

# 2019 BAJA SAE Technical Inspection Sheet

Competition: \_\_\_\_\_

School: \_\_\_\_\_

1	DRIVER	5	DRIVER	9	DRIVER
2	DRIVER	6	DRIVER	10	DRIVER
3	DRIVER	7	DRIVER	11	DRIVER
4	DRIVER	8	DRIVER	12	DRIVER

Vehicle #

Transponder 1		
Transponder 2		

Front Tires				Rear Tires				Gear Ratio  Total After CVT	CVT Primary Weight  Grams	CVT Primary Spring Color  Color or unique marks	CVT Secondary Spring Color  Color or unique marks
Size	Dia.	Wd.	Rim	Size	Dia.	Wd.	Rim				
Make				Make							
Model				Model							

Instructions:

- 1) Inspect your vehicle against this checklist **before entering the tech inspection area**. Initial each item under "TM" (team) column on the tech sheets. Check marks, X's or other similar marks are insufficient. Once complete, the faculty advisor must sign this form. Each unique car shall have its own set of forms for each competition.
- 2) Fill out the remainder of this form with all drivers' names, transponder numbers, tire, wheel, and drivetrain configuration, and sign and date the form **before entering the tech inspection area**.
- 3) This form and inspection sheets shall be presented to the technical inspectors with the vehicle.
- 4) Vehicles are to arrive at technical inspection ready to run, **with all documentation, all safety equipment, and all drivers present**.
- 5) These inspection forms shall be *printed single sided and in horizontal (landscape) format*.
- 6) Failure to comply with these instructions may result in your vehicle from being removed from the inspection line.

NTI Use Only			
In		Tech Num.	
Out			
In		Tech Num.	
Out			
In		Tech Num.	
Out			

Required Signatures

Team Captain \_\_\_\_\_ SIGN AND DATE

Faculty Advisor \_\_\_\_\_ SIGN AND DATE

Technical Inspector \_\_\_\_\_ SIGN AND DATE

NTI Only	
Tire 1 ID	
Tire 2 ID	
Tire 3 ID	
Tire 4 ID	
Other	

**C2.6 - "As Approved" Condition**

This form will be used to certify at any time that a vehicle has the original components presented at technical inspection. *Any vehicle found to have a tire/wheel and/or drivetrain configuration not matching this form shall receive a 75 point penalty for each time they are found in violation.*

FINAL TECH
Briggs & Stratton

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Design Constraints</b>						
<b>C.2.2.2</b>	Technical inspection sheets are printed single sided, horizontal format, and not stapled.			FR		
<b>B.1.5</b>	The vehicle must have four (4) or more wheels not in a straight line			FR		
<b>B.1.6</b>	Max width 1626 mm (64 in.) with wheels pointing forward			FR		
<b>B.2.5</b>	Hybrid electric power systems are specifically prohibited.			FR		
<b>B.2.6</b>	Energy storage devices used for propulsion, other than hydraulic accumulators, are specifically prohibited.			FR		
<b>Roll Cage - Material &amp; Documentation</b>						
<b>B.3.2.17</b>	Roll cage specification sheet must be present and filled out.			FR		
<b>B.3.7.1</b>	Calculations, purchase invoices, and material certifications of the materials used in the roll cage and bracing shall be required at technical inspection.			FR		
<b>B.3.2.16</b>	Primary roll cage members must be constructed of steel tubing with a minimum carbon content of 0.18%, OD of 25 mm (1.0 in), wall thickness of 3.0 mm (0.120 in).			FR		
<b>B.3.2.16</b>	Alternative Material must be steel tubing with a min. carbon content of 0.18% and have equivalent stiffness (EI) and bending strength ( $S_y I/c$ ) min thickness 1.57 mm (0.062 in); calculations must be in SI units.			FR		
<b>B.3.2.16</b>	Check thickness of Primary and Secondary Roll Cage Materials in a minimum of two places each. (1.57 mm (0.062 in) and 0.89 mm (0.035 in) minimum)			FR		
<b>B.3.2.3</b>	Secondary members may be circular or rectangular in shape and have a minimum OD (or width) of 25.4mm (1.0 in) and a minimum wall thickness of 0.89mm (0.035 in).			FR		
<b>B.3.2.15</b>	One destructive testing (sample #1) and one destructive inspection (sample #2) weld sample for each process performed by each roll cage welder is required at technical inspection. Weld samples shall be permanently marked with welder name, welder school, and weld date.			FR		
<b>B.3.2.15</b>	Weld samples are constructed of the same material and with the same process(es) as the inspected vehicle.			FR		
<b>B.3.2.15</b>	Weld samples exhibit superior weld strength with respect to the base material.			FR		
<b>B.3.2.15</b>	Weld samples exhibit sufficient and substantially uniform weld penetration.			FR		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Roll Cage - Geometry (Section 1)</b>						
B.3.2.1	Straight members may not extend longer than 1016 mm (40 in.) between Named Points and bent roll cage members may not be longer than 838 mm (33 in) unsupported. The minor angle between the two ends of a non-straight tube must not exceed 30°			FR		
B.3.2.5	Front two points (C) shall be joined by a lateral cross member (CLC); Located on the top plane of the roll cage.			FR		
B.3.2.6	RRH can have a maximum of 4 sections, no break in vertical members, driver seat cannot intrude RRH plane.			FR		
B.3.2.6	Rear Roll Hoop (RRH) must be substantially vertical (+/- 20° from vertical).			FR		
B.3.2.7	LDB max 127 mm (5 in) from top and 127 mm (5 in) from bottom of roll cage. Min angle of RRH and LDB ≥ 20°. A single, straight LDB exempt from length requirement.			FR		
B.3.2.12	Front bracing (FBM) max of 45° between vertical and FBM <sub>UP</sub> .			FR		
B.3.2.12	FBM <sub>UP</sub> joins points C to D. FBM <sub>LOW</sub> joins points F to D.			FR		
B.3.2.9	LFS members must extend from RRH to points forward of driver's heels which are connected by the FLC (and ELC for nose cars).			FR		
B.3.2.12.1	If the RHO and FBM <sub>UP</sub> are not made of a continuous tube, a gusset is required at point C.			FR		
B.4.2.4.3	Tubes anchoring safety harness shoulder straps shall be mounted to the primary welded structure of the vehicle and within the plane of the RRH.			FR		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Roll Cage - Geometry (Section 2)</b>						
B.3.2.13	Members in the FAB system, if straight, must not exceed 1016 mm (40 in) in unsupported length. If bent, members may not be longer than 838 mm (33 in) in unsupported length.			FR		
B.3.2.13	Projected to side view, roll hoop bracing triangulation angles must be at least 20°.			FR		
B.3.2.13.1	If front roll hoop bracing is used, it must connect FBMUP, LFS, and SIM <5 in from Point C. Point P must be vertically supported to Point Q. Points P and Q only exist with a complete front FAB system.			FR		
B.3.2.13.2	If rear bracing is used, there must be a structural triangle connecting point B (within 2 in) to either point A or S (within 2 in). The aft vertex of the structural triangle must also be connected to whichever point A or S (within 2 in) is not part of the structural triangle (this member is exempt from the maximum 30° bend rule). The aft vertices must be joined the lateral cross member RLC.			FR		
B.3.2.8	RHO must be >1041 mm (41 in) above driver seat; LC at point C must be >305 mm (12 in) forward of seat back; and RRH must be >737 mm (29 in) wide at 686 mm (27 in) above seat. All dimensions are with respect to the template in B.3.2.8			FR		
B.3.2.10	The side impact members shall run between 203 mm (8 in) and 356 mm (14 in) above the lowest point of the seat in contact with the driver.			FR		
B.3.2.11	The USM shall pass directly below the roll cage template fore-aft envelope.			FR		
B.3.2.14	All butt joints are reinforced with an internal sleeve and exhibit at least 102 mm (4 in) linear distance of weld bead.			FR		
B.3.5	Bolted roll cage meets specifications. No pin joints are permitted.			FR		
<b>Roll Cage - Driver Clearance</b>						
B.3.3.1	The roll cage is large enough for the largest driver. The driver's helmet will be at least 152 mm (6 in) away from a straight-edge applied to any two places on the structure.			FR		
B.3.3.1	The driver's torso, knees, shoulders, elbows, hands, and arms must have 76 mm (3 in) of clearance to the outside structure of the cockpit, less the roll cage padding.			FR		
B.3.3	The driver's feet must be completely within the roll cage.			FR		
B.3.2.10	If the tube between the front LC connecting the two SIM members (points D or G for nose cars) is below the driver's toes, an additional bar will be needed above the driver's toes.			FR		
B.3.1	The roll cage <b>protects</b> the driver as intended. No tubes showing any cracks or deformation. Final judgment will rest with National Technical Inspectors.			FR		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Driver Restraint</b>						
<i>B.4.2</i>	Minimum 5-point harness with 3-inch webbing and a single metal-to-metal quick release lever buckle. No cam lock systems.			1		
<i>B.4.2.1</i>	All driver restraint systems must meet either SFI Specification 16.5/16.1, or FIA specification 8853/98. No older than 3 years as of Jan 1st of competition year.			1		
B.4.4	Head restraint must be mechanically fastened (No Velcro or adhesive) to the vehicle. Head restraints may also be mechanically fastened or integral to the driver's seat.			1		
<i>B.4.2.4.2</i>	The shoulder webbing shall be laterally spaced 203 mm $\pm$ 25.4 mm (8 in $\pm$ 1 in) center to center and be directly routed towards the driver's shoulders. Redirection, diversion, or obstruction of the shoulder webbing is prohibited.			1		
<i>B.4.2.4.6</i>	Restraint webbing may pass through the firewall as long as the firewall construction is extended to protect the harness webbing.			2		
<i>B.4.2.4.3</i>	Shoulder belts shall be looped around a straight frame tube meeting secondary member requirements and have provisions to limit lateral webbing movement.			2		
<i>B.4.2.4.3</i>	The shoulder harness must be securely mounted to the primary welded structure of the vehicle and within the plane of the RRH.			2		
<i>B.4.2.5.2</i>	Frame tabs for mounting the lap and anti-submarine belts must be no less than 2.29 mm (0.090 in) thick, must have at least 38.1 mm (1.5 in) of weld length per tab, bear no holes other than those required for bolts, and not display significant deformation when pulled on. Fastener and tab hole diameters must be the same.			2		
B.4.2.5.2	Lap belt tabs must be in double shear, free to pivot and align with the direction of the load. Webbing may not be routed against the seat as to impede the function of the restraint system.			2		
<i>B.4.2.6</i>	Anti-submarine belts may be bolted by tabs, wrapped around a tube, or wrapped around a bolt in double shear. Webbing redirections over 30° are unacceptable. Webbing must not significantly twist between mounting point and latches.			2		
<i>B.12</i>	All fasteners in the <b>driver's harness</b> system shall meet requirements of B.12.			2		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Seat</b>						
<b>B.4.5</b>	Vehicle must have a conventional seat with the driver's back angle between 90 and 65 degrees from horizontal. Suspension seats are prohibited.			2		
<b>B.4.5.3.2</b>	The seat has a distinct back plane (not the firewall), with at least two mounting points at or near the RRH to tubes meeting at least secondary frame member requirements.			2		
<b>B.4.5.3.2</b>	The seat has a distinct bottom plane (not the skid plate), with at least four mounting points to tubes meeting at least secondary frame member requirements.			2		
<b>B.4.5.3.3</b>	All tabs used to mount seats shall be generally rigid and be at least 0.090 in (2.3 mm) thick and have at least 1.5 in (38 mm) of weld length			2		
<b>B.4.5</b>	Seat works in concert with the safety harness to secure driver.			2		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Fuel System</b>						
<b>B.2.7</b> <b>B.6.6.5</b>	Fuel pumps are prohibited. Fuel tanks shall not be modified.			2		
B.6.9	Any cover or lid over the fuel tank shall utilize rubber draw latches or over-center latches, easily actuated by track workers with gloves on.			2		
<b>B.6.3</b>	Entire fuel system, including tank and carburetor assembly, is contained within the roll cage. Test with straight edge between two points on the frame. (Incl. air box).			2		
<b>B.6.5</b>	One remote mounted stock B&S Model 20 fuel tank is allowed. BS 799863			2		
<b>B.6.4</b>	Tank has standard B&S gas cap (#B4325GS) with a built in check valve.			2		
<b>B.6.6</b>	All fuel lines must be SAE J30R14 or 30R7-RP fuel rated, 1/2 in OD and 1/4 in ID, located away from sharp edges, hot exhaust parts, and prevented from chafing with grommets or other means.			2		
B.6.1	Fuel tank position must be such that no fuel can spill onto the driver, engine, ignition, or exhaust during fueling.			2		
B.6.5.1	Fuel tank mounting tabs shall connect to secondary members and have no lightening holes or other cutouts, are less than 50.8 mm (2 in. hole center to tube edge), and at least 0.063 in (1.5 mm) thick. The minimum hole edge distance is 0.25 inches.			2		
B.6.5.1	All tank mounting holes shall be used. Any fasteners must meet rule B.12. Minimum hole edge distance 0.25 inches. The fuel tank shall not be crushed or deformed by any fastener.			2		
B.6.7	Splash shields are required to prevent fuel from accidentally being poured directly on the engine or exhaust while refueling or preparing to refuel the car.			2		
<b>B.6.7</b>	Splash shields shall be fixed (non-adjustable), effective at all times, divert spilled fuel away from the engine and towards the outside of the vehicle. Splash shields shall not allow pooling or retention of fuel.			2		
<b>B.6.7</b>	Splash shields shall be metallic, at least 0.020 in thick, generally rigid, and mounted using sound engineering practices, including adequate spacing from hot exhaust parts or gases.			2		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Guards</b>						
B.9.1	All powertrain components, such as gears, belts, chains, sprockets, etc. must have guarding/shielding systems to protect against hazardous release of energy and pinch points/entanglement.			2		
B.9.2	Shields protecting against release of hazardous energy must extend around the periphery of <b><i>all</i></b> rotating assemblies and be wider than the component they are guarding. (Including the entire width of CVT assembly)			2		
<b>B.9.2</b>	Material protecting against hazardous release of energy shall be 1010 steel plate or better and at least 1.524 mm (0.060 in) thick or 6061-T6 aluminum or better and at least 3.0 mm (0.12 in) thick. All other materials are prohibited.			2		
B.9.4	Unmodified, OEM, stock guarding shall be considered to meet the requirements of B.9.1 and B.9.2. Modified OEM components will be inspected for compliance with B.9.1 and B.9.2.			2		
B.9.3	All moving powertrain parts must be guarded <b>on all sides</b> so that a finger cannot be inserted into them. U-Joints, axle shafts, brake rotors and hubs in the final drive stage are exempt. OEM CVT covers are subject to finger guard requirements. Non rigid, fabric coverings such as "Frogskin", Ceconite, and neoprene are unacceptable.			2		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Cockpit</b>						
B.8.3	This firewall must be metal, and at least 0.508 mm (0.020 in) thick.			1		
B.8.7.2 B.7.2	Open universal joints in steering system near drivers feet shall be covered to prevent entanglement. Steering links shall be properly shielded and covered with a sturdy, full-width cover.			1		
B.8.6	The skid plate must extend the entire length of the cockpit and protect driver.			1		
B.8.6	Skid plate material must be metal, fiberglass, plastic, or similar material. Skid plates shall prevent debris and foreign object intrusion into the cockpit.			1		
B.8.8	Fire extinguisher mounted on the right side, easily accessible, with the top below the driver's head, and the top half above the SIM. Mounting bolts must meet B12 and match hole geometry. The pull knob shall be free and clear of any access obstructions. <b><u>Radial clearance to the pull knob shall be 2.5 in.</u></b>			1		
B.8.8.4	Extinguisher mount tabs are at least 0.125 in thick. Mount uses at least 2 bolts.			1		
B.8.8.4	Mount must resist shaking loose, but the extinguisher must be easily removable.			1		
B.8.8	Two extinguishers with a Minimum UL rating of 5 B C; must be equipped with a <b>manufacturer installed dial gauge</b> ; gauge must be <b>readable and properly charged</b> . Kidde units: Oldest Julian Date is 22817. (228th day of 2017)			1		
B.8.8.3	Fire extinguisher mount is Drake FIREX-MNT-DOR or FIREX-MNT-S-DOR. No other mounts are acceptable.			1		
B.8.3	All extinguishers must be labeled with school name and car number.			1		
B.7.2	Only foot operated, cable throttle controls are allowed. Wide open throttle stop is required (at the pedal).			2		
B.7.2	All throttle controls <b><u>must return to idle stop in the event of failure and ensure full throttle is achievable</u></b> . Throttle cable cannot be bare from the forward mounting point to the firewall.			2		
B.8.3	A firewall must completely separate the engine compartment and fuel tank from the cockpit. The firewall shall cover entire plane of RRH.			2		
B.8.3	Cutouts and multiple firewall panels are allowed , if no fuel may enter the cockpit.			2		
B.8.5	Body panels must cover the area between LFS member and SIM. The material must be plastic, fiberglass, metal or similar material. No gaps can exist that are larger than 6.35 mm (0.25 in). Velcro and / or Zip ties are <b>not</b> acceptable fastening methods.			2		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Electrical</b>						
B.10.1.1.3	Any electronic control device for drivetrain, steering, or suspension systems must be powered by a B&S engine alternator.			1		
<b>B.10.4.1</b>	BSAE approved, unmodified brake lights shall be mounted minimum 1000 mm (39.4 in) from ground, and clearly visible in daylight when on. Light shall be completely extinguished when brakes are not actuated.			1		
<b>B.10.4.1</b>	Each independent brake circuit must be equipped with a hydraulic pressure switch. Actuation of any one circuit or combination of any circuits shall turn the brake light on.			1		
<b>B.10.4.2</b>	Cars with reverse must have reverse light (SAE "R") of LED design and alarm mounted at min 700 mm (27.6 in) from the ground and aft of the RRH/firewall.			1		
<b>B.10.3</b>	Each vehicle must be equipped with two (2) <b><i>easily actuated</i></b> kill switches turning off the ignition. The Kill switch must not de-energize the Brake Light(s). (Note: Kill switches do not need to cut power to other electronics.)			1		
<b>B.10.3.2</b>	Kill switch is a: Ski-Doo 01-171, 27-0124, 27-0152, or Polaris 4013381			1		
B.10.3.3	One switch must be located on the driver's right side of the vehicle, on a <b><i>panel perpendicular (+/- 15°) to the firewall</i></b> , no more than 178 mm (7 in) from the top of the roll cage. Kill switch fasteners shall meet rule B.12			1		
B.10.3.3	The second kill switch must be located on the driver's left side, along the SIM, and be easily actuated by the driver.			1		
<b>B.10.2</b>	Kill switch wiring must be sealed, protected or securely attached to the frame to prevent the wires from being entangled with the driver or obstacles.			2		
<b>B.10.4.1</b>	Reverse and brake lights shall remain effective at all times. No cut-out or disabling switches are permitted.			2		
B.10.1.1	The batteries must be effectively sealed and secured and not leak in the event of a roll over. Terminals shall be insulated.			2		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Brakes</b>						
B.7.1.1	Vehicle must have two independent brake circuits and separate reservoirs.			1		
B.7.1.2	Outboard or inboard brakes are permitted, and must operate through the drive axle. Braking on an intermediate stage is prohibited.			1		
B.7.1.4	Brake lines shall be routed to prevent abrasion, pinching, tension, and fatigue for all suspension and steering positions. Brake lines must also not fall below any portion of the vehicle to be exposed to the terrain. Plastic brake lines are prohibited.			2		
B.7.1.3	"Cutting brakes" are permitted provided section B.7.1 is satisfied.			2		
<b>Identification</b>						
B.13.2.1	All vehicles must have a MYLAPS MX transponder. Classic, Flex, and X2 only.			1		
B.13.6	All vehicles must have an SAE issued RFID tag mounted to the right RHO.			1		
B.13.2.3.2	Transponder shall be mounted on the right side, forward of the seat and within 610 mm (24 in) of the ground. The transponder shall be properly oriented and have unobstructed LOS to the ground.			1		
B.13.3	Each vehicle must have three single-color, raised numbers in the approved font, 152 mm (6 in) tall, 12.7 mm (0.5 in) high, oriented horizontally, off a high contrast, single color background; two must be affixed to the upper side of the frame, behind the RRH. They must be in the vertical plane on the side of the car. One must face forward, but placement is open.			1		
B.13.3.2.2	One number shall be visible from the front of the vehicle. Numbers mounted above the SIM shall be less than or equal to 45° from vertical. Numbers mounted below the SIM shall be less than or equal to 15° from vertical.			1		
<b>Miscellaneous</b>						
B.11.2	Front hitch is tubular, Max OD 1.25 in, Min OD 1.00 in. Vertical location between LFS and SIM. Must be able to pass hitch inspection gauge.			1		
B.11.3	Rear hitch is plate-style. 0.125 to 0.375 in thick, Hole diameter is 1.0 in to 1.25 in. 1.0 in max edge distance. Minimum attachment width, 3.0 in.			1		
B.2.6.1	Hydraulic power systems must be properly shielded and documentation of the shielding made available for review by the National Technical Inspectors.			2		
B.8.4	Front or mid-engine cars must meet specification B.8.4			2		
B.2.7.13.1	Engine remains stock. Check exhaust, fuel system, and governor for compliance.			2		
B.3.4	Inspect vehicle for sharp edges which may harm drivers, crew, or track workers.			2		
A.3.4	The technical inspectors can require any modification at their discretion.			2		

Section	Rule	TM	TI	TIL	Failed Items	RC
<b>Driver Equipment</b>						
B.5.1	BSAE 2019 Helmet sticker required. Double check helmet: Snell M2010 or M2015.			1		
B.5.1	One-piece Motocross style helmet only, fitted with Tear Offs/Roll Off system. Check that tear offs are installed properly.			1		
B.5.3	Neck Support SFI 3.3 with valid expiration dates must be worn. Horseshoe collars, Leatt, & HANS devices are not allowed.			1		
B.4.3	Separate, independent arm restraints meeting SFI 3.3 certification, and have a valid expiration date.			1		
B.5.4	Drivers must wear long pants (cotton/Nomex), socks, shoes, gloves and a long sleeved upper garment bearing a factory label indicating it is SFI rated, FIA rated OR fire resistant. No date restriction. Check for good condition.			1		
B.5.4.5	Non fire-resistant outer shirts or jerseys are prohibited.			1		
<b>Egress</b>						
B.7.1	All vehicles must incorporate a foot-operated braking system capable of locking the front and rear statically and dynamically on pavement and unpaved surface.			1		
B.8.1	Restraints must be secured to driver restraint system and must separate completely from the vehicle when the driver releases the harness.			1		
B.4.2.4.1	Shoulder belts mounted at or below the driver's shoulders (No more than 102 mm (4 in) below shoulder level.)			1		
B.4.2.5.2	The harness mounts shall not exhibit noticeable deformation when webbing is adjusted.			1		
B.4.3	Arm Restraints must prevent arms from extending beyond the plane of the roll cage (plane is defined by RHO and SIM).			1		
B.10.3.3.1	Cockpit kill switch within easy reach of the restrained driver; Arm restraints do not impede driver's ability to reach kill switch.			1		
B.7.2.1	No type extension to the driver's foot pedals are allowed.			1		
B.7.2.1	Feet can not get trapped in the pedals and the driver's feet can not stick out of the car.			2		
B.4.2.5.1	Lap belt angle is between 45 and 65 degrees when worn, and in proper adjustment with the anti-submarine belt such that the belts are worn over the driver's pelvis.			2		
B.4.2.6.2	Driver anti-submarine belt angle is between 0 and 20 degrees aft of the chest line.			2		
B.4.2.4.5	Belts shall be adjustable for different drivers. Minimum excess webbing is 4 inches.			2		
B.8.2	Maximum egress time of 5 seconds, equipped with all safety gear per B16.			2		
B.8.1	Designed for driver protection & easy driver egress in an emergency.			2		