Vehicle Handling Performance

Volume 2 of 2
Vehicle Response Data

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# VOLUME 2

## VEHICLE HANDLING PERFORMANCE

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APPENDIX VII
FULL-SCALE PROGRAM DATA

This appendix contains the data plots for all test vehicles in all maneuvers. Each plot contains those data points which are considered to be valid as generated from the digital tabulation discussed in Appendix V.

The plots are organized by maneuver number groupings. The derivations of the various numerics are defined in Appendix V mathematically, and are redefined ahead of each group of plots in descriptive terms.

The data plots in each maneuver are arranged with an alphabetical order of vehicle presentation, as follows:

Ambassador (AMC)
Austin America
Brookwood (Chevrolet)
Dodge Coronet
Firebird (Pontiac)
Galaxie (Ford)
Gremlin (AMC)
Imperial (Chrysler)
Lotus Europa
Mercedes 300 SEL
Toronado (Oldsmobile)
Volkswagen Super Beetle

Data plots are not provided for either the Austin or Volkswagen in VHTP #5, 60 mph. In addition, no VHTP #6 data is provided for the Austin.
VHTP #1 - STRAIGHT LINE BRAKING

$(A_x)_{ave}$ - Average Deceleration from 35 mph to 10 mph

$P_B$ - Brake Line Pressure

● - Indicates 2 Wheels Locked on the Same Axle

○ - Indicates Fewer Than 2 Wheels Locked on Either Axle
(A_x)_{AV} - Average Longitudinal Acceleration (G's)

P_B - Brake Line Pressure (psi)

STRAIGHT LINE BRAKING - AMBASSADOR
(A_x)_{AV} - Average Longitudinal Acceleration (G's)

P_B - Brake Line Pressure (psi)

STRAIGHT LINE BRAKING - AUSTIN
\( A'_x \) A\text{v} - Average Longitudinal Acceleration (G's)

\( P_B \) - Brake Line Pressure (psi)

STRAIGHT LINE BRAKING - FIREBIRD TRANS-AM
$P_B$ - Brake Line Pressure (psi)

STRAIGHT LINE BRAKING - GALAXIE
(l_x)_{AV} - Average Longitudinal Acceleration (G's)

P_B - Brake Line Pressure (psi)

STRAIGHT LINE BRAKING - GREMLIN
$A_x \text{ AV} - \text{Average Longitudinal Acceleration (G's)}$

$P_B - \text{Brake Line Pressure (psi)}$

STRAIGHT LINE BRAKING - IMPERIAL
\( \langle A_x \rangle_{AV} \) - Average Longitudinal Acceleration (G's)

\( P_B \) - Brake Line Pressure (psi)

STRaight Line Braking - Lotus
(A_x)_{AV} - Average Longitudinal Acceleration (G's)

P_B - Brake Line Pressure (psi)

STRAIGHT LINE BRAKING - TORONADO
\((A_x)_{AV} - \text{Average Longitudinal Acceleration (G's)}\)

\(P_B - \text{Brake Line Pressure (psi)}\)

STRAIGHT LINE BRAKING - VOLKSWAGEN
VHTP #2 - BRAKING IN A TURN

$(A_x)_{ave}$ - Average Deceleration from 35 mph to 10 mph

$P_B$ - Brake Line Pressure

$\beta_P$ - Peak Vehicle Sideslip Angle

$\dot{\beta}_P$ - Peak Vehicle Sideslip Angle Rate

$R_o(1/R)$ - Average Path Curvature Ratio Relative to Initial Turn

○ - Indicates Right Turn - Fewer Than 2 Wheels Locked On Any Axle

△ - Indicates Left Turn - Fewer Than 2 Wheels Locked On Any Axle

● - Indicates Right Turn - 2 Wheels Locked On One Axle

▲ - Indicates Left Turn - 2 Wheels Locked On One Axle
(A_x)_{AV} - Average Longitudinal Acceleration (G's)

P_B - Brake Line Pressure (psi)

BRAKING IN A TURN - AUSTIN
BRAKING IN A TURN - DODGE
\( (A_x)_{AV} \) - Average Longitudinal Acceleration (G's)

\[ P_B \] - Brake Line Pressure (psi)

BRAKING IN A TURN - GREMLIN
\( (A_x^\text{AV}) \) - Average Longitudinal Acceleration (G's)

\( P_B \) - Brake Line Pressure (psi)

BRAKING IN A TURN - IMPERIAL
Average Longitudinal Acceleration (G's) vs. Brake Line Pressure (psi)
(A_x)_{AV} - Average Longitudinal Acceleration (G's)

P_B - Brake Line Pressure (psi)

BRAKING IN A TURN - MERCEDES
\( \dot{\beta}_p \) - Peak Sideslip Angle Rate - Radians/sec

\((A_x)_av\) - Average Longitudinal Acceleration - G's

BRAKING IN A TURN - AMBASSADOR
\( \dot{\phi}_p \) - Peak Sideslip Angle Rate - Radians/sec

\((A_x)_{av}\) - Average Longitudinal Acceleration - G's

BRAKING IN A TURN - DODGE
BRAKING IN A TURN - GALAXIE
$\beta_p$ - Peak Sideslip Angle Rate - Radians/sec

$(A_x)_av$ - Average Longitudinal Acceleration - G's

BRAKING IN A TURN - GREMLIN
\( \dot{\alpha}_p \) - Peak Sideslip Angle Rate - Radians/sec

\((A_x)_{av}\) - Average Longitudinal Acceleration - G's

BRAKING IN A TURN - IMPERIAL
\( \dot{\mu}_p \) - Peak Sideslip Angle Rate - Radians/sec

\((A_x)_{av}\) - Average Longitudinal Acceleration 0 G's

BRAKING IN A TURN - TORONADO
BRAKING IN A TURN - AMBASSADOR

(A_x)_av - Average Longitudinal Acceleration - G's

P_o^1/\sqrt{R} - Average Path Curvature Ratio
Average Longitudinal Acceleration - G's

BRAKING IN A TURN - AUSTIN
Braking in a Turn - Chevrolet

Average Longitudinal Acceleration - G's

\( R_o (\frac{1}{R}) \) - Average Path Curvature Ratio

\( (A_x)_{av} \) - Average Longitudinal Acceleration - G's
Average Longitudinal Acceleration - G's

BRAKING IN A TURN - DODGE

43
BRAKING IN A TURN - FIREBIRD

\[ (A_x)_{av} \] - Average Longitudinal Acceleration - G's
(A_x)_{av} - Average Longitudinal Acceleration - G's

BRAKING IN A TURN - GALAXIE
BRAKING IN A TURN - GREMLIN

(A_x)_{av} - Average Longitudinal Acceleration - G's
BRAKING IN A TURN - IMPERIAL
(A_x)_{av} - Average Longitudinal Acceleration - G's

BRAKING IN A TURN - LOTUS

48
BRAKING IN A TURN - MERCEDES
BRAKING IN A TURN - VW
VHTP #3 - ROADHOLDING IN A TURN

f - Roadroughness Fundamental Frequency—Determined by the Spacing of the Disturbance Elements in Each Grid

\[ R_o(1/R)_{ave} \] - Average Path Curvature Ratio Relative to the Initial Turn

\[ \dot{\phi}_p \] - Peak Body Sideslip Rate
The clipping of high frequency, large amplitude noise in the A signal during data acquisition may have introduced certain small distortions into these data numerics.
The clipping of high frequency, large amplitude noise in the A signal during data acquisition may have introduced certain small distortions into these data numerics.
The clipping of high frequency, large amplitude noise in the $A_y$ signal during data acquisition may have introduced certain small distortions into these data numerics.

Certain values of $(1/R)_ave$ for this vehicle were seen to register as negative quantities and thus, are not represented on this graph.

$f$ - Roadroughness Fundamental Frequency - Hz

ROADHOLDING IN A TURN - CHEVROLET

55
ROADHOLDING IN A TURN - DODGE

$R_o^{-1}/R$ - Average Path Curvature Ratio

$f$ - Roadroughness Fundamental Frequency - Hz
The clipping of high frequency, large amplitude noise in the A_y signal during data acquisition may have introduced certain small distortions into these data numerics.
ROADHOLDING IN A TURN - GALAXIE

$R_o(1/R)$ - Average Path Curvature Ratio

$f$ - Roadroughness Fundamental Frequency - Hz
The clipping of high frequency, large amplitude noise in the A_y signal during data acquisition may have introduced certain small distortions into these data numerics.
ROADHOLDING IN A TURN - IMPERIAL

\[ f - \text{Roadroughness Fundamental Frequency} - \text{Hz} \]
The clipping of high frequency, large amplitude noise in the A signal during data acquisition may have introduced certain small distortions into these data numerics.

Certain values of \((1/R)_{ave}\) for this vehicle were seen to register as negative quantities and thus, are not represented on this graph.
The clipping of high frequency, large amplitude noise in the $A_y$ signal during data acquisition may have introduced certain small distortions into these data numerics.

Certain values of $(1/R)$ for this vehicle were seen to register as negative quantities and thus, are not represented on this graph.

$R_o(1/R)$ - Average Path Curvature Ratio

$f$ - Roadroughness Fundamental Frequency - Hz

ROADHOLDING IN A TURN - MERCEDES

62
The clipping of high frequency, large amplitude noise in the A signal during data acquisition may have introduced certain small distortions into these data numerics.
ROADHOLDING IN A TURN - VW

$R_o \left( \frac{1}{R} \right)$ - Average Path Curvature Ratio

$f$ - Roadroughness Fundamental Frequency - Hz
ROADHOLDING IN A TURN - AMBASSADOR

\[
\hat{\beta}_p - \text{Peak Sideslip Angle Rate} \quad \text{Radians/sec}
\]

\[
f - \text{Roadroughness Fundamental Frequency} = H_f
\]

65
\( f \) - Roadroughness Fundamental Frequency - \( H_f \)

ROADHOLDING IN A TURN - CHEVROLET

67
ROADHOLDING IN A TURN - DODGE

$\dot{\phi}_p$ - Peak Sideslip Angle Rate - Radians/sec

$f$ - Roadroughness Fundamental Frequency - $H_f$
ROADHOLDING IN A TURN - FIREBIRD

\[ f - \text{Roadroughness Fundamental Frequency} - H_f \]

\[ \dot{\phi}_p - \text{Peak Sideslip Angle Rate} - \text{Radians/sec} \]
ROADHOLDING IN A TURN - GALAXIE

\[ \dot{\phi}_p - \text{Peak Sideslip Angle Rate - Radians/sec} \]

\[ f - \text{Roadroughness Fundamental Frequency - } H_f \]
ROADHOLDING IN A TURN - GREMLIN

71
f - Roadroughness Fundamental Frequency - $H_f$

ROADHOLDING IN A TURN - IMPERIAL

72
ROADHOLDING IN A TURN - LOTUS

\( f - \) Roadroughness Fundamental Frequency - \( H_f \)

\( \dot{\beta}_p - \) Peak Sideslip Angle Rate - Radians/sec

\( f = f - \text{Roadroughness Fundamental Frequency} - H_f \)
ROADHOLDING IN A TURN - MERCEDES

ROADROUGHNESS FUNDAMENTAL FREQUENCY - $H_f$
ROADHOLDING IN A TURN - TORONADO
ROADHOLDING IN A TURN - VW

\( f \) - Roadroughness Fundamental Frequency - \( H_f \)
VHTP #4 - TRAPEZOIDAL STEER

Δ - Indicates Left Turn

O - Indicates Right Turn

\( \dot{\beta}_p \) - Peak Vehicle Sideslip Angular Rate

\( \beta_p \) - Peak Vehicle Sideslip Angle

\( \dot{\beta}_p \) - Peak Vehicle Sideslip Angular Rate

\( R_s (1/R)_{ave} \) - Path Curvature Response Averaged Over Two Seconds and Ratiored to a Reference Path Curvature Deriving from a Steady Turn of 40 mph and 1.0g \( A_y \).

\( r_p \) - Peak Yaw Rate

\( \sigma' \) - Normalized Steer Angle, or Nominal Front Wheel Steer Angle

\( Y_p \) - Peak Lateral Acceleration

\( N \) - Test Runs
$R_s(\frac{1}{R})_{av}$ - Normalized Path Curvature Ratio

$\sigma'$ - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - BROOKWOOD

80
\( \frac{1}{R} \) - Normalized Path Curvature Ratio

\( \sigma' \) - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - GREMLIN
TRAPEZOIDAL STEER - IMPERIAL

\( \sigma' \) - Normalized Steer Angle - Degrees

\( \frac{1}{R} \text{av} \) - Normalized Path Curvature Ratio

Normalized Steer Angle - Degrees

85
TRAPEZOIDAL STEER - LOTUS
Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - MERCEDES

87
TRAPEZOIDAL STEER - VW

\( R_s (l/R)_{av} - \text{Normalized Path Curvature Ratio} \)

\( \sigma' - \text{Normalized Steer Angle - Degrees} \)
$\beta_p$ - Peak Sideslip Angle - Radians

$\sigma'$ - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - BROOKWOOD
\( \beta_p \) - Peak Sideslip Angle - Radians

\( \sigma' \) - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - DODGE
$\beta_p$ - Peak Sideslip Angle - Radians

$\sigma'$ - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - GALAXIE
TRAPEZOIDAL STEER - TORONADO
$\dot{\beta}_p$ - Peak Sideslip Rate - Radians/sec

$\sigma'$ - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - BROOKWOOD
\( \dot{\gamma} \) - Peak Sideslip Rate - Radians/sec

\( \sigma' \) - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - FIREBIRD
\( \dot{\beta}_p \) – Peak Sideslip Rate – Radians/sec

\( \sigma' \) – Normalized Steer Angle – Degrees

TRAPEZOIDAL STEER – GREMLIN
\( \dot{\phi}_p \) - Peak Sideslip Rate - Radians/sec

\( \sigma' \) - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - LOTUS
\( \dot{\beta}_p \) - Peak Sideslip Rate - Radians/sec

\( \sigma' \) - Normalized Steer Angle - Degrees

TRAPEZIODAL STEER - TORONADO
\( \dot{\beta}_p \) - Peak Sideslip Rate - Radians/sec

\( \frac{1}{R} \frac{1}{R_{av}} \) - Normalized Path Curvature Ratio

TRAPEZOIDAL STEER - BROOKWOOD
\( \dot{\beta}_p \) - Peak Sideslip Rate - Radians/sec

\( R_s \left( \frac{1}{R} \right)_{av} \) - Normalized Path Curvature Ratio

TRAPEZOIDAL STEER - DODGE
TRAPEZOIDAL STEER - GALAXIE
\[ \dot{\beta}_p - \text{Peak Sideslip Rate - Radians/sec} \]

\[ Rs \left( \frac{1}{R_v} \right) \text{- Normalized Path Curvature Ratio} \]

TRAPEZOIDAL STEER - IMPERIAL
\( \hat{\beta}_p \) - Peak Sideslip Rate - Radians/sec

\( R_s \left( \frac{1}{R} \right)_{av} \) - Normalized Path Curvature Ratio

TRAPEZOIDAL STEER - LOTUS
\( \sigma' \) - Normalized Steer Angle - Degrees

**TRAPEZOIDAL STEER - AMBASSADOR**
$\theta'$ - Normalized Steer Angle - Degrees

$A_{yp}$ - Peak Lateral Acceleration - G's

TRAPEZOIDAL STEER - AUSTIN

127
$\sigma'$ - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - FIREBIRD

130
TRAPEZOIDAL STEER - GALAXIE

\( \sigma' \) - Normalized Steer Angle - Degrees

\( A_{y_p} \) - Peak Lateral Acceleration - G's
TRAPEZOIDAL STEER - IMPERIAL

\( \sigma' \) - Normalized Steer Angle - Degrees

\( A_y_p \) - Peak Lateral Acceleration - G's
A_y^p \text{ - Peak Lateral Acceleration - G's}

\sigma' \text{ - Normalized Steer Angle - Degrees}

TRAPEZOIDAL STEER - LOTUS
$\sigma' - \text{Normalized Steer Angle - Degrees}$

$A_{y_p} - \text{Peak Lateral Acceleration - G's}$

**TRAPEZOIDAL STEER - TORONADO**

136
$A_{y_p}$ - Peak Lateral Acceleration - G's

$c'$ - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - VW

137
TRAPEZOIDAL STEER - AMBASSADOR

138
$\sigma'$ - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - DODGE

141
TRAPEZOIDAL STEER - GALAXIE
TRAPEZOIDAL STEER - GREMLIN
TRAPEZOIDAL STEER - IMPERIAL

\( \sigma' \) - Normalized Steer Angle - Degrees

\( r_p \) - Peak yaw rate - Radians/sec
\( \sigma' - \text{Normalized Steer Angle - Degrees} \)

\( \tau_p - \text{Peak Yaw Rate - Radians/sec} \)

TRAPEZOIDAL STEER - LOTUS

146
Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - MERCEDES

$p^\circ$ - Peak Yaw Rate - Radians/sec

$\sigma'$ - Normalized Steer Angle - Degrees

147
Normalized Steer Angle - Degrees

\( \sigma' \) - Normalized Steer Angle - Degrees

TRAPEZOIDAL STEER - TORONADO

148
TRAPEZOIDAL STEER - TIRE BREAK-IN DATA - AUSTIN
$A_{y,p}$ - Peak Lateral Acceleration - G's

$N$ - Test Runs

TRAPEZOIDAL STEER - TIRE BREAK-IN DATA - LOTUS
VHTP #5 - SINUSOIDAL STEER

$\Delta \psi$ - Vehicle Heading Angle Deviation After 3.4 Seconds

$\sigma$ - Normalized Steer Angle, or Nominal Front Wheel Steer Angle

$\Delta$ - Lane Change Deviation from "Ideal" Lane Change Displacement

$\beta_p$ - Peak Sideslip Angle

$\Delta$ - Indicates Sine Steer Input is of "Initially Left" polarity

$\bigcirc$ - Indicates Sine Steer Input is of "Initially Right" polarity
Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - AMBASSADOR

163
$\Delta$ - Lane Change Deviation - Feet

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - BROOKWOOD
SINUSOIDAL STEER - 45 MPH - DODGE
SINUSOIDAL STEER - 45 MPH - FIREBIRD

\( \sigma \) - Normalized Steer Angle - Degrees
SINUSOIDAL STEER - 45 MPH - GALAXIE
$\Delta$ - Lane Change Deviation - Feet

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - GREMLIN

169
SINUSOIDAL STEER - 45 MPH - IMPERIAL
SINUSOIDAL STEER - 45 MPH - LOTUS
A - Lane Change Deviation - Feet

σ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - MERCEDES
Δ - Lane Change Deviation - Feet

σ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - TORONADO

173
\( \Delta - \text{Lane Change Deviation - Feet} \)

\( \sigma - \text{Normalized Steer Angle - Degrees} \)

SINUSOIDAL STEER - 45 MPH - VW
SINUSOIDAL STEER - 60 MPH - AMBASSADOR

\( \sigma \) - Normalized Steer Angle - Degrees

\( \Delta \) - Lane Change Deviation - Feet
Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - DODGE
The plotted points on this figure are invalid, in a strict sense, because of an offset which was present in the steering displacement sinusoid during testing. The dashed line is shown to represent an approximate mean performance for this vehicle as is indicated by the data.
SINUSOIDAL STEER - 60 MPH - GREMLIN

\[ \Delta - \text{Lane Change Deviation - Feet} \]

\[ \sigma - \text{Normalized Steer Angle - Degrees} \]
A - Lane Change Deviation - Feet

σ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - MERCEDES
SINUSOIDAL STEER - 60 MPH - TORONADO
\( \beta_p \) - Peak Sideslip Angle - Radians

\( \sigma \) - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - AMBASSADOR
\[ \beta_p - \text{Peak Sideslip Angle - Radians} \]

\[ \sigma - \text{Normalized Steer Angle - Degrees} \]

**SINUSOIDAL STEER - 45 MPH - AUSTIN**
\( \beta_p \) - Peak Sideslip Angle - Radians

\( \sigma \) - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - DODGE
$\beta_P$ - Peak Sideslip Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - FIREBIRD
\( \beta_P \) - Peak Sideslip Angle - Radians

\( \sigma \) - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - GREMLIN
\[ \beta_p - \text{Peak Sideslip Angle - Radians} \]

\[ \sigma - \text{Normalized Steer Angle - Degrees} \]

SINUSOIDAL STEER - 45 MPH - Lotus
$\beta_p$ - Peak Sidetrip Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 45 MPH - VW
\( \beta_p \) - Peak Sideslip Angle - Radians

\( \sigma \) - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - AMBASSADOR
SINUSOIDAL STEER - 60 MPH - BROOKWOOD
$\beta_p$ - Peak Sideslip Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - DODGE
The plotted points on this figure are invalid, in a strict sense, because of an offset which was present in the steering displacement sinusoid during testing. The dashed line is shown to represent an approximate mean performance for this vehicle as is indicated by the data.

$\beta_p$ - Peak Sideslip Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - GALAXIE
SINUSOIDAL STEER - 60 MPH - LOTUS
$\beta_p$ - Peak Sideslip Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - MERCEDES
\[ \beta_p - \text{Peak Sideslip Angle - Radians} \]

\[ \sigma - \text{Normalized Steer Angle - Degrees} \]

SINUSOIDAL STEER - 60 MPH - TORONADO
$\beta_p$ - Peak Sideslip Angle - Radians

$\Delta$ - Lane Change Deviation - Feet

SINUSOIDAL STEER - 45 MPH - FIREBIRD
$\beta_p$ - Peak Sideslip Angle - Radians

$\Delta$ - Lane Change Deviation - Feet

SINUSOIDAL STEER - 45 MPH - LOTUS
\[ \beta_p \text{ - Peak Sideslip Angle - Radians} \]

\[ \Delta \text{ - Lane Change Deviation - Feet} \]

SINUSOIDAL STEER - 45 MPH - TORONADO
\( \delta_p \) - Sideslip Angle - Radians

\( \Delta \) - Lane Change Deviation - Feet

SINUSOIDAL STEER - 45 MPH - VW
The plotted points on this figure are invalid, in a strict sense, because of an offset which was present in the steering displacement sinusoid during testing. The dashed line is shown to represent an approximate mean performance for this vehicle as is indicated by the data.
$\beta_p$ - Peak Sideslip Angle - Radians

$\Delta$ - Lane Change Deviation - Feet

SINUSOIDAL STEER - 60 MPH - LOTUS
$\beta_p$ - Peak Sideslip Angle - Radians

$\Delta$ - Lane Change Deviation - Feet

SINUSOIDAL STEER - 60 MPH - TORONADO
SINUSOIDAL STEER - 45 MPH - AUSTIN
SINEOIDAL STEER - 45 MPH - GALAXIE

\[ \phi - \text{Normalized Steer Angle} \quad \text{Degrees} \]

\[ \delta - \text{Heading Angle} \quad \text{Radians} \]

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$\Delta Y$ - Heading Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINEUSOIDAL STEER - 45 MPH - LOTUS
\[ \Delta \psi - \text{Heading Angle - Radians} \]

\[ \sigma - \text{Normalized Steer Angle - Degrees} \]

SINUSOIDAL STEER - 45 MPH - MERCEDES
SINUSOIDAL STEER - 45 MPH - TORONADO
$\Delta \Psi$ - Heading Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - BROOKWOOD
$\Delta \psi$ - Heading Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - DODGE
SINUSOIDAL STEER - 60 MPH - FIREBIRD
The plotted points on this figure are invalid, in a strict sense, because of an offset which was present in the steering displacement sinusoid during testing. The dashed line is shown to represent an approximate mean performance for this vehicle as is indicated by the data.

\[ \Delta \psi \text{ - Heading Angle - Radians} \]

\[ \phi \text{ - Normalized Steer Angle - Degrees} \]

SINUSOIDAL STEER - 60 MPH - GALAXIE
$\Delta \Psi$ - Heading Angle - Radians

$\sigma$ - Normalized Steer Angle - Degrees

SINUSOIDAL STEER - 60 MPH - TORONADO
VHTP #6 - DRASTIC STEER AND BRAKE

N - Test Runs

$\phi_p$ - Peak Value of Roll Angle
DRASTIC STEER/BRAKE - DODGE
$\phi_p$ - Peak Roll Angle - Radians

$N$ - Test Runs

DRASTIC STEER/BRAKE - FIREBIRD
$\phi_p$ - Peak Roll Angle - Radians

N - Test Runs

DRASIC STEER/BRAKE - GALAXIE
$\phi_p$ - Peak Roll Angle - Radians

N - Test Runs

DRASTIC STEER/BRAKE - TORONADO