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**Topic:**

**Kinesiological Implications of SFSTs and  
NHTSA SFST Manual Changes 2013 - 2015**

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# **Kinesiological Implications of SFSTs and NHTSA SFST Manual Changes 2013 - 2015**

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\* **Kinesiology** is the scientific study of human body movement.

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\* **Center of Mass** is the point about which a body's weight is equally balanced in all directions. In other words, the point about which the sum of torques produced by the weights of the body segments is equal to zero.

\* **Equilibrium** is state of zero acceleration where there is no change in the speed or direction of the body.

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**Static equilibrium** - body is at rest or completely motionless

**Dynamic equilibrium** - all applied & inertial forces acting on the moving body are in balance, resulting in movement with unchanging speed or direction

\* **Balance** is the ability to control equilibrium, whether static or dynamic. In other words, the ability of the body to control the center of mass over its base of support.

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\* **Base of support** – the area enclosed by the outermost edges of the body in contact with the supporting surface

\* **Stability** is the ability to resist a disturbance of the body's equilibrium

\* **Mobility** is the ability to affect change in equilibrium

\* A person has balance when :

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**\* Senses Contributing to Balance**

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## **2013 – 2015 NHTSA Manual Changes**

### **COVER**

“Student Manual”

2006 Student Manual, cover

**\* “Participant Guide”**

2013 Participant Guide, cover

**\* “Participant Manual”**

2015 Participant Manual, cover

### **PREFACE**

\* “The procedures outlined in this manual describe how the standardized field sobriety tests (SFSTs) are to be administered under ideal conditions. We recognize that the SFSTs will not always be administered under ideal conditions in the field, because such conditions will not always exist. Even when administered under less than ideal conditions, they will serve as useful indicators of impairment. Slight variations from the ideal, i.e., the inability to find a perfectly smooth surface at roadside, may have some affect on the evidentiary weight given to the results. However, this does not necessarily make the SFSTs invalid.”

2006 Student Manual, Preface

2006 Instructor, Preface

2013 Instructor, Preface

2015 Instructor, Preface

\* The above preface was removed from the 2013 Participant Guide and the 2015 Participant Manual

# HORIZONTAL GAZE NYSTAGMUS (HGN)

## Medical Impairment

\* There is no material in the 2006 Student Manual or Instructor Manual suggesting that an officer ask any particular question, about medical conditions, eye conditions, or if they are taking any medication before administering HGN.

2013 Participant Guide Session 8, pp. 17,18 of 62  
2013 Instructor, Session 8, 27-31

## **NEW for 2015**

\* **“Officers are reminded to ask questions about the subject’s eyes and general health conditions prior to administering the HGN test.”**

2015 Participant, Session 8, p. 24 of 82

## Equal Tracking Assessment Procedures

\* “Move the stimulus rapidly from center to far right, to far left and back to center (approximately 2 seconds).”

2006 Instructor, VIII- 14

## **NEW in 2013**

\* “Move the stimulus rapidly from center to far right, to far left and back to center. **Remind the participants that the speed of the stimulus should be approximately the same speed used as checking the lack of smooth pursuit.**”

The “(approximately 2 seconds)” was deleted and replaced with the above statement.

2013 Instructor, 8-36  
2015 Instructor, p.29 of 82  
2015 Participant, p.29 of 82

## **NEW in 2013**

\* **“Point out that there should be a clear, distinguishable break between the check for equal tracking and lack of smooth pursuit.”**

2013 Instructor, 8 -36  
2015 Instructor, p. 29 of 82

\* No requirement that Equal Tracking be repeated a second time

2006 Student, VIII- 6  
2006 Instructor, VIII- 14

2013 Student, Session 8, p.23 of 62  
2015 Student, Session 8, p.29 of 82

### **NEW in 2013 Instructor only**

\* **“Remind the participants to make at least two complete passes in front of the eyes**  
This is regarding equal tracking instructions.

2013 Instructor, 8- 36

### **In 2015 Instructor- the above reminder is removed**

\* Prior to 2015, no instructions provided to officers of what to do if medical impairment is indicated (either through statements, unequal pupil size, resting nystagmus, or unequal tracking)

2006 Student, VIII- 6  
2006 Instructor, VIII- 14  
2013 Participant, Session 8, p.23 of 62  
2013 Instructor 8-36

### **NEW for 2015**

\* **“If there are any abnormal findings on the pre-test checks, the officer may choose not to continue with the testing. If HGN testing is continued, officers are reminded that this does not follow the standardized protocol and should acknowledge such in any report.”**

2015 Participant, Session 8, p. 24 of 82

### **NEW in 2013**

\* Regarding Equal Tracking: **“Point out that this can occur because the subject is blind (or nearly blind) in one eye. This can be checked by having the subject cover one eye and instructing the subject to reach out and touch the tip of the stimulus. If a person has sight in both eyes, but the eyes fail to track together, there is a possibility that the person is suffering from an injury or illness.”**

2013 Instructor, 0-12 “Intro to Drugged Driving”

\* The above statement does not appear in the 2015 Instructor Manual since the Drugged Driving Chapter was deleted entirely.

### Resting Nystagmus

### **NEW in 2013**

**\* “Remind the participants that if Resting Nystagmus is observed, they can continue with the remainder of the test to check for other possible indicators of impairment and any possible indicators of a medical condition.”**

2013 Instructor, 8- 36

2015 Instructor, Session 8, p. 29 of 82

### Blind in One Eye

#### **New for 2015**

**\* “Officers are reminded to ask questions about the subject’s eye and general health conditions prior to administering the HGN test. If a subject responds or volunteers information that he or she is blind in one eye or has an artificial eye, the officer should make note of that and may proceed with the HGN test. If there are any abnormal findings on the pre-test checks, the officer may choose not to continue with the testing. If HGN testing is continued, officers are reminded that this does not follow the standardized protocol and should acknowledge such in any report.**

**If HGN testing is conducted on a person with a blind eye, typical inconsistent findings could be related to the blind eye not being able to see or track the stimulus, or when the normal eye can no longer see the stimulus, e.g., when checking distinct and sustained nystagmus at maximum deviation on the blind eye side. Source: “Eye Tests on a Suspect with a Blind Eye” Karl Citek, OD PhD, FAAO, Pacific University College of Optometry, Sept. 2014”**

2015 Participant, Session 8, pp. 24-25 of 82

**\* “For most HGN testing, the normal eye can see the stimulus and the movement of either eye should be consistent with what is expected. When the normal eye can no longer see the stimulus, most commonly when assessing Distinct and Sustained Nystagmus at Maximum Deviation on the blind eye side, normal tracking may be disrupted and eye movements not consistent with nystagmus may be observed.**

**In the “Robustness of the Horizontal Gaze Nystagmus Test” study conducted by Dr. Marcelline Burns, published by NHTSA in 2007, she assessed seven individuals with different causes and levels of blindness in one eye, including one with a prosthetic eye. The general results, at least for the HGN test, indicated that the non-blind eyes exhibited clues consistent with performance of otherwise normal subjects, while the blind eye exhibited fewer clues on average. And, per Dr. Burns, her results should only be understood as preliminary findings.”**

2015 Instructor, Session 8, p.25 of 82

### Optokinetic Nystagmus

**\* “NOTE: Always face suspect away from flashing or strobe lights.”**

2006 Instructor, VIII- 57

### **New in 2013**

\* “NOTE: **Try** to face subject away from flashing or strobe lights that could cause visual or other distractions that could impede the test.”

2013 Instructor, Session 8, p. 56 of 62    2015 Instructor, Session 8, p. 74 of 82

### **New in 2013**

\* **“Examples of optokinetic nystagmus include watching strobe lights, rotating lights, or rapidly moving traffic in close proximity. The Horizontal Gaze Nystagmus test will not be influenced by optokinetic nystagmus when administered properly. During the Horizontal Gaze Nystagmus test, the suspect is required to fixate the eyes on a penlight, pencil or similar object that moves in accordance with the HGN testing procedures, thus optokinetic nystagmus will not occur. The movement of the stimulus and the fixation on the stimulus by the subject precludes this form of nystagmus from being observed by the officer.”**

2013 Participant, 8- 22    2015 Participant, Session 8, p.18 of 82

\* **“Point out that during the Horizontal Gaze Nystagmus test, the subject is required to focus the eyes on a penlight, pencil or similar object that moves smoothly and relatively slowly across the field of view, thus optokinetic nystagmus will not occur.**

**When practical, remind participants to face the driver away from potential distractions that could be raised later.”**

2013 Instructor, 8- 22

2015 Instructor, Session 8, p. 18 of 82

### HGN Interpretation

\* “Based on the original research, if you observe four or more clues, it is likely that the suspect’s BAC is above .10. Using this criterion, you will be able to classify about 77% of your suspect’s accurately. This was determined during laboratory and field testing and helps you weigh the various field sobriety tests in this battery as you make your arrest decision.”

2006 Student, VIII- 8

### **Modified in 2013**

\* **“Based on recent research, if you observe four or more clues it is likely that the subject's BAC is at or above 0.08. Using this criterion you will be able to classify about 88% of your subjects accurately. This was determined during laboratory and field testing and helps you weigh the various Standardized Field Sobriety Tests in this**

**battery as you make your arrest decision.”**

2013 Participant, Session 8, p.26 of 62

2015 Participant, Session 8, p.32 of 82

## **Walk & Turn**

### Test Conditions

\* “Walk and Turn test requires a designated straight line, and should be conducted on a reasonably dry, hard, level, nonslippery surface.”

2006 Student, VIII- 11

\* “Place your left foot on the line (real or imaginary)”

2006 Student, VIII- 9

\* **“Whenever possible, the Walk and Turn test should be conducted on a reasonably dry, hard, level, non-slippery surface.”** Designated line requirement deleted.

2013 Participant, Session 8, p.41

2015

Participant, Session 8, p.55 of 82

\* “The original research indicated that individuals over 65 years of age, back, leg or inner ear problems had difficulty performing this test.”

2006 Student, VIII- 11

\* **“The original SCRI studies suggested that individuals over 65 years of age or people with back, leg or inner ear problems had difficulty performing this test. Less than 1.5% of the test subjects in the original studies were over 65 years of age”**

2013 Participant, Session 8, p.41 of 62

2015 Student, Session 8, p.55 of 82

\* “Remind participants that prior to starting this test they should ask if the subject has any physical problems or disabilities.”

2006 Instructor, VII- 8, VIII- 35

2013 Instructor, 8- 67 “prior to administering”

\* “Remind participants that prior to administering psychophysical tests to ask the subject if they have any physical problems or disabilities.”

2015 Instructor, Session 8, p.55 of 82

## Instructions

\* “Begin and count your first step from the heel-to-toe position as ‘One’”

2006 Student, VIII- 9

\* **Instruct the person to begin the test.** Instruction how to count the first step is deleted.

2013 Participant, Session 8, p. 43 of 62

2015 Participant, Session 8, p. 57 of 82

## **NEW in 2013**

\* “Instruct the participants that there may be instances when the officer may have to remind the suspect that the first step taken from the heel-to-toe position is step one.”

2013 Instructor, 8-70

2015 Instructor, Session 8, p. 57 of 82

## **NEW in 2013**

\* **“Note: There may be times when the suspect takes a wrong number of steps or begins the heel-to-toe walk with the wrong foot resulting in a turn on the right foot instead of the left. If this occurs the suspect would normally be assessed a clue for an incorrect number of steps and not assessed a clue for an improper turn if the turn was made using a series of small steps as instructed and the suspect did not lose his/her balance while attempting the turn. This scoring is consistent with the original research and training conducted the Southern California Research Institute and with the administration and scoring of the Walk and Turn test in the San Diego Field Study.”**

2013 Instructor, 8- 74

2015 Instructor, Session 8, p.60 of 82

## Walk & Turn Interpretation

\* “Based on original research, if the suspect exhibits two or more clues on this test or fails to complete it, classify the suspect’s BAC as above 0.10. Using this criterion, you will be able to accurately classify 68% of your suspects.”

2006 Student, VIII- 11

## **Modified in 2013**

\* **“Based on recent research, if the subject exhibits two or more clues on this test or fails to complete it, classify the subject’s BAC as at or above .08. Using this criterion, you will be able to accurately classify 79% of your subjects.”**

2013 Participant, Session 8, p.47 of 62  
2015 Participant, Session 8, p. 62 of 82

## One Leg Stand

\* “Remind participants that prior to starting this test they should ask if the subject has any physical problems or disabilities.”

2006 Instructor, VIII- 47  
2013 Instructor, 8- 80 “prior to administering this test to check for...”  
2015 Instructor, Session 8, p. 64 of 82

\* “One- Leg Stand requires a reasonably dry, hard, level, and non-slippery surface.”

2006 Student, VIII- 13  
2013 Participant, Session 8, p. 49 of 62  
2015 Participant, Session 8, p. 65 of 82

\* “The original research indicated that certain individuals over 65 years of age, back, leg or inner ear problems, or people who are overweight by 50 or more pounds had difficulty performing this test.”

2006 Student, VIII-14

**\* ” The original SCRI studies suggested that individuals over 65 years of age; people with back, leg or inner ear problems; or people who are overweight by 50 or more pounds may have difficulty performing this test. Less than 1.5% of the test subjects in the original studies were over 65 years of age. There was no data containing the weight of the test subjects included in the final report.”**

2013 Student, Session 8, p. 49 of 62  
2015 Student, Session 8, p.65 of 82

## NEW in 2013

**\* “Stress to participants to consider age and excessive weight along with environmental factors, location, injury, or physical ailments while administering this test. The importance of the totality of all factors should not be overlooked.”**

2013 Instructor, 8- 82  
2015 Instructor, Session 8, p. 65 of 82

\* “When I tell you to start, raise one leg, either leg, with the foot approximately six inches off the ground, keeping your raised foot parallel to the ground.”

2006 Student, VIII- 12

**“FOOT PARALLEL” OMITTED IN 2013 PARTICIPANT GUIDE SESSION 8**

\* “When I tell you to start, raise either leg with the foot approximately six inches off the ground.”

2013 Participant, Session 8, p. 50 of 62 No instruction to keep foot parallel  
The instruction “raised foot parallel to the ground” is still in 2013 Session 7 p.14

### **“FOOT PARALLEL” BACK IN SESSION 8 FOR 2015**

\* “When I tell you to start, raise either leg with the foot approximately six inches off the ground, **keeping your foot parallel to the ground.**”

2015 Participant, Session 7, p.16 of 25  
2015 Participant, Session 8, p.67 of 82

\* “You must keep both legs straight, arms at your side.”

2006 Student, VIII- 12

### **Modified in 2013**

\* “**Keep both legs straight** and your arms at your side.” “Must” removed.

2013 Participant, Session 8, p. 50 of 62  
2015 Participant, Session 8, p. 67 of 82

\* “Observe the suspect from a safe distance and remain as motionless as possible during the test so as not to interfere.”

2006 Student, VIII- 13

### **Modified in 2013**

\* “Observe the subject from a safe distance and **minimize movement** during the test so as not to interfere.”

2013 Participant, Session 8, p.53 of 62  
2015 Participant, Session 8, p.70 of 82

### One Leg Stand Interpretation

\* “Based on original research, if an individual shows two or more clues or fails to complete the One-Leg Stand, there is a good chance the BAC is above 0.10. Using that criterion, you will accurately classify 65% of the people you test as to whether their BAC's are above 0.10.”

2006 Student, VIII- 13

## Modified in 2013

\* **“Based on recent research, if an individual shows two or more clues or fails to complete the One Leg Stand, there is a good chance the BAC is at or above 0.08. Using that criterion, you will accurately classify 83% of the people you test as to whether their BAC's are at or above 0.08.”**

2013 Participant, Session 8, p. 53 of 62

2015 Participant, Session 8, p.70 of 82

## Standardization

\* **“IT IS NECESSARY TO EMPHASIZE THIS VALIDATION APPLIES ONLY WHEN:**

\* **THE TESTS ARE ADMINISTERED IN THE PRESCRIBED, STANDARDIZED MANNER**

\* **THE STANDARDIZED CLUES ARE USED TO ASSESS THE SUSPECT'S PERFORMANCE**

\* **THE STANDARDIZED CRITERIA ARE EMPLOYED TO INTERPRET THAT PERFORMANCE.**

**IF ANY ONE OF THE STANDARDIZED FIELD SOBRIETY TEST ELEMENTS IS CHANGED, THE VALIDITY IS COMPROMISED.”**

2006 Student, VIII- 19

\* **THE ABOVE STATEMENT WAS REMOVED IN THE 2013 GUIDE**

\* **BACK IN 2015, BUT NOT BOLD AND NOT ALL CAPPED**

It is necessary to emphasize this validation applies only when:

- . The tests are administered in the prescribed, standardized manner,
- . The standardization clues are used to assess the suspect’s performance,
- . The standardization criteria are employed to interpret that performance. If any one of the SFST elements is changed, the validity may be compromised.

2015 Participant, Session 8, p. 13 of 82

## **What You Need to Know About the San Diego Field Study**

**Test Subject Results:** 297 (261 male, 36 female)

San Diego (1998), p.16

214 intoxicated , 83 not intoxicated

San Diego (1998) p.18

**Officers:** total of seven. All were DWI Task Force officers who had been trained in the past at least once and who received refresher training just before the experiment

San Diego (1998) p.8, 15

Of the 83 Not Intoxicated Individuals . . .

San Diego (1998) p.21

\* 81 were administered HGN. Of those, 30 were wrongfully scored as intoxicated based on HGN. (37% error rate on innocent people)

\* 76 were administered the W&T. Of those, 40 were wrongfully scored as intoxicated based on W&T. (53% error rate on innocent people)

\* 75 were administered the OLS. Of those, 31 were wrongfully scored as intoxicated based on OLS. (41% error rate on innocent people)

**FALSE POSITIVES ARE THE ONLY RELEVANT STATISTIC. IN A DWI/DUI TRIAL THE DEFENDANT IS PRESUMED TO BE INNOCENT (NEGATIVE), THEREFORE THE CONFIDENCE WITH WHICH SFST RESULTS CAN EXCLUDE HIM/HER FROM THE NEGATIVE POPULATION IS THE ONLY MEANINGFUL RATE.**