



Aluminum Matrix Composite (AMC) Pushrods

Lightweight, Stiff, Strong for Peak Performance

Introducing a New Competitive Edge:

3M AMC Pushrods – stiffer than steel and over 40% lighter!

3M Pushrods combine the light weight of aluminum with the high strength and stiffness of 3M™ Nextel™ Ceramic Fibers to form an innovative composite pushrod that helps to reduce the mass and improve the damping characteristics of critical valve train components. The resulting benefits are higher engine rpm's, increased horsepower, and reduced valve float.

PROPERTIES OF ALUMINUM MATRIX COMPOSITES

LIGHTER

AMC Pushrods weigh over 40% less than steel pushrods, which reduces the overall weight of the valve train.

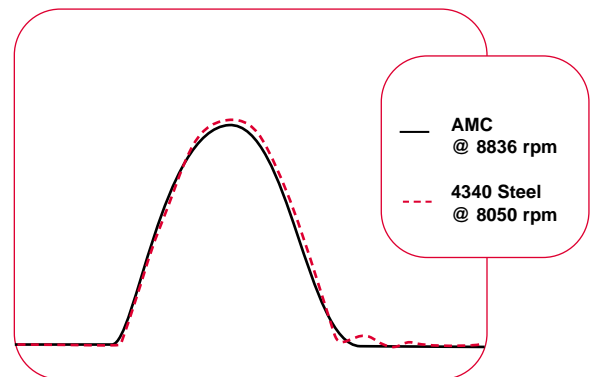
Lower mass translates into less energy required for valve actuation, lower valve spring pressure requirements, and greater resistance to valve float. In turn, reduced valve train spring pressure reduces deflection in all valve train components, decreases camshaft torsional vibration, and improves valve event accuracy and repeatability.

STIFFER

AMC Pushrods are stiffer than steel pushrods, which means that flexing is reduced and the cam profile is more closely followed. With controlled, precise timing the engine may achieve higher rpm's. Additionally, a stiffer pushrod may allow the engine to handle a cam with more aggressive ramp rates for even greater output.

SUPERIOR DAMPING

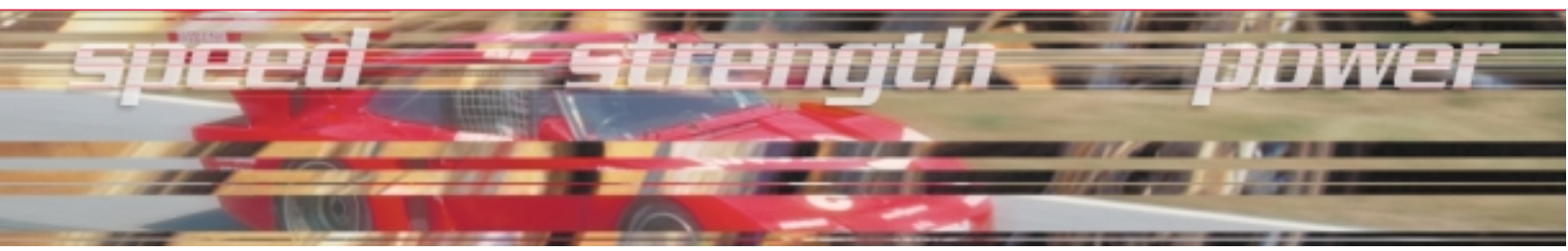
AMC Pushrods have superior damping characteristics compared to steel. Vibrations that occur during normal valve actuation or due to shock loads dissipate more quickly, keeping the pushrod straight and reducing the negative effect on valve motion control.



AMC Pushrods follow the cam at higher rpm's

DURABLE, PROVEN

According to Josh Wilson, Harley-Davidson Motor Company, "3M AMC Pushrods are the most durable that we've ever had. The pushrods lasted a full race season, and we never failed a pushrod." Increased stiffness, higher damping, and excellent durability enable AMC Pushrods to deliver peak performance race after race, unlike steel pushrods that may need to be replaced for every race.



MECHANICAL PROPERTY COMPARISON

3M ALUMINUM MATRIX COMPOSITE PUSHRODS AND 4130 STEEL PUSHRODS

Fundamental Material Properties

Property	AMC	4130 Steel
Stiffness	32.1 Msi 221 GPa	29.7 Msi 205 GPa
Ultimate Compressive Strength	348 ksi 2.4 GPa	218 ksi 1.5 GPa

3/8" Diameter, 8.900" Long Pushrod Comparison

Property	AMC	4130 Steel
Bending Stiffness	29,400 lb in ² * 84 Nm ²	25,800 lb in ² * 74 Nm ²
Compressive Failure Load	30,000 lbs*++ 132,000 N	16,000 lbs*++ 72,000 N
Critical Buckling Load	3700 lb 16,290 N	3200 lb 14,280 N
First Bending Resonance	630 Hz	430 Hz

* Calculated values

++ On short length where buckling does not occur

AMC VS. STEEL PUSHRODS QUICK COMPARISON

- Stiffer than steel
- Over 40% lighter than steel
- Increased damping, decreased resonance for improved valve control
- Increased stiffness for higher rpm, horsepower, and torque compared to steel
- More durable than steel

AVAILABILITY

- Currently available in 3/8" (7,6 cm) diameter
- 4.000" – 12.150" (10,16 cm – 30,86 cm) finished length
- Wide variety of press-in end caps available

ORDERING INFORMATION

Call us at 1-888-650-5116 to place an order or get further information.

IMPORTANT NOTICE:

All statements, technical information and recommendations contained in this brochure are based upon tests conducted with 3M approved equipment and are believed to be reliable. However, these data are representative or typical only and should not be used for specification purposes. 3M makes no warranties, express or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose.



Metal Matrix Composites

3M Center, Building 207-1W-11
St. Paul, MN 55144-1000
U.S.A.

Toll Free within the USA: 1-888-650-5116
From outside the USA: 1-651-733-5168
FAX: (651) 736-5860
www.3M.com/mmc

3M Canada

300 Tartan Drive
London, Ontario N5V 4M9
(800) 265-1840 Ext. 6003
FAX: (519) 452-6103

3M Deutschland GmbH Ceramic Textiles & Composites, Europe

Carl-Schurz-Str.1
41453 Neuss, Germany
+49 (0) 21 31 / 14 30 84
FAX: 49 (0) 21 31 / 14 38 98