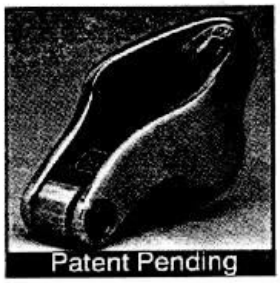
MAGNUM ROLLER ROCKER ARMS



INSTALLATION INSTRUCTIONS

Congratulations on your purchase of Competition Cams' Magnum Rocker Arms. Magnum Rocker Arms are the strongest, most accurate replacement rocker arms on the market today. Magnum Rocker Arms not only improve engine performance and efficiency, they also reduce friction and guide wear to help your motor stay healthier longer.

To ensure maximum benefit from your Magnum Rockers, installation and valve adjustment should be done with care. The following guide will assist you with the installation and adjustment of your new Magnum Rocker Arms.

Read through all the instructions thoroughly before beginning installation!

1 **Read the special instructions beginning on page 3.**

2 With the valve covers off, and old rocker arms removed, the first step will be to inspect the pushrods. Competition Cams strongly suggests when installing new rocker arms (of any kind), that new Competition Cams pushrods be incorporated to ensure that all mating surfaces are fresh to prevent any premature failures. If you are using the old pushrods, examine the ends of all pushrods for any flaking or galling. Any imperfections on the ends of the pushrods will result in either rocker arm or lifter failure.

Clean, and blow dry all pushrods. Also blow through the pushrod to remove any foreign matter such as sludge. Remember, in any type of motor work, cleanliness is imperative!

3 Inspect rocker arm studs, pedestals, etc. for excessive wear. Check to see if the old rocker was cutting into the side of the rocker arm stud. Also check the guide slots in the cylinder head or guide plates for excessive wear. Wipe clean the tops of all the valves and again inspect each one for wear or 'mushrooming' of the valve stem.

Movement of metal or galling of the studs, pedestals or valve stems is a sign of excessive wear. Now is the time to make whatever decisions are necessary. Installing new rocker arms on questionable studs or mushroomed valve stems is asking for trouble.

4 Remove the Magnum Rockers and wash thoroughly all balls, rockers and nuts with soap and hot water or denatured alcohol (lacquer thinner.) Blow dry.

5 Install the pushrods into the motor. We suggest that all the pushrods be pre-oiled through the pushrod holes. Apply a small amount of Competition Cams assembly lube to valve stem tips and rocker arm pushrod seat.

6 Install rocker arm on rocker stud. Pay special attention to the pushrod and rocker arm positioning. Be sure that the pushrods are seated in the lifter and rockers arm seats.

Apply a liberal coating of Competition Cams assembly lube to the rocker arm ball and position it on the rocker stud. Apply adjusting nut, but do not tighten the adjusting nut until you go through the proper sequence of lifter adjustment.

Install remainder of rocker arms in this manner.

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7 After carefully checking to be sure all pushrods are seated in the lifter and rocker arm, it is time for valve lash adjustment.

8 By installing the crankshaft dampner bolt back into the snout of the crankshaft, turn the engine over by hand in the direction of its running rotation until the exhaust pushrod begins to move upward to open the valve. You can now adjust the intake valve of that same cylinder and be assured that you are on the 'base circle' of the intake lobe.

Hydraulic Lifter Cams: Tighten the adjusting nut until all the slack is taken out of the rocker arm and pushrod. By lightly turning the pushrod with your fingers as you tighten the adjusting nut, you will discover or feel a point at which there will be a slight resistance. At that point, you have taken all the excess slack out of the pushrod. You are now at what we refer to as 'zero lash.'
Turn the adjusting nut one-half turn more. This will give you the ideal pre-load of the rocker arm, pushrod and lifter. Following this procedure, carefully adjust all intake valves.

Solid Lifter Cams: Consult cam specifications card or cam manufacturer for correct lash specs. Tighten adjusting nut while proper feeler gauge is between roller tip and valve to the point at which there is a slight drag when moving feeler guage.

Following this procedure, carefully adjust all intake valves.

9 **Hydraulic Lifter Cams:** To adjust the exhaust valves, turn the engine over until the intake pushrod moves all the way up. Rotate past maximum lift, approximately one-half to two-thirds of the way back down. You are now on the base circle of the exhaust lobe and can adjust the exhaust valve.

Rotate the exhaust pushrod with your fingers and begin to tighten the exhaust adjusting nut. When you feel resistance on the pushrod, you are at zero lash. Tighten the adjusting nut one-half turn more.
Go through the exhaust valves and repeat the procedure carefully. You now have all of the valves adjusted with the proper pre-load.

Solid Lifter Cams: To adjust the exhaust valves, turn the engine over until the intake pushrod moves all the way up. Rotate past maximum lift, approximately one-half to two-thirds of the way back down.

Tighten adjusting nut while proper feeler gauge is between roller tip and valve to the point at which there is a slight drag when moving feeler gauge. Following this procedure carefully adjust all exhaust valves.

10 Before you re-install the valve covers, take your oil can and squirt oil down on the the rocker arm ball and on the roller tip of the rockers. This will be extra insurance that the rocker arms will have adequate lubrication until the oil travels up from the motor.

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BE SURE TO CHECK THE FOLLOWING BEFORE OPERATING THE ENGINE.

1. Old pushrods should not be used.
2. Immediately upon startup rocker arms must have adequate oil supply.
3. Check pushrod to cylinder head slot clearance.
4. Check rocker arm to valve spring retainer clearance.
5. Check for valve spring coil bind. If this occurs, the correct spring must be installed.
6. The maximum open spring pressure is 350 lbs.

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If you have any questions about your Magnum Roller Rocker Arms, call our tech line at **1-800-999-0853**

SPECIAL INSTRUCTIONS

IMPORTANT!

1. The use of old pushrods may result in pushrod or rocker arm failure. It is necessary that you install new pushrods with your new Magnum Roller Rocker Arms to insure your rocker arm warranty. Pushrod ends have a mated surface to the rocker arm ball socket, much like a cam and lifter mate to each other. This is why used pushrods cannot be run with new Magnum Roller Rockers.

2. On racing applications with dual springs, the rocker arms should be removed and inspected after the first hour of running time. The recommended maximum open valve spring pressure is 350 lbs.

3. Never use Magnum Roller Rockers with solid roller lifter camshafts.

4. In most cases Magnum Roller Rockers fit under stock valve covers without any clearance problems, however, if your engine has cast aluminum valve covers, check for interference.

AMERICAN MOTORS

'66-'90 V-8 290-401 C.I. — PART NO. 1442

Before installing Magnum Roller Rockers, the cylinder heads must be machined to accept screw-in studs and guide plates.

For high valve lift applications (.500 +), longer pushrods may be required to correct rocker arm geometry. Remember, valve tip height, block deck height, cam base circle and head surface all effect the pushrod length required.

CHEVROLET

'65-'90 V-8 396-454 C.I. — PART NO. 1411

When installing Magnum Roller Rockers, check your new pushrods to make sure they fit your guide plates. Chevrolet has used 3 different pushrod diameters on production Big Blocks (5/16", 3/8", 7/16"). Be sure to check for valve spring coil bind. This is a major problem area for big block Chevrolets.

CHEVROLET

'55-'90 V-8 265-400 — '78-'90 V-6 200-262

PART NO. 1412 (1.52) & 1416 (1.6)

1987 - Up Corvette w/ Aluminum Heads: When installing Magnum Roller Tip Rocker Arms on engines equipped with aluminum Corvette cylinder heads, use Chevrolet hardened guide plates (#14011051). These guide plates must be used to maintain proper rocker arm alignment and prevent engine damage.

Engines using the 1416 (1.6) Magnum Roller Rockers should be checked for clearance between the pushrod and pushrod slot in the cylinder head. The pushrod slot may need to be elongated. Part #4710 (The Louis Tool) can be used with a 5/16" drill bit and a hand drill to provide extra clearance. We recommend removing the cylinder head to prevent metal shavings from contaminating the engine. An alternate method is to install screw-in studs and guide plates, then drill the guide holes to 1/2" diameter.

For high valve lift applications (.500+), longer pushrods may be required to correct rocker arm geometry. Remember, valve tip height, block deck height, cam base circle and head surface all effect the pushrod length required.

CHEVROLET

'80-'89 V-6 173 c.i. (2.8L) — Part No. 1413 (1.52) & 1414 (1.6)

2.8L V-6's come equipped with metric thread and stud sizes. We have included special metric lock nuts and pivot balls with the Magnum Roller Rockers. Both the 1.52 and 1.6 Magnum Roller Rockers are a direct bolt-on and need no special machine work to the cylinder head.

FORD

'62-'90 V-8 289, 302 & 351W — PART NO. 1431, 1442

1431-16: "Rail" type Magnum Roller Rocker Arm.

This rocker arm must be used with long tipped valves. Do not use guide plates or "slotted" cylinder heads with this rocker arm.

1442-16: "Non-Rail" Magnum Roller Rocker Arm.

These may be used on long or short tipped valves, but must have guide plates or guide slots in the cylinder head to maintain rocker arm alignment.

Most '78 and later 302, 302 H.O. and 351W engines have a cap screw (bolt) that holds the rocker arm in position. This bolt must be replaced with part #4504-16 screw-in studs when installing #1431 Magnum Roller Rocker Arms.

Some 1985 and later engines are equipped with hydraulic roller cams and use special length pushrods. Be sure to use the correct pushrod.

Some '67 - '77 engines come with tapered (bottleneck) studs, 3/8" bottom and 5/16" top. On these engines, you will need #4610-16 adjusting kit, containing a 5/16" locknut and hardened spacer to provide rocker adjustment.

For high valve lift applications (.500+), longer pushrods may be needed to correct rocker arm geometry.

FORD

'70-'82 351C; 351M-400M C.I. & '68-'90 429-460 C.I. — PART NO. 1411

Screw-in studs and guide plates will be required to install Magnum Rockers on these engines. Check rocker arm geometry, as longer pushrods may be needed.

PONTIAC

'55-'81 V-8 265-455 C.I. — PART NO. 1451

Pontiac Magnum Rocker Arms are supplied with larger, thicker rocker arm balls and 3/8" self-locking nuts. These components convert your non-adjustable valvetrain to permit valve lash adjustment.

DO NOT TORQUE ADJUSTING NUTS PER FACTORY SPECIFICATIONS. Follow steps 7, 8 & 9 on page 2 for the correct valve adjustment procedure.

Most Pontiac engines come equipped with tappered studs, 7/16" bottom and 3/8" top. However, some early engines have 7/16" straight studs and will require a 7/16" lock nut.

For high lift applications, longer pushrods may be required. Check your rocker arm geometry.

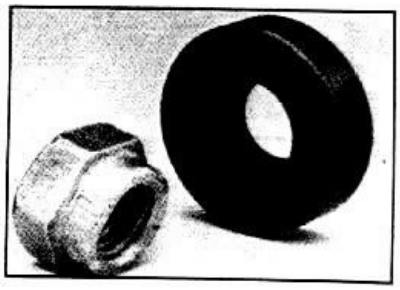
OLDSMOBILE

'67-'84 V-8 260-455 — PART NO. 1442

To install Magnum Roller Rockers on Oldsmobile engines, cylinder head machining will be required. Screw-in studs and guide plates must be used. Before operating the engine, check pushrod length and rocker arm geometry.

OTHER RECOMMENDED COMPONENTS

Ford Adjusting Kit Part #4610-16



Our Ford adjusting Kit is specially designed to convert non-adjustable valvetrains to allow rocker arm adjustment. This kit works on early model 302 and 351W engines with positive stop rocker arm studs. Simply install the hardened spacer over the stud and replace the stock nut with the 5/16" lock nut supplied. Your valvetrain is now fully adjustable.

The Louis Tool Part #4710

The Louis Tool is a special drill bushing for Small Block Chevrolets that allows the engine builder to simply use a hand drill with a 5/16" bit to elongate the pushrod slot for 1.6 rocker arms. This tool locates off the original pushrod slot and provides extra clearance between the pushrod and cylinder head. It eliminates the need for guide plates and costly machine work.

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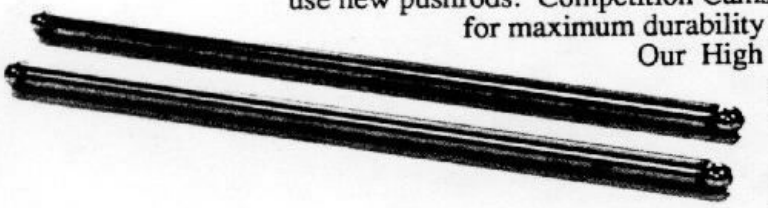
PUSHRODS

The absolute best insurance that your new Magnum Roller Rocker Arms will perform correctly is to use new pushrods. Competition Cams' pushrods are factory matched to our Magnum Rockers for maximum durability and performance.



Our High Energy Pushrods are an excellent stock replacement pushrod and are best used in applications with single valve springs. For high performance applications, especially when running dual valve springs, use our Magnum Pushrods. These pushrods are made from 4130 chromemoly steel tubing, feature hardened steel press-in ends and are heat treated for use with guide plates.

Brand & Size of Engine	Part #	No. Per Set	Description	Guide Plates	Dia.	Overall Length
HIGH ENERGY						
AMC						
V8 304-401	7812	16	Most 1970-up	Yes	5/16"	7.794
Chevrolet						
V6 173 (60°)	7816	12	1980-'86	Yes	5/16"	6.163
V6 200-262	7812	12	1978-'86	Yes	5/16"	7.794
V8 262-400	7812	16	1955-'86	Yes	5/16"	7.794
V8 396-454	7854	16	'65-'86 7811 Int. 7881 Exh.	Yes	3/8"	—
V8 396-454	7811	8	Intake - hardened replacement	Yes	3/8"	8.280
V8 396-454	7881	8	Exhaust - hardened replacement	Yes	3/8"	9.252
Ford						
V8 255-302	7831	16	1968-'85	No	5/16"	6.876
V8 351W	7835	16	1969-'78	No	5/16"	8.152
V8 351C & Cobra Jet	7832	16	1970-'74	No	5/16"	8.408
V8 351M & 400M	7837	16	1971-'79	No	5/16"	9.500
V8 429-460	7834	16	1972-'78	No	5/16"	8.550
Oldsmobile						
V8 260-403	7842	16	1971-'79	No	5/16"	8.234
Pontiac						
V8 265-455	7851	16	1955-'79	Yes	5/16"	9.136
MAGNUM CHROMEMOLY						
Chevrolet						
V8 265-400 + 90° V6 200-262	7372	16	Hardened Stock Length	Yes	5/16"	7.794"
V8 265-400 + 90° V6 200-262	7693	16	+ .100" Hardened	Yes	5/16"	7.894"
V8 265-400 + 90° V6 200-262	7694	16	+ .150" Hardened	Yes	5/16"	7.944"
V8 265-400 + 90° V6 200-262	7695	16	+ .200" Hardened	Yes	5/16"	7.994"
V8 265-400 + 90° V6 200-262	7472	16	+ .350" Hardened	Yes	5/16"	8.144"
V8 265-400 + 90° V6 200-262	7513	16	Stock Length Hardened	Yes	3/8"	7.794"
V8 265-400 + 90° V6 200-262	7684	16	+ .100" Hardened	Yes	3/8"	7.894"
V8 396-454	7154	16	7131 Int. - 7141 Exh. Stock Length	Yes	3/8"	—
V8 366-427 Truck Block	7654	16	7651 Int. - 7661 Exh. Stock Length	Yes	3/8"	—
Ford						
V8 221-302	7632	16	1962-'69	Yes	5/16"	6.804"
V8 302	7631	16	1969-'85 Non-roller, non-H.O.	Yes	5/16"	6.886"
V8 Boss 302	7492	16	1969-'70 Boss	Yes	5/16"	7.605"
V8 351W	7472	16	1969-'78	Yes	5/16"	8.144"
V8 351C (C.J.)	7502	16	1970-'74	Yes	5/16"	8.408"
V8 351C	7522	16	1970-'74	Yes	3/8"	8.408"
V8 Boss 351C	7532	16	1971-'72	Yes	3/8"	8.492"
V8 429-460	7651	16	1969-'71	Yes	3/8"	8.680"
Oldsmobile						
V8 260-403	7131	16	.046" Longer than stock	Yes	3/8"	8.280"
V8 400 & 455	7582	16	Hardened Replacement	Yes	5/16"	9.547"
V8 400 & 455	7664	16	+ .100" Hardened	Yes	3/8"	9.647"
Pontiac						
V8 350-455	7262	16	1968-'79	Yes	5/16"	9.130"

Competition Cams' Checking pushrods

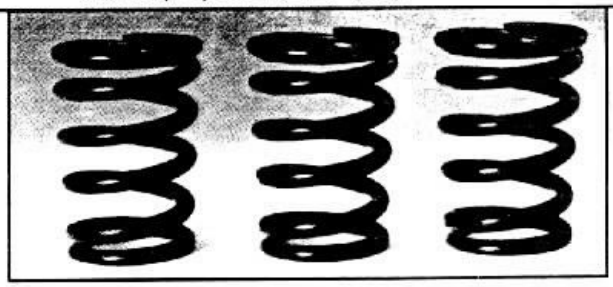
These new adjustable pushrods are an excellent tool to aid the engine builder in determining the correct pushrod length. They are offered in various lengths from 6.125" to 11.5" and have an adjustment range of approximately 1.3". These pushrods can be ordered individually or in a kit containing one each of the five different lengths.

PART #	RANGE	QUANTITY
7900	KIT (One each of all lengths)	5
7901	7.5" - 8.7"	1
7902	8.5" - 9.8"	1
7903	9.7" - 11.0"	1
7904	10.2" - 11.5"	1
7905	6.125" - 7.5"	1

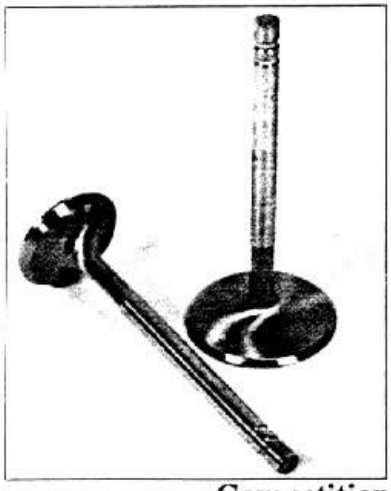
Competition Cams' Conical Valve Spring

Coil Bind Height:	1.070"
Pressure at 1.750:	105 lbs.
Pressure at 1.700:	120 lbs.
Pressure at 1.250:	280 lbs.

PART #	DESCRIPTION
982-16	Conical Springs
982-Kit	#982 Conical Springs (16), retainers (16), locks (16) and seals (16)



Competition Cams' Conical Valve Spring is the solution to a long standing problem. Small block Chevrolets that run .500" or more lift normally need dual springs and head machining. Our conical springs fit the standard 1.250" spring pocket with no modifications and allow the use of higher lift cams.
These springs are also offered in a kit with everything you need: retainers, locks, oil seals and springs.



Competition Cams' Stainless Steel Valves

Competition Cams' new one-piece stainless steel valves are a must for high performance street and bracket engines. We've designed these valves to take abuse and deliver the performance you expect! Each valve is forged from a special high quality stainless steel then swirl polished. They feature hard chrome stems and hardened stellite tips for superior durability and strength. Plus we've got sizes for all popular engines. Call our technical department today for your application.

Competition Cams' Valvetrain Reference Catalog

Competition Cams' new reference catalog (#106A) combines over 140 pages of technical tips, applications and part numbers with an all new easy to use format to help you find the exact part combinations for the way you drive. Throughout the catalog you'll find specialized sections like "How To Degree Your Cam" and "High Energy And Magnum Questions Answered". We also include a profile of Competition Cams' research and developement procedures as well as an introduction to our engineering staff. Don't leave your questions unanswered - Order now!

Competition Cams' Cam Installation Video

This video, narrated by Research and Development Director Paul "Scooter" Brothers, takes you through the various stages of cam installation and degreeing with all the know-how you'd expect from Competition Cams! Included are all the details and trade secrets that Competition Cams has accumulated in over 12 years in the performance business. Whether it's your first cam installation or your 40th, we're sure you'll refer again and again to this information packed 35 minute video! **Part #190-1**

COMPETITION CAMS®
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