

# SECTION II

## GENERAL RULES

### Brakes

All competing vehicles must be equipped with independent working rear brakes (except 4x4 trucks). Four-wheel drive vehicles must have working front wheel brakes.

### Drawbars

1. Drawbars shall be constructed so that in the event of drawbar breakage, the drawbar supports do not pull from a top link or brace above the centerline of the rear axle of the vehicle. If the NSPA tech inspector rules a vehicle drawbar is illegal and/or unsafe, the party involved can ask for NSPA Owners review by submitting a photo and construction information to the NSPA Owners. A drawbar which has provisions to be easily made shorter than legal length is not acceptable as a legal drawbar. Any vehicle with the drawbar hold-up device above the centerline of the rear wheels must have a single pin break-away type (slide out) drawbar. This rule does not apply to 4x4 trucks or two-wheel drive trucks.
2. Drawbars must be rigid in all directions.
3. All drawbars and hitching devices will be steel in all weight classes and divisions, including second drawbars and hitching devices.
4. All classes regardless of division must meet the following:
  - a. Drawbar to be a minimum of two (2) square inches total steel material at any point
  - b. Any pin will be a minimum of 7/8" grade 5.
  - c. Drawbar must be equipped with a steel hitching device and must measure 3 inches wide x 3.50 inches long hole.
5. No portion of the vehicle may interfere with sled, chain or hook during a pull or while being hooked or unhooked.
6. An area six inches (6") wide and twelve inches (12") high immediately above the drawbar must be free of all obstruction, including kill switches, weights, wheelie bars or second drawbars, for ease of hooking and unhooking.
7. Vehicles with second drawbars must have their primary drawbar eight inches (8") above the second drawbar. The hole in the second drawbar must be covered if not in use.
8. Drawbars and wheelie bars are not to be connected to each other.
9. No trick hitches or cam type rear ends will be allowed. Drawbar distance from the center of the rear axle cannot change during the pull.
10. All vehicles are required to have tow hitch on the front of the vehicles. The hitch can extend a maximum of six inches (6") ahead of the furthest most front portion of the vehicle. The tow hitch will not be counted in the overall length when measuring a vehicle. The tow hitch must have a three inch (3") diameter hole positioned horizontally and be strong enough to push or pull the vehicle at its heaviest weight. The device is to be used for no other purpose.

### Drawbar Heights and Lengths and Angles

Drawbars cannot be shorter or higher than the specifications listed below. Drawbar lengths are measured from the center of the rear wheels to the point of hook.

<b>CLASS</b>	<b>HEIGHT</b>	<b>LENGTH</b>	<b>Degree</b>
Super Stock Tractors	20"	27% of wheelbase	
Pro Stock 4x4 Pickups	26"	36% of wheelbase	20 deg. max
Modified 4x4 Pickups	26"	30% of wheelbase	25 deg. max
Two Wheel Drive	30"	18"	
Super Stock Tractor	20"	18"	
<b>CLASS</b>	<b>HEIGHT</b>	<b>LENGTH</b>	<b>Degree</b>
Super Stock Tractor	20"	18"	
Modified Tractor	20"	18"	
Super Farm	20"	18"	
Diesel Pickups	26"	44"	
Semi (Stock & Modified)	18"	34" and 30% of wheelbase	

### **Clutches, Flywheels and Automatics**

1. All torque converters and automatic transmissions must have a blanket built to the same specs as a super stock tractor blanket. The blanket is to extend from the rear of the engine block to the front of the tail housing. The blanket must be fastened forward securely with two (2) straps on each side, one above the crankshaft centerline and one below the crankshaft centerline. The blanket should have six inches (6") of overlap. Straps must be two inches (2") wide with not more than one inch (1") spacing between each strap.
2. All pulling vehicles using an automatic transmission must be equipped with a positive reverse gear lockout.
3. All pulling vehicles using a clutch are required to have a steel plate or steel billet flywheel. The flywheels must be made out of steel with the following mechanical properties:
  - a. Tensile strength of 60,000 PSI
  - b. Yield strength of 40,000 PSI
 If aluminum is used, it must meet the same qualification. This rule includes all "out-of-field" tractors that desire insurance coverage at a NSPA event. Absolutely no gray cast metal allowed in any flywheel or clutch components.
4. All super stock tractors are required to have NSPA approved bellhousing blanket that meet the following minimum construction specifications:
  - a. 20 ply ballistic nylon or 20 ply Kevlar style 713 meeting construction
  - b. 17" wide and long enough to wrap around the bellhousing with at least a six inch (6") overlap
  - c. Secured with six 2" wide nylon web straps with steel D-ring on one end and sewn the length of the blanket (except for overlap area), and long enough to pass back through the D-ring and be tied in a saddle cinch
  - d. And with four 2" nylon web retaining straps each at the front and back of blanket.
 All super stock tractor's scatter blankets must be approved by NSPA officials prior to competing.

5. The flywheel, clutch and pressure plate components on all vehicles in all classes must be inspected by the NSPA official and/or NSPA tech committee prior to pulling in competition. Must have owner certification letter on file prior to competition at any event.
6. All Lenco type planetary transmissions must be covered with an approved blanket.
7. Clutch Automatics: clutch to be certified, and automatic to be covered with approved blanket from back face of clutch can to the tail shaft. Straps are to be fastened forward and to the rear of the clutch/flywheel assembly. All straps must be securely fastened and the blanket must be secure against the rear of the block.
8. Liners can be used and are highly recommended except as listed in this section.
9. Any vehicle using two blown or supercharged automotive engines, three naturally aspirated automotive engines, or any industrial marine or aircraft engine that is turbocharged or twin-staged supercharged on one clutch must use a liner in the bell housing.
10. Clutch can liner specifications:
  - a. Thickness to be 1/8" 4130 moly
  - b. Liner is to be secured to the can by drilling and tapping a single 1/4" hole through the bottom of the can so that the liner begins directly behind the starting right gear (if used). The liner must extend the full length of the can until the back of the clutch can begins to taper. If starter ring gear is not used, can liner must then extend from block saver plate rearward to where they can taper begins. Stand adjustment slot in liner should be cut directly under the slot in the can. Do not weld this piece of fillet metal to the stand adjustment slot cover.
11. No lightening holes allowed on transmission face of bellhousing except for one cooling hole. This cooling hole must not exceed one inch (1") in diameter on the face of the bellhousing. Refer to figure below for more information.
12. No chemical milling allowed.
13. The inspection/maintenance hole (I/m hole) in the bellhousing shall not extend farther forward at its top edge than flush with the cross-shaft hole nor farther downward at its bottom edge than to allow 1/2" bolt diameter edge distance for the fastening holes in both the bellhousing and I/m cover. The length of the I/m hole shall be no more than 8.5" (measured in a straight line) and the ends of the hole shall be smoothly and fully radiused to produce an oval shape.
14. There shall be twelve 5/16" grade 5 or better cap screws securing the cover to the bellhousing. The cover must have a plate or fillet that fits flush inside the housing. The cover and fillet must be steel. The fillet must be welded to the cover and all bolts must be flush to the inside.
15. There must be five (5) bolts (minimum 3/8" in diameter) used to secure the transmission to the bellhousing. Four-wheel drive trucks may have a minimum of four 1/2" bolts to secure the transmission to the bellhousing.
16. All bell housings must be flush on the inside surface.
17. All automotive type engines with bellhousing and clutches will run a full block plate, either a commercially available unit, or minimum of 3/16" steel or minimum 1/4" aluminum with five 3/8" grade 5 bolts evenly spaced on the bottom of the bellhousing.

18. Four additional bolts will be added to fasten bellhousing to block saver plate. These bolts are to be 3/8" grade 5 and between existing bolts on top half of bellhousing along with five (5) evenly spaced bolts between block saver and bellhousing on lower half.

### **Driveline Shielding**

1. All remaining drive train, excluding any additional manual transmission, must be enclosed in 5/16" minimum steel or 3/8" aluminum, round, inside diameter not to exceed two inch (2") more than the outside diameter of the largest universal joint, fastened every six inches (6") or closer, with 3/8" or larger bolts, grade 5, or butt and seam welded, and securely mounted to vehicle's frame. This applies to all vehicles with exposed drive shafts. No more than 1/4" of end of driveline shall be visible with driveline shield in place.
2. In all divisions, if U-joints are used in any drive shaft application, the shield must be 5/16" steel or 3/8" aluminum with 1/8" steel insert in aluminum. The insert must be a minimum of six inches (6") wide.
3. All automatic transmissions with torque converters must be completely covered, 360 degrees, with a safety scatter blanket meeting NSPA standard. This must be from the back of the engine block to where the tail shaft bolts to main housing of the transmission and securely fastened in place using all straps intended. The opening at the bottom of the transmission/torque converter housing must be enclosed in steel (stock steel cover is acceptable). Remainder of the drive train is to be covered as prescribed in this section (except for four-wheel drive trucks).
4. All modified tractor engine automatic transmission combinations must have two front motor mounts, two rear motor mounts, and a support saddle for rear transmission with 1/2" maximum clearance or two (2) front motor mounts, support saddle at rear of engine with 1/2" clearance and a mount at rear of transmission. This is to prevent engine or transmission from dropping if breakage occurs.

### **Chassis**

1. Modified tractors with frame bolted to transmission must also have the frame bolted to axle housings to prevent splitting of tractor. Must be of sufficient strength to support the weight of the tractor (with bolts removed from plate of transmission or rear end) in the heaviest class being entered.
2. All tractors must have wide front axles. Front wheels shall track with the rear wheels.
3. Maximum width of vehicle cannot exceed 8'6".
4. In all truck classes, air shock or air suspension-type devices are allowed as long as there are no lines or controls going to or from the device to the operator area.

### **Engines**

1. A deflection shield is required on both sides of all engines. Shield must extend the complete length of block casting and be securely fastened. It is to be made of aluminum or steel a minimum of 0.060" thick or safety blanket material. Shields must be solid-motor mounts, filters, steering rods, etc. cannot serve as part of the shield. Solid frame rails with no holes can serve as part of at all of the shield, providing it covers required areas of block casting.

2. Starter motors, fuel filters, oil filters and fuel injection pumps may not be used as shielding. Shielding may cover or pass behind starter and fuel pump,
3. Shield on all V and Y type engines (including marine or aircraft and super stock types) must extend from base of head of the uppermost point of piston, travel to two inches (2") below center of crankshaft throw, and be securely fastened.
4. Side shield must be mounted independent of the engine block. Motor mounts, block saver plate, and header mounting or chassis mounting is acceptable.
5. All blow-by tubes must exit forward of rear tires. Engine crank venting blow-by tubes must be vented below the head of that engine and extend down to the engine pan.
6. All pulling vehicles must be equipped with a deadman's throttle. All throttles working in a forward-rearward direction shall be closed in the rearward direction. No hydraulic throttle linkage allowed, it must be positive two-way mechanical linkage. All foot throttles must have a toe strap.
7. All injection or butterfly shafts on engines must have dual return-to-idle arms and springs, one on each side.
8. All automotive engines equipped with a harmonic balancer must be certified in writing by the NSPA Owners.
9. A bolt in the crankshaft to hold the dampener pulley is required.
10. All engine fans must be shrouded with steel 1/16" or thicker, 360 degrees. Electric fans are excluded from the shrouding rule.
11. Engines used in both automobiles and truck by manufacturers are classified as automotive.
12. The only accepted formula for calculation of cubic inch displacement on any piston type engine is  $0.785 \times \text{stroke} \times \text{bore} \times \text{bore} \times \text{the number of cylinders}$ .
13. Shields on all super stock tractor in-line engines will be from sheet metal (hood) to two inches (2") below bottom center of crankshaft throw, and be securely fastened. They may be louvered, but no expanded metal allowed.
14. Turbocharged engines will have two 3/8" grade 5 or better bolts through the horizontal portion of the exhaust. Bolts will intersect each other at 90 degrees, within one inch vertically.
15. All diesel-fueled vehicles must contain a three-way shut-off valve with return to the tank. This valve must be located between the supply pump and the injection pump, and must be manually controlled from the operator compartment.
16. All classes to be allowed 1% cubic inch variance during engine cubic inch tech procedure.

### **Exhaust Systems**

1. All exhaust systems must discharge vertically. Height to be a minimum of one foot above the bend in the pipe which discharges vertically measured from the top of the pipe to the bottom of the bend. All exhaust pipes must be securely attached. Vertical is defined as being within 20 degrees (in any direction) of being plumb.
2. No rain caps allowed.
3. Megaphone pipes are prohibited.
4. Venturi type headers are allowed.

- Turbocharged engines must have a two 3/8" grade 5 bolt in vertical portion of exhaust pipe(s), bolts to be installed 90 degrees to each other within one inch (1") of each other.

**Fuel and Fuel Containers**

- All forms of nitromethane (including nitrous oxide and propylene) are illegal as fuel or fuel additives. Legal fuels (see class rules for specific fuel restrictions) are alcohol, methanol, water, diesel fuel aviation gas, race gasoline, propane gas and turbine fuel. Combustion accelerators are not allowed.
- Methanol is a clear, colorless fuel with a mild odor at ambient temperatures. Methanol is sold in 2 U.S. Federal Grades, A and AA. Either grade is acceptable for use in NSPA competition, or competitors should ensure that the methanol they purchase meets Federal standards and purity with no additives with the exception of upper cylinder lubricant. The purity standards for each grade are shown below:

<u>Property</u>	<u>Grade A</u>	<u>Grade AA</u>
Methanol content, wt. percentage, minimum	99.85	99.85
Acetone and aldehydes, ppm, maximum	30	30
Acetone, ppm, maximum	--	20
Ethanol, ppm, maximum	--	10
Acid (as acetic acid), ppm, maximum	30	30
Specific gravity, 20/20 deg C	.7928	.7928
Permanganate time, minimum	30	30
<u>Odor</u>	<u>characteristic</u>	<u>characteristic</u>
Distillation range at 100kPA	1 C must inc. 64.6	1 C must inc. 64.6
Color, platinum-cobalt scale mix	5	5
<u>Appearance</u>	<u>Clear, colorless</u>	<u>Clear, colorless</u>
Residual on evaporation, g/100ml	.001	.001
Carbonizable impurities, color platinum-cobalt scale mix	30	30

3. To be considered legal, methanol used in the NSPA competition must meet Federal standards because impurities beyond the limits established in the Federal standards in the fuel will result in disqualification.
4. Competitors are cautioned to keep methanol containers tightly capped at all times to minimize the absorption of water. Competitors are encouraged to have their fuel checked for purity periodically.
5. NSPA official may check fuel at any event.
6. Pressurized fuels allowed in U.S. approved pressure tanks. No oxygen allowed.

### **Kill Switches**

1. All kill switches must be mounted independent of drawbar and/or wheelie bars.
2. All pulling vehicles must have an automatic ignition kill switch and/or air shutoff in working order at all times. Track officials and/or tech inspectors have the option of checking kill switches as many times as they feel adequate during the event. Switch must be checked with the engine running. The use of OHM meters and buzz boxes may be allowed, however, if there is any doubt of whether the device is installed properly, or the person using the device is not 100% certain of the readings he/she received, the pulling vehicle will be started to check the kill switch.
3. The kill switch must be located in the rear center of the vehicle (maximum of 6" off center in any direction) 24" above the point of hook.
4. All automatic type engines, Allison aircraft, marine, industrial engines, turbine or super stock tractor engines that are spark ignition types must use a waterproof, dustproof, tether-type safety stop switch as a kill switch on the competing vehicle.
5. On a spark ignition vehicle, the kill switch must break or ground the ignition circuit. On vehicles equipped with spark ignition engines and electric fuel pump(s), the kill switch must also break current to the fuel pump(s).
6. The break-away kill switches must have attached to them a minimum two inch (2") diameter solid ring with a minimum of 1/8" cross-sectional thickness. The cable from the sled will be attached to this ring.
7. Portion of the kill switch and mounting brackets must be able to withstand 32 pounds of pull per switch when pulled independently or collectively.
8. Kill switch ring must be secured with a single nylon tie strap (1/8"). For consistency, NSPA will supply the 1/8" tie straps during the tech inspection process at each event. The competitor will be responsible for placing the kill switch mechanism and securing the tie strap once a kill switch has been checked by tech officials.
9. If a vehicle has a kill switch or shutoff located in a legal position and it is pulled and the nylon strap broken during a pull, and the presiding official inspects it and finds the switch capable of operating properly under normal conditions, the vehicle will be allowed to repull immediately or drop six (6) positions. Decision to drop must be made before the vehicle leaves the track. It is the puller's responsibility to see that the switch is checked by the official before leaving the track.
10. All ignition engines must have a master shut off switch (in working order) for all motors. This switch must be within easy reach of the driver.

## **Safety**

1. If presiding official and the tech official feel a vehicle is unsafe, they have the right to prevent the vehicle from competing.
2. All pulling vehicles must be equipped with a minimum two pound (2 lb.) Type C fire extinguisher, fully charged, in working condition and convenient to the operator.
3. All drivers in all divisions must wear a helmet with chin strap fastened while pulling. If vehicle has an open driver's compartment, the helmet must have a full face shield. Helmets must meet or exceed Snell 2012 rating for helmets. Loss of helmets is cause for disqualification.
4. Fire suit gloves and fire suit shoes are required to complete in the event.
5. Fire suits are mandatory for drivers in all divisions. Fire suits must meet the following requirements:
  - a. Minimum of one-layer fire suit on Nomex 3 or equivalent with the exception of flip pulling vehicles not equipped with working doors that are recognized and operable from the inside and outside and complete firewall.
  - b. Drivers of these vehicles must wear three layers of fire protection (three-layer suit or two-layer suit with Nomex or equivalent fabric underwear).
  - c. Escape hatches will not be counted as working doors.
6. A competitor must be seated in the vehicle when the engine(s) are being started and running and have complete control of the vehicle at all times.
7. A reverse safety light system is required on all pulling vehicles. A white automotive-quality light that is a minimum two inches (2") in diameter must be mounted directly above or below the safety kill switch at the rear of the vehicle. A light in the driver's compartment must be operated off the same system. Both lights are to be activated by a shift lever such that it will be lit only when the vehicle is in neutral gear.
8. All pulling vehicles must be equipped with a starter interrupter in the gearshift which allows the starter to engage only in a neutral gearshift position.
9. Roll cages are required on all open cab vehicles. Roll cages will be 1-5/8" minimum in diameter with 0.120" wall. They will consist of a minimum of 2 loops and 2 braces which attach the main structure.
10. All drivers must wear a lab belt or harness (preferred) while competing.

## **Seats and Fenders**

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 4" above the edge of the seat, must extend a minimum of ½ the distance from the back of the seat to the front edge, minimum strength equivalent to ½" pipe. If fenders are 6" or more above the seat and are 6" or less from the seat, no seat side rails are required. Seats will be thoroughly inspected by the tech officials.
2. All modified tractors are required to have fenders and/or a shield between driver and any part of the rear tire. Must curl a minimum of 6" from vertical out over the tire. Fenders or shields must be able to support the weight of the driver.

3. Fenders or tire shields must be constructed so that when the driver is seated and the hands are on the wheel, he/she cannot touch the rear tire with any part of the body.
4. All super stock tractors must have a shield between the driver and tire (not necessarily a fender) to consist of a solid barrier between the driver and any part of the rear tires to be able to support weight of driver. The barrier must be a minimum of six inches (6") wide at the bottom, increasing to a minimum of 36" wide at the top and the barrier must curl a minimum of six inches from vertical out over the tire in the configuration as the tire.

#### **Stabilizer (Wheelie) Bars**

1. For tractors, stabilizer bars are required. The drawbar and drawbar assembly cannot be attached to the stabilizer bar assembly.
2. On modified tractors where the hitch and wheelie bars are connected to the same frame, the wheelie bars must be fastened at least four inches (4") ahead of the hitch.

#### **Supercharger/Turbocharger**

1. PSI or screw-type superchargers will not be allowed in any class.
2. Supercharger restraints will be mandatory in all applicable classes.
3. All turbochargers not under the hood must be completely shrouded (except for inlet and exhaust pipes) with steel 0.060" or thicker. Turbocharger(s) under fiberglass (except for inlet and exhaust pipes).
4. All intercoolers located outside the normal engine shielding must be shielded to same as turbochargers not under the hood with 0.060" or thicker steel.
5. All supercharger drive components must be shrouded in the top and sides with 0.060" metal, the shield is to be wider than the drive belt or chain and securely mounted. Blower shield must be wider than all components (idler, pulleys, etc.).
6. Shield must start on the center line of supercharger housing and extend five inches (5") rearward only allowing notching to fit around accessory components.
7. Shield must extend eight inches (8") centerline of blower housing and notched only for accessory components (such as air boxes).
8. On the front edge of the shield, there will be a rolled lip extending inward one inch (1").
9. Shield will be 3/8" steel bolted every 2" or closer, 3/8" bolts or larger, grade 5 or better. Shield to start at bottom of blower housing. Holes or notches allowed only for accessory components. Shield must maintain its integrity.
10. On all pulling vehicles, the tubing in the pressure side of turbocharger to the intake must be under the hood or side shields, or be bolted or strapped securely.

#### **Tires**

1. Contests are open to pulling vehicles with rubber tires. No dual tires, tire studs, or chains permitted. All power must be transmitted through the wheels.
2. All new tires and/or tires sizes other than what is currently being used in NSPA competition must have prior NSPA Owners approval prior to being used.

#### **Tire/Rim Safety Warning**

All tire/rim assembly may burst with explosive force causing serious injury or death if:

- a. 35 PSI cold inflation pressure is exceeded.
- b. The rim is welded without the tire first being removed.
- c. The tire is drilled or screwed onto the rim.

### **Weights**

1. Weights must be securely fastened and no transfer of weights while vehicle is moving will be allowed.
2. Weights must not extend rearward beyond tires (except in two-wheel drive trucks).
3. Any ballast weight lost while hooked to the sled and under the green flag will be cause for disqualification. If weights touch the ground although they may still be attached to the pulling vehicle, the pull will be disqualified (internal breakage excepted).

### **Fuel and Brake Lines**

All lines passing past clutch or bellhousing must be outside of frame or incased in heavy wall tubing.