

VOLVO

Engineering Features





Volvo 144



Volvo 1800E



Volvo 164

For 1971, with the introduction of the new 142E sports sedan, Volvo buyers will be able to select from six different models.

This fuel injected model will join the 142 2-door sedan, 144 4-door sedan and 145 4-door station wagon in the Volvo 140 Series, the six-cylinder 164 4-door sedan and the 1800E sports coupe.

The diversification of our product line makes your selling job easier, because more Volvo models will appeal to more customers. But in this age of enlightened consumers, you'll have a greater need for product information.

You'll be expected to explain the merits of each model so that customers can determine which Volvo is best for them. That's the reason for this book. It will acquaint you with all Volvo models, pointing out the features common to the entire line as well as each model's distinctive differences.

Exterior

Introducing the Volvo 142E

Volvo's new 142E sports sedan, which includes as standard equipment many performance and comfort features found in the more expensive Volvo models, is a welcome addition to our 1971 product line.

Along with the 12-years of development behind the 140 Series and the new features found on the 1971 models, such as the cross-flow radiator and wider wheels, the 142E also has the 130-horsepower electronic computer controlled fuel injection engine and electrically operated overdrive from the 1800E; and leather upholstery, thicker front discs, radial tires and modified suspension featured on the 164.

Other standard equipment includes 4-wheel power disc brakes, 4-speed fully-synchronized transmission, reclining bucket seats, full interior carpeting, tinted glass on all windows and an electric rear window defroster. The new model is available in metallic blue and gold colors and has special chromed hub caps and lug nuts to mark the restyled five-inch wide wheels.

All these features made the 142E a totally balanced Volvo, a distinct alternative between the 142 and the higher priced 164 and 1800E, and a model assured of success in the growing sports sedan market.

Volvo has earned a reputation for building long-lasting cars because of quality construction. Volvos are unit constructed, combining extra strong side posts and bulkheads with precision-stamped body components. The majority of domestic cars are constructed with separate frames and bodies. This is dictated by economies . . . it's less expensive to make yearly body changes, and safety . . . most unit constructed hardtops without a center post lack proper side support.

A Volvo's frame and entire body are built as a single unit with inherent strength. All the components are welded, not bolted together. So they fit properly and will stay that way through years of stress.

Areas of the Volvo body susceptible to rust, such as the rocker panels, headlight surrounds, and front end panel are made of hot-dipped galvanized steel. It's an expensive process, but it really works.

Every Volvo that comes off the assembly line is protected by about 33 pounds of paint, including a dip in primer. The paint is so thick that a weighted magnet that clings to the door of a typical domestic car will slide down the side of a Volvo.

But thickness is only part of Volvo's paint story. Each completed body assembly gets a total surface inspection by trained workers who can feel rough spots invisible to the naked eye. Marked areas are sanded and the

Rubber-faced aluminum bumpers, side marker lights, and wrap-around turn signals, shown here on the 164, are features also found on 140 Series models.



body is acid etched for surface cleaning before the primer immersion. Undercoat and sealer coats are applied with rub-downs, washings and inspections between each coat, followed by three color coats. The hand spray work is performed in booths where the air is changed once every six seconds.

The underside of a Volvo is equally well protected with two coatings of preservative sealer. This undercoating, a sealing wax and the familiar black glop, is applied during final assembly.

Volvo's way of building cars means that engineers, not stylists, have the final say regarding the cars' appearance. So there's not an ounce of fat on a Volvo. No bulges, scoops or useless overhang.

The engine compartments are designed to allow working room at both sides of the block. The sedan's trunk is a box-like structure designed to hold an entire family's luggage, not just a few suitcases and odds and ends.

In overall length, Volvos fit into the American "compact" category. However, this is a misleading comparison because, while a domestic compact is a reduced version of a full-size car in all dimensions, Volvos have a larger passenger area than many higher priced cars. They're much larger on the inside than one would expect from a "compact." In fact, Volvos have more front seat legroom and more rear seat kneeroom than a Cadillac.

According to European categories, a Volvo is a full-size car (other European full-size

models are made by Audi, BMW and Mercedes). The trend is away from standard-size cars. From June 1969 to June 1970, compact sales were up by one-third. Intermediates also increased, while standard-size car sales decreased by 18%. Car buyers are passing up higher priced larger cars and demanding more value for their dollars. They are more interested in function than styling gimmicks, and Volvo's engineering features should be pointed out to them.

Some of the features Volvo customers are interested in include doors that open to an 80° angle and have an additional stop position for easy exit and entry in crowded parking lots. Patented latches will keep the doors closed even under severe impact conditions.

Volvo's strong but lightweight wraparound bumpers are made of rust proof anodized aluminum and protected by hard rubber inserts to prevent dents and scrapes. Tinted glass is used on all windows to reduce radiated heat. All the glass on a Volvo is only slightly, but adequately, tinted so as not to detract from night driving visibility.

Styling changes for 1971 include a new front end for the 140 series. In addition to enhancing appearance, the attractive design also enables greater air flow through the black aluminum grille and vertical slots below the bumper to the new cross-flow radiator. 1971 164 and 140 Series models also feature new, wider and thicker steel wheels with a distinctive slotted design.

Flow-through ventilation now is standard on the 145 station wagon. One-way exhaust vent in the right rear quarter panel is the same type used in the 1800E.

Grille below the rear window on sedans is the exit point for stale inside air, changed by Volvo's noiseless flow-through ventilation system.



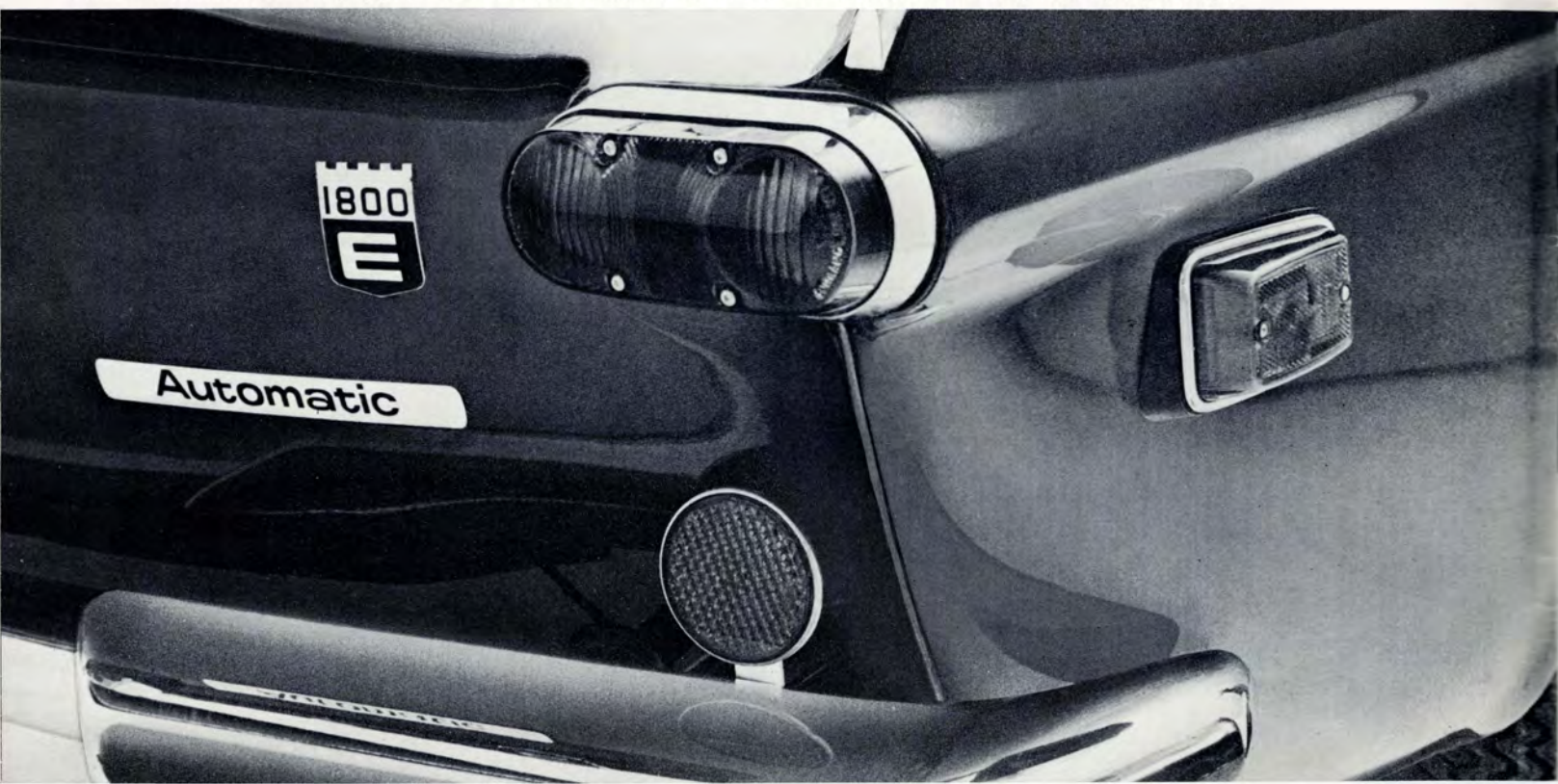
Sharp-eyed observers will note new emblems on 140 Series.



Station wagon rear door utilizes a gas cylinder spring to assist lift. Fixed rear quarter window now is a one-piece design.



Automatic transmission equipped 1800E is a new addition for 1971. New emblem is the only rear styling change.



Slotted 5" wheels are standard on 140 Series models. New screw-on stainless steel hub caps are backed with a rubber gasket.

Mag-type 1800E wheels have cast aluminum hubs and steel rims.



Special chromed hub covers and lug nuts, radial tires and rear fuel injection emblem mark the 142E.

New wheels for the 164 are one-inch wider. Thin whitewall stripe and stainless steel trim rings are distinctive features.



VOLVO
fuel injection

Interior

Volvo's philosophy of functional styling is carried over to the inside of the cars as well. The 144, first introduced in 1967, set a revolutionary trend in safety design. Included as standard equipment were three-point shoulder/lap safety belts; padded, non-glare dashboard; padded sun visors; collapsible seat backs with rear passenger protection; locking steering column; two-speed electric wipers and washers; recessed knobs; safety door locks; recessed door handles and an interior hood latch.

Most of these interior features are now required by law on all cars. And there is the possibility that other Volvo features, such as electric rear window defrosting, near perfect visibility and the 145's rear window wiper and washer will also appear on other cars.

Volvo has taken another safety step for 1971 with the addition of an improved three-point inertia reel shoulder belt for the 164 and 140 Series models. This new belt, similar to those installed in the 1970 164, requires no adjustments, is non-tangling, and is completely retractable. The inertia reel mechanism inside the center post automatically adjusts the belt to each occupant and will instantly lock up during acceleration or braking, when climbing or descending hills or when taking curves.

Rear seat passengers, provided with three

lap belts, now have convenient hangers for the buckle ends. These new belts are designed to be fastened and removed easier, and the attaching end protrudes only a few inches out from the backrest.

Other Volvo interior features include redesigned padded armrests, an improved handbrake conveniently located next to the driver's seat and a locking, illuminated glove compartment. 140 Series models now have fully carpeted floors. The form-pressed synthetic material, color coordinated with the seat upholstery, is designed for hard wear and serves as noticeably effective sound proofing and cold weather insulation. New durable plastic sill plates are installed this year, replacing aluminum types which had a tendency to scuff.

The 164 and 1800E models continue to use the same nylon carpeting as in the past. The 145 cargo area also retains its previous carpeting.

Volvo's station wagon has a 70-cubic foot storage area with the rear seat folded. Special features include recessed seat back release handles, a 3.5 cubic foot under-floor compartment with two lids and a vertical spare tire mount in the left rear fender well. The well on the right side holds the 1½-quart rear window washer fluid container.

Since the 145 uses the same doors and seat positioning of the 144, passenger space is identical to the sedan. The full-width rear seat

Glare-free 164 and 140 Series dashboard has controls conveniently grouped for the driver.



can be raised or lowered in seconds without interfering with front seat travel. First raise the cushion vertically by pressing down in the front center while lifting the rear, then slide the cushion forward on its rails. Release the backrest by turning a handle on either end, and lower the backrest flat to the floor.

Volvo's 1800E sports coupe, which received a new dashboard and other interior modifications in 1970, is unchanged. There are six white-on-black, non-glare gauges plus a clock along the slim, wood grained dashboard. Flanking the water and oil temperature gauges are a large tachometer and a speedometer with odometer and trip odometer. The oil temperature gauge takes its reading in the oil pan.

To the right of the steering wheel are a fuel gauge, oil pressure gauge, which also features a red warning light, and clock with a micrometer adjustment for perfect setting.

Warning lights indicate handbrake application or brake circuit failure and show whether the electrically operated overdrive is engaged. On the lower dash are control knobs for the three-position electric wiper and washer switch, two-speed heater fan, parking and headlights, four-way hazard warning flashers, rheostat adjustable panel lighting and the electric rear window defroster. Also along the lower dash is an ashtray and cigarette lighter.

Facing the driver is a padded, three-spoke steering wheel with horn buttons on each spoke. On the steering column are two levers.

The left one is for operating directional signals and, following Volvo practice, this lever also controls the highbeams.

The right side lever, operating vertically, engages or disengages the overdrive. This lever is in the same location on the 142E.

The 164 and 140 Series dashboard has the important operating controls to the left of the ribbon-type speedometer. These controls, many identified with picture symbols, are electric windshield wiper and washer, manual choke, lights, rear window defrosting and, on the 145, the rear window wiper and washer.

To the speedometer's right are controls for the heating system, cigarette lighter, four-way hazard warning flashers and center ashtray.

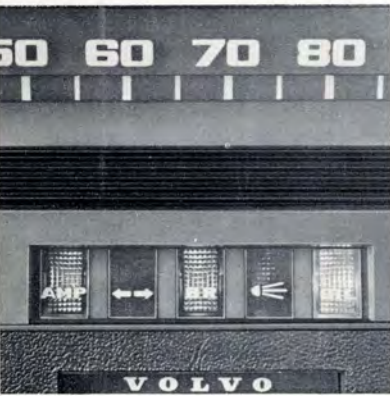
The instrument cluster, with rheostat adjustable lighting, includes gauges for fuel and coolant temperature and warning lamps for alternator charging, turn signals, handbrake, highbeams and oil pressure. A 999,999 mile odometer and a separate, push button reset trip odometer also are provided.

All Volvo models have full width, padded sun visors notched to extend over the top of the rear-view mirror to block out annoying and dangerous "hot spots." The anti-glare, tinted mirror has a breakaway feature built into the roof. Assist handles are provided for front and rear seat passengers.

Fully instrumented 1800E has recessed gauges to eliminate windshield reflections.



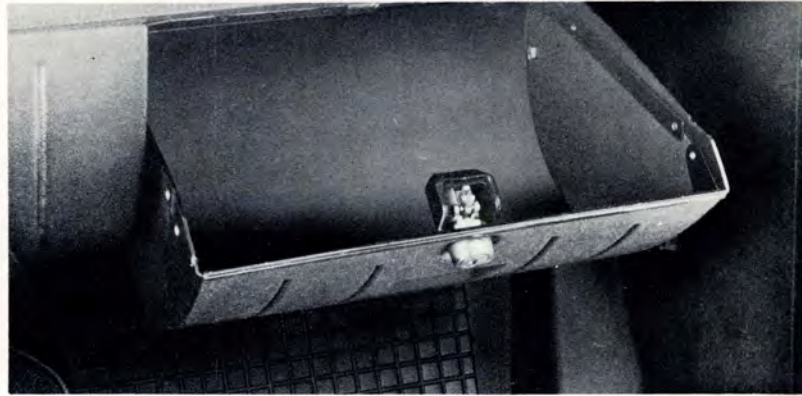
Warning lights are for alternator charging, directional signals, handbrake, highbeams and oil pressure.



Dashboard knobs have picture symbols for wiper and washer, lights, fan and cigarette lighter.



Oversized glove compartment, part of the underdash paneling, is lockable and illuminated.



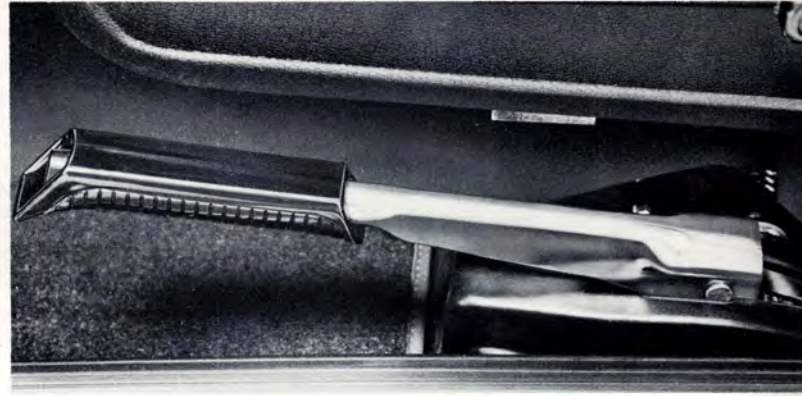
A new, easier-to-use vent window latch was introduced on late 1970 models.



Full interior form-pressed carpeting now is featured on 140 Series models.



Handbrake operating on brake shoes inside the rear drums has a dashboard warning light which also serves to alert drivers of a failure in one of the dual hydraulic brake circuits.



Retracting three-point safety belts are now standard on 140 Series models as well as the 164. The belt unwinds when pulled down from the center post and adjusts automatically to the wearer. When released, the belt retracts into the cannister.



140 Series models are equipped with a four-speed fully synchronized floor shift transmission with direct linkage (left) or an optional three-speed automatic transmission (right) with a steering column mounted gearshift.



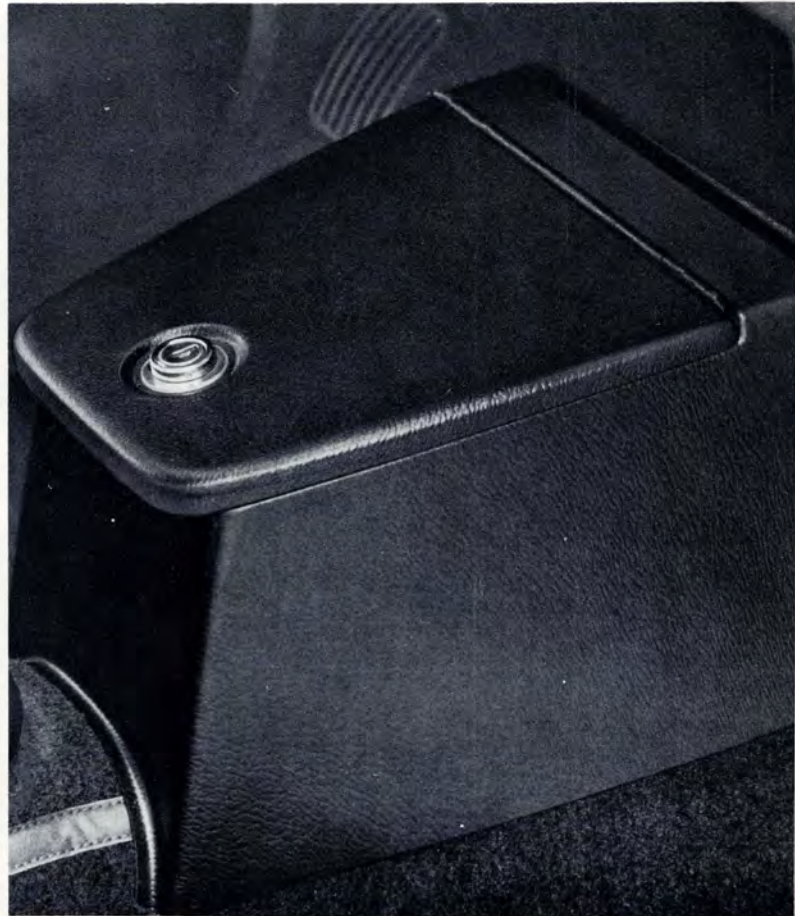
Four-speed fully synchronized transmissions for the 164 (left) and 1800E (right) have floor shifts with remote linkage.



1800E center console was redesigned to also fit on models equipped with automatic transmissions.

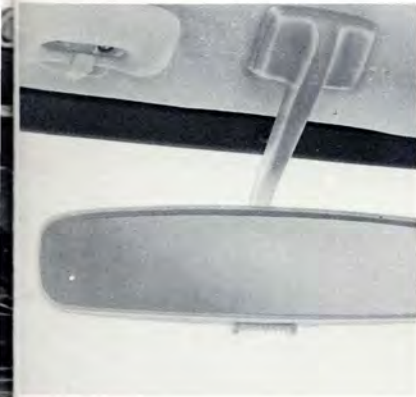
Lever to the right of the steering wheel on the 1800E (and the 142E) operates the overdrive switch.

The 164 has a locking center console that will hold as many odds and ends as most glove compartments.



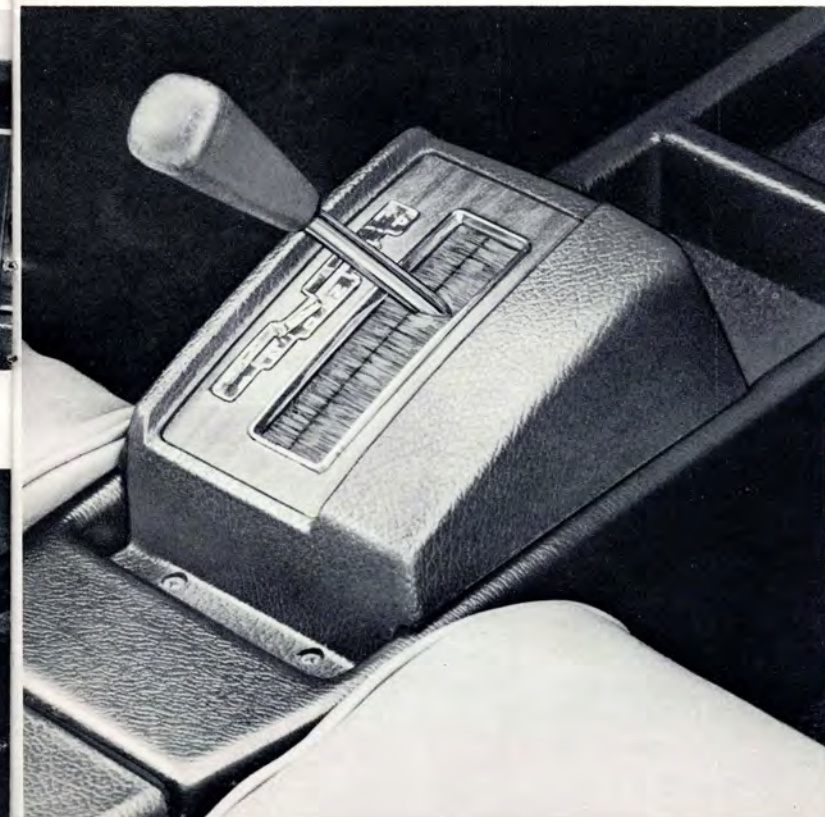
Roof-mounted breakaway, tinted interior mirror has an anti-glare feature.

New easier-to-use rear seat belts have convenient hangers, shown here on a 142.



Floor-mounted shift quadrant for the new 1800E automatic transmission has positions for all three forward speeds.

Attractive new foam-filled armrests are found on all doors of 164 and 140 Series models.



Grouped in front of the 1800E driver are white on black tachometer, speedometer and oil and water temperature gauges.





Foam-filled individual front seats, shown here in a 142, are designed to provide balanced support.

Seating

One of the features that sets Volvos apart from all other automobiles is superior seating. Volvo's bucket seats are orthopedically designed to provide maximum comfort with a wide range of adjustments.

The front seatbacks on 164 and 140 Series models are separately adjustable from bolt upright to reclining. An exclusive benefit of this adjusting mechanism is protection against whiplash injuries. The mechanism includes a device which will release the backrest if the car is subjected to a 10-mile-an-hour rear end collision, allowing the front seat backrests to recline automatically at a controlled rate, protecting passengers from injury.

An exclusive Volvo feature is adjustable lumbar support for both front passenger seats.

By turning a knob marked "firm" to "soft" on the side of the backrest, the seat's tension can be adjusted. The same principle for lumbar support can be found on some 747 airliners which use compressed air to alter the firmness of the backrest.

Fore and aft adjustments of the 164 driver's seat also are special. Two separate adjustments that allow 10.9" of travel provide more legroom in the 164 than in *any* other car on the road. Normal adjustment is made by raising the lever at the right front corner. This operation enables the seat to be moved forward or backward 7.9" on its track.

For extra short or extra tall drivers, a second lever in the front center can be raised to move the entire seat assembly forward and up, or back and down. Three stops on this device allow 1.6" of height adjustment and



Leather upholstered 164 seats can, in addition to back and forth adjustments, be raised or lowered.

three inches of fore and aft travel.

A combination of these two systems lets the driver regulate the amount of legroom and armroom he wants.

Similar adjustments are possible on the 164 passenger seat and on both front seats of the 1800E and 140 Series models. Moving the front and rear of the seats up or down or further increasing legroom are simple adjustments that take less than five minutes with a wrench when the snap-on cushions are removed.

A folding center armrest divides the full width three-passenger rear seats on the sedans and creates individual seating for two occupants. Volvos have ample rear seat legroom, more than many full sized cars which force occupants to ride with their knees pressed against the front seat backs. And Volvo

provides proper cushion support to give excellent riding comfort.

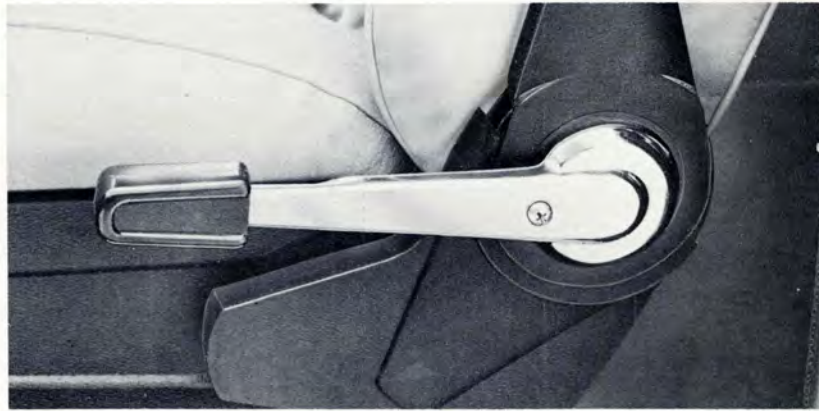
Volvo 142 and 144 seats are upholstered with a woven synthetic fabric for the cushions and backrest. This material has advantages over vinyl because it keeps the seats cooler in summer and warmer in winter. This strong material also provides better grip, is easier to clean, and does not discolor. The fabric is identical to that used in 1970 models but the weave now is a herringbone pattern, and colors are new. Sides and backs of seats and the head restraints are of matching vinyl.

The 145 station wagon seats are entirely upholstered in easy-to-clean vinyl. Luxurious leather upholstery, which is not available even as an option on nearly all other cars is standard equipment on the 164, 1800E and 142E models.

After removing headrests, front seats on 142 and 144 models can be fully reclined. Upholstery fabric is easily cleaned acrylic. New herringbone weave is in four new colors.



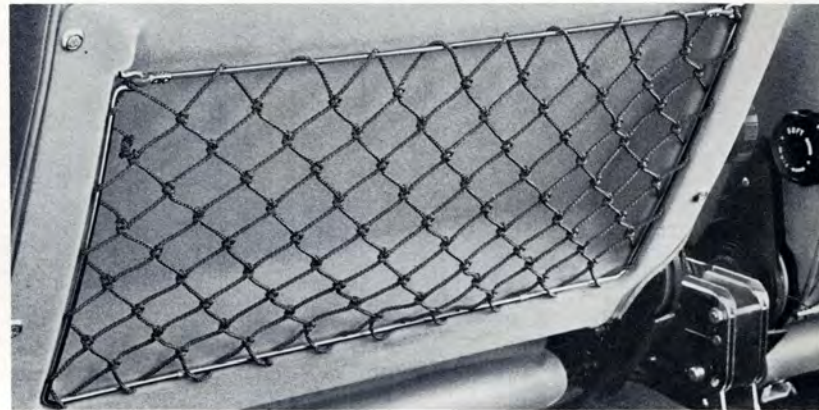
Lever on the outboard side of the seat adjusts the backrest to any position.



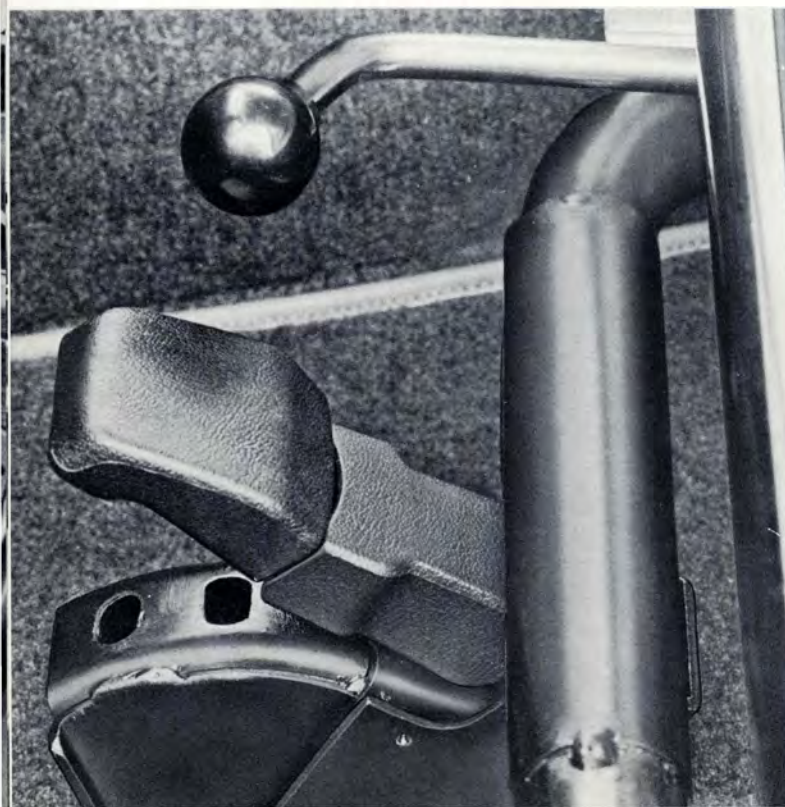
140 Series seats and the 164 passenger's seat move back and forth by pressing this lever on the outboard side of the seat.



164 and 142E bucket seats have expandable net storage pockets for the convenience of rear seat passengers.



Fore and aft adjustments of the 164 driver's seat is done by raising the top lever. The lower lever is used for moving the seat up and forward or back and down.



Spring-loaded lever on the 1800E seat will adjust the backrest to any angle. Knob on the side of the backrest controls the tension of a wide horizontal strip inside the seat back. This exclusive lumbar support device provides comfort for a critical area, the lower part of an occupant's back.



Rear seat on Volvo sedans is equipped with a center armrest which can be raised to accommodate a third passenger.



Individual 1800E bucket seats are leather upholstered. They are equipped with all the adjustment features found in other Volvo seats including adjustable backrests.



Because station wagon seats are normally subject to greater wear, 145 seats are fully upholstered in easily cleaned vinyl.



142E interior is fitted with reclining seats upholstered in black leather, and deep brown carpeting.



Heating and Ventilation

Since the southernmost part of Sweden is farther north than the northernmost part of Maine, a Volvo's heating system has to be extremely powerful. And to cope with American summers, proper ventilation and removal of stale inside air must be provided for. That's why Volvos have far better than average fresh air heating and ventilation systems.

The thermostatically controlled heating system is so effective that its full capacity is needed only in extremely cold weather. On 164 and 140 Series models this system is controlled by three vertically-mounted illuminated discs. These are recessed into the center of the dashboard.

Three vents across the top of the dashboard supply the windshield with air for defrosting. Any adjustment from full force to a partial air flow can be made. Air can be directed to either the floor or windshield or both by dialing the floor and defroster discs.

A third disc, for temperature adjustment, is connected to a thermostat in the air stream. The temperature selected is automatically maintained regardless of changes in speed, outside temperature, or engine temperature.

To get maximum benefit from this heating system the fan must be used. Moving 182-cubic feet of air per minute, the 100-watt, two-speed blower evenly distributes heated air to warm the entire car quickly. And because the rear floor is the last part of the car to get warm, two additional outlets have been placed atop the transmission tunnel to warm the feet of rear seat passengers.

Additionally, fresh air is drawn in at the base of the windshield, above the exhaust pipes of other cars, and enters the car through side outlets under the dashboard. The two vents, located on the left and right side walls of the cowl, have foot operated levers and two positions for partial or full force intake. An additional feature of this ventilation system is rust prevention. A constant flow passes through the sill plates in the rocker panels to avoid moisture accumulation.

The 1800E sports coupe also has a thermostatically controlled fresh air heating system so effective that the two-speed fan normally isn't needed. The operating controls, with the same functions as those of other Volvos, are located below the dashboard.

Standard equipment on all Volvo models is electric rear window defrosting. Special heat-conductive wires applied onto the tinted glass

defog or defrost the rear window. The wires, placed 1 1/8" apart, are so small in diameter that they are almost invisible. Ice that has formed on the outside of the glass can be easily removed after a few minutes because the system produces a maximum of 200 watts to raise the temperature of the glass above freezing. Defogging of the inside glass begins to take place within seconds. When left on for a long period the glass will get warm, but never hot to the touch.

Volvo's flow through air ventilation system pulls stale air out through exhaust vents. These vents are located below the rear window on sedans and on the rear quarter panels of the 1800E and 145. The addition of this system on Volvo station wagons is a new feature for 1971. By merely opening the floor or heating vents, enough positive pressure is created inside the car to open a one-way rubber flap in the exhaust vent. Since Volvo's optional air conditioning system creates negative pressure, this flap remains closed to prevent any loss of cooling.

The air conditioning system, designed expressly for Volvo, has separately adjustable cold air direction, force, distribution, and temperature. Maximum dispersion of cool air in the 164 and 140 Series models is provided by three adjustable outlets installed in under-dash panels. Temperature and blower controls are conveniently located below the center duct. The two end ducts have a shut-off feature.

On the 1800E the controls and dual outlets are installed under the dashboard in the center of the car. This unit also has additional outlets for cool air flow to the driver and passenger floors.

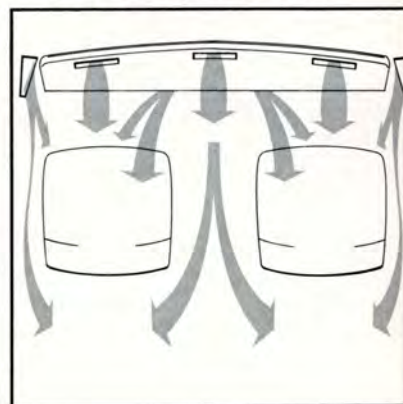
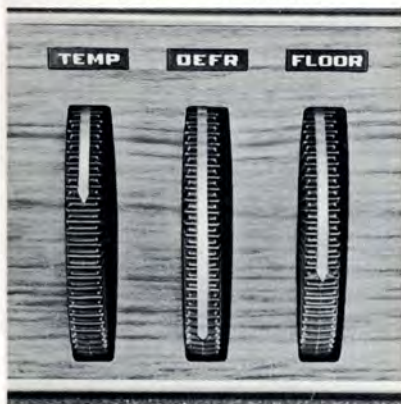
Volvo's air conditioners have a drive belt that runs free when it is turned off and, when operating, there is only a negligible horsepower loss although the system produces a maximum of 12,000 B.T.U.'s, more than twice as much as a single room home air conditioner unit.

Centered on the dashboard are controls for the fresh air heating system. Dialing the illuminated temperature, defroster and floor discs provides selected distribution of heated air.

Rear passengers are warmed with air distributed through ducts atop the transmission tunnel.

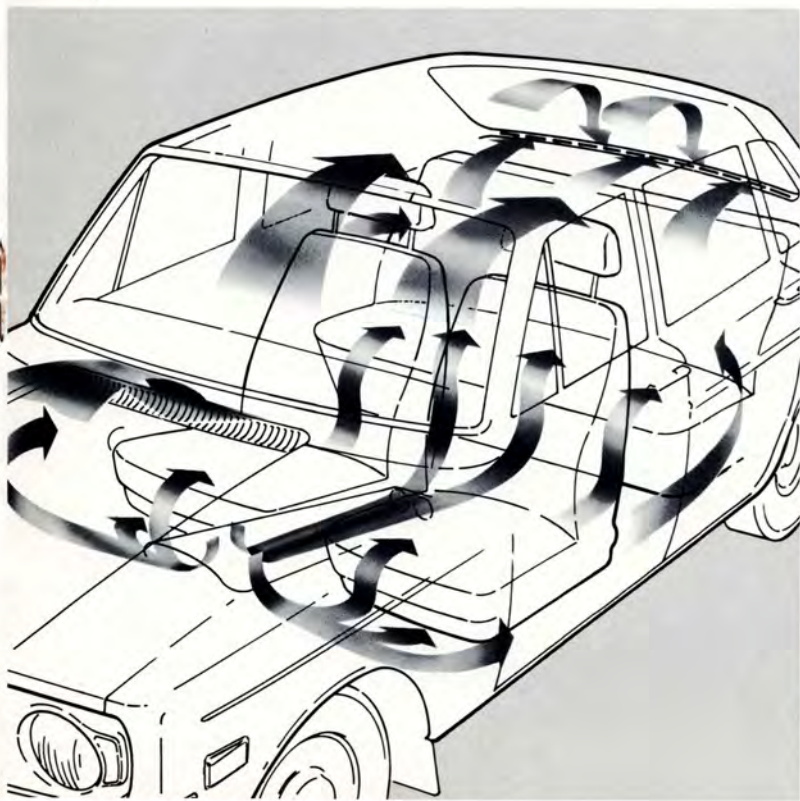
164 and 140 Series models have two-position fresh air outlets on either side of the car.

Fresh air is drawn through the heating system from defroster vents, underdash outlets and transmission tunnel ducts as well as through side outlets.



Fresh air for the ventilation and heating system is drawn from an intake at the base of the windshield. Air flow passes over, under and around the front seats and exits through a grille located below the rear window on sedans, behind the rear quarter window on the 1800E and in the right rear quarter panel of the 145.

Controls in this air conditioning panel on 164 and 140 Series models adjust temperature and blower speed. Additional adjustable outlets also are located at each end of the dash panel.



1800E air conditioning panel, with two of the four outlets, was designed to fit around controls for the heating system.



Luggage Compartment and Station Wagon

Despite modest exterior dimensions, Volvo engineers have designed exceptional storage space into their cars. The sedan's luggage compartment has more usable space than can be found in any compact, intermediate or standard-sized car. What accounts for this 23.6-cubic feet capacity is the box-like structure of the trunk, which even permits storing luggage vertically. Storing luggage upright also means that you can easily get at each suitcase without disturbing any other pieces.

The trunk lid, with a latch that can be left securely closed, but unlocked if desired, opens easily with gas operated springs that do the lifting. Inside, a spare tire is stored in a well where it is readily accessible but out of the way. Another well, hidden by the floor mat on the left side, is a "secret" storage area or a place to carry a specially fitted accessory gas can.

If even greater carrying capacity is needed, Volvo's station wagon fits the bill. Efficient planning of its interior space results in 70-cubic feet of cargo area with the rear seat folded. The Volvo wagon has a low loading height and a fully upholstered flat floor. The rear seat backrest and the bottom of the cushion, which folds vertically, also are upholstered as are the wheel arches. The rear

compartment is as long as a double bed mattress, just two inches narrower (at the wheel arches) and 27-inches higher.

Opening the 145 rear door either from the inside or outside is easy because a powerful gas cylinder assists the lifting. A lever located near the latch deactivates the inside handle to prevent accidental opening. An extra roof lamp will light automatically when the storage compartment rear door is opened. This one-piece door is a standard European design just this year "discovered" by Detroit for some of its new smaller cars, which like Volvo are unit constructed. This integral construction, especially in a station wagon, is superior to a frame design because body panels are welded not bolted in place. In addition to greater strength, a welded body also eliminates the possibility of annoying rattles.

Volvo sedans have an unusually large box-like trunk with 23.6 cubic feet of usable storage space. A durable rubber mat covers the floor, and the sides are protected with fiber padding.



145 safety feature is an electric wiper and washer to provide all-weather visibility through the rear window.



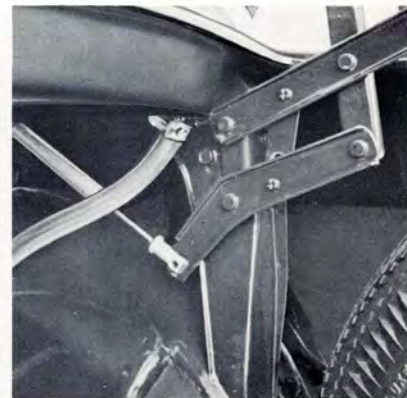
One and one-half quart reservoir for the electric rear window washer is stored in the side underfloor compartment.



Underfloor compartment, into which can be fitted an auxiliary rear facing seat, has 3½ cubic feet of storage space.



Gas operated cylinder on either side of the sedan's trunk enables the lid to be easily opened to any position.



Spare wheel is conveniently placed in the station wagon's left rear quarter panel.



Back of the full width 145 rear seat is upholstered in durable carpeting material.



Recessed handles on either side turn to fold the 145's rear seat-back flush with the floor.



Automatic lights in both the trunk and engine compartments are found on the 164.

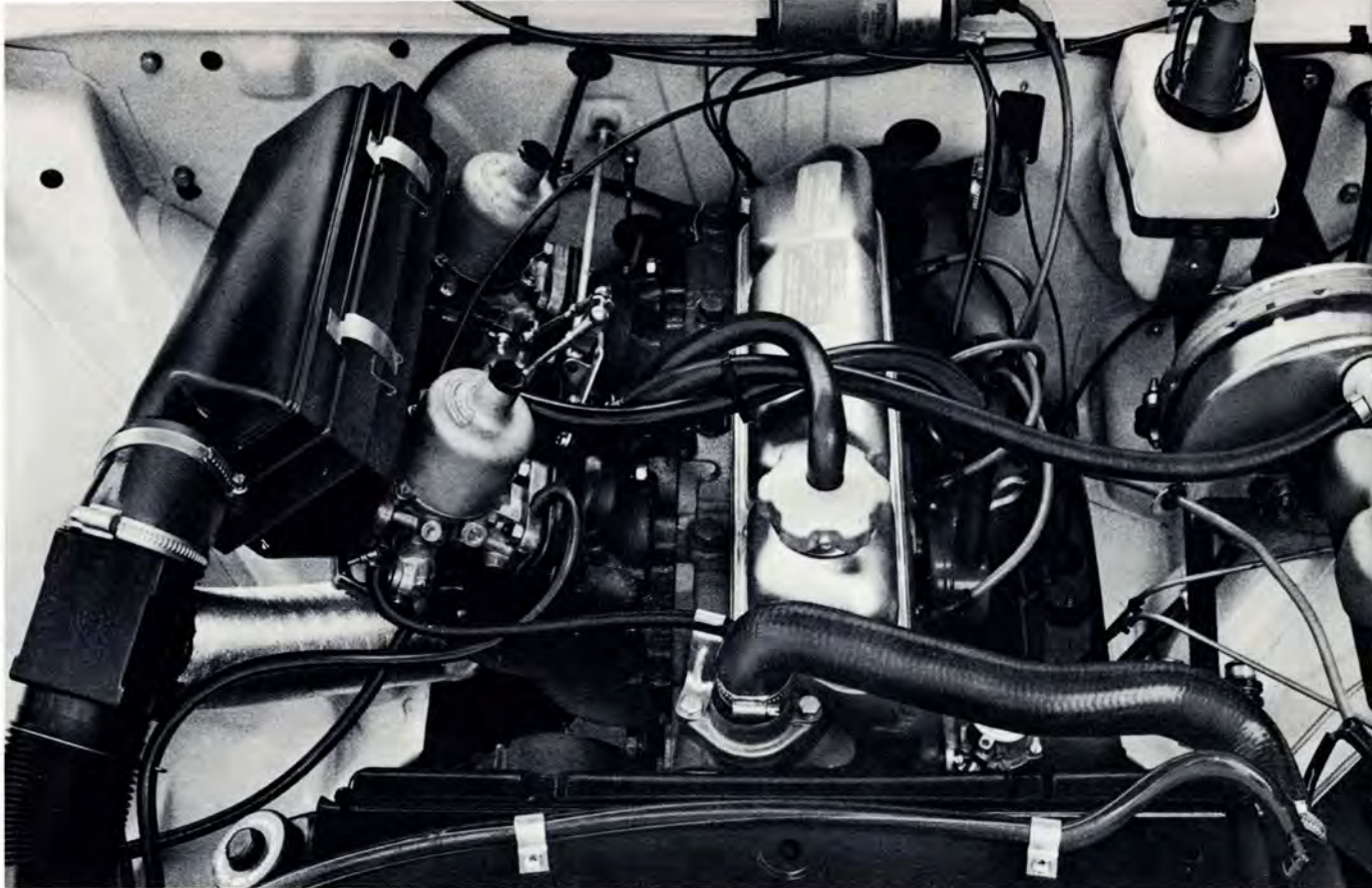


Easy-lift, one-piece tailgate on the 145 opens to 70-cubic feet of storage area with the rear seat folded.



Vinyl spare wheel cover and rubber floor mat are provided in the 1800E luggage compartment.





Principle underhood changes for the B20B engined 140 Series are new dual S.U. carburetors and an 18% larger radiator.

Engine

A casual glance at Volvo's horsepower ratings for 1971 might lead you to believe that there isn't anything new under the hood. But that is not the case. Although the changes don't produce any more power, they do produce better performance. While this seems to be a contradiction, since Americans normally equate horsepower to speed, it is perfectly logical to Volvo engineers. And by better performance we don't just mean faster acceleration but also increased longevity and smoother running.

The most changed models are the 140 Series, which have a new cooling system and new carburetors for the B20B engine. Both features were specifically designed with America's climate and drivers in mind. The new cross-flow radiator, with a 25% larger cooling area than previously used, will take even the hottest desert temperatures in stride. In addition to holding 18% more coolant, the horizontal rather than vertical design lets much more air pass through the core. Also new is an asymmetrically spaced six-blade metal fan that has a clutch device to limit its speed at highway speeds for reduced fan noise and horsepower gain.

It is important to note that this new system

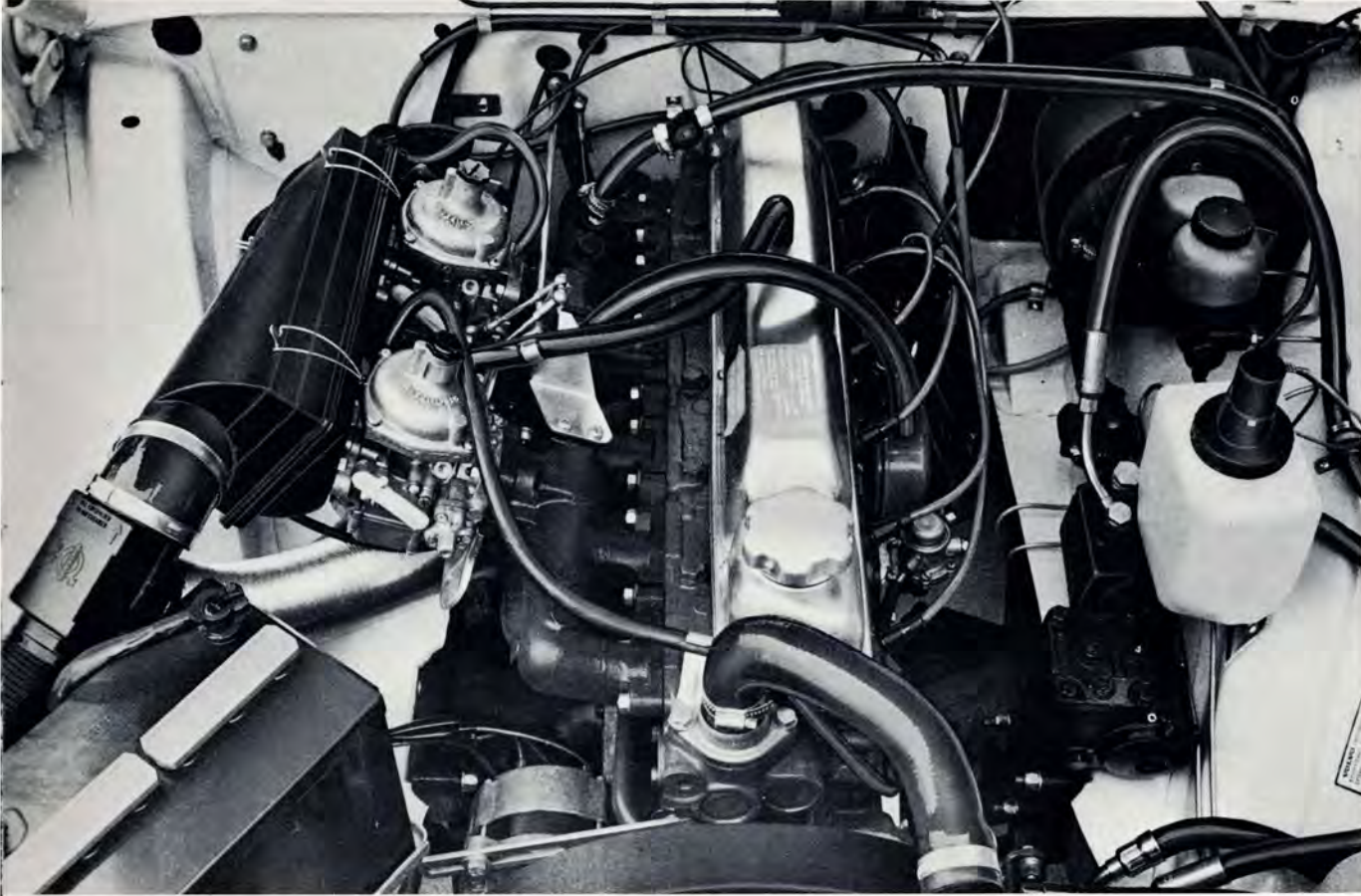
does not make the engine run cooler. On the contrary, Volvo engines are designed to run hot—about 200°F. But the new radiator does stabilize engine temperatures to eliminate damaging expansion or contraction of internal components and will ultimately increase engine life.

New S.U. carburetors, with a design similar to the Zenith carburetors still used on the 164, automatically keep the fuel/air mixture independent of temperature variations. This is made possible by the use of an alloy spring which is sensitive to fuel temperature. This spring controls the movable main jet so automatic adjustment of the main jet is achieved. The new carburetors were designed and built by S.U. at Volvo's request.

What this means to customers is that both hot and cold starting are improved and, along with Volvo's preheating air system, gives lower exhaust emissions.

This preheating system, also found on the 164, is designed to supply the carburetors with heated air of a constant temperature for maximum performance. Additional engine benefits are fast warm-up and quieter operation.

The induction system draws both cold and warm air through two flexible tubes and automatically regulates the flow with a thermostatically controlled flap valve in a housing



164's six-cylinder engine has the same bore and stroke as the B20B but has 23% more power and 33% more torque.

at the air cleaner where the branches meet. Depending on the temperature in the housing, cool air is taken from the front of the engine and/or hot air is taken from around the exhaust pipe. This system can hold temperatures within a few degrees of the optimum 85° F.

The choke is needed only for the first minute of operation as the temperature of the intake air rises so fast. The system adjusts to take air from both branches as the temperature rises. The dual S.U.'s and Zenith-Stromberg carburetors were specifically designed for Volvo's exhaust emission control system and are sealed at the assembly plant.

The air/fuel mixture travels from the carburetors to a pre-heating chamber inside the dual induction manifold. There the mixture is heated and blended to produce better combustion, which results in cleaner exhaust. At higher engine speeds, flap valves inside the manifold open to permit a direct flow into the combustion chambers. This system was introduced on cars built for the USA in 1967 and is now supplied on all dual carburetor Volvos throughout the world.

Volvo's two-and three-litre engines feature rigid construction and exceptional strength, especially at the bottom end. The four-cylinder B20B used in the 142, 144 and 145

produces 118-horsepower at 5800 rpm and 123-foot pounds of torque at 3500 rpm. The fuel injected B20E version used on the 1800E and 142E develops 130-horsepower at 6000 rpm and peak torque of 130-foot pounds at 3500 rpm. The six-cylinder B30A engine in the 164 produces 145-horsepower at 5500 rpm and 163-foot pounds of torque at 3000 rpm.

All three powerplants are virtually identical internally having the same bore and stroke measurements, but the additional torque and horsepower of the B20E and B30A calls for additional strength in some components. For example, the clutches and flywheels were redesigned for the increased power.

The crankshafts are designed for maximum strength; seven main bearings in the six-cylinder engine and five main bearings in the four-cylinder version. Journals are induction hardened for protection against wear. Lead/bronze alloy bearings are used for both main and connecting rods and also for the camshaft bearings.

Each individual bearing is inspected for conformity to tolerance standards as are all crankshaft journals. In addition, each crankshaft is dynamically balanced to contribute to vibration-free performance at even the highest speeds. Another Volvo engine feature is fully machined combustion chambers to thwart

carbon build-up and produce even burning of the fuel/air mixture. These chambers on the B20E engine are modified to take larger intake valves. The B20E engine also has a high performance camshaft and a specially designed exhaust system for improved breathing.

The fuel injection system for the B20E engine was developed for Volvo by the Robert Bosch Company of Germany. Principle features are electronic computer control and direct fuel injection to the valves. Basically, what fuel injection means is the absence of carburetors. Other advantages include increased fuel economy, cleaner exhaust, additional horsepower, improved warmup, and automatic compensation for changes in altitude, air temperature and coolant temperature.

An easy way to describe how fuel injection can improve gas mileage is to explain what happens at low speed when a driver floors the gas pedal. With the throttle suddenly opened on a carbureted car, large amounts of fuel are sucked into the engine at a rate that can't be used effectively. This causes unburned gases to pass into the exhaust system and hydrocarbons to be released into the atmosphere. The electric brain governing the injection system "knows" this and will not permit additional fuel to enter the engine until its speed has been sufficiently increased to efficiently burn the entire mixture.

Another important benefit is that the injections stop as soon as the throttle is closed. When coasting down a hill no gas is burned, allowing for maximum engine braking. When the engine speed falls to 1200 rpm, the fuel supply again is switched on to enable a smooth changeover to idling speed.

The controlling computer, located under the dash on the passenger side of the 1800E and under the passenger's seat of the 142E, is the heart of the two-litre engine. Inside it are 300 components including 37 transistors, 27 diodes, and two power amplifiers. Information is fed into the computer from five sources in the form of electric impulses. It includes air temperature, air pressure, water temperature, throttle position, and engine speed. Also, the computer "learns" when the engine is being started or stopped.

The easiest way to describe the fuel injection system is to trace the flow of both gas and air. The pressurized fuel system starts at a separate filter and electric fuel pump located below the gas tank. One feature of the pump is a by-pass valve that discharges any air that

may drift into the fuel line. When the engine is turned off, the valve maintains pressure for the next start.

From the pump, fuel is fed through the distribution line to the four injectors, one for each cylinder. Fuel not used by the injectors continues to the pressure regulator, which maintains a constant pressure in the fuel system. When the pressure exceeds the regulator setting, a valve opens allowing fuel to return to the gas tank.

Another important feature of the fuel system is a cold start valve that is triggered by the ignition key. When the starter is operated, at engine temperature below 140°F, a needle valve sprays a stream of gas into the air intake duct to enrich the mixture. To prevent flooding, the valve opening time is limited to 10 seconds.

The air intake system is equally complex. Air flow is regulated by a butterfly valve in the cast-aluminum duct. As engine speed increases, this flap valve opens to allow an additional air supply to mix with the increased injections.

This valve is completely closed at idle. When idling, air enters a by-pass which signals the computer to adjust the injections for idling speed.

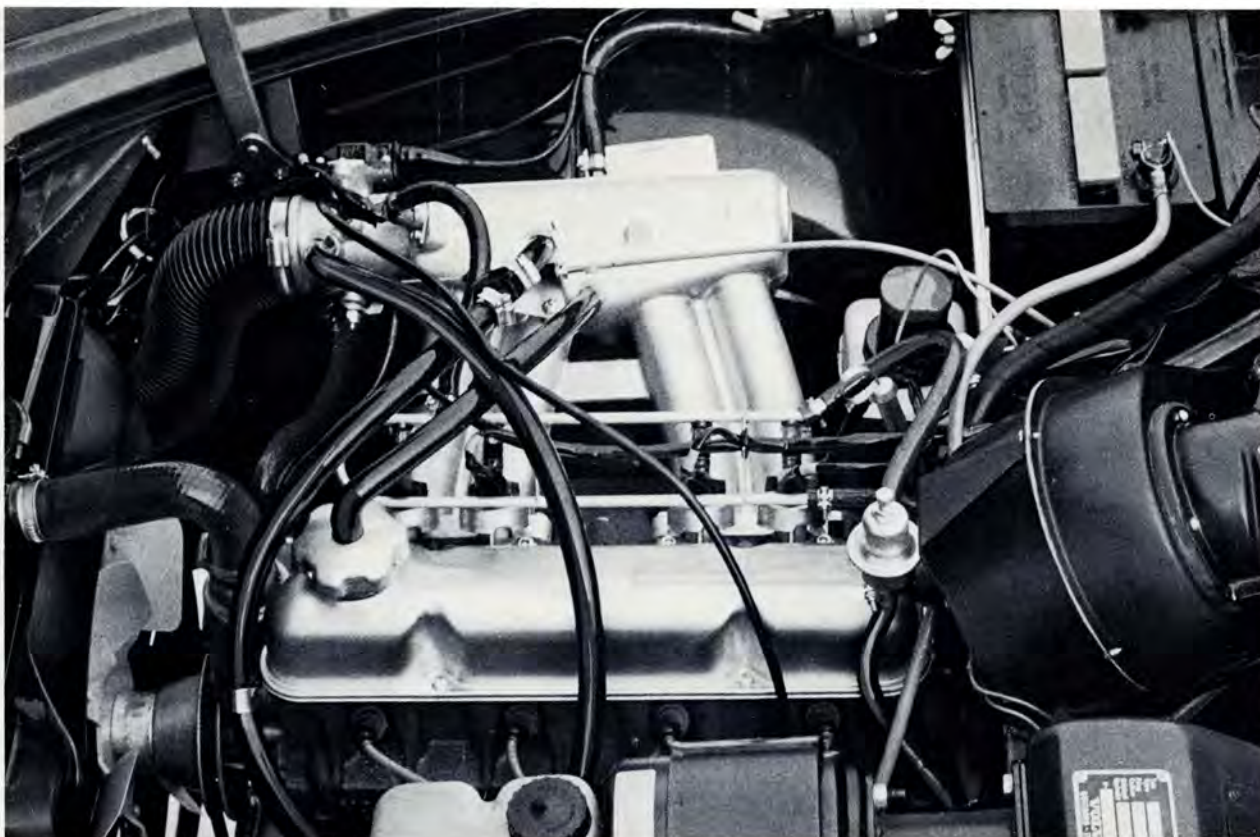
Under cold running conditions a varying amount of air enters the intake duct, also by-passing the throttle valve, through the auxiliary air regulator.

The four injectors are opened electrically in two sets; cylinders one and three, and cylinders two and four. This means that the intake valves of cylinders two and three will be closed when the injection occurs, storing the fuel for a small fraction of a second.

When the electro-magnetic injector is opened, the pressurized fuel is sprayed over the valve and mixed with air as the flow enters the combustion chamber. On a carbureted car this mixing is done in the intake manifold.

The length of time an injector stays open is minutely varied by the computer between two and twelve miliseconds, according to engine speed and load.

The constant impulses sent to and from the computer, and the resulting actions of valves and sensors, expansion of diaphragms and opening and closing of devices in the system can be boiled down to one feature . . . insuring the correct air/fuel mixture under any given condition.



Fuel injected B20E engine, shown here in the 1800E, is used without modification in the new 142E sports sedan.

Another Volvo strong point is its 12-volt electrical system with enough power to operate all accessories simultaneously. An alternator supplies a maximum output of 55-amps on the 164 and 35-amps on all other models. This is enough power to charge the 60-amp battery even at idling speeds. A one-horsepower starter assures quick winter starts without excessive cranking. The moisture proof ignition system has rubber seals originally developed for Volvo-Penta marine engines.

Volvo's engine compartments easily accommodate the powerplants and provide ample work room. The addition of an air conditioning unit does not interfere with routine servicing accessibility. The entire electrical system is easily reached as is the fuel system and oil filter.

A very important and beneficial change for 1971 was made in Volvo's transmissions. The 4-speed standard transmission 140 Series models use the further modified fully-synchronized M40 with strengthened countershaft bearings. The M41 model (with overdrive) is now used in the 1800E (instead of the M410 which was designed especially for the 164 and is unchanged in that model) and the 142E.

The familiar Volvo automatic transmission, the Borg Warner Model 35, has been redesigned through internal adjustments in the hydraulic control system to better match the engines' power. In the past the automatic was

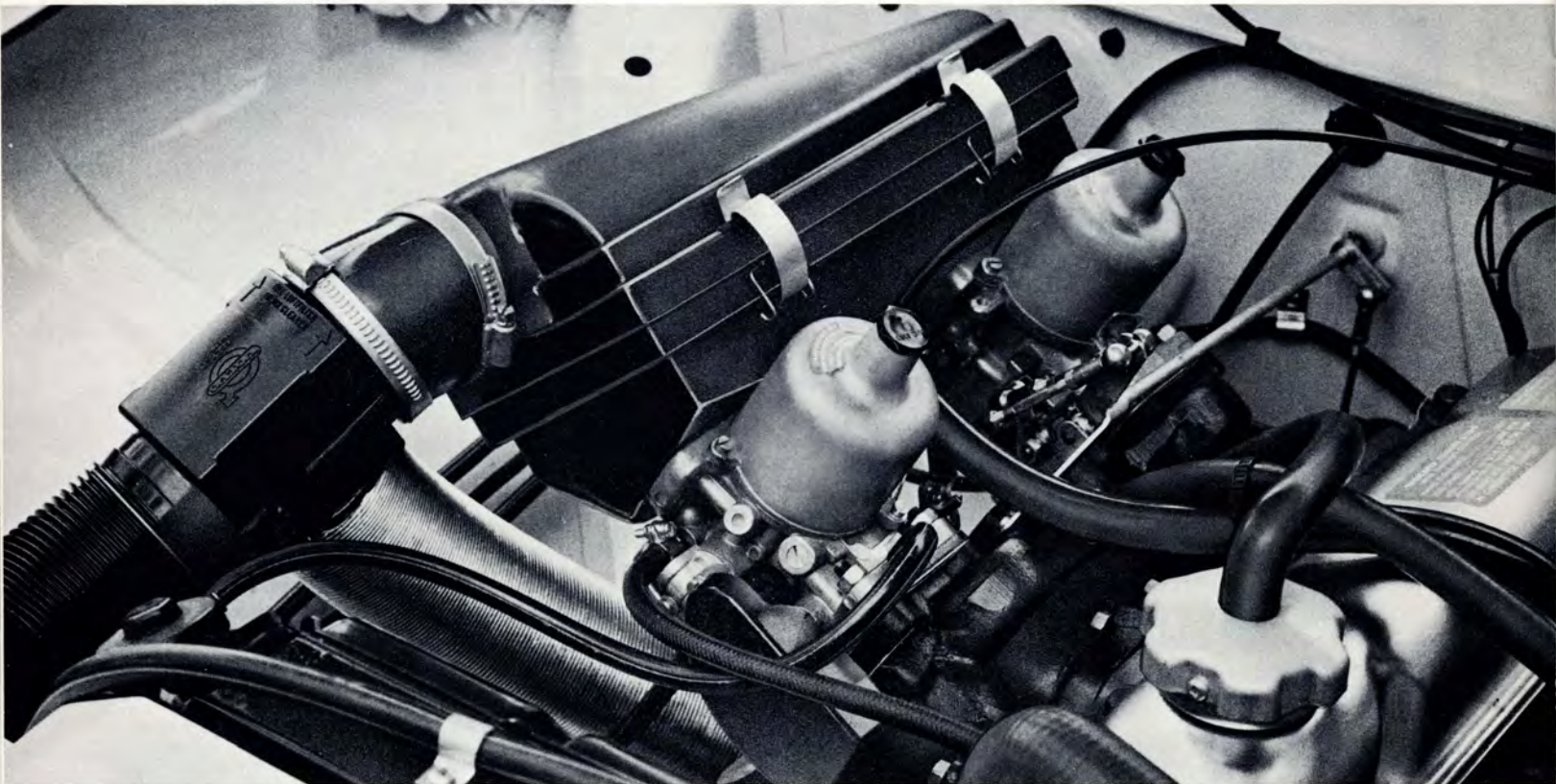
better suited to engines with high torque at lower engine speeds. The chart below shows the shift points of the three 1971 automatic transmission versions along with last year's figures. Acceleration now is quicker and shifts smoother due to altered fluid pressure.

The improved automatic with an entirely new torque converter is now offered on the 1800E sports coupe. The remote linkage is floor-mounted and the shift quadrant now has positions for all three forward speeds. This means that when second gear is selected, as when driving in city traffic, the transmission will only shift into first and second speeds. When third gear (drive) is used, all three forward speeds can be engaged. Holding the transmission in first will utilize only that speed. All Volvo automatics are equipped with a transmission oil cooler to reduce high-speed temperatures. The oil coolers are mounted in the radiator outlet tank.

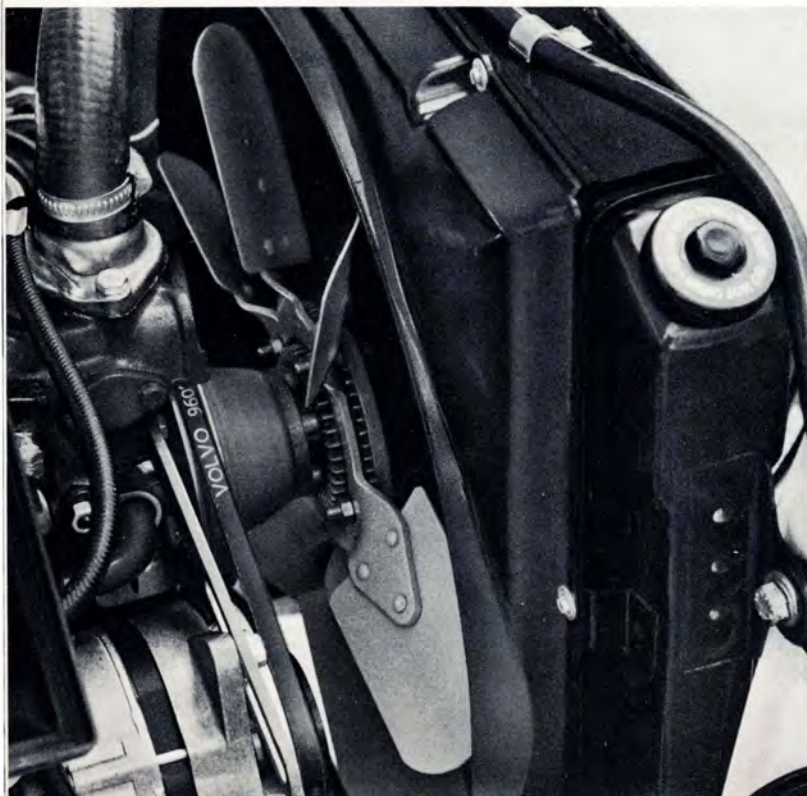
Shift Points/Automatic Transmissions

		B20B Engine		B20E Engine		B30A Engine	
		1970	1971	1971	1970	1971	
RPM	1-2	5000	5500	5500	—	4800	
	2-3	5000	5500	5800	—	5000	
MPH	1-2	37	41	40	39	40	
	2-3	59	66	72	70	73	
Kickdown.	3-2	53.5	59	62	62	65	
	2-1	32	36	34	32	33	

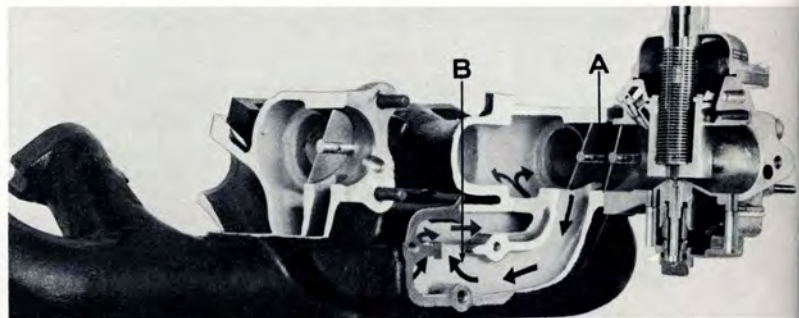
New S.U. carburetors, which no longer have separate float bowls, are supplied on the B20B engine. These carburetors have a movable main jet to automatically vary the fuel/air mixture according to fuel temperature variations.



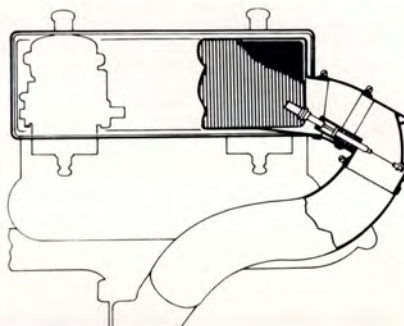
In addition to an 18% larger capacity, the new radiator for the 140 Series models has a 25% greater cooling area due to its cross-flow design.



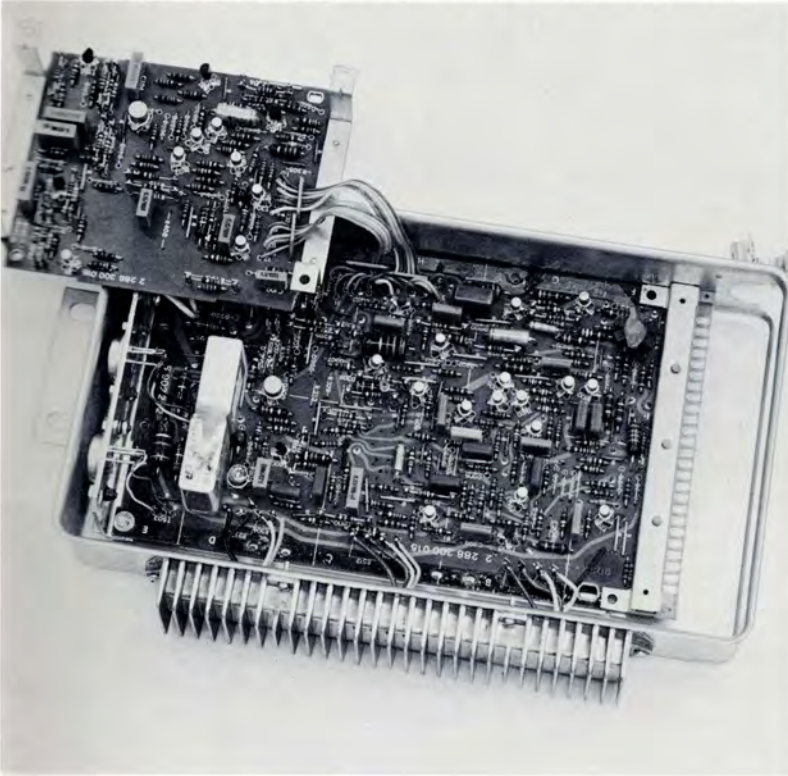
Cutaway of the B30A emission intake manifold shows the routing of the fuel/air mixture. Secondary valve (a) is closed at low engine speeds directing the mixture to the central pre-heating chamber (b), warmed by the exhaust manifold. At higher speeds, when combustion is complete, the secondary valve opens to bypass the pre-heating chamber.



Volvo's pre-heating system for carbureted models draws hot air from around the exhaust pipe and cool air from the front of the car. The two branches meet at a coupling in front of the air cleaner. Thermostatically regulated flap valve in the coupling is shown closed (left) and partly open (right).



Controlling computer for the B20E engine receives electronic impulses from five sensors to regulate the length of time the injectors remain open. Basic components for all cars with Bosch injection are found in the base of the larger aluminum case. Electronic components that apply only to Volvo engines are in the upper left plate which bolts face down in the case.



Fuel injection components:

- A. Electric fuel pump
- B. Auxiliary air regulator
- C. Fuel pressure regulator
- D. Temperature sensors
- E. Cold start valve
- F. Distributor and triggering contacts
- G. Pressure sensor
- H. Throttle valve switch

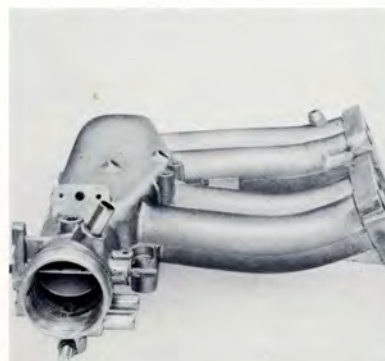
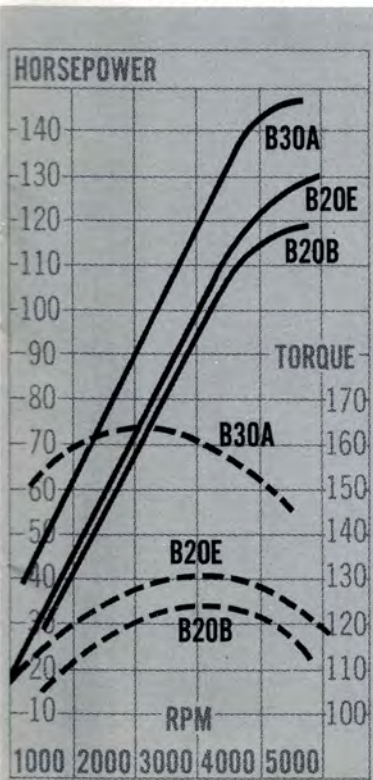


Power curves of Volvo engines show that the 164's power advantage is most obvious at low and mid-range engine speeds.

New thick soundproofing insulation is found under the 1800E hood. The foam padding effectively reduces engine noise.

Electro-magnetic injector (top) sprays fuel into the air stream. Aluminum intake duct (bottom) delivers regulated air flow.

Fuel pressure regulator, one of the four injectors, and part of the fuel delivery lines are shown here on a B20E engine.



Brakes

Disc brakes have been acknowledged as the brakes of the future. For 1971, after years of developing a low-cost system, many Detroit models will be equipped with front wheel discs as standard. But all Volvos have a four-wheel power assisted disc brake system that may be the most advanced and most expensive in the industry. This is because Volvo's brakes are designed to stand up under the toughest abuse, provide high speed directional stability, smooth application, fast response and long wear.

Disc brakes are superior to drums because the steel disc exposed in the air stream can dissipate heat better than an enclosed drum. The pads are placed evenly against both sides of the disc on every application and, because Volvos have a properly weighted power assist, foot pressure is in direct proportion of stopping ability.

Volvo's discs are designed to stop the car at a speed of 75 mph in four seconds or less under the toughest test conditions. This kind of stopping requires the brakes to produce some 700 horsepower, during which the disc's temperature can rise to over 900° F. Throughout this process the brakes must not lose any of their effectiveness.

Another reason why Volvos stop so well is that each model is separately engineered for optimum braking results. That is why the 164 and 142E have 25% thicker front discs than the other models. And because the 164 also is heavier, the power booster has

a higher ratio, one to four rather than one to three. In other words, for each pound of foot pressure, the 164 booster supplies four pounds of hydraulic stopping pressure.

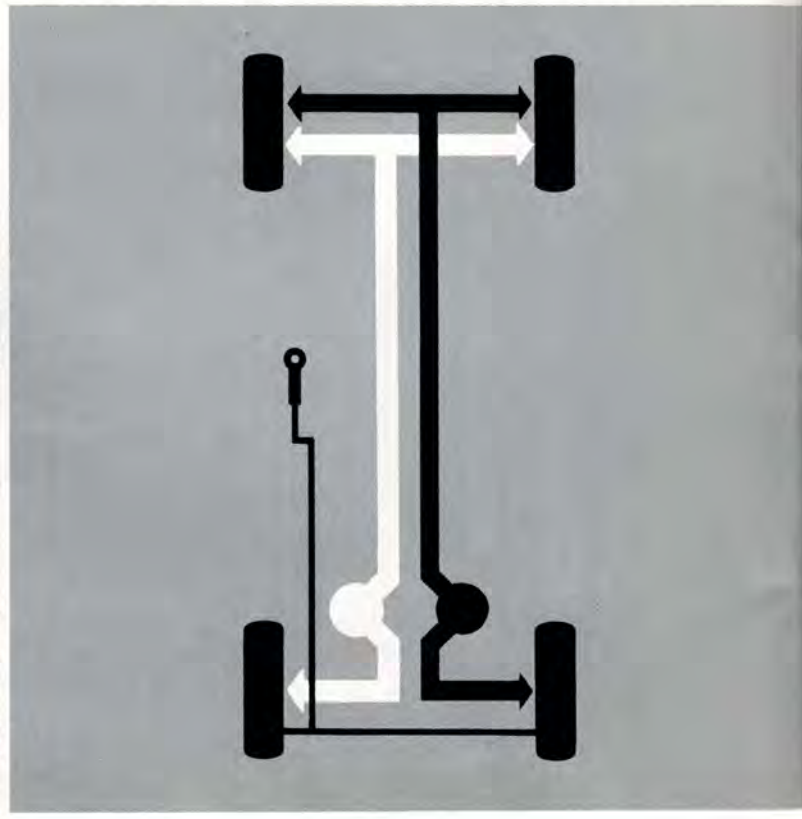
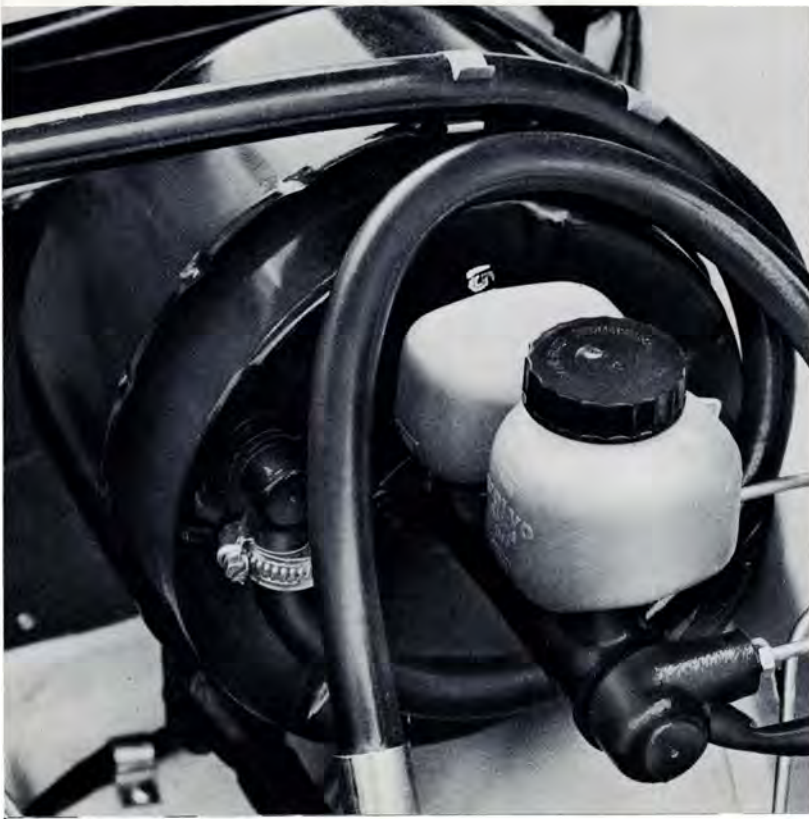
An exclusive Volvo feature is a three-wheel dual brake system that has each circuit operating on both front wheels and one rear wheel. Not only is it more efficient than the four other possible dual brake systems, but it also eliminates the hazard of control loss during heavy braking. With one circuit inoperable a Volvo maintains 80% of its total braking efficiency. And because of the single free-rolling wheel, directional stability also is maintained. Also contributing to a Volvo's ability to stop straight is a pair of special pressure relief valves incorporated into both rear brake hydraulic lines. They regulate hydraulic pressure which prevents premature rear wheel lock up, the primary cause of loss of control during emergency braking.

Premature lock up occurs under heavy braking when as much as 70% of the car's weight is placed on the front wheels. On a Volvo, the relief valves proportion the hydraulic pressure between the front and rear brakes as the weight transfer takes place.

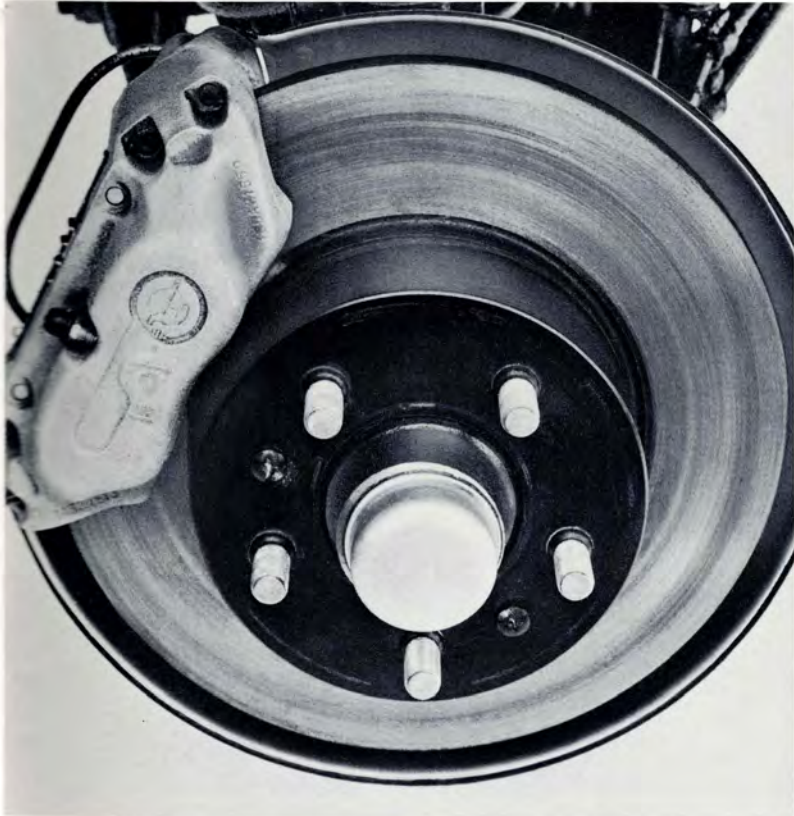
To back up this advanced foot brake system, Volvos feature an improved handbrake with a brake drum for each rear wheel. An automatic dashboard reminder light alerts the driver that the handbrake is applied. This light also serves to warn of a failure in one of the dual brake circuits.

Power brake assist, standard on all Volvos, and hydraulic brake fluid reservoir are shown here on a 164.

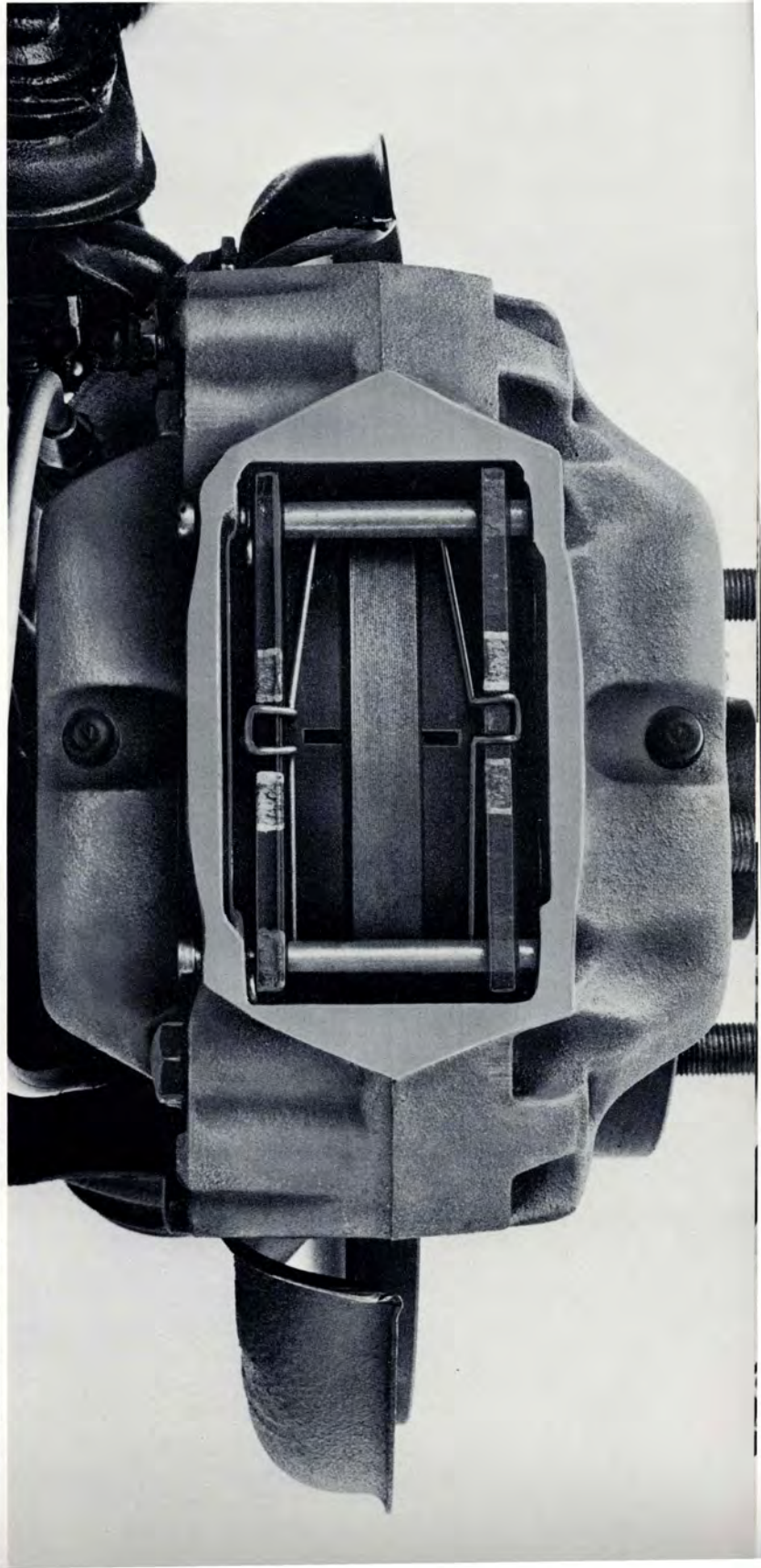
Volvo's dual brake system has each hydraulic circuit operating on three wheels (two front and one rear) for efficient, straight line emergency stops. Pressure relief valves incorporated into both rear brake hydraulic lines prevent premature lock-up.



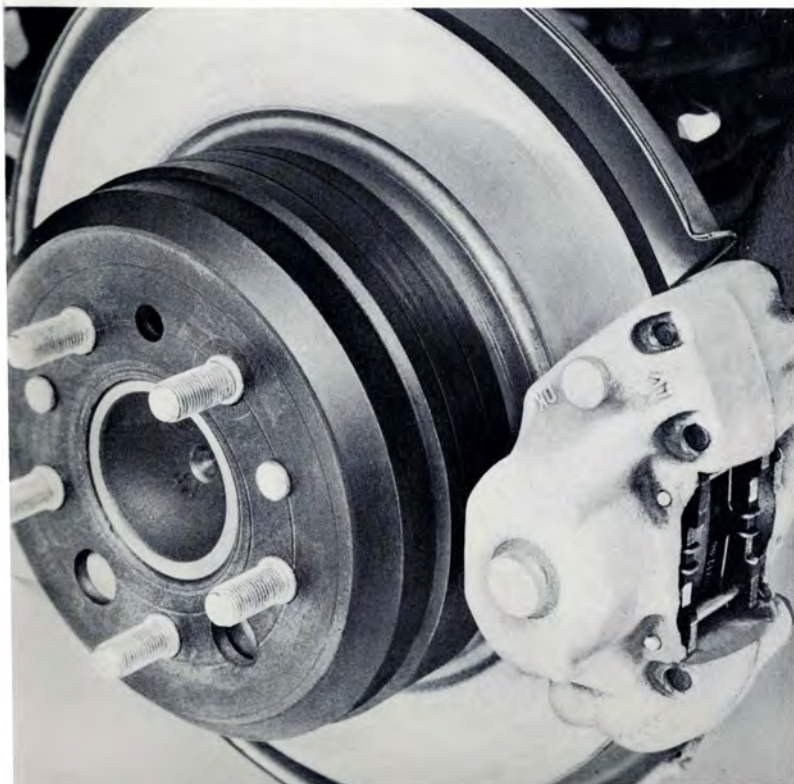
Massive front calipers have pads on the 164 that are 35% larger, compensating for greater front end weight and speed potential.



Front discs on the 164 and 142E are 25% thicker for greater heat dissipation. Brake pads, held in position by steel pins on either side of the disc, are easily serviced. Though seemingly tight against the disc, the pads actually are free floating until springs forced by hydraulic pressure push them against the disc.



Rear disc brakes have smaller pads than those in the front, although the discs actually are larger. A separate handbrake system is incorporated inside the drum.



Suspension and Steering

In most countries, and particularly in America, suspension engineers design their cars for smooth, dry roads. But Volvo suspensions, in addition to giving a good ride under optimum conditions, also have to be designed for bad weather and road conditions. Because in Sweden, winters last six months or more.

The foremost consideration for Volvo's engineers is safety. The steering must be light enough to permit easy parking and retain excellent road feel at high speeds.

The suspension has coil springs all around and double-acting shock absorbers for a somewhat firm but well controlled ride, so that a sudden swerve to prevent an accident shouldn't put the Volvo out of control, a common problem with cars with soft suspension systems. The conventionally designed front suspension features rubber-mounted control arms and a stabilizer bar. These components differ between models due to weight factors. Rear springs on the 145 are supplemented by hollow rubber springs (snubbers) that limit vertical axle travel on very rough roads or when the wagon is fully loaded.

Volvos are equipped with a solid (live) rear axle accurately stabilized by rubber-mounted support arms and torque rods. A 164 feature is a rear wheel bearing which absorbs greater lateral stress during cornering. This stress is taken on both sides of the car and both sides of the bearing adding to longer life. On 1971 164 and 140 Series models the rear axle has been relocated slightly to the rear by $\frac{3}{4}$ " for easier installation of snow tires.

Suspension improvements include wider 15" wheels, 5" wide on the 140 Series and $5\frac{1}{2}$ " wide on the 164. The thicker steel safety rims, now $5\frac{5}{64}$ " thick, provide even greater resistance to extreme stress. Because the increased wheel width on the 164 created a greater wheel balance sensitivity, the radial-shod wheels are dynamically balanced at the factory. Other models' wheels continue to be static balanced.

It should be noted that this wheel width increase was made without increasing the track. So steering effort was not raised and no extra load has been placed on the suspension. What the extra rim width does is to permit greater lateral stability and increased tire adhesion when cornering. To accommodate the one-inch wider wheels on the 164, the upper ball joint was repositioned to provide clearance.

The 164 has new rubber bushings installed

in the lower control arms to permit the installation this year of whitewall Pirelli Cinturato radial tires. The bushings give longitudinal flexibility to the front suspension, a necessity with radial tires. And because of this built-in flexibility, conventional cross-ply tires are not recommended as replacements.

The 142E also is equipped with radial tires, Michelin ZX, as is the 1800E with high-speed Michelin XAS. These latter tires have an advanced tread design which is asymmetric. The outside shoulders are built up to counteract wear and the tread patterns are varied and irregularly spaced for increased low and high speed cornering abilities. The 15" mag-type 1800E wheels have a steel outer safety rim and a cast aluminum alloy center. Stainless steel wheel trim rings are fitted on this model and on the 164 and 142E.

Whitewall cross-ply tires with a four-ply rating are supplied on the 142 and 144 while the 145 station wagon has eight-ply rated blackwall tires to accommodate greater loads.

Contributing to Volvo's good manners over all road surfaces are carefully engineered cam and roller steering systems. On the 164 this system is supplemented by a recirculating ball and nut power assist. ZF designed, this unit makes steering and parking easier and is both firm and responsive without the vagueness associated with most power systems in use today.

Only 3.7 turns of the steering wheel are required to turn it lock to lock. The 164 will make a tight turning circle of 31.5 feet, the same as a VW Super Beetle.

The manual steering used on the 140 Series gives light, precise control with a 17.5:1 steering ratio. The high front-wheel turning angle enables the cars to make a turning circle of only 30'4" with four turns lock to lock. The 1800E has an even smaller turning circle, 29'10", and its steering has only $3\frac{1}{4}$ turns lock to lock.

Different safety steering columns are used on all models, but one common feature is couplings suspended in hard rubber bushings to effectively absorb road noise and vibrations.

Independent front suspensions remain basically unchanged, but the 164 has new upper ball joints to allow for 5½" rims, which are one-inch wider than those used previously.



Rugged rear suspension has the axle carried by rubber-mounted control arms and torque rods. A track rod prevents axle shift.



Eight-ply rated 6.85X15 tires are installed on station wagons for increased load capacity.



Tubeless 165SR15 radial tires mounted on 15" safety wheels are standard on the new 142E.



Hydraulic pump for the 164's ZF power steering is belt driven off the crankshaft pulley. Reservoir, bottom center, is located next to the transparent radiator expansion tank.



Specifications

Engines

164—Type B30A. Water cooled, six-cylinder in-line, cast iron block and head, seven-main bearing crankshaft. Pushrod operated overhead valves with gear driven four-bearing camshaft. Bore: 3.50 inches. Stroke: 3.15 inches. Displacement: 182 cubic inches (2979 cc.). Maximum horsepower 145 SAE b.h.p. at 5,500 r.p.m. (130 DIN*). Maximum torque: 163 foot pounds at 3,000 r.p.m. Specific power output: .80 b.h.p. per cubic inch displacement. Compression ratio: 9.3:1. Oil filter: full flow. Oil capacity: 6.3 quarts including filter.

142, 144 and 145—Type B20B. Water cooled, four-cylinder in-line, cast iron block and head, five-main bearing crankshaft. Pushrod operated overhead valves with gear driven three-bearing camshaft. Bore: 3.50 inches. Stroke: 3.15 inches. Displacement: 121 cubic inches (1986 cc.). Maximum horsepower: 118 SAE b.h.p. at 5,800 r.p.m. (100 DIN*). Maximum torque: 123 foot pounds at 3,500 r.p.m. Specific power output: 1.03 b.h.p. per cubic inch displacement. Compression ratio: 9.3:1. Oil filter: full flow. Oil capacity: 4 1/8 quarts including filter.

1800E and 142E—Type B20E. Water cooled, four-cylinder in-line, cast iron block and head, five-main bearing crankshaft. Pushrod operated overhead valves with gear driven three-bearing camshaft. Bore: 3.50 inches. Stroke: 3.15 inches. Displacement: 121 cubic inches (1986 cc.). Maximum horsepower: 130 SAE b.h.p. at 6,000 r.p.m. (120 DIN*). Maximum torque: 130 foot pounds at 3,500 r.p.m. Specific power output: .93 b.h.p. per cubic inch displacement. Compression ratio: 10.5:1. Oil filter: full flow. Oil capacity : 4 1/8 quarts including filter.

*DIN horsepower ratings are similar to the net horsepower ratings being published this year by GM. Since they more accurately reflect available horsepower and may become the industry standard, DIN figures for Volvo engines have been included.

Clutch

Diaphragm spring type, single dry plate — nine-inch on 164, 8½-inch on 140 Series and 1800E.

Electrical System

Voltage: 12. Battery capacity: 60 amp hour. Alternator rating: 164—55 amps, 140 Series and 1800E—35 amps. Starter output: 1 h.p.

Cooling System

Sealed, anti-freeze coolant circulated by engine driven water pump. Transparent expansion tank. Capacity: 164 — 13.0 quarts; 140 Series — 11.0 quarts; 1800E — 10.0 quarts. Engine driven fan equipped with steel blades. 164 and 140 Series models have a clutch device to limit fan speed. 1800E fan has

flexible stainless steel blades which flatten out at high rpm.

Fuel system

Sealed system with evaporation control. B30A — Twin horizontal 1.75 - inch Zenith-Stromberg CDSE (emission) carburetors supplied by a mechanical pump. B20B — Twin horizontal 1.75-inch S.U. carburetors supplied by a mechanical pump. B20E — Pressurized electronic controlled Bosch fuel injection with electric fuel pump. Tank capacities: 1800E—11.75 gallons. All other models — 15.5 gallons. Fuel required: Premium.

Suspension

Front: Independent with rubber-mounted control arms. Steering knuckles supported by ball joints. Stabilizer bar. Coil springs with double acting telescopic shock absorbers. Permanently lubricated. **Rear:** Solid rear axle carried by longitudinal, rubber-mounted control arms and torque rods. Transverse location by rubber-mounted track rod. Coil springs with double acting telescopic shock absorbers.

Wheels and tires: 164 — Pressed steel wheels, rim size 5½J x 15 inches. Whitewall radial ply 165SR15 tires. 142/144 — Pressed steel wheels, rim size 5J x 15 inches. Whitewall 6.85 x 15 tires. 145 — Pressed steel wheels, rim size 5J x 15 inches. Blackwall 8-ply rated 6.85 x 15 tires. 142E — Pressed steel wheels, rim size 5J x 15 inches. Radial ply 165SR15 tires. 1800E — Combination alloy and steel wheels, rim size 5J x 15 inches. Radial ply 165HR15 tires.

Steering

140 Series — Cam and roller type with four turns lock to lock. Turning circle: 30 feet 4 inches. Steering ratio: 17.5:1. 164 — Cam and roller type with recirculating ball and nut power assist. 3.7 turns lock to lock. 31 feet 6 inch turning circle. Steering ratio: 15.7:1. 1800E — Cam and roller type with ¾ turns lock to lock. Turning circle 29 feet 10 inches. Steering ratio: 15.5:1.

Transmissions

Manual: Four-speed, fully synchronized with floor mounted shift lever. Overdrive on 1800E and 142E operates electrically on fourth gear.

	142/144/145	164	1800E/142E
	Ratios	Ratios	Ratios
1st	3.13:1	3.14:1	3.13:1
2nd	1.99:1	1.97:1	1.99:1
3rd	1.36:1	1.34:1	1.36:1
4th	1.00:1	1.00:1	1.00:1
Overdrive	—	—	0.80:1
Reverse	3.25:1	3.54:1	3.25:1

Automatic: Hydraulic three-speed with torque converter and part throttle kick down. Column-mounted

illuminated gear selector with standard PRNDL quadrant for 164 and 140 Series and PRND21 floor-mounted quadrant for 1800E.

	Ratios
1st	2.39:1
2nd	1.45:1
3rd	1.00:1
Reverse	2.09:1

Rear Axle: Hypoid type. Ratios:

	Manual	Automatic
142/144	4.10	4.10
145/142E/1800E..	4.30	4.30
164	3.73	3.30

Brakes

Power assisted, self-adjusting four-wheel disc brakes. Twin circuit hydraulic system, each circuit operating on both front wheels and one rear wheel. Each circuit alone provides 80% of total four-wheel braking effectiveness. Two pressure relief valves operate on rear wheels.

Front: 10.7 inch discs. Pad area: 164, 1800E and 142E – 27.0 square inches. 142, 144 and 145 – 22.8 square inches.

Rear: 11.6 inch discs. Pad area: 14.4 square inches.

Hydraulic power assist ratio: 164 – 1:4. 140 Series – 1:3. 1800E – 1:2.7.

Handbrake: Mechanical drum brakes acting on both rear wheels, Lining area: 27 square inches. Dashboard warning light.

Gauges and equipment

Fuel and water temperature gauges, speedometer, alternator, oil pressure, headlight beam, directional signal, hand brake and foot brake warning lights. Two-speed 100-watt electric blower. Electric rear window defroster. Two-speed electric windshield wipers plus electric windshield washers. Rear window wiper and washer on the 145. Automatic back-up lights. Variable instrument lighting. Illuminated glove compartment on 164 and 140 Series. Interior courtesy lights. Cigarette lighter. 1800E also has tachometer, oil pressure and oil temperature gauges, over-drive warning light (also 142E) and electric clock.

Exterior Dimensions

	140 Series	164	1800E
Length	182.7"	185.6"	173.3"
Wheelbase	103.1	107.1	96.5
Width	68.3	68.3	67.0
Height	56.7	56.7	50.5
Track, front-rear	53.1	53.1	51.7
Ground clearance	7.1	7.1	6.1
Curb weight, pounds ...			
142	2618	2937	2541
144	2640		
145	2816		

Interior Dimensions

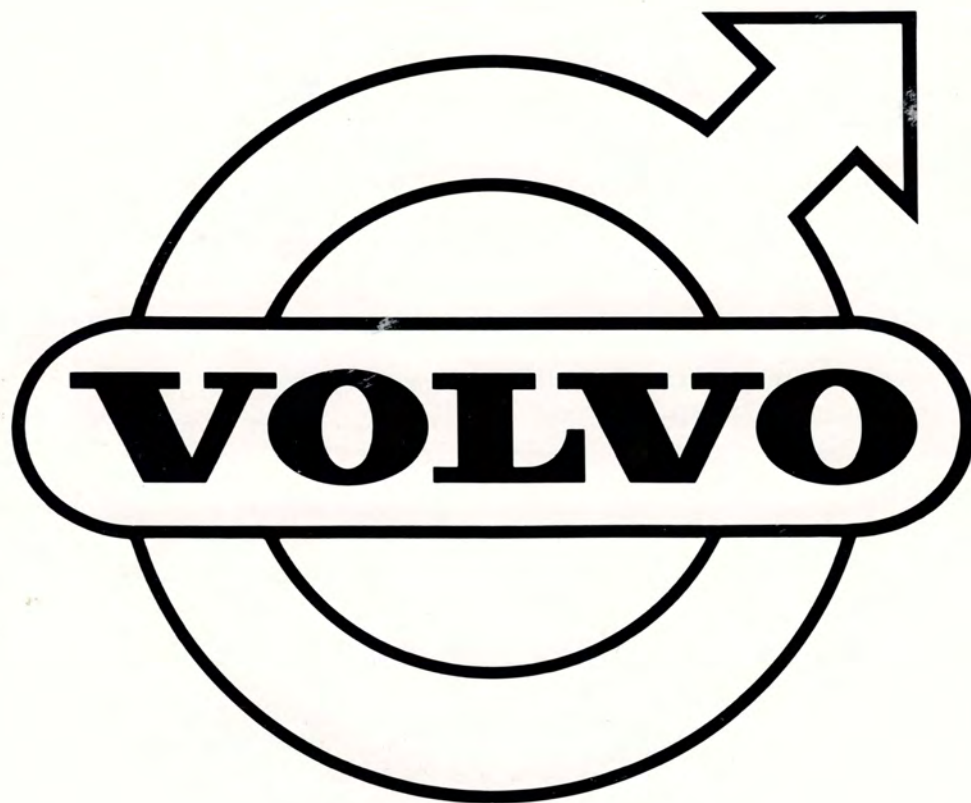
	164 and 140 Series	1800E
Front seat width, hip height	56.3"	49.3"
Width, front seat	22.5	19.7
Depth, front seat	19.3	19.3
Headroom, front	37.4	35.5
Height, front seat cushion		
to floor	164 – 14.2 – 12.6	22.8
	140 Series – 13.4	
Height, front seat backrest	20.9	
Rear seat width, hip height	56.3	–
Depth, rear seat	18.5	–
Headroom, rear	35.1	–
Height, rear seat cushion		
to floor	13.0	–
Height, rear seat backrest	23.6	–

Station Wagon Cargo Area Dimensions

Volume	70 cubic feet
Underfloor space	3.5 cubic feet
Length, minimum and maximum	44.5–74.0"
Width, minimum and maximum	42.0–52.0
Width, rear door opening	46.0
Height, rear door opening	31.5

Luggage Compartment Dimensions/Sedans

Width, minimum and maximum	52.0 – 55.0"
Width, with tire removed	61.1
Height	22.0
Length	47.7
Capacity	23.6 cubic feet



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