



# PERFORMER RPM HYDRAULIC ROLLER CAMSHAFT

## For EFI Chevrolet LS1 Engines

### Part #2218 & 2219

## INSTALLATION INSTRUCTIONS

**PLEASE** study these instructions carefully before installing your new Performer RPM Hydraulic Roller Camshaft. If you have any questions, do not hesitate to contact our **Technical Hotline at: 1-800-416-8628**, from 7am-5pm Monday-Friday, Pacific Standard Time.

**DESCRIPTION:** The Performer RPM Hydraulic Roller Camshafts for Chevrolet LS1 engines are designed for optimum power and torque in the 1500-6500 rpm range. #2218 provides 16" of vacuum at 1000 rpm and #2219 is slightly more aggressive, providing 14" of vacuum at 1000 rpm. These camshafts are ideal for performance vehicles with LS1 engine swaps, using Edelbrock's Pro-Flo XT EFI Intake Manifold #7139 or other aftermarket fuel injection system. In our testing, an LS1 engine with stock internals, Edelbrock #61969 CNC heads and Pro-Flo XT EFI system #3529 made 494 HP with camshaft #2218 and 536hp with #2219. Stock valve springs should be checked for potential coil bind at the lift specified for the camshaft being used; upgraded valve springs **MUST** be used if coil bind may occur. **NOTE:** These camshafts are designed for LS1 engines being used for engine swaps into earlier vehicles using aftermarket fuel injection **ONLY**. They are **NOT** intended for use in factory EFI- equipped LS1 engines.

**BEFORE BEGINNING:** This installation can be accomplished using common tools and procedures. However, you should have a basic knowledge of automotive repair and modification and be familiar with and comfortable working on your vehicle. If you do not feel comfortable working on your vehicle, it is recommended to have the installation completed by a professional mechanic. Due to varying vehicle types due to the use of the LS1 as an engine swap, these installation instructions are intended as a guide. It is highly recommended to have a factory service manual for your vehicle, and for an LS1 factory-equipped vehicle on hand during this installation. A service manual will cover certain steps in this instruction sheet in full detail, and also provide proper bolt torque values and sequences. **REMEMBER: When working on your engine, especially when oil or fuel is present, always work in a well ventilated area. Keep all sparks, open flames, or other sources of ignition away from the work area. Failure to do so could result in a fire or explosion causing vehicle or property damage, personal injury, and/or death.**

**NOTE:** Make sure your engine is in good running condition before installing the Edelbrock Performer RPM Hydraulic Roller Camshaft. If your engine is not in good working order, installation of a high performance camshaft could result in premature engine wear.

**NOTE:** This installation is most easily accomplished with the engine out of the vehicle. However, if your engine is in the vehicle, the removal of all vehicle pieces in order to provide access to the engine front cover and the removal of parts in order to provide clearance to remove and install the camshaft will not be covered. These items may include the cooling fans, radiator, emissions equipment bracketry, A/C brackets, A/C condenser, etc. Depending on the model of your vehicle, if the engine is in the vehicle, temporarily raising the engine in the engine compartment may be required to gain enough clearance to remove and install the camshaft. Please refer to your factory service manual for these procedures. If the vehicle needs to be raised for any reason, always use the factory recommended lift points and methods of supporting the vehicle. **Failure to do so could result in vehicle damage, personal injury, and/or death.**

**BEFORE BEGINNING:** If the Air Conditioning condenser needs to be removed to provide clearance for camshaft removal, have the system evacuated by an appropriate repair facility **BEFORE** starting the installation. The same facility can recharge the system after installation.

### Preparation Checklist

#### Kit Contents:

Qty.	Description
1	Hydraulic Roller Camshaft
1	2 oz. Container, Moly Assembly Lube

#### Special Tools:

- (Use the Supplied GM part numbers or equivalent)
1. GM # J-41816 - Crankshaft Balancer Remover
  2. GM # J-41816-2 - Crankshaft End Protector
  3. GM # J-41476 - Front/Rear Cover Alignment Tool
  4. GM # J-42386 - Flywheel Holding Tool (if engine is out of vehicle)

#### Parts Recommended for Installation:

1. Crankshaft Balancer Bolt (required)
2. Camshaft Sprocket Bolts (required)
3. Camshaft Retaining Plate Bolts (required)
4. Valve Cover Gaskets
5. Front Cover Gasket
6. Water Pump Gaskets
7. Oil Pan Gasket

**NOTE:** The LS1 uses o-ring type gaskets which can normally be re-used. Inspect the gaskets listed above during the installation and replace, if necessary.

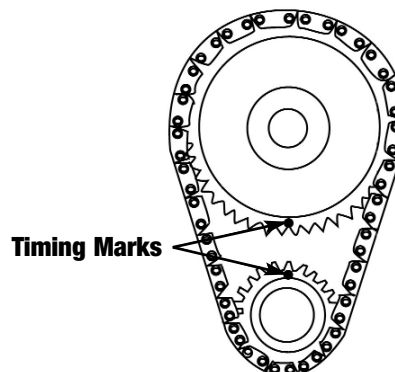
**PARTS REMOVAL**

1. Make sure the vehicle is on level ground and supported properly. Drain engine oil and coolant, storing them in appropriate containers or disposing of them properly. Refer to the factory service manual for proper draining procedure. Make sure the negative battery cable is disconnected.
2. After getting access to the front of the engine, remove the serpentine accessory drive belt, accessory drive belt tensioner, drive belt idler pulley, and any hoses connected to the water pump. Follow the factory service manual procedure.
3. Remove the water pump (*See service manual*).
4. **NOTE:** *Some LS1 engines (originally installed in Corvettes) do not use a key or keyway to position the crankshaft balancer on the crank. If your engine does not use a key, mark or scribe the end of the crankshaft and the balancer before removal.* Remove the balancer bolt. Using the Crankshaft Balancer Remover (J-41816) and the Crankshaft End Protector (J-41816-2), remove the balancer from the crankshaft.
5. Loosen the oil pan bolts enough to pull the oil pan away from the engine slightly to provide clearance for removing the front cover. Remove the front cover and gasket. Be careful not to damage the seals in the timing cover. Replace, if necessary. At this time, you should inspect the oil pan gasket for damage. Remove the oil pan and replace the gasket if necessary (*See service manual*).
6. Remove the oil pump (*See service manual*).
7. Remove the ignition coil harness connectors, and remove the valve covers. The individual coils do not have to be removed to do this. Remove the rocker arm bolts, rocker arms, and rocker arm pivot support. Make sure to keep parts in order, so they can be re-installed in their original locations. The pushrods do not need to be removed.
8. Rotate the crankshaft two full revolutions (*use flywheel holding tool J-42386, if necessary*). This will raise the lifters up into the lifter guides. The lifter guides will hold the lifters away from the camshaft so that it may be removed without the need to remove the lifters. Continue rotating the engine until the timing marks on the timing chain are in line (**See Fig. 1**). Remove the three bolts holding the camshaft sprocket and carefully remove the cam sprocket. You can allow the timing chain to rest on the crankshaft sprocket. (**NOTE:** *Now is a good time to inspect the timing set. Replace, if necessary, following the service manual procedure.*)
9. Remove the camshaft sensor bolt and sensor. **NOTE:** *Camshaft sensor MUST be removed prior to removing or installing the camshaft, or damage to the sensor could occur.* Remove the camshaft retaining plate and carefully remove the camshaft. Keep it straight as you remove it as to not damage the camshaft bearings. (**NOTE:** *Installing three 8mm x 1.25 x 100mm long bolts*

*into the front of the camshaft can give you a "handle" to help hold the camshaft. Carefully rotating the cam while removing it eases the removal.)* Inspect the camshaft lobes for any signs of unusual wear or damage. If damaged, the lifters may also need replacement. Removal of the cylinder heads is required to remove lifters (*See service manual*).

**INSTALLATION PROCEDURE**

1. Liberally coat the new Performer RPM camshaft journals and lobes with the supplied moly lube. Use the 100mm long bolts to create a "handle" and carefully insert the cam into the engine.
2. Replace the camshaft retaining plate using new bolts and tighten the bolts to the factory specification. Replace camshaft sensor.
3. Replace the timing chain and camshaft sprocket. Make sure to align the timing marks on the cam and crankshaft sprockets (**See Fig. 1**). Using new bolts, tighten bolts to factory specifications (*See service manual*).
4. Carefully press down on each pushrod to put each lifter back into contact with the camshaft. Make sure the pushrods are properly seated into the lifters.
5. Install the rocker arm pivot supports, rocker arms and rocker arm bolts. Finger tighten ONLY at this time.
6. Make sure the timing sprockets are still aligned as shown in **Fig. 1**. If they are not, rotate the engine in the direction of operation until the timing marks are aligned. Tighten the rocker arm bolts in the sequence described below:
  - A. With the timing marks aligned (**Fig. 1**), tighten exhaust valve rocker arm bolts 1, 2, 7, & 8 to 22 ft./lbs. Tighten intake valve rocker arm bolts 1, 3, 4, & 5 to 22 ft./lbs.
  - B. Rotate the engine 360°, in the direction of operation. The timing marks should both be in the 12 o'clock position.
  - C. Tighten exhaust valve rocker arm bolts 3, 4, 5, & 6 to 22 ft./lbs. Tighten intake valve rocker arm bolts 2, 6, 7, & 8 to 22 ft./lbs.



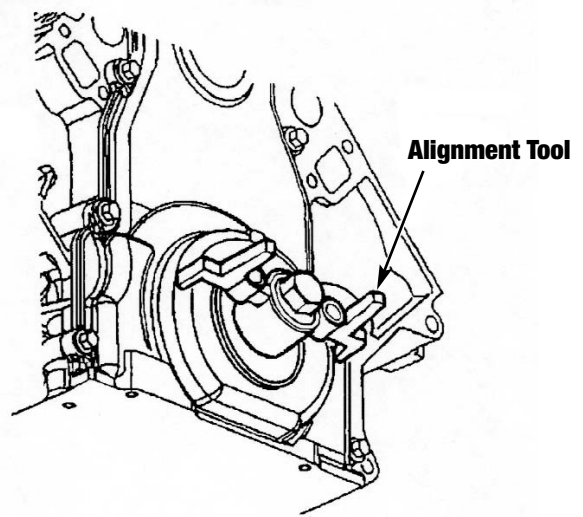
**Figure 1 - Timing Mark Alignment**

**NOTE:** Engine firing order is 1-8-7-2-6-5-4-3.

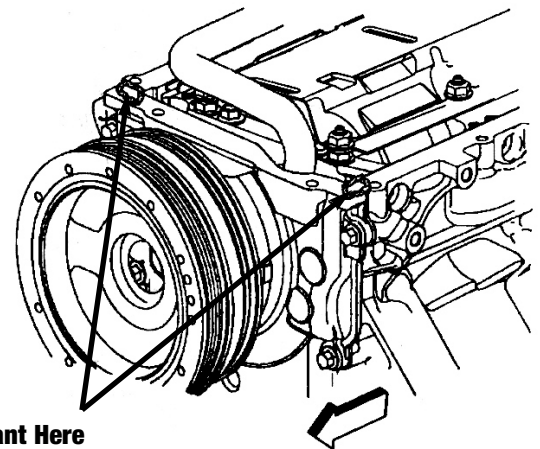
**NOTE:** Cylinders 1, 3, 5, & 7 are the driver's side bank, while cylinders 2, 4, 6, & 8 are the passenger's side bank.

**NOTE:** Due to the increased valve lift of these camshafts, it is critical that valve-to-piston and valve-to-bore clearances be checked prior to the completion of the installation. The recommended minimum clearance values are .080" for the intake valve and .100" for the exhaust valve. Failure to verify these measurements can cause severe engine damage.

7. Install the valve covers and reconnect the coil harness plugs. Use new valve cover gaskets, if necessary.
8. Install the oil pump (See service manual for torque specs).
9. Install the front cover, using a new gasket if needed. Install front cover bolts hand tight ONLY. Use front/rear cover alignment tool J-41476 and align the tapered legs of the tool with the machined alignment surfaces on the front cover (See Fig. 2). Install the crankshaft balancer bolt and tighten by hand until snug. Tighten the front cover bolts to 18 ft./lbs. Make sure the bottom of the front cover is flush with the oil pan gasket surface.
10. Apply a small amount of sensor safe RTV silicone to the areas of the front cover that meet the oil pan sealing surface (See Fig. 3). Tighten the oil pan bolts.
11. Install the crankshaft balancer using a new balancer bolt. Make sure it is aligned as marked previously. If your engine uses a keyway, use the original key to align the balancer properly.
12. Install the water pump, serpentine accessory drive belt idler pulley and tensioner. Install the serpentine belt and any components that were removed in order to gain access to the front of the engine (See service manual for installation procedures).



**Figure 2 - Front Cover Alignment Tool**



**Figure 3 - Sealant Locations**



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**CAMSHAFT: Performer RPM Hydraulic Roller****PART #: 2218 & 2219****ENGINE: Chevrolet LS1 V8****RPM RANGE: 1500-6500**

**CAUTION:** These camshafts are designed to be used in engine swap applications using aftermarket EFI systems ONLY. They are not intended to be used in factory EFI-equipped LS1 vehicles.

**PART #2218 (16" Hg Vacuum @ 1000 RPM):**

Duration at 0.006" Lift:	Intake 254°	Exhaust 281°
Duration at 0.050" Lift:	Intake 207°	Exhaust 220°
Lift at Cam:	Intake 0.337"	Exhaust 0.341"
Lift at Valve:	Intake 0.573"	Exhaust 0.580"
Centerlines:	Lobe Separation: 118.5°	Intake CL: 119.5°
Timing at 0.050" Lift:	Open	Close
	Intake: 16° ATDC	43° ABDC
	Exhaust: 47.6° BBDC	7.4° BTDC

**CATALOG #2219 (14" Hg Vacuum @ 1000 RPM):**

Duration at 0.006" Lift:	Intake 291°	Exhaust 308°
Duration at 0.050" Lift:	Intake 230°	Exhaust 243°
Lift at Cam:	Intake 0.371"	Exhaust 0.371"
Lift at Valve:	Intake 0.631"	Exhaust 0.631"
Centerlines:	Lobe Separation: 113°	Intake CL: 115°
Timing at 0.050" Lift:	Open	Close
	Intake: 2° BTDC	48° ABDC
	Exhaust: 56° BBDC	7° ATDC

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Part # 2218 & 2219  
Brochure #63-2218C

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