

TEAM NUMBER: _____

INSPECTOR: _____ INITIALS + DATE (after passing): _____

Initial Inspection

- _____ **Firmware Versions** - The cRIO image and DS firmware must be up-to-date (refer to the training doc for details) <R86>
- _____ **WPA Encryption** - The robot radio must be configured for WPA encryption (refer to the Assistant FTA for details)
- _____ **Weight** -
- Robot Weight (<= 120lbs excluding bumpers, battery and trailer hitch) <R11> = _____ pounds
 - Bumper Weight (Bumpers must be <= 18 pounds) <R8.E> = _____ pounds
- _____ **Size** - Fit within a 28"x38"x60" rectangular volume (Bumpers and Trailer Hitch excluded) <R11, R91>
- _____ **Standard Bumpers** - must follow all specifications
- BUMPER PERIMETER (tape measure pulled tight around robot base) = _____ inches
 - Bumpers can only be placed directly on the BUMPER PERIMETER <R8.L>
 - Total Length of Bumper Segments (all segments must be >= 6") <R8.A> = _____ inches
 - % of BUMPER PERIMETER covered by Bumpers (must be >= 66.7%) <R8.K> = _____ %
 - All corners must be protected by bumpers on both sides and include pool noodles within corner <R8.I-J>
 - Must use approximately 3/4" thick x 5" tall plywood backing and a pair of vertically-stacked 2.5" pool noodles with no extraneous holes for weight reduction (mounting holes and small cut-outs are acceptable) <R8.B-C>
 - Must use a durable fabric cover for the noodles <R8.D>
 - Must be removable for inspection <R8.F>
 - Must be securely mounted when attached <R8.G>
 - Bumper bottom edge must be between 1" and 2" from floor – BUMPER ZONE definition
 - Must be mounted with a structural robot component supporting the entire length of each segment <R8.M>
- _____ **Excursion Beyond Bumper** - No robot components can extend beyond the BUMPER PERIMETER at any time <R16>
- _____ **Trailer Hitch** - must include a spec-compliant Trailer Hitch
- Must use the 7" steel spacer and either of the 3 permitted aluminum C-channel designs <R18.A>
 - Horizontal center-line must be between 2.5" and 3.1" <R18.B>
 - Must be securely mounted to the Bumper Perimeter <R18.D>

Mechanical

- _____ **No Sharp Edges** <R4, R5>
- _____ **No Prohibited Materials** - eg sound, lasers, noxious or toxic gases or inhalable particles or chemicals <R2>
- _____ **No Unsafe Energy Storage Devices** - carefully consider safety of any springs or pneumatic systems <R1.D>
- _____ **No Risk of Damage to Other Robots** - e.g. spearing, entangling, upending or adhering <R5, R7, R17>
- _____ **Propeller and Shooter Safety** – must be reasonably protected from finger access and ejection of debris <R5>
- _____ **Trailer-to-Robot Interaction** - The Trailer Hitch and Bumpers must be oriented such that, when an attached Trailer swings side-to-side, the only robot-to-trailer interaction is (Robot)bumper-to-(Trailer)bumper. <R18.E>
- _____ **Rover Wheels** - Can only use unmodified Rover Wheels for traction (in a normal orientation with tread only touching the floor, only typical wear and tear, they can be lifted or dragged as well as being rolled or twisted) <R6>
- _____ **Other Floor Contact** - In addition to Rover Wheels, can only use relatively friction-free elements in contact with the ground (high friction wheels are fine as long as they freely roll and slip and don't damage the floor) <R6>
- _____ **Decorations** - Cannot interfere with other robots' electronics and sensors (particularly via color distraction) and be in spirit of "Gracious Professionalism". <R19>
- _____ **BoM Cost** - shall not include more than \$3500 of additional components with no single component > \$400. <R90, R21>
- _____ **Team Number** - clearly displayed on at least 4 surfaces that are separated by approximately 90° intervals around the perimeter of the robot. The numbers must be at least 4" tall with at least 3/4" high contrast stroke. <R15>
- _____ **Team Name** - Prominently and proudly display the team's school name and primary sponsor name/logo <R14>

Electrical

- _____ **Battery** - Only a single MK ES17-12 battery (2007 or later) is permitted on robot. <R58>
- _____ **Securely-Fastened Items** - Battery and control system must be securely fastened
- _____ **Insulated Battery Terminals** - must be well-covered with insulation <R42.C>
- _____ **Main Breaker Accessibility** – the 120A main breaker must be readily accessible <R42.G>
- _____ **Allowable PD Breakers** - Only 20, 30 and 40A Snap-Action breakers may be installed in the PD <R46.A>
- _____ **Robot Radio Power** – the wireless adapter on the robot must be powered via the dedicated connector on the PD
- _____ **Wire Size** - obey the wiring size conventions for attaching loads to the PD. <R45>

- ___ **Wire Colors** - must be color coded - red/white/brown for + supply wires and black/blue for supply return wires <R47>
- ___ **1 Wire per WAGO** - only 1 wire may be inserted in each WAGO, splices may be used to distribute power to multiple Breakouts and Sidecars but all wires in the splice are subjected to the Wire Size rules <R43.E>
- ___ **Servos** - must be attached directly to the Digital Sidecar's PWM Outputs. An unlimited number of FTC servos (HS-475HB) or any servo up to max torque of 55 oz-in and max speed of 100 rpm at 6VDC may be used. <R51.B,C>
- ___ **Motors/Actuators** - Only KoP motors (in KoP quantities) may be used with up to 2 additional CIMs. No electrical solenoids are permitted. <R51.A,D,E, R52>
- ___ **Motor/Actuator Power** – only one motor or load may be attached to each Spike, Victor or Jaguar (however multiple pneumatic valves may be driven by a single Spike) <R48>
- ___ **Motor/Actuator Control** – Motors/actuators must be controlled by Spike, Victor or Jaguar and driven directly by signals from a Digital Sidecar (including brake/coast signals) <R54>
- ___ **Custom Circuits, Sensors and Additional Electronics** - cannot be attached to the cRIO's serial port or Ethernet port 2 (except for the Axis 206 camera), cannot attach to Jaguar CAN or limit switch ports, cannot directly control Victors, Jaguars, Spikes or servos (including brake/coast controls which can only be connected to Digital Sidecar). <R66, R67>
- ___ **Powered Decorations (if any)** – can only draw power from a 20A breaker on the PD <R49>
- ___ **Solenoid Breakout** – only pneumatic valves may be driven by the Solenoid Breakout module <R63>
- ___ **Isolated Frame** - must be electrically isolated from battery (>100k Ohm between either battery post and chassis) <R41>

Pneumatic System (n/a for robots that do not use pneumatics)

- ___ **Compressor** - Only the KoP Thomas compressor (no others) may be used (on or off robot). <R72.A>
- ___ **Compressor Power** - must use a Spike (recommend replacing Spike's 20A fuse with a 20A breaker) <R54.C>
- ___ **Compressor Control** – Nason Pressure Switch must be wired directly to a Digital Sidecar. <R73.C, R77>
- ___ **Compressor Relief Valve** – 125 PSI relief valve must be directly attached to compressor <R76>
- ___ **Vent Valve** – must include an easily-accessible manual vent valve <R73.C, R78>
- ___ **Off-Robot Compressor (if used)** – must include an additional vent valve with off-board compressor. The on-robot control system must be used to control the compressor. <R74, R78>
- ___ **Accumulators** - up to 4 Clippard AVT-32-16 pneumatic storage tanks may be used <R71.A>
- ___ **Tubing** - no extraneous tubing or tubing with ID other than 0.16" <R1.B>
- ___ **Gauges** - must be present on both the compressor outlet and Norgren regulator outlet and be readily visible
- ___ **Pressure Rating** - all pneumatic components must be rated for at least 125PSI <R72.B>
- ___ **Valve Control** - pneumatic solenoid valves must have a max Cv of 0.32, controlled by either Spike or NI 9472. <R71.C>
- ___ **Allowable Cylinders** - any may be used, must be rated for at least 125PSI, <= 24" stroke, <= 2" bore <R71.D>
- ___ **Allowable Rotary Actuators** - any may be used, must be rated for at least 125PSI <R71>
- ___ **No Unsafe Alterations** - pneumatic parts cannot be altered such that their 125PSI rating may be compromised <R72>

Power On Check (Driver Station must be tethered to the Robot)

- ___ **Unauthorized Wireless Communication** – no wireless communication to/from ROBOT or OPERATOR CONSOLE without FIRST permission. <R57, R69, R87>
- ___ **Wireless Adapters** – no radios allowed on the OPERATOR CONSOLE, robot radio should be off when in the pits <R88>
- ___ **Driver Station ESD Rework** – enclosure must be grounded per FIRST instructions or in a similar manner. <R85.1>
- ___ **Confirm Pneumatics Operation** – Vent all pressure, power up robot, compressor should kick in
 - o Compressor should stop automatically <R73.C, R77>
 - o Main Pressure <= 125 psi <R73.A, R75> and Working Pressure <= 60 psi <R73.A, R75>
 - o Dump pressure via easily accessible vent valve, compressor should start automatically <R73.D, R78>
 - o Verify compressor stops on its own, recheck pressure gauges <R73.C, R77>
- ___ **Robot Signal Light** - The Robot Signal Light from the KoP must be visible from 3' in front of the robot, and be plugged into the RSL port on one of the Digital Sidecars. Confirm operation via powering-up <R58>.
- ___ **Battery Voltage Monitoring** – the DS must display a battery voltage <R64>
- ___ **Verify Team Number is correct on DS**
- ___ **Power Off** – remove power from the robot, confirm all LEDs are off, actuate pneumatic vent valve (if applicable) and confirm that all pressure is vented and gauges read 0 pressure

Team Compliance Statement

We, the Team Mentor and Team Captain, attest by our signing below, that our team's robot was built after the 2009 Kickoff on January 3, 2009 and in accordance with all of the 2009 FRC rules, including all Fabrication Schedule rules. We have conducted our own inspection and determined that our robot satisfies all of the 2009 FRC rules for robot design.

Team Captain: _____

Team Mentor: _____