TREND
Performance

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PRODUCT CATALOG #15

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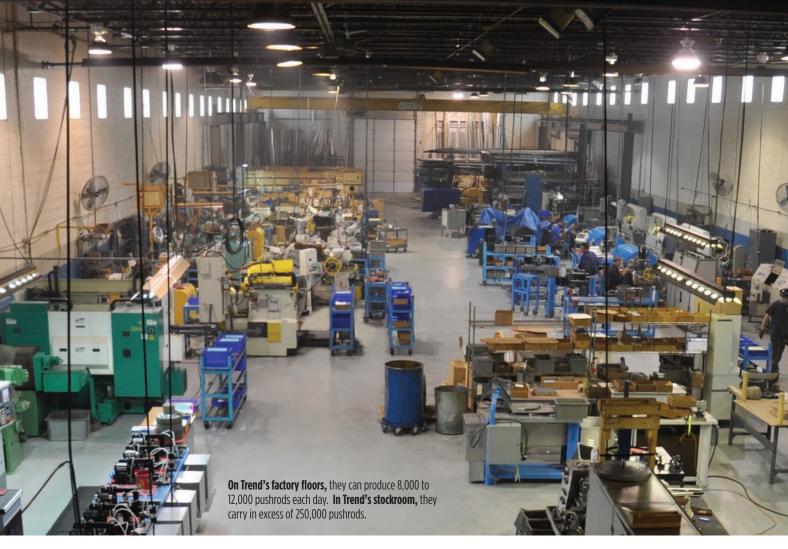


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since company founder Bob Fox first created a new way to make onepiece pushrods, Trend Performance has been the driving force of new products. In reality, though, the driving force has been increases in RPM and horsepower and Trend's response with new geometry and materials such as tool steel and bronze inserts, notably in Pro Stock applications.

Additionally Trend has its innovative valve train test machine, the SpinTron™, to develop new products. Moreover, collaboration with top engine builders leads to the development of new products that benefit all race teams.

Through extensive research and testing, including countless hours on a SpinTron™, Trend has learned that pushrods must not only resist bending loads and evade overheating on the ball ends but also the frequency of the pushrods must match the rest of the valve train components, as well as the RPM at which the engine will be run.

Today's race engines require the highest quality components at every step. Trend Performance aims to exceed those requirements.

Meet the Staff at Trend Performance



Bob Fox, Founder & owner Established Trend Performance in 1988, introduced the SpinTron in the '90s and perfected the one-piece pushrod.



JJ Zimmerman, Technical advisor specializing in diesel applications



Jerry Pelkey, SpinTron specialist and 20yr veteran of Trend Performance. Skilled in electronics



Steve Rhodey, Manager 5yr veteran of Trend Performance. Leads sales team and handles customer requests.



Paula Edel, Invoicing, billing and customer service 15yr veteran of Trend Performance



Frank Patrona, Grinding shop foreman with 30 years experience in centerless grinding and micro-finishing



Darin Decator, Inventory control manager Also active in sales and technical assistance.



Vickie Brown, Receptionist Vickie also handles stocking orders and inventory management



Andy Anderson, NC manufacturing plant Specialist in design, development and prototyping



Bill Vinton, Lead sales consultant and technical advisor with long background in customer service



Lief Glasius, Shop foreman and 14yr veteran of Trend Performance. Skilled in manual machining, CNC-machining, and fabrication



Chuck Jones, NC manufacturing plant Sales

Important Information about Trend's Pushrods:

5/16 x 0.080in - Case hardened to Rc58-62, guide plate design with 180° ball ends. Stocking from 5.850 - 11.050in. Most lengths supplied in 0.025in increments – no custom lengths available.

5/16 x 0.105in - Case hardened to Rc58-62, guide plate design with 210° ball ends. Stocking from 7.000 to 9.650in. Most lengths supplied in 0.025in increments.

3/8 x 0.080in -Case hardened to Rc58-62, guideplate safe with 180° ball ends. Stocking from 6.000 to 12.250in. Most lengths supplied in 0.025in increments – no custom lengths available.

3/8 x 0.135in - Case hardened to Rc58-62, guideplate safe with 210° ball ends. Stocking from 7.000 to 10.175in. Most lengths supplied in 0.025in increments.

7/16 x 0.125in - Discontinued but still available while stocks last. Case hardened to Rc58-62, guide-plate design with 180° ball ends. Inventory from 6.750 to 11.450in still available, but please

check to verify. Same price as straight style with 0.165in wall. Will supply if customer orders 200 or more pieces.

7/16 x 0.165in -Straight Style- Case hardened to Rc58-62, with 1-5/8in clearance tips and 210° ball ends. Not guide-plate usable. Stocking from 7.300 – 11.950in. Most lengths supplied in 0.025in increments.

Double Taper Style - Case Hardened to Rc58-62, with 210° ball ends. Not guide-plate usable. Stocking from 7.000 – 11.550in. Most lengths supplied in 0.025in increments.

Guide-plates - Pushrods operating in guideplates require 0.500in tip at the rocker end. A nonstocking item, they are available as a Quick Ship item, which takes 24 - 48 hours, or alternatively made from stock tubing (ST716100) in 7 - 10 days.

1/2 x 0.200in -Straight style pushrods with 1 -5/8 clearance tips with 210°. Case hardened to Rc58-62. Stocking lengths from 8.000 to 11.000in in 0.050in increments. Can be supplied in full or double taper styles. Available within one day.

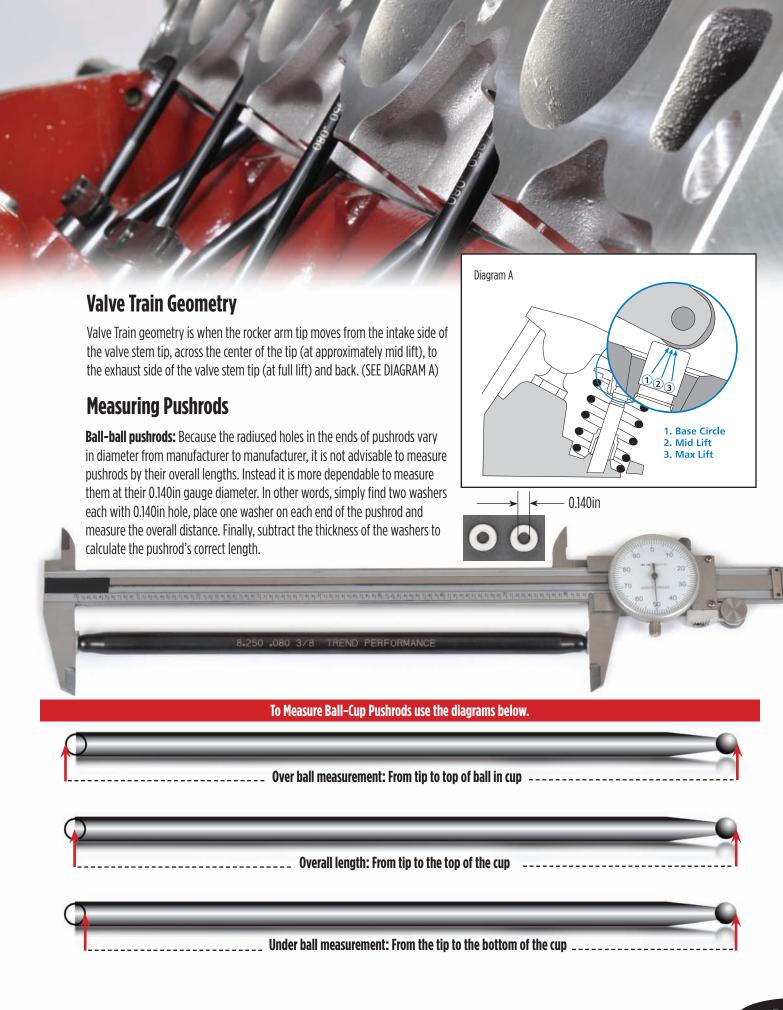
Quick Ship: 3/8 x 0.135in, 7/16 x 0.165in, 1/2 x 0.200in, 9/16 x 0.187in and 5/8 x 0.187in are available from our Quick Ship program up to 13.000in maximum length. Pushrods 3/8 x 0.135in are acceptable for guide-plate use. However 7/16 and larger are not as they have 1-5/8 clearance with 210° tips. Available in 24-48 hours including BZ and QSR pushrods.

Fully Hardened, V40 Quick Ship and H13 pushrods: Available 48-72 hours maximum depending on volume.

Kits: Typically kits can be completed in 1-2 days, but may be delayed 4-5 days during peak season production.

Restricted: Pushrods with oil restrictions can only be made through the stock tubing process as they require heavy wall pushrods and typically take 10-14 days to complete. They cannot be made from light wall or Quick Ship pushrod blanks.









marine applications.

Manufactured with 5/16in ballball ends they are available in lengths of 6.000in to 11.550in in increments of .025in. The ball ends are machined to a tolerance of plus or minus .001in and the pushrods are laser-etched with the customer's name and specifications on a black oxide finish.



As an option to those indicated at right, Trend machines the ball ends with a 210° radius for extra clearance.



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|----------------|----------|------|--------------------------------|-------------------|---------------------------|------------|
| Part Number | Diameter | Wall | Lengths in .025" increments | 210º Clearance | Single or Double Taper | Quick Ship |
| TXXX805 | 5/16" | .080 | 6" to 10" | Optional | N/A | N/A |
| TXXX1055 | 5/16" | .105 | 7" to 9.8" | Standard | N/A | N/A |
| TXXX803 | 3/8" | .080 | 6" to 12" | Optional | Optional | N/A |
| TXXX1353 | 3/8" | .135 | 7" to 9.8" | Standard | Optional | Optional |
| TXXX1657DT | 7/16" | .165 | 7" to 11.5" | Standard | **Standard | Optional |
| TXX1657 | 7/16" | .165 | 7.4" to 11.5" | Standard | Optional | Optional |
| TXXX2002 | 1/2" | .200 | *8" to 11" | Standard | Optional | Optional |

For ordering, use your desired length to replace "XXX". For example: T625805 would equate to a pushrod with a length of 6.25", 080"-wall, with a diameter of 5/16". For lengths longer than 10", use "TT" to preface part # instead of the single "T". *Lengths available in .050" increments. **Pushrods are stocked double-tapered.





Quick Ship Pushrods

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LIFTER EN

Because the length of the required pushrod isn't established until the engine is almost completely assembled, it is often the last part ordered but the part most urgently needed. To overcome this concern, Trend introduced a new **Quick Ship program** that decrees custom-length pushrods will be **shipped within 24 to 48 hours**. The service can be applied to any combination of machined tips, single or double tapers.

Just select the length (from 6.00 in to 13.00in); the diameter (3/8in, 7/16in, 9/16in, and 5/8in); single or double taper; and whether ball-end or radius-cup. This program is further strengthened by an inventory in excess of 100,000 pushrods.

Duilding successful Pro Stock race engines is a craft, involving hours of SpinTron and dyno testing. We look for valve train stability and durability. With Trend we have both.

–Jason Line, KB Racing

AVAILABLE FOR QUICK SHIP - UP TO 13.000" MAX LENGTH:

- NEW! 3/8" diameter available in 0.135" wall thickness
 - 7/16" diameter available in 0.165" wall thickness
 - 1/2" diameter available in 0.200" wall thickness
 - 9/16" diameter available in 0.187" wall thickness
 - 5/8" diameter available in 0.125" and 0.188" wall thickness
 - All diameters available with 5/16" and 3/8" ball ends
 - One-piece construction from SAE 4130 seamless tubing
 - Centerless ground, Satin finish

Quick Ship orders must be faxed to ensure proper processing. All fax orders will be confirmed within 2 hours of receipt. Please see ordering instructions on page 23 of this catalog. Verbal orders will be the responsibility of the customer (including quantities, dimensions and shipping instructions).



Alcohol Pushrods

Trend Performance has introduced a new pushrod for alcohol applications. It is designed for A-dragsters, Funny Cars, Pro Mods, Pro Extreme, Extreme 10.5, Comp Eliminator, Top Sportsman, Top Dragster, and alcohol boats and pulling trucks with BAE engines. Because of the growing numbers in the alcohol classes, Trend has placed these new pushrods on their **Quick Ship** program, which means they aim to dispatch orders within 24 to 48 hours.

- Created from 4130 chrome molybdenum tubing
- Heat-treated and available in 7/16-inch diameter with .165-inch wall
- Manufactured with a 3/8-inch ball on the lifter end and a 5/16-inch radiused cup on the rocker-ball end
- Case-hardened via a carbo-nitriding process to Rockwell Rc60 for extra strength and rigidity
- Precision-ground full taper, starting at 7/16-inch diameter near the lifter end and reducing to 3/8-inch under the cup for clearance
- Provided with a 1/4-inch shallow cup for extra working clearance





Precision Pushrods

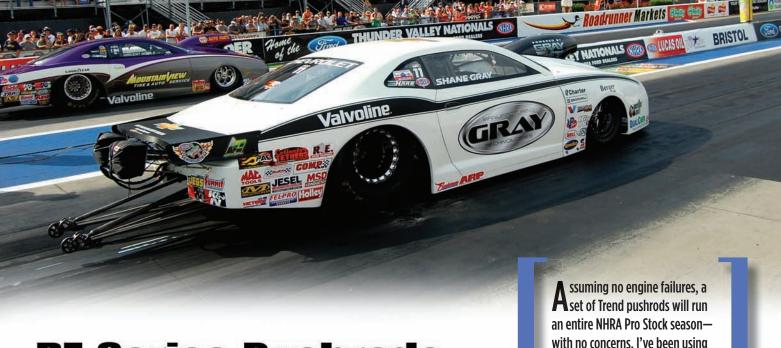
Mostly used with Cup teams, Trend's precision pushrods are similar to other CNCmachined pushrods but with closer machining tolerances (plus or minus 0.0005in) on the ball ends. They receive the

"kid-glove" treatment after heat treating: they are polished, cleaned, dipped in a rust preventative and



- Created from 4130 chrome-molybdenum thick-wall tubes, these Precision pushrods are made to tight tolerances: ball end radius to plus or-minus 0.001in and 0D and length to plus-or-minus 0.005in.
- Every pushrod is checked to ensure it is to the correct length and every pushrod is cleaned with a special brush and solvent to ensure its internals are free of heat treat scale or other contaminants.
- Trend's Precision pushrods are available in 7.000in to 11.500in and in increments of 0.025in. Diameters include 7/16in or 1/2in or 9/16in and with ball-ball ends or ball-cup ends in either 5/16in or 3/8in.
- Centerless-ground and case hardened to Rockwell Rc60 for extra strength and rigidity, each Trend Precision pushrod is checked for straightness, buffed by hand and one-hundred percent inspected
- To complete the process, Trend Precision pushrods are laser-etched with customer details, dipped in rust preventative, and individually bagged and sealed in a plastic sleeve





BZ Series Pushrods

BZ (Bronze Insert) pushrods are created for high-horsepower engines, especially for Pro Stock teams, 800 CID Mountain Motor racers, Top Sportsman teams, and large-displacement nitrous engine builders. In addition, BZ pushrods are now available on Trend's 24-hour Quick Ship program.

Constructed from 4130 chrome-molybdenum thick-wall tubes, preformed and centerless-ground with a high-load bearing bronze insert, these shelf-stock items are fully **heat-treated** and available in diameters of 7/16 x .165-inch wall or 1/2 x .200-inch wall or 9/16 x .187-inch wall. On the lifter end they are manufactured with conventional ball-end diameters of 5/16 or 3/8 inch. On the top end, the bronze insert is press-fitted and machined with a 0.140-inch radius cup—designed to accept the popular 9/32-inch rocker adjuster ball.

This new BZ Series is case hardened to Rockwell Rc60 for extra strength and rigidity and made available in straight form, full single taper, or double taper (tapered from the center to each end).

To lubricate the upper cup and rocker ball, a thin oil passageway runs through the center of the pushrod allowing pressurized oil to travel from the lifter bore to the rocker.

The heat treating process for the BZ Series is a one-step carbo-nitriding process, administered in an atmospheric furnace containing a combination of ammonia and natural gas. Carbon is induced into the surface of the pushrod from the natural gas, nitride from the ammonia.

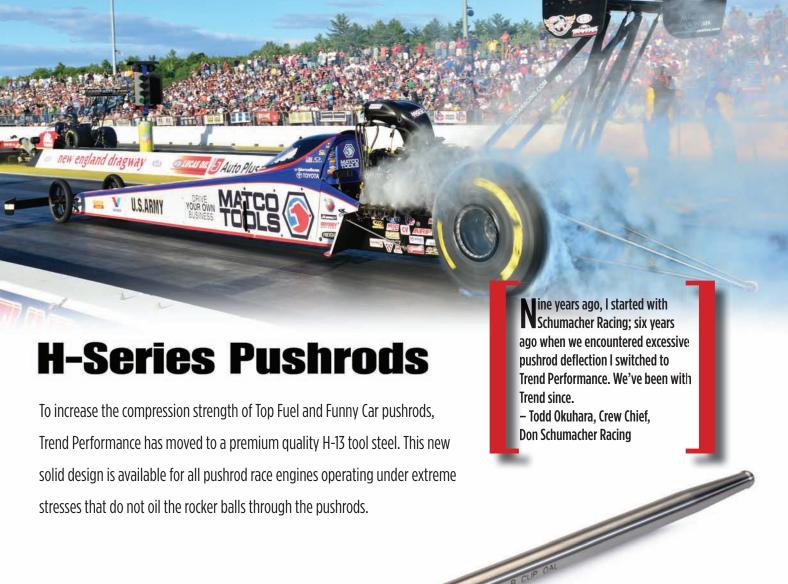
► Trend also offers a 7/16" tool steel ball-cup pushrod which has a .1405" tool steel radius cup insert to fit the .281" diameter of the ball.

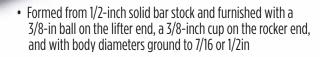
Trend's heat treatment process:

Trend pushrods and piston pins for almost 15 years. – Paul Hoskins,

Gray Motorsports

Trend brings their pushrods up to temperature then quenches them and then tempers them. The duration of the heat treatment determines the amount of case depth. The quench determines the retained austenite or material properties in the components. To increase the hardness a cryogenics procedure is also applied during the quenching process. This operation can freeze the pushrods to as low as minus 300 degrees. Finally the pushrods are tempered and returned to the desired hardness.





- Derived from H-13 tool steel, a very tough material which is ideal for parts with critical features
- Heat-treated to a hardness of 54 to 56 Rockwell then quenched and tempered to relieve stresses
- Case-hardened by nitriding to approximately 0.006 to 0.008inch deep, which invests it with a surface hardness of up to 70 Rockwell
- Finished by hand, using fine sandpaper and ScotchBrite



Hard-tip Pushrods Trend's new self-lubricating 5/16in Hard-tip competition pushrods

While their lower ends, those that engage the lifter seats, remain unaltered, their upper ends now feature self-lubricating tool steel tips hardened to 60Rc. Both 5/16in diameter ball ends are formed with a 210-degree radius at the end of a 1-5/8in taper to provide proper operating clearance around the rockers

as well as the lifters and lifter bores.

Engineered to overcome degradation troubles on the upper ball of high-revving high-powered engines, these new Hard-tip pushrods are now available in the following diameters: 7/16in, 1/2in, and 9/16in. Their wall thicknesses are 0.125in or 0.165in; 0.125in or 0.165in or 0.200in; and 0.200in respectively.

Prepared in a satin finish over a precision center-less ground surface and laser-etched to the customers' request, Trend's Hard-tip pushrods are available in any length—usually 6.000 to 13.000 inches.



Similar to Trend's hard-tip pushrods, the V-40 cup pushrods feature self-lubricating tool steel tips hardened to 60Rc. The 5/16in diameter ball end is formed with a 210-degree radius at the end of a 1-5/8in taper to provide proper operating clearance around the rockers as well as the lifters and lifter bores.

Engineered to overcome degradation troubles on the upper ball of high-revving high-powered engines, these new V-40 cup pushrods are now available in 5/16in with a .281 radius cup. Prepared in a satin finish over a precision center-less ground surface and laser-etched to the customers' request, Trend's V-40 cup pushrods are available in any length—usually 6.000 to 13.000 inches.



STRENGTH & RIDIGITY designed to handle higher spring pressures with greater resistance to deflection

NEW! FIRST ONE-PIECE forged pushrods for Cummins & Duramax 12v and 24v-now in 7/16" diameters

> OEM STOCK LENGTHS are available as shelfstock items CUSTOM LENGTHS available with Trend's Quick Ship program

> > ROBUST forged cup ends



| ENGINE | PART NUMBER | STAGE | FINISH | DESCRIPTION |
|-------------------|---------------------|-------|--------------|---|
| 12V CUMMINS | TPD1105803-3 | I | BLACK OXIDE | 2 piece .080" wall, Stock length |
| 24V CUMMINS | TPD1160803-3 | I | BLACK OXIDE | 2 piece .080" wall, Stock length |
| 12V CUMMINS | TPD11051353-10C3 3P | II | SATIN FINISH | 1 piece forged .135" wall, Stock length |
| 24V CUMMINS | TPD11601353-10C3 3P | II | SATIN FINISH | 1 piece forged .135" wall, Stock length |
| 12V CUMMINS | TPD11051657-10C3 | III | SATIN FINISH | 1 piece forged .165" wall, 7/16, Stock length |
| 24V CUMMINS | TPD11601657-10C3 | III | SATIN FINISH | 1 piece forged .165" wall, 7/16, Stock length |
| 7.3L POWER STROKE | TPD10225807-3 | I | BLACK OXIDE | 1 piece .080" wall, Stock length |
| 6.0L POWER STROKE | TPD9838803-3 | I | BLACK OXIDE | 1 piece .080" wall, Stock length |
| 6.4L POWER STROKE | TPD9795803-3 | I | BLACK OXIDE | 1 piece .080" wall, Stock length |
| 7.3L POWER STROKE | TPD102251657-3 | II | SATIN FINISH | 1 piece .165" wall, Stock length |
| 6.0L POWER STROKE | TPD98381353-3 | II | SATIN FINISH | 1 piece .135" wall, Stock length |
| 6.4L POWER STROKE | TPD97951353-3 | II | SATIN FINISH | 1 piece .135" wall, Stock length |
| 6.7L SCORPION | TPD9708803-5 | I | BLACK OXIDE | 2 piece .080"wall, Stock length |
| 6.6L DURAMAX | TPD9686807-12 | Ī | BLACK OXIDE | 2 piece .080" wall, Stock length |
| 6.6L DURAMAX | TPD96861657-12 | II | SATIN FINISH | 2 piece .165" wall, Stock length |

Use Stage I for mildly modified engines, Stage II for turbo or power-added engines, Stage III for competition engines operating under high stress.

Displaying robust forged cup ends, Trend pushrods are believed to be the first onepiece pushrods to suit Cummins 12v and 24v and 6.6L Duramax diesel engines. They are produced from 4130 chrome molybdenum and heat treated to around Rockwell Rc60. Their advantage lies in their strength and rigidity; thus they handle higher spring pressures and contribute greater resistance to deflection. For Ford's 6.0L and 6.4L Power Stroke diesels Trend has introduced four new 11/32in pushrods with wall thicknesses of 0.080in and 0.135in. For the larger 7.3L engine, 7/16in diameter with 0.080in wall and 0.165in wall are available. 0EM stock lengths for all three series are now offered as shelf-stock items. Custom lengths are dispatched via Trend's 24-to 48-hour Quick Ship program.



Diesel Tappets & Piston pins

Trend believes their new coated TP-1 pin possesses longevity beyond any comparable product currently in use. Heat treated to a through-hardness of Rc60 (hardened from its outer case to its inner core), Trend's new pin has the toughness of the maraging steels and the hardness, the compressive strength, and the surface qualities of M2, the superior high speed tool steel.







hough it is deceptively simple in appearance, the piston pin must be recognized as a precision engineered component—a vital link that hinges the piston to the connecting rod. It has to satisfy several conflicting requirements; it must combine strength with lightness, it must be close fitting but with freedom to move, and it must resist wear without scuffing.

High performance piston pins are hollow and hard and lapped to a mirror finish. On some engines the diameter of the pin may be as much as 40 per cent of the piston diameter, so that maximum bearing pressure in the piston bosses can be controlled. On a mild performance engine the thermal pressure reaches 600psi or higher. On a 4in diameter piston this figure may be higher than 8,500lb—or over 4 tons of momentary force on the pin!

Consider also the expansion and contraction rates of a piston pin which is a function of its metallurgy and manufacturing process. A general rule in the industry is: a one-inch diameter steel piston pin will expand

0.0003in for every 50 degrees Fahrenheit increase in temperature, while the pin bores in most aluminium pistons will expand 0.0006in for every 50 degrees Fahrenheit increase in temperature.

Under certain engine conditions the pin temperature can be much higher than that of the piston pin bosses. When this occurs, oil clearance is reduced. If the pin clearance becomes too tight, seizure will occur.

Thus, piston pins operate under severe cylinder pressures and thermal stresses and their materials, surface finishes, and tolerances are critical to the life of the engine. They are required to remain rigid and minimize any expansion or deflection. And since the production of horsepower creates cylinder pressure and heat, the piston pin needs to be designed for the application.

At Trend we've succeeded in establishing a full-time engineering staff that explores new materials and processes such as our new TP-1 pin.

Pushrod Kits & Tips for Pushrod Kits



Create your own Pushrod kits - you get only the sizes you need!

- ► 5/16in x 0.080 wall in 1-inch increments from 6.000in to 10.000in
- > 3/8in x 0.080 wall in 1-inch increments from 7.000in to 12.000in
- ▶ 3/8in x 0.080 wall with 3/8in ball end in 1-inch increments from 7.000in to 14.000in
- ► 7/16in x 0.125 wall in 1-inch increments from 7.000in to 14.000in
- ► 1/2in x 0.200 wall in 1-inch increments from 7.000 to 14.000in
- ▶ 9/16in x 0.187 wall in 1-inch increments from 7.000 to 14.000in

Pushrod kits are typically available in 1-2 days or 4-5 during peak months.

Tips are available in 5/16in ball, 3/8in ball, 5/16in cup and 3/8in cup for tapered and straight pushrods

Fuel Pump Pushrods

Trend makes fuel pump pushrods for virtually all American V8 engines that use a pushrod to activate the fuel pump.

Most US Original Equipment Manufacturers use solid fuel pump pushrods, whereas Trend uses 4130 chrome molybdenum tubular pushrods. These are lighter and some of them employ bronze tips. The bronze tips function better when used in conjunction with an alloy steel roller camshaft (like 8620) but steel tips function better when used in conjunction with a cast iron cam.

| Part Number | Description |
|-------------|---|
| FP1000 | Chevrolet pushrod Steel Tips |
| FP1000BS | Chevrolet pushrod Steel Tip and Bronze Ti |



Valve Locks

If engines are exposed to over-revving, valve springs and sometimes valve retainers begin to float, you are dependent upon the humble valve lock to remain locked or else...

Ideally the valve locks should have full engagement with the valve stem, the keeper groove, and the angled interface of the retainer—the fuller the engagement, the stronger the joint. Further, it is preferable that no part of the valve locks should protrude beneath the retainer.

The three critical dimensions of the valve lock are as follows: the outer angle, the outer diameter, and the inner diameter.

The **outer angle**, typically 7, 8, or 10 degrees, is measured on a sine vice. The narrower angle creates the tighter lock; the wider angle allows easier separation.

The **outer diameter** of the valve lock is measured at a specific point on the angle. A race engine builder might specify a gauge dimension of, say 0.575in OD at 0.300in high. To check this dimension, he acquires a 0.575in ring gauge, assembles the locks onto the valve, and measures the position on the angle.



The **inner diameter** of the valve lock must fit the valve stem precisely. If it is too large the locks may have only two points of contact, resulting in a poor connection with the valve stem. If it is too small the locks could spread and break. Case hardened smaller types are more susceptible to breakage.

Trend offers several sizes in 8620 steel and also in titanium. Please call for details.



Shims

Trend's hardened steel shims are used to adjust the installed heights and pressures of valve springs. Available in a wide range of OD and ID dimensions as well as thicknesses, Trend always carries large stocks of valve spring shims.



| Part # | 0.D. | I.D. |
|---------|--------|-------|
| 03-1915 | 1.510" | .760" |
| 03-1920 | 1.510" | .760" |
| 03-1930 | 1.510" | .760" |
| 03-1950 | 1.510" | .760" |
| 03-1960 | 1.510" | .760" |
| 03-2215 | 1.640" | .640" |
| 03-2220 | 1.640" | .640" |
| 03-2230 | 1.640" | .640" |
| 03-2250 | 1.640" | .640" |
| 03-2260 | 1.640" | .640" |

| Part # | 0.D. | I.D. |
|---------|--------|-------|
| 03-2015 | 1.480" | .700" |
| 03-2020 | 1.480" | .700" |
| 03-2030 | 1.480" | .700" |
| 03-2050 | 1.480" | .700" |
| 03-2060 | 1.480" | .760" |
| 03-2315 | 1.250" | .520" |
| 03-2320 | 1.250" | .520" |
| 03-2330 | 1.250" | .520" |
| 03-2350 | 1.250" | .520" |
| 03-2360 | 1.250' | .520" |

Part # 0.D. I.D. 03-2115 1.510" .570" 03-2120 1.510" .570" 03-2130 1.510" .570" 03-2150 1.510" .570" 1.510" .570" 03-2160 03-2415 1.610" .570" 03-2420 1.610" .570" 03-2430 1.610" .570" 03-2450 1.610" .570" 03-2460 1.610" .570" 03-2520 1.300" .580"

Boxes contain 100pcs. Shim thickness is denoted by the last two numbers of the part number.



Made in a multitude of different thicknesses, Trend's lash caps are used to adjust the valve clearances; that is the amount of lash. Weighing merely a few grams, the lash cap increases the diameter of the slender valve tip, allowing the roller of the rocker arm a greater footprint on which to operate. Often made from an alloy



steel and then case hardened, lash caps are usually supplied with around 0.001in operating clearance, allowing them to rotate on the valve stem tips.

Choose from Trend's Premium line made from 8620 steel or from their Elite line made from TP1 tool steel material.

Pushrod Cleaning Brush

Designed with a tapered brush head to thoroughly clean all diameter pushrods. Part # **PRBRUSH**

41144444444



Trend's pushrod length checkers are marked with a standard length which is laser etched into them. This number represents the gauge length of a part (0.140 gauge diameter) with the two halves tightly screwed together. Extending the checker one rotation lengthens the gauge length 0.050. For example, a pushrod etched 7.800 screwed apart one rotation would be: 7.800 + 0.050 = 7.850 gauge length. Therefore you would order the part number from the catalog based on this measurement.

MASTER LENGTH CHECKER SET -includes all of the lengths listed at right plus 1-Vcup and 1-5/16 cup tip

TC 5.800in - 6.800in

TC 6.800in - 7.800in

TC 7.800in – 8.800in

TC 8.800in - 9.800in

TC 9.800in - 10.800in

Rod Bushings



| | INNER DIAMETER | OUTER DIAMETER | LENGTH | RECOMMENDED BORE SIZE | APPLICATION | PART# |
|-----------|----------------|----------------|--------|--------------------------------|--|--------------------|
| | 0.890 | 0.975 | 1.055 | 0.972 - 0.973 | Carrillo - Chevy SB bushing | 02-5000 |
| | 0.926 | 0.975 | 1.055 | 0.972 - 0.973 | Carrillo - Chevy SB bushing | 02-5001 |
| | 0.926 | 0.975 | 1.125 | 0.972 - 0.973 | Carrillo - Chevy SB bushing | 02-5003 |
| | 0.890 | 0.980 | 1.055 | 0.977 - 0.978 | Carrillo or Oliver - Chevy SB bushing | 02-5005 |
| | 0.923 | 0.980 | 1.055 | 0.977 - 0.978 | Carrillo or Oliver - Chevy SB bushing | 02-5006 |
| ≽ | 0.925 | 0.982 | 0.965 | 0.979 - 0.980 | Oliver Ultra Light – Chevy SB bushing | 02-5007 |
| SB CHEVY | 0.890 | 1.000 | 1.120 | 0.997 - 0.998 | Crower - Chevy SB bushing | 02-5020 |
| 2 | 0.926 | 1.000 | 1.120 | 0.997 - 0.998 | Crower - Chevy SB bushing | 02-5021 |
| | 0.890 | 0.991 | 1.015 | 0.988 - 0.989 | Lentz - Chevy SB bushing | 02-5022 |
| | 0.926 | 0.991 | 1.005 | 0.988 - 0.989 | LA Ent - Chevy SB bushing | 02-5024 |
| | 0.926 | 0.984 | 1.200 | 0.9810982 | GM Olds rod to SB Chevy bushing | 02-5029 |
| | 0.874 | 0.935 | 1.000 | 0.932 - 0.933 | Chevy SB bushing to .875 pin | 02-5034 |
| | | | | | | |
| | 0.950 | 1.035 | 1.060 | 1.032 - 1.033 | Chevy BB bushing | 02-5010 |
| | 0.988 | 1.035 | 1.060 | 1.032 - 1.033 | Chevy BB bushing | 02-5011 |
| | 0.950 | 1.040 | 1.060 | 1.037 x 1.038 | Chevy BB bushing | 02-5012 |
| BB CHEVY | 0.988 | 1.040 | 1.060 | 1.037 - 1.038 | Chevy BB bushing | 02-5013 |
| 38 (1 | 0.950 | 1.038 | 1.125 | 1.035 - 1.036 | Chevy BB bushing | 02-5014 |
| - | 0.988 | 1.038 | 1.125 | 1.035 - 1.036 | Chevy BB bushing | 02-5015 |
| | 0.988 | 1.042 | 1.125 | 1.039 - 1.040 | Carrillo - Chevy BB bushing | 02-5016 |
| | 0.988 | 1.052 | 1.120 | 1.049 - 1.050 | LA Ent. – Chevy BB bushing | 02-5037 |
| | | | | | | |
| | 0.890 | 0.975 | 1.055 | 0.972 - 0.973 | 340 Mopar bushing (press fit rod) | 02-5025 |
| MOPAR | 0.984 | 1.030 | 0.930 | 1.027 - 1.028 | 340 Mopar bushing (press fit rod) | 02-5031 |
| | 0.984 | 1.040 | 0.930 | 1.037 - 1.038 | 340 Mopar bushing (OE bushed rod) | 02-5032 |
| 88 | 0.984 | 1.030 | 1.200 | 1.027 - 1.028 | 340 Mopar bushing (press fit rod) | 02-5033 |
| | 0.927 | 1.010 | 1.110 | 1.007 - 1.008 | Mopar to SB Chevy bushing – AMC KB Pistons bushing | 02-5038 |
| | 0.035 | 1.007 | 1100 | 1004 1005 | Harrista CD Charachastian (027 air) | 03 5036 |
| ~ | 0.926 | 1.097 | 1.100 | 1.094 - 1.095 | Hemi to SB Chevy bushing (.927 pin) | 02-5026 |
| B MOPAR | 1.029 | 1.088 | 1.250 | 1.095 - 1.086 | 426 Hemi bushing (1.031 pin) | 02-5027 |
| B M | 0.988 | 1.096 1.097 | 1.075 | 1.093 - 1.094 1.094 - 1.095 | 440 Mopar bushing 440 Mopar to BB Chevy bushing (.990 pin) | 02-5028 02-5030 |
| Δ | 0.988 | 1.097 | 1.250 | 1.042 - 1.043 | Mopar to BB Chevy bushing (.990 pin) | 02-5039 |
| | 0.500 | 1.043 | 1.230 | 1.042 - 1.045 | Propal to bb Chevy bushing (.550 pin) | 02-3039 |
| | 0.825 | 0.935 | 1.720 | 0.932 - 0.933 | Universal bushing | 02-4980 |
| | 0.865 | 0.972 | 1.050 | 0.969 - 0.970 | Universal bushing | 02-4985 |
| | 0.875 | 0.990 | 1.000 | 0.9870988 | Universal bushing | 02-4998 |
| | 0.890 | 1.125 | 1.250 | 1.122 - 1.123 | Universal bushing | 02-5008 |
| _ | 0.890 | 1.200 | 1.250 | 1.197 - 1.198 | Universal bushing | 02-5009 |
| UNIVERSAL | 0.864 | 0.975 | 1.060 | 0.972 - 0.973 | Universal bushing (.866/.875 pin) | 02-5035 |
| N | 0.926 | 1.040 | 1.200 | 0.923 - 0.924 | Universal bushing (.927 pin) | 02-5041 |
| - | 0.988 | 1.052 | 1.120 | 1.049 - 1.050 | Universal bushing (.990 pin) | 02-5042 |
| | 0.920 | 1.019 | 0.995 | 1.016 - 1.017 | Universal bushing | 02-5043 |
| | 0.926 | 1.000 | 1.060 | 0.997 - 0.998 | Universal bushing | 02-5044 |
| | 0.925 | 0.972 | 0.970 | 0.969 - 0.970 | Universal bushing | 02-5080 |
| | 0.988 | 1.048 | 1.070 | 1.045 - 1.046 | Universal bushing | 02-5090 |

All Trend rod bushings are made from aluminum/ bronze material with high load-carrying and lubricity characteristics.

NOTE: Recommended press for rod bushings is .002/.004.

Custom-made bushings can be available in 7 business days.



Lifter Bore Bushings

| | INNER DIAMETER | OUTER DIAMETER | LENGTH | TYPE | STOP HEIGHT | RECOMMENDED BORE SIZE | APPLICATION | PART# |
|--|----------------|----------------|--------|----------|-------------|-----------------------|---|---------|
| BUICK | 0.825 | 0.935 | 1.720 | Step | 0.120 | 0.933 | Buick V6 | 02-5060 |
| B | 0.760 | 0.960 | 1.720 | Step | 0.120 | 0.958 | Buick V6 (offset bore) | 02-5061 |
| | | | | | | | | |
| | 0.810 | 0.935 | 1.700 | Step | 0.120 | 0.933 | Chevy LS1 V8 | 02-5049 |
| | 0.810 | 0.935 | 1.500 | Step | 0.120 | 0.933 | Chevy 90* V6/V8 | 02-5050 |
| | 0.770 | 0.960 | 1.500 | Step | 0.120 | 0.958 | Chevy 90* V6/V8 (offset bores) | 02-5051 |
| _ | 0.840 | 0.965 | 1.500 | Step | 0.120 | 0.963 | Chevy 90* V6/V8 (.875 diameter lifter) | 02-5052 |
| CHEVY | 0.770 | 0.960 | 1.400 | Step | 0.120 | 0.958 | Alum. Chevy 90* V6/V8 (offset bores) | 02-5053 |
| | 0.841 | 1.002 | 1.500 | Straight | n/a | 1.000 | Chevy bushing for BHJ fixture | 02-5056 |
| | 0.841 | 1.002 | 1.600 | Straight | n/a | 1.000 | Chevy bushing for BHJ fixture | 02-5057 |
| | 0.820 | 1.002 | 1.500 | Straight | n/a | 1.100 | Chevy bushing for BHJ fixture (undersize l.D.) | 02-5058 |
| | | | | | | | | |
| | 0.840 | 0.965 | 1.670 | Step | 0.120 | 0.963 | Ford 351 Cleveland | 02-5062 |
| | 0.825 | 0.935 | 1.940 | Step | 0.340 | 0.933 | Ford SVO V6 | 02-5064 |
| 58 50 50 50 50 50 50 50 50 50 50 50 50 50 | 0.770 | 0.960 | 1.425 | Step | 0.120 | 0.958 | Ford SVO V6 | 02-5065 |
| 요 | 0.780 | 0.960 | 1.720 | Step | 0.120 | 0.958 | Ford SVO V6 | 02-5066 |
| | 0.780 | 1.010 | 1.420 | Step | 0.120 | 1.008 | Ford SVO V6 | 02-5068 |
| | 0.780 | 0.936 | 1.525 | Step | 0.120 | 0.934 | Ford SVO V6 | 02-5069 |
| | | | | | | | | |
| | 0.875 | 0.995 | 1.380 | Step | 0.120 | 0.993 | Mopar 340 | 02-5054 |
| MOPAR | 0.875 | 0.996 | 1.380 | Step | 0.120 | 0.994 | Mopar oversize | 02-5070 |
| 욷 | 0.903 | 1.002 | 1.700 | Straight | n/a | 1.000 | BB Mopar wedge | 02-5071 |
| | 0.875 | 0.995 | 1.700 | Step | 0.120 | 0.993 | Universal bushing | 02-5075 |
| | | | | | | | | |
| | 0.903 | 1.002 | 1.500 | Step | 0.120 | 1.000 | Universal bushing | 02-5072 |
| SAL | 0.903 | 1.002 | 1.600 | Straight | n/a | 1.000 | Universal bushing | 02-5073 |
| UNIVERSAL | 0.810 | 0.935 | 1.770 | Step | 0.120 | 0.933 | Universal bushing | 02-5085 |
| | 0.825 | 0.935 | 1.770 | Step | 0.120 | 0.933 | Universal bushing (.995" O.D. step) | 02-5091 |
| | 0.900 | 1.025 | 1.750 | Step | 0.120 | 1.023 | Universal bushing (1.055" O.D. step) | 02-5092 |

NOTE: Lifter bore bushings must be bored or honed after installation. Minimum press: .001" Maximum press: .002" #609 Loctite is recommended.



Trend makes the best piston pin. It is of the highest quality. In squareness and straightness and quality of finish as well as the volatilities of heat treatment, Trend has it covered – Michael Giannone, MGP Connecting Rods





*These pins are also in stock and chamfered for round wire locks.

G-Series 4130 Piston Pins

88

Part Number Wt. (g)

G-7872250155³

Diameter Length

2.500

2.750

0.977

0.927

Wall

0.185

0.155

Part Number Wt. (g)

137

132

G-9272500185CD

G-9272750155*

C 02727F010FCD

| | | 0.82/ | 2.500 | 0.155 | G-82/2500155 | 104 | 0.927 | 2./50 | 0.185 | G-92/2/50185CD | 151 |
|---|--|-------|-------|-------|---------------|-----|-------|-------|-------|----------------|-----|
| | | 0.866 | 2.500 | 0.155 | G-8662500155 | 111 | 0.927 | 2.950 | 0.155 | G-9272950155 | 141 |
| i | | 0.875 | 2.500 | 0.155 | G-8752500155* | 112 | 0.927 | 2.950 | 0.185 | G-9272950185CD | 162 |
| ١ | | 0.905 | 2.500 | 0.155 | G-9052500155 | 117 | 0.940 | 2.750 | 0.155 | G-9402750155 | 134 |
| | | 0.906 | 2.500 | 0.155 | G-9062500155 | 118 | 0.945 | 2.500 | 0.155 | G-9452500155 | 122 |
| | | 0.905 | 2.750 | 0.155 | G-9052750155 | 129 | 0.945 | 2.750 | 0.155 | G-9452750155 | 135 |
| | Trend's G-Series pin is produced from chrome | 0.912 | 2.400 | 0.125 | G-9122400125 | 93 | 0.975 | 2.930 | 0.155 | G-9752930155 | 155 |
| | molybdenum 4130 thick-wall tubing and is a | 0.912 | 2.500 | 0.155 | G-9122500155 | 118 | 0.980 | 2.750 | 0.155 | G-9802750155 | 142 |
| | popular choice with OEMs, piston manufacturers, | 0.912 | 2.750 | 0.155 | G-9122750155 | 128 | 0.980 | 2.930 | 0.155 | G-9802950155 | 151 |
| | and shelf-stock piston sellers. Superior to the | 0.912 | 2.950 | 0.155 | G-9122950155 | 138 | 0.984 | 2.750 | 0.155 | G-9842750155 | 140 |
| | common 1018 mild steel alternative, this alloy | 0.925 | 2.250 | 0.155 | G-9252250155* | 109 | 0.990 | 2.750 | 0.185 | G-9902750185CD | 164 |
| | steel pin is ideally suited for use in naturally | 0.927 | 2.200 | 0.155 | G-9272200155 | 106 | 0.990 | 2.930 | 0.185 | G-9902930185CD | 175 |
| | aspirated race engines. The four operations | 0.927 | 2.250 | 0.155 | G-9272250155* | 109 | 0.990 | 2.930 | 0.185 | G-9902930155* | 176 |
| | performed in its manufacture are as follows: | 0.927 | 2.400 | 0.125 | G-9272400125* | 97 | 1.000 | 2.930 | 0.155 | G-10002930155 | 155 |
| | Blanked to size, heat treated (60 Rockwell 0.D./45 | 0.927 | 2.400 | 0.155 | G-9272400155* | 115 | 1.031 | 2.930 | 0.155 | G-10312930155 | 160 |
| | core), tumbled, and ground. | 0.927 | 2.500 | 0.125 | G-9272500125 | 100 | 1.040 | 2.930 | 0.155 | G-10402930155 | 162 |
| | *These pine are also in stock and shamfored for round wire locks | 0.927 | 2.500 | 0.155 | G-9272500155* | 120 | 1.094 | 2.930 | 0.155 | G-10942930155 | 172 |

H-Series Piston Pins

H13 is a tool steel that Trend uses to good effect for the production of **premium piston pins**. It is probably the best all-round material for most applications, especially in power-adder engines; it is also a **popular choice in Pro Stock drag racing engines**.

Diameter Length

2.250

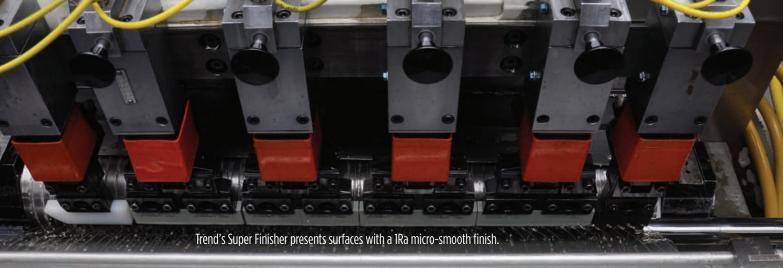
0.155

0.787

The H13 piston pin, which has a Rockwell hardness value around Rc54, has largely succeeded the alloy steel 9310 pin, probably because it accepts a DLC (Diamond-Like Carbon) coating better than the 9310. The 9310 material tempers (degree of hardness) at around 300 degrees while the H13 tempers in the neighborhood of 1000 degrees. The temperature for applying the DLC is around 400 degrees. So the application of DLC changes the structure of the alloy steel. However, the advantages of applying diamond-like coatings to alloy steels still out-weigh the disadvantages.







| H13 Tool Steel High Impact Pins (H–Series) Super Finished OD | | | | | | | | | | Diameter | Length | Wall | Part Number | Wt. (g) |
|--|----------------------------------|-------|-----------------|---------|----------|--------|-------|----------------|---------|----------|--------|-------|------------------|---------|
| | Precision Honed, Premium Upgrade | | | | | | | | | | | | H-9902765160 | 148 |
| | | | | | | | | | | 0.990 | 2.930 | 0.125 | H-9902930125 | 126 |
| Diameter | Length | Wall | Part Number | Wt. (g) | Diameter | Length | Wall | Part Number | Wt. (g) | 0.990 | 2.930 | 0.135 | H-9902930135 | 136 |
| 0.748 | 2.250 | 0.155 | H-7482250155 | 82 | 0.927 | 2.750 | 0.165 | H-9272750165 | 138 | 0.990 | 2.930 | 0.145 | H-9902930145 | 144 |
| 0.748 | 2.250 | 0.185 | H-7482250185 | 94 | 0.927 | 2.750 | 0.175 | H-9272750175 | 144 | 0.990 | 2.930 | 0.155 | H-9902930155 | 152 |
| 0.787 | 2.000 | 0.155 | H-7872000155 | 78 | 0.927 | 2.750 | 0.185 | H-9272750185* | 150 | 0.990 | 2.930 | 0.165 | H-9902930165* | 160 |
| 0.787 | 2.000 | 0.185 | H-7872000185 | 88 | 0.927 | 2.750 | 0.185 | H-9272750185CD | 151 | 0.990 | 2.930 | 0.165 | H-9902930165CD | 160 |
| 0.787 | 2.250 | 0.155 | H-7872250155 | 88 | 0.927 | 2.750 | 0.195 | H-9272750195 | 156 | 0.990 | 2.930 | 0.175 | H-9902930175* | 168 |
| 0.787 | 2.250 | 0.185 | H-7872250155 | 100 | 0.927 | 2.750 | 0.205 | H-9272750205 | 162 | 0.990 | 2.930 | 0.185 | H-9902930185 | 176 |
| 0.827 | 2.500 | 0.155 | H-8272500155 | 104 | 0.927 | 2.750 | 0.215 | H-9272750215 | 168 | 0.990 | 2.930 | 0.195 | H-9902930195 | 183 |
| 0.827 | 2.500 | 0.185 | H-8272500155 | 118 | 0.927 | 2.750 | 0.225 | H-9272750225 | 174 | 0.990 | 2.930 | 0.200 | H-9902930200 | 187 |
| 0.866 | 2.500 | 0.155 | H-8662500155 | 111 | 0.927 | 2.950 | 0.145 | H-9272950145 | 133 | 0.990 | 2.930 | 0.205 | H-9902930205 | 190 |
| 0.866 | 2.500 | 0.220 | H-8662500220 | 143 | 0.927 | 2.950 | 0.155 | H-9272950155* | 139 | 0.990 | 2.930 | 0.215 | H-9902930215 | 197 |
| 0.912 | 2.750 | 0.145 | H-9122750145 | 122 | 0.927 | 2.950 | 0.165 | H-9272950165 | 148 | 0.990 | 2.930 | 0.220 | H-9902930220 | 200 |
| 0.912 | 2.950 | 0.145 | H-9122950145 | 130 | 0.927 | 2.950 | 0.175 | H-9272950175 | 155 | 0.990 | 2.930 | 0.225 | H-9902930225 | 203 |
| 0.927 | 2.200 | 0.145 | H-9272200145 | 101 | 0.927 | 2.950 | 0.185 | H-9272950185* | 161 | 1.031 | 2.740 | 0.185 | H-10312740185 | 172 |
| 0.927 | 2.200 | 0.155 | H-9272200155 | 106 | 0.927 | 2.950 | 0.185 | H-9902750185CD | 164 | 1.031 | 2.750 | 0.165 | H-10312750165 | 157 |
| 0.927 | 2.200 | 0.165 | H-9272200165 | 112 | 0.927 | 2.950 | 0.205 | H-9272950205 | 174 | 1.031 | 2.750 | 0.170 | H-10312750170 | 162 |
| 0.927 | 2.200 | 0.185 | H-9272200185 | 122 | 0.927 | 2.950 | 0.215 | H-9272950215 | 180 | 1.031 | 2.750 | 0.200 | H-10312750200 | 184 |
| 0.927 | 2.250 | 0.145 | H-9272250145* | 103 | 0.927 | 2.950 | 0.225 | H-9272950225 | 186 | 1.031 | 2.925 | 0.200 | H-10312925200 | 196 |
| 0.927 | 2.250 | 0.165 | H-9272250165* | 114 | 0.940 | 2.750 | 0.155 | H-9402750155 | 135 | 1.031 | 2.925 | 0.220 | H-10312925220 | 210 |
| 0.927 | 2.500 | 0.125 | H-9272500125 | 100 | 0.984 | 2.750 | 0.155 | H-9842750155 | 143 | 1.031 | 2.930 | 0.155 | H-10312930155 | 160 |
| 0.927 | 2.500 | 0.135 | H-9272500135 | 106 | 0.990 | 2.500 | 0.165 | H-9902500165 | 135 | 1.031 | 2.930 | 0.170 | H-10312930170 | 172 |
| 0.927 | 2.500 | 0.145 | H-9272500145* | 113 | 0.990 | 2.500 | 0.175 | H-9902500175 | 142 | 1.031 | 2.930 | 0.180 | H-10312930180 | 180 |
| 0.927 | 2.500 | 0.155 | H-9272500155* | 118 | 0.990 | 2.500 | 0.185 | H-9902500185 | 148 | 1.031 | 2.930 | 0.185 | H-10312930185 | 185 |
| 0.927 | 2.500 | 0.165 | H-9272500165* | 124 | 0.990 | 2.500 | 0.195 | H-9902500195* | 154 | 1.031 | 2.930 | 0.200 | H-10312930200 | 195 |
| 0.927 | 2.500 | 0.175 | H-9272500175 | 130 | 0.990 | 2.500 | 0.205 | H-9902500205 | 160 | 1.031 | 2.930 | 0.215 | H-10312930215 | 207 |
| 0.927 | 2.500 | 0.185 | H-9272500185 | 136 | 0.990 | 2.500 | 0.225 | H-9902500215 | 166 | 1.031 | 2.930 | 0.220 | H-10312930220 | 210 |
| 0.927 | 2.500 | 0.195 | H-9272500195 | 142 | 0.990 | 2.750 | 0.135 | H-9902750135 | 128 | 1.094 | 2.925 | 0.220 | H-10942925220 | 226 |
| 0.927 | 2.500 | 0.205 | H-9272500205 | 147 | 0.990 | 2.750 | 0.145 | H-9902750145 | 136 | 1.094 | 2.930 | 0.145 | H-10942930145 | 163 |
| 0.927 | 2.500 | 0.225 | H-9272500225 | 156 | 0.990 | 2.750 | 0.155 | H-9902750155* | 143 | 1.094 | 2.930 | 0.185 | H-10942930185 | 197 |
| 0.927 | 2.750 | 0.125 | H-9272750125 | 110 | 0.990 | 2.750 | 0.165 | H-9902750165 | 150 | 1.094 | 2.930 | 0.200 | H-10942930200 | 210 |
| 0.927 | 2.750 | 0.135 | H-9272750135 | 117 | 0.990 | 2.750 | 0.185 | H-9902750185* | 164 | 1.094 | 2.930 | 0.220 | H-10942930220 | 226 |
| 0.927 | 2.750 | 0.145 | H-9272750145 | 124 | 0.990 | 2.750 | 0.195 | H-9902750195 | 170 | 1.094 | 3.100 | 0.300 | H-10943100300 | 298 |
| 0.927 | 2.750 | 0.155 | H-9272750155* | 131 | 0.990 | 2.750 | 0.205 | H-9902750205 | 176 | 1.094 | 3.400 | 0.250 | H-10943400250 | 289 |
| 0.027 | 2.750 | 0.155 | II 02727F01FF6D | 172 | 0.000 | 2.750 | 0.330 | 11 0003750330 | 10.0 | 1.004 | 7 400 | 0.075 | 11 100 17 100275 | 700 |

0.927

2.750

0.155

H-9272750155CD 132

0.990

2.750

0.220

186

1.094

3.400

0.275

H-10943400275

H-9902750220

309



M-Series Piston Pins

M2, like H13 is a tool steel. An exceedingly tough material—tougher and more expensive than H13—its chief advantage over C-350 maraging steel is its lower coefficient of friction when uncoated. The M2 piston pins are usually prepared to a Rockwell hardness value of around Rc60. M2 pins are used in the demanding environments of Top Fuel and Funny Car drag racing and also by some Pro Stock teams.

| Diamete | r Length | Wall | Part Number | Wt. (g) | Diamete | r Length | Wall | Part Number | Wt. (g) |
|---------|----------|-------|--------------|---------|---------|----------|-------|--------------|---------|
| 0.687 | 1.800 | 0.215 | M-6871800215 | 75 | 0.927 | 2.000 | 0.110 | M-9272000110 | 74 |
| 0.687 | 2.000 | 0.180 | M-6872000180 | 75 | 0.927 | 2.250 | 0.110 | M-9272250110 | 84 |
| 0.708 | 1.800 | 0.200 | M-7081800200 | 75 | 0.927 | 2.250 | 0.160 | M-9272250160 | 113 |
| 0.708 | 2.000 | 0.170 | M-7082000170 | 75 | 0.927 | 2.250 | 0.180 | M-9272250180 | 124 |
| 0.787 | 1.800 | 0.160 | M-7871800160 | 74 | 0.927 | 2.250 | 0.200 | M-9272250200 | 134 |
| 0.787 | 2.000 | 0.160 | M-7872000160 | 82 | 0.927 | 2.250 | 0.220 | M-9272250220 | 144 |
| 0.787 | 2.000 | 0.180 | M-7872000180 | 90 | 0.927 | 2.500 | 0.090 | M-927250009 | 78 |
| 0.787 | 2.000 | 0.200 | M-7872000200 | 97 | 0.927 | 2.500 | 0.180 | M-9272500180 | 138 |
| 0.866 | 2.000 | 0.160 | M-8662000160 | 93 | 0.990 | 2.250 | 0.185 | M-9902250185 | 137 |
| 0.866 | 2.000 | 0.180 | M-8662000180 | 101 | 0.990 | 2.250 | 0.200 | M-9902250200 | 146 |
| 0.866 | 2.250 | 0.160 | M-8662250160 | 104 | 0.990 | 2.500 | 0.160 | M-9902500160 | 136 |
| 0.866 | 2.250 | 0.180 | M-8662250180 | 114 | 0.990 | 2.500 | 0.180 | M-9902500180 | 150 |
| | | | | | 0.990 | 2.500 | 0.200 | M-9902500200 | 162 |

Piston Pin Coatings

The dynamics at work

The piston pin is the vital mechanical link that hinges the piston to the connecting rod. Though simple in appearance and has no moving parts, it must be recognized as a precision engineered component. This is because it has to satisfy several conflicting requirements: it must combine strength with lightness, it must be close fitting but with freedom to move, and it must resist wear without scuffing or galling.

The most prevalent piston pin materials currently in use are alloy steels, particularly 4130 chrome molybdenum, and H13 tool steel. To cope with extreme loadings, professional teams are using TP-1 and M2 tool steel. Perhaps, though, the greatest advances recently in piston pin durability have been achieved by the **application of Diamond-like Carbon coatings** to the pin's outer surfaces. Still, selecting the right material and the correct wall thickness are the first essentials.



TP-1 Series Piston Pins

Trend Performance has unveiled its hardest and toughest piston pin to date.

This new piston pin is not only exceedingly hard and extremely tough but also it is coated and less expensive than its rival: C300 (maraging steel). Initially available for **Top Fuel, Funny Cars**, and **Pro Stock** engines, these new pins are currently offered in the dimensions listed below but are also available in custom sizes.

The two top echelons in drag racing usually run their piston pins until they bend, but often they bend almost immediately. For that reason Top Fuel and Funny Car teams have no desire to coat them—why add further expense? But by not coating them they suffer from galling and other troubles.

Trend believes their new coated TP-1 pin possesses longevity beyond any comparable product currently in use. Heat treated to a through-hardness of Rc60 (hardened from its outer case to its inner core), Trend's new pin has the toughness of the maraging steels and the hardness, the compressive strength, and the surface qualities of M2, the superior high speed tool steel.

| | Stocking Popular Pro Stock Sizes | | | | | | | | | |
|----------|----------------------------------|----------|-------|-----------------|---------|--|--|--|--|--|
| Diameter | | r Length | Wall | Part Number | Wt. (g) | | | | | |
| | 0.827 | 2.125 | 0.120 | CA7081800120CD | 50.5 | | | | | |
| | 0.866 | 2.125 | 0.120 | CA7081810120 | 51.5 | | | | | |
| | 0.867 | 2.125 | 0.120 | CA7081810120CD | 51.0 | | | | | |
| | 0.868 | 2.125 | 0.120 | CA70871925120JC | 54.6 | | | | | |
| | 0.869 | 2.125 | 0.155 | CA78718898155C | 74.7 | | | | | |
| | 0.870 | 2.125 | 0.165 | CA78718898165C | 78.2 | | | | | |

| Stocking Top Fuel & Nostalgia Top Fuel Sizes | | | | | | | | | |
|--|----------|-------|-----------------|---------|--|--|--|--|--|
| Diamete | r Length | Wall | Part Number | Wt. (g) | | | | | |
| 1.156 | 3.300 | 0.330 | CA11563300330TD | 322 | | | | | |
| 1.156 | 3.400 | 0.330 | CA11563400330TD | 322 | | | | | |

For more dimensions and part numbers, see following page.

The DLC coating typically extends the life of piston pins by a factor of four or more—it reduces friction and wear and virtually eliminates pin bore troubles in even the most demanding applications. Trend's coated pins in Pro Stock engines now last up to 128 runs down the track instead of the normal 8 runs. NASCAR engines with uncoated pins often had trouble completing a race due to pin galling, but with the Trend DLC coating they can complete four 750-mile events with no concern for reliability or power loss.



TP-1 Series Piston Pins

Trend Performance TP-1 Series—its toughest piston pin to date.

This new piston pin is not only exceedingly hard and extremely tough but also it is coated and less expensive than its rival: C300 (maraging steel). Initially available for **Top Fuel, Funny Cars**, and **Pro Stock** engines, these new pins are currently offered in the dimensions listed below but are also available in custom sizes.



| | | - 10 | _ | | | 0.321 | L.ILJ | 0.233 | CHIZIZIZIZI | 131.2 | |
|---------|---|--|--|---|--|--|-------|-------|-----------------|-------|--|
| | | - 8 | | | | 0.927 | 2.250 | 0.215 | CA9272250215CD | 137.5 | |
| | | - 8 | | | | 0.927 | 2.250 | 0.300 | CA9272250300CD | 168.3 | |
| 1 | | | | | | 0.927 | 2.300 | 0.215 | CA9272300215CD | 141.0 | |
| | | | | | | 0.927 | 2.500 | 0.215 | CA9272500215 | 153.0 | |
| | | - | | | | 0.927 | 2.500 | 0.225 | CA9272500225 | 159.0 | |
| 1 | | | | | | 0.927 | 2.750 | 0.185 | CA9272750185CD | 151.0 | |
| iameter | Length | Wall | Part Number | Wt. (g) | | 0.927 | 2.950 | 0.200 | CA9272950200D | 172.8 | |
| 0.871 | 2.125 | 0.220 | CA7872250220 | 138.0 | | 0.927 | 3.100 | 0.225 | CA9273100225 | 196.1 | |
| 0.7874 | 1.772 | 0.197 | CA78741772197CD | 82.0 | | 0.927 | 3.100 | 0.225 | CA9273100225D | 196.1 | |
| 0.7874 | 1.800 | 0.180 | CA78741800180CD | 79.0 | | 0.927 | 3.100 | 0.250 | CA9273100250D | 217.0 | |
| 0.7875 | 1.772 | 0.197 | CA78751772197CD | 82.0 | | 0.928 | 2.125 | 0.235 | CA9282125235CD | 138.0 | |
| 0.7875 | 2.500 | 0.197 | CA78752500197CD | 116.0 | | 0.929 | 2.425 | 0.195 | CA9292425195C | 138.5 | |
| 0.825 | 2.125 | 0.325 | CA8252125325CD | 138.7 | | 0.931 | 2.250 | 0.215 | CA9312250215CD | 137.8 | |
| 0.827 | 2.125 | 0.310 | CA8272125310C | 136.0 | | 0.931 | 2.950 | 0.165 | CA9312950165 | 149.0 | |
| 0.827 | 2.125 | 0.310 | CA8272125310CD | 136.0 | | 0.990 | 2.500 | 0.125 | CA9902500125CD | 108.1 | |
| 0.827 | 2.500 | 0.310 | CA8272500310CD | 160.0 | | 0.990 | 2.500 | 0.140 | CA9902500140CD | 118.1 | |
| 0.866 | 2.125 | 0.270 | CA8662125270CD | 136.0 | | 0.990 | 2.500 | 0.185 | CA9902500185CD | 148.2 | |
| 0.866 | 2.125 | 0.275 | CA8662125275CD | 137.8 | | 0.990 | 2.750 | 0.140 | CA9902750140C | 130.0 | |
| 0.866 | 2.250 | 0.245 | CA8662250245 | 137.0 | | 0.990 | 2.750 | 0.175 | CA9902750175CD | 157.0 | |
| 0.866 | 2.250 | 0.250 | CA8662250250CD | 139.0 | | 0.990 | 2.750 | 0.185 | CA9902750185CD | 163.5 | |
| 0.866 | 2.500 | 0.210 | CA8662500210CD | 137.0 | | 0.990 | 2.750 | | CA9902750200D | 175.2 | |
| 0.866 | 2.500 | 0.210 | CA8662500210D | 137.4 | | | | | CA9902750205T | | |
| 0.867 | 2.125 | 0.270 | CA8672125270CD | 136.8 | | 0.990 | 2.750 | 0.250 | CA9902750250D | 203.0 | |
| 0.867 | 2.250 | 0.245 | CA8672250245CD | 137.6 | | | | | CA9902930185 | | |
| 0.868 | 2.125 | | CA8682125270 | | | | | | | | |
| 0.868 | 2.125 | | CA8682125270CD | | | | | | | | |
| | 2.250 | | | | | | | | | | |
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| | | | | | | | | | | | |
| 0.926 | 2.425 | 0.190 | CA9262425190CD | 135.5 | | 1.031 | 2.750 | 0.185 | CA10312750185CD | 206.1 | |
| | 0.7874 0.7874 0.7875 0.7875 0.825 0.827 0.827 0.866 0.866 0.866 0.866 0.866 0.866 0.866 0.867 | 0.871 2.125 0.7874 1.772 0.7875 1.772 0.7875 2.500 0.825 2.125 0.827 2.125 0.827 2.125 0.827 2.500 0.866 2.125 0.866 2.250 0.866 2.250 0.866 2.500 0.866 2.500 0.867 2.125 0.868 2.125 0.868 2.125 0.868 2.125 0.868 2.125 0.869 2.125 0.870 2.125 0.925 2.425 0.926 2.125 0.926 2.125 | 0.871 2.125 0.220 0.7874 1.772 0.197 0.7874 1.800 0.180 0.7875 1.772 0.197 0.825 2.125 0.310 0.827 2.125 0.310 0.827 2.125 0.270 0.866 2.125 0.270 0.866 2.125 0.275 0.866 2.250 0.250 0.866 2.250 0.250 0.866 2.500 0.210 0.866 2.500 0.210 0.866 2.500 0.210 0.867 2.125 0.270 0.868 2.125 0.270 0.868 2.125 0.270 0.868 2.125 0.270 0.868 2.125 0.270 0.869 2.125 0.270 0.870 2.125 0.270 0.871 2.125 0.270 0.925 2.425 0.195 | 0.871 2.125 0.220 CA7872250220 0.7874 1.772 0.197 CA78741772197CD 0.7874 1.800 0.180 CA78741800180CD 0.7875 1.772 0.197 CA78751772197CD 0.7875 2.500 0.197 CA78752500197CD 0.825 2.125 0.325 CA8252125325CD 0.827 2.125 0.310 CA8272125310C 0.827 2.125 0.310 CA8272125310CD 0.827 2.500 0.310 CA8272125310CD 0.827 2.500 0.310 CA8272125310CD 0.866 2.125 0.270 CA8662125270CD 0.866 2.125 0.275 CA8662125275CD 0.866 2.250 0.245 CA8662250245CD 0.866 2.500 0.210 CA8662250250CD 0.866 2.500 0.210 CA86622500210D 0.867 2.125 0.270 CA8672125270CD 0.868 2.125 0.270 CA8682125270CD | 0.871 2.125 0.220 CA7872250220 138.0 0.7874 1.772 0.197 CA78741772197CD 82.0 0.7874 1.800 0.180 CA78741800180CD 79.0 0.7875 1.772 0.197 CA78751772197CD 82.0 0.7875 2.500 0.197 CA78752500197CD 116.0 0.825 2.125 0.325 CA8252125325CD 138.7 0.827 2.125 0.310 CA8272125310C 136.0 0.827 2.125 0.310 CA8272125310CD 136.0 0.827 2.500 0.310 CA8272125310CD 136.0 0.827 2.500 0.310 CA8272500310CD 160.0 0.866 2.125 0.270 CA8662125270CD 137.8 0.866 2.250 0.245 CA8662250245 137.0 0.866 2.250 0.245 CA8662250250CD 137.0 0.866 2.500 0.210 CA8662500210D 137.4 0.867 <td< td=""><td>0.871 2.125 0.220 CA7872250220 138.0 0.7874 1.772 0.197 CA78741772197CD 82.0 0.7874 1.800 0.180 CA78741800180CD 79.0 0.7875 1.772 0.197 CA78751772197CD 82.0 0.7875 2.500 0.197 CA78752500197CD 116.0 0.825 2.125 0.325 CA8252125325CD 138.7 0.827 2.125 0.310 CA8272125310C 136.0 0.827 2.125 0.310 CA8272125310CD 136.0 0.827 2.500 0.310 CA8272125310CD 136.0 0.827 2.125 0.270 CA8662125270CD 136.0 0.866 2.125 0.270 CA8662125270CD 137.8 0.866 2.125 0.275 CA8662125275CD 137.0 0.866 2.250 0.245 CA8662250250CD 139.0 0.866 2.500 0.210 CA8662500210D 137.4 0.867 <</td><td> </td><td> </td><td> </td><td> </td><td> </td></td<> | 0.871 2.125 0.220 CA7872250220 138.0 0.7874 1.772 0.197 CA78741772197CD 82.0 0.7874 1.800 0.180 CA78741800180CD 79.0 0.7875 1.772 0.197 CA78751772197CD 82.0 0.7875 2.500 0.197 CA78752500197CD 116.0 0.825 2.125 0.325 CA8252125325CD 138.7 0.827 2.125 0.310 CA8272125310C 136.0 0.827 2.125 0.310 CA8272125310CD 136.0 0.827 2.500 0.310 CA8272125310CD 136.0 0.827 2.125 0.270 CA8662125270CD 136.0 0.866 2.125 0.270 CA8662125270CD 137.8 0.866 2.125 0.275 CA8662125275CD 137.0 0.866 2.250 0.245 CA8662250250CD 139.0 0.866 2.500 0.210 CA8662500210D 137.4 0.867 < | | | | | |

| D | iameter | Length | Wall | Part Number | Wt. (g) | Į | Diameter | Length | Wall | Part Number | Wt. (g) |
|---|---------|--------|--------|-----------------|---------|---|----------|--------|-------|-----------------|---------|
| | 0.926 | 2.425 | 0.195 | CA9262425195CD | 136.0 | | 1.031 | 2.930 | 0.215 | CA10312930215 | 213.2 |
| | 0.927 | 2.125 | 0.235 | CA9272125235CD | 137.2 | | 1.031 | 2.930 | 0.225 | CA10312930225 | 242.4 |
| | 0.927 | 2.250 | 0.215 | CA9272250215CD | 137.5 | | 1.031 | 3.100 | 0.250 | CA10313100250D | 196.7 |
| | 0.927 | 2.250 | 0.300 | CA9272250300CD | 168.3 | | 1.031 | 3.125 | 0.185 | CA10313125185D | 266.8 |
| | 0.927 | 2.300 | 0.215 | CA9272300215CD | 141.0 | | 1.031 | 3.400 | 0.250 | CA10313400250D | 232.2 |
| | 0.927 | 2.500 | 0.215 | CA9272500215 | 153.0 | | 1.094 | 2.750 | 0.250 | CA10942750250 | 209.0 |
| | 0.927 | 2.500 | 0.225 | CA9272500225 | 159.0 | | 1.094 | 2.930 | 0.200 | CA10942930200D | 210.0 |
| | 0.927 | 2.750 | 0.185 | CA9272750185CD | 151.0 | | 1.094 | 2.930 | 0.225 | CA10942930225D | 212.6 |
| | 0.927 | 2.950 | 0.200 | CA9272950200D | 172.8 | | 1.094 | 3.125 | 0.235 | CA10943125235T | 225.0 |
| | 0.927 | 3.100 | 0.225 | CA9273100225 | 196.1 | | 1.094 | 3.125 | 0.250 | CA10943125250T | 240.5 |
| | 0.927 | 3.100 | 0.225 | CA9273100225D | 196.1 | | 1.094 | 3.250 | 0.235 | CA10943250235T | 244.3 |
| | 0.927 | 3.100 | 0.250 | CA9273100250D | 217.0 | | 1.094 | 3.400 | 0.200 | CA10943400200 | 243.9 |
| | 0.928 | 2.125 | 0.235 | CA9282125235CD | 138.0 | | 1.094 | 3.400 | 0.200 | CA10943400200D | 249.4 |
| | 0.929 | 2.425 | 0.195 | CA9292425195C | 138.5 | | 1.094 | 3.400 | 0.205 | CA10943400205 | 265.8 |
| | 0.931 | 2.250 | 0.215 | CA9312250215CD | 137.8 | | 1.094 | 3.400 | 0.225 | CA10943400225D | 288.2 |
| | 0.931 | 2.950 | 0.165 | CA9312950165 | 149.0 | | 1.094 | 3.400 | 0.250 | CA10943400250 | 287.1 |
| | 0.990 | 2.500 | 0.125 | CA9902500125CD | 108.1 | | 1.094 | 3.400 | 0.250 | CA10943400250D | 287.0 |
| | 0.990 | 2.500 | 0.140 | CA9902500140CD | 118.1 | | 1.094 | 3.400 | 0.250 | CA10943400250TD | 238.0 |
| | 0.990 | 2.500 | 0.185 | CA9902500185CD | 148.2 | | 1.095 | 2.930 | 0.225 | CA10952930225D | 256.5 |
| | 0.990 | 2.750 | 0.140 | CA9902750140C | 130.0 | | 1.098 | 3.250 | 0.225 | CA10983250225D | 256.0 |
| | 0.990 | 2.750 | 0.175 | CA9902750175CD | 157.0 | | 1.156 | 3.125 | 0.330 | CA11563150330TD | 323.4 |
| | 0.990 | 2.750 | 0.185 | CA9902750185CD | 163.5 | | 1.156 | 3.300 | 0.330 | CA11563300330T | 318.6 |
| | 0.990 | 2.750 | 0.200 | CA9902750200D | 175.2 | | 1.156 | 3.300 | 0.330 | CA11563300330TD | 337.3 |
| | 0.990 | 2.750 | 0.205 | CA9902750205T | 162.6 | | 1.156 | 3.300 | 0.350 | CA11563300350TD | 286.0 |
| | 0.990 | 2.750 | 0.250 | CA9902750250D | 203.0 | | 1.156 | 3.400 | 0.225 | CA11563400225 | 255.6 |
| | 0.990 | 2.930 | 0.185 | CA9902930185 | 174.6 | | 1.156 | 3.400 | 0.250 | CA11563400250T | 333.1 |
| | 0.990 | 2.930 | 0.185 | CA9902930185D | 175.2 | | 1.156 | 3.400 | 0.330 | CA11563400330TD | |
| | 0.990 | 2.930 | 0.220 | CA9902930220D | 198.5 | | 1.250 | 3.500 | 0.450 | CA12503500450 | 571.8 |
| | 0.990 | 2.950 | 0.210 | CA9902950210D | 194.1 | | 1.375 | 4.000 | 0.375 | CA13754000375T | 602.0 |
| | 0.990 | 3.100 | 0.200 | CA9903100200D | 198.0 | | 1.625 | 4.090 | 0.437 | CA16254090437 | 852.0 |
| | 0.990 | 3.100 | 0.250 | CA9903100250D | 229.0 | | 1.625 | 4.090 | 0.470 | CA16254090470 | 891.0 |
| | 0.991 | 2.930 | 0.220 | CA9912930220D | 200.5 | | 1.625 | 4.090 | 0.470 | CA16254090470D | 891.0 |
| | 0.992 | 2.500 | 0.185 | CA9922500185CD | 149.2 | | | | | | |
| | 1 000 | 2 500 | 0.1/10 | CA10002500140CD | 120 0 | | | | | | |



DLC-COATED TOOL STEEL SOLID FLAT TAPPETS



Trend's new M2 tool steel solid flat tappets for GM, Toyota, Ford, and Chrysler engines.

For race engine builders, camshaft development has been an absorbing topic, especially of materials and coatings.

In the eighties you'd have heard discussions of hardened iron and chilled iron —the Johnson chilled iron tappets running on cast iron camshafts were popular in stockcar racing at the time. Later the terms alloy steel and 8620 cores and 9310 cores entered the camshaft lexicon. Perhaps, the most intriguing of all was the term Stellite hard-faced cams, where talented TIG welders would coat the camshaft lobes with a Stellite filler rod.

Today the adoption of tool steel camshafts combined with coated tool-steel lifters has done much to increase revs via higher valve spring pressures. Here are the latest tool steel flat tappets from the leaders in this field of exotic metals, Trend Performance.

| | Premium Series |
|-------------|--|
| Part Number | Description |
| | CHEVROLET |
| EC842GM-1 | .842 Diameter |
| EC842GM-1H | .842 Diameter - No oil hole, low movement |
| EC842GM-2 | .842 Diameter - Oil hole in foot |
| EC842GM-2H | .842 Diameter - Oil hole in foot, low movement |
| | TOYOTA 3TC |
| EC873T-1 | .873 Diameter |
| EC873T-1H | .873 Diameter - No oil hole, low movement |
| EC873T-2 | .873 Diameter - Oil hole in foot |
| EC873T-2H | .873 Diameter - Oil hole in foot, low movement |
| | FORD |
| EC875FF-1 | .875 Diameter |
| EC875FF-1H | .875 Diameter - No oil hole, low movement |
| EC875FF-2 | .875 Diameter - Oil hole in foot |
| EC875FF-2H | .875 Diameter - Oil hole in foot, low movement |
| FYBL | Y-Block Tool Steel |
| | CHRYSLER |
| EC904CH-1 | .904 Diameter |
| EC904CH-1H | .904 Diameter - No oil hole, low movement |
| EC904CH-2 | .904 Diameter - Oil hole in foot |
| EC904CH-2H | .904 Diameter - Oil hole in foot, low movement |

- Extremely durable yet lightweight, in most cases 70 grams or less
- Operates reliably at higher RPM and spring pressures
- Available in DLC-coated or uncoated finishes
- Prepared to 63–64 Rc hardness
- · Heavy-duty snap ring included
- · Available with or without oil hole in foot
- All part numbers with the suffix -1H or -2H feature a low-movement seat, where seat travel is limited to .015in



Y-block tool steel tappets

| | Elite Series |
|-------------|--|
| Part Number | Description |
| | CHEVROLET |
| LM842GM-1 | Late Model .842 Diameter |
| LM842GM-1C | Late Model .842 Diameter, DLC coating |
| LM842GM-1H | Late Model .842 Diameter, low movement seat assist |
| LM842GM-2 | Late Model .842 Diameter, Oil hole in foot |
| LM842GM-2H | Late Model .842 Diameter, Oil hole in foot, low movement |
| | TOYOTA 3TC |
| EC873T-1 | Late Model .873 Diameter |
| EC873T-1C | Late Model .873 Diameter, DLC coating |
| EC873T-1H | Late Model .873 Diameter, low movement seat assist |
| EC873T-2 | Late Model .873 Diameter, Oil hole in foot |
| EC873T-2H | Late Model .873 Diameter, Oil hole in foot, low movement |
| | FORD |
| LM875F-1 | Late Model .875 Diameter |
| LM875F-1C | Late Model .875 Diameter, DLC coating |
| LM875F-1H | Late Model .875 Diameter, low movement seat asssit |
| LM875F-2 | Late Model .875 Diameter, Oil hole in foot |
| LM75F-2H | Late Model .875 Diameter, Oil hole in foot, low ment |
| | CHRYSLER |
| LM904CH-1 | Late Model .904 Diameter |
| LM904CH-1C | Late Model .904 Diameter, DLC coating |
| LM904CH-1H | Late Model .904 Diameter, low movement seat assist |
| LM904CH-2 | Late Model .904 Dia, Oil hole in foot |
| LM904CH-2H | Late Model .904 Dia, Oil hole in foot, low movement |
| | |

*Premium Series Lifters are manufactured with a finish of 1.5-2.5 Ra (roughness average). Ideal for racers with modest budgets





Two essential requirements of flat-tappets are strength and resistance to wear. These qualities are largely derived from careful, controlled heat treating processes, including hardening to Rockwell 64. To achieve their mirror-like status they are carefully ground and lapped to a micro-polished finish.

In 2011 Trend introduced a new series of **uncoated tool steel solid flat tappets** for engines using **cast iron camshafts**. Ideal for engines turning in excess of 7,000rpm with higher valve spring pressures, these tappets easily surpass the performance of their iron counterparts as they **can be re-used many times**. Also by returning them to Trend, their contact area (the foot) can be re-ground, allowing them to last indefinitely.

- Use DLC-coated tool steel solid flat-tappets with tool steel or case-hardened alloy steel camshafts. These coated flat tappets suit any type of steel camshaft that exceeds 60Rc, including the popular 8620 alloy cams used with roller lifters, but they do not suit cast iron cams.
- Use non-coated tool steel solid flat-tappets with cast iron camshafts, either nitrided or non-nitrided.
- ▶ DLC-coated lifters perform better on tool steel and case-hardened alloy steel camshafts that have been treated with an REM super finish or a highly polished finish of 2Ra or better.
- ▶ Use steel camshafts and DLC-coated tool steel flat-tappets when valve spring seat pressures exceed 200psi.
- Though these tool steel tappets are exceedingly tough, always use the conventional break-in procedure as poorly finished camshafts can destroy them.

 ${\it Champion, Driven, or LAT\ brand\ oils\ are\ recommended\ for\ use\ with\ all\ Trend\ Performance\ products.}$

If you aspire to produce the best solid flat-tappet lifters, take notice of NASCAR Cup racing, for its regulations have influenced most of the improvements made in flat-tappet design. Years ago solid flat-tappets were manufactured from hardened iron or chilled iron, but today Trend fashions them from M2 tool steels.





New Chrome Moly Rocker Shaft with DLC coating for HEMI: Eliminates deflection worries

A new rocker shaft for 5.7L and 6.1L high-performance Hemi engines. Its advantages are strength, reduced friction, and affordability.

Created to overcome deflection and to improve valve-train stability when used in conjunction with high-performance camshafts and valve train, Trend produces this new shaft from thickwall 4130 chrome molybdenum, subjects it to two heat treatments—through-hardening and nitriding—and finally applies a DLC (diamond-like coating).

The nitriding process not only contributes a tough surface skin (.015in deep) but also produces the ideal surface for the application of the DLC. The DLC provides increased wear-resistance and reduced coefficient of friction. The 4130 chrome molybdenum material is selected not only for its strength and excellent heat-treatment properties but also for its ability to facilitate a fine surface finish of .5 micro inches (Ra—roughness average).

With a diameter and length of 0.865in and 19.3125in respectively, the new shaft directly replaces the original (contained within the Mopar rocker assembly, 0EM Part Number 053021574AA).

Trend Spark Plug Tubes for Early Chrysler 426 Hemi Engines: Prevents oil leaks between tubes and valve covers

Produced from 6061 T6 aluminum billets and finished in a hard anodized bronzebrown color and supplied complete with 0-rings, these spark plug tubes prevent oil leaks between the tubes and the valve covers.



Rocker shaft end detail before freeze plugs are fitted





Knowledge is power and the Spintron tells you where to find it

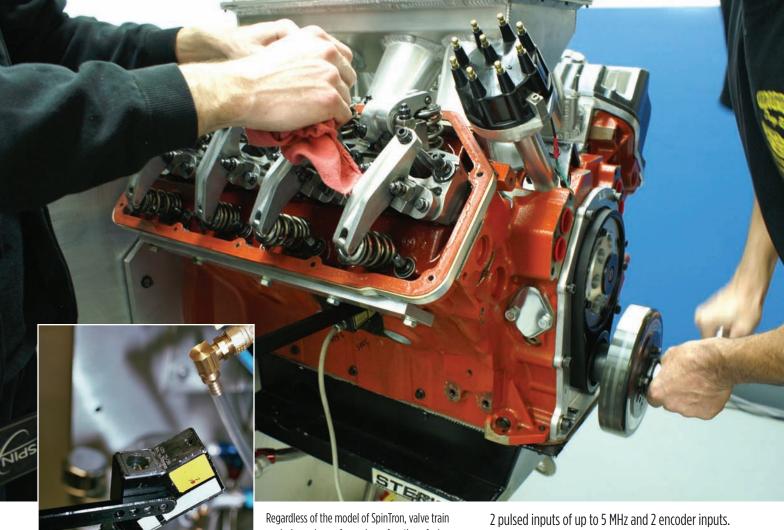
Powered by an AC electric motor, the SpinTron uses a substitute crankshaft that spins the engine's internal components as fast or as long as desired. Equipped with laser tracking, it records precise valve movements in relationship to the camshaft position. Engineers are particularly interested in three aspects of high-speed valve movement. First, they identify the amount of deflection in the pushrod as the valve is opening. Second, they track the amount of valve lofting as the cam follower is travelling over the cam lobe. Third, they record the amount of valve bounce when the valve is closing. The SpinTron is also used to investigate frictional losses. These tests are usually conducted on piston rings, water pumps and alternators as well as on transmissions and final drives.

Advanced engine development, either for the race track or at the OE level, depends on the ability to test and simulate real-world conditions while in the laboratory. Only in a controlled and repeatable environment can accurate data be gleaned. Certain areas however, such as the study of the valve train while it operates at high engine speeds, have denied close examination until fairly recently. The SpinTron by Trend Performance changed all of that—the behavior of every component responsible for valve actuation (either OHV or OHC) can now be examined, imaged, and graphed in real time for analysis.

The SpinTron was born of necessity by Trend Performance's owner and founder Bob Fox. Being desirous of creating the ultimate push rod for racing applications, there seemed no way to improve its design other than hit-and-miss dyno testing. And when pushrod failure did occur, the reason was often unknown. For valve train technology to move forward, Fox recognized that a means to study the valve's response to the profile of the camshaft was necessary. The SpinTron quickly revealed what was believed to be happening in the valve train was not the case.

Most of these remarkable test machines are in the hands of the country's leading engine builders. To stay ahead of their rivals, engine builders and professional race teams use them to gain vital data. Whether they are gathering information on valve train performance or calculating frictional losses within the engine, transmission, or final drive, they are aware that knowledge is power, and having access to SpinTron data is a good first step.

"How else can you explore beyond normal mechanical limits of race engine development without provoking a trail of devastation," says SpinTron creator Bob Fox.



analysis can be performed as a function of a Laser Valve Tracking System (LVTS) or, alternatively, through a very high-speed camera that captures up to 4,000 frames per second. The LVTS provides measurable data, for example, data displayed on a graph showing the magnitude and duration of valve openings referenced to the crankshaft position. The high-speed camera allows valve events to be viewed but not measured.

There are two principal versions of the SpinTron: a gear-reduction model and a direct-drive model. The gear-reduction model, which is the most prevalent, is used principally for valve train testing and is offered with one of four electric motors: 25, 50, 75, or 100 horsepower. On the other hand the direct-drive model is equipped with a 150-, 200-, or 250-horsepower motor. It is used for spinning the entire engine, including pistons, and its principal function is to determine frictional losses. With an optional torque arm attachment this more powerful machine has the capacity to measure torsional deficiencies of internal components. The gear-reduction machine operates up to 11,000 rpm whereas the direct-drive model, which uses liquid-cooled electric motors, operates up to 12,000 rpm.

In addition there is an optional high-speed data acquisition system boasting 16 differential 16-bit analog inputs, 250 KHz acquisition rate,

2 pulsed inputs of up to 5 MHz and 2 encoder inputs. The 16-bit analog input option relates to the number of sensor signals the machine's high-speed data acquisition system can receive. For example, you might wish to monitor a load gauge under a valve spring or, perhaps, observe the differential signal of an oil temperature sensor. This high-speed optional acquisition system converts the differential signal to an intelligible gauge reading. The term 250 KHz reveals how fast the SpinTron receives and stores its

information. The encoder is used to identify the position of the crankshaft, and the two pulsed inputs permit the use of two encoders which, for example, could be used to determine torsional deficiencies in a part.

Other functions such as a 16-digital I/O (input/output) signal, a termination board and oscilloscope can be added. The oscilloscope allows valve motion to be observed in real time. Additional sensors to measure flow, pressure, vacuum, temperature, and knock can also be integrated into the SpinTron. Accordingly, any or all of this data can be acquired during testing and, importantly, recorded on a report. A work station console is offered as an option or the operator can choose to run the SpinTron through a laptop or PC with the dedicated software. For endurance testing, other custom accessories can be ordered for your engine program.



will repeat precisely the profile of the cam lobe. Baselines are typically established at 2,000 to 3,000 rpm. Then, through the control software, engine speeds are increased in increments of your choosing. The SpinTron will record each new valve trace over the baseline trace. This practice, known as **step-testing**, performs complete valve train analysis, providing the ideal conditions to compare valve train stability at different engine speeds. It detects events such as valve bounce; lofting (that is, when components of the valve train lose contact with each other due to inertia); harmful spring harmonics; and pushrod deflection. It also identifies weaknesses, design flaws, and misbehavior that will not only cost horsepower but reliability as well.

Another important area of research is **endurance-testing or cycletesting** where every gear change and every rpm over the duration of a race or over thousands of road miles can be simulated. In common with step-testing, the SpinTron can record and graph data from a variety of sensors at different engine speeds. This provides an excellent opportunity to test a host of components like a fuel pump or an oil pump, as it will record vacuum or flow or pressure during each segment of a lap. Running comparison tests is also effective, particularly comparing different valve springs.

Through advanced software, dedicated race track simulation can be created without the risk of engine wear or failure and without any fuel or vehicle required. None of these components are needed to perform SpinTron testing.

SpinTron Testing Now Available – call for details. **Questions?** Contact Jerry Pelkey





SPIN TRON®

reached.

The two common tests performed by the SpinTron are the step test and the endurance test. The step test involves recording a base profile, a trace of the

valve movement at low engine speeds (perhaps 3.000rpm). This is followed by

a sequence of step tests where engine speed is increased, perhaps by 100rpm or 500rpm and tracings are taken at each step until the maximum desired rpm is

TREND Performance PACING OIL MAREHOUSE

Seven or eight years ago when oil companies removed vital zinc and phosphorous elements from their lubricants auto makers applauded as the changes meant they could apply longer warranties to certain components. But for many race engine parts suppliers, engine builders, and racing teams, the ramifications were disastrous. Galling occurred on numerous highly loaded components and hundreds of camshaft lobes and flat tappets were destroyed during vital break-in procedures.

Now Trend supplies the brands below suitable for use in all competition engines, especially those using flat tappet and/or roller cams operating at high RPM and requiring high-pressure (stiff) valve springs. These products are offered in a popular range of multi-viscosity SAE grades and formulated to meet the demands of most of today's high performance race engines.

Contact Trend for more information.









TRENDY APPAREL

T-Shirts: Made from 100% pre-shrunk Ultra Cotton and sporting the Trend logo on right-front chest and across the back, Trend's T-shirts are available in sizes Small to 5X.

Hats: Made from 100% cotton with Trend logo on front, hats adjust easily with a Velcro[™] back strap to fit any head size.

Beverage holders: Keep your favorite beverage cool with these snug-fitting holders available with pink or white Trend logo.



with Bob Fox

Today the Michigan firm Trend Performance is the largest manufacturer and supplier of pushrods in racing and in the performance after market. But in 1988 when **Bob Fox founded** his pushrod company, after working the phones as a tech rep at Diamond Racing, things were different. During his time at the piston company he noticed that



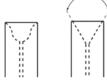
the performance of competition pushrods was little better than adequate their lengths varied and their ends failed—both ends!

Manufacturers would reduce the material thickness of the cup ends in order to form them, and as a result they would crack. Further, their lengths were so inconsistent that each pushrod had to be inspected and graded accordingly. It was this encounter that caused Fox to contemplate life as a pushrod maker.

What are the biggest challenges that face today's competition pushrod maker?

"Racers seeking to exploit every tiny advantage tend to select lighter and lighter weight oils, many of which are impaired or even deficient in lubricity at high loads and high revs. Also, installing pushrods positioned between lifters and rockers with contact surfaces rougher than 1Ra expose the pushrod ends to severe abrasion. For example, a rocker arm adjuster ball with a rough, hard contact surface can act like a file. Plainly, it's prudent for the engine builder to inquire about the surface finishes of the parts that operate in conjunction with the pushrods.

"Another factor that leads to premature failure occurs when pushrod balls are bound in tight cups. It's imperative they have sufficient operating clearance. A further problem arises when you set the ball end of a pushrod in a V-cup. The V-cup presents a very narrow contact seat which significantly increases the loading on the pushrod ball end. If its seat is heat treated to a very hard condition, it will eventually pound its V-shape into the pushrod ball. Much more desirable is to set the pushrod ball end in a radius cup and reduce the point loadings.



"Recently, I was reminded by Jon Kaase, the race engine builder, of the severe environment in which the pushrod operates. 'Assume,' he said, 'you have an open spring pressure of 1,400lb and a rocker ratio of 1.9:1, therefore, the loading on the pushrod equates to around 2,660lbs. This is then transmitted through the tiny area of the pushrod ball. If the surface area of a V-cup is 100th of a sq. in., the loading could be somewhere around 300,000psi!'

"In addition to these loadings, increased rocker ratios and engine revs further increase surface speeds on the ball ends."

How long do pushrods last in racing engines?

"In Sprint Cup, the top teams might use them only once or twice and then switch them to their Busch Series engines. Other Cup teams will run them much longer. In NHRA Pro Stock, most of the teams will run them until they show signs of wear. The same is true in Top Fuel and Funny Car, except those pushrods might show signs of discoloration on their ends instead of wear. If they begin to turn blue from excessive heat, it's time to replace them. In short track oval racing, engine builders will use the same pushrods for several seasons—often six to eight thousand laps—providing they are not bent and show no signs of wear."

Do you make single-piece or three-piece pushrods?

"Trend doesn't make three piece pushrods, but we do manufacture twopiece. These allow the engine builders to cut the pushrods to length and install the tips as required. Our tips are pressed into the pushrod using a hydraulic press and an installation tool.

But a few years ago, when we introduced a Quickship program, we discovered most engine builders preferred one-piece pushrods. These were finished to size and length—they required no more work—and they're shipped within 24 hours."

From which materials do vou manufacture pushrods?

"The biggest proportion is made from chrome molybdenum, a type of alloy steel known as 4130. This material possesses an excellent strengthto-weight ratio and is considerably stronger and harder than standard 1020 steel. Sprint Cup engines use it as do much of Pro Stock and Pro Mod. In contrast, Top Fuel and Funny Car teams use H13 tool steel in solid bar form. The 4130 pushrods are produced from thick-wall tubing. Their hollow center passage is pressurized by oil destined to lubricate the rocker adjuster."

What do you consider the biggest recent failures in valve train?

"As long as racing engines continue to produce more power, failures will soon follow. But failure isn't too concerning as long as you learn from it. The most recent troubles we encountered derived from galling in the top cup of Pro Stock pushrods, which we overcame by introducing a bronze insert. When similar troubles afflicted ball-ball pushrods, we succeeded in eradicating it by replacing the top ball with one made of a special self-lubricating tool steel." Pushrod ball ends are checked for size by a coordinate measuring machine. Trend holds this tolerance to plus-or-minus 0.001in.



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| Diameter/ Wall | 5/16"/.105" Wall | 3/8"/.135" Wall | .14 | | Overall Length 140 Gauge Length | | |
| | 7/16"/.165" Wall 9/16"/.187" Wall 5/8"/.188" Wall | 1/2"/.200" Wall 5/8"/.125" Wall H-13 Solid | Y | | Over .281" Ball Diameter Length Radius Cup Overall Length Under Ball Length | | |
| Rocker End | 5/16" Ball 3/8" Ball 281 Radius Cup 281 Radius Cup Tool Stee | 5/16" Ball Tool Steel 281 Radius Cup BZ I 3/8" Cup | | Diamete | Full Taper | 1 | |
| Lifter End | 5/16" Ball Oil Restrictor (not availab | 3/8" Ball ole on all pushrods) | | - Double 12 | per Ball End Double Taper H-13 Full Taper 3/8" Ball/Cup Overall | | |
| Options | Full Taper Half Taper | Double Taper Neck Down | | 1.625 → | Double Clearance | 1.625 | |
| Tip Clearance | 5/8" Rocker Tip 1-5/8" Lifter Tip Length Full Taper | 5/8" Lifter Tip 1-5/8" Rocker Tip Length Double Taper, 1-5/8" Cleara | nnce | Neck [| | | |

Standard Ball End Tips are 1-5/8" With 210° Clearance



TREND Performance



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