

OCAS-DRI-FCW-13-011

NCAP FORWARD COLLISION WARNING CONFIRMATION TEST

2013 Ford Taurus

DYNAMIC RESEARCH, INC.

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9 November 2012

Final Report

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16. Abstract These tests were conducted on the subject 2013 Ford Taurus in accordance with the specifications of the Office of Crash Avoidance Standards most current Test Procedure in docket NHTSA-2006-26555 to confirm the performance of a forward collision warning system. The vehicle passed the requirements of the test for all three FCW test scenarios.			
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Section I INTRODUCTION

This test evaluates the ability of a forward collision warning (FCW) system to detect and alert drivers to potential hazards in the path of the vehicle as specified in the New Car Assessment Program "Forward Collision Warning Confirmation", March 2010. Three driving scenarios are utilized to assess this technology. In the first test, a subject vehicle (SV) approaches a stopped principle other vehicle (POV) in the same lane of travel. The second test begins with the SV initially following the POV at the same constant speed. After a short while, the POV stops suddenly. The third test consists of the SV, traveling at a constant speed, approaching a slower moving POV, which is also being driven at a constant speed.

Section II
DATA SHEETS

FORWARD COLLISION WARNING

DATA SHEET 1: TEST SUMMARY

2013 Ford Taurus

VIN: 1FAHP2F80DG1xxxx

Test Date: 10/16/2012

Forward Collision Warning setting:

Test 1 - Subject Vehicle Encounters
Stopped Principal Other Vehicle: **Pass**

Test 2 - Subject Vehicle Encounters
Decelerating Principal Other Vehicle: **Pass**

Test 3 - Subject Vehicle Encounters
Slower Principal Other Vehicle: **Pass**

Overall: **Pass**

Notes:

FORWARD COLLISION WARNING
DATA SHEET 2: GENERAL TEST AND VEHICLE PARAMETER DATA
(Page 1 of 2)
2013 Ford Taurus

TEST VEHICLE INFORMATION

VIN: 1FAHP2F80DG1xxxx

Body Style: SUV

Color: Red

Date Received: 9/24/2012

Odometer Reading: 2762 mi

Engine: 3.5 L V-6

Transmission: Automatic

Final Drive: FWD

Is the vehicle equipped with:

ABS X Yes No

Adaptive Cruise Control X Yes No

Collision Mitigating Brake System Yes X No

DATA FROM VEHICLE'S CERTIFICATON LABEL

Vehicle manufactured by: Ford Motor Co.

Date of manufacture: 02/12

DATA FROM TIRE PLACARD:

Tires size as stated on Tire Placard: Front: 255/45 R19

Rear: 255/45 R19

Recommended cold tire pressure: Front: 235 kPa (34 psi)

Rear: 235 kPa (34 psi)

**FORWARD COLLISION WARNING
DATA SHEET 2: GENERAL TEST AND VEHICLE PARAMETER DATA**

(Page 2 of 2)

2013 Ford Taurus

TIRES

Michelin Primacy

Tire manufacturer and model: MXM4

Front tire size: 255/45 R19

Rear tire size: 255/45 R19

VEHICLE ACCEPTANCE

Verify the following before accepting the vehicle

- X All options listed on the "window sticker" are present on the test vehicle
- X Tires and wheel rims are the same as listed.
- X There are no dents or other interior or exterior flaws.
- X The vehicle has been properly prepared and is in running condition.
- X Verify that spare tire, jack, lug wrench, and tool kit (if applicable) is located in the vehicle cargo area.

FORWARD COLLISION WARNING
DATA SHEET 3: TEST CONDITIONS (Page 1 of 2)
2013 Ford Taurus

GENERAL INFORMATION

Test date: 10/16/2012

AMBIENT CONDITIONS

Air temperature: 29.4 C (85 F)

Wind speed: 0.0 m/s (0.0 mph)

X Wind speed \leq 10 m/s (22 mph)

X Tests were not performed during periods of inclement weather. This includes, but is not limited to, rain, snow, hail, fog, smoke, or ash.

Tests were conducted during daylight hours with good atmospheric visibility (defined as an absence of fog and the ability to see clearly for more than 5000 meters). The tests were not conducted with the vehicle oriented into the sun during very low sun angle conditions, where the sun is oriented 15 degrees or less from horizontal, and camera "washout" or system inoperability results.

VEHICLE PREPARATION

Verify the following:

All non consumable fluids at 100 % capacity : X

Fuel tank is full: X

Tire pressures are set to manufacturer's recommended cold tire pressure: X

Front: 235 kPa (34 psi)

Rear: 235 kPa (34 psi)

FORWARD COLLISION WARNING
DATA SHEET 3: TEST CONDITIONS (Page 2 of 2)
2013 Ford Taurus

WEIGHT

Weight of vehicle as tested including driver and instrumentation

Left Front: 603.7 kg (1331 lb)

Right Front 571.1 kg (1259 lb)

Left Rear 413.7 kg (912 lb)

Right Rear 400.5 kg (883 lb)

Total: 1989.0 kg (4385 lb)

FORWARD COLLISION WARNING

DATA SHEET 4: FORWARD COLLISION WARNING SYSTEM OPERATION

(Page 1 of 3)

2013 Ford Taurus

How is the Forward Collision Warning presented to the driver?
(Check all that apply)

Warning light

Buzzer or audible alarm

Vibration

Other

Describe the method by which the driver is alerted. For example, if the warning is a light, where is it located, its color, size, words or symbol, does it flash on and off, etc. If it is a sound, describe if it is constant beep or a repeated beep. If it is a vibration, describe where it is felt (e.g., pedals, steering wheel), the dominant frequency (and possibly magnitude).the type of warning (light, audible, vibration, or combination) etc.

Warning light is a row of red lights that are reflected onto the windscreen directly ahead of the driver (i.e. HUD). Acoustic alert is three sets of four beeps with a dominant tone at 600 Hz

FORWARD COLLISION WARNING

DATA SHEET 4: FORWARD COLLISION WARNING SYSTEM OPERATION

(Page 2 of 3)

2013 Ford Taurus

Is the vehicle equipped with a switch whose purpose is to render FCW inoperable? Yes
 No

If yes please provide a full description including the switch location and method of operation, any associated instrument panel indicator, etc.

FCW is switched on and off via the menu system on the left side of the instrument panel, via buttons on the left side of the steering wheel.

-> Settings

-> Driver Assist

-> Collision Warn

-> Warn – ON

Acoustic alert can be turned on and off using

-> Settings

-> Driver Assist

-> Collision Warn

-> Chimes -> On/Off

See Figures a-14 and A-15

Are there other driving modes or conditions that render FCW inoperable or reduce its effectiveness? Yes
 No

If yes please provide a full description

- Speeds below 5 mph

- Surface of the radar is dirty or obstructed in some way

- Heavy rain, spray, snow or fog

- Swirling water or snow or ice on the surface of the road

- When encountering stationary vehicles, vehicles moving below 6 mph, Pedestrians, objects in the roadway, or oncoming vehicles in the same lane

- If there is a small distance to the vehicle ahead

If steering wheel and pedal movements are large (very active driving style)

- High interior temperatures

- If the front of the vehicle is damaged

FORWARD COLLISION WARNING

DATA SHEET 4: FORWARD COLLISION WARNING SYSTEM OPERATION

(Page 3 of 3)

2013 Ford Taurus

Is the vehicle equipped with a control whose purpose is to adjust the range setting or otherwise influence the operation of FCW? Yes
 No

If yes please provide a full description.

FCW sensitivity is adjusted via the menu on the left side of the instrument panel, via buttons on the left side of the steering wheel.

-> Settings

-> Driver Assist

-> Collision Warn

-> Sensitivity -> High/Normal/Low

Notes:

Section III
TEST PROCEDURES

A. Test Procedure Overview

Three test procedures were used, as follows:

- Test 1. Subject Vehicle (SV) Encounters Stopped Principal Other Vehicle (POV) on a Straight Road
- Test 2. Subject Vehicle Encounters Decelerating Principal Other Vehicle
- Test 3. Subject Vehicle Encounters Slower Principal Other Vehicle

With the exception of trials associated with Test 1, all trials were performed with SV and POV automatic transmissions in "Drive" or with manual transmissions in the highest gear capable of sustaining the desired test speed. Manual transmission clutches remained engaged during all maneuvers. Except for Test 2, the brake lights of the POV were not illuminated.

In order to pass the test, if the FCW system provides a warning timing adjustment for the driver, at least one setting must meet the criterion of the test procedure. Therefore, if the vehicle was equipped with a warning timing adjustment, only the most "conservative" (earliest warning) setting was tested.

An overview of each of the test procedures follows.

1. TEST 1 - SUBJECT VEHICLE ENCOUNTERS STOPPED PRINCIPAL OTHER VEHICLE ON A STRAIGHT ROAD

This test evaluates the ability of the FCW function to detect a stopped lead vehicle, as depicted in Figure 1.

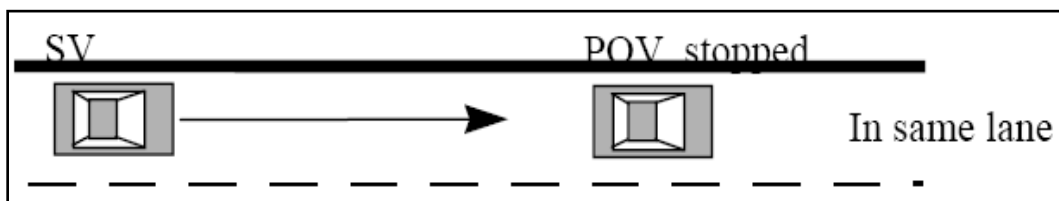


Figure 1. Depiction of Test 1

a. Alert Criteria

In order to pass the test, the FCW alert must be issued when the time-to-collision (TTC) is at least 2.1 seconds. (Note: TTC values were computed in accordance with Ref 1). The TTC for this test was calculated by considering the speeds of the subject vehicle (SV) and the lead vehicle (POV) at the time of the FCW alert (i.e., when the SV and POV speeds are nominally equal to 45 and 0 mph (72.4 and 0 kph), respectively).

b. Procedure

The POV was parked in the center of a travel lane, with its longitudinal axis oriented parallel to the roadway edge, and facing the same direction as the SV, so the SV approaches the rear of the POV.

The SV was driven at a nominal speed of 45 mph (72.4 kph) in the center of the lane of travel, toward the parked POV. The test began when the SV was 492 ft (150 m) from the POV and ended when either of the following occurred:

- The required FCW alert occurred.
- The TTC to the POV fell to less than 90 percent of the minimum allowable range (i.e., $TTC = 1.9$ sec) for the onset of the required FCW alert.

The SV driver then steered and/or braked to keep the SV from striking the POV.

For an individual test trial to be valid, the following was required throughout the test:

- The SV vehicle speed could not deviate from the nominal speed by more than 1.0 mph (1.6 kph) for a period of three seconds prior to (1) the required FCW alert or (2) before the range fell to less than 90 percent of the minimum allowable range for onset of the required FCW alert.
- The SV driver could not apply any force to the brake pedal before the required FCW alert occurred, or before the range fell to less than 90 percent of the minimum allowable range for onset of the required FCW alert.

- The lateral distance between the centerline of the SV, relative to the centerline of the POV, in road coordinates, could not exceed 2.0 ft (0.6 m).
- The yaw rate of the SV could not exceed ± 1 deg/sec during the test.

Nominally, the Test 1 series was comprised of seven individual trials. The FCW system must satisfy the TTC alert criteria for at least five of the seven test trials.

2. TEST 2 – SUBJECT VEHICLE ENCOUNTERS DECELERATING PRINCIPAL OTHER VEHICLE

The SV in this test initially followed the POV at a constant time gap, and then the POV suddenly decelerated, as depicted in Figure 2. The test evaluates the ability of the FCW to recognize a decelerating lead vehicle and to issue an alert to SV driver in a timely manner.

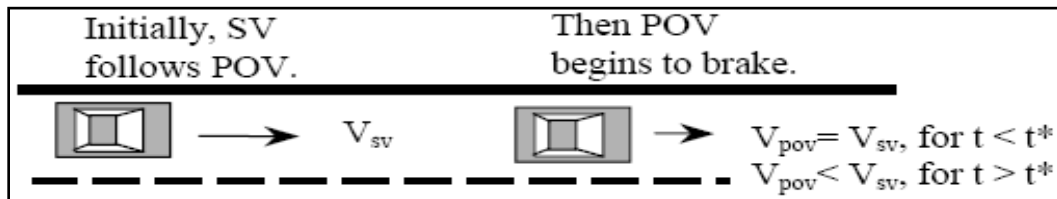


Figure 2. Depiction of Test 2

a. Alert Criteria

In order to pass the test, the FCW alert must be issued when TTC is at least 2.4 seconds. The TTC for this test, a prediction of the time it would take for the SV to collide with the POV, was calculated by considering three factors at the time of the FCW alert: (1) the speed of the SV, (2) the speed of the POV, and (3) the deceleration of the POV¹.

b. Procedure

¹To simplify calculation of the TTC for Test 2, the deceleration of the POV is assumed to remain constant from the time of the FCW alert until the POV comes to a stop (i.e., a "constant" rate of slowing is assumed).

Test 2 began with the SV and the POV traveling on a straight, flat road at a constant speed of 45.0 mph (72.4 kph), in the center of the lane of travel. The headway from the SV to the POV was nominally maintained at 98.4 ft (30 m) until the POV braking was initiated.

The test began approximately 7 seconds before the driver of the POV started a braking maneuver in which the POV brakes were rapidly applied and modulated such that a constant deceleration of 0.3 g was achieved within 1.5 seconds after braking is initiated. The test ended when either of the following conditions was satisfied:

- The required FCW alert occurred.
- The TTC to the POV fell to less than 90% of the minimum allowable range (i.e., $TTC = 2.2$ sec) for the onset of the required FCW alert.

The SV driver then steered and/or braked to keep the SV from striking the POV.

For an individual test trial to be valid, the following was required throughout the test:

- The initial POV vehicle speed could not deviate from the nominal speed by more than 1.0 mph (1.6 kph) for a period of 3 seconds prior to the initiation of POV braking.
- The speed of the SV could not deviate from the nominal speed by more than 1.0 mph (1.6 kph) for a period of 3 seconds prior to (1) the required FCW alert or (2) before the range fell to less than 90 percent of the minimum allowable range for onset of the required FCW alert.
- The lateral distance between the centerline of the SV, relative to the centerline of the POV, in road coordinates, could not exceed 2.0 ft (0.6 m).
- The yaw rates of the SV and POV could not exceed ± 1 deg/sec during the test.
- The POV deceleration level was nominally required to be 0.3 g within 1.5 seconds after initiation of POV braking. The acceptable error magnitude of the POV deceleration was $\pm 0.03g$, measured at the time the FCW alert first occurred. An

initial overshoot beyond the deceleration target was acceptable, however the first local deceleration peak observed during an individual trial could not exceed 0.375 g for more than 50 ms. Additionally, the deceleration could not exceed 0.33 g over a period defined from (1) 500 ms after the first local deceleration peak occurs, to (2) the time when the FCW alert first occurred.

- The tolerance for the headway from the SV to the POV was ± 8.2 ft (± 2.5 m), measured at two instants in time: (1) three seconds prior to the time the POV brake application was initiated, and (2) at the time the POV brake application was initiated.
- SV driver could not apply any force to the brake pedal before the required FCW alert occurred, or before the range fell to less than 90 percent of the minimum allowable range for onset of the required FCW alert.

Nominally, the Test 2 series was comprised of seven individual trials. The FCW system must satisfy the TTC alert criteria for at least five of the seven test trials.

3. TEST 3 – SUBJECT VEHICLE ENCOUNTERS SLOWER PRINCIPAL OTHER VEHICLE

This test examines the ability of the FCW system to recognize a slower lead vehicle being driven with a constant speed and issue a timely alert. As depicted in Figure 3, the scenario was conducted with a closing speed equal to 25.0 mph (40.2 kph).

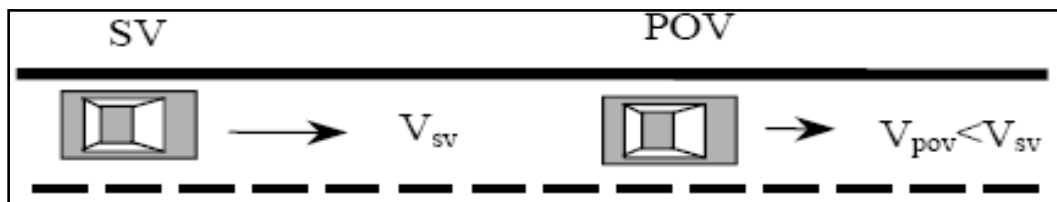


Figure 3. Depiction of Test 3

a. Alert Criteria

In order to pass the test, the FCW alert must be issued when TTC is at least 2.0 seconds. The TTC for this test, a prediction of the time it would take for the SV to collide with the POV, was calculated by considering the speeds of the SV and POV at the time of the FCW alert.

b. Procedure

Throughout the test, the POV was driven at a constant 20.0 mph (32.2 kph) in the center of the lane of travel.

The SV was driven at 45.0 mph (72.4 kph), in the center lane of travel, toward the slow-moving POV.

The test began when the headway from the SV to the POV was 329 ft (100 m) and ended when either of the following occurred:

- The required FCW alert occurred.
- The TTC to the POV fell to less than 90% of the minimum allowable range (i.e., $TTC = 1.8$ sec) for the onset of the required FCW alert.

The SV driver then steered and/or braked to keep the SV from striking the POV.

For an individual test trial to be valid, the following was required throughout the test:

- The SV vehicle speed could not deviate from the nominal speed by more than 1.0 mph (1.6 kph) for a period of 3 seconds prior to (1) the required FCW alert or (2) before the range fell to less than 90 percent of the minimum allowable range for onset of the required FCW alert.
- Speed of the POV could not deviate from the nominal speed by more than 1.0 mph (1.6 kph) during the test.
- The lateral distance between the centerline of the SV, relative to the centerline of the POV, in road coordinates, could not exceed 2.0 ft (0.6 m).
- The yaw rates of the SV and POV could not exceed ± 1 deg/sec during the test.

- SV driver could not apply any force to the brake pedal before the required FCW alert occurred, or before the range fell to less than 90 percent of the minimum allowable range for onset of the required FCW alert.

Nominally, the Test 3 series was comprised of seven individual trials. The FCW system must satisfy the TTC alert criteria for at least five of the seven test trials.

B. Principal Other Vehicle

The vehicle used as the Principal Other Vehicle (POV) was a 2000 Honda Accord. This satisfied the test requirement of Ref 1 that the POV be a mid-size sedan. The vehicle had a rear license plate in order to provide a suitable representative radar profile. Vehicle loading consisted of the driver plus equipment and instrumentation.

C. Automatic Braking System

The POV was equipped with an automatic braking system, which was used in Test 2. The braking system consisted of the following components:

- High pressure nitrogen bottle, strapped to the front passenger seat, with regulator and pressure gauges.
- Pneumatic piston-type actuator, with solenoid valve
- "Pickle" switch to activate brakes

D. Instrumentation

Table 1 lists the sensors, signal conditioning and data acquisition equipment used for these tests.

As part of the pre-test instrumentation verification process, the tonal frequency of the audible warning was determined through use of the PSD (Power Spectral Density) function in Matlab. This was accomplished in order to identify the center frequency around which a band-pass filter was applied to subsequent audible warning data such that the beginning of the audible warning could be programmatically determined. The band-pass filter used for the audible warning signal was a phase-less, forward-reverse pass, 5th order elliptical (Cauer) digital filter, with 3 dB peak-to-peak ripple, minimum stop-band attenuation of 60 dB, and a pass-band of center frequency +/- 5% of the identified center frequency.

TABLE 1. TEST INSTRUMENTATION AND EQUIPMENT

Type	Output	Range	Accuracy, Other Primary Specs	Mfr, Model
Tire Pressure Gauge	Vehicle Tire Pressure	0-100 psi 0-690 kPa	0.5 psi 3.45 kPa	Ashcroft, D1005PS
Platform Scales	Vehicle Total, Wheel, and Axle Load	8000 lb 35.6 kN	± 1.0% of applied load	Intercomp, SWII
Differential Global Positioning System	Position, Velocity	Latitude: ± 90 deg Longitude: ± 180 deg Altitude: 0-18 km Velocity: 0-1000 knots	Horizontal Position: ± 1 cm Vertical Position: ± 2 cm Velocity: 0.05 km/h	Trimble GPS Receiver, 5700 (base station and in-vehicle)
Multi-Axis Inertial Sensing System	Position; Longitudinal, Lateral, and Vertical Accels; Lateral, Longitudinal and Vertical Velocities; Roll, Pitch, Yaw Rates; Roll, Pitch, Yaw Angles	Latitude: ± 90 deg Longitude: ± 180 deg Altitude: 0-18 km Velocity: 0-1000 knots Accel: ± 100 m/s ² Angular Rate: ± 100 deg/s Angular Disp: ± 180 deg	Position: ± 2 cm Velocity: 0.05 km/h Accel: ≤ 0.01% of full range Angular Rate: ≤ 0.01% of full range Roll/Pitch Angle: ± 0.03 deg Heading Angle: ± 0.1 deg	Oxford Technical Solutions (OXTS), Inertial+
Real-Time Calculation of Position and Velocity Relative to Lane Markings (LDW) and POV (FCW)	Distance and Velocity to lane markings (LDW) and POV (FCW)	Lateral Lane Dist: ± 30 m Lateral Lane Velocity: ± 20 m/sec Longitudinal Range to POV: ± 200 m Longitudinal Range Rate: ± 50 m/sec	Lateral Distance to Lane Marking: ± 2 cm Lateral Velocity to Lane Marking: ± 0.02m/sec Longitudinal Range: ± 3 cm Longitudinal Range Rate: ± 0.02 m/sec	Oxford Technical Solutions (OXTS), RT-Range

TABLE 1. TEST INSTRUMENTATION AND EQUIPMENT (CONTD)

Type	Output	Range	Accuracy, Other Primary Specs	Mfr, Model
Data Acquisition System [Includes amplification, anti-aliasing, and analog to digital conversion.]	Record Time; Position; Velocity; Distance to lane markings; Headway distance; Closing Velocity; Lateral, Longitudinal, and Vertical Accels; Roll, Yaw, and Pitch Rates; Roll, Yaw and Pitch Angles.	Sufficient to meet or exceed individual sensors	Sound digitized at 10 kHz, all other channels digitized at 100 Hz. Accuracy is sufficient to meet or exceed individual sensors	SoMat, eDaq ECPU processor
				SoMat, High level Board EHLS
Microphone	Sound (to measure time at alert)	Max SPL: 139 dB/SPL Frequency Response: 40 Hz – 20 kHz	≤ 3 dB over Freq. Resp. Range	Sennheiser, e614
Light Sensor	Light intensity (to measure time at alert)	Spectral Bandwidth: 440-800 nm	Rise time < 10 msec	DRI designed and developed Light Sensor
Accelerometer	Acceleration (to measure time at alert)	± 5g	≤ 3% of full range	Silicon Designs, 2210-005
Coordinate Measurement Machine	Inertial Sensing System Coordinates	0-8 ft 0-2.4 m	± .0020 in. ± .051 mm (Single point articulation accuracy)	Faro Arm, Fusion

APPENDIX A

Photographs

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Figure A1. Front View of Subject Vehicle



Figure A2. Rear View of Subject Vehicle



Drive one.
ford.com

VEHICLE DESCRIPTION

TAURUS

2013 LIMITED FWD
5-PASSENGER
3.5L V6 TIVOT ENGINE
6-SPEED AUTO TRANSMISSION

DG 101212

EXTERIOR
RUBY RED METALLIC TC
INTERIOR
DUNE LEATHER SEATING

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy

23 MPG
combined city/hwy

19 29
city highway

4.4 gallons per 100 miles

You save \$0
in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$2,300

Fuel Economy & Greenhouse Gas Rating (saferp only) **6** (Best)

Smog Rating (saferp only) **5** (Best)

fueleconomy.gov
Calculate personalized estimates and compare vehicles.

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver Passenger	Not Rated
Side Crash	Front seat Rear seat	★★★★★ ★★★★★
Rollover		★★★★

Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA).
www.safercar.gov or 1-888-327-4236

IIHS Ratings

Top Safety Pick Award Winner

Frontal Offset GOOD
Side Impact GOOD
Rear Impact GOOD
Roof Strength GOOD

The Institute rates vehicles Good, Acceptable, Marginal, or Poor based on performance.

Scan this code to experience this vehicle or text 1FDG101212 to 48028 or Visit ford.com/windowsticker

STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE

EXTERIOR

- 18" PAINTED ALUMINUM WHEELS
- P235/55R19 A/S BSW TIRES
- AUTO PROJ BEAM HEADLAMPS
- LED TAILLAMPS
- SUPPLEMENTAL PARK LAMPS
- MIRRORS-MAN FOLD DUAL PWR HEATED WITH APPROACH LAMP
- SECURICODE KEYLESS ENTRY
- QUASH-DUAL EXHAUST SYSTEM
- EXHAUST TIPS - CHROME
- BRIGHT BELTLINE MOLDING
- DOOR HANDLES - BODY COLOR
- MINI SPARE TIRE/WHEEL
- EASY FUEL CAPLESS FILLER

INTERIOR

- POWER DRV AND PASS SEATS-10-WAY WITH DRV MEMORY AND LUMBAR
- 80/40 SPLIT FOLD REAR SEAT
- DUAL-ZONE ELECTRONIC AUTO CLIMATE CONTROL
- LEATHER/WOOD STR WHEEL W/ CRUISE, AUDIO, CLIMATE AND MEDIA CONTROL
- AMBIENT LIGHTING
- 1 TOUCH UP/DOWN DR/PASS WIN
- CENTER CONSOLE W/ ARMREST, STORAGE & 2 CUPHOLDERS
- SILL PLATES/BRIGHT METAL
- UNIQUE DOOR/TP APPLIQUES

FUNCTIONAL

- FRONT WHEEL DRIVE
- 6-SPEED SELECTSHIFT TRANS
- POWER STEERING W/EPAS
- 4-WHL DISC BRAKES W/ ABS
- CURVE CONTROL
- SYNC W/ MY/FORD TOUCH
- SYNC SERVICES
- MEDIA HUB - 2 USB, SD CARD READER & VIDEO INPUT JACK
- SINUSOID RADIO W/ HD, TTI
- ELECTROCHROMIC MIRROR
- REVERSE SENSING AND REAR VIEW CAMERA
- REMOTE START
- 19.0 GALLON FUEL TANK

SAFETY/SECURITY

- TRUCK POINT CRASH ALERT SYS
- PERSONAL SAFETY SYSTEM
- ADVANCED FRONT AND SIDE SAFETY CURTAINS - 2 ROWS
- PERIMETER ALARM
- LATCH CHILD SAFETY SYSTEM
- CHILDPROOF REAR DOOR LOCKS
- 8 LOCKABLE DOORS
- MYKEY
- TIRE PRESSURE MONITOR SYS

WARRANTY

- 3 YEAR/50K MILE BUMPER-TO-BUMPER WARRANTY
- 5 YEAR/100K MILE POWERTRAIN WARRANTY
- 3 YEAR/50K MILE CORROSION RESISTANCE WARRANTY

INCLUDED ON THIS VEHICLE (MSRP)

EQUIPMENT GROUP 302A 3800.00

- ADJUSTABLE PEDALS W/MEMORY
- AUTO-DIMMING DR MIRROR
- BLIND SPOT MONITORING SYS
- HD RADIO
- HEATED/WOOLLED FRONT SEATS
- PUSH BUTTON START W/REMOTE
- PWR TILT/TELESCOPE STEER WHEEL
- SONY AUDIO SOUND SYSTEM
- ACTIVE PARK ASSIST
- RAIN SENS WIPERS/AUTO HIGHBEAM
- LIMITED BRANDED FLOOR MAT
- HEATED STEERING WHEEL
- REAR WINDOW POWER SUNSHADE
- HEATED REAR SEATS

OPTIONAL EQUIPMENT

2013 MODEL YEAR

- RUBY RED METALLIC TC 395.00
- NO CHARGE
- FRONT LICENSE PLATE BRACKET NO CHARGE
- CALIFORNIA EMISSIONS SYSTEM 1195.00
- ADAPT CRUISE/COLLI WARNING

PRICE INFORMATION

BASE PRICE \$33,000.00

TOTAL OPTIONS 2000.00

TOTAL VEHICLE & OPTION DESTINATION & DELIVERY 38000.00


195.00

TOTAL MSRP \$38,885.00

SOLD TO Bob Wondries Ford P.O. BOX 1151 Alhambra CA 91902	71A 061	RAMP ONE CC27	DEALER NO. 71A 061	TOTAL MSRP \$38,885.00
SHIP TO (IF OTHER THAN SOLD TO)		RAMP TWO	FINAL ASSEMBLY PLANT CHICAGO	This label is affixed pursuant to the Federal Automobile Information Disclosure Act. Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.
SHIP THROUGH		METHOD OF TRANSP. RAIL	ITEM #. 71-7126	B463 A 7AX X 315 000121 03 20 12

Extended Service Plan

Ford ESP is the only extended service plan honored at every Ford dealership in the U.S. and Canada. See your dealer for additional details or visit www.FordDew.com for more information.



1FAHP2F80DG10

Ford Credit

Choose the vehicle you want. Whether you decide to lease or finance, you'll find the choices that are right for you. See your Ford Dealer for details or visit www.FordCredit.com.

Figure A3. Window Sticker (Monroney Label)

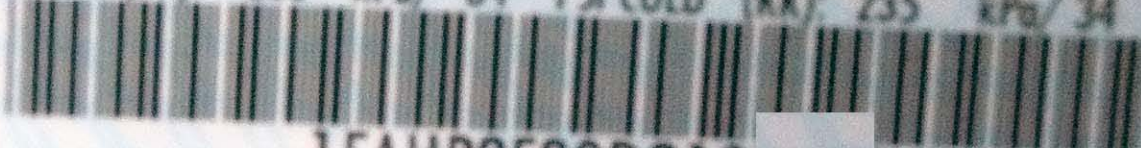
MFD. BY FORD MOTOR CO.

DATE: 02/12
 FRONT GAWR: 1279 KG (2820 LB) GVWR: 2386 KG (5260 LB)
 REAR GAWR: 1143 KG (2520 LB)

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
 VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS
 IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 1FAHP2F80DG101212 TYPE: Passenger Car
 MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 430KG/ 950LB
 OCCUPANTS = 5 TOTAL; 2 FRONT, 3 REAR

TIRE (FR): 255/45R19 100V RIMS (FR): 19XB SJ
 (RR): 255/45R19 100V (RR): 19XB SJ
 PRESSURE (FR): 235 kPa/ 34 PSI COLD (RR): 235 kPa/ 34 PSI COLD



1FAHP2F80DG10

TRAILER TOWING - SEE OWNER GUIDE

EXT PNT: RR	RC: 71	DSO:	F0073
INT TR	TP/PS	R AXLE	TR SPR
PD	H	2A	J AAAA
1201202060315		CMC	USUSA-5420472-AA

Figure A4. Vehicle Certification Label



Figure A5. Front View of Principal Other Vehicle



Figure A6. Rear View of Principal Other Vehicle

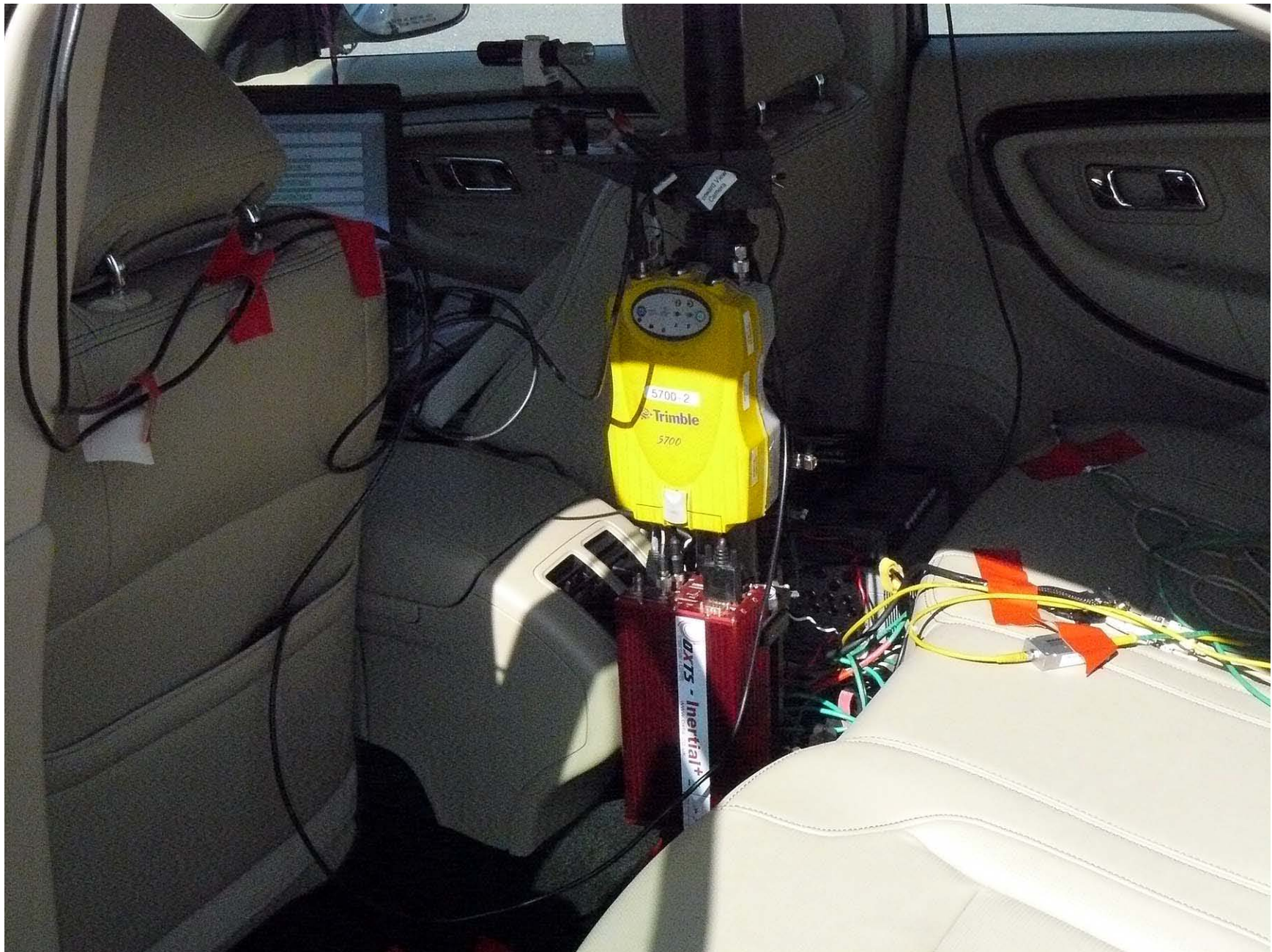


Figure A7. DGPS and Inertial Measurement Unit Installed in Subject Vehicle



Figure A8. Data Acquisition System Installed in Subject Vehicle



Figure A9. Computer Installed in Subject Vehicle



Figure A10. Brake Actuation System Installed in Principal Other Vehicle



Figure A11. Forward Collision Visual Warning



Figure A12. Sensors for Detecting Visual and Aural Warnings



Figure A13. Controls for Adjusting Vehicle Settings

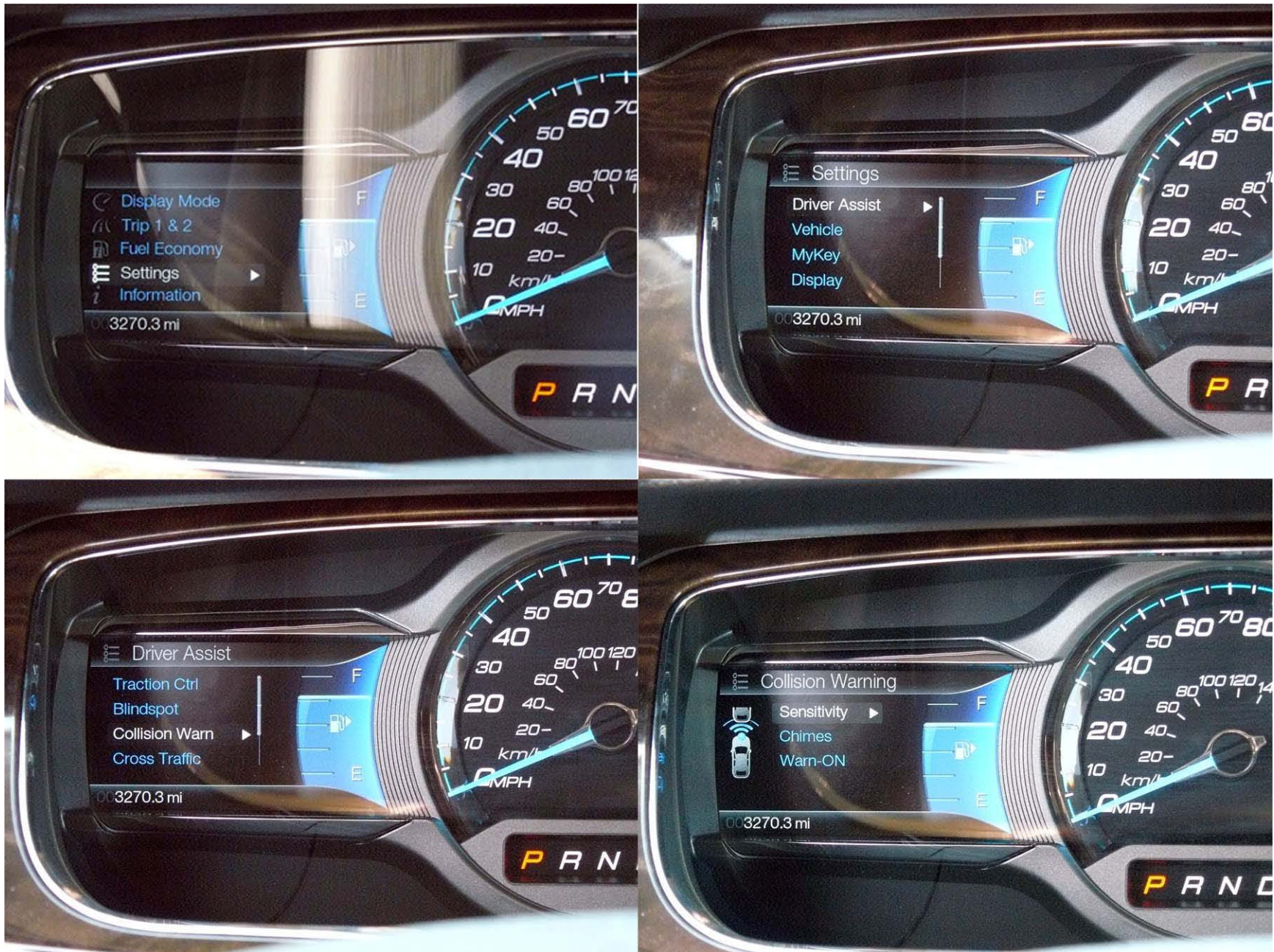


Figure A14. FCW Settings Menu

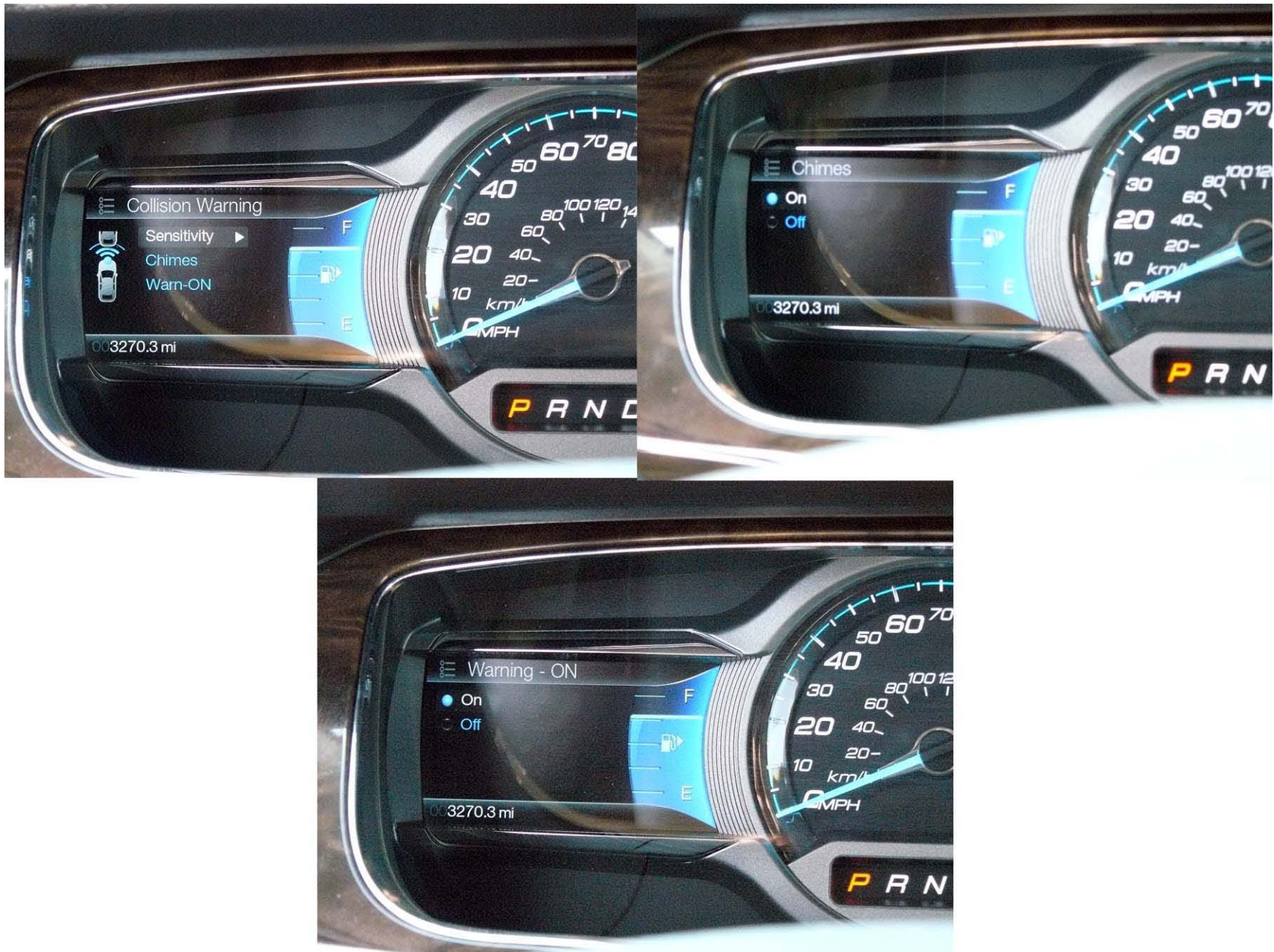


Figure A15. FCW Settings Menu (cont.)

APPENDIX B

Excerpts from Owner's Manual

PRINCIPLES OF OPERATION

MyKey® allows you to program keys with restricted driving modes to promote good driving habits. All but one of the keys programmed to the vehicle can be activated with these restricted modes. Any keys that have not been programmed are referred to as an administrator key or admin key which can be used to:

- create a restricted key
- program optional MyKey settings
- clear all MyKey features altogether.

Once a key has been programmed, you can access the following information using the information display control:

- How many admin keys and MyKeys are programmed to the vehicle.
- The total distance the vehicle has been driven with a MyKey.

For vehicles equipped with Intelligent Access (push button start), when both a MyKey and an Admin Intelligent Access key (fob) are present, the admin fob will be recognized by the vehicle to start the engine.

Standard Settings


These settings cannot be changed.

- Belt-Minder. This cannot be disabled and the five-minute timer does not expire. The audio system is muted when MyKey Belt-Minder is activated.
- Early low fuel. Warnings are displayed in the information display control followed by an audible tone when the fuel tank is at 1/8 tank or less.
- Driver assist features, if equipped on your vehicle, are forced on: rear parking aid, BLIS® (Blind Spot Information System) with cross-traffic alert, lane departure warning, forward collision warning system and satellite radio adult content restriction.

Optional Settings

These settings can be configured right after a MyKey is first created or changed afterward with an admin key.

- Vehicle speed limit of 65, 70, 75 and 80 mph (105, 113, 121 and 130 km/h). Visual warnings are displayed followed by an audible tone when vehicle speed has reached the selected top speed.
- Vehicle speed minder of 45, 55 or 65 mph (75, 90, or 105 km/h). Visual warnings are displayed followed by an audible tone when the preselected vehicle speed is exceeded.

 **WARNING:** Driving a vehicle with the brake system warning light on is dangerous. A significant decrease in braking performance may occur. It will take you longer to stop the vehicle. Have the vehicle checked by your authorized dealer as soon as possible. Driving extended distances with the parking brake engaged can cause brake failure and the risk of personal injury.

Charging system (RTT)

Illuminates when the battery is not charging properly. If it stays on while the engine is running, there may be a malfunction with the charging system. Contact your authorized dealer as soon as possible. This indicates a problem with the electrical system or a related component.

Door ajar (RTT)

Displays when the ignition is on and any door is not completely closed.

Engine oil pressure (RTT)

Illuminates when the oil pressure falls below the normal range.

Engine coolant temperature (RTT)

Illuminates when the engine coolant temperature is high. Stop the vehicle as soon as possible, switch off the engine and let cool.

Grade assist (if equipped) (RTT)

Illuminates when grade assist is turned on.

Heads up display (if equipped)

A red beam of lights will illuminate on the windshield in certain instances when using adaptive cruise control and/or the collision warning system. It will also illuminate momentarily when you start your vehicle to make sure the display works.

Settings				
Driver Assist	Traction Control			
	Blind Spot			
	Collision Warning	Sensitivity	High, Normal or Low	
		Chimes (not selectable if using a MyKey)		
		Warning (not selectable if using a MyKey)		
	Cross Traffic			
	Cruise Control	Adaptive or Normal		
Rear Park Aid				
Display	Language	Select your applicable language		
	Units	Distance	Miles and Gallons or km/L or L/100km	
		Temperature	Fahrenheit (°F) or Celsius (°C)	

Fuel Economy	Inst Fuel Economy	XX. Min Fuel History
Instantaneous fuel usage	X	
‡Fuel usage over a 5, 10, or 30 minute time span		X
Total odometer (lower left corner)		
Press and hold OK to reset the currently displayed fuel usage information.		
‡To configure the fuel usage time span, press the right arrow button when in this screen.		

- Inst. Fuel Economy: This display shows a visual graph of your instantaneous fuel economy.
- XX. Min Fuel History: This display shows a bar chart of your fuel history.

Settings



In this mode, you can configure different driver setting choices.

Note: Some items are optional and may not appear.

Driver Assist		
Traction Control	On (default setting) / Off	
Blindspot	On (default on key cycle) / Off	
Collision Warning	Sensitivity	High / Normal / Low
	Chimes	On (default on key cycle) / Off
	Warn-ON	On (default on key cycle) / Off
Cross Traffic	On (default on key cycle) / Off	
Cruise Control	Adaptive or Normal	
Driver Alert	On (default on key cycle) / Off	
Rear Park Aid	On (default on key cycle) / Off	

Information Displays

Collision Warning System Messages	Action / Description
Collision Warn Not Available	Displayed when there is a system malfunction with the collision warning system. The system will be disabled. Contact your authorized dealer as soon as possible.
Collision Warn Not Available Sensor Blocked	Displayed when the collision warning system radar is blocked because of poor radar visibility due to bad weather or ice/mud/water in front of the radar. Driver can typically clean the sensor to resolve. Contact your authorized dealer as soon as possible.
Collision Warning Malfunction	Displayed when there is a system malfunction with the collision warning system. The system will be disabled. Contact your authorized dealer as soon as possible.
Collision Warning Display Fault	Displayed when there is a system malfunction with the collision warning system display. Contact your authorized dealer as soon as possible.
Door Messages	Action / Description
X Door Ajar	Displayed when a door is not completely closed.
Trunk Ajar	Displayed when the trunk is not completely closed.
Fuel Messages	Action / Description
Check Fuel Fill Inlet	Displayed when the fuel fill inlet may not be properly closed.
Fuel Level Low	Displayed as an early reminder of a low fuel condition.

System Errors

If either system senses a problem with the left or right sensor, the BLIS® indicator in the information display will illuminate and remain on. Also, **BLIND SPOT SYSTEM FAULT** or **CROSS TRAFFIC SYSTEM FAULT** message will appear. When problems that may cause the left or right indicator not to illuminate, only the information display message faults appear.

Switching the Systems Off and On

One or both systems can be switched off temporarily by using the information display control; refer to the *Information Display* chapter. When the BLIS® is switched off, the driver does not receive alerts and the information display shows BLIND SPOT SYS OFF and/or CTA SYSTEM OFF. The system switches back on whenever the ignition is switched on.

One or both systems can also be switched off permanently at your authorized dealer. Once switched off, switching it back on must also be done at the dealership.

COLLISION WARNING SYSTEM (IF EQUIPPED)

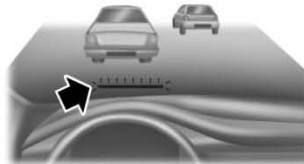
WARNING: This system is designed to be a supplementary driving aid. It is not intended to replace the driver's attention, and judgment, or the need to apply the brakes. This system does NOT activate the brakes automatically. Failure to press the brake pedal to activate the brakes may result in a collision.



WARNING: The collision warning system with brake support cannot help prevent all collisions. Do not rely on this system to replace driver judgment and the need to maintain distance and speed.

Note: The system does not detect, warn or respond to potential collisions with vehicles to the rear or sides of the vehicle.

Note: The collision warning system is active at speeds above approximately 5 mph (8 km/h).



This system is designed to alert the driver of certain collision risks. A radar detects if your vehicle is rapidly approaching another vehicle traveling in the same direction as yours.

If it is, a red warning light illuminates and an audible warning chime sounds.

The brake support system assists the driver in reducing the collision speed by charging the brakes. If the risk of collision further increases after the warning light illuminates, the brake support prepares the brake system for rapid braking. This may be apparent to the driver. The system does not automatically activate the brakes but, if the brake pedal is pressed, full force braking is applied even if the brake pedal is lightly pressed.

Using the Collision Warning System



WARNING: The collision warning system's brake support can only help reduce the speed at which a collision occurs if the driver applies the vehicle's brakes. The brake pedal must be pressed just like any typical braking situation.

The warning system and chime can be turned on and off separately; the warning system sensitivity can be adjusted to one of three possible settings by using the information display control. Refer to the *Information Displays* chapter.

Note: If the system cannot be turned off in a vehicle equipped with MyKey®, refer to the *MyKey®* chapter.

Note: If collision warnings are perceived as being too frequent or disturbing then the warning sensitivity can be reduced, though the manufacturer recommends using the highest sensitivity setting where possible. Setting lower sensitivity would lead to fewer and later system warnings. Refer to the *Information Displays* chapter for instructions on reducing the sensitivity.

Blocked Sensors

If a message regarding a blocked sensor appears in the information display, the radar signals from the sensor have been obstructed. The sensors are located behind a fascia cover near the driver side of the lower grille. When the sensors are obstructed, a vehicle ahead cannot

be detected and the collision warning system does not function. The following table lists possible causes and actions for this message being displayed.

Cause	Action
The surface of the radar in the grille is dirty or obstructed in some way	Clean the grille surface in front of the radar or remove the object causing the obstruction
The surface of the radar in the grille is clean but the message remains in the display	Wait a short time. It may take several minutes for the radar to detect that it is no longer obstructed
Heavy rain, spray, snow, or fog is interfering with the radar signals	The collision warning system is temporarily disabled. Collision warning should automatically reactivate a short time after the weather conditions improve.
Swirling water, or snow or ice on the surface of the road may interfere with the radar signals	The collision warning system is temporarily disabled. Collision warning should automatically reactivate a short time after the weather conditions improve.

System Limitations

⚠ WARNING: The collision warning system's brake support can only help reduce the speed at which a collision occurs if the driver applies the vehicle's brakes. The brake pedal must be pressed just like any typical braking situation.

Due to the nature of radar technology, there may be certain instances where vehicles do not provide a collision warning. These include:

- Stationary vehicles or vehicles moving below 6 mph (10 km/h).
- Pedestrians or objects in the roadway.
- Oncoming vehicles in the same lane.
- Severe weather conditions (see blocked sensor section).
- Debris build-up on the grille near the headlamps (see blocked sensor section).
- Small distance to vehicle ahead.
- Steering wheel and pedal movements are large (very active driving style).
- High interior temperatures, which may deactivate the illumination or the warning lamps until the interior temperature reduces (audible warning still sounds).

Certain conditions may reduce the visibility of the warning lamp; therefore, it is recommended to keep the audible warning on.

If the front end of the vehicle is hit or damaged, the radar sensing zone may be altered causing missed or false collision warnings. See your authorized dealer to have your collision warning radar checked for proper coverage and operation.

STEERING

Electric Power Steering



WARNING: The electric power steering system has diagnostic checks that continuously monitor the system to ensure proper operation. When a system error is detected a steering message will appear in the information display.

APPENDIX C

Run Log

Subject Vehicle: 2013 Ford Taurus

Date: 10/16/2012

Principal Other Vehicle: 2000 Honda Accord

Run	Test Type	Valid Run?	TTCW Sound (sec)	TTCW Light (sec)	TTCW CAN (sec)	TTCW Margin (sec)	Pass/Fail	Notes
1	FCW1 (Stopped)	Y	2.39	2.40	2.41	0.31	Pass	
2		Y	2.39	2.38	2.40	0.30	Pass	
3		Y	2.41	2.41	2.43	0.33	Pass	
4		Y	2.07	2.06	2.08	-0.02	Pass	(All TTCW round to 2.1)
5		Y	2.43	2.42	2.44	0.34	Pass	
6		Y	2.02	2.02	2.04	-0.06	Fail	
7		Y	2.42	2.42	2.44	0.34	Pass	
8	FCW3 (Slower)	Y	2.75	2.75	2.77	0.77	Pass	
9		Y	2.88	2.88	2.91	0.91	Pass	
10		Y	2.70	2.71	2.72	0.72	Pass	
11		Y	2.88	2.88	2.90	0.90	Pass	
12		Y	2.77	2.77	2.79	0.79	Pass	
13		Y	2.79	2.79	2.81	0.81	Pass	
14		N						Data file problem
15		Y	2.57	2.57	2.59	0.59	Pass	

Subject Vehicle: 2013 Ford Taurus

Date: 10/16/2012

Principal Other Vehicle: 2000 Honda Accord

Run	Test Type	Valid Run?	TTCW Sound (sec)	TTCW Light (sec)	TTCW CAN (sec)	TTCW Margin (sec)	Pass/Fail	Notes
16	FCW2 (Braking)	Y	3.05	3.07	3.09	0.69	Pass	
17		Y	3.01	3.01	3.04	0.64	Pass	
18		Y	3.11	3.11	3.16	0.76	Pass	
19		Y	3.08	3.08	3.11	0.71	Pass	
20		Y	3.20	3.20	3.21	0.81	Pass	
21		N						Lateral offset high
22		Y	3.14	3.14	3.17	0.77	Pass	
23		Y	3.07	3.10	3.11	0.71	Pass	

APPENDIX D

Time History Plots

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Description of Time History Plots

A set of time history plots is provided for each valid run in the test series. Each set of plots comprises time varying data from both the Subject Vehicle and the Principal Other Vehicle, as well as pass/fail envelopes and thresholds. The following is a description of data types shown in the time history plots, as well as a description of the color code indicating to which vehicle the data pertain.

Time History Plot Description

Each time history plot consists of data pertinent to the test type under consideration. The data shown in time history plots for test type 2 differs slightly from the data shown in test types 1 and 3, owing to the headway distance criterion which is used exclusively for test type 2.

Time history figures include the following sub-plots:

- Event – indicates timing of warning issued by FCW system. Depending on the type of FCW alert or instrumentation used to measure the alert, this can be any of the following,:
 - Filtered and rectified sound signal
 - Filtered and rectified acceleration (e.g., steering wheel vibration)
 - Light sensor signal
 - Discrete on/off value
- TTC (sec) – indicates the Time to Collision as calculated up to the point of FCW alert issuance. The value of TTCW (Time to Collision at Warning) is given numerically on the right side of the figure. A passing value is indicated in green, while a failing value is indicated in red.
- SV Speed (mph) – speed of the Subject Vehicle
- POV Speed (mph) – speed of the Principal Other Vehicle
- Yaw Rate (deg/sec) – yaw rate of both the Subject Vehicle and Principal Other Vehicle
- Lateral Offset (ft) – lateral offset within the lane from the Subject Vehicle to the Principal Other Vehicle
- Ax (g) – Longitudinal acceleration of both the Subject Vehicle and Principal Other Vehicle
- Headway (ft) – Longitudinal separation between front of Subject Vehicle to rear of Principal Other Vehicle (Exclusive to test type 2)

Envelopes and Thresholds

Each of the time history plot figures can contain either green or yellow envelopes and/or black threshold lines. These envelopes and thresholds are used to programmatically and visually determine the validity of a given test run. Envelope and threshold exceedances are indicated with either red shading or red asterisks, and red text is placed to the right side of the plot indicating the type of exceedance.

Green envelopes indicate that the time-varying data should not exceed the envelope boundaries at any time within the envelope. Exceedances of a green envelope are indicated by red shading in the area between the measured time-varying data and the envelope boundaries.

Yellow envelopes indicate that the time-varying data should not exceed the envelope only at the left and/or right ends. Exceedances at the left or right extent of a yellow envelope are indicated by red asterisks.

For test type 2, the plot indicating the longitudinal acceleration of the Principal Other Vehicle includes a solid black threshold line indicating the maximum deceleration (-0.33 g) allowed while braking. Exceedance of this threshold is indicated with red shading in the area between the measured time-varying data and the threshold boundary.

Color Codes

Color codes have been adopted to easily identify which data correspond to which vehicle, as well as to indicate the types of envelopes and thresholds used in the plots.

Color codes can be broken into four categories:

1. Time-varying data
2. Validation envelopes and thresholds
3. Instantaneous samplings
4. Text

1. Time-varying data color codes:

- Blue = Subject Vehicle data
- Magenta = Principal Other Vehicle data

- Brown = Relative data between SV and POV (i.e., TTC, lateral offset and headway distance)
2. Validation envelope and threshold color codes:
 - Green envelope = time varying data must be within the envelope at all times in order to be valid
 - Yellow envelope = time varying data must be within limits at left and/or right ends
 - Black threshold (Solid) = time varying data must not exceed this threshold in order to be valid
 - Black threshold (Dashed) = for reference only – this can include warning level thresholds, TTC thresholds, and acceleration thresholds
 3. Instantaneous sampling color codes:
 - Green circle = passing or valid value at a given moment in time
 - Red asterisk = failing or invalid value at a given moment in time
 4. Text color codes:
 - Green = passing or valid value
 - Red = failing or invalid value

Examples of time history plots for each test type (including passing, failing and invalid runs) are shown in Figure D1 through Figure D6. Actual time history data plots for the vehicle under consideration are provided subsequently.

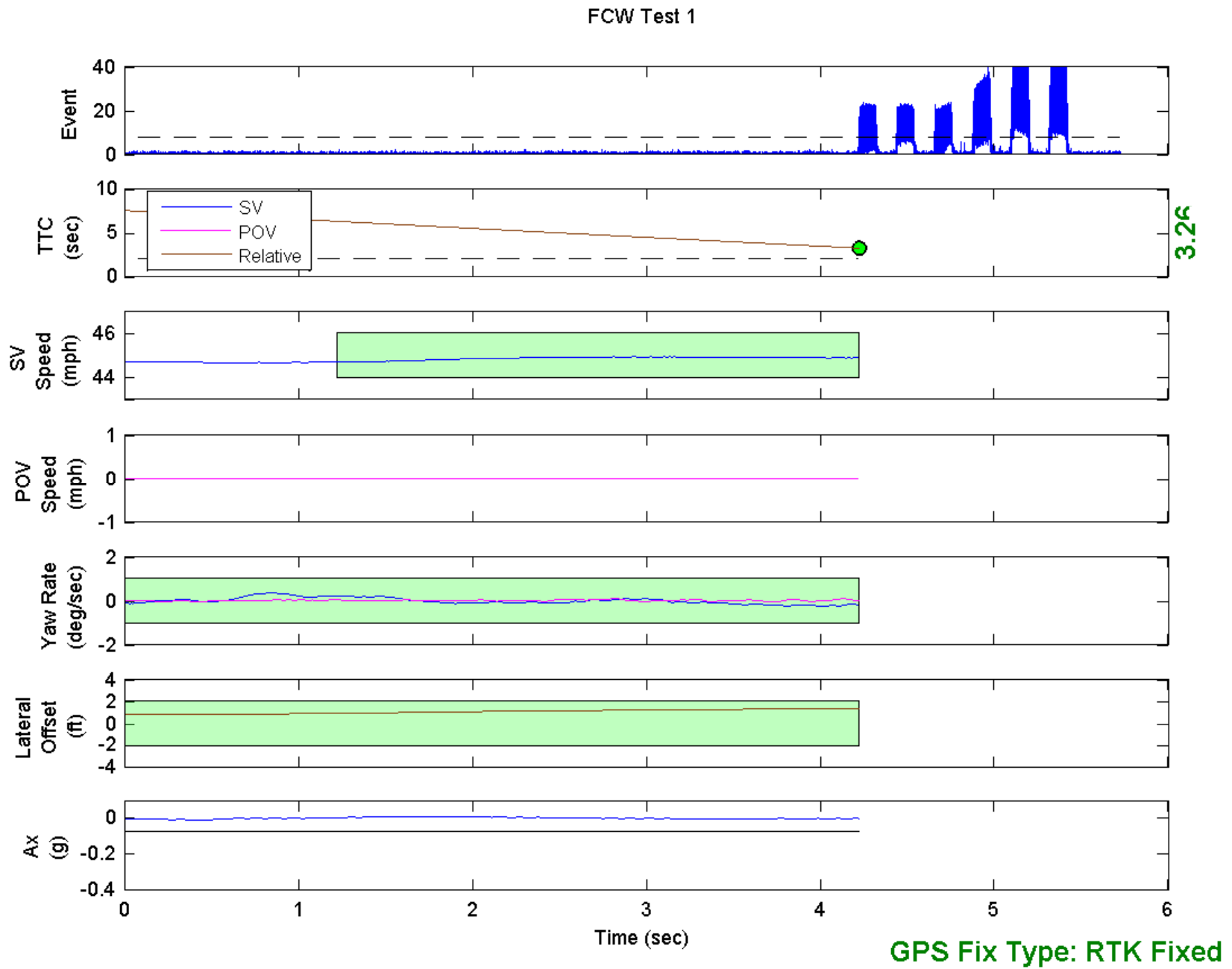
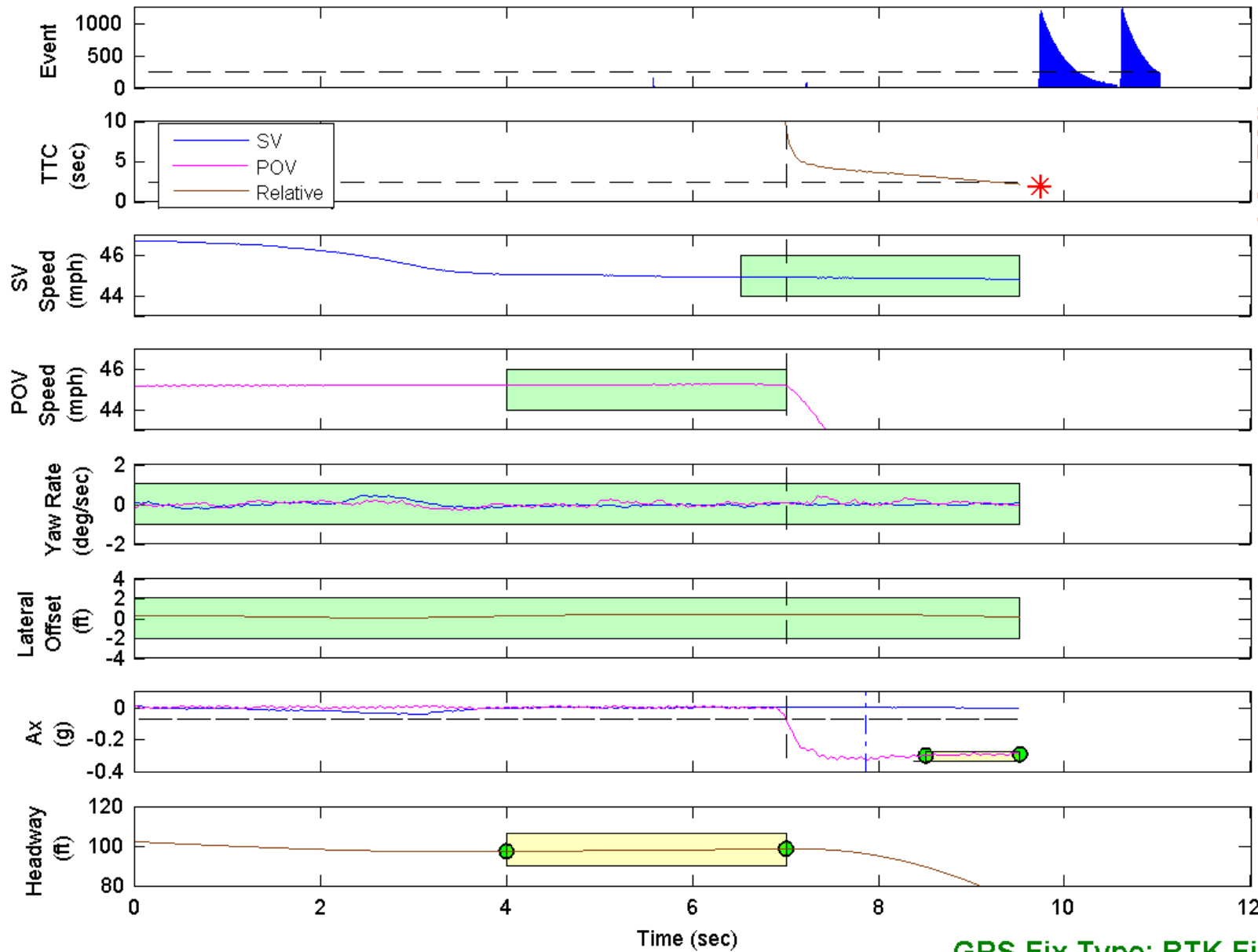


Figure D1. Example Time History for Test Type 1, Passing

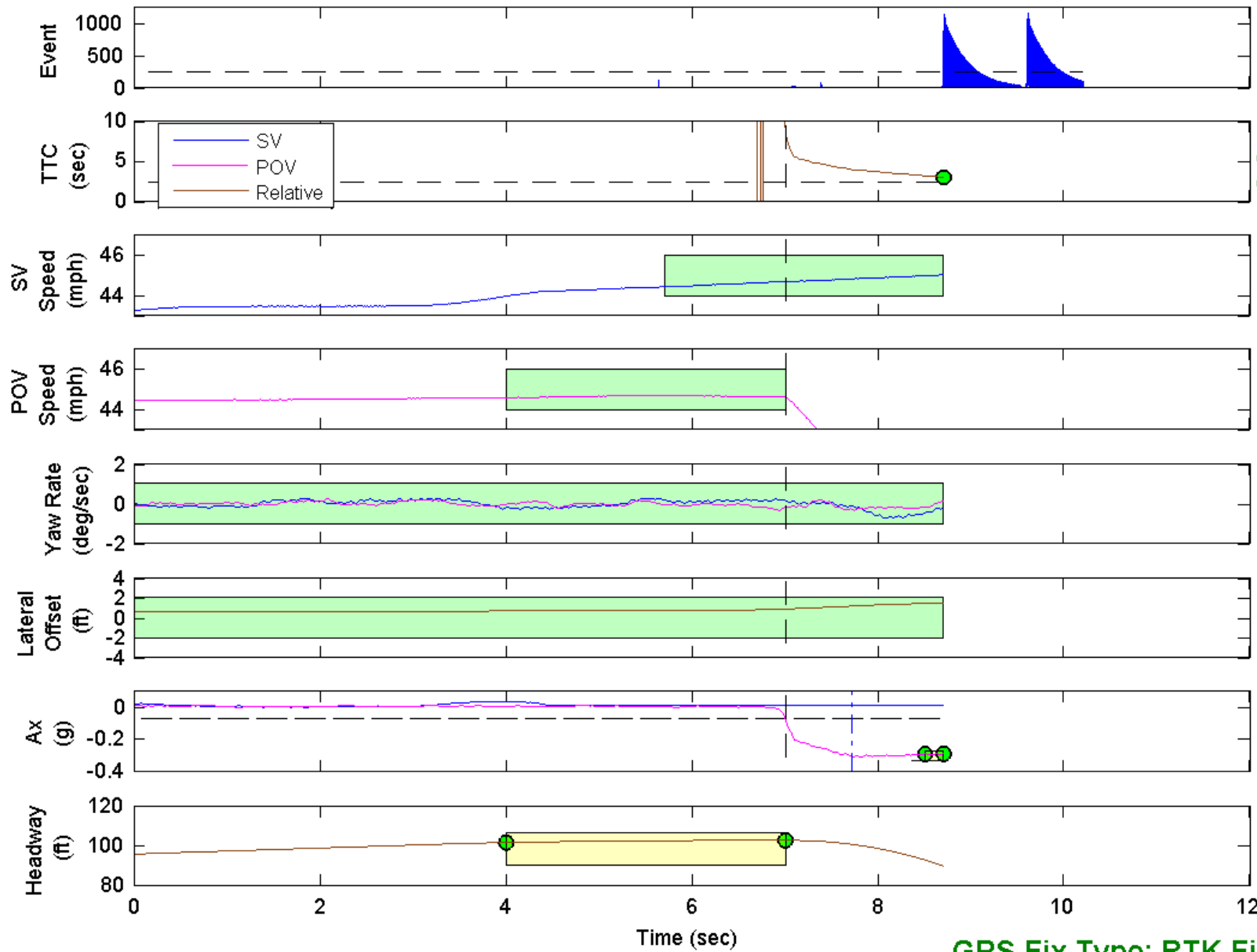
FCW Test 2



GPS Fix Type: RTK Fixed

Figure D2. Example Time History for Test Type 2, Failing

FCW Test 2



GPS Fix Type: RTK Fixed

Figure D3. Example Time History for Test Type 2, Passing

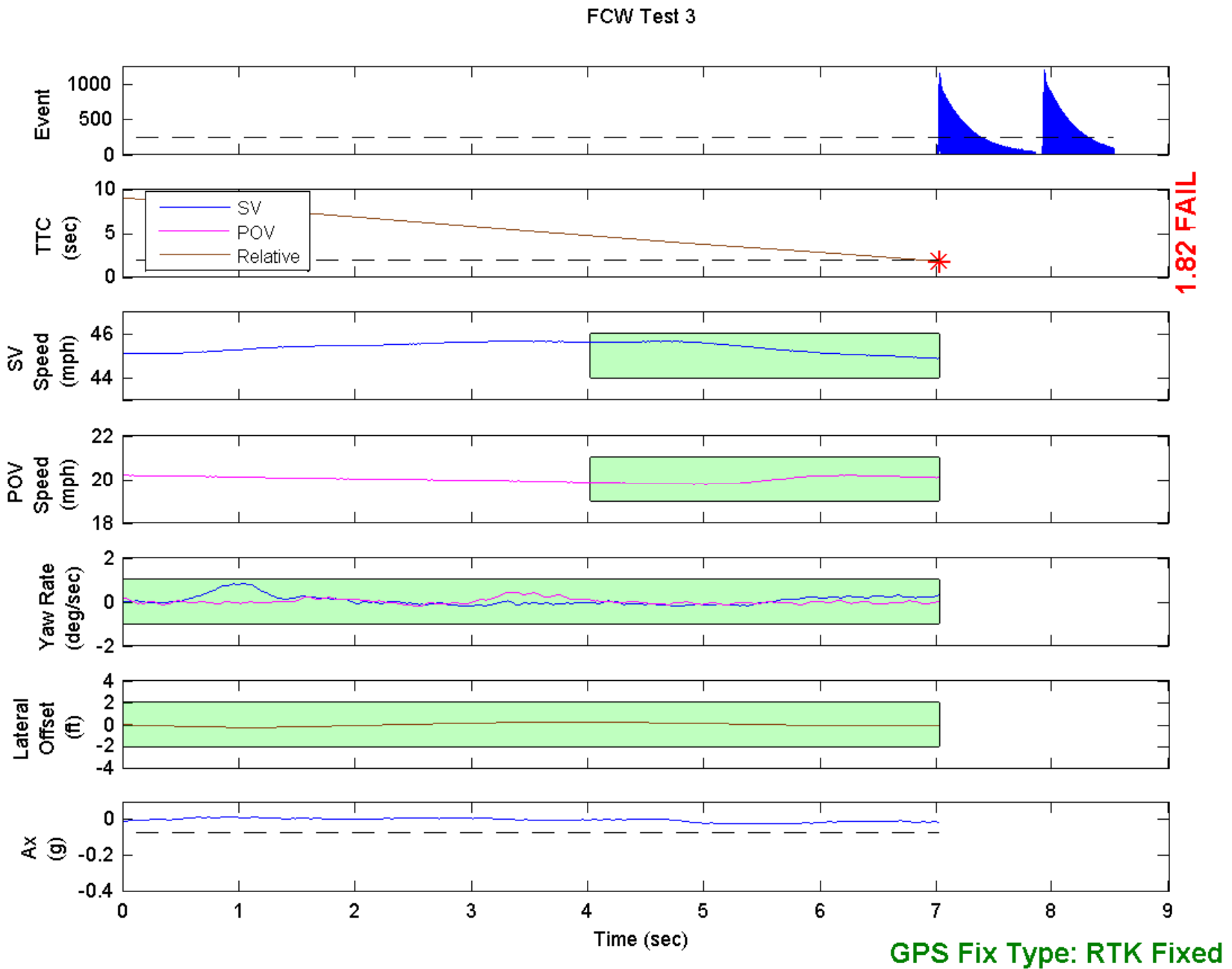


Figure D4. Example Time History for Test Type 3, Failing

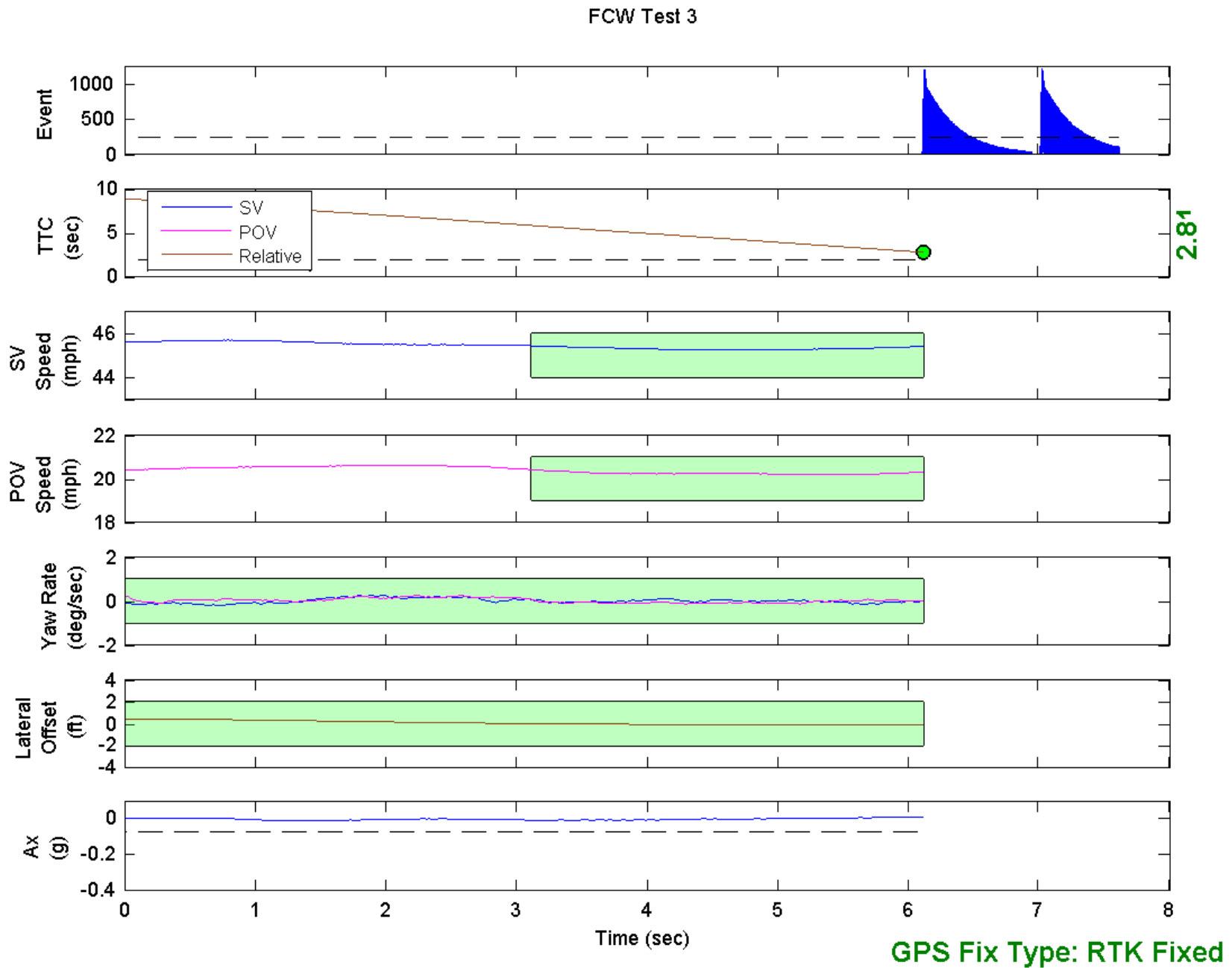


Figure D5. Example Time History for Test Type 3, Passing

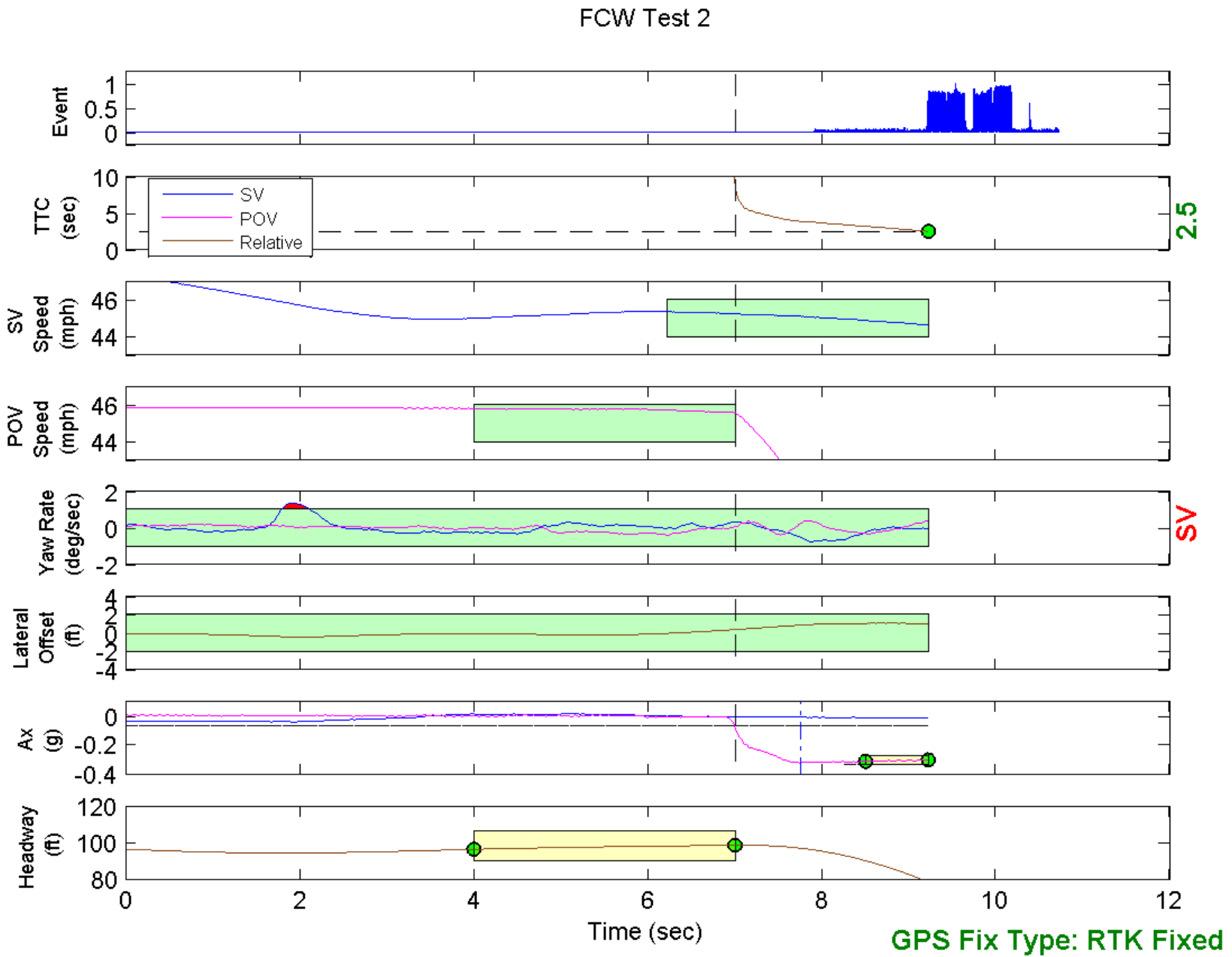


Figure D6. Example Time History for Test Type 2, Invalid Run Due to Subject Vehicle Yaw Rate

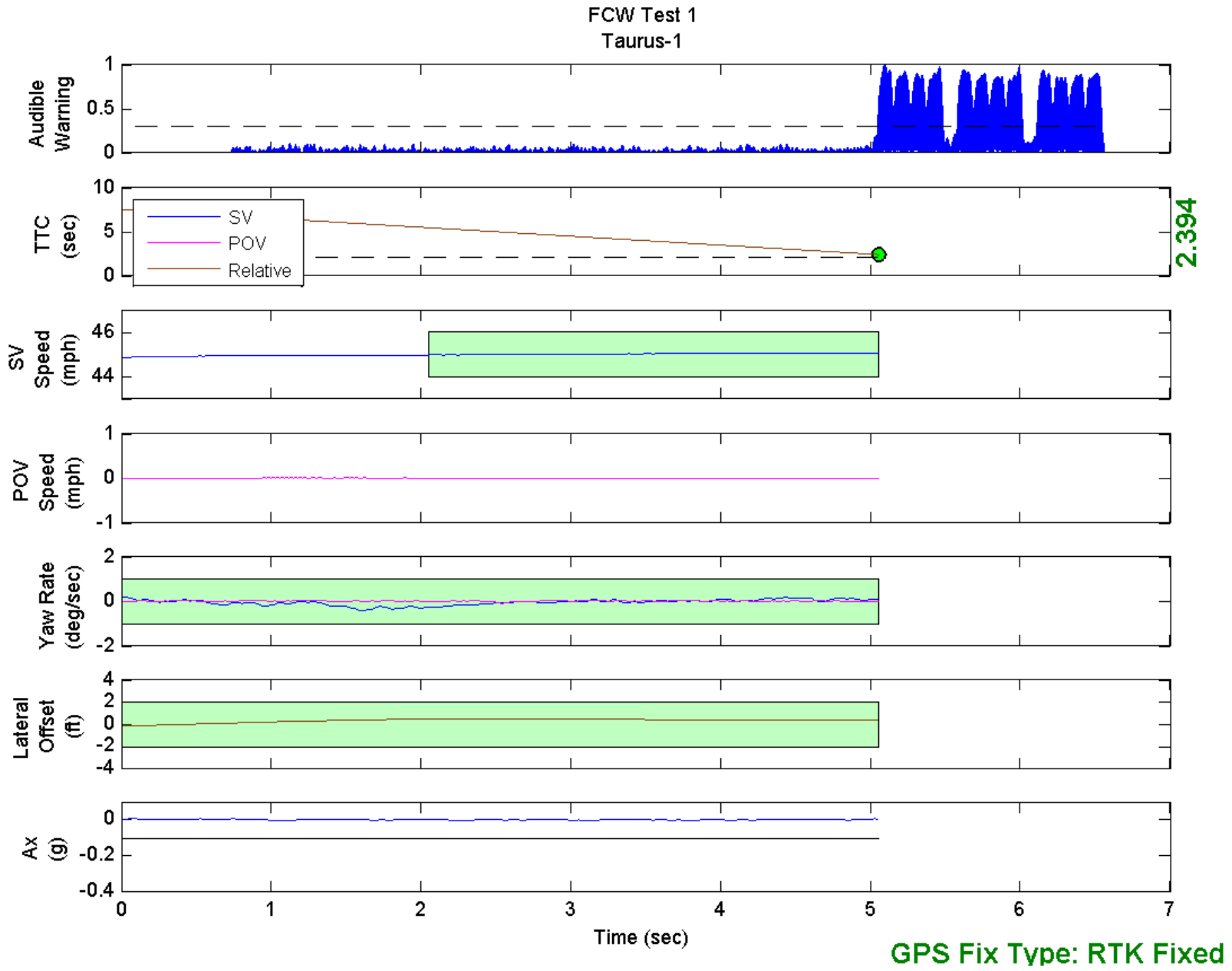


Figure D7. Time History for Run 1, FCW Test 1, Audible Warning

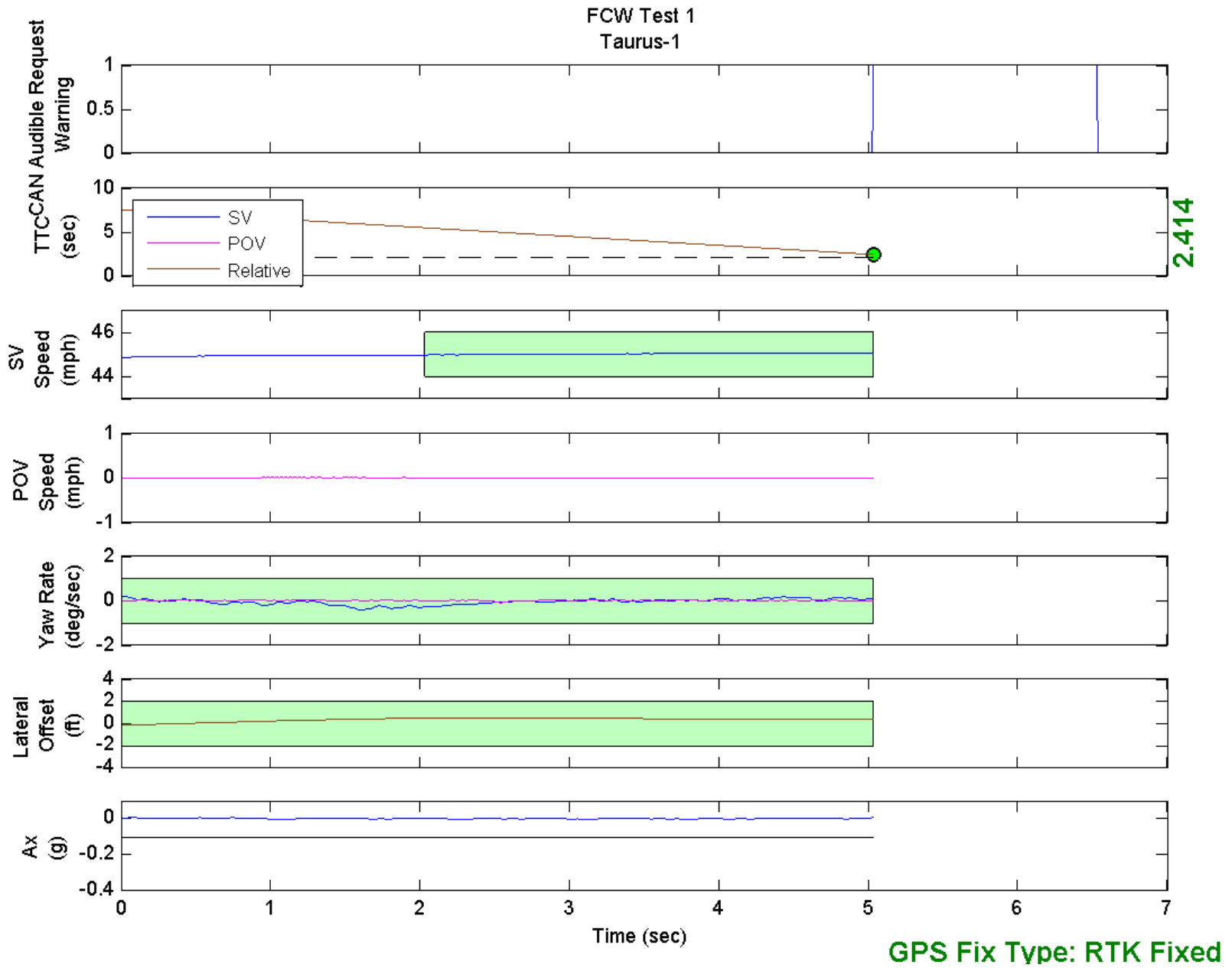


Figure D8. Time History for Run 1, FCW Test 1, CAN Audible Warning Request

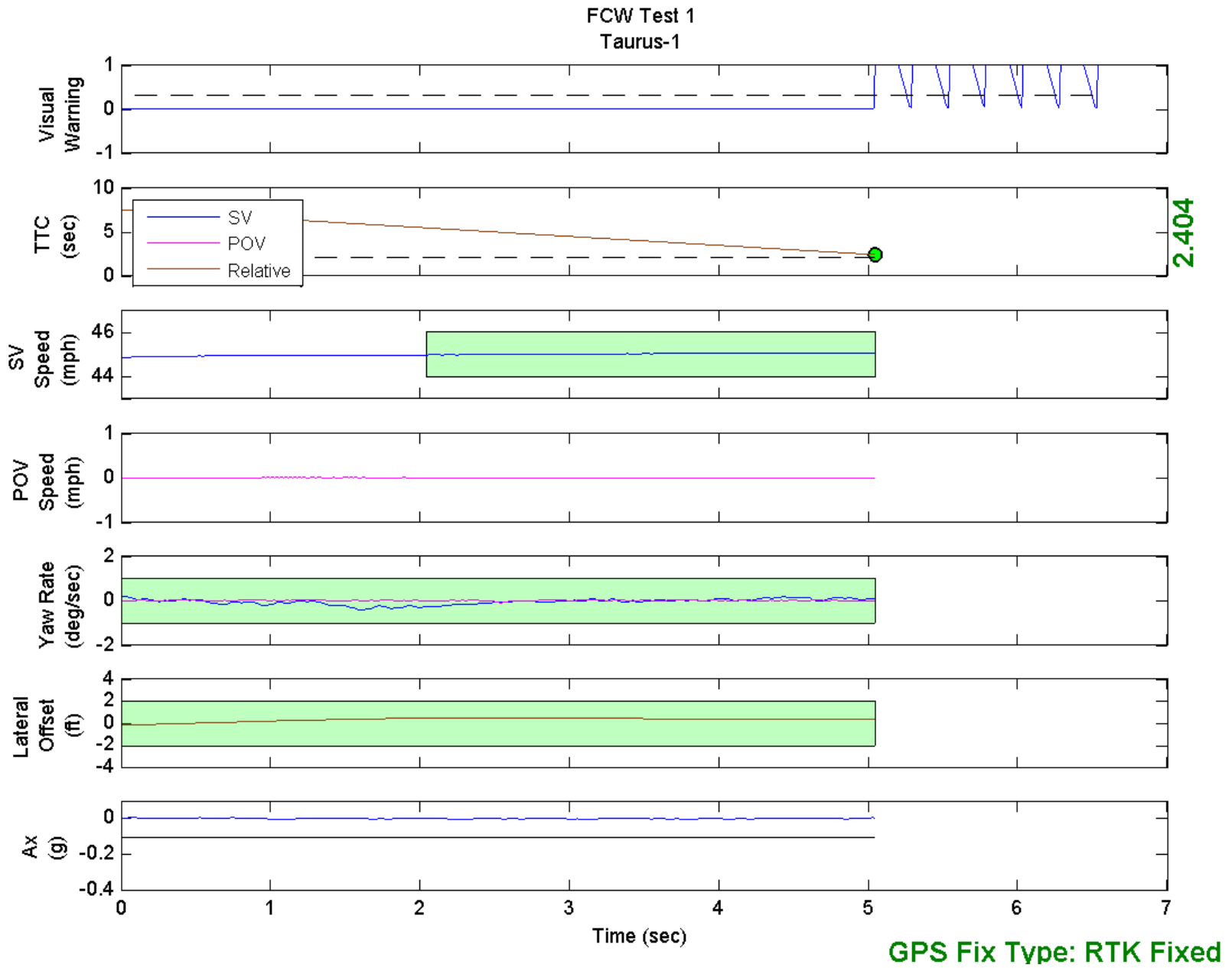


Figure D9. Time History for Run 1, FCW Test 1, Visual Warning

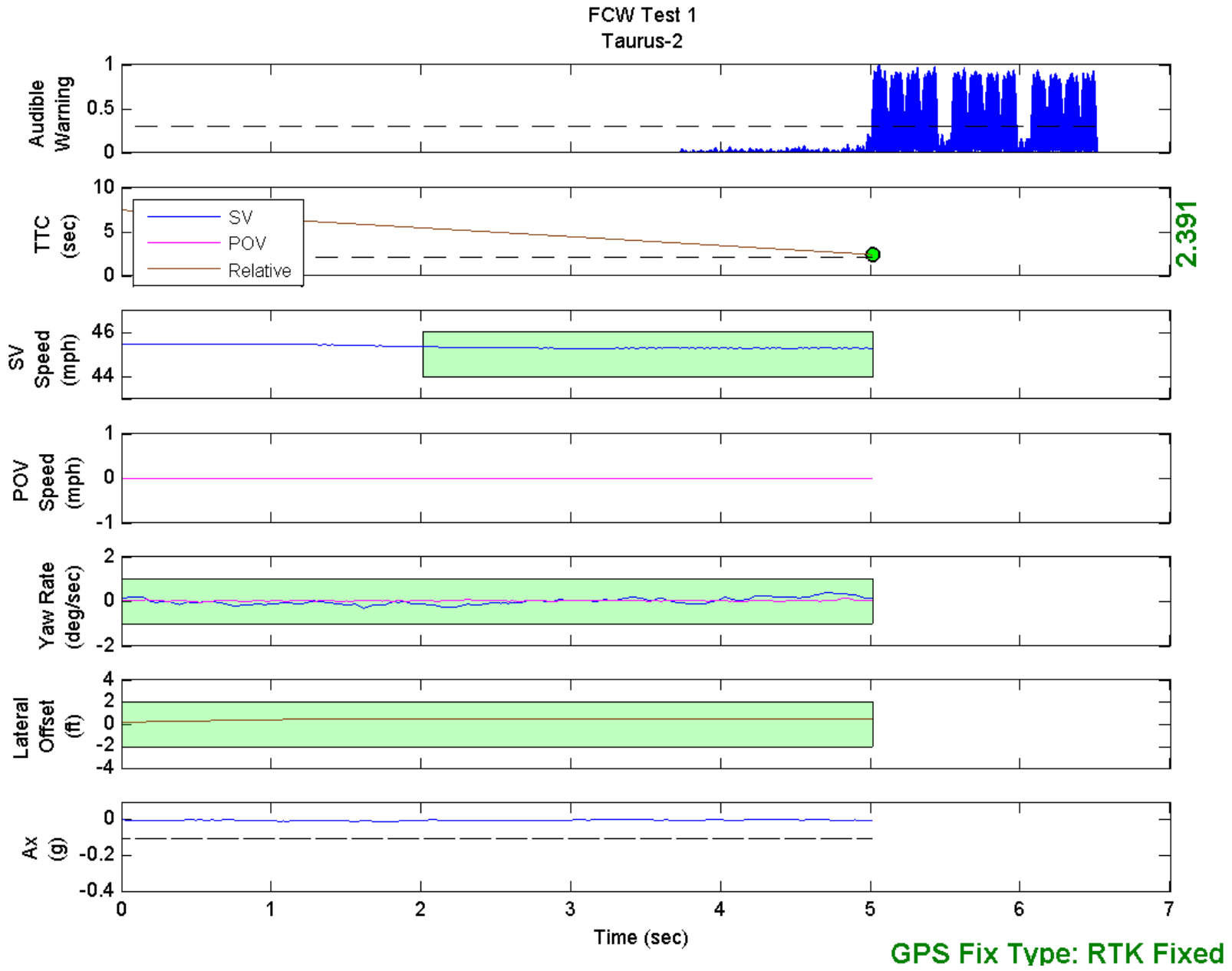


Figure D10. Time History for Run 2, FCW Test 1, Audible Warning

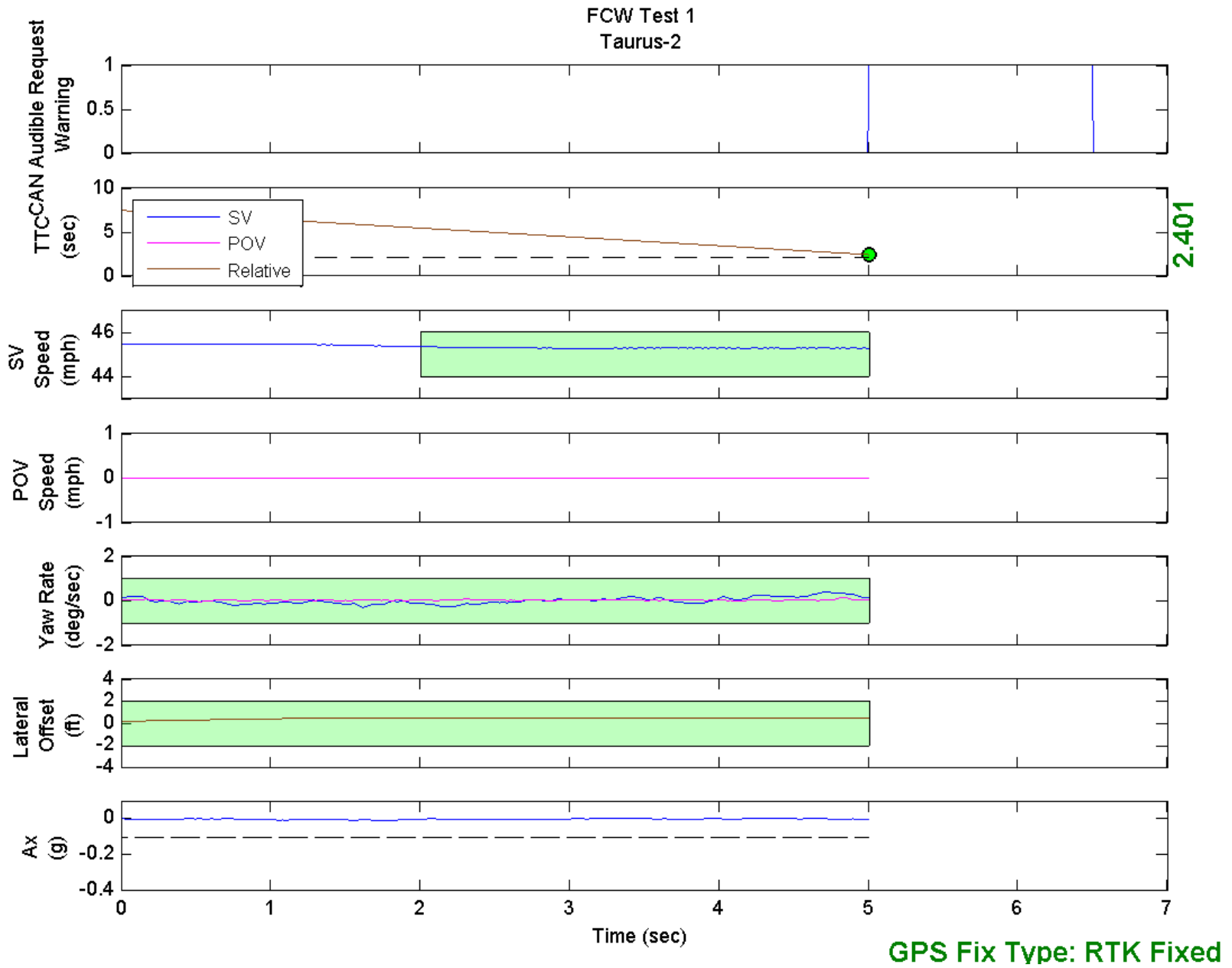


Figure D11. Time History for Run 2, FCW Test 1, CAN Audible Warning Request

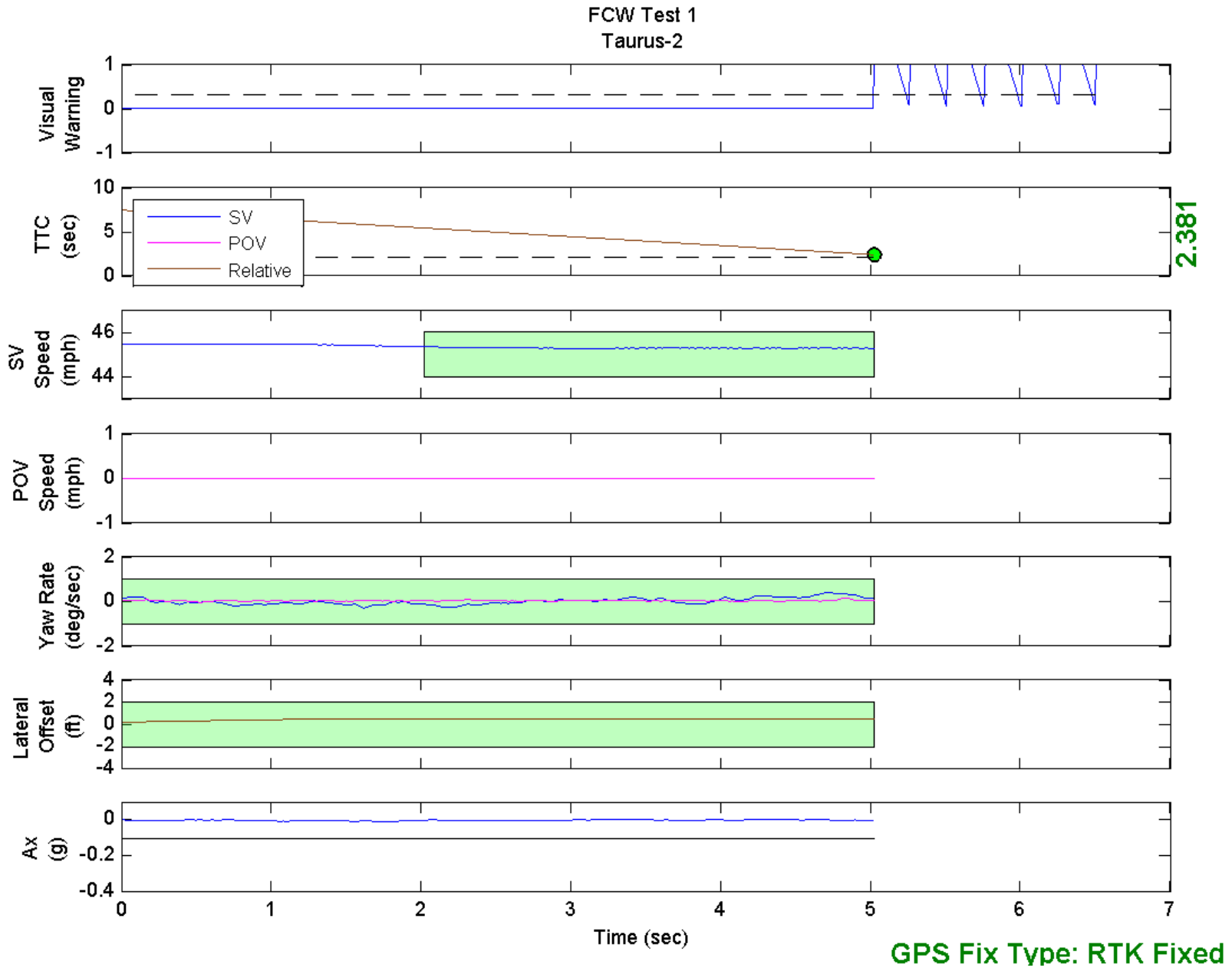


Figure D12. Time History for Run 2, FCW Test 1, Visual Warning

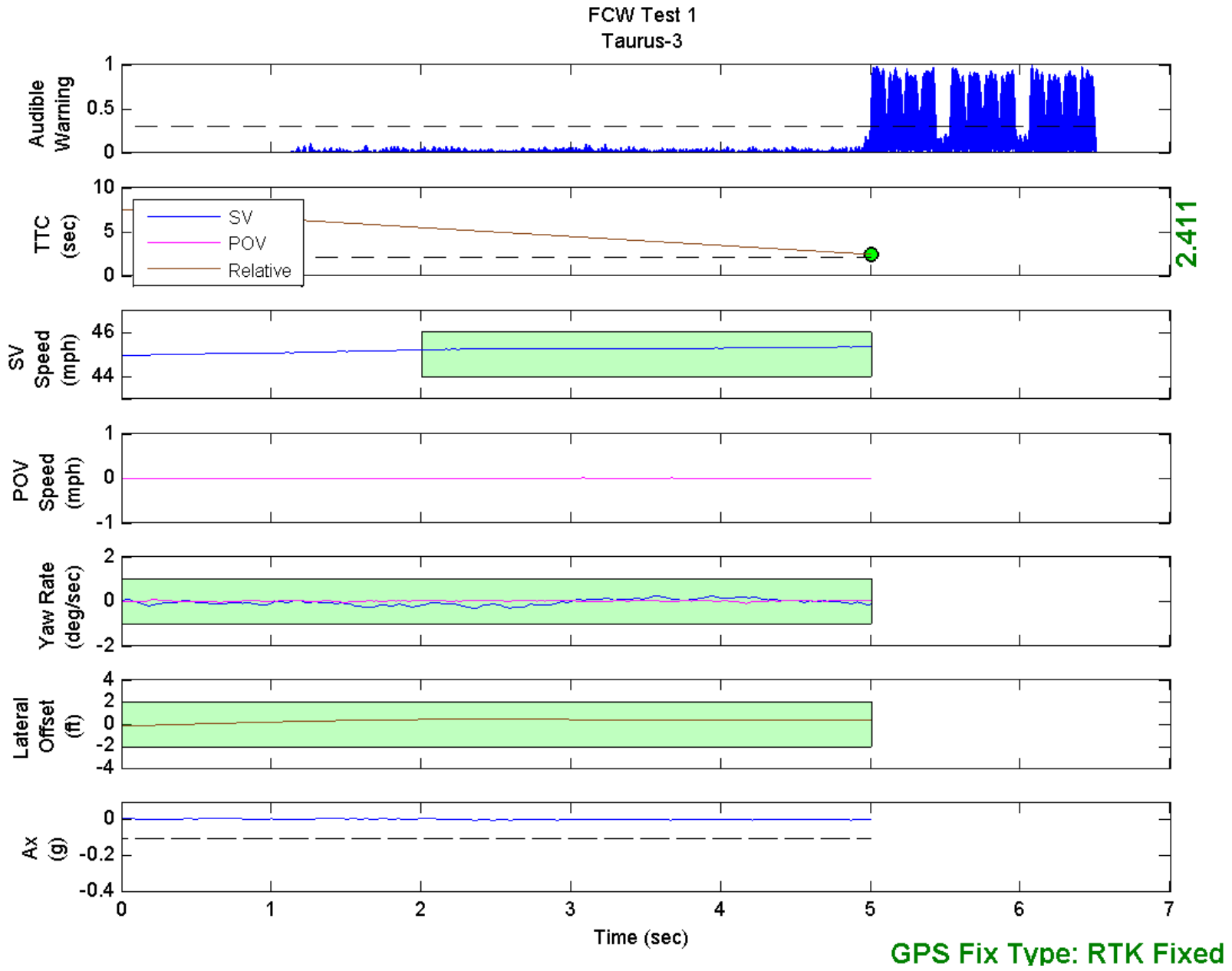


Figure D13. Time History for Run 3, FCW Test 1, Audible Warning

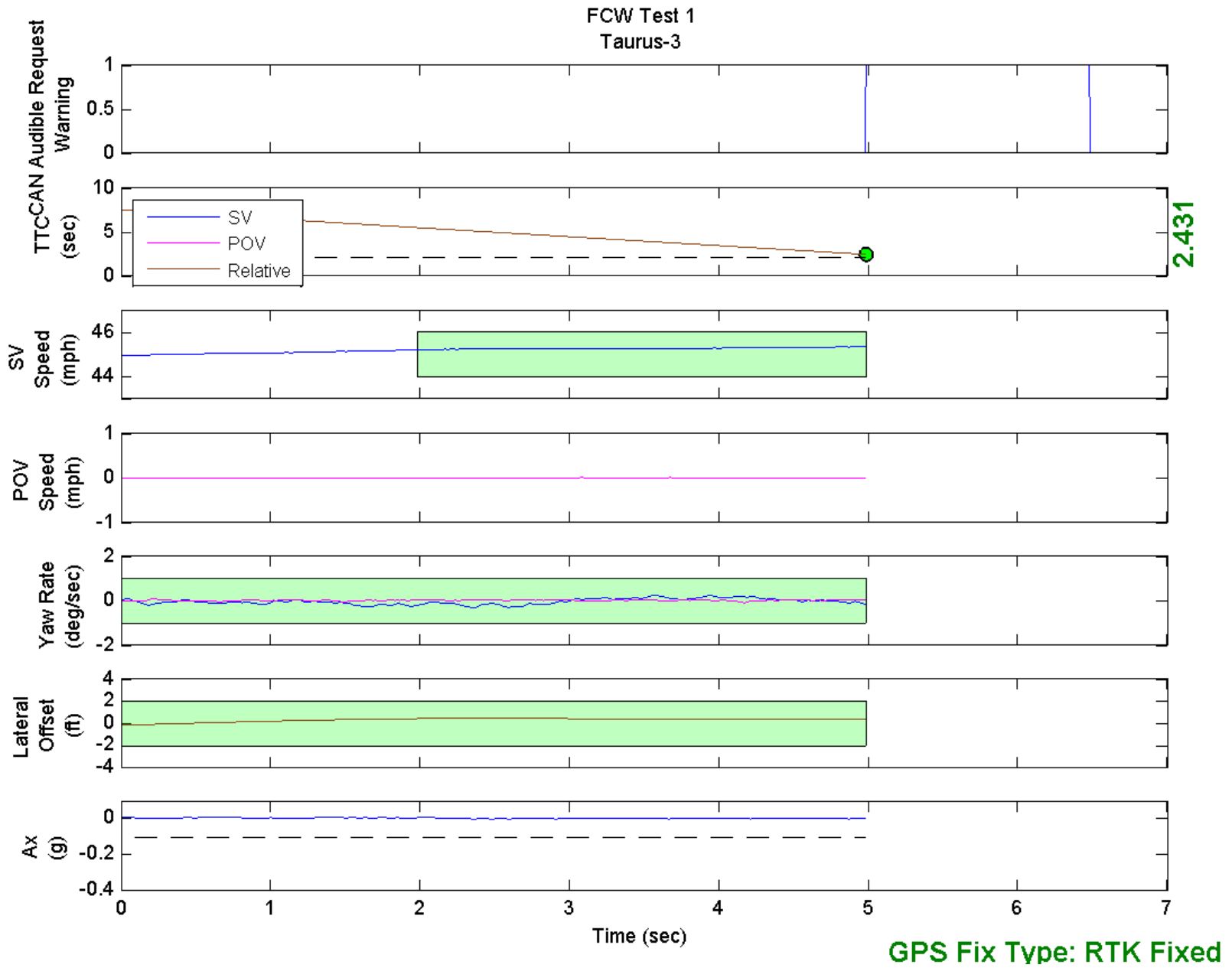


Figure D14. Time History for Run 3, FCW Test 1, CAN Audible Warning Request

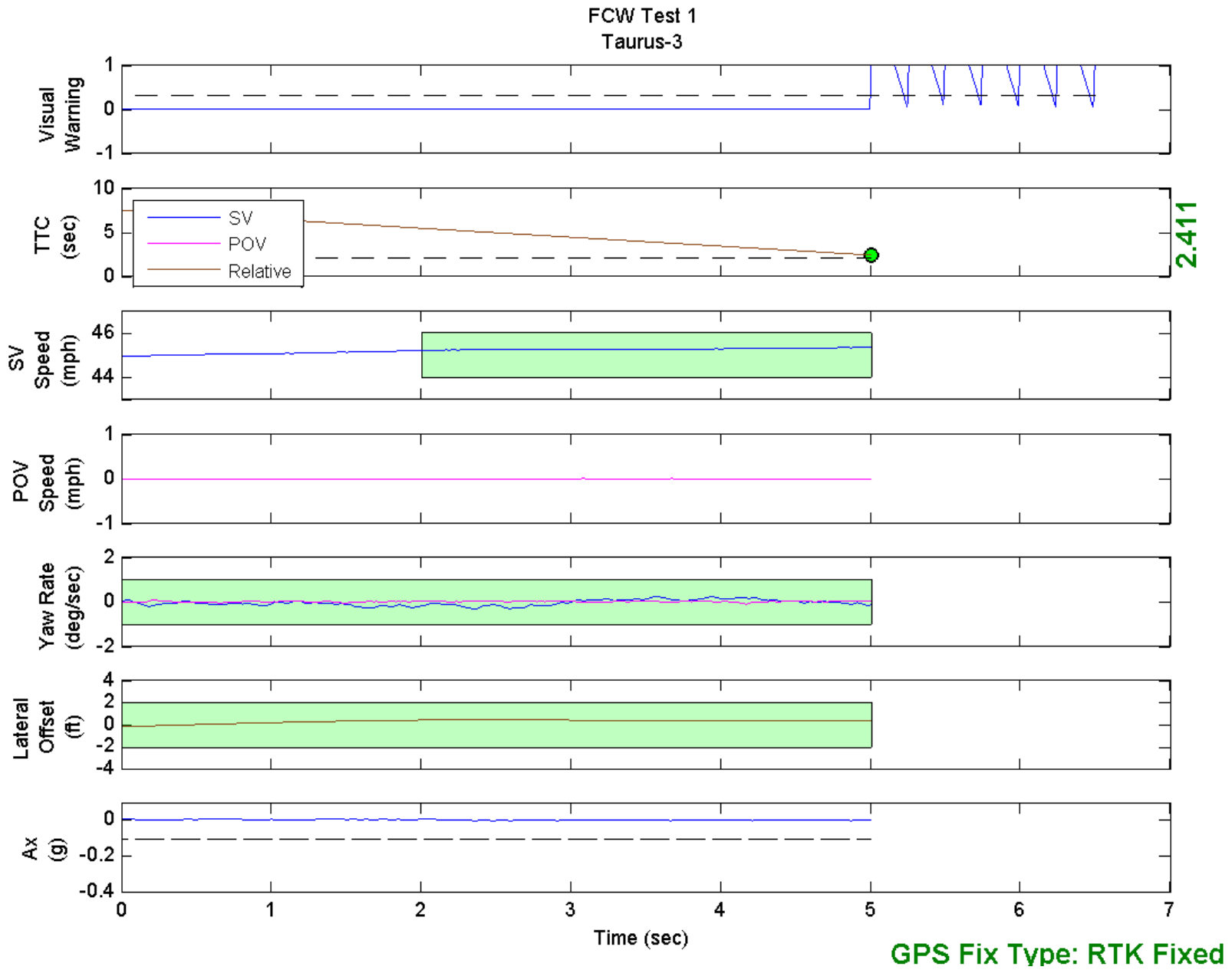


Figure D15. Time History for Run 3, FCW Test 1, Visual Warning

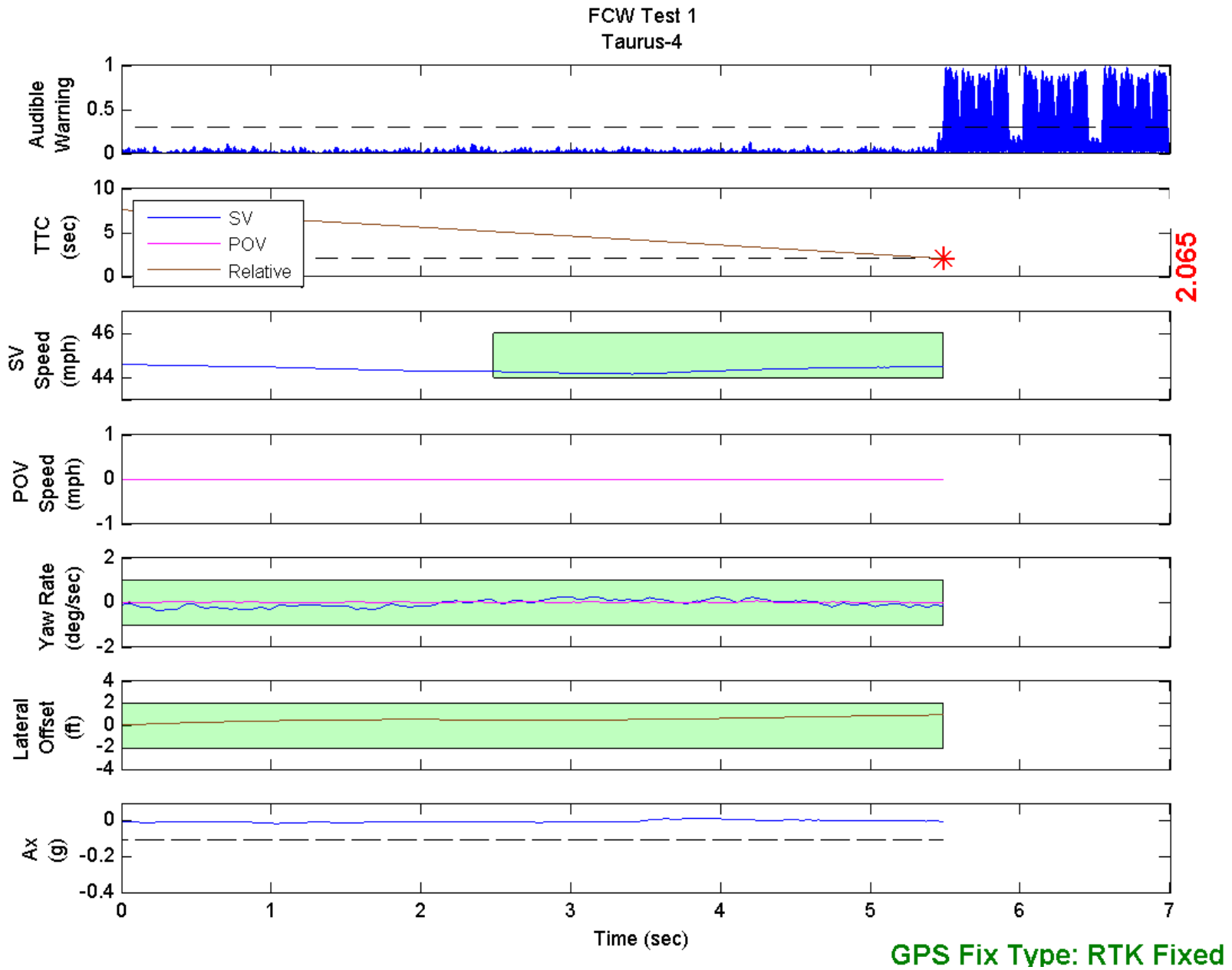


Figure D16. Time History for Run 4, FCW Test 1, Audible Warning

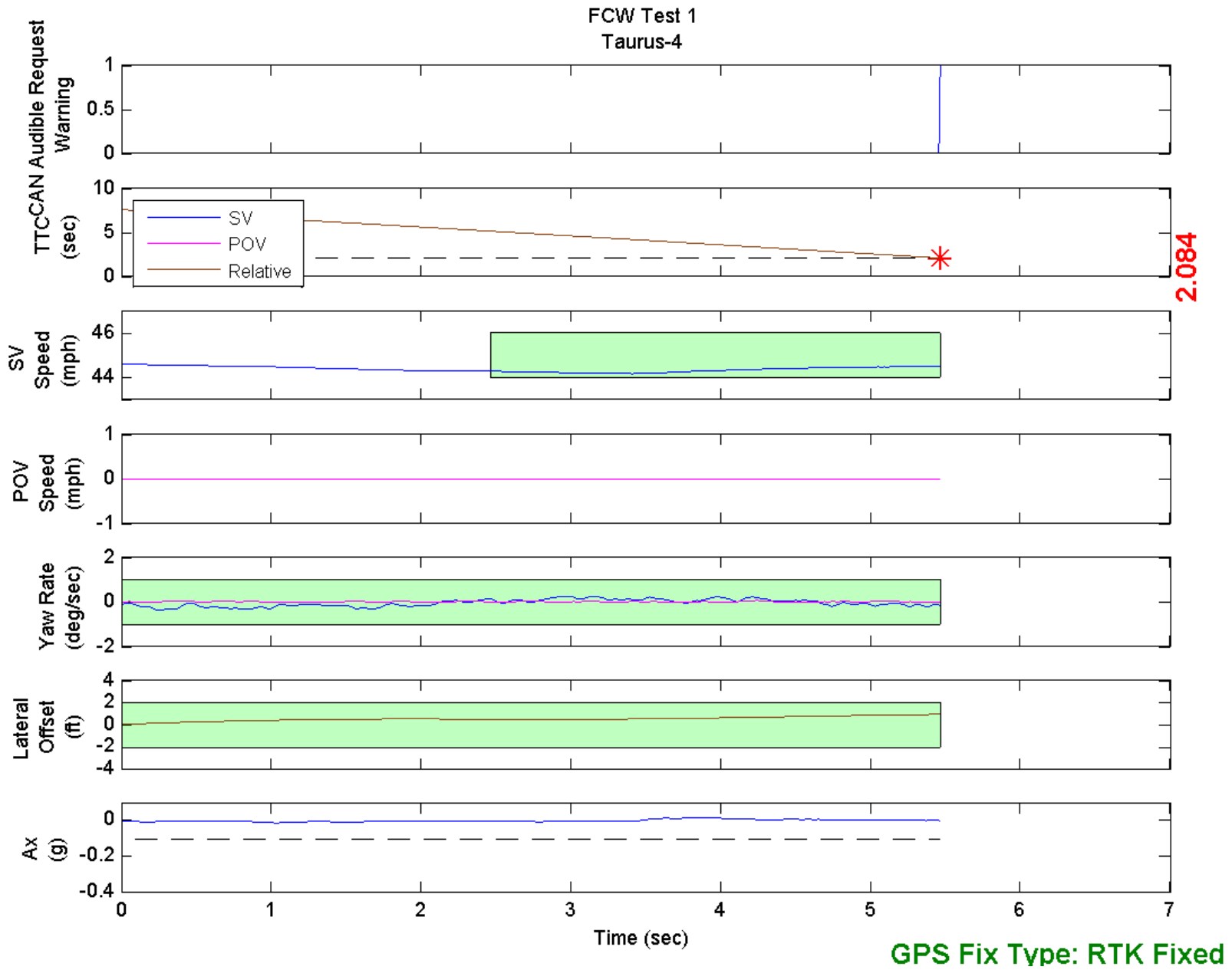


Figure D17. Time History for Run 4, FCW Test 1, CAN Audible Warning Request

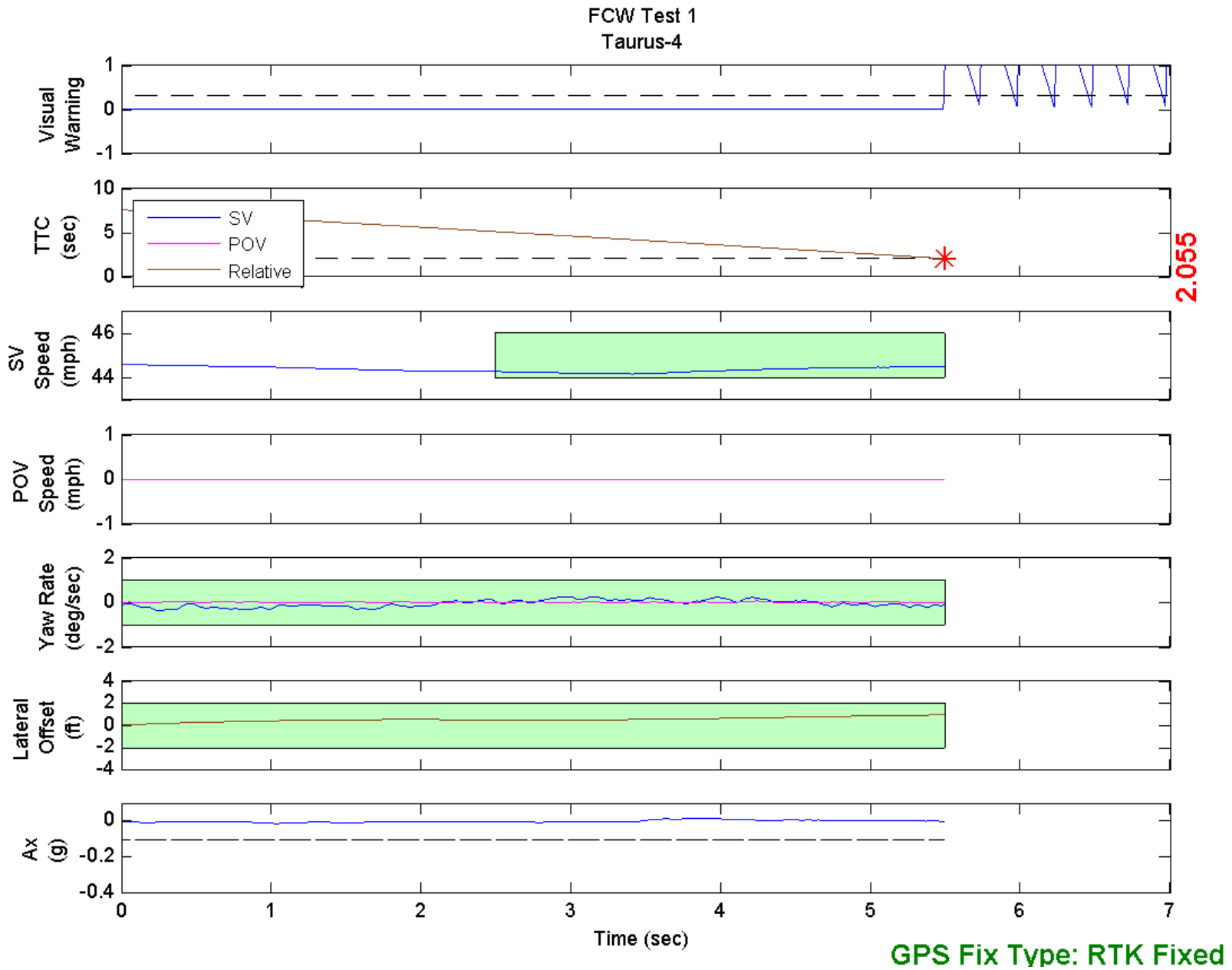


Figure D18. Time History for Run 4, FCW Test 1, Visual Warning

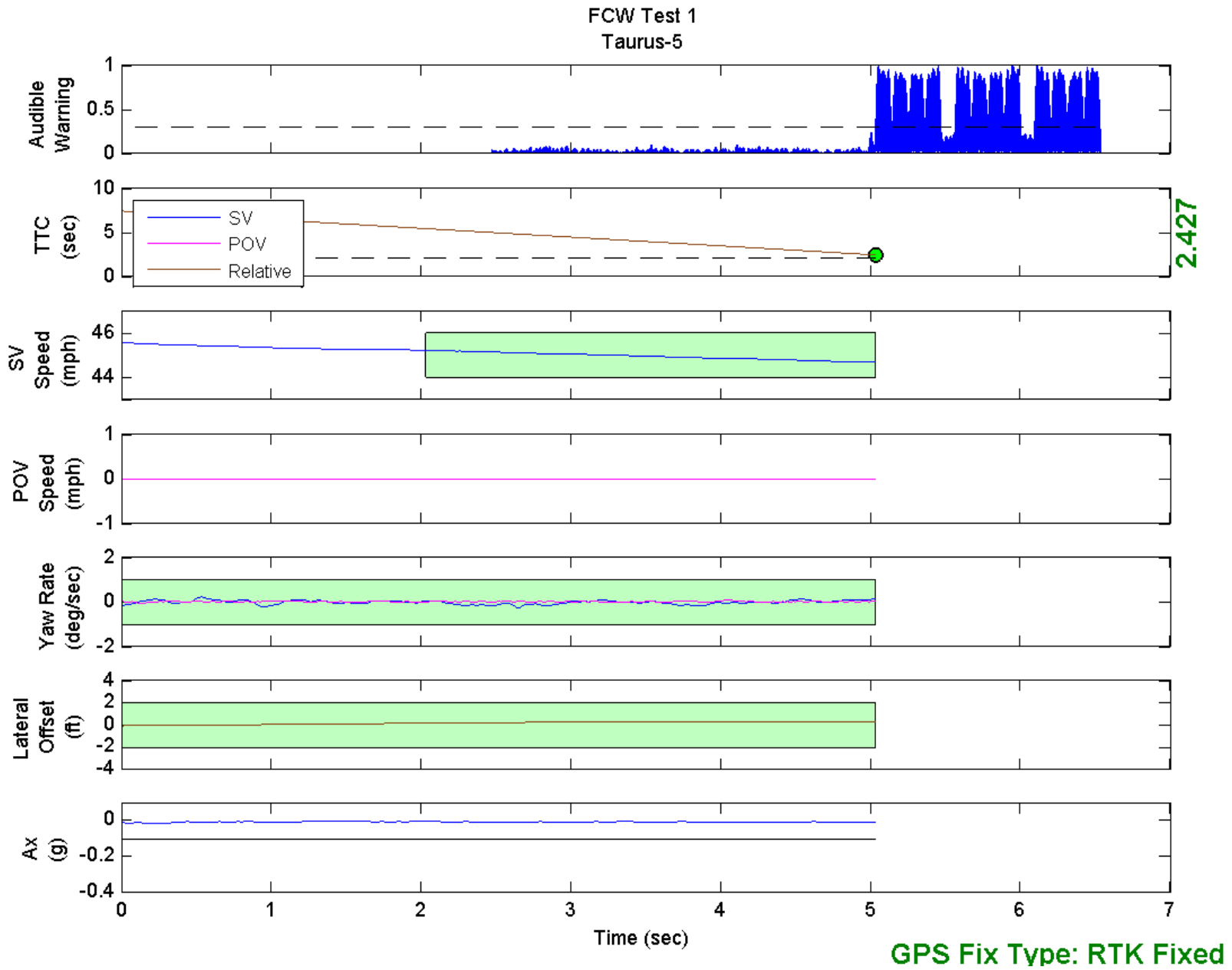


Figure D19. Time History for Run 5, FCW Test 1, Audible Warning

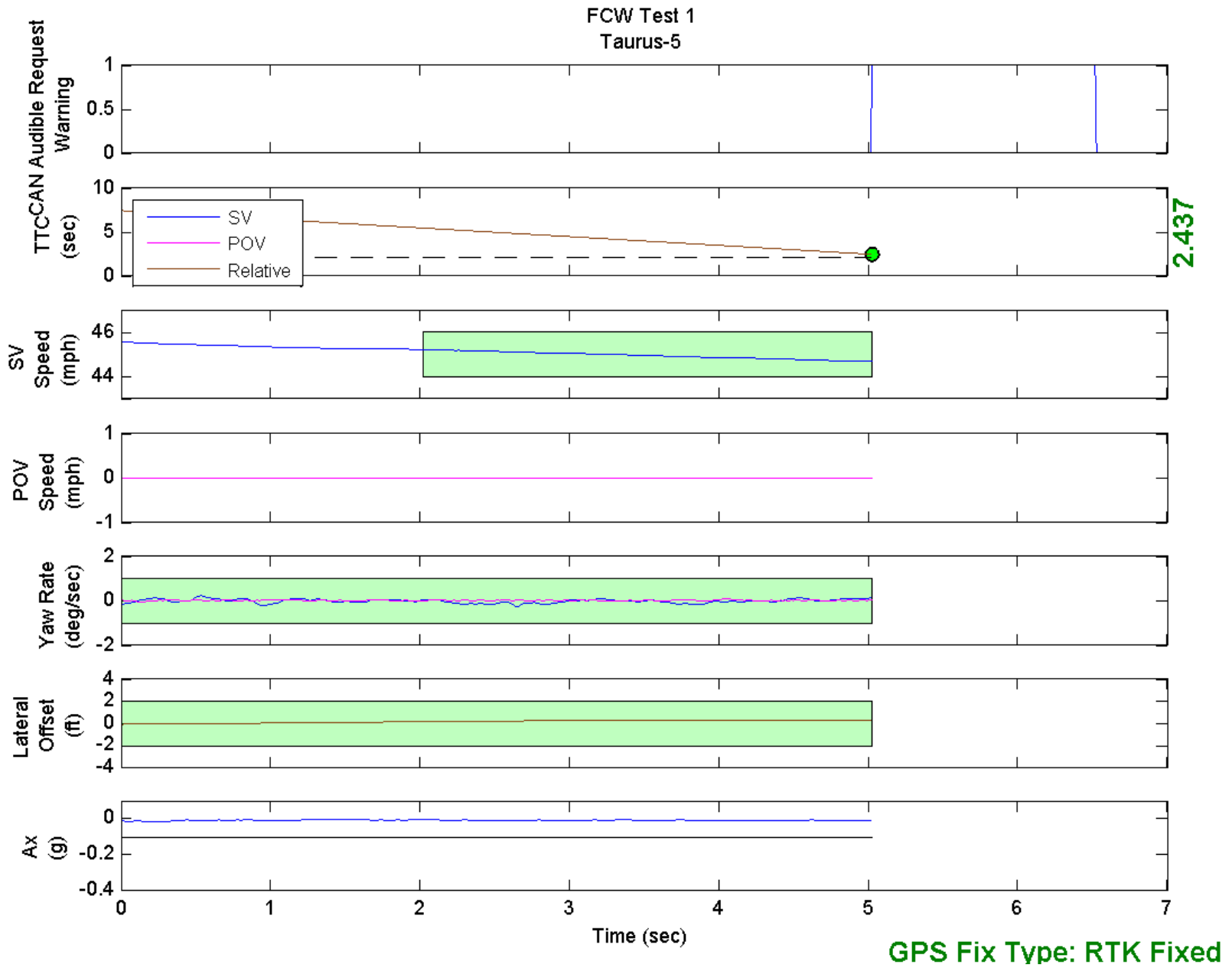


Figure D20. Time History for Run 5, FCW Test 1, CAN Audible Warning Request

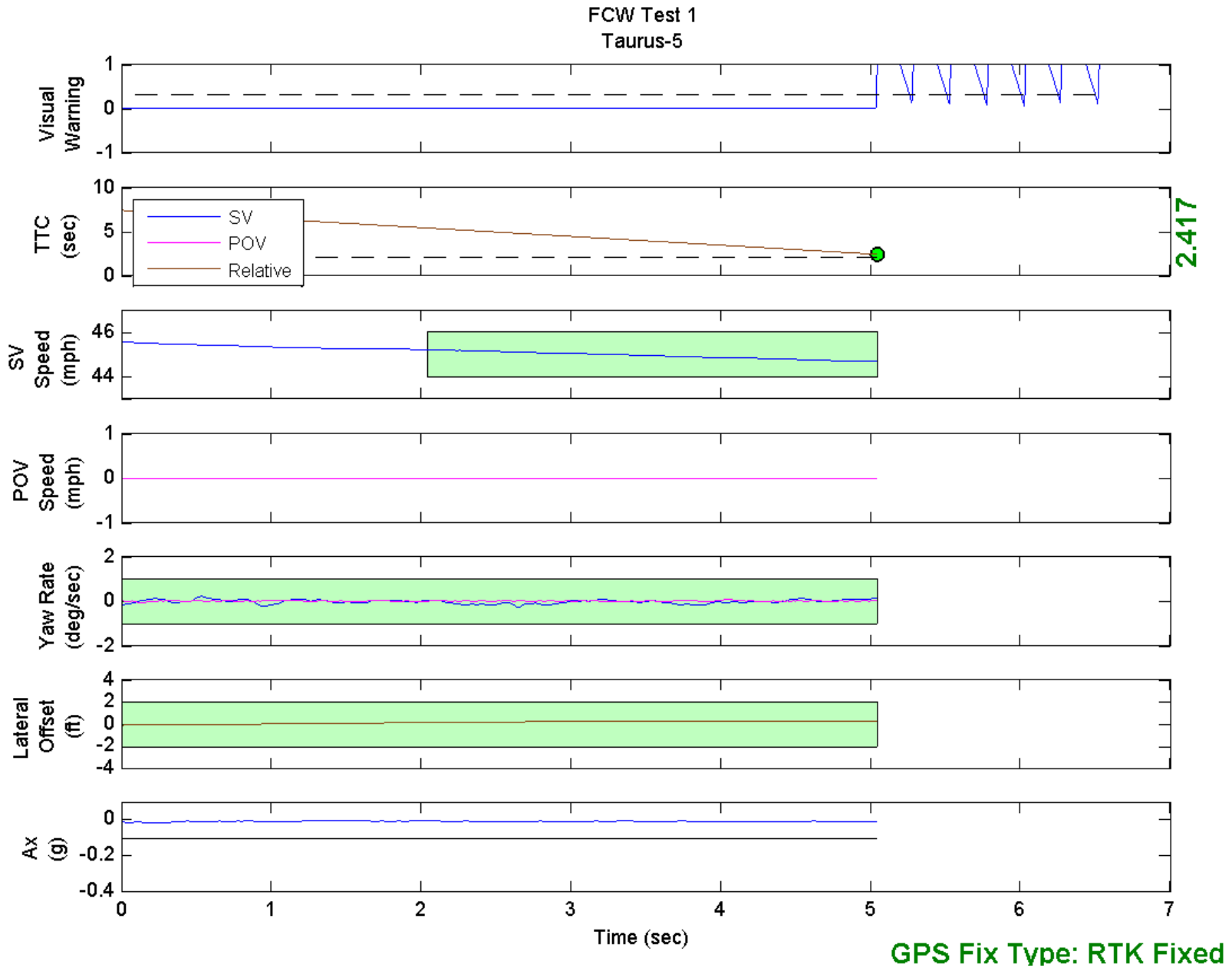


Figure D21. Time History for Run 5, FCW Test 1, Visual Warning

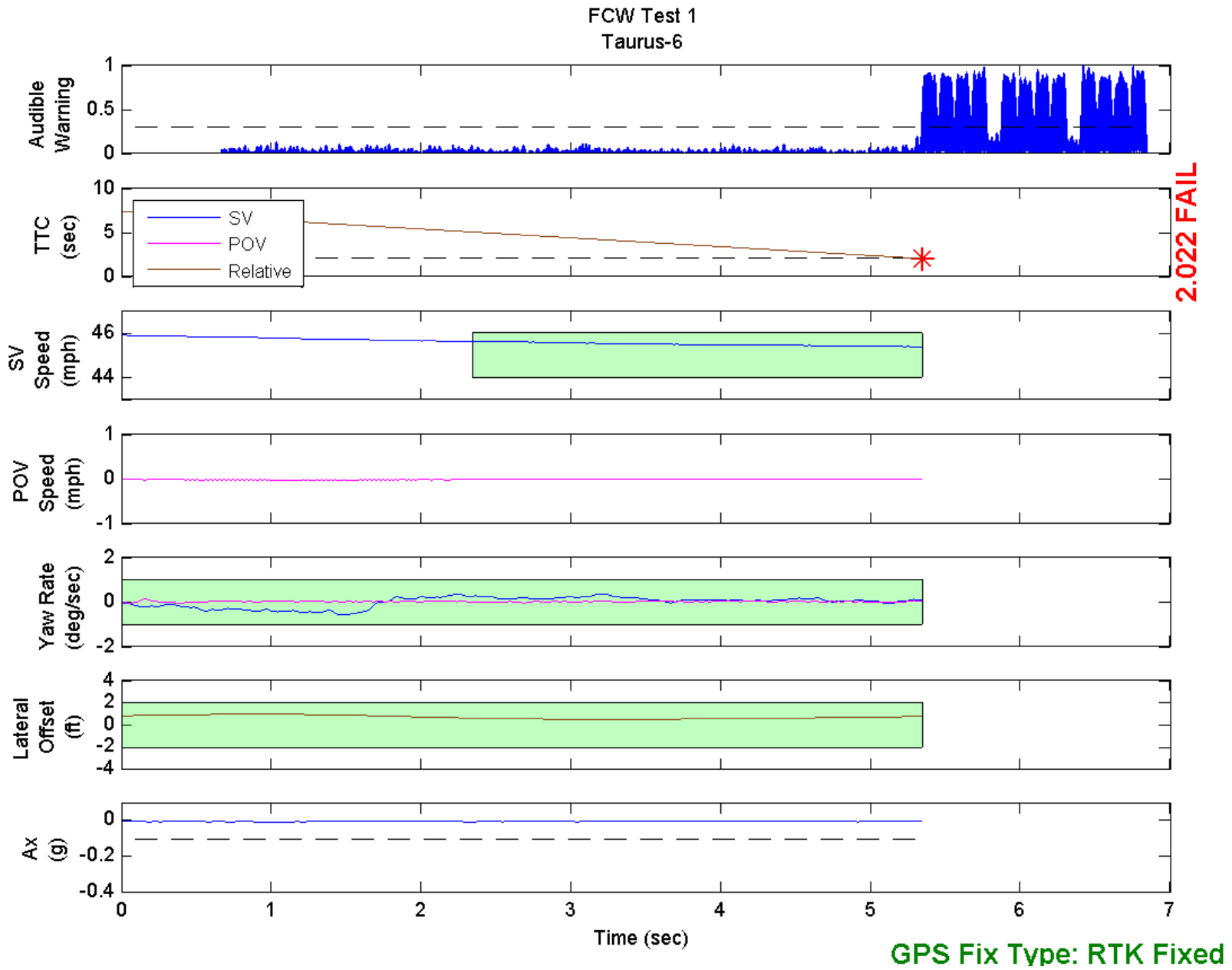


Figure D22. Time History for Run 6, FCW Test 1, Audible Warning

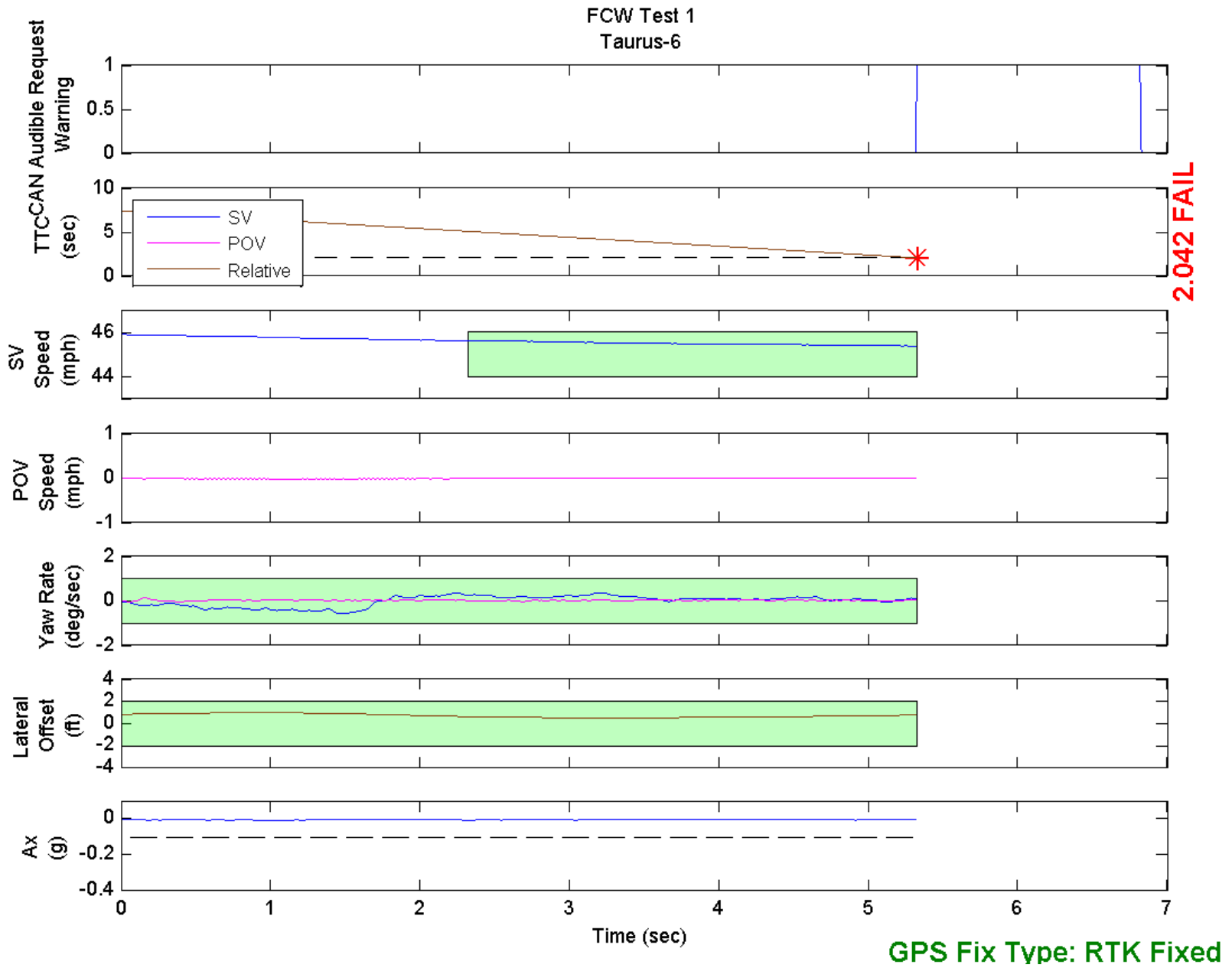


Figure D23. Time History for Run 6, FCW Test 1, CAN Audible Warning Request

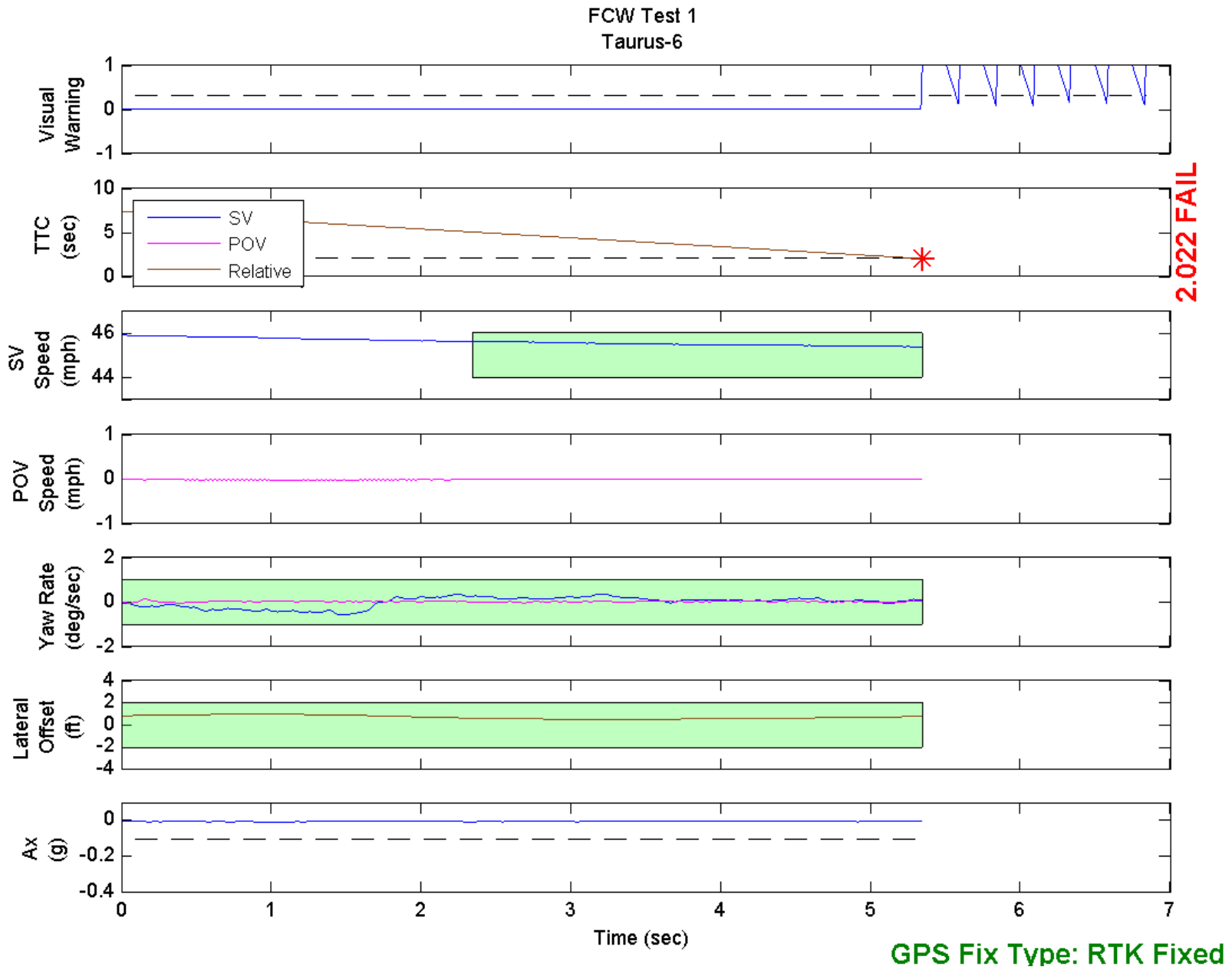


Figure D24. Time History for Run 6, FCW Test 1, Visual Warning

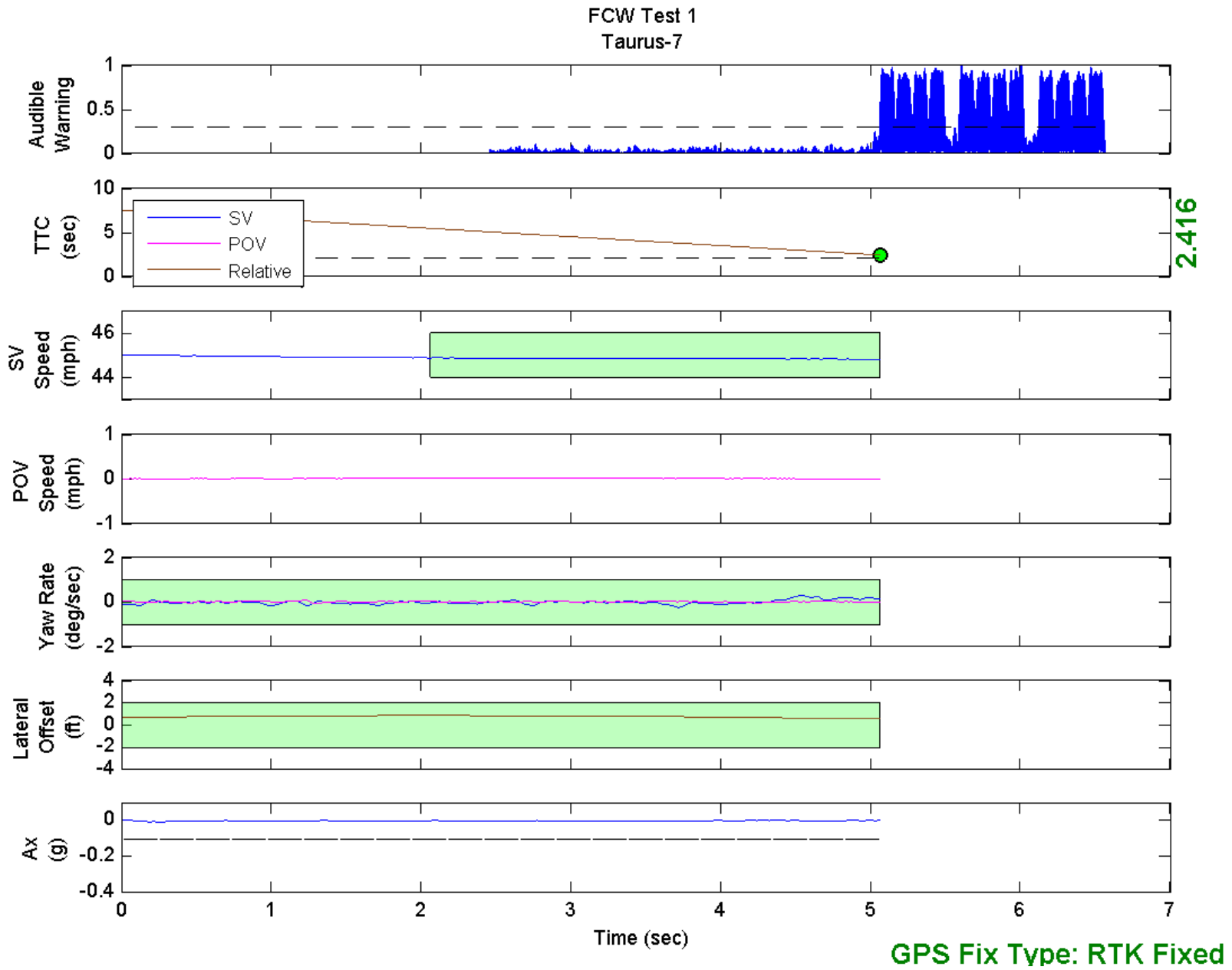


Figure D25. Time History for Run 7, FCW Test 1, Audible Warning

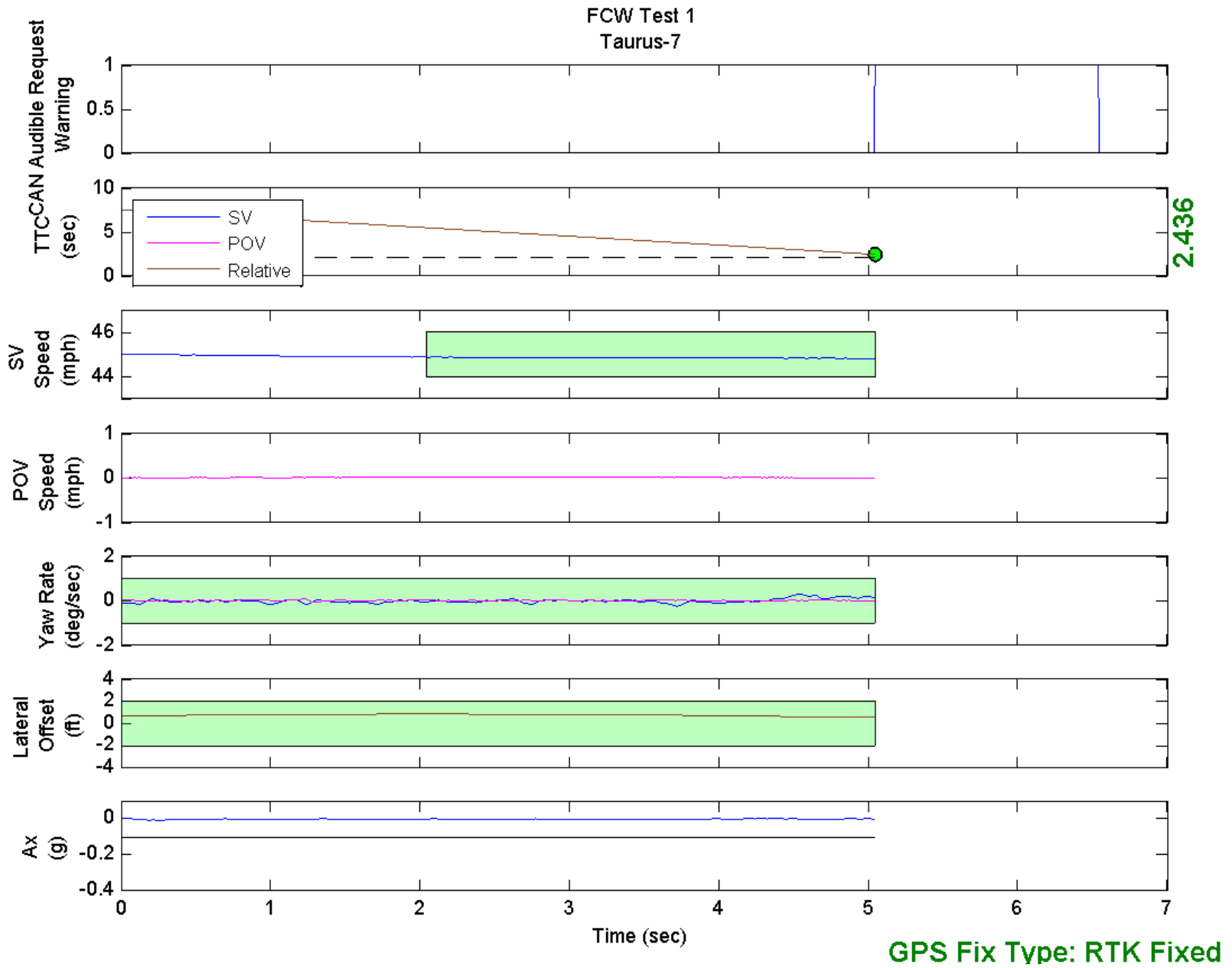


Figure D26. Time History for Run 7, FCW Test 1, CAN Audible Warning Request

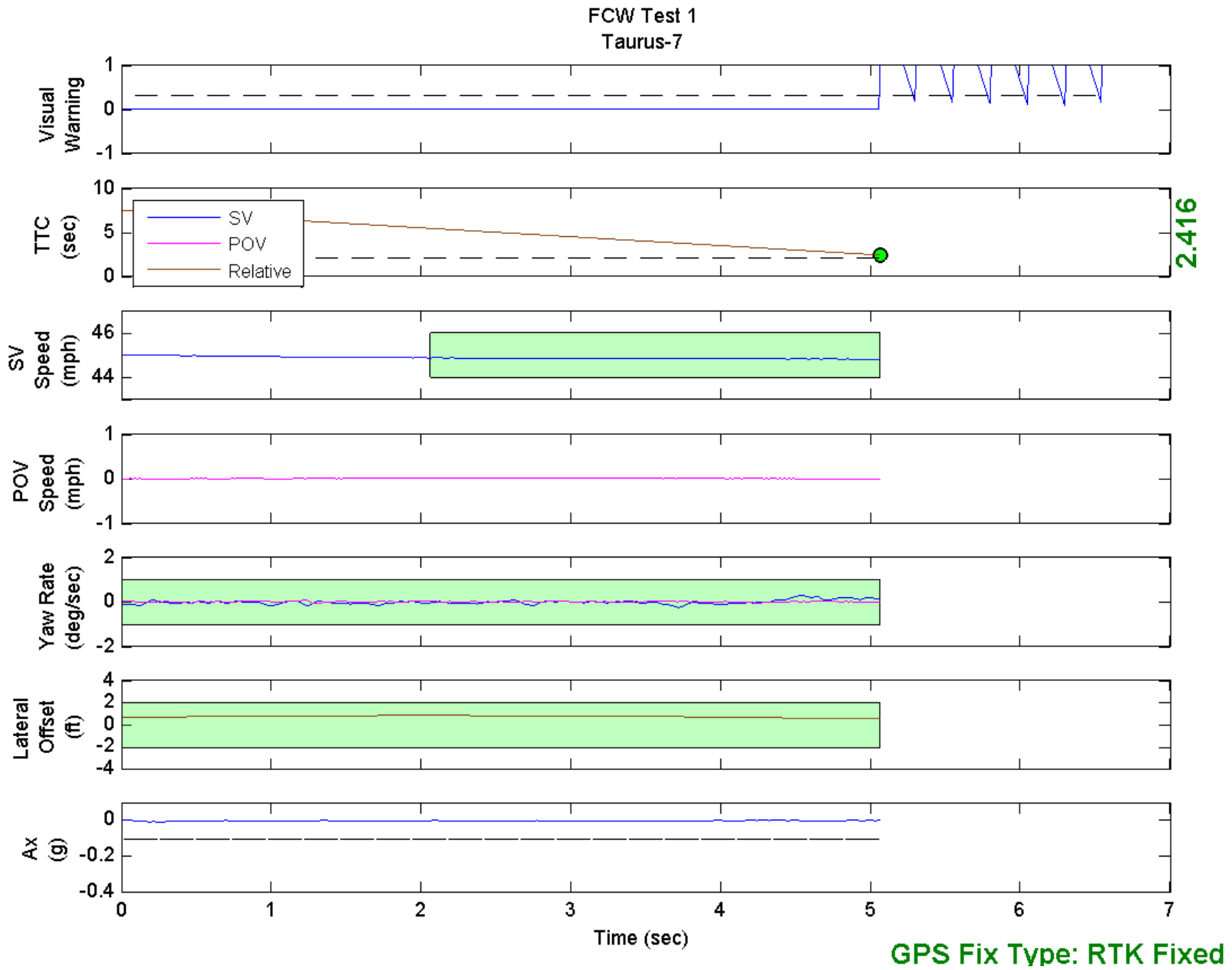


Figure D27. Time History for Run 7, FCW Test 1, Visual Warning

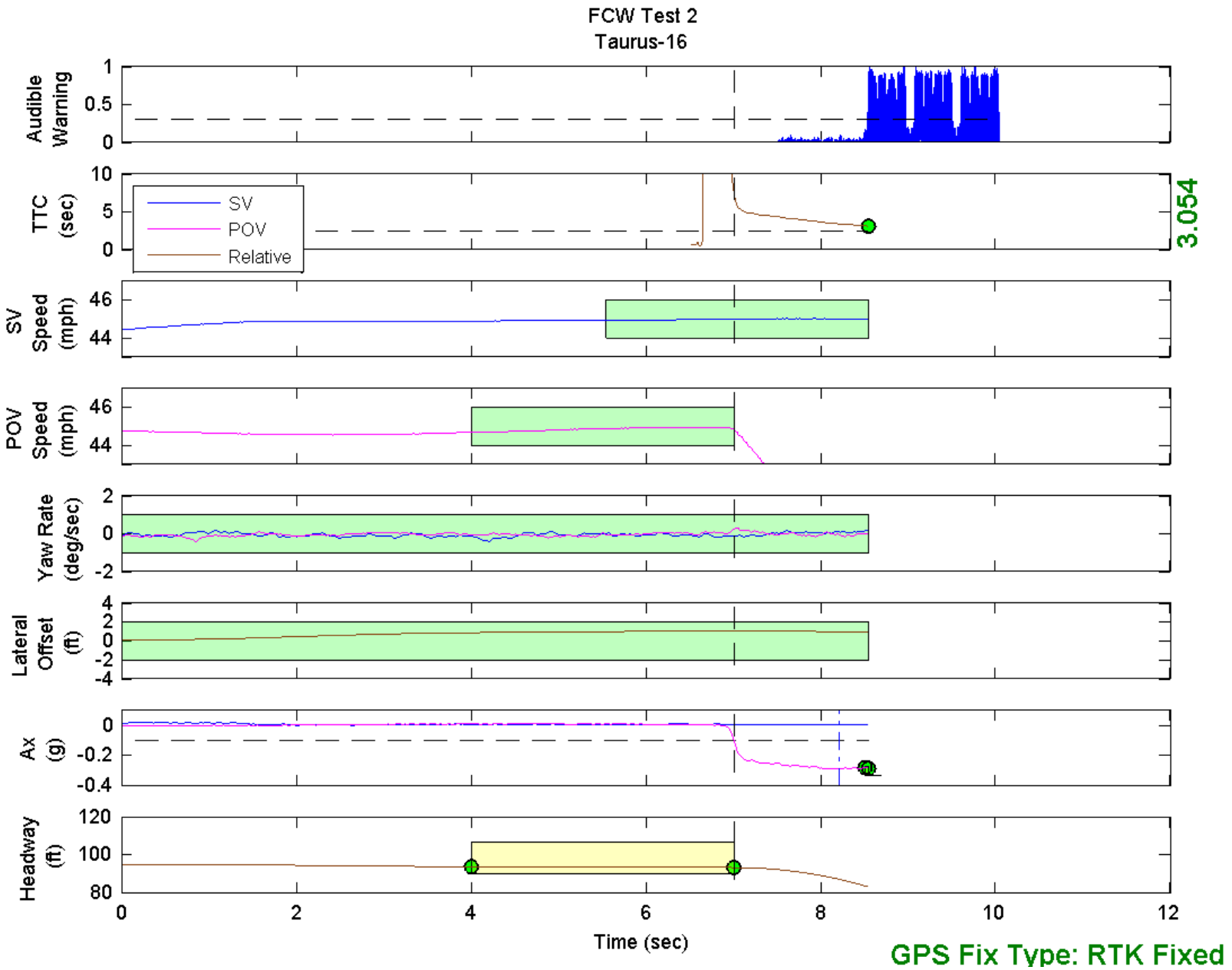


Figure D28. Time History for Run 16, FCW Test 2, Audible Warning

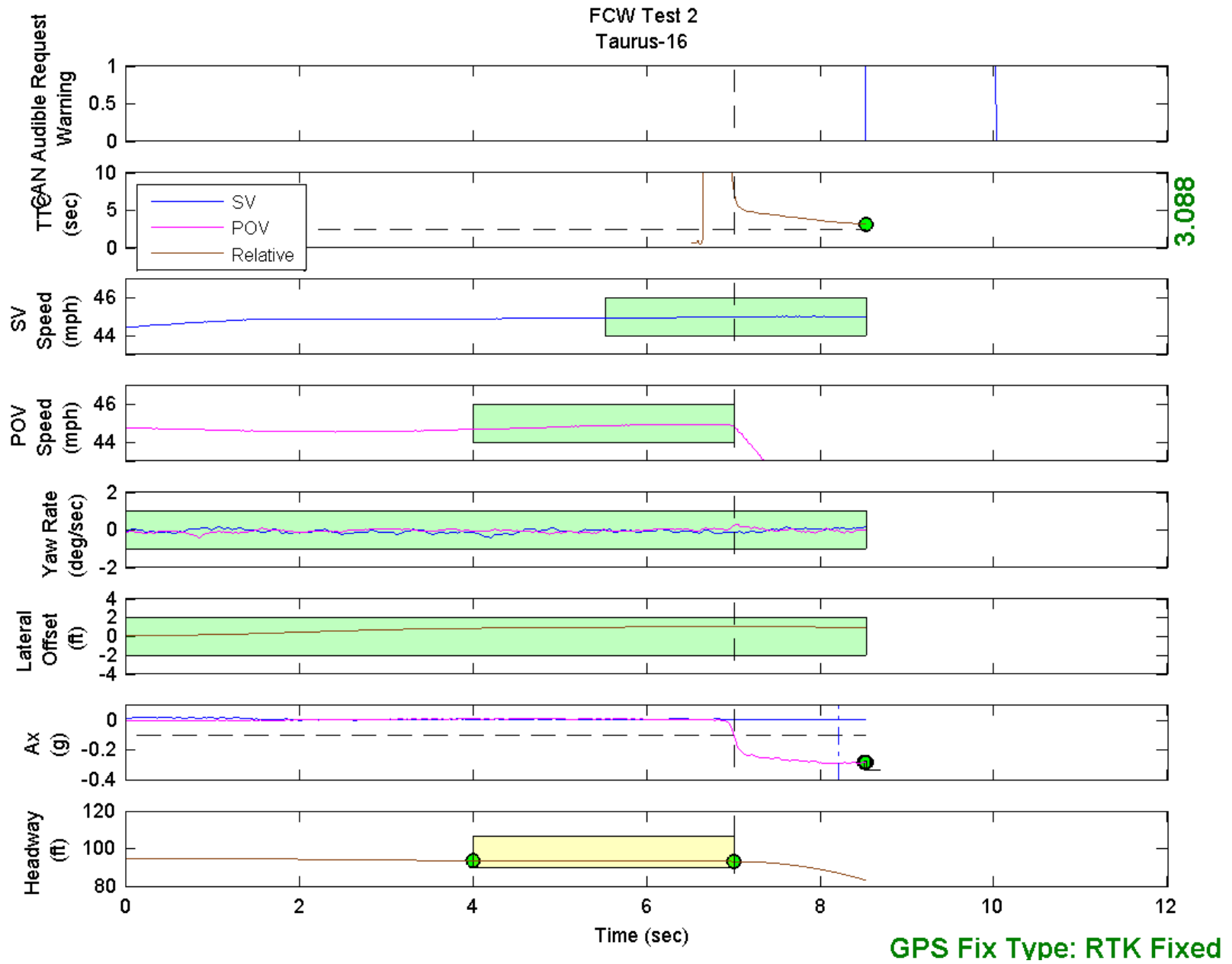


Figure D29. Time History for Run 16, FCW Test 2, CAN Audible Warning Request

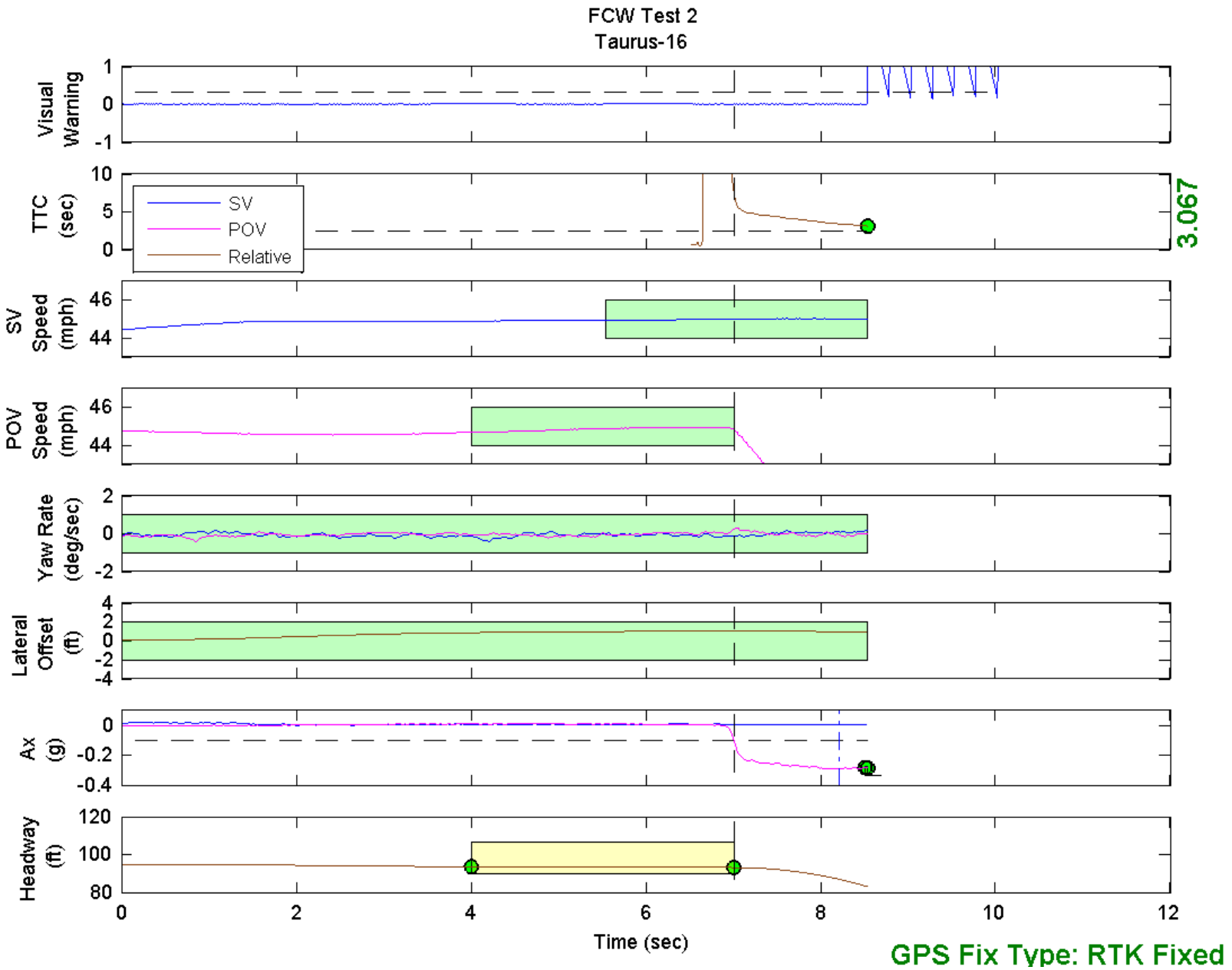


Figure D30. Time History for Run 16, FCW Test 2, Visual Warning

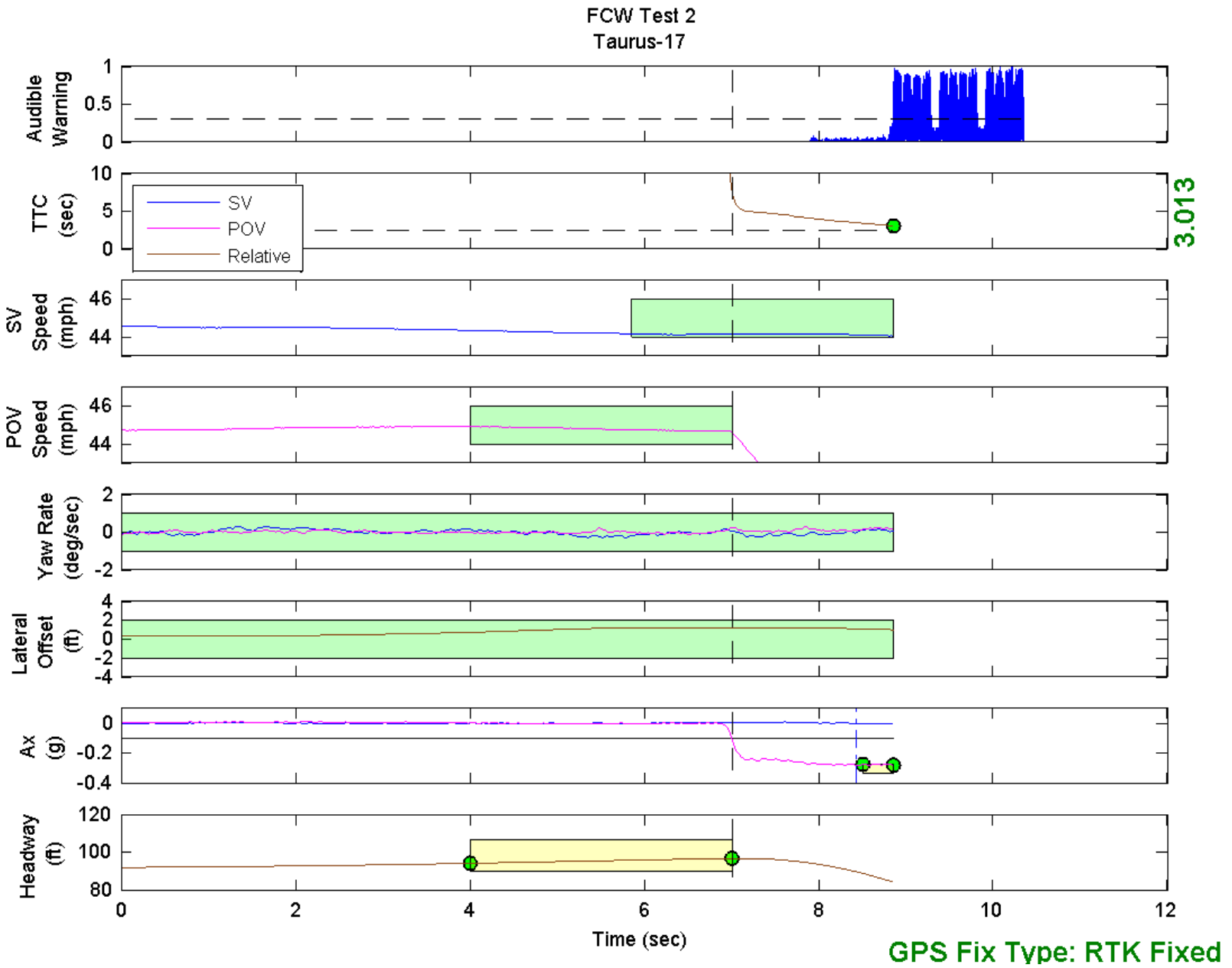


Figure D31. Time History for Run 17, FCW Test 2, Audible Warning

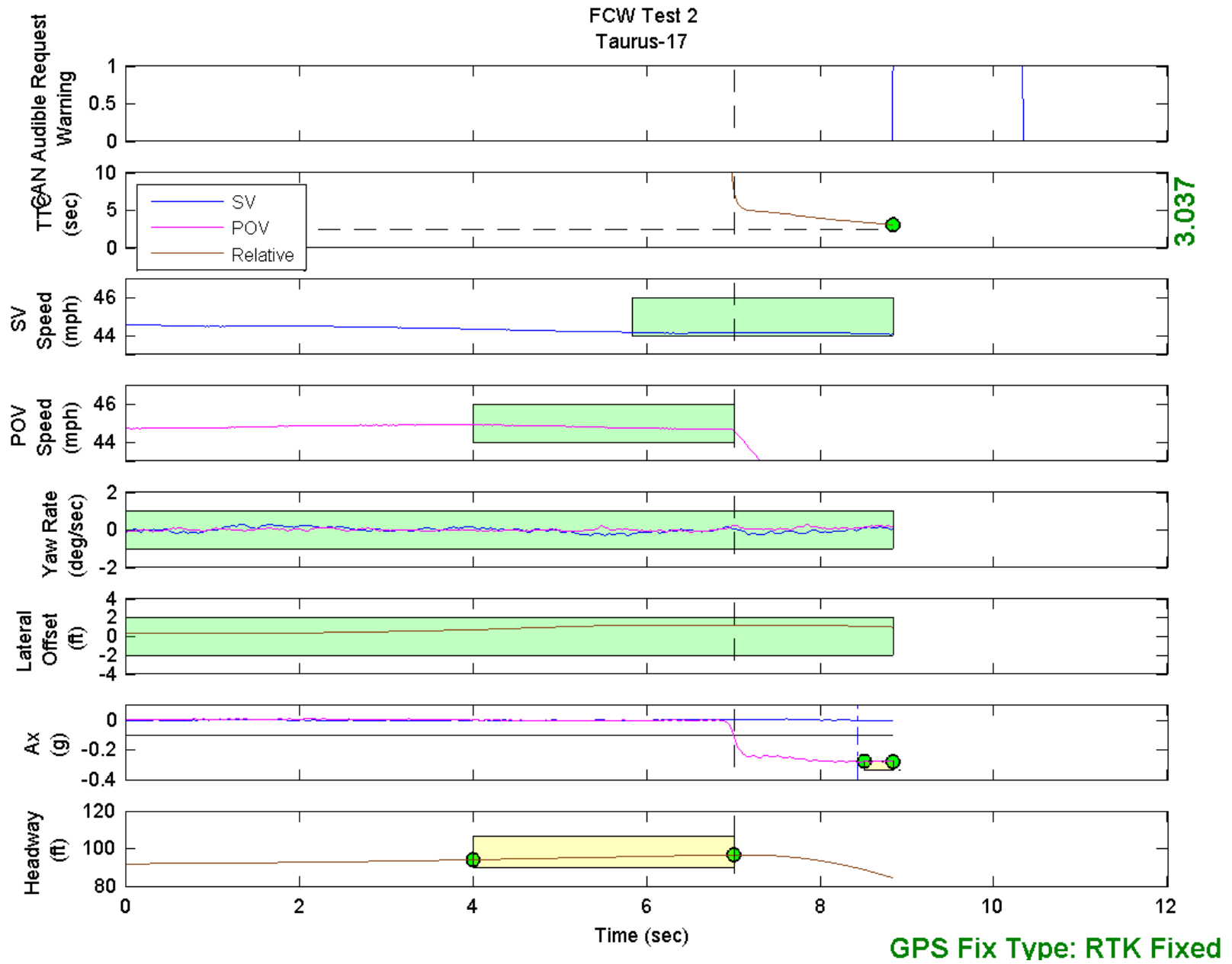


Figure D32. Time History for Run 17, FCW Test 2, CAN Audible Warning Request

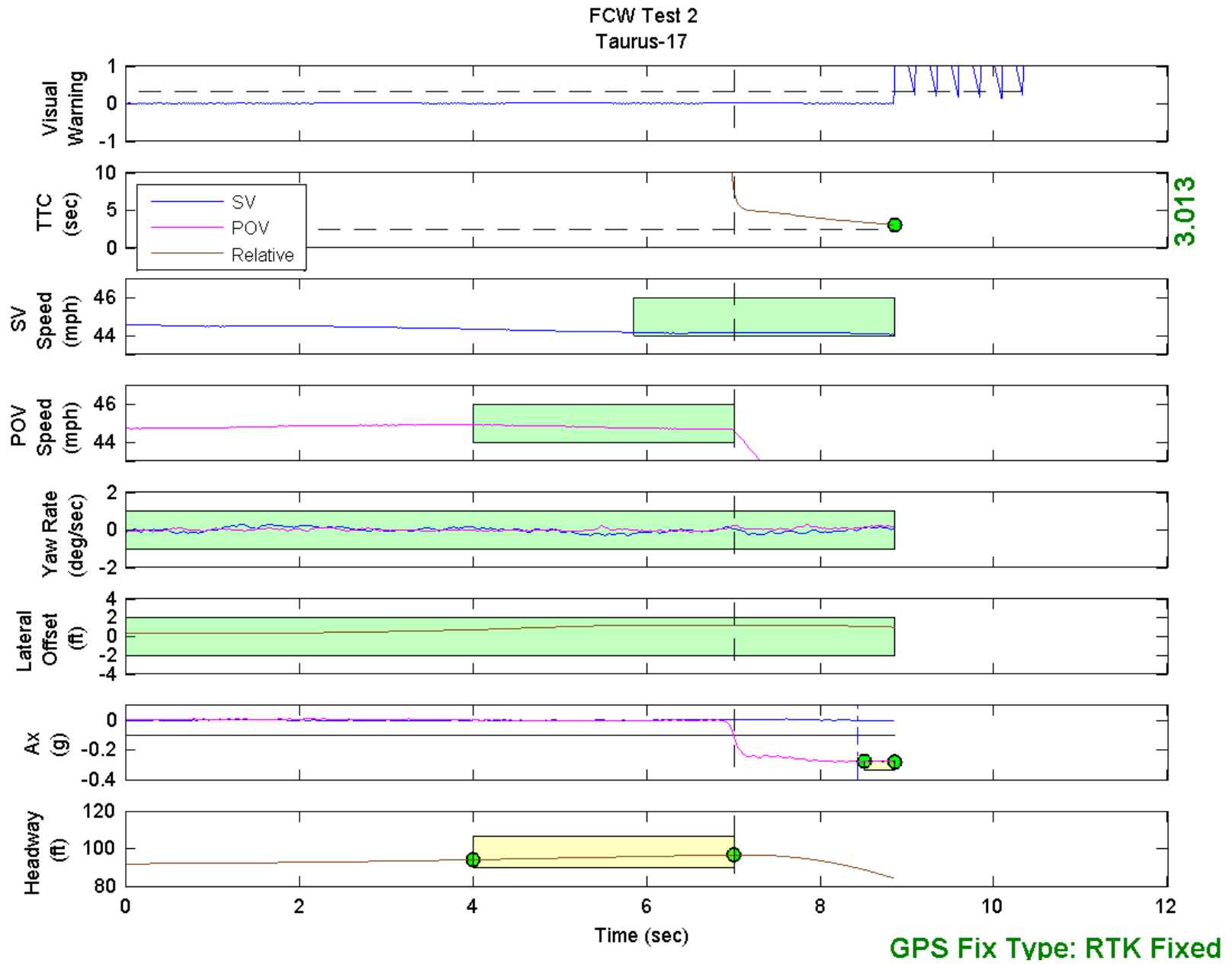


Figure D33. Time History for Run 17, FCW Test 2, Visual Warning

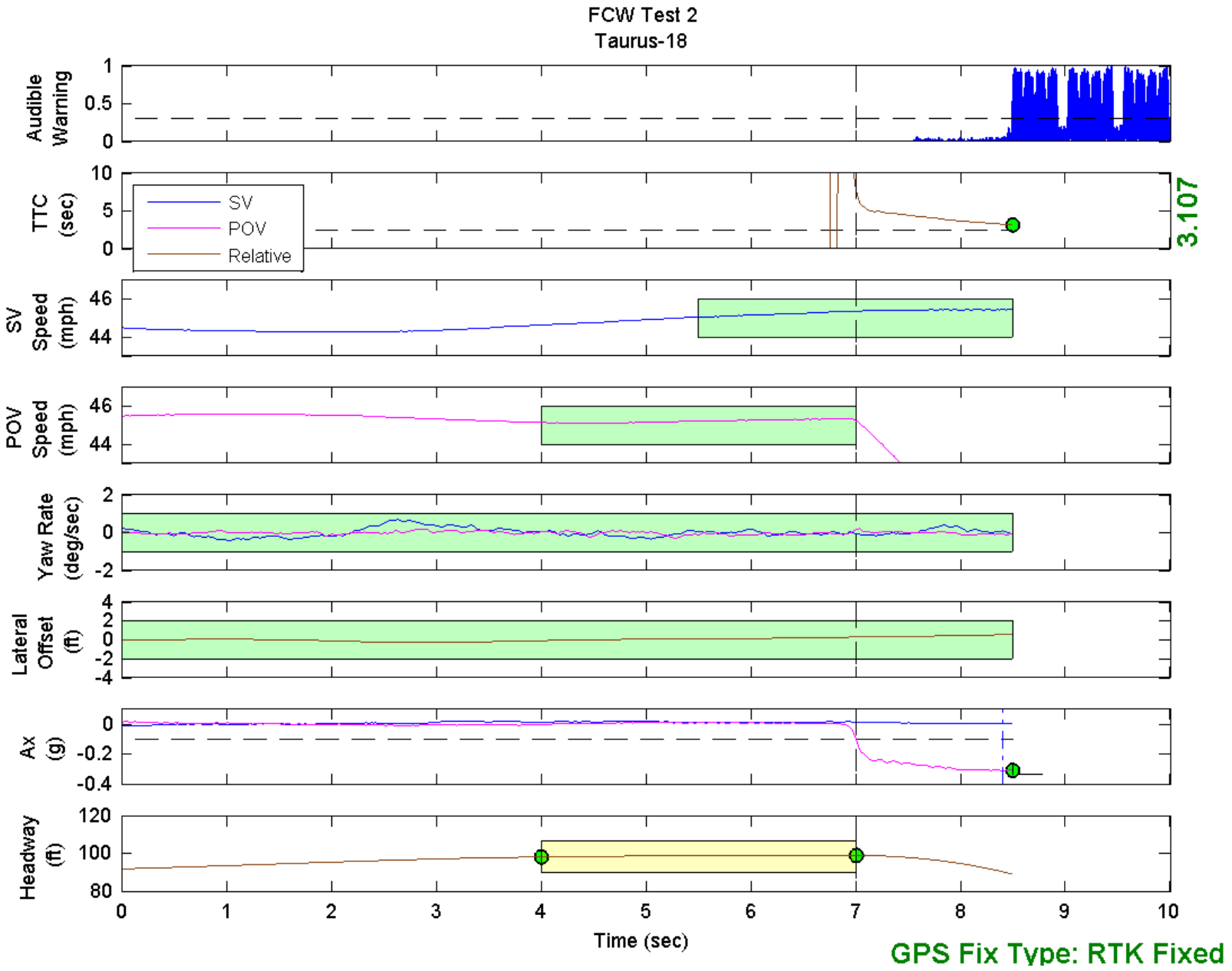


Figure D34. Time History for Run 18, FCW Test 2, Audible Warning

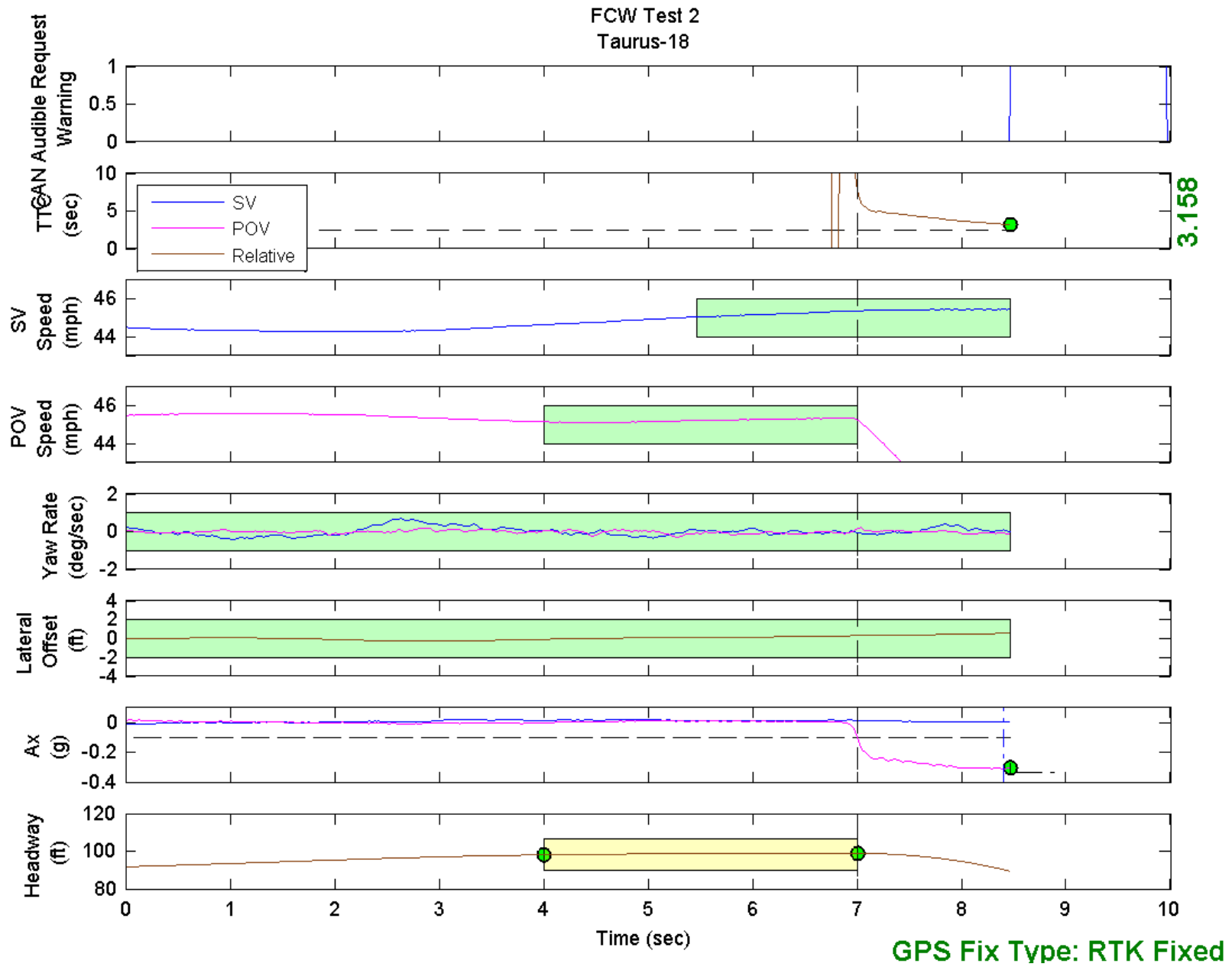


Figure D35. Time History for Run 18, FCW Test 2, CAN Audible Warning Request

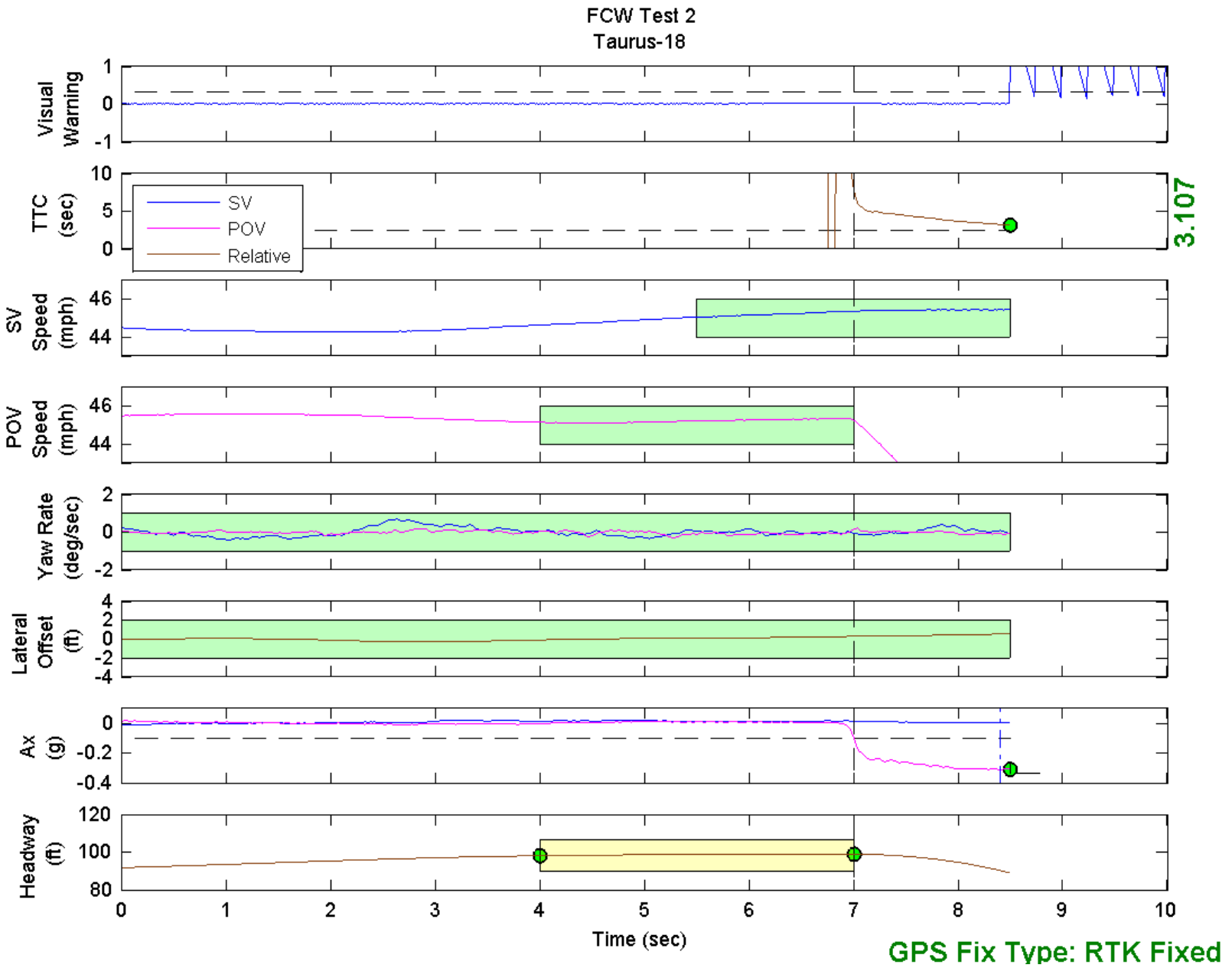


Figure D36. Time History for Run 18, FCW Test 2, Visual Warning

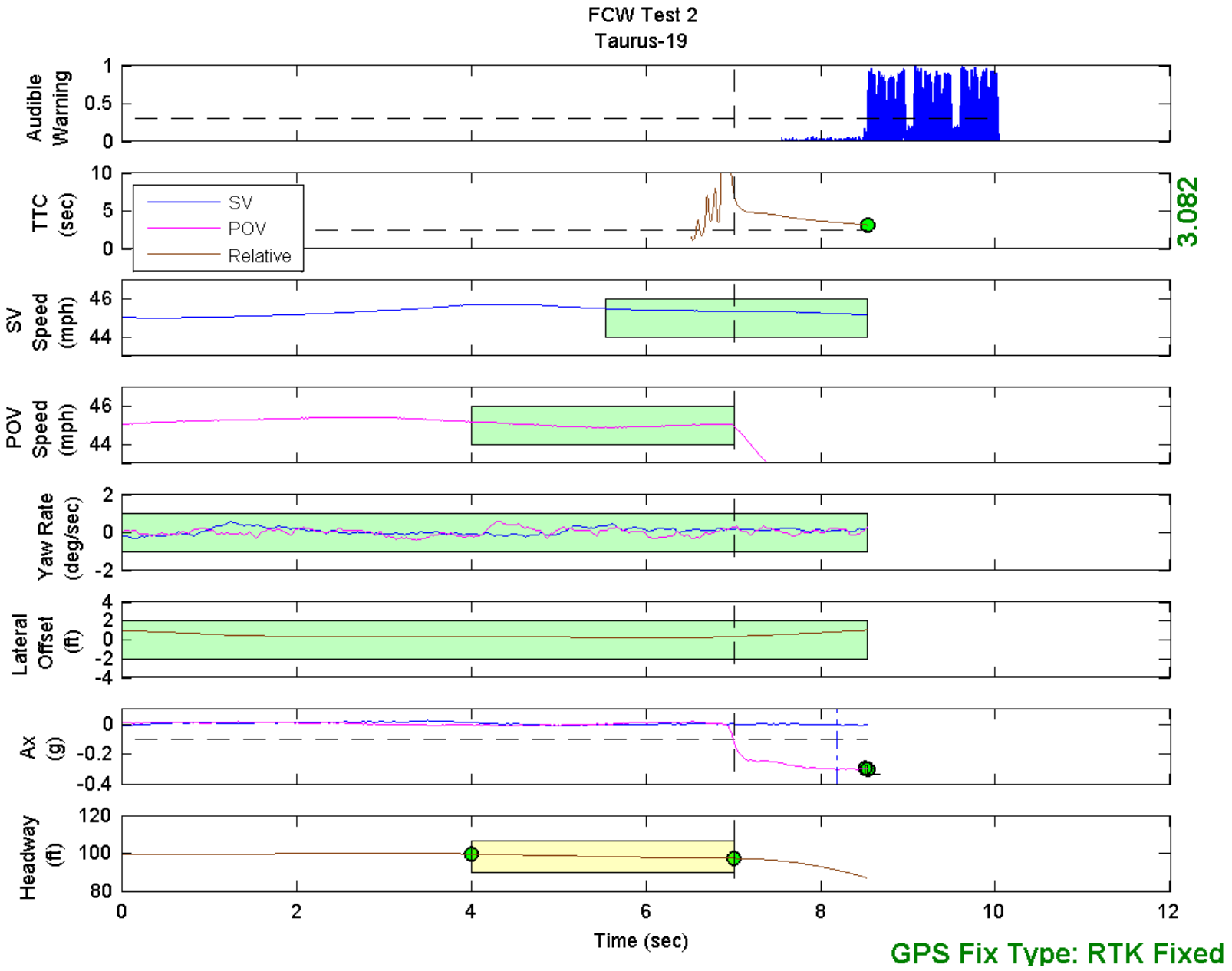


Figure D37. Time History for Run 19, FCW Test 2, Audible Warning

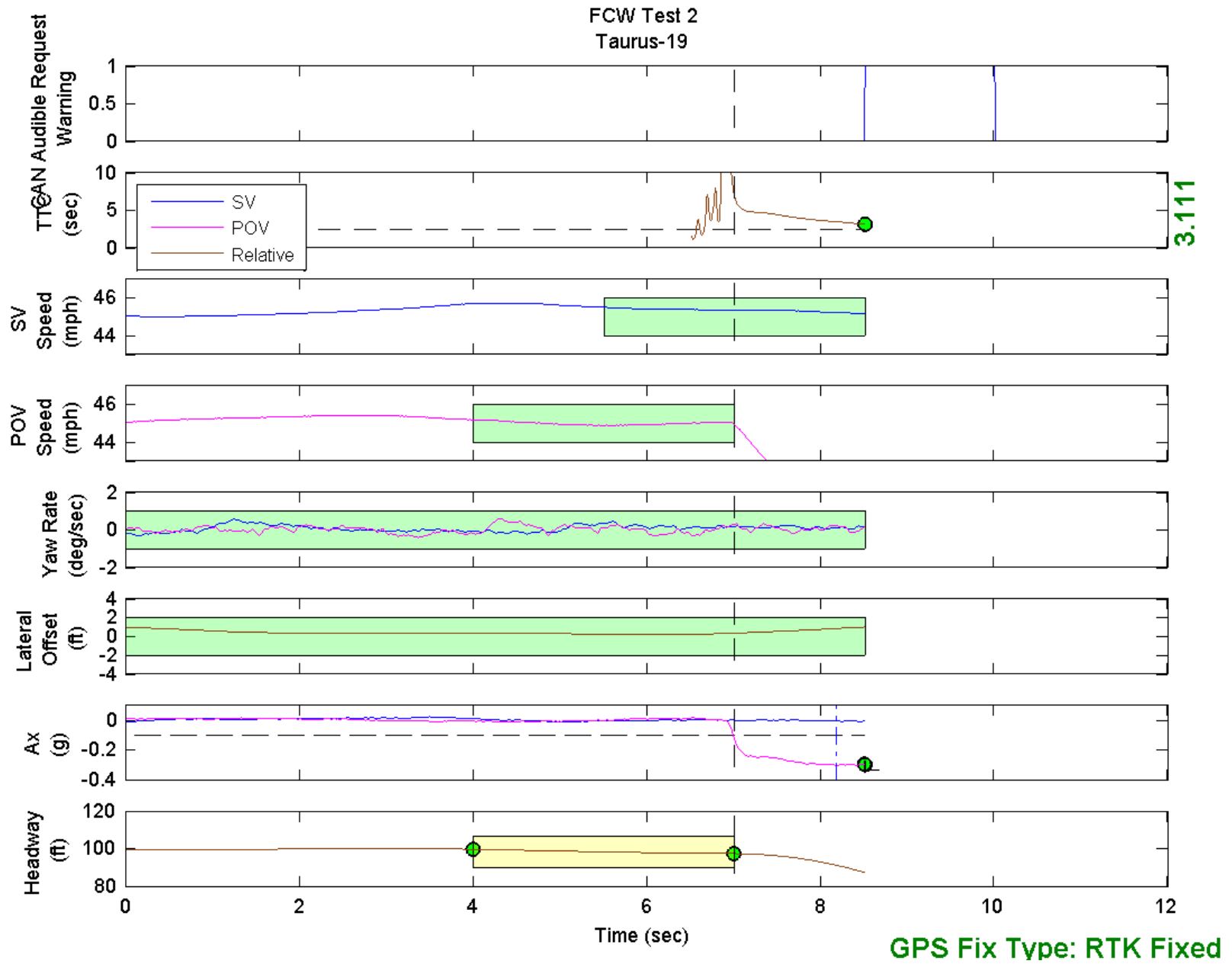


Figure D38. Time History for Run 19, FCW Test 2, CAN Audible Warning Request

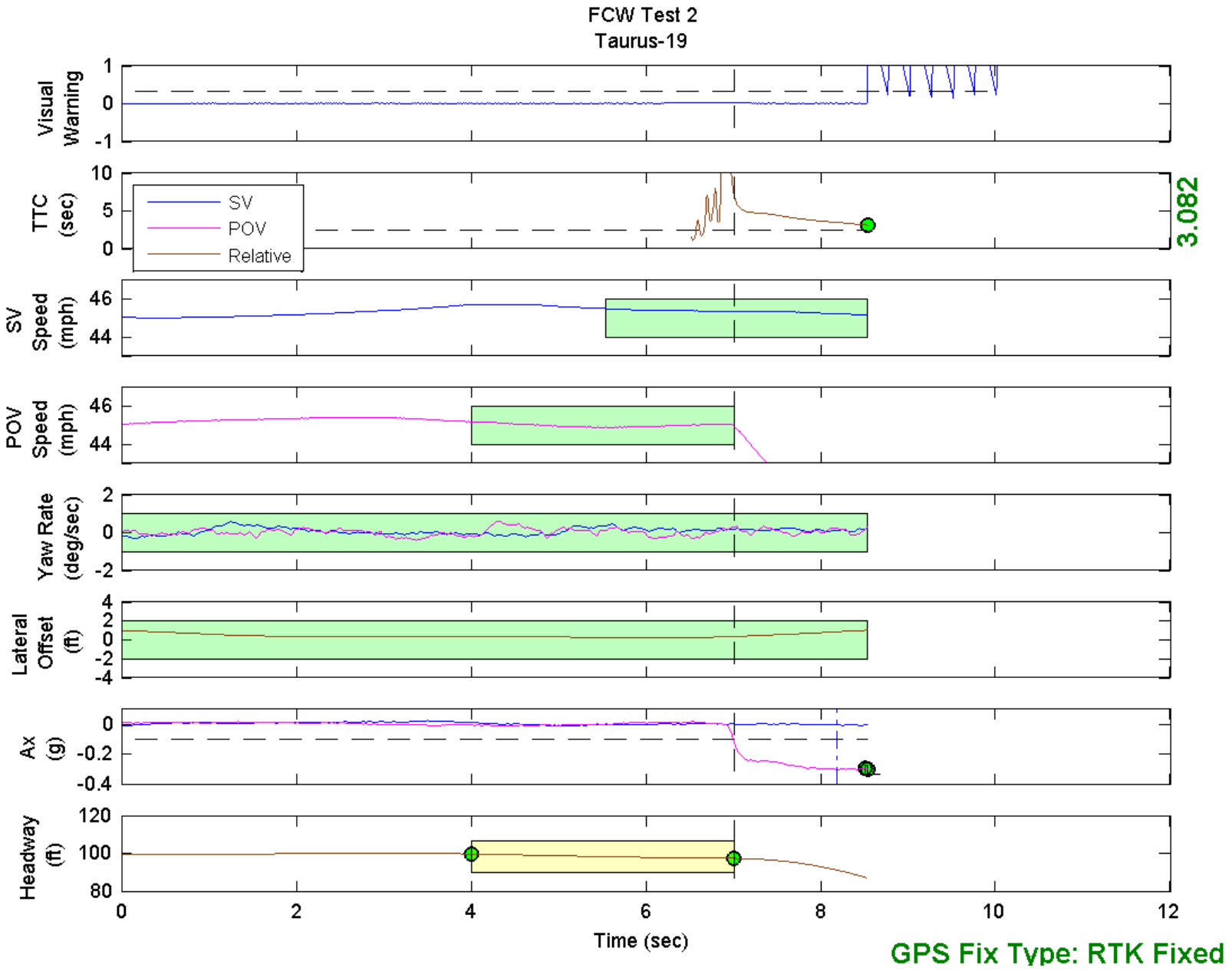


Figure D39. Time History for Run 19, FCW Test 2, Visual Warning

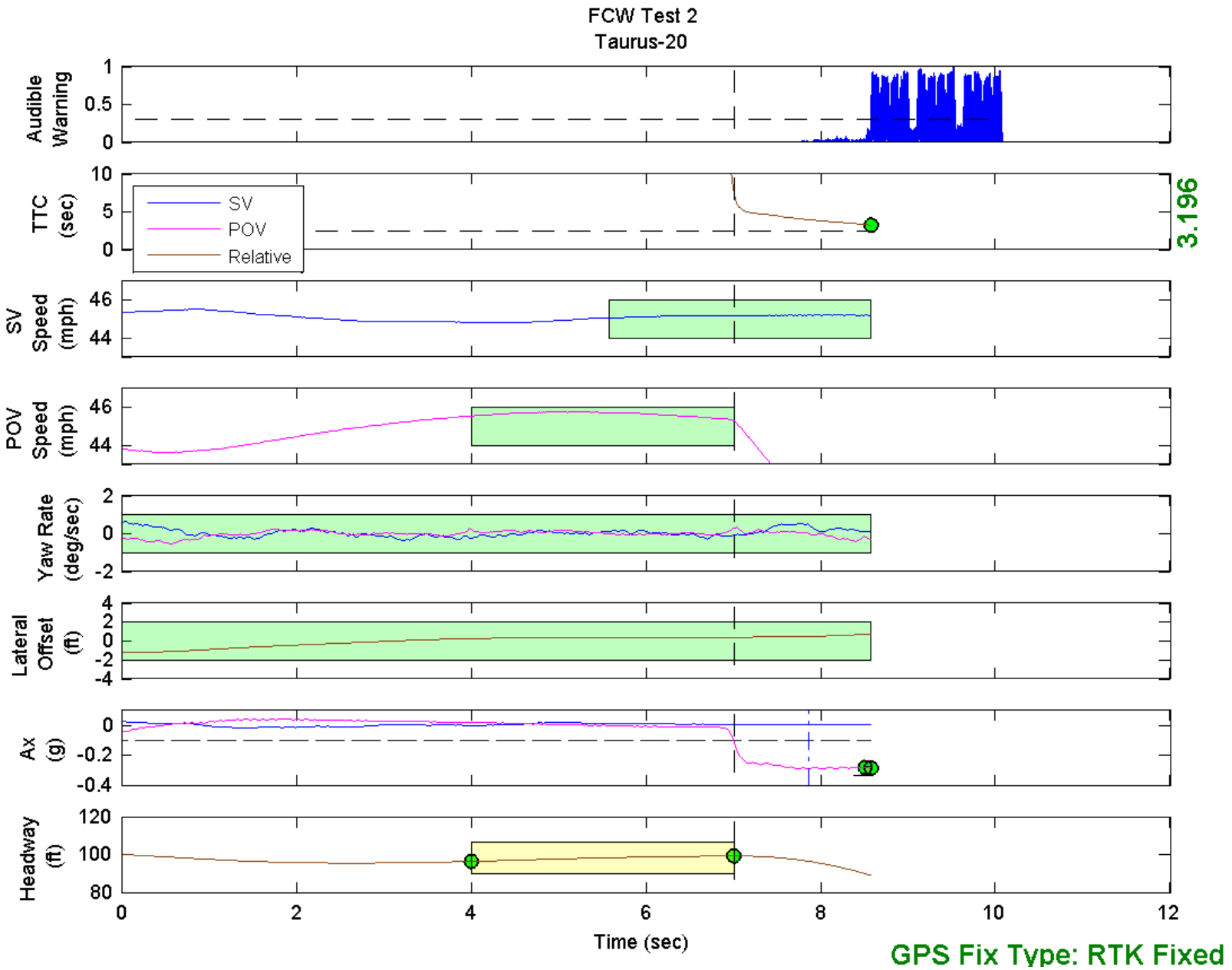


Figure D40. Time History for Run 20, FCW Test 2, Audible Warning

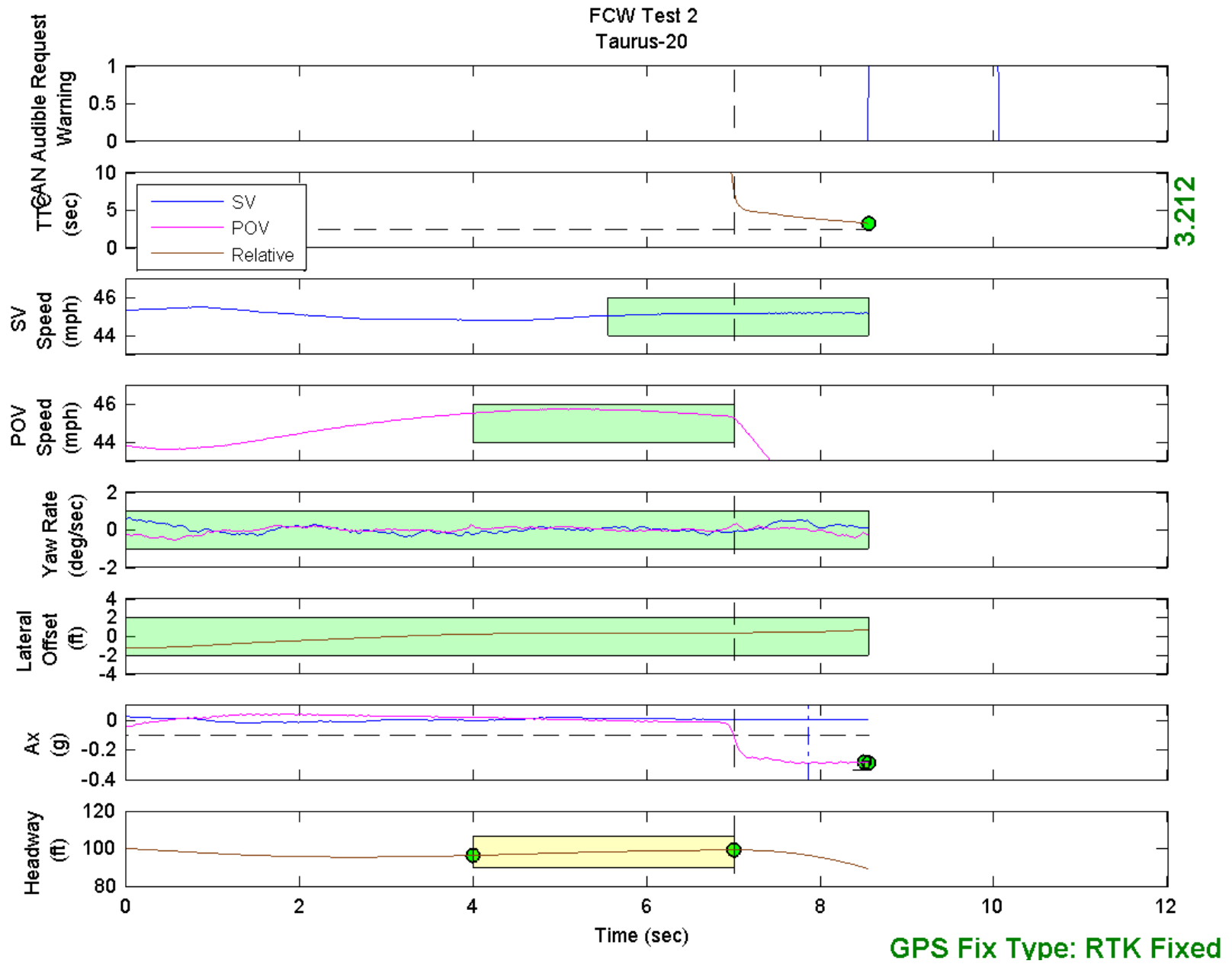


Figure D41. Time History for Run 20, FCW Test 2, CAN Audible Warning Request

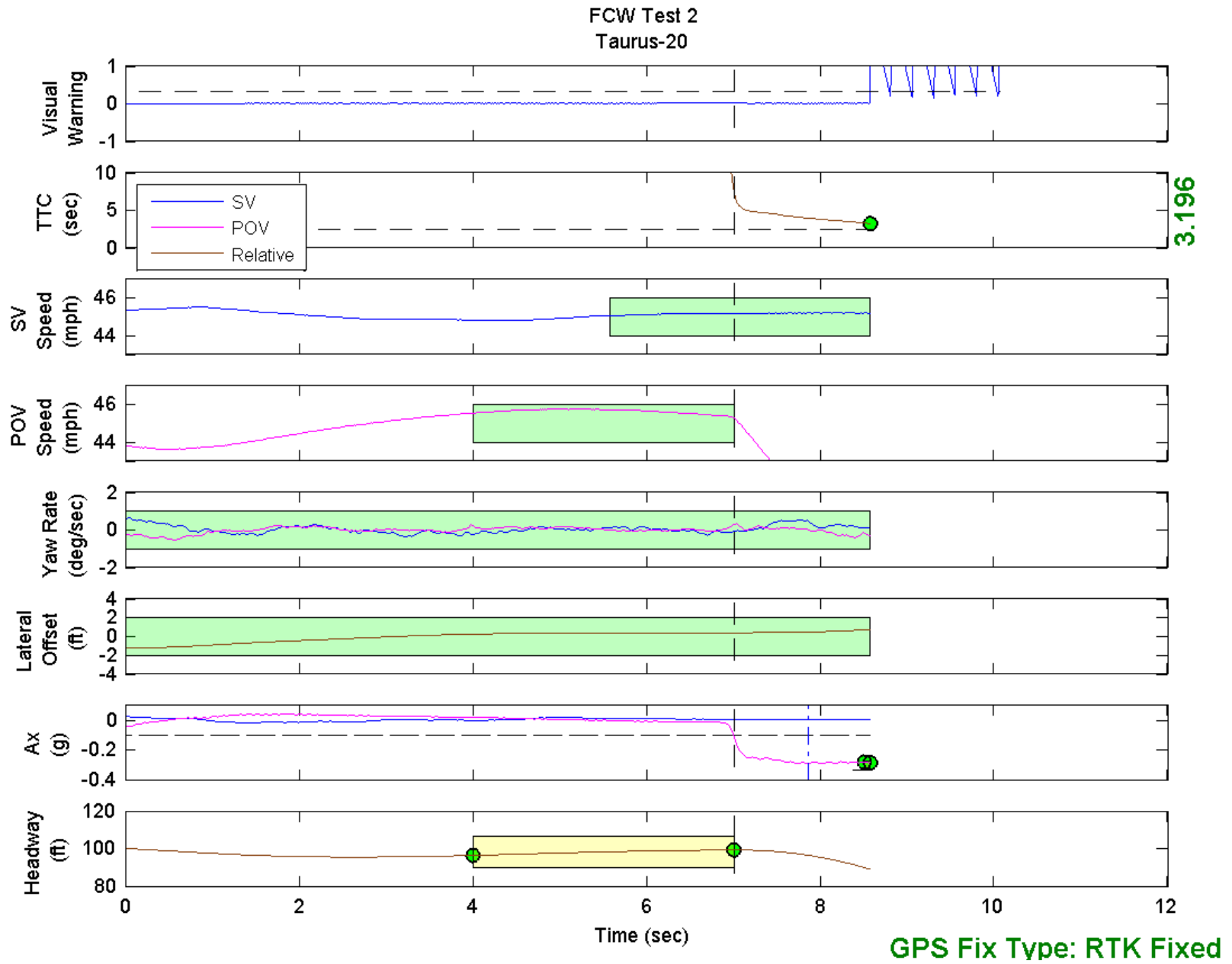


Figure D42. Time History for Run 20, FCW Test 2, Visual Warning

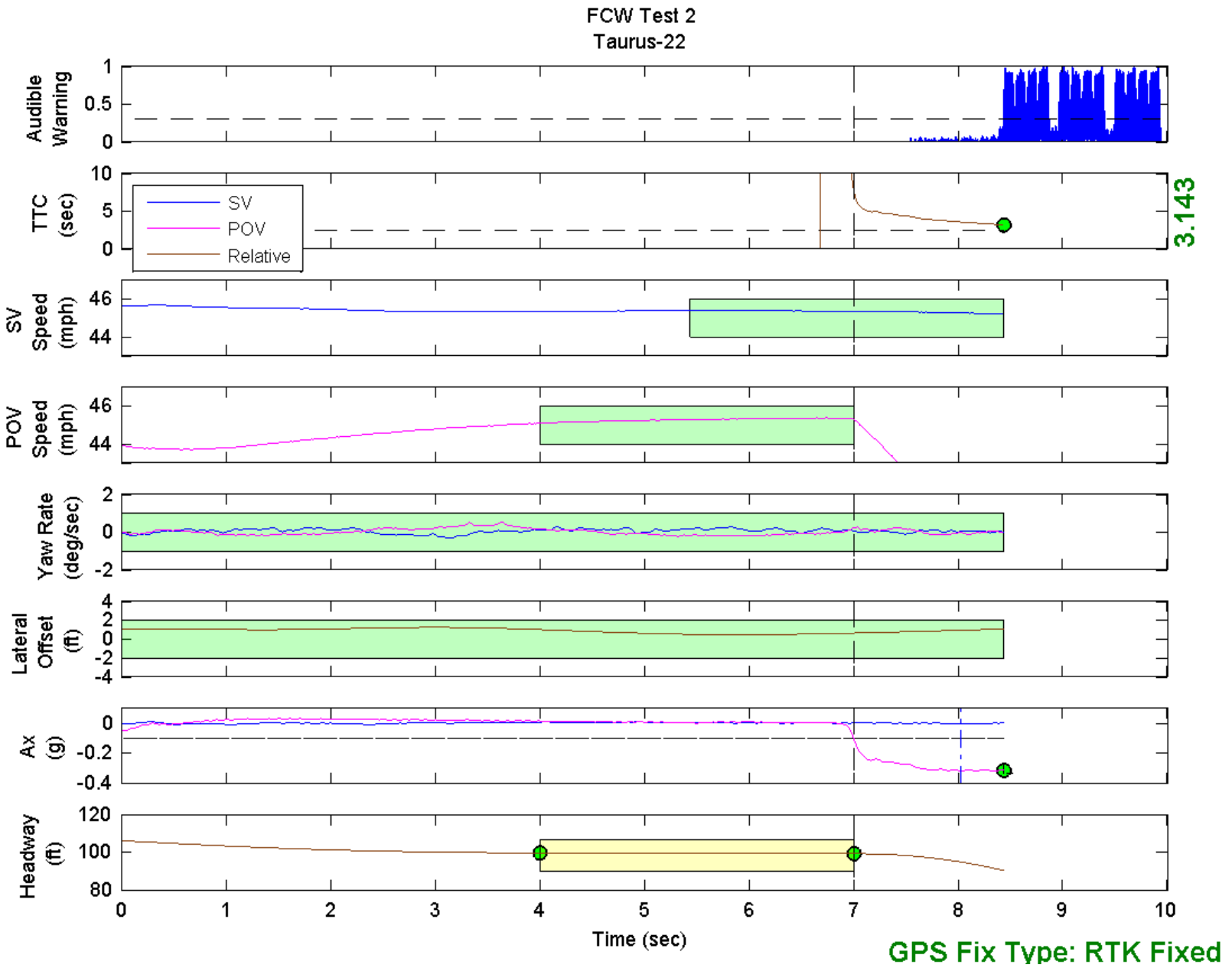


Figure D43. Time History for Run 22, FCW Test 2, Audible Warning

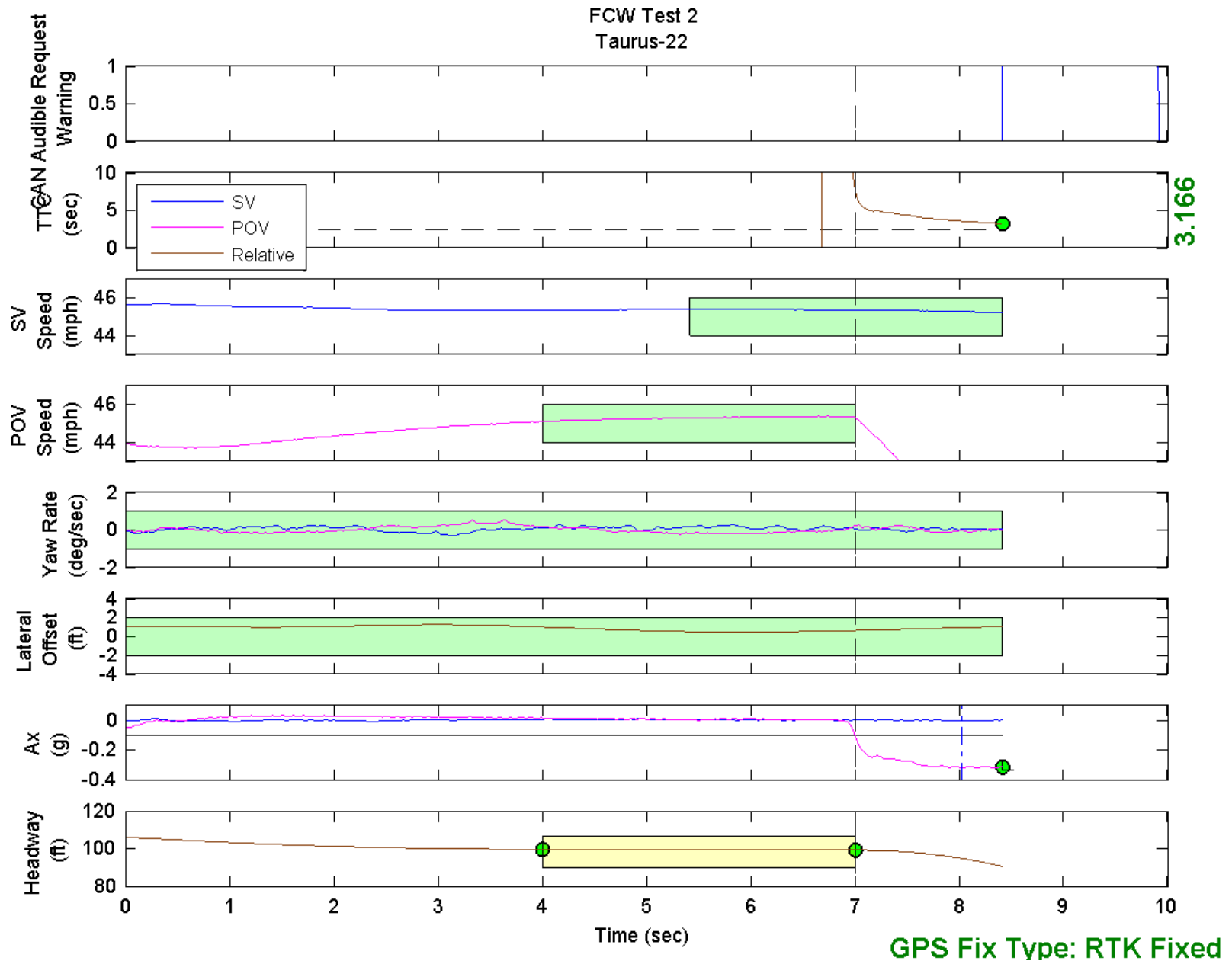


Figure D44. Time History for Run 22, FCW Test 2, CAN Audible Warning Request

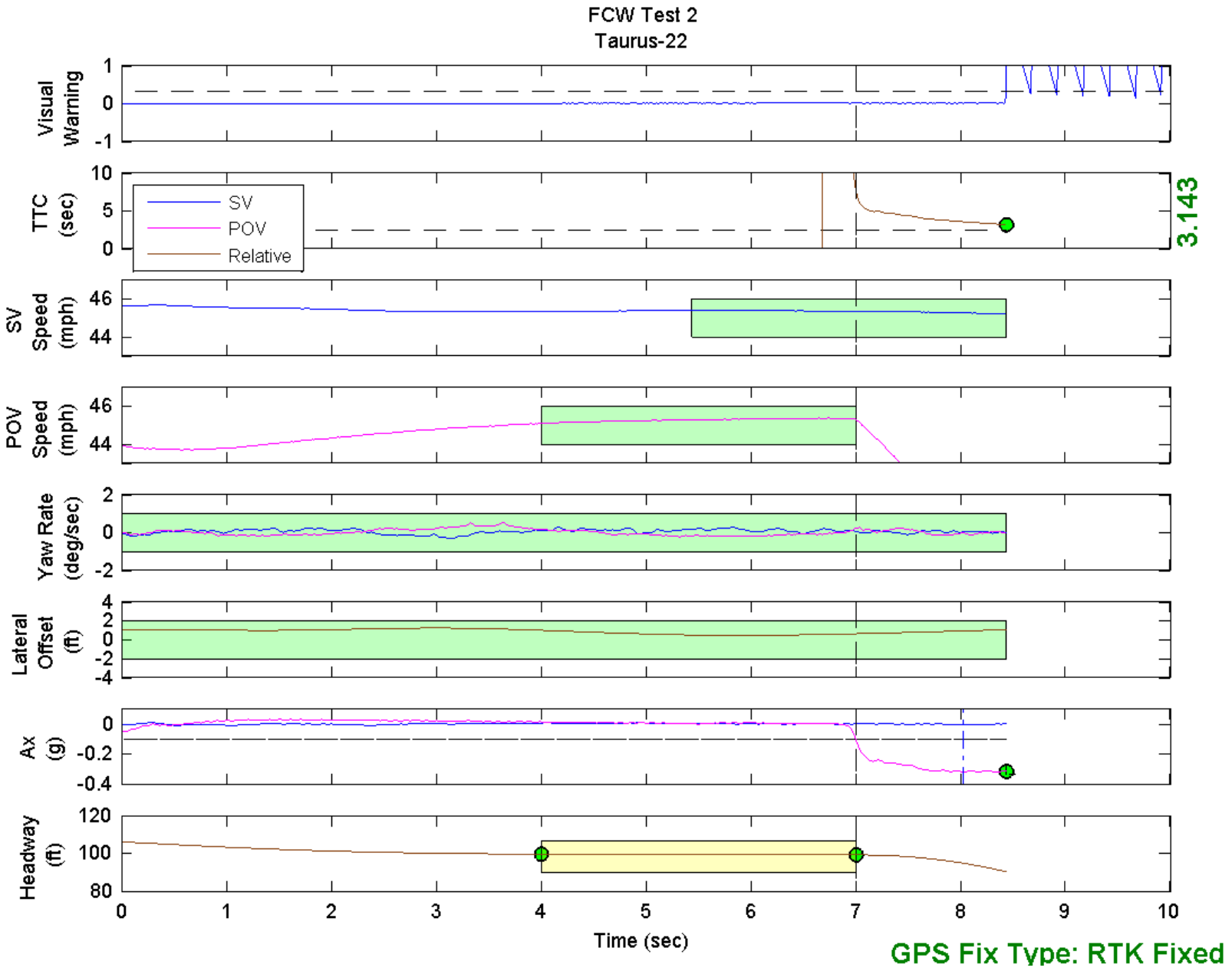


Figure D45. Time History for Run 22, FCW Test 2, Visual Warning

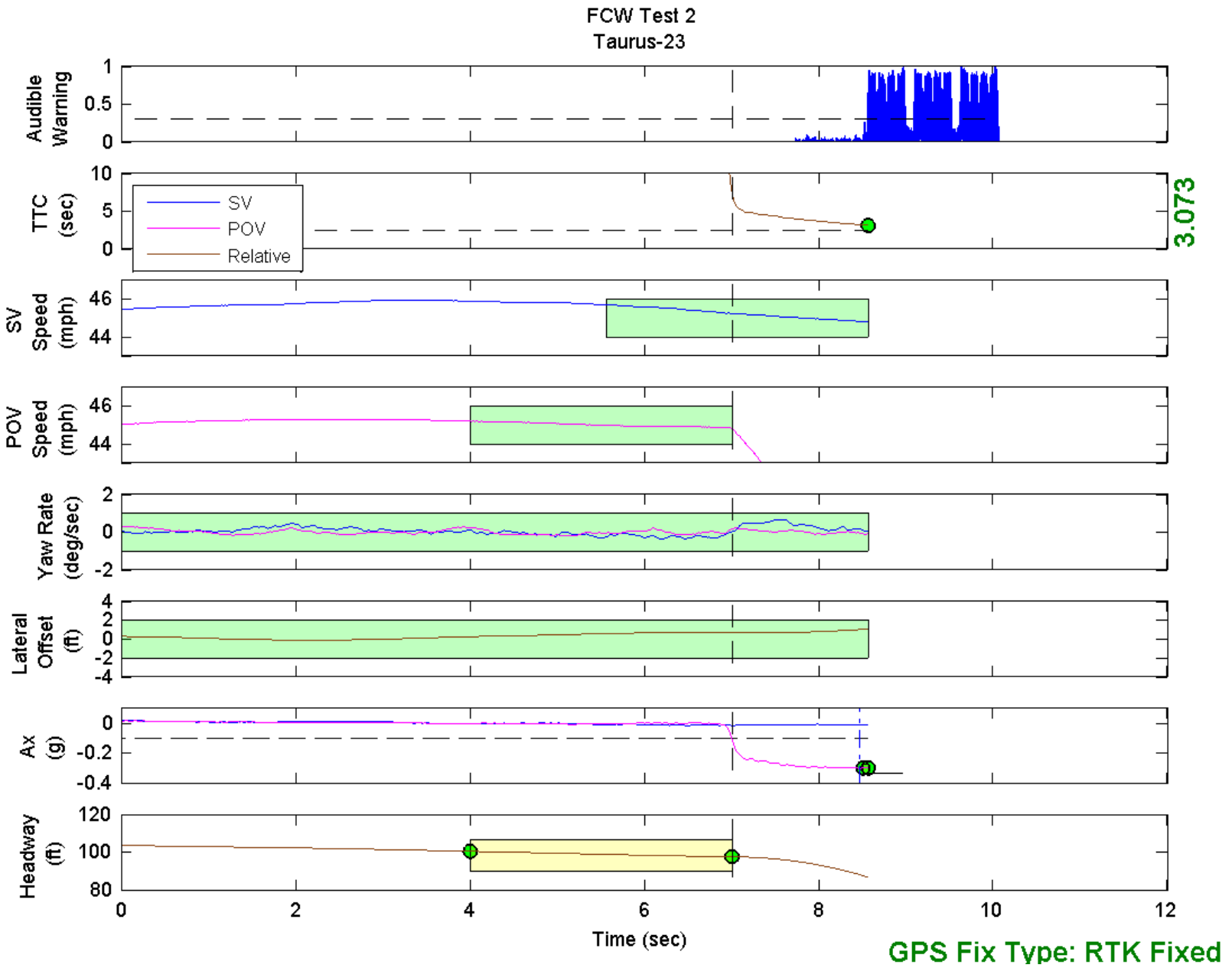


Figure D46. Time History for Run 23, FCW Test 2, Audible Warning

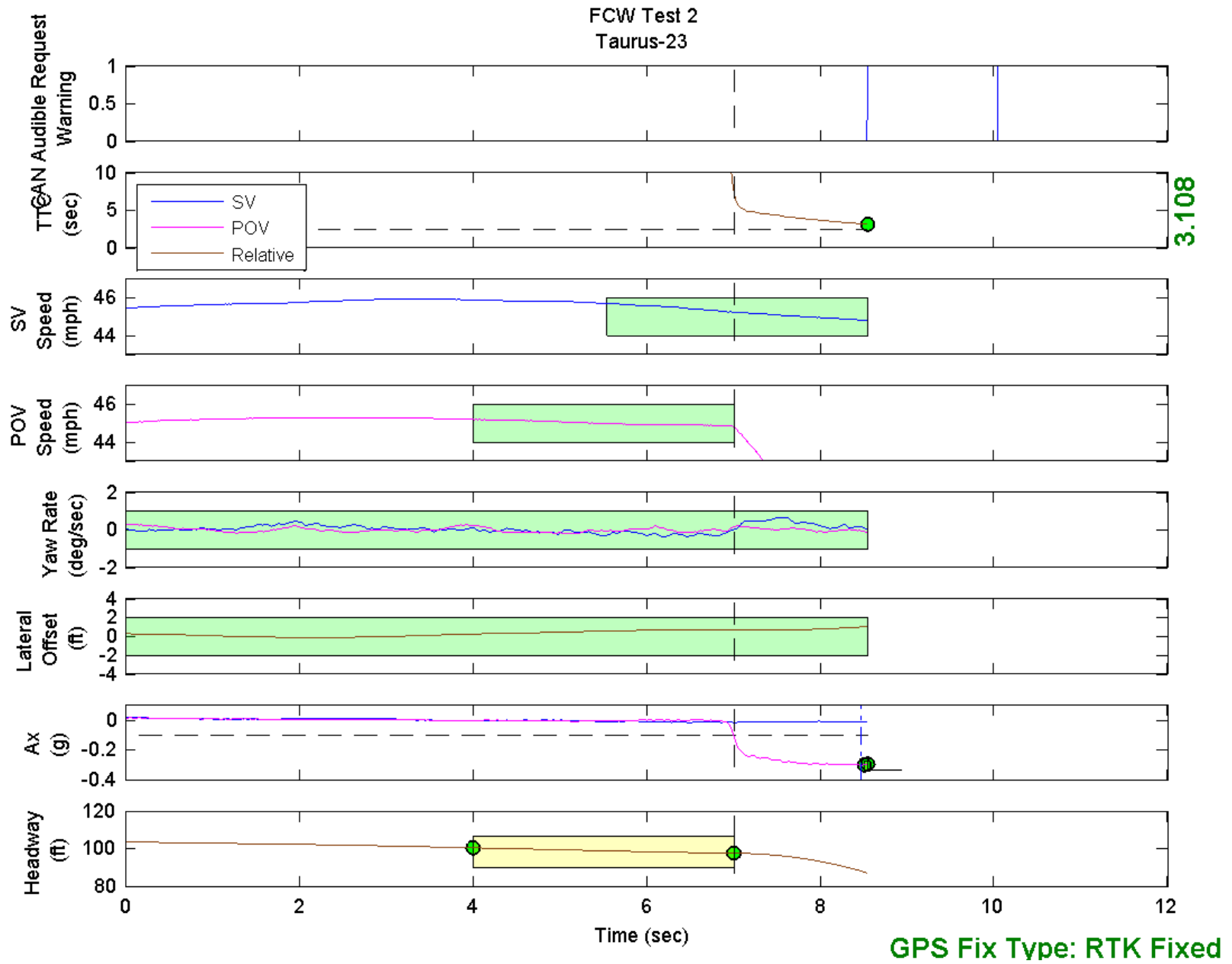


Figure D47. Time History for Run 23, FCW Test 2, CAN Audible Warning Request

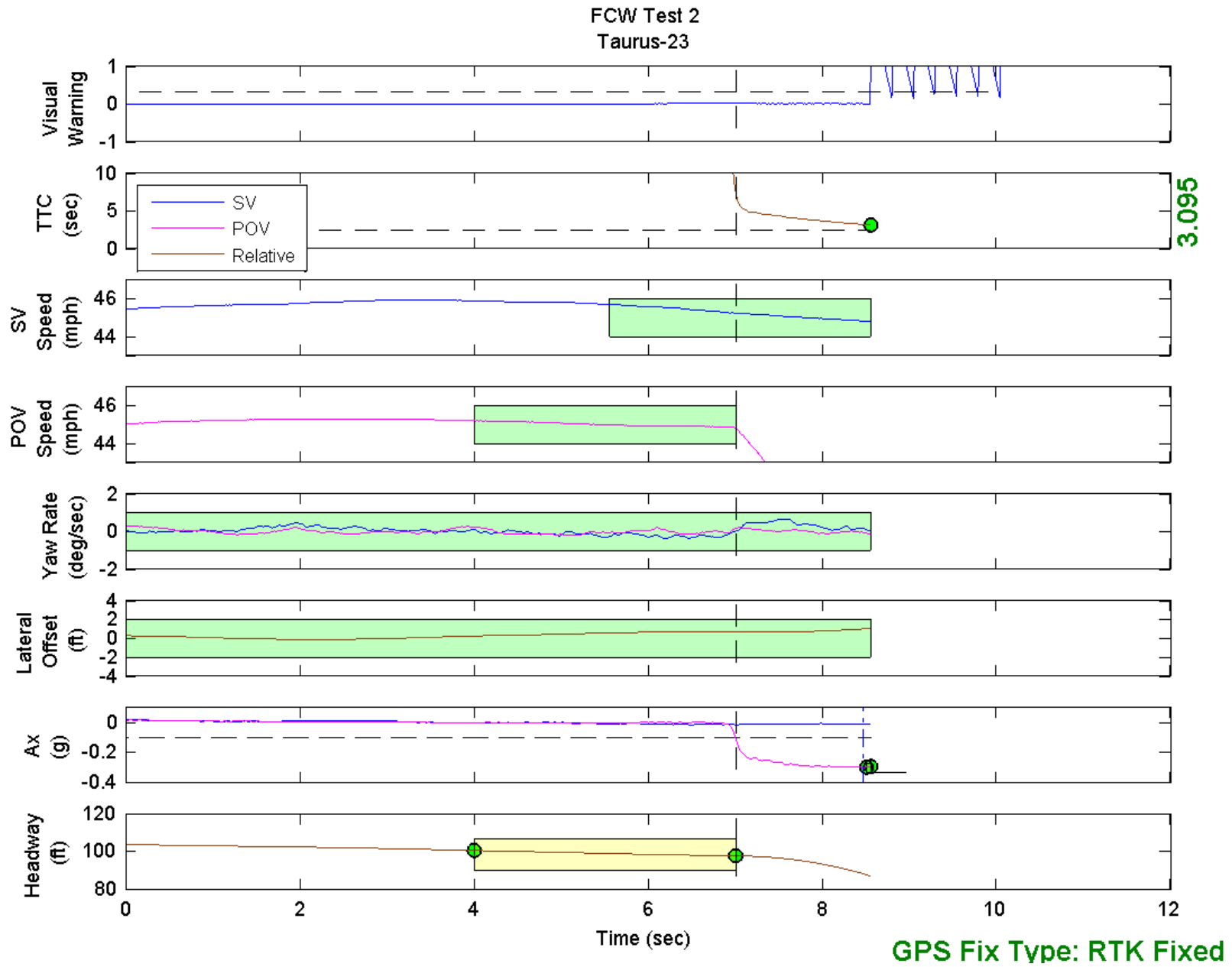


Figure D48. Time History for Run 23, FCW Test 2, Visual Warning

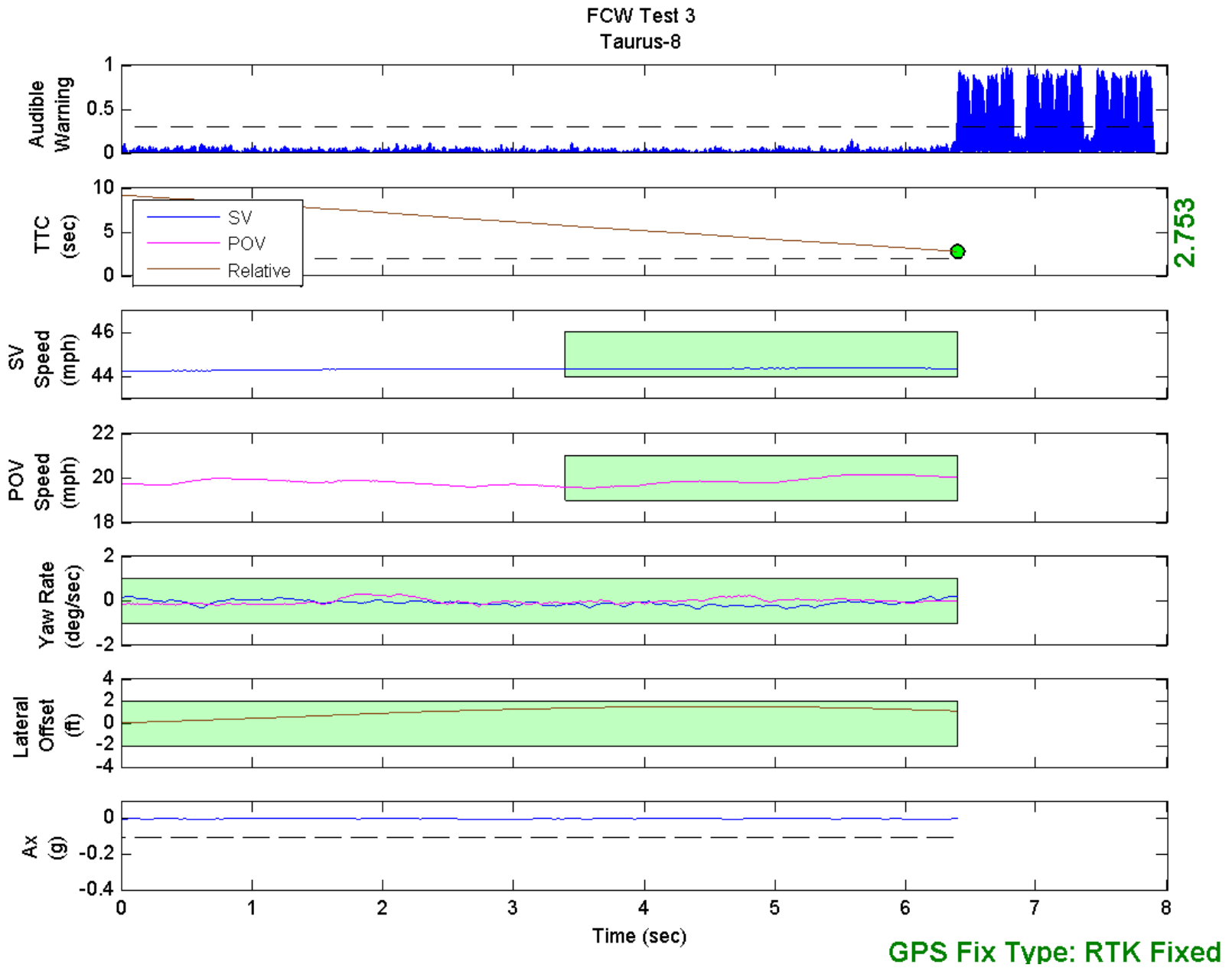


Figure D49. Time History for Run 8, FCW Test 3, Audible Warning

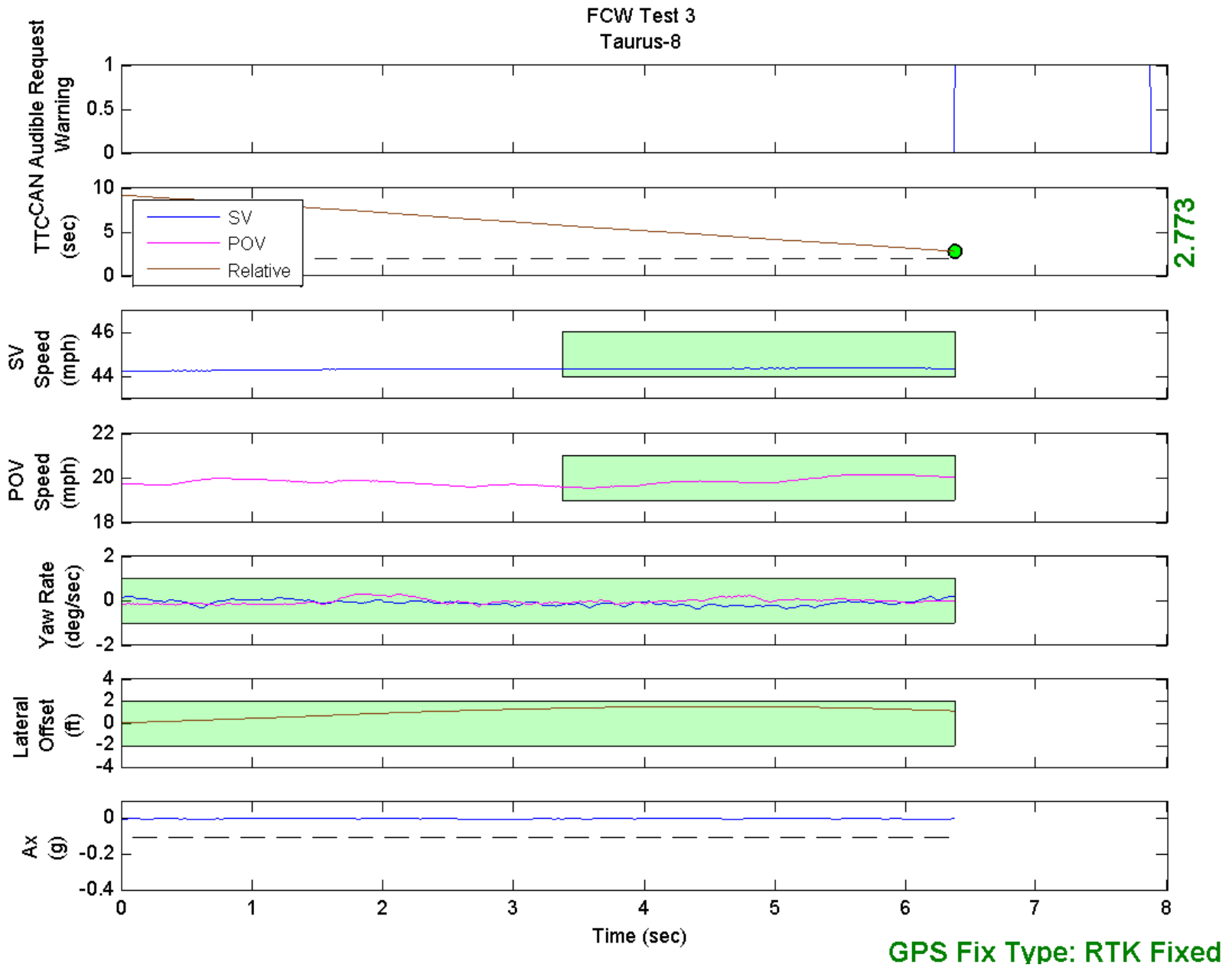


Figure D50. Time History for Run 8, FCW Test 3, CAN Audible Warning Request

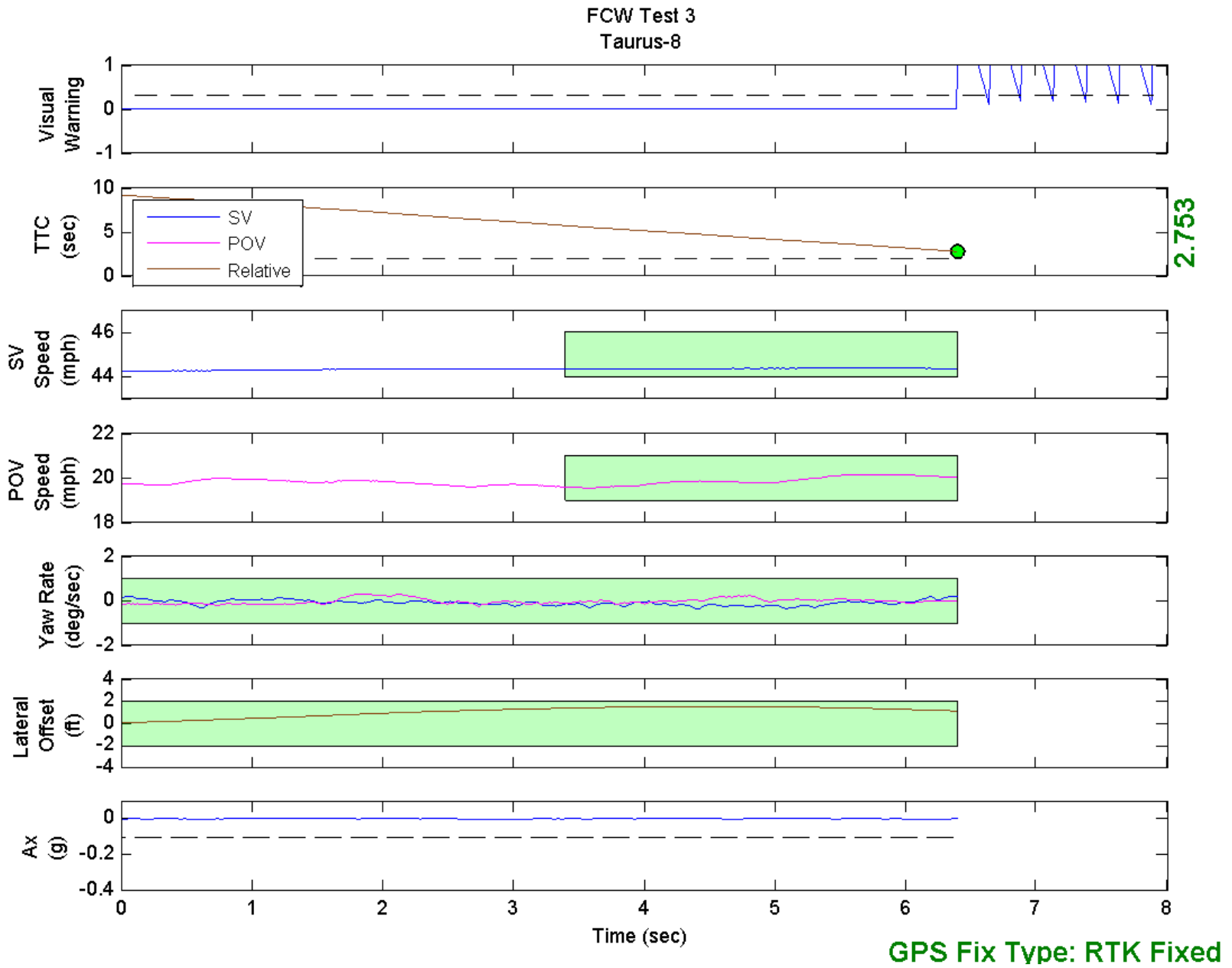


Figure D51. Time History for Run 8, FCW Test 3, Visual Warning

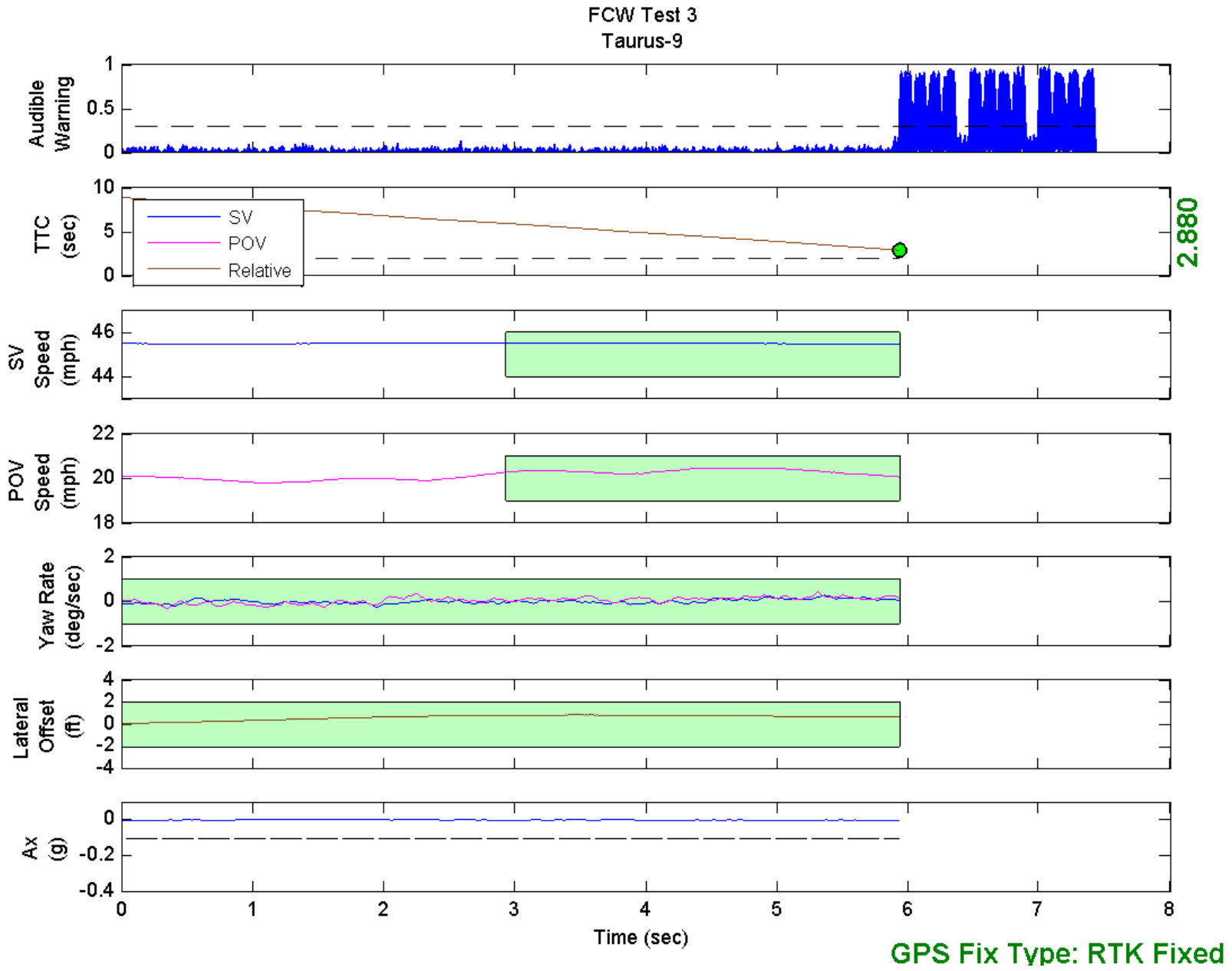


Figure D52. Time History for Run 9, FCW Test 3, Audible Warning

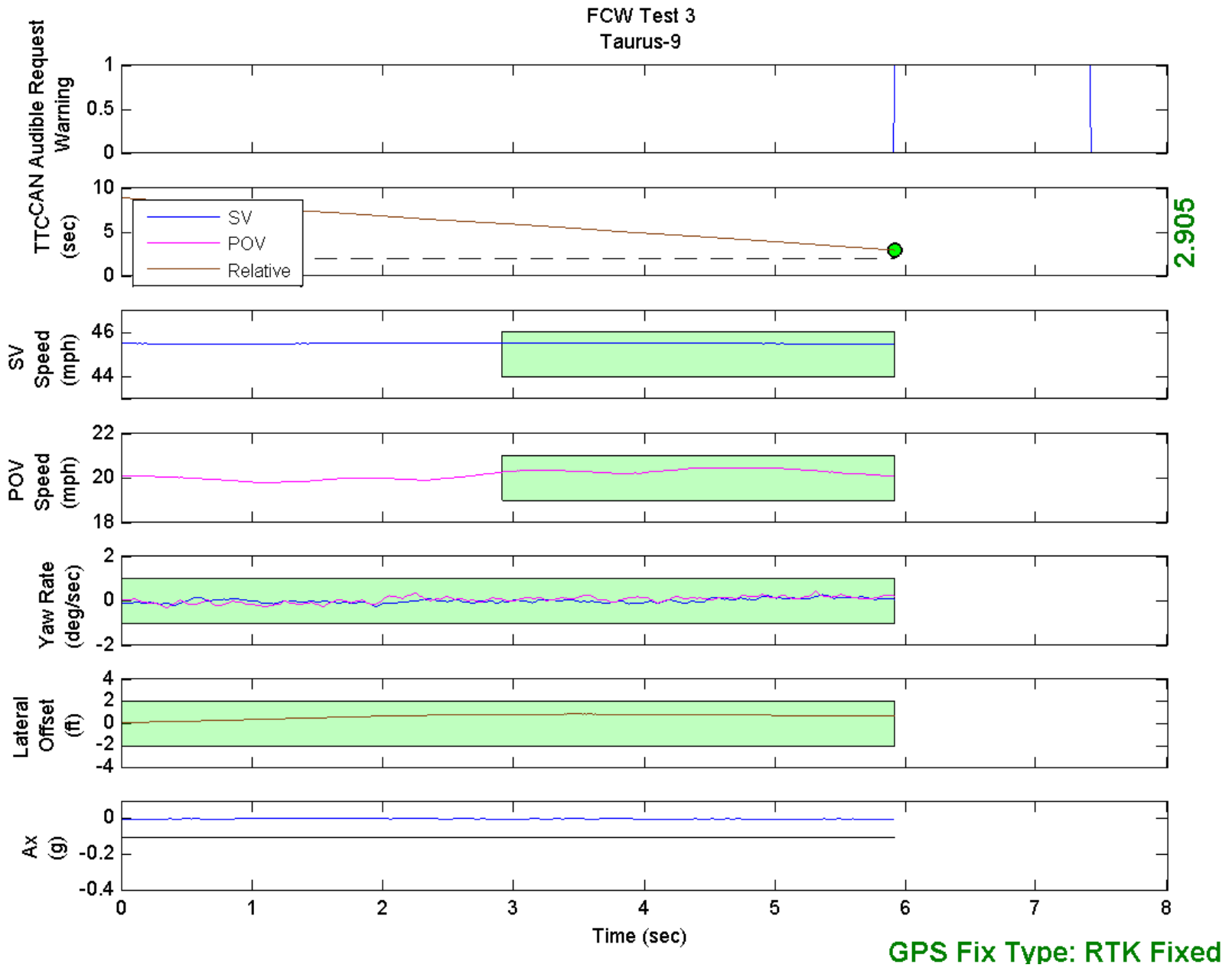


Figure D53. Time History for Run 9, FCW Test 3, CAN Audible Warning Request

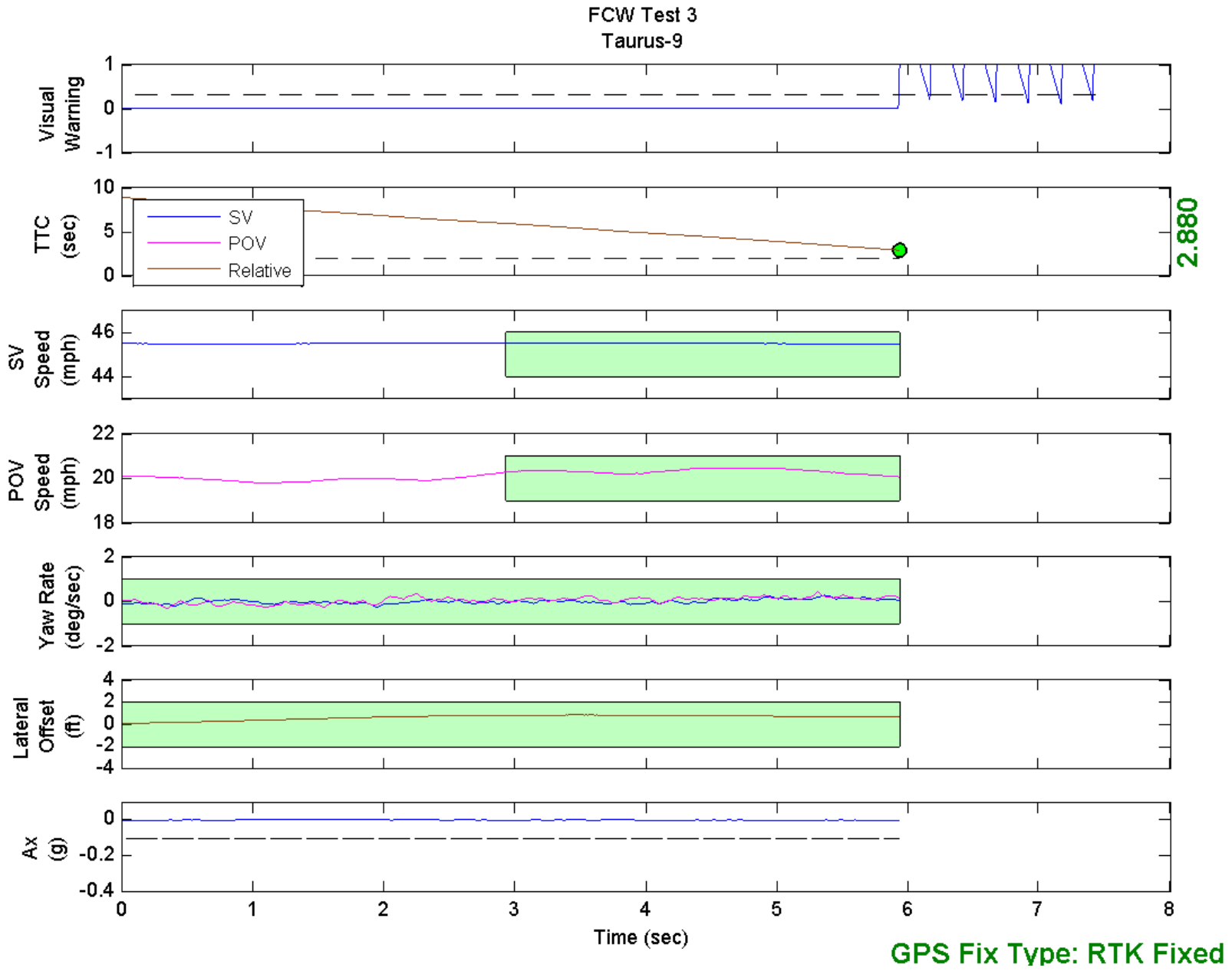


Figure D54. Time History for Run 9, FCW Test 3, Visual Warning

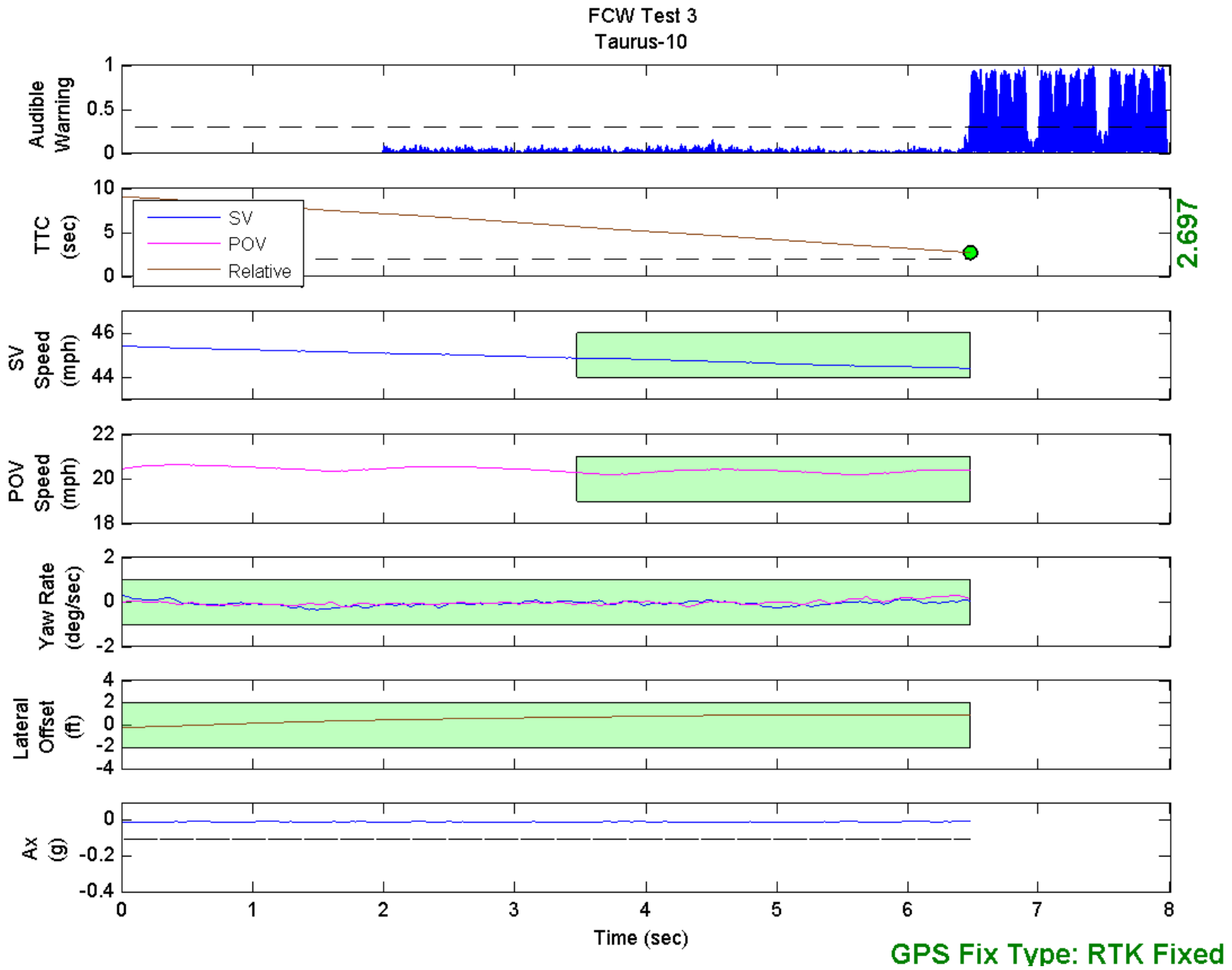


Figure D55. Time History for Run 10, FCW Test 3, Audible Warning

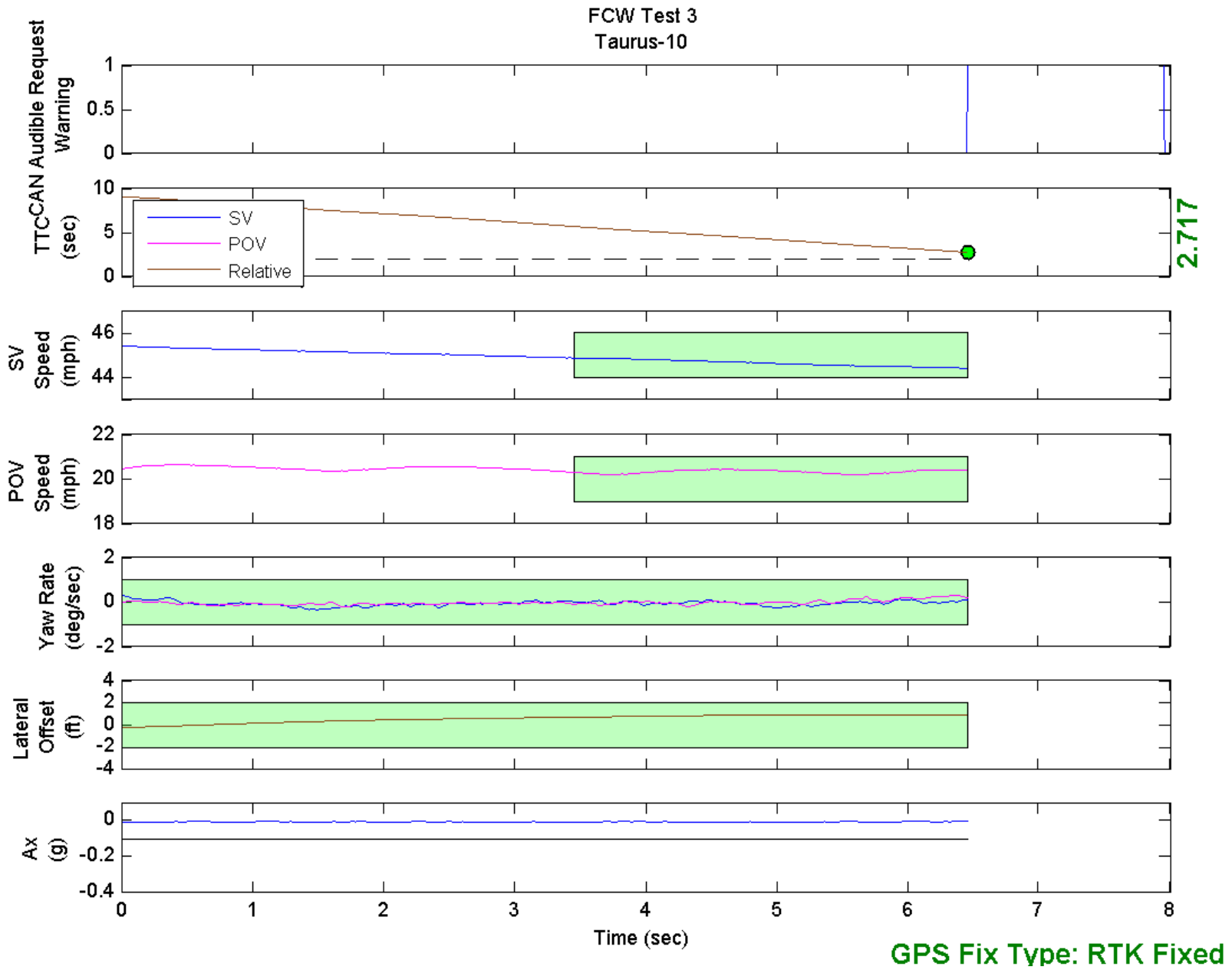


Figure D56. Time History for Run 10, FCW Test 3, CAN Audible Warning Request

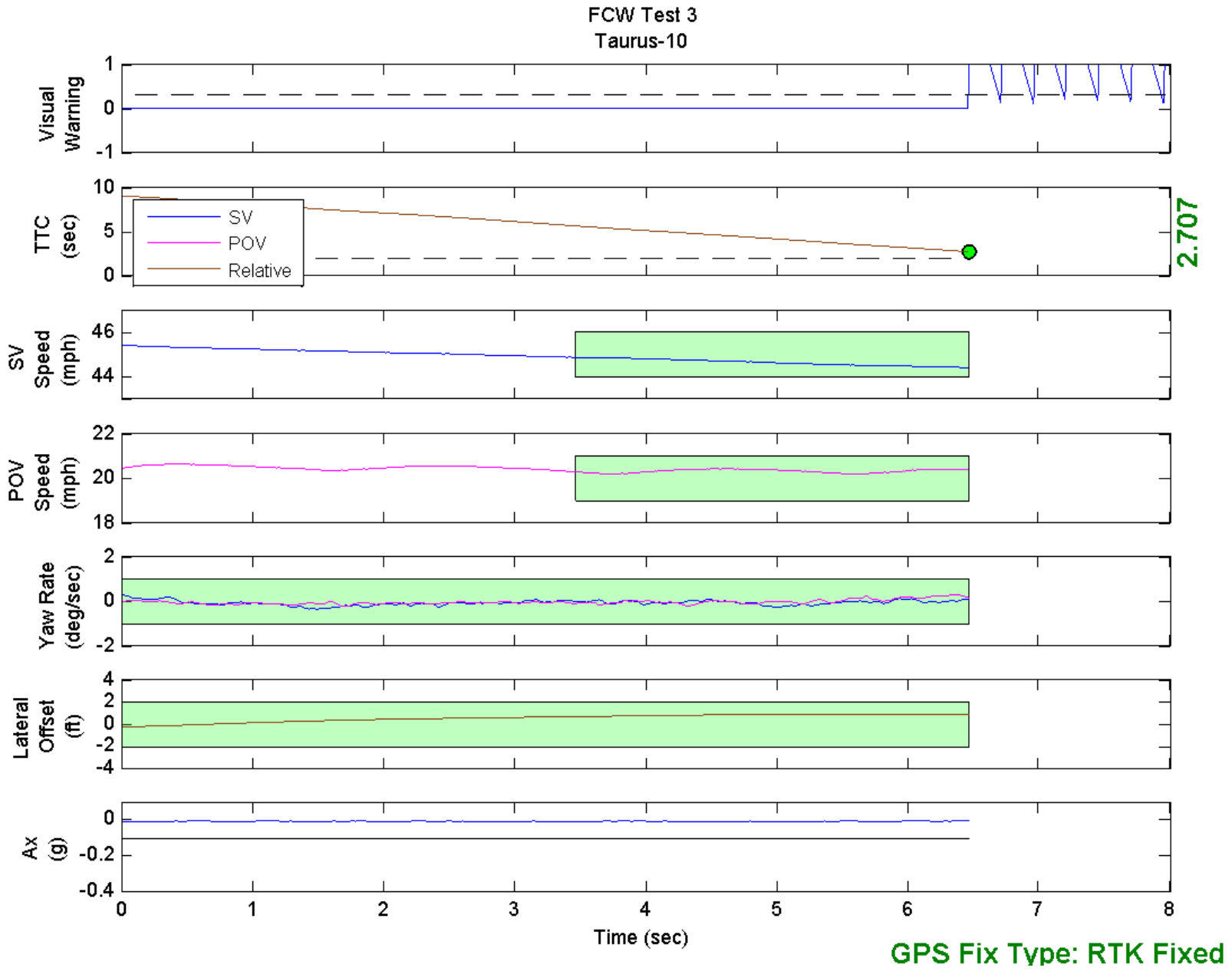


Figure D57. Time History for Run 10, FCW Test 3, Visual Warning

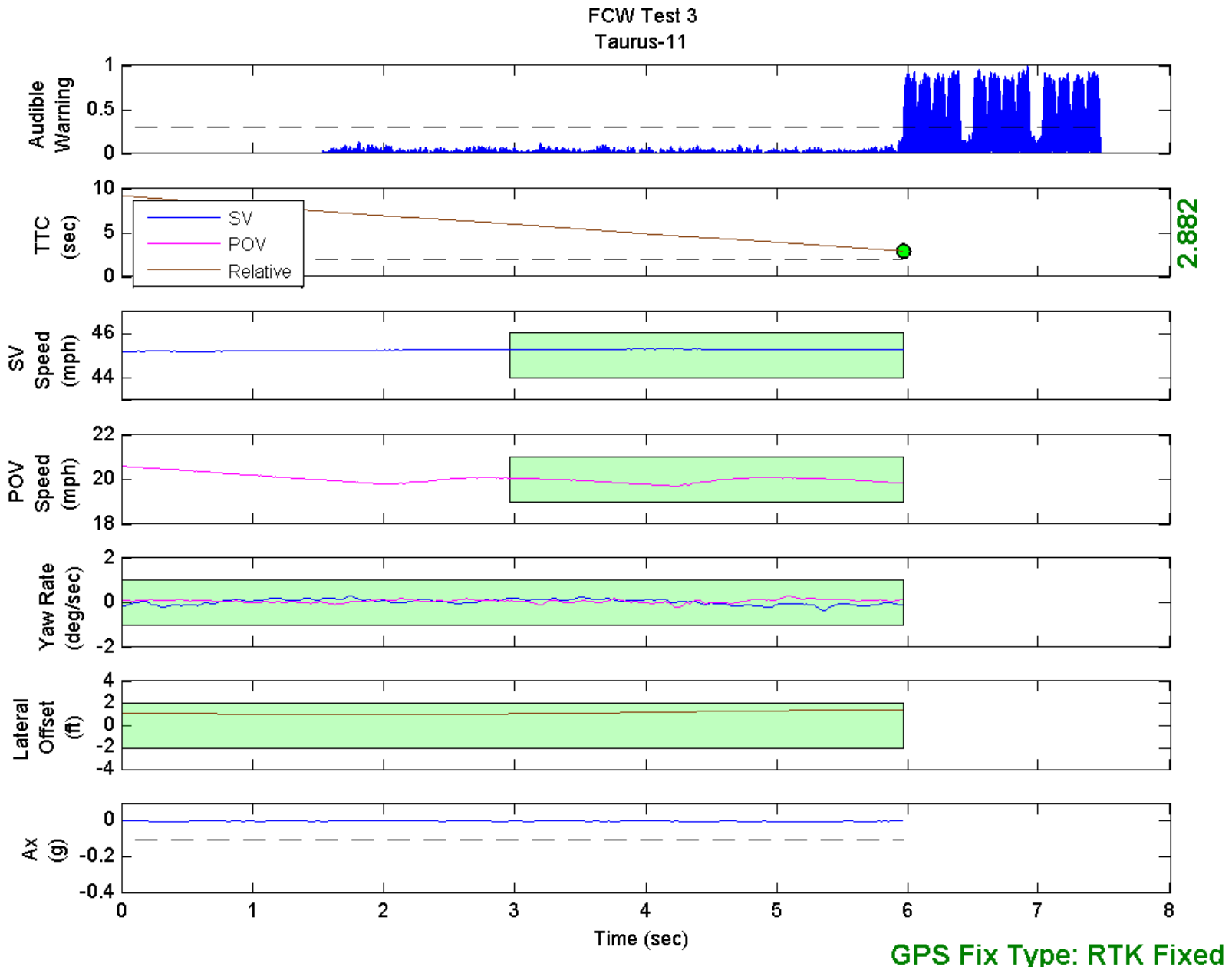


Figure D58. Time History for Run 11, FCW Test 3, Audible Warning

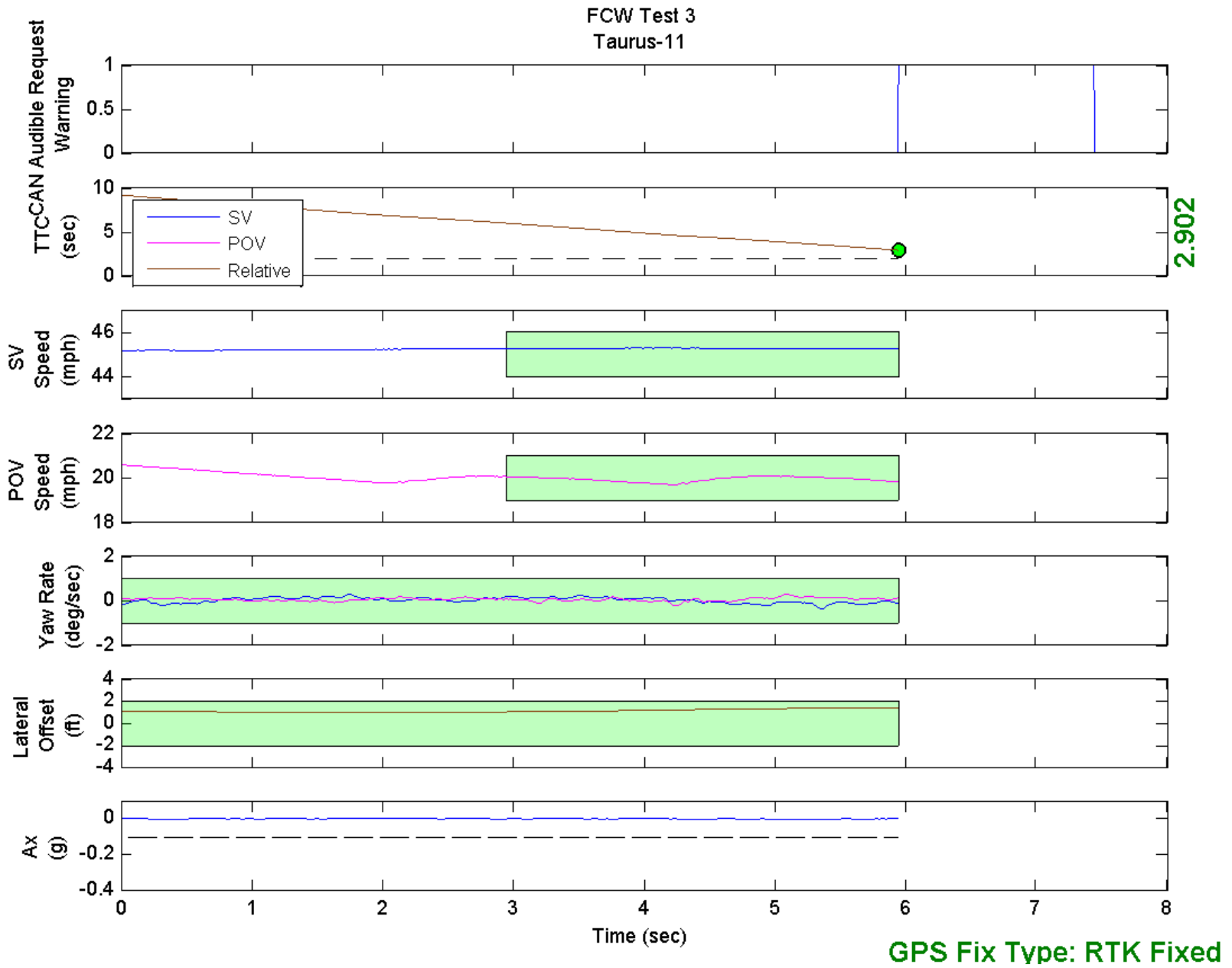


Figure D59. Time History for Run 11, FCW Test 3, CAN Audible Warning Request

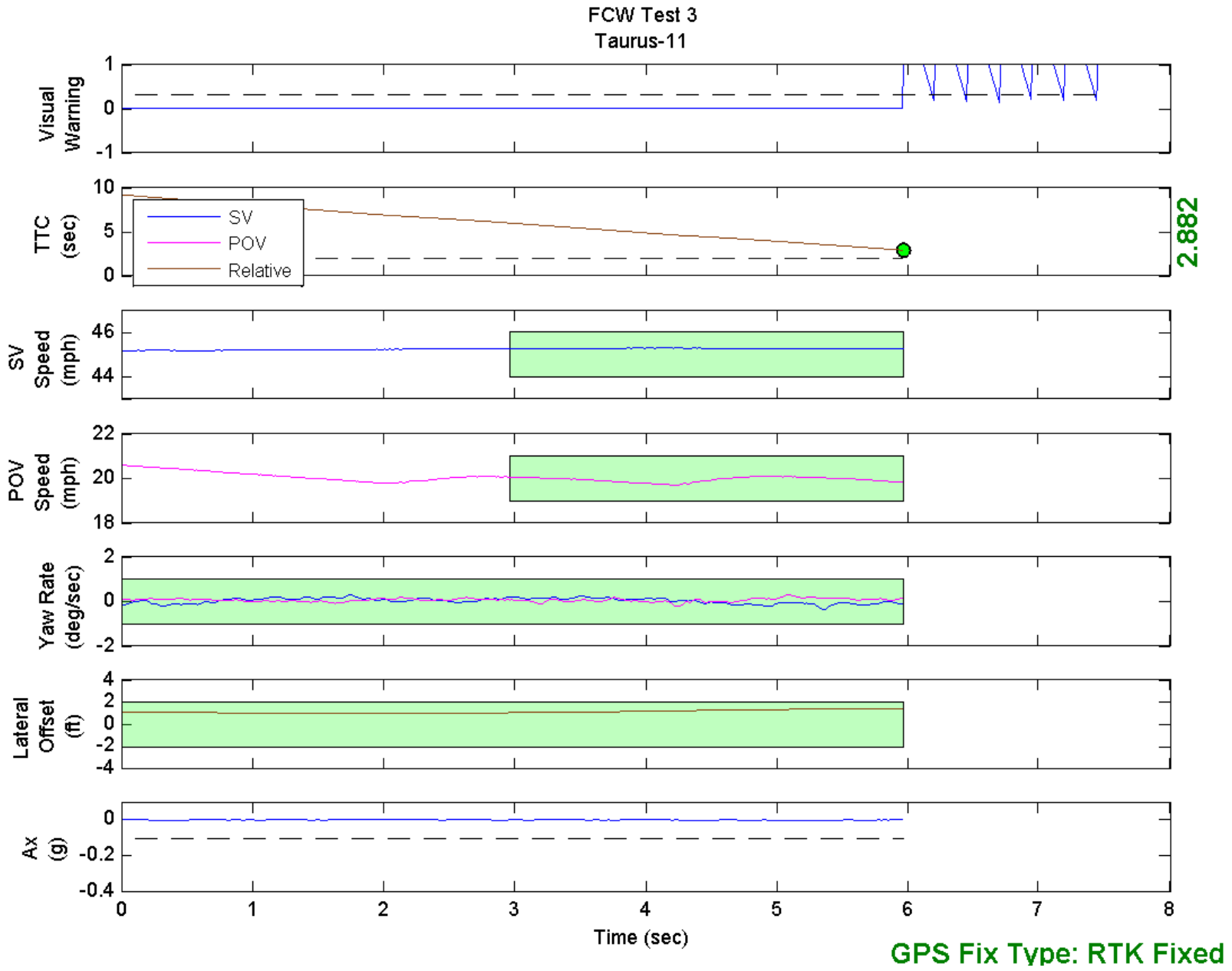


Figure D60. Time History for Run 11, FCW Test 3, Visual Warning

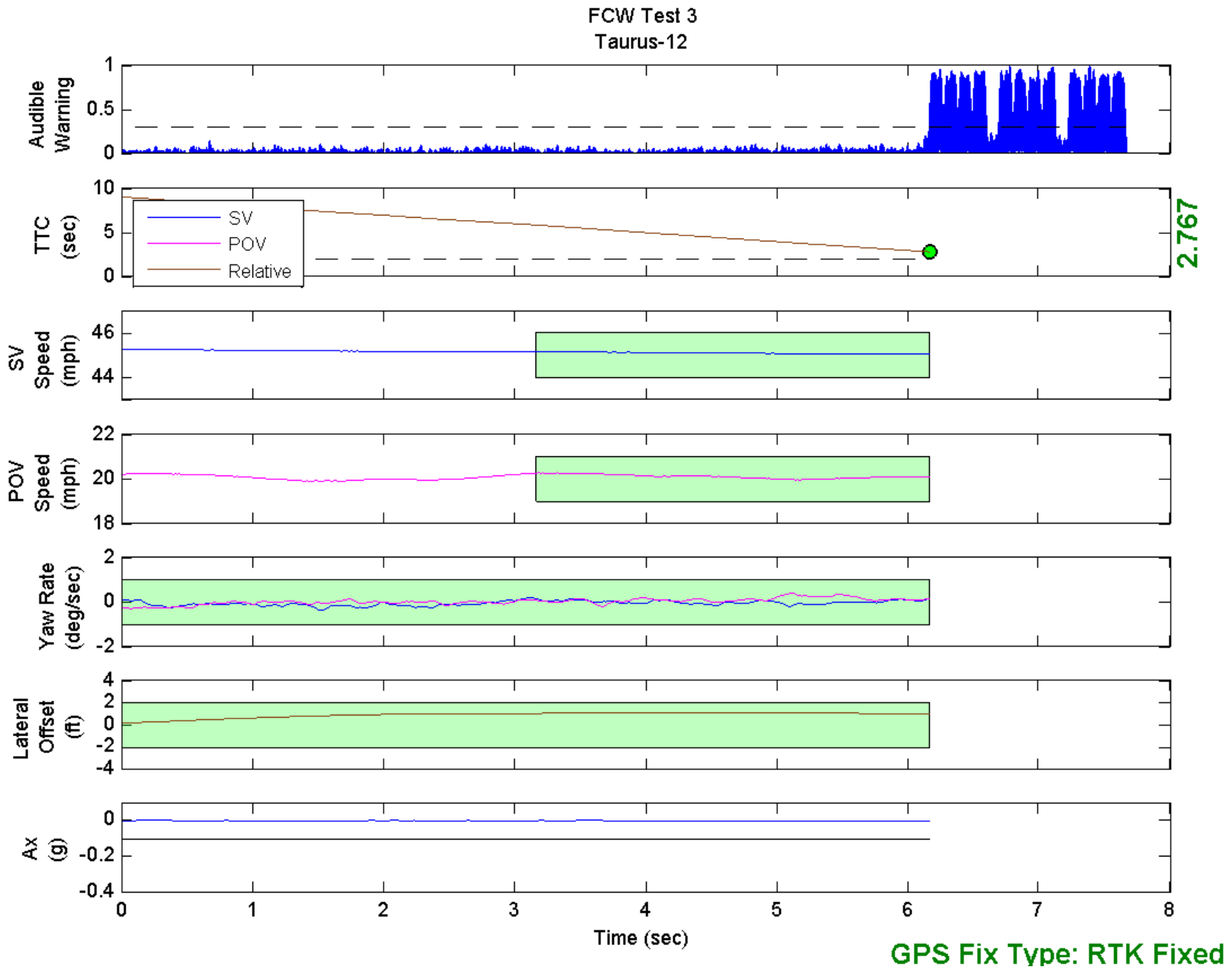


Figure D61. Time History for Run 12, FCW Test 3, Audible Warning

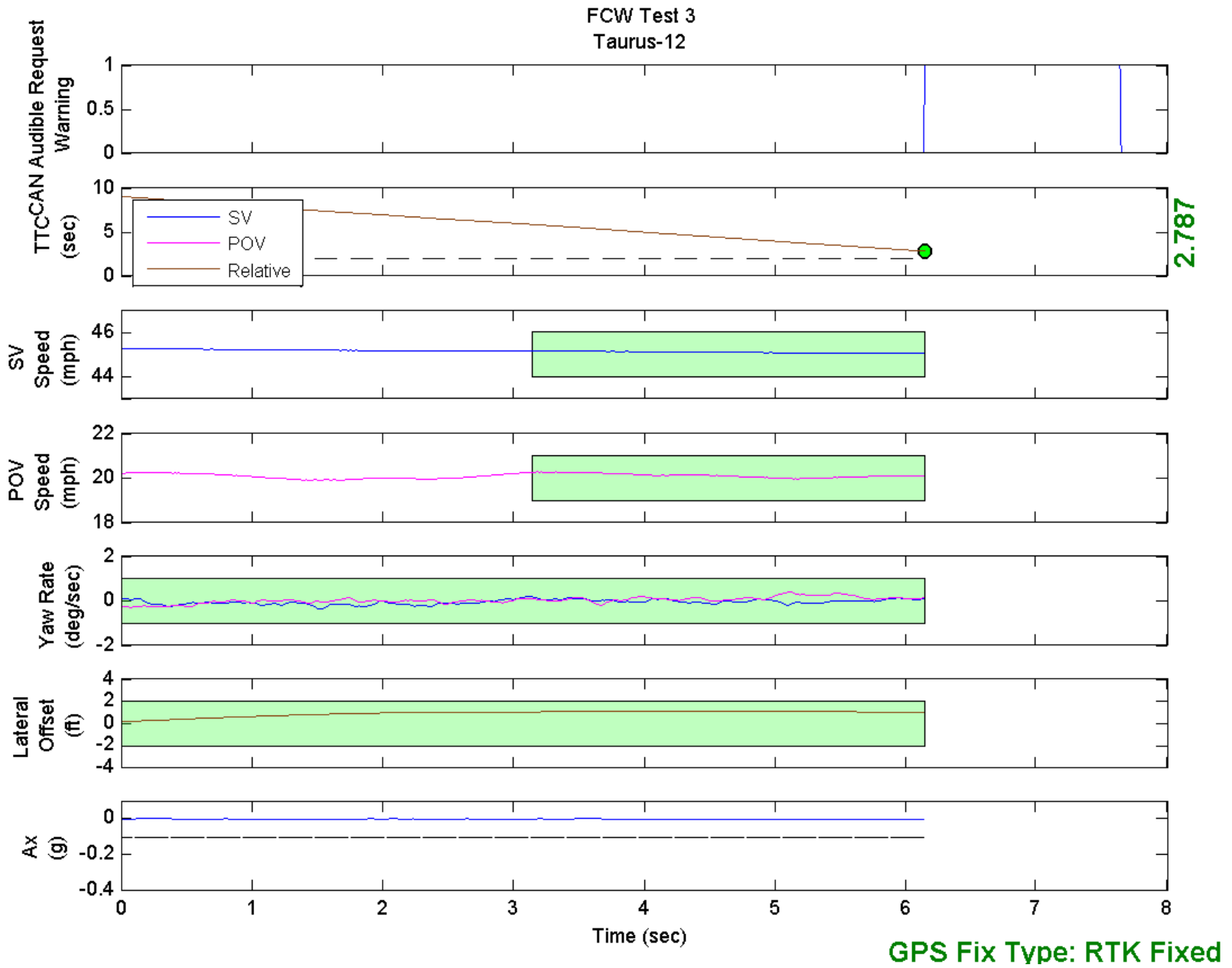


Figure D62. Time History for Run 12, FCW Test 3, CAN Audible Warning Request

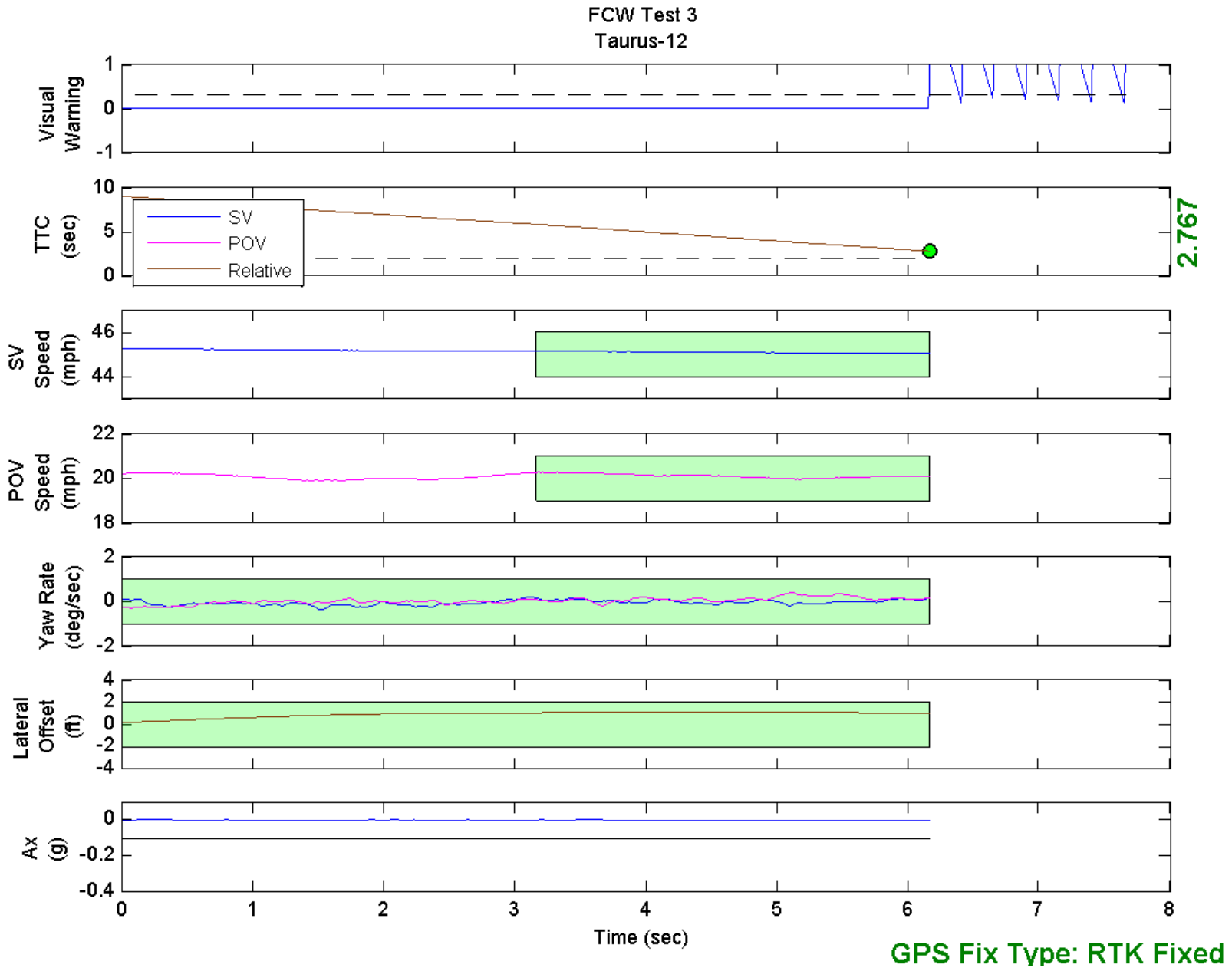


Figure D63. Time History for Run 12, FCW Test 3, Visual Warning

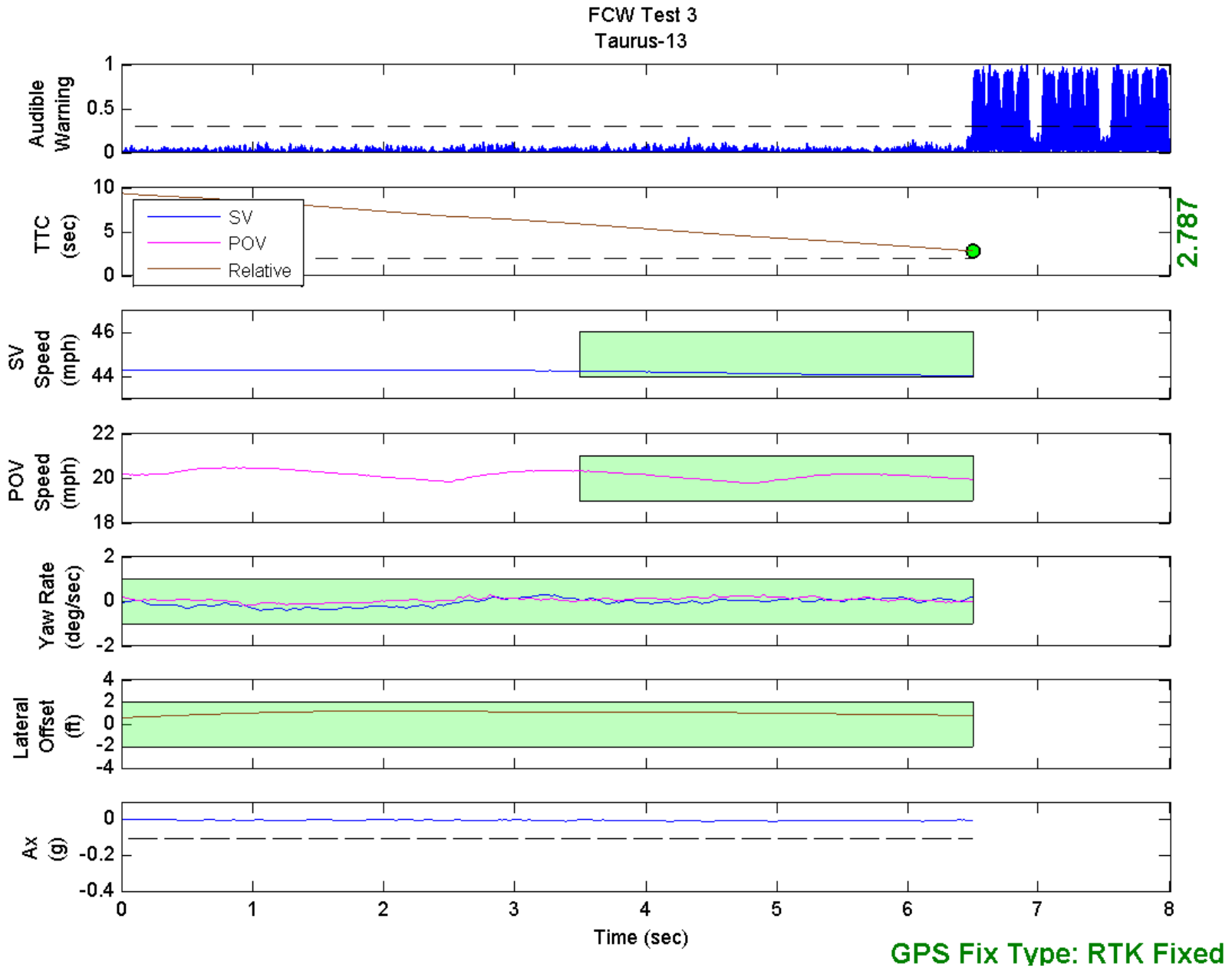


Figure D64. Time History for Run 13, FCW Test 3, Audible Warning

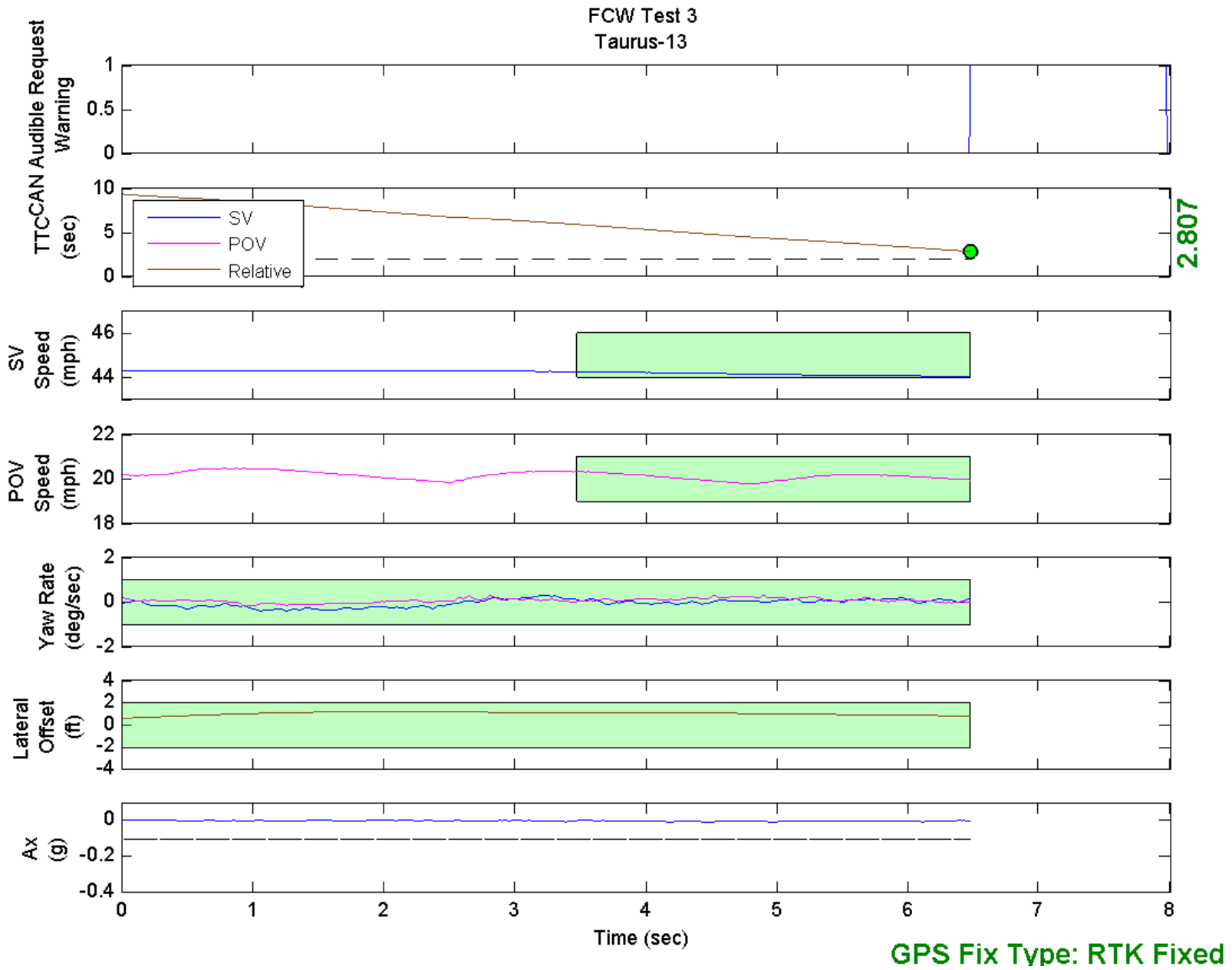


Figure D65. Time History for Run 13, FCW Test 3, CAN Audible Warning Request

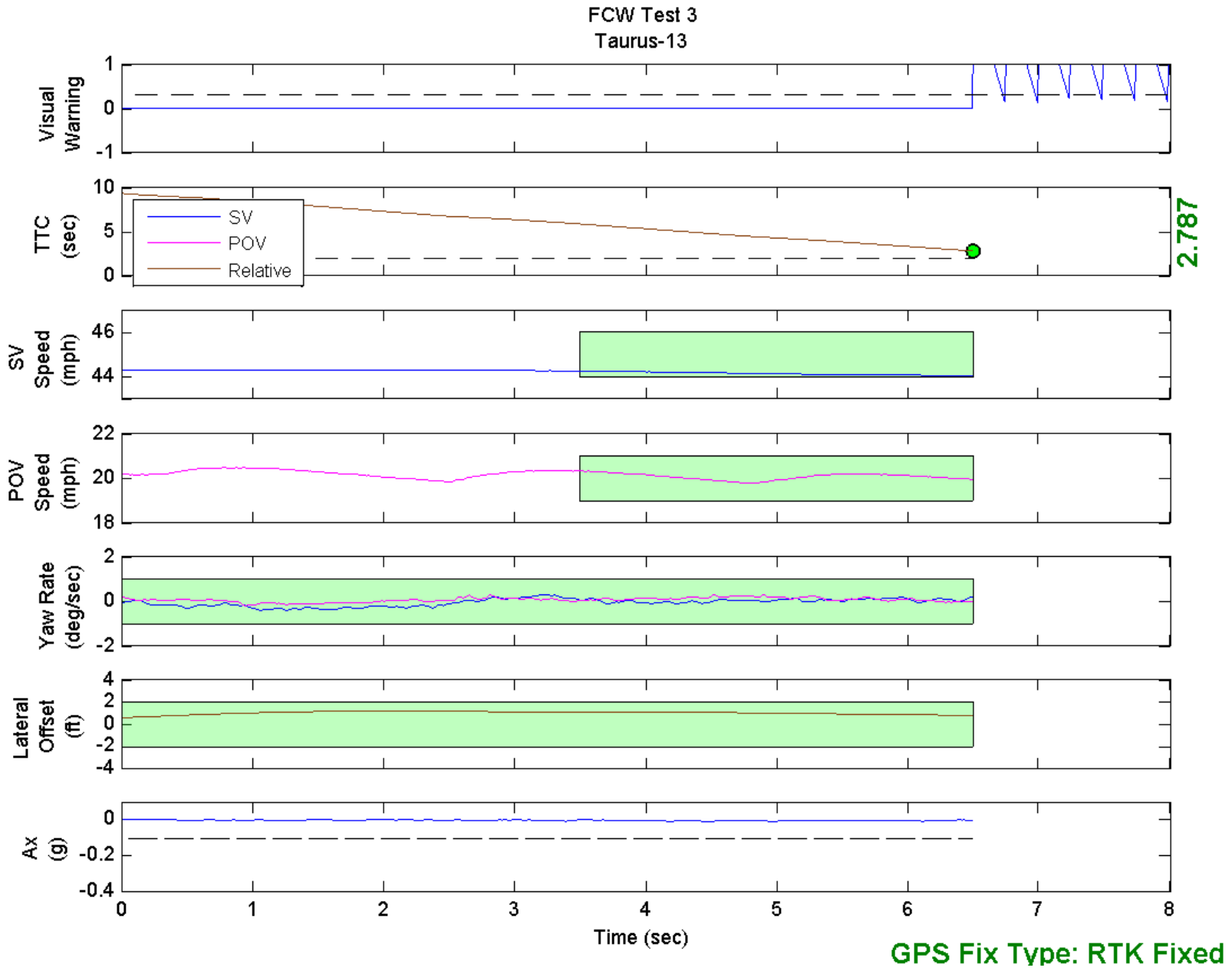


Figure D66. Time History for Run 13, FCW Test 3, Visual Warning

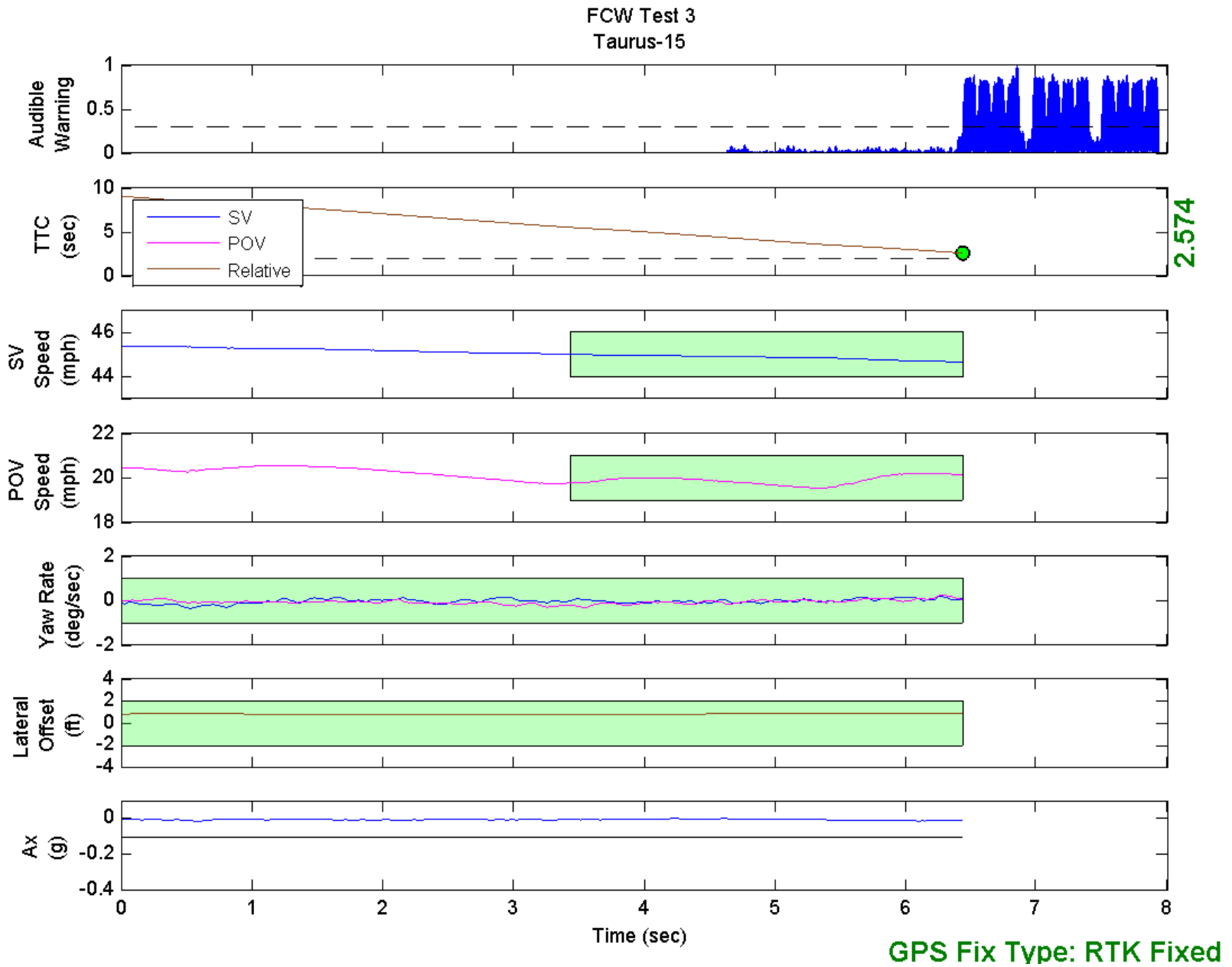


Figure D67. Time History for Run 15, FCW Test 3, Audible Warning

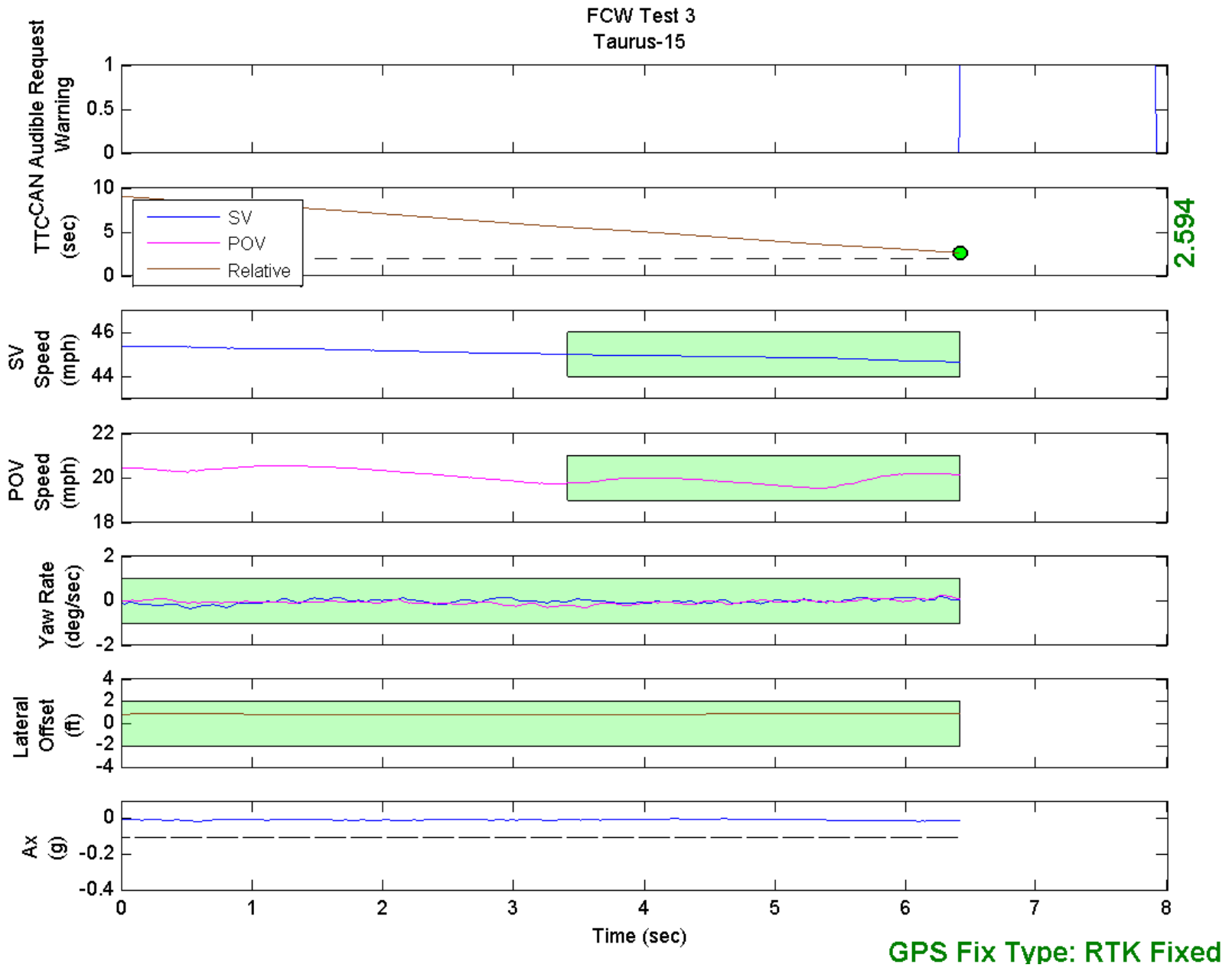


Figure D68. Time History for Run 15, FCW Test 3, CAN Audible Warning Request

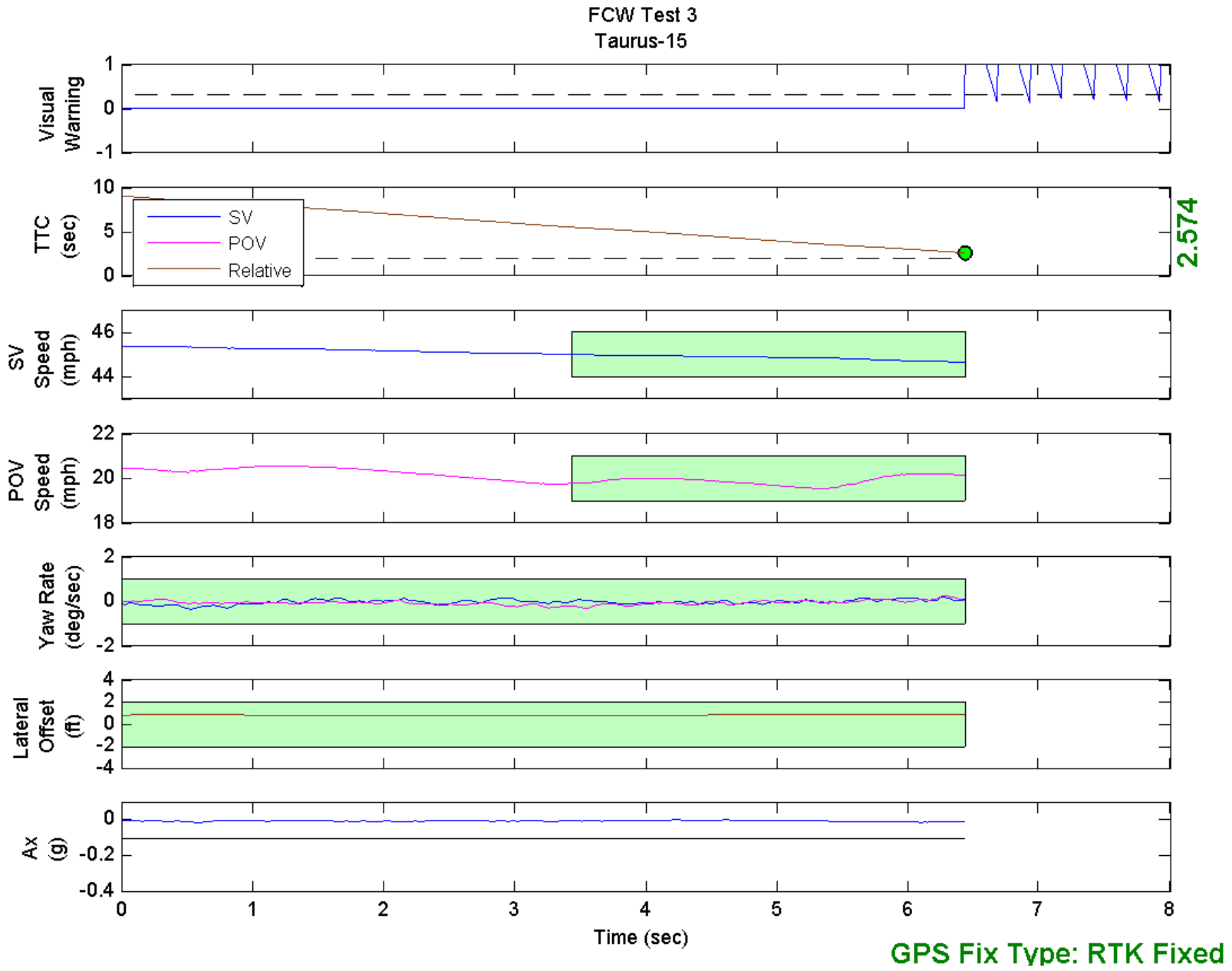


Figure D69. Time History for Run 15, FCW Test 3, Visual Warning