CompuSport

Integrating Science in Sport

Single Session Sprint Analysis
Noah Lyles

Session: 3/5/2020-On-Track Sesssion Summary-Model View – Final

Coach: Lance Brauman

Videos and Results are available on the CompuSport.com website.

This is a summary of the On-Track or Competitive Sprint Session listed above. Performance Variables that are flagged as errors are identified in four Groups: Result, General, Special, and Specific. The challenge for the Elite Coach is to improve the Specific Performance Descriptors which will, in turn, improve the results in the remaining Groups.

Finally, if a comprehensive summary of the results of every Variable is of interest, refer to the Appendix at the end of this report.

Result:

The Variable that is the end product of all of the athlete's efforts is put in the Result category. In the Sprint, this Variable is the Horizontal Velocity down the Track. Since this result is compared to the velocity required to produce a World Record effort, it is extremely rare for this variable not to be flagged as one to be improved.

Sprint Velocity is Too Low (Compared to World Record Performance)

General Performance Descriptors:

The variables in this Group identify how well the athlete is doing in creating the Time and Rate results, but they do not identify how the performer is mechanically producing the results. They are critical, however, in determining what areas needs to be addressed for improvement to occur. They are listed below where they occur - either in the Ground Phase or the Air Phase.

Ground Phase:

There Are No Ground Phase Errors

Air Phase:

Air Time Right to Left is Too Short

Special Performance Descriptors:

Stride Length in the Sprint is placed in its own Special group because it is evaluated differently than other Variables. Because the actual Length result is directly affected by Air Time, to determine if the Length is actually a problem the result is adjusted for the athlete's actual Air Time. This error can be mechanically based, but in most cases it is due to the athlete's inability to generate sufficient Dynamic Strength during Ground contact.

Not Producing Sufficient Stride Length During Ground Contact

Specific Performance Descriptors:

These Variables identify how the performer is mechanically producing the results in the Result, General, and Special groups. These are the areas where changes must be made to improve performance. In the unlikely case where all Specific Variables fall in the acceptable range, the only remaining way to improve performance would be to improve Strength levels (Static, Dynamic, or Elastic). As with the General results, they are listed below where they occur - either in the Ground Phase or the Air Phase.

Ground Phase:

Upper Leg Full Extension Angle Left is Too Small (Extending into Back Side)
Lower Leg Angle at Takeoff is Too Large (Extending into Back Side)

Air Phase:

There Are No Air Phase Errors

Sprint Scores: Noah Lyles

All of the Errors listed above are triggered when the Athlete’s performance in any Variable falls outside of a certain range. Although these Errors identify the major problems with the Athlete’s Sprinting action, it does not identify how bad each Variable actually is (does it barely reach the

problem level or is it really bad). Likewise, it does not identify the level of performance of those Variables that do not reach the problem level (do they barely reach the level of acceptance or are they very good).

To provide greater insight into the overall Sprint performance of an Athlete, each Session is given a Score in each of the four Groups (Result, General, Special, and Specific) that includes the quality of every Variable. If the Athlete's Score reaches 100, they have matched the Model in every Variable in the Group.

These Scores provide an excellent measure of the overall strength or weakness of each of the Groups, as well as the best measure of how the Athlete changes over time.

For every Group result, a Score above 50 places the Athlete above the average for Elite Sprint performance. A Score of 75 or higher places the Athlete among the best in this category.

Sprint Result Score:

For the Sprint, the Velocity Variable is the only measure of overall success. If a Sprinter can produce a Score of 75 in the On-Track Practice Sessions, or a Score of 90 in Competition, they will have reached a level of performance that will be hard to beat.

Sprint Result Score: 44

Sprint General Score:

The General Score is made up of the results of all the Time Variables, including the Stride Rate. This Score provides an excellent measure of how well the Athlete is producing and managing the time demands of the performance. Regardless of the quality of the rest of the Sprint Scores, this Score tends to be high in all Elite Sprinters. In fact, it is difficult to be a world class sprinter without the genetic ability to score well in these Variables. Many times young Athletes will score in the 70s or higher, while producing poor Scores in both the Special and Specific Groups.

Since this Score is primarily genetically driven, it tends to be similar in both the On-Track Practice Sessions and Competitions.

Sprint General Score: 86

Sprint Special Score:

The Special Score indicates the Athlete's ability to produce an effective Stride Length during the Ground Contact phase. Since the Ground Phase becomes shorter as the quality of the Sprint

performance increases, scoring high in this Group is a difficult task. Successful Sprint times can be produced with average Special Scores (40-60), but the great Sprinters score well here as well (above 80).

Due to the extreme power demands required to produce a world class Stride Length, coupled with the fact that good Sprint Mechanics tends to decrease Stride Length, this Score is typically the lowest of the Group.

Sprint Special Score: 35

Sprint Specific Score:

The Specific Score is the best indicator for how the Athlete is using the body segments to produce the overall Sprint performance. Talent alone can produce respectable levels of Result, General, and Special Scores, but for a true World Class result, proper body movements must be achieved to allow the talent to achieve its potential.

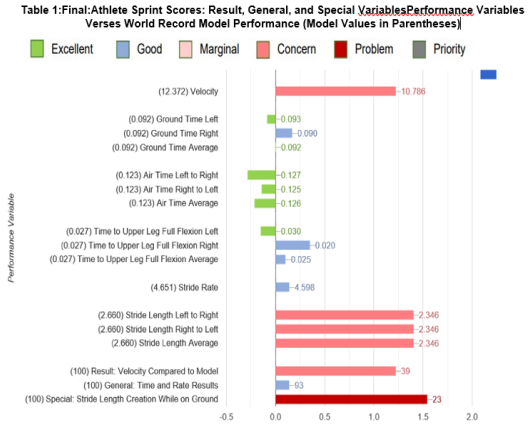
Due to the stress of Competition, coupled with the emphasis on proper Mechanics during the On-Track Practice Sessions, the Specific Scores in Competition are always lower. The truely great athletes develop the ability to produce high Scores in both Practice and Competition.

Sprint Specific Score: 88

Appendix

This is a graphical summary of the Competition or On-Track Sprint Session presented in this document. Video and full results are available in your secure site at www.compusport.com.

For the athlete, two sets of graphs are created for each Session. For Competitions, there will be one set for the short race (100 Fatigue), and two for each long race (200 or 400: Non-Fatigue and Fatigue). For On-Track Practice Sessions, there will normally be two sets: an Initial (first run-through) and a Final (last run-through).



In each graph, the Model result for each Variable is listed in parentheses (in front of the Variable name). The Athlete's result is shown in the bar graph result, with each value scored from -2.0 to 2.0. Results in Green and Blue are acceptable, while Pink, Orange, Red, and Black indicate results of increasing levels of concern.

Table 1 presents the Athlete's ability to generate Velocity,as well as managing the time and distance results required to produce a successful Sprint performance. It should be remembered that these scores are based on World Record performance for each Variable. In Competition, the goal for Table 1 is always to achieve scores that are in the Green or Blue. In On-Track Sessions,however, since Velocity can never be as high as in competition, adjustments in the expectations for some of the Variables need to be made.

For Practice Sessions, the goal for the Velocity and Stride Length Variables is to get the Scores less than 1.0 (in the Pink Zone) when going into the peak competitive season. Early in the Season, these values should be less of a concern. For the Variables Ground Time, Air Time, and Time to Upper Leg Full Flexion, however, the goal should always be to have these Scores in the Green or Blue Zones. The Scores for Ground Time should always be of primary concern since without acceptable results in this Variable, elite level Sprint success is simply not possible.

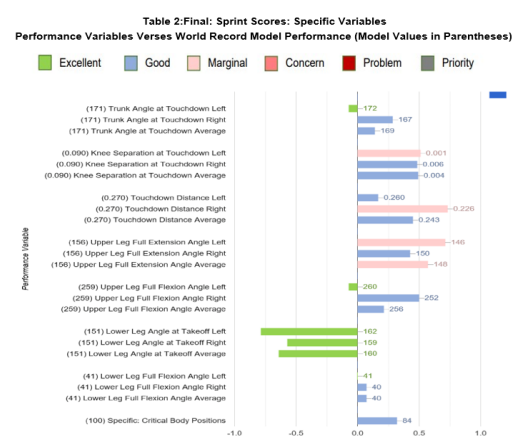


Table 2 summarizes how the Sprinter is moving the body to generate the Table 1 Scores. These Variables are a direct measure of how well the Athlete is producing the proper Sprint Mechanics. Regardless of the type of Session (Competition or Practice) or time of year, the goal should always be to have all of the Scores in the Green or Blue Zones. Competition tends to produce lower Mechanics Scores, but the successful Sprinters generate and maintain higher Scores.

Finally, each Graph displays an Overall Score for each of

the Performance Groups (Result, General and Special in Table 1, and Specific in Table 2). As with all of the individual Variables, the goal for Competition should always be to have these Scores in the Green or Blue Zones. For Practice Sessions, the goal for the Overall Score for the Result and Special Groups should be to get the Scores less than 1.0 (in the Pink Zone) while keeping the General and Specific Groups in the Green or Blue Zone.

If you have any questions concerning any part of this Summary, feel free to contact us.