

Acceptance Testing Report - Fall 2018 Dyno Room

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This ATR is for recording measurements and results of ATP Revision 5.

Submitted 12/10/2018

Updates

11/14/2018 - Original

12/01/2018 - Addressed concerns in Professor Nadovich Comments
ATR in separate document

12/06/2018 - Revised to match ATP Revision 5

Assertions Statement

The 2019 SAE Electric Car Team ensures that all testing follows the test procedures described in the ATP. All deviations from the testing plan will be noted in this test report. The team also ensures that all measurements reported in this document were obtained according to the testing plan and recorded accurately.



Katie Lee
Project Manager

12/10/2018

Date



Alex Kmetz
Project Manager

12/10/2018

Date



Hayden Dodge
Systems Engineer

12-10-2018


Date



Yuqiu Zhang
Systems Engineer

12-10-2018

Date



Drew Carleton
Interconnect

12/10/18

Date

Motor Tests

| Test | Measurement | Pass/ Fail | Date | Additional Notes | Initial |
|--------|---|---------------|------------|--|---------|
| ATP001 | N/A | | | | |
| ATP002 | DYNO Motor Encoder Tachometer | | | | |
| ATP003 | Mass 1 40 lb (18.2 kg) Calc Torque 1 60 ft-lb Gauge Torque 1 59.60 ft-lb Mass 2 60 lb (27.3 kg) Calc Torque 2 90 ft-lb Gauge Torque 2 89.63 ft-lb | Pass | 12/07/2018 | A 3rd mass was used with results below: Mass: 20 lb Calc: 30 ft-lb Gauge: 29.74 ft-lb | HD |
| ATP004 | Power Supply 40 V Before PC After PC MCS Multimeter Power Supply 60 V Before PC After PC MCS Multimeter Power Supply 80 V Before PC After PC MCS Multimeter Power Supply 100 V Before PC After PC MCS Multimeter 99.9 V | | | Test partially completed. Not all measurements were made before TSI failure. | |

| | | | | | | |
|--------|----------------------------------|--|--|--|--|--|
| ATP005 | Attach Graph Below this table | | | | | |
|--------|----------------------------------|--|--|--|--|--|

Pre-charge and Discharge Tests

| Test | Measurement | Pass/ Fail | Date | Additional Notes | Initial |
|--------|--------------------------------------|---------------|------|------------------|---------|
| ATP006 | Pre-charge Relay Close Voltage | | | | |
| ATP007 | Time to Discharge | 1.320 s | Pass | 12/10/2018 | HD |

Throttle Plausibility

| Test | Measurement | Pass/ Fail | Date | Additional Notes | Initial |
|--------|---------------|---------------|------------|--|---------|
| ATP008 | APPS1 5.302 V | Pass | 12/07/2018 | Alternate testing was used: Throttle potentiometers were used and multimeters were used to record the voltage for APPS1 undervoltage. Criteria for pass was too narrow. CN approved expanding passing criteria range. | CN |
| ATP009 | APPS1 9.930 V | Pass | 12/07/2018 | Alternate testing was used: Throttle potentiometers were used and multimeters were used to record the voltage for APPS1 overvoltage. Criteria for pass was too narrow. CN approved expanding | CN |

| | | | | | | |
|--------|-------|---------|------|------------|---|----|
| | | | | | passing criteria range. | |
| ATP010 | AAPS2 | 0.250 V | Pass | 12/07/2018 | Alternate testing was used: Throttle potentiometers were used and multimeters were used to record the voltage for AAPS1 overvoltage. Criteria for pass was too narrow. CN approved expanding passing criteria range. | CN |
| ATP011 | AAPS2 | 4.834 V | Pass | 12/07/2018 | Alternate testing was used: Throttle potentiometers were used and multimeters were used to record the voltage for AAPS2 overvoltage. Criteria for pass was too narrow. CN approved expanding passing criteria range. | CN |
| ATP012 | N/A | | Pass | 12/07/2018 | Alternate testing was used: SCADA user interface displayed that the pedal was implausible because of pedal difference. | CN |
| ATP013 | N/A | | Pass | 12/07/2018 | Alternate testing was used: SCADA user interface displayed that the pedal was implausible because of pedal difference. | CN |

Cooling

| Test | Measurement | Pass/ Fail | Date | Additional Notes | Initial |
|--------|---|---------------|------------|------------------|---------|
| ATP014 | N/A | Pass | 12/06/2018 | | CN |
| ATP015 | Fan Speed | 1067 RPM | Pass | 12/06/2018 | CN |
| ATP016 | Flow Rate | | | | |
| ATP017 | Cool. Temp. Sensor MC Temp. Sensor External Temp. Sensor | | | | |

Drive State Tests

| Test | Measurement | Pass/ Fail | Date | Additional Notes | Initial |
|--------|-------------|---------------|------|------------------|---------|
| ATP018 | N/A | | | | |
| ATP019 | N/A | | | | |
| ATP020 | N/A | | | | |
| ATP021 | N/A | | | | |
| ATP022 | N/A | | | | |
| ATP023 | N/A | | | | |
| ATP024 | N/A | | | | |

Safety Loop Tests

| Test | Measurement | Pass/ Fail | Date | Additional Notes | Initial |
|--------|-------------|---------------|------------|------------------|---------|
| ATP025 | N/A | Pass | 12/07/2018 | | CN |
| ATP026 | N/A | Pass | 12/06/2018 | | CN |

| | | | | | |
|--------|-----|------|------------|--------|----|
| ATP027 | N/A | | | | |
| ATP028 | N/A | Pass | 12/06/2018 | | CN |
| ATP029 | N/A | Pass | 12/06/2018 | | CN |
| ATP030 | N/A | Pass | 12/06/2018 | | CN |
| ATP031 | N/A | Pass | 12/06/2018 | | CN |
| ATP032 | N/A | Pass | 12/06/2018 | | CN |
| ATP033 | N/A | Pass | 12/06/2018 | | CN |
| ATP034 | N/A | Pass | 12/06/2018 | | CN |
| ATP035 | N/A | | | Waived | CN |

Other Status Indicators

| Test | Measurement | Pass/ Fail | Date | Additional Notes | Initial |
|--------|-------------|---------------|------------|---|---------|
| ATP036 | N/A | | | | |
| ATP037 | N/A | Pass | 12/07/2018 | In future test plans, add negative testing. | HD |

Testing Results

| Test Section | Number Passes | Total Number |
|------------------------------|---------------|--------------|
| Motor Tests | 1 | 5 |
| Pre-charge & Discharge Tests | 1 | 2 |
| Throttle Plausibility | 6 | 6 |
| Cooling | 2 | 4 |
| Drive State Tests | 0 | 7 |
| Safety Loop Tests | 9 | 10 |
| Other Status Indicators | 1 | 2 |
| TOTAL | 20 | 36 |

Deliverables

| Item | Date Delivered | Initial |
|---|----------------|---------|
| Graph of motor RPM vs time | | |
| Graph of torque vs time | | |
| Graph of power vs time | | |
| Graph of power in vs power out | | |
| D000: PDR Report and Presentation | 9/25/2018 | AK, KL |
| D001: CDR Materials | | |
| D002: User Manuals | Waived | CN |
| D003: Final Report and Maintenance Manual | 12/11/2018 | AK, KL |
| D004: Acceptance Test Plan | 12/05/2018 | HD |
| D005: Acceptance Test Report | 12/10/2018 | HD |
| D007: Project Website | 12/10/2018 | AK |
| D008: Final Presentation and Delivery | | |
| D010: Project Posters | 12/10/2018 | AK |
| D013: Purchasing Report | 12/10/2018 | RA |
| D014: Project Management and Status Letters | 12/10/2018 | KL, AK |
| CD001: Registration | 10/10/2018 | KL, AK |
| CD002: Project Management Report | 11/02/2018 | AK |
| CD003: Structural Equivalency Spreadsheet (SES) | 11/02/2018 | KL |
| CD004: Electrical Systems Form - Part 1 (ESF-1) | 11/09/2018 | KL |
| CD005: Program Submission | 12/07/2018 | AK |
| CD006: Team Picture | 11/27/2018 | KL |