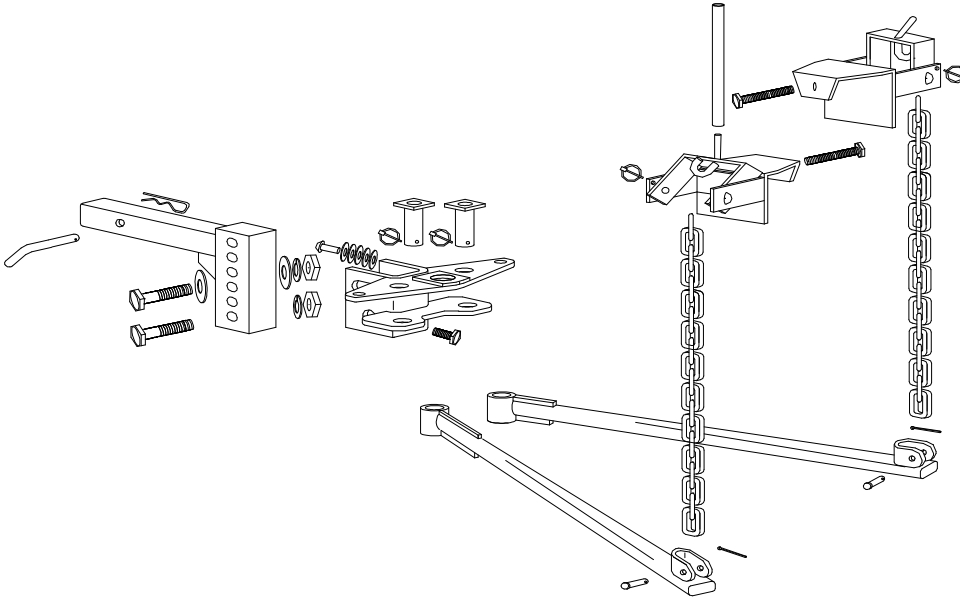


DSP Trunnion Style Weight Distribution Systems

Installation & End User Guidelines

Function of Weight Distribution Systems:

When the trailer is coupled onto the towing vehicle the tongue weight (T.W.) will commonly cause the rear of the towing vehicle to squat and the front end to lift causing a rough ride and limiting the towing capacity as well as steering ability. The use of the Weight Distribution System will relieve the downward force on the rear axle and distribute the T.W. of the trailer evenly to all axles of the towing vehicle producing a smoother and safer ride.



WARNING!

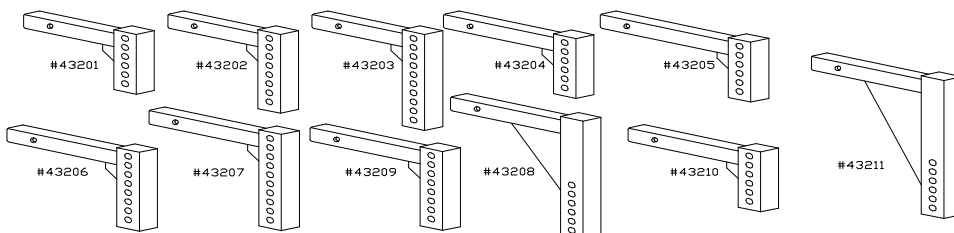
To increase the towing capacity of the hitch system from the weight carrying (W.C.) to the maximum weight distribution (W.D.) the end user must recognize and understand the limitations of the towing vehicle and the weight capacities (W.C. & W.D.) of the bolt on hitch receiver that is installed directly to the frame of the towing vehicle. Use the correct hitchball rated for the W.C. rating, and always use the torsion bars while towing.

Hitch Ratings (Found on the bolt on hitch receiver)				Weight Distribution System Rating when torsion bars:				DSP WD System Hitch Required Item #
W.C. (with ball mount)		W.D. (with weight distribution)		are not use during towing		are used during towing		
G.T.W.	T.W.	G.T.W.	T.W.	G.T.W.	T.W.	G.T.W.	T.W.	
4,000 lbs	400 lbs	4,000 lbs	400 lbs	4,000 lbs	400 lbs	3,500-4,000 lbs	350-400 lbs	42153
4,000 lbs	400 lbs	6,000 lbs	600 lbs	4,000 lbs	400 lbs	4,001-6,000 lbs	401-600 lbs	42154
6,000 lbs	600 lbs	8,000 lbs	800 lbs	6,000 lbs	600 lbs	6,001-8,000 lbs	601-800 lbs	42155
8,000 lbs	800 lbs	10,000 lbs	1,000 lbs	6,000 lbs	600 lbs	8,001-1,000 lbs	801-1,000 lbs	42156

Warning: To achieve maximum rating the torsion bars must be used at all times while towing, Failure to do so will cause damage to the bolt on hitch receiver and may cause damage to the towing vehicle frame.

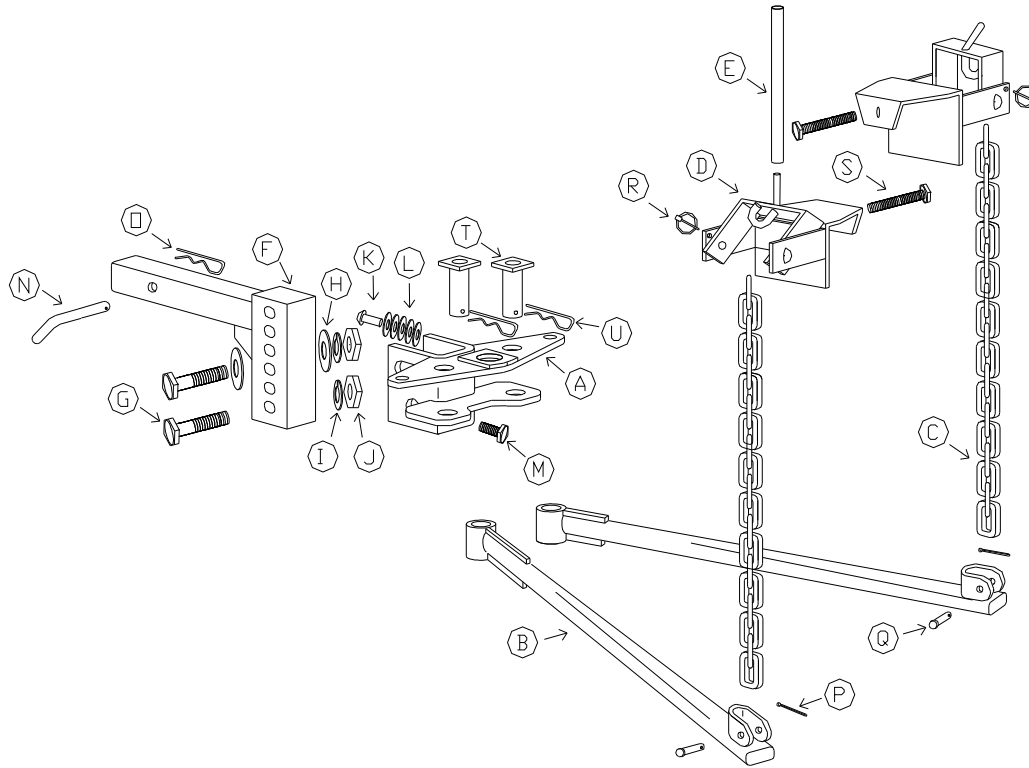
DSP Options: Weight Distribution Systems Bolt On Adjustable Shanks

For the best towing result, the user should achieve to have the towing vehicle and the trailer frame parallel to ground level while towing. Due to the large variety of towing vehicle options combined with an expanding variety of trailer options, DSP offers 11 different adjustable shanks available with greater drops or rises and various shaft lengths (extending it further from the bumper). The installer or end user must establish which shank will give the best results (for optimum results select a shank that is closest to the bumper of the towing vehicle).



See following page for dimensions.

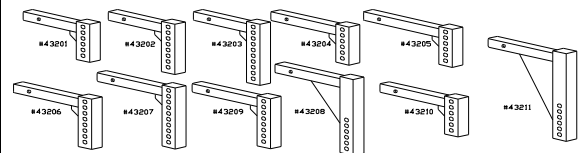
Weight Distribution Parts Identification and DSP Terminology



Terminology	Weight Capacity	Part #	Reference #	Quantity supplied	Fasteners (Bolt Pack #43751)	Part #	Reference #	Qty supplied
Classic Head	400-1,000	43441	A	1	Flat Washer 1/2, Plated	FFW0001	L	6
Torsion Bar	400	43541	B	2	Flat Washer 3/4, Plated	FFW0002	H	2
Torsion Bar	600	43542			Hex Bolt 3/4 x 4 1/2, Grade 5, NC, Plated	FHB0051	G	2
Torsion Bar	800	43543			Hex Bolt 5/8 x 2, Grade 5, UNC, Plated	FHB0041	M	1
Torsion Bar	1,000	43544			Hex Nut 3/4-10 Grade 2, N.C Plated	FHN0013	J	2
Chain Pack (incl. 2x5/16" Chain 17)		43765	C/P/Q	1	Lock Washer 3/4, Grade 5, Plated	FLW0007	I	2
Clamp (incl. Set Screw and Lynch Pin)		43604	D/S/R	2	5/8" Pin & Clip	FPN0001	N/O	1
Handle		43737	E	1	1-1/4x1-5/8x1/2 Rivet	FRI0001	K	1
Adjustable Shank (see below)		Varies	F	1				
Trunnion Pin set with clip (set of 2 pins & clips)		43767	T/U	1				

Adjustable Shank options:

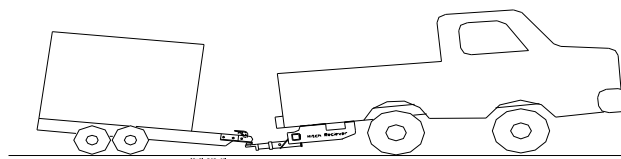
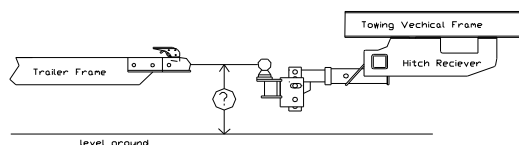
Item #	Drop	Rise	Length	Holes	Receiver Size
43201	2"	7"	10"	6	2" x 2"
43202	4"	9.5"	10"	8	2" x 2"
43203	7"	12.5"	10"	10	2" x 2"
43204	2"	7"	12"	6	2" x 2"
43205	2"	7"	14"	6	2" x 2"
43206	4"	9.5"	12"	8	2" x 2"
43207	7"	12"	12"	10	2" x 2"
43208	10"	15"	12"	6 DD	2" x 2"
43209	4"	9.5"	14"	8	2" x 2"
43210	2"	7"	16"	6	2" x 2"
43211	13"	18"	14"	6 XD	2" x 2"



DD: Deep Drop, equivalent to a 12 hole

XD: Extra Deep Drop, equivalent to a 14 hole

Establishing the Correct Heights



- 1) Line up the towing vehicle and trailer on level ground in the straight ahead position, uncoupled.

Note: For vehicles with air springs, air shocks or automatic levelling systems check for vehicles owner manual or any other instruction on these options, unless otherwise indicated. Deflate the air springs or shocks to the minimum recommended pressure before assembling the Weight Distribution System.

- 2) Establish the trailer coupler height: Measure and record the height of the front and rear bumpers of the towing vehicle to the level pavement.

Front bumper to pavement: _____

Rear bumper to pavement: _____

- 3) Establish hitch ball height: Using the towing vehicle uncoupled height (measured in step # 2) the hitch ball should be set higher than the trailer's coupler height to accommodate the towing vehicle squat when both units are attached. For vehicles with heavy or stiff suspension such as trucks add a 1/16" to the trailer coupler height measured in step # 2 for every 100 lbs of trailer tongue weight. For cars and wagons or lighter suspensions add 1/8" for every 100 lbs of trailer tongue weight.

Established ball height: _____

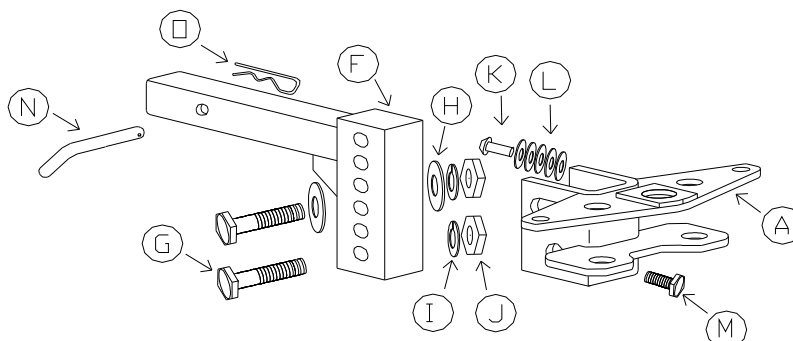
- 4) Install Adjustable Shank: Install the shank into the bolt on hitch receiver that is fastened to the rear of the towing vehicle frame. Fasten in place with the supplied 5/8" hitch pin and clip. Depending on the application, the adjustable shank may be placed in the upward (rise) or downward (drop) position.

Note: If the shank is in the downward (drop) position check for adequate ground clearance.

- 5) Selecting and installing the correct Hitchball: When selecting a hitchball match the ball size with the diameter of the trailer's coupler and ensure that the hitchball's rating has the right towing capacity that will meet or exceed the trailer's gross trailer weight (G.T.W.). ONLY use hitchball that has the correct hitchball shank diameter. (DSP DOES NOT recommend the use of bushings and if used will void warranty on the system). **Important:** If the trailer has an underslung or reverse coupler, please refer to the section in Towing Tips on page 6. Mount the hitchball into position but do not tighten the ball.

- 6) Position and mark the weight distribution head and ball onto the shank into the nearest vertical hole for the height established in step # 3.

- 7) Place 4 x 1/2" flat washers (L) on the 1-1/2 x 1-5/8 x 1/2" mushroom shaped rivet (K). Insert the rivet into the upper non-threaded hole located on the weight distribution head as shown in diagram to the right. The number of washers may be changed later depending on the requirements.



Please see parts reference on page 2

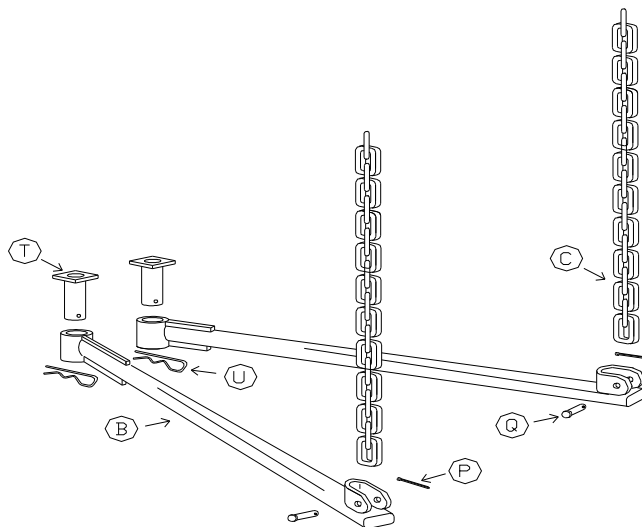
8) Place the weight distribution head onto the shank in the marked position with the 3/4" bolt (G) placed in the lower hole confirming the head's tilt. With the head tilted the hitchball should sit in a vertical position. If the hitchball does not sit vertically remove some washers installed in step # 7 until the hitchball sits vertical. Hand tighten the 3/4" bolt, lock washer and nut. Fasten the head and shank together with the remaining 3/4" bolt, flat washers, lock washers and nut, do not tighten.

9) Push the head up against the rivet and tighten fasteners in this position to 250 FT/LBS torque, tighten the hitchball to the manufacturer's specifications.

10) Assemble the torsion bars (B) and chain (C) attaching them with the clevis pin (Q) and cotter pin (P). See diagram at right.

11) Position torsion bar (B) in head and drop trunnion pin (T) from the top through the head channel and torsion bar. Secure trunnion pin in place with hair pin clip #9 (U). Repeat with other torsion bar.

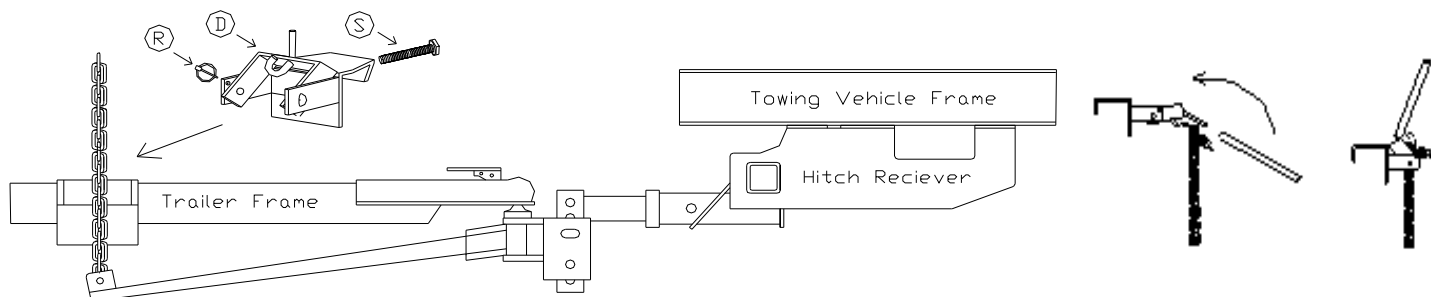
12) Attach the trailer to the hitchball and head assembly by lowering the coupler down onto the hitchball with the tongue jack. Engage the locking mechanism of the coupler.



Lift Clamp Installation:

Note: The DSP weight distribution system is designed for use with "A" frame tongues. On trailers with narrow or single pole frames an additional "single pole adaptor" (item # 43811) is required. For trailers with side mount swivel jacks an additional off-set adaptor is required. Ask a retailer for availability.

13) To position the clamps, the bar must be attached to the head assembly (as described in step 11). The weight distribution bars should be on a slight downward angle to the trailer tongue. Hold the chain straight up beside the trailer frame. Situate the chain in the center of the clamp as shown in the diagram below. Mark the required location of the clamp onto the trailer frame.



Warning: If the chain is angled while in the engaged position on the clamp, it may cause binding or buckling while turning, causing damage to the clamps or bars. This will void the warranty of the weight distribution system!

14) Attach the clamp to the frame with the 1/2" x 4" hex bolt (S). Thread the bolt through the clamp until the bolt contacts the frame. Give an additional 1/4" turn with a wrench. DO NOT OVERTIGHTEN THE HEX BOLT. DO NOT USE AN IMPACT WRENCH as this would void the warranty!

Hooking up the Torsion Bars:

15) Once the weight distribution head is connected properly to the towing vehicle, proceed to hook up the torsion bars.

16) Hook up the bars as described in step 11.

17) Swing the torsion bars towards the trailer and place them under the clamps

Note: If the trailer and towing vehicle are requiring additional levelling, use the different links on the torsion bar chain. More information can be found under section "Engaging of the Clamps" below.

Engaging/disengaging of the Clamp

Warning high tension:

Due to the tension on the clamping system while engaged, proceed to lower the handle and hook or disengage with caution and attention. Maintain control of the lift handle at all times!

Reduce the tension:

Before trying to engage the clamps for the first time, ensure the clamps are installed correctly. In order to (a) reduce the physical requirements needed to engage and (b) to reduce the risk of injury, reduce the tension on the torsion bars by lifting the front of the trailer to reduce the tongue weight by jacking up the trailer frame with the trailer jack while the trailer coupler is hooked up to the hitchball (refer to step #12)

First time engaging of lift clamp

18) With the trailer jacked up so that trailer tongue and head assembly sit level to the ground, extend the bar chain straight up past the lift clamp. Ensure clamp is in locked (up) position and slip the closest link over the curved portion of the clamp hook. **!!!When choosing the closest link let both connecting chain links drop to the lower end of the selected link and hook the upper end onto clamp!!!** Repeat on other side. Slowly lower the trailer tongue jack to place pressure on the weight distribution system.

Adjustment of the Torsion Bars (if required)

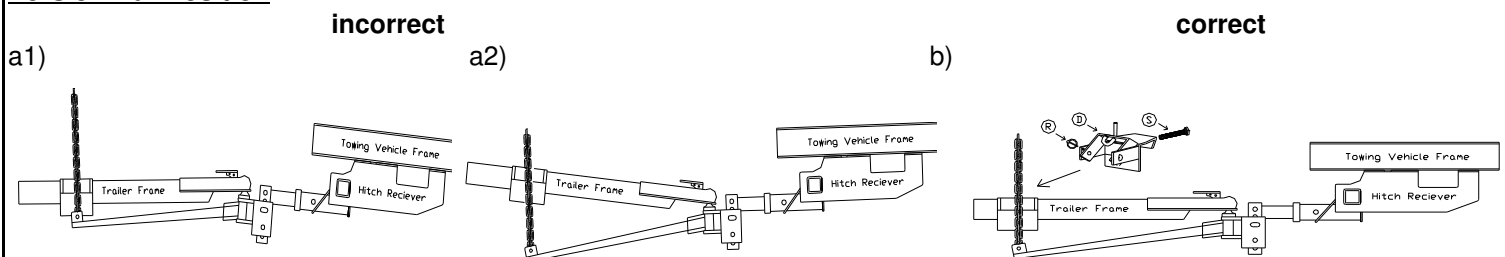
a) The vehicle frame should be parallel to ground level (within 1/2"). Remeasure the towing vehicles front and rear bumper height as done in step #2.

a1) If the front bumper is much lower than the rear bumper's original measurements, increase the number of chain links between the hook up clamp and torsion bar. As shown in illustration a1) over-torquing the bars may cause damage to the bars/head/keyway of the weight distribution system and will void the warranty of the system.

a2) If the rear bumper is much lower than the front bumper's measurements, decrease the number of chain links between the hook up clamp and torsion bar.

b) When the vehicle has settled evenly and the correct torsion bar position is achieved, mark the chain link for future reference.

Torsion Bar Position



Future engaging or lifting of the lift clamp:

- 1) Slip the required or marked chain link over the lift clamp hook. Ensure the two other chain links attached to the marked link hang in the lower portion of the chain link while the upper portion of that chain link is being placed over the clamp hook.
- 2) Place the hook-up handle on the straight position of the hook.
- 3) Using the handle for additional leverage, lift the hook up and over the pivot point (rivet) so the chain is engaged resting on the clamp bracket.
- 4) Lock the clamp into position using the supplied lynch pin (R).

Disengaging or lowering the lift clamp:

- 1) Remove the locking lynch pin (R) from the lift clamp.
- 2) Place the hook-up handle on the straight position of the hook.
- 3) Using the handle for additional leverage, lift the hook up over the pivot point (rivet) so the chain is loose and removable.

Towing Tips:

Choosing the right hitchball for your coupler

Choosing the right hitchball for your weight distribution system will depend on the coupler of your trailer. Always use the right hitchball diameter size. In addition, if you have an underslung or reverse coupler, it is highly recommended to use a hitchball with EXTRA LIFT to provide additional space between the sides of the coupler and the weight distribution head. Insufficient clearance will cause damage to the weight distribution head and shank during turns or while travelling on rough and uneven terrain. Such damage is not covered under DSP warranty.

Check equipment and fasteners periodically

If there are damaged parts they should be replaced, cleaned, removed and rusted parts be repainted.

Remove hitch when not in use to prevent:

theft, contact with driveways with high grades or other objects when not towing, and to reduce premature rusting. ALWAYS store the trunnion pins inside your bars and NOT the head assembly. DSP sells head assembly replacement kits, however, trunnion pin set is sold separately.

Driving a Towing Vehicle:

The additional weight of the trailer will affect acceleration and braking. Extra time should be taken for passing, stopping and changing of lanes. Signal well in advance of maneuvering to let other drivers know of your intentions. On rough terrain or severe bumps reduce speed while travelling. If the towing system "bottoms out" or is suspect of damage in any other way, stop and inspect the towing system, correct or replace if necessary.

Trailer Loading:

Proper loading is important. Heavy items should be placed close to the floor and near the axle. The load should be balanced side to side and firmly secured to prevent shifting. The tongue weight should be between 10-15% . Too low of a percentage of tongue weight will often produce a tendency to sway or give a bumper ride.

Manufacturer's Recommendations:

Read the owners manual of the towing vehicle and trailer for any specific recommendations on tow capacities and any other requirements.

Passengers in trailers:

Trailers should not be occupied while towing under any circumstances!

Trailer lights:

Always hook up and confirm the correct connection of the signal and brake lights as well as brake-away switch before towing. Even on short trips.

Tow Regulations:

Regulations will vary from jurisdiction to jurisdiction, provincial or state. Become familiar with the towing regulation of your travel destinations to avoid fines or delays.

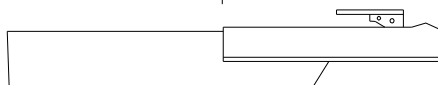
Tire Inflation:

Unless otherwise specified by the towing vehicle and trailer, tires should be inflated to the maximum requirements.

Maintenance:

- 1) Keep all parts of your weight distribution system free of dirt and clean before travelling.
- 2) Maintain the good appearance of the weight distribution system by cleaning and painting all parts to prevent rust.
- 3) For ease of operation of lift clamps clean the pivot pints (near rivets) with a dry brush.

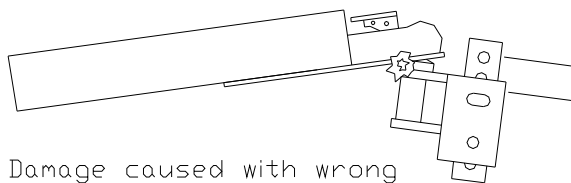
Standard Coupler



Underslung or Reverse Coupler



Warning: use correct hitch ball



Damage caused with wrong hitchball will not be covered under warranty

Before towing

- 1) Clean the hitch ball and the coupler socket. Lubrication can be achieved by using a graphite spray available at most automotive stores.
- 2) Check for wear on the torsion bar chain 3/8" clevis pin (Q), replace if necessary.
- 3) Check all fasteners for proper tightness and that the lynch pin (R) for the lift clamps are in place while engaged.
- 4) Confirm that the 5/8" hitch pin (N) is secure with a clip (O).
- 5) Tighten the 3/4" fasteners to 260 FT/LBS (G/J).
- 6) Hand tighten the 1/2" lift clamp bolts (S) with an additional 3/4" turn.
- 7) Confirm that the electrical hook up is functioning correctly by testing the brake and signal lights.
- 8) Connect the safety chains and brake-away switch to the towing vehicle hitch receiver.

Note: DO NOT grease the weight distribution head or bars as this will create a grinding compound and cause excessive wear. This will void the warranty of the weight distribution system!

Surge Brakes:

Some surge brake actuators are not designed for use with Weight Distribution Systems. Check your surge brake operating instructions for any specific requirements regarding the use with weight distribution systems.

Caution!!!

Use extreme caution when backing up and turning. Do not allow towing vehicle and trailer to maneuver into the "jack knife" position. Components of the hitch and sway control, if used, may be forced into a damaging contact. If the "jack knife" position is unavoidable and occurs, examine all towing system parts for damage, repair or replace before resuming travelling. For best results loosen or remove sway control systems while backing up and maneuvering. Please consult your manufacture's manual for more information.

Ask for Weight Distribution System Accessories

Sway controls: Are intended to reduce the sway from sudden manoeuvres, wind gusts and buffeting from passing or on-coming vehicles which will increase with the size of the surface area of the trailer. The DSP weight distribution system is designed to accept one or two sway control units based on the preference of the driver.

Single pole tongue adapter: trailers that are built with straight single pole (instead of an "A" frame). An adapter will be required to mount the lift clamps onto the trailer frame.

Swivel jack adaptor: trailers built with side mounted swivel jacks (instead of "A" frame jacks) will require an adapter to mount the lift clamps onto the trailer frame to avoid the side mounted jack.

Bolt on hitch receivers: to use a weight distribution system a frame mounted receiver must be installed directly to the towing vehicle frame (not the bumper) and must be rated with the correct towing capacity to achieve maximum rating of the weight distribution system. DSP currently produces a large variety of receivers for various towing vehicles.

Thank you for purchasing a DSP product and supporting Canadian manufacturers.