

The History of Nuffield and Leyland Tractors - The 98 Series engine, 'Q' Cab & the 'Synchro' Gearbox

At Smithfield in 1971 a completely new tractor was introduced, the 253. This was designed to be an alternative to the very successful Massey Ferguson 135. The same 2.5 ltr Perkins D3-152 engine producing 47 hp was employed in the Monocoque construction, apart from this the specification was virtually the same as the 344 model. Although sales didn't match those of the 135 it nevertheless gained a loyal following and proved very reliable for the smaller farmer.

Also in 1971 a 'Narrow Track' version of the 154 was offered. The overall width of the tractor was 46½". Aimed mainly at the French vineyard application its biggest market was in Denmark for pavement snow clearance. The axles were 'Cut & Shut' by Beans engineering and assembled at Bathgate. The rest of the tractor was largely the same as the existing 154.

1972 was a 'Big Year' for Leyland tractors, a new Bathgate designed and built engine was fitted to the 344 and 384, the model numbers were changed and a range of 6 cylinder tractors was introduced. Due to company policies, designations were changed from engine capacity and cylinders to number of driving wheels and hp to the nearest hp. The 154 was unchanged and the 253 became the 245. With the introduction of the 98 series engine the 344 became the 255 and the 384 became the 270.

The 98 mm bore engine was designed to overcome certain weaknesses and reliability problems associated with the previous 100 mm bore ex BMC engine. In particular a new shell cast cylinder head was fitted with redesigned valves, porting & injector location. The liners and liner sealing received particular attention. The long stroke engine provided the ultimate design for an agricultural unit by offering high torque at low rpm and low specific fuel consumption. Over the years this engine in its various forms was acknowledged as being the best tractor engine available!

The hydraulic lift capacity on the 245 was 3750 lbs and on the 255/270 4000 lbs. As with previous models the pressure remained the same at 2600 psi. Heavy duty linkage became optional on the 270.

The model range was doubled by the introduction of four new models based on 6 cylinder 98 series engines at 85 and 100 hp in both 2 and 4 wheel drive. These models were known as the 285, 485, 2100 & 4100 – again the number signified the number of driving wheels and horse power. On these models fully live hydraulics, two speed PTO, 'wet' disc brakes, hydraulically operated clutch and brakes, hydrostatic steering, rubber mounted engine and flat floor cab were introduced. The rear axles and front driven axles were sourced from 'County'. During the design of these tractors the subject of comfort, safety, noise and pollution were given considerable priority. This ensured that the Leyland Tractors incorporated many features well in advance of legislative requirements.

The next change came in 1975 when the 255 and 270 were up-rated to 62 & 72 hp respectively and the model numbers changed to 262 & 272. The DPA fuel pump was modified to give, what's called, 5% governing (from 10%) this change maintained, where possible, a more even engine speed when going up or down hill. In practice this meant that if, for example, a sprayer was being used a much more even application rate was achieved. Silver decals and cab roof differentiated the new models. The 262 was fitted with 8" PCD rear wheel flanges so that larger wheel sizes could be fitted. An 'H' specification (High Ratio) option with 11 x 46 ratio final drive pinions and gears was introduced to alleviate the final drive failure problem when ploughing in very heavy clay soils. To prevent illegal road speeds 10th gear was 'Blocked'.

To alleviate the reliability problem with the PTO engagement a new design was introduced.

Another company inherited during the formation of British Leyland was 'Barfords of Belton' who manufactured agricultural implements. For a while during the '70's a small range of implements; ploughs, cultivators, seed drill and a brush breaker etc. were sold under the Leyland name. In 1979 Barfords were sold to Bamlett of Thirsk.

Due to Government legislation an approved quiet cab had to be fitted, in the UK market, from 1976. Except the 154, the 245, 262 & 272 were fitted with the Leyland 'Q' cab whilst the 6 cylinder 285 & 2100 models had sound absorbent cladding added. (The 485/4100 were dropped due to poor sales and the cost of adapting a 'Q' cab) This gave all cabs a noise level of no more than 87 dBA at the drivers ear level. The rubber mounted 'Q' cab featured hydrostatic steering, hydraulically operated brakes & clutch, heater and windscreen washers. These tractors were launched at Livingston, West Lothian.

At this time various previously optional features were fitted as standard for the UK market: Universal Drawbar and Pick-up hook, 'Cessna' tipping trailer kit and power steering.

After many years of extensive research, development and field trials the 'Synchro' gearbox was introduced at Torquay in March 1978. This represented a massive step forward by Leyland Tractors in terms of tractor engineering. With 9 forward and 3 reverse 'Synchromesh' gears, adequate ratio coverage was provided in the new transmission without unnecessary duplication of ratios. There were 3 forward gears in each range, allowing the driver to change up or down within the range with the tractor in motion and providing a new feature of synchromesh between forward and reverse, giving a shuttle change for loading operations. The range change was 'Constant Mesh' and the gear levers were side mounted on the gearbox lid leaving the area in front of the drivers' seat free from levers. This allowed a safer, easier 'cross cab' access. Cab less tractors had conventional levers on the gearbox lid.

A new Leyland Quick fit loader was introduced at the same time as the Synchro gearbox to maximise the advantage of the new transmission. The tractors were identified by new decals with a red stripe top and bottom and the word 'Synchro' in red. The basic specification of all models remained the same.

At the Royal Show in July 1978 462 & 472 models were introduced, adding a 4 wheel drive feature to the middleweight range. The front axle used in these models was an Italian 'Carraro' unit, centrally driven from a selectable drop box fitted under the main gearbox.

In 1979 the 'Synchro' gearbox was fitted to the 285 & 2100 models along with a general improvement package of better cab cladding and floor mats to reduce in-cab noise levels below what was already the legal limit. (For info the decibel scale is logarithmic, therefore a 10 dB alteration in sound level represents a 10 fold change in noise intensity) During the development of the Synchro gearbox, the engineers designed the transmission for well over 100 hp to ensure reliability.

At the Smithfield show of that year, the 82 hp Turbo charged 4/98 TT engine was introduced. The engine was up-rated to allow a turbocharger to be fitted while retaining reliability, a heavy duty clutch plate was fitted to transmit the extra power. A number of export tractors had already been locally retrofitted with a turbo, mainly to restore power at higher altitudes. The new turbo models were designated 282 & 482. At the same time a new 60% stronger 'Spheroidal Graphite' hydraulic casing and top cover, along with revised 'X' grade fixing bolts plus Loctite 510, in-place of the main gasket & top cover sealant, was fitted allowing the lift capacity to be increased to 5200 lbs. This was achieved by the fitment of an assistor ram and HD cat 2 linkage. Sometime previous to this a new 'displacement' type high pressure relief valve was fitted to prevent pressure 'drop off' with increasing oil temperature.