

Carter Racing (A)

"What should we do?"

John Carter was not sure, but his brother and partner, Fred Carter, was on the phone and needed a decision. Should they run in the race or not? It had been a successful season so far, but the Pocono race was important because of the prize money and TV exposure it promised. This first year had been hard because the team was trying to make a name for itself. They had run a lot of small races to get this shot at the bigtime. A successful outing could mean more sponsors, a chance to start making some profits for a change, and the luxury of racing only major events. But if they suffered another engine failure on national television

Just thinking about the team's engine problems made John wince. They had blown the engine seven times in twenty-four outings this season with various degrees of damage to the engine and car. No one could figure out why. It took a lot of sponsor money to replace a \$ 20,000 racing engine, and the wasted entry fees were no small matter either. John and Fred had everything they owned riding on Carter Racing. This season had to be a success.

Paul Edwards, the engine mechanic, was guessing the engine problem was related to ambient temperature. He argued that when it was cold the different expansion rates for the head and block were damaging the head gasket and causing the engine failures. It was below freezing last night, which meant a cold morning for starting the race.

Tom Burns, the chief mechanic, did not agree with Paul's "gut feeling," and had data to support his position (see Exhibit 1). He pointed out that gasket failures had occurred at all temperatures, which meant temperature was not the issue. Tom had been racing for twenty years, and believed that luck was an important element in success. He had argued this view when he and John discussed the problem last week: "In racing, you are pushing the limits of what is known. You cannot expect to have everything under control. If you want to win, you have to take risks. Everybody in racing knows it. The drivers have their lives on the line, I have a career that hangs on every race, and you guys have got every dime tied up in the business. That's the thrill, beating the odds and winning." Last night over dinner he had added to this argument forcefully with what he called Burns' First Law of Racing: "Nobody ever won a race sitting in the pits."

John, Fred and Tom had discussed Carter Racing's situation the previous evening. This first season was a success from a racing standpoint, with the team's car finishing in the top five in 12 of the 15 races it completed. As a result, the sponsorship offers critical to the team's business success were starting to come in. A big break had come two weeks ago after the Dunham race, where the team scored its fourth first-place finish. Goodstone Tire had finally decided Carter Racing deserved its sponsorship at Pocono -- worth a much-needed \$40,000 -- and was considering a full season contract for next year if the team's car finished in the top five in this race. The Goodstone sponsorship was for a million a year, plus incentives. John and Fred had gotten a favorable response from Goodstone's Racing Program Director last week when they presented their plans for next season, but it was clear that his support depended on the visibility they generated in this race.

"John, we only have another hour to decide," Fred said over the phone. "If we withdraw now, we can get back half the \$15,000 entry and try to recoup some of our losses next season. We will lose Goodstone, they'll want \$25,000 of their money back, and we end up the season \$50,000 in the hole. If we run and finish in the top five, we have Goodstone in our pocket and can add another car next season. You know as well as I do, however, that if we run and lose another engine, we are back at square one next season. We will lose the tire sponsorship and a blown engine is going to lose us the oil contract. No oil company wants a national TV audience to see a smoker being dragged off the track with their name plastered all over it. The oil sponsorship is \$500,000 that we cannot live without. Think about it -- call Paul and Tom if you want -- but I need a decision in an hour."

John hung up the phone and looked out the window at the crisp, fall sky. The temperature sign across the street flashed "40 DEGREES AT 9:23 AM."

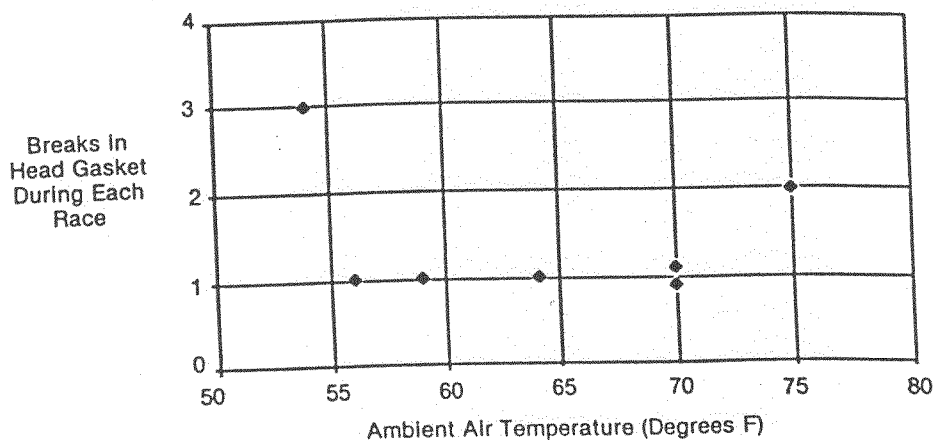
EXHIBIT 1:

Note from Tom Burns

John:

I got the data on the gasket failures from Paul. We have run 24 races this season, with temperatures at race time ranging from 53 degrees to 82 degrees. Paul had a good idea in suggesting we look into this, but as you can see, this is not our problem. I tested the data for a correlation between temperature and gasket failures and found no relationship.

Relationship Between Temperature and Gasket Failures²



In comparison with some of the other teams, we have done extremely well this season. We have finished 62.5% of the races, and when we finished, we were in the top five 80% of the time. Our rate of blown engines is 29%, but we are running fast, so we have to expect some difficulties. I am not happy with the engine problems, but I will take the four first-place finishes and 50% rate of finishing in the money³ over seven engines any day. If we continue to run like this, we will have our pick of sponsors.

- Tom

² Each point is for a single race. A gasket can have multiple breaks, any of which may produce an engine failure.

³ The top five finishers in a race are "in the money."

Carter Racing (B)

"Get Paul Edwards for me." John was calling to get his engine mechanic's opinion on whether they should run. The data Tom put together indicated that temperature was not the problem, but John wanted to get Paul's direct assessment.

Paul Edwards was a classic "gas station mechanic." His fingernails were permanently blackened by grease and his coveralls never stayed clean for more than two minutes on Saturday mornings. He had been knocking around the professional circuit for ten years after dropping out of school at sixteen to follow drag racing. He lacked the sophisticated engineering training that was getting more common in racing, but he did know racing engines.

John had discussed the gasket problem with Paul two days ago. As he waited for Paul to come to the phone, he reflected on their previous conversation. Paul was a man of few words, and was not given to overstatement. "The way I see it, the turbo-pressure during warm-up -- in conjunction with the different expansion rates for the head and block -- is doing a number on us," was about the extent of what he had to say on the problem. It was his personal opinion on the cause of the engine failures and he would never represent it as anything else.

It was the same story John had heard twenty times, but it did not match Tom's data. "Paul, we have chewed this over before. How do you know this is the problem? When we ran at Riverside the temperature was 75 degrees and we still lost the gasket and the engine."

"I am not sure what happened at Riverside," Paul had replied. "I am not sure that temperature is the problem, but it is the only thing I can figure out. It is definitely the gaskets that are blowing out and causing the engine to go."

Part of Carter Racing's success was due to a unique turbo-charging system that Tom and John had developed. They had come up with a new head design that allowed them to get more turbo pressure to the engine while maintaining fuel consumption at a fairly constant level. By casting the head and turbo bodies in a high-strength aircraft alloy, they had also saved almost fifty pounds of weight. The alloy they were using was not as temperature sensitive as the material in the engine block, but the head gasket should be able to handle the different expansion rates.

John could hear the sounds of race day in the background as Paul approached the phone. "Hello John," he said, obviously excited. "The Goodstone coveralls just got here. We are talking some fine threads, and no sew-on patches from these guys. The logo on the back and our names are stitched right into the material. I guess this means we get to keep 'em. Course, I got some grease on mine already, so they probably won't want 'em back anyway."

"I'm glad you like them," John said. "I need some information from you. What are we doing about the gasket failure business?"

"The car is set to go. We have been using a different sealing procedure since Slippery Rock, and had no problems for two races. Tom says the Goodstone deal is set as long as we finish in the money today. The guys in the shop want this bad. Goodstone is a class act. They can make us the number one team on the circuit if they decide to take us on."

Carter Racing (C)

John had only ten minutes to make up his mind when he called Tom. There was one last thing he wanted to know. "Give me the temperatures for the races where we did not have any gasket problems."

"What do you need them for?"

"Just call it idle curiosity. Do you have them?"

"Hold on." Tom was organized, which counted for a lot at a time like this. "Okay, here we are. I am going to give you the number of races at each temperature. Let's see: One race at 66 degrees; three races at 67; one each at 68 and 69 degrees; two at 70; one each at 72 and 75; two at 76; one each at 79, 80 and 82. That 82 was Tampa. What a scorcher that day turned out to be. And I do not have the last two races on my list. They were 78 and 73 degrees at race time."

John plotted the points as Tom read them off (see below). It was time to call Fred.

Ambient Temperature for Races without Blown Gaskets

