

**Suggested enclosures**

For those who want to build their own enclosures but don't want to go through the design process using driver parameters, Peavey provides the following optimized designs:

**For Low Rider 18:**

ENCLOSURES	Net volume cubic feet/liters	Vent diameter (qty) inches/mm	Vent length inches/mm	V <sub>b</sub> box tuning frequency in Hz	F <sub>3</sub> , -3 dB point in H
Small Vented Box	5.0 / 142	(2) 6" / 152	15.25 / 387	37	40
Medium Vented Box	6.75 / 191	(2) 6" / 152	12.75 / 324	34	35
Large Vented Box	9 / 255	(2) 6" / 152	12 / 305	30	31
Single-Reflex Bandpass	Sealed: 4.0 / 113 Vented: 3.5 / 85	(2) 6" / 152	5.0 / 127	65	40 ~ 104

- Small Vented Box**  
This enclosure is as small as many 15" cabinets but has better bass performance and handles tons of power. This design is an excellent choice for large touring systems because it can handle a large number of enclosures at the same load-out volume.
- Medium Vented Box**  
This enclosure offers an exceptional combination of deep bass extension, high power handling and reasonable size. It is capable of extremely high output below 40 Hz.
- Large Vented Box**  
This box produces superb performance in the bottom octave for high level playback, movie theaters, special effects and permanent installation. It reduces power handling by at least 15% but offers usable output to 25 Hz.
- Single-Reflex Bandpass**  
This special design uses the enclosure as an acoustic filter for shaped response. It's not as efficient as a vented system, but it doesn't require a crossover for sub-woofer use.

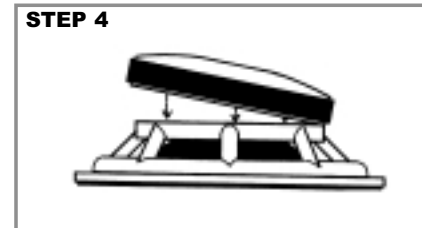
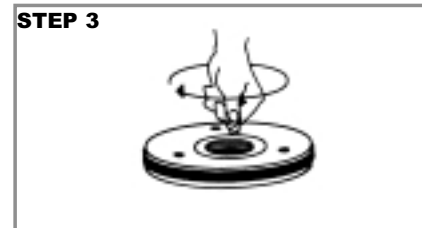
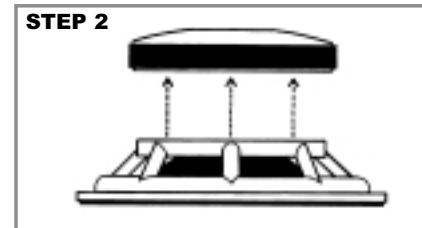
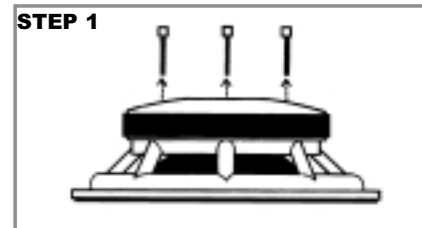
**For Low Rider 15:**

ENCLOSURES	Net volume cubic feet/liters	Vent diameter (qty) inches/mm	Vent length inches/mm	V <sub>b</sub> box tuning frequency in Hz	F <sub>3</sub> , -3 dB point in H
Small Vented Box	2.0 / 56.6	(2) 4" / 102	12 / 305	45	48
Medium Vented Box	3.0 / 85.0	(1) 6" / 152	12-3/4 / 324	38	40
Large Vented Box	4.5 / 127.4	(3) 4" / 102	12-5/8 / 321	34	33
Single-Reflex Bandpass	Sealed: 1.8 / 51.0 Vented: 1.3 / 36.8	(3) 6" / 102	9-3/4 / 248	78	45 ~ 131

- Small vented box**  
This incredibly tiny enclosure has good bass performance and serious power capacity. An excellent choice for very compact, high powered systems and bass guitar/keyboard enclosures.
- Medium vented box**  
This enclosure is an exceptional compromise of deep bass extension, high power handling, and compact size. It is capable of extremely high output to below 40 Hz for excellent performance.
- Large vented box**  
The large vented box extends superb performance into the bottom octave for high level playback, movie theater, special effects and permanent installation. The enclosure reduces power handling by at least 15% but offers usable output to below 35 Hz.
- Single-Reflex Bandpass**  
Special enclosure design that uses the enclosure as an acoustic filter for shaped response. Not as efficient as a vented system, but it doesn't require a crossover for subwoofer use.

**REPLACING THE SPEAKER BASKET ASSEMBLY**

- Prior to the replacement procedure, clean the work area of all metal objects and other debris.
- With the speaker laying face-down, remove the three screws on the back of the magnet structure with a 7/16" nut driver.
- After the screws are removed, lift the magnet structure off the basket frame.
- Clean the voice coil "gap" before the magnet structure is placed on the new replacement basket (see illustration). Fold a piece of masking tape onto itself several times, sticky side out, and insert it into the voice coil "gap." Run it all the way around the "gap" several times to remove all particles and other trash before placing the magnet structure on the new replacement basket.
- Holding the magnet structure in a slanted position, gently lower the structure down into the basket so it rests inside the magnet structure counter bore, align the screw holes and lower the structure into place. Insert screws and tighten.



**ONE YEAR LIMITED WARRANTY**

**NOTE:** For details, refer to the warranty statement. Copies of this statement may be obtained by contacting Peavey Electronics Corporation, P.O. Box 2989, Meridian, MS 39335

Nomex is registered trademark of DuPont

Rubatex is a registered trademark of Rubatex Corporation



Features and specifications subject to change without notice.

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# SPECS

PEAVEY ELECTRONICS

**Peavey Low Rider® 18  
00479910  
Peavey Low Rider 15  
00493710**



**INTRODUCTION**

The new Low Rider driver series represents a milestone in high-powered sub-woofer design. An incredible 1,600 Watt program rating and extra-long cone excursion provide maximum amounts of amazingly clean, deep bass.

The Low Rider is a superior choice for the bottom end of any high-powered sound system, from DJ rigs to the largest professional touring shows.

**DESIGN**

The Low Rider utilizes a variation on the existing Kevlar®-impregnated cones used on all Black Widow® speakers. The new cone is stronger and tougher and uses an innovative asymmetrical-M surround for superior excursion and motion control.

High quality spring terminals accepting large gauge wire are attached to large diameter, high-current tinsel leads with silver solder to withstand high currents, high temperatures and long excursion.

The massive new voice coil uses polyimide-insulated copper ribbon wire, edge-wound and bonded onto an incredibly durable and heat-resistant polyimide composite former. The coil's winding length of 1.150" is an amazing 80% longer than Peavey's standard Black Widow coil. The long coil has much more surface area to dissipate heat, and its increased length drives the cone to a far higher excursion. The coil is overcoated with a tough thermoset epoxy for added durability, abrasion resistance and heat dissipation.

The coil wires are solderless diffusion welded to high-conductivity OFHC copper ribbon leads, which are embedded inside the former assembly and soldered to the tinsel leads with high temperature silver solder. The solder joint is then coated

with a special, thermally conductive silicone adhesive for encapsulation and heat dissipation.

The voice coil assembly is bonded to the existing Kevlar®-impregnated cones used on all Black Widow® speakers. The new cone is stronger and tougher and uses an innovative asymmetrical-M surround for superior excursion and motion control. High quality spring terminals accepting large gauge wire are attached to large diameter, high-current tinsel leads with silver solder to withstand high currents, high temperatures and long excursion. The magnet structure is all-new and was designed using extensive Finite Element computer modeling. The back plate/pole piece is cold-forged from a single massive billet of ultra-low carbon steel, includes Peavey's patented Focused Field Geometry and is undercut to allow greater coil travel. The pole is extended beyond the front plate to improve coil cooling and make it more magnetically linear, and the front plate is 10 mm thick to match the long voice coil and provide a better path for heat and magnetic energy. The result is 50% more total magnetic gap energy than can be found in the standard Black Widow Super Structure magnet assembly.

The cast aluminum frame is tough and rigid and has the strength needed to hold the cone and huge magnet assembly in perfect alignment. The deep dish design and large spider clearance make high excursion and high output possible. These dynamic new drivers also utilize the user-friendly Black Widow replaceable basket assemblies with Rubatex® gaskets. The result of these specially designed components are truly amazing loudspeakers. The Low Rider's astonishing low frequency output is due to its high power handling capability and its 1.4" of available cone movement. These speakers can also be used with small enclosures, adding a new dimension to compact, high output sound reinforcement systems.

A patent-pending vent plate greatly improves voice coil cooling. This heat-conductive, ported and finned aluminum ring delivers cool air pumped by the spider directly to the voice coil to keep operating temperatures under control. The improved cooling increases power handling and reliability and reduces power compression.

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## APPLICATIONS

The Low Rider® is specifically designed for sub-woofer use, with extremely high output capabilities and massive power handling. While most sub-woofer applications are below 150 Hz, it is usable to frequencies as high as 500 Hz.

The compact enclosure designs are ideal for instrument amplification and high portability applications such as DJ and small touring bands. They provide solid bass performance in extraordinarily small enclosures. Bandpass enclosures also fit into this range as stand-alone sub-woofers.

The medium-sized enclosures are still smaller than usual and have more bass extension and much higher output capabilities than conventional designs. They are excellent choices for high performance sound reinforcement. These designs are the best combination of size and bass performance.

For permanent installations and applications requiring extremely deep bass performance, the large vented enclosures are ideal. The low frequency extension and high sound pressure levels these systems can produce is astounding. As is typical in large, vented systems with low vent tuning, power handling is reduced by at least 15% due to the increased cone excursion.

Due to the Low Rider's high output capabilities, excessive levels may cause structural damage to buildings or induce permanent hearing loss, nausea, vertigo or intestinal disturbances in listeners. Please be cautious when setting maximum sound pressure levels.

## ENCLOSURES

To assist with the growing interest in home-built enclosure designs, Peavey includes complete parameter data on these drivers and also provides the user with several recommended enclosure designs. This information and much more can be found at [www.peavey.com](http://www.peavey.com).

The 18" Low Rider driver performs best with vented enclosures between 5 and 9 cubic feet (142 to 255 liters) and vent tunings from 30 to 45 Hz. The Low Rider 18 is optimized for vented systems but will also work with appropriate single-reflex bandpass enclosures. Sealed, infinite baffle, horn, transmission line and dual-reflex bandpass enclosures are not recommended.

The Low Rider 15" driver works best in vented enclosures between 2 and 5 cubic feet (56.6 to 141.6 liters) and vent tunings from 34 to 45 Hz. It can also be used in certain single-reflex bandpass designs. As with the Low Rider 18, sealed, infinite baffle, horn, transmission line and dual-reflex bandpass enclosures are not recommended.

Active filtering must be included with amplifiers greater than 750 Watts. This filter should be a high pass 24dB Butterworth at a minimum of 25 Hz for the 18" and 32 Hz for the 15". Filtering is also recommended below 750 Watts in order to conserve amplifier power and reduce excessive cone motion. Failure to use filtering with high power operation may cause driver damage that can void your warranty.

Enclosures should be built of quality 3/4" to 1-1/4" (20mm to 32mm) marine, 7-ply birch or other high-grade plywood. If you must use construction-grade plywood, inspect each sheet thoroughly and use grade BC or better. Do not use plywood thinner than 3/4". Other materials such as particle board and MDF are not acceptable.

Use a quality wood glue and fit joints tightly. Dado corner joints are highly recommended. Wood screws or a pneumatic nailer should be used to assemble the enclosure during gluing to maximize joint strength.

Strength of the completed enclosure has a great effect on the bass performance of the finished system. Internal bracing is required to improve the structural strength of the cabinet. Low Riders can generate enormous forces inside the enclosure, and panels that aren't stiff enough will vibrate – reducing bass and creating undesired sounds of their own. If your cabinet vibrates or if the cabinet panels are not stiff enough, add more bracing.

Vents shown in the examples require standard Schedule 40 PVC pipe for vent construction. The pipe should be dadoed tightly into the back of the baffle and glued firmly in place with high quality epoxy or high strength industrial-grade hot glue. Roughen up the outside of the pipe to improve the glue bond. Radius the insides of the vent ends to improve air flow and reduce vent noise.

Vents for these enclosures are much longer than typical for a sound reinforcement sub-woofer. This reflects the special characteristics of the Low

Rider's design that make it possible to combine a large, high excursion woofer with an unusually small enclosure. For best performance, the inside ends of the vents should be a distance of at least one vent diameter from any interior wall of the enclosure. The vent should be straight, without elbow fittings or other methods to bend it for greater length. Vent diameter should not be decreased, as high air velocity will result in noise and reduced power handling.

Be sure to allow for the displacement of the vent, bracing and woofer in your enclosure design before building it. Mistakes in net volume will mis-tune the enclosure and can drastically reduce performance. This requires a considerable amount of planning before construction, but is well worth the extra effort.

Line the inside of the enclosure with polyester fiber batting such as quilt stuffing. For bandpass loosely fill the sealed side, leave the vented side empty, and place the Low Rider's magnet in the vented side for cooling. The batting material should conform to California bedding fire codes. Attach the batting with spray adhesive or staples and keep material away from the end of the vent tube where it can be pulled in by air flow.

Handles, protective corners, cabinet covering, grille materials and crossovers are available through Peavey Accessories. Take particular care when positioning handles, as sub-woofers tend to be large and heavy.

Do not use 1/4" phone plugs or jacks in the construction of your enclosures. Power capacity of Low Rider sub-woofers is well above safe limits for phone plugs and jacks. Neutrik® Speakon® connectors are highly recommended, and internal cabinet wiring should be at least 16-gauge stranded copper wire.

Flying of sub-woofers is not recommended. An array of sub-woofer enclosures at ground level will typically outperform any other possible arrangement.

These instructions are a general guideline for design. Proper construction techniques, good planning and common sense will result in a reliable, high quality, high performance system.

Peavey in no way accepts liability for any damage, accidents or injury that may result from design, construction or operation of enclosures using this information. Due to Peavey's continuing

efforts to improve products, features and specifications are subject to change without notice.

## PARAMETERS

Thiele-Small parameters for Low Rider subwoofers follow. This data is for use in designing enclosures. Numerous software packages are available that use this data to simulate the response of the driver and enclosure together for optimum performance in any application.

## PARAMETER DEFINITIONS

$Z_{nom}$ : The nominal impedance of the driver in Ohms.

$R_{evc}$ : DC resistance of the driver in ohms Also known as  $R_e$ .

$S_d$ : The functional radiating surface area of the cone assembly in meters<sup>2</sup>.

$BL$ : Efficiency of the voice coil and magnet system in Tesla meters.

$F_0$ : Free air resonance. Also known as  $F_s$ .

$V_{as}$ : Volume of air having the same compliance (springiness) as the driver's suspension.

$C_{ms}$ : Restorative force of the driver's suspension in micrometers/Newton.

$M_{ms}$ : The total mass of the moving parts of the loudspeaker, including the air load, in grams.

$Q_{ms}$ : Resonance characteristics of the mechanical factors of the loudspeaker.

$Q_{es}$ : Resonance characteristics of electrical factors of the loudspeaker.

$Q_{ts}$ : Resonance characteristics of the electrical and mechanical factors combined together.

$X_{max}$ : Distance the cone can move in one direction before the coil begins to leave the magnetic gap.

$L_e$ : Inductance of the voice coil in millihenries.

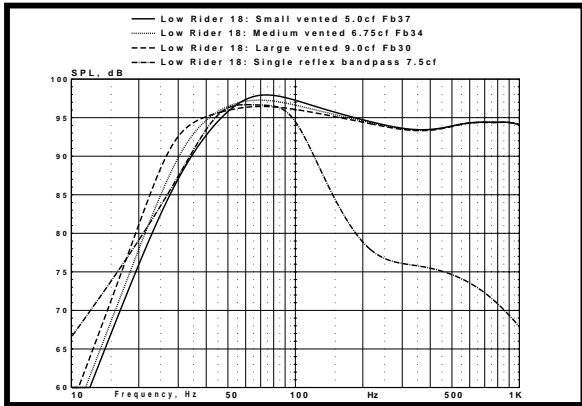
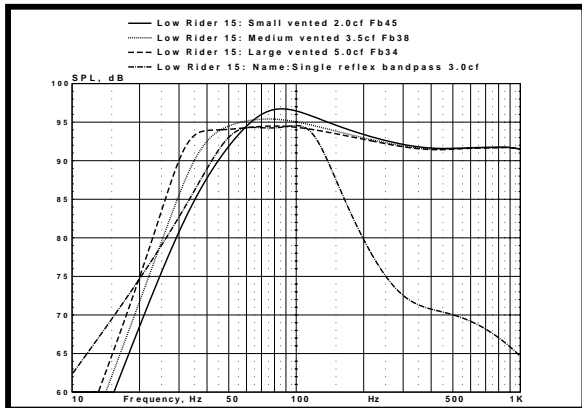
$SPL$ : Typical sound pressure level at 1 watt, 1 meter.

$\eta_0$ : Electrical-to-acoustical conversion efficiency in percent

$V_d$ : Air displacement of the driver from negative  $X_{max}$  to positive  $X_{max}$ .

$P_{max}$ : Maximum continuous program power in watts.

$Disp$ : Volume displaced by the driver inside the cabinet when mounted on its rear flange.



SPECIFICATIONS	1808-8HPS Low Rider 18	1508-8HPS Low Rider 15
Part #	00479910	00493710
Size: inches / mm	18 / 460 nominal	15 / 380 nominal
Frame OD inches / mm	18-1/8 / 460	15-1/4 / 387 mm
Bolt circle inches / mm	17-3/8 / 441	14-9/16 / 370mm
Cutout diameter inches/mm	16-3/4 / 425	14 / 356 mm
Depth	6-3/8 / 162	5-1/4 / 133
Impedance:	8 Ohms	8 Ohms
Power Capacity:	3200 Watts peak 1600 Watts program 800 Watts continuous per AES 2-1984, 40 Hz – 400 Hz	3200 Watts peak 1600 Watts program 800 Watts continuous per AES 2-1984, 50 Hz – 500 Hz
Usable frequency range:	25 Hz ~ 500 Hz	30 Hz ~ 500 Hz
Cone:	Kevlar impregnated cellulose	Kevlar impregnated cellulose
Voice coil diameter:	4"/100 mm	4"/100 mm
Voice coil material:	Polyimide coated copper ribbon wire Polyimide-impregnated fiberglass former Nomex stiffener Solderless diffusion welded OFHC copper leads	Polyimide coated copper ribbon wire Polyimide-impregnated fiberglass former Nomex stiffener Solderless diffusion welded OFHC copper leads
Net weight lb. / kg:	22 / 10	21 / 9.5
$Z_{nom}$ (ohms)	8	8
$R_{evc}$ (ohms)	6.21	6.21
$S_d$ (Square Meters)	0.1237	0.084
$BL$ (T/M)	22.73	22.73
$F_0$ (Hz)	28.9	33.9
$V_{as}$ (liters)	403.9	155.1
$C_{ms}$ (uM/N)	185.9	154.8
$M_{ms}$ (gm)	163.2	142.3
$Q_{ms}$	8.770	10.669
$Q_{es}$	0.356	0.364
$Q_{ts}$	0.342	0.352
$X_{max}$ (mm)	9.6	9.6
$L_e$ (mH)	0.87	0.83
$SPL$ (1 W 1m)	97.3	94.4
$\eta_0$ (%)	2.65	1.61
$V_d$ cubic inches / milliliters	145 / 2375	98.4 / 1613
$P_{max}$ (Watts pgm.)	1600	1600
$Disp$ (inches <sup>3</sup> ) / milliliters	235 / 3852	211 / 3458