



Performer RPM Hydraulic Roller Camshaft For 289-302 Ford V8 Engines Part #2221 INSTALLATION INSTRUCTIONS

Please study these instructions carefully before installing your new camshaft. If you have any questions or problems, please call our **Technical Hotline at: 1-800-416-8628**, 7:00 am - 5:00 pm, Monday through Friday, Pacific Standard Time.

These instructions are designed to give general installation guidelines. A complete step-by-step procedure manual would require many pages. If you are a novice or just learning to work on automotive engines, we recommend consulting either Chilton or Motors automotive manuals before you begin. You may also contact an experienced mechanic. Please be advised that an improper installation may result in **LOW MILEAGE, POOR PERFORMANCE, COSTLY REINSTALLATION AND EVEN ENGINE DAMAGE.** Installing a camshaft is a complex procedure. Please follow these instructions carefully. Failure to do so may void your warranty.

- Before you begin the removal and installation process, please examine the kit for possible shipping damage. If the camshaft is damaged, contact your dealer immediately. Also, make sure you have all the recommended tools and parts as listed below. As you read through these instructions the first time, use the preparation checklist to check off the exact items you will need.
- Performer RPM camshafts are ground specifically for use with the corresponding Performer RPM manifolds. Both are dyno-matched and street proven to work as a team; especially when matched with the Edelbrock Tubular Exhaust Systems. However, the Performer RPM camshaft package may be used by itself.

PREPARATION CHECKLIST

Tools & Equipment For Installation

- Box and open end wrenches
- Socket set
- Distributor wrench
- Pliers (channel locks & hose clamp)
- Screw drivers (regular and phillips)
- Torque wrench
- Hammer
- Gasket scraper or putty knife
- Timing light vacuum gauge
- Rags
- Water bucket
- Harmonic balancer puller
- Masking tape (for tagging hoses and electrical wires)
- Chalk, paper and pencil
- Crankshaft dampener puller

Hardware & Parts To Buy

- Edelbrock Roller Lifters #97453 or equivalent
- Appropriate Length Push Rods; Edelbrock #9655 or equivalent
- Gaskets - Intake #7220, Cyl. Head #7313, Valve Cover #7560
- Pipe plugs, if needed
- Edelbrock Gasgacinch #9300
- RTV Silicone sealer
- Engine oil and filter
- Radiator coolant
- Edelbrock True Rolling Timing Chain Set #7811
- Front cover oil seal, OEM or equivalent
- Valve Springs with a closed pressure of 110-120 lbs., open pressure and 320-340 lbs. and a lift of .575" (**Note:** Edelbrock Sure Seat Valve Springs #5722 are not recommended.)

REMOVAL OF ENGINE PARTS BEFORE CAMSHAFT INSTALLATION

Be sure to keep all parts in order

WARNING! DO NOT REMOVE RADIATOR CAP OR RADIATOR HOSES WHILE ENGINE IS HOT!

NOTE: If your vehicle is equipped with air conditioning, you are legally required to have the system evacuated by an authorized repair center prior to beginning camshaft installation.

1. Disconnect the battery.
2. Drain radiator coolant. Drain plug will normally be located on lower right or left side of the radiator facing the engine.
3. Remove radiator and air conditioning condenser if so equipped. In some cases, the front grill may have to be removed. Measure distance from front cover to grill or brackets that may interfere with camshaft against the length of the camshaft.
4. Remove the gas cap to relieve pressure. Disconnect fuel line and plug. Replace gas cap.
5. Disconnect all linkage from carburetor such as throttle, throttle springs, transmission, cruise control and automatic choke.

6. Tag and remove coil wires and sensor wires.
7. Tag and remove vacuum lines.
8. Remove valve covers.
9. Remove distributor cap and wires, rotate engine until rotor points towards number 1 terminal in cap and pointer on front cover is on top dead center (TDC) and remove distributor. (see Fig. 1)
Note: Mark the approximate position of the distributor housing in relation to the manifold to assist in getting the distributor properly located during re-installation.
10. Remove carburetor and intake manifold. Remove and discard intake manifold gasket.
11. Remove rocker arms and pushrods.
CAUTION: If your engine has non-adjustable rocker arms (1969-1/2 or later), you must install screw-in studs and high performance

adjustable rocker arms. Crane and other manufacturers sell conversion kits for this which do not require removal and machining of the heads.

12. Remove hydraulic valve lifters.
13. Remove cylinder heads, see a Chilton or Motors manual for reference. (**Note:** 289-302 engines require removal of the cylinder heads to provide enough clearance to install roller lifters, which are taller than standard hydraulic lifters.)
14. Remove crankshaft pulley, and using a suitable puller, crankshaft dampener.
15. Loosen oil pan and remove water pump and front cover.
NOTE: The front cover oil seal should be replaced before the front cover is re-installed.
16. Rotate engine until timing marks are aligned as in **Figure 2**.
17. Remove camshaft sprocket bolt, washer, and fuel pump eccentric. Slide sprocket and chain forward to remove.
18. Remove thrust plate and camshaft. Using an appropriate gear puller, remove the crank sprocket.

• VALVE SPRINGS

CAUTION: WARNINGS ABOUT YOUR WARRANTY

In order for this Performer RPM roller cam to be covered under ANY WARRANTY, you MUST use the correct Valve Springs. Failure to install the correct valve springs may cause lifters not to follow the cam lobes and damage engine parts. This camshaft is designed to function with valve springs that have a closed pressure of 110 lbs, open pressure of 320 lbs and a lift of .575". Special H.P. retainers may be necessary with your installation for proper spring height. Do not use rotator type valve springs or retainers for this application. **Note:** Edelbrock Sure Seat Valve Springs #5762 are not recommended.

• IMPORTANT NOTES AFFECTING YOUR WARRANTY

CAM LOBE DAMAGE - Cam lobe wear is almost non-existent unless mismatched parts are used or installation of the cam and lifters is done improperly. Cam damage can result from the timing gear loosening due to improper torque on bolts. Bolts holding gear to camshaft should be torqued carefully and a locking compound applied to threads of bolts. Before installing your new Performer-RPM roller camshaft, check the gear drive on the distributor and oil pump for any signs of wear. If worn, be sure to replace with a new gear or you may wear out your camshaft prematurely. High-pressure oil pumps are not recommended with Performer RPM roller camshafts. Edelbrock camshafts are designed to use with Edelbrock timing chains.

- **CAM GEARS AND CAMSHAFT END PLAY** - If cam gear becomes loose, the cam will slide back in the block, causing the lifters to hit the lobes next to them and also the cam bearing journals. If the engine is run after this happens, the bottom of the lifters and the sides of the lobes will become damaged. See Installation Instructions section for end play specifications.

• LIFTERS

Edelbrock offers a retrofit roller lifter kit for engines not originally equipped with roller lifters. Use part #97453. To install your roller lifters, use fresh clean oil on the lifter and the lifter bore just prior to installing. The guide bar (high side of tappet) must face the opposite side of block. See roller lifter instructions for additional information.
(Note: 289-302 engines require removal of the cylinder heads to provide enough clearance to install roller lifters, which are taller than standard hydraulic lifters.)

• PUSHRODS AND ROCKER ARMS

High performance pushrods, roller rocker arms and rocker studs are recommended for this installation. After the cam is installed and timed correctly (see Figure 2), it will be necessary to check each pushrod for correct lifter preload.

• INSTALLATION INSTRUCTIONS

1. Check lifters as covered in Lifters section. Coat cam lobes with fresh clean oil. Lube distributor drive of cam with assembly lube (supplied).
2. Install new camshaft. Re-install thrust plate with new sprockets and timing chain with timing marks lined up as recommended by factory specifications (**See Figure 2**). Reinstall the fuel pump eccentric before installing sprocket bolt and washer.
CAUTION: When using Performer-Link True Rolling Timing Chain and Gear Set (#7810) with an Edelbrock cam, straight up timing alignment is achieved. If any other timing gear set is used, it is necessary to check camshaft position for correct timing alignment. This requires indexing the camshaft with a degree wheel to verify timing alignment. O.E.M. or non-Edelbrock timing gear sets are not recommended for use with Edelbrock camshafts. Use locking compound material on bolt threads holding gear to cam. Torque to factory recommendations specified in Motors or other repair manual.
3. Install your roller lifters using fresh clean oil on the lifter and the lifter bore just prior to installing. Check to make sure all lifters fit freely in lifter bores.
4. Re-install cylinder heads (refer to manual for reference).
5. Install front timing cover and re-tighten oil pan.
NOTE: Install new seal between oil pan and front cover if old seal is damaged from removal. Use RTV silicone sealant on seal to ensure proper seal to pan.
6. Torque front timing cover bolts to 6-7 ft. lbs.
7. Install front harmonic balancer and torque to 60 ft.-lbs.
8. Install fuel pump and pushrod.
9. Install water pump using new gaskets and torque to 30 ft.-lbs.

10. VALVE ADJUSTMENT

Step 1. Install pushrods with lube on both ends. Make sure tip hits center of lifter cup. Install rocker arms. You are now ready to start valve adjustment.

Step 2. With #1 cylinder at TDC firing position (Position "A" - Both #1 lifters are down in the lifter bores), make a chalk mark on the dampener 180° from the TDC mark (Position "B"), and also make a chalk mark 90° counter-clockwise from the TDC mark (Position "C"). You may now adjust intake valves on cylinder numbers 1, 7, & 8 and exhaust valves on cylinder numbers 1, 5, & 4 as follows: You need to set rockers at zero lash. While tightening the rocker nut, spin the pushrod, when you feel resistance, you are at zero lash. Tighten rocker nut half turn past zero lash. **Note: We recommend the use of roller rockers only.**

Step 3. Turn the engine 180° (1/2 turn) so that the first chalk mark (Position "B") is lined up with the timing pointer. Adjust the intake valves on cylinder numbers 4 & 5 and adjust the exhaust valves on cylinder numbers 2 & 6.

Step 4. Turn the engine 270° (3/4 turn) so that the second chalk mark (Position "C") is lined up with the timing pointer. Adjust the intake valves on cylinder numbers 2, 3, & 6 and the exhaust valves on cylinder numbers 3, 7, & 8. The valves are now adjusted.

11. Install intake manifold using new intake gasket set and torque bolts to 18-20 ft/lbs.

DISTRIBUTOR INSTALLATION & ENGINE TIMING

Note: This cam is a cast cam and requires a cast distributor drive gear.

1. Turn the engine over in direction of rotation until the No. 1 intake valve closes and continue until the pointer on the front cover is approximately ten degrees before top dead center (BTDC). **See Figure 1 for firing order.**
2. Re-install the distributor with the rotor pointing towards No. 1 terminal in the cap, and with the distributor housing in its original position. If distributor will not drop down all the way to the flange on the manifold, it will be necessary to align the distributor shaft with the oil pump drive. Slowly rotate the engine until the distributor drops down against the manifold, then continue turning until two complete revolutions are completed and the timing marks once again come to five degrees BTDC.
3. Lightly tighten the hold-down clamp so that the distributor can still be turned to determine final setting using a timing light with the engine running.
4. Replace valve covers, carburetor linkage and remaining vacuum and electrical connections.
5. Engine oil and filter should be changed before start-up.

CAMSHAFT & LIFTER RUN-IN

IMPORTANT: Standard camshaft run-in is not required when using a roller cam.

SPECIAL INSTRUCTIONS

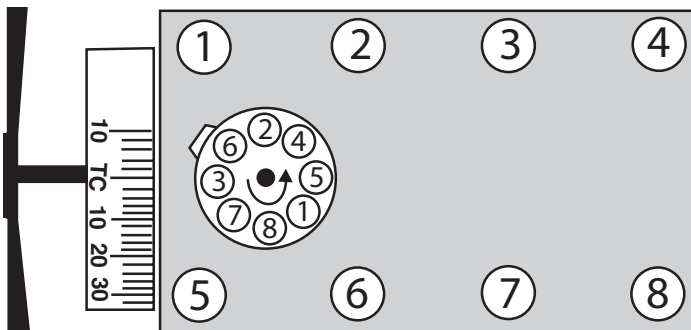
With the Edelbrock manifold and camshaft package installation, a carburetor jet change and ignition timing changes may be required for best performance. Due to the varied applications of years and models of vehicles, no one combination could suffice for all installations. The following procedure is only a guideline.

IGNITION TIMING

Increase initial setting to 12-14° BTDC (Before Top Dead Center) for best idle. Total advance not to exceed 38°. To select the proper distributor vacuum advance port on your carburetor, we suggest the following procedure. Before removing the vacuum line from your carburetor, with the engine idling, pull the hose off the port that routes to the vacuum advance canister. After the hose has been removed from the carb, place your finger over the vacuum outlet. If (at idle), you feel your finger being sucked in toward the carburetor, you have full-time vacuum advance. If you do not feel any vacuum pulling at your finger with the engine at an idle, you have timed/ported vacuum advance.

HEADERS

For best performance, headers are recommended. For this application, they should be 1-5/8" to 1-3/4" diameter, approximately 31" long, and terminate into a 3" collector. The remainder of the exhaust system should consist of dual exhaust and tail pipes, at least 2" - 2-1/2" in diameter, with low back-pressure mufflers.



Firing Order: 1-5-4-2-6-3-7-8

Figure 1

289-302 c.i.d Ford V8

Firing Order and Timing Marks

Turn distributor counter clockwise to advance timing

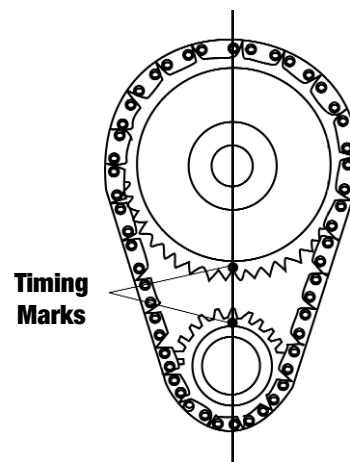


Figure 2

Timing Chain Sprocket Alignment

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- **CAMSHAFT: Performer RPM Roller Hydraulic**
- **PART #2221**
- **ENGINE: Ford 289-302 V8**
- **RPM RANGE: 1500-6500**
- **CAUTION:** Do not use dual valve springs. Use recommended valve springs with closed pressure of 110 lbs., open pressure of 320 lbs, and lift of .575". Use stock ratio rocker arms only.

Duration at .004" Lift:	Intake 298°	Exhaust 302°
Duration at .050" Lift:	Intake 227°	Exhaust 234°

Lift at cam:	Intake .325"	Exhaust .325"
Lift at valve:	Intake .520"	Exhaust .520"

Timing at .050 Lift:	Open	Close
Intake	6° BTDC	41° ABDC
Exhaust	54° BBDC	0° ATDC
Centerlines:		
Lobe Separation: 112°	Lobe Centerline:	Int: 107° ATDC Exh: 117° BTDC

- **CAUTION:** Use Edelbrock Performer-Link Timing Chain and Gear Set #7811 or Accu-Drive gear drive #7892. Do not use late model timing chain and gear sets that are designed for emission-controlled engines. These timing sets are machined in a retarded position and are not recommended for this camshaft installation. Edelbrock Timing Sets feature three keyways for specified timing selection. Use "0" position for most applications.

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