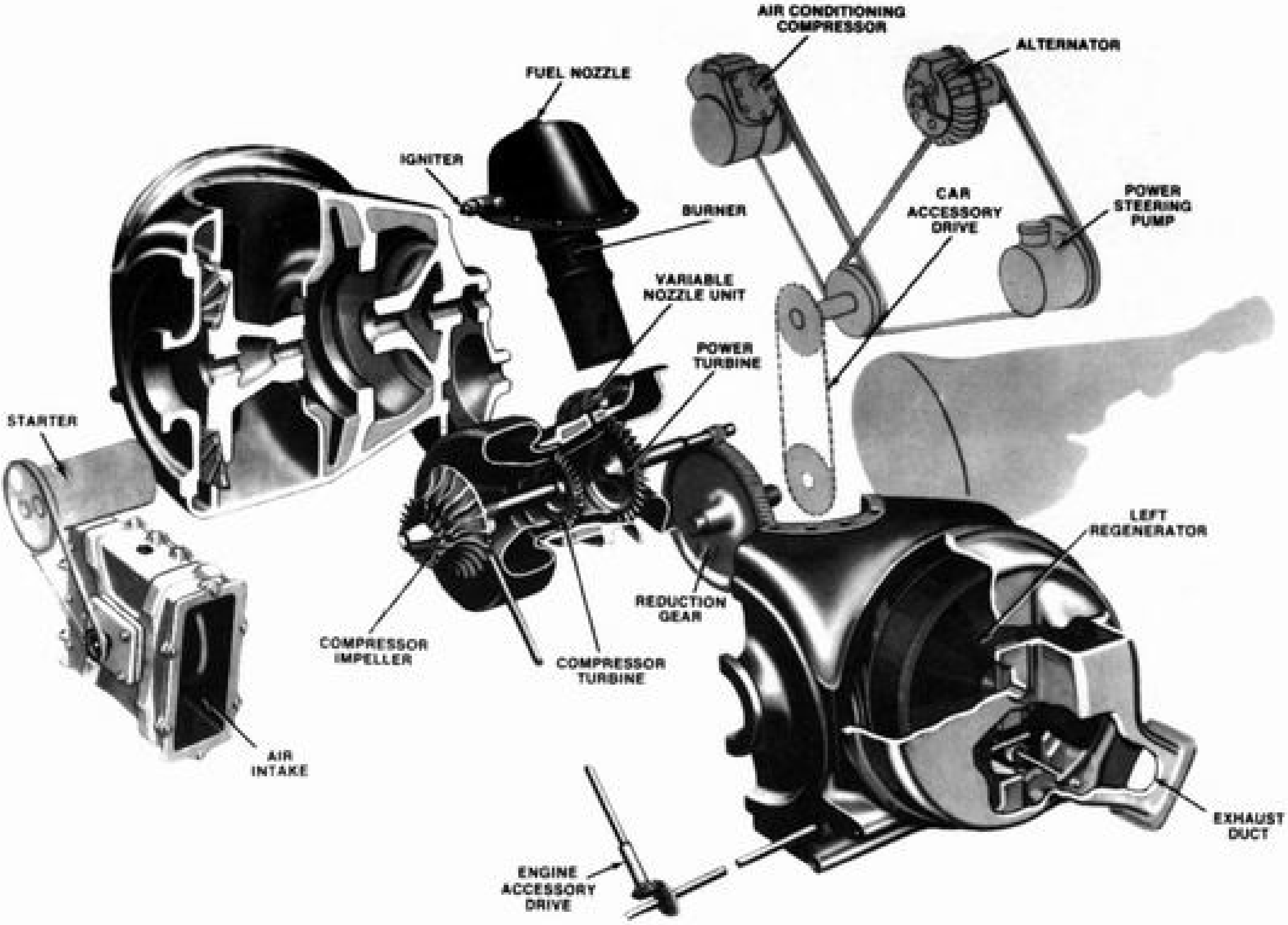
Engineers were especially watching for problems that had not shown up in laboratory or proving ground tests. For example, the engines in the 50 test cars had a combined starter-generator which had performed well in previous testing, but during the user program it was found that the starter-generator brushes would not stand up to a combination of high altitude and low humidity. It was concluded that until further progress occurred in brush design or materials, the best solution was to have separate starter and alternator units.

The 1.1 million miles (1.8 million km) accumulated during the 50-car program have been a valuable direct source of information on the daily, over-the-road behavior of gas turbine engines and components. The program was useful in judging the potential value and acceptance of the gas turbine as an automobile power plant, and the lessons learned were useful in helping Chrysler engineers improve performance, reliability, life, and manufacturing methods.

An extremely beneficial aspect of the program was the experience gained in turbine engine maintenance and in the training of service personnel. For this program, Chrysler had five field service men and two supervisors who were charged with providing engine service and keeping track of the time during which engines could not be operated because of malfunction. The service required on 50 cars, scattered the length and breadth of the nation, was performed essentially by these five men.

During the early weeks of the program, operating time lost because of engine malfunction amount to about 4 percent. Eventually this was reduced to slightly more than 1 percent. Considering that many of the lost days included travel time for service men and shipping time for parts -- a situation that would not exist with a vehicle that is produced and sold in volume -- this was a remarkable record for an experimental engine out on its own for the first time.

The experience of the 50-car program indicated that training of mechanics in the maintenance and repair of gas turbines would not present unusual problems.



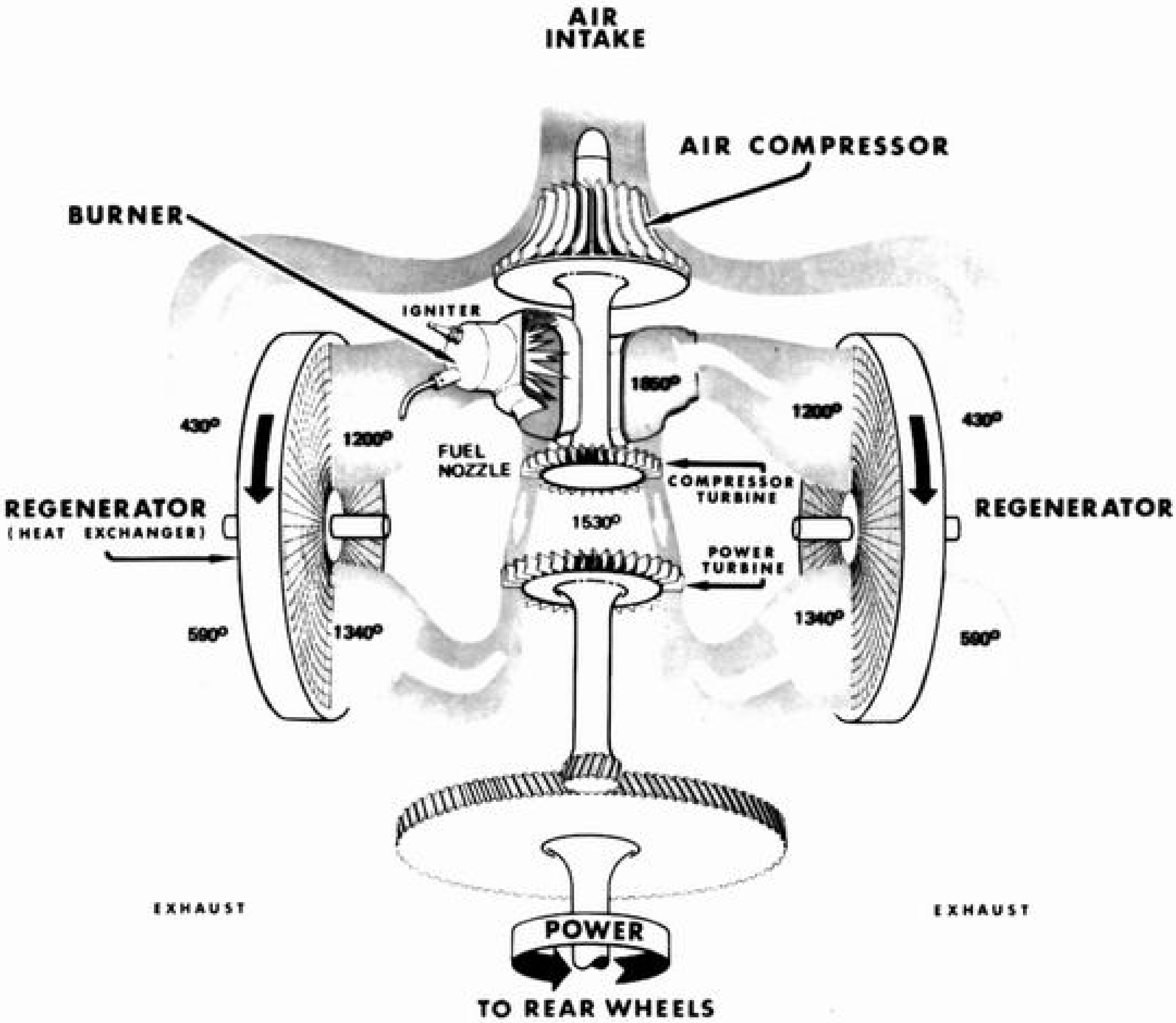
SIXTH GENERATION GAS TURBINE ENGINE

THE FIFTH AND SIXTH GENERATION TURBINE ENGINES

The fourth generation engine built for the 50-car user evaluation program met most requirements of smoothness and reliability, but consumers found its performance and economy were not comparable to that of contemporary piston engine-powered vehicles. In anticipation of consumer demand for a turbine engine with better fuel economy, tentative plans had been made for a limited production run of 500 1966 Dodge Charger Coupes utilizing a fifth generation engine. This engine, which was a modified version of the fourth generation engine, utilized larger regenerators and a higher cycle temperature for improved power and fuel economy.

However, the 500 car program was postponed because of economic conditions prevailing at the time and because studies revealed that substantial burner development was still required before this engine could meet strict requirements limiting emissions of oxides of nitrogen.

During this period, a sixth generation engine evolved. It utilized most of the fifth generation components, but was designed for development use. It incorporated a split accessory drive system, whereby car accessories like power steering and air conditioning were powered by the power turbine, while engine accessories, such as the fuel pump, were still run by the compressor turbine. This engine was also modified internally for improved engine braking and provided an excellent test bed for component life evaluation, noise reduction, and combustion system development.



SIXTH GENERATION GAS TURBINE ENGINE

The sixth generation engine was installed in a 1966 Dodge Coronet which was used for engineering development work from 1966 until early 1973. This car was not displayed in public.

The sixth generation turbine engine delivered 150 horsepower (112 kW) and in terms of overall car performance, it was equivalent to a normally-carbureted V-8 spark ignition engine of approximately 380 CID (6.2 L) displacement. It was lighter in weight than the conventional engine, and characteristic of the turbine engine, it could operate on a variety of fuels.

In 1969, activity on the sixth generation turbine engine was greatly reduced because it became necessary to assign increasing numbers of engineers to research and development programs on emissions controls for conventional engines.

TURBINE POWERED 1966 DODGE CORONET

However, in view of the growing complexity of conventional engine emissions control systems and the low emission potential of the gas turbine engine, work was continued on low emission gas turbine burners.

Because of continuing turbine development progress, Chrysler Corporation won a competitively-bid Federal government contract from the U.S. Environmental Protection Agency (EPA) in November 1972. The goals of the gas turbine development program were modified to demonstrate an experimental gas turbine powered automobile which will accomplish these objectives:

- Meet advanced Federal emissions standards
- Have significantly improved fuel economy compared to earlier gas turbine-powered automobiles
- Be competitive in performance, reliability, and potential manufacturing costs with the conventional piston engine powered compact-size American car.

This contract was a milestone because it was the first time that EPA had ever awarded an advanced power system development contract to an automobile manufacturer.

**THIS TURBINE POWERED
1973 INTERMEDIATE CAR
WAS DELIVERED TO EPA IN 1973 FOR EVALUATION**