



Sled Inspection Team

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ETPC Sled Rule Book

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ETPC has written this Weight Transfer Rule Book to define safety, design and 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 an 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 Minis and Garden Pulling divisions.

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

Type of Sled:

Traveling Weight Box:

The only type of weight transfer machine certified by ETPC for use at ETPC sanctioned events is a weight transfer type sled where a weight box starts at the rear of frame rails over 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 weigh transfer machine.

Rules

1. Axles:

- a. Tandem axle configuration is required on all big sleds licensed to all levels of ETPC pulling, tandem axles allowed for Mini sleds .
- b. One Axle may be released from ground (raised) while sled is traveling down the track. Release of any axle must be controlled by weight box movement.
- c. Drive axle for weight box must be locked in same fixed position (front to rear and distance from the rails) for duration of competition class.
- d. Box drive axle must retain adequate down force from rails so wheels cannot skid or slip.
- e. For all big and mini sleds the brakes on the drive axles must be fail safe (for example spring chamber breaks). The breaks must be able to lock the wheels when the sled is loaded with the maximum weight and hold the lock at any given position of the weight box. Brake slack adjusters recommend being automatic adjusting type (auto slack) and maintaining a 90 degree angle when brakes are fully applied.
- f. If Kill switch is applied the axle Breaks had to be applied together with the box breaks (mandatory for Big and Mini Sleds)
- g. All sleds had to use axles and breaks 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 that country where the sled is registered.

2. Tires:

For ETPC Licensed Sleds there are the minimum specifications about the width of ground contact and a minimum radius of the tires:

- h. Mini sled: width min. 300mm, radius min. 300 mm.
- i. big sled: width min. 400mm, radius min. 400 mm

3. Pans / Chains:

- a. Pan must be constructed rigidly. No flexing allowed with maximum weight in 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 100% of the weight class being pulled. The panweight must be within 50-75%.
- c. Sled must be mounted to pan using a 5th wheel type attachment, which allows the pan to pivot up and down to follow ground attitude and prevent bouncing.
 1. For sleds up to National A level it is recommended that Pan can pivoting from side to side limited to min. 5 degrees and a max of 15 degrees for big sleds and 7 degrees and a max of 10 degrees for mini sleds.
 2. For International and ETPC Gold sleds it is mandatory that Pan can pivoting from side to side limited to min. 5 degrees and a max of 15 degrees for big sleds and 7 degrees and a max of 10 degrees for mini sleds.
- d. Any ground attitude device must not limit the pan's ability to pivot or steer after pan holdup device has been released.
- e. Pan dimensions on all weight transfer machines should approximate the length and width dimensions of largest vehicle that pulls sled – bigger pans are allowed.
- f. Pan drawbar must be manufactured as strong as drawbars of pulling vehicles (for mini sleds the drawbar for the mini tractor and for a big sled the drawbar of a Mod. Tractor had to be taken as equivalent.
The minimum diameter of any pin is 25mm (or 1 inch).
- g. Drawbar chain with hook must be a single chain design. The drawbar pinhole must be a min of 25mm (or 1 inch) above the ground and a maximum of 50mm (or 2 inch) above the ground.
- h. The pinhole for the chain had to be located on the front edge of the pan, as close as possible to the pan. The pin for chain had to be parallel to the ground.

- i. All chains on big sleds should have a special anti-unhooking device on them, it is mandatory for all mini sleds.
- j. Drawbar chain length on all Big Sleds must be 1170 mm (or 46 inch) long plus or minus 20 mm (or ¾ inch) with hook connectors and chain to be minimum 22mm (or 7/8 inch) Grade 8 items.
- k. Drawbar chain length on Big sleds for Trucks must be 2870 mm (or 112 inch) long plus or minus 20 mm (or ¾ inch) with hook connectors and chain to be minimum 22mm (or 7/8 inch) Grade 8 items.
- l. Drawbar chain length on all Mini Sleds is to be 920 mm or (36 inch) plus or minus 12,5 mm (or ½ inch) and all hooks, connectors and chain are to be a minimum 12,5 mm (or ½ inch) Grade 8 items
- m. Drawbar chain length is measured from center of sled drawbar pinhole to inside of hook when chain is tight.
- n. Any grinding, drilling or welding on any chain, chain connectors or hook is strictly forbidden.
- o. Steer Chains connecting buckboard to pull chain are mandatory on all sleds. 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 20 mm (or ¾ inch) grade 8 chains or next size larger for normal duty chain. When main chain extended tight and straight ahead both steer chains should be snug (not loose or not tight).
Mini sleds – steer chains attached to pan and buckboard to be 229 mm (or 9") (plus or minus 19 mm or ¾") 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.10 mm (or 3/8") grade 8 chain or next size larger for normal duty chain. When main pull chain is extended forward tight and straight ahead, both steer chains should be snug (not loose or not tight)..
- p. 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.
- q. Minimum king pin size: 76,2 mm (or 3") all big sleds – 50,8 mm (or 2") for mini sleds. No Trailer balls allowed.
- r. All pans must be equipped with a buckboard 914mm (or 36") high on Big sleds and 610mm (or 24") high on Mini sleds with horizontal 102 mm (or 4") belt flap at top of buckboard. Buckboard must be attaches solid to pan at 90 degrees (plus or minus 5 degrees
- s. 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 (or 12")
- t. Center opening in buckboard required of access to connect chain to drawbar. Buckboard opening for big sleds to be not more than 813 mm (or 32") wide and 356 mm (or 14") down from top of buckboard. No Buckboard opening necessary on mini sled.
- u. 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.
- v. 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.

4. Pan Lift / Holdup Device:

- a. Mechanical: Single arm or multiple arms progressive, constructed in order that pan will always drop right and even.
- b. 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 fame length and cannot be dropped by operator from operators station except with Emergency Shutdown System
- c. 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 save (dead man save) the pan must drop if any hold up device fails or breaks. Hydraulic holdup systems are allowed.

- d. All sleds using of some type of push down device on rear of pan and under side 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 can not push so far down (pan) or up (rails) that it raises the front of pan off ground removing drawbar chain angle from pulling vehicle.
- e. Push down limits as follows:
Push down must be limited, that on a loaded box for the given class with fully forward position, each wheel can lift max. 38mm from hard and flat ground, the device used to activate push down system must be located within last of 700 mm (or 28") of box travel.
- f. 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.
- g. Fifth wheel pins and locking jaws cannot be welded or built up for repair. Worn parts must be replaced with new parts.

5. Drivetrain:

- a. The sleds must have a positive ground drive and driven by a minimum of two (2 of four (4) wheels of tandem, this is mandatory for big sleds. If only one axle is used for the box drive it had to be the front axle. New big sleds build after 2005, or sleds who asking for an upgrade to International or ETPC gold must be driven by all four (4) wheels of the tandem.
- b. Sled must utilize a mechanical, means of for engagement and lock up, spring type pressure plate or over center clutch.
Any clutch on any sled that is not a normally engaged clutch (spring-loaded or over center) must be air or air-over-hydraulic engaged. If there are other systems powerful enough to transmit the torque of the drivetrain, 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 up and stay.
- e. Box drivetrain must be equipped with a brake mechanism capable of stopping weight box fully loaded at maximum speed

6. Weightbox & 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:
 - 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. Braking system must be capable of stopping a fully loaded box at maximum speed, the system had to be fail save.
- f. Box brake system must be mounted directly to weight box and use frame rails as friction surface for brake pads to stop box.
- g. Weights in Box had to be secured in that way that they could not move in the box or come out of the box in any situation.
- h. Top weight on front of sled rails had to be mounted in a way they never can come off.

7. Rails:

- a. Rail strength must be adequate enough so that there is no flexing or distortion at sled's heaviest weight and stress load. If rail becomes distorted it must be replaced and not "patched" to add strength after original construction of the sled.
- b. Rail length should be long enough so that box can travel forward of fifth wheel pin in front and rearward behind rear axle.
- c. In front of rails 2 sets of stops for box each stop strong enough to stop a fully loaded box free wheeling at any speed.
- d. Stops on rear of rails are to be strong enough to stop a fully loaded box free wheeling backwards at any speed.

8. Emergency shutdown System:

- a. Recommended a fail safe emergency system be designed that is separate from normal sled controls that can be activated by use of one control on operators station that activates the following systems:
 1. Applies Kill Switch.
 2. Applies all four emergency brakes on drive axles.
 3. Applies box drivetrain breaks.
 4. Applies weight box brakes on sled frame rails.
 5. Applies pan push down device.

9. General Rules:

- a. Operators Station must be located on top rear of the sled (mandatory on big sleds)
- b. Sled Operator had to wear a helmet and a neck protection.
- c. The seat and seatbelts for the sled operator had 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. Sled operation must be tested by making at least three passes down entire length of track prior to start of event. Sled operation test includes but not limited to weight box travel, pan hold up and drop operation, pan push down device and all brakes including weight box and drive wheels.
- h. A clear windshield capable of protecting the operator is mandatory. Recommended windshield to be Lexan or similar shatterproof material.
- i. Tow back device (tongue) required at rear center of sled for use when sled is not capable of moving under its own power.
- j. The operation of a sled by persons incapacitated by intoxicating agent and / or drugs is strictly forbidden.

10. Safety:

- a. All sleds must have a minimum of two (2) yearly inspected fire extinguishers. 2kg for mini sleds and 3kg for big sleds (*each*). They must be mounted on each side, in the rear half of the sled, so they are easy to catch, also if there is a fire behind the tractor.

- b. Life hammer (belt knife) mandatory on all sleds.
- 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 had to be plastic coated steel cable or equivalent. 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 save Kill switch Device. The Device must be capable of adjusting cable length to limit excessive slack in kill witch 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. If Kill switch is applied box breaks and driveline breaks had to be applied. Its recommended to activate emergency shutdown system by kill switch activation.
- j. Each sled had 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 Weightbox emergency shutdown had to be activated.
- k. ETPC Gold and International rated sleds are recommended to have a data collection system, where the main functions of the sled are monitored and saved. If a clutch is used in the box drive an rpm sensor on the input and the output shaft is mandatory. The Data collection unit must be able to store a minimum of 10 pulls. This system must be installed independent from all other electrical systems.
- l. All lights required on all sleds, min 100 mm diameter or equivalent, and clearly visible to track officials. All lights must be non see-through type or either revolving, flashing, or strobe type.
- m. 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 had to switch of and not come back green.
- n. Green light required illuminating when both sled and operator ready for pull attempt. Green light to remain on when box is fully forward.

11. 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:
- c. Big Sleds
 1. Standard:
(this type of sleds are only legal to use for stock tractors) min 300% weight transfer
 2. National B:
min 300% weight transfer
- Big Tractors: legal for use with tractors up to the half engine points according to the actual rules, no Alky Super Stock tractors.
 3. National A: legal for use with all national tractors and up to 75% of the Engine Limits on International tractors according to the actual ETPC Rules.
Min. 300% weight transfer
 4. International:
min 400% weight transfer + self propelled
legal for use with national and international tractors, backup at Euro cup Events.
 5. ETPC Gold:

min 500% weight transfer + self propelled
legal for use at any level of pulling mandatory for Euro cups, Euro cup Classes and EC's

d. Mini Sleds

1. National B:

min 300% weight transfer

Only Natural aspirated Engines – no Jets.

(does not depend if tractors are national or not)

National A:

Min. 300% weight transfer

All national Tractors and

International tractors max. 19 points according to the current ETPC engine point system.

International:

min 400% weight transfer + self propelled

legal for use with national and international tractors, backup at Euro cup Events.

ETPC Gold:

min 500% weight transfer + self propelled

legal for use at any level of pulling mandatory for Euro cups, Euro cup Class and EC's

12. 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. Only every second inspection (according to the level of the sled) needs to be done on an event (where the sled is operated).
 4. Sleds can only be inspected if the sled weight form is sent in before.
(You will find a sled weight for attached to this rule book).
 5. The sled weights need to be weight on a certified scale and the weight had to be stamped on the weights.
- e. Sled inspection requests had to be sent in by the ETPC Members before the spring Meeting. (To make it possible to plan the inspection better). In addition to the request we need to know the dates and locations where the sleds will be in operation.
- f. Rating of a sled:

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

For an upgrade above International level, in addition to the SIT the ETPC track officials (Flagman and Jury Members) have to check this sled at least 1 time in action and made a written report to the ETPC SIT and TSB. For voting on any upgrade request the sled owner had to include a written statement of the national board.
- g. Requirements for an inspection
 - All Documents listed in Chapter 14 had to be available for the Sled inspector
 - The operator(s) of the sled had to be present
 - Inspection Language is English – when needed translator had to be present
 - If the inspection is carried out during an event the sled had to be at least 3 hours before the sled had to work ready for inspection.
 - a measurement tape a flashlight and a caliper had to be provided by the sled team.
 - The location of the inspection had to be on dry and hard bottom.

If one of the requirements listed above are not fulfilled the sled inspector can stop the inspection – the costs had to be covered by the national organization.
- h. Inspection of a sled is carried out up on request of the national organization. The inspections are done on a “first come first serve” base.

- i. 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 had 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 had to be covered by the national organization.
- j. 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 had to be done and the costs had to be covered by the national organisation.
- k. The national organization is responsible for the eligibility of sleds used in ETPC sanctioned events.
- l. 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.
- m. 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.
- n. 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 had 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.
- o. Each sled need to have a proper insurance according to the laws of the country where the sled is operated. Its up to the national organization and the sled owner that the insurance meets the national laws.

13. License Fee:

- a. ETPC Gold Sleds: EUR 250 each year.
- b. All other Sleds EUR 187.50 each year.
- c. The license fee has to be paid before March the 1st of the current year to the ETPC Bank account.
- d. If the license of the sled is paid as mentioned above the license sticker is handed out at the March Meeting of the ETPC to the national delegate.

14. Documentation:

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

The he following Documents are mandatory:

- a. The Service Book.
This Book had to contain a description of all maintenance jobs carried out on the main components of the sled responsible for a save and proper function, pictures had to be added to the description.
All checks carried out by the sled team (breaks, kill switch, box drive components, king pin, chain certificates) had to be documented in this book.
- b. The Logbook.
This book had to contain an exact description of the sled setting for each class on each event. The log had to contain the following data:
 - Date and Location
 - Treck length
 - Class
 - Attempts to find the right setting
 - Number of competitors in 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
 - Number of full pulls
- c. The sled weight form according to the ETPC SIT standard weight form.

Weight Procedure:

- 1.) Determine the weight of the whole Sled.
- 3.) Place only the Pan of the Sled on the scale.

- The following Steps had to be done for each weight Class a Sled is running

- 3.) Put a certain amount of weight in the Box
- 4.) Move the Box back as far as possible (this is Box position A) – Determine the weight of the Pan.
- 5.) Move the Box some distance forward (this is Box position B) – Determine the weight of the Pan.
- 6.) Continue in the same way for Box Position C and D
- 7.) Move the box to the front of the Sled (This is the Box in front Position) –Determine the weight of the Pan.
- 8.) Now you place your Top weight on the Sled and repeat the Steps 4 to 7.

Extra topweight in Front of the Sled							
.....kg							
.....kg in Box			Box Position A	Box Position B	Box Position C	Box Position D	Box in Front
rear	front		Panweight	Panweight	Panweight	Panweight	Panweight

Extra topweight in Front of the Sled							
.....kg							
.....kg in Box			Box Position A	Box Position B	Box Position C	Box Position D	Box in Front
rear	front		Panweight	Panweight	Panweight	Panweight	Panweight

Explanation of the ETPC weight form

Box in position A,B,C or D means: that the box can be in different places at the starting line, and that will effect on the weight of the pan.

Pos of weight means: is the weight in the rear or in the front of the Weightbox.

Extra top weight in front of sled means: one or more weights extra in front of the rails or under the rails

The total weight of the sled without weights plus the maximum loaded weights will give the max total.

When a sled inspector must check a sled he must check also the weights of the sled, otherwise he can't give the sled and the crew the right level.

Also its very important for the team himself, that they know what happense with the different kind of weights when they put in a weight in the box.

Transition to the new Sled Rules

1. All Rules resulting in changing the construction of a sled will went productive with 01.01.2008
2. All other Rules will went productive with 01.01.2006