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TRUCK OF THE 80'S?**

**ROAD TEST:  
GMC SUBURBAN  
TURBO-DIESEL**

**TROUBLESHOOTING:  
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ALL COLOR  
CATALOG GUIDE





# A CLASS OF ONE

Road Test:  
GMC V-2500 Suburban—  
now with Banks turbo power

By Ken Von Helmolt

Illustrations by Joe Martinez



The Suburban is unique. Introduced in 1935, this giant four-door, four-wheel-drive bus is currently a class of one. Classified as a "Truck Wagon," the Suburban has seen some competition during its 55-year history, but since the 1975 demise of the International Travelall, no major manufacturer has offered a vehicle even remotely Suburban-like. For the last 15 years, only GM has manufactured a giant 4x4 wagon. This has been a boon to sales. And it cuts down considerably on advertising costs.

With a 100-percent market share of the truck wagon class, GM hasn't been spurred by either lagging sales or competition to improve the Suburban. The General sells every Suburban it makes, and the only competition comes from low-volume, specialty conversion businesses that stretch and add doors to full-size Ford Broncos. As far as GM—and the purchasing public too, apparently—is concerned, the Suburban is fine

as is." According to sources at GM, no major redesign is planned for another few years.

The current Suburban chassis and sheet-metal still bear a passing resemblance to the 1955 model. The chassis sports familiar solid axles with leaf springs front and rear, and the truck is still big and boxy—none of that sissy aerodynamic nonsense here. No doubt, ride and handling are better than they were 35 years ago, but if you're considering a Suburban, take the "Truck" part of Truck Wagon seriously.

Fortunately, the flurry of activity in the GM Truck and Bus group has brought some improvements to the Suburban's interior and powertrain. Although seats with adjustable headrests have yet to appear, there are two trim levels (possibly four, if you count Chevy and GMC separately): Scottsdale/High Sierra and Silverado/Sierra Classic. For 1990, the GMC trim-level designations change to

SLX and SLE.

Our test model's Sierra Classic trim made for a rather plush interior, and the truck had most of the modern operating conveniences that have found their way onto trucks since 1955: power steering, power brakes, front and rear air conditioning, cruise control, and a nearly acceptable stereo.

The GM Truck and Bus group has also bestowed the fruits of its substantial light-truck powertrain development on the Suburban. All the gas engines now use electronic fuel injection as part of a complete electronic engine-management system. A four-speed automatic transmission is available in most applications, and automatic locking hubs make shifting into four-wheel drive more convenient, if not quite state-of-the-art. The 1990 Suburban also will be graced with a rear-wheel antilock braking system, which is the current full-size light truck standard.

Suburbans are available in four distinct

# GMC



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models. Two-wheel drives are "R" models, and 4x4s are "V" models. In addition, Subs are designated either 10/1500 or 20/2500 series, which are simply indications of GVWRs—the total amount that the truck and its cargo can weigh. The 10/1500 Subs are ½-ton models, with maximum GVWRs around 7,300 pounds, and available only with gas engines and the light-duty diesel V-8. The 20/2500 Suburbans are closer to 1-ton models, with max GVWRs of up to 8,600 pounds. The 20/2500-series Subs can be ordered with the heavy-duty version of the 6.2-liter diesel, until recently the only engine available via the GMC/Gale Banks ship-through program.

GM's 7.4-liter big-block gas engine is available only in two-wheel-drive Suburban models, making the turbo diesel option especially attractive for buyers who must have a 4x4.

The GMC V-2500 Suburban we tested was powered by the heavy-duty version of the 6.2-liter diesel V-8 with the Banks turbo system installed. The light-duty 6.2 differs from the heavy-duty version in only one major detail: The light-duty version has an EGR valve and the heavy-duty version doesn't. Other than the minor changes in intake manifold design and injection pump calibration that this difference requires, the two engines are identical.

A diesel engine is a feasible alternative to a gasoline engine. Diesels traditionally offer durability in the form of long life and relatively low maintenance costs. Good fuel economy is another diesel virtue, and if you have other diesel-powered equipment, the practicality and fuel-sharing ability of a diesel truck is hard to resist. Also, because of a diesel's potential for low-end torque, it's a popular choice for towing. The trade-off is an increase in noise and smoke, and a decrease in acceleration.

This lack of acceleration has been especially true of vehicles powered by GM's light-truck diesels. In stock form, GM's 6.2-liter diesel rates third out of three. Ford increased its light truck diesel engine displacement to 7.3 liters, and Dodge contracted with Cummins for its sellout 5.9-liter turbo diesel. For 1990, GM will increase the rated output of the heavy duty 6.2-liter diesel by seven horsepower, to 155 at 3,600 rpm. Torque will also increase to 270 lb.-ft. at 2,000 rpm. This small improvement still leaves the normally-aspirated GM diesel in third place.

What the 6.2 really needs is a turbocharger, and aftermarket turbocharging kits have been popular additions to both Ford and GM light truck diesels. Advanced Turbo Systems

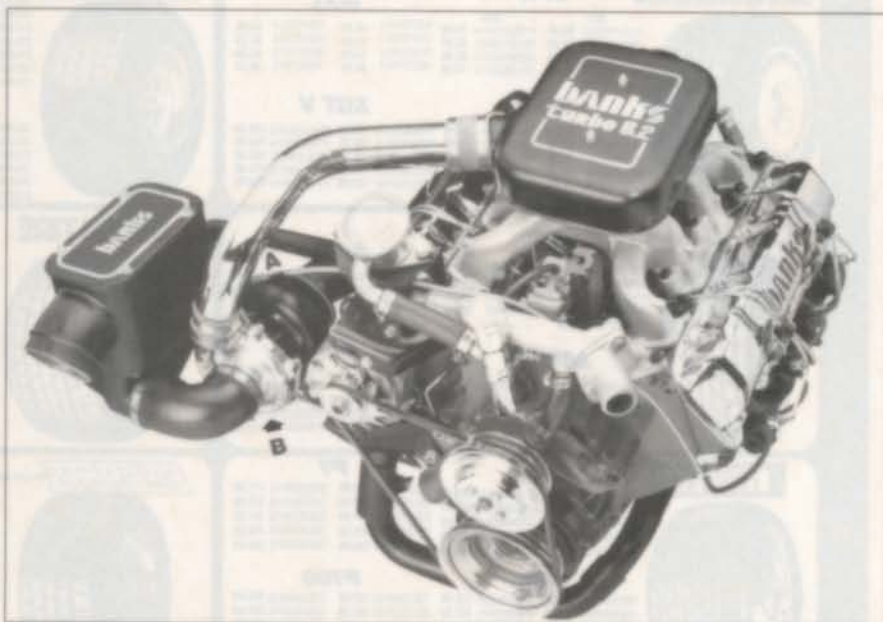
(Dept. FW, P.O. Box 7547, 5919 S. 350 W., Murray UT 84107, 801/263-6900) sells a turbo kit for the 6.2-liter diesel. The ATS kit lists for \$1,995; a 3-inch exhaust system is an additional \$250, and installation typically costs about \$200. Gale Banks Engineering also makes a turbo kit for the 6.2, and now, when certain models of GMC trucks are ordered from a GMC dealer, a factory-installed Gale Banks turbo system is an available option—and you can't get it from Chevy.

Turbocharging, to give a brief review, is a type of forced induction. The process improves the volumetric efficiency of an internal combustion engine by forcing a denser charge into the cylinders. Unlike a supercharger, which is driven by a belt off the crankshaft, the engine's exhaust gasses drive a turbocharger—making it a comparatively non-parasitic way to increase the engine's

power output. The engine's exhaust gasses spin the turbine, which is on a common shaft with the compressor. The turbo's compressor packs more air into the cylinders, and a recalibrated injection pump, in the case of the GM diesel, delivers more fuel. Banks'

## LIGHT TRUCK DIESEL ENGINES MANUFACTURERS' RATINGS (SAE NET)

Engine	Max. hp @ rpm	Torque @ rpm
GM HD 6.2 V-8 (1989)	148 @ 3,600	259 @ 2,000
GM HD 6.2 V-8 w/Banks turbo	207 @ 3,300	367 @ 2,200
Ford 7.3 V-8	180 @ 3,300	345 @ 1,400
Dodge 5.9 I-6 Cummins turbo diesel	160 @ 2,500	400 @ 1,700



A turbocharger is actually two turbines on a common shaft. Exhaust gasses spin the "hot side" turbine (A), which turns the compressor (B) or "cold side" turbine. The compressor forces more air into the cylinders and a recalibrated injection pump supplies additional fuel. A 3-inch-diameter, low backpressure exhaust system completes the installation.



The top-level Sierra Classic trim made for a rather plush interior. Seats with adjustable headrests are not available. All controls are within easy reach of the driver, but the ventilation controls are hard for the passenger to reach. The stock gauges are easily seen, but the optional bank of Banks gauges is inconveniently located.



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system also includes a free-flowing exhaust system to reduce backpressure. Put these components together and presto! a vastly improved 6.2-liter diesel.

Turbocharged engines also give better performance in the rarefied atmosphere of higher altitudes. A big-block gas engine could lose 30 percent of its rated power at 10,000 feet, where a turbo diesel would perform almost as well as at sea level.

A turbocharger does increase cylinder pressures—compression ratio stays the same, of course—but the 6.2-liter diesel is a heavy-duty assembly, designed with features such as four-bolt main caps that make the engine easily able to handle the 10 psi of boost a Banks turbo can provide. And, Banks claims, the turbo system lowers engine oil temperature, exhaust temperature, and transmission fluid temperature. Although we couldn't test Banks' claims, the optional "bank" of gauges showed the oil and exhaust temperatures within Banks' specified range, so these benefits could help the engine live longer by reducing piston and valve temperatures. For heavy hauling or towing, we'd still recommend an auxiliary remote oil cooler, which Banks also happens to offer. The Banks turbo system carries a one-year warranty, which is separate from the standard GMC new truck warranty. An extended warranty is available for a nominal additional charge.

The Banks turbo system for the GM 6.2-liter diesel has been available in kit form since 1982, when GM first released the engine for light truck applications. Only in the 1989 model year has the system become available as a dealer option. For 1990, light-duty 6.2 diesels will also be available with the Banks turbo—this will include GMC models of the full-size Jimmy and 10/1500-series Suburbans. The Banks turbo system for the GM diesel is emissions-legal in all 50 states. Banks also offers 50-state-legal turbocharger kits for the Ford 6.9- and 7.3-liter diesel engines, but no Ford ship-through program has been established.

GMC's ship-through program (in all states except California) works like this: A buyer specifies the Banks turbo system option on an appropriate model GMC truck; the dealer orders the turbo system from Banks, and orders the truck from GMC; a Banks-approved installation facility near the GMC plant confirms the truck's build date, and eventually the truck is shipped from the plant to the Banks facility for the turbo installation; after the installation, the truck is road tested and returned to the GMC plant; GMC ships the truck to the dealer, who in turn delivers it to the customer. This way, the

cost of the turbo system can be included in the truck financing.

In California, the turbo kit is legal for installation only after the truck has entered commerce. This means that, in theory, a Califor-

nia customer can't finance the truck and turbo system in one fell swoop. In practice, however, an accommodating dealer could probably work something out.

With a suggested retail price of \$2,595

## 1990 GMC SUBURBAN



### General

Vehicle/model	1990 GMC V-2500 Diesel Suburban
Base price	\$19,322
Options as tested	
Banks Turbo System	\$2,595
Center and rear seats	\$953
Electric tailgate window	\$103
Air conditioning	\$1,161
Rear locking differential	\$252
Cruise control	\$205
40-gal. fuel tank	\$60
Skidplates	\$175
Tilt steering wheel	\$121
AM/FM/cassette stereo	\$504
Sierra Classic equipment	\$1,506
California emissions	\$100
Bucket seats	\$1,090
Operating convenience package	\$308
Front quad shocks	\$100
HD trailer equipment	\$272
Miscellaneous	\$230
Price as tested	\$29,057

### Engine

Type	90-degree V-8 (HD) turbo diesel
Displacement (cu. in./liters)	379/6.2
Bore x stroke (in.)	3.98 x 3.82
Compression ratio	21.3:1
Fuel induction	Mechanical fuel injection
Valve gear	OHV, pushrods; 2 valves/cyl.
Redline (rpm)	4,000
Fuel requirement	Diesel

### Engine Output

Max. rear-wheel hp @ rpm	N/A
Max. rear-wheel torque (lb.-ft.) @ rpm	N/A
Mfg.'s ratings (SAE net)	
Hp @ rpm	207 @ 3,300
Torque (lb.-ft.) @ rpm	367 @ 2,200
Engine rpm @ 55 mph	2,350

### Acceleration

0-30 (sec.)	4.38
0-40 (sec.)	6.58
0-50 (sec.)	9.71
0-60 (sec.)	14.02
Standing ¼-mile (sec. @ mph)	19.54 @ 70

### Drivetrain

Transmission	TH 400 3-speed automatic
Ratios: 1st	2.48:1
2nd	1.48:1
3rd	1.00:1
Rev.	2:10:1
Axle ratio	3:73:1
Final drive ratio	3:73:1
Transfer case	Part-time 2-speed NP 208
Low-range ratio	2.61:1
Hubs	Automatic

### Suspension

Front	Live axle, leaf springs, quad shocks
Rear	Live axle, leaf springs

### Steering

Type	Integral power, rotary vane
Turns, lock to lock	3.5
Overall ratio	19.4/17.7:1
Turning circle, curb to curb (ft.)	43.9

### Brakes

Front	Power-assisted hydraulic discs
Rear	Power-assisted hydraulic drums
Swept area (sq. in.)	906.8

### Braking Distances

30-0 (ft./sec.)	33/2.0
55-0 (ft./sec.)	121/3.6

### Wheels and Tires

Wheels	N/A
Tires	31x10.50 BFG Radial All-Terrains

### Fuel Economy

EPA estimate, city/highway (mpg)	N/A
Actual combined, city/highway/off-road (mpg)	13.6

### Dimensions and Capacities

Wheelbase (in.)	129.5
Length (in.)	219.1
Width (in.)	79.6
Height (in.)	76.1
Overhang, f/r (in.)	33.8/55.8
Track, f/r (in.)	68.5/65.5
Minimum ground clearance (in.)	8.6
Ride height (in.)	35.0
Load lift height (in.)	33.6
Maximum unobstructed cargo capacity (cu. ft.)	165.0
Approach/departure angles (degrees)	N/A
Base curb weight (lb.)	5,900
Base weight distribution, f/r (%)	52/48
Advised GVWR (lb.)	8,600
Payload (lb.)	2,700
Towing capacity (lb.)	5,000
Fuel capacity (gal.)	40

### Accommodation

Seating capacity, persons	8
Headroom, f/r (in.)	40.5/41.1/39.1
Legroom, f/r (in.)	40.8/14.0/16.0

### Calculated Data

Power-to-weight ratio (lb. per hp)	47.6:1
Hp per liter	33.4
Brake swept area per ton (sq. in.)	307.4
Breakover angle (degrees)	19

### Interior Sound Levels

#### (dB "A" scale)

Idle	56
1st gear redline	78
55mph cruise (dB)	72

installed, the Banks turbo costs more than other available turbo kits. But having a turbo produces a marked improvement in performance, and the turbo may pay for itself in fuel savings over the life of the truck. Banks claims a potential 33-percent increase in fuel economy. Our unladen test Suburban recorded a combined average of 13.6 mpg, with a one-tank high of 14.4 mpg. These mileage figures give our diesel Sub, with its optional 40-gallon fuel tank, a cruising range exceeding 540 miles. This is peachy for a truck of this heft, especially considering the transmission and differential gearing. The heavy-duty diesel is available only with the TH 400 automatic transmission. This is a stout unit with a good reputation, but it's only a three-speed with a 1.0:1 final drive, no overdrive. Even with 31-inch-tall aftermarket tires, the 3.73:1 differential gears have the engine turning at 2,350 rpm at 55mph. An aftermarket overdrive to lower cruise rpm could further improve fuel economy and would reduce induction noise at cruise.

We could and did test for improved acceleration. Informal, seat-of-the-pants, on- and off-road testing of the diesel Sub—promptly dubbed "The U-boat" for its size—felt good: Almost no turbo lag, pleasing throttle response, and respectable acceleration made the big Sub surprisingly fun to drive. It sounded good, too. Banks' 3-inch-diameter exhaust tubes give the turbocharged engine a pleasingly mellow exhaust note. At the track, the turboed Sub accelerated from zero to 60 mph in just over 14 seconds, making it faster than the gas engine-powered Ramcharger and Bronco we tested last year.

The turbo changed the character of the engine power, but it couldn't change the basic nature of the Suburban. Due to its size and configuration, the Suburban is not the most agile off-road vehicle. It doesn't mind rugged terrain, but with its 10-foot wheelbase and five feet of rear overhang, tight turns, sharp drop-offs, and narrow trails don't show the Suburban at its best.

A Suburban excels in cargo capacity, passenger seating, and towing. Pack 160 cubic



**The Banks turbo comes with a pyrometer, to monitor exhaust temperature. The other gauges pictured are an extra cost option. From left to right, a diesel tach, a boost gauge, an exhaust temperature gauge, and an engine oil temperature gauge. After a long or strenuous workout, the turbo should be allowed to idle down before shutting off the engine.**



feet of gear into a Suburban and tow a Jeep to the trail. The four-wheel-drive Suburban is an excellent choice for towing a boat and transporting the family to a lakeside resort, and then recovering the boat from a slippery launch ramp.

By offering the Banks turbo system as an option, GMC does two things: It makes the

diesel engine a much more attractive choice, especially in four-wheel-drive Suburbans, where the largest gas engine is the 5.7-liter small-block V-8; and it distinguishes GMC models from their Chevrolet brethren. Of course, no special effort is needed to distinguish the Suburban from its competition—it has none. □



Both Chevrolet and GMC sell the Suburban, a vehicle unique among light trucks. The last competitor in the Suburban's class was the Travelall, and International Harvester stopped manufacturing it in 1975. We tested a GMC V-2500 Suburban equipped with the 6.2-liter diesel and optional Banks turbocharging system.