An Introduction to

CORVAIR



Spyder

CHEVROLET MOTOR DIVISION

GENERAL MOTORS CORPORATION

DETROIT 2, MICHIGAN



Congratulations—your choice of a Corvair equipped with a turbocharged engine places you among those who appreciate and demand the finest in engine performance. For the first time, a Turbo-Supercharger is available on an American stock car and, naturally, that car is made by Chevrolet.

As the owner of this advanced design engine, you will soon experience the thrill of having extra power available at your command. However, we thought you would like to know how the Turbo-Supercharger gives you that extra power. Here in this booklet is a brief explanation of what it is and what it does. We are also including some tips for top performance and important tune-up specifications.

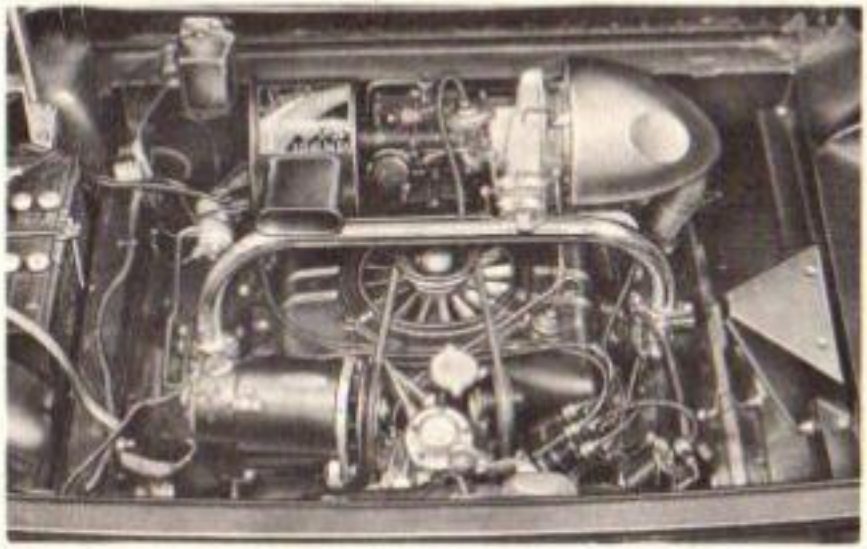
We hope you find this information both interesting and useful—that it will help you explain to your friends and neighbors why your car outperforms theirs.

H. F. Barr

Chief Engineer

Part No. 3826119—First Edition

An Introduction to the



Here's What it is . . .

In brief, the Corvair Turbo-Supercharger is a device to increase engine output by increasing input. The power system of a conventional carburetor provides supplementary fuel when it is needed, but the amount of combustible mixture is limited by the available air. The supercharger provides more combustible mixture than formerly possible by using higher pressure. Basically, it can be compared to packing a suitcase; the more pressure you apply, the more you can put in.

Here's What it Does For You . . .

The Corvair Turbo-Supercharger is designed to operate efficiently at high rotative speeds. Utilization of the supercharger permits Chevrolet Engineers to eliminate the old restriction to more engine output. You have more power and you also have——

- Greater safety. The reserve power is ready when needed for an emergency.
- Spectacular middle and high speed acceleration. This permits you to pass other cars and return to your lane much faster.
- Maximum power from minimum fuel. We all know that the faster you drive the more fuel your engine needs. The supercharger, by providing more air, greatly increases engine efficiency at higher speeds.

Turbo-Supercharger



Here's Why You Get the Extra Power . . .

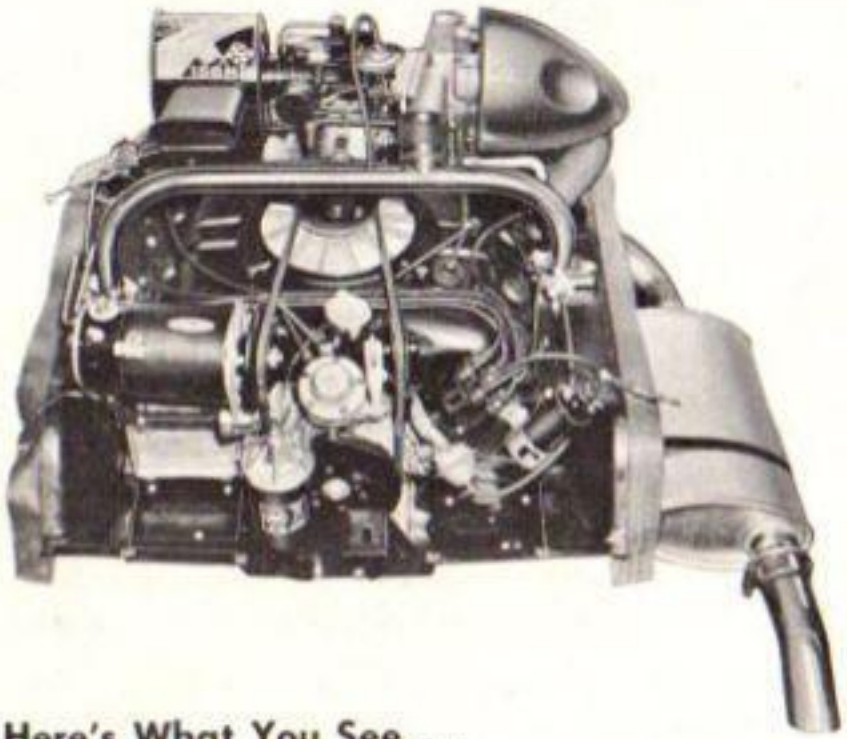
As you know, the automobile engine obtains its power from gasoline. The heat energy contained in the gasoline is converted to mechanical energy when combustion occurs—However, the liquid gasoline must be combined properly with the correct amount of air and delivered to the cylinders of the engine as a combustible mixture.

The power output of an engine, therefore, is a function of the quantity of air and fuel which can be delivered to the cylinders in the correct proportions. There is a definite range of air-fuel ratios at which combustion will occur. The amount of gasoline can be increased rather easily, but that alone is not enough. An overrich mixture will waste fuel and increase engine wear by washing the lubricant from the cylinder walls and diluting the engine oil.

It is apparent, then, that the controlling factor is the amount of air that is drawn or forced into the combustion chamber. Naturally aspirated engines are those that depend on the difference between atmospheric pressure and engine manifold vacuum to provide the necessary air to the cylinders. Since atmospheric pressure is a fairly constant factor, depending on altitude, power output or performance is limited.

The supercharger solves the problem of this limitation. The amount of air available for mixing with gasoline has been increased by forcing the combustible mixture into the manifold under higher than atmospheric pressure. The old limit of atmospheric pressure has been removed and thus —more air means more power.

This is Your Corvair Spyder Engine



Here's What You See . . .

The turbocharged engine is special—and looks it. The first glance under the hood gives the impression of power and fine workmanship. The impressive Turbo-Supercharger unit promises something extra. The gleaming chrome, liberally used, indicates that this engine has received particular attention to make it a suitable partner for your Turbo-Supercharger. The crankshaft, connecting rods, pistons, valves and cylinder heads are just a few of the parts that have been changed to give you more power and longer engine life.

In Addition . . .

Chevrolet Engineers have provided many design features which play an important part in overall dependability and performance. Just a few of the areas that, in addition to the engine, have received special attention are—

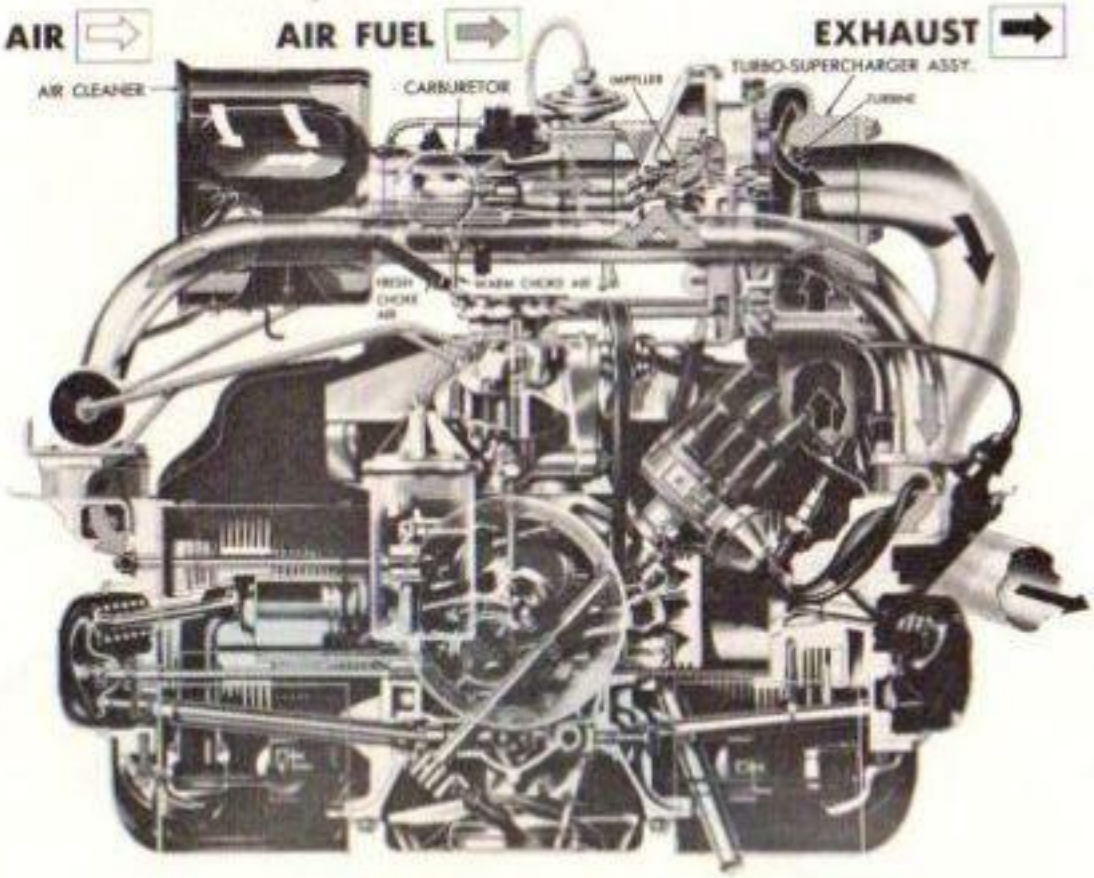
Instrument panel. A fitting companion to your turbo-charged engine, the new instrument panel is designed to add to your driving pleasure.

Four-speed transmission. Permitting personal, efficient control of the power developed by the Turbo-Supercharger, your four-speed transmission assures top performance.

Rear axle. You have a 3.55 ratio rear axle for better performance.

How the Turbo-Supercharger Operates

Your Turbo-Supercharger has two basic parts, a turbine and a compressor. As shown in the illustration, the hot exhaust gases are directed against the turbine wheel, spinning the wheel and shaft at up to 70,000 rpm. The exhaust gases then continue out the exhaust pipe.



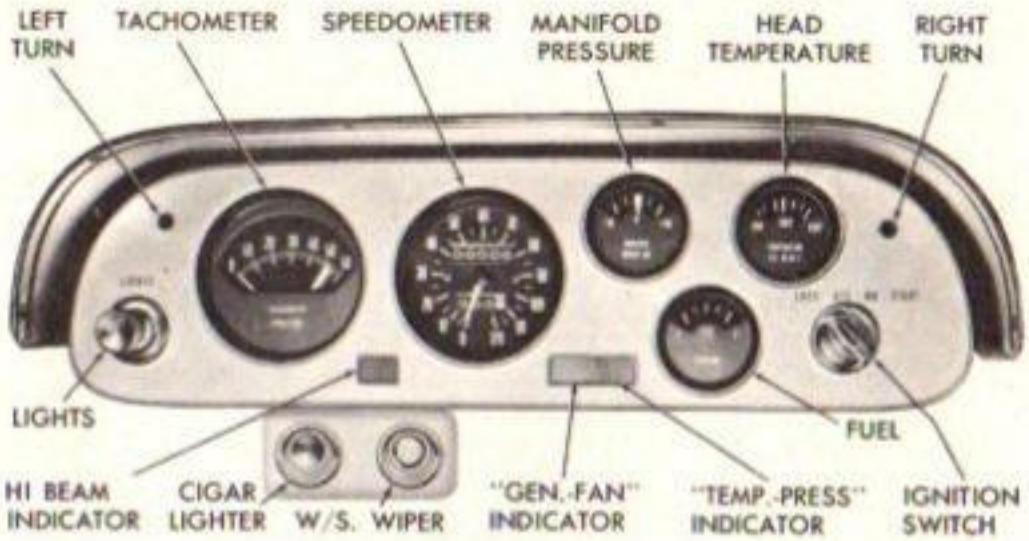
As the turbine wheel turns, it drives the impeller wheel mounted at the other end of the shaft. The impeller in the compressor portion of the supercharger draws in a mixture of air and gasoline. This combustible mixture passes through a diffuser radially outward to build up pressure in the intake manifold. This increases the amount of combustible mixture available to the engine and results in greater horsepower output.

Under heavy load, the supercharger speed automatically increases providing more combustible mixture to the engine to meet the demand. When engine load is light, the speed of the supercharger decreases.

Since the supercharger is not mechanically coupled to the engine, but is driven by the exhaust energy that is normally wasted, no engine power is consumed. The effect of the exhaust manifold back pressure is more than offset by the discharge of air from the compressor.

Your Corvair Spyder Instrument Panel

We feel that you, as owner of the Corvair Spyder, will be more interested in a constant check on engine operation than would the average driver. Therefore the following instruments have been provided for your use and information.



Tachometer—with a range of 6000 rpm. Upshifts can be made up to 5300 rpm. Downshift as desired provided engine speed in new gear does not exceed 5300 rpm. The red line at 5500 rpm indicates recommended maximum engine speed.

Speedometer—maximum reading of 120 mph. Odometers are provided for both trip and cumulative mileage. Set the trip odometer by means of the knob located beneath the instrument panel and to the left of the steering column.

"Temp-Press" and "Gen-Fan" Indicators—operate in the same manner as on other Corvairs. In addition, a warning buzzer connected to the temperature light will operate if engine temperature reaches the danger point. Under extreme operating conditions, momentary engine overheating may occur. Should the "Temp-Press" light come on, release the throttle and, if the light stays on, follow the instructions presented in the Corvair Owners Guide.

Manifold Pressure Gauge—tells when the supercharger is functioning. Negative readings indicate normally aspirated engine operation. Positive readings indicate that the supercharger is building up pressure for more power.

Cylinder Head Temperature Gauge—indicates cylinder head temperature to warn of approaching overheat condition.

Tips For Top Performance

Your turbocharged engine is a well designed, well built unit which will give you the extra power you want. However, as with any precision machine, there are certain requirements on your part. The following information will help you get the best possible performance from your Turbo-Supercharger.

Break-In Period—We recommend that the supercharger not be used for the first 500 miles. Keep engine speed below 2500 rpm to maintain negative readings on the Manifold Pressure Gauge. From 500 to 1000 miles, short bursts are permitted but not sustained runs. After the first 1000 miles, the car may be driven to take full advantage of the extra power from the supercharger.

Fuel Requirement—A good quality premium fuel is required. Change fuel filter every 10,000 miles.

Engine Oil—See recommendations in the Corvair Owners Guide.

Caution—Do not overfill the crankcase.

Detonation—Caused by low grade fuel, faulty timing or carbon deposits, this condition is more serious than on other engines. If detonation occurs, have your car checked by your Chevrolet Dealer.

Air Cleaner, Element—No excess oil should remain after servicing the polyurethane element. After oiling the element, squeeze it as dry as possible. Then wrap it in a clean, dry cloth and squeeze out any remaining oil.

Air Recirculating Plates—These plates, the same as used on Air Conditioned Corvairs, should be installed in the summer and removed in the winter as shown in the Corvair Owners Guide.

Metallic Brakes—Vehicles equipped with metallic brake linings will require somewhat more pedal pressure when the linings are cold than will conventional brakes. This condition will exist only until you make several stops to warm up the linings. (If possible, avoid hard brake stops for the first 500 miles. This will properly burnish the linings for better heavy duty breaking.)

Specifications For Precision Tune-up

VALVE SYSTEM ..... Hydraulic

DISTRIBUTOR

Breaker Arm Spring Tension ..... 19-23 oz.

Breaker Point Gap

New Points ..... .019"

Old Points ..... .016"

Cam Angle (Dwell) ..... 31°-34°
(33° preferred)

IGNITION TIMING

Initial Setting at Idle ..... 24° BTDC*

*CAUTION—Never advance the initial spark setting more than recommended or pre-ignition, with subsequent engine damage, may occur.

SPARK PLUGS

Normal Use ..... 44 FF

Competition ..... 42 FF

Gap ..... .035"

Torque ..... 20-25 ft. lbs.

CHOKE SETTING ..... 1 Notch Rich

RECOMMENDED IDLE SPEED ... 850 rpm

Important

Recommended top speed for the turbocharged engine is 5500 rpm. This point is indicated by a red line on the tachometer.

Your Turbo-Supercharger is a precision manufactured unit. It should not be tampered with and any necessary repairs or inspections should be made by your Chevrolet Dealer.

Under no conditions should the Turbo-Supercharger be removed and installed on another car. Your Corvair Spyder is designed around the Turbo-Supercharger and all the related parts are necessary for complete satisfaction and top performance.

All information contained in this booklet is based on latest product information available at time of printing. The right is reserved to make changes at any time without notice.

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CHEVROLET