

# Details of the Unified Buick Assembly Line

Unusual Features of This New Outfit Which Turns Out 1,300 Cars a Day—How Speed Is Regulated—Grouping of Three Lines—Chute Delivery of Parts

**B**UICK Motor Company's new unified line, an assembly system said to be unrivaled for speed and economy, is now in full operation at Flint after over a year of planning and building. This assembly system, completely housed under one roof, is capable of turning out over 1,300 complete automobiles each day. It is supplemented by additional lines which on necessity can raise the daily assembly total to over 2,000 cars a day. A production of over 13,000 has already been reached, which set a new high daily record.

The supplementary lines are part of the old Buick assembly system which have been retained for use when needed in peak seasons. Normal output however is practically all taken care of by the new unified line.

The sixteen factories in the Buick group which build thousands of parts for the cars, deliver their enormous daily output to one central point, the unified line. Two hundred and twenty-five tons of previously finished parts reach this line every hour and are assembled to the cars.

## Designed by C. B. Durham

Cady B. Durham, vice president and assistant general manager of the Buick factory, conceived the unified line and built it with the assistance of his staff of plant engineers. They say that their purpose was to obtain the most speed and economy in the assembly operation consistent with the rigid standards of quality maintained in the past. How well this purpose has been accomplished is shown by the fact that between 885 and 900 men, with the aid of the new system, are able to assemble 1,100 complete automobiles each day. This places the actual cost of assembling each car at a figure less than the wage of one man for one day, as far as the labor item is concerned.

This is but one of the many costly items that figure in the price of the completely assembled car however. Another expensive and difficult problem for any automobile plant is to get materials to the assembly line at the lowest possible handling cost. In the case of Buick, this means handling over 200 tons every hour.

In order to do this with the most efficiency and at the lowest cost, an array of elaborate and intricately designed conveyors, all of them designed and built by Buick engineers, are incorporated in the unified line. From the engine plant, more than half a mile away, comes a steady stream of finished and tested valve-in-head engines. They come in a covered tunnel on an endless chain, over buildings and around corners. So perfectly is this conveyor built that it takes only one and one-half horsepower to operate it. It is said to be the longest conveyor in the world.

## System Regulates Speed

From the enamel plant comes rack after rack of sheet metal parts, also by conveyor, propelled by an endless chain with hooks which deliver the racks of parts to the assembly line as fast as they are needed. Fisher bodies are lifted from the street level to the body wiring assembly operation by conveyor, from whence they are dropped from a platform through the floor to the chassis waiting

below. Axles are automatically conveyed to the unified line from the axle plant. Transmissions come from the transmission plant to meet the engines in a building adjacent to the assembly line. Here the engines and transmissions are assembled and the completed unit, handled by conveyor, is dropped into the frame on the assembly floor. These are but a few of the more elaborate conveyors used to get materials to the assembly line just when they are needed.

A third expense item which may vary between two widely separate extremes depends in part on the quality of the labor employed and in part on the manner in which materials reach the line. This is that of speed, which is regulated directly by the efficiency of the assembly system as a whole. But in considering this item it must be remembered that the unified line is a complete assembly system in itself. A bare frame starts at one end of the line and a finished and rigidly tested automobile is driven away to the loading docks from the other. Progress from the frame to the finished car is smooth, continuous and uninterrupted. The frame never leaves the line until it leaves as the backbone of a complete, thoroughly tested Buick.

## Three Lines Grouped

The unified line in reality consists of three assembly lines, located in a building 64 feet wide. This fact alone speaks volumes for the efficiency of the system. When Buick engineers proposed to operate three assembly lines in a space only 64 feet wide they were told that it was impossible; that other companies had trouble operating even one line in a space so narrow. But thanks to the efficient manner in which materials are delivered to the unified line by both gravity and power conveyors, the space available has proven more than ample.

The actual assembly of the car starts in riveting bays at the extreme end of the building. Here trained crews of men rivet body brackets, cross member seats, running board brackets and other parts to the frame. Next the front and rear axles, with the torque tube already assembled to the latter, are placed on the frame. These parts have come from the axle plant by power conveyor.

The frame up to now has been upside down. It is now "thrown," that is, lifted by a power hoist and turned to an upright position. This hoist carries it to one of the three assembly lines and places it on an endless conveyor which will now move it forward at measured speed until it is ready to roll on its own wheels.

## Mezzanines Efficient

The assembly lines are crossed at various places by mezzanines, or platforms, built over the lines. On these platforms many minor assembly operations are performed. The first of these supplies the axles and torque tube to the frame. The next one supplies the previously tested engine and transmission assembly. The assembly is dropped through the floor of the platform by an air hoist, and accurately placed in the frame. The torque tube is attached to the single, automatically lubricated universal

joint and the entire assembly is carefully lined up and centered with gauges. Other parts are added as the conveyor carries the chassis forward between the lines of busy workmen.

As it passes under the next mezzanine, a steering gear, which has been previously assembled on the platform above, is dropped through an opening in the floor and attached to the chassis. At this point the brake bands are rounded and adjusted and the entire braking system is assembled. The conveyor then moves up an incline into a short tunnel, in which the chassis is thoroughly cleaned with live steam. As it emerges from its cleaning, it is painted by expert sprayers. The gasoline tank, which is added at this point, is also painted. Then a long journey starts through the bake ovens, in which the paint is thoroughly dried.

As it comes from the baking process, the chassis passes under a conveyor which is delivering trays of previously tested batteries to each of the three lines. Wheels complete with tires and rims are being delivered by another conveyor immediately beyond.

### Chutes Deliver Parts

They arrive in the proper order, a front wheel, a rear wheel, another front wheel, and so on. They are delivered to both sides of each line so that there are six delivery points in all.

The wheels assembled, says a writer in *American Metal Market*, the chassis next reaches another platform and passes underneath. Here front fenders, running boards and side aprons which have already been assembled, are handed down long chutes to the workmen below. There is a chute on each side of each line. The radiator, also previously assembled with its shell and with hose connections in place, is the next part to arrive to the chassis. It comes from a mezzanine by means of a gravity conveyor.

At the next platform conveyors deliver various sheet metal parts to the car which have been previously given a finish of baked enamel and brought to the line by the huge conveyor from the enamel plant. The chassis is now ready for the body.

It leaves the conveyor on which it has moved from the beginning and rolls under an opening in the platform high above, where it is stopped by its own four wheel brakes. A body, suspended by a hoist, shoots downward and is accurately dropped into place. The body bolts are tightly set and the rear fenders, which are at hand on a gravity conveyor, are bolted into place.

From this point the car travels rapidly forward to receive many finishing operations. The lights are attached, water is placed in the radiator, gasoline in the vacuum tank, and a workman steps into the seat. There is a whirr from the starter and the engine takes hold. The car whirls into the inspection room and receives a final and very thorough examination. Power wrenches and screw drivers are used in all the assembly operations.