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INNOVATION: TRACKMAN COMBINE

Launching in early 2010, the TrackMan Combine is a global initiative that will establish shot making standards at various distances for all types of golfers

In golf today, there's surprisingly only one comprehensive benchmarking system for shot results at various distances – ShotLink. ShotLink measures every shot made on the PGA TOUR to within inches, allowing players to, among other things, understand their shot making skills and abilities from any distance and situation. This gives PGA TOUR players the unique opportunity to study shot statistics to determine their strengths and weaknesses relative to every other player on TOUR. For example, ShotLink statistics for the 2009 season reveal that Steve Stricker was the best player for Approach Shots from 75 to 100 yards, with an average result at 13'0", while Phil Mickelson's rank for the same category was 112th at 18'4".

Unfortunately, ShotLink data is available only to those players talented and fortunate enough to compete on the PGA TOUR. Introduced in 2001 at the Buick Classic, the solution became widely used at the start of the 2002 PGA TOUR season. Requiring approximately 200 volunteers each week and a team of dedicated support staff, not to mention the significant investment in development, hardware, transportation, and course mapping, it is unlikely that ShotLink or any similar system will be making its way to smaller professional tours anytime in the near future, much less the golf events most amateurs play in.

Even when statistical reporting on shot results is made available on smaller tours or top amateur events, it is usually limited to the efforts of a handful of volunteers assisting in the measurement of Driving Distance on one or two holes. Beyond driving distance, they might also report percentage of fairways hit, percentage of greens in regulation, sand saves percentage, and the like. Common are the aggregate scoring statistics such as average 18-hole score, per-hole score average, eagle percentage, birdies, pars, which can be done for full field, teams, and individual players.

If you don't play professional golf or in major amateur events (and even if you do), there are some valuable golf statistics solution providers offering shot results analysis. However, these solutions require self reporting, so you'll need to make a journal of your shot results during rounds of golf and be diligent and objective in your approach.

Outside of big time tournament golf and these self tabulated stats applications, shot making results data for the great majority of golfers is lacking.



Upload combine results to on-line platform

Consider the following scenarios:

- > An 18 handicap amateur in Michigan wants to compare his shot making ability from 100 yards to PGA TOUR players, as well to scratch golfers and other 18 handicap amateurs around the world.**
- > Your client's high school son or daughter wants to know if they have the potential to compete in Division I, II, or III college golf.**
- > You're a golf instructor and want to set improvement goals together with your clients. You need to establish current skill level and demonstrate measurable improvement. You desire a standardized evaluation metric with a shorter feedback cycle than handicap index.**
- > A college golf coach would like a standardized golf test, similar to SAT score, allowing a quick assessment of a player's potential in order to determine recruiting priority. The test can also be used with active team members to identify strengths and weaknesses, as well provide focused practice routines.**
- > A serious player wants to evaluate their equipment and technique strategy for various scoring zones.**

The TrackMan Combine has been designed to address scenarios like this and more.

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INNOVATION: TRACKMAN COMBINE

Range Set Up

Before starting any TrackMan Combine, the test administrator sets up range targets at each of the following yardages: 60, 70, 80, 90, 100, 120, 150, and 180. Targets shall be located along a single target line with minimal elevation change.



TrackMan Combine - in action on the range

TrackMan Combine Test Procedure

Once the range has been set up with combine targets, the test can be administered. The combine consists of 80 shots and lasts on average 45 minutes. The test subject starts the combine by hitting 4 shots to the first target and follows with 4 shots to each sequential target in the following order: 60 yards, 70, 80, 90, 100, 110, 120, 150, 180, Driver. After the 40th shot, or 4th Driver shot, the process repeats itself starting with the 5th shot at 60 yards (41st shot). Once the 80th shot is hit (8th Driver), the test is complete. Upon completion of the test, the administrator logs onto www.mytrackman.com to upload the test results. Immediately following, test results are available online for administrator and player to review. The player can also log in later with his/her unique log in details to review results at home or in the office.

An example of summary results is shown below in Figure 1.

YARDAGE	SHOTS	Avg. Dist. From Pin	Percentile Ranking	10th Percentile	50th Percentile	90th Percentile	95th Percentile	
60YD	6	4.5	58	2.6	5.1	3.1	4.7	6.2
70YD	10	2.5	96	2.1	5.2	3.2	4.0	5.9
80YD	10	2.3	96	2.3	5.6	3.8	4.2	5.4
90YD	6	3.5	80	2.8	6.1	3.5	4.0	5.8
100YD	6	5.9	47	3.2	6.6	3.9	4.8	5.8
110YD	10	2.8	94	2.2	6.6	4.1	4.9	5.9
120YD	7	6.0	64	2.6	6.8	4.7	5.8	6.8
150YD	9	5.9	90	3.6	9.3	5.9	7.5	9.1
180YD	4	12.6	27	5.9	12.3	6.3	7.1	10.8
DRIVER	6	232.2	75	208.9	239.9	210.3	250.1	221.4
DRIVE DATA	6	13.2	58	6.6	14.6	8.2	10.3	11.6

Objectives of the TrackMan Combine:

- > **Standardized Test – Objective, easy to administer and repeat**
- > **Time Efficient – 1 hour or less**
- > **Immediate Feedback**
- > **Test results automatically hosted online – always accessible to both coach/teacher and player**
- > **Cover a wide spectrum of shot types**
- > **Benchmark skill and offer global peer rankings, comparisons**
- > **Initiate discussions about technique, equipment, and goal setting**
- > **Leverage the power of TrackMan accuracy – no other system or method is accurate and reliable enough to be valid**
- > **Offer TrackMan customers additional ROI**

Drop down menu options allow participants to compare their combine results to peers or any other player categories.

Here you can see the player receives:

- > **Average Distance from Pin at every yardage**
- > **Average Drive Distance**
- > **Average Offline for Drives**
- > **Percentile Rankings for every shot category**
- > **Aggregate TrackMan Combine Score**

(continues)

INNOVATION: TRACKMAN COMBINE

Beyond the shot results accuracy and percentile ranking data, up to 21 TrackMan data parameters are measured and reported for every shot made during a combine test.

This means that instructors and coaches have the opportunity to check combine data to review club delivery tendencies, and club fitters can use the Driver launch statistics including ball speed, launch angle, spin rate, and land angle to learn if the driver being used is optimal for the player.

When will the TrackMan Combine be available?

The TrackMan Combine is available now!

Who can administer and upload a TrackMan Combine?

Any current TrackMan customer may administer a combine test and upload the data for analysis. Combine tests must be conducted outdoors, so TrackMan Launch customers can use Pro Upgrade hours to do so.

Today the TrackMan Combine database consists of over 100 Division I college player results, among others. These results are shown in Figure 1 on the previous page.

With its web based service and worldwide use, the TrackMan Combine database will grow exponentially.

To get started with the TrackMan Combine for your students and clients, please contact us. (See front page for contact details.)



MYCOMBINE TESTS			
DATE	SCORE	PERSON	
18-DEC-2009	73	Matt Bralich	Delete
01-DEC-2009	74	Klaus Ehling	Delete
24-NOV-2009	79	Jesper Christiansen	Delete
7-NOV-2009	82	Spenn Narvegard	Delete
7-NOV-2009	84	Soren Pallesen	Delete
02-DEC-2009	88	Tomo Jappene	Delete
7-NOV-2009	90	Justin Paulsen	Delete
18-DEC-2009	90	Frankik Toome	Delete
7-NOV-2009	94	Nicolai Henningsen	Delete
7-NOV-2009	94	Arvid Engberg	Delete
22-NOV-2009	97	Selmae Ehling	Delete
17-DEC-2009	99	Leif Sævergard	Delete

TrackMan Combine player list

INSIGHT: TOUR PROFESSIONAL DATA

TrackMan has established itself as the industry leader in club and ball measurements. Because of this, TrackMan has been used to capture data from nearly every professional to play in a PGA TOUR or European PGA Tour event since 2006.

Even all time greats such as Gary Player, Nick Faldo, Tom Watson, Jack Burke Jr, and Jack Nicklaus have been known to hit on TrackMan to get data about their swing, ball flight, and equipment.

Since 2006, TrackMan has had a relationship with the PGA TOUR under which TrackMan has been setup on at least one hole each week to collect driving stats for the tour. For the first time ever, this has allowed data to be collected about the players' swings and ball flights during competition. The same has been accomplished during WGC, European Tour, US Open, British Open, and other events.

Then in 2007, TrackMan began also having a regular presence on the range during practice rounds of PGA TOUR events. This included equipment manufactures that had adopted TrackMan as the way to test equipment onsite, but as important it included TrackMan staff that was available as support to the players, the PGA TOUR, and equipment manufacturers. Since that time, TrackMan staff has worked with over 200 professional golfers from tours around the world and well over 100 from the PGA TOUR itself.

For decades there have been theories about what separates Tour Pros from the average golfer. These golfers buy the same clubs, shafts, and balls as the professionals. They try to emulate pro swings by watching what they do on TV or from video clips of their swings. The new ultra high frame rate cameras have even slowed down the action to give a new and different perspective. But not until TrackMan has there been the ability to measure the club head traveling through impact, the club and ball collision, and the entire trajectory of the golf shot including launch, spin, and other interesting data. The following is a look at some of this data collected over the last several years.

The data listed on the Tour Pro Averages chart is a compilation of thousands of shots hit on TrackMan by PGA TOUR, European PGA Tour, LPGA Tour, and European LPGA Tour Professionals over the last several years. The data represents an average of all Tour Professionals. The data is a combination of data collected from the range along with on course. Location and weather conditions are not considered with regards to the data, but given the numerous amounts of locations and weather conditions involved, it is assumed that the overall effects are minor, if not completely neutralized.



Why is the average PGA TOUR attack angle with the driver negative when it is better to hit up on the ball?

To say a golfer should hit up on the ball with the driver has always been in the pursuit of maximizing distance. Hitting up, or having a positive attack angle, with the driver allows the golfer the potential to maximize their distance by creating the sought after high launch, low spin shot result. However, there is still much debate and theory in the teaching world as to what creates the straightest shot most consistently. It is widely understood that a squarely hit shot with zero face angle and zero path results in a straight shot, but what swinging motion makes this achievable the highest percentage of the time?

The one thing that is certain is that a player's horizontal swing plane (HSP) must be positive with the driver if the player is going to hit up on the ball and hit a straight shot. For every other club in the bag (assuming negative attack angle), the HSP must be negative in order to zero out club path, thus hit an effective straight shot. So, is it harder to make the same swing and impact when hitting up on the ball? Or is it harder to repeat this swing and impact because Driver is the only club in the bag swung this way? Or is it just as easy to repeat this swing if the differences were understood and it were practiced correctly? Or more simply, it may just be the case that Tour Pros can generate so much club speed, that they can afford to trade off some distance result for accuracy and consistency. See the July 2009 newsletter article, Secret of the Straight Shot, for more information on why the HSP must change between a shot with a negative attack angle and positive attack angle.

Is Max Height supposed to be the same for all clubs?

This theory or idea that all clubs should apex at the same height has been around for some time. It can be seen from the data that the max height or apex, on average, is close to 30 yards for each club. It should be noted that even though the max height is nearly the same, this point does not occur at the same down range distance for each club. See the following graph.



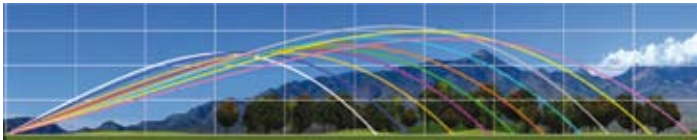
Ted Purdy's, multiple time PGA TOUR winner, Find Your Distance. Average driver club speed – 113 mph.
Clubs include 60 degree through 3 wood.

(continues)

INSIGHT: TOUR PROFESSIONAL DATA

Looking back at the chart again, you will notice a slight drop off in the max height around the 3 and 4 iron and then it jumps back up with the hybrid and fairway woods. This data suggests why hybrids have become so popular over the last decade. The design and build of a golf club has a significant effect on the trajectory of the golf ball. With traditional irons and lower club speeds, the ball will not have enough energy to climb into the air to reach a suitable max height and achieve a proper trajectory. Over time, different club head designs came about to help with this problem. It started with the cavity back iron and has led to the hybrid. The hybrids have a center of gravity (CG) that is lower and further away from the face, helping to create a higher launch angle. Head design, shaft properties, and the build of the golf club allow for players to create the proper trajectory, even at lower club speeds.

At the end of the day, matching the max height of a golfer's clubs should not be the main objective. Creating the proper landing angle and distance gaps between each club are the more important objectives. However, a properly fit and gapped set of golf clubs will typically have a max height that is similar for each club. For lower club speeds, it is not unusual to see the hybrids and/or high lofted fairways apex at a greater height in order to create the proper gapping and land angle. Again, this goes back to the different club design and build within a player's set of clubs that may be necessary for optimizing their bag setup.



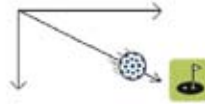
Julieta Granada's, LPGA Tour winner, Find Your Distance.
Average driver club speed – 89 mph.
Clubs include PW through 3 wood.

What is the optimal landing angle for each club?

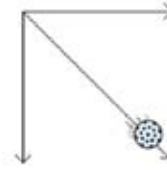
The quick answer is - the one that allows the golfer to control their ball once it hits the green. A lot of a golfer's potential landing angle has to do with how much ball speed the player can generate. Looking at the Tour Pro data, you can see that for most clubs they hit into the green the ball is coming down around 50 degrees. A golfer with a driver club speed of 90 mph is not going to be able to achieve this same landing angle for approach shots.

In such cases, a landing angle of 45 degrees or more is advisable. The spin also helps the ball to stop when it lands, but the landing angle plays the bigger part in the equation. By having the ball land at 45 degrees or steeper, the golfer knows that at least half of the momentum of the ball is traveling down as opposed to forward. Then the spin can help with the rest.

30 degree Land Angle



45 degree Land Angle



60 degree Land Angle



Based on the speed that a golfer can generate, there is going to be a point of diminishing returns where the carry distance will suffer at the benefit of a steeper landing angle. There are not many golfers that are willing to sacrifice distance. So, what options are available for golfers with lower club speeds? One idea is to find a club design and build that maximizes distance while still maintaining a reasonable land angle with a 6 or 7 iron. Then, attempt to fill out the bag with other clubs that achieve this same or similar land angle (while creating the proper distance gap). At least then the golfer can plan for similar bounce and roll with each club.

What is the correct distance gap between clubs?

The USGA allows for a maximum of 14 clubs including the driver and putter, so it is up to the golfer to determine the best allocation of these remaining 12 clubs. A golfer with Tour Pro club speed will have more yardage range to cover with these clubs than a golfer whose driver speed is 90 mph. First, a golfer should determine the highest lofted wedge they can be effective with and then determine how far a standard full shot carries with that club. This will give the low end of the range. If the golfer subtracts this distance from how far an average drive carries, this will give the range of yardages that need to be covered. If the golfer would prefer evenly spaced gaps between all clubs they should take the calculated range and divide by 12.

The following is an example based on the tour data:

Driver average carry	269 yds
60 degree estimated carry	77 yds*
Range between Driver and 60 degree	192 yds
192/12	16 yds

* Assuming this is highest lofted club in bag

(continues)

INSIGHT: Tour Professional Data

This would mean there would be a gap of 16 yards between each club if a golfer hit the ball as far as the average Tour Pro and wanted evenly spaced gaps. Applying this theory is just one of many ways that a player can setup their bag to benefit their game the most. It could even end up that a golfer with lower club speed may have the gaps structured the way they want and end up with an extra club or two left to use. This situation could allow for a special chipping club or bunker club. It could even allow for the golfer to carry 2 drivers, one that has a flatter trajectory and runs more and one that maximizes carry for forced carries or other reasons.

It seems that Tour Pros hit their irons further than the listed data. Isn't that true?

One of the most surprising values on the chart for most people is likely to be the average carry distance with each club. A lot is made by TV personalities and the media about how far Tour Pros can hit the ball. They are correct. Some Tour Pros have the ability to hit the ball a tremendous distance, but their average or "stock" shot is not trying to hit the ball 100%. The purpose is to control the distance and direction of the shot and swinging all out is not the most effective way to accomplish this goal.



TrackMan on tee measuring PGA TOUR players

Conclusion

There is a lot that can be learned from this Tour Pro data and there is still much more still to learn. It is important to gather as much information about the situation as possible in order to determine the real cause and effect. A Tour Pro may hit a drive 380 yards, but the viewer wasn't aware that the fairway dropped off 90 feet to the landing area, the wind was from behind, and the fairways were hard and fast? Only when the whole story is known and real data is used can the truths about how professionals play the game be determined. As a great teacher and TrackMan owner once said, "Never guess what you can measure."

PGA TOUR Averages

	Club Speed (mph)	Attack Angle (deg)	Ball Speed (mph)	Smash Factor	Vertical Launch (deg)	Spin Rate (rpm)	Max Height (yds)	Land Angle (deg)	Carry (yds)
Driver	112	-1.3	165	1.49	11.2	2685	31	39	269
3-wood	107	-2.9	158	1.48	9.2	3655	30	43	243
5-wood	103	-3.3	152	1.47	9.4	4350	31	47	230
Hybrid 15-18"	100	-3.3	146	1.46	10.2	4437	29	47	225
3 Iron	98	-3.1	142	1.45	10.4	4630	27	46	212
4 Iron	96	-3.4	137	1.43	11.0	4836	28	48	203
5 Iron	94	-3.7	132	1.41	12.1	5361	31	49	194
6 Iron	92	-4.1	127	1.38	14.1	6231	30	50	183
7 Iron	90	-4.3	120	1.33	16.3	7097	32	50	172
8 Iron	87	-4.5	115	1.32	18.1	7998	31	50	160
9 Iron	85	-4.7	109	1.28	20.4	8647	30	51	148
PW	83	-5.0	102	1.23	24.2	9304	29	52	136

LPGA TOUR Averages

	Club Speed (mph)	Attack Angle (deg)	Ball Speed (mph)	Smash Factor	Vertical Launch (deg)	Spin Rate (rpm)	Max Height (yds)	Land Angle (deg)	Carry (yds)
Driver	94	3.0	139	1.47	14.0	2628	25	36	220
3-wood	90	-0.9	132	1.47	11.2	2705	23	39	195
5-wood	88	-1.8	128	1.47	12.2	4501	26	43	185
7-wood	85	-3.0	123	1.45	12.7	4693	25	46	174
4 Iron	80	-1.7	116	1.45	14.3	4801	24	43	169
5 Iron	79	-1.9	112	1.42	14.8	5081	23	45	161
6 Iron	78	-2.3	109	1.39	17.1	5943	25	46	152
7 Iron	76	-2.3	104	1.37	19.0	6699	26	47	141
8 Iron	74	-3.1	100	1.35	20.8	7494	25	47	130
9 Iron	72	-3.1	93	1.28	23.9	7589	26	47	119
PW	70	-2.8	86	1.23	25.6	8403	23	48	107

Note: Please be aware that the location and weather conditions haven't been taken into consideration. Besides these reservations the data is based on a large number of shots and give a good indication on key numbers for tour players.

EVENTS: TRACKMAN USERS CONFERENCE

On November 6 and 7, 2009, over 100 industry professionals from North America and Europe descended to the PGA of America facilities in Port St. Lucie, Florida, for the first TrackMan Users Conference.

The objective of the conference was to increase the value of TrackMan technology through the discussion of significant research and insights about TrackMan data. Topics ranged from technical discussions on the relationships between club delivery, launch conditions, and the resulting ball flight, to practical conversations on best practices for coaching, fitting, practice, and technique.

Matt Frelich, the Director of Sales and Business Development in the US for TrackMan, hosted the event, which included presentations from TrackMan CTO and co-founder Fredrik Tuxen, TrackMan's Tour Operations Manager Justin Padjen, Top 100 Instructor TJ Tomasi, 2008 PGA of America Teacher of the Year Martin Hall, PGA Golf Professional James Leitz, PING nFlight's Kevin Noble, and Tom Wishon and Matt Mohi of Wishon Golf Technology.

Attendees included Top 100 Golf Instructors, Division I College Golf Coaches, professionals from major golf equipment manufacturers, staff from Top 50 Driving Ranges and Pro Shops, private business owners, and many of the industry's top fitting experts. PGA and LPGA Members attending the conference earned 16 hours of continuing education credits towards their member service requirements.

"We (TrackMan) once again thank the attendees who made the trip to Port St. Lucie for a tremendous event. Since the presentation materials were distributed to attendees, the TrackMan staff is still receiving questions regarding the content presented. We hope this is the first of many User Conferences to come," said Frelich.



TrackMan Users Conference brings industry experts and TrackMan 'Family' together

Feedback from the participants was very positive overall. Bill Pepe of Tour Van Golf commented, "I was so grateful to attend the Users Conference. It always seems the more you know, the more there is to know. I thought the event was a great success and look forward to the next one. Great guest speakers, wonderful venue, and run first rate. Proud to be part of the team." (continues)

“ I thought the event was a great success and look forward to the next one. Great guest speakers, wonderful venue, and run first rate ”

Bill Pepe
Tour Van Golf



Additionally, participants were invited to bring their TrackMan radars and computers to be tuned up by TrackMan technicians.



EVENTS: TRACKMAN USERS CONFERENCE

Highlights from the event include insights from TrackMan and other industry experts:

> Fredrik Tuxen spoke about the latest research from TrackMan, including “Secret of the Straight Shot”, “Smash Factor”, and “Spin Loft.” His talks included discussions about the New Ball Flight Laws, D-Plane, Swing Plane vs. Club Path, and much more about content originally presented in TrackMan Newsletters from January 2009 and July 2009. Visit www.trackman.dk/Media/Newsletter.aspx to download these original articles.

> Tuxen also discussed groundbreaking plans for developing the TrackMan for Teaching applications, which will launch in 2010 and be targeted specifically at coaches and their students.

> TrackMan’s Justin Padjen presented Tour Pro Data and the RE/MAX LDA Championship Review. Having now three years of experience collecting TrackMan data on the PGA TOUR and LPGA, Padjen was armed with truckloads of data to share with the attendees. During his presentation, Padjen discussed Tour Pro averages, unique insights into fitting tour pros, suggestions on appropriate swing improvements using TrackMan data, and fun stories from his experiences at various tour events.

> A TrackMan Combine demonstration was performed for the group, in which a mini-tour player from Southeast Florida, a PGA of America staff employee, and a recently graduated Division I college player participated. See the article entitled ISG Launches TrackMan Combine in 2010 in this issue of the TrackMan Newsletter to learn more about the TrackMan Combine.

> TJ Tomasi discussed the interrelationship between club data points, including a detailed discussion on the continuum between accommodating downward angles of attack with negative swing planes and promoting positive angle of attack with driver by having positive horizontal swing plane.

> Martin Hall was the subject of a Best Practices Teaching with TrackMan Q&A session, during which, Hall described his and wife Lisa Hackney’s encounter with Fredrik Tuxen. Together they learned new things about the Ball Flight Laws because of TrackMan. Hall warned the attendees that video just cannot see what the club is doing through impact, and in fact that it can often fool an instructor, where TrackMan provides clarity.

> James Leitz of Pinewood CC in Slidell, Louisiana, presented his compelling work entitled Trackman’s Measuring of the Golf Swing’s Two Systems: Speed Generation and Impact Alignment.



Driving-range session at the PGA Center for Golf Learning and Performance - Port St. Lucie, Florida

> PING nFlight’s Kevin Noble provided an entertaining and informative presentation on the PING testing process, cluster analysis, and methodology that has manifested as nFlight ball conversion. Through sharing this information, Noble shed light on a question asked often by TrackMan customers: What is the difference between the range ball we have at our facility and a premium ball?

> Tom Wishon and Matt Mohi of Wishon Golf Technology presented an overview of Wishon’s Full Specifications Fitting Inputs and Factors. Wishon shared insightful details about how he uses TrackMan in his business for fitting and equipment design, and many personal experiences from his years as an author, top fitter, and equipment designer. He also discussed the impact of moving CG on a golf club from a theoretical and practical standpoint. Furthermore, Wishon shared his feelings about the new groove rules for 2010, how they impact fitting, how they impact equipment design and manufacturing costs, and how they affect the golfer.

Frelich adds, “We’d like to personally thank Eric Hogge, Joe Hallett, and Jane Birkhimer for their outstanding support and allowing us to host our conference at their tremendous facilities. We appreciate the positive energy and commitment from them, which went a long way to ensuring a successful conference for all of us. They are a great team at a great facility!”

FOCUS: Henry Brunton

Observe & Report

Henry Brunton is Canada's preeminent golf coach and educator. A 24-year veteran of the Canadian PGA, Brunton is a Master Professional and the only Canadian to be named to GOLF Magazine's "Top 100" Teachers in America.

He is in his eleventh year as the full-time National Coach for the Royal Canadian Golf Association and also operates his own private practice, Henry Brunton Golf, based out of Eagles Nest Golf Club in Toronto. Over the past several years, Brunton has become one of golf's most sought after lecturers, extensively traveling the world to share insights about his coaching methods and research. Henry Brunton is a keen user of the TrackMan at his Golf Academy. He has found the system to be golf's finest player development tool and proudly offers it to all of his students.

We talked to Henry Brunton about his use of TrackMan on and off the Range. "TrackMan is revolutionary technology that provides golfers with comprehensive feedback and data for every club in the bag – exact carry and roll yardages, trajectory, spin rates, clubface position, swing shape and dispersion patterns. It is a phenomenal evaluation tool and practice aid. TrackMan is like having an MRI Machine for your golf swing," he says.

As one of GOLF Magazine's Top 100 teachers, Brunton works with all kinds of golfers and uses TrackMan to offer them an immediate response. And Brunton's affair with TrackMan doesn't stop at the Golf Academy gates. He is doing significant research and university studies with TrackMan to define metrics that assess skill level, predict golfer potential, and measure how different club deliveries result in various shot shapes, among others.

Tell us about how you use TrackMan?

"It's a world class diagnostic assessment tool that has allowed us to obtain very valuable information. One of the first steps for my students is to go through the bag and see how they perform: their consistency, trajectory, dispersion with every club in the bag. To me, that is the first step towards improvement and the game development process, to see how they perform.

TrackMan provides objective feedback that my students and I can immediately agree upon, leaving no room for different interpretations or doubts in either of our minds. As a result, the players are very motivated by the TrackMan information and we test them frequently. We also use the system for driver fitting, set gapping strategy, and testing wedge skill levels. It is very rewarding," he says. "We do club fitting for Titleist - working with their TrackMan and ours. Together, we are very dialled in. TrackMan has proven itself as a tremendous tool for ball fitting, club fitting and testing, and to practice technique."



“TrackMan is like having an MRI Machine for your golf swing”

Henry Brunton

GOLF Magazine's "Top 100" Teachers in America

Although Henry Brunton is coach of the Canadian National Team and operates a top notch academy based out of one of the country's leading courses, it was neither the national team nor the golf club that chose to buy TrackMan; Brunton purchased it on his own.

Why did you make the investment to buy a TrackMan?

"TrackMan technology is too advanced and powerful to ignore. I found a way to afford it in order to offer athletes and students the best possible coaching and development opportunities. TrackMan enables us to maintain and build upon a leadership position in the industry. The power of the TrackMan brand is an ideal partner for our company.

We are committed to providing instruction and coaching on the cutting edge – and TrackMan communicates this to our clients. For the coaching staff, it's like an MRI machine for the golfers swing. You can see the health and strength of student swings. We try to identify strengths and build on them.

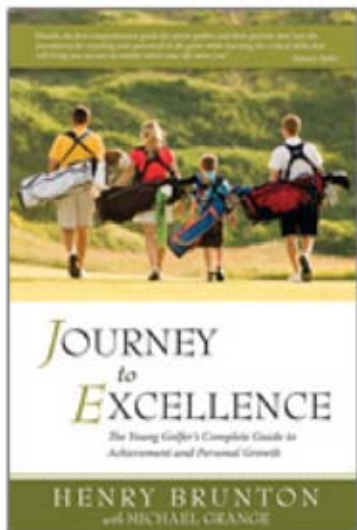
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FOCUS: Henry Brunton

This makes TrackMan a fantastic tool. On top of this, the TrackMan is a smash hit at corporate outings. Our customers love to spend time on TrackMan and as a result they love to put their clients on it too.”

Brunton brings his own TrackMan along to the various teams he trains. He uses it with the national squad as well as in his junior programs. In addition, he will be using it on the course at major junior and amateur championships in Canada to gather performance data during competition.

As for his home club, Eagles Nest, TrackMan has become an integral part of its teaching program. It is heavily marketed on the course as well as on Brunton’s website – www.henrybrunton.com. He considers TrackMan an invaluable addition and draw for his program and looks forward to the purchase of his next system. Brunton created and developed the highly acclaimed Teaching and Coaching Certification Program (TCCP) for the Canadian PGA.



Brunton’s Book “Journey to Excellence”

He is the author of several books, guides and articles on the game. His latest book “Journey to Excellence” was released in August 2009 and scheduled for release in the future is his next book “The New Competitive Golfer,” which will feature a section on how TrackMan is used to effectively evaluate and assess players.

When working with players, Brunton’s observations are always put into a report that is sent to his clients. “Reports are sent to clients so they know what to work on. During follow up sessions we do re-testing and create follow up reports. They love the reports. It helps educate players about the status of their game, golf ball, shafts, set make up, etc.”

“And it works great with elite junior golfers as well. When we train we always have a TrackMan station. It’s a great motivator and the kids love it. It makes everyone want to get better.”

Do the players trust TrackMan data?

“No issues. They all have romantic visions of how far they hit the ball. TrackMan helps them get their heads on straight and learn to play the game,” Brunton says.

Two of Brunton’s top students, Matt Hill and Nick Taylor, both give a lot of credit to their work with Henry and TrackMan. Matt Hill, the # 1 ranked amateur in the world, has told Brunton one of the keys to his ascent to the top of his game is that he NOW has three shots for every yardage, literally three separate trajectories to get the job done. When he and Henry started working together, Matt was not completely locked in on his yardages. Now, as a result of time with Henry and TrackMan, he is competing as a sophomore for North Carolina State University, Matt won the 2009 NCAA Division I Individual Championship.

Nick Taylor, the #2 ranked amateur in the world, also gives a lot of credit to his success on the golf course to being able to practice with the TrackMan under the guidance of both Henry and his coaches at University of Washington, who also use the system for their team’s development. Nick finished as the low amateur during the 2009 US OPEN at Bethpage Black. In Round 2 Nick carded a 65 – the lowest 18-hole score ever recorded by an amateur in the US OPEN.

Another top amateur and student of Henry’s is Eugene Wong, who won the 2008 Callaway World Junior Championship and is playing college golf at University of Oregon. Working with Henry and TrackMan last year, Eugene was able to optimize his technique and equipment, resulting in a driving distance increase of an incredible 27 yards.

How would you rate the service and support from ISG on your TrackMan?

“It is absolutely top rate service. The learning curve for my staff and me on how to effectively use TrackMan was fine, because it is remarkably simple to use. And in case we have a question, the TrackMan sales and service staff is always just a phone call away,”

“My first thought now having owned and coached with TrackMan for two years is: How could anyone coach without it?”

Henry Brunton

GOLF Magazine’s “Top 100” Teachers in America

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FOCUS: Henry Brunton

Henry Brunton's new book "Journey to Excellence: The Young Golfer's Complete Guide to Performance, Achievement and Personal Growth" was released in August 2009 and is available for order.

The following is the back cover notes from the book:

"They are the dreams that give long summer days shape, a childhood direction and a sport its lifeblood. From Bobby Jones to Nancy Lopez to Tiger Woods, golf has been sustained by the youthful imaginations of those who have fallen in love with the sense of power and control that comes from a solidly struck shot.

Golf is meant to be fun, a time for friendships, laughs, disappointments and triumphs. But for you the game means a little more. Golf is what you dream about at night and think about all day, the anvil on which you fashion your childhood and adolescence. It shapes who you are and the adult you will become.

Journey to Excellence: The Young Golfer's Complete Guide to Performance, Achievement and Personal Growth is designed to help you maximize your potential, on and off the course. This Book moves beyond the traditional emphasis on the sport's mechanical side and offers insight into what it takes to reach your potential and achieve your goals.

Journey to Excellence provides advice to sharpen every aspect of your game, such as:

- > The irrefutable mental habits of championship golfers.
- > Practice secrets used by the game's best players.
- > How to choose your equipment.
- > How to avoid nutritional double-bogies.
- > How to accurately compare your game against college and professional golfers.

To purchase Journey to Excellence, visit www.henrybrunton.com



ANALYSIS: LONG DRIVERS OF AMERICA

What is the world's fastest sport? Yes, drag cars have been clocked at over 330 miles per hour (mph) and a Formula One car was recorded at 229 mph during a race in Italy. But what about sports where engines are not involved and speed is created by man-made horsepower? For years Jai-Alai was touted as the world's fastest sport with ball speeds nearing 190 mph. Then badminton measured the initial speed of a shuttlecock at 206 mph. Well, what about golf? Tiger Woods' ball speed has been measured as high as 191 mph during competition. If that is the case, then the world's longest hitters should be able to come close to the shuttlecock speed of 206 mph, right?

This year TrackMan was asked to measure and record drives at the 2009 RE/MAX World Long Drive Championship. The competition was held in Mesquite, NV, at the Mesquite Sports and Events Complex from October 25-30, 2009. Over 5,000 shots spanning four divisions (Open, Senior, Super Senior, and Military) were recorded during the six days of competition. "Having TrackMan at the RE/MAX world finals was another step forward for the sport of long driving," said LDA chief executive officer Art Sellinger. "TrackMan was able to provide accurate measurements for shots hit under the lights on the world's biggest stage for the world's top long drive competitors." The TrackMan data recorded during the event was also used throughout the ESPN telecast of the 2009 RE/MAX World LDC on December 20th and 25th.

So, what was the highest recorded ball speed of the competition? Jesse Pettersen of Kelowna, BC, Canada, not once, but twice, reached a ball speed of 220 mph. The new world's fastest sport has just been crowned. Now let's look further into the data that was collected during the week in Nevada.

Club Speed

Canadian Jamie Sadlowski went back-to-back by repeating as this year's world champion. Weighing in at 170 pounds and measuring less than 6 feet tall, Jamie's average club speed for the entire tournament was an astonishing 145 mph. To put that into some perspective, take the highest recorded club speed on any single shot hit on the PGA TOUR in 2009. That would be Bubba Watson at 128 mph. Now, Sadlowski's driver is about two inches longer which should increase club speed, but that added length also increases the swing weight making it feel much heavier. For argument's sake, let's assume the swing weight does not matter. Then it would be expected that the extra length would increase Watson's club speed on that shot to 134 mph. That's still 11 mph slower than Sadlowski's average, or 15 mph slower than the fastest club speed of the entire week.

Averages	Sadlowski	Open	Senior (45 & up)	Super Senior (53 & up)	Military
Club Speed (mph)	145	135	127	120	129



“ Having TrackMan at the RE/MAX world finals was another step forward for the sport of long driving ”

Art Sellinger

Long Drivers of America - CEO

Ball Speed

What does it take to be an elite competitor in the sport of long driving? Of the 144 competitors in the Open division, the average ball speed for all shots was 199 mph. How about to make it into the final day or better?

Averages	Sadlowski	Full Field	Final 24	Quarter-finalists	Semi-finalists
Ball Speed (mph)	214	199	204	208	208

First, the competitor has to generate the club speed. Then he has to make solid contact in order to transfer the energy to the golf ball resulting in an efficient smash factor (See May 2008 newsletter – Sadlowski averaged 1.48). No matter how optimized a competitor's launch angle and spin rate are, he better be able to create some speed. No speed, no chance.



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ANALYSIS: LONG DRIVERS OF AMERICA

Launch Angle / Spin Rate

Don't be fooled, optimizing launch conditions are critical to success for a long drive competitor. When the ball is traveling over 200 mph, even 100 revolutions per minute (rpm) of spin or couple tenths of a degree of launch can make a difference. There were 25 competitors in Mesquite that registered a ball speed of more than 210 mph. There were two quarterfinalists that did not register a ball speed of more than 210 mph. The best way to beat out 19 competitors that can create more ball speed – optimize your launch conditions.

A master at optimization is 5-time world champion Jason Zuback. Zuback averaged 10.7 degrees of launch and 2100 rpm of spin for the week. Take for instance this 6-ball set of Zuback's on Friday morning to qualify for the Quarterfinals.

	Club Speed	Ball Speed	Launch Angle (degrees)	Spin Rate (rpm)
Shot 1	139	208	12.1	1606
Shot 2	141	209	9.1	1442
Shot 3	139	202	13.9	1707
Shot 4	140	208	8.5	1632
Shot 5	141	209	11.2	2173
Shot 6	138	206	11.0	2117

While we have to take into account the varying weather conditions, Zuback's shots having the longest total yardage typically launched between 10 – 12 degrees and had between 1800 – 2100 rpm of spin.



TrackMan at the 2009 RE/MAX World Long Drive Championship in Mesquite, NV

Attack Angle

A lot has been said over the past couple years about attack angle and how a golfer must hit up on the ball to maximize their distance. TrackMan's Fredrik Tuxen wrote about this topic and the importance of spin loft in the January 2008 newsletter. "When you hit more up on the ball, the launch angle will be higher but the spin rate will be virtually the same. The spin rate is dictated primarily by the spin loft and impact position on the club face. The spin loft is the difference between the dynamic loft and the attack angle," Tuxen stated.

What does this mean to a long drive competitor? In a very simplified explanation: hit up on it with a low lofted driver. Zuback uses a driver with less than 5 degrees of loft and averaged a +5 attack angle for the week. Sadlowski uses a 6.5 degree head with an average attack angle of +3.5 for the week. Another winner of multiple world championships, Sean "The Beast" Fister had an average attack angle of +9.5 degrees for the week.

Averages	Open Division	Final 24	Quarter-finalists	Senior Division	Super Senior	Military Division
Attack Angle (degrees)	+4.4	+4.8	+4.6	+3.9	+2.4	+1.1

SUMMARY

The week of the championship featured club speeds nearing 150 mph, ball speeds well over 200 mph, and drives that totaled more than 400 yards with no help from the wind. "The 2009 RE/MAX World Long Drive Championship in Mesquite, NV, included the top long drive competitors from around the world. It was great to have TrackMan onsite to record data for the over 200 competitors that competed throughout the week. There has been a lot of interest in the TrackMan data from the competitors and it was a great addition to the broadcast on ESPN," Sellinger concluded.



The giant scoreboard displayed TrackMan statistics to Long Drive fans throughout the event.