

(48 Class Drawing courtesy of DATA SHEETS)

**SPECIFICATIONS**

Model DL-531	Built 09/1959 to 10/1970	Length 13.490m	Engine ALCO 251, 6
Power 670kW (I)	Road Nos. 4801-4845 (I)	Height 4.090m	Generator: GE GT-584 (I)
710kW (II) & (III)	4846-4885 (II)	Width 2.740m	AEI TG-3602 (II) & (III)
Max Speed 121km/h	4886-48165 (III)	Mass 75.2t	Traction Motors: GE761 (I) & (II)
	No. in Service: 165		AEI253 (III)

**HISTORICAL NOTES**

The DL531 (of which the NSW 48 Class and the AN 830 Class are examples) was introduced by ALCO to compete with the increasing success of the EMD (General Motors) G8 (eg: VR T Class, NSW 49 Class) and G12 (QR 1400 Class), in the export market, in particular in areas with gauges as small as one metre.

The DL531 had six axles, all driven. EMD on the other hand only used four driven axles, in the belief that the operating railways would allow a heavier axle load for diesel power than for steam, owing to the reduction in unbalanced forces on the track. This hope was not, in the short term, fulfilled, and EMD had to match the six driven axles in later models.

As it turned out, most of the DL531s were built (by AE Goodwin, NSW) for use in Australia, and most of them operated on broad or standard gauge lines. New South Wales, with 165 units, had the largest fleet. Very few were ever built for Narrow gauge lines.

The New South Wales system had many light branch lines, built for political reasons and carrying mainly seasonal traffic, usually grain. These lines were worked by the survivors of the mainline steam locomotives of the 1880's, supplemented by suburban tank locomotives, from the turn of the century, which had been converted into tender locos.

Twenty DL531s (4801 - 4820) were ordered to see if the high and rapidly increasing operating costs of these branch lines could be brought under control. Starting in late 1959 fourteen units were sent to Werris Creek, to operate the wheat lines of the North West, and the remaining six went to Casino to replace steam on the Murwillumbah branch. They were an immediate success, and by the early 1960's the heaviest trains in the state were being hauled by 48 Class locomotives (in multiples of up to three) on the light lines radiating from Werris Creek.

The next batch, 4821 - 4830, were allocated to Goulburn to work the Canberra, Cooma, Batlow and Captain's Flat lines. For the first time advantage was taken to provide electric power from the locomotive main generator to passenger trains, and this group of locomotives was equipped to power heating in specially fitted passenger cars on the "Cooma Mail". Some 44 Class locomotives were also equipped for the main line haul to Goulburn.

Junee became the home depot for 4831 - 4845, where they took over working the South Western branches, including the alternate day working of the Riverina Express to Griffith. On the main line the Riverina remained a 38 Class working for a short time.

At this stage, with the 49 Class working the far Western branches, the initial rounds of conversion to diesel were complete, as far as the branch lines were concerned. Rail motors had already taken over most of the remaining branch line passenger traffic and the first rail tractors were appearing for minor shunting duties.

The 48 Class was seen as a general purpose locomotive, capable of replacing a 32 Class or 50 Class steam loco on the main lines as well as on light track. They were allocated to Eveleigh for Illawarra passenger working, replacing the 32 Class. There was no improvement in running times, although allowances for taking water were removed from the timetable.

Thus, another three orders each of forty locomotives were placed, resulting in a total of 165 locomotives, mainly for use on the main lines. From 4886 onward they were fitted with a larger fuel tank (3178 versus 2270 litres) and an externally mounted battery box. The Powerline model represents the earlier configuration.

Towards the end of steam triple 48 Class could be seen substituting for double 60 Class Garratt locomotives. By the late 1970s a 48 was often matched with one or two mainline units on fast interstate freight trains. By 1981 the allocation of 48 Class was rationalised in order to prevent the first series with the smaller fuel tanks from being involved in interstate express freight working. The arrival of the 81 Class greatly reduced the requirement for 48 Class on fast freight, and the closure of many branch lines reduced their utility in that area. They were also used on Mail trains and lighter interurban trains until locomotive haulage of passenger trains was virtually eliminated in 1989.

The 48 Class remains in service as an extremely simple and reliable type, capable of any duty, limited only by the low power rating of the engine. Their purchase in such large numbers, however, is an indication that the operating authorities of the time were intending to continue past operating practices into the future, rather than move towards the longer trains and higher powered locomotives required for economical operation.

**A: GENERAL PROCEDURES**

**A1: SEPARATING BODY FROM CHASSIS**

**IMPORTANT:** Take care not to damage the plastic hand-rails at the body ends, the metal handrails around the body, and the horns on the roof.

**PROCEDURE:** Hold the loco upside down and, using a small Phillips (+) screwdriver undo the screws at the outer end of each bogie which secure the couplings, and remove both couplings. Take care not to lose either the screws or the small washers. Next undo the two screws (one each side) through the fuel tank. Holding the body and chassis together in your hands, turn them over and shake the screws out. Body and chassis will now come apart freely

**TO REFIT:** Reverse above procedure, taking care not to snag the wiring. The body only fits on one way - with the motor in the cab.

**NOTE:** The cab end walls and the cab glazing are separate mouldings from the body, held in place by the chassis, and may come free during this operation. If they do, simply push them back, after taking note of the front versus back orientation.

**A2: REMOVING POWER BOGIE**

**IMPORTANT:** Take care with wiring.

**PROCEDURE:** Remove body as described in (A1). Then remove one screw on each side of worm gear on top of bogie. Slide motor housing towards centre of loco. Bogie should now drop out of the chassis.

**WARNING:** The gears are not properly meshed while the motor housing is not screwed down tightly and the motor must not be run.

**TO REFIT:** Reverse the above procedure.

**A3: REMOVING UNPOWERED BOGIE**

**IMPORTANT:** Take care with wiring.

**PROCEDURE:** Remove body as described in (A1). Then while pulling the bogie away from the chassis gently squeeze the two tabs that the wiring passes through with point nosed pliers.

**TO REFIT:** Just push the bogie in until the tabs "pop".

**A4: TEST RUNNING**

The locomotive should be test run on a suitable section of track, or on the bench properly cradled to protect roof and other details. As power is collected from one side only (on the powerbogie this is the side without the traction tyres, and the opposite side on the unpowered bogie) of each bogie, both bogies must be in contact with the track or other power supply for the loco to run.

**B: MAINTENANCE PROCEDURES**

**B1: LUBRICATION**

**IMPORTANT:** Take extreme care not to get oil on the traction tyres, on the paintwork, or inside the motor itself - it can damage all of them. Only use light machine oil, such as "sewing machine" oil, and apply it very sparingly using the flat of a very small screwdriver or, better still, a length of small copper electrical wire.

**PROCEDURE:** Separate body and chassis as described in (A1) above. Apply a very small amount of oil to the motor

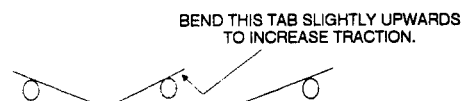
bearing, to the intermediate drive gear on the top of the bogie and the four gears accessible on the underside of the bogie. It is unnecessary and undesirable to take the power bogie apart.

**B2: REPLACING TRACTION TYRES**

**PROCEDURE:** Remove the body but do not remove the Power Bogie. Undo the screw on the underside of the bogie, then using a penknife or screwdriver blade under the front of the bogie, pop the frame off. Take care to note the position of the contact plate before slipping out the wheelsets for re-tyring.

The old tyres can be slipped off with the aid of the tip of a knife blade. The new tyres can then be stretched on, and smoothed out evenly with the aid of the flat of a small screwdriver. Do not use the same screwdriver that you have used for oil application, as you can never get them completely clean and oil wrecks traction tyres.

Now you can put the wheels back, making sure you do not dislocate the contact plate, re-attach the bogie frame mouldings and re-assemble the loco. The diagram below shows the correct orientation of contact plate and axles.



**B3: REPLACING MOTOR/BRUSHES**

**NOTE:** The motor used in 48 and 830 class models has long lasting brushes that are designed to work for the life of the motor and cannot be easily replaced. When the brushes are worn out the motor is most likely near the end of its life and therefore only complete motors including brushes and worm gears (refer part number P1230) are sold as spares.

**IMPORTANT:** Take care not to damage wiring.

**PROCEDURE:** Remove power bogie as described in (A2). The motor will now work free from the end bracket. Carefully pop motor housing free, unsolder wires from the motor contacts one by one and transfer to the new motor. Check that the motor runs the correct way, and reverse connections if it does not. Lastly re-assembly bogie and test chassis on the track before re-fitting the body.

**C: SPAREPARTS**

A comprehensive range of spare parts and accessories, including mounting kits for Kadee Couplings, is available. Your Powerline dealer has full details.

**D: MODEL SPECIFICATIONS**

Weight: approx. 270grams

Motor: Open frame style - 12Volts DC only

Power consumption: 250mA to 450mA, depending on voltage and load.

Note: A slightly higher haulage capacity may be evident with the long hood (ie the end without the motor) leading. You may also increase traction by "easing-off" the contact strip bearing down on the centre axle of the power bogie.

**WARRANTY STATEMENT**

Your Powerline Locomotive is warranted for a period of 12 months from the date of purchase against any defect due to faulty workmanship and/or materials.

All items subject to warranty claims must be placed with your local dealer (accompanied by the original sales docket identifying the model) for forwarding to Powerline for repair or replacement at Powerline's

exclusive option. Goods which have been damaged through misuse will not be accepted for warranty repair. Tampering with the model in any way may void the warranty.

In the case of non-warranty repairs, these will only be accepted on the proviso that the owner agrees to accept the repair charges prior to the damaged loco being forwarded to Powerline. If in doubt, ask.