

# Spec MX-5 Data Webinar



**SMX Data Webinar**

*How data will shape  
the future of Spec Racing*

July 12th, 2023  
9PM ET/6PM PT

**SPEC MX-5 CHALLENGE SERIES**  
Presented by TOYO TIRES

**AiM**

**MAZDA MOTORSPORTS**

Joshua Smith

Mazda Motorsports Manager

Roger Caddell

AiM Sports - National Training Manager

Justin Cornelison

Spec MX-5 Series Manager



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Wednesday July 12<sup>th</sup>, 2023

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# Today's Agenda

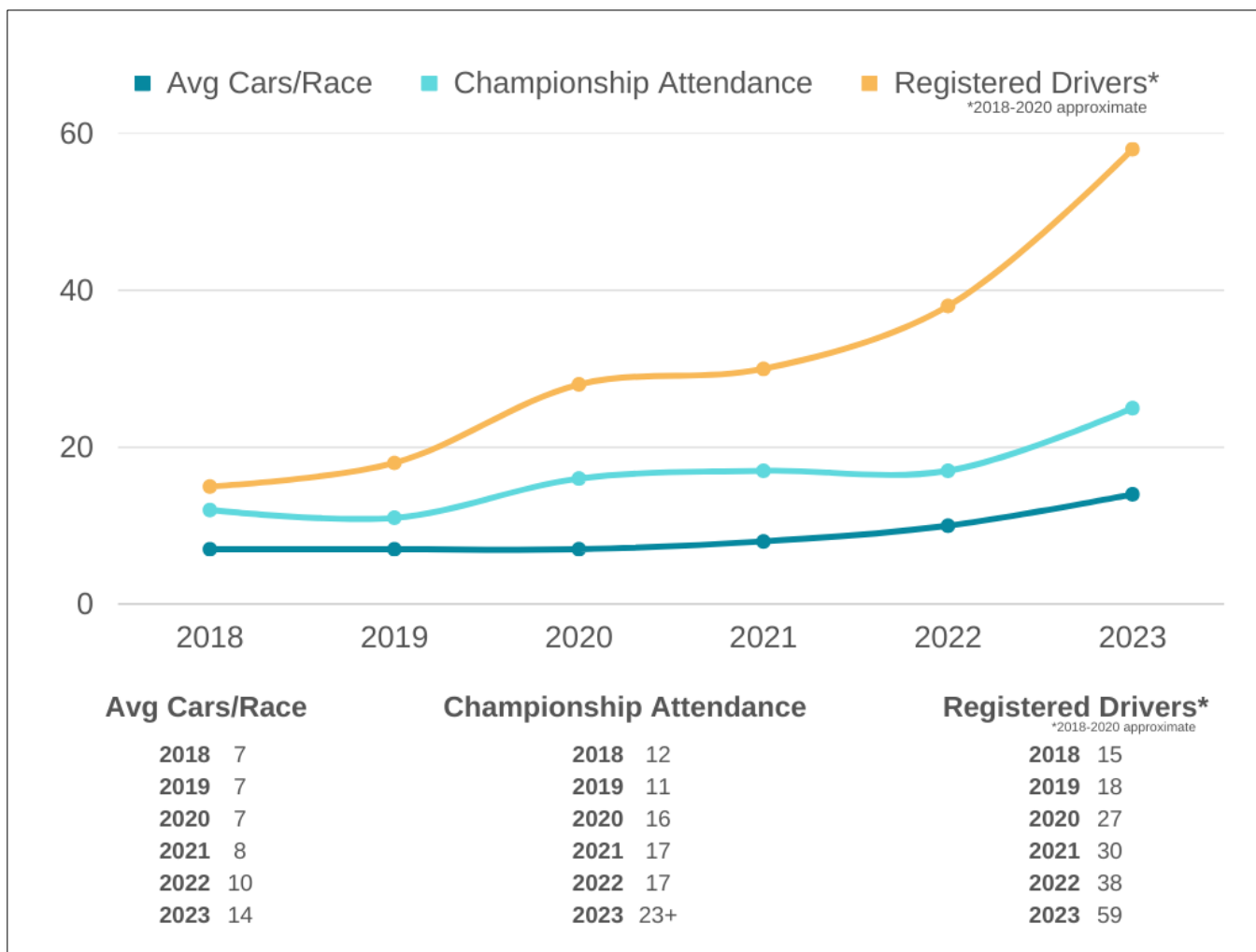
- **Josh Smith – Mazda Motorsports Manager**
  - Intent of this Webinar
  - Mazda's Commitment
  - National Status
  - Contingency Commitment
  - Unique Tech Platform
- **Justin Cornelison – Spec MX-5 Series Director**
  - Introduction
  - Data Acquisition Process
  - Why Spec MX-5?
- **Roger Caddell – AiM Sports National Training Manager**
  - Tech Compliance Background
  - Data Consistency – Additional Data Channels
  - Transferring and Importing Data
  - Current Tech Compliance Process
  - Real Racing Examples

**Introducing Data Reports**

Today's Agenda

# Spec MX-5 Growth

2018 - 2023



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Spec MX-5 Growth

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# Roger Caddell

AiM Sports - National Training Manager  
roger@aimsports.com



1995



1994



2006



2007

## Roger Caddell

AiM Sports National Training Manager

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# Tech Compliance Using Data

- We are Not Going to Cover the Topic Fully Today
- This Has Been a Focus for Me for Over 10 Years
- This Technology is Well Suited for this Task
- Data Should be Viewed as the 1<sup>st</sup> Level of Technical Compliance
- It is not Simple or Easy but can be Very Effective
- Not Everything can be Directly Found but the Resulting Performance Gains can be Quantified



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Technical Compliance Using Data



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# Data Consistency

## Mazda MX-5 NC Spec - ECU Protocol

- Current ECU Protocol – Follow Series Direction
- Channel Naming – Do Not Modify
- Leave All Channels Enabled

| Enabled Channels (Max. 120) 19 / 19 |                                     |                  |                        |          |       |
|-------------------------------------|-------------------------------------|------------------|------------------------|----------|-------|
| ID                                  | <input checked="" type="checkbox"/> | Name             | Function               | Unit     | Freq  |
| CC04                                | <input checked="" type="checkbox"/> | ECU RPM          | Engine RPM             | rpm      | 10 Hz |
| CC12                                | <input checked="" type="checkbox"/> | ECU ABS ALARM    | Number                 | #        | 10 Hz |
| CC05                                | <input checked="" type="checkbox"/> | ECU VEH SPEED    | Vehicle Speed          | mph 0.1  | 10 Hz |
| CC12                                | <input checked="" type="checkbox"/> | ECU SPD FL       | Wheel Speed            | mph 0.1  | 10 Hz |
| CC13                                | <input checked="" type="checkbox"/> | ECU SPD FR       | Wheel Speed            | mph 0.1  | 10 Hz |
| CC14                                | <input checked="" type="checkbox"/> | ECU SPD RL       | Wheel Speed            | mph 0.1  | 10 Hz |
| CC15                                | <input checked="" type="checkbox"/> | ECU SPD RR       | Wheel Speed            | mph 0.1  | 10 Hz |
| CC10                                | <input checked="" type="checkbox"/> | ECU WATER TEMP   | Water Temperature      | F        | 10 Hz |
| CC09                                | <input checked="" type="checkbox"/> | ECU INTAKE AIR T | Intake Air Temperature | F        | 10 Hz |
| CC16                                | <input checked="" type="checkbox"/> | ECU MAF          | Air Mass Flow          | g/s 0.1  | 10 Hz |
| CC01                                | <input checked="" type="checkbox"/> | ECU STEERING ANG | Steering Angle         | deg      | 10 Hz |
| CC06                                | <input checked="" type="checkbox"/> | ECU PPS2         | Percent                | % 0.1    | 10 Hz |
| CC07                                | <input checked="" type="checkbox"/> | ECU PPS          | Percent                | % 0.1    | 10 Hz |
| CC19                                | <input checked="" type="checkbox"/> | ECU LAMBDA       | Inner AFR              | A/F 0.01 | 10 Hz |
| CC02                                | <input checked="" type="checkbox"/> | ECU BRAKE PRESS  | Number                 | #        | 10 Hz |
| CC03                                | <input checked="" type="checkbox"/> | ECU BRAKE SWITCH | Number                 | #        | 10 Hz |
| CC08                                | <input checked="" type="checkbox"/> | ECU CLUTCH SW    | Number                 | #        | 10 Hz |
| CC11                                | <input checked="" type="checkbox"/> | ECU OIL LEV SW   | Number                 | #        | 10 Hz |
| CC20                                | <input checked="" type="checkbox"/> | ECU FUEL LEVEL   | Percent Fuel Level     | % 0.01   | 10 Hz |

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# Additional Data Channels

## Mandatory Analog Channels



- Follow Series Direction
- Currently Fuel Pressure is Mandatory
- Possibly More in Future

The image shows a 'Channel Settings' dialog box with the following fields and options:

- Name:** Fuel Pressure
- Function:** Fuel Press
- Sensor:** 0-150 psi (X05PSA00150P18)
- Sampling Frequency:** 20 Hz
- Unit of Measure:** psi
- Display Precision:** 1 decimal place

At the bottom right are 'Save' and 'Cancel' buttons.

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Additional Data Channels



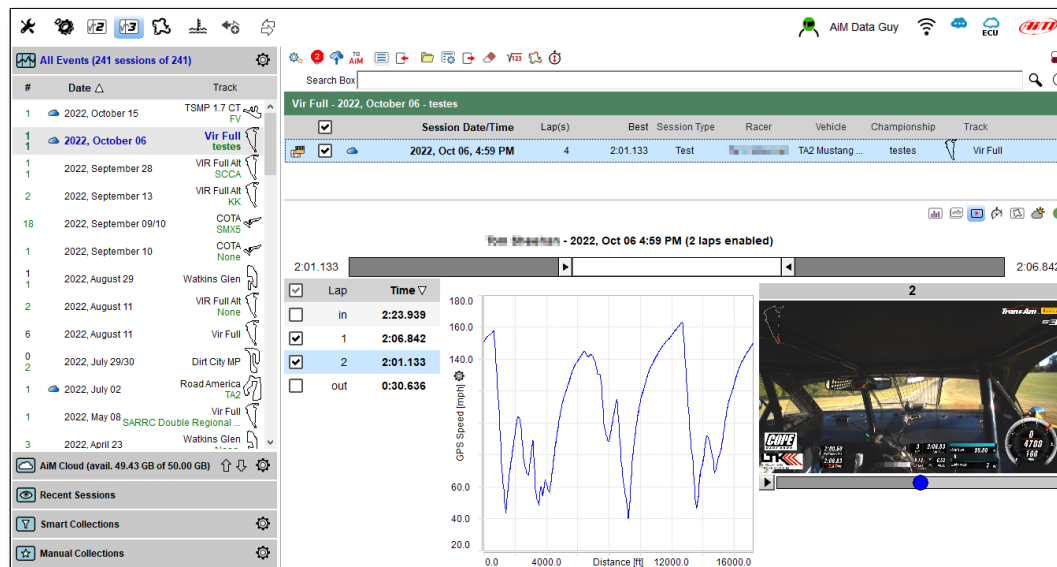
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# Data Transfer

## Data From Competitor to Series

- Data Transfer is an Evolving Process
- Currently Using a Defined E-mail Process
- In the Future There will be an Automated 'AiM Cloud' Process
- Security, Privacy, and Speed are Priorities



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Data Transfer

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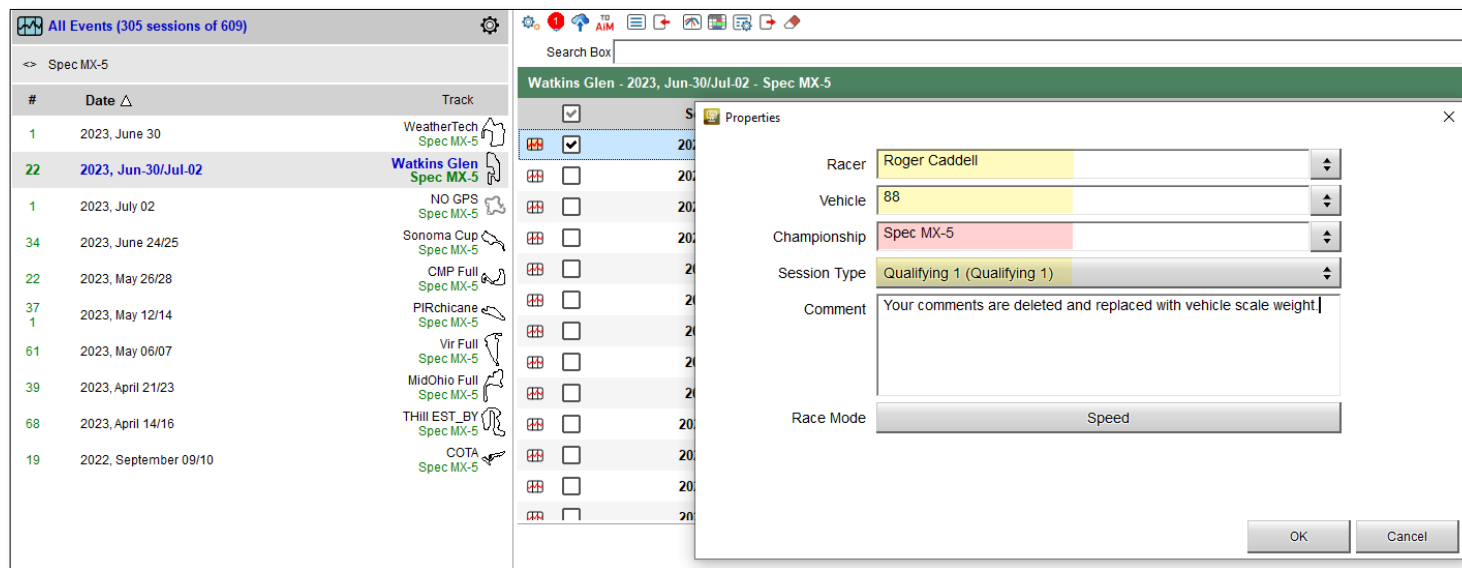


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# Data Import

## Importing Into Race Studio 3

- The Properties Can be Edited but Helpful if Correct
- The Most Helpful is Getting the 'Championship' Correct
- I Compare With RaceHero Results and Adjust to Match
- Any Comments are Deleted and Replaced with Scale Weight
- Tech Compliance Data is Imported Just Like Normal in RS3



The screenshot shows the Race Studio 3 interface. On the left, a list of events is displayed under the heading 'All Events (305 sessions of 609)'. The selected event is 'Watkins Glen - 2023, Jun-30/Jul-02 - Spec MX-5'. A 'Properties' dialog box is open, showing the following details:

- Racer: Roger Caddell
- Vehicle: 88
- Championship: Spec MX-5
- Session Type: Qualifying 1 (Qualifying 1)
- Comment: Your comments are deleted and replaced with vehicle scale weight.
- Race Mode: Speed

The dialog box has 'OK' and 'Cancel' buttons at the bottom right.

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Data Import

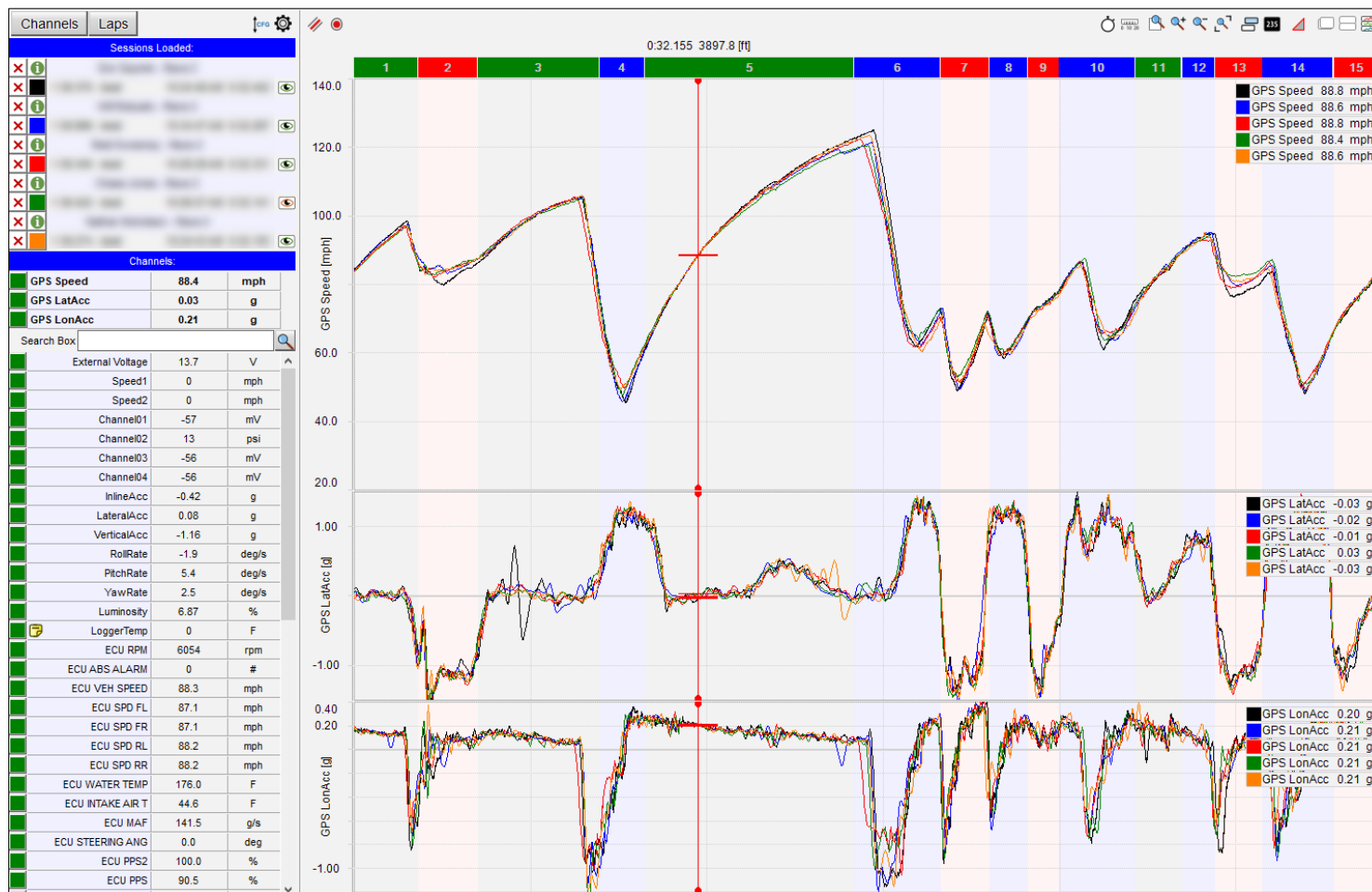
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# Initial Performance Checks

Start with Just Each Cars Best Lap



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Initial Performance Checks

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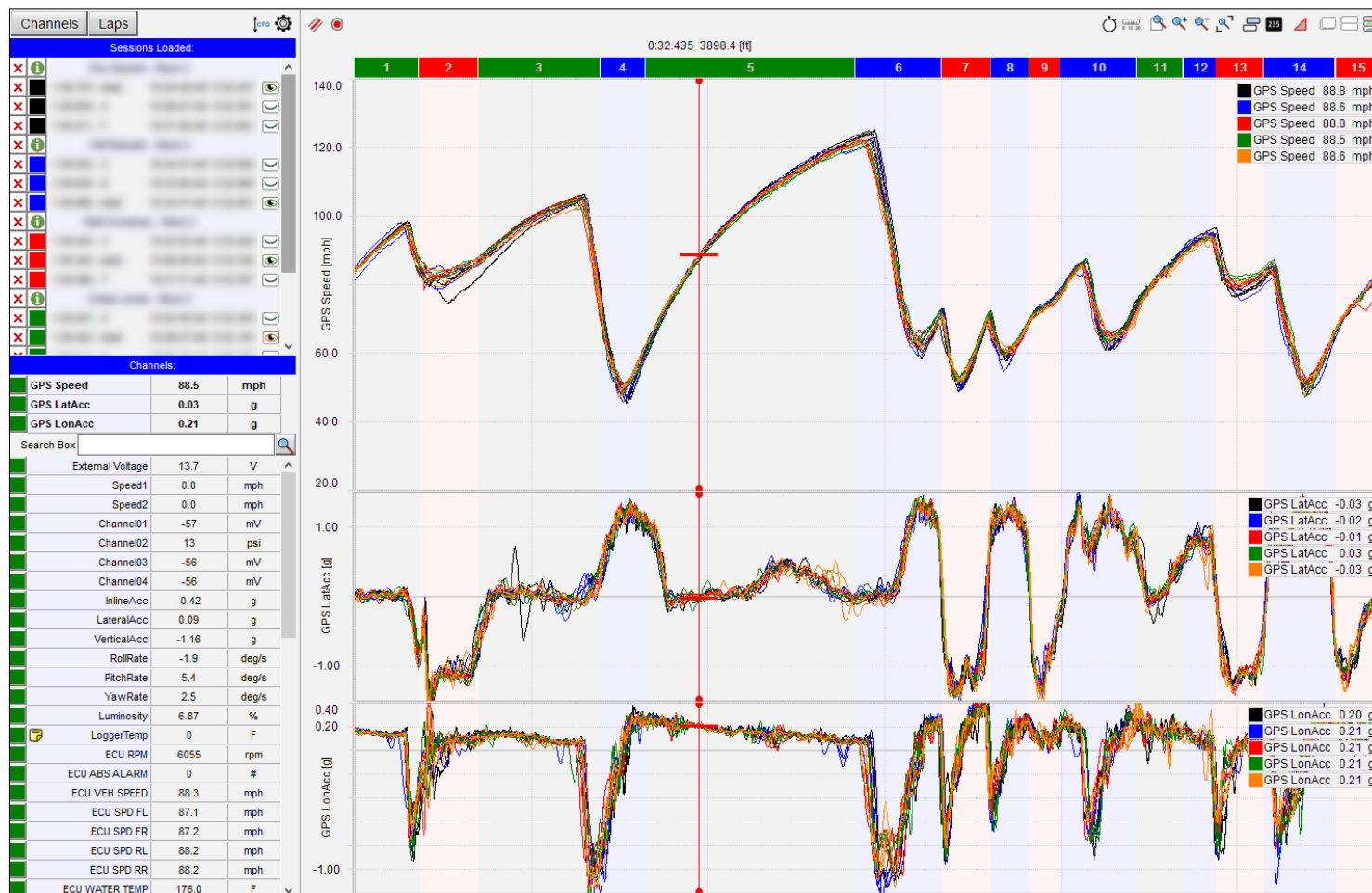
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# Initial Performance Checks

Followed by Each Cars 3 Best Laps



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Initial Performance Checks

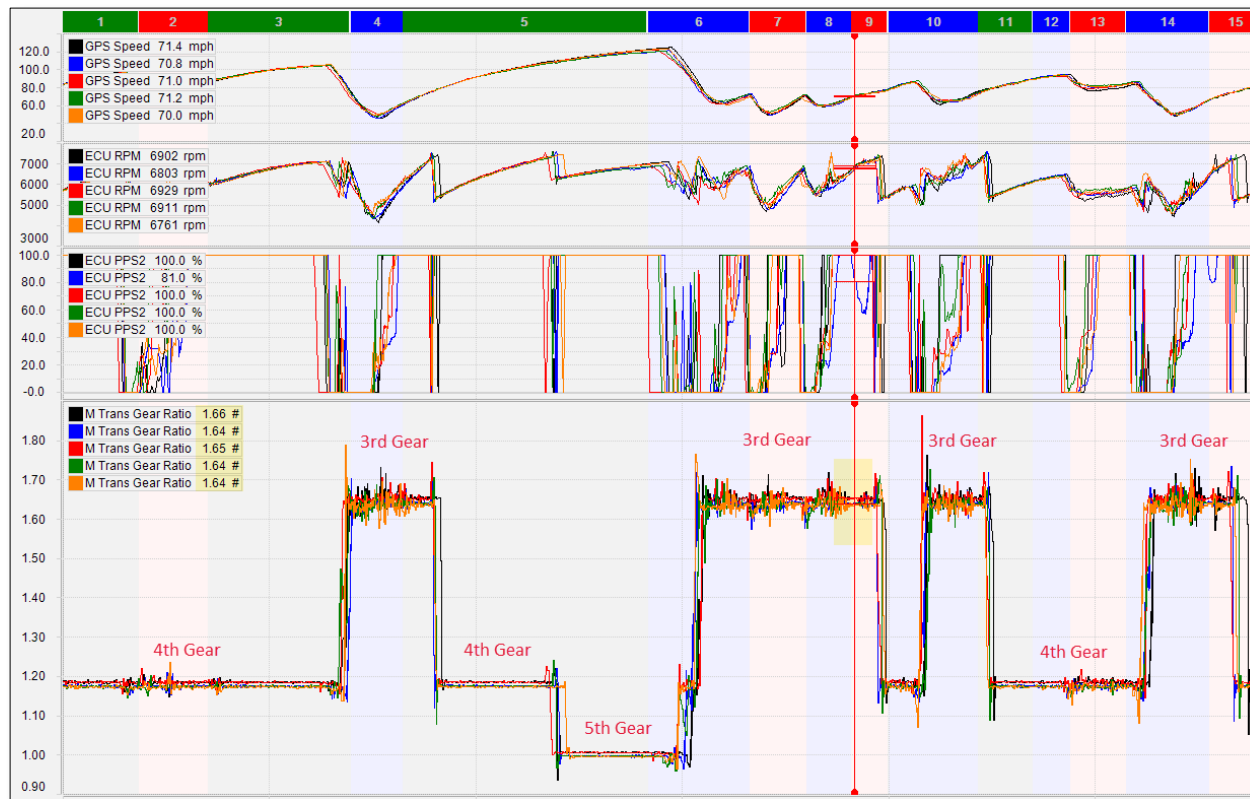
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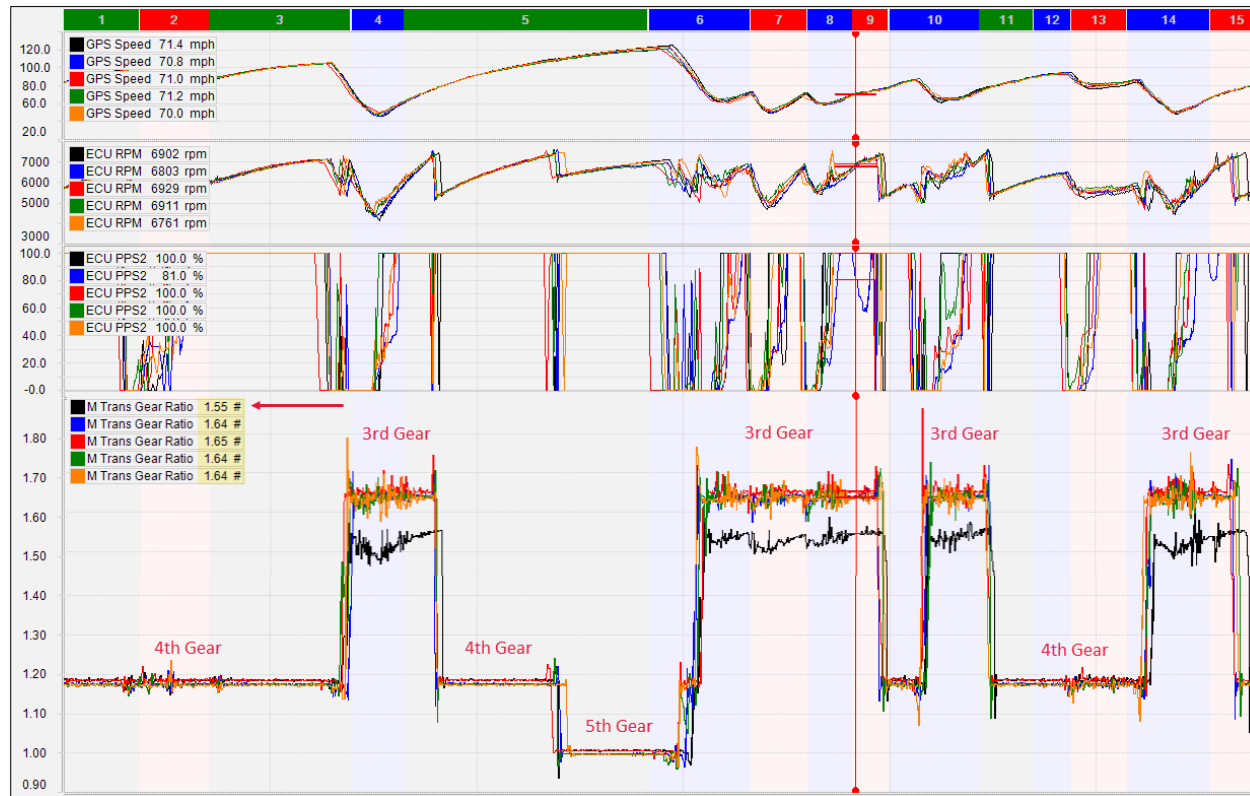
# Gearing Checks

- Gearing is Checked in Every Session
- We have Created a 'Gear Ratio' Math Channel
- $((\text{"ECU RPM"} * 74.2) / (\text{"ECU VEH SPEED"} * 4.10 * 1056))$



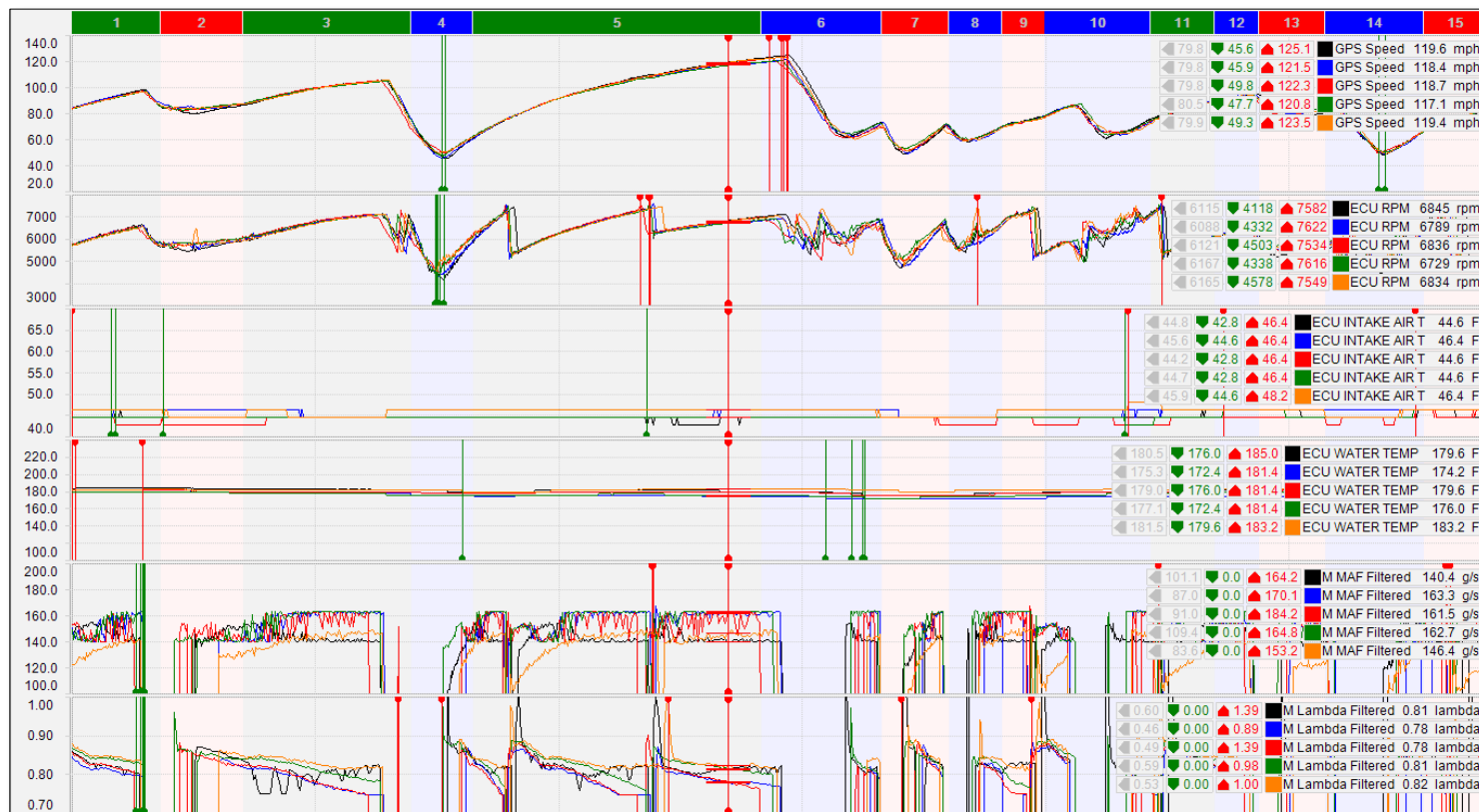
# Gearing Checks - Bad

- Here is an Example of a Non-Compliant 3<sup>rd</sup> Gear Ratio
- There is a RX8 3<sup>rd</sup> Gear (1.54 Ratio) that could be (illegally) Used
- Below is what it would Look Like in Compliance Data



# Basic Engine Checks

Each Cars Best Lap



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Basic Engine Checks

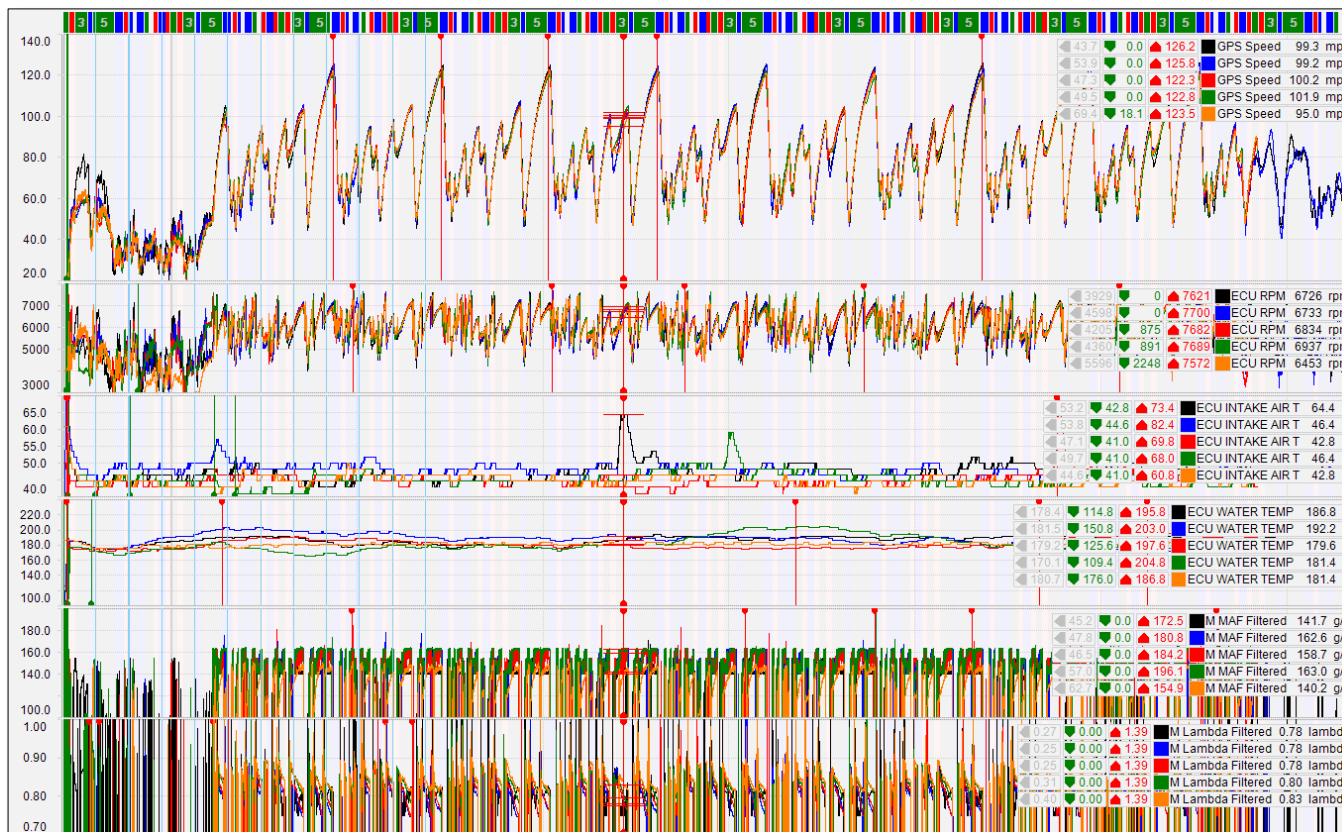
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# Basic Engine Checks

Zoom Out to Full Session



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Basic Engine Checks

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# Channel Report Checks

Selected Only Valid Laps (2-10)



| Lap           | Δ | Time | Dist<br>[m] | Avg [F]<br>ECU WATER TE... | Avg [F]<br>ECU INTAKE AIR... | NonZ [g/s]<br>M MAF Filtered | NonZ [lambda]<br>M Lambda Filter... | NonZ [A/F]<br>MAF Ratio Filter... | Avg [V]<br>External Voltage | Avg [%]<br>ECU PPS2 | Max [mph]<br>GPS Speed |
|---------------|---|------|-------------|----------------------------|------------------------------|------------------------------|-------------------------------------|-----------------------------------|-----------------------------|---------------------|------------------------|
| out           |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| 1             |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| 2             |   |      | 11644.8     | 188.0                      | 45.3                         | 151.7                        | 0.82                                | 12.04                             | 13.8                        | 65.8                | 121.3                  |
| 3             |   |      | 11639.3     | 182.4                      | 44.3                         | 151.8                        | 0.82                                | 12.06                             | 13.8                        | 67.7                | 122.2                  |
| best          |   |      | 11632.0     | 179.0                      | 44.2                         | 151.7                        | 0.82                                | 12.04                             | 13.8                        | 67.6                | 122.3                  |
| 5             |   |      | 11623.5     | 176.9                      | 43.2                         | 151.4                        | 0.82                                | 12.05                             | 13.8                        | 67.5                | 121.3                  |
| 6             |   |      | 11667.4     | 176.0                      | 43.3                         | 151.5                        | 0.82                                | 12.10                             | 13.7                        | 64.2                | 120.3                  |
| 7             |   |      | 11636.4     | 176.7                      | 44.1                         | 151.6                        | 0.82                                | 12.09                             | 13.7                        | 66.7                | 122.1                  |
| 8             |   |      | 11617.3     | 178.7                      | 45.4                         | 151.8                        | 0.82                                | 12.08                             | 13.7                        | 65.8                | 120.5                  |
| 9             |   |      | 11635.7     | 190.4                      | 48.8                         | 151.0                        | 0.82                                | 12.03                             | 13.6                        | 63.7                | 119.4                  |
| 10            |   |      | 11651.3     | 193.0                      | 45.9                         | 144.5                        | 0.83                                | 12.16                             | 13.6                        | 65.3                | 121.6                  |
| in            |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| average value |   |      | 11638.6     | 182.3                      | 44.9                         | 150.8                        | 0.82                                | 12.07                             | 13.7                        | 66.0                | 121.2                  |
| maximum value |   |      | 11667.4     | 193.0                      | 48.8                         | 151.8                        | 0.83                                | 12.16                             | 13.8                        | 67.7                | 122.3                  |
| minimum value |   |      | 11617.3     | 176.0                      | 43.2                         | 144.5                        | 0.82                                | 12.03                             | 13.6                        | 63.7                | 119.4                  |
| std deviation |   |      | 14.9        | 6.5                        | 1.7                          | 2.4                          | 0.00                                | 0.04                              | 0.1                         | 1.5                 | 1.0                    |
| out           |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| 1             |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| 2             |   |      | 11628.9     | 170.3                      | 44.7                         | 154.7                        | 0.84                                | 12.42                             | 13.6                        | 73.1                | 120.3                  |
| 3             |   |      | 11645.1     | 177.5                      | 44.5                         | 155.1                        | 0.84                                | 12.34                             | 13.6                        | 75.6                | 122.1                  |
| best          |   |      | 11625.4     | 177.1                      | 44.7                         | 154.5                        | 0.84                                | 12.29                             | 13.6                        | 76.2                | 120.8                  |
| 5             |   |      | 11618.1     | 184.8                      | 47.5                         | 153.9                        | 0.84                                | 12.30                             | 13.6                        | 72.7                | 122.8                  |
| 6             |   |      | 11615.6     | 201.4                      | 48.6                         | 154.2                        | 0.83                                | 12.25                             | 13.5                        | 73.8                | 122.1                  |
| 7             |   |      | 11655.2     | 196.3                      | 45.7                         | 153.9                        | 0.84                                | 12.34                             | 13.5                        | 71.4                | 119.4                  |
| 8             |   |      | 11647.7     | 182.4                      | 43.7                         | 155.0                        | 0.84                                | 12.28                             | 13.6                        | 73.3                | 119.6                  |
| 9             |   |      | 11625.4     | 176.8                      | 45.0                         | 154.1                        | 0.84                                | 12.34                             | 13.6                        | 68.2                | 120.2                  |
| 10            |   |      | 11640.9     | 173.9                      | 43.3                         | 154.2                        | 0.84                                | 12.34                             | 13.6                        | 73.1                | 119.3                  |
| in            |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| average value |   |      | 11633.6     | 182.3                      | 45.3                         | 154.4                        | 0.84                                | 12.32                             | 13.6                        | 73.0                | 120.7                  |
| maximum value |   |      | 11655.2     | 201.4                      | 48.6                         | 155.1                        | 0.84                                | 12.42                             | 13.6                        | 76.2                | 122.8                  |
| minimum value |   |      | 11615.6     | 170.3                      | 43.3                         | 153.9                        | 0.83                                | 12.25                             | 13.5                        | 68.2                | 119.3                  |
| std deviation |   |      | 14.0        | 10.4                       | 1.7                          | 0.4                          | 0.00                                | 0.05                              | 0.1                         | 2.3                 | 1.3                    |
| out           |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| 1             |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| 2             |   |      | 11619.9     | 180.8                      | 45.6                         | 135.0                        | 0.85                                | 12.51                             | 11.2                        | 68.8                | 121.9                  |
| best          |   |      | 11656.1     | 181.5                      | 45.9                         | 134.8                        | 0.85                                | 12.49                             | 11.2                        | 68.7                | 123.5                  |
| 4             |   |      | 11650.2     | 181.3                      | 44.5                         | 133.2                        | 0.35                                | 12.52                             | 11.2                        | 69.8                | 122.1                  |
| 5             |   |      | 11639.4     | 181.7                      | 45.3                         | 133.5                        | 0.85                                | 12.48                             | 11.2                        | 65.4                | 122.2                  |
| 6             |   |      | 11663.2     | 181.6                      | 44.7                         | 133.9                        | 0.85                                | 12.56                             | 11.2                        | 65.9                | 121.0                  |
| 7             |   |      | 11650.9     | 181.5                      | 43.4                         | 134.6                        | 0.85                                | 12.48                             | 11.2                        | 67.3                | 121.2                  |
| 8             |   |      | 11632.1     | 181.7                      | 44.7                         | 133.7                        | 0.85                                | 12.54                             | 11.2                        | 68.4                | 121.2                  |
| 9             |   |      | 11643.6     | 181.7                      | 43.7                         | 134.8                        | 0.86                                | 12.57                             | 11.2                        | 66.9                | 120.8                  |
| 10            |   |      | 11647.3     | 181.9                      | 44.1                         | 134.6                        | 0.85                                | 12.52                             | 11.2                        | 66.1                | 121.1                  |
| in            |   |      |             |                            |                              |                              |                                     |                                   |                             |                     |                        |
| average value |   |      | 11644.7     | 181.5                      | 44.7                         | 134.2                        | 0.85                                | 12.52                             | 11.2                        | 67.5                | 121.7                  |
| maximum value |   |      | 11663.2     | 181.9                      | 45.9                         | 135.0                        | 0.86                                | 12.57                             | 11.2                        | 69.8                | 123.5                  |
| minimum value |   |      | 11619.9     | 180.8                      | 43.4                         | 133.2                        | 0.85                                | 12.48                             | 11.2                        | 65.4                | 120.8                  |
| std deviation |   |      | 13.0        | 0.3                        | 0.8                          | 0.6                          | 0.00                                | 0.03                              | 0.0                         | 1.5                 | 0.9                    |

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Channel Report Checks

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# Split Report Times

## Selected Only Valid Laps (2-10)



|                    | 1        | 2         | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10       | 11       | 12       | 13       | 14       | 15       |
|--------------------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| out                |          | 13:23.299 | 0:12.816 | 0:07.265 | 0:34.150 | 0:19.595 | 0:09.410 | 0:07.383 | 0:06.684 | 0:20.613 | 0:09.711 | 0:07.385 | 0:11.882 | 0:17.381 | 0:12.651 |
| -1                 | 0:11.917 | 0:10.720  | 0:28.568 | 0:08.550 | 0:25.947 | 0:09.360 | 0:06.998 | 0:05.212 | 0:03.517 | 0:08.767 | 0:04.406 | 0:02.727 | 0:04.734 | 0:09.465 | 0:04.621 |
| -2                 | 0:05.427 | 0:05.784  | 0:10.005 | 0:06.476 | 0:16.467 | 0:08.467 | 0:06.605 | 0:04.798 | 0:03.269 | 0:08.536 | 0:04.357 | 0:02.686 | 0:04.720 | 0:08.949 | 0:04.606 |
| -3                 | 0:05.462 | 0:05.538  | 0:09.748 | 0:06.270 | 0:16.592 | 0:08.010 | 0:06.390 | 0:04.786 | 0:03.180 | 0:08.214 | 0:04.309 | 0:02.652 | 0:04.681 | 0:08.912 | 0:04.626 |
| -4                 | 0:05.489 | 0:05.576  | 0:09.670 | 0:06.233 | 0:16.559 | 0:08.327 | 0:06.383 | 0:04.833 | 0:03.213 | 0:08.235 | 0:04.334 | 0:02.705 | 0:04.643 | 0:09.012 | 0:04.618 |
| -5                 | 0:05.440 | 0:05.873  | 0:10.109 | 0:08.462 | 0:16.542 | 0:08.511 | 0:06.444 | 0:04.728 | 0:03.225 | 0:08.229 | 0:04.331 | 0:02.660 | 0:04.502 | 0:08.868 | 0:04.624 |
| -6                 | 0:05.463 | 0:05.534  | 0:09.678 | 0:06.115 | 0:16.571 | 0:08.826 | 0:06.666 | 0:04.937 | 0:03.269 | 0:08.280 | 0:04.289 | 0:02.654 | 0:04.538 | 0:08.975 | 0:04.602 |
| -7                 | 0:05.478 | 0:05.929  | 0:09.928 | 0:06.238 | 0:16.741 | 0:08.196 | 0:06.302 | 0:04.807 | 0:03.218 | 0:08.304 | 0:04.266 | 0:02.621 | 0:04.577 | 0:08.823 | 0:04.583 |
| -8                 | 0:05.420 | 0:05.709  | 0:09.846 | 0:06.408 | 0:16.408 | 0:08.265 | 0:06.510 | 0:04.869 | 0:03.261 | 0:08.443 | 0:04.379 | 0:02.678 | 0:04.547 | 0:09.018 | 0:04.634 |
| -9                 | 0:05.479 | 0:05.497  | 0:09.655 | 0:06.421 | 0:16.515 | 0:08.435 | 0:06.660 | 0:04.695 | 0:03.269 | 0:08.289 | 0:04.322 | 0:02.689 | 0:04.589 | 0:08.957 | 0:04.605 |
| -10                | 0:05.483 | 0:05.734  | 0:09.815 | 0:06.365 | 0:16.436 | 0:08.396 | 0:06.771 | 0:04.950 | 0:03.401 | 0:08.380 | 0:04.350 | 0:02.703 | 0:04.628 | 0:09.166 | 0:04.712 |
| -11                | 0:06.258 | 0:05.888  | 0:12.376 | 0:08.883 | 0:20.050 | 0:10.735 | 0:07.129 | 0:05.181 | 0:03.926 | 0:10.113 | 0:05.401 | 0:04.192 |          |          |          |
| -in                |          |           |          |          |          |          |          |          |          |          |          |          |          |          |          |
| average value -    | 0:05.460 | 0:05.686  | 0:09.828 | 0:06.332 | 0:16.537 | 0:08.358 | 0:06.526 | 0:04.823 | 0:03.256 | 0:08.323 | 0:04.326 | 0:02.672 | 0:04.603 | 0:08.964 | 0:04.623 |
| median value -     | 0:05.463 | 0:05.709  | 0:09.815 | 0:06.365 | 0:16.542 | 0:08.386 | 0:06.510 | 0:04.807 | 0:03.225 | 0:08.289 | 0:04.331 | 0:02.678 | 0:04.589 | 0:08.957 | 0:04.618 |
| best theoretical - | 0:05.420 | 0:05.497  | 0:09.655 | 0:06.115 | 0:16.408 | 0:08.010 | 0:06.302 | 0:04.695 | 0:03.180 | 0:08.214 | 0:04.266 | 0:02.621 | 0:04.502 | 0:08.823 | 0:04.583 |
| maximum value -    | 0:05.489 | 0:05.929  | 0:10.109 | 0:06.476 | 0:16.741 | 0:08.826 | 0:06.771 | 0:04.950 | 0:03.401 | 0:08.536 | 0:04.379 | 0:02.705 | 0:04.720 | 0:08.166 | 0:04.712 |
| std deviation -    | 0:00.024 | 0:00.149  | 0:00.151 | 0:00.116 | 0:00.093 | 0:00.173 | 0:00.149 | 0:00.081 | 0:00.059 | 0:00.103 | 0:00.033 | 0:00.026 | 0:00.067 | 0:00.093 | 0:00.035 |
| best rolling -     | 0:05.489 | 0:05.576  | 0:09.670 | 0:06.233 | 0:16.559 | 0:08.010 | 0:06.390 | 0:04.786 | 0:03.180 | 0:08.214 | 0:04.309 | 0:02.652 | 0:04.681 | 0:08.912 | 0:04.626 |
| out                |          | 6:16.077  | 0:16.617 | 0:07.198 | 0:36.038 | 0:20.511 | 0:09.841 | 0:08.068 | 0:06.345 | 0:19.437 | 0:10.219 | 0:06.920 | 0:11.061 | 0:18.336 | 0:12.112 |
| -1                 | 0:12.534 | 0:11.226  | 0:30.430 | 0:09.495 | 0:26.543 | 0:09.598 | 0:06.961 | 0:05.362 | 0:03.489 | 0:08.754 | 0:04.351 | 0:02.740 | 0:04.819 | 0:09.119 | 0:04.684 |
| -2                 | 0:05.514 | 0:05.514  | 0:09.787 | 0:06.361 | 0:16.363 | 0:08.334 | 0:06.646 | 0:04.999 | 0:03.681 | 0:08.422 | 0:04.305 | 0:02.708 | 0:04.568 | 0:08.945 | 0:04.724 |
| -3                 | 0:05.630 | 0:05.523  | 0:09.783 | 0:06.156 | 0:16.559 | 0:08.314 | 0:06.437 | 0:04.716 | 0:03.261 | 0:08.071 | 0:04.309 | 0:02.664 | 0:04.550 | 0:08.989 | 0:04.590 |
| -4                 | 0:05.476 | 0:05.446  | 0:09.611 | 0:06.362 | 0:16.793 | 0:08.688 | 0:06.380 | 0:04.705 | 0:03.255 | 0:08.330 | 0:04.368 | 0:02.717 | 0:04.541 | 0:09.177 | 0:04.575 |
| -5                 | 0:05.294 | 0:05.926  | 0:10.045 | 0:06.341 | 0:16.542 | 0:08.346 | 0:06.328 | 0:04.669 | 0:03.242 | 0:08.143 | 0:04.267 | 0:02.642 | 0:04.529 | 0:09.099 | 0:04.641 |
| -6                 | 0:05.482 | 0:05.428  | 0:09.677 | 0:06.354 | 0:16.855 | 0:08.438 | 0:06.402 | 0:04.829 | 0:03.339 | 0:08.196 | 0:04.290 | 0:02.651 | 0:04.495 | 0:09.077 | 0:04.801 |
| -7                 | 0:05.619 | 0:06.154  | 0:10.053 | 0:06.234 | 0:16.674 | 0:08.050 | 0:06.391 | 0:04.692 | 0:03.258 | 0:08.175 | 0:04.277 | 0:02.670 | 0:04.529 | 0:09.011 | 0:04.591 |
| -8                 | 0:05.469 | 0:05.611  | 0:09.779 | 0:06.242 | 0:16.694 | 0:07.947 | 0:06.389 | 0:04.816 | 0:03.287 | 0:08.119 | 0:04.325 | 0:02.705 | 0:04.681 | 0:08.924 | 0:04.650 |
| -9                 | 0:05.476 | 0:05.440  | 0:09.699 | 0:06.269 | 0:16.649 | 0:08.102 | 0:06.420 | 0:04.723 | 0:03.275 | 0:08.084 | 0:04.311 | 0:02.662 | 0:04.509 | 0:08.767 | 0:04.612 |
| -10                | 0:05.497 | 0:05.485  | 0:09.739 | 0:06.275 | 0:16.514 | 0:08.017 | 0:06.325 | 0:04.653 | 0:03.261 | 0:08.039 | 0:04.291 | 0:02.665 | 0:04.465 | 0:09.694 | 0:05.010 |
| -11                | 0:06.408 | 0:06.093  | 0:12.239 | 0:07.354 | 0:20.895 | 0:09.950 | 0:07.344 | 0:05.333 | 0:04.081 | 0:09.845 | 0:05.289 | 0:04.034 |          |          |          |
| -in                |          |           |          |          |          |          |          |          |          |          |          |          |          |          |          |
| average value -    | 0:05.495 | 0:05.614  | 0:09.797 | 0:06.288 | 0:16.627 | 0:08.248 | 0:06.413 | 0:04.756 | 0:03.318 | 0:08.175 | 0:04.304 | 0:02.676 | 0:04.585 | 0:09.055 | 0:04.688 |
| median value -     | 0:05.492 | 0:05.514  | 0:09.779 | 0:06.275 | 0:16.649 | 0:08.314 | 0:06.391 | 0:04.716 | 0:03.261 | 0:08.143 | 0:04.300 | 0:02.665 | 0:04.541 | 0:08.989 | 0:04.641 |
| best theoretical - | 0:05.294 | 0:05.428  | 0:09.611 | 0:06.156 | 0:16.363 | 0:07.947 | 0:06.325 | 0:04.653 | 0:03.242 | 0:08.039 | 0:04.267 | 0:02.642 | 0:04.495 | 0:08.767 | 0:04.575 |
| maximum value -    | 0:05.630 | 0:06.154  | 0:10.053 | 0:06.362 | 0:16.855 | 0:08.688 | 0:06.446 | 0:04.999 | 0:03.681 | 0:08.422 | 0:04.368 | 0:02.717 | 0:04.565 | 0:08.994 | 0:05.010 |
| std deviation -    | 0:00.092 | 0:00.240  | 0:00.145 | 0:00.067 | 0:00.142 | 0:00.225 | 0:00.090 | 0:00.103 | 0:00.131 | 0:00.119 | 0:00.028 | 0:00.025 | 0:00.111 | 0:00.250 | 0:00.133 |
| best rolling -     | 0:05.497 | 0:05.485  | 0:09.739 | 0:06.275 | 0:16.514 | 0:08.017 | 0:06.325 | 0:04.653 | 0:03.261 | 0:08.039 | 0:04.291 | 0:02.662 | 0:04.509 | 0:08.767 | 0:04.612 |
| out                |          | 10:24.397 | 0:16.556 | 0:07.518 | 0:36.597 | 0:21.015 | 0:09.737 | 0:08.428 | 0:06.363 | 0:19.824 | 0:10.085 | 0:06.519 | 0:11.147 | 0:19.028 | 0:11.191 |
| -1                 | 0:12.486 | 0:12.579  | 0:31.209 | 0:09.404 | 0:26.956 | 0:09.309 | 0:06.788 | 0:04.919 | 0:03.336 | 0:08.253 | 0:04.330 | 0:02.735 | 0:04.515 | 0:09.111 | 0:04.624 |
| -2                 | 0:05.550 | 0:05.474  | 0:09.803 | 0:06.411 | 0:16.475 | 0:08.588 | 0:06.388 | 0:04.782 | 0:03.262 | 0:08.187 | 0:04.374 | 0:02.724 | 0:04.492 | 0:08.923 | 0:04.604 |
| -3                 | 0:05.509 | 0:05.493  | 0:09.747 | 0:06.063 | 0:16.668 | 0:08.333 | 0:06.345 | 0:04.731 | 0:03.244 | 0:08.263 | 0:04.373 | 0:02.728 | 0:04.472 | 0:08.949 | 0:04.627 |
| -4                 | 0:05.481 | 0:05.497  | 0:09.834 | 0:06.110 | 0:16.603 | 0:08.362 | 0:06.301 | 0:04.720 | 0:03.231 | 0:08.145 | 0:04.362 | 0:02.719 | 0:04.514 | 0:08.856 | 0:04.604 |
| -5                 | 0:05.473 | 0:05.479  | 0:09.890 | 0:06.137 | 0:16.742 | 0:08.112 | 0:06.321 | 0:04.769 | 0:03.241 | 0:08.237 | 0:04.329 | 0:02.735 | 0:04.983 | 0:09.218 | 0:04.811 |
| -6                 | 0:05.556 | 0:05.561  | 0:09.993 | 0:06.572 | 0:17.587 | 0:08.441 | 0:06.310 | 0:04.795 | 0:03.272 | 0:08.667 | 0:04.393 | 0:02.741 | 0:04.452 | 0:08.864 | 0:04.623 |
| -7                 | 0:05.485 | 0:05.499  | 0:09.770 | 0:06.156 | 0:16.656 | 0:08.163 | 0:06.256 | 0:04.813 | 0:03.280 | 0:08.340 | 0:04.358 | 0:02.712 | 0:04.454 | 0:08.866 | 0:04.778 |
| -8                 | 0:05.732 | 0:05.499  | 0:09.711 | 0:06.116 | 0:16.999 | 0:08.219 | 0:06.361 | 0:04.865 | 0:03.301 | 0:08.268 | 0:04.350 | 0:02.709 | 0:04.464 | 0:08.932 | 0:04.653 |
| -9                 | 0:05.554 | 0:05.479  | 0:09.775 | 0:06.172 | 0:16.761 | 0:08.432 | 0:06.301 | 0:04.767 | 0:03.283 | 0:08.298 | 0:04.375 | 0:02.721 | 0:04.543 | 0:09.053 | 0:04.663 |
| -10                | 0:05.550 | 0:05.494  | 0:09.733 | 0:06.248 | 0:17.041 | 0:08.317 | 0:06.285 | 0:04.753 | 0:03.279 | 0:08.188 | 0:04.370 | 0:02.735 | 0:04.873 | 0:09.574 | 0:05.045 |
| -11                | 0:05.928 | 0:05.681  | 0:11.862 | 0:07.765 | 0:20.622 | 0:10.275 | 0:07.529 | 0:05.551 | 0:03.888 | 0:09.994 | 0:05.126 | 0:03.912 |          |          |          |
| -in                |          |           |          |          |          |          |          |          |          |          |          |          |          |          |          |
| average value -    | 0:05.543 | 0:05.497  | 0:09.806 | 0:06.221 | 0:16.837 | 0:08.330 | 0:06.319 | 0:04.777 | 0:03.266 | 0:08.288 | 0:04.365 | 0:02.725 | 0:04.583 | 0:09.026 | 0:04.712 |
| median value -     | 0:05.509 | 0:05.494  | 0:09.775 | 0:06.156 | 0:16.742 | 0:08.333 | 0:06.310 | 0:04.769 | 0:03.272 | 0:08.263 | 0:04.370 | 0:02.721 | 0:04.492 | 0:08.932 | 0:04.653 |
| best theoretical - | 0:05.473 | 0:05.474  | 0:09.711 | 0:06.063 | 0:16.475 | 0:08.112 | 0:06.256 | 0:04.720 | 0:03.231 | 0:08.145 | 0:04.329 | 0:02.709 | 0:04.452 | 0:08.856 | 0:04.604 |
| maximum value -    | 0:05.732 | 0:05.561  | 0:09.993 | 0:06.572 | 0:17.587 | 0:08.588 | 0:06.388 | 0:04.865 | 0:03.301 | 0:08.667 | 0:04.393 | 0:02.741 | 0:04.983 | 0:09.574 | 0:05.045 |
| std deviation -    | 0:00.074 | 0:00.024  | 0:00.084 | 0:00.157 | 0:00.315 | 0:00.141 | 0:00.038 | 0:00.041 | 0:00.022 | 0:00.145 | 0:00.017 | 0:00.010 | 0:00.188 | 0:00.222 | 0:00.137 |
| best rolling -     | 0:05.473 | 0:05.479  | 0:09.890 | 0:06.137 | 0:16.742 | 0:08.112 | 0:06.301 | 0:04.720 | 0:03.231 | 0:08.145 | 0:04.362 | 0:02.719 | 0:04.514 | 0:08.856 | 0:04.604 |

Spec MX-5 Data Webinar

Split Report Times

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# Split Report Times

## Selected Only Valid Laps (2-10)



| Driver             | Car# | 9:01.504 | 0:16.123 | 0:07.974 | 0:36.372 | 0:21.328 | 0:10.322 | 0:08.296 | 0:06.158 | 0:20.110 | 0:09.666 | 0:06.411 | 0:11.084 | 0:19.214 | 0:11.007 |
|--------------------|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| out                |      |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
| -1                 |      | 0:05.516 | 0:05.623 | 0:09.951 | 0:06.291 | 0:16.646 | 0:08.375 | 0:08.280 | 0:04.847 | 0:03.261 | 0:08.137 | 0:04.298 | 0:02.692 | 0:04.547 | 0:08.812 |
| -2                 |      | 0:05.515 | 0:05.504 | 0:09.767 | 0:08.105 | 0:16.802 | 0:08.239 | 0:08.285 | 0:04.722 | 0:03.214 | 0:08.098 | 0:04.300 | 0:02.697 | 0:04.440 | 0:08.918 |
| -3                 |      | 0:05.509 | 0:05.457 | 0:09.737 | 0:08.076 | 0:16.693 | 0:08.091 | 0:06.164 | 0:04.729 | 0:03.203 | 0:08.071 | 0:04.305 | 0:02.684 | 0:04.433 | 0:08.664 |
| -4                 |      | 0:05.490 | 0:05.429 | 0:09.682 | 0:08.073 | 0:16.659 | 0:08.294 | 0:08.281 | 0:05.002 | 0:03.260 | 0:08.623 | 0:04.390 | 0:02.722 | 0:04.652 | 0:09.260 |
| -5                 |      | 0:05.468 | 0:05.573 | 0:09.787 | 0:08.157 | 0:16.821 | 0:08.221 | 0:08.249 | 0:04.739 | 0:03.220 | 0:08.157 | 0:04.321 | 0:02.707 | 0:04.460 | 0:08.840 |
| -6                 |      | 0:05.478 | 0:05.515 | 0:09.952 | 0:08.099 | 0:16.939 | 0:08.331 | 0:08.583 | 0:04.937 | 0:03.319 | 0:08.342 | 0:04.348 | 0:02.719 | 0:04.832 | 0:08.922 |
| -7                 |      | 0:05.572 | 0:05.563 | 0:09.885 | 0:08.131 | 0:16.827 | 0:08.229 | 0:08.302 | 0:04.852 | 0:03.241 | 0:08.263 | 0:04.340 | 0:02.726 | 0:04.489 | 0:08.683 |
| -8                 |      | 0:05.536 | 0:05.465 | 0:09.818 | 0:08.133 | 0:16.881 | 0:08.445 | 0:08.532 | 0:04.935 | 0:03.370 | 0:08.588 | 0:04.489 | 0:02.801 | 0:04.602 | 0:08.886 |
| -9                 |      | 0:05.702 | 0:05.582 | 0:09.933 | 0:08.020 | 0:17.087 | 0:08.108 | 0:08.208 | 0:04.778 | 0:03.243 | 0:08.347 | 0:04.385 | 0:02.747 | 0:04.538 | 0:08.922 |
| -10                |      | 0:05.543 | 0:05.523 | 0:09.835 | 0:08.121 | 0:16.817 | 0:08.259 | 0:08.320 | 0:04.838 | 0:03.259 | 0:08.292 | 0:04.353 | 0:02.722 | 0:04.555 | 0:08.876 |
| average value -    |      | 0:05.515 | 0:05.515 | 0:09.818 | 0:08.105 | 0:16.821 | 0:08.239 | 0:08.281 | 0:04.847 | 0:03.243 | 0:08.263 | 0:04.340 | 0:02.719 | 0:04.538 | 0:08.840 |
| median value -     |      | 0:05.468 | 0:05.429 | 0:09.682 | 0:08.020 | 0:16.646 | 0:08.091 | 0:06.164 | 0:04.722 | 0:03.203 | 0:08.071 | 0:04.298 | 0:02.684 | 0:04.433 | 0:08.663 |
| best theoretical - |      | 0:05.702 | 0:05.623 | 0:09.952 | 0:08.291 | 0:17.087 | 0:08.445 | 0:08.583 | 0:05.002 | 0:03.370 | 0:08.628 | 0:04.489 | 0:02.801 | 0:04.832 | 0:09.260 |
| maximum value -    |      | 0:00.072 | 0:00.082 | 0:00.094 | 0:00.071 | 0:00.134 | 0:00.110 | 0:00.134 | 0:00.097 | 0:00.051 | 0:00.193 | 0:00.058 | 0:00.033 | 0:00.120 | 0:00.166 |
| std deviation      |      | 0:05.490 | 0:05.429 | 0:09.682 | 0:08.073 | 0:16.659 | 0:08.091 | 0:06.164 | 0:04.729 | 0:03.203 | 0:08.071 | 0:04.305 | 0:02.684 | 0:04.433 | 0:08.664 |
| best rolling -     |      | 0:05.490 | 0:05.429 | 0:09.682 | 0:08.073 | 0:16.659 | 0:08.091 | 0:06.164 | 0:04.729 | 0:03.203 | 0:08.071 | 0:04.305 | 0:02.684 | 0:04.433 | 0:08.664 |

| Driver          | Car# | Race Fin Pos | Best Lap | Lap Diff | Best Main Straight Time | Avg Main Straight Time | Max Top Speed | Avg Top Speed |
|-----------------|------|--------------|----------|----------|-------------------------|------------------------|---------------|---------------|
| James Hinch     | 54   | 1            | 1:06.408 | 0.00     | 16.646                  | 16.817                 | 122.8         | 120.7         |
| William Byrd    | 95   | 2            | 1:06.276 | -0.82    | 16.555                  | 16.760                 | 123.5         | 121.7         |
| Tommy Milner    | 68   | 3            | 1:06.341 | -0.89    | 16.475                  | 16.837                 | 122.3         | 121.2         |
| Robert Dahlgren | 22   | 4            | 1:06.308 | -0.56    | 16.363                  | 16.627                 | 125.8         | 123.7         |
| Tommy Milner    | 75   | 7            | 1:06.408 | -0.96    | 16.408                  | 16.537                 | 126.2         | 125.2         |

Spec MX-5 Data Webinar

Split Report Times

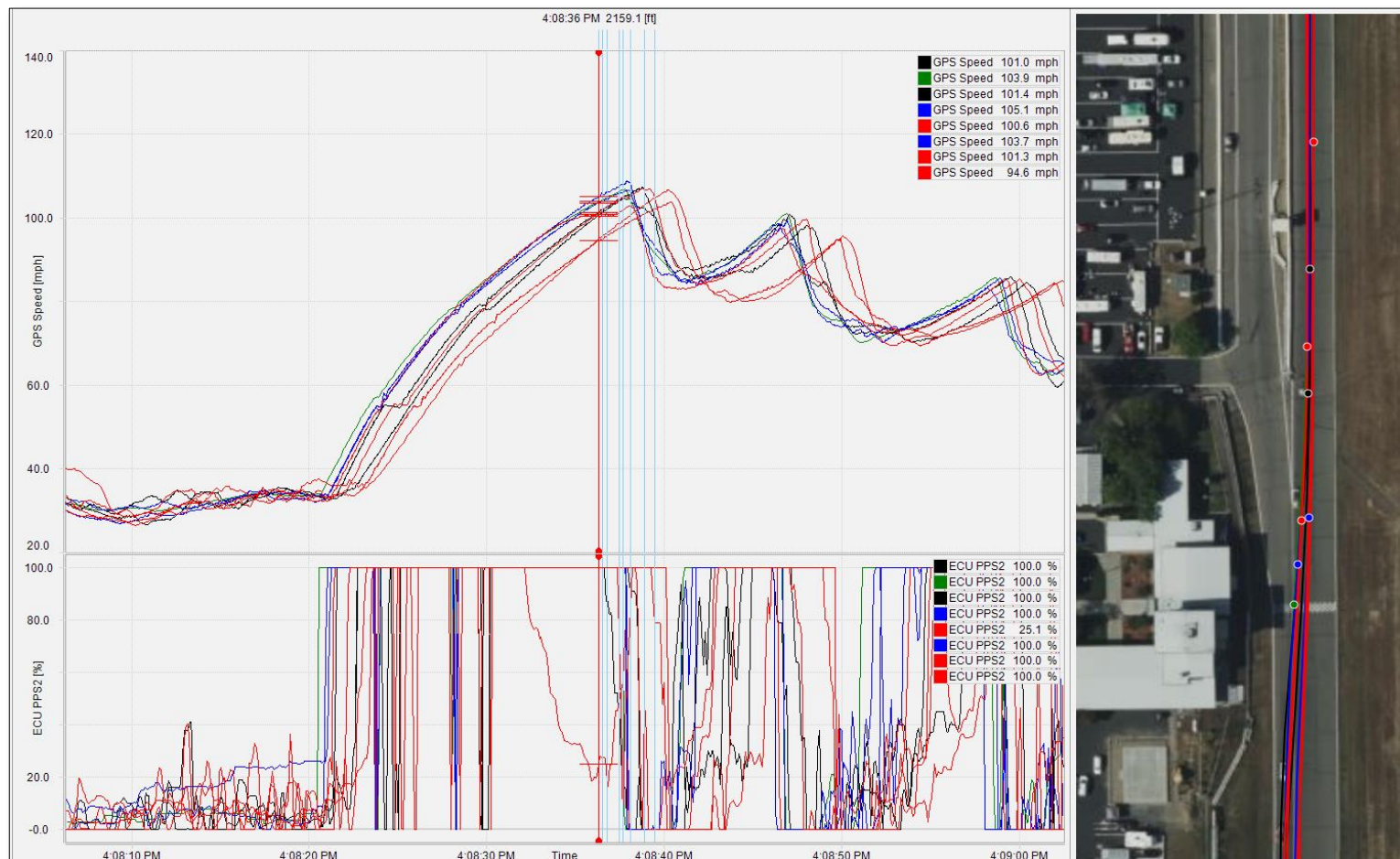
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# GPS Time Aligned Data

## Position, Speed, and Throttle at Start



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GPS Time Aligned Data - Start

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# GPS Time Aligned Data

Position, Speed, PPS, and Temps During Draft



**Spec MX-5 Data Webinar**

GPS Time Aligned Data - Draft

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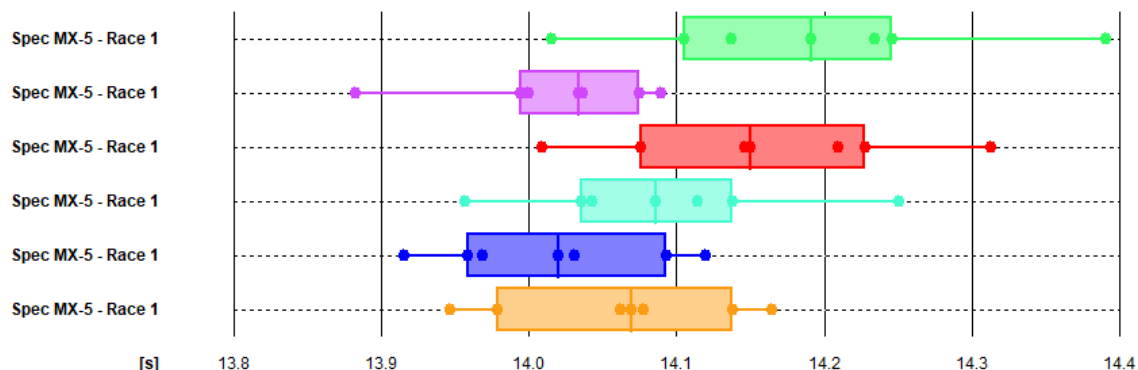
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# AiM Data Report

## Part 1 - Sector Time & Max Speed

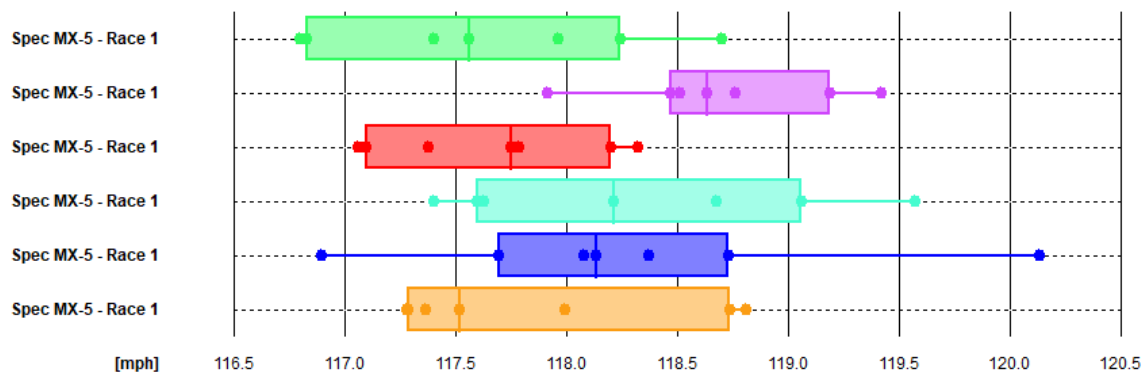
### Sector Time

Time to complete the sector. Lower is better.



### GPS Speed - Maximum

Maximum speed in the sector



Spec MX-5 Data Webinar

AiM Data Report – Part 1

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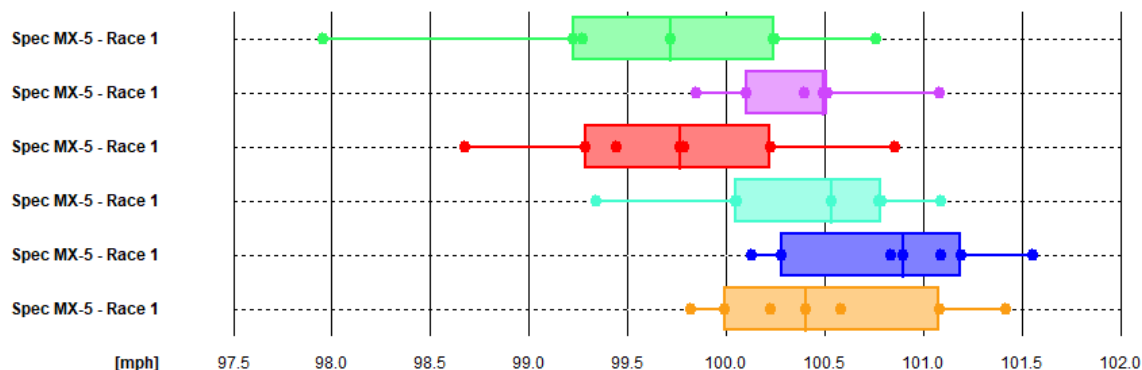


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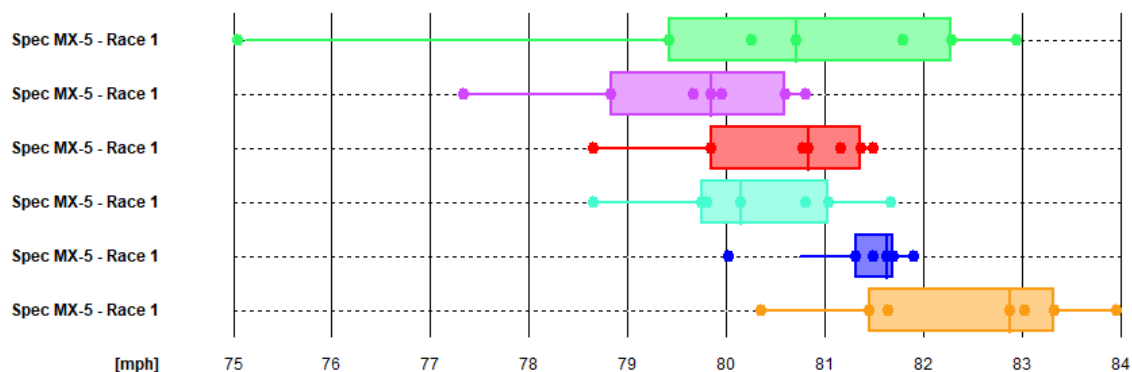
# AiM Data Report

## Part 2 – Average & Min Speed

GPS Speed - Average



GPS Speed - Minimum



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AiM Data Report – Part 2

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# Q & A

Time Permitting



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Q & A Time

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**Host:**  
Roger Caddell  
AIM Sports - National Training Manager

**Co-Host:**  
Emiliano Bina  
AIM Sportline Software

aimsports.com Tuesday June 27<sup>th</sup>, 2023 LearnFast™

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**Host:**  
Roger Caddell  
National Training Manager

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  - Customizing AiM Device Logos
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  - *\*I Have Downloaded my Data, Now What - Part 1*
  - *\*I Have Downloaded my Data, Now What - Part 2*
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  - Measure Units
    - Conditional Alarms
  - Sort Channels
    - Gear Position
  - Test Properties
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- \* Most Popular and Recommended*

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# Contact Information



***SMX Data Webinar***

*How data will shape  
the future of Spec Racing*

July 12th, 2023  
9PM ET/6PM PT

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**MAZDA MOTORSPORTS**

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**Wednesday July 12<sup>th</sup>, 2023**

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