



# ipd turbovolvo

*Volvo's image gets a much needed boost*

**ipd** READERS WHO HAVE only started their subscriptions to R&T within the last two or three years might get the impression that turbocharging automobiles is a phenomenon of the last few years, spurred on by Porsche's Turbo Carrera. In fact, we've had turbocharged cars brought to us almost since the beginning of the emissions era, but many of them were pretty wretched machines. Perhaps a turbo is basically too easy to install, especially if you don't care that most pure production engines aren't happy with 15 psi of boost and that stock drivelines and suspensions are equally ill-designed for such dramatic increases in power. How about a Datsun 710 with 14 psi of raw boost for its stock engine and nothing more than its standard rear leaf springs?

Happily, the turbocharger has gained acceptance for street automobiles through the work of auto manufacturers and some of the better aftermarket tuners. The creation displayed here is by Richard Gordon, of ipd (Import Parts Distributing Co Inc, 2762 Broadway N.E., Portland, Ore. 97232). Gordon's speciality is Volvos, a fact that reflects the marque's popularity in the northwest as much as Gordon's personal tastes.

This time ipd has produced a turbocharged Volvo 242, or turbovolvo as they like to tag it and, considering the rumors out of Göteborg, that puts them one step ahead of the Volvo factory. Working with a standard Volvo B21 Lambda-Sond 4-cylinder engine, ipd started by doing nothing to the engine's innards. All the additions to the engine are external, which is not to imply their conversion to turbo power is a simple bolt-on, as we shall shortly see. One of the points of the ipd conversion was to leave the emissions system intact, which should please the feds, and rely on the flexibility inherent in the Lambda-Sond 3-way catalyst system to keep emissions down. This is similar to the present Saab turbocharging system and not unlike the upcoming Ford turbo 4-cylinder system, which also uses a 3-way catalyst combined with an oxygen sensor and an electronically controlled carburetor.

The basic theory is that you are able to add the turbo to the system and the built-in oxygen sensing system will continue to adjust the fuel metering to meet emissions. It isn't quite that easy

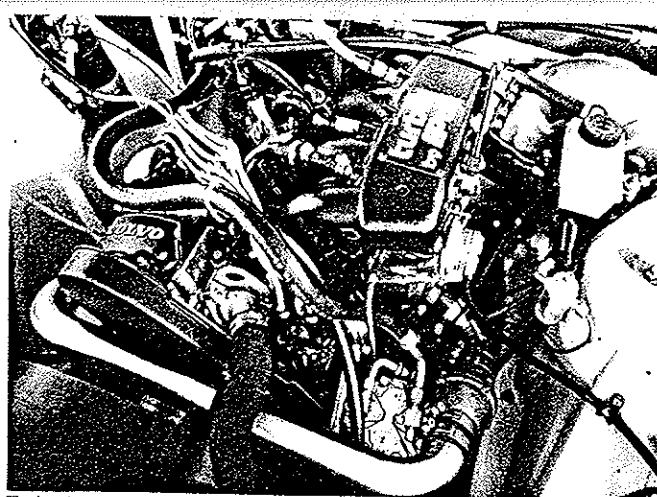
but ipd started by adding the Schwitzer turbocharging and all necessary plumbing, but using the stock exhaust manifold. Instead of a wastegate, they added an IMPCO boost restrictor to the air inlet to keep boost between 9 and 11 psi, for the system would go to 15 psi without it. When the exhaust finally gets a chance to escape the engine, it dumps into an ipd Big Bore tailpipe.

At this point, ipd found they needed extra mixture richening as the boost and rpm rose and to accomplish this they added their own variable enrichening device which starts when boost reaches 2.5-3.0 lb and increases with the boost. The next problem was detonation, resulting from the low-octane unleaded fuel they had to use with the 3-way catalyst. To solve that, ipd added a water-injection system which cools the intake charge when the boost rises above 6 psi.

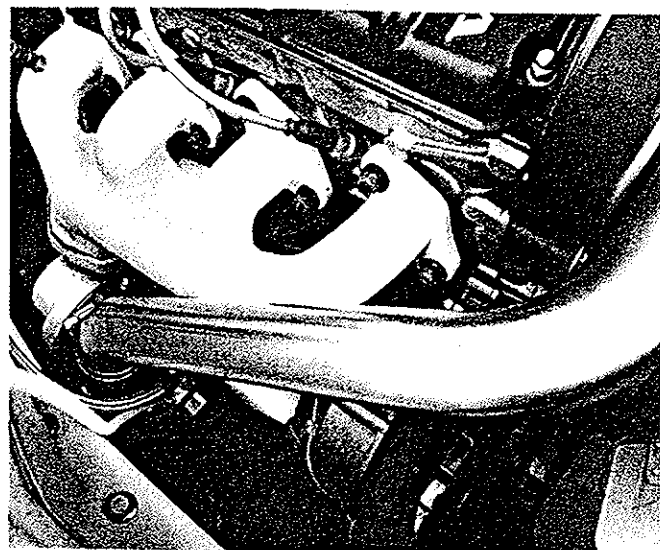
Without an engine dynamometer, ipd uses a chassis dyno to compare pre- and post-turbo horsepower figures, which they say rise from 70 rear-wheel horsepower at 5000 rpm to 120 at 5000 rpm. Behind the engine is a stock 4-speed transmission with overdrive and a standard 3.91:1 rear axle ratio, though ipd has added a Spicer Pow-r-Lock differential.

Now, before we describe how this increase translates to on-the-road performance, we should tell you what ipd did with the Volvo 242's suspension to deal with that 70-percent increase in power. As you no doubt notice from the photos, the ipd Volvo is quite a bit lower than stock. It has shorter coil springs (40 percent stiffer than stock up front and 20 percent stiffer in back), lowering the car 2.5-3.0 in. The anti-roll bars are appropriately beefier than the 242 GT model, the front one now being 1.13 in. thick instead of the standard 0.82 in. and the rear one up to 1.00 in. from 0.74 in. The disc brakes are stock, but with Repco pads and Safety Brakers to reduce wheel lock-up. The tires are 225/50VR-15 Pirelli P7s on very expensive Jongbloed 3-piece 15 x 8-in. wheels. (ipd does have a less expensive alternative with 195/70SR-14 Pirelli P3s on 14 x 6-in. Intra alloys.) The front end, by the way, has been set at 1 degree negative camber and 2 degrees positive caster, compared to the normal settings of 2-3 degrees positive camber and 1.0-1.5 degrees positive caster which are not con-





Turbocharger mounts to stock exhaust manifold. Pressurized air is pushed into the intake manifold via a chrome pipe running in front of the engine. Emissions systems is in place and operational.



PHOTOS BY JOE KUSZ

ductive to spirited driving. Bilstein gas-filled shock absorbers are used to damp all this commotion.

Being a purveyor of automotive goods, Gordon was not about to let the Volvo package go at this, of course, and so his turbovolvo is filled with a long inventory of interesting add-ons, including . . . ahem . . . an ipd front air dam to improve fuel mileage and stability; Paddy Hopkirk racing seats; extra instruments such as clock, oil pressure, boost gauge and pyrometer for exhaust temperature; European Volvo rectangular halogen headlamps; the usual things like a leather-wrapped steering wheel and special AM/FM stereo/cassette player and, potentially most important of all, a Whistler X-K Band radar detector.

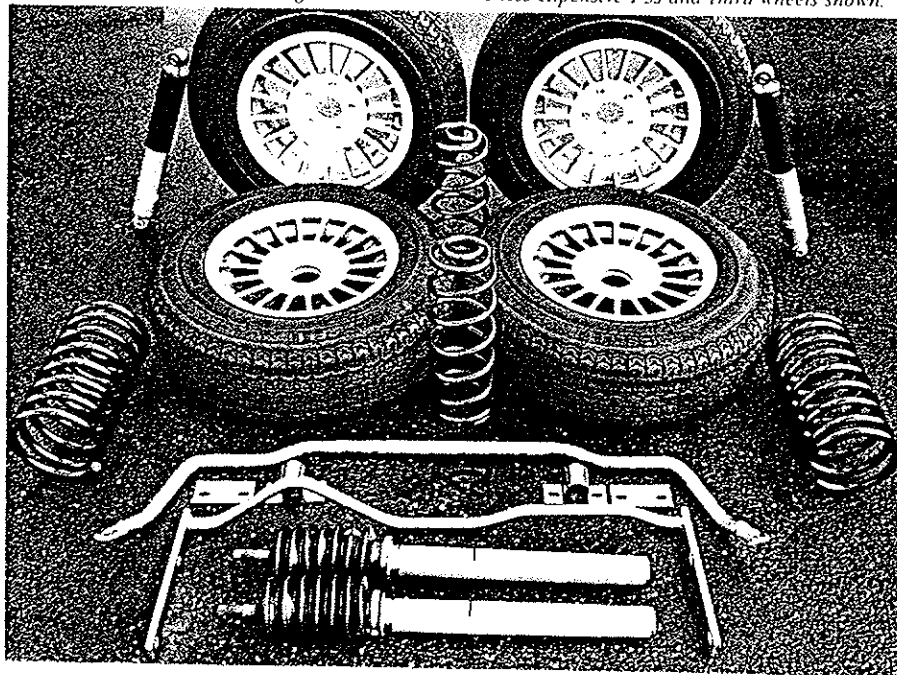
All these pieces have been added to a stock 242 in the usual clean ipd fashion, the engine conversion being particularly smart and obviously well thought out with little of the cobbled look these non-factory jobs sometimes have. The turbo engine isn't a quick starter, whether cold or warm, and it stumbles a bit when first lit, but after getting a chance to clear its throat it's ready; a small price to pay for what you are about to get. The boost starts smoothly around 3000 rpm and by 4500 rpm it's really huffing, the engine feeling very strong right to the redline, which we pushed to 6300 rpm. As long as you aren't poking around at 2000

rpm, driving this Volvo is like having a built-in passing gear in all four speeds. The gears and boost are arranged so you are almost always into the boost or on the edge of it, which makes for excellent around-town flexibility.

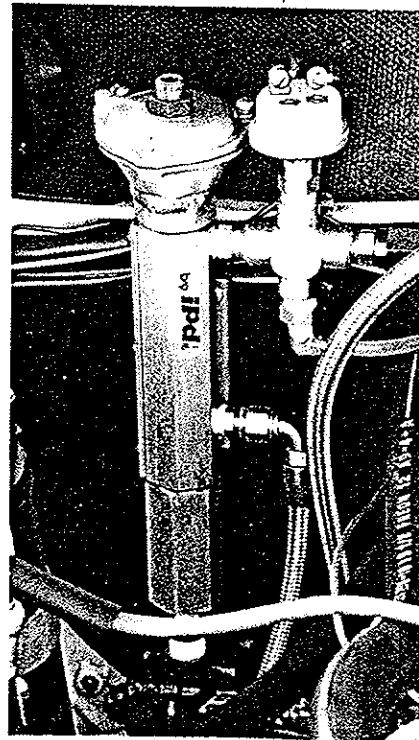
All this isn't meant for trudging around town, of course, because the turbovolvo lives best on the open road, where its flexibility and four speeds plus overdrive again mean you are always on the boost. Given enough room and the correct conditions, that could mean 121 mph in 4th gear overdrive. Getting up there requires 8.8 sec to 60 mph and 17.0 sec through the quarter-mile, compared to 11.3 sec and 18.5 sec for the standard 242 GT we tested last March.

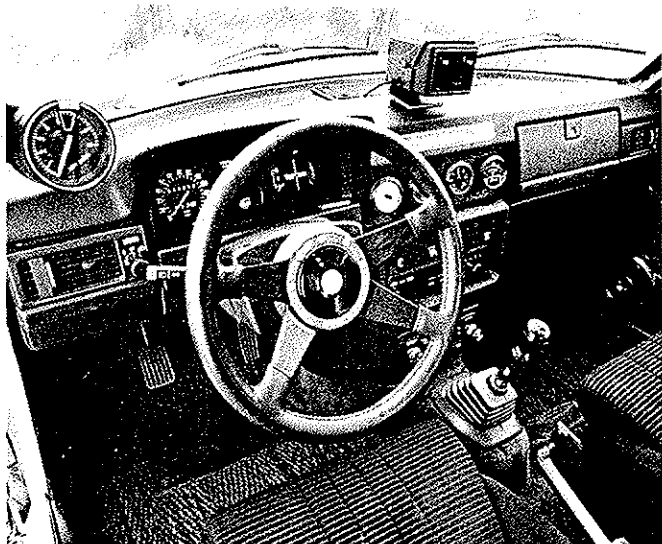
On the skidpad, the turbovolvo generated an impressive 0.817g, while on the slalom it managed 61.5 mph, a performance combination which is in Ferrari territory. Yet you can't quantify the fun of a car like this, which feels so nicely balanced, very stable and ready to work with you down any sort of twisty road. Once again the Pirelli P7s proved their worth, sticking like crazy while soaking up most road irregularities with relative ease. The turbovolvo isn't smooth riding but it isn't terribly harsh either. Interestingly, ipd specifies enough negative wheel offset that the P7s fit within the wheel wells without any flaring, needing only a ➡

Suspension components include shorter, higher-rate springs, Bilstein shocks and beefier anti-roll bars. We tested on Pirelli P7s and Jongbloed wheels, not the less expensive P3s and Intra wheels shown.



Ipd's variable enriching device starts adding extra gasoline to the air-fuel mixture when the boost pressure reaches 2.5-3.0 psi.





little bend in the fender lip to prevent rubbing. Our only major complaint from a driving standpoint is that the car is so low you ought to keep a few spare front spoilers around, and anticipating that problem ipd is developing a shorter air dam for lowered Volvos.

The brakes were also quite impressive with stops of 140 ft from 60 mph and 250 ft from 80 mph with excellent control. Even with the Safety Brakers, which modulate line pressure during heavy braking to prevent wheel lock-up, we got a little rear wheel hop from 80, but still all the stops were easy to control.

Inside, the driver is held snugly by the contours of the racing bucket seat and with all the added gauges there is plenty to keep him or her entertained on the longer straightaways. In the city you can watch the pyrometer to check exhaust temperature. The small diameter padded steering wheel is just right and the general environment excellent . . . and there's always that radar detector to hold your interest.

Ah, that's all very nice, you're probably saying, but what's it like when you total the tab for this toy? When you consider how much you change on the car, you might as well start with a basic Volvo 242, which costs \$6645 POE. The major item is, of course, the turbo kit at \$1150 (not including approximately 12 hours labor), with the P7s at \$226 each and the wheels a buck cheaper per corner (which is why Gordon offers the P3 alternative). By the time you add in the gauges and seats and Bilsteins and air dam and short coils, etc. the accessories come to \$4692 for a total bill of \$11,337 plus tax, license and a radio.

Now if the thought of 11.3 grand for a 240 series Volvo makes you wonder if Gordon hasn't created a little overkill, consider what else you might buy at that figure, including Volvo's own 262C at \$14,700.



## PRICE

List price .....\$6645  
Price as tested .....\$11,337

## GENERAL

Curb weight, lb .....3135  
Weight distribution (with driver),  
front/rear, % .....50/50  
Wheelbase, in. ....104.0  
Track, front/rear .....57.5/54.3  
Length .....192.6  
Width .....67.2  
Height .....56.2  
Fuel capacity, U.S. gal. ....15.8

## CHASSIS & BODY

Body/frame .....unit steel  
Brake system .....10.3-in. discs  
front, 11.0-in. discs rear; vacuum  
assisted  
Wheels .....Jongbloed alloy, 15 x 8  
Tires .....Pirelli P7, 225/50VR-15  
Steering type .....rack & pinion  
Turns, lock-to-lock .....3.5  
Suspension, front/rear: MacPherson  
struts, lower A-arms, coil springs,  
tube shocks, anti-roll bar/live  
axle on trailing arms & Panhard  
rod, coil springs, tube shocks,  
anti-roll bar

## ENGINE & DRIVETRAIN

Type .....sohc inline 4  
Bore x stroke, mm .....92.0 x 80.0  
Displacement, cc/cu in. ....2127/130  
Compression ratio .....8.5:1  
Bhp @ rpm, net .....est 175 @ 5000  
Torque @ rpm, lb-ft .....est 190 @ 2500  
Fuel requirement .....unleaded, 91-oct  
Transmission .....4-sp manual with OD  
Gear ratios: OD (0.80) .....3.13:1  
4th (1.00) .....3.91:1  
3rd (1.37) .....5.36:1  
2nd (2.16) .....8.45:1  
1st (3.71) .....14.51:1  
Final drive ratio .....3.91:1

## CALCULATED DATA

Lb/bhp (test weight) .....18.5  
Mph/1000 rpm (OD) .....23.5  
Engine revs/mi (60 mph) .....2550  
R&T steering index .....1.13  
Brake swept area, sq in./ton .....243

## ROAD TEST RESULTS

### ACCELERATION

Time to distance, sec:  
0-100 ft .....3.6  
0-500 ft .....9.3  
0-1320 ft (¼ mi) .....17.0  
Speed at end of ¼ mi, mph .....84.0  
Time to speed, sec:  
0-30 mph .....2.9  
0-50 mph .....6.3  
0-60 mph .....8.8  
0-80 mph .....15.2  
0-100 mph .....28.0

### SPEEDS IN GEARS

OD (5000 rpm) .....121  
4th (6400) .....116  
3rd (6400) .....86  
2nd (6400) .....54  
1st (6400) .....32

### FUEL ECONOMY

Normal driving, mpg .....20.0

### BRAKES

Minimum stopping distances, ft:  
From 60 mph .....140  
From 80 mph .....250  
Control in panic stop .....very good  
Pedal effort for 0.5g stop, lb .....18  
Fade: percent increase in pedal ef-  
fort to maintain 0.5g deceleration  
in 6 stops from 60 mph .....nil  
Overall brake rating .....very good

### HANDLING

Speed on 100-ft radius, mph .....35.0  
Lateral acceleration, g .....0.817  
Speed thru 700-ft slalom, mph .....61.5

### INTERIOR NOISE

All noise readings in dBA:  
Constant 30 mph .....64<sup>1</sup>  
50 mph .....71  
70 mph .....76

<sup>1</sup>Noise readings were taken in 4th gear because overdrive was not working during our track tests.

### SPEEDOMETER ERROR

30 mph indicated is actually .....29.5  
60 mph .....58.5  
70 mph .....69.0

## ACCELERATION

