



HOLLEY LS-SWAP WATER PUMPS WATER PUMP INSTALLATION INSTRUCTIONS FOR GM LS-ENGINE APPLICATIONS:

Holley LS- Swap cast water pumps are designed for street/performance applications and provide optimum performance for street/performance applications, extended durability and quality, and great looks. Specific water pump part numbers and fitment applications covered by these installation instructions are listed below:

P/N 22-100 – HOLLEY Standard & Middle Alignment Water Pump

- Fits all LS engine blocks
- Forward facing water inlet
- Works with Standard (Corvette type) belt spacing
- Works with Middle (F-body type) belt spacing
- OE applications include:
 - '97-'04 Corvette
 - '04-'05 CTS-V
 - '98-'02 Camaro/Firebird
 - '04-'06 GTO

P/N 22-101 – HOLLEY Long Alignment Water Pump (with Forward Facing Water Inlet)

- Forward inlet allows truck swap engines to be installed in low hood vehicles.
- Allows original truck accessories to be used in swap applications.
- Fits all LS engine blocks
- Works with Long (truck type) belt spacing

P/N 22-102 – HOLLEY Long Alignment Truck Water Pump

- Fits all LS engine blocks
- Short upward facing water inlet
- Works with Long (truck type) belt spacing
- OE applications include:
 - All LS equipped truck applications

BEFORE YOU BEGIN INSTALLATION:

The following installation instructions must be carefully read and understood before you begin installation. Below is a preliminary check list that should be completed before you begin installation. Improper application or installation of this product may result in water pump failure, poor performance, cooling system leaks, or engine over-heating. Failure to follow these installation instructions could result in engine or vehicle damage and may void your warranty. If you require any assistance regarding this product please contact Holley Technical Support at: **270-781-9741** or for online assistance refer to the Tech Service section of our website at **www.holley.com**.

PRELIMINARY CHECKLIST:

- Carefully read and understand these installation instructions.**
- Check that this water pump is the correct choice for your engine application, vehicle application, and desired performance level. **Inspect all threaded holes.**
- Inspect the water pump for any damage that may have occurred during shipping. If damaged is observed, contact your dealer immediately.
- Check that all of the parts listed in the **Kit Contents** list have been included with your water pump.
- Check for proper drive hub to mounting flange height and that all of the hose connections and accessory bosses required for your application are available on the Holley LS-Swap water pump you have purchased. **Important: If there is a slight difference in hub height do not attempt to move the drive hub on the pump to adjust the height, this will alter the installed drive hub press-fit and void the warranty. Serious damage could occur.**
- Check that the pulley is in good condition; no cracks, no excessive runout, and the belt grooves are in good condition. Check that the pulley that will be used clears the pump housing by at least a 1/16" when installed.
- Check that the water pump driven fan or fan/clutch assembly that will be installed is in good operating condition. If the fan or fan/clutch assembly has excessive imbalance; if any fan blades are cracked, bent, have loose rivets, or show any signs of damage; or if the thermally activated fan clutch is not operating per the original manufacturer's specifications, they should be replaced before installing the new pump. **Warning: Any imbalance or improper operation of the fan or fan/clutch assembly can cause catastrophic failure of any water pump that can cause engine and vehicle damage.**
- Check that the hoses, clamps, heater hose and bypass fittings, thermostat, thermostat housing and gasket, radiator cap, and coolant are in good condition. If not, they should be replaced.
- Check the drive belts for cracks, frayed edges, or missing sections. If the condition of the drive belts is in doubt, replace them.
- Check the clearance between the pump and timing cover.
- Make sure the radiator and the heater core are in good condition. Make sure neither are leaking, have excessive damage to the external cooling fins, and that there are no flow obstructions in the internal passages of the radiator or heater core. If the condition of the radiator or heater core is in doubt, replace or have them serviced by a qualified radiator repair shop. No water pump can improve the performance of the engine cooling system, if the radiator and the heater core are not functioning properly.
- If there is any sign of corrosion or loose debris in your engine coolant system, it should be flushed. Check that there is not excessive corrosion at the engine block water pump mounting flanges, openings, or bolt holes that could cause sealing problems at the water mounting gaskets.
- Check the condition of the motor mounts, look for splitting or wear, check that the fasteners are tight. Replace the mounts if they are not in good condition. Excessive engine movement can cause the fan blades to contact the fan shroud or radiator causing catastrophic pump, engine, and vehicle damage.
- Once it is confirmed that the mounts are in good condition, make sure the fan blades have proper clearance to the fan shroud and the radiator. Make sure that the shroud is good condition.
- Check that you have all of the supplies and parts required for the installation. These could include gasket adhesive, pipe thread sealant, coolant, heater hose fittings, new hoses, clamps, fasteners as shown in the **Parts Required** list.
- Check that you have all the tools you will need to perform the water pump installation. Check the **Tools Required** section

- Check that you have the proper water pump fasteners for this application. For all other applications covered in these instructions, stock or equivalent fasteners should be suitable. If the stock mounting bolts do not include a flat washer underneath the bolt heads, a flat washer should be added. A bolt head or a split lock washer **should not** come in direct contact with the aluminum housing. A 3/8" flat washer of a minimum 1/16" thickness that properly fits the pump mounting hole counter bores should be used.
- Warning: Never stand in line with or near the engine cooling fan when revving the engine. For your own protection, the hood should be closed when revving the engine. Bodily proximity to the engine cooling fan during a fan blade or water pump failure could result in serious personal injury or death.**

KIT CONTENTS FOR 22-100, 22-101, & 22-102:

- Qty. 1 – Water Pump Assembly
- Qty. 2 – Mounting Gaskets
- Qty. 1 – Literature Package – includes 199R10929 Instructions, Warranty Claim Tag, & 90 Day Warranty Statement

PARTS & SUPPLIES REQUIRED:

NOTE: It will be necessary to purchase some of the parts listed below (or equivalents) in order to properly complete the water pump installation. Determining equivalency is the consumer's responsibility. **Holley®** does not assume that responsibility.

NOTE: Never install tapered (pipe) fittings in an aluminum water pump dry without thread sealer or thread damage will occur.

- Spray gasket adhesive (Permatex® 80064 High Tack™ Spray-A-Gasket™ sealant or equivalent)
- Thread sealer (Loctite® 565 or Permatex® P/N 56521)
- Silicone sealer
- Heater hose and bypass fittings, (used in good condition or new)
- Pipe plugs, (if the heater hose connections are not being used)
- Hoses and hose clamps, (new hoses are recommended)
- Coolant – Ethylene Glycol, green color, mixed with distilled water to coolant manufacturer recommendations.
- Shop towels, paper and/or cloth
- Brake cleaner, lacquer thinner, or acetone
- Motor oil
- Masking tape
- Pad and pencil

TOOLS REQUIRED:

- Socket wrench set 3/8"-drive ratchet and extensions
- Open end wrenches 3/8" to 1"
- Box end/flare wrenches (optional)
- 10" adjustable wrench (crescent)
- Screwdrivers, standard & Phillips, various lengths
- Gasket scraper
- Pliers – standard, channel lock, needle nose
- Hose clamp pliers, (for wire type hose clamps only)
- Hose cutter or utility knife
- Drain bucket
- Thread chaser, or tap (for cleaning bolt holes)

INSTALLATION INSTRUCTIONS:

These instructions are designed to provide an overview for a wide variety of vehicle applications. A shop manual for your specific vehicle application should be consulted along with these instructions. **If any difficulties are encountered during the installation of this Holley® LS-Swap water pump, please contact the Holley® Technical Support Team at 866-464-6553, 270- 781-9741, Fax: 270-781-9772, or for online assistance refer to the Tech Service section of our website at www.holley.com.**

WATER PUMP REMOVAL PROCEDURE:

1. Disconnect the ground cable from the battery.

WARNING: Hot water and steam may be present if the engine is still warm.

2. Drain the radiator. **NOTE:** *It may be necessary to remove the bottom radiator hose if there is no drain plug in the radiator.* Replace and tighten the drain plug immediately after the coolant has finished draining.
3. Identify and mark the attachment locations for the hoses and locations for the accessory drive belts.
4. Disconnect the lower radiator hose, heater hoses, and bypass hose. Remove the radiator shroud and loosen the fan/water pump pulley bolts.
5. Loosen the drive belt tension for each accessory and remove the belts.
6. Remove the fan/water pump pulley bolts, fan, and pulley.
7. Remove the accessory brackets attached to the water pump and any brackets impeding the removal of the water pump. Be careful to note the bracket locations and the locations of the bracket fasteners.
8. Remove all fittings and plugs from the old water pump that will transferred to the new pump. It is easier to loosen the fittings and plug while the pump is mounted on the engine.
9. Loosen and remove the water pump mounting bolts.
10. Remove the water pump. If the water pump does not separate from the engine block easily, make sure that all of the water pump mounting fasteners are removed and there are no other possible obstructions before applying force of any kind to separate the water pump from the engine block.
11. Clean the water pump mounting flanges on the engine block. Scrape away any gasket material, sealer, or loose rust. Clean the engine block mounting flanges with brake cleaner, lacquer thinner, or acetone to remove any residue. Inspect the mounting flanges for pitting or excess corrosion to assure that there will not be any gasket sealing issues when the new water pump is installed.
12. Clean-out the water pump mounting threaded holes in the engine block with a 3/8-16 thread chaser or tap. Note if any of these threaded holes breakthrough in to a water jacket. If so, thread sealer will be needed when the water pump mounting bolts are installed at the locations where a threaded bolt hole breaks into a water jacket.

INSTALLING YOUR NEW HOLLEY® LS-SWAP WATER PUMP:

1. Using gasket adhesive, install the water pump mounting flange to engine block gaskets to the pump mounting flanges.
2. Trial fit your new water pump to the engine block. Make sure that the water pump seats in its proper position on the engine block without contacting any other part of the engine, such as the front timing cover or the crankshaft damper (aftermarket crankshaft damper and front covers sometimes vary in size and create water pump clearance issues).
3. Mount the water pump to the engine block. If there is any question about the condition of the engine block sealing surfaces, a thin film of silicone sealer should be applied to the engine block sealing surfaces. Otherwise, the pump can be installed with the gaskets dry. Make sure to use washers under the mounting bolt heads or under the split lock washers, if used. Thread engagement of the mounting bolts into the engine block should be 1.5-2 bolt diameters in length (9-12 turns with 3/8-16 threads). Apply a drop of motor oil on the mounting bolts installed into blind threaded holes. Apply thread sealer to the bolts installed into any threaded hole breaking into water. Torque the water pump mounting bolts to 30-35 ft./lbs. in a diagonal pattern.
4. Trial fit your water pump drive pulley to check alignment of the pulley with the crankshaft pulley. **Do not attempt in any manner to reposition the drive hub on the bearing shaft. This will disturb the press fit of the hub and could damage the bearing. This may result in a pump failure that could cause damage to you engine and vehicle.**
5. Transfer all of the heater hose or bypass fittings from the old pump to your new water pump in the appropriate locations. Use a pipe plug in any port that will not be occupied by a fitting. Make sure the fittings are in good condition. Replace any that are not in good condition. Use thread sealer on the pipe threads. **Do not install any fittings or pipe plugs in the pump dry, this can cause galling of the threads.**
6. Install the accessory brackets as they were originally installed. It is always good practice to make sure the fasteners and threaded holes are clean and that the threads are lubricated with few drops of motor oil to ensure consistent clamping of all bolted joints as the fasteners are tightened.
7. Install the pulley, fan, and fan belts. Make sure the bolt ends do not contact the pump housing. Contact will damage the pump and void the warranty. In some vehicles, the fan shroud will need to be placed into position at the same time as the fan. Adjust the drive belts to factory tension specifications.
8. Install the fan shroud, making sure that the fan to shroud and fan to radiator clearance is correct.
9. Install the heater, bypass, and lower radiator hoses. Make sure none of the hoses come in contact with any moving parts, such as the drive belts.
10. Fill the engine cooling system with coolant. While filling the cooling system, make sure air is not being trapped in the engine coolant passages by venting air from engine. Often, the best way to vent air is to disconnect the heater hose at the engine outlet. Reconnect the heater hose as soon as coolant begins to flow from the heater hose fitting.
11. Once the cooling system is full, replace the radiator cap. Check for any leaks.

WARNING: Never stand in line with or near the engine cooling fan when revving the engine. For your own protection, the hood should be closed when revving the engine. Bodily proximity to the engine cooling fan during a fan blade or water pump failure could result in serious personal injury or death.

12. Start and warm-up the engine. Make sure the cooling system is operating normally, that the thermostat opens at the appropriate temperature, and that the vehicle's heating system is working properly. Once the engine has reached normal operating temperature, shut off the engine. Again, check for leaks. Allow the engine to cool and recheck the coolant level. Add more coolant, if needed. Also re-check the fan belt tension adjustments. Re-adjust, if needed.
13. Your Holley LS-Swap water pump installation is complete.

Holley® Technical Support
Toll-Free Phone: 1-866-464-6553, Phone: 1-270-781-9741 or Fax: 1-270-781-9772
For online help, please refer to the Tech Service section of our website: www.holley.com

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