

# Javelin #1

## Brakes

In *The Unfair Advantage*, Mark Donohue describes the selection process of the calipers for the AMC Javelin Trans Am race cars. The decision on calipers was based on the process of elimination. Girling calipers were available and were well known. The Penske team selected the same Girling caliper that Porsche used on the 917. Later, these calipers were used on Porsche street cars such as the 930 Turbo (from 1978 to 1988).



*A pair of Porsche 917 calipers. There are several variations on these calipers. These have fins, but not all do. Some have "Porsche" cast into the puck housings. This pair does not.*



*Yet another variation of the 917 Porsche caliper. The fins on the inboard puck housing are parallel to the ground. The fins on the outboard puck housing are perpendicular to the ground and the outward facing surface of the puck housing is machined smooth- probably for wheel clearance. Photo: A.J. Serrano*

To get the front to rear brake bias right on the Javelin, three steps were taken:

- 1) Twin Girling master cylinders connected via a balance bar were installed.
- 2) A Girling in-line booster was used on the front circuit only.
- 3) A fixed restrictor was installed in the brake line between the rear master cylinder and the rear calipers. This restrictor does not affect brake bias after the fluid pressure equalizes throughout the brake line. However, the restrictor delays the time it takes for the pressure at the rear calipers to equal the applied pressure at the brake pedal.

These three steps, combined, balanced the braking front-to-rear.

The decision on rotors was based on the engineering of Don Cox. Most rotor/hat combinations slide over the wheel studs, with the inside surface of the hat coming to rest on the outer face of the hub. Then the wheel slides over the wheel studs and is fastened with the lug nuts. The wheel and lug nut secure the rotor/hat in place. For the rotor and caliper to clear the wheel center, the rotor must be offset inboard. So, most hats, by necessity, have a significant offset (inboard).

With the Trans Am Camaro's the Penske team used Corvette front rotor/hats on all four corners. These same rotors were part of the JL-8 and J-56 brake option packages for the Camaro. On the Sunoco Camaro, the Penske team experienced cracked rotors. Cox conjectured that the cracking was related to the design of the integrated rotor/hat casting. Cox felt that the large offset between the hat and the rotor allowed the rotor to flex and crack.

So, for the Javelin project, Cox selected a Mercury rotor with minimal offset. In addition, rather than slide the rotor/hat over the wheel studs on the front side of the hub, Cox bolted the rotor to the rear of the hub. While this did minimize cracking of rotors, it requires the removal of the hub the change rotors.



*The Mercury rotor is bolted to the rear of the hub. Thus, a hat with sizeable offset is not needed. Photo: Mark Sorensen*

Brake pads were made by Raybestos (a concatenation of the name of founder of the company, A.H. Raymond, and the mineral asbestos,

that was thought for centuries to have near miraculous properties). The pads were part number R4528-19FF. Some of these Raybestos pads, that came as spares with Javelin #1, have a single vertical slot bisecting the pad. Such a slot allows loose pad material, as well as some gases, to escape the pad to rotor interface without having to travel all the way across the pad. Vertical slots in brake pads are commonplace. However, some of the spare pads have a horizontal slot, in addition to the vertical slot. The purpose of the horizontal slot is a mystery.

Raybestos continues to manufacture this pad. The original part number has been superceded. The current Raybestos part number is R608. During the 1990's, when Javelin #1 participated in vintage races, Performance Friction pads were used. The PFC part number is 727.83.4. The 83 is PFC's designation of the compound.

Manufacturer of Pad	Current Part Number
Raybestos	R608
Performance Friction	727.83.4
Hawk	HB170.650
Pagid	1203



*Pagid 1203 pad for the Javelin.*

Pagid application list for the 1203:

- *Front: 1978-1990 911 Turbo, 1989-1994 911 C4, 1990-1994 911 C2 & RS America,*
- *1986-1991 944 Turbo and 944S2, 1992-1996 968 ALL MODELS*
- *Rear: 1978-1990 911 Turbo, 1989-1994 911 C4, 1995-1996 993, 1988-1989 944 Turbo S,*
- *1992-1995 968 w/M030 package, 1990-1994 911 Turbo, 1992-1994 RS America,*
- *1986-1991 944 Turbo & S2, 1992-1996 968, 1986-1991 928S4, 1992-1995 928GT*