



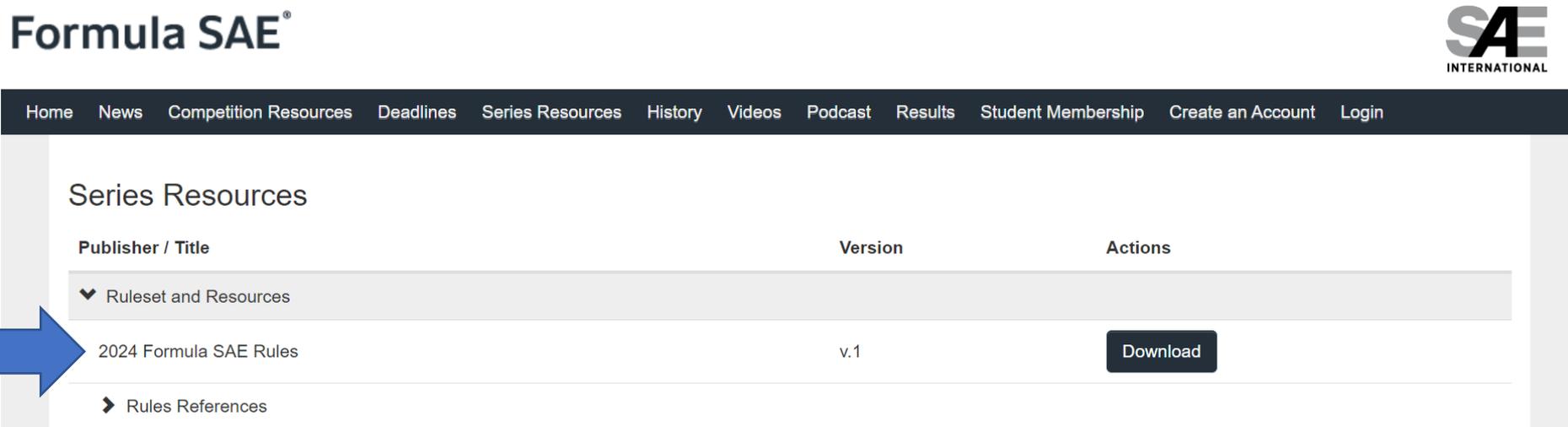
FÓRMULA SAE BRASIL 2024
TECHNICAL INSPECTION GUIDE FSAE-B Teams

Inspeção Técnica

Informações Gerais

- **“Boa prática de engenharia” (GR.1.4)**
 - Mesmo não estando explícito na regra, se o juiz encontrar alguma situação potencialmente perigosa, como má posição dos comandos, estado insatisfatório de componentes, caminho inadequado das cargas na estrutura ou mal isolamento do cockpit, ele está apto a solicitar mudanças.
- **A decisão dos juízes é final e definitiva**
 - Se a alteração for solicitada, ela deve ser executada. Casos especiais serão levados ao Comitê Técnico.
- A versão do regulamento abaixo é a vigente para a competição:
Formula SAE® Rules 2024 – Version 1

Formula SAE®



SAE INTERNATIONAL

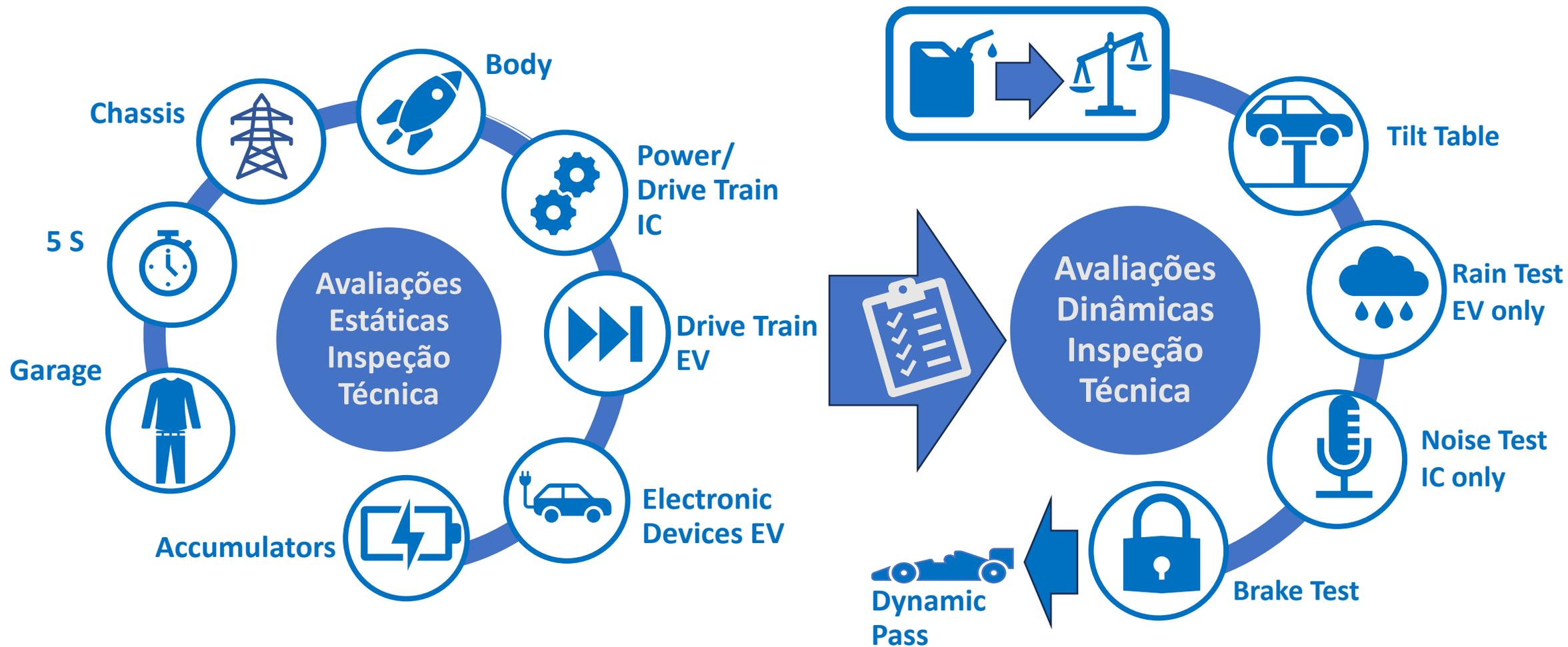
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Series Resources

Publisher / Title	Version	Actions
▼ Ruleset and Resources		
2024 Formula SAE Rules	v.1	Download
▶ Rules References		

Inspeção Técnica

Fluxo de aprovações.



Pré - Inspeção Técnica

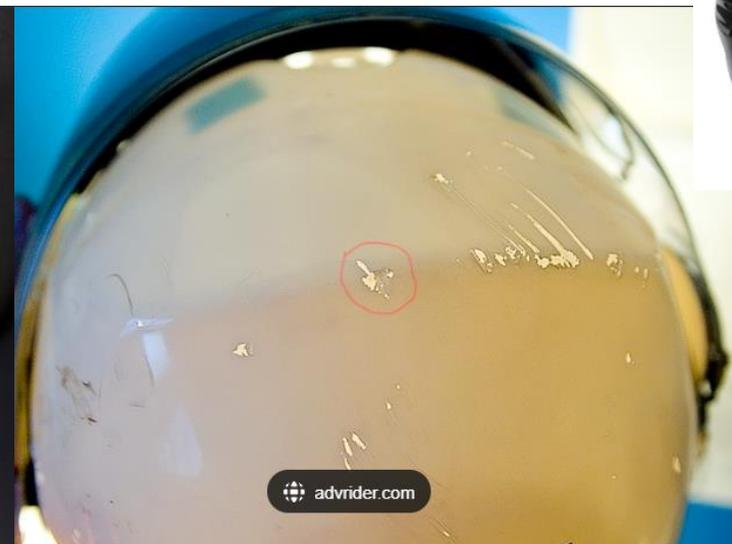
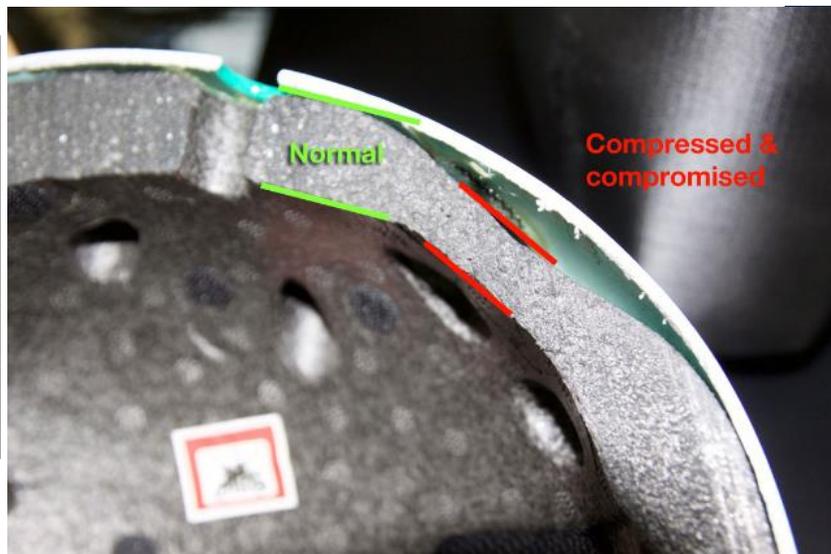
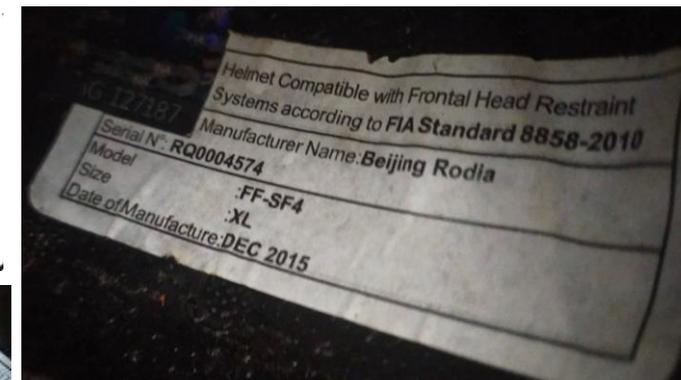
Garage Inspection

HELMETS - VE.3.2

- Closed-face with integral chin guard (no dirtbike helmets).
- Face shield integral with helmet, impact resistant material.
- Specification: **Snell: K2010, K2015, K2020, M2010, M2015, M2020, SA2010, SAH2010, SA2015, SA2020; or SFI: 31.1/2010 thru /2015; 41.1/2010 thru /2015; or FIA: 8860-2004, 8860-2010, 8860-2018, 8859-2015.**
- No camera mounts: VE.2.5.3
- (Place sticker on left side)

A regra não indica uma data de vencimento, mas como boa prática de engenharia e ações de segurança de automobilismo, estão autorizados capacetes com mais de 5 anos após sua fabricação, porém em boas condições de uso.

O Juiz poderá reter capacetes em mau estado de conservação e devolver após o termino do evento da FSAE-B



Comunicação:
Colado OK
Furado NOK

Pré - Inspeção Técnica

DRIVER'S EQUIPMENT

Driver Suit A one piece suit, made from a minimum of two layers of Flame Resistant Material that covers the body from the neck to the ankles and the wrists. Each suit must meet one or more of the following standards and be labeled as such:

- SFI 3.2A/5 (or higher ex: /10, /15, /20)
- SFI 3.4/5 (or higher ex: /10, /15, /20)
- FIA Standard 1986
- FIA Standard 8856-2000
- FIA Standard 8856-2018

Driver Gear

Flame Resistant Material For this section some, but not all, of the approved materials are: Carbon X, Indura, Nomex, Polybenzimidazole (common name PBI) and Proban.

(macacão, sapatilhas, luvas, restritor de braços, balaclavas)

Proibido utilização de macacões com certificação CIK - FIA

Underclothing

All competitors should wear fire retardant underwear (long pants and long sleeve shirt) under their approved Driver Suit.

We require underwear, socks, t-shirts to be cotton



Manchas serão aceitas, se não houver degradação do material



Qualquer item do Diver Suits e Driver Gear não deve apresentar furos ou rasgos.

Se a Equipe realizar reparos ou costuras de decias as linhas deste reparo deve ser de material resistente a altas temperaturas e fogo conforme materiais descritos ao lado em "Driver Gear" e somente na camada externa do macacão

Inspeção Técnica

Body – Aerodynamica Car

OPEN WHEEL - V.1.1

- Top 180° of wheel/tire unobstructed from above. •Tires unobstructed from sides. •**Vertical keepout zones 75mm in front & behind tires.**

BODYWORK - T.7.2

- No large openings (> ~6mm) in bodywork into driver compartment in front of or alongside driver.
- Body/nose min 38 mm radius, +/-45° all directions.**

WHEELBASE - V.1.2

Minimum 1525 mm.

AERODYNAMIC DEVICES - T.7.1

- No powered ground effects. •Securely mounted - no oscillation or excessive movement. (Wings, undertray, splitter, endplates, vanes, etc.)

EDGE RADII - T.7.1

- Horizontal leading edges min 5 mm radius.**
- Vertical forward-facing edges min 3 mm radius.**
- Other edges: not sharp - GR.1.5

FRONT MOUNTED AERO - T.7.4

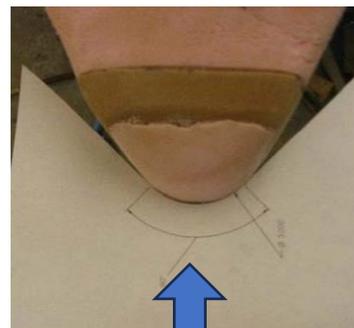
- Max forward: 700 mm ahead of the front tires.**
- Max width: OUTSIDE of the front tires (at hub height).**
- Max height: 250 mm if in front of tires (w/out driver).**

REAR MOUNTED AERO - T.7.5

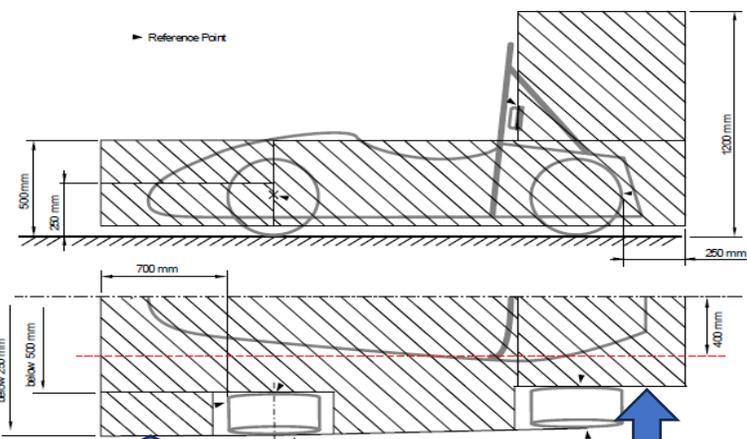
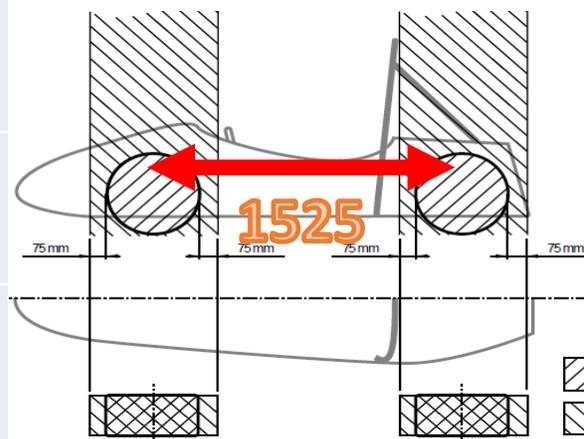
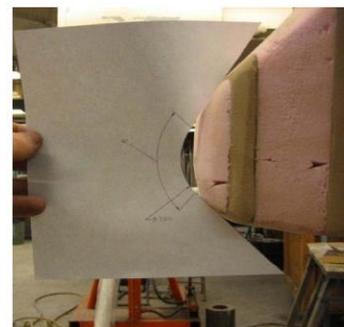
- Max rearward: 250 mm behind the rear tires.**
- Max forward: Headrest support (undertrays exempt).**
- Max width: INSIDE of the rear tires (at hub height).**
- Max height: 1.2 m above ground (w/out driver).**

AERO BETWEEN WHEEL CENTERLINES - T.7.6

- Max width: Line between front & rear tires (at hub height).
- Max height: 500 mm (exempt if w/in 400 mm of car centerline).



Gabarito



Régua

Gabarito

Inspeção Técnica

Body – Cockpit

DRIVER RESTRAINT HARNESS - T.2.2.5,

6 or 7 point and be •labeled: SFI 16.1, 16.5, or FIA 8853/98, 8853/2016 (or lookup FIA D-number) •All lap belts must have Quick Adjusters. •Reclined drivers must have 6 or 7 point, and Quick Adjuster sub-belts OR 2 sets of sub belts. •Belts expire after expiration year (not month) marked on label (SFI & FIA).

HARNESS MOUNTS - T.2.4

•Belts must be protected by firewalls. •All belts attached securely to Primary Structure. •Tabs 1.6 mm (0.063”) thick min, 60 mm² shear area; tabs combining lap & sub belts 90 mm². Double-shear preferred. •Tabs welded on both sides; bolt-on tabs use minimum of two ¼” dia Grade 5 bolts. •Tabs aligned with load direction of belt, may be pre-bent.

SHOULDER HARNESS FIT - T.2.6

Angle from shoulder between 10° up and 20° down (vs horiz).

LAP BELT FIT - T.2.5

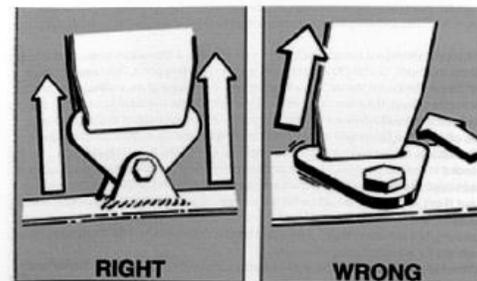
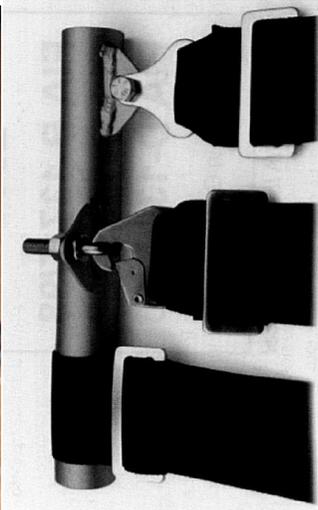
•Must pass over pelvis, not waist. •45-65° to horizon for upright driver, 60-80° for reclined

SUB BELT FIT - T.2.7

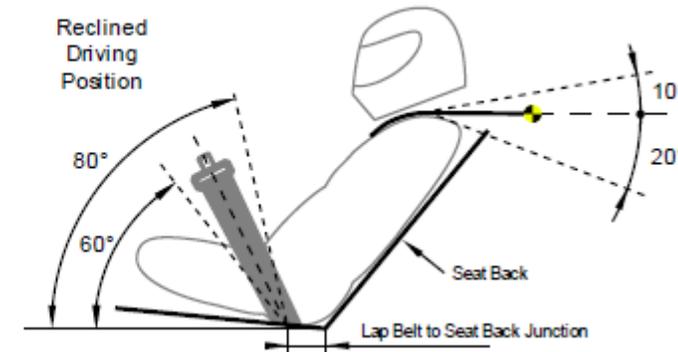
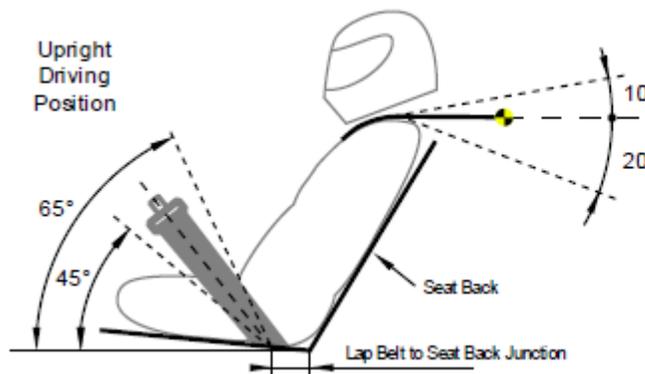
•Snug, holding latch in place. •Position in side-view: 5 Point: aligned with or forward of shoulder belt line; 6 Point: vertical or rearward of latch.

ARM RESTRAINTS - VE.3.3.7

- Required for all drivers. Must be commercially manufactured. (No label required.)



•Lap & Shoulder 10 mm Grade 8.8 (3/8” SAE Grade 5), •Sub 8 mm (5/16”) or as specified by harness manufacturer. •Pins required in clip-brackets •CRITICAL (positive locking) - T.8



Inspeção Técnica

Body – Firewall



FIREWALL - T.1.8

Rigid, nonflammable material. •Separates driver (line-of-sight to mid-height of driver's helmet) from fuel, cooling, oil, lithium battery, heat sources , and all tractive system components other than outboard wheel motors. Wire/cable pass-throughs OK with grommets. Multiple panels OK w/ gaps sealed. •No gaps at sides or bottom. •Leaks cannot contact driver

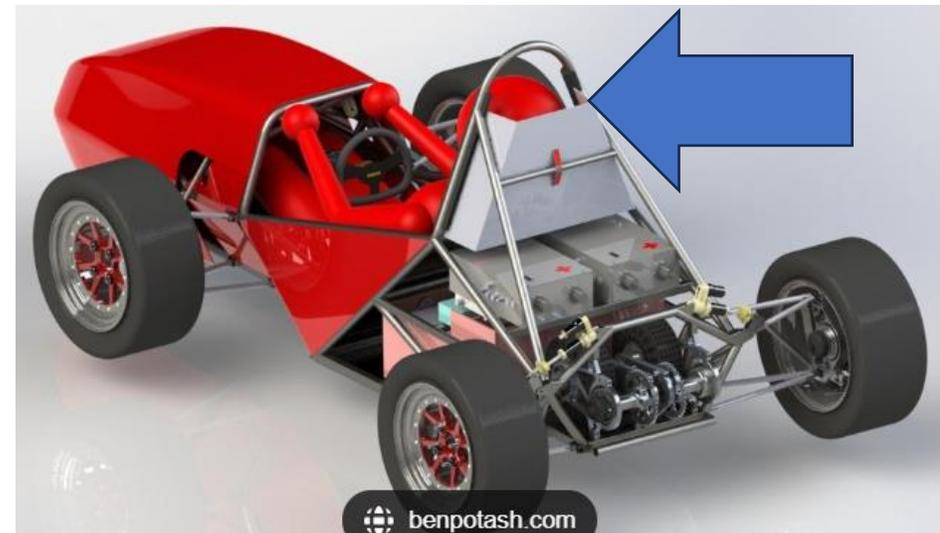


Deve proteger a Cabeça e Pescoço do piloto mais alto. Isto deve estender-se suficientemente para cima e/ou para trás, de modo que qualquer ponto inferior +/- 100 mm (4 pol.) acima da parte inferior do capacete do piloto mais alto não deve estar em linha direta de visão com qualquer parte do sistema de combustível, sistema de arrefecimento ou o sistema de óleo do motor.



Para garantir a selagem da Firewall em passagem de cabos, sugerimos **Grummetts sanfonados ou cegos** tanto do lado externo quanto interno.

É expressamente proibido o uso de qualquer material de origem betuminosa para selar a *firewall*, assim como materiais inflamáveis ou que emitam gases tóxicos sob alta temperatura.



Inspeção Técnica

Body – Cockpit

OTHER SIDE TUBES - F.5.12

Cockpit design must prevent driver's neck from hitting bracing or other side tubes

VEHICLE CONTROLS - T.1.4

No hands, arms, or elbows outside side impact system when actuating controls. All controls, including shifter, must be inside cockpit and below topmost point of Front Hoop.



Inspeção Técnica

Body – Cockpit

DRIVER'S FOOT PROTECTION - T.1.3.2

Feet must be rearward of the Front Bulkhead and no part of **shoes or legs** above or outside the Major Structure in side or front views when touching pedals. Remove nose bodywork if necessary for visual access

EGRESS - IN.5.2

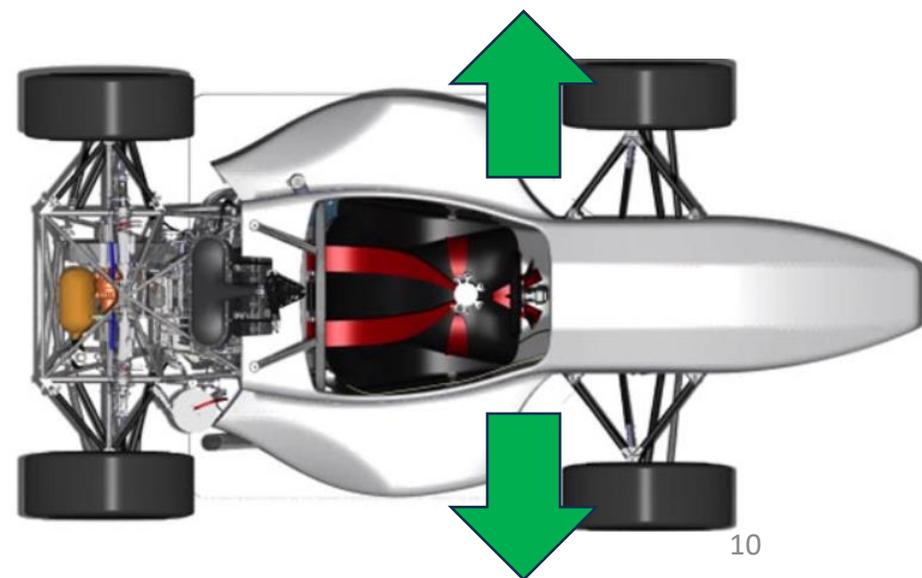
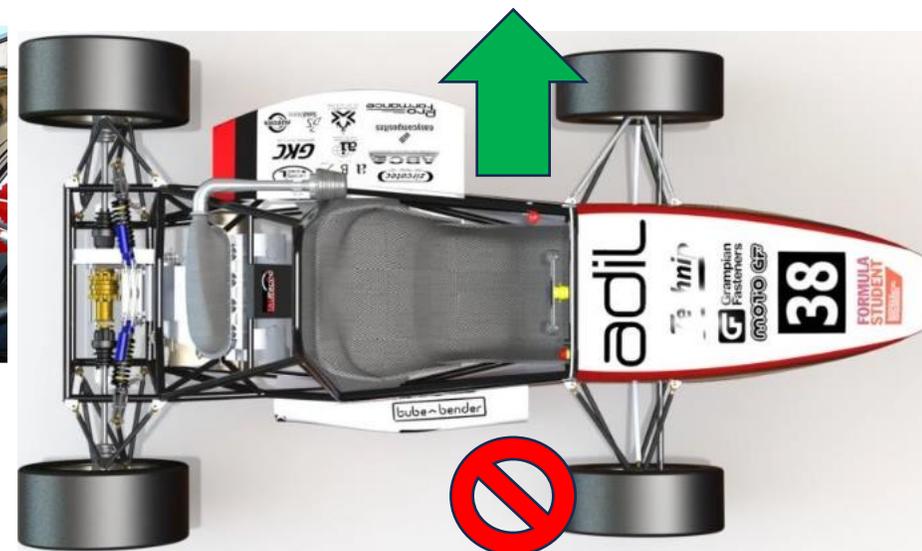
5 seconds max to actuate cockpit master switch and exit to side of vehicle, from driving position, wearing safety equipment. Wings must remain fixed in position. (See egress worksheet.)



O CARRO DEVE TER O ADESIVO DA INSPEÇÃO TÉCNICA MECÂNICA (LUPA PRETA)

- 1) Toda a carenagem lateral e frontal deve estar montada.
- 2) Pilotos com todos os equipamentos (incluindo arm-restraints)
- 3) Capacete a 50mm (2") da linha entre os topos do Front Hoop e Main Hoop e da linha entre o topo do Main Hoop e base do Main Hoop Bracing. O piloto tem que ser capaz de esterçar o volante sem problemas.
- 4) Cinto Pélvico - Acima dos ossos do quadril e coxas.
- 5) Cinto do Ombro - Entre 10° acima e 20° abaixo da horizontal, e devidamente apertado.
- 6) Anti-Submarinos - Devidamente apertados.
- 7) Menos de 5 segundos entre o piloto tirar uma das mãos do volante e colocar os DOIS pés no chão em condição de correr.
- 8) Durante a saída, a Kill Switch deve ser acionada.
- 9) **O lado será determinado pelo Juiz, a escolha deverá ser feita pelo lado mais dificultoso do veículo, Carros simétricos a saída pode ser escolhida pelo piloto. (BR.4.7 Saída em 5 segundos)**
- O piloto mais alto aprovado –

Se um piloto mais alto aparecer após o carro ter sido aprovado na Tilt-Table, a equipe perderá o adesivo da Tilt-Table (IN.9.1b, IN.13.3.1).



Inspeção Técnica

Body – Cockpit

SEAT - T.1.5, T.1.6

• **Insulated against heat conduction, convection and radiation.**

• Lowest point no lower than top of lower structure OR must have longitudinal 1.00" OD x 0.065" steel tube underneath.

HEAD RESTRAINT FIT - T.2.8

• Max 25 mm (1") forward gap to helmet. • Helmet contact point min 50 mm (2") from any edge. **APPLIES TO ALL DRIVERS** (may be adjusted for each driver)

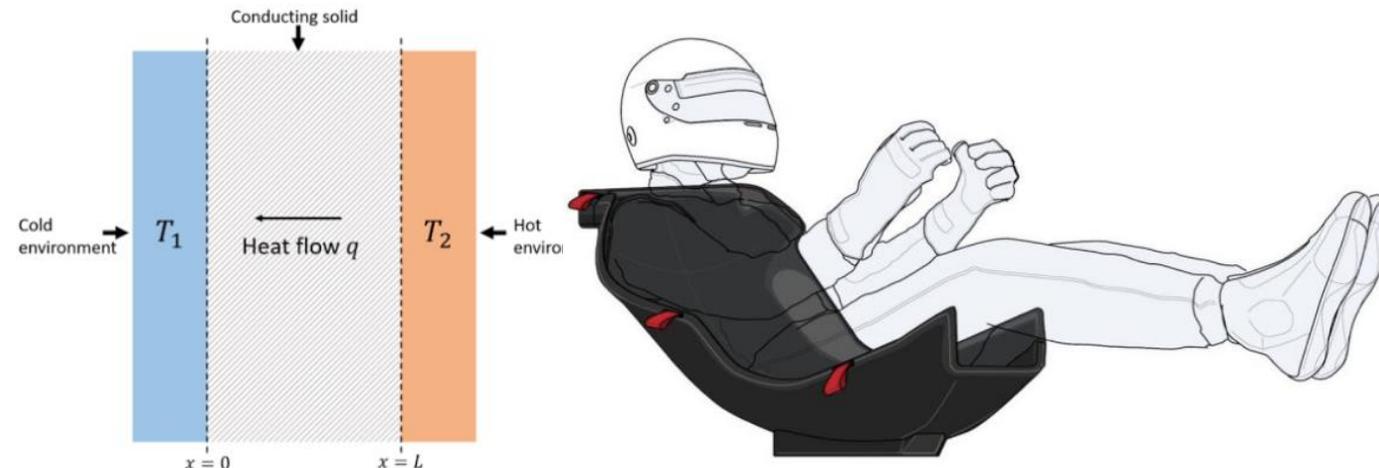
HEAD RESTRAINT - T.2.8

• Min 150x150 mm (6"x6") AND height adjustment of 175 mm (7"); OR 150x280 mm (6"x11"). • 38 mm (1.5") thick. • Near vertical. • Pad and mount must take 900 N rearward and 300 N lateral forces. • Energy absorbing material: **SFI Standard 45.2 or (CONFOR blue CF45 or CF45M).** • Mount must be within Main Hoop Bracing envelope, or add extra tube per F.5.10

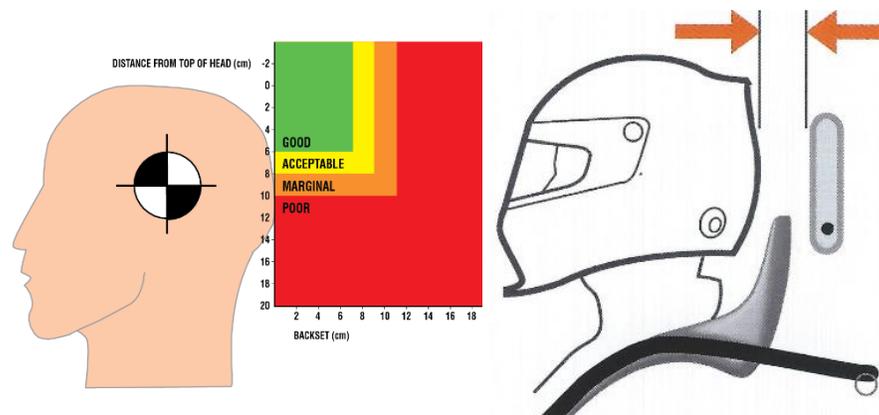
ROLL BAR PADDING - T.2.9

Installed on any bar that could be hit by the driver's helmet. • 12 mm thick.

• **Specification: SFI 45.1 or FIA 8857/2001 (pipe insulation or other foams not OK).**



Se a equipe tiver problemas com o **MAIN HOOP & FRONT HOOP HEIGHTS - F.5.6.5**, e a solução é em retirar o banco, a parede de fogo deverá ser revestida pelo lado do Cock Pit com material de isolamento térmico (não será aceito material betuminoso)

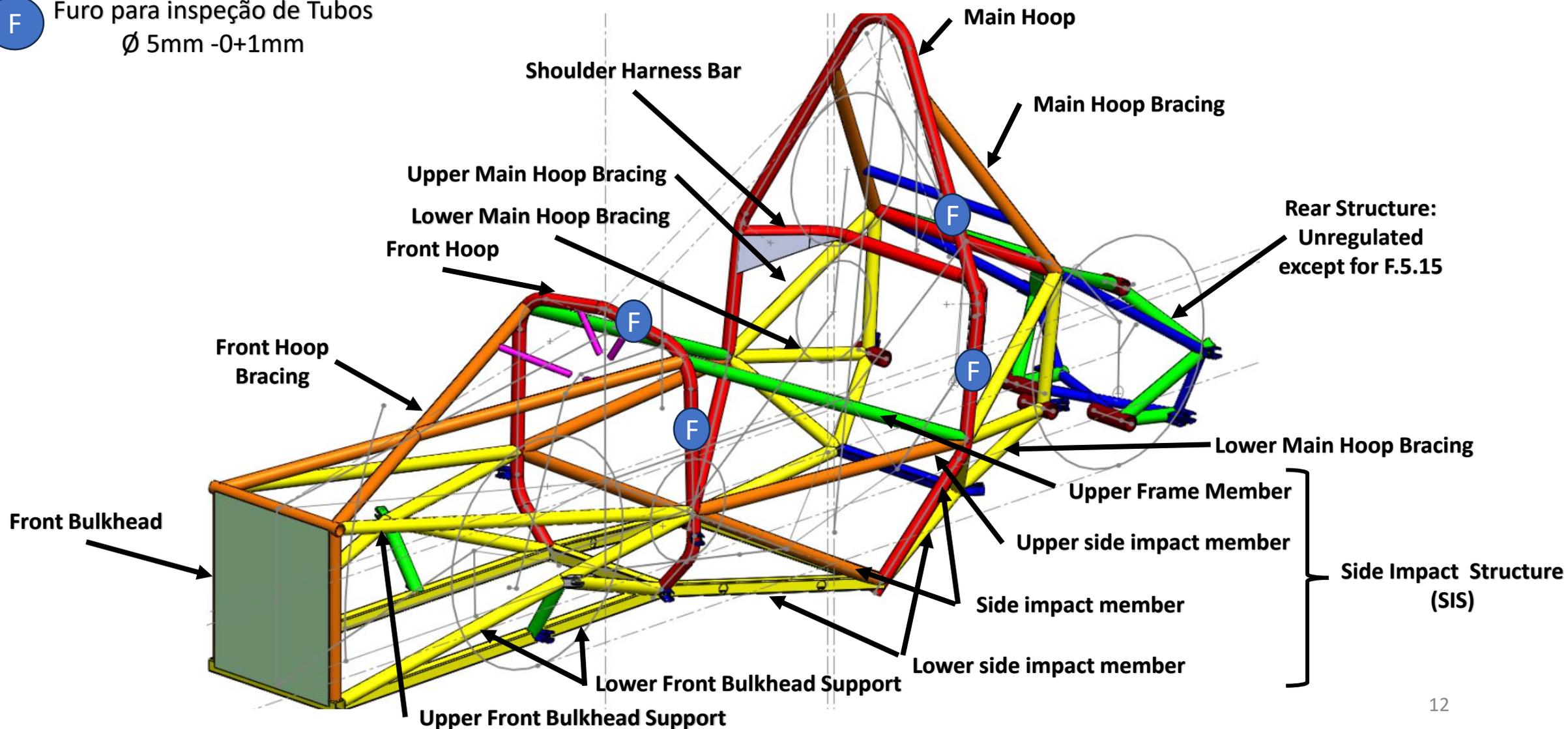


Não será aceito Head Restraint :
Qualquer tipo de espuma , CONFOR™ foam CF42 (cor pink) e CONFOR™ foam CF42M (cor pink)

Inspeção Técnica

Chassis – Conhecendo o Chassi.

F Furo para inspeção de Tubos
 $\varnothing 5\text{mm } -0+1\text{mm}$

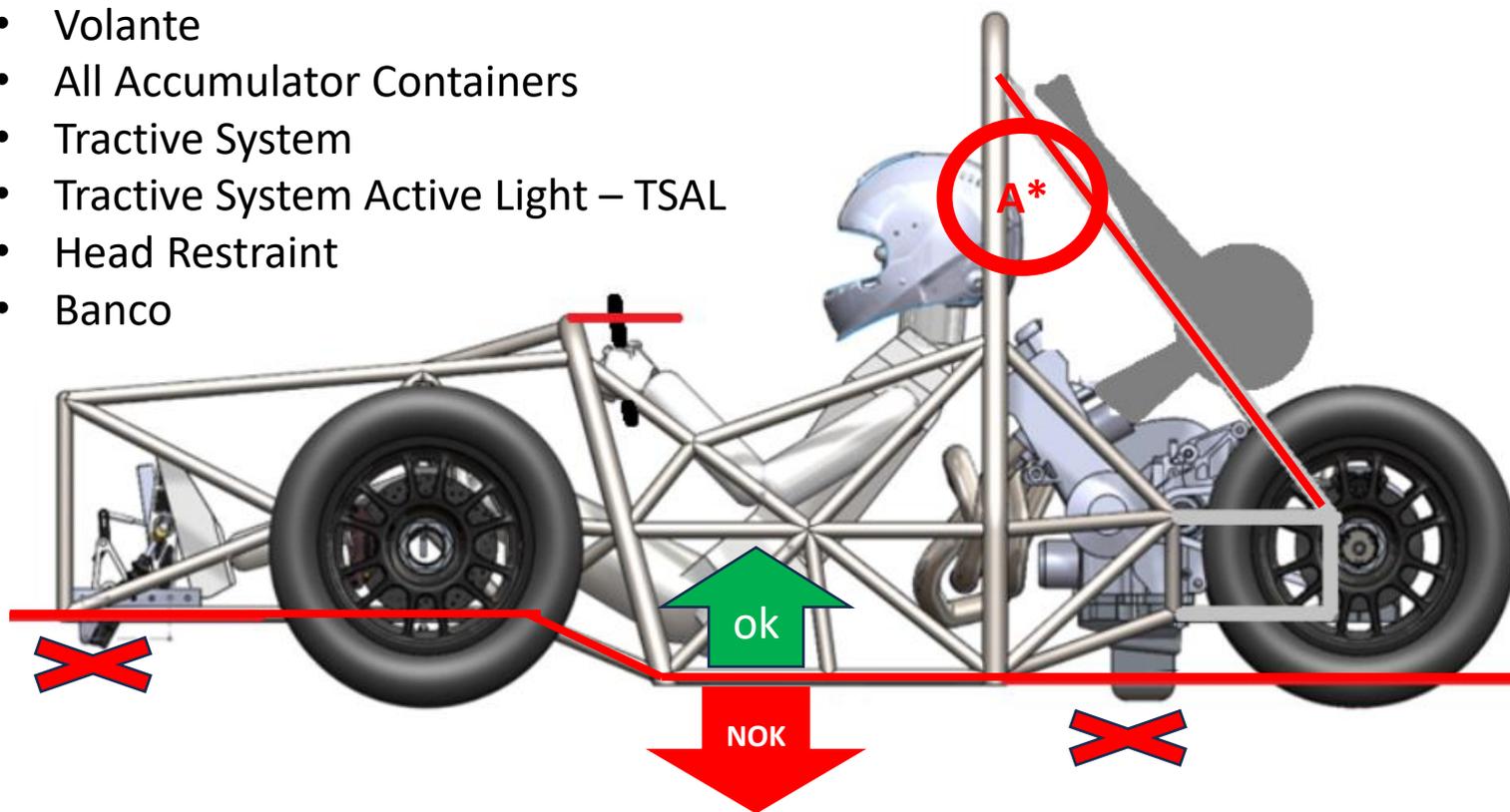
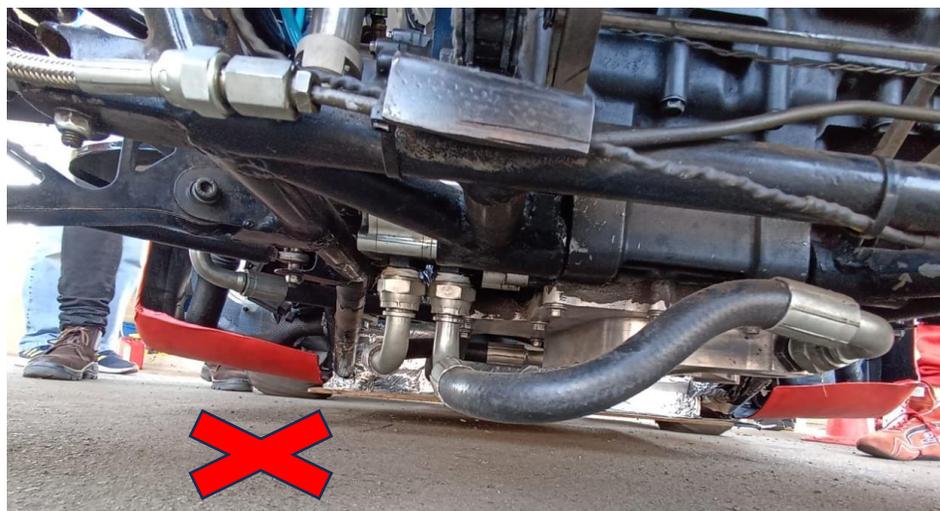
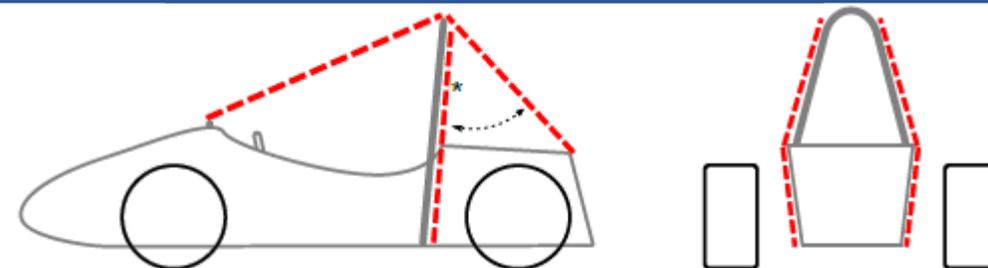


Inspeção Técnica

Chassis – Rollover Protection Envelope

Itens que deverão estar dentro do Rollover Protection Envelope:

- Piloto (A* Capacete)
- Pedal Box
- Motor (inferior chassi)
- Fuel Rail
- Tanque de Combustível
- Linha de Combustível (Incluso retorno)
- Bateria
- Cinto de segurança
- Shift
- Volante
- All Accumulator Containers
- Tractive System
- Tractive System Active Light – TSAL
- Head Restraint
- Banco

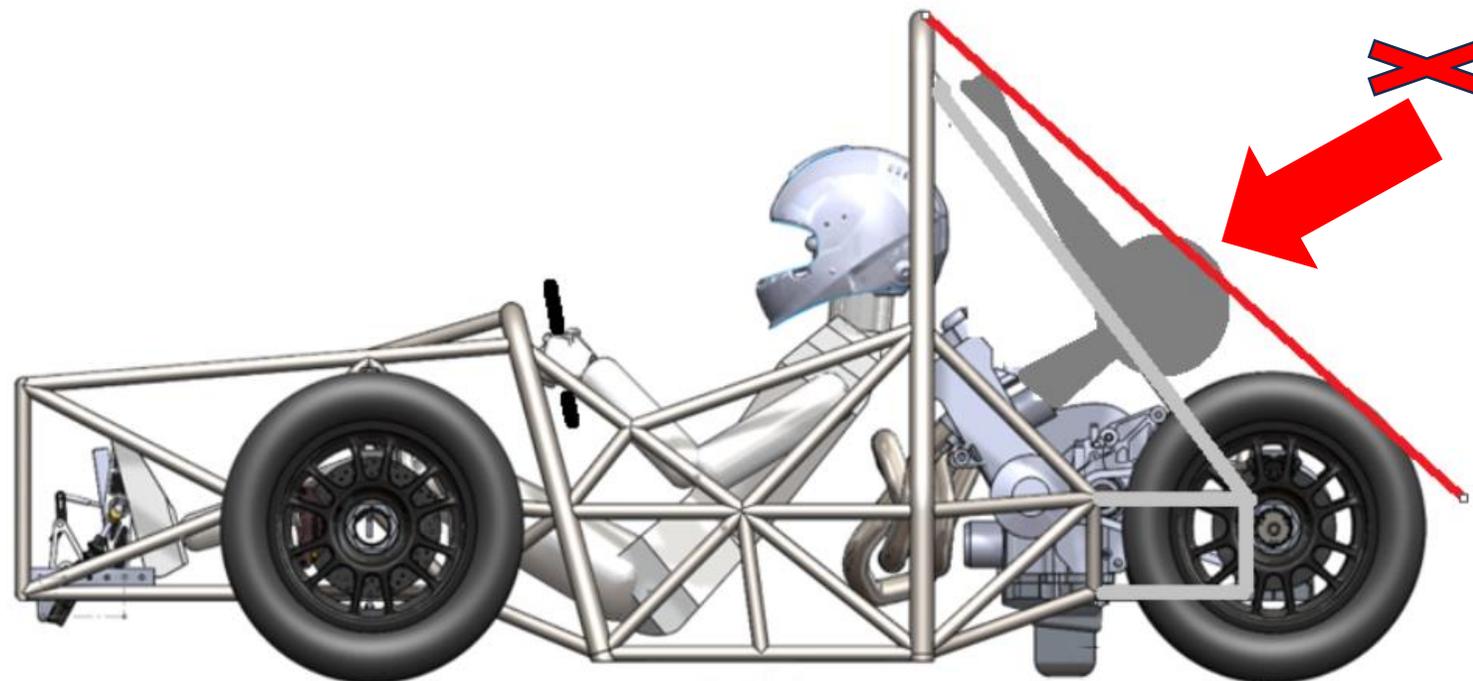
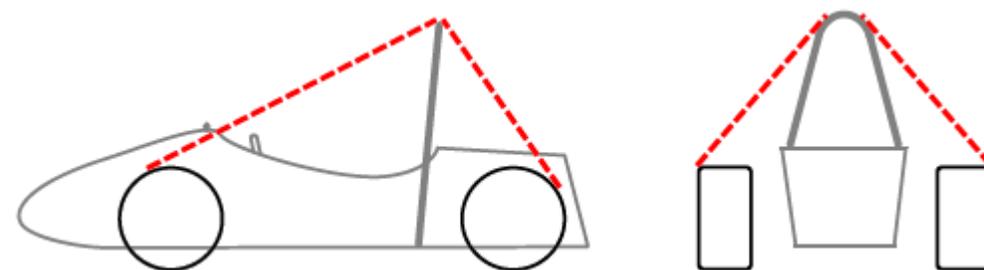


Inspeção Técnica

Chassis – Tire Surface Envelope

Itens que deverão estar dentro do Tire Surface Envelope :

- Throttle
- Air intake System
- Fuel control
- Fuel System
- Air Cleaner / Air box
- Motor e Transmissão

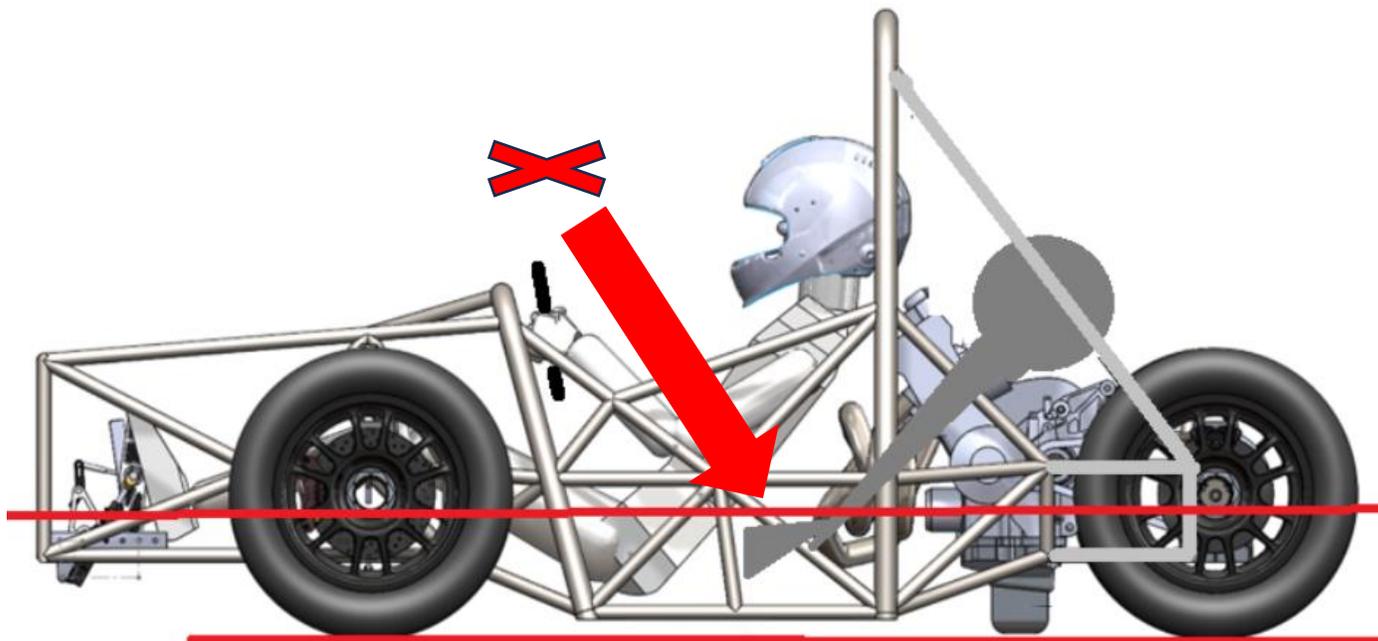
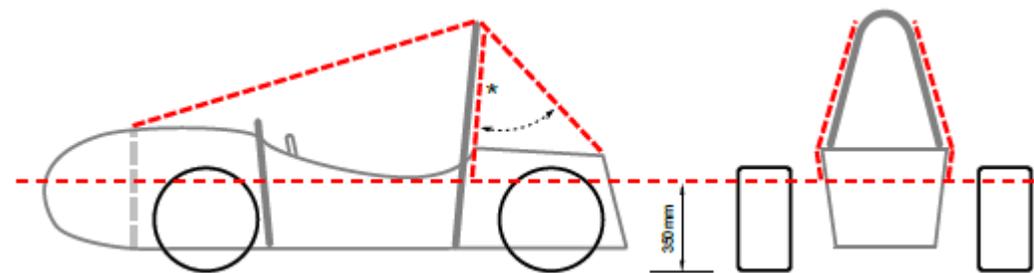


Inspeção Técnica

Chassis – Componente Envelope

Itens que deverão estar dentro do Component Envelope:

- Throttle (vista lateral acima de 350mm) (vista frontal Tire Surface Envelope)
- Air intake System (vista lateral acima de 350mm) (Tire Surface Envelope)
- Fuel control
- Air Cleaner / Air box



All parts of the engine air Any portion of the air intake system that is less than 350 mm above the ground must be shielded from side or rear impacts by structure

Inspeção Técnica

Chassis – Cockpit - Templates

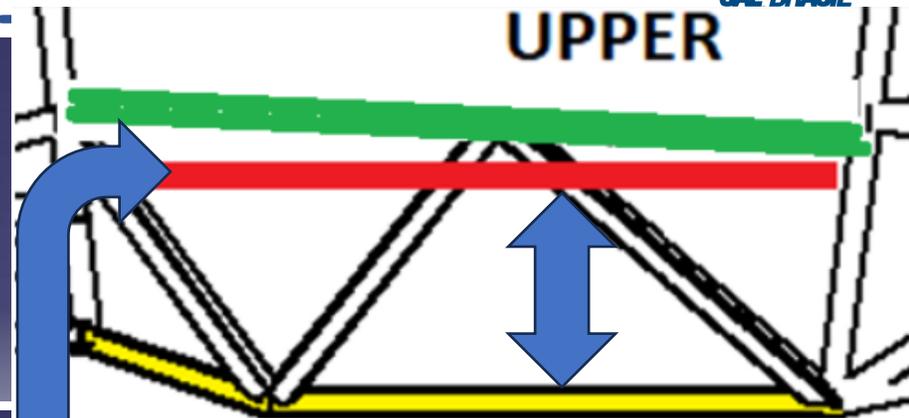
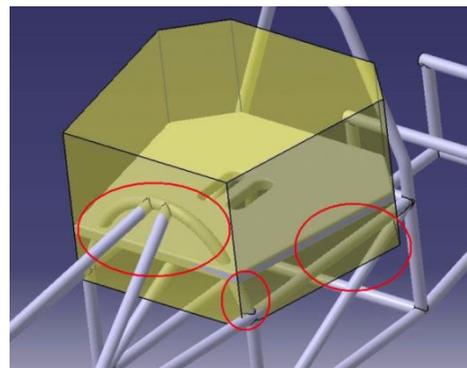
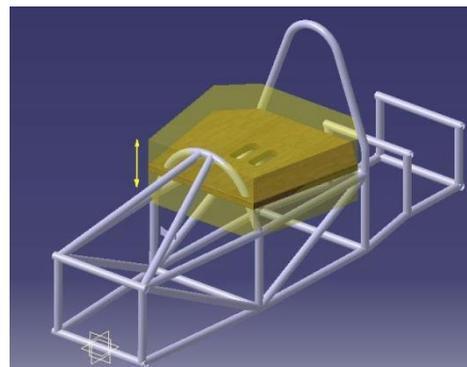
COCKPIT OPENING - T.1.1

Template to pass from above cockpit to bottom of top SIS tube and less than 320mm from lowest point inside cockpit. Steering wheel & column, seat and padding can be removed; no removing firewall. Fore/aft translation of template OK.

COCKPIT INTERNAL CROSS SECTION - T.1.2

Template to pass from rearwards of the steering column to 100 mm rearwards of the pedals.

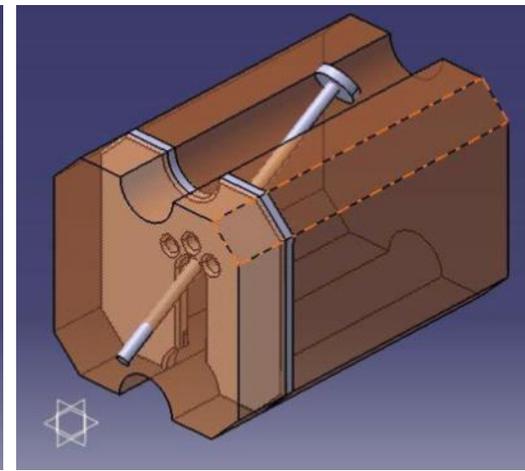
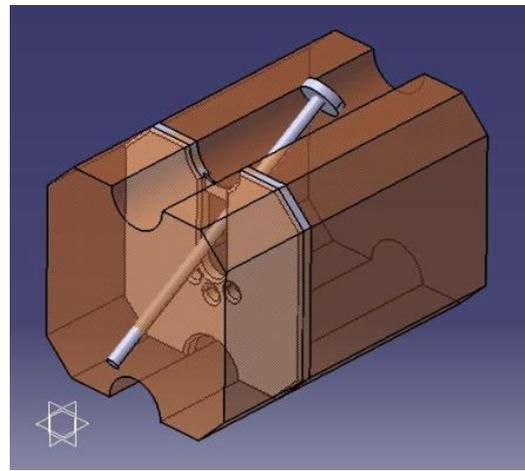
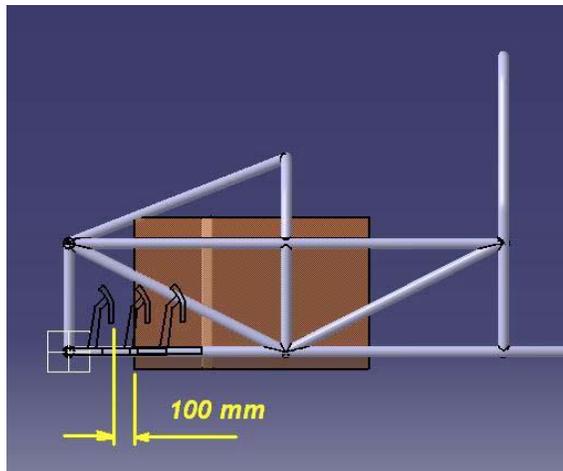
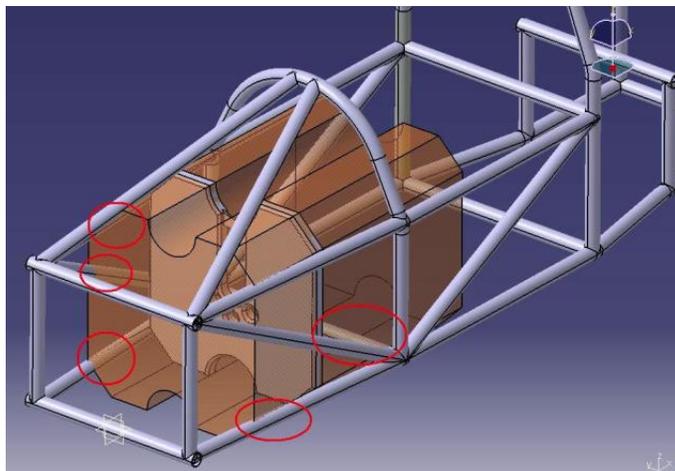
Steering wheel may be removed; padding may be removed if removable with no tools & with driver in seat.



LOWER

25 mm abaixo do ponto mais baixo do topo da Estrutura de Impacto Lateral

É menor ou igual a 320 mm acima do Lower Side Impact Member



Inspeção Técnica

Chassis – Cockpit - Templates

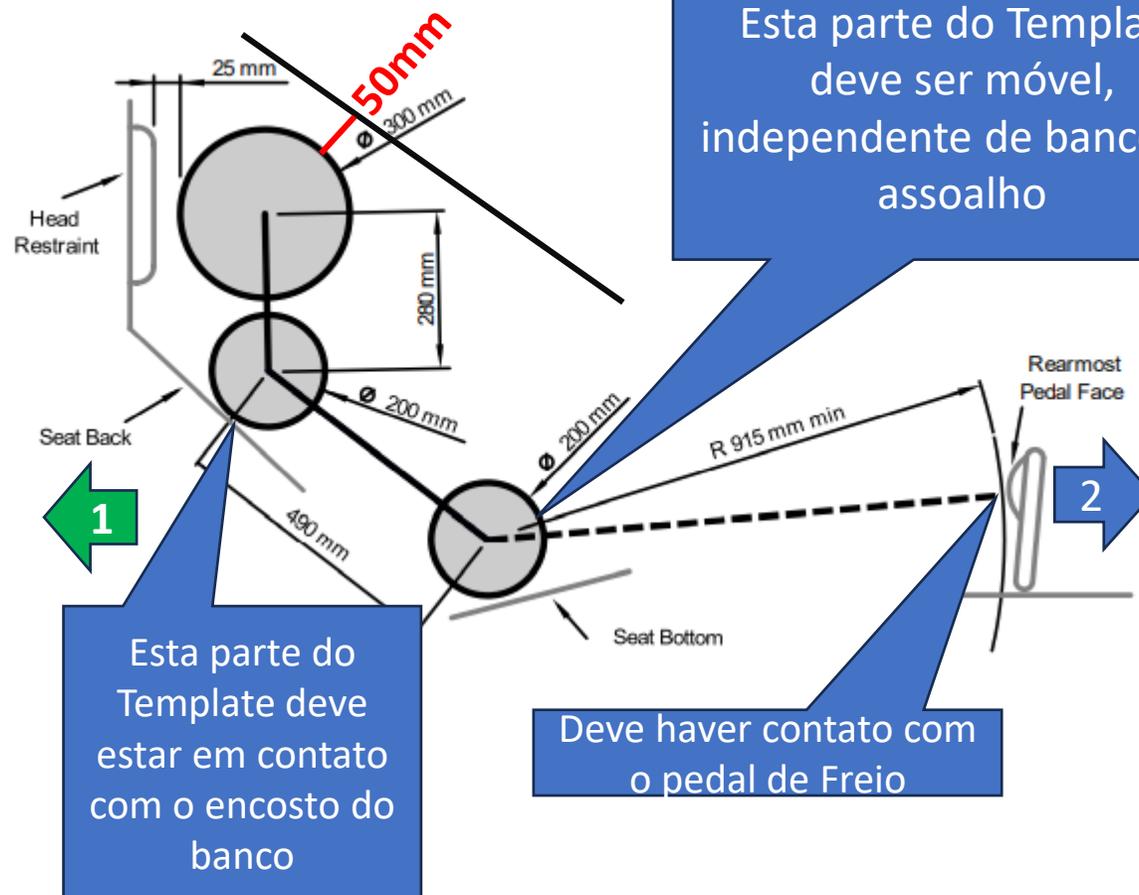
MAIN HOOP & FRONT HOOP HEIGHTS - F.5.6.5

Helmet of 95th percentile male (PERCY) to be 50 mm below the lines between top of front and main roll hoops and between top of main hoop to rear attachment point of main hoop bracing. Center of bottom circle placed minimum 915 mm from pedals.

Roll Hoop e Posição do Piloto quando sentado normalmente deve estar preso completamente pelo Cinto de Segurança, o capacete de um homem do percentil 95 (ver V.2.1.1) e todos os pilotos da equipe devem:

Tenha no mínimo 50 mm da linha reta traçada do topo do bastidor principal até o topo do bastidor frontal.

Esteja a uma distância mínima de 50 mm da linha reta traçada do topo do Front Hoop até topo do Main Hoop.



Posição do Driver Template o Driver Template (Ricardão) será posicionado da seguinte forma:

- 1 - O assento será ajustado para a posição mais recuada
- 2 - Os pedais serão colocados na posição mais avançada

Inspeção Técnica

Chassis – Side Impact Structure

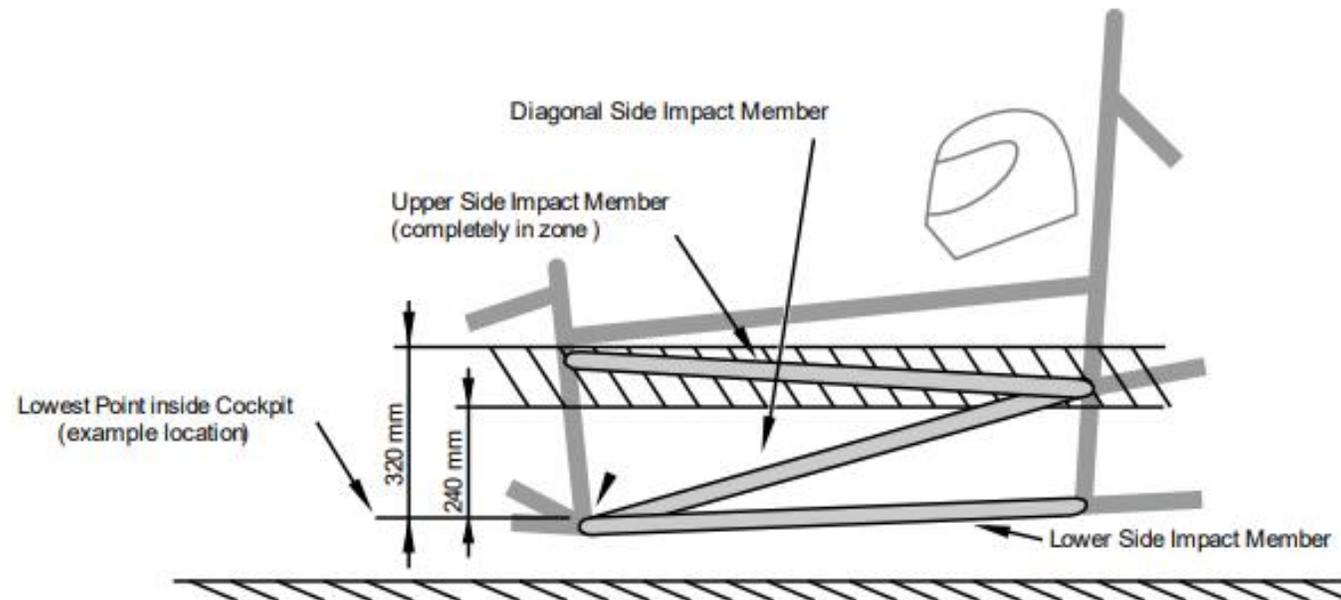
Tube Chassis

SIDE IMPACT STRUCTURE - F.6.4

- Upper tube must be between 240 mm and 320 mm above highest surface of lower SIS tube (F.6.4.3).
- Lower tube must connect endpoints of Main and Front hoops.

Posição do Upper Side Impact Member

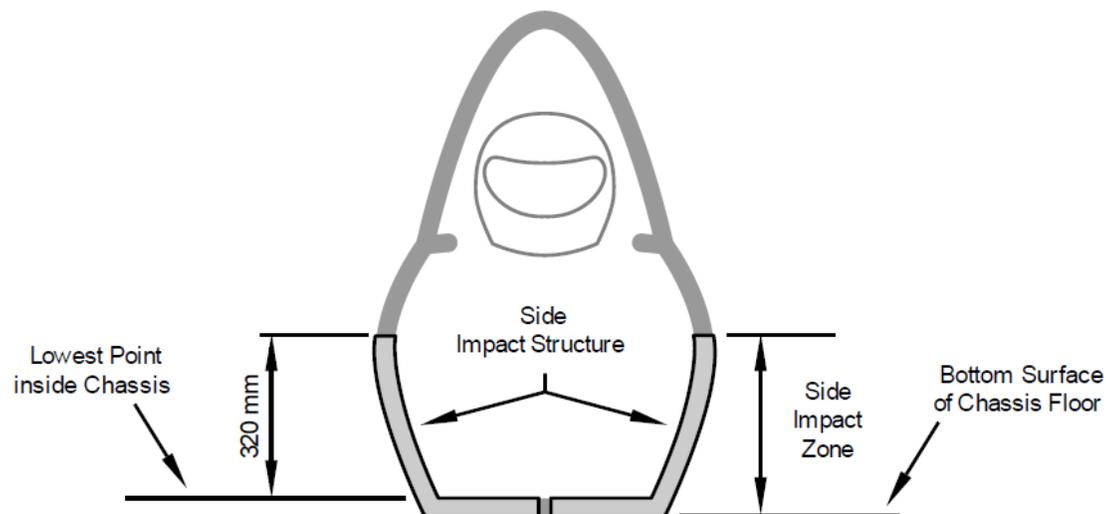
Deve estar na zona de 240mm á 320mm da parte frontal do Lower Side Impact Member que é ligado ao Front Hoop.



Monocoque Chassis

SIDE IMPACT PROTECTION - F.7.5

- Min 240 height above Lowest SIS point.
- No side view openings between Front Hoop and Main Hoop.



Inspeção Técnica

Chassis – Front Impact

IA LEADING EDGE VERTICAL POSITION - F.8.5.6

- Relative to lowest point of top surface of lower SIS tube, IA top edge must be higher than 240 mm (except std foam), and bottom edge lower than 220mm

STANDARD IMPACT ATTENUATOR - F.8.4.3

- Must be fully bonded to AIP. •IA must not be degraded or damaged.

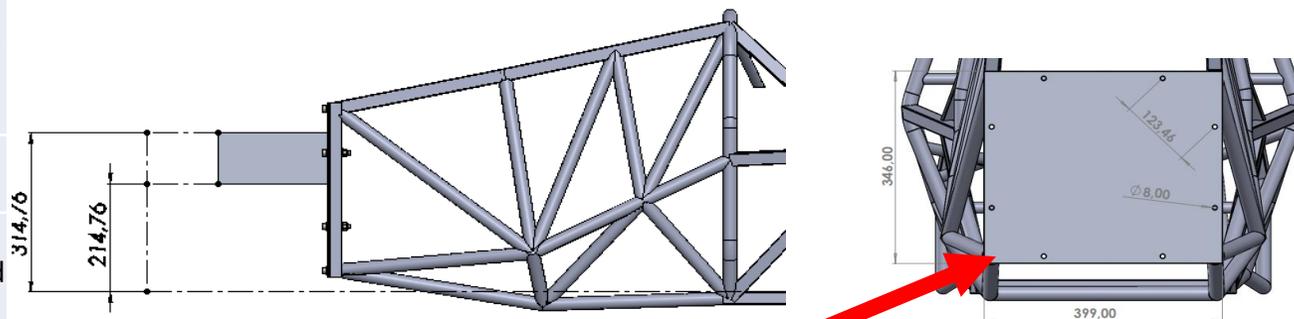
NON-STANDARD IMPACT ATTENUATOR - F.8.4

- 200 mm long x 200 mm wide x 100 mm high. •Adhesive attachment required for foam or honeycomb. •Attached to AIP w/ welds - 1:1 weld ratio, beads 25 mm min, or eight 8 mm (5/16") bolts. •Must be capable of taking vertical and transverse loads. •Must be identical to test specimen, engraved dates of test. •Suitable failure mode (crushed element, not collapsed mount).

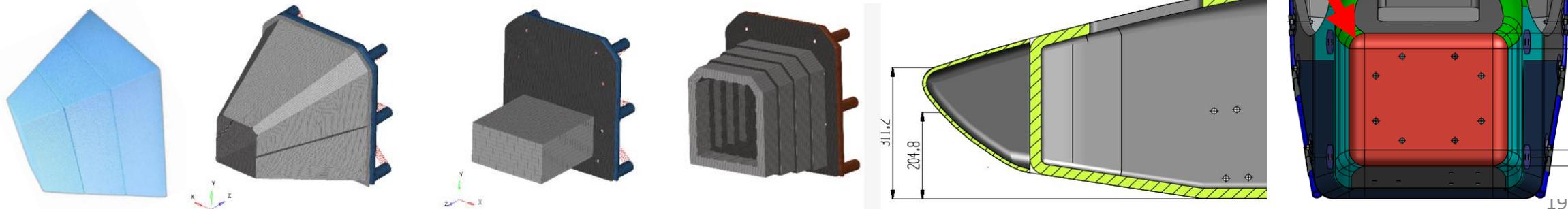
ANTI-INTRUSION PLATE - F.8.2

- 1.5 mm steel or 4 mm aluminum. •120KN physical test, or 3-point composite per SES. •Attached to bulkhead w/ eight 8 mm (5/16") bolts, or bonded or laminated (AIP extending to outer edge of bulkhead), or >50% welded (AIP extending to centerline of bulkhead tubes).

- Quick release and shear pin per SES if present. •CRITICAL FASTENERS: F.8.5.5



ANTI-INTRUSION PLATE



Inspeção Técnica

Chassis - Tube Primary Structure

LOAD PATHS AND TRIANGULATION - F.1.17

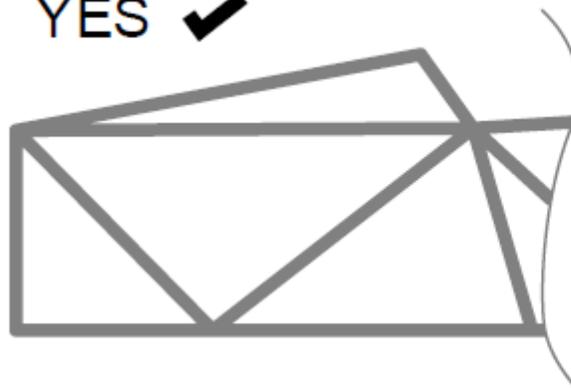
•Upper and lower load paths, with sufficient diagonal tubing to fully triangulate in between, are required continuously through the FBHS, SIS, MHBS, (EV) ACC Side Protection, (EV) HV Side Protection, back to the (EV) Rear Impact F.6.6. •Minimum tube size requirements apply to Upper, Lower, and Diagonal structural tubes.

BENT OR MULTIPLE TUBES - F.5.2

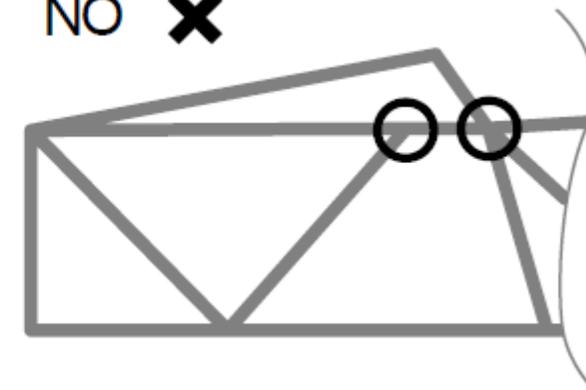
•Min bend radius at centerline: 3x tube OD. •A brace must connect from on the bend to a frame node, •Within 30° of plane of bend (Upper SIS, Shoulder Harness Bar exempt from 30°). •Brace tube matches min, except Roll Hoop bends Size C, Upper SIS diag Size B, Shoulder Harness Brace Size C.

Realizar Double Check com o “SES Book Approval”

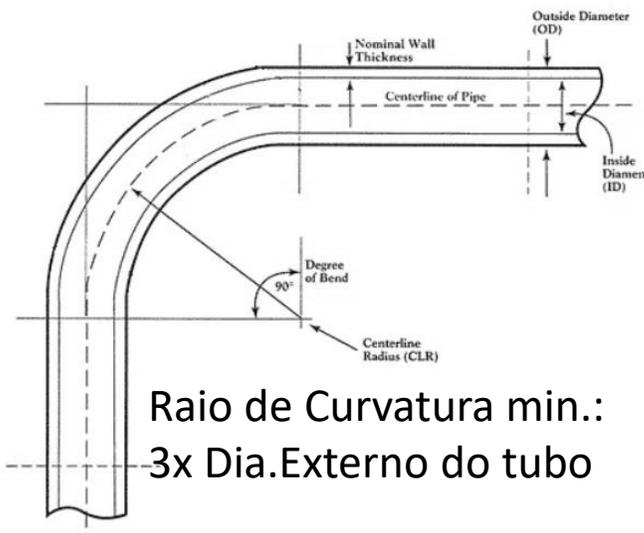
YES ✓



NO ✗

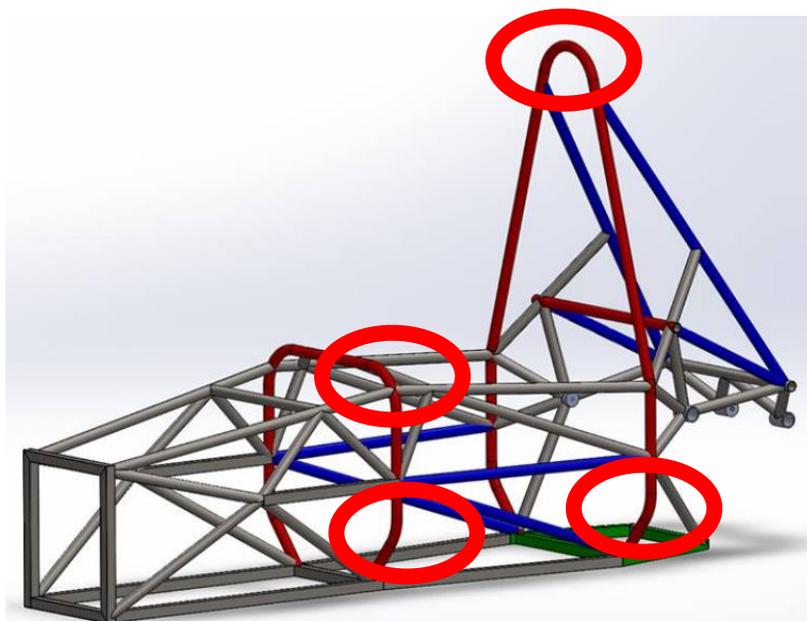
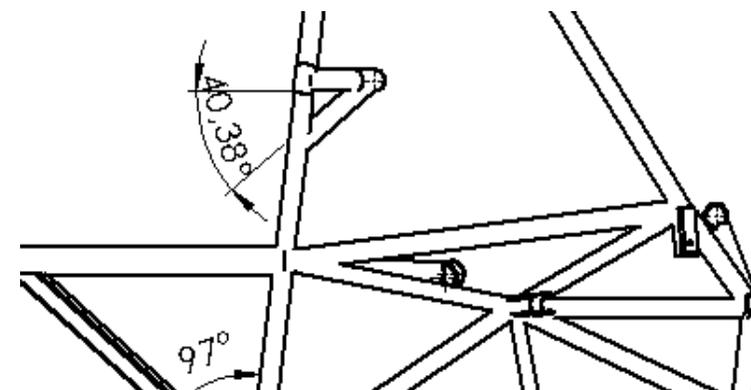


BENT OR MULTIPLE TUBES - F.5.2



Raio de Curvatura min.:
3x Dia.Externo do tubo

Quanto maior o ângulo do SH Brace ($\geq 30^\circ$), melhor será a reação do momento do Cinto de Segurança



Inspeção Técnica

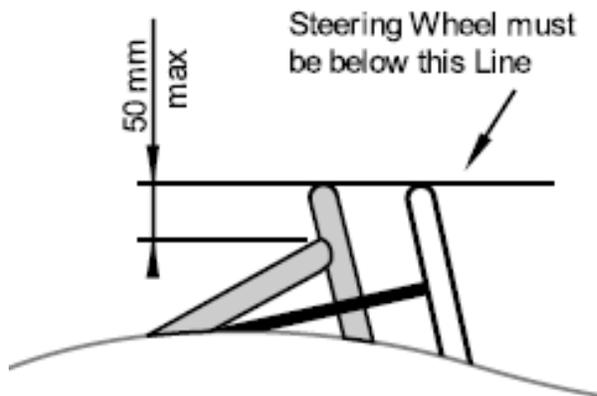
Chassis - Tube Primary Structure

FRONT BULKHEAD SUPPORT - F.6.2

- Connect bottoms of Front Bulkhead and Front Hoop;
- Connect within 50mm of top of bulkhead, 100 mm above and 50 mm below upper SIS tube
- Brace to Main Hoop if top tube does not connect near upper SIS.

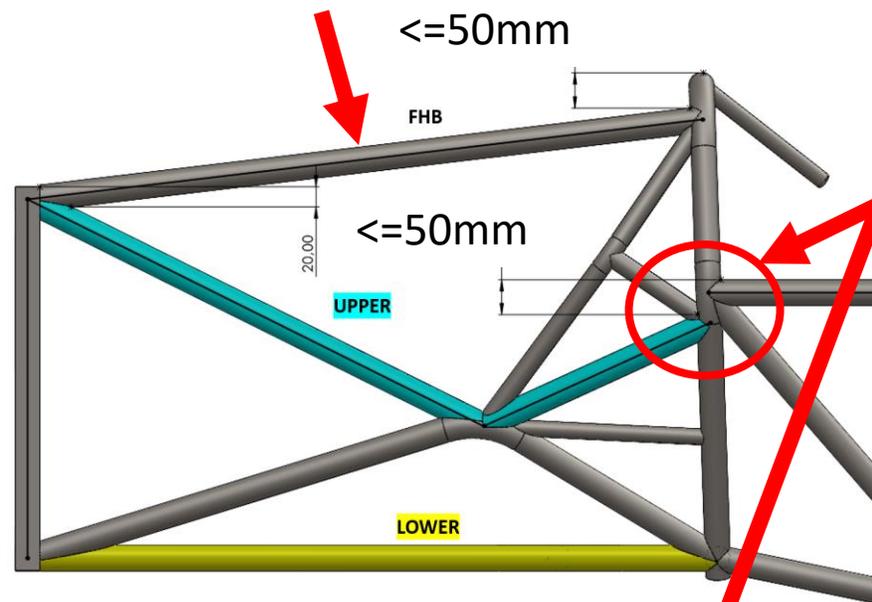
FRONT HOOP BRACING - F.6.3

- Two forward facing braces, attached within 50 mm of top of hoop, attached to Front Bulkhead or triangulated structure.
- Rearward bracing if FH more than 10° rear above Upper SIS.

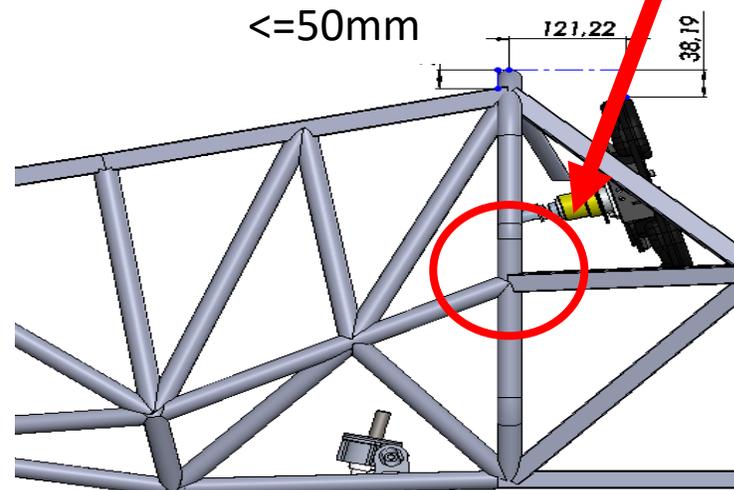


Realizar Double Check com o “SES Book Approval”

FRONT HOOP BRACING - F.6.3



FRONT BULKHEAD SUPPORT - F.6.2



Inspeção Técnica

Chassis – Fasteners in Primary Structure - Brackets

BOLTED JOINTS CONNECTING PRIMARY STRUCTURES F.5.4, F.5.13

•Double-shear (capped) or Sleeved butt joints only. •No bends. •No rod-end bearings. •Edge of any bolt hole located $> 1.5 \times$ hole diameter from nearest edge of the material. •No blind or welded threaded fasteners. •Bolts 8 mm (5/16"), plates 2.0 mm (0.08").

Bolted connections in the Primary Structure using tabs or brackets must have an edge distance ratio "e/D" of 1.5 or greater.

"D" equals the hole diameter. "e" equals the distance from the edge of the hole to the nearest free edge

Tabs attaching the Suspension to the Primary Structure are NOT "in the Primary Structure" Tabs attaching suspension members to the primary structure are not required to meet this rule"

- Se houver no projeto junta aparafusada como um suporte, ela deve seguir a seguinte regra conforme abaixo:

$$E \geq 2 \cdot D$$

D = Diâmetro do furo

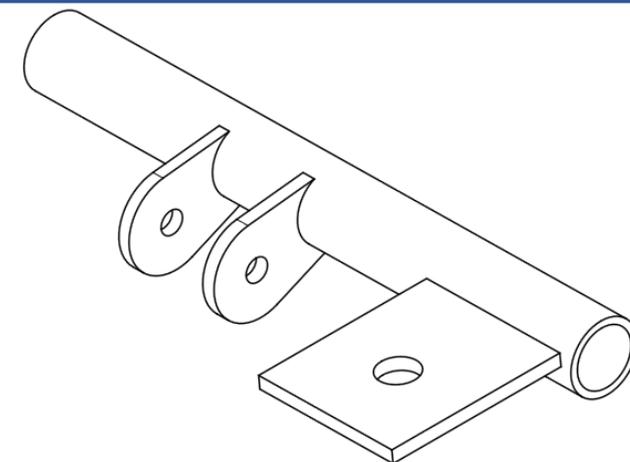
E = Distância de centro do furo até a borda da forma geométrica adotada

Ou seja, se a equipe estiver fazendo suportes "orelhas" para fixação do motor, ou qualquer outro suporte para fixação de componentes na estrutura primária, este suporte deve ter uma área ao redor do furo de duas vezes o diâmetro deste furo.

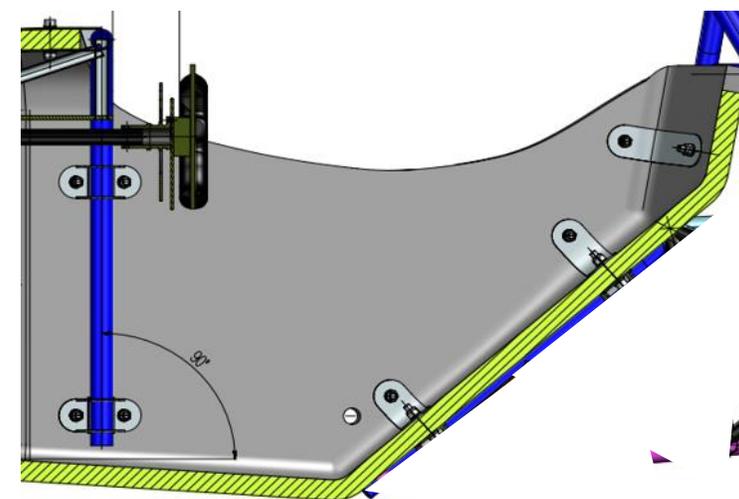
Ex.: Se um suporte tiver um furo de 8,2 mm para utilizar um parafuso M8, a borda deve estar a uma distância do centro do furo de no mínimo 16,4 mm.

Atenção: Somente os suportes do Sistema de Suspensão, Motor, e demais "Attachment" estão fora desta regra.

Será cobrado para suportes de Transmissão ligados ao Chassis, Fixação de Cinto de Segurança, Pedal Box, Coluna de Direção.



Aplicação em Tubos



Aplicação em Chassis Monocoque

Inspeção Técnica

Chassis - Brake System

BRAKE PEDAL - T.3.1.11-.13

Steel, aluminum, or machined titanium (no welded Ti). Alt matl. NOK for pad face. Entire pedal-to-frame system capable of 2kN (tested only by organizers).

BRAKES - T.3.1

- Single pedal actuates all 4 wheels (one brake on limited slip OK)
- Two separate hydraulic circuits w/ reservoirs; no brake-by-wire.
- Protected by structure/shields from drivetrain & collisions.
- No plastic brake lines.
- No parts below chassis/tub in side-view.

CRITICAL FASTENERS: BRAKES - T.3.1

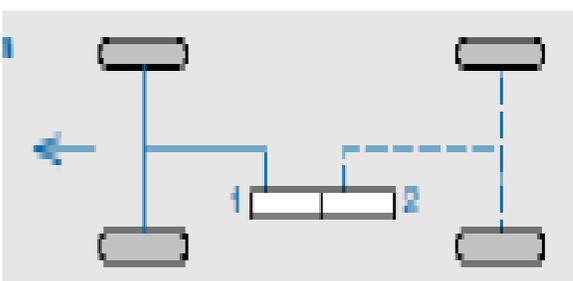
- Pedal Assembly: including adjustment mechanism, caliper to knuckle mounts, rotor to hat.
- Exempt: COTS caliper body assembly

BRAKE CONTROL SYSTEMS - GR.1.5

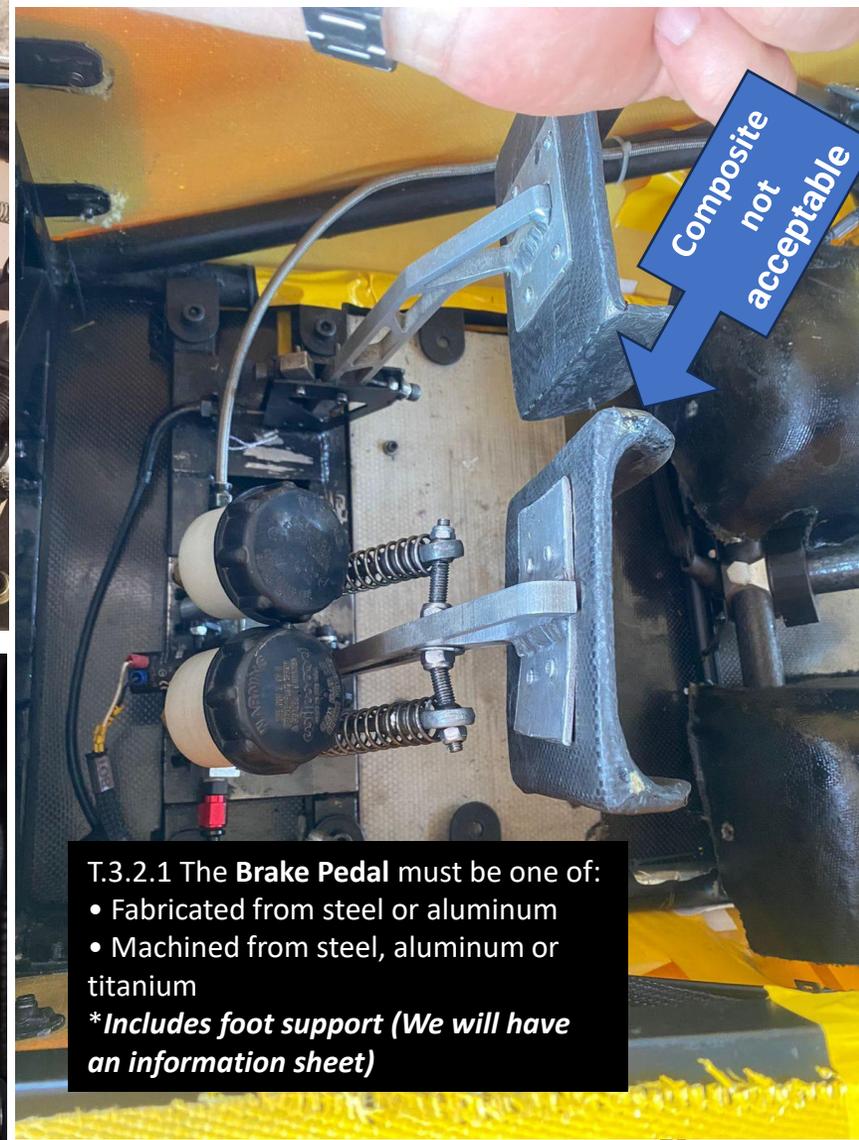
ABS, Traction, Yaw Control, etc: must have an approved FMEA.

BRAKE LIGHT - T.3.3

- RED color, •clearly visible from the rear, located on vehicle centerline.
- Height between wheel centerline & driver's shoulders.
- Round, triangle, or rectangular on black background.
- 15 cm² minimum illuminated area. LED strips OK if elements closer than 20 mm apart and total length > 150 mm (5.9").
- Sufficient brightness for visible activation in bright sunlight



Mangueiras como reservatórios - ok



T.3.2.1 The Brake Pedal must be one of:

- Fabricated from steel or aluminum
- Machined from steel, aluminum or titanium

*Includes foot support (We will have an information sheet)

Inspeção Técnica

Chassis – Steering

STEERING - V.3.2

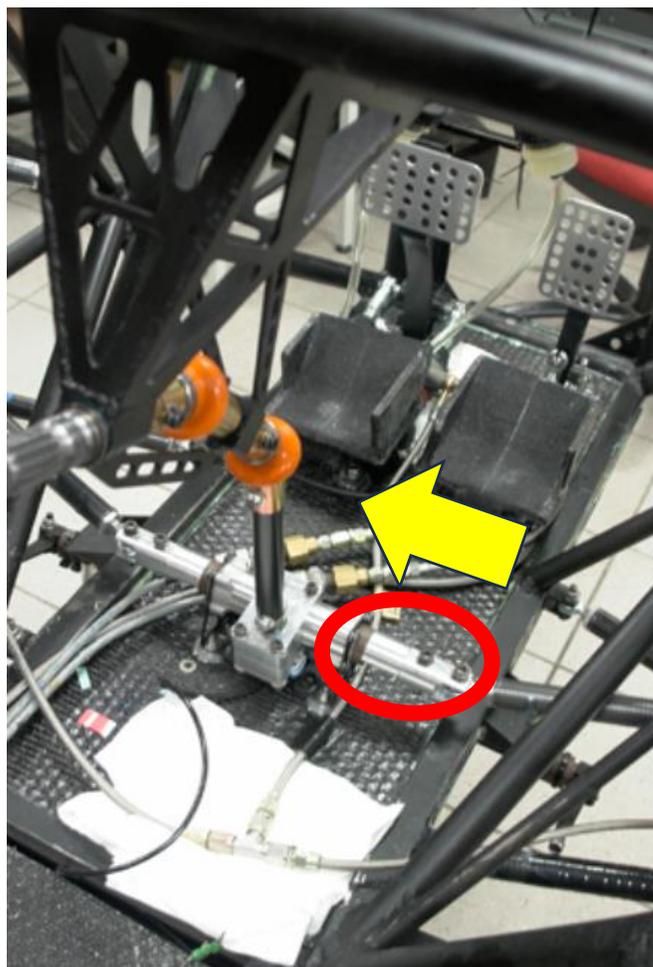
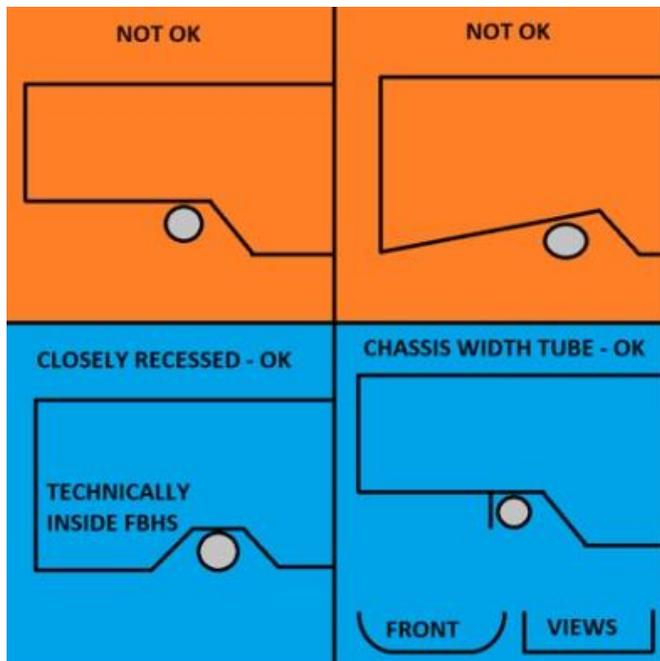
- All steerable wheels must have positive stops to prevent linkage lock-up or contact with other parts. •7° max freeplay at the steering wheel.
- NO STEER-BY-WIRE on front wheels.
- No cables or belts. •No bonded joints in column without metal backup.
- Rear steer limited to 6° total, with mechanical stops.

STEERING WHEEL - V.3.3

- Continuous perimeter, near round (no concave sections).**
- Driver operable quick disconnect. •Not higher than top of Front Hoop, in any ang

STEERING COMPONENTS OUTSIDE FRAME - F.5.14

- Racks protected to top, bottom, and local chassis width.



Inspeção Técnica

Positive Locking Mechanisms



SEXTEVADA CÔNICA



GAIOLA



SEXTEVADA



NYLON BAIXA



CALOTA



GARRA



SEXTEVADA FLANGEADA COM NYLON



RÁPIDA



BORBOLETA



PROLONGADORA



SOLDA QUADRADA



SEXTAVADA LÂMINA TRATOR



QUADRADA ESTEIRA TRATOR



SEXTEVADA CÔNICA



CASTELO SEM COROA



CASTELO ALTA COM COROA



CASTELO BAIXA COM COROA



SEXTAVADA FLANGEADA SERRILHADA



CALOTA BAIXA



PALL NUT



SEXTAVADA TORQUE



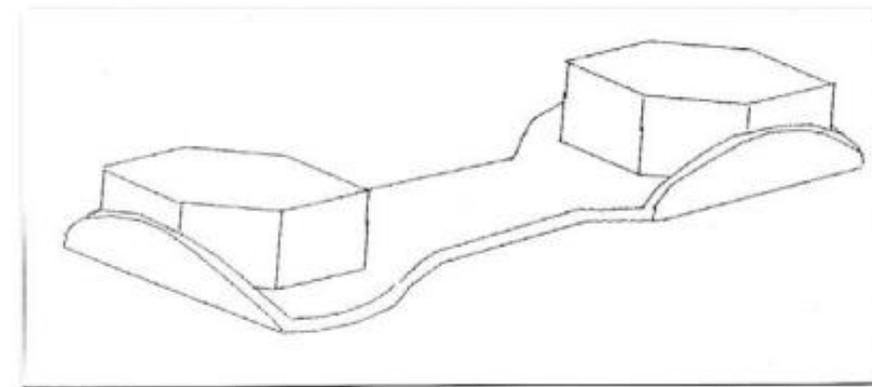
SOLDA



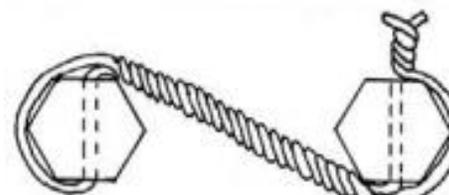
DUPLA



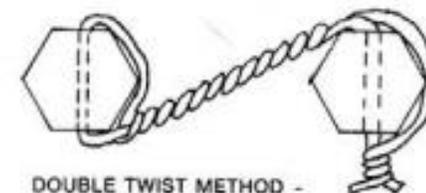
BAIXA



Use for screws



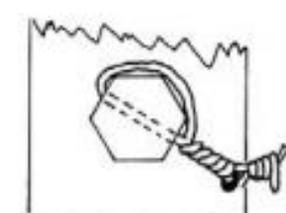
DOUBLE TWIST METHOD - CORRECT



DOUBLE TWIST METHOD - INCORRECT



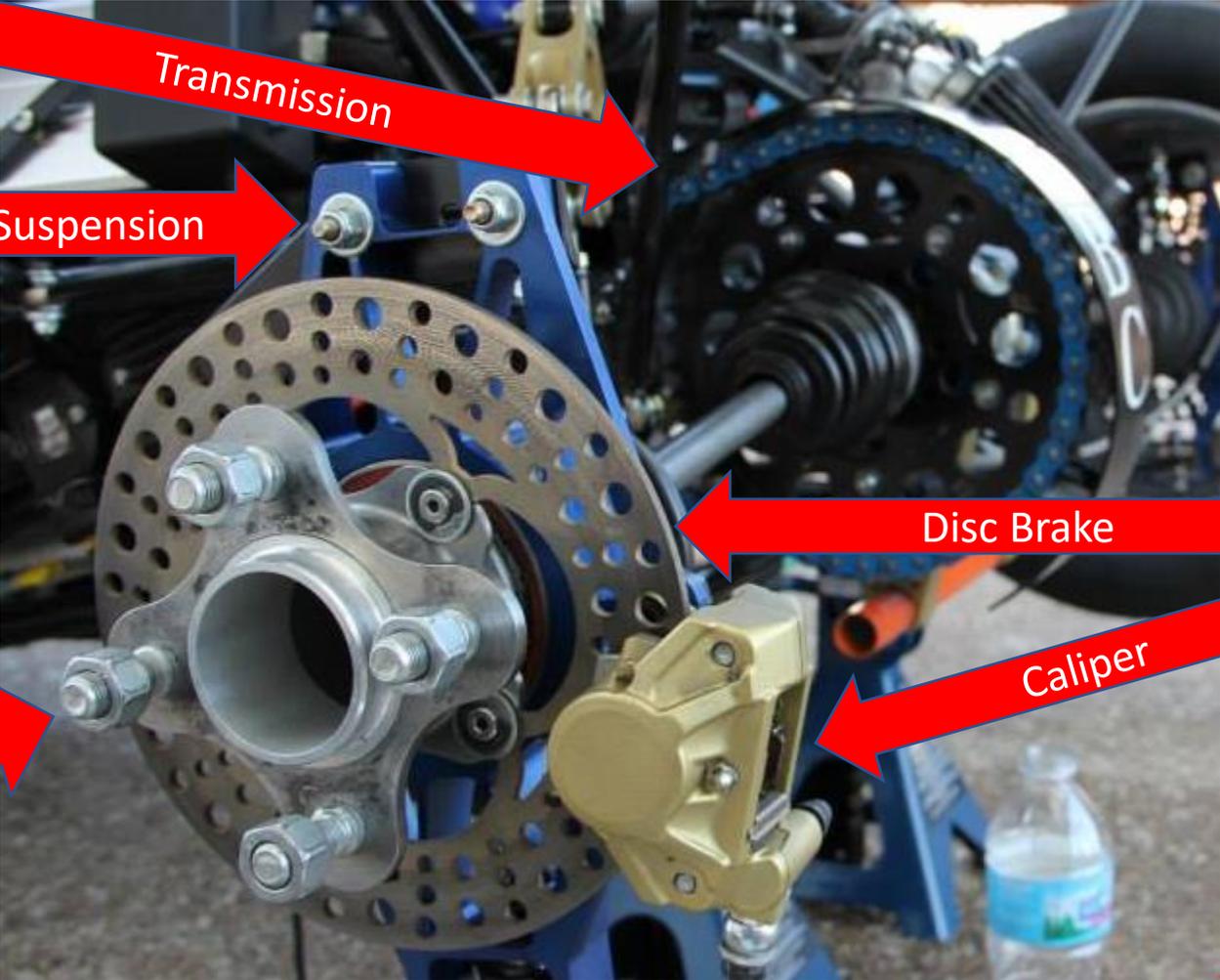
DOUBLE TWIST METHOD - MULTIPLE FASTENER



DOUBLE TWIST - SINGLE FASTENER

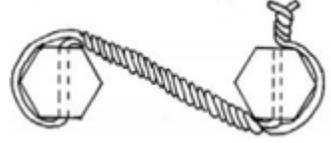
Inspeção Técnica

Chassis – Critical Fasteners (T.8.3.1 and T.8.3.12)

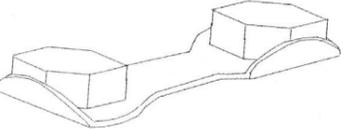




NYLON
BAIXA



Frenagem de parafuso



Abas de travamentos



SXTEVADA
CÔNICA

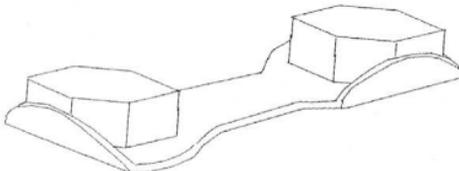
Transmission

Suspension

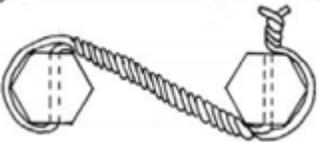
Disc Brake

Caliper

Whell Nuts



Abas de travamentos



Frenagem de parafuso

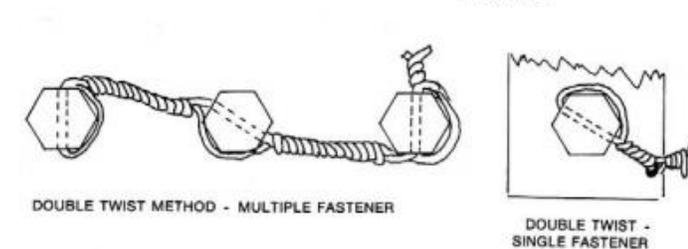
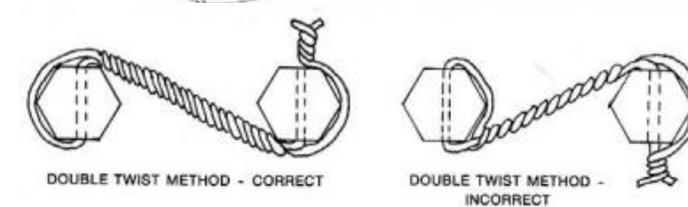
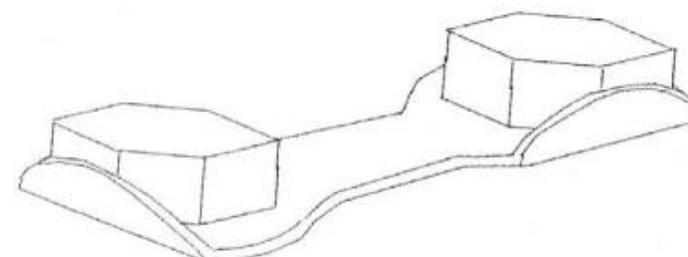
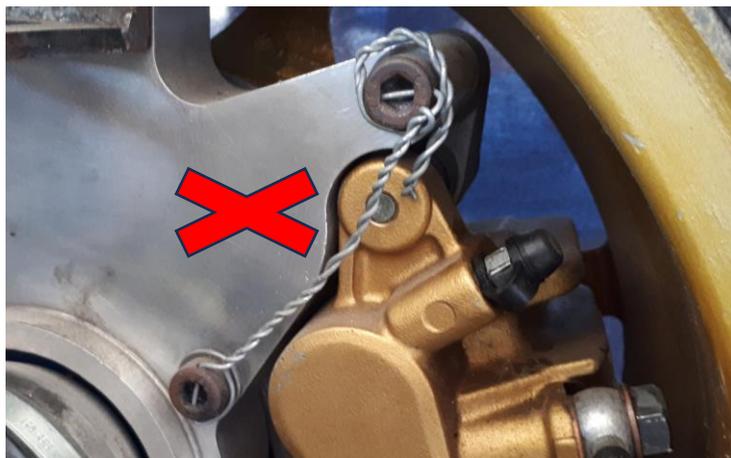


SXTEVADA
TORQUE

NUT/COUNTER
NUT IS NOT
ALLOWED

Inspeção Técnica

Critical Fasteners



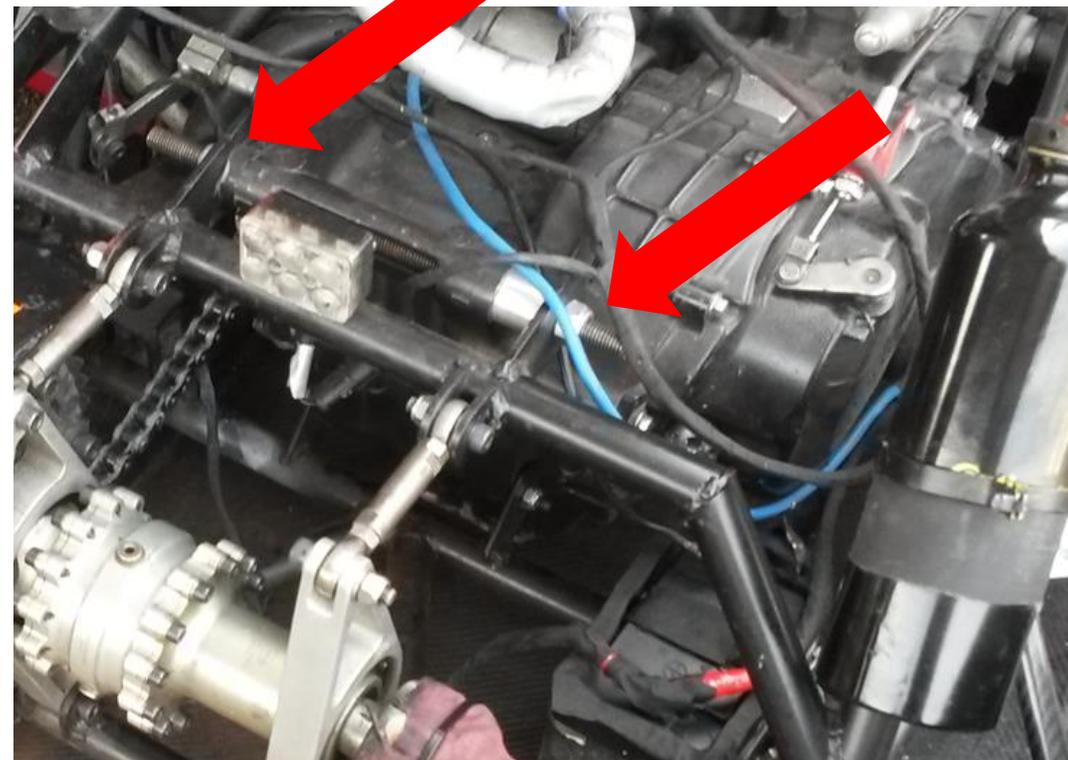
Inspeção Técnica

Critical Fasteners

Positive Locking não se aplica:



Coletor de Escape



Fixação do motor na Estrutura
primaria por parafusos.
Se houver utilização de porca
indicamos que esta porca seja
positive locking.

Inspeção Técnica

Chassis – Critical Fasteners

CRITICAL FASTENERS, Steering - V.3.2.8

Steering wheel, column, rack mounting, tie rods

CRITICAL FASTENERS: SUSPENSION - V.3.1.4

Control arms, knuckle, spring load path, single wheel nuts.

Exempt: lug nuts, multi-piece wheels, anti-roll bars, dampers.

All fasteners must be tight (esp: jam nuts).

A roda esta fixada ao cubo com um parafuso DIN 933 e necessita de um positive looking.



Atenção: deixar no minimo 02 fios de rosca passante na porca

Arruela DIN463



Travamento do Tie End



Porca e contra porca não é aceito
Utilizar Porca Parlock ou Arruela de segurança DIN463



Inspeção Técnica

Chassis - Suspension

SUSPENSION PICK-UP POINTS - GR.1.5

Inspected thoroughly for integrity: binding, over-articulation.

SUSPENSION - V.3.1

• Full suspension including front and rear damping. • Spherical rod ends and bearings: double-shear or safety washers.

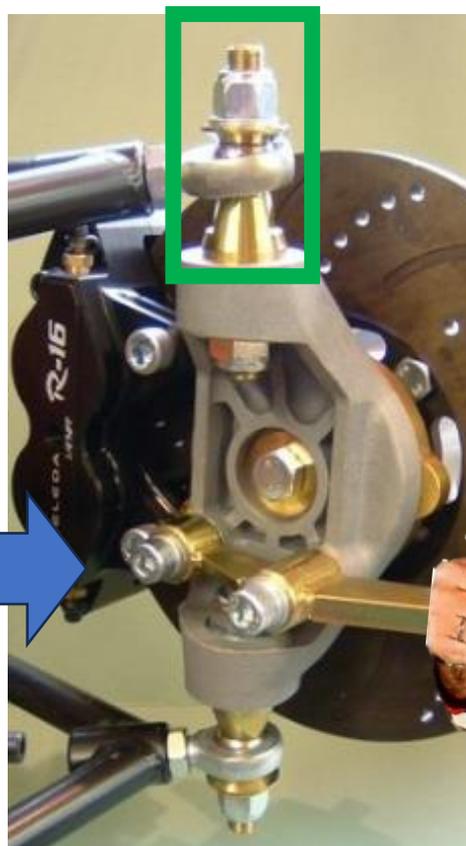
MODIFIED LUG BOLTS/STUDS - V.4.2.2

Verify good engineering practices are followed e.g. no drill holes for mass reduction.



Travamento do Rod End
V.3.1.5 - Mounted in double shear

Travamento do Rod End
V.3.1.5 - Captured by having a screw/bolt head or washer with an outside diameter that is larger than spherical bearing housing inside diameter.

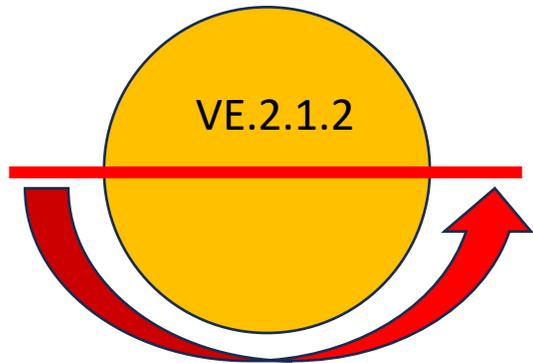
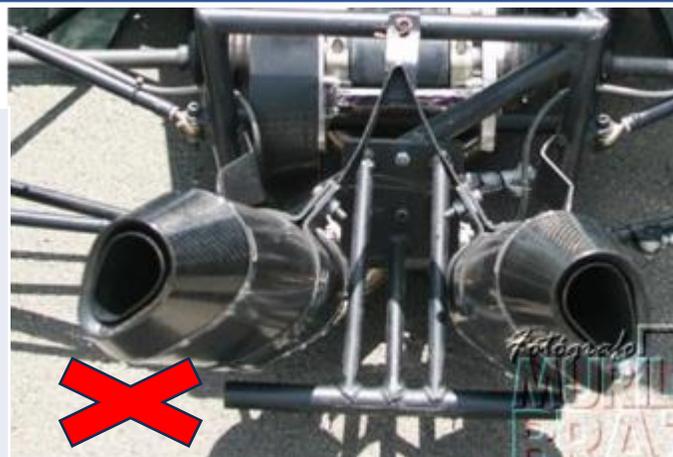


Inspeção Técnica

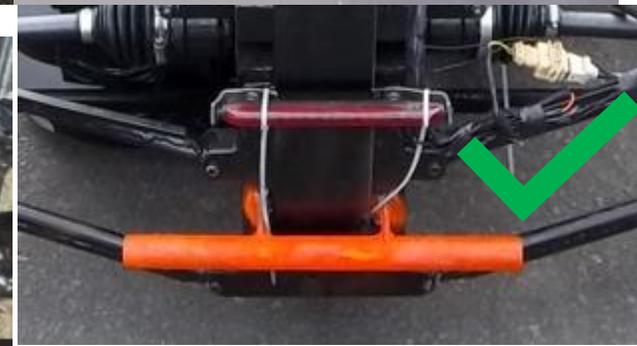
Chassis – Add Devices

JACKING POINT - VE.2.1

- Horizontal, lateral tube at the rear.
- Orange color.
- 300 mm wide by 25-30 mm O.D.
- Visible to person standing 1 meter behind car.
- 75 mm min ground clearance
- Rear tires must come off the ground using Quick-Jack (lifts to 200 mm). Exposed around the lower 180° of its circumference



180° inferior do tubo “livre”



Qualquer Quick Jack tem que levantar seu carro pelo Jacking Point

