



GM PHOTO

# Engine Dress At St. Louis-Corvette

PLANTING SMALL-BLOCKS DURING ST. LOUIS ASSEMBLY

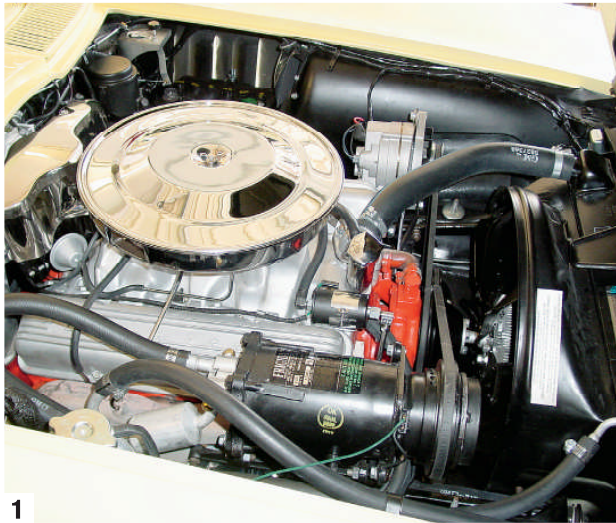
BY JOHN HINCKLEY

**St. Louis-Corvette was unique due to its low volume of 50-60 cars per day on one shift during the C1 years, and 110-120 cars per day on two shifts during the C2-C3 years (vs. 900-1,000 cars per day on two shifts at typical high-volume assembly plants). St. Louis also required totally Corvette-unique engine configurations that weren't used in any other assembly plant, such as solid-lifter and fuel-injected versions (and the C1 Corvette was the only Chevrolet that used the front engine mount bracket behind the water pump and the spacer behind the harmonic balancer).**

Those “naked” engines from Flint V-8 came out of the shipping rack and went right on the engine dress line, then into the chassis. There is a common misconception that Corvette engines were run off-line after they were dressed and before they went into the chassis, but that's not the case; there WAS an off-line

engine test stand, but it was used only on a sample basis, for audit checks about once a week. It would hardly be possible to run an engine through the crude test stand setup every eight minutes. If an engine was found to be defective when the car was started at the end of the line or during Roll Test, that engine was

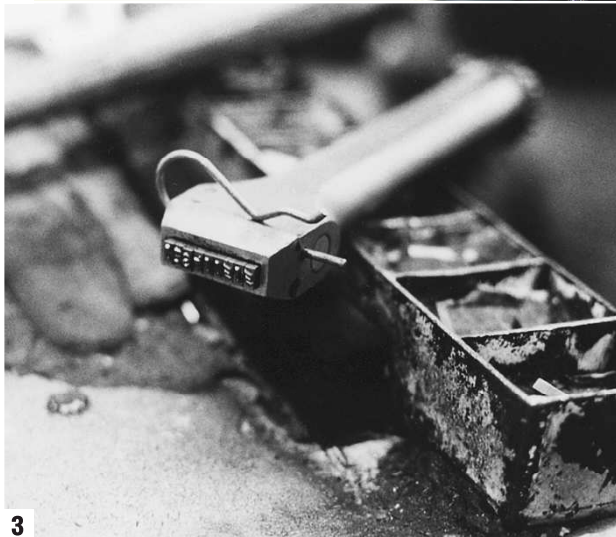
removed and returned to Flint Engine for credit, and a new engine was dressed for that car and installed in Final Repair. Major internal engine repairs weren't done in assembly plants – those workers were neither equipped nor trained for that kind of work.



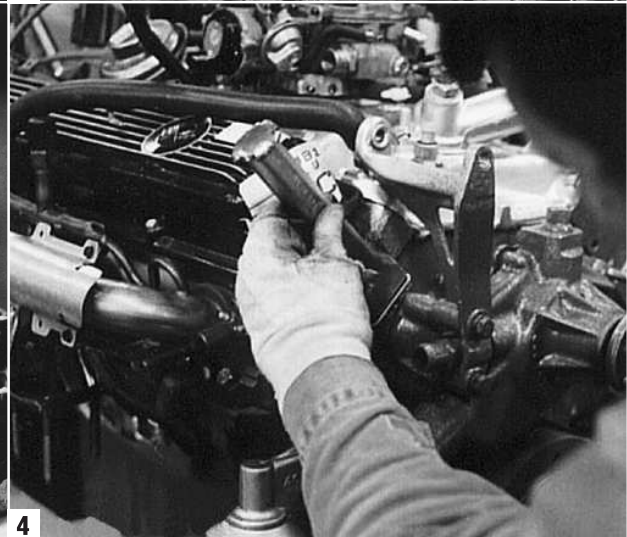
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1 A typical fully dressed Corvette engine we're used to seeing. This month's article will show you how it got that way as it came down the engine dress line at St. Louis.

2 Picking up where we left off last month, here's the "naked" engine being shipped from Flint V-8; it came out of the shipping rack at St. Louis and was hung on the engine dress line. (GM Photo)

3 This is the St. Louis gang-stamp tool used to stamp the car's VIN derivative on the front block pad. Individual dies were changed for each car's VIN by removing the retaining pin. (Hanson Photo)

4 Positioning the gang-stamp tool on the front block pad prior to whacking it with a 3-pound sledge. The same operator stamped the transmission with the same tool. (Hanson Photo)

**The Engine Dress Line:** Based on the order specs for the car, the correctly coded engine was plucked out of its shipping rack with an air-operated hoist on an overhead bridge and was hung on the overhead engine dress conveyor, with the order copy and production sequence number taped to the front of the conveyor hook so each operator could see the options required for that engine.

After lubing and installing the throwout bearing (on manuals), the transmission was installed. On a Powerglide, the converter bolts were driven while the flexplate was turned by an air-powered dummy starter tool, and the inspection cover was installed. At this point, beginning in mid-1960, the six-digit

VIN derivative for that car was stamped on the front engine pad. This became a seven-digit number in 1961, with the first digit being the model year, and this VIN derivative number was also stamped on the transmission.

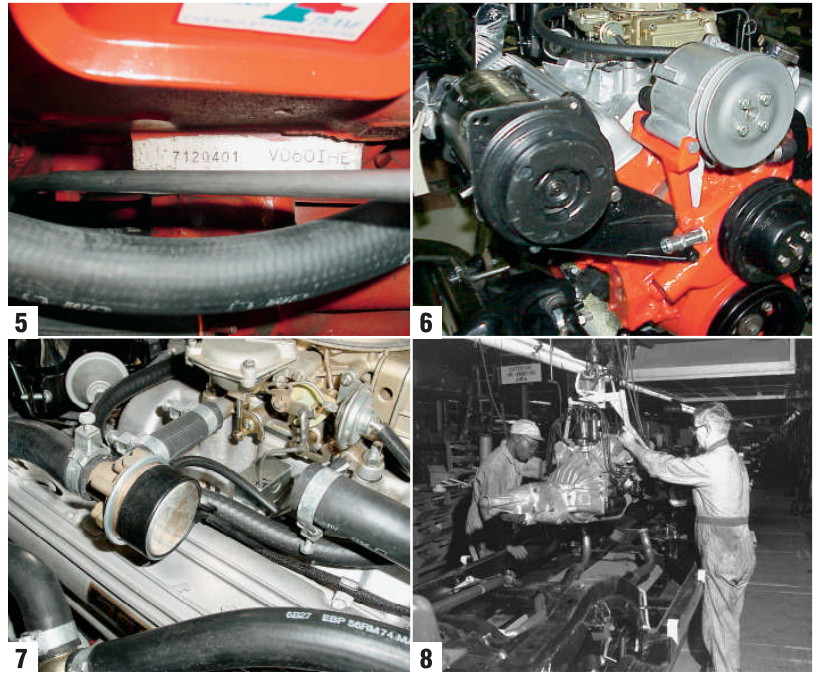
As the engine continued down the line, the shifter assembly and linkage rods/levers were installed and adjusted, and Powerglides got their oil fill tube, dipstick, and neutral safety switch. The Powerglide kickdown linkage was installed and adjusted later, after the carburetor was installed. The correct speedo gear and adapter sleeve were then installed based on the car's axle ratio, along with the transmission mount.

The oil filter bypass valve, oil filter

element and canister assembly and the oil fill tube in the intake manifold were installed, the engine was filled with oil, and the oil fill cap was installed. Manual transmissions were filled, and the Powerglides got their initial fill of ATF as well (they weren't topped off until after car-start on the Final Line, as the converter didn't fill until the engine was started).

The fuel pump pushrod was dipped in chassis grease and inserted, held in place by a substitute bolt in the front of the block, followed by the gaskets, mounting plate, and the fuel pump. The substitute bolt was then removed and replaced with the short bolt that came from Flint Engine. The carburetor(s) and





5 A typical pad after stamping; the Flint Engine stamp on the right, and the St. Louis VIN derivative stamp on the left.

6 Carburetor, pulleys, and belt-driven accessories (A/C compressor and A.I.R. pump shown) were installed after transmission assembly and pad stamping.

7 A.I.R. plumbing, hoses, and diverter valve were added near the end of the dress line.

8 A late '63, no-radio, L-76 engine being readied for drop on the chassis line. Note the prop shaft and clutch cross shaft positioned on the frame, ready for assembly. (GM Photo)

gaskets were then installed, followed by the pump-to-carburetor fuel line with its associated elbows, fittings, and the fuel filter, and the choke hot air tube from the exhaust manifold. The large single air cleaners weren't installed until after body drop on the Final Line so they didn't block access for assembly of other parts. Heater hose fittings were added to the intake manifold and water pump (on pre-'62 cars specifying a heater and on all '62-up cars) after removing Flint Engine-installed plugs, and a vacuum fitting was added to the intake manifold when needed for windshield washers and/or Powerglide modulator lines. (Some years used a hollow carb stud instead as a manifold vacuum source.

The starter, road draft tube, and battery ground cable came next, followed by the coil bracket, coil, and spark plug wire supports. The crank pulley, water pump pulley, fan and spacer (or fan and clutch), and the generator and its adjusting brace came next, followed by installing and tensioning the fan belt. A.I.R. pumps, A/C compressors and power steering

pumps and their pulleys and belts were also installed at this point. Spark plug wires were then installed one at a time with their 4-hole routing grommets and were routed and grommeted through the "boomerang" lower ignition shields, which were then secured when the four exhaust manifold spark plug heat shields were installed. Engine mounts were assembled after the plug wires and shields were installed.

Most cars called for radios, which required installation of the chrome/stainless ignition shielding and radio noise suppression capacitors on the coil and the generator, plus a ground strap under the left rear intake bolt for the accelerator lever. The horizontal shields required brackets on each side, which were attached by removing the engine plant-installed exhaust manifold bolts, French locks and spacers and installing the brackets, re-tightening the bolts, and bending the tabs on the locks (which were left unbent at Flint Engine, only on Corvette engines, to simplify removing the bolts).

Flint Engine had no idea what



**9** A 1966 L-79 engine positioned for drop on the chassis line. Note shim count markings at the front of the frame horn. (GM Photo)

Corvette their engines would end up in, but 90 percent of Corvettes were ordered with radios, so the lock tabs were left open on all engines at St. Louis' request. The upper (top) ignition shield was installed after body drop on C1s in order to connect the (+) coil wire from the body harness; on C2s and C3s, the upper shield was installed on the engine dress line, as a separate engine wiring harness was installed on the engine dress line, and its multiple connector was attached to the fuse block bulkhead connector after body drop on the Final Line.

The last operation on the dress line was the small 2x4 air cleaner installation, followed by inspection and repair, and the engine was then conveyed to the Chassis Line for installation in the frame. At the installation point, the prop shaft and clutch cross-shaft were resting loose on the frame, ready for assembly.

The dress process for fuel injection engines followed the same basic pattern. However, those engines were received from Flint Engine with the F.I. unit already installed, needing only their unique throttle/kickdown linkage and vacuum connections. All other dress operations were similar to those for the carbureted engines.

It's easy to determine which parts were installed on the St. Louis engine dress line if questions arise. Any part that shows in the assembly manual with a part number was installed at St. Louis; if no part number is shown or the illustration indicates "Part of engine assembly" or "existing" it came as part of the engine assembly as-shipped from Flint V-8.

Next month we'll drill deeper into the dressed engine and examine the theory, operation, evolution, and assembly of the PCV (Positive Crankcase Ventilation) system. Stay tuned! ■