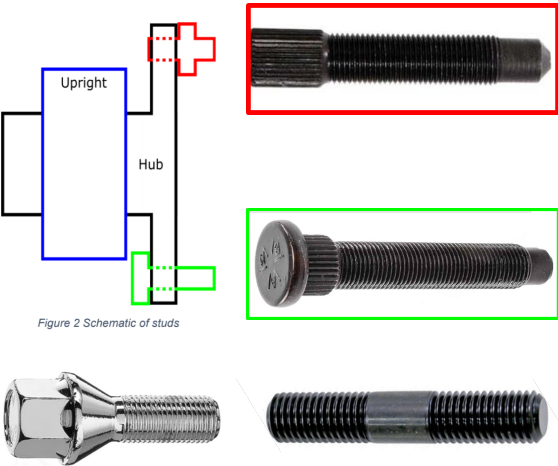


Car No
University

MECH 4				
!ONLY FOR CV! NO FUEL IN THE FUEL TANK ! IF YES, EMPTY AT THE PIT				
!ONLY FOR EV! CHECK IF THE TEAM HAS THE ACCUMULATOR INSPECTION STICKER! IF NOT THE ACCUMULATOR MUST NOT BE PRESENT!				
Technical Inspection Sticker (IN1.3)				
WHEELS (T2.5) (VEHICLE ON THE GROUND)				
No.	Checkpoint	Rule No	Checkbox	Comments
WHEEL FREE PLAY				
	GUIDELINES <ul style="list-style-type: none"> • Check the wheels' free play in both TOE and CAMBER direction - Play in camber direction can be treated with more leniency within reasonable levels. - Play in TOE direction in REAR wheels must be barely existent - Force capable to rock the vehicle should be applied - Larger wheels are usually expected to have more play (more leverage) - While moving the wheels, inspect the A-arm mounting points on the chassis as well as the mounting points inside the rim. - While moving the REAR wheels, inspect the TOE link mounting points (on the chassis and on the wheel assembly) - If the suspension is mounted to the uprights with brackets, the brackets need to be rigid (check for deflections) 			
176	• FRONT LEFT			
177	• FRONT RIGHT			
178	• REAR LEFT			
179	• REAR RIGHT			
WHEEL FASTENING				
180	WHEEL NUTS <ul style="list-style-type: none"> • If a single nut is used to retain the wheel, a device must be incorporated to prevent loosening of the nut and the wheel. A second nut (jam nut) is not allowed. 	T2.6.1		
181	<ul style="list-style-type: none"> • Custom wheel nuts must show proof of good engineering practices. Purchased single nut systems must show proof of purchase. - Ask for pretension force of the wheel lug assembly 			
182	No safety wiring for positive locking of center wheel nuts. Only proper industrially manufactured cotter pins, center lock wheel springs or mechanisms compliant with T10.2			
183	WHEEL LUG BOLTS - STUDS - NUTS <ul style="list-style-type: none"> • Wheel lug bolts and studs must be made of steel or titanium. The team must be able to show good engineering practice and providing adequate strength by calculations. Wheel lugbolts and studs must not be hollow. • Aluminum wheel nuts may be used, but they must be hard anodized and in pristine condition. • Wheel nuts must comply with T 10.2. An exception is made for commercially designed fasteners designated for wheels. In this case documentation must be presented together with proof of purchase, datasheets, calculations, proof of correct installment and other necessary documentation needed to prove their compliance. - Ask for calculations that justify the design's safety. 	T2.6.2 T2.6.3		

184	<ul style="list-style-type: none"> The assembly must be positively locked and be a mechanical connection (green example). Wheel studs may not be fastened/locked by friction only, e.g. a press fit (red example). Threaded studs are allowed as long as it is positively locked. Off-the-self conical nuts as well as conical lug nut bolts are allowed if the correct pretension values are used.  <p>Figure 2 Schematic of studs</p>			
185	<p>SUSPENSION (EV - WITH ACCUMULATOR STICKER AND ACCUMULATOR INSIDE) (Checked also in M1 with driver inside)</p> <ul style="list-style-type: none"> The vehicle must be equipped with fully operational front and rear suspension systems including shock absorbers and a usable wheel travel of at least 50mm and a minimum jounce of 25mm with driver seated. All suspension pickup points must be secure and rigid 	T2.5.1		
STEERING SYSTEM (T6) (VEHICLE ON THE GROUND)				
No.	Checkpoint	Rule No	Checkbox	Comments
186	Steering systems using cables or belts for actuation are prohibited. This does not apply for autonomous steering actuators.	T2.8.1		
187	Rear wheels steering maximum 6 degrees and with mechanical stops	T2.8.11		
188	<ul style="list-style-type: none"> If adjustable tie-rod ends are used, a jam nut must be used to prevent loosening Purchased devices that mechanically prevent loosening are allowed after being thoroughly inspected. 	T10.2.6		
STEERING WHEEL				
189	<ul style="list-style-type: none"> Steering wheel must be round, oval or near-oval with a quick release installed. No concave sections ! <p>(Check quick release)</p>	T2.8.5 T2.8.7		
190	<ul style="list-style-type: none"> The steering wheel must be no more than 250 mm rearward of the front hoop. This distance is measured horizontally, on the vehicle centerline, from the rear surface of the front hoop to the forward most surface of the steering wheel with the steering in any position. In any angular position, the top of the steering wheel must be no higher than the top-most surface of the front hoop. 	T2.8.6 T2.8.8		
191	Assess the steering wheel's structural integrity by pushing it (from the handles) forwards to simulate breaking situation and backwards to simulate acceleration forces			
STEERING SYSTEM FREE PLAY				
192	<ul style="list-style-type: none"> Allowable steering system free play is limited to a total of 7° measured at the steering wheel. <p>- Position your foot against the wheel and slowly steer. Assess the force on your foot and the steering play existing.</p>	T2.8.4		
193	<ul style="list-style-type: none"> Check for CONTACT between components in the wheel assembly <p>(If in doubt, inspect again with the vehicle lifted and the wheels on)</p>			
194	FRONT LEFT			

195	FRONT RIGHT			
BRAKE SYSTEM				
No.	Checkpoint	Rule No	Checkbox	Comments
196	• No "Brake-by-wire" in manual mode.	T6.1.5		
197	• Hydraulic brake system that acts on all four wheels and is operated by a single control.	T6.1.1		
198	• Two independent hydraulic circuits. In case of leak or failure effective braking power maintained in on at least two wheels	T6.1.2		
199	• A single brake acting on a limited-slip differential is acceptable	T6.1.4		
200	• Sealed to prevent leakage • Unarmored plastic brake lines are prohibited.	T6.1.3 T6.1.6		
201	• The brake system must be protected from failure of the drivetrain , see T 7.3.2, from touching any movable part and from minor collisions. <i>(rotating parts - gears, clutches, chains, belts etc must be fitted with scatter shield. Check protection of brae system)</i>	T6.1.7		
202	Any part of the brake system must be within the surface envelope, see T1.1.18 • No part of the braking system on the sprung part of the vehicle below the lower surface of the chassis	T6.1.8		
VEHICLE LIFTED AND WHEELS REMOVED				
!WHILE THE VEHICLE IS LIFTED, PERFORM CHECKS WHILE KEEPING ANY BODY PART OUTSIDE OF THE VEHICLE'S FOOTPRINT!				
No.	Checkpoint	Rule No	Checkbox	Comments
	<i>Guidelines</i> - Ask the teams to loosen the wheel nuts to jack the car up. - Check for the proper position of the jacking device (use the points indicated by orange triangles if safe) - Ask the team to remove the wheels			
203	STEERING SYSTEM STOPS • Must have positive steering stops that prevent the steering linkages from locking up. The stops must be placed on the rack and must prevent the tires and rims from contacting any other parts. Steering actuation must be possible during standstill. <i>(Check for collisions in the wheel assembly)</i>	T2.8.3		
FASTENERS (T10)				
No.	Checkpoint	Rule No	Checkbox	Comments
204	LOCKING: The following fasteners are considered critical and have to be positively locked according to T10.2: • Steering System • Braking system (Pedalbox) • Suspension System • ETC • Primary Structure (M2) • Drivers harness (M2) • Accumulator Container (M2)	T 10.1.1 T 10.2.1		
FRONT LEFT				
205	A-ARMS and A-ARM MOUNTS			
206	• 2 threads minimum	T 10.2.4		
207	• Positive locking	T 10.2.1		
208	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
209	• Check if the bolts are tight			
210	TIE ROD AND TIE ROD LENGTH ADJUSTING SYSTEM			

211	• 2 threads minimum	T 10.2.4		
212	• Positive locking	T 10.2.1		
213	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
214	• Check if the bolts are tight			
215	PUSH/PULL ROD AND LENGTH ADJUSTING SYSTEM			
216	• 2 threads minimum	T 10.2.4		
217	• Positive locking	T 10.2.1		
218	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
219	• Check if the bolts are tight			
220	BRAKE CALIPERS			
221	• 2 threads minimum	T 10.2.4		
222	• Positive locking	T 10.2.1		
223	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
224	• Check if the bolts are tight			
225	BRAKE DISKS			
226	• 2 threads minimum	T 10.2.4		
227	• Positive locking	T 10.2.1		
228	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
229	• Check if the bolts are tight			
	FRONT RIGHT			
230	A-ARMS and A-ARM MOUNTS			
231	• 2 threads minimum	T 10.2.4		
232	• Positive locking	T 10.2.1		
233	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
234	• Check if the bolts are tight			
235	TIE ROD AND TIE ROD LENGTH ADJUSTING SYSTEM			
236	• 2 threads minimum	T 10.2.4		
237	• Positive locking	T 10.2.1		
238	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
239	• Check if the bolts are tight			
240	PUSH/PULL ROD AND LENGTH ADJUSTING SYSTEM			
241	• 2 threads minimum	T 10.2.4		
242	• Positive locking	T 10.2.1		
243	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
244	• Check if the bolts are tight			
245	BRAKE CALIPERS			
246	• 2 threads minimum	T 10.2.4		

247	• Positive locking	T 10.2.1		
248	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
249	• Check if the bolts are tight			
250	BRAKE DISKS			
251	• 2 threads minimum	T 10.2.4		
252	• Positive locking	T 10.2.1		
253	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
254	• Check if the bolts are tight			
	REAR LEFT			
255	A-ARMS and A-ARM MOUNTS			
256	• 2 threads minimum	T 10.2.4		
257	• Positive locking	T 10.2.1		
258	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
259	• Check if the bolts are tight			
260	TOE LINK AND TOE LINK LENGTH ADJUSTING SYSTEM			
261	• 2 threads minimum	T 10.2.4		
262	• Positive locking	T 10.2.1		
263	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
264	• Check if the bolts are tight			
265	PUSH/PULL RODS AND THEIR LENGTH ADJUSTING SYSTEM			
266	• 2 threads minimum	T 10.2.4		
267	• Positive locking	T 10.2.1		
268	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
269	• Check if the bolts are tight			
270	BRAKE CALIPERS			
271	• 2 threads minimum	T 10.2.4		
272	• Positive locking	T 10.2.1		
273	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
274	• Check if the bolts are tight			
275	BRAKE DISKS			
276	• 2 threads minimum	T 10.2.4		
277	• Positive locking	T 10.2.1		
278	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
279	• Check if the bolts are tight			
	REAR RIGHT			
280	A-ARMS and A-ARM MOUNTS			
281	• 2 threads minimum	T 10.2.4		

282	• Positive locking	T 10.2.1		
283	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
284	• Check if the bolts are tight			
285	TOE LINK AND TOE LINK LENGTH ADJUSTING SYSTEM			
286	• 2 threads minimum	T 10.2.4		
287	• Positive locking	T 10.2.1		
288	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
289	• Check if the bolts are tight			
290	PUSH/PULL RODS AND THEIR LENGTH ADJUSTING SYSTEM			
291	• 2 threads minimum	T 10.2.4		
292	• Positive locking	T 10.2.1		
293	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
294	• Check if the bolts are tight			
295	BRAKE CALIPERS			
296	• 2 threads minimum	T 10.2.4		
297	• Positive locking	T 10.2.1		
298	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
299	• Check if the bolts are tight			
300	BRAKE DISKS			
301	• 2 threads minimum	T 10.2.4		
302	• Positive locking	T 10.2.1		
303	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
304	• Check if the bolts are tight			
305	DIFFERENTIAL MOUNT			
306	• 2 threads minimum	T 10.2.4		
307	• Positive locking	T 10.2.1		
308	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
309	• Check if the bolts are tight			
310	WHEEL-MOTOR-GEARBOX ASSEMBLY • The teams should provide a 2D cross section of the assembly and explain the design. The individual components (motor mount, bearing installation, planetary gear box installation etc.) shall be properly locked and consist a safe design • Check to the possible extend, if the presented design matches the installation on the car			
STEERING SYSTEM				
311	• 2 threads minimum	T 10.2.4		
312	• Positive locking	T 10.2.1		
313	• No nylon locknuts in areas with heatsource (max 80 °C, minimum 50mm distance from the heatsource)	T 10.2.2		
314	• Check if the bolts are tight			

315	<ul style="list-style-type: none"> The teams should provide a 2D cross section of the steering system assembly and explain the design. The individual components, transfer of movement to the wheels, upper and lower steering column bearing mount system should be checked 			
316	STEERING RACK <ul style="list-style-type: none"> must be mechanically attached to the primary structure. Joints between all components attaching the steering wheel to the steering rack must be mechanical and visible at technical inspection. Bonded joints are allowed in accordance with T 3.2.8. 	T2.8.9		
BRAKE SYSTEM				
No.	Checkpoint	Rule No	Checkbox	Comments
317	<ul style="list-style-type: none"> The brake pedal, including the pedal face, must be fabricated from steel or aluminium or machined from steel, aluminium or titanium. 	T6.1.10		
318	<ul style="list-style-type: none"> Repeat check on safety wiring of the braking assembly on each wheel 			
319	<ul style="list-style-type: none"> The brake pedal and its mounting must be designed to withstand a force of 2 kN without any failure of the brake system or pedal box. This may be tested by pressing the pedal with the maximum force that can be exerted by any official when seated normally <p><i>The team must provide calculations that all the individual components as mentioned above (brake pedal, brake pedal mounting, pedal box mounting) can withstand a 2 kN force.</i></p>	T6.1.9		
320	EV ONLY - BRAKE OVER-TRAVEL SWITCH - BOTS <ul style="list-style-type: none"> The BOTS must be a push-pull, push-rotate or flip type mechanical switch Repeated actuation of the switch must not close the SDC The driver must not be able to reset it. <p><i>Visually Check if the brake pedal is designed so that the BOTS can be triggered. Teams should provide extra documentation if the method of triggering is unclear.</i></p>	T6.2		
VEHICLE ASSEMBLED AND ON THE GROUND				
No.	Checkpoint	Rule No	Checkbox	Comments
321	BRAKE PEDAL TEST <ul style="list-style-type: none"> Enter the vehicle and kick the brake pedal Also apply force progressively and slowly to feel any abnormal flexing. <p><i>Pay special attention to the brake pedal and pedalbox assembly, failures happen.</i></p>	T6.1.9		
322	STEERING SYSTEM CHECK <ul style="list-style-type: none"> The steering wheel must directly mechanically actuate the front wheels. Steering actuation must be possible during standstill. <p><i>While inside the vehicle, quickly steer the wheels to check including your weight</i></p>	T2.8.2 T2.8.3		
APPROVAL STATUS			qid=0	
MECH 4	Approval (Control box) (DON'T CHANGE MANUALLY)		FALSE	