BODY REPAIR

Freeze Frame

Over the last 50 years or so, frame machines have evolved from basic garage-built machines to high-tech modern marvels.

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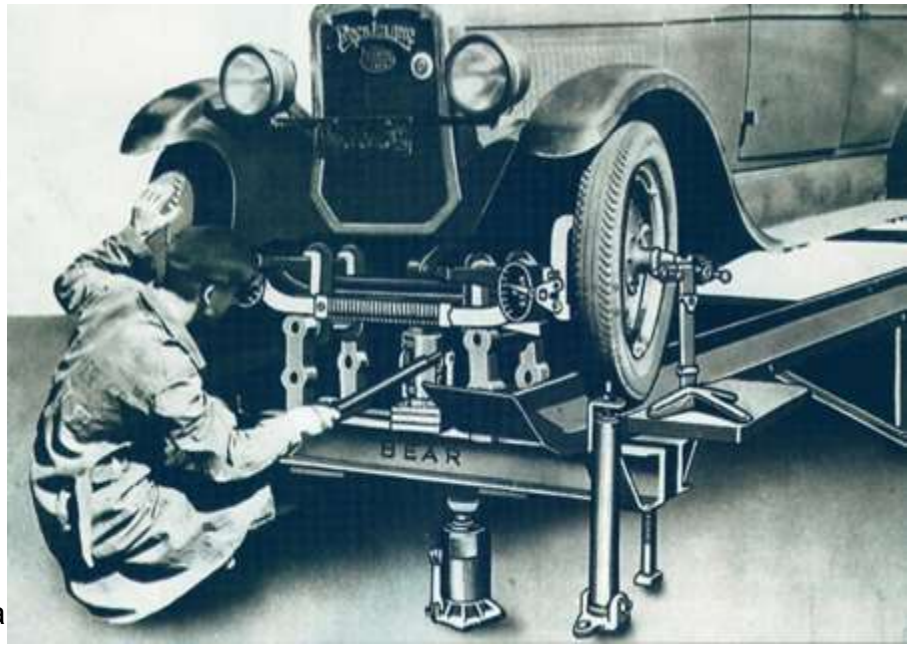
When I began in this business 35 years ago, body shops that had a frame machine were more the exception than the rule. Instead, there were specialists whose shops would handle frame repairs and wheel alignments for those collision repair facilities that didn't have the technical training or equipment required to do such procedures. In fact, I remember one such specialist we had a relationship with at the first shop I ever worked at, an Olds-Saab dealership in suburban Philadelphia. He was essentially a subcontractor, and the frame repair portions written in the sublet columns of the insurance estimates were a reflection of the nature of this arrangement.



This was, of course, before the unitized body in passenger cars became the mainstream. These cars then became more susceptible to structural damage than their full chassis predecessors, which resulted in a greater number of cars needing frame repairs and made it worth shops' time to own their own frame machines.

Early Designs

An early and popular design for frame repair equipment was introduced by Blackhawk in 1949. Called a "Damage Dozer," it was basically a right angle formed by two heavy steel beams with a hinge at the bottom and a hydraulic ram located near the junction where the two beams came together. One beam was anchored to one side of the car and the other was chained to the damaged portion of the body or frame being straightened. In some instances, this machine damaged the points where they were anchored to the car, but this damage was considered an unavoidable consequence. The frame repair specialist we subcontracted to at my first shop had one such dozer he towed around behind his '65 El Camino in a specially built trailer.

The early "drive-on" frame racks (predecessors of modern frame machines today) were adapted from wheel alignment racks, some made by Bear Manufacturing in Rock Island, Ill. Alignment shops were frequently given cars to align after the collision repair work was completed, but in many cases, the cars' frames were bent so badly that they couldn't be brought back into spec. It was a natural progression to equip an alignment rack with hydraulic mechanical devices to pull or push a frame rail.

After the dozer came the Blackhawk Korek system, which consisted of a matrix of steel tracks inlaid in the concrete floor of a body shop into which anchors and a pulling tower or a vector system could be placed. The concrete mix for the floor was formulated for superior hardness and strength. These systems proved to be very popular and many are still in use today.

Korek machines were often used with bench systems and dedicated fixtures, which were known for their extreme accuracy. The dedicated fixture systems were popular with dealership body shops that did the majority of their work on the same model of car

because it made purchasing the fixtures needed for that model worth it. Those systems, however, often required the removal of suspension components in order to fit the fixtures into the dedicated openings in the vehicle bodies. This sometimes proved to be inefficient in terms of setup time. As a result, many of the systems with the fixtures sat unused, particularly in cases where flat-rate technicians who were all about speed operated the systems.

For example, at a Chevy dealer where I was the body shop manager, the flat-rate techs viewed setting up the bench as a hassle and scoffed at the accuracy of the fixtures, preferring to work by the seat of their pants. For them, time was money, so our bench sat gathering dust in the corner. They figured if the sheet metal fit (with some hole reaming, of course), the car was good to go.

Evolution Up Close

Dave Demarest, owner of Metropolitan Car-O-Liner, a North Jersey distributor of Car-O-Liner equipment and welders, has watched the frame machine evolve up close from the time he was just a kid to when he began managing a few shops and eventually purchased a shop in Northvale, New Jersey. The shop happened to be adjacent to Volvo North America's headquarters, which led him to being introduced to the Swedish equipment manufacturer Car-O-Liner.

According to Demarest, Car-O-Liner started out in the early '70s in Europe, where cars were first manufactured on fixtures. The body shops there only had five or six different chassis configurations to work with, which leant itself well to using fixtures, but the problem was that the fixtures were not always available when the cars came into the shops. As a result, Demarest said, fixture usage declined as frame techs began to overlook damage and made assumptions that the structures were OK just by eyeing the cars up.

"As more and more models came out, the logistics of obtaining fixtures demanded that you had to wait for them," Demarest says. "You had to take the mechanicals out and, as a result, the techs would tend to use fewer fixtures than were recommended."

Volvo finally obtained a Car-O-Liner machine (developed by Uno Johansson) in 1978 and asked Demarest to evaluate it for the U.S. market. At the time, only about 25 percent of the automobiles in the U.S. had unitized bodies. Volvo was a relatively small player at that point but saw the market's potential and the significance of having equipment to repair its cars as well as the other unibodies sold in the U.S.

"The idea of a bench was not new, but the idea of a universal bench was," Demarest says. "Any car could be put on the bench and it would be repaired on exactly the same data plane."

According to Demarest, in 1972, Johansson partnered with an engineering and metal fabricating firm called SEMFA, where the engineers made things strong enough, light

enough and accurate enough for producing the machine he had in mind. The machine was then introduced to the European market, where car manufacturers transitioned to unitized bodies after World War II due to high fuel prices. Demarest said the United States underwent the same change to unitized bodies in 1979 due to the Arab oil embargo.

Demarest noted that it was not until the early ’80s that American frame equipment companies made clamps to hold rocker panel pinch welds. The sales manager of Car-O-Liner in Sweden realized that the United States market was going to grow dramatically.

A first, Demarest said, was measuring data supplied by Car-O-Liner that served as a three-dimensional guide to the car body’s structure. Up until then, techs had to use trams and tape measures and new body parts to measure cars’ inner structures. With this new system, trying on parts was no longer necessary.

Today, Car-O-Liner is one of the world’s most respected manufacturers of body and frame repair equipment and makes a drive-on bench rack with removable ramps for greater access to the vehicle. The company still provides frame data directly to those who still use the mechanical measuring systems of the early benches, but it also has a Web-based system that allows users to access the information online.

Pioneering Ways

Lavell Chisum is regarded as a genuine pioneer in the collision repair business, namely because he invented the Chief EZ Liner.

“I didn’t like to do [auto body work], but I was trained to do it as a young boy and got good at it…and I could always get a job doing it,” says the 82-year-old Chisum, who includes body shop owner, rodeo cowboy, farmer and Alaska homesteader on his resume.

Chisum entered the industry in the early ’40s, taking a job in his father’s shop in Vernon, Texas. He picked up a 9-inch buffer and never looked back.

“I’m not in the business any more, [but] I’m still into it in a way because what I do best is invent things,” Chisum said. “I have about 10 to 15 patents, although only one or two are still in force. I’m still in good health and can do anything I want, it just takes a little longer.”

When Chisum started straightening frames, he says he visualized a machine that could do the ultimate job. During his stint in Alaska, he says the repairs being performed by the competition were not of the highest quality and knew that he could do better.

“I couldn’t do the quality of work I wanted to do and compete with the local guys, which was when I began to get serious about making the machine that I had been dreaming about for years,” he says.

Chisum used to spend weekends in the shop drawing up plans for the machine using compact, mid-sized and large cars to establish a scale for it. He then built three machines out of the same material until he finally got one that performed to his satisfaction. He then sold the machine to Glacier Lincoln Mercury in Anchorage in June 1968 and, as part of the deal, agreed to operate the first EZ Liner in the dealer's shop for a year.

Chisum then sold another one to Bean's Glass and Body Works in Fairbanks. He built that particular machine in his front yard.

"They almost threw me out of the neighborhood," recalls Chisum.

Those were lean times, Chisum says, with he and his son pulling his machine behind a half-ton pickup with a truck axle under the front of the machine and a trailer hitch attached to the opposite end.

"I didn't have enough money to stay in a hotel," he said.

After building and selling a few more machines, Chisum made a deal with a man in Minneapolis to start a plant in Oklahoma and take over the manufacturing process. He claims there have never been any major changes to the EZ Liner since he made the first one, although there have been a series of minor improvements.

Chisum says the pickings were slim for frame repair equipment in those days, unlike today where the shop owner has a comparatively unlimited choice. Back then, there was basically two choices: the Bear machine and the Marquette. According to Chisum, the Marquette, the forerunner to the DuzMor, was a decent machine but was too big and too expensive.

After selling everything he owned in Alaska, Chisum and his family moved to Minneapolis. On a trip to Oklahoma, when he says he was "flat broke" and towing a wife, four kids and two dogs, he found that his sales people hadn't sold any of his machines. So he canvassed Oklahoma himself in the hope of finding someone to back him and his EZ Liner. He went to 13 banks before arriving in Claymore and visiting the First National Bank with the head of the Chamber of Commerce.

Chisum says he hit it off with the banker and, after about 30 minutes of chatting, the banker looked at him and said, "I believe you can do this. I'm going to loan you enough money to build your machines."

The rest, as they say, is history. Chisum's EZ Liner went on to become one of the most popular frame repair systems ever. He was recognized as inventor of the year in 1982 by the Patent, Trademark and Copyright Law Section of the Oklahoma Bar Association based on his contribution to the automobile body and frame alignment business. In 2003, BodyShop Business cited Chisum's invention of the EZ Liner as one of the events that shaped the U.S. collision repair industry.

Straight to the Future

Like other types of equipment, frame machines have followed a fascinating line of evolution. “Necessity is the mother of invention,” said philosopher Plato, and that was never more true than when reflecting on the development of the modern marvels we have today that are crucial to putting vehicles back into their proper dimensions. There are many variations, yet all are vital to performing the duties required of high-tech collision repair facilities. As vehicles become more sophisticated, these machines undoubtedly will, too.

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