

turbo

APC system

1982 SAAB OWNER'S MANUAL SUPPLEMENT

INFORMATION CONTAINED HEREIN APPLIES ONLY
TO 900 TURBO MODELS EQUIPPED WITH APC SYSTEM

Starting and Driving

The starting and driving instructions given in the 1982 Saab Owner's Manual also apply to the Saab 900 Turbo with APC System. Observe the notes about starting and stopping the turbocharged engine. Do not tamper with the turbocharging, APC or emission control systems.

RECOMMENDED FUEL

The Turbo with APC System is designed to run on any unleaded gasoline fuel. A pump octane rating of 87 to 92 is recommended (see Owner's Manual for explanation of rating method). The conditional gasohol recommendations in the Owner's Manual also apply.

NOTE! It is normal for "pinging" or knocking to occur in short bursts while the engine is operated under load, particularly on lower octane grades of fuel. When such knock is heard you may observe the needle of the Turbo pressure gauge oscillating slightly, an indication that the APC System is functioning. If severe sustained knock is heard or, conversely, if the engine seems unable to develop an appreciable amount of charge pressure, take your car to an authorized Saab dealer for inspection.

CHARACTERISTICS OF THE TURBO WITH APC SYSTEM

The APC System detects the onset of engine knock and adjusts the charging pressure of the turbocharged engine accordingly. With the engine thus protected from excessive and potentially

harmful knock, the compression ratio was able to be increased to improve overall fuel efficiency. The APC System's capability to constantly adjust maximum charging pressure for variance of fuel octane and engine operating conditions allows optimum performance to be obtained relative to the fuel quality chosen. Using 92 octane (pump rating) fuel, little or no knocking will be heard and maximum performance will be available. On 87 octane, audible knock will be present (but controlled) under load and performance will be somewhat reduced due to the APC System's effect upon the maximum charging pressure.

A control system, such as the APC System, which is based upon a knock detector cannot eliminate individual occurrences of knocking as these are necessary for the function of the system. When the knock detector "hears" engine knock the control unit lowers the charge pressure in stages to the point where knock does not occur. If the same power demand (throttle position) is maintained the APC System increases pressure until knock once again occurs. The knock detector will again "hear" the knock and the cycle will be repeated. The System thereby constantly searches for the optimum charge pressure for the combination of engine speed, load and knock level.

The APC System control unit has been optimized with a fixed sensitivity and pre-set high charge pressure limit to protect the engine. Maximum operating charge pressure under full load is adjusted electronically. The wastegate is mechanically adjusted to provide a safe, low charge pressure limit should the APC System cease to function. The latter two adjustments, which have anti-tampering seals, are to be checked by a qualified Saab technician at the Break-In Service and every 15,000 miles (see Maintenance Program, charging pressure).

Power Unit

EMISSION CONTROL SYSTEMS

Engine Family

The 1982 Saab 900 Turbo with APC System, engine family CSA2.0V6FTA8, is certified to both U.S.A. Federal Standards and California State Standards. The engine family and appropriate tune-up specifications are identified on a label affixed to the left front inner fender. This family is equipped as follows:

- A. Continuous Injection System
- B. Lambda Control System
- C. Three-Way Catalyst
- D. Decel Dashpot (automatic transmission)
- E. Decel Fuel Shut Off (manual transmission)

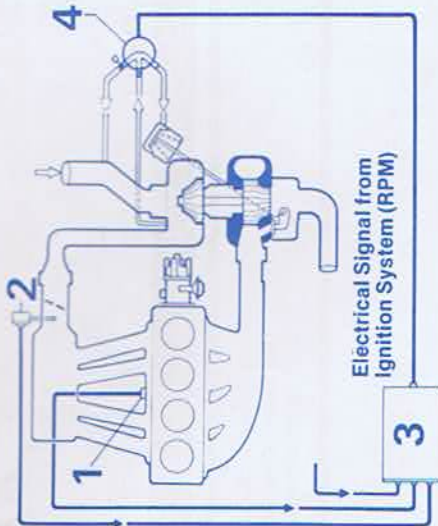
Note: A limited number of pre-introduction Turbos with APC System are also equipped with an exhaust gas recirculation system and are certified under the standard Turbo engine family. These vehicles have VIN Serial Numbers below — C1012900.

TURBOCHARGING SYSTEM

In the Saab 900 Turbo with APC System the turbocharging system is comprised of an exhaust driven turbocharger to compress the air entering the engine cylinders and a charge pressure regulator (wastegate) to control the flow of exhaust gases to the turbine. Unlike previous turbocharger applications, the wastegate is regulated by an electronically modulated pressure signal from the APC System rather than a manifold pressure signal. See the Owner's Manual for a schematic of the basic turbocharging system.

APC SYSTEM

The APC (Automatic Performance Control) System consists of simple electronic components that make it durable and easy to service. A knock detector (1) on the engine block senses the onset and degree of engine knock and transmits an electronic signal to the control unit (3) which also receives a signal from the inlet manifold pressure transducer (2) and from the ignition system (engine rpm). The data is processed by the control unit (3) which transmits a signal to a solenoid valve (4) that modulates the control pressure to the charge pressure regulator (wastegate).



- 1. Knock Detector
- 2. Pressure Transducer
- 3. Control Unit
- 4. Solenoid Valve

Specifications

ENGINE, TURBO WITH APC

Type	4 cyl., 4 stroke inline OHC with continuous fuel injection
Cylinder Bore	3.543"
Stroke	3.071"
Displacement	121 cu. in.
Order of Firing (Cylinder 1 nearest firewall)	1-3-4-2
Valve Clearance, Cold Engine:	
Intake	(0.15-0.30mm) ... 0.006"-0.012"
Exhaust	(0.40-0.50mm) ... 0.016"-0.020"
Engine Family Number	CSA2.0V6FTA8
Power Rating, SAE Net HP @ RPM	135 @ 4800
Max. Torque @ 3500 RPM (87-92 octane)*	160-170 ft. lbs.
Compression Ratio	8.5:1
Dashboard Adjustment (Automatic)**	2200 ± 100 RPM
Decel Fuel Shut Off (Manual)	Activates above 1575 ± 75 RPM, throttle closed; deactivates below 1375 ± 75 RPM.
Oil Capacity Including Filter	4.5 U.S. qts.
Charge Pressure Settings***:	
Wastegate (safety limit only)	0.30 ± 0.03 bar
Control Unit (operating limit)	0.60 ± 0.05 bar
RPM Limiter Setting	5900-6200 RPM
Overpressure Safety Switch	0.95 ± 0.05 bar
Ignition Advance Setting	20° BTDC @ 2000 RPM (vac, hose plugged)
Spark Plug Type	NGK-BP 7ES
Spark Plug Gap	0.024-0.028"
Engine Idling Speed in Neutral (A.C. off)	875 ± 50 RPM

* Maximum Torque increases with fuel octane number up to 92 (pump rating).

** Adjust plunger to contact throttle lever with engine operating at indicated RPM.

*** Checked at 3,000 RPM full load with special test equipment.

MANUAL TRANSMISSION

No changes. See Owner's Manual.

AUTOMATIC TRANSMISSION

Torque Converter Stall Speed	2200-2700 RPM
Primary Gear Ratio	
Gear ratios (transmission):	0.93:1
1st Gear	2.39:1
2nd Gear	1.49:1
3rd Gear	1.00:1
Reverse Gear	2.09:1
Final Drive Ratio	3.67:1

WHEELS AND TIRES

Wheel Size	5 1/2 J x 15" H2 (Aluminum Alloy)
Spare Wheel	4 J H1 x 15"

Tire Dimensions:

4-door (Std.)	185/65 SR 15
4-door (Spl. Ed.), 3-door	195/60 HR 15
Compact Spare	T115/70 D15

Consumer Information

Other Consumer Information required by Part 575, Code of Federal Regulations is given in the 1982 Saab 900 Owner's Manual. The Tire Reserve Load table in the manual does not apply to the 900 Turbo with APC System. See below.

Tire Reserve Load

Refer to the Tire Information Label on the left side vehicle doorpost to determine the tire size that your vehicle is equipped with.

This table lists the tire size designations recommended by Saab for use on the vehicles to which it applies, with the recommended inflation pressure for maximum loading and the tire reserve load for each of the tires listed. The tire reserve load indicated is met by each vehicle to which this table applies.

This table applies to all 1982 Saab 900 Turbos with APC System.

WARNING: Failure to maintain the recommended tire inflation pressure or to increase tire pressure as recommended when operating at maximum loaded vehicle weight, or loading the vehicle beyond the capacities specified on the tire information placard affixed to the vehicle, may result in unsafe operating conditions due to premature tire failure, unfavorable handling characteristics and excessive tire wear. The tire reserve load percentage is a measure to tire capacity, not of vehicle capacity. Loading beyond the specified vehicle capacity may result in failure of other vehicle components.

RECOMMENDED TIRE SIZE DESIGNATIONS	RECOMMENDED COLD INFLATION PRESSURE FOR MAXIMUM LOADED VEHICLE WEIGHT		TIRE RESERVE LOAD PERCENTAGE*
	FRONT	REAR	
195/60 HR 15	30	32	18%
185/65 SR 15	30	32	17%

* The difference, expressed as a percentage of tire load rating, between (a) the load rating of a tire at the vehicle manufacturer's recommended inflation pressure at maximum loaded vehicle weight and (b) the load imposed upon the tire by the vehicle at that condition.

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