

“KEEPING PACE” - #84

(Page 1)



VOLTAGE SURGES CAUSE FIRE:

A fire began after a neighbor saw arcing at the middle of the worn electrical service cables running from the electrical transformer on the utility pole into the insured's house, shown above. These cables were connected to the conduit shown by the arrow. The neighbor stated that there were five or six arcs which shot blue flame from the service cables. Within a few minutes, he saw smoke coming from the basement.

When I arrived, I determined that the fire was caused by one of numerous short circuit arcs in the romex-type (NM) cables in the basement. This could not be a coincidence. Rather, the arcing in the service cables outside the house created large transient surge voltages in the branch circuits inside the house. The rapid changes in the large electrical currents outside the house, combined with the inductance of the windings in the transformer, created these high transient voltages inside the house.

The household wiring is only rated at 600 volts, so voltages much higher than that, however brief, can punch through the household wiring's insulation to create damage through which electrical current can travel. The utility company paid 90% of this claim.

“KEEPING PACE” - #84

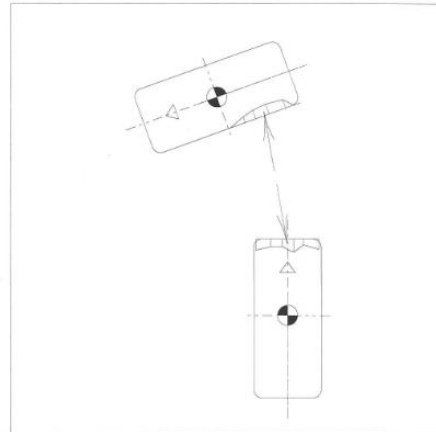
(Page 2)



COMMON RESULTS

Impulse, IMP
Collision Time, Dt
Total Energy, Et
Closing Speed, Vc

2024.4 lb-sec
0.042 sec
69119 ft-lb
46.6 mph ←



CLOSING SPEED FROM WINCRASH™

My computerized accident reconstruction program, WinCRASH™, has a feature which calculates the closing speed between two vehicles at the moment of impact from the crush damages alone. This is extremely useful when the speed of one vehicle is known, such as when one vehicle is stopped prior to an accident. Also, when a vehicle is turning left, its speed is usually relatively low. So the closing speed calculated by WinCRASH™ is close to the speed of the other vehicle at the time of impact (technically, WinCRASH™ calculates the vector closing speed between the two vehicles).

When skid marks are left, they can be used along with the closing speed at impact, to calculate the speed at the beginning of the skid marks, using normal skid mark calculations.

One page of the WinCRASH™ printout is shown for the vehicle in the photograph.

Sincerely,

Frederick F. Franklin, P.E.
Forensic Engineer