

ETPC Sled Rule Book

2016



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ETPC has written this Weight Transfer Rule Book to define safety, design an operation requirements for weight transfer sleds used at ETPC sanctioned events.

Sled Definition:

A weight transfer sled is a machine that can move a given amount of weight from a relatively ground friction free area and transfer that weight to a ground friction area consistently and a given length of pulling surface.

Sled Size Definition:

Weight transfer sleds certified by ETPC will be categorized into two divisions based on size and weight transfer capacity.

Big Sled:

A sled certified and licensed in this category is capable of controlling all classes of pulling except Mini and Garden Pulling divisions.

Mini Sled:

A sled certified and licensed in this category is capable of controlling the Mini division.

Garden Pulling sled:

A sled certified and licensed in this category is capable of controlling the Garden Pulling division.

Type of Sled:

The only type of weight transfer machine certified by ETPC for use at ETPC sanctioned events is a **Downhill** weight transfer type sled where a weight box starts at the rear of the frame rails over the axles and travels forward towards pan (friction device) as it is pulled down the track. All rules found in this ETPC Weight Transfer Sled Rule Book are applicable to this type of weight transfer machine.

Rules:

1. Axles:

- A.** Tandem axle configuration is required on all big sleds licensed GOLD. Sleds licensed STANDARD, BRONZE and SILVER are allowed to use a single axle, tandem axles allowed for STANDARD, MINI and GARDEN Pulling sleds.
- B.** Drive axle for weight box must be locked in the same fixed position (front to rear and distance from rails) for duration of the competition class.
- C.** Box drive axle must retain adequate down force from rails so wheels cannot skid or slip.
- D.** For all big, mini and garden pulling sleds the brakes on the drive axle must be fail safe (for example spring chamber brakes). The brakes must be able to lock the wheels when the sled is not loaded with weight with the weight box in the rear position.
- E.** If Kill switch is applied the axles brakes has to be applied together with the box brakes and the drive line brake (mandatory for a Big and Mini sleds).
- F.** All big and mini sleds has to use axles and brakes legal for use in trucks, for that weight a certain sled is delivering to the axles when sled is loaded with the maximum weight, in thr country where the sled is registered.

2. Pans / Chains:

- A.** Pan must be constructed rigidly. No flexing allowed with maximum weights in the box all the way forward and push down device applied. Pan should be constructed in a way that the track material stays as long as possible under the pan (banana shape pan).
- B.** The maximum weight on the pan at the starting line can be no more than 125% of the weight of the class being pulled. The pan weight must be with in 50-125%.
- C.** Sled must be mounted to pan using an attachment, which allows the pan to pivot up and down to follow ground altitude and prevent bouncing. Sleds for all levels of ETPC pulling are allowed to use a 5th wheel type attachment which also enables the pan pivoting from side to side limited a maximum of 15 degrees for big sleds and maximum 10 degrees for mini and garden pulling sleds.
- D.** Pan drawbar must be manufactured as strong as drawbars of pulling vehicles. The minimum diameter of any pin is 25mm and 16mm for garden pulling sleds.
- E.** Drawbar chain with hook must be a single chain design. The drawbar pin hole must be minimum of 25mm (or 1 inch) thickness and a maximum of 50mm above the ground.
- F.** The pin hole for the chain had to be located at the front edge of the pan, as close as possible to the pan. The pin for chain had to be parallel to the ground.
- G.** All chains on mini sleds it's mandatory to have a special anti-unhooking system device on them.
- H.** Drawbar chain length on all big sleds must be 1170mm (or 46 inch) long plus or minus 20mm (or ¾ inch). Whit hook connectors and chain to be minimum 22mm (or 7/8 inch) grade 8 items.
- I.** Drawbar chain length on big sleds for trucks must be 1170mm + an extra chain with a length off 1150mm plus or minus 20mm with hook, connectors and chain. To be minimum 22mm (or 7/8 inch) Grade 8 items. Or 1 long chain from 2320mm (Truck chain had to be also checked yearly).
- J.** Drawbar length on all mini and garden pulling sleds has to be 920mm (or 36 inch plus or minus 12,5mm (or ½ inch) and all hooks connectors and chain has to be a minimum thickness of 12,5mm (or ½ inch) grade 8 items for mini sleds. And a thickness of 10mm for garden pulling sleds.
- K.** Drawbar length is measured from centre of sled drawbar pinhole to inside hook when the chain is tight.
- L.** Any grinding, drilling or welding on any chain, chain connectors or hook is strictly forbidden.
- M.** Steer chains connection to buckboard to the pull chain are mandatory on all sleds.

- N.** Chains attached to pan and buck-board to be 305 mm (or 12 inch) (plus or minus 20 mm) on each side of pan drawbar at the same height from ground as pan drawbar. Chains to tie onto main pull chain 432 mm or 453 mm (or 17 inch or 18 inch) ahead of first pivot point (pin or hammer link) clamp to or bolt through main chain. Steer chains to be 12 mm (or 1/2 inch) grade 8 chains. When main chain. Extended tight and straight ahead both steer chains should be snug (not loose or not tight). Mini and garden pulling sleds – steer chains attached to pan and buckboard to be 229 mm (or 9") (plus or minus 19 mm or 3/4") on each side of pan drawbar at same height from ground as drawbar. Chain to tie into main pull chain 343 mm to 368 mm (or 14" – 15") ahead of first pivot point (pin or hammer link), and clamp to or bolt through main chain. Steer chains to be min. 8 mm (or 5/16") grade 8 chain. When main pull chain is extended forward tight and straight ahead, both steer chains should be snug (not loose or not tight).
- O.** Drawbar chains must be yearly checked and certified for all sleds by a classified company and a certificate should be included in the Service book of the sled. (For big sleds also truck chain).
- P.** Minimum king pin size: 76,2 mm (or 3") all big sleds – 50,8 mm (or 2") for mini sleds and 40,6mm (or 1.6") for garden pulling sleds. No Trailer balls allowed.
- Q.** All pans must be equipped with a buckboard 914mm (or 36") high on Big sleds and 610mm (or 24") high on Mini and garden pulling sleds with horizontal 102 mm (or 4") belt flap at top of buckboard. Buckboard must be attached solid to pan at 90 degrees (plus or minus 5 degrees).
- R.** Buckboard required to have a transitions radius between buckboard and pan and to be not less than 102 mm (or 4") and not more than 306 mm (or 12")
- S.** Centre opening in buckboard required for easy access to connect chain to drawbar.
- T.** All pans must be equipped with dirt shields (mud flaps) attached on each side of buckboard. Dirt shields must be min 25 mm (or 1") thick rubber or 12,5 mm (or 0,5" inch) rubber on a steel frame. Flaps must be extended outward at 45 degree angle forward to an overall width of 4000 mm (or 13 ft.) on a big sled and 3350 mm (or 10 ft.) On a mini sled. Mud flaps must secure Ground contact.
- U.** Grouser bars allowed under rear half of the pan. No bars allowed under front half of pan. Bars must be placed in a staggered pattern across the width of pan.

3. Pan Lift / Holdup Device:

- A.** Mechanical: Single arm or multiple arms progressive, constructed in order that pan will always drop right and even.
- B.** Hydraulic holdup systems are allowed.
- C.** Sled must be interlocked so it cannot function unless pan is always in fully raised position at starting line. Drop trigger must be located somewhere on main frame length and cannot be dropped by operator from operators station except with Emergency Shutdown System.
- D.** Air: Any air hold system must operate always in the same air pressure. No regulator allowed for drop speed and drop trigger on frame .All pan hold up devices must be fail safe (dead man safe) the pan must drop if any hold up device fails or breaks. Except mechanical hold up.
- E.** Hydraulic pushdown mandatory for GOLD sleds. (From 01-01-2016) Except garden pulling sleds.
- F.** All sleds using some type of push down device on rear of pan and underside of sled main frame when weight box is at far end of rail, will be limited as to how far it can push rear of pan or lift rear of sled. Limiting device is adjusted so it cannot push so far down (pan) or up (rails) that it raises the front of pan off ground.
- G.** The device used to activate push down system must be located within last of 700 mm (or 28") of box travel.
- H.** The connection point of the sled frame to the pan or skid (fifth wheel pin and plate), will be min 33% to max. 50% of pan length measured from rear end of pan.
Fifth wheel pin must be yearly visually inspected by the sled operator yearly, independent from sled rating. Photo of fifth wheel pin and plate added to the service Book.
- I.** Fifth wheel pins and locking jaws cannot be welded or built up for repair. Worn parts must be replaced with new parts.

4. Drive Train:

- A.** All sleds must have a positive ground driven Box drive. STANDARD, BRONZE, SILVER and MINI sleds have to use 1 axle to drive the weight box. GOLD rated sleds have to use 2 axles to drive the weight box.
- B.** Sled must utilize a mechanical, means of for engagement and lock up, spring type pressure plate or over centre clutch. Any clutch on any sled that is not a normally engaged clutch (spring-loaded or over canter) must be air or air-over-hydraulic engaged. If there are other systems powerful enough to transmit the torque of the drive train, they can be used. I.e. Electromagnetic. Recommendation: No Clutch in the Box drive (example: 2 gears engaged by air or hydraulic)
- C.** No overrunning or spread dog type clutches allowed anywhere in drive train.
- D.** As long as the sled is in “self-propelling mode” (what means the engine is able to deliver power to the sled drive train) the red light had to come on and stay on.
- E.** Box drive train must be equipped with a brake mechanism capable of creating a minimum static braking force that equals 25% of the max. weight box mass. STANDARD and GARDEN pulling sleds are allowed to use only one (either box brake or driveline brake) box brake.

5. Weight box & Weights:

A. Drive Chain Size:

1. Big sleds:

- using 2 chains each chain has to be 1 inch
- using 1 chain the chain has to be 1,75 inch

2. Mini sleds and Garden pulling sleds:

- using 2 chains each chain has to be 0,75 inch
- using 1 chain the chain has to be 1 inch

B. Chain attachment to weight box must be equivalent to chain size and strength.

C. Weight box wheels must be inside frame rails.

D. All weight boxes must have braking system working independently from weight box drive system, idler chain or cable attached to box.

E. Box brake has to come on when clutch is released.

F. Braking system must have a braking force of 0,25 G and 0,5 G together with the drive train brake.

G. Box brake system must be mounted directly to the weight box.

STANDARD and GARDEN pulling sleds are allowed to use only one (either box brake or driveline brake) box brake.

H. Weights in Box have to be secured in that way that they could not move in the box or come out of the box in any situation.

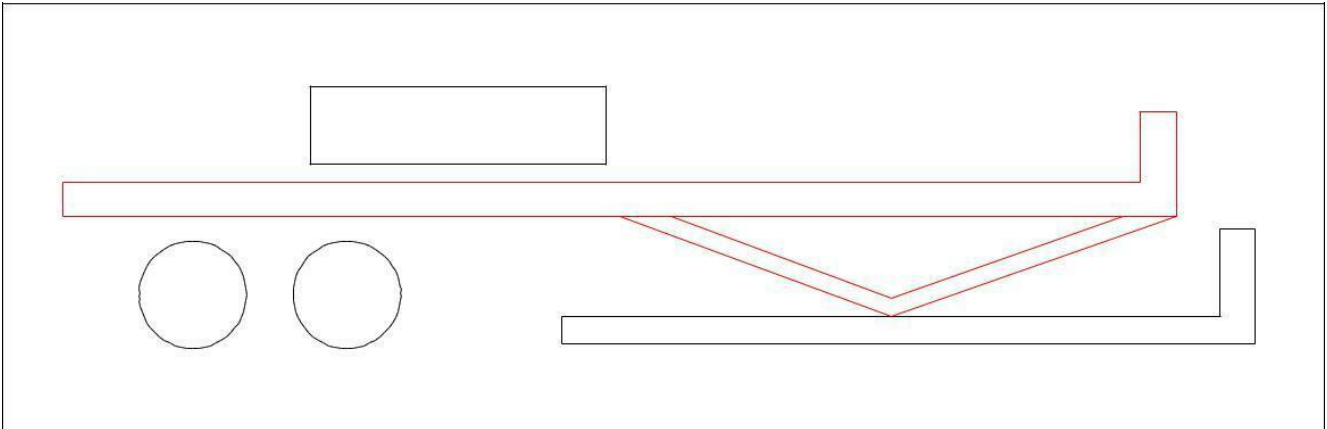
I. Top weight on front of sled rails has be mounted in a way they never can come off.

J. The weight box must have a certificated absorbing system that can absorb the maximum force possible that could be released in case of a flying weight box. According to the original ETPC Excel file. The absorbing system has to be certified by a competent manufacturer.

K. Weights have to be stamped whit their weight in kgs.

6 Rails, Front end and Chassis:

- A. Rail strength must be adequate enough so that there is no flexing or distortion at sled's heaviest weight and stress load. With a maximum of 10% plastic strength.
- B. Rail length should be long enough so that box can travel forward of fifth wheel pin in front .
- C. In front of rails there must be a calculated front end according to the highest force. This must be calculate by external engineering's company. **The red coloured chassis must be calculated.**



- D. Stops on rear of rails are to be strong enough to stop a fully loaded box freewheeling backwards at any speed.
- E. The weight box must have the possibility to travel the whole distance of the rails without the buffers.
- F. Calculations must be according to the excel data sheet of ETPC

7. Emergency Systems:

A. Kill switch mandatory on all sleds.

Kill switch has to activate the following systems:

- Pulling the Kill switch of pulling vehicle
- Axle Brakes
- Box and Drive train brakes (only one for Garden pulling sleds)
- Pan drop (only with non mechanical pan drop)
- Green light has to change to red light and must stay on red
- Brake Light has to come on and stay on

B. Maxi safety system mandatory on all sleds.

Maxi safety system has to activate the same points as Kill switch. And gets triggered by:

- Electrical power failure
- Low air pressure
- Low hydraulic pressure

C. Box movement mandatory on all sleds except STANDARD and GARDEN pulling sleds.

Each sled has to have a system which observes the box movement according to the movement of the ground wheels. If the speed of ground wheels disagrees with the speed of the Weight box emergency shutdown has to be activated.

8. Safety:

- A.** All sleds must have a minimum of two (2) fire extinguisher sticks, with a maximum using of 5 years. Or a minimum of 2 fire extinguishers 2KG each for Mini and Garden pulling sleds and 3KG each for big sleds, with a yearly inspection. They must be mounted on each side and have to be easy to reach. Also if there is a fire behind the tractor.
- B.** Life hammer (belt knife) mandatory on all sleds. Placed in the front half on each side of the sled.
- C.** Kill switch cable required to extend from front of sled main frame to competition vehicle kill switch. Kill switch cable must be operable at any time competition vehicle is connected by chain to sled and either moving down track or standing still.
- D.** Cable has to be a steel cable. Diameter of cable min 3,2 mm Minimum capable tension (pull) to pull out a minimum of 3 ETPC standard kill switch tie wraps.
- E.** A solid type of latch with a min. 5 mm cross section thickness at any point used to connect cable to kill switch ring. Latch must be attached to cable with at least two (2) cable clamps. Big Sled cable latch must be capable of disconnecting a minimum of 7 switches at one time.
- F.** Kill switch cable must long enough to reach min. 150 mm beyond point of hook when chain is hooked into drawbar and tight.
- G.** Kill switch cable must be connected to a fail safe Kill switch Device. The Device must be capable of adjusting cable length to limit excessive slack in killswitch cable. Control of this device must be from operator's station. No manual Operation of Kill Switch cable by operator is allowed.
- H.** All kill switch devices must be able to retract cable latch rearwards beyond buckboard of pan.
- I.** All lights required on all sleds has to be clearly visible to track officials. All lights must be non see-through type or either revolving, flashing, or strobe type.
- J.** Red light required to illuminate anytime sled or operator are not ready for competition or any time service brakes, emergency brakes kill switch or Emergency Shutdown System is applied. If Red light illuminates green light has to switch off and not come back on green.
- K.** Green light required illuminating when both sled and operator ready for pull attempt. Green light to remain on when box is fully forward.
- L.** Wheel brake light must be activated when the sled operator applies and stays on during green.
- M.** When the sled operator is not seated or when the cabin door is open on the sled, the sled must automatically go off green. And must not change automatically back to green. Operator has to reset the sled and give again green light when he is ready for competition.

9. General Rules:

- A.** Operators Station must be located on top rear of the sled (mandatory on big sleds).
- B.** Sled Operator has to wear a helmet and a neck protection. Except sleds with closed cabin.
- C.** The seat and seatbelts for the sled operator has to meet the same requirements as for a mod. Tractor.
- D.** All sled controls must be located within easy reach of operator while seated in operator's station.
- E.** No person other than one sled operator allowed on machine after ready for competition under green flag.
- F.** All sled operator(s) or crew person(s) must be at least 18 years of age.
- G.** A clear windshield capable of protecting the operator is mandatory. Recommended windshield to be Lexan or similar shatterproof material.
- H.** Tow back device (tongue) required at rear centre of sled for use when sled is not capable of moving under its own power.
- I.** The operation of a sled by persons incapacitated by intoxicating agent and / or drugs is strictly forbidden.
- J.** Fill in the ETPC sled check form before every event and a copy must be kept in the logbook. (Sled check form available by etpc-sit@tractorpulling.com)

10. Sled Levels:

A. Each ETPC licensed Sled is limited in its use in order to the level of license.

B. The following levels of sleds are known:

Big Sleds

Standard:

Used for Stock and Farm stock Level 1, Level 2 and Level 3 up to 3,6T
Not allowed for trucks. Box movement control system recommend.

2. Bronze:

- 50 % weight transfer of the sled
- Big Tractors: legal for use with tractors up to 42 engine points according to the actual rules, no Alky Super Stock tractors.
- Not self propelled
- Push down not required

3. Silver:

- 75 % weight transfer of the sled
- Big Tractors: legal for all tractors
- Self propelled
- The driving axle must be the front axle and be fixed on the frame.
- The front axle must not be pivoting with the rear axle.
- Push down is required.

4. Gold:

- 90 % weight transfer of the sled
- Big Tractors: legal for all tractors
- Self propelled and tandem drive
- Push down is required.
- Tandem axle driven
- Legal to use at any level of pulling mandatory for Euro cups, Euro cup Class and EC's
- Sled crew must have the experience to pull at least one (1) year at the Silver sled level with a minimum of six (6) events

Mini Sleds

1. Bronze :

- 60 % weight transfer of the sled
- Use for national events no international tractors

2. Silver :

- min 80 % weight transfer of the sled + self propelled
- Legal to use as back up for euro cup

3. Gold:

- min 90% weight transfer of the sled + self propelled
- legal for use at any level of pulling mandatory for Euro cups, Euro cup Class and EC's

Garden Pulling Sleds

1. Bronze :

- 50 % weight transfer of the sled
- Use for national events

2. Silver :

- min 70 % weight transfer of the sled + self propelled

3. Gold:

- min 80% weight transfer of the sled + self propelled
- legal for use at any level of pulling mandatory for EC's

11. Sled Licensing Procedures:

A. For any Sled eligible for use at a ETPC sanctioned event sled must meet all ETPC Sled Rules and requirements and be inspected and certified by ETPC

B. A sled can only be considered as legal if the annual sled fee is paid to the ETPC and the License sticker for the current year is displayed on a visible spot of the sled.

C. The sled license is legal for one calendar year for ETPC gold sleds and legal for two years for all other sled levels.

D. The Inspection Procedure:

1. All ETPC Gold Sleds had to be inspected yearly.

2. All other sleds had to be inspected every second year.

3. All new sled must be inspected before the first event and the rest during the season

E. Only every second inspection (according to the level of the sled) needs to be done on an event (where the sled is operated).

F. Sleds can only be inspected if the sled weight form is sent in before. The sled weights need to be weighed on a certified scale and the weight had to be stamped on the weights in kgs.

G. Sled inspection requests have to be sent in by the ETPC Members before the 1 st January. In addition to the request we need to know the dates and locations where the sleds will be in operation.

H. Rating of a sled:

The SIT (Sled Inspection Team) is inspecting the technical components (safety, mechanical quality and weight transfer) only. Up to Silver level the SIT will decide the rating of the sled.

I. For an upgrade above Silver level, in addition to the SIT has to check this sled at least 1 time in action and make a written report to the ETPC SIT and ETPC DB. For voting on any upgrade request the sled owner had to include a written statement of the national board.

J. Requirements for an inspection:

All Documents listed in Chapter 13 must be send every year before March 1st to the SIT.

- The operator(s) of the sled have to be present and the national ETPC delegate.

- Inspection Language is English – when needed translator has to be present

- If the inspection is carried out during an event the sled had to be ready at least 3 hours before the start of the event.

- Sled had to work ready for inspection.

- A measurement tape a flashlight and a calliper had to be provided by the sled team.

A measuring device (crane weight scale or similar) including connectors to the weight box has to be provided by the sled team. A box brake test must be possible.

- The location of the inspection has to be on dry and hard bottom surface.

A tractor must be available that is capable of pulling the sled with blocked rear wheels but without weights in the box.

- If one of the requirements listed above are not fulfilled the sled inspector can stop the

inspection – the costs has to be covered by the national organization.

K. Inspection of a sled is carried out up on request of the national organization. The inspections are done on a “first come first serve” basis.

L. Only the national Organization can request an Upgrade for a sled.

The Upgrade Request can only be handled at a dynamic inspection of the sled, for the dynamic test a whole class has to be worked by the sled.

If the Upgrade Request can be handled during a regular inspection according to the level of the sled the expenses will be covered by ETPC. If the Upgrade inspection had to be done separately the costs has to be covered by the national organization.

M. Because of safety concerns the ETPC sled inspectors have the right to exclude a sled from competition until the requested improvements are done. In a case like that a second inspection of the sled has to be done and the costs has to be covered by the national organization.

N. The national organization is responsible for the eligibility of sleds used in ETPC sanctioned events.

O. If a sled is used not according to the rating the national organization which is responsible for the event in question will get a penalty fee of EUR 1000,- for the first incident. For each following improper use of the sled the last penalty fee is doubled.

P. The ETPC Member (National Organization) which has requested a license for a sled is defined as the home organization of a sled in this way the home country of a sled is defined.

Q. Border crossing:

If a sled wants to work an event outside his home country only the ETPC Member (National Organization) where the event is held, can give/deny a permit for the foreign sled (Permit / Deny message has to be in writing at least 14 days before the event is held) Crossing a Border without permit, the home Organization of the sled will get a penalty fee of EUR 1000,- for the first incident. For each following improper Border crossing of the sled the last penalty fee is doubled.

L. Each sled need to have a full insurance certificate according to the laws of the country where the sled is operated. It's up to the national organization and the sled owner that the insurance meets the national laws.

M. The correspondence between SIT is only with national ETPC delegate. In the correspondence it is necessary to use the ETPC sled number.

N. The sled owners must sign a paper that states that the responsibility is for him even with a checked sled inspection form.

12. License Fee:

Big and mini sleds:

A. ETPC Gold sleds: €400,- a year.

B. ETPC Silver sleds €300,- a year.

C. ETPC Bronze and Standard sleds €250,- a year

Garden pulling sleds:

A. ETPC Gold sleds: €150,- a year.

B. ETPC Silver sleds: €100,- a year.

C. ETPC Bronze sleds: €50,- a year.

Every first yearly inspection is for free. When a second inspection is necessary travel costs are for the sled owner.

13. Documentation:

In this section all the Documents which are mandatory for each ETPC licensed sled are listed and described. During an inspection of the sled these documents have to be present and up to date. The documents have to be in clear written English.

The following Documents are mandatory:

A. The Service Book:

This Book has to contain a description of all maintenance jobs carried out on the main components of the sled responsible for a safe and proper function, pictures have to be added to the description.

- All checks carried out by the sled team (breaks, kill switch, box drive components, king pin, chain certificates N.) have to be documented in this book.
- Calculations, external engineering calculations and ETPC excel Data sheet

B. The Logbook:

This book has to contain an exact description of the sled setting for each class on each event. - The log has to contain the following data:

- Date and Location
- Class
- kg weight in box
- kg top weight on frame rails
- box on top (meters of track)
- pan weight at starting line
- box starting position on frame
- Sled checklist from every event according to the ETPC 'Sled check form'

C. Documents that must be sent to SIT inspector before inspection, without this papers there can be no inspection.

- Calculation of the chassis with the max. impact force with a flying weight box.
- The Etpc Excel data sheet
- a confirmation from the sled owner that the sled is built according to the calculations and according to the current sled rules.
- information about the absorbing system with data of maximum absorbing energy and max.force.
- Weight list of the sled.
- Explanation of the box movement control. Notice that there must be a box movement control!
- Photo documentation of the inspection of fifth wheel pin.
- Documents of the chain inspection.
- Insurance papers
- The sled Weight form