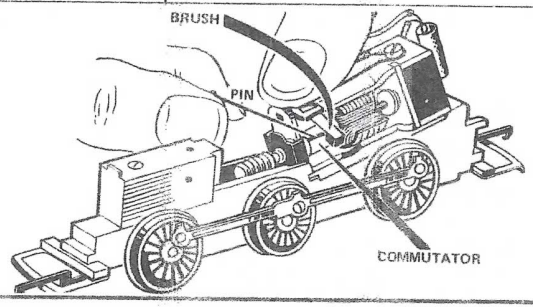

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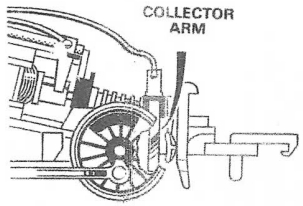
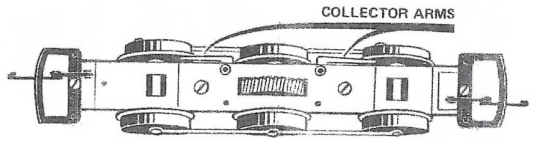


2h



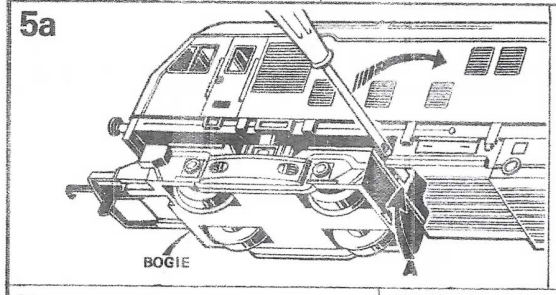
Type 5

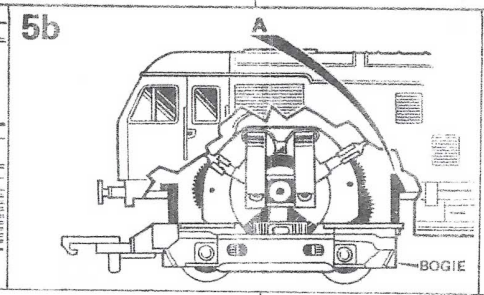
Before lubricating read the instructions on page 4.
Use a drop of light machine oil on each point marked O.

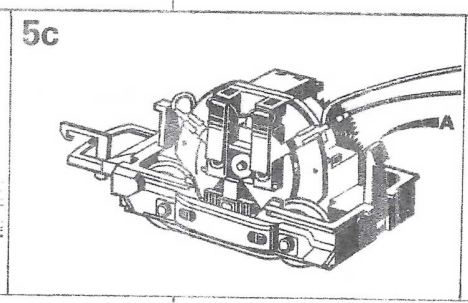
When mechanism is exposed do not unclip wires but take note of wire positions in case of accidental disconnection.

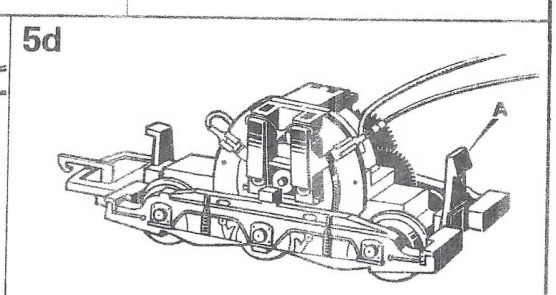
Model No.	*Special Instructions*	*To expose mechanism*	*Lubricate*	*Brush replacement*

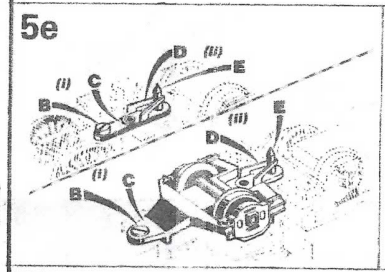
4—Wheel Bogie **R.326, R.327, R.335, R.337** **R.338, R.360, R.370, R.768**	*Note . . . R.317, R.318, R.335 and R.768 have the release clip A at the outer end of the bogie frame (opposite to that illustrated).* The bogie with the mechanism can be identified by its two tyred wheels. 4-wheel and 6-wheel bogies have common features.	Use a screwdriver blade to release clip A at the end of bogie frame *(Diags. 5a, 5b and 5c or 5d).* Ease complete bogie out of chassis. Do not disconnect wires.	Oil gear shafts on mechanism *(Diag. 5h).* Axle bearings *(Diag. 5j).* Axle bearings on non-powered bogie.	Taking great care not to let the springs jump out lift the two spring retaining arms F with a screwdriver blade *(Diag. 5m).* Withdraw springs, **S.8382** *(Diag. 5n).* Should the carbon brushes, **S.8319**, not come out turn mechanism over and tap lightly. If the non-tapered ends are less than 1/16" *(1.6mm)* long, brushes should be renewed. Use the point of a sharpened matchstick to replace springs. Bend retaining arms back into their original position *(Diag. 5p)* ensuring that points G *(Diag. 5q)* fit into the centre of springs ends.
6—Wheel Bogie **R.307, R.317, R.318, R.328** **R.368, R.369, R.778**	To negotiate tight radius curves the centre wheels are loosely mounted. When placing on track ensure that all wheels are correctly positioned.			
Tender for: **R.033, R.053, R.303, R.305** **R.309, R.311, R.320, R.349** **R.372, R.376, R.376, R.378, R.398** **R.842**	Good electrical contact must be maintained through loco/tender connection *(Diag. 5e).* Keep clean and free from oil: (i) Screw **B** and drawbar **C**. (ii) Clip **D** and tender contact pin **E**.	Insert blade between body and chassis and twist open *(Diags. 5f and 5g).* Do not disconnect wire.	Oil gear shafts on mechanism *(Diag. 5h).* Axle bearings *(Diag. 5j).* Locomotive valve gear *(Diag. 5k)* and axle bearings.	

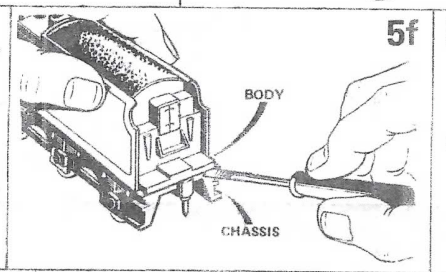


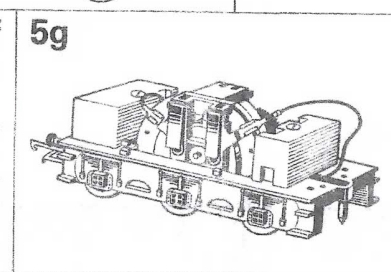


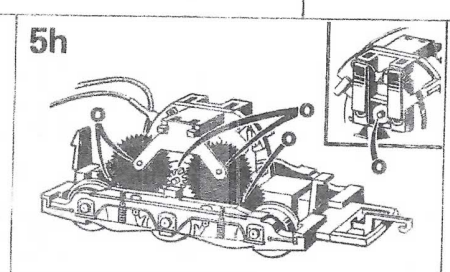


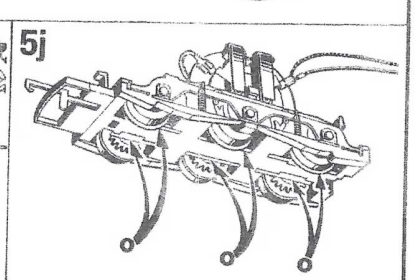


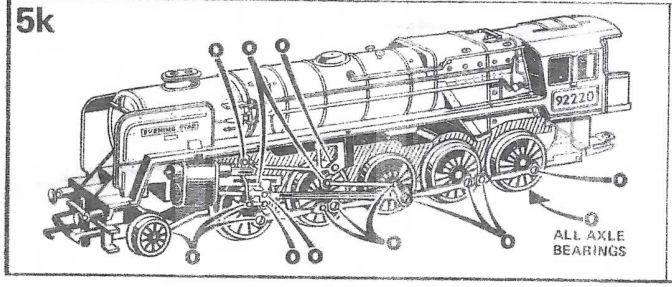


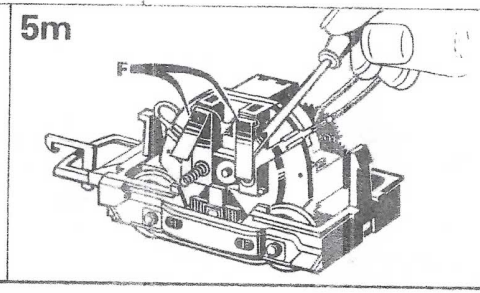


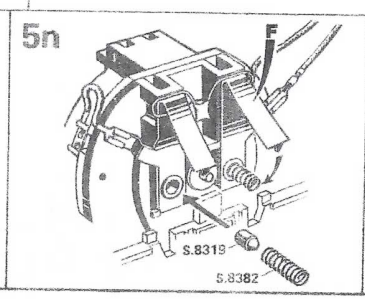


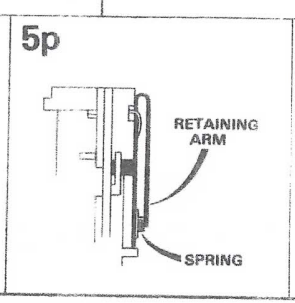


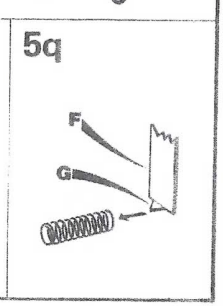








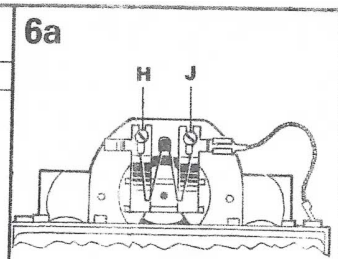


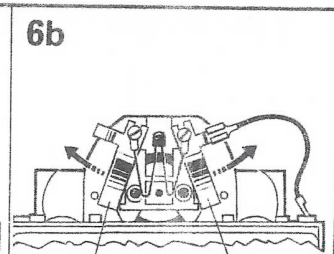


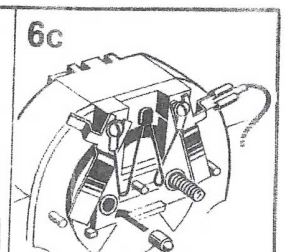
Type 6

Before lubricating read the instructions on page 4.
Use a drop of light machine oil on each point marked 0.

Model No.	*Special Instructions*	*To expose mechanism*	*Lubricate*	*Brush replacement*
Tender for: **R.380, R.392**	When placing on track ensure centre pair of wheels are correctly positioned.	Insert blade between body and chassis and twist open *(Diag. 5f).*	Oil gear shafts on mechanism *(Diag. 5h).* Axle bearings *(Diag. 5j).* Locomotive valve gear and axle bearings.	Loosen screws H and J (Diag. 6a) by ¼ turn only. Rotate brush retaining arms K and L outwards *(Diag. 6b).* Withdraw springs S.8382 and turn mechanism over to let carbon brushes S.8319 fall out. If the non-tapered ends are less than $\frac{1}{16}$" (1.6mm) long, brushes should be renewed. Use the point of a sharpened matchstick to reposition springs. Compress springs with screwdriver blade and swivel retaining arms back to hold springs in position. Retighten screws H and J.







Lubrication

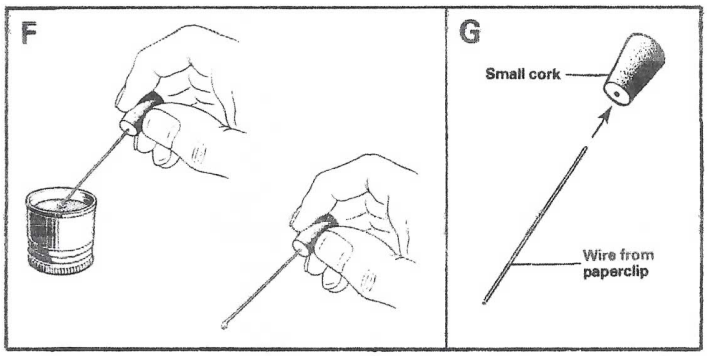
Use a light machine oil such as "3 in 1", strictly according to these instructions. Mineral oils of this type, while excellent for lubricating, can cause deterioration to certain plastics including polystyrene from which locomotive and tender bodies are made. Therefore, if any oil should get onto a body, wipe it off gently with a cotton rag. The plastics used for gear wheels and underframes are not adversely affected by this oil.

The art of successful lubrication is to get a small amount of oil in **exactly** the right place. The best method is to pour a little oil into a metal screw-top bottle lid, or similar, and to transfer one drop only to each oiling point on the end of a piece of wire *(Diag. F).*

An oiling "tool" can be made by fixing a piece of stiff wire, about 2" *(50 mm)* long, into a cork *(Diag. G)*. The cork is easy to hold and makes it a simple matter to place the oil in exactly the correct position.

Do not get oil on the commutator, it will soften the carbon brushes and impair the efficiency of the motor.

Ensure that the track and locomotive wheel rims are entirely free from oil.



Never handle any equipment with oily hands.

Remember—oil is only required where two moving parts are actually in contact. If you can see oil there is usually too much.

General Information

Track Cleaning

As stated on page 1 it is essential that the surfaces of the running rails are kept clean. Inevitably dirt will collect on them in time and this will seriously impair the flow of current to the electric motor.

It is recommended that the surfaces be wiped over with a "Scotch Pad" or similar as available at most supermarkets and grocers. These have a sufficiently abrasive texture to remove dirt and grease without damaging the coating which protects the steel rails from rustng. Emery paper or rougher abrasives will remove the coating and are therefore not recommended.

0-6-0 Diesel Shunter Locomotive

The action of the coupling hook at the cab end of this model is influenced by an internal counterweight. With normal operation, coupling and uncoupling is effected in the same way as on other vehicles. The additional feature enables the locomotive to be uncoupled solely by the operation of the Controller.

To uncouple from a train it is hauling forwards, the locomotive should be stopped with a slightly abnormal jerk. This action causes the counterweight to move forward, thus lifting the coupling hook out of engagement. The locomotive should then resume movement smoothly.

To recouple, the locomotive is backed smoothly up to the train. It then gives a slight reverse jerk, causing the counterweight to fall backwards. This releases the coupling hook which will re-engage with the adjacent vehicle. A little practice will enable you to carry out this operation readily.

(British Patent No. 1490630)

R.059, R.301, R.302, R.315 & R.396 0-6-0T Locomotives

The facility for automatically uncoupling from the front of these models is limited by the action of the drive gear on the front axle depressing the uncoupling ramp. The ramp is effective for approximately 1" *(25 mm.)* relative to the approaching locomotive.

Magnadhesion

Many of the Hornby Locomotives in Classes 1 and 2 are fitted with this unique feature, consisting of a small permanent magnet mounted in the chassis block between the driving wheels. The magnet causes the wheels to adhere to Hornby rails *(which are made of steel)* thus increasing the hauling power of the Locomotive.

Traction Tyres

Hornby mechanisms with traction tyred wheels have been specially designed to operate on Hornby steel track. This track has a surface which ensures that the tyred wheels have a good grip thus enabling long trains to be hauled. Any oil spillage on the running rails will cause loss of adhesion.

Service Sheets *(See below)*

Service Sheets are normally available within a few months of the release of new models. They show the model in exploded form including wiring and are helpful if it becomes necessary to replace parts such as light bulbs.

Television

Hornby locomotives are fitted with suppressors and under normal conditions these provide adequate protection against interference with television reception. However, in some cases local circumstances will cause reception to be below standard and interference may then be experienced. In this case check all electrical connections *(Rail surfaces and joints, locomotive/tender wheel rims, wire leads, plugs, etc.)* and ensure that they are clean and making good contact. If after taking the above action, interference still persists, then write for further advice to the Rovex Service Centre at the address below.

Zero 1

The Hornby Zero 1 Control System operates locomotives by different means from those described in this leaflet. Full details and instructions are included with the Zero 1 Master Control Unit. Only locomotives that have been fitted with a Zero 1 Locomotive Module should be placed on track that is powered from a Master Control Unit.

Spare Parts and Service

Spare carbon brushes, light bulbs, screws etc. may be purchased from Hornby Service Dealers or direct from the Rovex Service Centre. Service sheets illustrating Hornby locomotives in exploded view form are also available. An index of these will be sent on receipt of a stamped addressed envelope.
If your model is broken or disabled we recommend you to take it to your local Hornby Service Dealer *(see Service Dealer List).* If this is not practicable, send it to the address below.
Pack securely and enclose your name and address in BLOCK CAPITALS.

Enquiries regarding spares and service should be addressed to:
Rovex Service Centre, Albert Street, Ramsgate, Kent, CT11 9HD.

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