

Version: 2021-01	ETPC- Farmstock Rulebook	Period of validity:
Date of absolution: 2021-01-31		From: 2021-01-31 To: 2024-01-30

European Tractor Pulling Committee FSC - Farm Stock Committee



Farm Stock Rulebook 2021

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Change History

Revision History / Technical Changes where have been done

Date	Description	Responsible	Version
2016-01-17	Correlate Chapter 4, unlimited Farm Classes. Frame specification according Pro-Stock	ETPC-FSC ETPC-T&S	2016-1
2016.01-5	Chapter 2.4 Safety Rules: add Reverse light & Starter interrupter	ETPC-FSC	2016-1
2016-02-10	Adding new regulation Oscillation Damper.	ETPC-FSC	2016-2
2016-02-11	L2: Chapter 2.5//L3: Chapter 3.12// L4 : Chapter 4.12		
2016-03-06	<ol style="list-style-type: none"> 1. Remove pump limit, <ul style="list-style-type: none"> o Chapter 3.11-4 2. Remove foot throttle in all chapter 3. Allow 2% downsizing in L2 & L3 (same as Prostock Main Rulebook 2016), if running above 2700rpm 4. Stabilizer bar drawing & text update, according main rulebook 2016 5. Cast Flywheel out in Level 2, add Chapter 2.5 6. Chapter 3.5: Remove text, refer to Appendix (from Pro-Stock) clutch & clutch Protection. 7. Move following subjects to an separate appendix: <ul style="list-style-type: none"> o Drawbar (L2 & L3 & L4) o RPM Control (L2 & L3 & L4) o Turbocharger Shielding (L2 & L3 & L4) o Turbocharger inlet protection (L3 & L4) o Stabiliser Bar 8. Update specification from legal diesel fuel (according main Rulebook 2016) <ul style="list-style-type: none"> o Chapter 1.7.7 o Chapter 2.6.16 o Chapter 3.15 o Chapter 4.15 9. Add fuel sampling Valve (according Main Rulebook) <ul style="list-style-type: none"> o Chapter 1.7.8 o Chapter 2.6.16 o Chapter 3.15 o Chapter 4.15 	Technical responsibility: ETPC-FSC Secretary & document update: Ackermann, STPV	2016-3
2017-03-17	<ol style="list-style-type: none"> 1) Chapter 2.6: Cylinder Head according PS 2) Chapter 2.6: Machining Cylinder Head, intake 3) Chapter 2.6.16: Remove multiple Engines 4) Chapter 2.7: Definition Common Rail system requirement 5) Chapter 2.8: Engine Throttle, update according L3 6) Chapter 2.9: Add Skid Plates with non OEM axle 7) Chapter 2.11: Kill Switch, move text to appendix 8) Chapter 3.1: Definition: RPM & displacement limit 9) Chapter 3.9: Add Skid Plate on all tractor 10) Chapter 3.10: Engine Limit 11) Chapter 3.11: Cylinder head according PS 12) Chapter 3.11: Definition Common Rail system requirement 13) Chapter 3.11: orientation Injection Pump, new engine St 14) Chapter 3.11: Machining Cylinder Head 15) Chapter 3.12: Exclude small belt from coverage 16) Chapter 3.13: Engine Throttle, new definition 17) Chapter 3.17: Kill Switch, move text to appendix 18) Chapter 4.9: Add Skid plate to all tractor 19) Chapter 4.12: Exclude small belt from coverage 20) Chapter 4.13: Engine Throttle, new definition 21) Chapter 4.17: Kill Switch, move text to appendix 22) Chapter 5.8: Turbo shielding correct value turbine out 	Document update, adding outcome of FSC- Tech Meeting Ackermann, STPV	2017-1
2017-03-20	<ol style="list-style-type: none"> 1) Do a complete new structure on Rulebook. Insert the superior Rules in the book, to avoid having same text several times. 2) Take note: Change history is not updated according new Document structure 	STPV Ackermann	2017-2
2017-11-05	<ol style="list-style-type: none"> 1) 1.3.1 Apply Rule from L3 (same rule) to L2 2) 1.3.2 Apply Rule from L3 (same rule) to L2 3) 1.3.5 Add skid plate for homemade front axle 4) 1.4.1.1 Apply Rule from L3 (same rule) to L2 5) 1.4.1.2 Add Cylinder head regulation (according PS) 6) 1.4.1.4 Add Common Rail Injection System definition 7) 1.4.1.5.2 Add Chapter Speed Signal Evaluation / Disqualification 8) 1.5.1.1 Rotating parts, describe difference better 9) 1.5.1.2 Harmonic balancer: no welding at all 	ETPC- Working Weekend STPV-Ackermann	2018-01

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	10) 1.5.1.3 no new content, only better wording/definition 11) 1.5.2 No automatic transmission in FS /delete text 12) 1.5.2 Change taken over from Main Rulebook- All Bellhousing less than 10mm- additional Liner 13) 1.5.5 No onboard starting chemicals allowed any more 14) 2.3 Clutch need to be from ETPC-Safety program (no cast parts any more- no OEM Clutch any more) 15) 3.1 Add 2.8ton Class on L3 (request from a Member country), exclude them from EuroCup 16) 3.2.1 Extend Engine Limit with 4Valve head & 2.8ton class 17) 3.4 Engine Rear End & Clutch protection, correct text according main rulebook 18) 3.4 Redefine component Chassis for 2800kg class, Engine Position from center rear axle. 19) 3.4 Allow component tractor in all Level3 classes 20) 3.5.1 Fire extinguisher according Main Rulebook		
2017-11-07	1) Correct Title in Superior Rule (erase Level4) 2) 3.4 Adapt Title		2018-02
2018-01-18	1) Update Member List 2) All cylinder head with more than 2 valves will be called Multi Valve 3) Time of validity will be from now on 3 Years for all performance rules. Safety rules can be updated at any time		2018-03
2018-03-09	4) Overhead camshafts in level 3 5) Sledges for level 3 tractors to EuroChallenge and EC		2018-03
2021-01-31	1) Level 3 - Update engine limits – 2 or 4 valve @3200rpm 2) Level 3 – Update engine limits – any amount of downsizing allowed 3) Level 3 – Proposed 2,800kg class removed 4) Fuel definition – align with ETPC rulebook		2021-01

Members of Farm Stock Committee, from February 2021

	Function	Name	Country	In FSC since	In function since	Next election
1)	Chairman	Claus Fey	DK	2019	2019	2022
2)	Member	Hans Christian Schmidt	DK	2012	2016	2021
3)	Member	Anette Færk Andersson	S	2019	2019	2022
4)	Member	Gerard Sikes	NL	2016	2016	2022
5)	Member	Max Wehri	D	2017	2017	2023
6)	Member	David Todd	GB	2017	2018	2021
7)	Member	Evert-Jan v.d. Wekken	NL	2017	2018	2021
8)						

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ETPC Farm Stock Rules

Introduction

The Farm Stock Committee of the European Tractor Pulling Committee (ETPC) made this rulebook as a guide for you. We expect it will help you to make RPM limited pulling easy and fair for you as we strive to standardize pulling rules and make Truck and Tractor Pulling a safe and fair sport for all involved.

Whenever you need more information, please contact the ETPC representative of your national organization. All individual inquiries from pullers, promoters etc. must go through the respective national boards, which if needed, will pass them on to the ETPC.

Neither the ETPC Board, nor the Tech and Safety Board, nor the Farm Stock Committee, nor any of their members can be made responsible for any damage or loss of technical or other kind, or for any kind of human injury that may be caused by the Truck and Tractor Pulling sport.

RPM limited classes

The ETPC recognises three levels of RPM limited classes in Tractor Pulling:

Level 1- Farm classes:

Tractors are not allowed to be modified in any way for the use in Tractor Pulling. Only modifications for safety are allowed, or mandatory.

Level 2- Sport classes:

Tractors are allowed to be modified for the use in Tractor Pulling sport. Additional limitation next to the limit of 2700 rpm is the use of different Air-Restrictor (Different Design & inner Diameter), variably with or without Intercooler

Level 3- Super Sport classes:

Tractors are allowed to be modified for the use in Tractor Pulling sport. The basic limits in these classes are a combination of a maximum rpm & engine displacement.

Integration from component chassis in this class is common sense, to allow later engine models to this class

Level 4- Unlimited Farm Stock class:

Class is skipped from 2018 onwards. No interest in past 4 years. No tractor is built according to this level.

Period of validity

All performance rules are frozen for a period of 3 years.

All safety rules can be updated instantly

General competition rules:

The general competition rules are according to the ETPC main rule book. Please refer to the ETPC main rule book.

Sledges:

EuroChallenge for level 3 tractors: minimum a Bronze sledge

EC for level 3 tractors: minimum a Silver sledge

0 Chapter - Level 1 // Farm Classes

0.1 Definition

Farm classes are intended for tractors “just out of the field”, it is not allowed to do any technical changes to the tractor except for safety reasons. Tractors should be divided in different categories based on weight and horse power. The ETPC has experience in two ways of controlling the horse power limit. Testing the amount of horsepower after the pull with a dynamometer and setting a limit on the size of the air intake by an air restrictor.

It is not the intention of the ETPC to sanction international events with the Farm Classes, however, promoters can of course offer international competition.

The ETPC recommends following limits

- 3.5 ton - 100 hp - 30mm Air Restrictor
- 4,5 ton - 125 hp - 34 mm Air Restrictor
- 5,5 ton - 150 hp - 37 mm Air Restrictor
- 6,5 ton - 175 hp - 40 mm Air Restrictor
- 7,5 ton - 200 hp - 43 mm Air Restrictor
- 9,5 ton - 275 hp - 50 mm Air Restrictor
- 11,5 ton - 350 hp - 57 mm Air Restrictor

(Air Restrictor sizes according to tests performed by BKTV)

0.2 General Rules, apply to all tractors

1. All official weights include driver, vehicle with oil, water, fuel and safety equipment, ready to compete. All drivers must weigh in with the pulling vehicle when it is officially weighed. No vehicles will be allowed past weighbridge that exceed class weight. No adding fuel or weights unless reweighed. Weighing out is at the discretion of the track officials.
2. The tractor must be an original farm stock tractor without any changes.
3. It is allowed to use a non OEM turbocharger.
4. The complete original 3-point hitch and p.t.o. must be present.
5. If the ETPC or national organization doubts the legality of any entry, the contestant in question must verify that 150 units of the tractor in question have been manufactured (notarized statement from the manufacturer), furnish parts numbers, and prove to the board's satisfaction that the tractor is legal.
6. The tractor must have been assembled by the manufacturer or national dealer in the way the contestant wants to participate. If there are any doubts, the contestant in question must prove the tractor is legal.
7. The only legal fuel is diesel. For definition see below in this document.
8. All pulling vehicles are required to have a sample valve installed for water and fuel sampling, as close to the pump as possible. Multi engine vehicles only on one engine.
9. ETPC officials or officials from affiliated organizations can check fuel at any time during any event.

0.3 Safety

1. The RPM is allowed to a maximum of 30% over the standard RPM to a maximum of 2700 rpm.
2. The tractor must be fitted with a national (e.g. CE or GS) approved roll over protection, a safety cab or ETPC roll bar (see Level 2).
3. Advertising boards are allowed, if they do not extend outside the tractor and providing they do not influence the visibility of the driver. Advertising boards are not allowed to be movable, boards turn able within the wheels excluded.

0.4 Tyres

1. Tractors are only allowed to drive with rubber tyres; Chain or similar are not allowed. Tyres are not allowed to be cut. Puller tyres are not allowed.
2. The size of the tyres is free of choice with a maximum height of 2200 mm. The use of dual tyres is allowed.

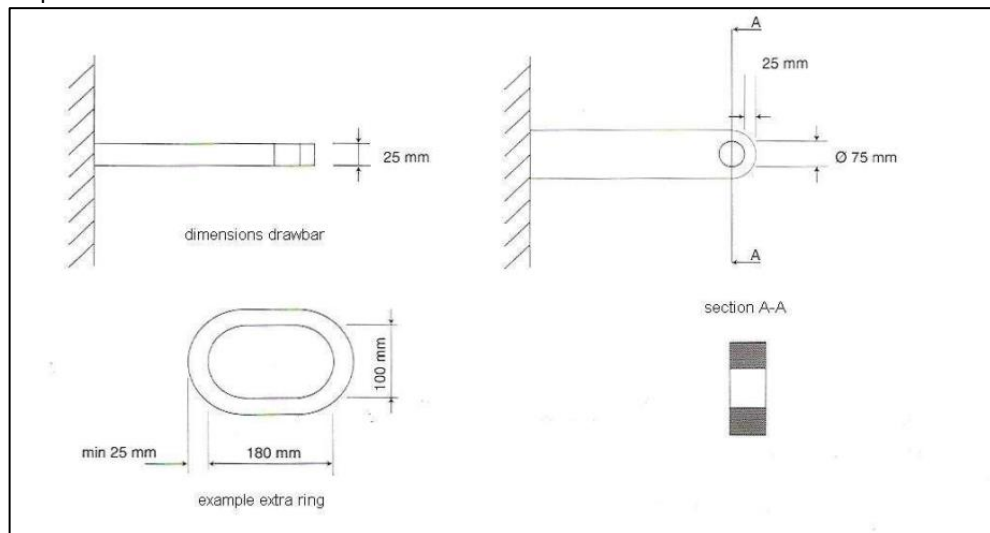
3. The total width of the tractor is maximum 3000 mm.
4. Dual tyres need, besides the normal connection, an extra provision to prevent the wheel breaking loose.

0.5 Stabiliser bars

1. Stabiliser bars are mandatory for all tractors, except for four wheel drive tractors in the classes 7500, 9500 and 11500 kg that have all movable weights in front of the front axle.
2. It is allowed to use the original 3-point hitch if this is blocked in a solid way and quick locks are secured. The draw bar and draw bar assembly must not be attached in any way to the stabilizer bar assembly.
3. The stabiliser bar system must be able to support the weight of the vehicle including ballast weights in the heaviest class it competes in.
4. It is allowable to have a connection between both stabilizers, but it must not touch the sled chain.

0.6 Drawbars

1. Drawbars have to be constructed so that in the event of drawbar breakage, the drawbar supports do not pull from a top link or brace above the center line of the rear axle of the vehicle.
2. Drawbars must be rigid in all directions
3. Drawbars must be parallel to the ground with a tolerance of +/- 10 degrees
4. Maximum drawbar height is 500 mm above the ground.
5. Drawbars on tractors with front axle suspension must be measured in the lowest position of the front axle.
6. The drawbar must not be shorter than 450 mm, measured horizontal from the center of the rear axle.
7. The drawbar must be equipped with a hitching device with a minimum 75 mm round hole.
8. A swing hook is allowed, if it has a minimum 75 mm round hole. It is allowed to use an extra ring that meets the specs according illustration below. The fixed part of the drawbar is considered when measuring length and height of the draw bar.
9. The area of 150 mm wide and 300 mm high above the drawbar must be free of all obstructions (including weights, stabilizer bars) for easy hooking and unhooking.
10. All tractors are required to have a tow hitch on the front of the vehicle.



0.7 Weights

1. No weights may extend rearwards beyond rear tyres.
2. No weights may cause any danger or trouble to the contestant.
3. All weights must be securely fastened. The use of movable weights or movable weight carriers is not permitted.
4. Weights or a weights carrier may not extend more than 850 mm in front of the grill, tow hitch not included. In the classes 7500, 9500 and 11500 kg not more than 1100 mm.
5. All vehicles must be able to pass the weighbridge in a normal way (without weights touching).

1 Superior Rules applied to L2 & L3

These rules are general, for the following Farmstock Level. In the Requirement is clearly written, to which Level the application is required. If a rule is only applied to a specified Level, there are clear definitions for which Level it will be required.

For Performance and Limit Rules, see Chapter: Level 2 / Level 3 in this Document.

1.1 Legality

Requirement Level 2 / Level 3

1. Tractor must retain stock appearance.
2. Engine manufacturer must fit the hood.
3. The combination of engine, bell housing/ transmission and reared must have been manufactured in that combination (but not necessarily with that brand of hood).
4. There must not be a visible part in the drive line that is of another brand. (For example, you must not mix a JD back end with an IH engine).
5. The only vehicles that are considered legal in Supersport / Farmstock are those that are OEM available as farm tractors with front wheel steering.
6. If the ETPC or national organization doubts the legality of any entry, or upon protest by another contestant in that class, contestant in question must verify that 150 units of the tractor in question have been manufactured (notarized statement from the manufacturer), furnish parts numbers, and prove to the Board's satisfaction that the tractor is legal.

1.2 Carrying Structure

1.2.1 Brakes

Requirement Level 2 / Level 3

1. All competing vehicles must be equipped with working rear brakes.

1.2.2 Ballast (Weights)

Requirement Level 2 / Level 3

1. No weights may extend rearwards beyond rear tires.
2. All weights must be securely fastened.
3. Any ballast lost while hooked to the sled and under the green flag will be cause for disqualification (internal breakage excepted).
4. The use of movable weights or movable weight carrier is not permitted.

1.2.3 Tow Devices

1.2.3.1 Tow-Hitch

Requirement Level 2 / Level 3

1. All vehicles are required to have a tow hitch on the front of their vehicle.
2. The tow hitch can extend a maximum of 150 mm ahead of the furthest front portion of the vehicle (hitch will not be counted in length when measuring the vehicle).
3. The tow hitch must have a 75 mm diameter hole, preferably positioned horizontally, and be strong enough for pushing or pulling the vehicle at its heaviest weight.

1.2.3.2 Drawbar

A. Superior Requirement Level 2 / Level 3

1. The pulling link to the sledge is a drawbar with a 37mm thick hitch, with a round opening of minimum 75mm
1. Drawbars must be constructed, so that in case of a drawbar breakage the drawbar support do not pull from a top link or brace above the center line of the rear axle of the vehicle.
2. A drawbar which can be made shorter than legal length (from center of rear axle: 45cm) is not acceptable.

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3. Drawbars must be rigid in all directions.
4. Drawbars must be parallel to the ground with a tolerance +/- 10 degrees. The front axle suspension must be totally lowered, if this is possible from the manufacturer.
5. An area of 150 mm wide and 300 mm high, immediately above the drawbar, must be free from all obstructions (including weights, stabilizer bars) for easy hooking and unhooking.
6. No portion of the vehicle may interfere with the sledge, chain or hook during a pull or while being hooked or unhooked.
7. Drawbar and stabiliser bars must not be connected to each other
8. The drawbar distance from center of rear axle must not change during pull.

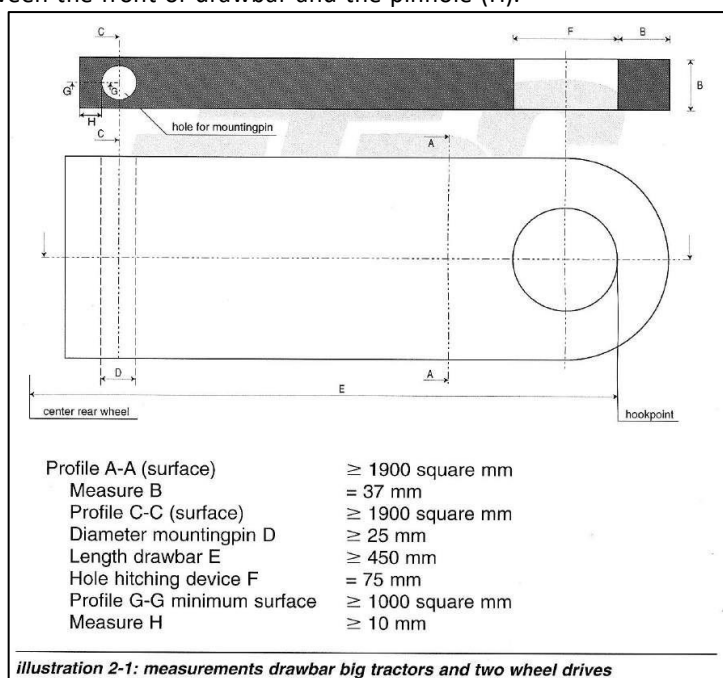
Note: The ETPC highly recommends that competing vehicle should not be tied down to a tow vehicle through or on the drawbar in any way

B. Additional requirement applied to Level 2:

1. The ETPC recommends a drawbar to the following specification: Level 3

C. Additional requirement applied to Level 3:

1. Drawbars and hitching devices must be made out of solid steel with a minimum of 520 N/mm² tensile strength in all weight classes.
2. No welding on drawbars.
3. Drawbar must meet the following (illustration 2-1):
 - a) Drawbars to be a minimum of 1900 mm² total material (steel) at any point. This includes the area of the mounting pin with the pin removed.
 - b) The mounting pin must be made of steel with a thickness of 25 mm.
 - c) The vertical cross section A-A of the drawbar must be a minimum of 1900 mm², and the horizontal cross section G-G must be a minimum of 1000 mm² with a minimum of 10 mm of cross sectional thickness between the front of drawbar and the pinhole (H).



1.2.4 Stabiliser Bar

Requirement Level 2 / Level 3:

1. Stabiliser bars are required. The drawbar and drawbar assembly will not in any way be attached to the stabiliser bar assembly.
2. The stabiliser bars will extend a minimum of ½ tire diameter behind a line drawn from the center of the wheel to the ground.
3. The stabiliser pad must not be more than 250mm off the ground
4. The stabiliser pad must be a minimum of 15000mm² at ground contact point, minimum with 100mm,

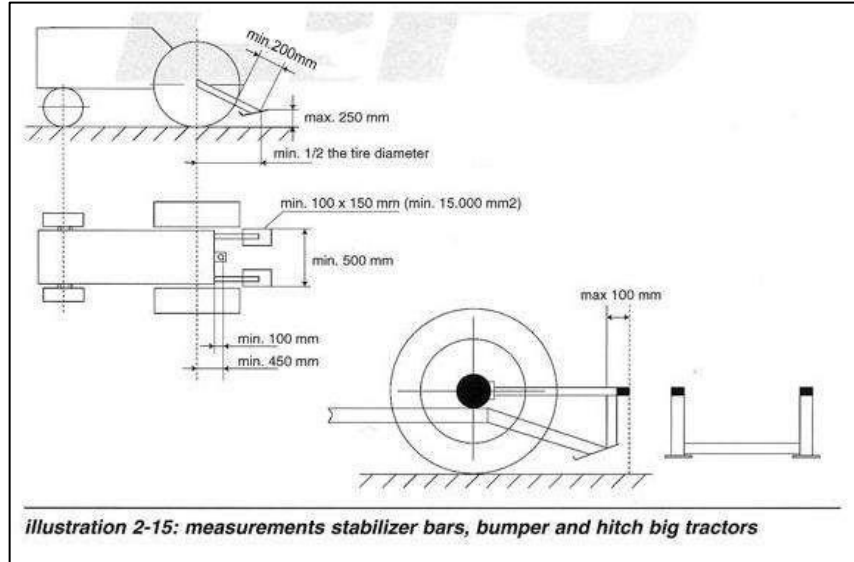
minimum length 150mm

5. A minimum of 500mm will be allowed from Outside of one pad to the other. Stabiliser bars are not be mounted in any way to the drawbar. (See illustration 2-15).

Note:

The stabiliser bar system must be able to support the weight of the vehicle in the heaviest class pulled. Jacking up the pads, so tractor is completely off the ground will be a test

The ETPC highly recommend the use of bumpers on all vehicles, to prevent them from passing over the buckboard of the sled.



1.2.5 Tyres

Requirement Level 2 / Level 3

1. Tractors are only allowed to drive with rubber tyres; Chains or similar are not allowed. Dual tyres are not allowed.
2. All tyres are allowed to be cut.
3. The total width of the tractor is maximum 3000mm. This will be measured at the axle height.
4. Puller tyres allowed
5. The maximum allowed tyre width is 30.5" or 800mm. The maximum diameter of wheel rims is 32". If the width of the tyres is less than or equal to 710mm, a wheel rim diameter of 42" is allowed. The manufacturer's markings on the tyres state the tyre dimensions.

1.2.6 Seat & Fenders

A. Superior Requirement Level 2 / Level 3

1. All tractors must have a shield between the driver and the tyres consisting of a solid barrier between driver and any part of the rear tyres, which is able to sufficiently support the weight of the driver. It must be fitted with a fender construction, stable enough to take the weight of the driver.

B. Additional requirement applied to Level 2

1. All tractors must have a stable and tightly fastened driver's seat with a back rest. All folding seats must be fastened securely during a pull.

C. Additional requirement applied to Level 3:

1. All tractors must have a strong and rigid seat; All tip seats must be securely fastened while pulling. All seats must have side rails that are a minimum of 100 mm above the edges of the seat, must extend a minimum of one half the distances from the back of the seat to the front edge. If fenders are 150 mm or more above the seat, and are 150 mm or less from the seat, no seat side rails are required.

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1.3 Dimensioning / Sheet Metal / OEM Body Housing (Chassis)

1.3.1 *Wheel base and total length*

Requirement for Level 2 / Level 3

1. Maximum wheelbase unless originally produced with longer wheelbase, in which case stock length must remain.
 - a. Tractor <3000kg: 2600mm
 - b. Tractor >3000kg: 2900mm
2. Maximum length from center of rear wheel forward to most portion including weights and weight racks.
 - a. Tractor <3000kg: 3500 mm
 - b. Tractor >3000kg: 4000mm
3. The towing hitch, with maximum length 150mm, is not measured in the maximum length, it may be additional.

1.3.2 *Sheet Metal*

Requirement for Level 2 / Level 3

1. Sheet metal can be up/down graded to present/past manufacturer by approval of ETPC and national TSB.
2. Tractor must have hood and grill in place as intended by the manufacturer.
3. Sheet metal to be stock length and in stock location.
4. The distance from center of the rear axle to that part of the hood that is farthest forward must be the same length as that model of the upgraded sheet metal.
5. Wheelbase rule will apply according to the original chassis, not to the model of the upgraded sheet metal.
6. Level 3 Supersport chassis rules A: 1-8 above will apply according to the original chassis, not to the model of the upgraded sheet metal.

1.3.3 *OEM body housing (Chassis)*

Requirement Level 2 / Level 3

1. Advertising boards are allowed, providing they do not influence the visibility of the driver. They may not extend over the sides.
2. The drive line, existing of engine, bell housing, gearbox and rear axle, must hold without external strengthening. Connecting plates, flanges or welded on parts are not allowed. If the engine and bell housing do not form one unit in the original tractor, the tractor must have a self-carrying frame (according to the rules in L3).
3. Engine block must remain in original location as located by manufacturer.
4. All engines must be secured and held rigid to OEM chassis. Engine cannot move independent of rear end/transmission housing.
5. The stock transmission housing or manufacturer's replacement and the stock final drive housing or manufacturer's replacement. Planetary are considered part of final drive and are not removable.
 - a) Machining OEM components allowed.
 - b) Welding of cast iron not allowed.
 - c) Welding of wheel-hub to drive-axle only on outside of wheel
6. Any alterations to the chassis shell must have the written approval of the ETPC and the national Tech and Safety Board (TSB), before the tractor in question will be considered legal.
7. The chassis and frame must remain stock from the rear of the engine block to the rear of the tractor.
8. The clutch housing, transmission case, rear end housing and axle housing must be OEM, with no aluminum replacements. Machining OEM components allowed. Welding of cast iron is not allowed.

1.3.4 *Modification on housing*

Requirement for Level 2 / Level 3

1. The use of a spacer between the engine block and clutch housing is allowed; with a maximum

additional thickness of 35mm (the spacer must have the same bolt pattern as the engine and bell housing). Aluminum spacer-plate cannot be part of the clutch protection.

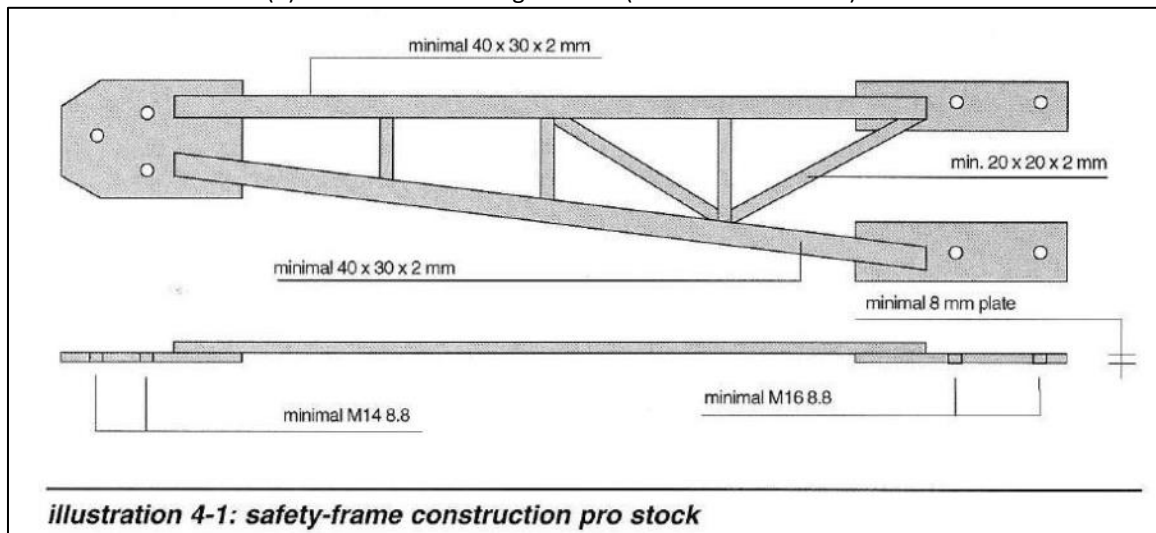
1.3.5 Sub Frame (Frame)

Requirement for (Level 2*) / Level 3

*only if required (see chapter Level 2)

1. Tractor must have either

- a) Safety tie bars made out of steel mounted to rear axle housing with at least four (4) axle housing bolts and extending forward of flywheel area and fastened to side of engine block or main frame with at least three (3) 14 mm steel bolts grade 8.8 (See illustration 4-1)



OR

- b) A one piece frame extending from front of tractor to rear axle housing mounting bolts.

OR

c) a divisible frame under the following conditions:

- The steel split frame construction must extend from front of tractor to rear axle housing mounting bolts.
- The two pieces have to fit in one another (sliding in construction) in the area where the tractor can be split (clutch area).
- The two pieces of the frame must be made of tubes or u-shaped steel with a thickness of at least 3 mm.
- If the frame is made of u-shaped steel it must have a u-shaped connection bar inside min. 500 mm length. (250 mm in the rear part and 250 mm in the front part of the u-shaped split frame).
- If the frame is made out of tubes it must have inner tubes min. 500 mm length. (250 mm in the rear part and 250 mm in the front part of the tube frame).
- Rear part of the frame has to be mounted to rear axle housing with at least four
- (4) Axle housing bolts and extending forward of flywheel area and fastened to side of engine block or engine plate with at least three (3) 14 mm bolts min. grade 8.8.
- Two parts of frame must be locked together with at least two (2) fasteners of 8 mm steel.
- Two piece frames must be of sufficient strength to support weight of tractor with the bolts used to split the tractor removed.

2. Tie bars or frame must be of sufficient strength to support weight of tractor with the bolts used to split the tractor removed.

1.3.6 Skid plate

Requirement for Level 2 / Level 3

A Farmstock tractor must have skid plates under the front axle (**except:** on OEM front-axes) to keep vehicle on the track, in case of losing a front wheel. Skid plates must be one of the two types listed below:

- a) Skid plate mounted in line with each frame rail (on both sides) at the center of the front axle equal in strength to frame rail material. Skid plate surface to be a min of 100 wide and 300mm long with a

min. 150mm curve measured from the front most part of rolled edge.

OR

- b) Skid plate mounted to center of axle, must be a min of 300mm wide with rolled edge front. Plate must be min 200 mm lengths.

Skids must be securely mounted and braced to the chassis front axle. Skids must be able to support the weight of the front end when checked with a jack.

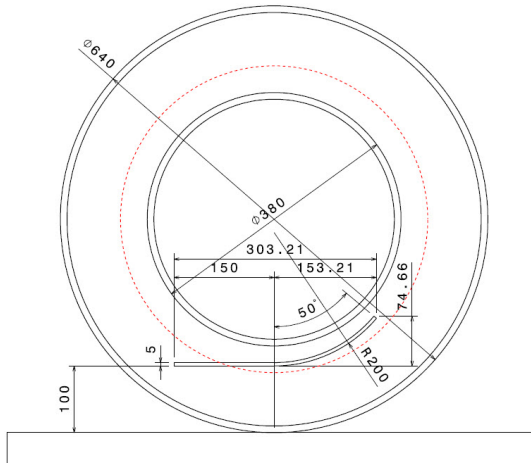
Maximum ground clearance is from the bottom of the wheel rim to the ground, not to exceed 100mm with front tires in normal operating position.

For better understanding:

This is a crude example, based on certain assumptions. These assumptions, regarding the outer rim diameter or outer tire diameter are just theoretically. Perhaps real dims of real items will be a bit different. Okay, we assume that the outer wheel dia of a more or less common farm pulling tractor is around 640. The outer (rated) rim diameter shall be 380 (15" rim?!).

Following both criteria are fulfilled. The ground clearance is max 100, and the bottom surface of the skids is at a lower location than the lower edge of the outer rim diameter. If there are different wheels applied, e.g. with same tire outer diameter, but a significant larger rim diameter, the second criteria can't get fulfilled. Or lets say, if you're using 18" rims (here marked with the dashed red circle) with the same outer tire diameter, the edge of the rims are lower than the bottom surf of the skids -> NoGo!

To get the second criteria "repaired", it's allowed to install the skids even lower, e.g. with only 70-80mm ground clearance. Not very comfortable, but perhaps the only way to reach a state of conformity with the ETPC rules.



The overall length of the skid plate shall be at least 300. In this example half of the length is behind the front axle transverse vertical plane, and the other half in front of it. Rules say that the curve also has to be at least 150 long.

Using some kind of raw material (tube?) to build the curved front part of the skid, with e.g. a radius of 200 and a section of 50 deg angle, this piece end up in a length of appr 150 (153.21).

There is nothing specific written in the rules about the height of the front edge of the skids relative to the bottom surf of the skids, here marked with 74.66. It's possible to use significant larger radii for the curve, to fulfill the min length of 150 for the curve. But this will lead automatically to much lower (less height) curved pieces for the front curve of the skids.

The only requirement regarding material properties in the rules: "equal in strength to frame rail material" The example shows t=5, but just read it as kind of recom for a min val from my view.

Origin:
ETPC- T&S, Kai Uwe Wegner

1.4 Engine & Driveline

1.4.1 Engine regulations (no Limit)

All Engine Limit (displacement Limit or any Air Restrictor), you will find directly in the chapter of various classes.

1.4.1.1 Engine alteration

Requirement for Level 2 / Level 3

- All classes are limited to one (1) pressure stage with turbochargers (consisting of inlet and exhaust). No mechanical blowers / superchargers / pro-chargers.
- The conversion from 4-stroke into 2-stroke principle is not allowed.
- The use of another oil-sump is allowed, providing it is not part of the carrying structure in frameless tractors. It must be possible to replace the original oil-sump on the engine block in its original position.
- A girdle under the engine block is allowed, and falls under the same rules as the sump.
- The use of another rocker cover is allowed. It must be possible to replace the original rocker cover on the cylinder head in its original position.
- The stock engine block or OEM engine block that will operate with the stock crankshaft for that model without any alterations for chassis mounting.
- The OEM engine block cannot be modified externally, except for normal repair or for mounting of fuel injection equipment.
- Internal webbing and water jacket must remain intact with provisions to re-bore engine block.
- No deck plate when the engine is downsized (otherwise a deck plate is allowed). The maximum distance between the centre line of the crankshaft and the top of the engine block, including deck plate and gasket material is 410mm.
- One piece engine main cap bearings allowed. One piece main cap not considered as a girdle.
- The competitor needs to drill two holes of (3.5 mm) into two bolts (next to each other) of the sump.

These holes can be used to seal the engine

1.4.1.2 Cylinder head definition

Requirement for Level 2 / Level 3

1. European John Deere heads are allowed to machine the inlet manifold housing off, to the line of the valve cover. Same rule apply for other brands (e.g. Cummins), where have a combined intake Manifold & Cylinder head Design.
2. Engine cylinder head(s) must be OEM agricultural type for that brand engine as fitted in serial production in combination with the original engine block- no mixing of brand, or series of the brand. There must be a minimum of 150 units produced with this engine block and cylinder head(s) combination and replacement cylinder head(s) used must be available under the part number from the manufacture of that engine brand as listed in the original parts catalogue for that particular engine. If the brand no longer manufactures them these are acceptable as long as they are approved as a "true" replacement copy by the original brand manufacturer and conform to all other rules. For all engines designed as "water cooled" within the cylinder head system the original water channels must be present as per the original production cylinder head(s) casting used in serial production. The original cylinder head(s) must be able to fit and work with the standard agriculture- operationally not just functionally (i.e. must continue to work continuously over a number of hours). "Air cooled" cylinder head(s) must be as per original serial production casting. No recasting of cylinder head(s). Recasting will be defined as the process of manufacturing with an alternative mold/template to the one used in serial production. Aftermarket machining and modifications allowed on the cylinder head(s) casting. No alterations to be casting allowed that will alter the original air inlet and outlet positions or bolt pattern. Bolt pattern head to block must be as original. Connection side of inlet and exhaust manifolds must be 90 degrees with head gasket or OEM. If there is any question of legality of cylinder head(s) it is up to the team to prove that the engine block and cylinder head combination is legal. If it cannot be confirmed that it is a legal combination ETPC will enforce the maximum penalty of a one (1) year and ten (10) days ban for that tractor and team.

1.4.1.3 Fuel definition

Requirement for Level 1 / Level 2 / Level 3

1. Diesel fuel only. Use of gasohol and/or alcohol is prohibited.
2. The only legal fuel is diesel. Oxygen carriers and combustion accelerators are illegal. Diesel fuel is defined by the ETPC as a pure hydrocarbon. GTL fuel (Gas to Liquid), CTL fuel (Coal to Liquid) and BTL fuel (Biomass to Liquid) are allowed as fuel for Diesel Engines. The use of additives containing oxygen, such as nitro methane, propylene oxide, dioxide, MTBE, alcohol or nitrous oxide, are strictly prohibited. These additives, and others of the oxygen bearing family, will significantly change the dielectric constant value of any diesel fuel. It is prohibited other fluids, fuels or gasses to add, inject or spray in or on any part of the tractor. The ETPC keeps the right to decide that the fuel that has to be used for the competition will be supplied thought the ETPC.

1.4.1.4 Fuel Injection System

Requirement for Level 2 / Level 3

1. In all Farmstock classes one (1) fuel injection pump of any size, within only one (1) pump element per cylinder is allowed. If using OEM (available of parts counter) 12 cylinder fuel injection pump two (2) pump elements per cylinder allowed.
2. The use of a Common Rail diesel fuel system is permitted under the following criteria and specifications:
 - Must use a dual throttle position sensor output circuit (circuit 1 ramps up, circuit 2 ramps down)
 - Single throttle circuit not allowed
 - Must use two (2) springs to return throttle to idle
 - Kill switch must interrupt the permanent current (T30) and the current by ignition (T15) to the engine control unit (ECU)
 - Kill switch must work according the fail-safe principle, activated when the electrical system is interrupted
 - Kill switch must also activate the air shut-off a required on all diesel engines
 - Must have a fuel shut off valve control in the low pressure line towards the high-pressure pump and as close as possible to the high- pressure pump with control in easy reach of driver.

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- All pulling vehicles are required to have a sample valve installed for water and fuel sampling, as close to the pump as possible.
- ETPC officials or officials from affiliated organizations can check fuel at any time during any event.
- Injection pump and camshaft have to be driven the original way. Different flanges, extensions or turning around of the injection pump are allowed.

1.4.1.5 RPM Control

1.4.1.5.1 Tractor Arrangement

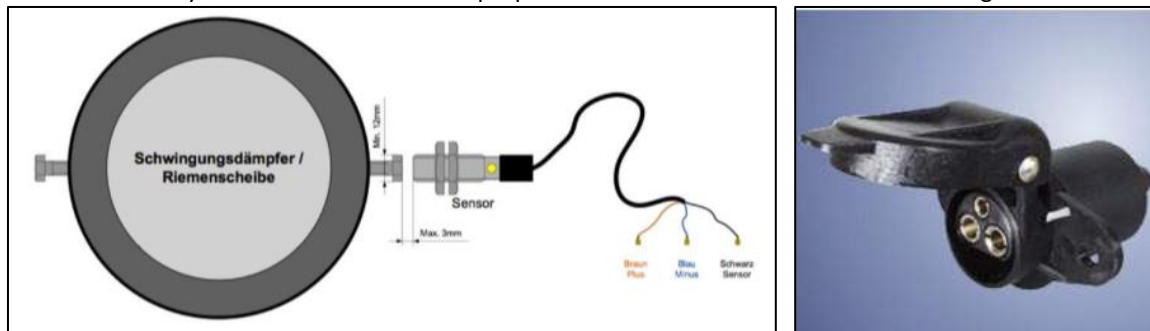
Requirement for Level 2 / Level 3

- If the on board rpm measuring devices of a national association is used, it is recommended to use two signals per revolution for good measurement. A single signal per revolution is not considered accurate enough to base decisions upon.
- All tractors must have an rpm measuring point. This consists of a reflective sticker of size 30x30mm. It must be on an easily accessible point on the front of the engine. It must be possible to measure the RPM within three minutes, otherwise the competitor will be disqualified. Measuring will take place with a non-contact tachometer.
- It is strongly recommended to measure engine RPM during the run. Every tractor must be equipped with a 3-pole socket (DIN 9680, Hella No. 8JB 001 933-011 / John Deere No. AZ 54775 / Jaeger No. 151130) near the kill switch ring.
- A magnetic sensor (e.g. Pepperl & Fuchs No. NBB4-12GM30-E2-V1) must be placed at a crank pulley and pick up the signals of two M12 bolts in the pulley (see drawing below).
- The wire connection to the socket is:

Brown = +
Blue = -
Black = **Sensor Signal**

Notice:

Some national circuits (Netherlands) only measure with one bolt (one pulse per revolution). Ask before you hook outside of your home circuit and be prepared to take one bolt out before running.



1.4.1.5.2 Speed Signal evaluation / Disqualification Rule

Proposal from ETPC according standards from NTT0:

- On weigh bridge, there is a control of signal (no need to check by full Engine Speed):
 - If no signal is available, competitor is not allowed to hook on the sledge
 - If Signal is available, competitor is allowed to hook on the sledge
- Measurement Box takes 10 samples/sec
- If 5 samples (during the whole Run) are over nominal engine speed by 50rpm, red light show up and competitor is disqualified.
- System must work with:
 - 1 & 2 Signal per Revolution
 - 2,700 & 3,200 rpm.

1.4.2 Clutch & Clutch Definition

Requirement for Level 2 / Level 3

- Only mechanical activated clutches permitted.
- Hydraulic engagement allowed.

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3. All electronic, pneumatic or hydraulic devices that affect the clutch system are prohibited.

1.5 Safety provisions

1.5.1 Engine

1.5.1.1 Engine Shielding

A. Superior Requirement Level 2 / Level 3

1. A deflection shield is required on both sides of engine. Shield must extend the complete length of engine crankcase casting and be securely fastened. It has to be made of aluminum or steel, minimum thickness 2 mm. Shields must be solid. Engine mounts, filters, steering rods, etc. cannot serve as part of shield. Solid frame rails with no holes can serve as part or all of shield, providing it covers required areas of block casting. It is recommended that quick release fasteners are used (winged Dzus type or cotter pin type hoop pins). Uses of bolts with nuts, screw locks are undesired. (Reason: ease of access in case of emergency fire, run off, etc.)
2. Shielding on all tractors with inline engines must be from sheet metal (hood) to 50 mm below bottom center of crankshaft throw, and be securely fastened. They may be louvered, but no expanded metal. Fastening of hood and side shielding must be strong enough to keep them in place in case of an explosion.
3. Starter engines, fuel filters, oil filters and fuel injection pumps may not be used as shielding. Shielding may cover or pass behind starter or fuel pump.
4. Shielding on all V or Y type engines must extend from base of head or the uppermost point of piston, travel to 50 mm below bottom of crankshaft throw, and be securely fastened.
5. Side shields must be mounted independently of the engine block. Engine mount, block saver plate and header mounting, or chassis mounting is acceptable.
6. All engine fans must be shrouded 360 degrees, with steel 2 mm or thicker, electric fans excluded.
7. All other rotating engine parts must be shielded with 2 mm steel.
 - a. Closed hood (any material, included webbing) construction will be sufficient for small belt (low mass) coverage only. (E.g. Belt drives a Generator.)
 - b. Larger rotating parts like cam-belt or chain's (heavy mass) need a shield (e.g. Belt or chain drives a fuel injection Pump).

B. Additional requirement applied to Level 3

1. All turbocharged engines must have one steel cable totally surrounding the engine block and head. This cable must be placed between first and second cylinder (from front of tractor) trough exhaust port area.
 - a) Cable must be 12 mm thick (with certificate from manufacturer: min. 110kN breaking force). If 12mm cable cannot be placed, two 8mm cables (same length) with min. 60 kN breaking force).
 - b) Cable ends must be connected together with D-lock (dee shackle).
 - c) Cable must have approximately 100 mm of slack.
 - d) Diesel engines with single type cylinder heads need a steel bar with a minimum thickness of 12 mm, this steel bar must extend from first to last cylinder head and be connected to each of them.

1.5.1.2 Engine harmonic balancer

Requirement for Level 2 / Level 3

Torsional vibration dampers & belt drive pulley on crankshaft are restricted to following specification:

1. No welding on all options listed below

Strictly not allowed:

- Torsional viscos- damper, high Risk for overload vibration amplitude (specific calculation to inertia Ring)

Following 3 option in addition with specific shielding:

- a) OEM balancer only allowed, if it is a one piece part. Composite (e.g. Rubber for decoupling) balancers allowed. Cast Iron is only allowed up to 3200rpm.

Under following shielding:

- Shrouded 360° with 10mm steel to be no more than 25mm away in any direction of rotation,

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except opening for Belt drive.

- o Securely fastened to frame or engine Crankcase
 - o prevent the balancer from being thrown out of the tractor
- b) Made from solid (no cast iron), according following specification
- o Tensile strength: > 500 N/mm²
 - o Yield strength: > 280 N/mm²

Under following shielding:

- o Mechanism (e.g. steel shield) where is able to hold the balancer in place, in case of bolt or crankshaft collapse. Mechanism must prevent in any case, that Damper comes off from Tractor (prevent the balancer from being thrown out of the tractor).
 - o Mechanism must be securely fastened to Chassis or engine Crankcase.
- c) High performance balancer with Certification from Manufacturer. Please contact your national T&S board first.

Under following shielding:

- o Mechanism (e.g. steel shield) where is able to hold the balancer in place, in case of bolt or crankshaft collapse. Mechanism must prevent in any case, that Damper comes off from Tractor (prevent the balancer from being thrown out of the tractor).
- o Mechanism must be securely fastened to Chassis or engine Crankcase.

1.5.1.3 **Engine Throttle**

Requirement for Level 2 / Level 3

1. All pulling vehicles must be equipped with a dead man's throttle. All throttles working in a forward-rearward direction shall be low-idle in the rearmost position. Must be positive, two ways, mechanical linkage.
 - No foot throttles allowed
 - No hydraulic throttle linkage allowed
2. Mechanical linkage allowed only. By definition, there are two options given:
 - Flexible Cable: it must be a push-pull cable
 - A stiff linkage: have the same function and meaning
3. Working wise/ activation
 - Pulling cable, or linkage = decreasing rpm
 - Pushing cable, or linkage = increase rpm
4. Engine Throttle need to have a visible return-to-idle spring on fuel injection pump lever.
5. No computers allowed controlling any mechanical operation of the competing vehicle. RPM- limiters are exempt of this rule. No automated or computer controlled or operated traction control devices.
6. Computer controlled electronic fuel management allowed. For definition see Common Rail injection system requirement.

1.5.1.4 **Exhaust System**

Requirement for Level 2 / Level 3

1. All exhaust pipes must discharge vertically. Height to be a minimum of 305 mm above the bend in the pipe which discharges vertically measured from the top of pipe to the bottom of bend (see illustration 2-12). All pipes must be securely attached. Vertical is defined as being within 10 degrees, in any direction of being in plumb. Rain caps may not be used.
2. No megaphone pipes are allowed. Venturi type headers are acceptable.

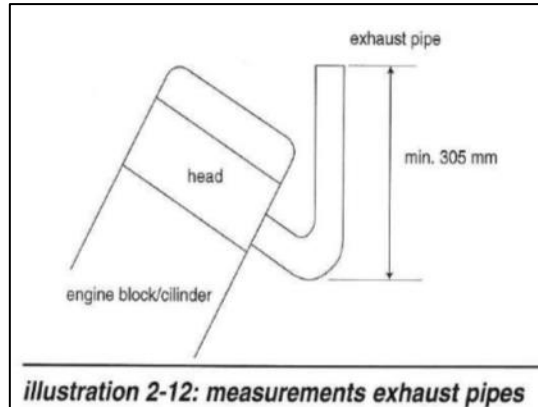


illustration 2-12: measurements exhaust pipes

3. All diesel engines vehicles competing at indoor pulls must be equipped with demountable (for clearing purpose) exhaust extension which will discharge all exhaust horizontally rearwards at a point vertically above the hitching device, at a height of 3.000 mm from the ground to center of extension pipe. Maximum diameter of extension is 200 mm. Rear end of extension must protrude rearwards a minimum of 610 mm from rear brace holding extension. All diesel smoke pipes used at indoor pulls must be 150 mm higher in the rear than in the front. The exhaust extension and the pin must meet the specifications given in the drawing.
4. All exhaust systems used during indoor pulls must be secured. Excessive leakage or exhaust systems that collapse and do not fall off are cause for disqualification, unless caused by smoke collector on the sled.
5. The pin on the end of the extension must have a hole for a safety pin

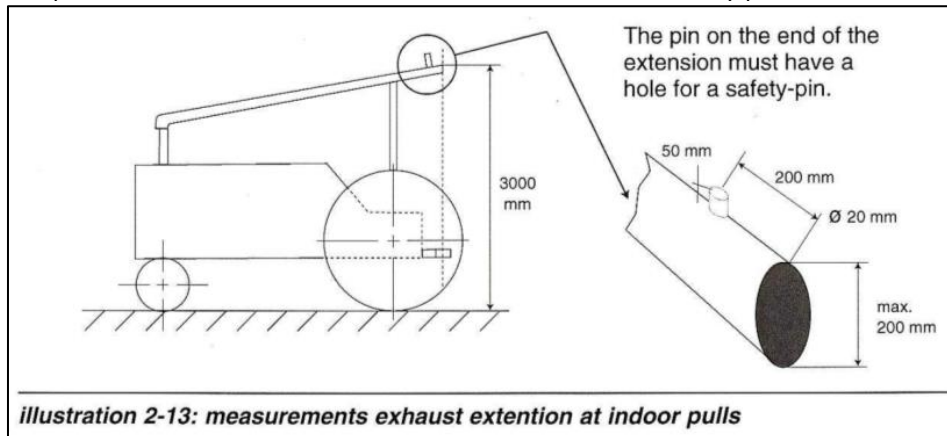


illustration 2-13: measurements exhaust extension at indoor pulls

1.5.1.5 Kill Switch

Requirement for Level 2 / Level 3

1. All kill switches must be mounted independent of drawbar and or stabilizer bars.
2. All pulling vehicles must have an automatic ignition kill switch and / or air shut-off, in working order at all times. The kill switch device must also work in a situation where the electric circuit of the vehicle is interrupted. Every kill switch must generally work according to the failsafe principle. This means no situation whatsoever may cause the kill switch to go out of function. Track Officials and/or Tech Inspectors have the option of checking the kill switches as many times as they feel adequate at any event. The switch must be checked with the engine running, or with Buzz Box only if supplied by puller.
3. The kill switch on all tractors must be located in the rear center of the vehicle (maximum of 150 mm off center in any direction) 1200 mm above the point of hook
4. The kill switch must activate the air shut-off. A cable may be used for this purpose, but the flap must have a spring-loaded closing mechanism. A system to be deemed acceptable must at least prevent building of boost. A hole with a maximum diameter of 25 mm in the flap is allowed. It is recommended that a gasket/seal arrangement is used to shut off the air flow more effectively.
5. On tractors with an electric kill switch system, the solenoids holding the flap up must have a positive (+) connection through the kill switch. The use of solenoids or electric engines that need voltage in

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order to activate the flap is not allowed. Also, systems that need air pressure to activate the kill switch are not permitted.

6. The break-away kill switches must have a 50mm diameter ring attached. The cable from the sled will be attached to this ring. The kill switch ring or cable 'ring' must be secured with a nylon tie wrap (1/8 inch). The tie wrap must be broken for a re-pull. ETPC and affiliated organizations will supply the tie wraps for uniformity.
7. If a vehicle has a kill switch or shut off in legal position and during the pull the kill switch is pulled and the nylon strap is broken and the presiding official inspects and finds the switch capable of operating properly under normal conditions, the vehicle will be allowed to re-pull immediately, or drop six positions. The decision to drop must be made before vehicle leaves the track. It is the puller's responsibility to see whether the kill switch is working.
8. The force which is necessary to pull the kill switch must not be more than 10 kilo.
9. All tractors must have a fuel shut off valve control within easy reach of the driver (a fuel shut-off valve on the diesel pump will do).
10. A tractor must be equipped with an emergency shutdown air shut-off at the air-intake, which can be utilized from the driver's seat.
11. On-board batteries must be securely fastened and properly covered to prevent any sparks. Especially, any possibility of them getting into contact with the kill switch cable from the sled must be avoided.

1.5.1.6 Charge air array

Requirement for Level 2 / Level 3

1. Titanium turbo wheels are not allowed in all classes.
2. All intercoolers located outside of normal the engine shielding must be shielded with steel 2 mm thick or thicker.
3. On all pulling vehicles the tubing on the pressure side of a turbocharger to the intake must be under the hood, shield or be bolted or strapped securely.
4. The ETPC recommends the use of a burst panel on charged engines.

1.5.1.7 Turbocharger shielding

Requirement for Level 2 / Level 3

Turbocharger with exhaust outlet up to 95 mm. diameter

1. All turbochargers must be completely shrouded (360 degrees), except for inlet- and exhaust and supply pipes with 2mm steel.
2. Any openings in the guarding around inlet/exhaust/oil supply pipes can have a max. of 25 mm clearance to the guarding. (drawing 1)
3. Front (inlet) and rear (exhaust) end of guarding must be closed with 2mm steel.
4. The guarding must ensure that no wheels or other parts of the turbocharger can come out in case of a turbocharger explosion.
5. The guarding must be mounted as close as possible to the turbocharger, at min. four (4) points with min. M8 8.8 bolts. (connection to inlet or exhaust pipe is not seen as connection point)
6. Around every bolt hole must be min. 1.5 x hole diameter of material.
7. Guarding must extend until cross in exhaust.
8. Hood construction or grille cannot be part of the shielding.
9. For tractors with a closed hood construction (min 2mm steel or min. 3mm aluminum), an open bottom to guarding with max. 90 degrees of the radial part is allowed.
10. Open bottom shielding must extend at least 50 mm. below the bottom of the turbocharger (drawing 2).
11. If turbo protection is made out of separate parts welds must be full length or 360 degrees round.
12. In case of a bolted construction there must be min. M8 8.8 bolts used, placed at maximum of 75mm centres.
13. Distance from bolt location to edge of the shielding or plate maximum 25 mm.
14. Around every bolt hole must be minimum 1.5x hole diameter of material.
15. Minimum overlap of material 32mm (drawing 3).
16. Exhaust pipe must have a steel cross as close as possible to the turbo exhaust housing outlet, but maximum 50 mm. from turbo exhaust wheel.
17. Cross to be made from min. 10 mm. diam. steel pin. (Compact Diesel: min. 8mm.diameter)
18. Pins to be installed 90 degrees to each other, as close as possible to each other.

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19. If exhaust pipe has a diameter larger than 95mm there must be a third pin of 10 mm maximum 50 mm from cross.(pin every 60 degrees)
20. If exhaust pipe has a diameter larger than 160 mm there must be a fourth pin of 10 mm diam. max. 50 mm from cross. (pin every 45 degrees)
21. Maximum diameter of exhaust pipe allowed is 200mm.
22. Pins must have 5mm. visible on the outside of the exhaust pipe and be welded to the pipe.
23. From cross to turbo exhaust wheel there must be an axial stud minimum 12mm diameter. Welded to the cross.
24. Max. Distance between axial stud and turbo exhaust wheel is 2mm.
25. Wall thickness of exhaust pipe from turbo to cross min 4 mm. (drawing
26. If it is not possible to use the 10mm pins, 25x5 mm. flat steel may be used as the cross.
27. This cross must also follow the above rules concerning the stud and the 5mm visible on the outside plus the welding's on the outside, and 3rd and 4th flat steel by bigger diameter pipe.
28. Flat steel can only be used after written approval of the National and the ETPC T&S board
29. Exhaust pipe must have 3 additional connections to the exhaust protection to prevent pipe coming loose from turbo (if clamp fails or breaks)
30. Connections made from min. 25x5 flat steel inside the turbocharger guarding.
31. 25x5 flat steel to be connected with min. M8 8.8 bolts to guarding
32. Around every bolt hole must be min. 1.5 x hole diameter material.(drawing 5)

Turbocharger with exhaust outlet above 95 mm and up to 114 mm diameter

As per rules for turbochargers with exhaust outlets up to 95 mm but with the following differences

1. Cross pins to be made from 12 mm diameter (not 10 mm)
2. Axial stud to be made from 20 mm diameter (not 12 mm)

Turbochargers with exhaust outlet above 114 mm and up to 132 mm diameter

As per rules for turbochargers with exhaust outlet up to 95 mm but with the following differences:

1. Cross pins to be made from 12 mm diameter (not 10 mm)
2. Axial stud to be made from 20 mm diameter (not 10 mm)
3. By one stage turbocharged diesel engines the following stronger shielding:
4. All turbochargers must be completely shrouded (360 degrees), except for inlet, exhaust and oil supply pipes with 3mm steel. (radial part: pipe or rolled steel section)
5. Any openings in the guarding around inlet/exhaust/oil supply pipes can have a maximum of 25 mm. clearance to the guarding.
6. The turbocharger guarding must also cover the first cross in the exhaust outlet.
7. Axial: front (inlet) and rear (exhaust) end of guarding must be closed with 6mm steel. (not 3mm)
8. Guarding may be divided axially, on these separate axial parts a 6mm plate must be full welded and then bolted together with the second part with minimum M8 8.8 bolts, with maximum distance bolt to bolt of 50 mm. Minimum 5.5 mm material around bolt hole.
9. Around the exhaust pipe there must be a fixed ring or plate of min. 6mm thick. The ring must be connected on the inside of the rear end of guarding.
10. Ring or plate must have 30 mm larger diameter than the hole in rear part of guarding, this is to prevent the exhaust and cross with axial stud is coming loose from turbocharger. (drawing 6)
11. If turbocharger guarding cannot be made according specifications above, engine or chassis. Chassis may be part of guarding, only after written approval of the Nat. and ETPC T&S board after written approval of the National and the ETPC T&S board.
12. Above turbocharger shielding must be yearly inspected and stamped. Inspection paper and photo must be filed and a copy must be with the vehicle at all times for inspection.

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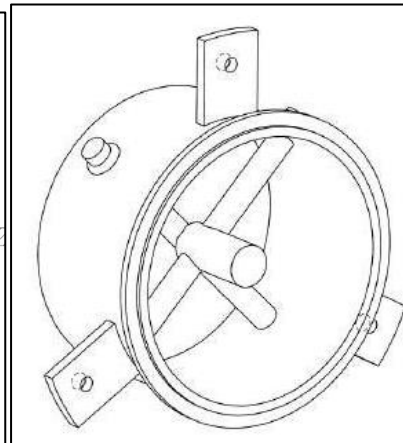
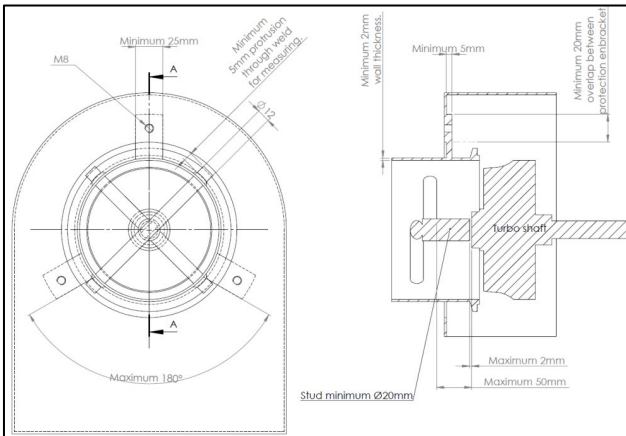
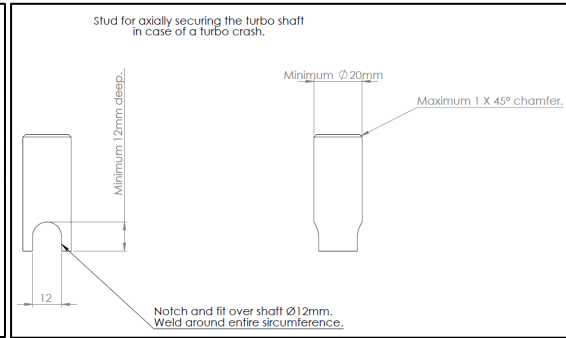
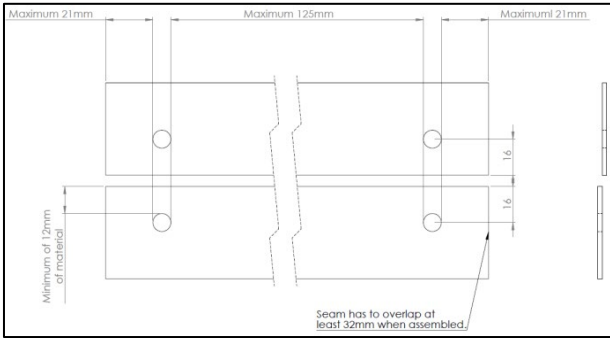
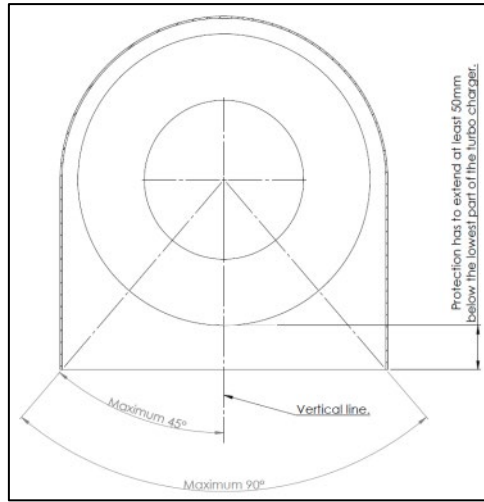
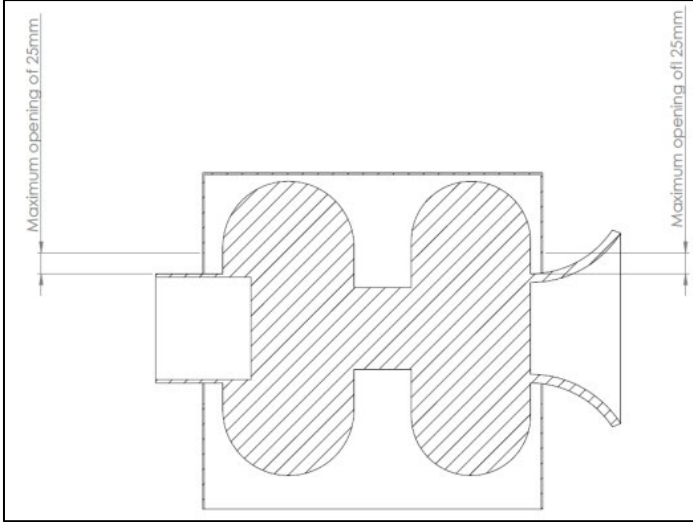
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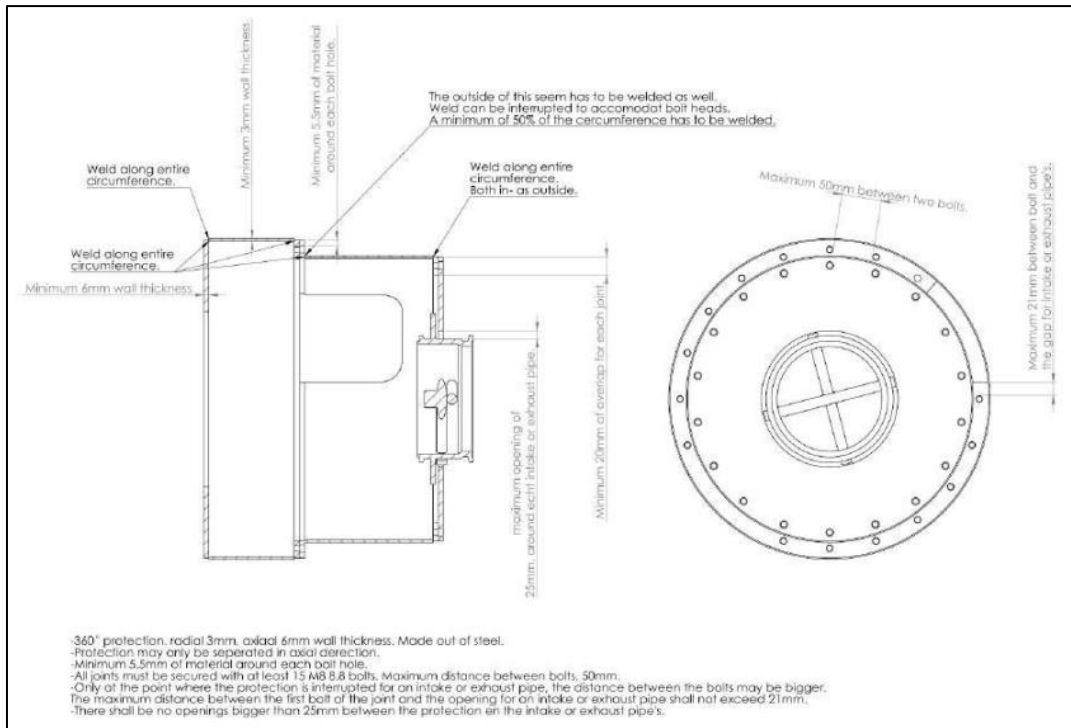
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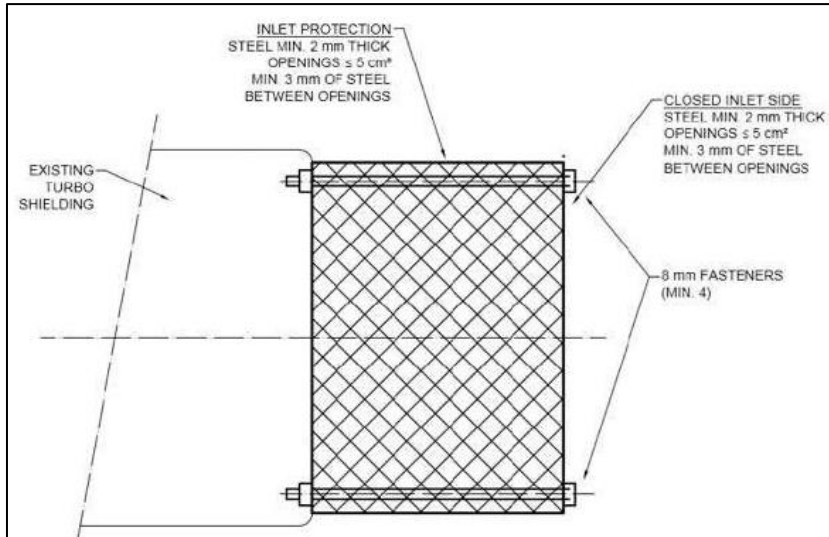
1.5.1.8 **Turbocharger inlet protection**

Requirement for Level 3

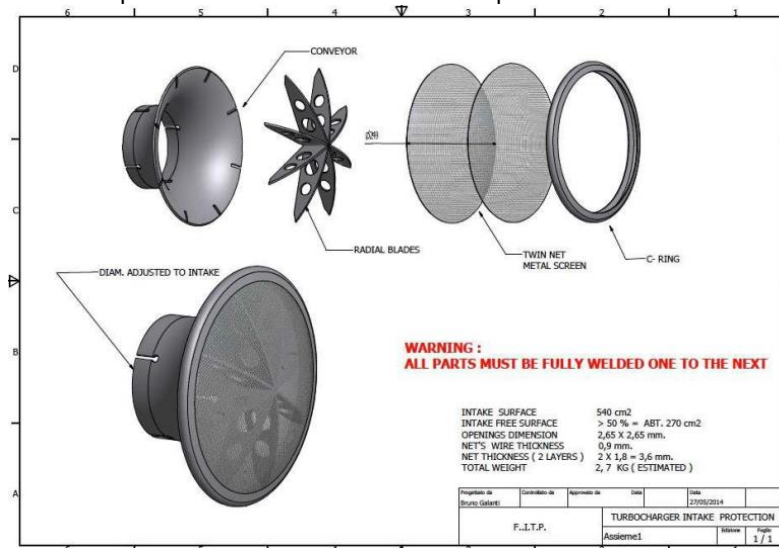
All turbocharged diesel engines without air restrictor must have an inlet protection to prevent the turbo inlet wheel or parts from coming out.

Protection must consist of:

1. Steel turbo air intake cage min.2 mm. thick, having openings no larger than 5 cm².
2. Around these openings there must be minimum 3 mm. steel.
3. The air intake cage must be mounted as an extension of the turbo protection, securely mounted to the turbo protection with min.4 8mm. fasteners.
4. In addition, further mounting points can be used on the engine or frame with min. 8mm. fasteners.
5. Intake cage to be seen as a tube closed on the inlet side and mounted to the turbo protection with the open side.
6. Tractor must have a fully closed hood to contain the smaller particles in the event of a turbo failure.(any openings or plastic grill etc. must be closed with a steel/aluminum screen having openings no larger than 10 mm.)
7. Tractors with a fully closed steel (min.2mm. thick) or aluminum (min 3mm. thick) hood are allowed to use this hood as inlet protection (any openings or plastic grill etc. must be closed with a min. 2mm. thick steel/aluminum screen having openings no larger than 10 mm.)



FITP inlet protection allowed as turbo inlet protection:



1.5.2 Flywheel / Clutch protection / Shutter blanket

Requirement for (Level 2*) / Level 3

**if required*

ETPC main Rulebook, Chapter 2.D

1. No Automatic Transmission allowed.
2. All pulling vehicles using a flywheel and/or clutch assembly are required to use an ETPC approved item, producer must be on the manufacturers list of the ETPC Safety Program (see chapter 13 A).

The ETPC will allow homemade flywheel and clutch parts under the following criteria:

All non-- ETPC Safety Program flywheel and/or clutch assemblies must fulfill the following minimum specifications:

- All parts must be made of steel plate or billet steel.
 - **POSITIVELY NO GRAY CAST IRON.**
 - Flywheel, pressure plate and pressure plate cover are allowed out of aluminum only wrought (billet) aluminum is adequate for pulling applications if mechanical properties are acceptable.
- A. Minimum mechanical properties (steel and aluminum):
 - Tensile strength 500 N/mm²
 - Yield strength 280 N/mm²
 - B. Maximum peripheral speed (rotating speed on the outer diameter of flywheel/clutch component) is 200 m/sec. Is 125 percent of maximum working speed (safety for over speed). This means that maximum rotating speeds (working speed, by 1:1 engine/clutch rpm) are:

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Components max. 250 mm (10") diam. = 12000 RPM
 Components max. 280 mm (11") diam. = 10500 RPM
 Components max. 305 mm (12") diam. = 10000 RPM
 Components max. 318 mm (12,5") diam. = 9500 RPM
 Components max. 330 mm (13") diam. = 9000 RPM
 Components max. 355 mm (14") diam. = 8500 RPM

Components max. 380 mm (15") diam. = 8000 RPM
 Components max. 405 mm (16") diam. = 7500 RPM
 Components max. 430 mm (17") diam. = 7000 RPM
 Components max. 455 mm (18") diam. = 6500 RPM
 Components max. 480 mm (19") diam. = 6000 RPM
 Components max. 505 mm (20") diam. = 5500 RPM

- C. All cap screws and bolts used in the clutch assembly and to connect flywheel to crankshaft must meet class 10.9 (grade 8) or higher. No welding's and/or chemical milling allowed on any home made parts.
- D. Drawings with measurements of all home made major components (flywheel, friction discs, floater plates, pressure plates and pressure plate cover) must always be with the pulling vehicle and be shown upon tech. inspectors request.
 A copy of all drawings and the manufacturer report must be sending to and stored by the national Tech and Safety board.

Manufacturer report shall include:

- Name of all components used, with specification of used material and the mechanical properties (max. yield strength, tensile strength etc.)
- Material specification(s) with 3.1 .b certificate, signed by producer.
- All components must have on paper (and stamped in by producer): identification number, producer name and date of produce.
- Name of pulling vehicle and type of engine(s).
- Max. Rotating speed of flywheel/clutch assembly allowed by producer.
- Manufacturer's name (and contact name) ; address; Telephone and fax numbers; Email address; Name and signature of responsible supervisor; Signing date and place; any other appropriate information.

If point A,B, C and D above are fulfilled and according the rules national T&S board in cooperation with ETPC T&S board may give permission to use named flywheel/clutch components.

After written permission, components can be used in ETPC pulling events.

- 5. All listed Farmstock tractors are required to have an ETPC approved shatter blanket 430 mm wide and long enough to wrap around the bell-housing with at least 150 mm overlap; Secured with six 50 mm wide nylon web straps with a steel D-ring on one end and sewn the length of the blanket (except for overlap area) and long enough to pass through D-ring and be tied in a saddle clinch, and with four 50 mm nylon web retaining straps each at the front and back of the blanket or an ETPC approved bell housing bolted to a steel engine plate, mm. 5 mm thick, inside the original clutch housing.
- 6. Component build Farmstocks (and Prostocks) can also use an ETPC approved bell-housing bolted to a steel engine plate, 5 mm thick, instead of a blanket, in this application the use of a complete frame underneath the tractor is mandatory.

Note: For ETPC approved items see Chapter 13 ETPC rulebook or appendix 6.

- 7. Straps to be separately fastened forward and to the rear of clutch/flywheel assembly all straps must be securely fastened and the blanket must be secured against the rear face of the block.
- 8. Fixes and/or changes, in whatever form, to shatter blankets may only be done by the manufacturer of the blanket.
- 9. The flywheel, clutch and pressure plate(s) on all vehicles in all classes must be yearly inspected and approved by a board member of the affiliated organizations of the ETPC before first pull in current season. Approved components will be marked with a stamp and are subject to inspection at all times. Clutch inspection forms and photos including certificates of passed X-ray/ultrasonic/Magnaflux test of welding's in homemade bellhousings, certificates of conformity and age of shatter blankets, age documents of fire suits, cross section drawings of turbines, certificates of cables around engine block (for 6+8 mm cables) and current season's tech inspection forms have to stay with the pulling vehicle and be shown upon Tech Inspector's request.
- 10. All modified tractors, two wheel drive trucks and trucks are required to have a complete closed flywheel/clutch protection made of steel with the following minimum specifications A, B or C:
 - A 0 An ETPC approved factory-made bellhousing:
Note: For ETPC approved items see Chapter 13 ETPC rulebook or appendix 6.
 - A 1 The inspection/maintenance hole in the protection shall not extend further forwards at its top edge than flush with the cross shaft hole. The length of the inspection hole shall be no more than 215 mm and it must not be more than 100 mm wide (measured in a straight line), and the

hole shall be smoothly and fully radiused to produce an oval shape (see illustration 2-7).

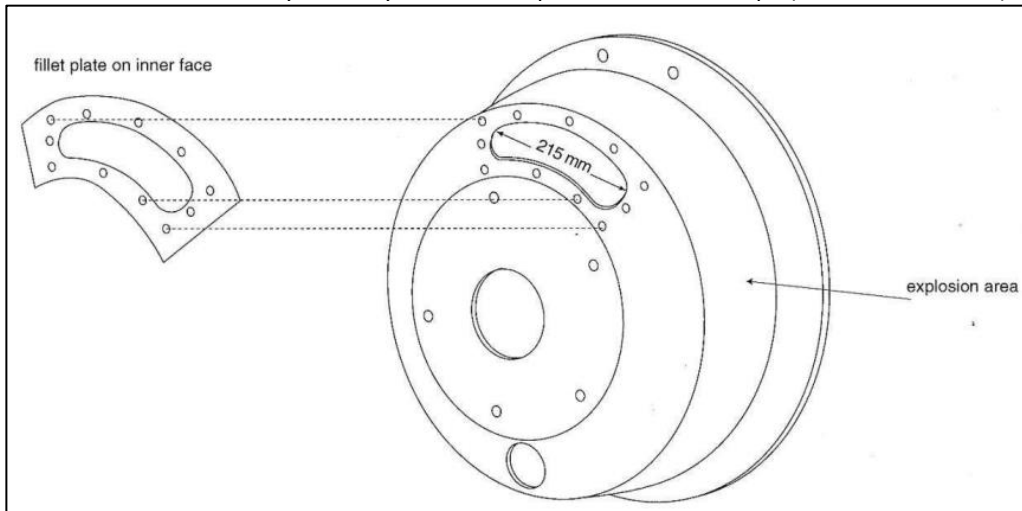


Illustration 2-7: bellhousing with inspection/maintenance hole

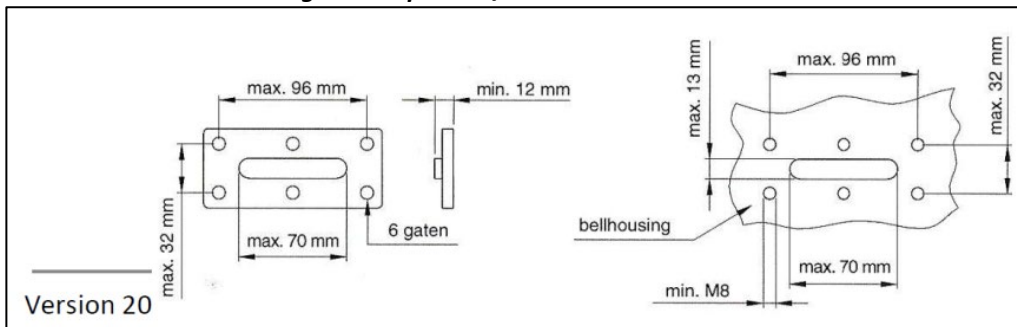
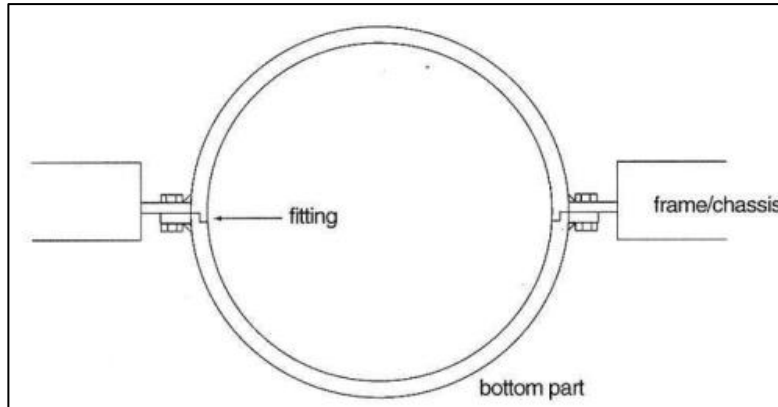


Illustration 2-8: measurements bellhousing / adjustment slot and cover

- A 2 There shall be twelve (12) M8 grade 8.8 or better cap screws securing the cover the bellhousing. The cover must have a plate or fillet that flush inside of the housing. The cover and fillet must be steel. The fillet must be flush to the inside.
- A 3 The bellhousing must be flush on the inside surface.
- A 4 Titanium bellhousings permitted by the NTPA are acceptable.
- A 5 ETPC approved bellhousings with stand adjustment slot are acceptable (see illustration 2-8).
- A 6 Fixes and/or changes, in whatever form, to bellhousings may only be done by approval of manufacturer. No welding's on factory-made bellhousings.
- B 0 A homemade one piece protection // Inner liner (minimum of 10 mm thick steel) is allowed on the following conditions:
- B 1 It must be tested using X-ray, Magnaflux or ultrasonic method. Test certificates of the welding's must be available to prove their appropriate quality, otherwise an ETPC approved shatter blanket with a minimum width of 380 mm is required around this protection. Magnaflux, ultrasonic or X-ray testing may be carried out by any company who can give a written certificate that the welding's are appropriate.
- B 2 Protection must be flush on the inside surface.

**Illustration 2-9: Two piece protection**

- B 3 No inspection/maintenance hole or stand adjustment slot or any other opening allowed.
 - B 4 Tube covering explosion (or rotating) area of clutch/flywheel combination must be seamless and flush on the inside
 - B 5 The ETPC recommends no grinding of the welding's.

 - C 1 No inspection holes. Material and thickness like alternative B.
 - C 2 The top part of the protection must be securely fastened to the frame.
 - C 3 The bottom part of the protection must be securely fastened to the top part with M12 grade 8.8 bolts with a maximum spacing of 5 cm.
 - C 4 The connection must flush on the inside surface.
 - C 5 Any other alterations must be approved by the ETPC board or affiliated organization board.
11. All bellhousings less than 10 mm thick (explosion area) must use a 4130 chrome molybdenum liner minimum 2,3 mm thick. Inner diameter of clutch protection not more than 50mm larger than flywheel/clutch combination.
 12. Liner is secured to the bellhousing by drilling and tapping a single 6 mm hole through bottom of clutch can Liner must cover rotating area of clutch/flywheel combination and must be flush on the inside surface Stand adjustment slot in the liner is acceptable when it is smaller than it is in the bellhousing.
 13. The ETPC recommends no openings in bellhousings.
 14. All automotive type engines with bellhousing and clutch will run a full block plate either a commercially available unit or minimum 5 mm steel or minimum 6 5 mm aluminum with five (5) M10 grade 8 8 bolts and nuts evenly spaced on the bottom part of the bellhousing and four (4) additional M10 grade 8.8 bolts and nuts between existing bolts on top half of bellhousing to fasten the bell- housing to block saver plate
 15. No chemical milling allowed except when factory-made.

1.5.2.1 Shutter blanket mounting on Farmstock tractor**Requirement for (Level 2*) / Level 3****if required*

1. Shatter blankets must be on the inside of the tie bars or one piece frame and the tie bars must be fastened forward of the rear of the engine block.
2. However, in some occasions there is no space for the blanket inside the tie bar or the one piece frame, in that case a written approval from ETPC or affiliated organization must be available to Tech Inspectors.

1.5.3 Fuel container & Lines & array**A. Superior requirement Level 2 / Level 3**

1. All tractors must have a fuel shut off valve control within easy reach of the driver (a fuel shut-off valve on the diesel pump will do). For detail see chapter "Kill Switch"

B. Additional requirement for Level 3

1. No fuel tanks, fuel pressure gauges, fuel pumps and/or fuel lines allowed in the driver's compartment. If the fuel tank is located behind the driver, a fire barrier is highly recommended from front to rear of compartment beneath the driver's seat between fuel line and driver.

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Minimum width of the fire barrier equal to width of driver's seat.

1.5.4 Onboard Fire control system

Requirement for Level 3

1. Farm tractors that require tools for removal of side shields must be equipped with an onboard fire control system. Onboard system nozzles must be in engine compartment.
2. Farm tractors utilizing onboard fire extinguishing system must place one nozzle on each side of engine, inside the engine compartment. Not to be attached to the sheet metal.

1.5.5 Starting Chemicals

Requirement for Level 2 / Level 3

No onboard ether systems allowed.

1.5.6 Tractor safety provisions

Superior Requirement Level 2 / Level 3

1. A reverse safety light system is required on all pulling vehicles. A white light, minimum 50 mm in diameter, must be mounted directly above or below the safety kill switch at the rear of the vehicle. A white light, minimum 50 mm in diameter, in the driver's compartment must be operated by the same system. Both lights are to be activated by the gearshift lever in such way that it will be lit only when the vehicle is in reverse.
2. All pulling vehicles must have a neutral gear. They must be equipped with a starter interrupter switch on the gearshift, which will allow starter engagement only in neutral gearshift position.
3. The ETPC recommends the use of Tech Inspection stickers on all tractors; the best location is on the left front position of the tractor.
4. Drivers must be seated on the vehicle when his/her tractor is being started and running and must have complete control of the vehicle at all times. Anytime an engine is being started or running, steering wheel must be installed and securely attached to steering shaft.

1.5.7 Authority

Requirement for Level 2 / Level 3

1. If Track Officials and/or Tech Inspectors feel a vehicle is unsafe, they have the right not to allow the vehicle to pull.
2. Officials can ban any vehicle at any event from competition if they believe the vehicle has a potential safety problem.

2 Chapter - Level 2 // Sport Classes

Level 2 Sport classes are RPM limited classes where modifications to increase the horsepower are allowed. The air restrictor is considered the “equalizing” factor.

2.1 Weight Classes

1. Weight classes are

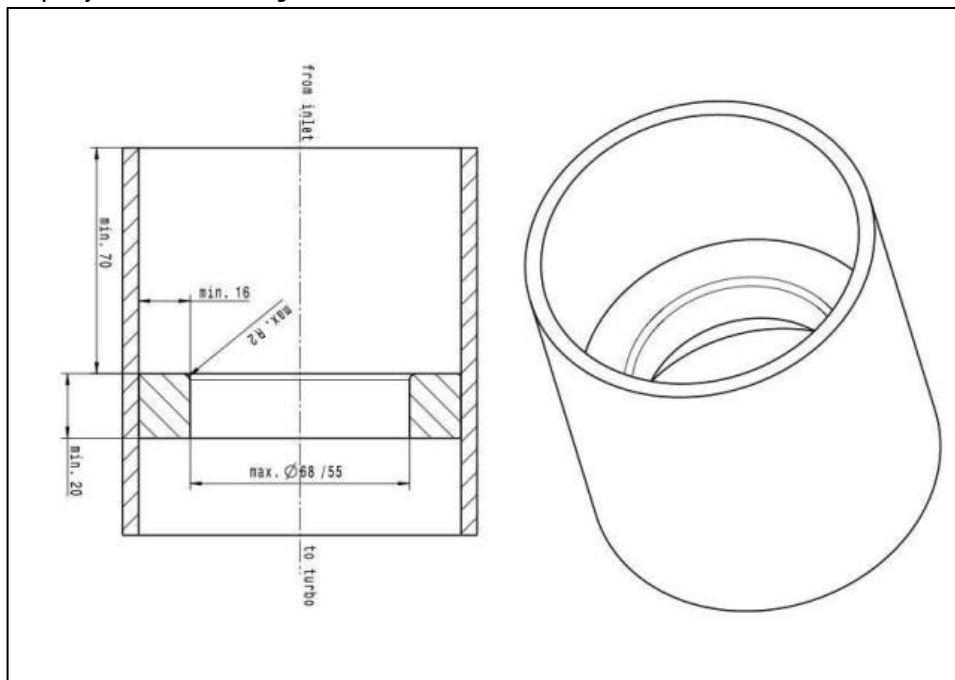
<ol style="list-style-type: none"> a) 2500 kg b) 3500 kg c) 4500 kg 	<ol style="list-style-type: none"> d) 5500 kg e) 6500 kg
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2.2 Engine

2.2.1 Engine Limit

1. Engine revolutions are limited to 2700 rpm.
2. It is possible to run with up to 3200 rpm, if the tractor has a frame, certified clutch & clutch protection and cable around the engine according to the Level 3 rules.
3. Overhead camshafts are only allowed if the engine came with it from the factory.
4. The tractors with 2500kg must have a turbo inlet of max 55mm, or an air restrictor tube with a max inner diameter of 55mm or max 57mm outer diameter, with 20mm measurable distance, mounted in front of the turbo and all air going to the turbo must flow through the tube.
5. The tractors with 3500kg and more must have a turbo inlet of max 68mm, or an air restrictor tube with a max inner diameter of 68mm or max 70mm outer diameter, with 20mm measurable distance, mounted in front of the turbo and all air going to the turbo must flow through the tube.
6. In the 3500kg Level 2 Sport class, within 70mm in front of the 68mm zone it's not allowed to have any tubes, ventures or funnels smaller than 100mm diameter. The area before the 68mm may be open (e.g. a flat plate, 20mm thick). The area behind the 20mm long tube (to turbo) is free of choice. Refer to the following drawing. The Air Shut off may be placed directly in front of the restrictor, but must not have any venturi or funnel style design.

Sample of Air Restrictor 3500kg Level2:



2.2.2 Performance Limit

1. The fitting of an intercooler is allowed in all classes except the 2500kg class.
2. When using an intercooler (in >3500kg), they have to have an air restrictor.
3. Water Injection is **not** allowed.

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2.3 Clutch, Flywheel & and protection

1. If tractor runs with Intercooler, clutch need to be out of the ETPC-safety Program (according Level 3)
2. If Tractor run above 2700rpm, Clutch assembly must be according ETPC-safety Program (see also Chapter 2.2.1-2)
3. Clutch protection only required, if engine run above 2700rpm (for possibilities see superior Rule).
4. Positively no Cast Iron Flywheel in all Level 2 classes. Material Specification see ETPC-Safety Program

2.4 Chassis / OEM Body housing

See superior Rules

2.4.1 *Frame Definition*

1. Frame required, if Engine performance is exceeded as above described
2. Frame required, if OEM body housing does not form a ridged construct, as described above.

2.5 Safety provisions

2.5.1 *Drivers safety equipment*

1. The driver must wear good work clothes (tight cotton) on the whole body covering complete arms and legs and closed shoes (no sandals).
2. Government approved full-face helmets are recommended. Helmets must be worn with chin strap fastened when pulling.
3. Safety belt (minimum lap belt) is mandatory and must be fastened before the start.
4. If an ETPC - ROP is fitted, fireproof clothing, helmet, minimum four point harness, firewall between the engine compartment and driver, and ETPC chassis support (help frame) are obligatory. The specific information can be found in the rules of Level 3

2.5.2 *Tractor safety provision*

1. The tractor must be fitted with an approved roll over protection: A factory ROP, a safety cab, an ETPC ROP or ETPC – roll bare.
2. The ETPC roll bar must be made from a minimum of 80mm x 80mm x 8mm box section made from standard S355 J (ST 52-3) material. It must be welded onto two fixing plates of minimum thickness 30mm. Both plates must be fastened to the tractor with 4 x M20 grade 8.8 bolts on the left and right trumpet housings. For lighter solutions see following list:

Weight of Tractor	Dimensions	Fixing Plates	Bolts
Up to 2500kg	60 x 60 x 4 mm	15 mm	M16 (8.8)
Up to 3500kg	70 x 70 x 4 mm	15 mm	M16 (8.8)
Up to 4500kg	80 x 80 x 4.5 mm	20 mm	M16 (8.8)
Up to 6000kg	80 x 80 x 6.3 mm	30 mm	M20 (8.8)
Over 6000kg	80 x 80 x 8 mm	30 mm	M20 (8.8)

3. The both diagonal parts must be minimum 700mm long and the joint with the vertical bar must be above the rear tires.
4. The top of the bar must be no higher than 1.71m above the ground (fixing plates).
5. Self-build roll bars not build to this design must be calculated and the calculation must be signed by an engineer / technician, and be given to the technical commissar before the first start of the vehicle. The technical commissar then decides on the reliability of the self-built roll bar.

[See examples and pictures in appendix 1](#)

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3 Chapter - Level 3 // Super Sport

Sport and Supersport/ Farm Stock classes are RPM & displacement limited classes, where modifications are allowed to increase the horsepower.

3.1 Weight Classes

1. Weight classes are
 - a) 3600 kg
 - b) 4500 kg

3.2 Engine

3.2.1 Engine Limit

Following Classes are defined:

	Tractor Weight	Maximum Displacement	Max N° Cylinder	Max Engine Speed	Max N° of Valves/cyl	Downsizing From Engine	Note:
1.	3600kg	6063cm ³ (370cui)	6	3200rpm	2 or 4	Any amount	
2.		7000cm ³ (427.2cui)		2700rpm	2		
3.	4500kg	8364cm ³ (510cui)	8	3200rpm	2 or 4	Any amount	
4.		9000cm ³ (550cui)		2700rpm	2		

3.2.2 Engine Performance Limit

1. Intercooler allowed
2. Tractors equipped with an intercooler are permitted to use a **water injection** to cool the inlet wheel with a single nozzle in front of the turbocharger compressor wheel only.
3. No overhead camshafts allowed unless OEM cylinder head is fabricated with camshaft at the top.

3.3 Clutches, flywheels, and protection

1. Clutches, flywheels and protection must meet the ETPC specifications for Pro Stocks. See superior Rule

3.4 Chassis / OEM Body housing / Component Chassis

1. The clutch housing, transmission case, rear end housing and axle housing must be OEM. Machining OEM components is allowed. Welding of cast iron is not allowed. Non component Farmstock Tractor allowed to use a steel clutch Protection on /housing under the following criteria. Replacement steel clutch protection/ housing must:
 - a. Be constructed according ETPC rules in chapter 2.10 point B1-5 (in main rulebook)
 - b. Have external shape as the OEM housing.
 - c. Have the same length as the OEM housing
 - d. Use OEM flange and connecting bolts
2. The ETPC will allow **component tractors** in the Level3, Supersport Farm Stock class under the following criteria (equivalent to Pro Stock):
 - a) Must install a one-piece frame extending from front of tractor to rear axle housing with an ETPC approved bellhousing (Main Rulebook: chapter 2 point D) to replace the original clutch housing. Must also install non cast-iron transmission and rear- end to replace the original equipment transmission and rear end/final drive housing. No cast iron type transmission or rear-end/final-drive housing components allowed.
 - b) Drawbar and roll-cage must be part of the frame structure.
 - c) Engine block of given brand to remain consistent with that brand sheet metal.
 - d) Engine location of component pro stock tractors: centerline of the crank shaft may be below the centerline of rear wheels but must be parallel to the ground +l 2 degrees. From centerline of rear wheels to center height of front of crankshaft max drop of 75 mm. Frame must be parallel to the ground+/- 2 degrees. This equals approximately 100 mm of fall from centerline of rear wheels to the 2900 mm wheelbase point. This to be measured with tires, hitch and weight in ready-to-pull position.

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- e) All engines in component Farmstock class tractors to be mounted no farther forward than 1524 mm (60 inch) measured from the centerline of the rear axle to rear of the engine block.
- f) Crankshaft centerline to be between top and bottom main rail of frame. Bottom of main rail maybe no more than 150 mm. below centerline of crankshaft from rear of engine to front axle.
- g) All tube ladder-type frames must be covered on the outside with steel or aluminum 2 mm thick and run in the same plane as the crankshaft.
- h) Appearance to remain stock of given brand and model.
- i) Driveline shielding same as in Modified tractor rules.
- j) All component tractors can run a maximum of 2900 mm wheel base, with a maximum overall length of 4000 mm from center of rear wheel to forward- most point.

The constructions of all component tractors must be pre-approved by national tech inspectors. All dimensions must be measured and, together with pictures, be on a file and signed before the vehicle is allowed to compete. This file has to stay with the tractor and it must be shown upon Tech Inspector's request.

3.5 Safety provisions

3.5.1 Drivers safety equipment

1. All pulling vehicles must be equipped with a fire extinguisher or fire stick fully charged, in working condition and in easy reach of driver.
Fire extinguisher/ Fire stick must meet following requirements:
 - must be according DIN/EN 3norm
 - must have a CE confirmation
 - Must show expiry date
 - Minimal firefighting time 8 seconds
 - Must be manufacturer approved for use outside under windy conditions
 - Powder extinguisher must be checked yearly (with Certificate)
 - All other fire extinguisher must have a pressure gauge to check charged condition and have an age limit of max 5 years.
2. Government approved full-face helmets are mandatory. All drivers in all classes must wear helmets with chin strap fastened when pulling.
3. The use of a fire suit (including gloves, socks, head socks, leather shoes) is mandatory for all drivers in all classes. Fire suits must meet the following requirements:
 - A minimum of one layer fire suit of Nomex 3 or equivalent.
 - Nomex or equivalent fabric underwear is highly recommended with the use of any fire suit.
 - The maximum age of a Nomex fire suit is six (6) years, of other suits two (2) years, in cases of doubt it is the competitor's duty to prove the age of the suit
 - Suits must have the possibility to tie collar, sleeves and legs. If leather boots are used fire socks are not mandatory.
4. Helpers must wear clothing with long sleeves on the track.

3.5.2 Tractor safety provision

3.5.2.1 Roll Over Protection

1. A roll over protection- safety cage is mandatory in all classes.
➤ [See Appendix for all specification](#)
2. In all classes with ROP the use of a 4-point seatbelt assembly is mandatory. The seatbelt assembly must be attached to the roll cage.

3.5.2.2 Firewall

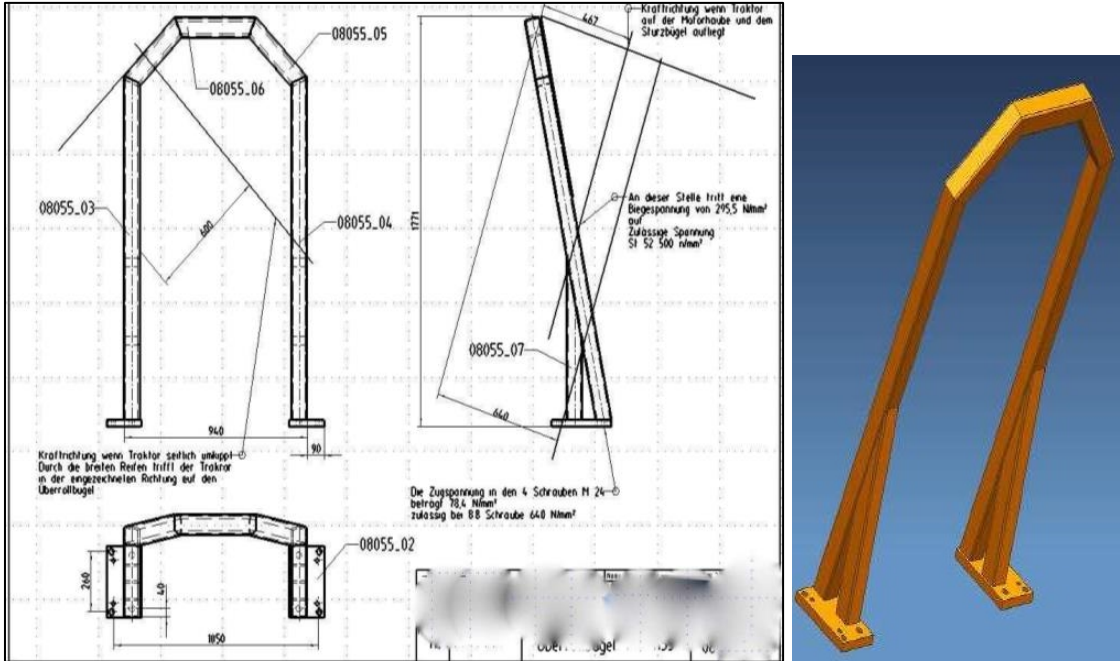
1. Steel deflection shield between driver and engine from hood to top of torque tubes or transmission or clutch housing from side shield to side shield, minimum 2 mm thick. This also serves as a flash fire shield.

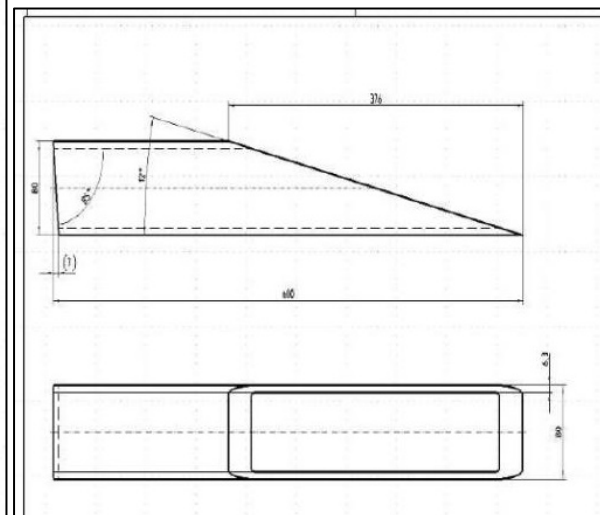
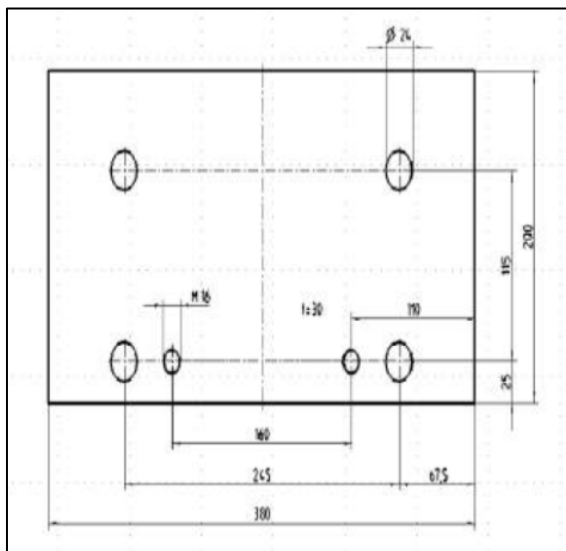
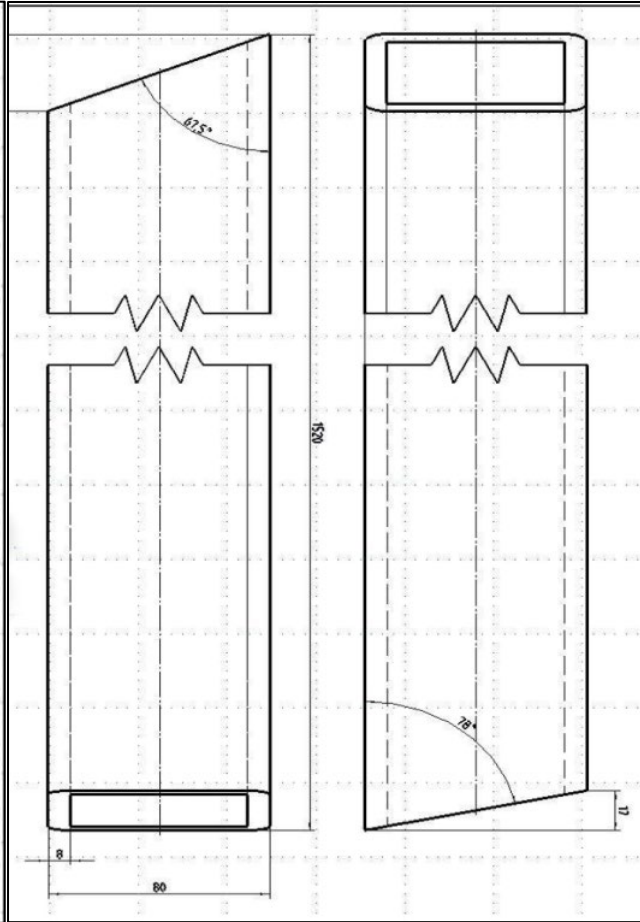
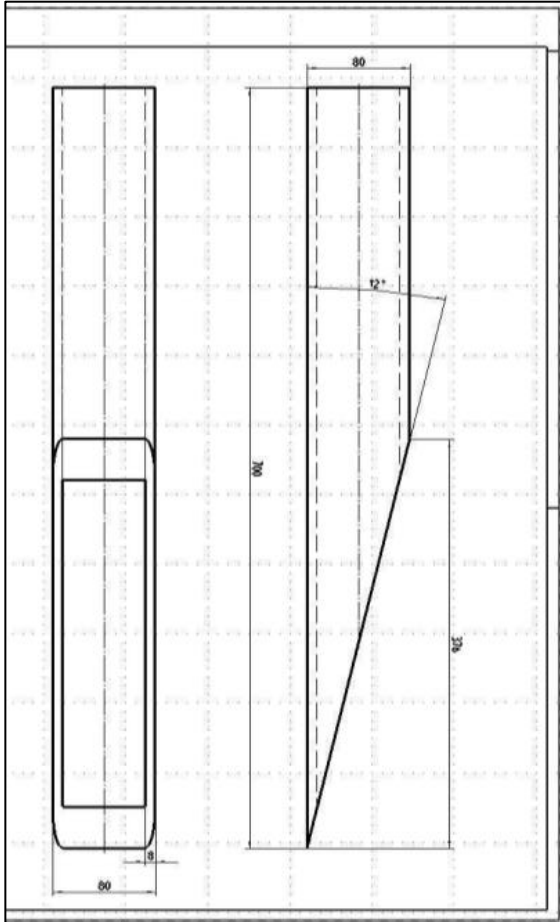
4 Appendix

4.1 Appendix 1: Roll bars

Two options of Roll bar are given from ETPC-FSC: fixed and foldable. Check out the illustration:

4.1.1 Fixed Roll bar Option





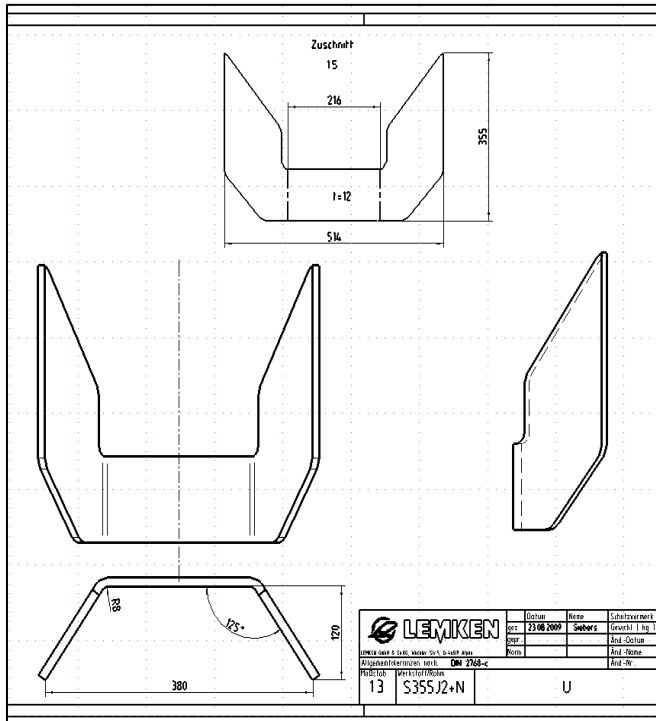
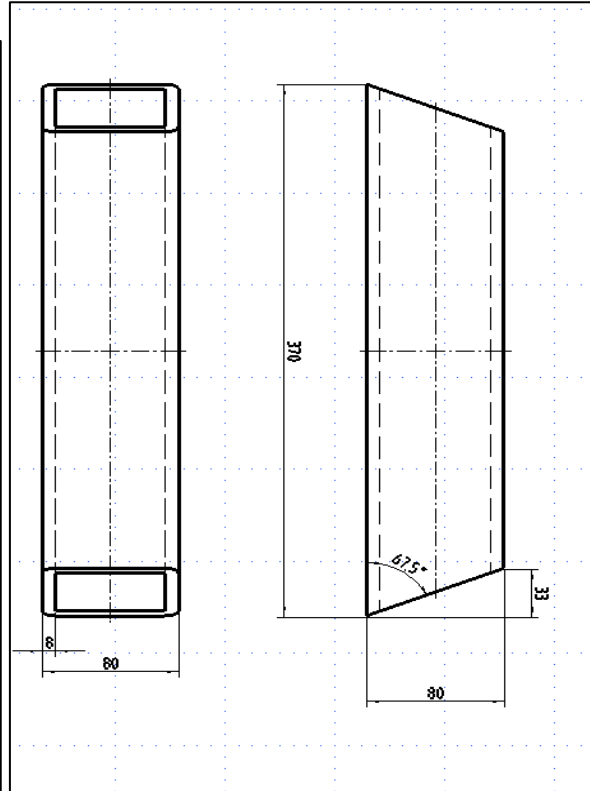
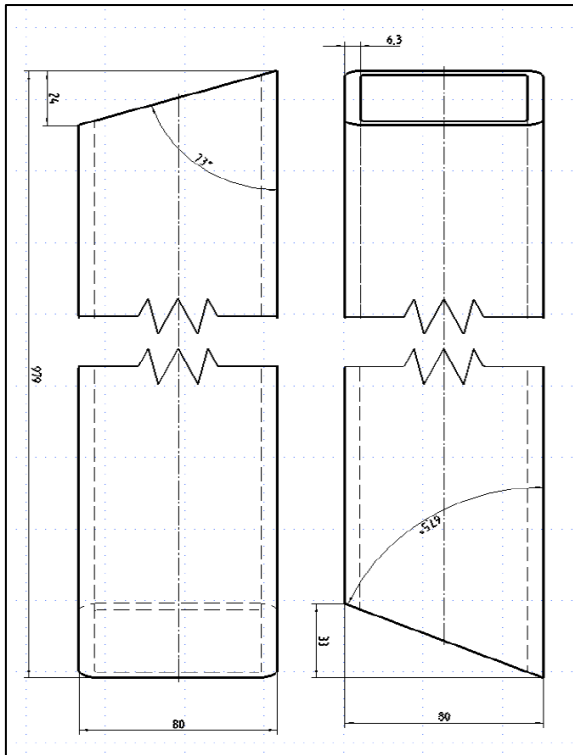
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ETPC- Farmstock Rulebook

Period of validity:

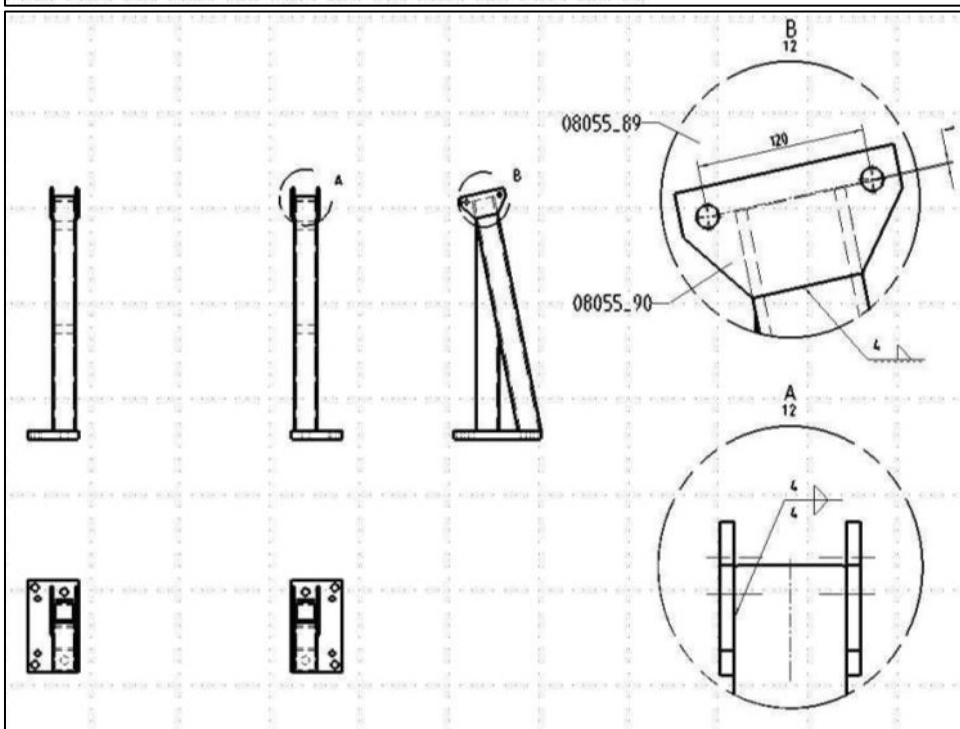
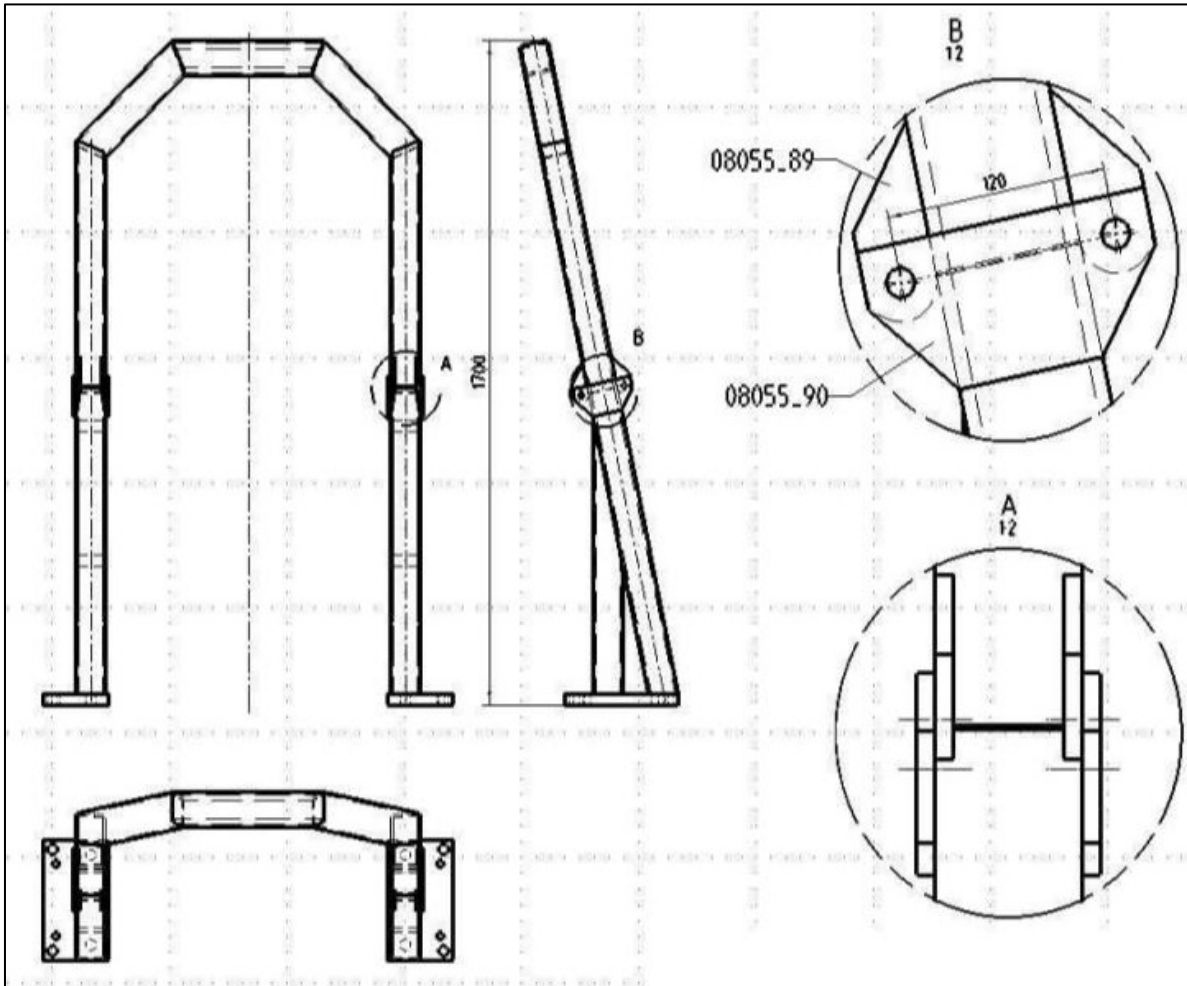
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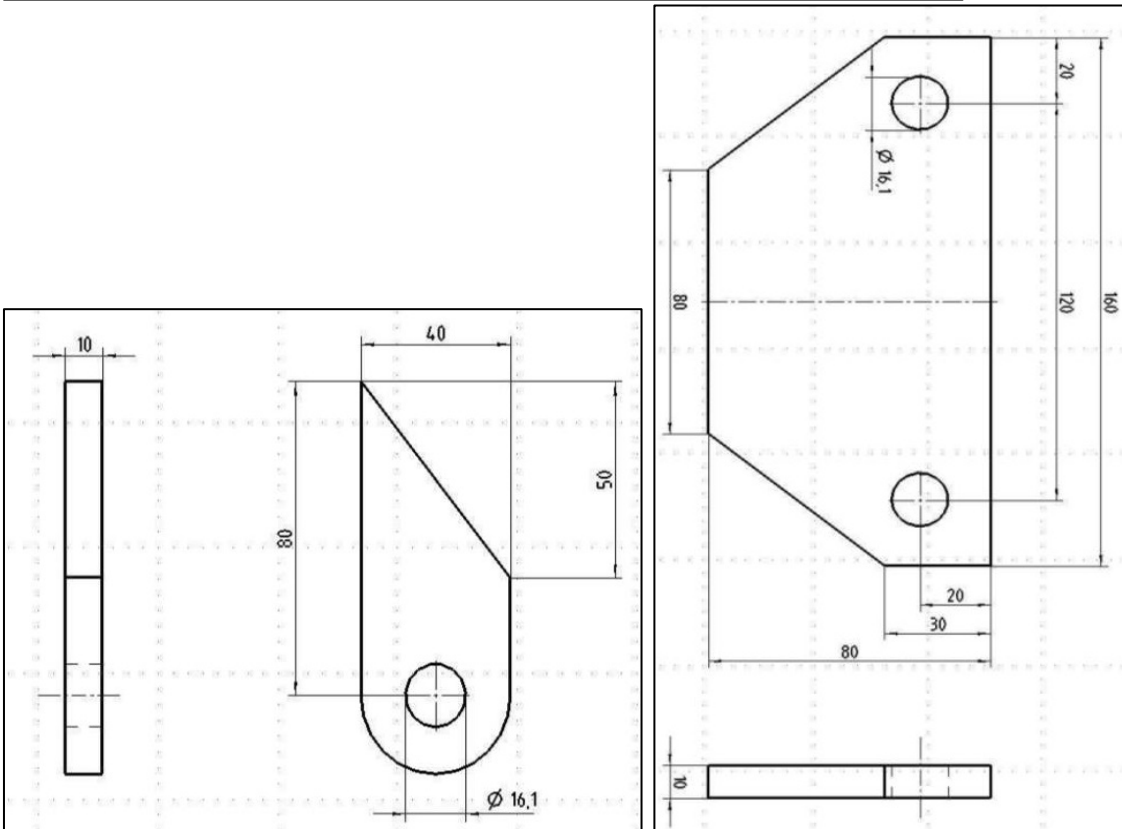
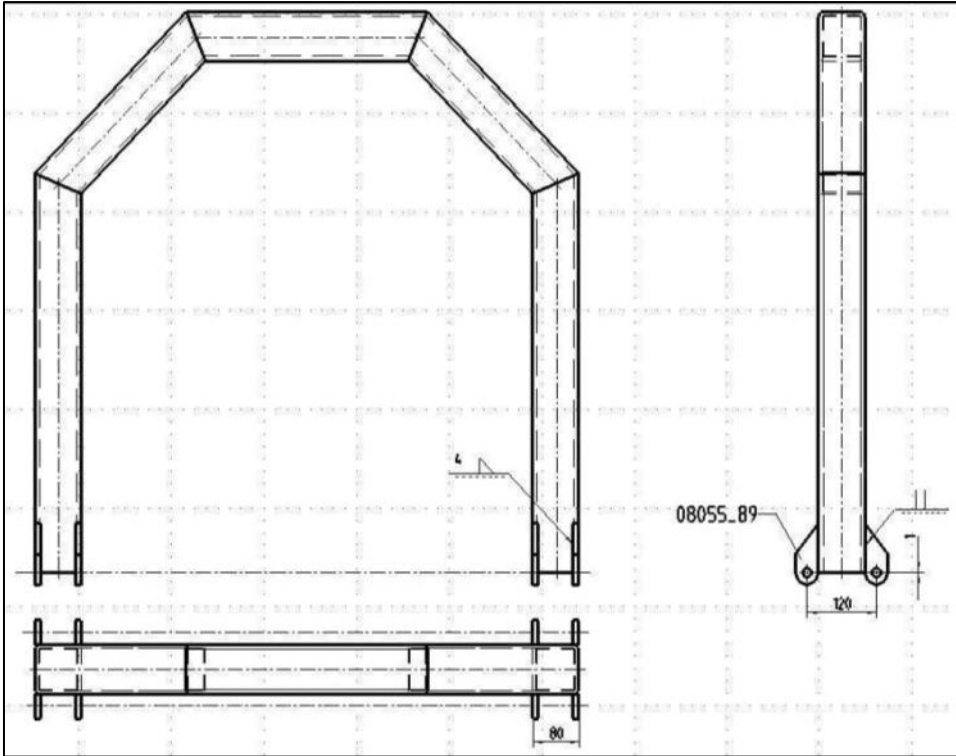


LEMKEN		Datum	Reviz	Schnittzeichnung
002	23.08.2009	Seiberg		Gewähl. 1/1
003				Änd. Datum
004				Änd. Name
005				Änd. Nr.

Produkt: 13 S355J2+N U

4.1.2 Foldable roll bar





4.2 Appendix 5, Roll over protection

Equal to ETPC main Rulebook (Chapter 14)

1. The Driver Roll Over Protection (ROP) has been designed in co-operation with specialists in order to protect the driver in the event of his vehicle tipping over during a tractor pulling competition.
2. The design, or the ROP built according to the given specifications, are not to be understood as an automatic guarantee, as for providing an always adequate protection for the driver during an accident with the tractor.
3. The ROP specifications must be seen as a set of minimum requirements and advisory guidelines.
4. Neither the ETPC Board, the T&S Board nor any of their members can be made responsible for consequences resulting from the application of the ROP specifications or malfunction of the safety devices in question.

A. General Considerations

1. The construction must allow an easy exit for the driver in the event of a fire etc.
2. Tractors weighing more than 4000 kg are recommended to have a tube wall thickness 0.5 mm higher, or more, than specified.
3. If team drivers or tractor constructors think that the ROP constructions specified below are not solid enough, they are free to make them stronger.
4. All NTPA certified ROP cages are permitted by the ETPC.
5. No ballast can be hung from or attached to any portion of the ROP structure. Chassis attachment is exempt of this rule.

B. Construction

1. Bending radius of all tubing should be as wide as possible, the minimum is two (2) times the outside diameter of the tube being bent.
2. All fastening bolts must be grade 8.8 or better, this must be clearly marked on the head of the bolt.
3. All welded joints must be welded by an experienced professional; a steel filler metal must be employed that is compatible with the base metal.
4. All welding must be done according to generally accepted welding practices.
5. No grinding on any welding.
6. All structural material for the ROP shall be seamless mild steel (carbon mechanical) tube or normalised chrome molybdenum (DIN Norm 25 CrMo 4) seamless steel tube.
7. Tubing diameters and wall thicknesses are nominal measurements.
8. The dimensional locations of the main structural hoops and secondary tubing shown in the figures are to be used as guidelines but must remain within 20% of the dimensions specified in the figures. The maximum backward inclination of the cage is 20 degrees.
- 9. Tubing size and material shown in the figures and tables are minimum requirements!**
10. There shall be a minimum of 50 mm between the main hoops and the driver's helmet, both vertically and laterally, with the driver seated in normal position.
11. In order to avoid possible neck injury, the horizontal distance between the main hoops and the driver's helmet must not be over 200 mm.
12. It is recommended that the fastening construction of the ROP cage to the tractor frame is significantly stiffer than the ROP itself.
13. It is also recommended that the driver's seat should be so constructed that it provides adequate back and shoulder support during an accident. The seat should be mounted to the ROP cage, or the lower support structure with at least four (4) M8 grade 8.8 bolts. The seat back should be bolted to the rear main hoops, and the seat should include a head rest.
14. The use of a 4-point seat belt or better is mandatory. The seat belt must be attached to the roll cage.

C. Remarks

The T&S Board will allow options 'B' or 'C' to be applied where 'A' is not technically possible (see drawings).

1. If 'A' is used, then both hoops from rear to front must be of one-piece tube.
2. If 'B' or 'C' is used, an additional tube 'S' must be added to the ROP, and the front hoops must be out

of ONE piece.

- 3. If 'C' is used, then the both side-to-side hoops must be out of one-piece tube. In general, you should have as few welds as possible and do them according to the drawings. Basically, no welding allowed on the main hoops, if you must weld a main hoop, please ask the T&S Board. It is highly recommended to move the front hoop aft to allow quick exit in the event of fire or other mishap.

See next pages for drawings/illustrations.

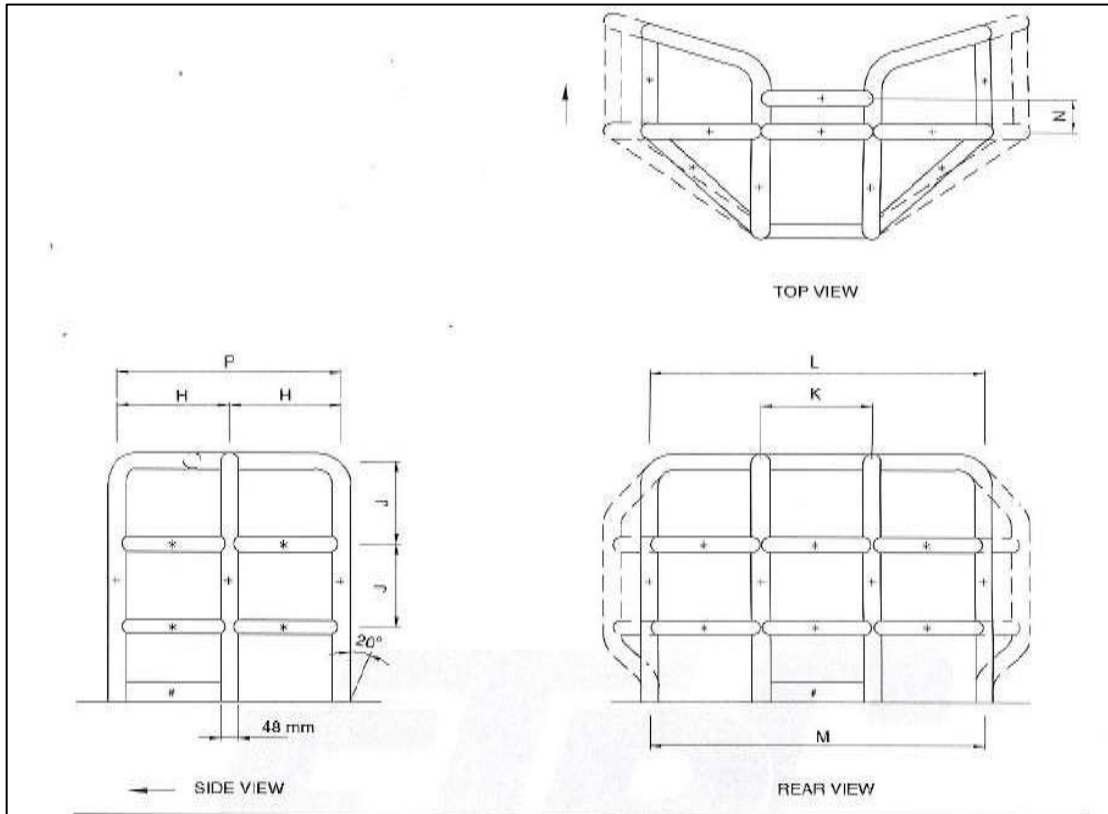


illustration 14-1: driver roll-over protection A

DRIVER ROLL OVER PROTECTION A

	min. outside diam.	mild steel min. wall thickness	chrome molybdene min. wall thickness
tube " + "	48 mm	3,0 mm	2,5 mm
tube " * "	42 mm	3,0 mm	2,5 mm

- # = support webs of 6 mm thick and 80 mm high to be welded between vertical tubes on both sides of rear tubes and to the bottom structure.
- H = min. 200 mm
- J = 250 mm
- K = 200 mm
- L = optional, but uppershape must have 50 mm min. clearance (vertical and horizontal) and 200 mm max. clearance (horizontal) to drivers helmet; to avoid neck injury.
- M = width, dependent upon specific tractor.
- N = 100 mm (min.)
- P = 600 mm (max.)
- ← = forward driving
- = options for construction

Illustration 14-1: driver roll-over protection A

DRIVER ROLL OVER PROTECTION A

	Mild Steel	Chrome molybdenum
Min Outside Diameter		
Min Wall thickness		

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Tube +	48mm	3.0mm	2.5mm
Tube *	42mm	3.0mm	2.5mm

- # = support webs of 6 mm thick and 80 mm high to be welded between vertical tubes on both sides of rear tubes and to the bottom structure.
- H = min. 200 mm
- J = 250 mm
- K = 200 mm
- L = Optional, but upper shape must have 50 mm min. clearance (vertical and horizontal) and 200 mm max. Clearance (horizontal) to driver's helmet, to avoid neck injury.
- M = Width, dependent upon specific tractor.
- N = 100 mm (min.)
- P = 600 mm (max.)
- ← = forward driving
- = options for construction

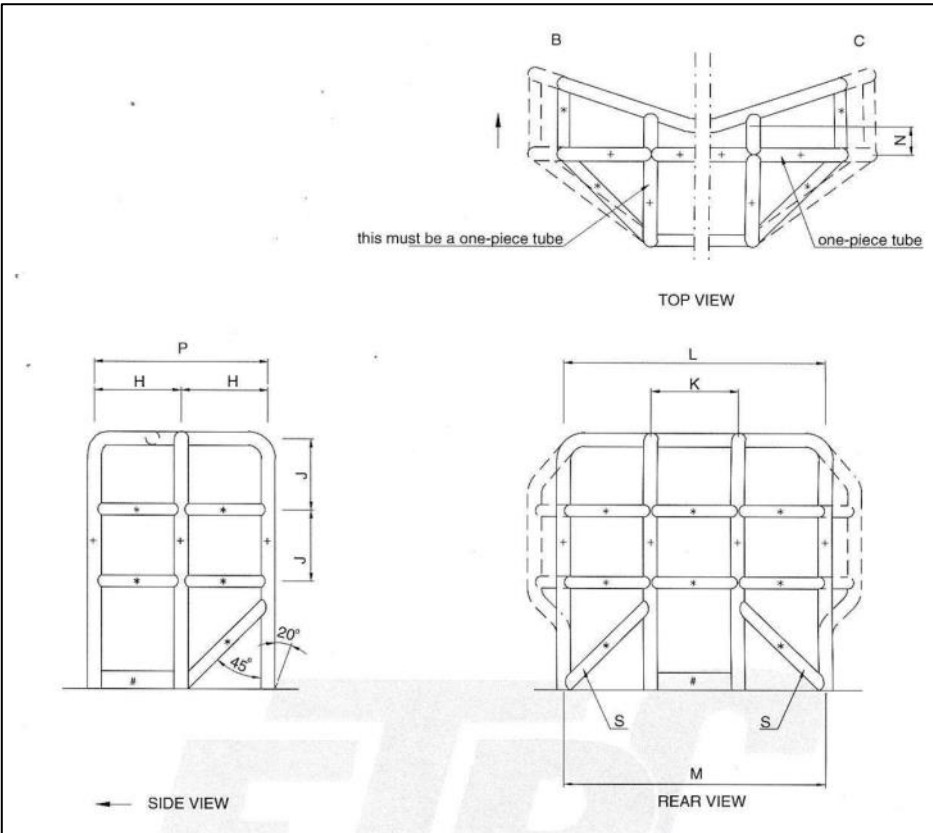
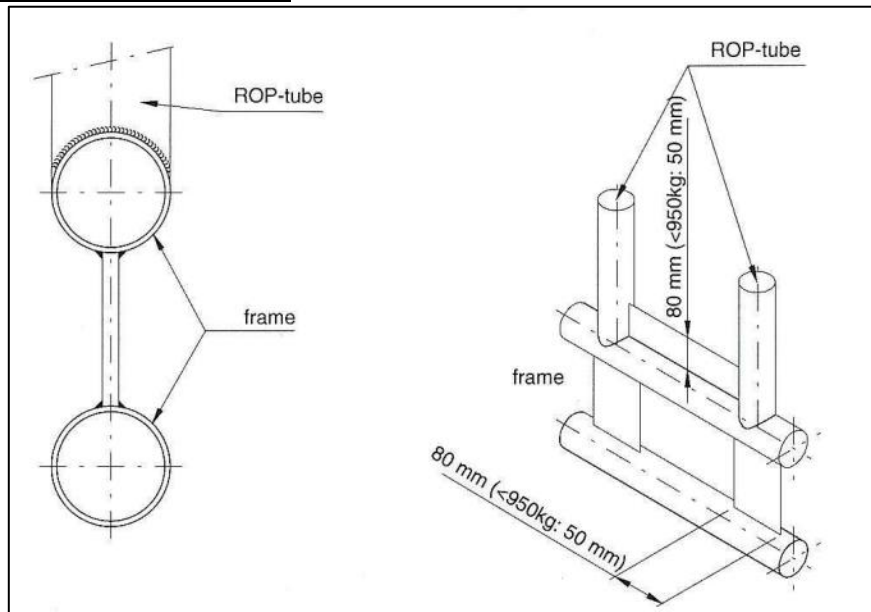


Illustration 14-2: driver roll-over protection B/C

DRIVER ROLL OVER PROTECTION option B and C

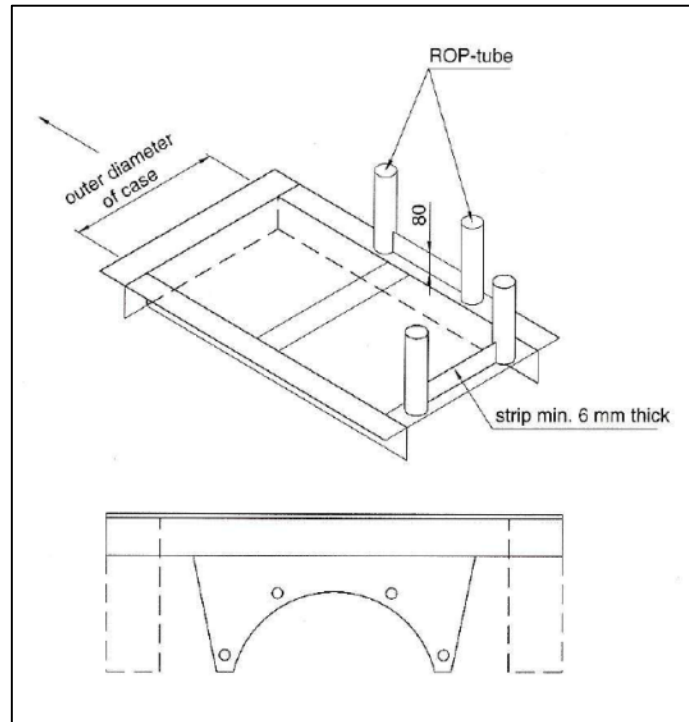
		Mild Steel	Chrome molybdenum
Min Outside Diameter		Min Wall thickness	
Tube +	48mm	3.0mm	2.5mm
Tube *	42mm	3.0mm	2.5mm

- # = support webs of 6 mm thick and 80 mm high to be welded between vertical tubes on both sides of rear tubes and to the bottom structure.
- H = min. 200 mm
- J = 250 mm
- K = 200 mm
- L = optional, but upper shape must have 50 mm min. clearance (vertical and Horizontal) and 200 mm max. Clearance (horizontal) to driver's helmet, to avoid neck injury.
- M = Width, dependent upon specific tractor.
- N = 100 mm (min.)
- P = 600 mm (max.)
- ← = forward driving
- = options for construction

Roll cage mounting on tube type chassis**Illustration 14-4: Mounting ROP on tube type frame**

Recommendations regarding mounting the Roll cage to any tube type chassis

1. Vertical Roll cage supports can be welded directly to horizontal tube frame structure.
2. Use steel supports to be installed directly between horizontal frame tube and in line with each vertical Roll cage tube, this steel supports 80 mm x 6 mm min. (50 mm x 6 mm min. for mini's) must extend to the next horizontal frame tube directly below.
3. Rear Roll cage vertical tubes can be welded directly to a rear structure same as the side frame. This rear frame structure can be welded to the vehicle frame.
4. Support webs of 80 mm x 6 mm min. (50 mm x 6 mm min. for mini's) can be welded between vertical tubes on both sides and rear tubes.

Roll cage mounting to OEM housing**Illustration 14-5: Mounting ROP on OEM rear-end housing**

Recommendations regarding mounting the Roll cage to any stock OEM housing

1. Try to create a rigid one piece assembly on tractor for maximum strength.
2. Do not use material thinner than 6 mm.
3. Create two U-shaped attachment flange's to use the side flange bolts (four (4) min. each side) to keep the assembly in place.
4. Use four additional bolts (min. M12 grade 8.8) to attach the assembly to the axle housing, two before and two after the axle housing.
5. Weld the assembly solid together without grinding on any welding.
6. Support webs of 80 mm x 6 mm min. (50 mm x 6 mm min. for mini's) vertical from base plate must be welded between vertical tubes on both sides and rear tubes, to create a solid connection from Roll cage to OEM housing.

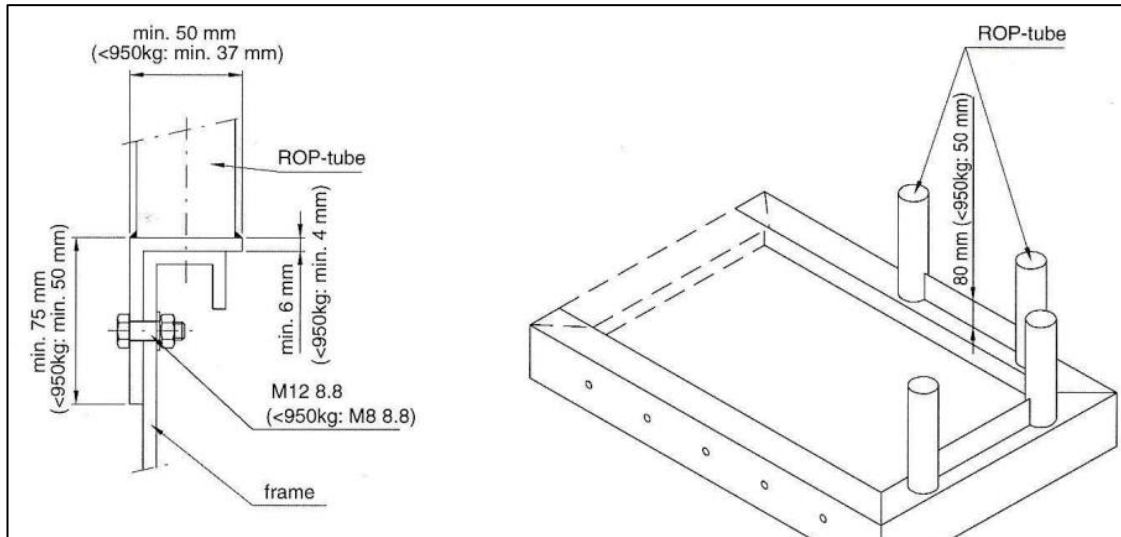
Roll cage mounting on channel type chassis

Illustration 14-6: Mounting ROP on channel type frame

Recommendations regarding mounting the Roll cage to any channel type chassis

1. Vertical Roll cage supports can be welded to a single piece of 6 mm min thickness steel with a 50 mm min. horizontal flange and 75 mm vertical flange (angle iron).
2. Attachment flanges secured to vertical side of frame by at least five (5) M12 grade 8.8 or better bolts.
3. Rear Roll cage vertical tubes can be welded to a 6 mm min. thickness steel
4. Flange (with at least same dimensions as side flange).
5. Rear mounting flange to be welded to the side flanges or vertical frame rails and must have supports directly below ROP- cage rear tubes, which can be bolted or welded to vehicle frame or rear- end.
6. Support webs of 6 mm thick and 80 mm (50 mm for mini's) high to be welded between vertical tubes on both sides and rear tubes.

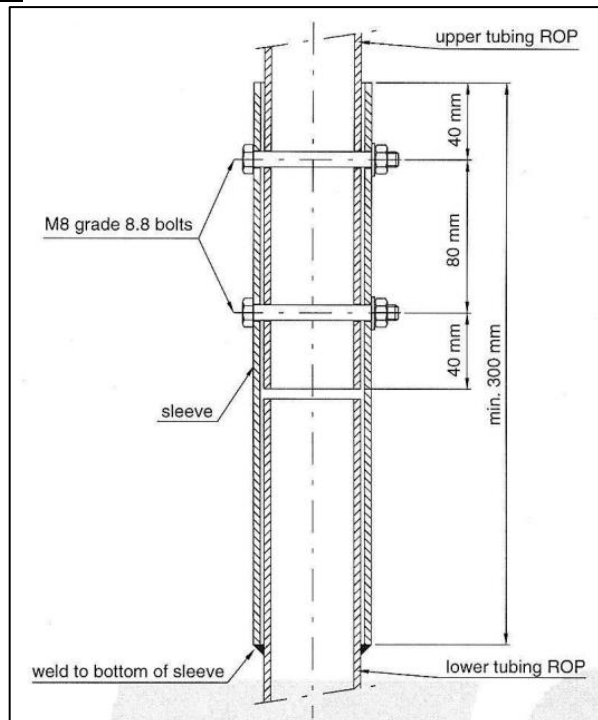
Removable upper portion - option with sleeves

Illustration 14-7: construction removable upper portion

1. Per tube two (2) holes as shown to allow M8 grade 8 8 or better bolts.

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2. Bolts through upper tubing, or lower tubing, for removal if desired.
3. Sleeve 300 mm min. length (min. wall thickness 3 mm).
4. One side of sleeve welded to tubing.
5. Sleeve may be on inside or outside ROP tubing.
6. An inside sleeve should be mounted with bolts as shown, two (2) bolts through each part (top and bottom) of the ROP.

4.3 Appendix 3, Approved Manufacturers

ETPC main Rulebook, Chapter 13, ETPC SAFETY PROGRAMME

A. Approved manufacturers

Multiple disc clutch assemblies

1. Ace Mfg & Parts Co.
2. Advance Clutches
3. Allied Precision Products
4. Applied Friction Techniques
5. Atlas Tractor Company
6. Carolina Precision Engines
7. Clutch Works Inc.
8. CMW Racing
9. Crower Cams & Equipment Co.
10. Eagle Clutches, *Finland*
11. East-West Engineering
12. Exedy America Corp
13. High Performance Clutch Corp
14. Hypermax Engineering Inc.
15. L&T parts Inc.
16. Mark Puwak Racing
17. McLeod Industries
18. Mr. Gasket/Hays Clutch
19. Performance Industries Racing Clutches
20. RAM Automotive Co.
21. RF Enterprises
22. Rursch Specialty
23. SSG Engineering Pro-ducts inc

24. Stroud Safety
25. Van der Waal Clutches, *Netherlands*
26. Titan Speed Engineering

Shatter Blankets

1. Belpport, *Belgium*
2. Clifton Blankets, *UK*
3. DJ Safety inc
4. Holland Blankets, *Netherlands*
5. Security Race Products
6. Stroud Safety

Turbine Blankets

1. Belpport, *Belgium*

Bellhousings

1. Boninfante Racing
2. Browell Bellhousing Inc.
3. Mr. Gasket/Lakewood Industries
4. Probell Racing
5. Trick Titanium Inc.

Blower Restraints - Devices

1. Deist Safety Equipment
2. DJ Safety Inc

3. Don Gerardot Racing
4. J & S East Valley Garage
5. Mike Kuhl Enterprises
6. Specialty Automotive Engineering Inc.
7. Stroud Safety
8. TAK Racing Enterprises
9. Tayor Enginesports

Blower Restraints – Straps

1. SES, *Netherlands*
2. Zimmermann Restraints, *Germany*

High Performance Harmonic Balancers

1. ATI Racing Transmissions, Inc.
2. B.H.J. Products
3. C.A.T. Power Engine Parts
4. Cyco System Pty, Ltd
5. Innovators West
6. Precision Cam Drives Pty, Ltd
7. Precision Parts Pty, Ltd
8. TCI Automotive
9. Vibrattech/Unit of Index Corp

ALL SAFETY ITEMS PERMITTED BY THE NTPA ARE ACCEPTED BY THE ETPC.

Age Limits for Safety Equipment

1. The age of blower restraints, fire suits and shatter blankets must not exceed the limits given below.
2. Blower restraints
3. The maximum age of blower restraints (straps) is six (6) years, if not given a shorter warranty by manufacturer.
4. Fire suits
5. The maximum age of Nomex fire suits is six (6) years, for suits made of other materials two (2) years.
6. Shatter blankets
7. The maximum age of shatter blankets is five (5) years, if not given a shorter warranty by blanket manufacturer.

The age of safety equipment has to be documented, see chapter 2, Rule 9 in this rulebook.

finish