TEAM NUMBER:_____ **INSPECTOR(S):_____ _____**
INITIALS (after passing):_____ **DATE (after passing):_____/_____/_____**
REINSPECTION (initial**) _____** **FINAL INSPECTION (**initial**) _____**

Size and Weight:

____ **ROBOT Weight -** Must be ≤ 125.5 lbs. (~56kg) excluding BUMPERs and battery. <R103> _____**pounds**
____ **Total Inspected Weight -** ROBOT + swappable mechanisms ≤150 lbs. **<**I103**>** _____**pounds**
____ **BUMPER Weight** - Must be ≤ 15 pounds (~6kg). <R407> **Red BUMPER** _____**Blue BUMPER** _____**pounds**
____ **FRAME PERIMETER** – Frame must be non-articulated. Minor protrusions ≤1/4" (6mm) OK. <R101>
____ **STARTING CONFIGURATION** – Parts may not extend past the vertical projection of the FRAME PERIMETER. <R102>
____ **Starting Volume –** FRAME PERIMETER ≤ 120in. (~304 cm), height ≤ 48 in. (~121 cm) <R104>
____ **Playing Configuration –** ROBOT may not extend beyond the FRAME PERIMETER by more than 12 in. (~30 cm) <R105>

BUMPERS

____ **Coverage -** BUMPER segments protect the entire FRAME PERIMETER, any gaps between segments < ½" (~1.3cm) <R401>
____ **Hard BUMPER parts** - Defined by BUMPER backing, may not extend >1" (~25mm) beyond ROBOT frame. <R408-B>
____ **Support** - No BUMPER segment may be unsupported by ROBOT structure/frame for a length > 8" (~20cm), Gaps ≤ ¼" (~6mm) may be wider than 8". BUMPER segments must be supported by at least ½" (~13mm) of ROBOT frame at each end (< ¼" (~6mm) gap between segment and frame are OK) <R410 & Fig 8-8>
____ **Corners** - Must be filled with pool noodle such that no "hard parts" are exposed. <R409 & Fig 8-7>
____ **Wood backing** - Must use ¾" (~19mm) thick x 5±½" (~127 mm ± 12.7 mm) tall plywood, OSB, or solid robust wood backing w/out extraneous holes affecting structural integrity. (shallow clearance pockets and/or access holes are acceptable). <R408-A>
____ **Pool Noodles** - Must use a pair of stacked 2½" nominal (2⅛" – 2 ¾") pool noodles. Pool noodles may be any shape cross section, solid or hollow, but both must be identical in shape and density. <R408-C>. Must use a durable cloth cover secured as in Fig 8-6 cross section. <R408-D>
____ **Color** - Must be able to display red or blue to reflect alliance color. < R405>
____ **Team number** - displayed with Arabic numerals, min. font 4" (~11cm) tall x ½" (~13mm) stroke, in white, and be easily read from approximately 60' (1828 cm) when walking around the perimeter of the ROBOT. No logos may be used for numerals. *FIRST* logos comparable to 2024 Virtual KOP may also be applied <R405 & R406>
____ **Attachment** - Must be securely mounted when attached and be easily removable for inspection. <R404 & R408-G>
____ **Height -** When ROBOT is on a flat floor, all BUMPER segments must reside entirely between the floor and 7½" (~19cm) above floor. They may not be articulated. <R402 & R403>

Mechanical

____ **No Sharp Edges or Protrusions that are a hazard for participants, ROBOTS, ARENA, or FIELD.** <R202>
____ **No Prohibited Materials** – E.g. sound, lasers (other than class 1), flammable gases, or untreated hazardous materials <R203>
____ **No Unsafe Energy Storage Devices** - Carefully consider safety of all stored energy or pneumatic systems <R203>
____ **No Risk of Damage to Other ROBOTS** - E.g. damaging, entangling, upending or adhering <G419 & R203 >
____ **No Risk of Damage to FIELD** – E.g. metal cleats on traction devices or sharp points on frame. <R201 & R202>
____ **No Risk of damage to Game Pieces** – areas interacting with game pieces free of sharp or damaging surfaces <R206>
____ **Decorations** - Cannot interfere with other ROBOTS' electronics or sensors, be in spirit of "Gracious Professionalism". <R203>
____ **End Game –** GAME PIECES can be removed from ROBOT and ROBOT from FIELD without power. <R204>
____ **STAGE Chain –** ROBOT not designed to reduce working length of field chain (e.g. create slack or twist chain) <R106>

Electrical

____ **Components –** None may be modified, except for motor mounting and output shaft, motor wires may be trimmed, window motor locking pins may be removed, and certain devices may be repaired with parts identical to the originals. PDP/PDH fuses may be replaced with identical fuses only. Servos may be modified per manufacturer's instructions. <R503, R710>
____ **Battery** - A single 12 volt, 17-18.2 Ah ROBOT battery, securely fastened inside ROBOT. <R601, R605, R606>
____ **Other Batteries** – Integral to COTS computing device or camera or COTS USB < 100Wh (20,000mAh at 5V) and 5 Amp max output per port used for COTS computing device and accessories only. Small batteries for CMOS/RTC are OK. <R602>
____ **PDP/PDH Visibility** –The single PDP/PDH, and PDP/PDH breakers must be easily visible for inspection. <R613 >
____ **Main Breaker Accessibility** – The single 120A main breaker must be readily accessible with labeling preferred. <R612>
____ **Allowable PD Breakers** - Only AT2-A, VB3-A, MX5-A, MX5-L Series Snap-Action breakers or REV Robotics ATO (40A or lower) may be inserted in the PDP/PDH <R619>
____ **ROBOT Radio** – A single Vivid Hosting VH-109 radio powered via a VRM +12 volt, 2 amp output, REV RPM, or directly from the PDP/PDH. The VRM/RPM or wiring must connect to the dedicated +12 volt output on the PDP/PDH. Radio LEDs are easily visible. <R616, R702, R707, R708>
____ **CAN BUS –** The roboRIO and PDP/PDH must be connected via CAN wiring even if no other CAN devices are used. <R716>
____ **roboRIO Power** – Only the roboRIO must be connected to dedicated power terminals on PDP/PDH. <R615>

____ **Wire Size Minimum and Breaker Size** - obey the wiring size conventions.
- ____ All wire from battery to main breaker to PDP/PDH must be min 6 AWG (7 SWG or 16mm2) wire <R609 & Fig.8-9>
- ____ 40 amp breakers must have min 12 AWG (13 SWG or 4 mm^2) wire connected <R622>
- ____ 30 amp breakers must have min 14 AWG (16 SWG or 2.5 mm^2) wire connected <R622>
- ____ 20 amp breakers must have min 18 AWG (18 SWG or 1 mm^2) wire connected <R622>

____ **Wire Colors** – All power wire must be color coded - red, yellow, white, brown, or black w/stripe for +24, +12, +5 VDC supply (positive) wires and black or blue for common (negative) for supply return wires except original wire by manufacturer <R624>

____ **Copper Wire Only –** All wire used on ROBOT must be copper wire. (Signal wire excluded) <R622>

____ **1 Wire per WAGO** - Only 1 wire may be inserted in each WAGO terminal. Splices and/or terminal blocks, may be used to distribute power to multiple branch circuits but all wires in the splice are subject to the wire size rules <R618>

____ **Motors** – Only motors listed per Table 8-1, **there may be no more than four (4) propulsion motors** <R501 & R502>

____ **Actuators** – Electrical solenoid actuators or electromagnets, less than 50 watts @12V continuous duty <R501 & Table 8-1>

____ **Motor/Actuator Power** –Each legal motor controller may have one motor connected to the load terminals with exceptions in Table 8-2. Specified motors may be individually connected to Spike or Automation Direct Relay (however multiple pneumatic valves may be driven by a single Spike). <R504, R505 & Table 8-2>

____ **Motor/Actuator Control** – Motors/actuators must be controlled by legal motor controllers and driven directly by PWM signals from roboRIO or through legal MXP board or by CAN bus. <R504, R712-R714, R717, R718>

____ **Custom Circuits, Sensors and Additional Electronics** - Cannot directly control speed controllers, relays, actuators or servos. Custom Circuits may not produce voltage exceeding 24V.<R614 & R625>

____ **Pneumatic Control Module (PCM) -** PCM/PH modules must be connected to roboRIO via CAN bus<R715>

____ **Isolated Frame** – Frame must be electrically isolated from battery, roboRIO must be insulated from frame. (>120 Ohm between either PDP/PDH battery post and chassis) <R611>

Pneumatic System using one on-board compressor (n/a for ROBOTS that do not use pneumatics)

____ **No Modifications** - Actuator mounting pins may be removed, small labels allowed. No painting or large labels. <R803>

____ **Compressor** - Only one (on ROBOT only) FRC Legal compressor (max 1.1 CFM flow rate) may be used. <R806>

____ **Compressor Power** - Must use a PCM/PH or Relay module <R812 & Table 8-2>

____ **Compressor Control** – A Pressure Switch must be wired directly to the PCM/PH or roboRIO to control compressor. <R812>

____ **Vent Plug Valve** – Must include an easily-accessible manual vent plug valve to release all system pressure. <R813>

____ **Tubing** – Equiv. to KOP with a maximum OD of ¼" (~6 mm) (documentation may be required). <R804-D>

____ **Gauges -** Must be present on both the stored pressure side and working pressure side of the regulator outlet(s) and be readily visible. <R805-E, R810>

____ **Pressure Rating** - All pneumatic components at **working** pressure, must be rated for at least 70 psi (~483 kPa, 4.8 Bar). All components at **stored** pressure must be rated for at least 125 psi (~862 kPa, 8.6 Bar). <R802>

____ **Valve Control** - Pneumatic solenoid valves must have a max 1/8" NPT, BSPP, or BSPT port diameter, be controlled by either a PCM or PH or Relay Module and valve outputs may not be combined. <Table 8-2, R804-C, & R814>

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

____ **Unauthorized Wireless Communication** – No wireless communication to/from ROBOT or OPERATOR CONSOLE without prior *FIRST* written permission. No radios allowed on the OPERATOR CONSOLE or in the pit <R707, R905>

____ **Confirm Pneumatics Operation** – With no pressure in system, compressor should start when ROBOT is enabled.
- ____ **Compressor stops –** Stops automatically at ~120 psi (~827 kPa, 8.2 Bar) or less under roboRIO control. <R807>
- ____ **Check Main Pressure –** Must be ≤ 120 psi (~827 kPa, 8.2 Bar) <R807> and Working Pressure must be ≤ 60 psi (~413 kPa, 4.1 Bar) <R808>
- ____ **Compressor Relief Valve** – Set to 125 psi, attached to (or through hard fittings) the compressor outlet port. <R811>
- ____ **Relieving Pressure Regulator** – Set to ≤ 60 psi (~413 kPa, 4.1 Bar), providing all working pressure. <R808>

____ **ROBOT Signal Light(s)** - A legal ROBOT Signal Light (two max.) must be easily visible while standing 3 ft. (~100 cm) away from at least one side of the ROBOT, and be plugged into the RSL port on roboRIO. Confirm that the RSL flashes in sync with roboRIO. <R709>.

____ **Verify Team Number on DS –** Team has programmed the OpenMesh Wireless Bridge at kiosk for this event. <R702>

____ **Software Versions** – The roboRIO image (FRC 2024_v2.1 or later) and DS (24.0 or later) must be loaded <R701 & R901>

____ **Power Off –** Disable ROBOT, then open Main Breaker to remove power from the ROBOT, confirm all LEDs are off, actuate pneumatic vent plug valve and confirm that all pressure is vented to atmosphere and all gauges read 0 psi pressure. <R813>

____ **Driver Console is less than 60" x 14" x 6'6" above floor (approx.).** May have hook and loop hook side attached to secure to Driver's Station shelf**.** <R904>

Team Compliance Statement

We, the Team Mentor and Team Captain, attest by our signing below, that our team's ROBOT was built after the 2024 Kickoff, and we are not aware of any rules it violates. We confirm that it and its MAJOR MECHANISMS are products of our team's work. We understand that the LRI at this event may be consulted, at any time, for questions arising from ROBOT inspection.

Team Captain:_____ Team Mentor:_____