Turbocharging: A shot of adrenaline for the V-6.
Exotic power for two T Types.

The Riviera T Type and Regal T Type feature the turbocharged V-6 offered by Buick. It's an engine that's been a part of selected Buicks since 1978, and judging by the way the rest of the automotive world is bringing out turbo models of its own, there must be something to it.

There is. This exotic powerplant uses an exhaust-driven impeller to force extra fuel/air mixture into the engine at higher engine rpm. The result is like a shot of adrenaline. Smoothly, powerfully, the engine develops significantly more horsepower than its naturally aspirated counterpart; 180 of them at 4,000 rpm, in fact.

By comparison, the 3.8 liter cubic-inch turbocharged V-6 develops 64% more horsepower than its non-turbo 3.8 liter brother; 44% more horsepower than the larger 4.1 liter V-6, and 29% more horsepower than a 5.0 liter V-8. The chart on page 5 gives you a dramatic comparison.

Yet, in normal driving, without calling for the turbo boost, this 3.8 liter V-6 behaves like a normal engine.

The concept of turbocharging is by no means new; it is a regular fixture on most Indy 500 engines. Turbocharging has been used for years in aircraft, unlimited class hydroplanes, and even for the more prosaic task of increasing efficiency in diesel-engine trucks.

Turbocharging differs significantly from mechanical supercharging. The latter is driven from belts or gears on the engine, while turbocharging uses the natural heat and force of the engine exhaust to do its work.

In fact, the secret to success is the way Buick engineers have maintained a high degree of exhaust heat conversion efficiency to spin the turbo's impeller. Part of this high efficiency comes from lightweight stainless steel exhaust manifolds. They take less heat out of the exhaust, saving this energy for the turbo.

Since Buick began offering the turbocharged V-6 in its 1978 production cars, engineers have refined the unit.

In 1979, Buick introduced "hotter" spark plugs to its turbocharged V-6 engines and narrowed the gap to make them less susceptible to fouling. Another improvement was the introduction of "free breathing" cylinder heads.

In 1980, an aluminum intake manifold was added along with a recalibrated thermal vacuum valve to the choke for improved cold starts and driveability. This same year, an early version of Computer Command Control was added. For the first time in the turbocharged V-6, electronics were used to carefully monitor engine performance and emissions.

1981's changes, which included electric Early Fuel Evaporation, an available dual exhaust system to lower backpressure, and a high-performance 3.08 axle ratio, improved the driveability and performance. A higher pressure oil pump improved lubrication. Emission control progressed with air gap exhaust pipes and a simplified evaporative control system. The electronics were revised to incorporate Signal
Inside the Turbocharged V-6. How it’s been improved.


Noise Enhancement Filter (SNEF). It makes detonation
detection more precise. A
converter clutch in the auto-
matic transmission locks up
the torque converter at
higher speeds, eliminating
slippage.

In 1982, Buick engineers
redesigned the turbocharger,
reducing the size of the
exhaust gas passage, increas-
ing exhaust gas speed, and
generating higher turbo rpm.
The result was to get even
more fuel/air mixture into
the engine than before. They
also increased the size of the
exhaust system to get
exhaust gasses out faster. The
combination permitted the
increase in power. By 1982,
the turbocharged V-6 was
rated at 170 hp.

The engine also got a new
camshaft, valve springs and
valve spring dampers to per-
mit the higher engine rpm.
Even the intake plenum
chamber and intake manifold
were revised to aid perform-
ance and give better control
over the Exhaust Gas Recir-
culation (EGR) system.

There were improvements
to aid cold-engine warmup,
and additional control by the
 sophisticated on-board elec-
tronics over spark and
detonation. The oil pan con-
tained five quarts instead of
four; there were additional
lubricating improvements
which extended the oil change
interval to 7,500 miles, the
same as for other Buicks.

There were other, non-
engine changes which helped
improve Riviera and Regal
performance, too. A new
torque converter, with a
higher stall speed, permitted
faster turbocharger response.
The automatic's converter
clutch was computer-
controlled. The result: im-
proved performance at wide
open throttle, and improved
economy during cruising.

All 1982 turbo engines
were 100% inspected before
they were installed. And each
turbocharged Regal and
Riviera was road tested for
performance.

1983 turbocharged
ingines, now rated 180 hp,
have been given the following
tweaks to improve perform-
ance. You'll notice that the
turbocharger has a new
finned housing to help keep
its bearings cooler. A new,
lower restriction exhaust
crossover along with tubular
exhaust manifolds are made
from stainless steel.

This construction, along
with a new stainless steel
exhaust sealing ring, helps
improve durability.

A revised Early Fuel
Evaporation (EFE) grid in a
revised intake manifold on
Riviera T TYPE contacts more
fuel/air mixture for more
thorough vaporization dur-
ing warmup.

1983 Regal T TYPEs will
have a new 3.42 axle ratio for
better acceleration and, for
the first time, an automatic
transmission with overdrive.

A piezo element replaces
the accelerometer as a knock
sensor, and generates a better
signal to the electronic spark
control system.

The exotic turbocharged
Riviera T TYPE and Regal
T TYPE. Outstanding, yet
socially responsible, perform-
ance. And they're a ball to
drive.

You will find this engine
used exclusively on selected
Buick offerings.
How it performs.

3.8 liter Turbocharged V-6
180 HP @ 4,000 rpm
290 ft.-lbs. torque @ 2,400 rpm

3.8 liter V-6
110 HP @ 3,800 rpm
190 ft.-lbs. torque @ 1,600 rpm

4.1 liter V-6
125 HP @ 4,000 rpm
205 ft.-lbs. torque @ 2,000 rpm

5.0 liter V-8
140 HP @ 3,600 rpm
240 ft.-lbs. torque @ 1,600 rpm

Here’s a comparison of horsepower and torque ratings for the 3.8 liter Turbocharged V-6, the non-Turbocharged 3.8 liter V-6; the 4.1 liter V-6; and a 5.0 liter V-8.
How it works.
1. Under light throttle pressure, air and fuel are mixed in the normal manner in the carburetor and flow into the combustion chambers. Electric Early Fuel Evaporation (EFE) helps vaporize intake mixture.

2. As engine load and speed are increased, the intake mixture is pressurized by the exhaust-driven compressor to increase or boost the amount of air/fuel mixture in the intake system.

3. The denser charge increases cylinder pressures and results in a denser air/fuel mixture.

4. The boosted charge is ignited by the spark plug and produces more power per stroke of the piston than the same V-6 without turbocharging.

5. Exhaust gasses flow across the turbine wheel, rotating the turbine shaft which powers the compressor. A normally closed waste gate gives turbocharging response at lower engine rpm.

6. The Turbo Control Center is an electronic spark control plus an Electronic Control Module. It retards the spark advance, when necessary, controlling detonation; electronically controls EFE; and controls other engine functions.
Are there any tricks to driving a turbocharged V-6?
No, not at all. The turbocharged engine is started just as a normally aspirated engine would be: for cold starts, depress the accelerator fully and release it slowly. Then turn on the ignition. For warm starts, simply turn on the ignition and crank until the car is running.

As with any normal engine, the turbocharged engine should not be run at excessive rpm immediately upon starting or shut down abruptly after running at high speeds.

Don't attempt do-it-yourself fixes.
The turbocharger has but a handful of parts, but since it is precision-manufactured with some tolerances as fine as 1/10,000 of an inch, maintenance and repairs should be done by an authorized Buick dealer or any qualified service outlet which regularly does such service.

Catch trouble before it becomes major.
The turbocharger is an integral part of your engine and not an add-on device. If you spot an oil leak or hear an unusual sound coming from the turbocharger, take it in for service immediately. The trouble may be simple to correct, but if allowed to continue, may necessitate a more costly repair.

Normal scheduled maintenance, with one exception.
The recommended maintenance for the turbocharged V-6 engine is shown in the 1983 General Motors Maintenance Schedule found in the glove compartment of your Buick. Your turbocharged V-6 requires basically the same maintenance as a regular V-6, except that the oil filter should be changed with each oil change.

Engine oil change:
every 7,500 miles.

Oil filter change:
every 7,500 miles.

Important: a word about this brochure.
We have tried to make this brochure as comprehensive and factual as possible and we hope you find it helpful. However, since the time of printing some of the information you will find here may have been updated. Your dealer has details, and before ordering, you should ask him to bring you up to date.

The right is reserved to make changes at any time, without notice, in prices, colors, materials, equipment, specifications and models. Check with your Buick dealer for complete information.

A word about engines.
Some Buicks are equipped with engines produced by other GM divisions, subsidiaries, or affiliated companies worldwide. See your dealer for details.

“Let’s Get it Together...Buckle Up”

BUICK
Wouldn’t you really rather have a Buick?