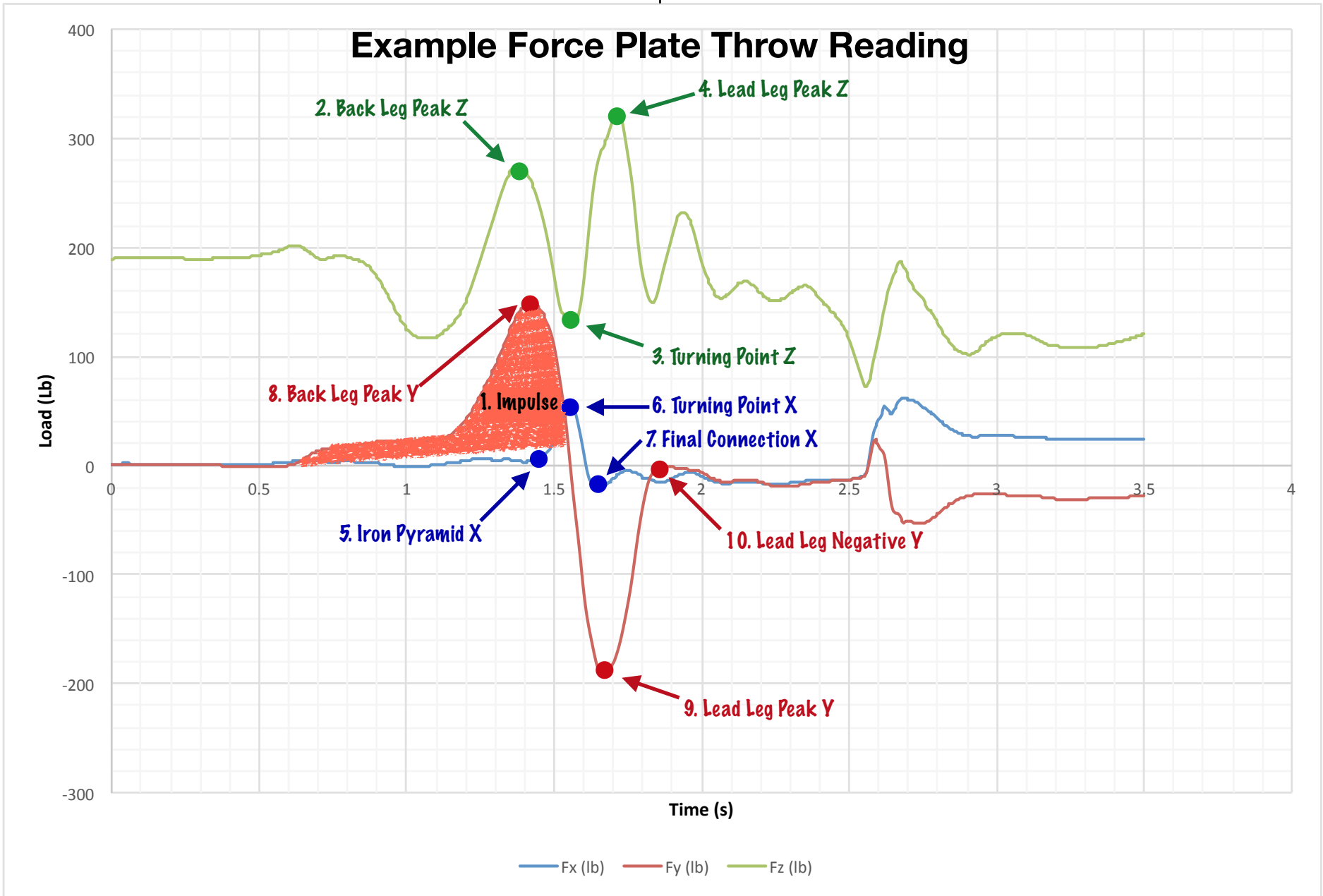


# Timing Features

- 11. Time Diff. Back Leg Peaks YZ = Back Leg Peak Z to Back Leg Peak Y
- 12. Time Diff. Lead Leg Peaks YZ = Lead Leg Peak Z to Lead Leg Peak Y
- 13. Time of Transfer = Back Leg Peak Z to Lead Leg Peak Z
- 14. Back Leg to Turning Point Z = Back Leg Peak Z to Turning Point Z

- 15. Iron Pyramid to Final Connection X = Iron Pyramid X to Final Connection X
- 16. Iron Pyramid to Turning Point X = Iron Pyramid X to Turning Point X
- 17. Back Leg Peak to Negative Y = Back Leg Peak Y to Lead Leg Negative Y
- 18. Lead Leg Peak to Negative Y = Lead Leg Peak Y to Lead Leg Negative Y



# Force Plate Term Descriptions

**1. Impulse:** represents the overall effect of force acting over time. In this case, it is the area underneath the Y-force curve for the back leg (force multiplied by time). Impulse is one of the most important contributors in understanding how elite pitchers use the ground-reaction forces and throw hard.

**2. Back Leg Peak Z:** is the maximum Z-force (force pushed down into the ground) by the back leg during the pitching delivery. One of the most important metrics in regard to Z-force applied into the ground.

**3. Turning Point Z:** is the minimum Z-force (force pushed down into the ground) by the back leg in between the back leg energy transfer to the lead leg during the pitching delivery. Also one of the most important metrics in regard to Z-force applied into the ground.

**4. Lead Leg Peak Z:** is the maximum Z-force (force pushed down into the ground) by the lead leg landing at the time around ball release during the pitching delivery. Can be a good indicator of whether a player created more force through a "foot plant from above" landing mentality.

**5. Iron Pyramid X:** is the minimum X-force (force of pushing forward or back toward 1st or 3rd base) by the back leg right before the back foot begins to rotate during energy transfer of the kinetic chain. Values further from 0 lb. could show that a player is applying pressure to the toe or ball of their foot prematurely in the early stages of the pitching delivery.

**6. Turning Point X:** is the maximum X-force (force of pushing forward or back toward 1st or 3rd base) by the back leg created when the back foot rotates during energy transfer of the kinetic chain. Values further from 0 lb. could show to a degree how quad dominant a pitcher could be during the pitching delivery.

**7. Final Connection X:** is the minimum X-force (force of pushing forward or back toward 1st or 3rd base) directly following full rotation of the back leg and foot. It also takes into account the X-force applied by the lead leg at weight bearing, which could be useful in seeing how the player is applying forces laterally by their lead leg at ball release.

**8. Back Leg Peak Y:** is the maximum Y-force (force pushed back toward the rubber) by the back leg during the pitching delivery. Can be useful in showing how hard a player is pushing their back leg against the rubber (really high spikes could show that they are independently leaping off the mound versus a controlled/gradual push).

**9. Lead Leg Peak Y:** is the minimum Y-force (force resisting moving toward home plate) by the lead leg during the pitching delivery (will show as negative spike on force plate graph). One of the most important overall factors in regards to importance in throwing hard for elite pitchers.

**10. Lead Leg Negative Y:** is the maximum Y-force following the "claw back" or swing leg retraction of the lead leg at the end of the pitching delivery. Another important overall factor in regards to importance in throwing hard for elite pitchers.

**11. Time Diff. Back Leg Peaks YZ:** is the timing difference between the back leg peak Z-force and the back leg peak Y-force. Represents the difference in time between sheer force applied into the ground at the bottom of initial leg lift and when the pitcher is pushing hardest toward the rubber.

**12. Time Diff. Lead Leg Peaks YZ:** is the timing difference between the lead leg peak Z-force (positive value) and the lead leg peak Y-force (negative value). Represents the difference in time between these forces when the forces are being applied greatest into the ground at lead leg landing. More important than the time difference for the back leg peaks YZ-forces.

**13. Time of Transfer:** is the timing difference between the back leg peak Z-force and lead leg peak Z-force. The most important time-related metric that represents the overall time of transfer of energy during the pitching delivery.

**14. Back Leg to Turning Point Z:** is the timing difference between the back leg peak Z-force and minimum Z-force right before the lead leg lands. Represents the amount of time of the "ride" for the back leg before the lead leg landing.

**15. Iron Pyramid to Final Connection X:** is the timing difference between iron pyramid X-force and final connection X-force. Represents the amount of time between even foot distribution (not toward toe of foot) and when the back foot is finished rotating toward ball release during the pitching delivery.

**16. Iron Pyramid to Turning Point X:** is the timing difference between iron pyramid X-force and turning point X-force. Represents the amount of time between even foot distribution (not toward toe of foot) and when the most force is being applied toward 1st base or 3rd base at peak back foot rotation.

**17. Back Leg Peak to Negative Y:** is the timing difference between the back leg peak Y-force and the lead leg negative Y-force. Essentially represents the entire amount of time for the delivery between maximum pushing away from the mound and the lead leg clawing back at the end of the pitching delivery.

**18. Lead Leg Peak to Negative Y:** is the timing difference between the lead leg peak Y-force (negative value) and the lead leg negative Y-force at the end of "claw back". Represents the amount of time for swing leg retraction or the amount of time it takes for the lead leg to pull back in Y-force toward the pitcher at the end of the pitching delivery.