

Nuffield and Leyland Tractor production took place at the Leyland Truck and Bus factory at Bathgate, West Lothian, Scotland. Many of the components required to build the tractor were produced 'In house'. The factory was arranged into five 'Blocks' 'A', 'B', 'C', 'D' & 'E'



Bathgate factory 1979

All the parts that needed machining for the engines were produced in 'B' block as were all gearbox gears, shafts, differential crown wheels and pinions plus many small components required to complete main units. Where parts required heat treatment this was also carried out in 'B' block. The main tractor assembly line was contained in 'C' block where all the gearbox, half axle, hydraulic, main frame, front axle and other smaller castings were machined. Rear axle half shafts and numerous other parts that required turning on lathes were also produced in 'C' block. If a tractor had to be

shipped abroad in a SKD (Semi Knock Down) or CKD (Completely Knocked Down) condition this was carried out in 'B' or 'E' block respectively.

Before a tractor could be built down the production line all sub assemblies had to be built, and if required tested, on separate 'Flow line' moving tracks, these were then sequenced to arrive at the main tractor production line at the right time and in the right order for a particular tractor to be built.

When visitors were shown round Bathgate we would start at the Tractor Training Centre at Mossie Farm where we would introduce the company and show a 'Tractor' film, usually 'Tractors for the 70's'. We would then proceed to 'B' block where we showed them the engine block and cylinder head 'Transfer' lines to see the engine blocks and cylinder heads being machined. (All the rough castings were produced at either Wellingborough, Coventry or Leeds in England and taken to Scotland by Train or Truck) after viewing the finished engine blocks we would then pass the heat treatment facility where items like crankshafts, camshafts and gears were hardened. This area was very hot and no time was wasted before we moved across to view the crankshafts being machined, hardened by being heat treated and then balanced, we would then view the engines being assembled and tested in a dedicated sound proofed test facility.

A short walk across to 'C' block then took us past hydraulic unit, gearbox and half axle assembly. Before arriving at the production line we would watch the engines being fitted out with their clutches, clutch shafts and various other small components.



Fitting the engine

Tractor assembly started with the gearbox being placed on a stand fixed to the moving 'Track', both half axles were added followed by the main frame which had already been fitted with the front frame extension and front axle assembly. Once these had all been bolted together the engine would be lowered and bolted into place and the clutch shafts connected to the gearbox. (A different technique was employed for tractor models that didn't use cast main frames) The hydraulic unit and draw-bar or pick-up-hitch would also be added at this

stage. (A build card and serial number plate, in a plastic bag, were attached to each tractor so that the assembly workers could check that the build was correct.) The tractor serial number would then be stamped in the appropriate place.

At this point any tractor mechanics on the tour would be invited to take a handful of clutch release finger retaining 'Staples' which had been placed in a bin at the side of the track after being removed from the clutch units. (These staples were highly prized)

By this time the recognisable tractor was approaching the paint plant but before being lifted off the production line and entering the plant all excess grease and other contaminants were washed off. In the paint plant an 'Electrostatic' paint process was used to ensure the entire tractor was covered with paint. This process caused positive charged paint to be attracted to the negative surface to be painted with minimal paint 'Drift'. Once the tractor was painted it passed through a hot oven to 'Cure' the paint. All tin work and any other painted parts also passed through the same paint process.



The paint plant

Once through the paint process, and moving on down the track, the visitor would see the tractor being lowered back onto the moving production line where the fuel tank was added, the fluids filled and grease points greased. Also at this stage the serial number plate would be riveted in place. Next the tin work and cab, which had been assembled to one side of the track, was added, once the cab was fitted the brakes and clutch cylinders were bled and the power steering filled and checked (All the tin work was pressed at the GKN Sankey factory in Wellington, Shropshire, the cabs were sourced from Sekura and other manufacturers) the pre-assembled wheels and tyres now arrived in the correct order, via overhead conveyers, to be fitted on the now near complete tractor.



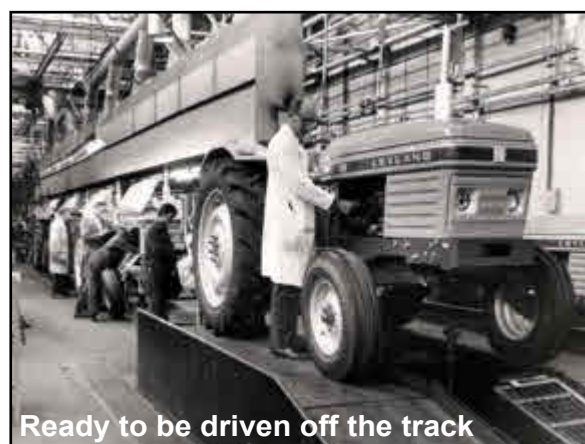
After the paint plant

All that had to be done now was to start the tractor to see that everything worked correctly. Skid units, which represented a large proportion of production were much simpler to build and were inserted in sequence behind complex builds to allow the workers to catch up.

The build card was also checked to ensure that the particular specification had been built. A number of 'Production Inspectors' on the track ensured quality was adhered to and all major bolts were torqued correctly.

The tractor would then be driven off the production line for delivery to its new owner. Skid units would require to be lifted off the track onto a waiting trailer towed behind one of the many 'Works' tractors.

At the height of production in the mid 1970's 450 tractors a day were produced, 70% of which were exported to 97 different countries.



Ready to be driven off the track

Note; This is a snap shot of one particular time in the production of tractors at Bathgate, over the years many changes were made to the design of tractor which would require different production methods and techniques. When many cab-less tractors were produced the track could be run at a faster speed than when a run of 'Q' cab tractors were built.