



SystemAX II™



**CYLINDER HEADS FOR
1962 - 1986 CHEVROLET 302, 327, 350 C.I.D. ENGINES**

***Part Number 300-552-1**

Part Number 300-569

Part Number 300-570

Part Number 300-571

***CYLINDER HEADS ARE 50 STATE LEGAL
ON 1967 - 1986 CHEVROLET 350 C.I.D.
CARBURETED ENGINES ONLY**

Installation Instructions

NOTE: These instructions must be read and fully understood before beginning installation. If this manual is not fully understood, installation should not be attempted.

INTRODUCTION:

Holley Performance Products has written this manual for the installation of the **SystemAX II or Avenger** cylinder heads. This manual contains all the information needed to install this system. Please read all the **WARNINGS** and **NOTES**. They contain valuable information that can save you time and money.

It is our intent to provide the best possible products for our customer; products that perform properly and satisfy your expectations. Should you need information or parts assistance, please do not return the unit to the store without first contacting technical service at 1-270-781-9741, Monday through Friday, 7 a.m. to 5 p.m. Central Time. By using this number, you may obtain any information and/or parts assistance that you may require. Please have the part number of the product you purchased when you call.

IMPORTANT INSTALLATION NOTES:

This instruction manual will take the installer through a step by step process to install the **SystemAX II or Avenger** cylinder heads with the engine in the vehicle. Before beginning the installation of the **SystemAX II or Avenger** cylinder heads, several things must be considered:

1. The vehicle will be out of service for a day or so, depending on your experience, with cylinder head installation. Considerations should be taken accordingly.
2. The installation should only be performed by those familiar and comfortable enough with cylinder head replacement, removal, and installation. Inexperience with critical necessary procedures will cause poor vehicle performance and /or engine damage.
3. If the removal and installation of **SystemAX** components require removal of either the condenser or air compressor, the air conditioning system must first be evacuated. Take the vehicle to a certified air conditioning technician to recover and evacuate the air conditioning system. Releasing Freon gas into the Atmosphere is illegal.

DANGER! THIS TYPE OF WORK MUST BE PERFORMED IN A WELL-VENTILATED AREA. DO NOT SMOKE OR HAVE AN OPEN FLAME NEAR GASOLINE VAPORS OR AN EXPLOSION MAY RESULT CAUSING SERIOUS PERSONAL INJURY, PROPERTY DAMAGE, AND/OR DEATH.

DANGER! ALWAYS WEAR SAFETY GLASSES WHEN WORKING ON A VEHICLE. FAILURE TO WEAR EYE PROTECTION MAY RESULT IN SERIOUS EYE INJURY.

DANGER! DO NOT SMOKE OR HAVE AN OPEN FLAME PRESENT NEAR GASOLINE VAPORS OR AN EXPLOSION MAY RESULT CAUSING SERIOUS PERSONAL INJURY, DEATH AND/OR PERSONAL PROPERTY DAMAGE.

WARNING! FOR A SAFE AND RELIABLE INSTALLATION OF THE HOLLEY SYSTEMAX MANIFOLD, A THOROUGH KNOWLEDGE OF THE VEHICLES MECHANICAL AND ELECTRICAL SYSTEMS IS NECESSARY. OTHERWISE, ONLY A PROFESSIONAL MECHANIC SHOULD DO THE INSTALLATION. AN IMPROPERLY INSTALLED MANIFOLD CAN CAUSE POOR PERFORMANCE, PERSONAL INJURY, AND/OR PROPERTY DAMAGE.

PARTS IDENTIFICATION:



300-552-1 CYLINDER HEADS

ADDITIONAL PARTS REQUIRED:

- **Cylinder Head Bolts** (Holley P/N 301-35 or Equivalent)
- **Cylinder Head Gaskets** (Felpro Gasket, #1003 or Equivalent)
- **Intake Manifold Gaskets** (Felpro Gasket, #1205 or Equivalent)
- **Exhaust Manifold Gaskets** (Earl's Gasket, #29E03BERL or Equivalent)
- **Valve Cover Gaskets** (Earl's Gasket, #29D03BERL or Equivalent)
- **Permatex Ultrablue Sealer or equivalent**
- **Anti-Seize Compound**
- **Oil, Oil Filter, & Antifreeze**

TOOLS REQUIRED:

- 1/2" Ratchet and Extensions
- 1/2" Deep Standard and Metric Socket Sets
- 3/8" Ratchet and Extensions
- Combination Wrench set, Standard and Metric
- Pliers and/or Vice Grips
- Timing Light
- Torque & Oil Filter Wrenches
- 1/2" Standard and Metric Socket Sets
- 3/8" Deep Standard and Metric Socket Sets
- 3/8" Standard and Metric Socket Sets
- Standard and Phillips Screwdrivers
- Distributor Wrench
- Utility Knife
- Gasket Scraper

REMOVAL OF ENGINE ACCESSORIES

1. Disconnect the negative cable from the battery. Secure cable to prevent accidental grounding.
2. Drain coolant from the radiator. Remove the accessory belt, A/C compressor, and power steering pump, if so equipped.

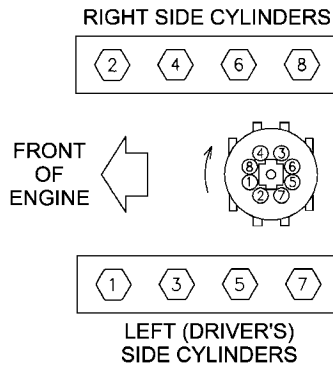
DANGER! COOLANT IN A HOT ENGINE WILL BE UNDER PRESSURE. ALLOW ENGINE TO COOL BEFORE DRAINING COOLANT. FAILURE TO FOLLOW THIS PROCEDURE MAY RESULT IN SEVERE PERSONAL INJURY.

DANGER! FAILURE TO PROPERLY EVACUATE THE AIR CONDITIONING SYSTEM COULD CAUSE SERIOUS INJURY UPON OPENING OF THE SYSTEM.

3. Identify and mark each spark plug wire and the cylinder designation on the block. Leaving the spark plug wires attached to the distributor cap, disconnect the wires from each spark plug and position to avoid interference with the cylinder head removal and installation. See Figure 1.
4. Remove the distributor making note where the # 1 cylinder is located.
5. Remove fuel lines from the carburetor. The fuel pressure must be relieved prior to the removal of the fuel lines.

DANGER! BEFORE DISCONNECTING OR REMOVING FUEL LINES, MAKE SURE THE ENGINE IS COLD. DO NOT SMOKE. EXTINGUISH ALL OPEN FLAMES. AN OPEN FLAME, SPARK, OR EXTREME HEAT NEAR GASOLINE COULD RESULT IN A FIRE AND/OR EXPLOSION CAUSING SERIOUS INJURY OR DEATH!

6. Carefully mark and disconnect all linkages and vacuum hoses.
7. Remove the intake manifold.
8. Remove the valve covers.

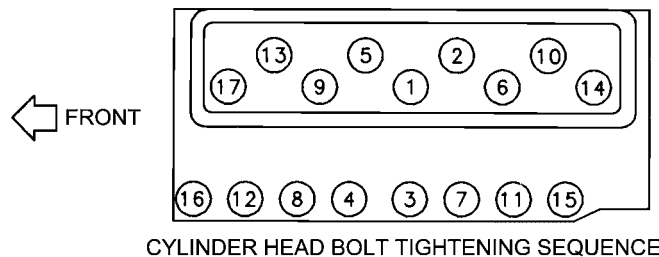


CLYINDER NUMBERS AND DISTRIBUTOR
SPARK PLUG LOCATIONS

Figure 1

CYLINDER HEAD REMOVAL:

1. Remove the rocker arms and nuts, and mark each item as to which cylinder and valve they were removed.
2. Remove the push rods, and mark each as to which cylinder and valve they were removed.
3. Loosen and remove exhaust manifold / header bolts from cylinder head.
4. Loosen or remove collector bolts to gain access to the cylinder head bolts. It may be necessary on some vehicles to completely remove the exhaust manifolds / headers.
5. Loosen and remove cylinder head bolts. Loosen all the cylinder head bolts 1/4 turn in a reverse torquing sequence before removing.



CYLINDER HEAD BOLT TIGHTENING SEQUENCE

Figure 2

6. Remove the cylinder heads.
7. Take time now to transfer any sensors and brackets from the original cylinder heads to the **SystemAX II or Avenger** cylinder heads. The tapped holes in the water jackets of the Holley heads are 1/2" NPT a 1/2" to 3/8" pipe adapter may be needed to install the water temperature sensor in some applications.

SystemAX CYLINDER HEAD INSTALLATION:

WARNING! PRIOR TO INSTALLATION OF THE SYSTEMAX II OR AVENGER CYLINDER HEAD, ROCKER ARM RATIOS AND PUSH ROD LENGTH WILL NEED TO BE DETERMINED BASED ON YOUR ENGINE REQUIREMENTS. FAILURE TO CALCULATE YOUR ENGINE GEOMETRY FOR THESE TWO ITEMS COULD RESULT IN POOR PERFORMANCE, PERSONAL INJURY, AND/OR SEVERE ENGINE DAMAGE.

1. Be sure deck surface is cleaned and is free of oils or cleaning solutions.
2. Install the head gaskets (Felpro gasket, #1003 or equivalent).
3. Install **SystemAX II or Avenger** cylinder heads with all parts transferred from the original cylinder heads. Using new cylinder head bolts Holley P/N 301-35 or equivalent. Apply Permatex Ultrablue sealer to the threads of the new head bolts as they are installed.

- Sequentially, torque all bolts in the following manner, as shown in Fig. 3, first to 35 ft./lbs., then to 50 ft./lbs., then to 65 ft./lbs.

WARNING! BE SURE TO TORQUE BOLTS IN THE DESIGNATED SEQUENCE TO THE CORRECT TORQUE. FAILURE TO DO SO CAN RESULT IN ENGINE DAMAGE.

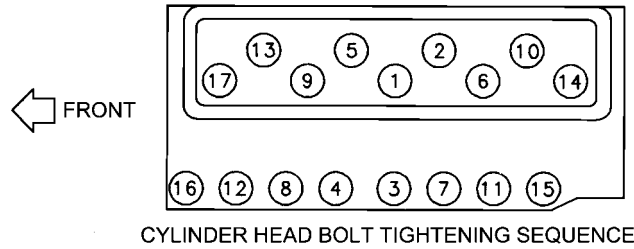


Figure 3

- Install the required push rods based on your engine requirements. Be sure to lube both ends of the push rods with the cam assembly lube.
- Install the new rocker arms based on your engine requirements. Lunati 1.5 ratio Roller Rocker Arms are highly recommended. Finger-tighten only.
- With the #1 cylinder at TDC on the compression stroke, turn the rocker arm nut on the intake valve until all clearance is removed between the tip of the valve and the rocker arm with the push rod in it's seat, both in the lifter and the rocker arm. Turn the rocker arm nut an additional 1/4 turn to set the appropriate lash. The valve is now lashed.
- Repeat the above procedure on the exhaust valve. After finishing #1 cylinder, rotate the crankshaft 90° until both #8 valves are closed. Repeat the lash procedure for #8 cylinder. Continue to rotate the crank 90° increments and repeat the lash procedure for each remaining cylinder. The firing order on a Chevy is 1-8-4-3-6-5-7-2.

NOTE: It is best to go through this procedure twice as a precautionary check.

- Rotate the crankshaft to #1 TDC.

INSTALLATION OF ENGINE ACCESSORIES:

- Be sure all gasket surfaces are clean and free of oils and cleaning solutions. Wipe the gasket surfaces with a clean shop rag to remove any contamination.
- Install the intake manifold Sequentially torque all intake bolts to 30 ft./lb. in 10 ft./lb. increments using the sequence in Figure 4.

WARNING! BE SURE TO TORQUE BOLTS IN THE DESIGNATED SEQUENCE TO THE CORRECT TORQUE. FAILURE TO DO SO CAN RESULT IN ENGINE DAMAGE.

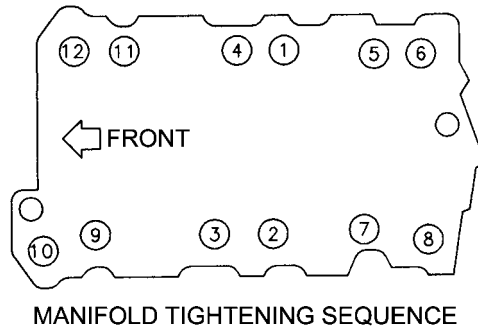


Figure 4

- Install the valve covers with new gaskets. Torque the valve cover bolts to 8 ft./lbs.
- Reconnect the vacuum lines per factory specifications. A diagram can be found in the engine compartment of the vehicle.

5. Reconnect all linkages.

DANGER! FAILURE TO ATTACH THROTTLE RETURN SPRING OR TO CORRECT STICKING THROTTLE OR LINKAGE MAY RESULT IN UNCONTROLLED ENGINE OR VEHICLE SPEED WHICH COULD CAUSE PERSONAL PROPERTY DAMAGE, SERIOUS INJURY, OR DEATH.

6. Reconnect all fuel lines.

7. Insert the distributor so the rotor points to the # 1 post on the cap.

8. Reconnect the spark plug wires to their correct cylinder designation ensuring to route the wires away from any direct sources of heat.

9. Now is the time to reinstall any accessories or belts removed for the installation of the cylinder heads.

10. Fill the radiator with a 50/50 antifreeze and water mix.

11. Drain the oil from the crankcase and remove the old oil filter. Install the new oil filter and refill the crankcase with fresh oil to the manufacturer's specifications.

12. Reconnect the negative battery cable.

NOTE: If the air conditioning system was evacuated, the air conditioning system will need to be recharged. This procedure has to be done by certified air conditioning technicians with the proper recycling and recharging equipment.

SYSTEMS CHECK:

NOTE: Before attempting to start the engine, check the following items:

- Are fuel lines hooked up and securely tightened?
- Are all throttle linkages and return springs connected and working properly?
- Are all vacuum hoses connected?
- Are all radiator and heater hoses connected properly?
- Has the cooling system been filled with a mixture of anti-freeze and water?
- Are all electrical connections that were removed during the installation reconnected?
- Was the crankcase oil and oil filter changed and refilled?

TROUBLESHOOTING:

A	Engine backfires during initial cranking.	- Check ignition timing with a timing light during cranking. - If timing marks align, check to see if distributor was installed 180 degrees out. - Check to insure all spark plug wires are located on the appropriate spark plug. - Check for vacuum leaks.
B	Decked block or milled heads.	- If the cylinder heads have been milled or the engine block decked, the cylinder head faces and the end surfaces of the manifold must be milled to compensate. This is necessary to maintain correct port alignment, to minimize the possibility of manifold vacuum and oil leaks, and assure proper engine performance.
C	Rocker arms making noise	- Readjust the rocker arms following the procedure in this manual.
D	Bent push rods	- Bent push rods occur due to mechanical interference. Check for interference or coil binding of the valve springs.
E	Noisy lifters	- Lifter noise may occur for a short time, due to bleed down of the lifters. The noise should diminish and quit after a few minutes.