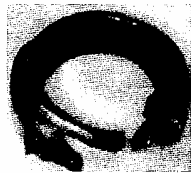


**Broken Rod End at BRIC**

*-by John McCrory*

**Aurora Bearing Company**

At the end of this Summer's Brian Redman International Challenge weekend, a friend of mine flagged me down, and tossed me a metallic object. "Here," he said. "They found this as they were cleaning up the mess." The mess he referred to was the unfortunate pile up at the start of the Sunday Group 6 race. The object was the head of a rod end. To most people, it would be considered a piece of race track refuse. To me, it's a lot more. It tells me a lot of things that would concern me if I found this part on a car, and I'd like to share these things with you.



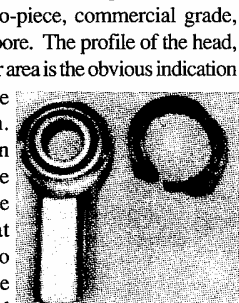
**Portion of the rod end found at the track.**

Before going any further, I will be up front that the part, or more correctly, the part that this piece was off of was not an Aurora part, and I work for the Aurora Bearing Company. The manufacturer of this part is unimportant, but I want to be honest about what I know. Also, I do not know anything as far as a direct fact as to what car it was off of, or where it was used. However, my experience with rode ends, race cars, and the types of cars involved in the incident, lead me down a certain path of reasoning.

The part was a two-piece, commercial grade, female rod end, 5/8" bore. The profile of the head, with the spherical inner area is the obvious indication of the two-piece commercial design. The female conclusion is drawn from the geometry on either side of the break that indicates a transition to a wide, barrel shape female body as opposed to the narrower cross section of a male body at the junction of the head and threaded shank. From this, I would suspect it was used as a tie rod end joint. The tie rods on most late model Detroit cars as in the field, i.e. Camaros, Mustangs and derivatives, Corvettes, etc.

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**Rod end piece found, along with a complete unit.**

have a 5/8" male thread, so this is a logical place to see a joint as described used.

I don't think this was the first incident that this joint, or car, was involved in. There are two big flat spots on the outside diameter of the piece. These marks occurred long enough ago that a coating of light rust has appeared. There are also a number of smaller gouges and dents that have discolored. There are also a few gouges that are shiny. These more likely occurred in the incident.

This part was not well maintained. If it had, the inner race would have had a coating of fresh grease. This part has a thin film of almost dry lubricant combined with dirt. There are a few areas that show through and are highly polished from the ball running dry on the race area. I would suspect that if you looked at the ball from this part, it would show discoloration or black scorch marks from running dry under load. The way the part shows the shank being torn from the head, and the ball being ripped out leads me to believe that the spindle/upright/wheel was torn from the control arm, with the rod end ball left on the steering arm, and the rod end body left on the tie rod.

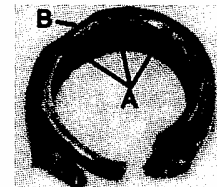
The fact that the area where this piece separated from the rest of the part shows no evidence of rust, combined with the fact that you would not expect a piece of debris this large to have laid undetected on an active race track makes me conclude it was generated in the incident.

So beyond the fact that I've proven I can make a lot out of a little, what have I shown that might be reason for concern?

This part had been in incidents before, had visible signs of damage, and therefore its integrity had been compromised. It probably had a noticeable amount of play in it. I would not want to see this on a race car, especially in the application presumed.

It was not well maintained, again as evidenced by the lack of grease. This would accelerate wear, and therefore development of play between ball and race.

I don't know if it would be the place of a tech official to object to this part being on the car. The car was certainly operating with the joint on it, and



**Gouges and dents from previous incidents (A), and previously ground down area (B).**

the damage to the joint (i.e. the body ripped in two) was most certainly an effect of the wreck.

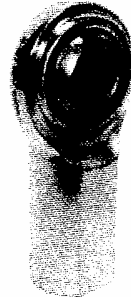
However, I would argue that running the joint on the car was a questionable choice. Again, the joint appears to have been previously damaged, it had also been poorly maintained. It is reasonable to say that it no longer could be relied on to provide the same level of performance, structural integrity and safety it did when new.

This type of joint retails for about \$15. It is made from low carbon steel, and has a load capacity of about 9500 lbs. It requires maintenance in the form of maintaining a coating of clean grease on the ball and race. For about \$45 retail, this joint could be replaced by a precision grade, self-lubricating, heat-treated alloy bodied rod end. This type of joint has a load capacity of over 17,000 lbs, and is maintenance free. While it's easy for the sales guy to spend the customer's money, the long-term reliability and performance of the higher-grade joint should be well worth the cost.

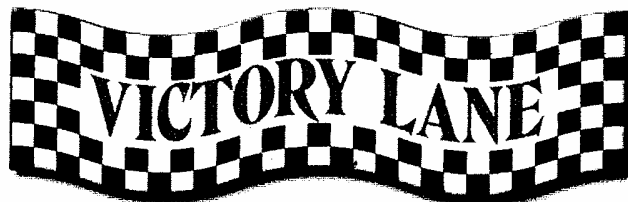


**3 piece high strength precision grade rod end. Heat treated alloy body, 17,000 lb. load capacity.**

If there is one thing racers should take away from this, it's that a closer look at the condition of the rod ends on your car, and consultation with the manufacturer of the joints, and car builder if available, about the application, along with replacement when appropriate, will enhance the long-term reliability of your race car. Again this joint appears to have failed because of severe stress caused by an accident. However, it was much closer to the end of its life than the beginning. For the sake of reliability and long-term safety, it probably should have been replaced a while ago.



**2 piece commercial grade rod end. Low carbon steel body, 9500 lb. load capacity.**



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