

The Texas breakaway design utilizes a wide flange or I-beam section as the cantilevered support post. The safety features incorporated in the design are a slip base and a hinge joint.

The sign can be attached to the post in several ways. This sign employs a plywood background with aluminum wind beams bolted to the plywood and clamped to the posts.

The slip base is designed in such a manner that a shear plane is created at the base of the post. The base connection is fabricated by bolting the base of the post to the foundation stub and thus providing resistance to overturning from wind forces. The shear plane consists of slots rather than holes in the base of the post and the foundation stub.

The hinge joint is a weakened plane, approximately 7 feet above the base. Its purpose is to permit upward rotation of the post after impact.

To form the hinge joint, the front flange and the web of the post are severed and reconnected with a bolted fuseplate that slips or fractures to permit rotation of the post to clear the colliding vehicle.

The Texas breakaway design functions as follows:

As impact occurs, energy is absorbed by the post and the automobile until the impact force is sufficient to cause the base to slip. After the base slips, the fuse breaks. Energy that was stored in the vehicle and the post results in the post being thrown clear of the automobile. Acceleration of the lower portion of the post causes it to continue in its upward swing and the automobile passes through safely.

Now, observe this behavior in one of the slow motion crash test films taken at 1,000 pictures per second.

Dr. HIRSCH (interpolating). The change in velocity of the vehicle is on the order of 1 to 2 miles an hour.

Mr. BLATNIK. Would you repeat that?

Dr. HIRSCH. The change in velocity of the vehicle is on the order of 1 to 2 miles an hour.

Mr. BLATNIK. The deceleration?

Dr. HIRSCH. Yes

VOICE (continuing). Note how little damage was done to the vehicle.

Another design recommended by the Policy Committee is the Minnesota deforming post, A-frame design. The post braces and wind beams are all made of U-section rail steel prepunched for easy assembly.

The posts can be driven in the ground, usually to a depth of four feet or more, or they may be set in concrete, dependent upon the soil conditions.

The Minnesota deforming post, A-frame design, functions as follows:

As impact occurs, energy is absorbed by the vehicle and the post until the force is sufficient to shear the post below the bumper level. The impact energy results in bending of the slender post member and twisting the sign.

As the collision progresses, the vehicle collides with the brace member, deforming it, and causing shear failure in the bolted connection.

A secondary collision may normally be expected as the vertical post member strikes the vehicle above the windshield.

Now observe this behavior in a continuous run of the slow-motion crash test film.

In crash testings of this design, the vehicles have sustained only minor property damage.

Another design recommended by the Policy Committee is the joint failure, A-frame design. The sign support is an A-frame structure with features of a truss. The joints of the various members are made of a frangible material which will fracture upon impact. The individual members are tubular in shape and deform upon impact.

Extruded aluminum panels are used for the sign background. The panels clamp directly to the vertical post member.

The joint failure A-frame design functions as follows:

As the colliding vehicle strikes the upright member, the member deforms and the frangible foundation fitting breaks. As the collision progresses, the member is bent, causing a plane of failure near the sign face.

As the vehicle strikes the two brace members, deformation occurs in the first member, and the frangible foundation connection breaks.

As the connection breaks, members are rotated upward by the impact force, the sign background is twisted, and the upper connections break.