

The 81 Class Locomotive

A New Era

For the New South Wales State Rail Authority the arrival of the first of a batch of eighty 81 Class locomotives in September, 1982 was the start of a new era. It represented a significant increase in power rating over existing mainline units (2240kW/3000hp vs a previous maximum of 1500kW/2000hp), featured an innovative and highly serviceable mechanical design, included up-to-date computer technology and was the first new class of locomotive to appear in the red striped "candy" livery. In 1991, a batch of four additional units were also the first new locomotives in the Freight Rail blue scheme.

Over the next two years ANR's BL Class and a little later V/Line's G Class appeared, with virtually identical specifications, but totally different in appearance. All three locomotive classes are coded "JT 26C-2SS" by the manufacturers, Clyde Engineering, but were designed to meet differing operational and servicing requirements. All of these locomotives were derived from the earlier ANR AL (JT26C) and CL Class (AT26C) units, and their ancestry can be traced back to the Westrail L Class (GT 26C). The SRA 422 Class (J26C) is also related, having basically the same engine but lacking the Turbocharger.

The 81 Class is built on a separate rigid chassis, with every section of bodywork between the cabs designed to lift off to give access to all major components. This, in theory, should make the locomotive much easier to maintain at major services and overhauls. In contrast, the G and BL use conventional carbody design with roof hatch access to the components. This latter arrangement is cheaper to build, but less convenient for servicing. A less obvious difference is the 81's use of "High-Ad" bogies, while G's and BL's have the more modern "Trimount" pattern, which is claimed to have better performance when starting.

The "SS" in the model code stands for "Super Series", a sophisticated wheelslip control system. The maximum tractive effort for a locomotive is reached when its wheels are turning at a speed 5% to 15% faster than the actual speed of the train, ie., for maximum pulling power the locomotive, has to just start to slip. The control system determines the actual "ground speed" using the "Doppler Effect" from radar directed on to the track and can then limit power to keep the wheel speed just slightly more than ground speed.

Super Series wheelslip control has meant that while only 50% more powerful on paper than, say a Clyde-GM 422 Class or a Comeng-Alco 80 Class loco, an 81 is in many ways worth two such units, because it can use its power so much more effectively. The result was a dramatic increase in tonnages per train, and in overall annual freight tonnages for the State Rail system as a whole.

The flexibility of the 81 Class body design was demonstrated early in their life when the decision was made to modify the location of air intakes from the roof angle to the side of the locos (at the end away from the triple fan radiator unit). These were moved down to the side panels due to overheating problems when operating in confined tunnels due to drawing in exhaust gases. After testing on 8117, all units after 8126 were built with this modification installed, while all of the original units were quickly modified.

Close examination of the Powerline model in the area of the original air intake location will reveal a blanking panel, since it appears that the first eighty air intake body sections were all built to take the intakes in the original position. The last four units were built without this blanking panel.

Later modifications also included some members of the class being fitted with equipment for slow running when hauling coal trains through loaders and unloaders.

In 1991, several years after the completion of the original eighty units, a further four units were built for Freight Rail, by Clyde Engineering using spare diesel engines, alternators and other major sub-assemblies, plus special reconditioned and up-rated traction motors recovered from withdrawn Clyde-GM 421 Class locos. This was possible because the 81's

had proven significantly more reliable than previous classes and Freight Rail had found that it did not need all of the spares that had been purchased with the original locos, whereas the extra four locos would help them handle their growing freight business.

Problems with cooling the engine room for running maintenance, common to all cab units, were addressed in the later four units by the addition of small louvres on the roof near the Turbocharger and the fitting of a double door in the body centred (under the numbers, so it is hard to see). A small door was added under the radiators for the same reason. There were also a number of internal changes to the exhaust system, one of which resulted in the exhaust stack moving from one side of its square roof panel to the other.

In 1988, two locomotives, 8120, (then a Hunter Valley coal locomotive) and 8172 (which worked through freight and passenger traffic to Melbourne) were painted in a Bicentennial livery along with a 48 Class, a 422 Class and two each 80 and 86 Class locomotives. Powerline released a commemorative Limited Edition in that livery in 1988 which is highly prized by collectors and modellers.

In 1990, a new scheme was developed to coincide with the introduction of a new "Superpak" container service, and to match the container livery of a dark blue with a low positioned yellow stripe. 8167 and 8175 were repainted in the scheme, but were not complete in time for use on the initial train. Two electric locomotives, 8601 and 8602 were finished in time, and participated in the initial publicity.

This scheme was considered too complex, having five colours on each unit, and a simpler scheme lacking the Grey (or Stone on the electrics), and with a yellow panel at the top and bottom of the ends for better recognition was adopted. Because of the poorer visibility, and the release of public information about previously classified United States military aircraft about that time, the first Blue scheme became popularly known as the "Stealth" scheme. A Limited Edition of this scheme was issued by Powerline in 1997.

The replacement scheme became known as the Freight Rail Blue scheme, and was released by Powerline as a part of normal production. 8177 and 8172, (the latter a former Bicentennial unit) were both initially repainted in this scheme without any modification. The rest of the class were repainted as they were brought up to the standard of the final four units, 8181 – 8184. The first to be rebuilt was 8179, which had suffered an engine room fire.

In 1997, the Freight Rail division of State Rail was split off as a separate corporation, known as Freight Corp. The livery of the locomotives was retained, but the new symbol, similar to the Freight Rail logo, but generally reproduced larger, was substituted.

Another change that affected the 81 class was the formation of the National Rail organisation, funded by the Federal Government to operated all interstate rail freight traffic. While awaiting delivery of their own locomotives, National Rail made extensive use of 81 Class locomotives, particularly in Victoria where radio compatibility problems existed even after the introduction of the new NR class locomotives.

The 81 Class units are all still in service with Freight Corp., and have been used on services as diverse as the Melbourne Express, and in double triple and even quadruple unit on coal trains. They still travel all over the Broken Hill and Griffith Passenger trains for Countrylink.

With the withdrawal of the once 100 strong 44 Class, except for the 48 Class, the 81 Class are now the largest class in operation in New South Wales. They are also one of the most popular both with crews and with the public.

With the G Class units of V/Line, and the twelve cylinder DL class (AT 42C) derivative for AN, Clyde's implementation of the JT26C-2SS was certainly an Australian engineering success story. This must have contributed to Clyde's success in gaining the contract for the Freight Rail "Ready Power" lease fleet of thirty one 90 Class (GT 46C) and fifty eight 82 Class (JT 42C) units.

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