# Service Manual

## K Series

| | |
|---|---|
| Product Model: | K8, K10, K12, KSub |
| Document #: | TD-000487-00 |
| Initial Release: | February 2015 |
| Revised Release: | |
| Revision: | A |

TECHNICAL SERVICES

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## K Series Powered Loudspeakers Service Manual



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**www.qsc.com** (main web site)

**www.qscservice.com** (Technical Service Group web site)

**www.qscparts.com** (parts and accessories sales)

# 1. Introduction

## 1.1 Restriction of Hazardous Substances Directive (RoHS)

QSC K Series loudspeaker products are manufactured to conform to the European Union's RoHS Directive, which reduces the amount of hazardous substances allowed in products for sale within its member nations. In electronic equipment such as audio processors, this applies primarily to certain toxic heavy metals, such as lead, which may be present in electronic components, solder, and other parts.

### RoHS-compliant materials

When servicing RoHS-compliant electronic products, it is important for the service technician to use only RoHS-compliant components and solder (lead-free). All replacement parts provided by QSC for RoHS-compliant products are certified as RoHS compliant.

### RoHS-compliant tools

Soldering irons and desoldering apparatus used on RoHS-compliant products must also not be contaminated by hazardous substances, such as lead. Therefore, you cannot use the same soldering and desoldering tools for RoHS-compliant products and solder as you do for non-compliant products and solder. You must either use separate soldering irons, desoldering tools and braid, etc., or at the very least designate separate tips and braids and use only the appropriate ones. If you contaminate a tip or braid, even inadvertently, by using it on a non-compliant product or solder, you should no longer use it with RoHS-compliant products or solder.

## 1.2 Revision history

No revision history yet.

## 1.3 Service bulletins

At the publish date of this service manual, **two** service bulletins concerning the K Series loudspeakers have been issued. Check www.qscservice.com or contact QSC Technical Services Group (TSG) for the latest information on applicable service documents. For a quick summary, refer to "10. Service updates" on page 41.

## 1.4 Serial Numbers

Serial numbers on QSC K Series loudspeakers are nine digits long. The second digit represents the month of manufacture, and the third digit represents the year; use the decoder chart on the right to find the manufacture date. (The first digit is an individual factory code, and the fourth through ninth digits are the sequential identifying number for each individual speaker.) For example, a serial number of G**JC**xxxxxx would indicate that the speaker was built on 10/12, or October 2012.

The speaker's serial number can be found on a label on the amplifier module's face plate.


**G X X 5xxxxx**

| Month | Year |
|---|---|
| A = Jan | 9 = 2009 |
| B = Feb | A = 2010 |
| C = Mar | B = 2011 |
| D = Apr | C = 2012 |
| E = May | D = 2013 |
| F = Jun | E = 2014 |
| G = Jul | F = 2015 |
| H = Aug | G = 2016 |
| I = Sep | ↓ |
| J = Oct | |
| K = Nov | |
| L = Dec | |

# 1.5 The well-equipped service bench

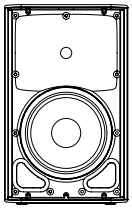
## Hardware and Software

- Personal computer (PC) running Windows® 7 or newer operating system with available USB2.0 or newer port
- Total Phase Aardvark I2C host adapter (for programming)
- Digital multimeter (DMM)
- Oscilloscope
- Audio sine wave generator
- 8ohm resistive load, capable of 500 W power handling
- SPL meter
- Soldering iron
- K Family test adapter
- Distortion analyzer (Audio Precision recommended)
- Class D output filter for distortion analyzer

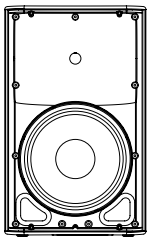
## Tools required

- Electronic screwdriver
- Various hand tools for electronic repair, including Phillips screwdrivers, needle-nose pliers, etc.
- 2.5x or higher magnifier with lamp
- ROHS-compliant (lead-free) soldering iron
- RoHS-compliant electronic solder
- ROHS-compliant desoldering equipment or desoldering braid

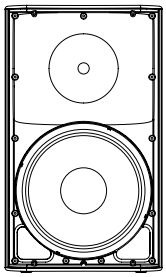
# 2. Product specification and images



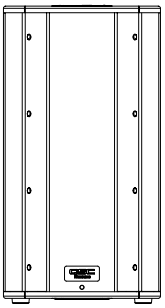
**K8**



**K10**



**K12**



**KSub**

| | | | | |
|---|---|---|---|---|
| Configuration | Trapezoidal 2-way | Multipurpose 2-way | Multipurpose 2-way | 4th Order Bandpass |
| Transducers | | | | |
| Low-frequency | 8" cone transducer | 10" cone transducer | 12" cone transducer | 2 x 12" cone transducers |
| High-frequency | 1.75" diaphragm compression driver | 1.75" diaphragm compression driver | 1.75" diaphragm compression driver | |
| Frequency Response (-6 dB) | 66 Hz – 18 kHz | 60 Hz – 18 kHz | 52 Hz – 18 kHz | 48 Hz – 134 Hz |
| Frequency Range (-10 dB) | 61 Hz – 20 kHz | 56 Hz – 20 kHz | 48 Hz – 20 kHz | 44 Hz – 148 Hz |
| Nominal Coverage (-6 dB) | 105° conical | 90° conical | 75° conical | |
| Maximum SPL [1] | 127 dB peak | 129 dB peak | 131 dB peak | 130 dB peak |
| Amplifiers | | | | |
| Power Output [2] | 1000 W continuous Class D (500 W LF, 500 W HF), 2000 W peak | | | 1000 W continuous Class D (2 x 500 W), 2000 W peak |
| Input Impedance (Ω) | XLR/ ¼": 40k balanced/ 20k unbalanced • XLR/ ¼" MIC mode: 2260 balanced • RCA: 10k | | | |
| Controls | Power • Gain A • Gain B • Mic/Line • LF Mode (Ext Sub/Norm/DEEP™) • HF Mode (Flat/Vocal Boost) Front LED (On/Off/Limit) | | | Power • Gain • LF Mode (Normal/ DEEP™) • Polarity (Normal/Reverse) • Front LED (On/Off/Limit) |
| Indicators | Power • Signal A • Signal B • Standby • Limit • Mic | | | Power • Signal • Standby • Limit |
| Connectors | Balanced female XLR/ ¼" line/mic level input • Balanced female XLR / ¼" line level input • Dual Balanced male XLR full range line level out • Balanced male XLR "mix" out • Stereo RCA line level input • Remote gain control • Locking IEC power connector | | | Dual balanced female XLR/ ¼" line level input • Dual Balanced male XLR full range line level out • Remote gain control • Locking IEC power connector |
| Cooling | On demand, 50 mm variable speed fan | | | |
| Amplifier Protection | Thermal limiting • Output overcurrent • Overtemperature muting • GuardRail™ | | | |
| Transducer Protection | Thermal limiting • Excursion limiting | | | |
| AC Power Input | Universal power supply 100 – 240 VAC, 50 – 60 Hz | | | |
| AC Power Consumption 1/8 Power | 100 VAC, 2.3 A • 120 VAC, 2.01 A • 230 VAC, 1.13 A | | | |
| Enclosure | Impact resistant ABS | | | Painted birch plywood |
| Finish | Black Paint | | | Black textured paint |
| Grille | Black powder coated 18 gauge steel | | | |
| Dimensions (HWD) | 17.7" x 11" x 10.6"<br>450 mm x 280 mm x 269 mm | 20.4" x 12.6" x 11.8"<br>519 mm x 320 mm x 300 mm | 23.7" x 14" x 14"<br>603 mm x 356 mm x 356 mm | 26" x 14" x 28.1" (including casters)<br>665 mm x 356 mm x 714 mm |
| Weight (Net) | 27 lb (12.2 kg) | 32 lb (14.5 kg) | 41 lb (18.6 kg) | 74 lb (33.6 kg) |
| Available Accessories | K8 TOTE • K8 YOKE • K SERIES M10 KIT | K10 TOTE • K10 YOKE • K SERIES M10 KIT | K12 TOTE • K12 YOKE • K SERIES M10 KIT | KSub COVER |

# 3. Firmware

Very infrequent DSP firmware updates have occured to K Series loudspeakers during production. While firmware can be updated from the programming header using an Aardvark I2C programmer, it's not recommended and almost never needed to perform updates on the DSP firmware after a repair.

What is more important is understanding the behavior of the particular DSP firmware revision that is loaded in the speaker being serviced. Use the table below to see all firmware changes.

## 3.1 Firmware revisions and program numbers

Current firmware revision at the publication of this service manual (January 2015) is: **revison F**

| Revision | Effective Date | S/N range | Description of changes |
|---|---|---|---|
| A | March 11, 2009 | GC9xxxxx only | Production release |
| B | March 25, 2009 | GD9xxxxx — GE9xxxxx | Increased mute turn-on time to avoid signal passing through when the system powers off with certain AC input situations |
| C | April 21, 2009 | GF9xxxxx — GAAxxxxx | Increased the fan turn-on voltage because some fans wouldn't come on with lower voltage |
| D | January 28, 2010 | GBAxxxxx — GLAxxxxx | Adjusted fan thresholds to accommodate hardware changes and modified limiters based on amplifier updates. The fan no longer spins until it's absolutely needed. |
| F | December 16, 2011 | GABxxxxx and newer | Test mode changes only to shorten burn-in times. |

The firmware revision for K-Series loudspeakers is printed on a small label near the channel A gain pot. Remove the chA gain knob to locate the DSP firmware revision that the amplifier was originally manufacutred and programmed with.

| | K8 | K10 | K12 | KSub |
|---|---|---|---|---|
| **QSC PG- number** | PG-000210-00 | PG-000211-00 | PG-000212-00 | PG-000213-00 |

### Same DSP board for K8, K10, and K12 - different firmware

K8, K10, and K12 models have exactly the same DSP board. There is no physical difference between the boards and the components stuffed on the PCB. The only difference between them is the firmware code that is programmed into the DSP. This means that you can program a DSP/input board that was originally programmed as a K8 into a K10, K12, or vice-versa. The KSub DSP/input board is the exception to this rule since less components are stuffed on the PCB.

Please note the PG- numbers in the table above for the correct firmware files.

**Important Note**: Due to component changes between board revisions, it is not recommended to upload a different firmware revision than the revision that is printed on the small label on the DSP board. The firmware will upload into the DSP fine, but temperature sensing, limiting, speaker voicing, and fan speed may behave strangely due to the component changes between board revisions.

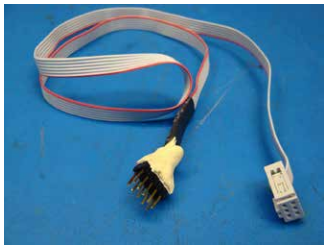
# 3.2 Firmware programming instructions

## Warning

If the instructions are not followed carefully, there is a possibility that the amplifier inside the loudspeaker will stop working. Because House of K loudspeakers use DSP technology, all audio signals are routed through the DSP controller. If the firmware is not programmed into the DSP controller correctly, then the amplifier will fail to pass audio. While performing a firmware update, never plug the ribbon cable into the programming header with the amplifier turned on.

## Equipment needed

- Total Phase Aardvark I2C Host Adapter, TP240141
- Ribbon cable adapter, 6 pin to 10 pin (not needed for some older K models)
- USB cable, A-type to B-type (included with Aardvark)
- Computer with Windows XP, Vista, or 7 operating system (32 bit or 64 bit okay)

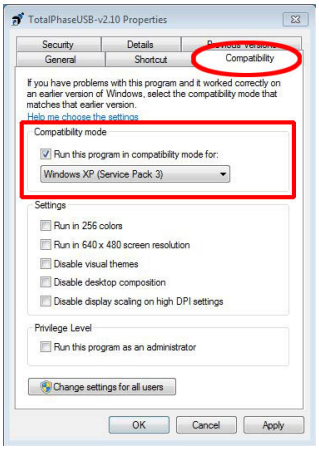



## Software needed

- Total Phase USB driver setup file: **TotalPhaseUSB-v2.10.exe**
- K Programmer Utility (32 bit or 64 bit)
- HEX file which contains specific loudspeaker firmware

## Installing the Total Phase Aardvark USB Drivers

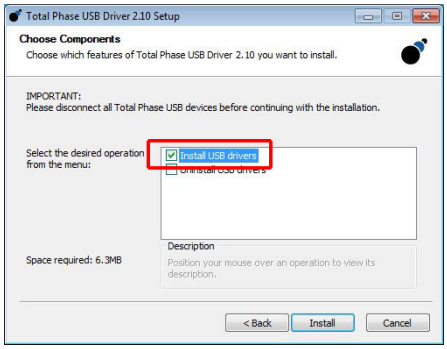
This step must be performed before any programming takes place. The installation file for the USB drivers will work on Windows XP, Vista, 7 (32 bit and 64 bit), and 8.




1. Disconnect the Aardvark if you've already connected it.
2. Open the installer file named **TotalPhaseUSB-v2.10.exe.**

   **Important Note:** There is a known bug in the installer that affects **Windows Vista** only. You must run the installer in a different mode. Right-click on the install file **TotalPhaseUSB-v2.10.exe** and click on Properties. Click the Compatibility tab and mark the box titled "Run Compatibility mode for Windows XP (Service Pack 3)". Click OK to save the changes.
3. Mark the box titled "Install USB Drivers" and continue with the installation utility until complete.
4. Connect the Aardvark to the computer with the USB cable.
5. The Total Phase USB drivers will install automatically. You may skip any Windows Update notification as you do not want Windows to look for USB drivers via the Internet. Windows will let you know that the drivers installed correctly with a pop-up window.

   **Note**: If you want to check that the USB drivers installed correctly, go to the Device Manager under the Control Panel menu and look for "Total Phase Aardvark I2C/SPI Host Adapter" under Universal Serial Bus controllers.



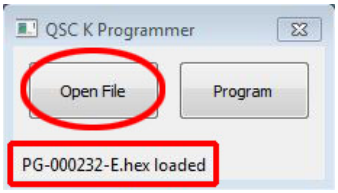
## Programming a House of K Loudspeaker

In order to program the loudspeaker with new firmware you must open the correct K Programmer utility that works with your Windows operating system. To find out what type of operating system you have, go to the System icon under Control Panel. The information will be available there.

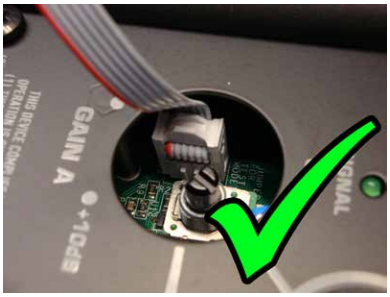
1. Connect the Aardvark to the computer with the USB cable.
2. If you own **32 bit** operating system, open the file **KProgrammer.exe** in the folder labeled "XP-Vista-win7 32bit". If you own a **64 bit** operating system, open the file **KProgrammer.exe** in the folder labeled "Vista-win7 64bit".

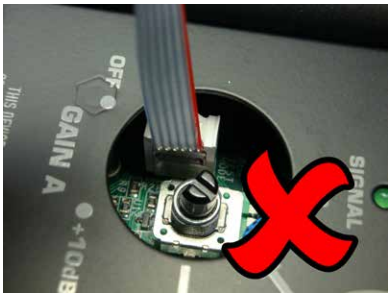
   **Note**: If the USB drivers did not install correctly or the USB cable is not securely connected to the computer's USB port, the K Programmer utility will display the text "Aardvark not attached".

3. Click on the button labeled "Open File" and navigate to the directory where the HEX file you received is located. If you received this firmware file from a QSC employee, make sure that it's the correct one or the speaker will not work after being programmed.

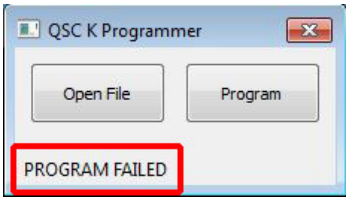


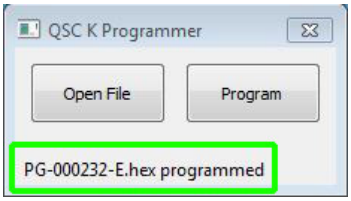

4. Turn the power switch to the off position and connect the IEC power cable.
5. Remove the plastic knob of Gain A and insert the header (6 pin or 10 pin) into the jumpers on the PCB with the correct orientation. The red strip on the ribbon cable should be on the bottom as in the photo.


6. Connect the IEC power cable and turn the power switch to the ON position. Wait at least 5 seconds.
7. Press the "Program" button on the K Programmer utility.
8. In the bottom of the window, the utility will display "PG-xxxxxx-xx programmed". Occasionally the utility will display "PROGRAM FAILED", so press the Program button again on the K Programmer utility until you have a successful program. This process may take two or three tries.




9. Turn the power switch to the off position and disconnect the header from the PCB.
10. Test the speaker with an audio source to verify that the firmware uploaded properly.

# 4. Operational description

## 4.1 Series description

Converging our expertise in loudspeaker, amplifier, and digital signal processing technologies, QSC has created a spectrum of active loudspeakers designed with one common goal - accurate acoustical performance for the widest selection of applications. Ranging from a compact and potent eight-inch, two-way utility loudspeaker to a fixed-accurate line array system, all K Family models feature common power modules, DSP and performance characteristics - irrespective of their size or configuration. Models are differentiated primarily by coverage angle, bass extension, woofer diameter and enclosure size. With the K Family there is no “good, better, best” - only “best, best, best”.

## 4.2 Top-Box Models

The K8, K10, and K12 loudspeakers are all top-box style loudspeakers. The enclosure is constructed of ABS plastic and are painted over with QSC black RAL 9011. The front grille, which displays the QSC logo, is 16 gauge steel and finished with a black powder coat. Behind the grille is the main baffle of the speaker. The baffle incorporates a wave guide that determines the coverage angle of the speaker. Attached to the baffle are two transducers — the low and high frequency. Each model has a different size low frequency transducer - the K8 has a 8”, K10 has 10”, and K12 has a 12”, all extending bass response as diameter increases. Top-box models share the same high frequency transducer, which has a 1.75” diameter voice coil with a neodymium magnet to decrease overall size of the transducer. The transducers are powered by a two channel class D amplifier module which is fastened to the rear of the ABS enclosure. The amplifier module is bi-amped. The low channel is connected to the low frequency transducer and is dedicated to frequencies below 2 kHz and the high channel is connected to the high frequency transducer and is dedicated to frequencies above 2 kHz.

Top-box models are effective as mains or monitors. The K10 and K12 have rubber feet on the side so they can be placed sideways in the monitor wedge position. All models share the same handles and hardware. The pole-cup assembly is different on each model but share the same characteristics. The speakers can be placed on a speaker stand at a 0 or 7.5 degree downward angle. Three mounting points are available for vertical suspension with QSC’s M10 Kit-C. There are two M10 mounting points on the top and one on the lower-back. If horizontal suspension is preferred, a yoke mount kit must be used.

# 4.3 KSub

The KSub is a dual-12" bandpass design, constructed of premium birch. The wood enclosure is texture painted with a water-based acrylic paint color RAL 9011. A single large port sits behind the front panel. The two transducers are mounted vertically on a piece a wood panel that is in the center of the enclosure. The two channel class D amplifier module is similar in size, weight, and design compared with the top-box models. Each amplifier channel is dedicated to powering, in phase with each other, a single 12" transducer.

The KSub includes four low-noise casters. The subwoofer features a threaded pole receptacle for a positive, wobble free connection to a threaded speaker pole (included in box). There are two handles on the subwoofer enclosure - one on the top panel and another on the bottom. Four round rubber feet are also on the bottom for support.

# 4.4 Bucket of power (BOP) amplifier module

### Startup sequence

When mains voltage is applied, the IC charges up its large supply capacitor via trickle-start circuitry inside the power supply controller IC. Once a preset voltage threshold is reached on the cap, the IC shuts off the trickle start and begins switching the power supply FETs. Once the supply is running, an auxiliary winding on the transformer powers the controller IC. Thus, an auxiliary supply is not needed for BOP because the main supply is able to start itself. While the DSP is booting, audio is muted since the DSP is not passing any signal. After booting, the DSP has an additional 4.5 second delay before the amplifier comes out of muting, to allow all internal voltages to fully settle.

### Power supply

The BOP's switch mode power supply is a regulated, fixed frequency, active-clamped flyback. It is similar to a typical flyback converter except that when the main switch is off another switch turns on and recovers the transformer energy into a resonant tank. A typical flyback power supply has good cross-regulation and can operate over a wide input voltage range, but the power dissipation of a passive clamp limits the power level a flyback can reasonably output; adding the active clamp allows a flyback converter to scale to much higher power levels. Because the power supply accepts universal AC voltages, the incoming mains voltage is bridge rectified to DC and stored in a bank of 2 primary capacitors in parallel. This rectified voltage varies directly with mains voltage. The main and clamp FETs, operating at 200kHz, couple energy to the secondary diodes through the transformer. The regulated ±85V secondary voltage is stored in a pair of secondary capacitors, one per rail. Regulation is taken across the entire +170V secondary voltage, relying on proper circuit operation to keep the rails balanced. Adjusting the duty cycle of the PWM signal driving the power supply FETs keeps the power supply's output voltage constant regardless of changes to input voltage or load.


Housekeeping voltages of ±15V and +7V nominal are created with separate transformer windings from the main secondary rails, but all windings are tied together at ground. Under load, the amplifiers will pull energy from the main rails and the power supply will increase the duty cycle to compensate and keep the main rails at ±85V; this means the housekeeping voltages increase under load.

## Class D amplifier

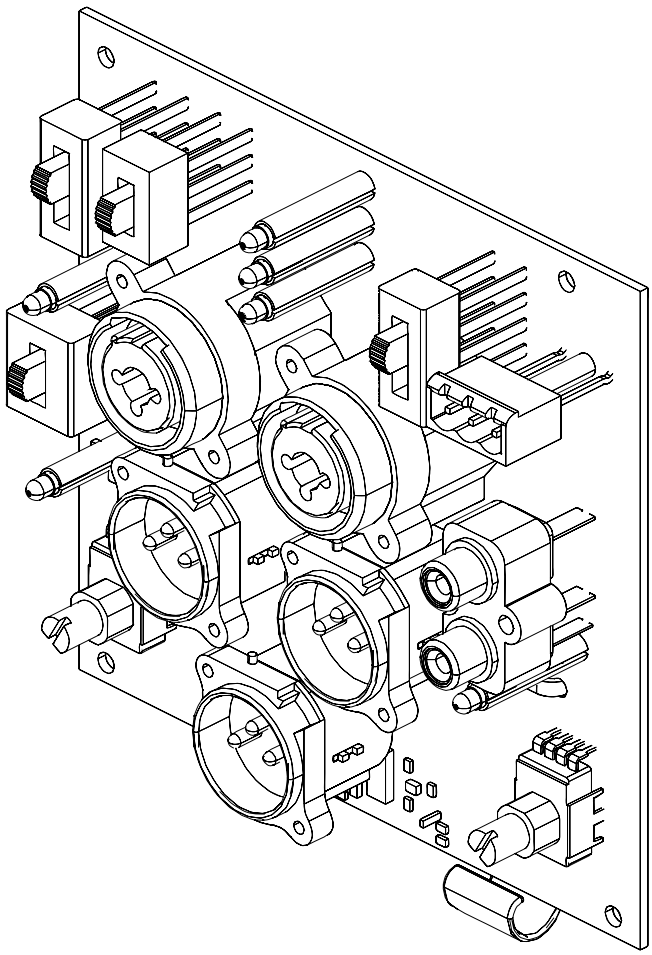
Each of the BOP amplifiers is a type of class D amplifier called 'self-oscillating', as opposed to a class D amplifier that requires a clock to switch. Self-oscillating class D amplifiers create a PWM signal solely by using feedback; although many different variations have been invented. Unique to the BOP's type of self-oscillating amplifier, PWM is created by taking feedback only after the output filter and bringing it to a comparator input through a lead filter network. The lead filter in the feedback network, combined with the output filter phase shift and the delay between the comparator and FETs, creates the required phase shift with gain to allow oscillation at a specific frequency. Idle frequency is about 400kHz, and the switching frequency dips to about 100kHz at full power since this is a self-oscillating amplifier and switching frequency varies with modulation index.

The modulated switching voltage must be filtered to recover the audio signal before being connected to a transducer. The filter uses a toroid inductor and film capacitor for each channel. When idle, a capacitor between the amplifier outputs couples high frequencies between the channels, thus forcing a common switching frequency to eliminate sirens and lower hiss from HF transducers. Because this isn't enough to get acceptably lower noise floor, a high pass filter is used to further lower both the amplifier power and the noise from only the amp channel driving the HF transducer. Although not required with the type of self-oscillating amplifier used in the BOP, small Zobel filters are present on each channel to aid in stability and help reduce cross-channel interference during over-current (OC) conditions.

A terminal block, sticking through the back of the bucket into the loudspeaker cabinet, brings both amplifier outputs to the transducers via a detachable wire harness. Another pair of wires goes to the front LED which is mounted in the loudspeaker cabinet

## Input/DSP board

The BOP has two separate input sections, A and B, each with a balanced combination female XLR/TRS jack with a pass-through male XLR jack. On 2-way versions of BOP, each input also has unique features. Input A has a switch which increases the gain by 25.4dB to boost low-amplitude signals, specifically microphones. When in MIC mode, a yellow LED is lit to indicate this mode setting to the user. Input B has an unbalanced stereo phono jack, with 6dB more gain, that can mix its signal with the XLR/TRS input. Each input has a separate gain knob, allowing adjustment from OFF to +10dB, with 0dB right in the middle. The gain knob markings also indicate the level of another female XLR, labeled LINE OUT, which carries the signal of the two inputs after being mixed together. With the gain knob at 0dB, the LINE OUT XLR is the same amplitude as a signal at either input; with the gain knob at +10dB the LINE OUT XLR level is 10dB greater than a signal at either input. The subwoofer version of BOP has only the balanced XLR/TRS inputs, with pass-through female XLRs, that are summing to a single gain knob. No MIC/LINE or phono connections are present.

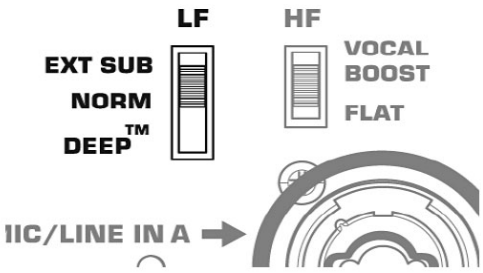


Green LEDs for each input indicate the presence of an audio signal before the gain controls, meaning even with the BOP output level at zero the LEDs will still light up and indicate if a signal above about 3.5mVp is presented to the inputs. The subwoofer version, naturally, only has one signal presence LED as it has only one input. The DSP controls the other 3 LED on the faceplate, labeled LIMIT, STBY, and PWR. STBY and PWR are mutually exclusive and indicate the operation of the amplifiers; if the DSP turns off the amplifiers the green STBY LED is on, while the blue PWR LED is on when the DSP allows the amplifiers to run. A condition in which the DSP performs long-term amplifier limiting or muting triggers the red LIMIT LED. OC conditions are handled by the amplifiers without the DSP's knowledge so the LIMIT LED is not turned on when OC is detected.

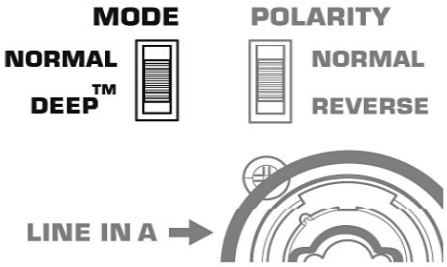
Besides the MIC/LINE switch on input A, 3 other switches are present on the BOP faceplate. The FRONT LED switch selects between 3 different modes of operating for the blue LED on the front of the loudspeaker cabinet: PWR, LIMIT, or OFF. When switched to PWR the front LED is always bright and

when in OFF the front LED is always off. By setting this switch to LIMIT, the LED is normally glows dimly but becomes bright when the DSP is limiting the amplifiers, giving some feedback to the loudspeaker operation from the front of the system.

On 2-way systems, HF and LF switches allow adjustment of the amplifier's response. The LF switch selects between EXT SUB with a 100Hz high-pass filter, NORM that does not change the amplifier's natural response, and DEEP which provides boost at low frequencies which diminishes as volume increases. Setting the HF switch to FLAT also has no response change while selecting VOCAL BOOST increases the amplifier's gain only in the mid frequencies to help bring out the typical frequency range of the human voice. The subwoofer BOP has a MODE switch instead of LF, with NORMAL and DEEP selections, equivalent to FLAT and DEEP on 2-way systems. The HF switch is replaced by a POLARITY switch in subwoofer versions, with the self-explanatory choices of NORMAL and REVERSE.




The final connector on the faceplate of BOP is a versatile 3 pin 'Euro' header called REMOTE GAIN. The +5V pin, naturally, supplies +5V and is internally protected and current limited by an op amp; the chassis ground pin is earth ground. The middle pin, labeled with a triangle having the tall side by the +5V, can be used to adjust the level of the BOP output. With nothing connected to this pin, it is internally pulled up to +5V and the output is not attenuated. When at ground, the DSP output, and thus the amplifier output, is muted. Any voltage between +5V and ground continuously adjusts the BOP output level by varying the DSP output level. Connecting a potentiometer between +5V and ground, with the wiper on the attenuation pin, allows full control of volume. Because the attenuation pin is buffered, a single pot can control the level of multiple BOPs. Voltage can also be injected into the connector, or a contact can pull the attenuation pin to ground to affect a muting function.




## Protection systems

As with all audio amplifiers, full rated power is only required for brief program peaks and typical use rarely exceeds 1/8 average power. High peak power must be able to flow for reasonable periods of time, while providing various protective systems that limit this power to reasonable long-term levels. The amplifier's protection systems rely on the DSP to perform all protection systems except amplifier OC, based on predetermined limits and operating conditions of the amplifier and transducers. A thermal sensor is placed near the amplifier FETs and is read by the DSP to perform thermal limiting and muting, but also for fan speed control. Measurement of the amplifier output current is done by the gate driver which terminates a PWM pulse if the current rises above a certain level. Muting of the amplifier, by the gate driver or DSP, occurs only if stresses continue to build up.

As part of the current loop of the power supply, cycle-by-cycle current limiting will protect the power supply FETs from damage. Another advantage of having the power supply current monitored is that the maximum AC mains current can be limited in case the mains voltage drops below a level at which the amplifier should not be allowed to output full power. Although the DSP signal level limiting and power supply current limiting will keep the mains current draw from blowing the fuse in normal operation, a fuse is present and will open under catastrophic circumstances.

# 5. Top-box disassembly instructions

To reduce the number of pages in this service manual, all top-box K-Series loudspeakers have been combined into one section. The K10 powered loudspeaker is used as an example for these generic disassembly and repair procedures. The K8 and K12 models are assembled nearly identical to the K10. Slight differences are as follows:

- K8 does not have rubber feet on the side for floor monitor wedge use.
- Pole-cup assembly is slightly different on each model
- The K12's high frequency transducer is not secured to the front of the baffle with screws. Instead, it's all mounted behind the waveguide with screws and washers.

For QSC part numbers, use "12. Component identification" on page 48 or "13. Exploded view drawings" on page 52.

## 5.1 Bucket of power

### Removal

1. Remove the 10 screws along the outer perimeter of the BOP.
2. Partially remove the amplifier module out of the main enclosure as seen in Figure 5.1.

   **Note**: Occasionally the module will be stuck to the enclosure. Place a putty or butter knife between the enclosure and edge of the module to pry the module out.
3. Detach the multi-pin molex connector from the read of the module.
4. The BOP can now be fully removed.

### Installation

1. Verify all internal wiring. The positive and negative terminals of the LF and HF transducers should be securely connected. The molex connector should be inspected for loose wires.
2. Lay the speaker face-down on its front grille.
3. Connect the molex connector into the module.
4. Slowly drop the BOP down and align the holes along the rim of the BOP to the holes on the enclosure.
5. Fasten the 10 screws that secure the BOP to the enclosure, beginning with the corner screws.

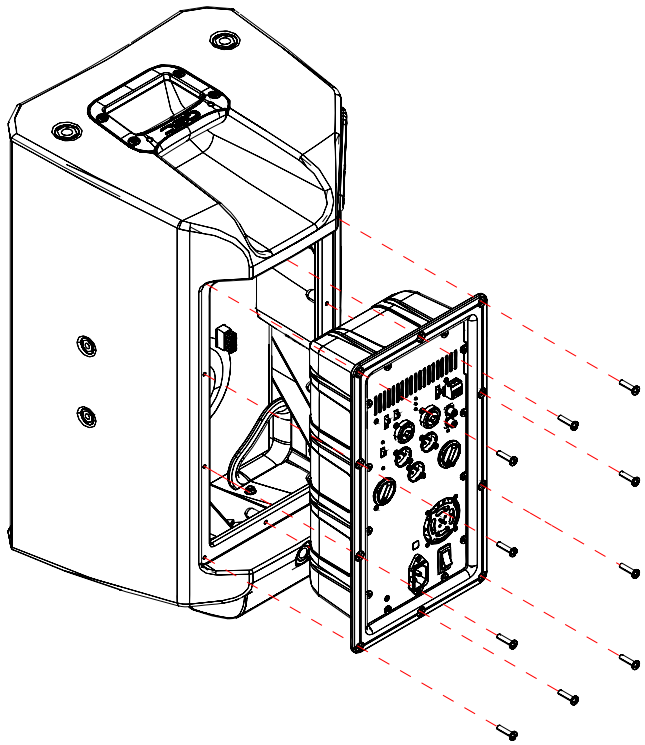


*Figure 5.1 - BOP removal from a top-box model*

## 5.2 Front grille

### Removal

1. Remove the four screws that attach the front grille to the baffle.
2. Using a putty or butter knife, pry the grille outward and remove it. If the grille is stuck, gently pry along the sides in multiple locations until the grille becomes loose enough to remove.

### Installation

1. Verify that the gasket along the top and bottom of the grille is still in place. If you are replacing the grille with a new one, install new gasket along the top and bottom of the grille to reduce vibrations between the grille and baffle.

   **Note**: Recommended gasket size is 1/2" width and at least 1/16" thickness.
2. Fit the side edges of the grille in the space between the baffle and enclosure. Press down gently. Be careful not to bend the grille. If the grille does not fit in the space, the baffle may need to be realigned.
3. Fasten the four screws that secure the grille to the baffle.
4. Use a rubber mallet with a large head to gently press in the sides of the grille so that the grille is flush with the enclosure.

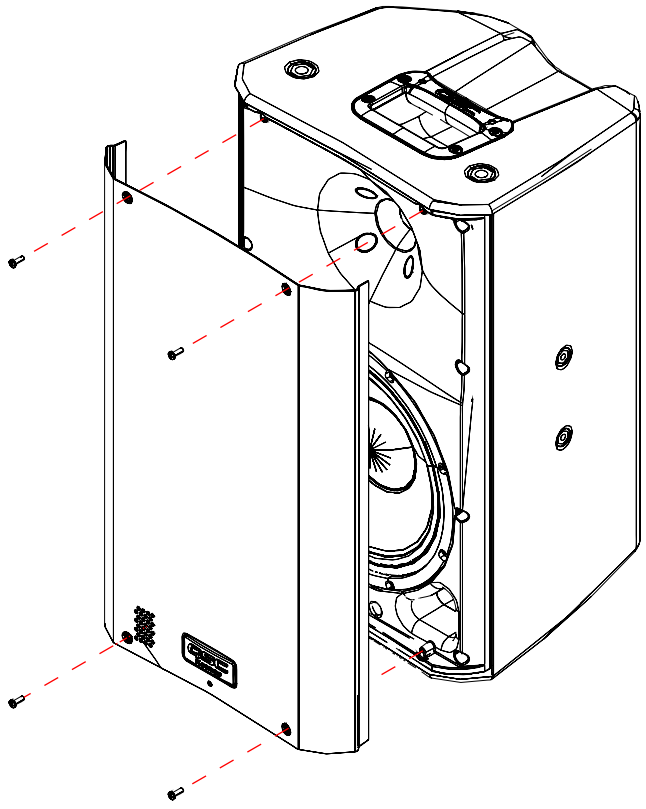


*Figure 5.2 - Front grille removal*

## 5.3 Front baffle

### Removal

1. To access the front baffle, the front grille must be removed. Follow the instructions in "5.2 Front grille" on page 16.
2. Remove all screws around the perimeter of the baffle.
3. Place the speaker on a work surface so that the baffle is face-down.
4. Partially lift the enclosure away from the baffle assembly.
5. Disconnect the molex connector from the BOP.
6. You may now fully remove the baffle assembly from the main enclosure.

### Installation

It's recommend that the LF and HF transducers are installed before reinstalling the baffle to the main enclosure assembly.

1. Verify that the positive and negative terminals on the LF and HF transducers are connected securely to the wiring harness.
2. Verify that the gasket is properly installed around the edge of the baffle.
3. Reinstall all acoustic insulation in both the main enclosure assembly and baffle assembly.

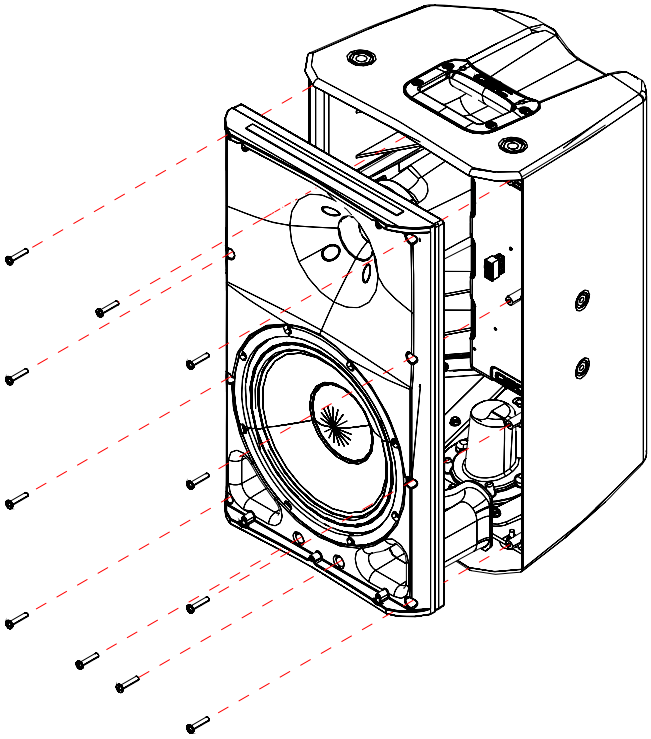


*Figure 5.3 - Front baffle removal*

4. Set the baffle assembly face down on a work surface.
5. Gently place the main enclosure assembly on top of the baffle assembly, paying close attention to the orientation. If possible, connect the molex connector to the BOP.

   **Note**: Connecting the wiring harness to the BOP at this stage can be difficult. Perform that step after the baffle has been installed by removing the BOP, connecting the harness, and reinstalling the BOP.
6. Verify that the small gap between the sides of the main enclosure and the baffle are even. Both sides of the front grille must fit inside these gaps.
7. Fasten the screws that secure the baffle to the enclosure, starting with the corner screws.

# 5.4 High frequency transducer

The K8 and K10's HF transducer is secured to the baffle by four mounting points that come out of the waveguide. Covering the screws are four rubber plugs that allow the high frequency sound waves to propagate out correctly. The K12's HF transducer is secured on the baffle as well, but behind the waveguide.

### K8 and K10 high frequency transducer removal

It's recommended to remove the baffle from the main enclosure but not required for HF transducer removal. Alternately, the BOP can be removed if you're okay with working in tight spaces.

1. Disconnect the yellow and yellow/black wires from the HF transducer's terminals.
2. Remove the 4 rubber plugs from the waveguide.
3. Remove the 4 screws that secure the HF transducer to the baffle.
4. The HF transducer can now be removed from the baffle.

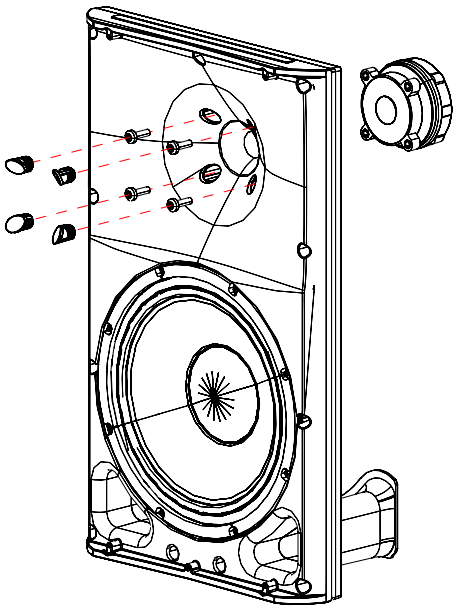


*Figure 5.4 - HF transducer removal on K8 and K10*

### K12 high frequency transducer removal

It's required to remove the baffle from the main enclosure for HF transducer removal.

1. Disconnect the yellow and yellow/black wires from the HF transducer's terminals.
2. Remove the 4 screws, 4 lock washers, and 4 normal washers that secure the HF transducer to the baffle.
3. The HF transducer can now be removed from the baffle.

### Diaphragm replacement

Instead of replacing the entire HF transducer, the transducer can be repaired by replacing the diaphragm. Replacing the diaphragm can be much cheaper than replacing the entire HF transducer. Follow the instructions below to replace the diaphragm (QSC part number SR-000145-00).

1. Remove the 4 screws that secure the cover to the frame of the transducer.
2. Lift the cover away from the transducer assembly.
3. Remove the diaphragm.
4. Clean out the gap that the voice coil sits in. Wipe the edges of the gap with isopropyl alcohol and spray the gap with compressed air to remove all contaminants inside.
5. Install the new diaphragm with the correct orientation.
6. Place the cover back on the transducer assembly.
7. Fasten the 4 screws to secure the cover on the transducer assembly.

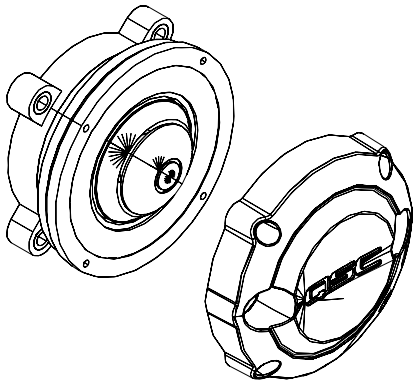


*Figure 5.5 - Diaphragm replacement.*

### Transducer installation

Simply follow the removal instructions in reverse.

# 5.5 Low frequency transducer

The LF transducer can be removed and reinstalled without removing the baffle.

### Removal

1. Follow the removal instructions in “5.2 Front grille” on page 16.
2. Place the speaker on it’s back (or in monitor wedge position) so the LF transducer doesn’t fall out after the screws are removed.
3. Remove 8 screws around the perimeter of the transducer’s frame.

   **Note**: Be very careful when removing the screws. The screwdriver can easily slip and pierce a hole in the surround or cone of the transducer.
4. Partially lift the transducer out of the speaker assembly.
5. Disconnect the fastons from the transducer’s positive and negative terminals.
6. Fully remove the transducer from the speaker assembly.

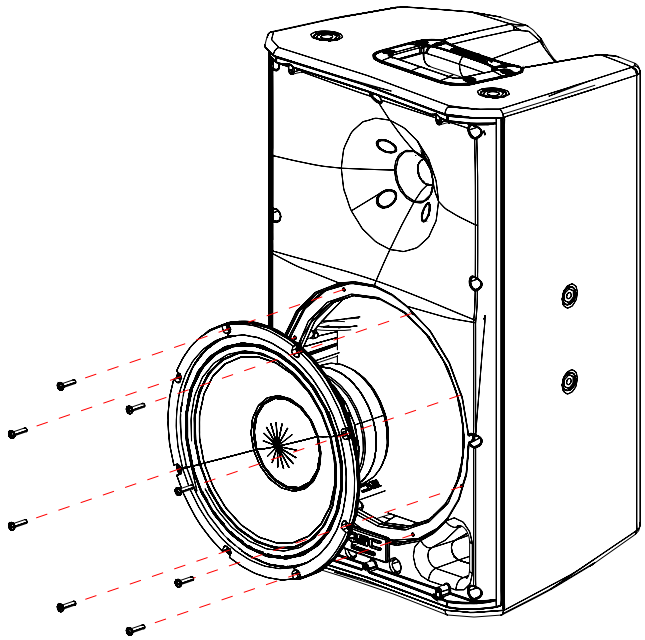


*Figure 5.6 - LF transducer removal with baffle installed*

### Installation

1. Place the speaker on it’s back (or in monitor wedge position).
2. Connect the fastons to the transducer’s positive (green wire) and negative (green/black wire) terminals.

   **Important note**: This connection must have high retention force! Crimp new fastons (0.205” or 5.21 mm female, 14–16 AWG, insulated straight ) to the wiring harness if the old ones are weak.
3. Gently lower the LF transducer into the speaker assembly.
4. Fasten the 8 screws that secure the transducer to the baffle in a star pattern.

   **Note**: Be very careful when installing the screws. The screwdriver can easily slip and pierce a hole in the surround or cone of the transducer.

# 5.6 Handles, feet, and pole mount

### Handle removal and installation notes

- The handle is secured to the enclosure with machine screws (on the exterior of the enclosure) and mounting plates (on the interior of the enclosure).
- Access to the interior of the speaker assembly is required to remove and install the handles.
- The easiest way to access the interior of the enclosure is to remove the BOP. See removal instructions in “5.1 Bucket of power” on page 15.
- Reapply a small amount of thread locking fluid to the mounting plate when replacing the handles.

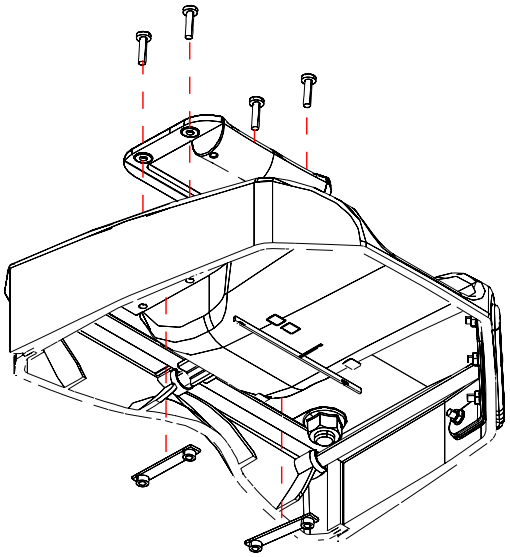


*Figure 5.7 - Handle removal*

## Rubber feet removal and installation notes

- Rubber feet are secured to the enclosure with machine screws (on the exterior of the enclosure) and nuts (on the interior of the enclosure).
- Access to the interior of the speaker assembly is required to remove and install the rubber feet.
- The easiest way to access the interior of the enclosure is to remove the BOP. See removal instructions in "5.1 Bucket of power" on page 15.
- Reapply a small amount of thread locking fluid to the nuts when replacing the rubber feet.

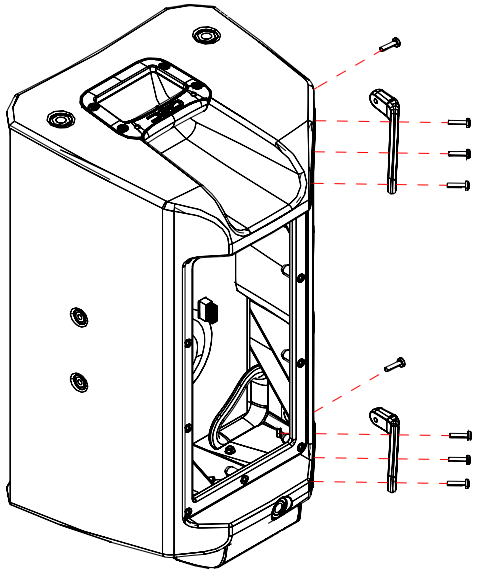


*Figure 5.8 - To remove the rubber feet, there must be access to the interior of the enclosure*

## Pole cup removal and installation notes

- Replace the entire pole-cup assembly if any parts are broken or have failed. Individual parts are not available.
- The pole cup assembly is secured to the enclosure with machine screws (on the exterior of the enclosure) and mounting nuts (on the interior of the enclosure).
- Access to the interior of the speaker assembly is required to remove and install the pole cup assembly.
- Due to the limited space inside the enclosure, the baffle assembly and BOP must be removed from the main enclosure to replace the pole-cup assembly.
- Reapply a small amount of thread locking fluid to the nuts when replacing the pole-cup assembly.

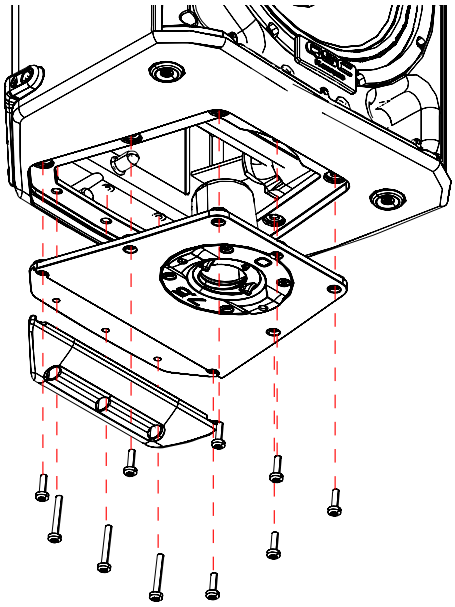


*Figure 5.9 - To remove the pole cup assembly, you must locate the nuts on the interior of the enclosure*

# 6. KSub disassembly and repair procedures

## 6.1 Bucket of power

### Removal

1. Remove the 10 screws along the outer perimeter of the BOP.
2. Partially remove the amplifier module out of the cabinet as seen in Figure 6.1.

   **Note**: Occasionally the module will be stuck to the cabinet. Place a putty or butter knife between the cabinet and edge of the module to pry the module out.
3. Detach the multi-pin molex connector from the read of the module.
4. The BOP can now be fully removed.

### Installation

1. Inspect the molex connector for loose wires.
2. Connect the molex connector into the module.
3. Carefully insert the BOP and align the holes along the rim of the BOP to the holes on the cabinet.
4. Fasten the 10 screws that secure the BOP to the cabinet, beginning with the corner screws.

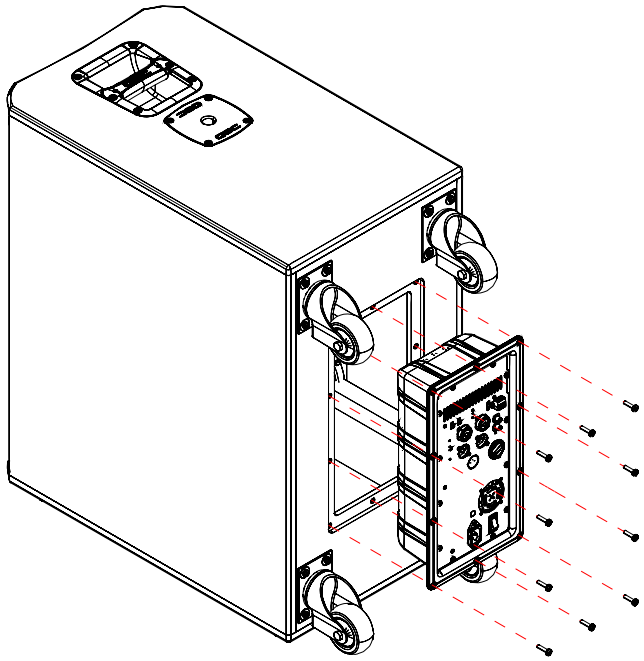


*Figure 6.1 - BOP removal on the KSub.*

## 6.2 Low frequency transducers

### Removal

Contrary to the top-box models, the LF transducer can only be removed through the rear hole (that the BOP sits in). There is no access to the transducers through the front section of the cabinet.

1. Follow the removal instructions in "6.1 Bucket of power" on page 20.
2. Place the cabinet assembly on a padded surface front grille-side-down so the LF transducer doesn't fall out after the screws are removed.
3. Remove the 8 screws around the perimeter of the LF transducer.

   **Note**: This can be an extremely difficult task without the right equipment. We recommend you use a flexible extension bit holder that can be adjusted and twisted, similar to a snake.

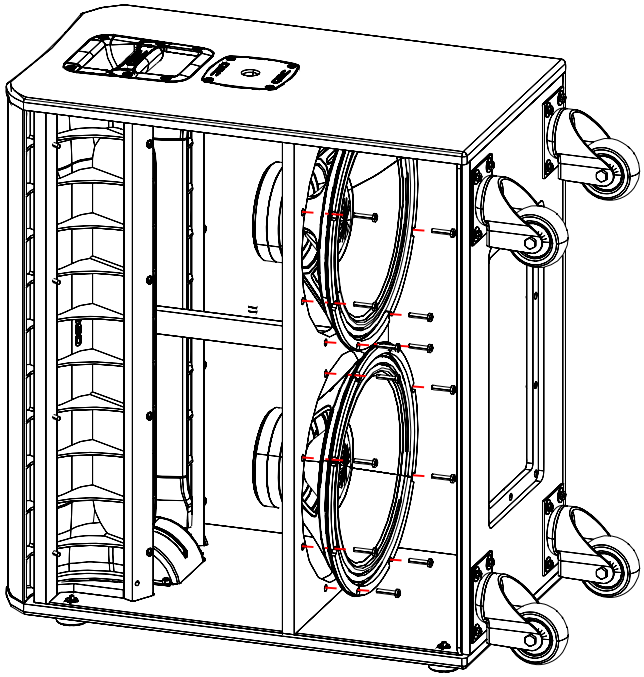


*Figure 6.2 - LF transducer removal can only performed through the rear of the cabinet*

4. Partially lift the transducer out of the cabinet.
5. Disconnect the fastons from the transducer's positive and negative terminals.
6. Lift and rotate the transducer out of the rear BOP cutout hole. It will barely fit.

### Installation

1. Place the cabinet assembly on a padded surface front grille-side-down.
2. Rotate the LF transducer sideways and drop it down through the rear BOP cutout.
3. Connect the fastons to the transducer's positive (green wire) and negative (green/black wire) terminals.

   **Important note**: This connection must have high retention force! Crimp new fastons (0.205" or 5.21 mm female, 14–16 AWG, insulated straight ) to the wiring harness if the old ones are weak.
4. Gently lower the LF transducer into the cutout in the cabinet.
5. Fasten the 8 screws that secure the transducer to the baffle in a star pattern.

   **Note**: Be very careful when installing the screws. The screwdriver can easily slip and pierce a hole in the surround or cone of the transducer.

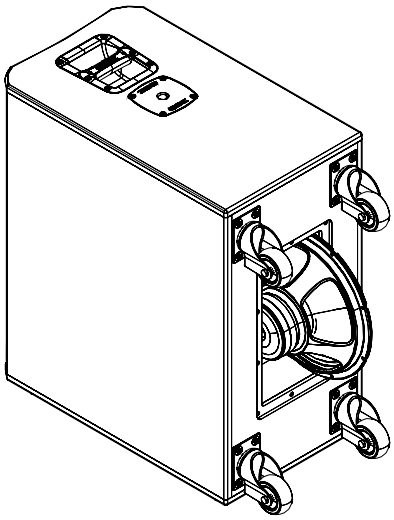


*Figure 6.3 - The transducer will fit through the cabinet's BOP cutout*

## 6.3 Handles, threaded pole mount, and casters

### Handle removal and installation notes

- The handle is secured to the cabinet with machine screws (on the exterior of the cabinet) and mounting plates (on the interior of the cabinet).
- There is no easy way to remove or install new handles. Access to the interior of the subwoofer cabinet is required to remove and install the handles. The BOP and at least 1 transducer must be removed to access them.
- Reapply a small amount of thread locking fluid to the mounting plate when replacing the handles.

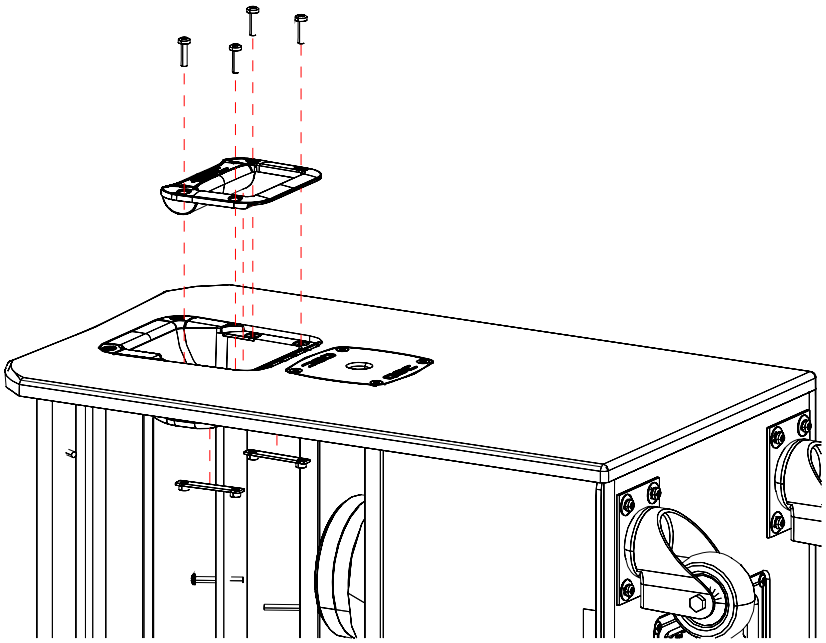


*Figure 6.4 - The handle is secured by mounting plates on the interior of the cabinet*

## Threaded pole mount removal and installation notes

- Threaded T-nuts are installed in the cabinet for the threaded pole mount to secure to
- Remove the four machine screws and lift the threaded pole mount out of the cabinet.
- Verify that any new threaded pole mount has gasket. Air will leak out of the cabinet if there is no gasket.

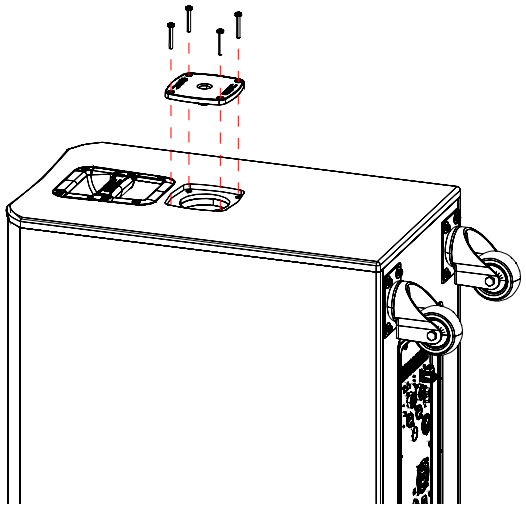


*Figure 6.5 - The threaded pole mount is easy to remove*

## Caster removal and installation notes

- Because of the normal wear and tear of the casters, they may have to be replaced often
- Remove the four machine screws that secure the caster to the cabinet.

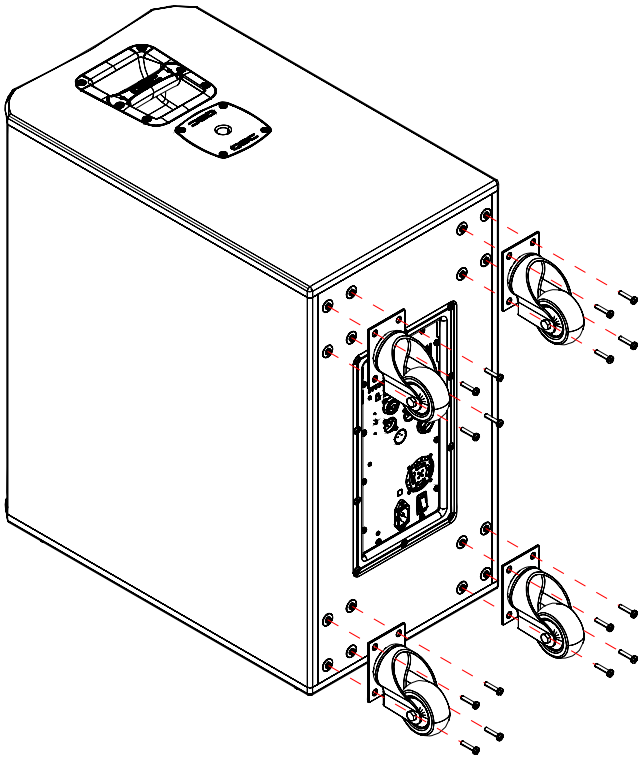
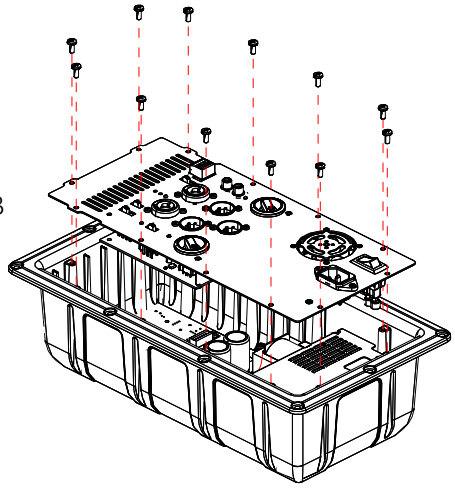


*Figure 6.6 - Caster removal on the KSub*

# 7. BOP disassembly and repair procedures

## 7.1 Faceplate

### Removal



1. Remove the 10 screws around the perimeter of the BOP. These screws secure the faceplate to the main bucket.
2. Partially lift the faceplate assembly out to gain access to the ribbon cable wire trap.
3. To release the ribbon cable, press down on the white housing of connector J2B (see Figure 7.2).

   **Note**: Do not pull up forcefully on the ribbon cable. It should come out easily if the white housing is firmly being pressed down.
4. Remove the four screws that secure the EMI shield to the main bucket.
5. Remove the EMI shield from the assembly.
6. Disconnect the two AC power wires from J14 (brown wire) and J15 (blue wire).
7. Separate the faceplate assembly from the main bucket assembly. Complete.

### Installation

1. Install the input/DSP and PSU/amplifier PCBs to their original locations.
2. Connect the two AC power wires (J14 brown, J15 blue) to the PSU/amplifier PCB.
3. Install the EMI shield.
4. Fasten the 4 screws that secure the EMI shield to the main bucket.
5. Prepare the ribbon cable for insertion. Straighten and align the wires coming out of the ribbon cable.
6. Insert the ribbon cable into the wire trap.

   **Note**: If the ribbon cable doesn't go in easily, press down on the white housing of connector J2B so that the cable easily goes into the wire trap.
7. Set the faceplate assembly on the main bucket and align the holes along the perimeter of the faceplate.
8. Fasten all 10 screws to complete installation.

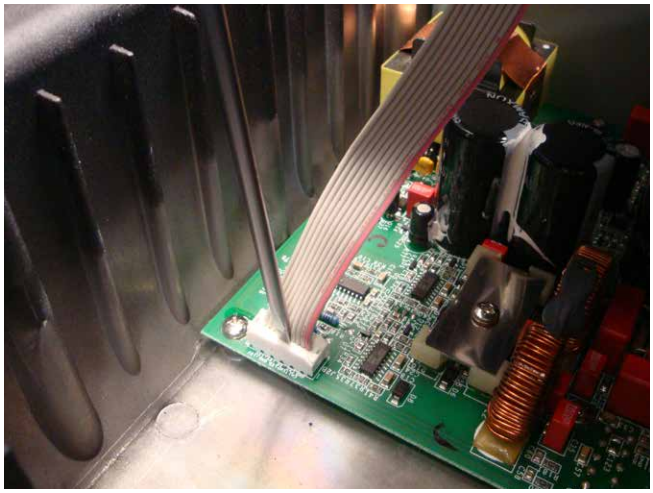


*Figure 7.2 - Put pressure on the white housing to release the ribbon cable*

# 7.2 PSU/amplifier board

## Removal

1. Remove the faceplate assembly to gain access to the PSU/amplifier PCB. Follow removal instructions in "7.1 Faceplate" on page 23.
2. Remove all screws that secure the PSU/amplifier PCB to the bucket chassis.
3. Remove the rectangular plate and nylon spring seat.
4. Gently lift the PSU/amplifier PCB out of the bucket.

## Installation

1. Prepare the PSU/amplifier PCB for installation. Apply new thermal grease to the large MOSFETs and thermal sensor mounted to the bottom-side of the PCB.
2. Verify that the thermal pads are clean and placed in their appropriate locations on the bottom of the bucket chassis.

   **Warning**: Thermal pads are also used to isolate the body of the MOSFETs from the bucket chassis (ground). If there is any part of the MOSFET grounded to the chassis, the BOP won't power on or output audio.
3. Place the PSU/amplifier PCB in the bucket chassis and align the mounting holes.
4. Set the nylon spring seat and the rectangular plates.
5. Beginning with the corner screws, fasten all short screws to secure the PCB to the chassis.
6. Fasten the two long screws last. This will press the MOSFETs against the chassis for good heat transfer.

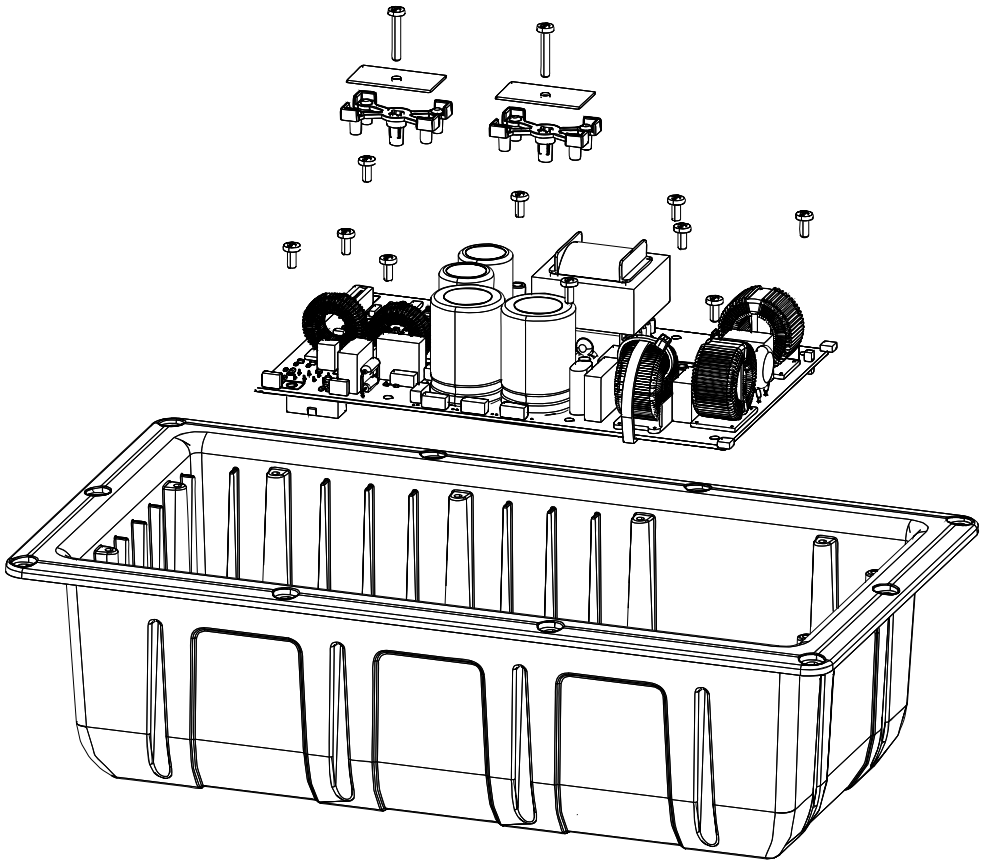


*Figure 7.3 - PSU/amplifier PCB removal from the bucket chassis.*

# 7.3 Input/DSP board

### Removal

1. Remove the faceplate assembly for easy access to the input/DSP PCB. Follow removal instructions in “7.1 Faceplate” on page 23.
2. Remove all screws securing the XLR and RCA connectors to the faceplate.
3. Remove all screws securing the input/DSP PCB to the faceplate’s standoffs.
4. Remove the gain knob(s).
5. Disconnect the fan wiring harness.
6. Fully remove the input/DSP board from the faceplate.

### Installation

1. Connect the fan wiring harness.
2. Install the input/DSP board into the faceplate.
3. Install the gain knobs. They will temporarily hold the input board in place.
4. Fasten the screws securing the input/DSP PCB to the faceplate’s standoffs.
5. Fasten the screws securing the XLR and RCA connectors to the faceplate.

# 7.4 Power inlet, power switch, and fan

### Power inlet notes:

- Soldering is required to install a new IEC power inlet
- Use the removal instructions in “7.1 Faceplate” on page 23 to gain access to the power inlet.
- Two screws secure the power inlet to the faceplate.
- Brown is line, blue is neutral, and green is ground. The power inlet has AC labels near the soldering points.

### Power switch notes

- Use the removal instructions in “7.1 Faceplate” on page 23 to gain access to the power switch.
- Fastons are connected to the power switch. If the fastons are damaged or weak, crimp on new ones.
- The power switch has two tabs holding it in place to the faceplate. Scrape off the glue to uncover these tabs.
- The easiest way to remove the power switch is to cut the tabs with a wire cutter and push the switch out.

### Fan notes

- Use the removal instructions in “7.1 Faceplate” on page 23 to gain access to the fan.
- To remove the fan, a series of nuts and washer must be removed first.
- Replace the fan if it’s dirty, noisy, or not functional.
- Test the fan with a DC power supply to confirm failure.

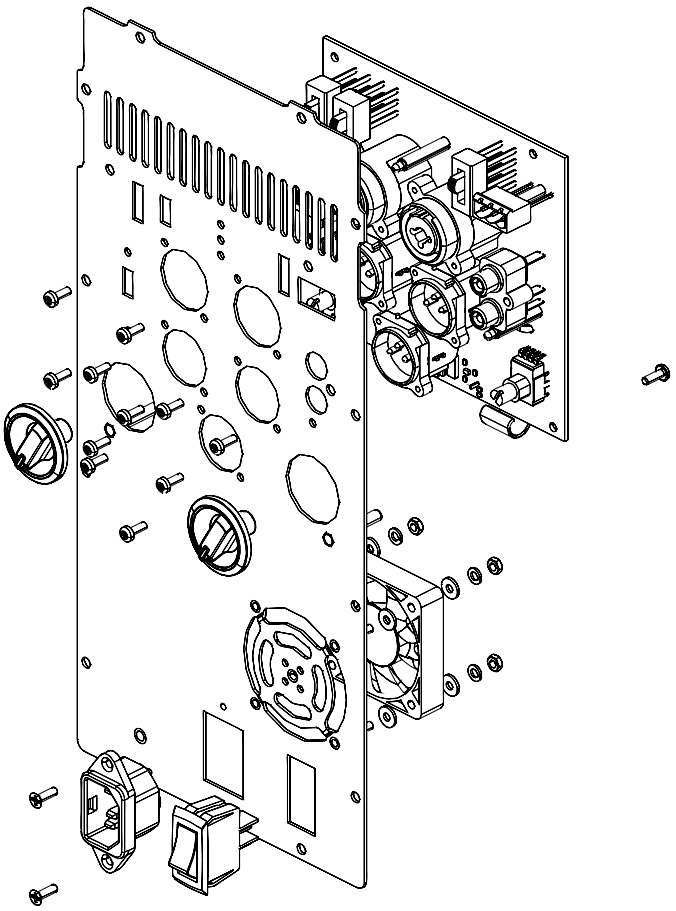


*Figure 7.4 - Exploded-view of BOP faceplate assembly*

# 8. Testing

## 8.1 Requirements

### Hardware

- Digital multimeter (DMM)
- Oscilloscope
- Audio sine wave generator
- SPL meter
- Soldering iron
- K Family test adapter
- Distortion analyzer (Audio Precision recommended)
- Class D output filter for distortion analyzer

## 8.2 Bucket of power testing

### Molex pinout (output connector)

The molex jack, which connects to the speaker's internal wiring harness, is located on the back of the BOP. Channel 1 and channel 2's outputs can be tested from the molex jack. The K8/K10/K12 PSU/amp boards have both normal (filter bypass) and high-pass filtering connections available on the molex jack. Because of this, it's important to determine which molex pins are being measured when testing channel 2's output.

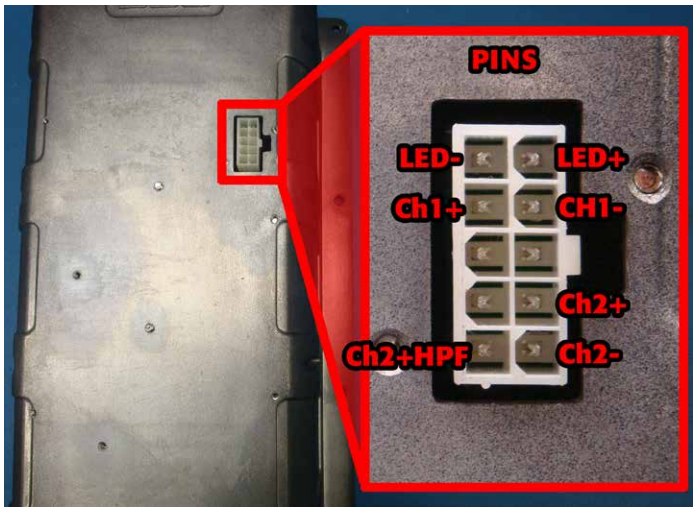



*Figure 8.1 - Molex output connector pinout*

### K Family test adapter

QSC Technical Services Group offers an output adapter for testing any K, KW, or KLA series BOP. The adapter includes a switch for testing channel 2's normal and high-pass filtering sections. It also includes a front LED for test. This adapter is highly recommended for troubleshooting and testing the output power of the amplifier. Please call and ask for QSC part number SG-000576-TS.

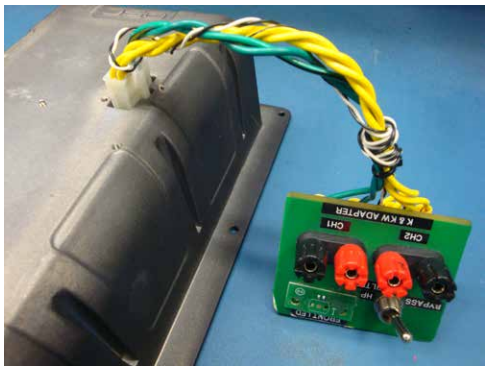


*Figure 8.2 - Test adapter for K Family*

### Activating "test mode"

When the BOP is running in "test mode" it acts like a full-range 2 channel amplifier that can pass frequencies from 20 Hz to 20 kHz at full power. All DSP voicing is ignored while in test mode, however the signal will still pass through the DSP controller. Test mode is required if verifying full power output from the amplifier but can also be useful when troubleshooting the BOP.

**To activate test mode:**

1. Disconnect AC and turn off the BOP. Remove the gain knob on the right side of the amplifier (channel B for K8/K10/K12 models).
2. Locate the two triangular-shaped pads on the PCB next to the gain potentiometer or near the text "SHORT FOR TEST MODE" as in Figure a.
3. Solder the two pads together so that the pads are shorted or bridged.
4. The BOP is now in Test Mode.

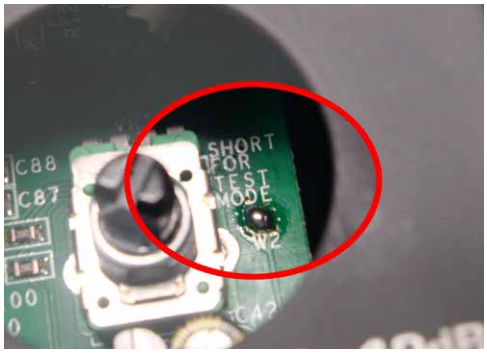



*Figure 8.3 - Test mode activated*

### Audio Precision (AP) Test Procedures

If an Audio Precision distortion analyzer is available, please contact QSC for the test procedure files. They are available upon request. A test adapter is required if using the AP test procedures.

## Step 1: Power up sequence

This test is meant to verify the proper power up sequence. If the BOP's standby or power LEDs continually blink during power up, there may be an issue with the amplifier's power supply or output section.

5. Disconnect all XLR, 1/4", or RCA cables from the BOP. Connect a 120 or 230 V power source to the IEC inlet.
6. Turn on the power switch.
7. Monitor the BOP's LEDs. The LIMIT, STBY, and/or POWER LEDs will blink very quickly. The STBY LED will then illuminate for 1-2 seconds. Finally, the POWER LED will turn on and stay illuminated.


*Figure 8.4 - Input connection to Ch.B*

## Step 2: Shock test

The purpose of this test is to look for intermittent connections that may exist within the BOP assemblies.

1. Apply AC power and turn the switch on.
2. Using a audio sine-wave generator, connect a balanced XLR or 1/4" TRS cable to channel B's input only. Turn the gain knob on the right side to the 12 o'clock or 0 dB position.
3. If the test adapter is available, connect channel 1 and channel 2 to an oscilloscope. If not, disregard.
4. Apply a 500 mVrms, 80 Hz sine wave signal. Verify channel 1 has a signal on the oscilloscope.
5. Using a rubber mallet, lightly bang the back of the BOP a couple of times. Verify that you don't lose the signal on the oscilloscope. Verify that the power is not lost. If a rubber mallet is not available, lightly bang the amplifier on the work bench.
6. Apply a 500 mVrms, 5 kHz sine wave signal. Verify channel 2 has a signal on the oscilloscope. Repeat step 5 for channel 2.
7. Test complete.

*Figure 8.5 - Shock test*

## Step 3: DSP functional test

These tests are meant to verify that the DSP controller and mode switches are working correctly. Make sure that test mode is deactivated before performing these steps. Please note that these tests are not meant to verify full DSP voicing and are only quick checks.

1. Using a audio sine-wave generator, connect a balanced XLR or 1/4" TRS cable to channel B's input only. Turn the gain knob on the right side to the 12 o'clock or 0 dB position.
2. On KSub models set the mode to "NORMAL" and the polarity to "NORMAL". On K8/K10/K12 models set the LF to "NORMAL" and the HF to "FLAT".
3. Apply AC power and turn the switch on.
4. Apply a 500 mVrms, 70 Hz sine wave signal. Using a digital multimeter (DMM), verify the measurements in the table below. You may take the measurements from the pins on the molex connector (or test adapter if you have one).

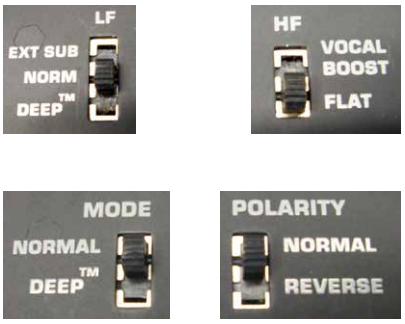



*Figure 8.6 - DSP function switches*

| Model | Ch1+/Ch1- Vrms @ 70 Hz | Ch2+/Ch2- Vrms @ 70 Hz |
|---|---|---|
| KSub | 10—15 V | 10—15 V |
| K8 | 15—20 V | 0 V |
| K10 | 30—35 V | 0 V |
| K12 | 30—35 V | 0 V |

5. Adjust the mode switch to “DEEP”. Verify a slight increase in output voltage on the LF channel.
6. On K8/K10/K12 models, adjust the mode switch to “EXT SUB”. Verify a decrease in output voltage on the LF channel.
7. Apply a 500 mVrms, 6 kHz sine wave signal. Using a DMM, verify the measurements in the table below.

| Model | Ch1+/Ch1- Vrms @ 6 kHz | Ch2+/Ch2- Vrms @ 6 kHz |
|---|---|---|
| KSub | 0 V | 0 V |
| K8 | 0 V | 13—17 V |
| K10 | 0 V | 13—17 V |
| K12 | 0 V | 13—17 V |


8. On K8/K10/K12 models, adjust the mode switch to “VOCAL BOOST”. Verify a increase in output voltage on the HF channel.
9. On K8/K10/K12 models, apply a 100 mVrms, 6 kHz sine wave signal to channel A now. Turn the gain knob on the left side to the 12 o’clock or 0 dB position. Adjust the mode switch from “LINE” to “MIC”. Verify a large increase in output voltage on the HF channel.

**Note**: KSub BOPs should only pass frequencies 100 Hz and below from both channels. K8/K10/K12 BOPs should pass frequencies below 2 kHz on channel 1 and pass frequencies above 2 kHz on channel 2.

## Step 4: Full power test

In order to test full power it is highly recommended to purchase a test adapter from Technical Services Group (QSC part # SG-000576-TS). Without the test adapter it will be very difficult to connect an 8 ohm load to the molex connector.

**Warning**: Do not perform full power tests with load for more than 10 seconds. It may cause internal damage to the BOP and/or blow AC fuse F1.


1. Place the BOP in test mode by following the instructions in “Activating “test mode”” on page 26.
2. Using a audio sine-wave generator, connect a balanced XLR or 1/4” TRS cable to channel B’s input only. Turn the gain knob on the right side to the 12 o’clock or 0 dB position.
3. Connect the test-adapter to the back of the molex jack. Adjust the adapter’s switch to “bypass”. Disconnect any loads from the adapter. We will perform an open-circuit, unloaded test on both channels first.
4. For KSub BOPs, apply a 2.35 mVrms sine wave signal. For K8/K10/K12 BOPs, apply a 1.75 mVrms sine wave signal. Adjust the frequency while taking individual output voltage measurements for each frequency. Verify channel 1 and channel 2 have similar output voltages compared with the graph below, +/- 5V.

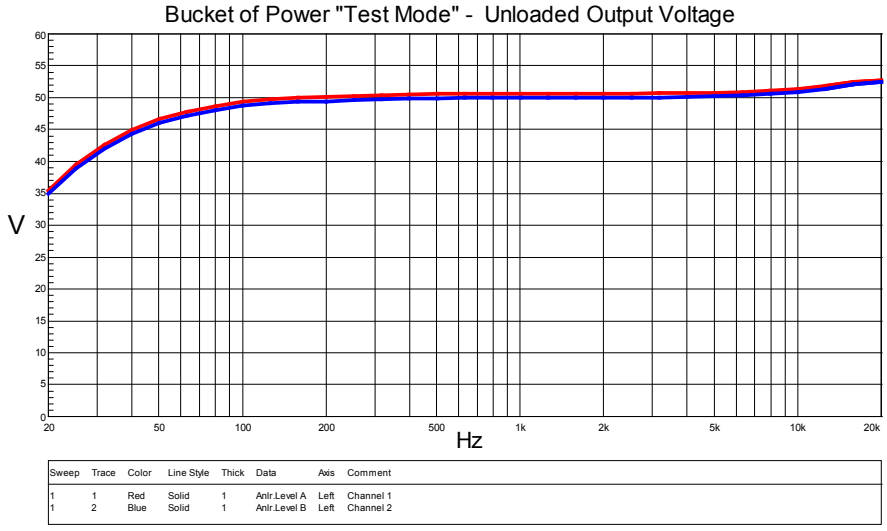



*Figure 8.6 - Unloaded output voltage (both channels) vs frequency*

5. Apply an 8 ohm load to channel 1 only. Follow step 4 again, except test for power this time. A power graph is provided below.
6. Disconnect channel 1's load. Apply an 8 ohm load to channel 2. Follow step 4 again, except test for power this time.
7. Test complete. Deactivate the BOP from test mode by removing the solder across the two triangular-shaped pads.

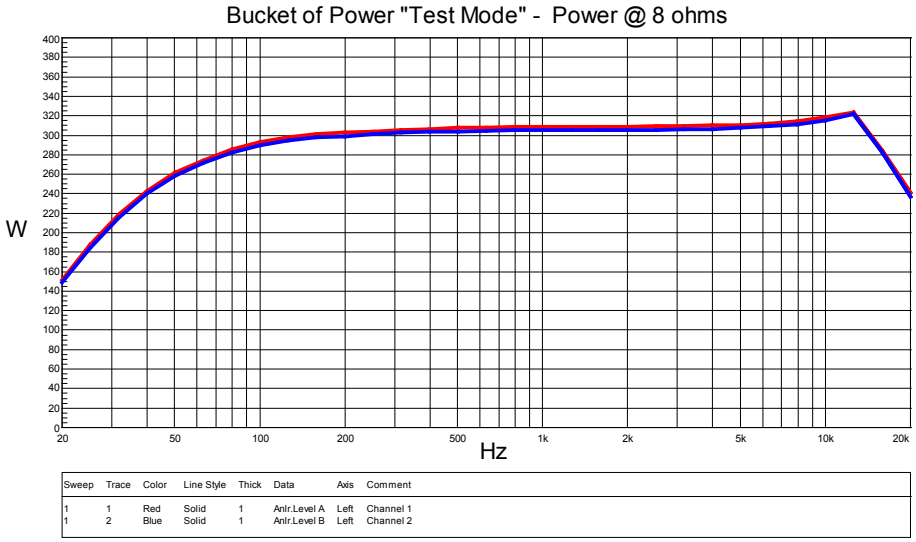



*Figure 8.7 - Loaded test at 8ohms*

# 8.3 Loudspeaker testing

Once a K Series loudspeaker is fully assembled it must be tested to meet all audio specifications. This final step is required to verify that the BOP powers the transducers, no distortion is present, and that the speaker meets SPL specifications.

### Step 1: System setup

Verify that the BOP is in a normal mode, not test-mode!

Connect the output of the audio sine wave generator to channel B input and set the gain to the 12 o'clock or 0 dB position. Power up the speaker and begin the tests in next steps below.

Set the SPL meter approximately 1m in front of the loudspeaker, directly on axis with its centerline.

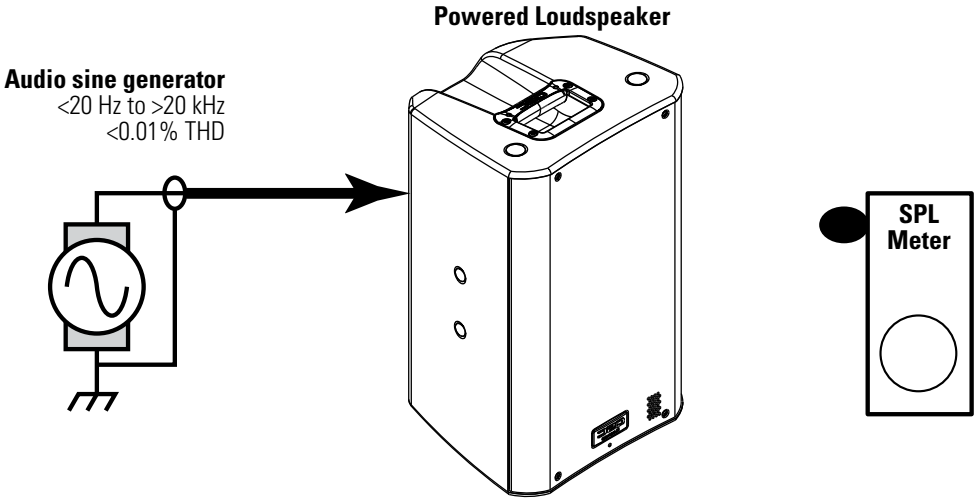



*Figure 8.8 - Test setup for a powered loudspeaker*

### Step 2: Measuring sensitivity (sound pressure level)

1. Set the frequency of the sine wave generator to 100 Hz.
2. Hold the SPL meter 1 meter in front of the loudspeaker, directly on axis with its centerline. Measure and take note of the sound pressure.
3. Gradually adjust the generator amplitude and the BOP gain until the SPL in the table below meets or exceeds the SPL dB numbers.
4. Compare your measurements with the data in the table below.
5. Change the generator frequency to 5 kHz and repeat the measurement.

| Model | 100 Hz SPL (dB) | 5 kHz SPL (dB) |
|---|---|---|
| **K8** | 105 dB | 102 dB |
| **K10** | 105 dB | 102 dB |
| **K12** | 106 dB | 102 dB |
| **KSub** | 112 dB | n/a |

NOTE: These figures apply only to on-axis measurements. If the SPL meter's microphone is not on-axis with respect to the loudspeaker, the relative SPL measured at 5 kHz may be significantly lower.

### Step 3: Frequency sweep

Turn up the signal generator or BOP gain until the SPL at 1 meter distance is suitably loud, about 100 to 105 dB.

Step or sweep the generator frequency from about 20 Hz up to about 20 kHz. Listen for a clean, undistorted tone; any buzzes, rattles, distortion, etc., could indicate a defective transducer, loose hardware, damaged enclosure, or other problem that must be corrected.

# 9. Troubleshooting guide

## 9.1 General tips and tricks

### Testing the line filter components for open circuit in two measurements

The components in the line filter (L11, L12, L13, R140, F1) and the bridge rectifier (BR1) can all be checked in two measurements taken from the top of the power/amp PCB.

With a DMM in diode-check mode, place the negative/black lead on J14 (AC LINE) and the positive/red lead on PRI_HI (R147). If the measurement reads normal (approximately 0.5 V) then there are no obvious lead breaks. Next, place the positive/red lead on J15 (AC NEUTRAL) and the negative/black lead on PRI_LO (R144). Again, if the measurement reads approximately 0.5 V, then there are no obvious lead breaks.

**Note**: This tip does not account for *intermittent lead breaks* that can be discovered by applying solder to the leads on the bottom of the board! Please read "9.2 Line filter - broken components (BOP)" on page 33 for more info.

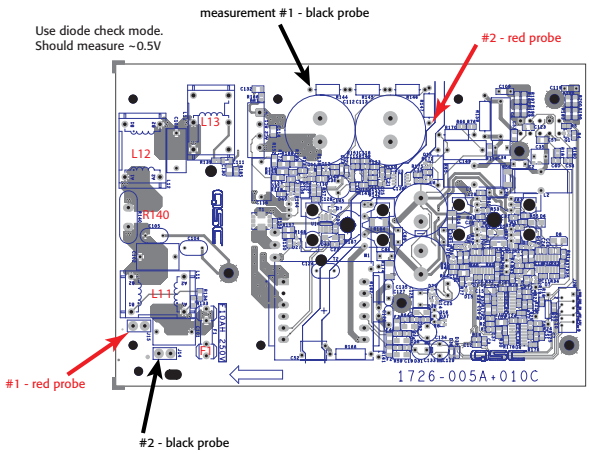



*Figure 9.1 - Quick check of line filter components*

### Testing the PSU/amplifier board without the input/DSP board

The PSU/amplifier board can operate without the input/DSP board connected because there is no PSU control or link coming from the DSP. You can perform a quick test on the PSU/amplifier board. This is only a simple test to determine the SMPS is switching and generating the main/auxiliary voltage rails. Follow the instructions below to test the PSU/amplifier PCB.

1. Disconnect AC power from the BOP.
2. Wait at least 5 minutes to allow the BOP to naturally discharge all capacitors.
3. Remove the faceplate assembly by following removal instructions in "7.1 Faceplate" on page 23.

   **Warning**: High voltage! The board must be mounted to the heatsink if being left on for more than 10 seconds, or the MOSFETs will overheat and fail.
4. Connect AC wires to J14 (LINE brown) and J15 (NEUTRAL blue). We recommend a custom IEC jack with brown/blue wires as pictured in Figure 9.2.
5. Apply 120 Vac (or 230 Vac if 120 Vac is not available) across the AC wires. If possible, set current trip to approximately 3 amps for safety.
6. Take the following measurements and verify functionality.

*Figure 9.2 - Powering up just the PSU/amp board*

| Signal Name | Best location to measure | Reference | Measurement (Vdc) @ 120 Vac | Measurement (Vdc) @ 230 Vac |
|---|---|---|---|---|
| PRI_HI | R144 | PRI_LO | 164 V | 308 V |
| VIN | R147 | PRI_LO | 41 V | 77 V |
| LINE_UV | R189 | PRI_LO | 3.1 V | 5.8 V |
| +VCC | R174 | GROUND | 85 V | 85 V |
| -VCC | C33 | GROUND | -85 V | -85 V |
| +15V | D38 cathode | GROUND | 15 V | 15 V |
| -15V | D39 anode | GROUND | -15 V | -15 V |
| VDD1 | D28 cathode | GROUND | 8.7 V (no load) | 8.7 V (no load) |

## Amplifier section tips

- A quick check of the amplifier feedback path can be done by measuring resistance from the switching node (Q2 source and Q3 drain, for example) back to the comparator inverting input; it should be about 11.3kΩ.
- You may check for amp switching by looking for about 7.5 Vdc on the U2/U4 pin12 comparator output (0-15V at 50% duty cycle).
- Verify the thermal sensor output isn't telling the DSP the heatsink is very hot (Vout is below 0.85V on temp sensor U9), causing amplifier muting.
- Q16 can fail if the gate drivers and/or amp FETs fail. Check for shorts across Q16 collector-emitter, shorted D37, shorted D36, shorted D14/29, or opened R12/15. A failure with the gate drive supply can also take out the -85V rectifier, so check for a shorted D34.
- If the gate driver ICs are not detecting over-current (OC), the CSD pin will be at +10V. This allows a quick way to see if the gate driver has detected a fault and is holding the FETs off. If the pin is at ground, an OC condition has been detected by the gate driver. But if the pin is a diode drop above ground the DSP has turned on Q17 and is asserting shutdown. In this case try a new input board to determine if the DSP is detecting a real fault.

## Testing the DSP without the PSU/amp board

The DSP can operate without the PSU/amplifier board by applying power to the board through capacitor C45.

1. Disconnect AC power from the BOP.
2. Remove the faceplate assembly by following removal instructions in "7.1 Faceplate" on page 23.
3. Connect a bench-top DC power supply to the bottom-side of the PCB. Connect the positive/red lead to positive side of C45. Connect negative/black lead to a metal chassis component on the faceplate. (Figure 9.3)
4. Set the bench-top supply to 7V.
5. If the DSP boots, the green and red LED will illuminate and remain active.

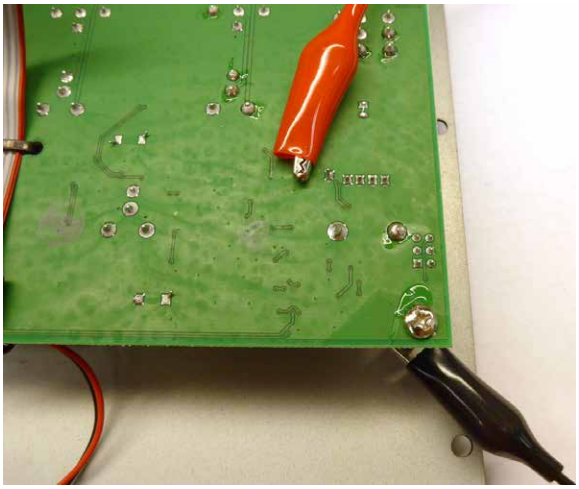


*Figure 9.3 - DSP quick check with DC power supply*

**Note**: This is not a complete DSP test. We are just testing that the DSP powers up and performs limited functions. To test signal flow through the DSP, the a input board will have to be connected to the PSU/amplifier board as a complete system.

## Advanced DSP tips

- Check the output of the +3.3V regulator, easy accessed by the tab on U8, and the +1.8V rail, best accessed on Q8's collector or C81. The DSP needs these voltages to run.
- Check to make sure the 12.288MHz clock is present, as the DSP obviously won't run without a clock.
- Looking at the RST-L line (accessible at J7, pin8) may also be useful as this signal not be resetting the DSP during a power-up. Reset IC U12 could be the culprit.
- Another tricky culprit can be the Euro connector, J6. Make sure the middle pin is nearly 5V; if it is at ground the DAC output will be zero.
- Check for 1.5—1.65 Vdc at both ADC pins, all 4 DAC pins, FILTA (pin 47), FILTD (pin 41), and CM (pin 40). If any of those pins is at ground, audio will not pass through the DSP.

# 9.2 Line filter - broken components (BOP)

PCB flex/vibration issues seem to cause more broken-component failures in the K12 than in the other K Series models. Most common are component leads that break between the base of the component and the PCB. Most vulnerable are the heavier components, such as ferrite-core inductors, located in the AC line filter. Fortunately, these failures usually cause no collateral damage to other electronics, though in some rare cases, arcing could burn the PCB and the whole PCB assembly would need to be replaced.

### Symptoms:

- no power or intermittent power cycling
- turns off while playing audio, especially at peak levels

### Failure verification:

- any one broken lead on any component listed in the table below

### Repair notes:

- Check every single component in Figure 9.5 and the table below for lead breaks.
- Check *all* leads on the components for breaks. Any of them could potentially break.
- If you find one of the components has a broken lead, there is a good chance that a second component also has one.

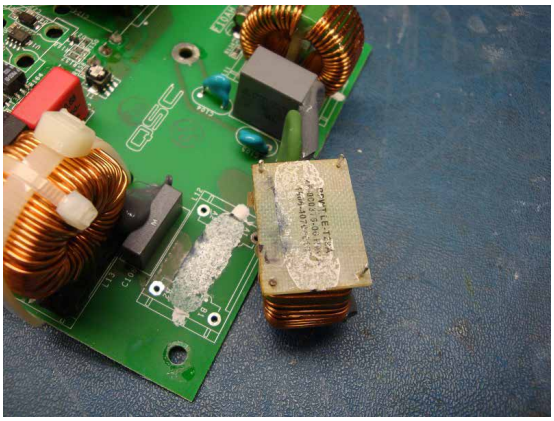


*Figure 9.4 - One lead broken on inductor L12*

- Heat the leads from the underside of the board with a soldering iron to check for lead breaks. A broken lead will simply float away when solder is applied to it.
- To check for intermittence, it's recommended to remove the amplifier module from the speaker enclosure, apply AC power through the IEC jack, turn the amplifier module on, and gently hit the amplifier module with a rubber mallet or hammer. (Figure 8.5).

| Reference | Description | QSC Part # |
|---|---|---|
| L13 | Inductor 774 µH, 2 pin | XF-000377-00 |
| L11, L12 | Inductor 4 mH 4 pin | XF-000376-00 |
| R140 | NTC resistor 2.5W | RE-000300-NR |
| T2 | Transformer | XF-000362-00 |

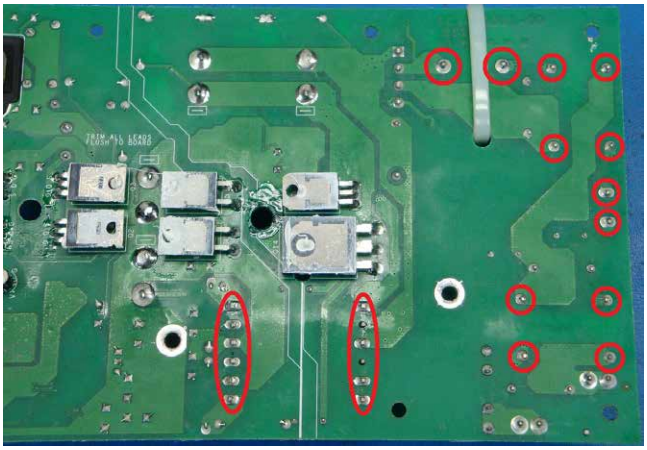


*Figure 9.5 - Components to heat up with solder and check for lead breaks*

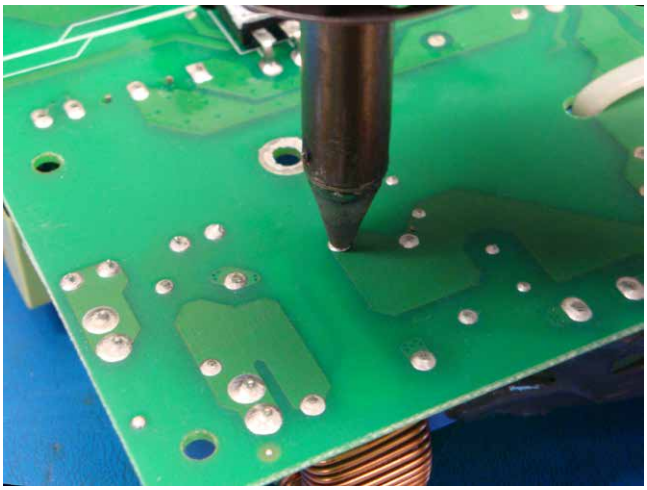


*Figure 9.6 - Heating up a lead on inductor L11.*

# 9.3 Broken capacitor C45 (BOP)

PCB flex and vibration issues can also cause the leads on a large electrolytic capacitor, C45, to break. While the amplifier can idle perfectly fine and play music at low power levels with the capacitor broken, the BOP will power cycle under high power levels if a lead on the capacitor is broken because the capacitor can no longer provide sufficient charge to the supply . The failure is extremely easy to find - simply remove the channel A gain knob - C45 can be checked from there.

### Symptoms:

- power cycling during high power levels only - runs normally otherwise

### Failure verification:

- C45 has a broken lead (Figure 9.7)

### Repair notes:

- C45 can be quickly checked by simply removing the channel A gain knob. Push the capacitor back and forth with your finger to verify the broken lead.
- The symptom (power cycling) can be difficult to replicate.
- The input board must be removed to replace the capacitor with a new one.


*Figure 9.7 - Broken capacitor C45*

# 9.4 Input op-amp damage (BOP)

If the customer accidentally applies a powered speaker-level signal to the input of the BOP, most likely the op-amp U14 will fail. Because the op-amp is shared between channels A and B, either input can damage the op-amp. The QSC part number for the MC33078 op-amp is IC-000048-30.

### Symptoms:

- Channel A or channel B green signal LED permanently lit without an input connected
- BOP emitting noise or distortion to the output without an input connected

### Failure verification:

- Op-amp U14 has a DC voltage offset on pin1 or pin7
- Audio signal does not flow through op-amp U14

### Repair notes:

- The op-amp is powered by a +15V and -15V voltage rail. If the op-amp has failed, there may be a short circuit across op-amp U14 pins 4, 8, and ground. Check the impedance with the BOP powered off.
- Check resistors R102 and R103 for open circuits. If the +/-15V voltage rails failed, these resistors will be open.
- Apply a sine-wave source of 500 mVrms @ 1 kHz to input A or input B (not both) using an audio sine wave generator. The gain pots should be set to 12 o'clock (0 dB). Check the measurements in the table below to find the location where signal is lost or distorted.

| Input Details | U14 pin1 | U14 pin7 | U17 pin1 | U17 pin7 (to DSP) |
|---|---|---|---|---|
| Ch.A - 500mVrms @ 1kHz | 0 | 240 mVrms | 530 mVrms | 757 mVrms |
| Ch.B - 500mVrms @ 1kHz | 240 mVrms | 0 | 530 mVrms | 757 mVrms |

- The input section can be difficult to troubleshoot. If more than an hour is spent locating the problem, it may be better to replace the PCB assembly with a new one.
- The input/DSP board is not available as a spare part by itself. The power/amp board and input/DSP always come together.

# 9.5 Amplifier section, MOSFET failure (BOP)

While not a common failure due to the DSP limiting and protecting the amplifier section from being over-driven, the MOSFETs in the amplifier section can fail in certain conditions. For example, if the LF or HF transducer has a short across the positive and negative terminals, high-current can flow through the MOSFET, ultimately causing failure to the amplifier section. Timing issues with the gate drive circuit can also cause MOSFET failures.

### Symptoms:

- BOP will not power up - keeps restarting
- one channel not outputting audio (with verified output from the DSP into the amplifier section)

### Failure verification:

- MOSFETs Q2—Q5 shorted between any two pins of gate, source, or drain

### Repair notes:

- Use the highlighted schematic in Figure 9.8 as a component check guide. Replace components in red and check components in blue.
- The MOSFETs almost always fail in pairs. Always replace both MOSFETs with new.
- Check the gate resistors tied to the MOSFETs for open circuit.
- The gate driver ICs can easily fail when the MOSFETs short.
- An amp FET failure can also fail the secondary rectifiers; check for shorted D33—34.
- Check the components (resistor and diode) tied to +12VLOW. If the gate driver IC fails, these components usually fail as well.
- A quick check of the amplifier feedback path can be done by measuring resistance from the switching node (Q2 source and Q3 drain, for example) back to the comparator inverting input; it should be about 11.3kΩ.
- You may check for amp switching by looking for about 7.5 Vdc on the U2/U4 pin12 comparator output (0-15V at 50% duty cycle).
- Q16 can fail if the gate drivers and/or amp FETs fail. Check for shorts across Q16 collector-emitter, shorted D37, shorted D36, shorted D14/29, or opened R12/15. A failure with the gate drive supply can also take out the -85V rectifier, so check for a shorted D34.
- Check the transducer associated with the failed amplifier section (LF or HF) for a short across the positive and negative terminals.

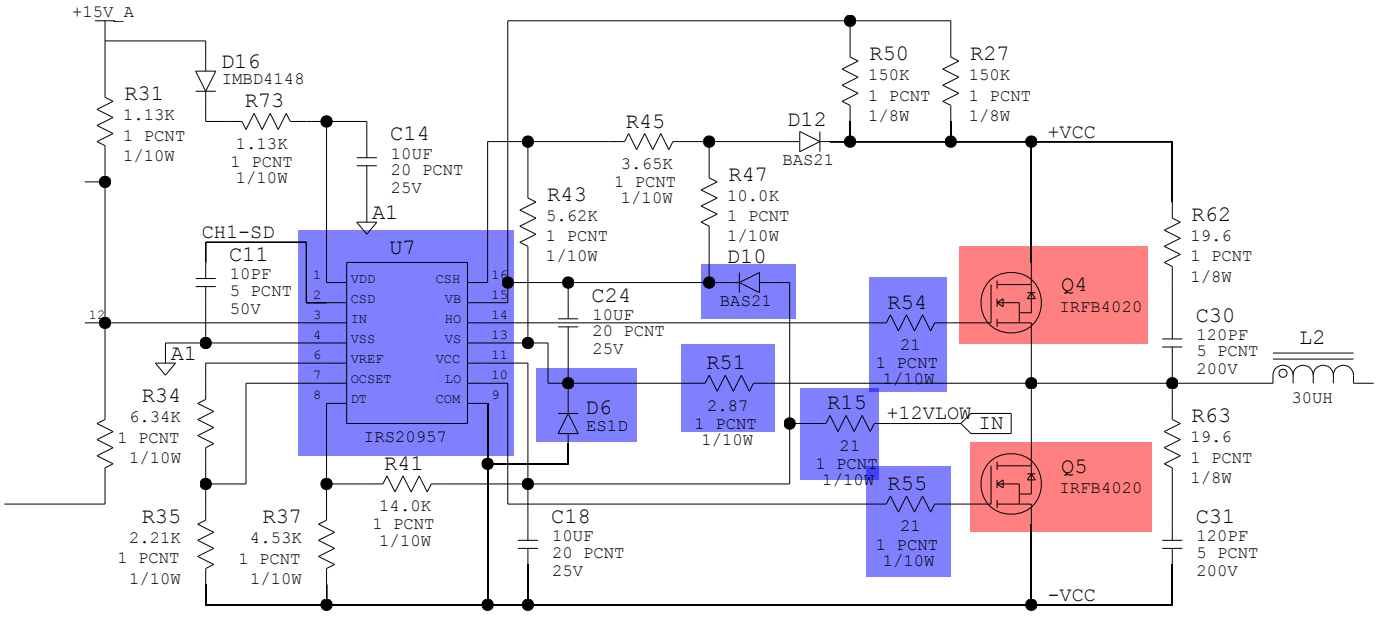



*Figure 9.8 - Components to replace and/or check in the event of an amplifier section MOSFET failure.*

# 9.6 Power supply, MOSFET failure (BOP)

The most common PSU failure is a failed Q13 or Q14 MOSFET. The failure can cascade down further to gate-drive components. In some cases, the PSU will not start due to a PWM controller U15 failure.

### Symptoms:

- no power
- The PSU attempts to start but does not succeed.

### Failure verification:

- Q13 or Q14 shorted between any two pins of gate, source, or drain.

### Repair notes:

- Use the highlighted schematic in Figure 9.9 as a component check guide. Replace components in red and check components in blue.
- Q13 and Q14 don't always fail in pairs, but they should both be replaced in the event of a failure.
- A failure of Q14 can put a huge current pulse through C112 and C113 while Q14 is failing; check for the proper rectified AC voltage across the primary caps if the power supply appears to be dead.
- Check gate drive components (resistors and diodes) tied to gate signals QCL-DR and QM-DR.
- If the LEDs blink but the module won't start, suspect a failure to the power supply controller, U15.
- AC current draw at idle should be 0.1—0.3A at 120Vac and 0.1—0.2A at 230Vac. If the idle current is not in this range, there is a problem.

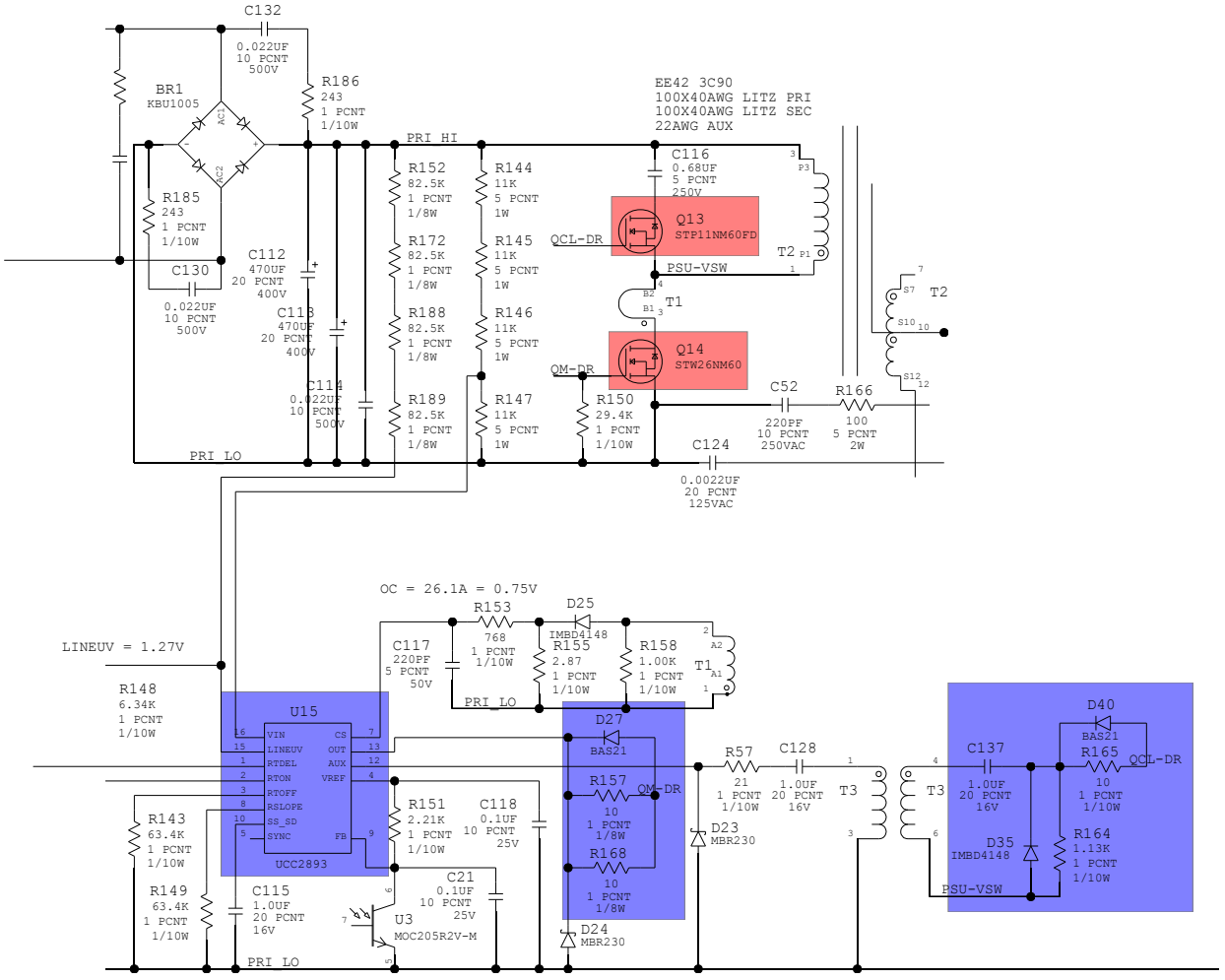



*Figure 9.9 - Components to replace and/or check in the event of a power supply MOSFET failure.*

# 9.7 Fan behavior

There may not be a problem with the fan itself due to firmware changes. Please see "3.1 Firmware revisions and program numbers" on page 8. On newer models the fan does not turn on until the BOP reaches a high temperature condition. On older models the fan runs all the time, except in standby-mode.

### Symptoms:

- Fan is loud - making a clicking sound
- BOP is hot to the touch and fan doesn't turn on

### Failure verification:

- Apply an external DC voltage (using a DC power supply) to the fan to verify the symptom
- Fan is very dirty or sticky affecting the rotation and noise
- Temperature sensor has failed or does not have thermal grease applied.

### Repair notes:

- Cleaning a dirty fan is not recommended - replace the fan with a new one (QSC part number WP-000367-00).
- If the fan does not spin with a DC voltage applied to it, also check the fan drive circuit on the input/DSP board. C42, Q7, or R70 may have failed.
- A failed temperature sensor with Vout shorted to ground could turn the fan on full-speed indefinitely. Alternatively, a temperature sensor with Vout shorted to the voltage on R78 could turn off the fan completely.
- Always check for thermal grease application on the temperature sensor

# 9.8 Internal wiring harness

Wiring harness problems tend to occur more often in the K8, K10, and K12 models than in the KSub. Sometimes the wires to the woofer (green and green/black) disconnect from the transducer terminals because they are too taut. If this happens, make some slack in the wires and crimp new faston connectors on them before reconnecting.

### Symptoms:

- missing or intermittent high and/or low frequencies
- crackling noises in loudspeakers

### Failure verification:

- A faston connector is disconnected from one of the terminals on the LF or HF transducers.
- A wire is loose inside the black molex connector that connects to the amplifier

### Repair notes:

- Plug a low-distortion audio sine wave generator into a 1/4" or XLR input connection on the amplifier module. Gradually sweep the frequency from 20 Hz to 20 kHz. All frequencies should be audible and free of distortion or rattling. You should notice the sound crossing over from the woofer to the horn at about 2 kHz. If one of the transducers is disconnected internally because of the wiring harness, it will be very obvious with the sine-wave sweep.


*Figure 9.10 - One of these fastons can disconnect easily from the LF transducer's terminals*

- If the faston connector was disconnected from the transducer terminal, it's recommended to crimp a brand new faston connector. For the LF green and green/black wire, use a 0.205" or 5.21 mm female, 14–16 AWG, insulated straight faston. For the HF yellow and yellow/black wire, use a 0.250" or 6.35 mm female, 14–16 AWG, insulated straight faston.
- Inspect all six wires in the wiring harness. Gently pull each one separately to make sure it is well secured in the black Molex connector. If any wire is loose and easily pulls out of the connector, replace the wiring harness assembly - do not repair it.
- The wiring harness should be slack enough to not put excessive stress on the connections, but taut enough that the wires will not flop around and possibly make noise. If the harness wires are too taut, cut off the tie-wraps and install new ones in a way that provides more slack. Attach the wires to the driver terminals, while making sure the polarity is correct.

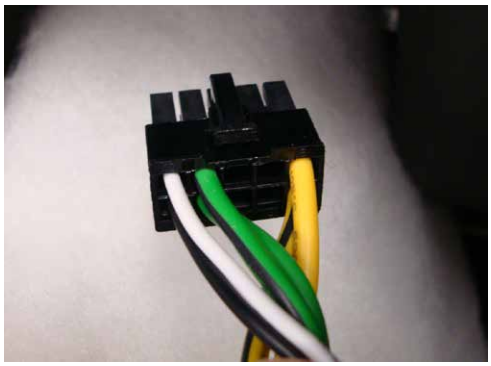


*Figure 9.11 - Wiring harness connector*

## 9.9 Front LED

Due to possible vibration issues, component problems, or a short circuit in the wire, the front blue LED can burn out. This repair is not easy and can take at least an hour of labor to finish. While only the blue LED needs to be replaced (QSC part number QD-000312-GP), the front grille and baffle assembly must be removed from the main enclosure to access the LED.

### Symptoms:

- Front LED is not working, even with setting on the BOP as "FRONT LED" or "LIMIT".

### Failure verification:

- The BOP is outputting a voltage through the black Molex connector but the front LED is not illuminated. The front LED setting is on "FRONT LED".

### Repair notes:

- Remove the BOP first. Before replacing the LED, always verify that the BOP is outputting a voltage through the Molex connector with the wiring harness disconnected.
- Remove the front grille then the main baffle (you can keep the transducers installed to the baffle. Set the baffle assembly on a flat work surface to begin replacement of the LED.
- The glue that holds the LED in place can be tough to remove. Carefully chip away the glue and try not to damaging the wires.
- Order a new wiring harness just in case the current one is damaged during repair.
- Reuse the existing plastic spacer if possible. Before soldering the new LED to the wires, slip a piece of small heat shrink tubing on each wires Then solder the LED's long lead (anode) to the white wire and its short lead (cathode) to the black wire. Cover the soldered connections with the heat shrink tubing and apply heat to shrink it. Make sure the wires cannot touch.
- Put the LED and plastic spacer back into the hole and apply hot glue to secure it in place. Make sure the LED wires are routed neatly between the edge of the woofer and the port. Add more hot glue to secure the wires, if needed.

*Figure 9.12 - Front LED wire routing*

*Figure 9.13 - Glue covering the front LED*

# 9.10 Transducer issues

There are many different types of failures for transducers in K series loudspeakers. The most common issues found are the following: spider becomes unglued from the frame, cone tears near the surround, burnt voice coil (because of a BOP failure), and voice coil rubbing on edge of magnet. These are often manufacturing issues but they do not occur very often.

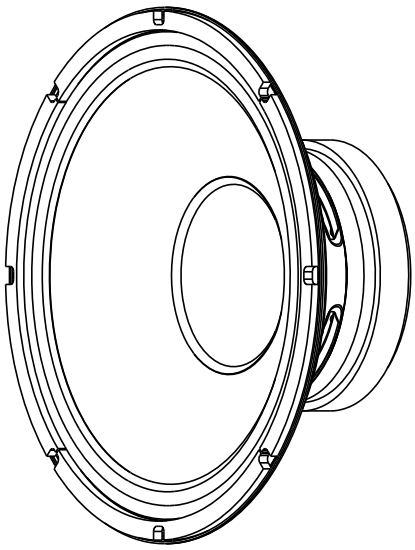


*Figure 9.14 - LF transducer*

### Symptoms:

- missing or intermittent high and/or low frequencies
- distorted sound

### Failure verification:

- tears in cone or surround, glue application issue, magnet damage, or other obvious transducer failures
- open circuit measured across the transducer's terminals
- Can hear obvious distortion when powering the transducer with a sine-wave tone using a separate amplifier (not the BOP).

### Repair notes:

- On top-box models, the low frequency transducer can be replaced without removing the baffle.
- On the KSub, the only way to remove the low frequency transducers is through the back by first removing the BOP. There is no access from the front.

  **Note**: Foreign objects can enter the KSub through the front grille/wood panel. These objects can stick between the magnet, frame, and cone, which can result in a very distorted sound.
- Always apply gasket around the rim of the low frequency transducer where it will mate to the surface of the enclosure. Poke holes in the gasket material over the mounting holes in the frame.

  **Important note**: When refastening the low frequency transducer to the baffle, tighten the screws in a crisscross pattern. Be careful to not damage the surround on the replacement transducer when you insert the screws, because it cannot be repaired except by replacing the entire driver...again!

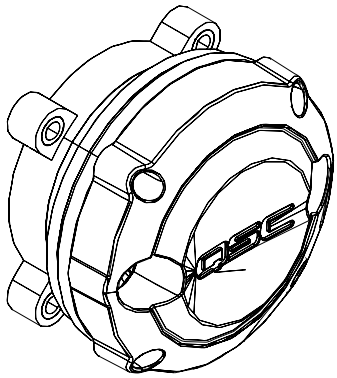
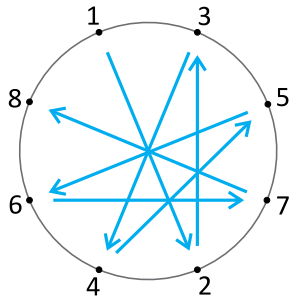


*Figure 9.15 - HF transducer*

- To replace the high frequency transducer, the baffle should be removed.
- All K-series top-box models share the same HF transducer.
- A diaphragm replacement is available for the HF transducer. Use QSC p/n SR-000145-00
- Note the wire color in the table below for each model.




| | LF+ wire | LF- wire | HF+ wire | HF- wire |
|---|---|---|---|---|
| K8 | green | green/black | yellow | yellow/black |
| K10 | green | green/black | yellow | yellow/black |
| K12 | green | green/black | yellow | yellow/black |
| KSub | green | green/black | | |

- Before attaching the grille, do a quick test on the loudspeaker. Plug a low-distortion audio sine wave generator into a 1/4" or XLR input on the amplifier module. Gradually sweep the frequency from 20 Hz to 20 kHz. All frequencies should be audible and free of distortion or rattling. You should notice the sound crossing over from the woofer to the horn at about 2 kHz.

# 9.11 Broken baffle

This applies to top-box models only. Though not a common failure, the mounting point where the baffle is secured to the main enclosure can break the ABS plastic mounts.

### Symptoms:

- very distorted sound
- air leaking around the edges of the baffle

### Failure verification:

- cracks on the baffle and the enclosure

### Repair notes:

- Remove the baffle from the enclosure and closely inspect every point where the baffle is screwed into the enclosure
- The baffle is available as a spare part, which includes the wiring harness.
- The main enclosure is NOT available as a spare part. If the enclosure has broken or sheared plastic near any mounting point, the speaker cannot be repaired. Please contact QSC for alternative options.
- If replacing the baffle, reuse the rectangular gasket that is installed along the edges of the baffle. Carefully re-align the gasket as it was previously installed so that air leaks do not form between the baffle and main enclosure.
- When replacing a new baffle into the enclosure, the front grille may not line up correctly if the screws that secure the baffle to the main enclosure are tightened without prior grille alignment. Try to install the grille first without tightening the baffle screws to form the correct spacing between the baffle, gasket and main enclosure. After the correct gap has been formed, remove the grille carefully, tighten the screws on the baffle, and then attempt to fit the grille again.

*Figure 9.16 - Broken enclosure - this speaker is not repairable.*

*Figure 9.17 - Broken baffle near screw mounting hole. New baffle assemblies are available.*

# 10.Service updates

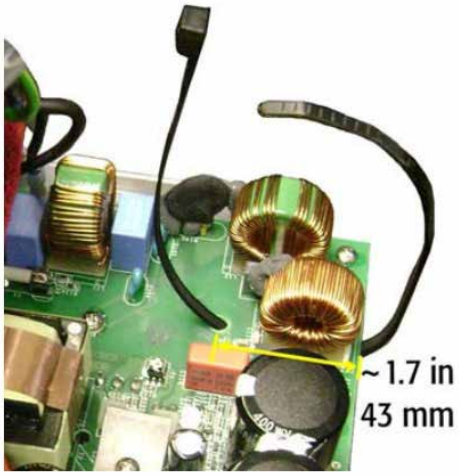
## 10.1 Inductor reinforcement, L13

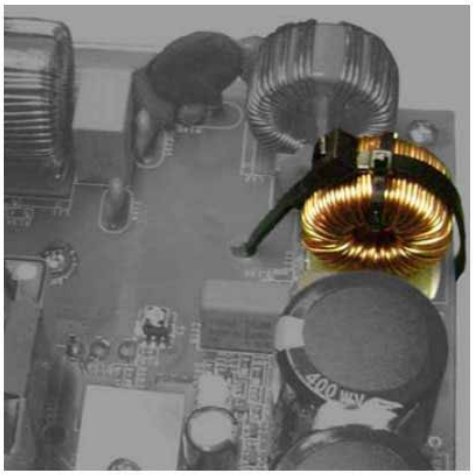
Please read QSC service bulletin KSE0001 for more information regarding the inductor reinforcement. New K-series models have changed L13 to a 6-pin inductor for added stability on the board.

### Summary

Within the power supply of each K Series loudspeaker is a toroidal inductor, L13, that is a crucial part of the line filtering scheme. In K Series loudspeakers covered by this bulletin, despite the adhesive that secures L13 mechanically to the printed circuit board (PCB), vibrations associated with transport and usage of the loudspeaker could stress the inductor's leads enough that one or both break. If this happens, the power supply will not work, and the loudspeaker will be dead—completely inert—with no sound, fan movement, LED display, etc.

QSC prescribes two approaches to the L13 situation in the affected K Series loudspeakers, one remedial and one preventative. The remedial solution is for repairing K Series loudspeakers that are inoperative because of an L13 failure, while the preventative solution is for averting an L13 failure in otherwise well-functioning loudspeakers.



## 10.2 XLR combo jacks with locking tabs

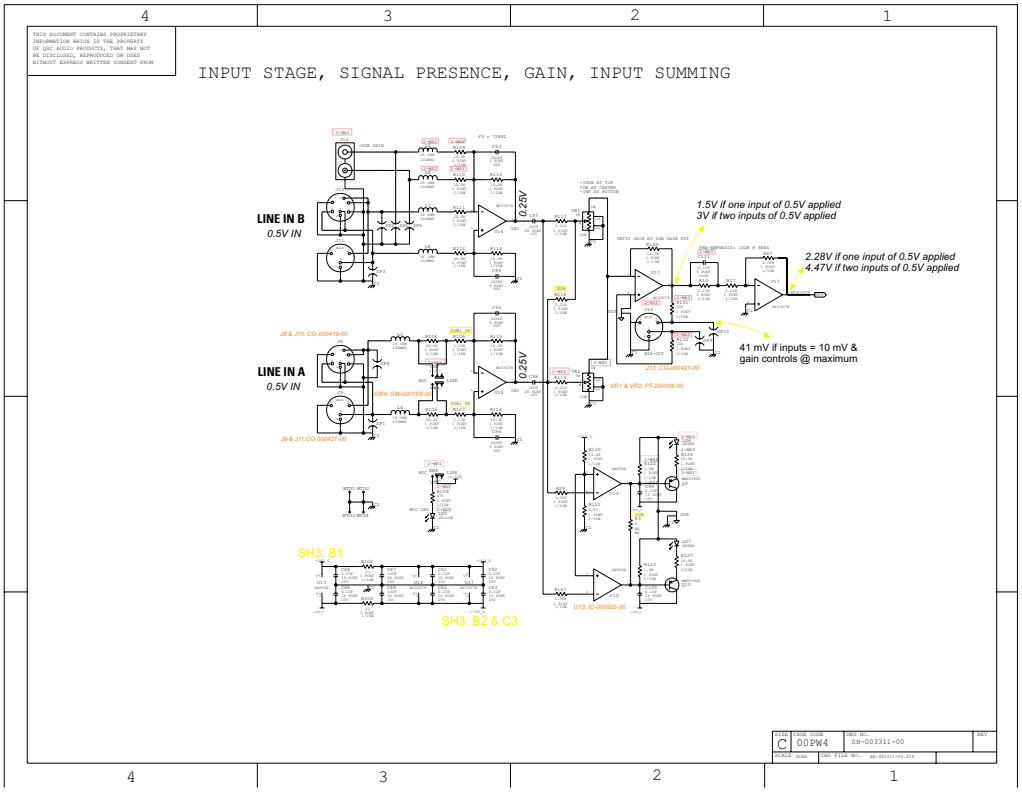
Please read QSC service bulletin KKW0001 for more information regarding the change to XLRs with locking tabs.

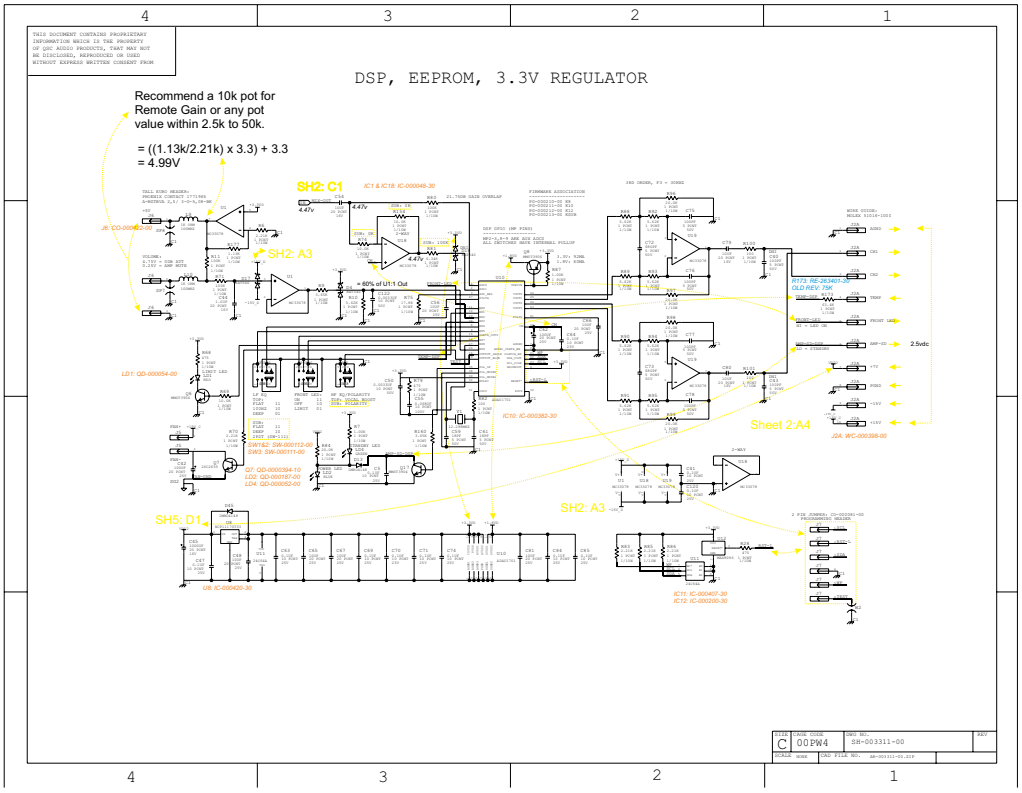
### Summary

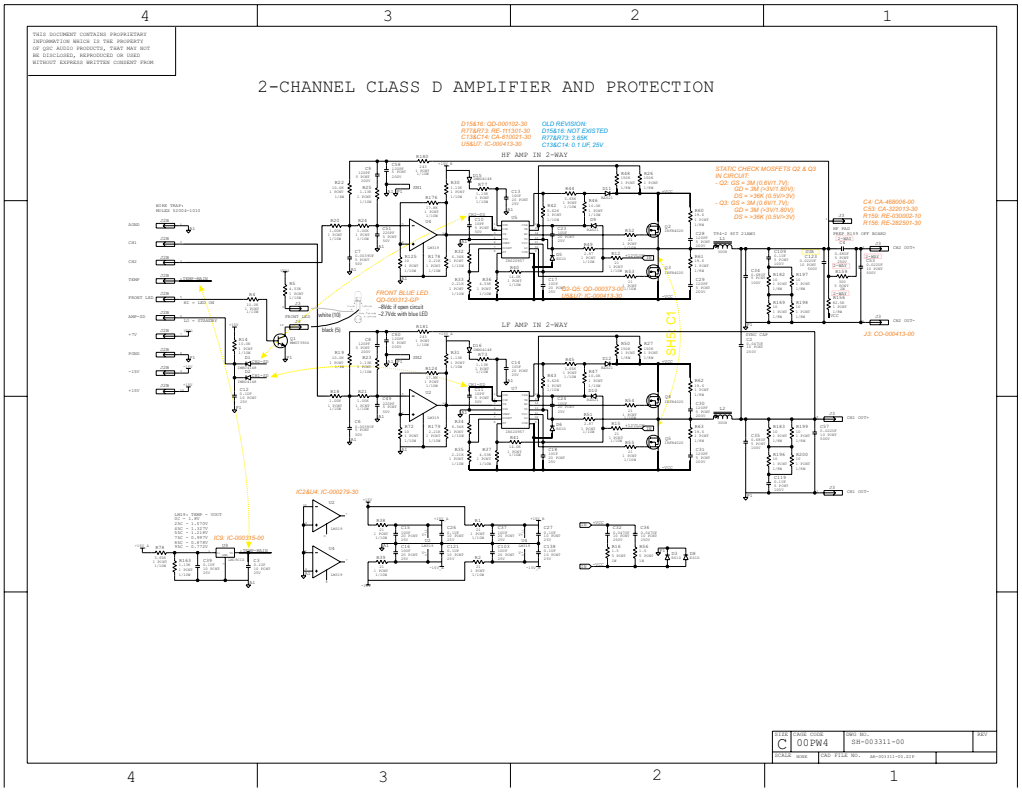
K and KW series loudspeakers manufactured after November 2013 (serial dates codes of GKDxxxxxx or newer) have a locking XLR and 1/4" TRS combo jack. Loudspeakers manufactured before November 2013 (serial date codes of GJDxxxxxx or older) have a non-locking version of the jack. QSC changed the input connector to a locking version because all other connectors, including the IEC power inlet and XLR output jack, have a locking mechanism. Field complaints about XLR connectors detaching themselves from the jack due to natural vibrations in the speaker was another reason for changing to a locking version of the jack.

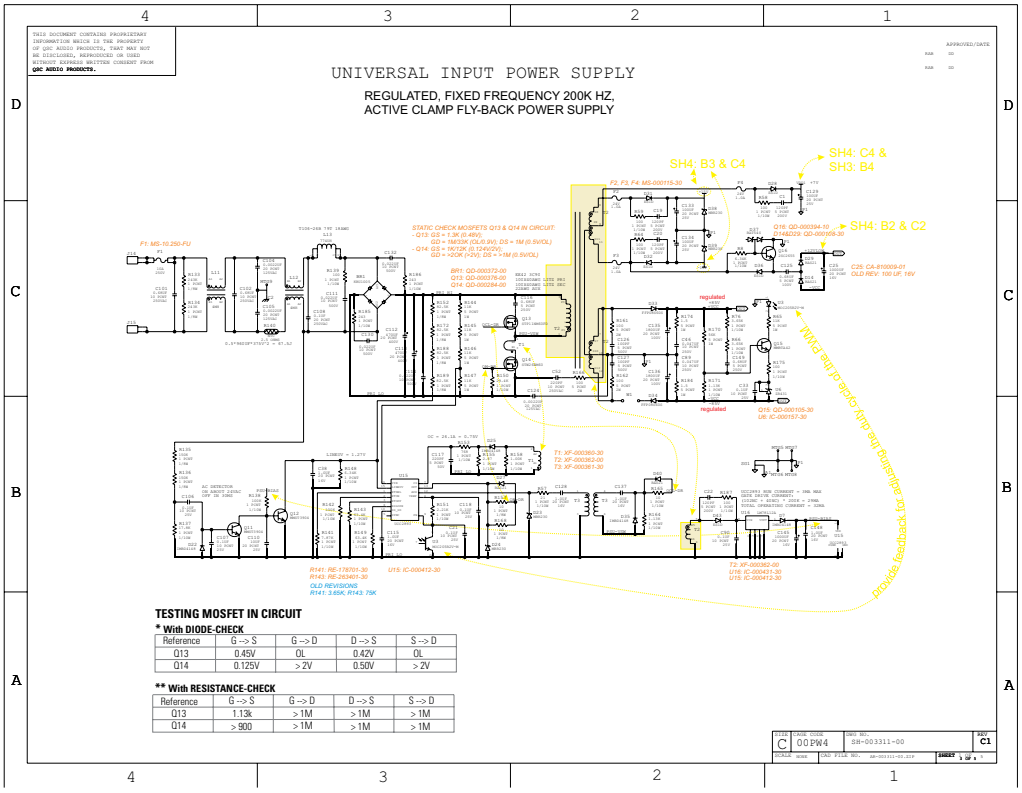

# 11. Schematics and PCB images

## 11.1 Schematic with notes (all models)

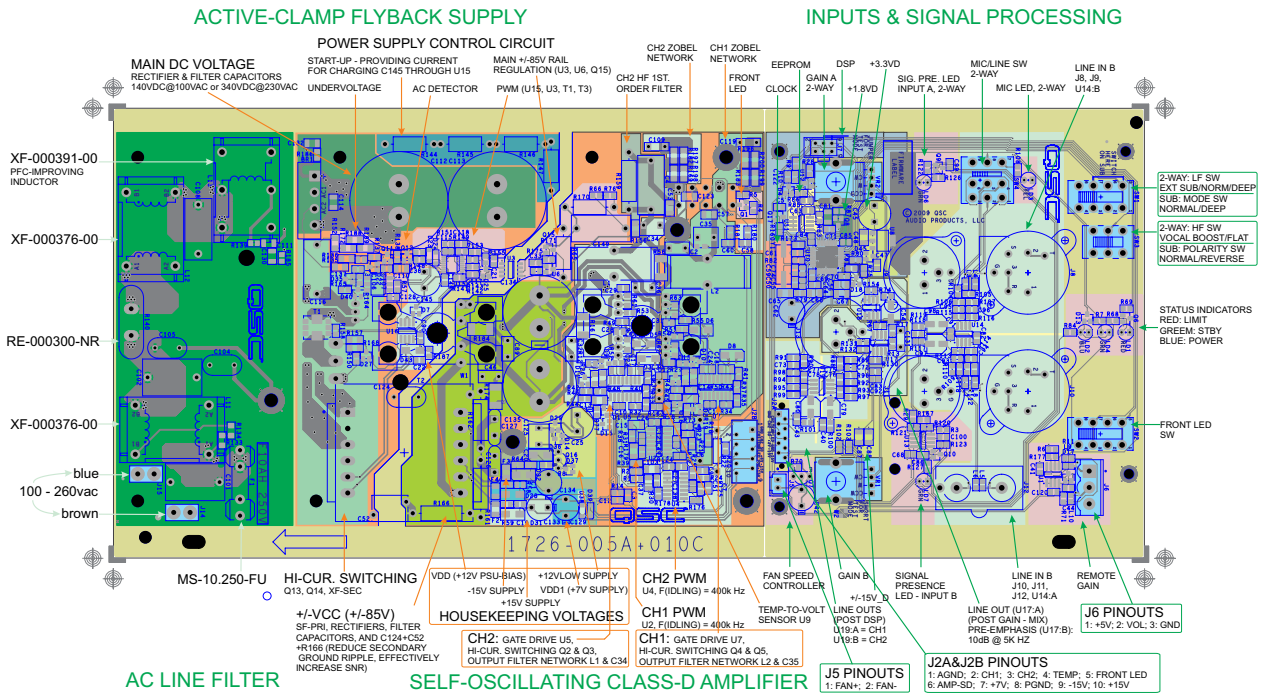






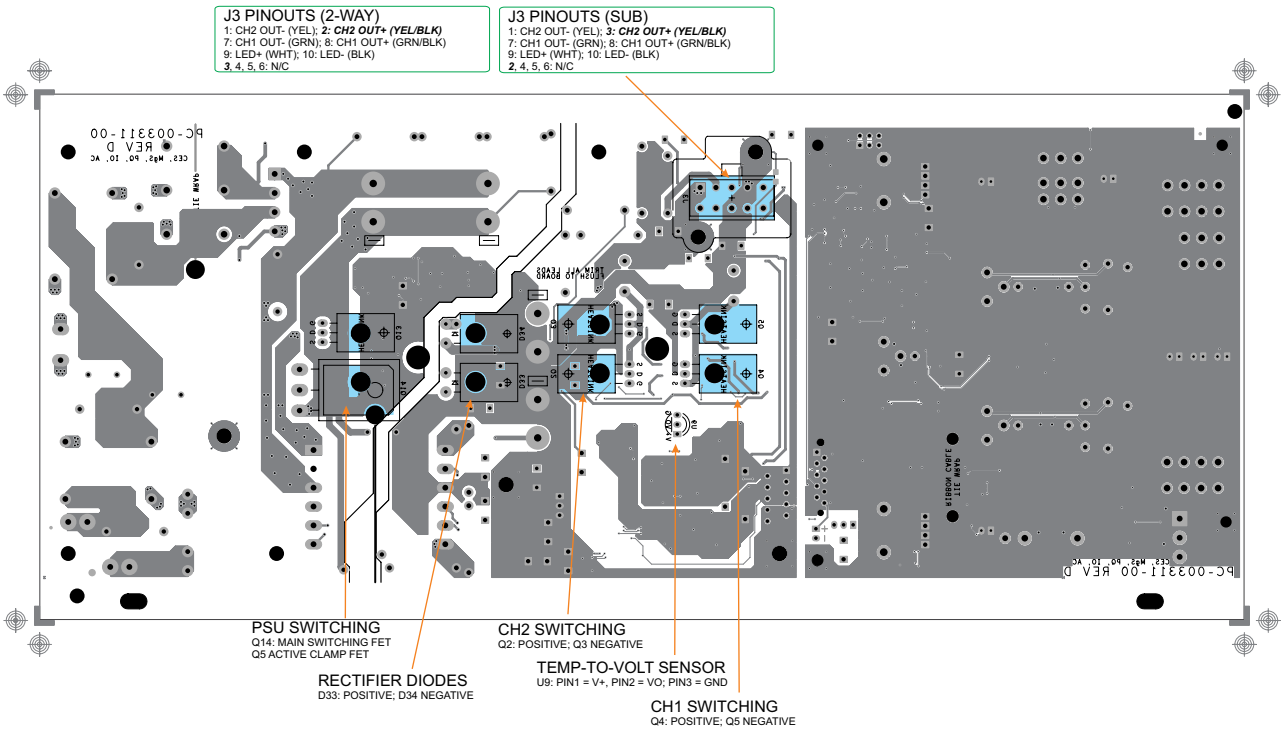


## 11.2 PCB image with notes (all models)




PC-003311-00 K-SERIES BOARD - TOP SIDE - REV. D

DATE: JULY 22th, 2010
REV.: B
SHEET 1 OF 3

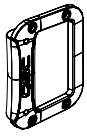
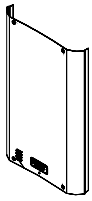
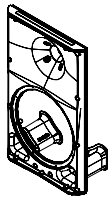
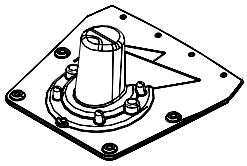
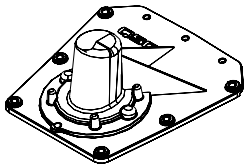
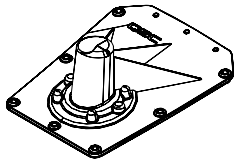
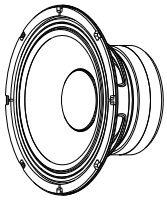
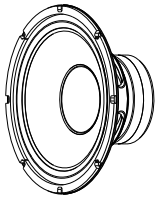


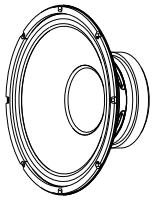
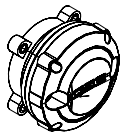
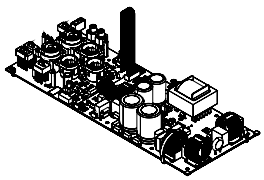
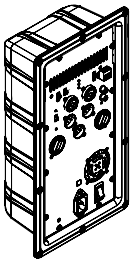

# PC-003311-00 K-SERIES BOARD - BOTTOM SIDE - REV. D

DATE: JULY 22th, 2011
REV.: B
SHEET 2 OF 3

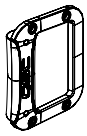
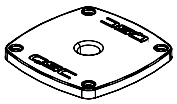
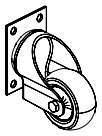
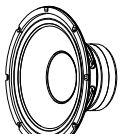
# 12. Component identification

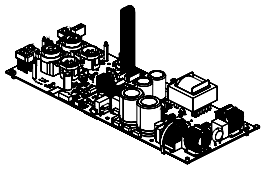
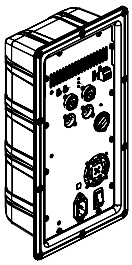
## 12.1 Top-box assembly components

| | Part number and description | Quantity |
|---|---|---|
|  | **CH-000850-01**<br>HANDLE,,BLK,SPEAKERS, | 2 |
|  | **PA-00024x-01**<br>GRILLE ASSY, WITH LOGO,BLK,,,<br>For K8, use **PA-000244-01**<br>For K10, use **PA-000245-01**<br>For K12, use **PA-000246-01** | 1 |
|  | **SB-00015x-TS**<br>FRONT BAFFLE SUBASSY,,,BLK,,,<br>Includes baffle, L/R ports, LED, and wiring harness.<br>For K8, use **SB-000155-TS**<br>For K10, use **SB-000156-TS**<br>For K12, use **SB-000157-TS** | 1 |
|  | **SG-000558-TS**<br>POLE CUP ASSY,,K8, | |
|  | **SG-000562-TS**<br>POLE CUP ASSY,,K10, | 1 |
|  | **SG-000566-TS**<br>POLE CUP ASSY,,K12, | |
|  | **SP-000180-00**<br>WOOFER,8",PAPER,FERRITE,K8<br>K8 only | 1 |
|  | **SP-000181-00**<br>WOOFER,10",PAPER,FERRITE,K10<br>K10 only | 1 |

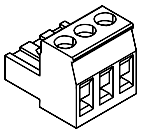
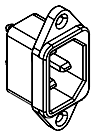
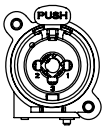
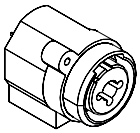
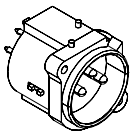
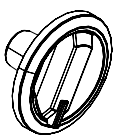
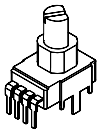
| | Part number and description | Quantity |
|---|---|---|
|  | **SP-000182-00**<br>WOOFER,,,12",PAPER,FERRITE,K12/KW122<br>K12 only | 1 |
|  | **SP-000184-00**<br>COMPRESSION DRIVER,,,1.75",PETP,NEODYMIUM,K/KW SERIES<br>Same HF transducer for K8/K10/K12 | 1 |
|  | **WP-00331x-00**<br>PCB ASSY,UNIVERSAL SUPPLY<br>Includes PSU/amp and input/DSP boards together. Cannot be separated.<br>For K8, use **WP-003311-00**<br>For K10, use **WP-003312-00**<br>For K12, use **WP-003313-00** | 1 |
|  | **WP-00330x-00**<br>CHASSIS ASSY,MAIN,,UNIVERSAL SUPPLY<br>Fully assembled amplifier module replacement..<br>For K8, use **WP-003307-00**<br>For K10, use **WP-003308-00**<br>For K12, use **WP-003309-00** | 1 |

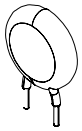
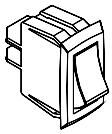
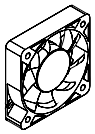
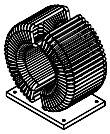
## 12.2 KSub assembly components

| | Part number and description | Quantity |
|---|---|---|
|  | **CH-000850-01**<br>HANDLE,,BLK,SPEAKERS, | 2 |
|  | **CH-000889-00**<br>POLE MOUNT,THREADED,M20,KSUB, | 1 |
|  | **MS-000259-GP**<br>CASTER,SWIVEL,3 INCH,, | 4 |
|  | **SP-000183-00**<br>WOOFER,12",PAPER,FERRITE,KSUB | 2 |

| | Part number and description | Quantity |
|---|---|---|
|  | **WP-003314-00**<br>PCB ASSY,,KSUB,,UNIVERSAL SUPPLY | 1 |
|  | **WP-003310-00**<br>CHASSIS ASSY,MAIN,KSUB,,UNIVERSAL SUPPLY | 1 |

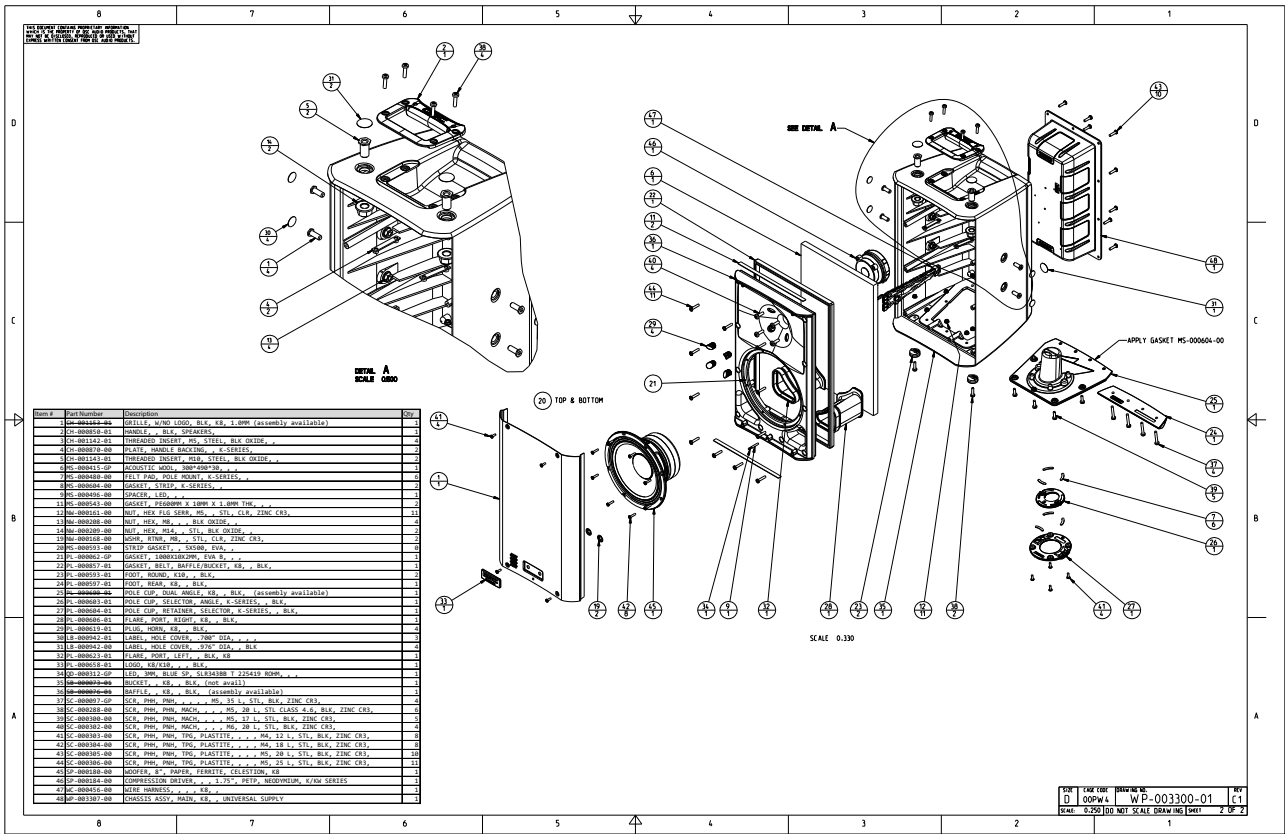
## 12.3 BOP components

| | Part number and description | Quantity |
|---|---|---|
|  | **CO-000436-00**<br>PLUG,EURO,3 POS,MALE,GRN | 1 |
|  | **CO-000386-00**<br>JACK,IEC,3 POS,FEMALE,LOCKING | 1 |
|  | **CO-000168-00**<br>XLR,COMBO,3 POS,FEMALE,VERTICAL W/LATCH<br>Locking tab version only on later K models. | |
|  | **CO-000414-00**<br>SOB-XLR,COMBO,3 POS,FEMALE,VERTICAL W/OUT TAB<br>Non-locking version only on early K models | 2 |
|  | **CO-000421-00**<br>XLR,,3 POS,MALE,VERTICAL PLASTIC SHELL | 3 |
|  | **PL-000836-00**<br>KNOB,,HOUSE OF K,PLASTIC,BLACK, | 2 |
|  | **PT-250006-00**<br>GAIN,5K,20 PCNT,,21 DETENT, | 2 |

| | Part number and description | Quantity |
|---|---|---|
|  | **RE-000300-NR**<br>NTC,2.5 OHMS,8 AMPS,,,INRUSH LIMIT 90J | 1 |
|  | **SW-000088-GP**<br>ROCKER POWER SWITCH | 1 |
|  | **WP-000367-00**<br>FAN ASSY,,BOP-2CH,, | 1 |
|  | **XF-000376-00**<br>INDUCTOR,COMMON MODE,TOROID,4M-H,BOP,,50/60HZ 6.3A | 2 |

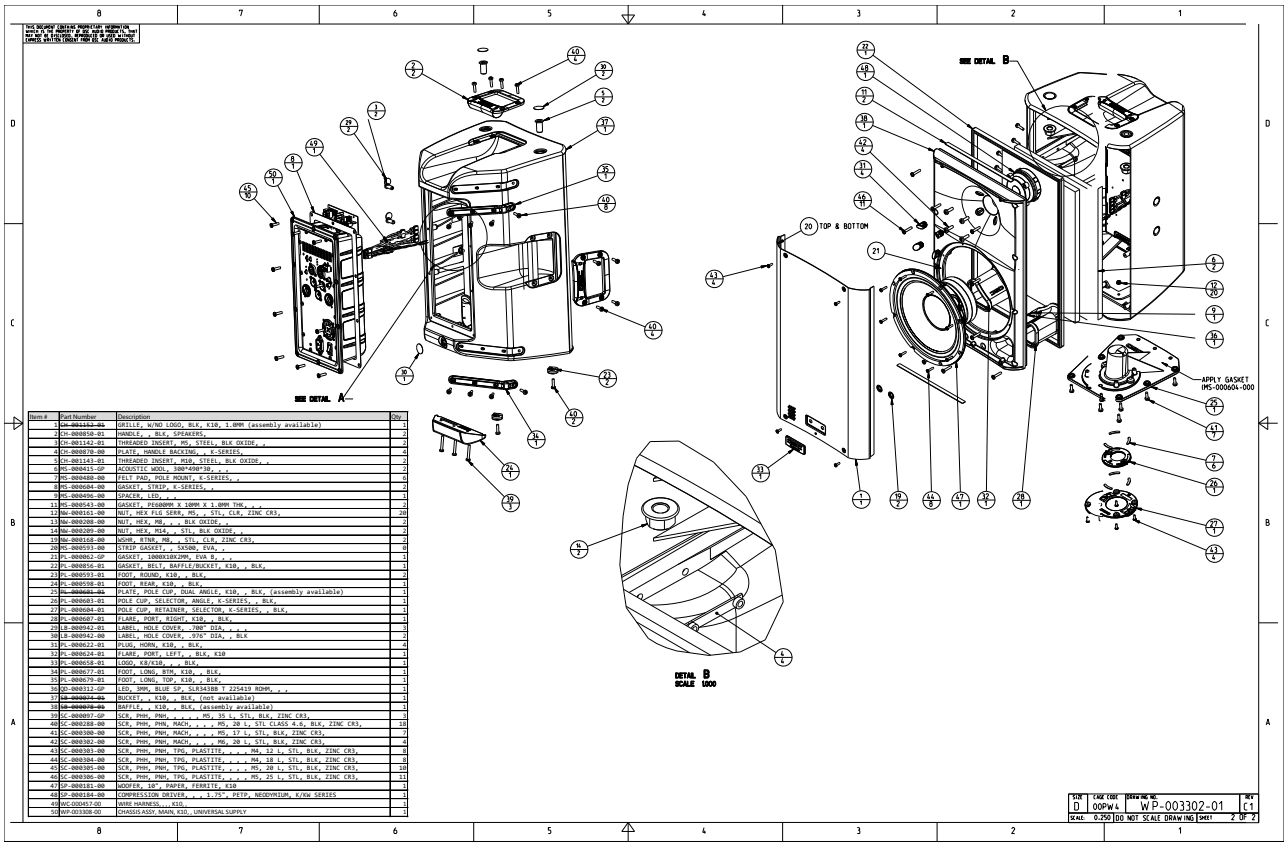
# 13.Exploded view drawings

## 13.1 K8 exploded view




| Item # | Part Number | Description | Qty |
|---|---|---|---|
| 1 | ~~CH-001153-01~~ | GRILLE, W/NO LOGO, BLK, K8, 1.0MM (assembly available) | 1 |
| 2 | CH-000858-01 | HANDLE, , BLK, SPEAKERS, | 1 |
| 3 | CH-001142-01 | THREADED INSERT, M5, STEEL, BLK OXIDE, , | 4 |
| 4 | CH-000878-00 | PLATE, HANDLE BACKING, , , K-SERIES, | 2 |
| 5 | CH-001143-01 | THREADED INSERT, M10, STEEL, BLK OXIDE,, | 2 |
| 6 | MS-000415-GP | ACOUSTIC WOOL, 300*400*38, , , | 1 |
| 7 | MS-000488-00 | FELT PAD, POLE MOUNT, K-SERIES, , | 6 |
| 8 | MS-000604-00 | GASKET, STRIP, K-SERIES, , | 2 |
| 9 | MS-000496-00 | SPACER, LED, , , | 1 |
| 11 | MS-000543-00 | GASKET, P560PPF X 10MM X 1.0MM THK, , , | 2 |
| 12 | SW-000161-00 | NUT, HEX FLG SERR, M5, , STL, CLR, ZINC CR3, | 11 |
| 13 | SW-000208-00 | NUT, HEX, M8, , , BLK OXIDE, | 4 |
| 14 | SW-000209-00 | NUT, HEX, M14, , STL, BLK OXIDE, , | 2 |
| 19 | SW-000168-00 | WSHR, RTNR, M8, , STL, CLR, ZINC CR3, | 2 |
| 20 | MS-000593-00 | STRIP GASKET, , SX500, EVA, , | 0 |
| 21 | PL-000062-GP | GASKET, 1000X100X2MM, EVA B, , , | 1 |
| 23 | PL-000857-01 | GASKET, BELT, BAFFLE/BUCKET, K8, , BLK, | 1 |
| 23 | PL-000593-01 | FOOT, ROUND, K10, , BLK, | 2 |
| 24 | PL-000597-01 | FOOT, REAR, K8, , BLK, | 1 |
| 25 | ~~PL-003600-01~~ | POLE CUP, DUAL ANGLE, K8, , BLK, (assembly available) | 1 |
| 26 | PL-000603-01 | POLE CUP, SELECTOR, ANGLE, , K-SERIES, , BLK, | 1 |
| 27 | PL-000604-01 | POLE CUP, RETAINER, SELECTOR, , K-SERIES, , BLK, | 1 |
| 28 | PL-000606-01 | FLARE, PORT, RIGHT, K8, , BLK, | 1 |
| 29 | PL-000623-01 | FLARE, PORT, LEFT, , BLK, K8 | 1 |
| 33 | PL-000658-01 | LOGO, K8/K10, , , BLK, | 1 |
| 34 | QD-000312-GP | LED, 3MM, BLUE SP, SLR343BB T 225419 ROHM, , , | 1 |
| 35 | ~~SB-000713-01~~ | BUCKET, , K8, , BLK, (not avail) | 1 |
| 36 | ~~SB-000876-01~~ | BAFFLE, , K8, , BLK, (assembly available) | 1 |
| 37 | SC-000097-GP | SCR, PHH, PNH, , , , , , M5, 35 L, STL, BLK, ZINC CR3, | 4 |
| 38 | SC-000288-00 | SCR, PHH, PNH, MACH, , , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 6 |
| 39 | SC-000300-00 | SCR, PHH, PNH, MACH, , , , , M5, 17 L, STL, BLK, ZINC CR3, | 5 |
| 40 | SC-000302-00 | SCR, PHH, PNH, MACH, , , , , M6, 20 L, STL, BLK, ZINC CR3, | 4 |
| 41 | SC-000303-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , , M4, 12 L, STL, BLK, ZINC CR3, | 8 |
| 42 | SC-000304-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , , M4, 18 L, STL, BLK, ZINC CR3, | 8 |
| 43 | SC-000305-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , , M5, 20 L, STL, BLK, ZINC CR3, | 10 |
| 44 | SC-000306-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , , M5, 25 L, STL, BLK, ZINC CR3, | 11 |
| 45 | SP-000180-00 | WOOFER, 8", PAPER, FERRITE, CELESTION, K8 | 1 |
| 46 | SP-000184-00 | COMPRESSION DRIVER, , , , 1.75", PETP, NEODYMIUM, K/KW SERIES | 1 |
| 47 | WC-000456-00 | WIRE HARNESS, , , , K8, , | 1 |
| 48 | WP-003307-00 | CHASSIS ASSY, MAIN, K8, , UNIVERSAL SUPPLY | 1 |

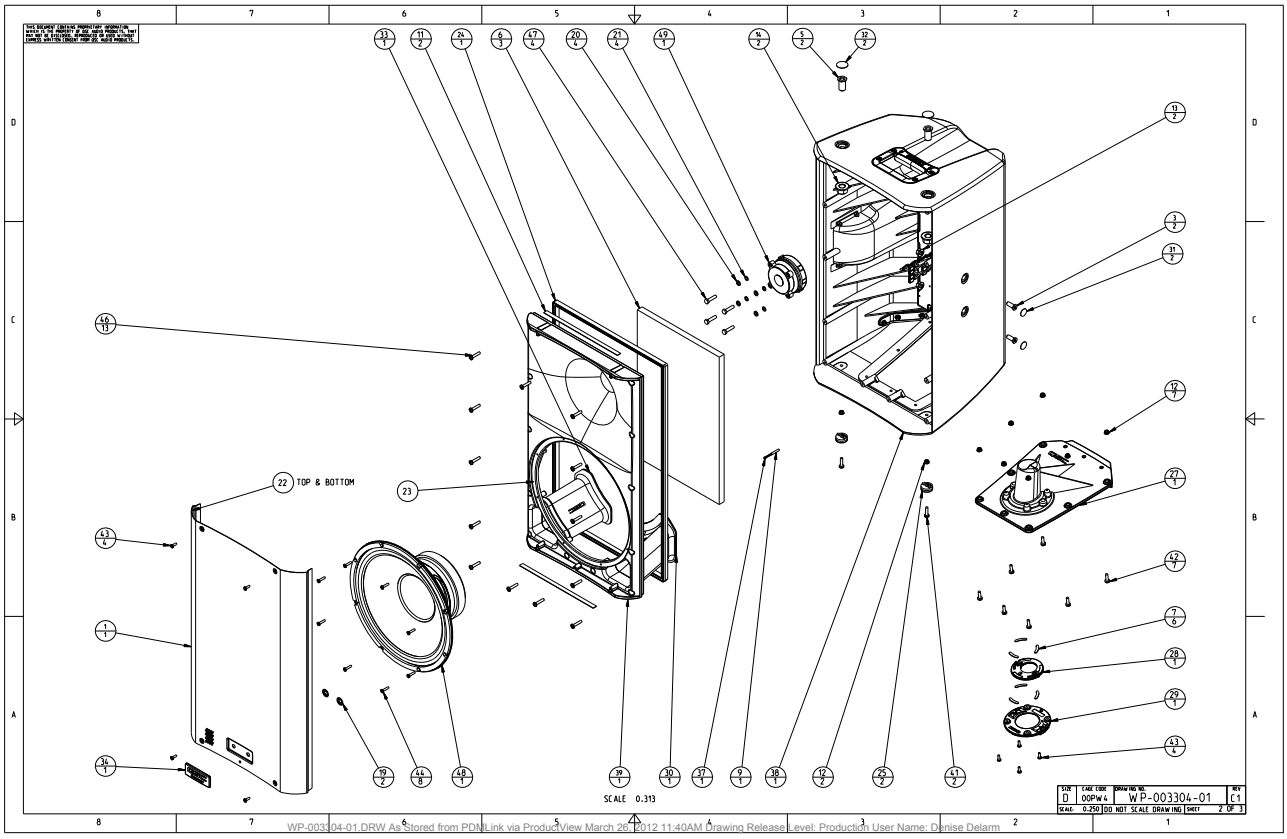
## 13.2 K10 exploded view



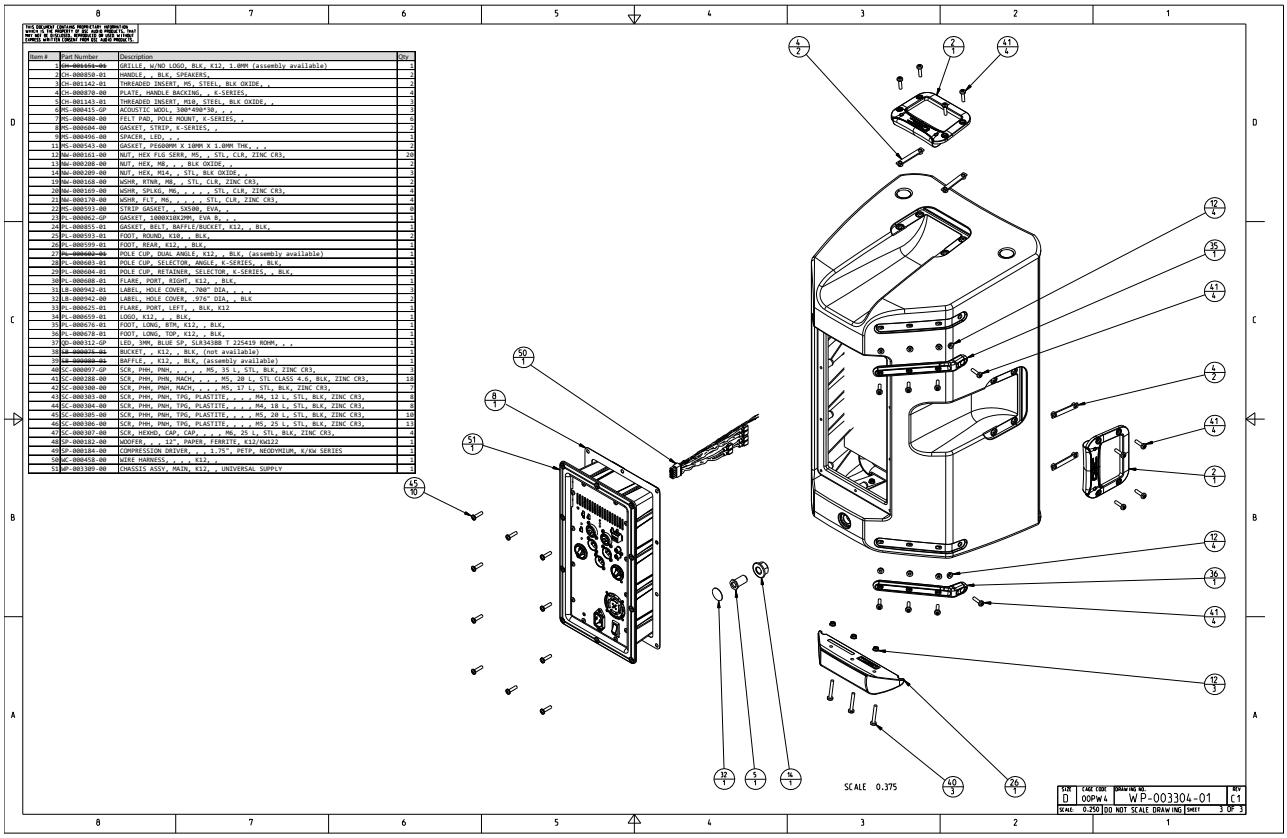

| Item # | Part Number | Description | Qty |
|---|---|---|---|
| | ~~SM-001152-01~~ | GRILLE, W/NO LOGO, BLK, K10, 1.0MM (assembly available) | 1 |
| 2 | CM-000850-01 | HANDLE, , BLK, SPEAKERS, | 2 |
| 3 | CM-001142-01 | THREADED INSERT, M5, STEEL, BLK OXIDE, , | 2 |
| 4 | CM-000879-00 | PLATE, HANDLE BACKING, , K-SERIES, | 4 |
| 5 | CM-001143-01 | THREADED INSERT, M10, STEEL, BLK OXIDE, , | 2 |
| 6 | MS-000415-GP | ACOUSTIC WOOL, 300*490*10, , , , | 2 |
| 7 | MS-000408-00 | FELT PAD, POLE MOUNT, K-SERIES, , | 4 |
| 8 | MS-000604-00 | GASKET, STRIP, K-SERIES, , | 2 |
| 9 | MS-000496-00 | SPACER, LED, , , | 1 |
| 11 | MS-000543-00 | GASKET, PEGBMM X 10MM X 1.0MM THK, , , | 2 |
| 12 | NW-000161-00 | NUT, HEX FLG SERR, M5, , STL, CLR, ZINC CR3, | 20 |
| 13 | NW-000208-00 | NUT, HEX, M8, , , , BLK OXIDE, , | 2 |
| 14 | NW-000209-00 | NUT, HEX, M14, , STL, BLK OXIDE, , | 2 |
| 19 | SW-000168-00 | WSHR, RTNR, M8, , STL, CLR, ZINC CR3, | 2 |
| 20 | MS-000593-00 | STRIP GASKET, , SX500, EVA, , | 4 |
| 21 | PL-000862-GP | GASKET, 1000X10X2MM, EVA B, , , | 1 |
| 22 | PL-000856-01 | GASKET, BELT, BAFFLE/BUCKET, K10, , BLK, | 1 |
| 23 | PL-000593-01 | FOOT, ROUND, K10, , BLK, | 2 |
| 24 | PL-000598-01 | FOOT, REAR, K10, , BLK, | 1 |
| 25 | ~~PL-000601-01~~ | PLATE, POLE CUP, DUAL ANGLE, K10, , BLK, (assembly available) | 1 |
| 26 | PL-000603-01 | POLE CUP, SELECTOR, ANGLE, K-SERIES, , BLK, | 1 |
| 27 | PL-000604-01 | POLE CUP, RETAINER, SELECTOR, K-SERIES, , BLK, | 1 |
| 28 | PL-000607-01 | FLARE, PORT, RIGHT, K10, , BLK, | 1 |
| 29 | LB-000942-01 | LABEL, HOLE COVER, .700" DIA, , , , | 3 |
| 30 | LB-000942-00 | LABEL, HOLE COVER, .976" DIA, , BLK | 2 |
| 31 | PL-000622-01 | PLUG, HORN, K10, , BLK, | 4 |
| 32 | PL-000624-01 | FLARE, PORT, LEFT, , BLK, K10 | 1 |
| 33 | PL-000658-01 | LOGO, K8/K10, , , BLK, | 1 |
| 34 | PL-000677-01 | FOOT, LONG, BTM, K10, , BLK, | 1 |
| 35 | PL-000679-01 | FOOT, LONG, TOP, K10, , BLK, | 1 |
| 36 | SD-000312-GP | LED, 3MM, BLUE SP, SLR343BB T 225419 ROHM, , , | 1 |
| 37 | ~~SM-000674-01~~ | BUCKET, , K10, , BLK, (not available) | 1 |
| 38 | ~~SM-000676-01~~ | BAFFLE, , K10, , BLK, (assembly available) | 1 |
| 39 | SC-000097-GP | SCR, PHM, PNH, , , , , M5, 35 L, STL, BLK, ZINC CR3, | 2 |
| 40 | SC-000288-00 | SCR, PHM, PHH, MACH, , , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 18 |
| 41 | SC-000300-00 | SCR, PHM, PNH, MACH, , , , , M5, 17 L, STL, BLK, ZINC CR3, | 7 |
| 42 | SC-000302-00 | SCR, PHM, PNH, MACH, , , , , M6, 20 L, STL, BLK, ZINC CR3, | 4 |
| 43 | SC-000303-00 | SCR, PHM, PNH, TPG, PLASTITE, , , , , M4, 12 L, STL, BLK, ZINC CR3, | 8 |
| 44 | SC-000304-00 | SCR, PHM, PNH, TPG, PLASTITE, , , , , M4, 18 L, STL, BLK, ZINC CR3, | 8 |
| 45 | SC-000305-00 | SCR, PHM, PNH, TPG, PLASTITE, , , , , M5, 20 L, STL, BLK, ZINC CR3, | 10 |
| 46 | SC-000306-00 | SCR, PHM, PNH, TPG, PLASTITE, , , , , M5, 25 L, STL, BLK, ZINC CR3, | 11 |
| 47 | SP-000181-00 | WOOFER, 10", PAPER, FERRITE, K10 | 1 |
| 48 | SP-000184-00 | COMPRESSION DRIVER, , , , 1.75", PETP, NEODYMIUM, K/KW SERIES | 1 |
| 49 | WC-000457-00 | WIRE HARNESS, , , K10, | 1 |
| 50 | WP-003308-00 | CHASSIS ASSY, MAIN, K10, , UNIVERSAL SUPPLY | 1 |

| SIZE | CAGE CODE | DRAWING NO. | REV |
|---|---|---|---|
| D | 00PW4 | WP-003302-01 | C1 |
| SCALE 0.250 | DO NOT SCALE DRAWING | SHEET 2 OF 2 | |

## 13.3 K12 exploded view



**K12 exploded view, continued**

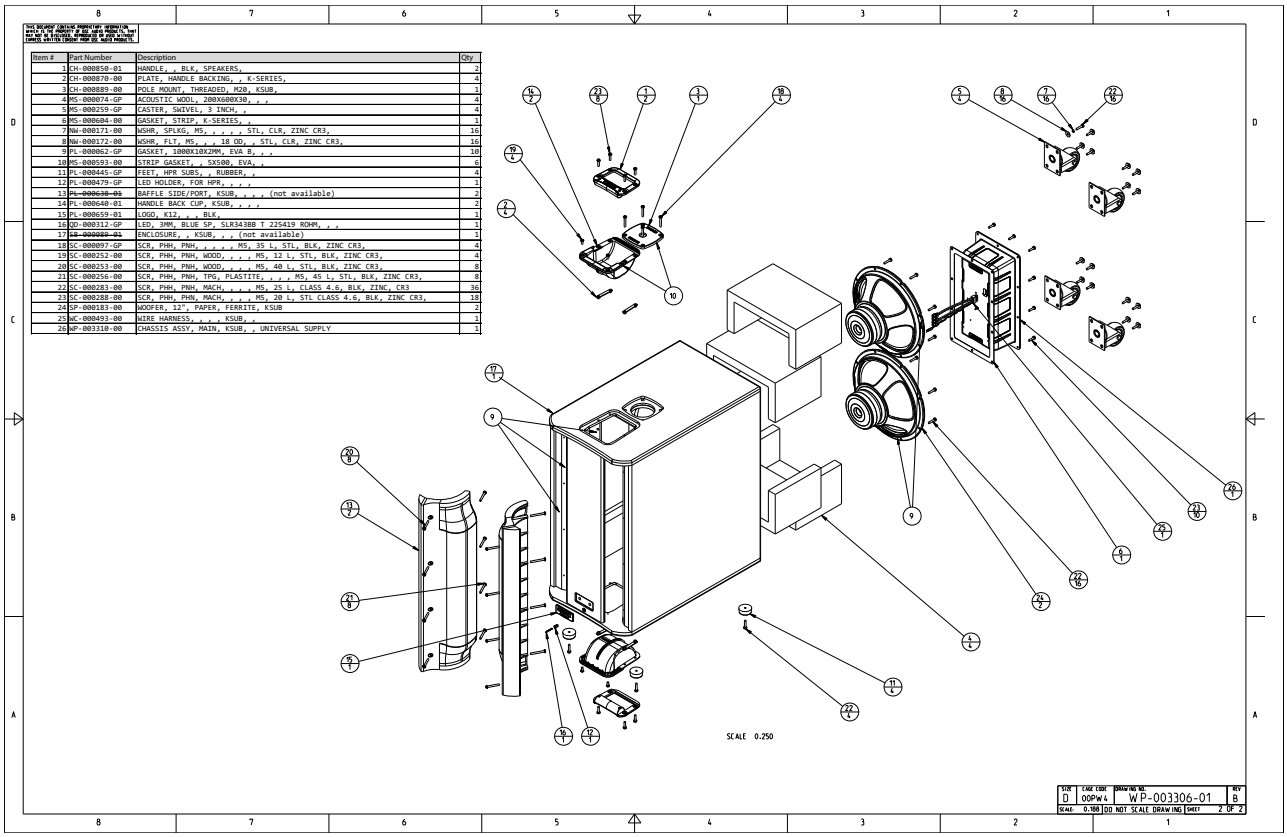


| Item # | Part Number | Description | Qty. |
|---|---|---|---|
| 1 | ~~CH-000556-05~~ | GRILLE, W/NO LOGO, BLK, K12, 1.0MM (assembly available) | 1 |
| 2 | CH-000850-01 | HANDLE, , BLK, SPEAKERS, | 2 |
| 3 | CH-001142-01 | THREADED INSERT, M5, STEEL, BLK OXIDE, , | 2 |
| 4 | CH-000870-00 | PLATE, HANDLE BACKING, , K-SERIES, | 4 |
| 5 | CH-001143-01 | THREADED INSERT, M10, STEEL, BLK OXIDE, , | 1 |
| 6 | MS-000415-GP | ACOUSTIC WOOL, 300*400*30, , , | 3 |
| 7 | MS-000480-00 | FELT PAD, POLE MOUNT, K-SERIES, , | 8 |
| 8 | MS-000604-00 | GASKET, STRIP, K-SERIES, , | 2 |
| 9 | MS-000496-00 | SPACER, LED, , , | 1 |
| 11 | MS-000543-00 | GASKET, PE60MM X 10MM X 1.0MM THK, , , | 2 |
| 12 | NW-000161-00 | NUT, HEX FLG SER8, M5, , STL, CLR, ZINC CR3, | 20 |
| 13 | NW-000208-00 | NUT, HEX, M8, , , BLK OXIDE, , | 2 |
| 14 | NW-000209-00 | NUT, HEX, M14, , STL, BLK OXIDE, , | 3 |
| 19 | NW-000168-00 | WSHR, RTNR, M8, , STL, CLR, ZINC CR3, | 2 |
| 20 | NW-000169-00 | WSHR, SPLKG, M8, , , , , STL, CLR, ZINC CR3, | 4 |
| 21 | NW-000170-00 | WSHR, FLT, M8, , , , , , STL, CLR, ZINC CR3, | 4 |
| 22 | MS-000593-00 | STRIP GASKET, , SX500, EVA, , | 0 |
| 23 | PL-000062-GP | GASKET, 1000X18X2MM, EVA B, , , | 1 |
| 24 | PL-000855-01 | GASKET, BELT, BAFFLE/BUCKET, K12, , BLK, | 1 |
| 25 | PL-000593-01 | FOOT, ROUND, K10, , BLK, | 2 |
| 26 | PL-000599-01 | FOOT, REAR, K12, , BLK, | 1 |
| 27 | ~~PL-000602-05~~ | POLE CUP, DUAL ANGLE, K12, , BLK, (assembly available) | 1 |
| 28 | PL-000603-01 | POLE CUP, SELECTOR, ANGLE, K-SERIES, , BLK, | 1 |
| 29 | PL-000604-01 | POLE CUP, RETAINER, SELECTOR, K-SERIES, , BLK, | 1 |
| 30 | PL-000608-01 | FLARE, PORT, RIGHT, K12, , BLK, | 1 |
| 31 | LB-000942-01 | LABEL, HOLE COVER, .700" DIA, , , | 3 |
| 32 | LB-000942-00 | LABEL, HOLE COVER, .976" DIA, , BLK | 2 |
| 33 | PL-000625-01 | FLARE, PORT, LEFT, , BLK, K12 | 1 |
| 34 | PL-000659-01 | LOGO, K12, , , BLK, | 1 |
| 35 | PL-000676-01 | FOOT, LONG, BTM, K12, , BLK, | 1 |
| 36 | PL-000678-01 | FOOT, LONG, TOP, K12, , BLK, | 1 |
| 37 | QD-000312-GP | LID, 5MM, BLUE SP, SLR3438B T J25419 ROHM, , , | 1 |
| 38 | ~~LB-000741-05~~ | BUCKET, , K12, , BLK, (not available) | 1 |
| 39 | ~~SB-000680-05~~ | BAFFLE, , K12, , BLK, (assembly available) | 1 |
| 40 | SC-000077-GP | SCR, PHH, PNH, , , , , M5, 35 L, STL, BLK, ZINC CR3, | 3 |
| 41 | SC-000288-00 | SCR, PHH, PNH, MACH, , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 18 |
| 42 | SC-000300-00 | SCR, PHH, PNH, MACH, , , , M5, 17 L, STL, BLK, ZINC CR3, | 7 |
| 43 | SC-000303-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 12 L, STL, BLK, ZINC CR3, | 8 |
| 44 | SC-000304-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 18 L, STL, BLK, ZINC CR3, | 8 |
| 45 | SC-000305-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 20 L, STL, BLK, ZINC CR3, | 10 |
| 46 | SC-000306-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 25 L, STL, BLK, ZINC CR3, | 13 |
| 47 | SC-000307-00 | SCR, HEXHD, CAP, CAP, , , , M6, 25 L, STL, BLK, ZINC CR3, | 4 |
| 48 | SP-000182-00 | WOOFER, , , 12", PAPER, FERRITE, K12/KW122 | 1 |
| 49 | SP-000184-00 | COMPRESSION DRIVER, , , 1.75", PETP, NEODYMIUM, K/KW SERIES | 1 |
| 50 | WC-000458-00 | WIRE HARNESS, , , , K12, , | 1 |
| 51 | AP-003309-00 | CHASSIS ASSY, MAIN, K12, , UNIVERSAL SUPPLY | 1 |

SCALE 0.375

| SIZE | CAGE CODE | DRAWING NO. | REV |
|---|---|---|---|
| D | 00PW4 | WP-003304-01 | C1 |
| SCALE: 0.250 | DO NOT SCALE DRAWING | SHEET | 3 OF 3 |

## 13.4 KSub exploded view



| Item # | Part Number | Description | Qty |
|---|---|---|---|
| 1 | CH-000850-01 | HANDLE, , BLK, SPEAKERS, | 2 |
| 2 | CH-000870-00 | PLATE, HANDLE BACKING, , K-SERIES, | 4 |
| 3 | CH-000889-00 | POLE MOUNT, THREADED, M20, KSUB, | 1 |
| 4 | MS-000074-GP | ACOUSTIC WOOL, 200X600X30, , , | 4 |
| 5 | MS-000259-GP | CASTER, SWIVEL, 3 INCH, , | 4 |
| 6 | MS-000604-00 | GASKET, STRIP, K-SERIES, , | 1 |
| 7 | NW-000171-00 | WSHR, SPLKG, M5, , , , , STL, CLR, ZINC CR3, | 16 |
| 8 | NW-000172-00 | WSHR, FLT, M5, , , 18 OD, , STL, CLR, ZINC CR3, | 16 |
| 9 | PL-000062-GP | GASKET, 1000X10X2MM, EVA B, , , | 10 |
| 10 | MS-000593-00 | STRIP GASKET, , , 5X500, EVA, , | 6 |
| 11 | PL-000445-GP | FEET, HPR SUBS, , RUBBER, , | 4 |
| 12 | PL-000479-GP | LED HOLDER, FOR HPR, , , , | 1 |
| 13 | ~~PL-000630-01~~ | BAFFLE SIDE/PORT, KSUB, , , , (not available) | 2 |
| 14 | PL-000640-01 | HANDLE BACK CUP, KSUB, , , , | 2 |
| 15 | PL-000659-01 | LOGO, K12, , , BLK, | 1 |
| 16 | QD-000312-GP | LED, 3MM, BLUE SP, SLR343BB T 225419 ROHM, , , | 1 |
| 17 | ~~SB-000889-01~~ | ENCLOSURE, , KSUB, , , (not available) | 1 |
| 18 | SC-000057-GP | SCR, PHH, PNH, , , , , M5, 35 L, STL, BLK, ZINC CR3, | 4 |
| 19 | SC-000252-00 | SCR, PHH, PNH, WOOD, , , , M5, 12 L, STL, BLK, ZINC CR3, | 4 |
| 20 | SC-000253-00 | SCR, PHH, PNH, WOOD, , , , M5, 40 L, STL, BLK, ZINC CR3, | 8 |
| 21 | SC-000256-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 45 L, STL, BLK, ZINC CR3, | 8 |
| 22 | SC-000283-00 | SCR, PHH, PNH, MACH, , , , M5, 25 L, CLASS 4.6, BLK, ZINC, CR3 | 36 |
| 23 | SC-000288-00 | SCR, PHH, PHN, MACH, , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 18 |
| 24 | SP-000183-00 | WOOFER, 12", PAPER, FERRITE, KSUB | 2 |
| 25 | WC-000493-00 | WIRE HARNESS, , , , KSUB, , | 1 |
| 26 | WP-003310-00 | CHASSIS ASSY, MAIN, KSUB, , UNIVERSAL SUPPLY | 1 |

# 14.Replacement parts

## 14.1 FG-003300-01 (120V) or FG-003320-01 (230V), K8

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CO-000436-00 | PLUG, EURO, 3 POS, MALE, GRN | 1 | | |
| LB-000747-00 | LABEL, GRILLE TAG, , K8, | 1 | | |
| PM-000270-GP | POLYBAG MANUAL, 240X360X0.05, , , , | 1 | | |
| PM-000434-00 | CARTON, SHIPPING, , K8, , 120V | 1 | | |
| PM-000435-00 | INSERT, TOP, , K8, , 120V | 1 | | |
| PM-000436-00 | INSERT, BOTTOM, , K8, , 120V | 1 | | |
| PM-000446-00 | POLYBAG, , , K8, 750X530X.04MM, | 1 | | |
| TD-000276-00 | HOOKUP DRAWINGS, K-SERIES, | 1 | | |
| TD-000337-00 | WARNING SHEET, PWRD AMP/PWRD LOUDSPEAKER, | 1 | | |
| WC-000361-GP | POWER CORD, 120V, IEC V-LOCK, 18AWG, 3M, , NEMA 5-15, , | 1 | | |
| WC-000362-GP | POWER CORD, 240V, IEC V-LOCK, 0.75MM, 3M, , CEE 7/7, , | 1 | | |
| WP-003300-01 | SPEAKER ASSY, 8", K8, BLK, , UNIV SPLY, FULL RNG, 2-WAY, PWRD | 1 | | |

## 14.2 WP-003300-01, K8 speaker assembly

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000850-01 | HANDLE, , BLK, SPEAKERS, | 1 | | |
| CH-000870-00 | PLATE, HANDLE BACKING, , K-SERIES, | 2 | | |
| CH-001142-01 | THREADED INSERT, M5, STEEL, BLK OXIDE, , | 4 | | |
| CH-001143-01 | THREADED INSERT, M10, STEEL, BLK OXIDE, , | 2 | | |
| ~~GH-001153-01~~ | GRILLE, W/NO LOGO, BLK, K8, 1.0MM | 1 | | Use grille assembly, PA-000244-01 |
| LB-000942-00 | LABEL, HOLE COVER, .976" DIA, , BLK | 4 | | |
| LB-000942-01 | LABEL, HOLE COVER, .700" DIA, , , , | 3 | | |
| MS-000415-GP | ACOUSTIC WOOL, 300*490*30, , , | 1 | | |
| MS-000480-00 | FELT PAD, POLE MOUNT, K-SERIES, , | 6 | | |
| MS-000496-00 | SPACER, LED, , , | 1 | | |
| MS-000543-00 | GASKET, PE600MM X 10MM X 1.0MM THK, , , | 2 | | |
| MS-000593-00 | STRIP GASKET, , 5X500, EVA, , | 0 | | |
| MS-000604-00 | GASKET, STRIP, K-SERIES, , | 2 | | |
| NW-000161-00 | NUT, HEX FLG SERR, M5, , STL, CLR, ZINC CR3, | 11 | | |
| NW-000168-00 | WSHR, RTNR, M8, , STL, CLR, ZINC CR3, | 2 | | |
| NW-000208-00 | NUT, HEX, M8, , , BLK OXIDE, , | 4 | | |
| NW-000209-00 | NUT, HEX, M14, , STL, BLK OXIDE, , | 2 | | |
| PL-000062-GP | GASKET, 1000X10X2MM, EVA B, , , | 1 | | |
| PL-000593-01 | FOOT, ROUND, K10, , BLK, | 2 | | |
| PL-000597-01 | FOOT, REAR, K8, , BLK, | 1 | | |
| ~~PL-000600-01~~ | POLE CUP, DUAL ANGLE, K8, , BLK, | 1 | | Use pole cup assembly, SG-000558-TS |
| PL-000603-01 | POLE CUP, SELECTOR, ANGLE, K-SERIES, , BLK, | 1 | | |
| PL-000604-01 | POLE CUP, RETAINER, SELECTOR, K-SERIES, , BLK, | 1 | | |
| PL-000606-01 | FLARE, PORT, RIGHT, K8, , BLK, | 1 | | |
| PL-000619-01 | PLUG, HORN, K8, , BLK, | 4 | | |
| PL-000623-01 | FLARE, PORT, LEFT, , BLK, K8 | 1 | | |
| PL-000658-01 | LOGO, K8/K10, , , BLK, | 1 | | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| PL-000857-01 | GASKET, BELT, BAFFLE/BUCKET, K8, , BLK, | 1 | | |
| QD-000312-GP | LED, 3MM, BLUE SP, SLR343BB T 225419 ROHM, , , | 1 | | |
| SB-000073-01 | BUCKET, , K8, , BLK, | 1 | | Not available for purchase |
| ~~SB-000076-01~~ | BAFFLE, , K8, , BLK, | 1 | | Use baffle assembly, SB-000155-TS |
| SC-000097-GP | SCR, PHH, PNH, , , , , M5, 35 L, STL, BLK, ZINC CR3, | 4 | | |
| SC-000288-00 | SCR, PHH, PHN, MACH, , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 6 | | |
| SC-000300-00 | SCR, PHH, PNH, MACH, , , , M5, 17 L, STL, BLK, ZINC CR3, | 5 | | |
| SC-000302-00 | SCR, PHH, PNH, MACH, , , , M6, 20 L, STL, BLK, ZINC CR3, | 4 | | |
| SC-000303-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 12 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000304-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 18 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000305-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 20 L, STL, BLK, ZINC CR3, | 10 | | |
| SC-000306-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 25 L, STL, BLK, ZINC CR3, | 11 | | |
| SP-000180-00 | WOOFER, 8", PAPER, FERRITE, , K8 | 1 | | |
| SP-000184-00 | COMPRESSION DRIVER, , , 1.75", PETP, NEODYMIUM, , K/KW SERIES | 1 | | Diaphragm available, SR-000145-00 |
| WC-000456-00 | WIRE HARNESS, , , , K8, , | 1 | | |
| WP-003307-00 | CHASSIS ASSY, MAIN, K8, , UNIVERSAL SUPPLY | 1 | | |

# 14.3 FG-003302-01 (120V) or FG-003322-01 (230V), K10

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CO-000436-00 | PLUG, EURO, 3 POS, MALE, GRN | 1 | | |
| LB-000748-00 | LABEL, GRILLE TAG, , K10, | 1 | | |
| PM-000270-GP | POLYBAG MANUAL, 240X360X0.05, , , , | 1 | | |
| PM-000437-00 | CARTON, SHIPPING, , K10, , 120V | 1 | | |
| PM-000438-00 | INSERT, TOP, , K10, , 120V | 1 | | |
| PM-000439-00 | INSERT, BOTTOM, , K10, , 120V | 1 | | |
| PM-000447-00 | POLYBAG, , , K10/K12, 870X845X.05MM, | 1 | | |
| RD-000153-00 | LABEL, SHIPPING CARTON, SPEAKERS, OEM | 0 | | |
| TD-000276-00 | HOOKUP DRAWINGS, K-SERIES, | 1 | | |
| TD-000337-00 | WARNING SHEET, PWRD AMP/PWRD LOUDSPEAKER, | 1 | | |
| TS-000004-WR | 3 YEARS WARRANTY | 3 | | |
| WC-000361-GP | POWER CORD, 120V, IEC V-LOCK, 18AWG, 3M, , NEMA 5-15, , | 1 | | |
| WC-000362-GP | POWER CORD, 240V, IEC V-LOCK, 0.75MM, 3M, , CEE 7/7, , | 1 | | |
| WP-003302-01 | SPEAKER ASSY, 10", K10, BLK, , UNIV SPLY, FULL RNG, 2-WAY, PWRD | 1 | | |

# 14.4 WP-003302-01, K10 speaker assembly

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000850-01 | HANDLE, , BLK, SPEAKERS, | 2 | | |
| CH-000870-00 | PLATE, HANDLE BACKING, , K-SERIES, | 4 | | |
| CH-001142-01 | THREADED INSERT, M5, STEEL, BLK OXIDE, , | 2 | | |
| CH-001143-01 | THREADED INSERT, M10, STEEL, BLK OXIDE, , | 2 | | |
| ~~CH-001152-01~~ | GRILLE, W/NO LOGO, BLK, K10, 1.0MM | 1 | | Use grille assembly, PA-000245-01 |
| LB-000942-00 | LABEL, HOLE COVER, .976" DIA, , BLK | 2 | | |
| LB-000942-01 | LABEL, HOLE COVER, .700" DIA, , , , | 3 | | |
| MS-000415-GP | ACOUSTIC WOOL, 300*490*30, , , | 2 | | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| MS-000480-00 | FELT PAD, POLE MOUNT, K-SERIES, , | 6 | | |
| MS-000496-00 | SPACER, LED, , , | 1 | | |
| MS-000543-00 | GASKET, PE600MM X 10MM X 1.0MM THK, , , | 2 | | |
| MS-000593-00 | STRIP GASKET, , 5X500, EVA, , | 0 | | |
| MS-000604-00 | GASKET, STRIP, K-SERIES, , | 2 | | |
| NW-000161-00 | NUT, HEX FLG SERR, M5, , STL, CLR, ZINC CR3, | 20 | | |
| NW-000168-00 | WSHR, RTNR, M8, , STL, CLR, ZINC CR3, | 2 | | |
| NW-000208-00 | NUT, HEX, M8, , , BLK OXIDE, , | 2 | | |
| NW-000209-00 | NUT, HEX, M14, , STL, BLK OXIDE, , | 2 | | |
| PL-000062-GP | GASKET, 1000X10X2MM, EVA B, , , | 1 | | |
| PL-000593-01 | FOOT, ROUND, K10, , BLK, | 2 | | |
| PL-000598-01 | FOOT, REAR, K10, , BLK, | 1 | | |
| ~~PL-000601-01~~ | PLATE, POLE CUP, DUAL ANGLE, K10, , BLK, | 1 | | Use pole cup assembly, SG-000562-TS |
| PL-000603-01 | POLE CUP, SELECTOR, ANGLE, K-SERIES, , BLK, | 1 | | |
| PL-000604-01 | POLE CUP, RETAINER, SELECTOR, K-SERIES, , BLK, | 1 | | |
| PL-000607-01 | FLARE, PORT, RIGHT, K10, , BLK, | 1 | | |
| PL-000622-01 | PLUG, HORN, K10, , BLK, | 4 | | |
| PL-000624-01 | FLARE, PORT, LEFT, , BLK, K10 | 1 | | |
| PL-000658-01 | LOGO, K8/K10, , , BLK, | 1 | | |
| PL-000677-01 | FOOT, LONG, BTM, K10, , BLK, | 1 | | |
| PL-000679-01 | FOOT, LONG, TOP, K10, , BLK, | 1 | | |
| PL-000856-01 | GASKET, BELT, BAFFLE/BUCKET, K10, , BLK, | 1 | | |
| QD-000312-GP | LED, 3MM, BLUE SP, SLR343BB T 225419 ROHM, , , | 1 | | |
| SB-000074-01 | BUCKET, , K10, , BLK, | 1 | | Not available |
| ~~SB-000078-01~~ | BAFFLE, , K10, , BLK, | 1 | | Use baffle assembly, SB-000156-TS |
| SC-000097-GP | SCR, PHH, PNH, , , , , M5, 35 L, STL, BLK, ZINC CR3, | 3 | | |
| SC-000288-00 | SCR, PHH, PHN, MACH, , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 18 | | |
| SC-000300-00 | SCR, PHH, PNH, MACH, , , , M5, 17 L, STL, BLK, ZINC CR3, | 7 | | |
| SC-000302-00 | SCR, PHH, PNH, MACH, , , , M6, 20 L, STL, BLK, ZINC CR3, | 4 | | |
| SC-000303-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 12 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000304-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 18 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000305-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 20 L, STL, BLK, ZINC CR3, | 10 | | |
| SC-000306-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 25 L, STL, BLK, ZINC CR3, | 11 | | |
| SP-000181-00 | WOOFER, 10", PAPER, FERRITE, , K10 | 1 | | |
| SP-000184-00 | COMPRESSION DRIVER, , , 1.75", PETP, NEODYMIUM, , K/KW SERIES | 1 | | Diaphragm available, SR-000145-00 |
| WC-000457-00 | WIRE HARNESS, , , , K10, , | 1 | | |
| WP-003308-00 | CHASSIS ASSY, MAIN, K10, , UNIVERSAL SUPPLY | 1 | | |

# 14.5 FG-003304-01 (120V) or FG-003324-01 (230V), K12

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CO-000436-00 | PLUG, EURO, 3 POS, MALE, GRN | 1 | | |
| LB-000749-00 | LABEL, GRILLE TAG, , K12, | 1 | | |
| PM-000270-GP | POLYBAG MANUAL, 240X360X0.05, , , , | 1 | | |
| PM-000440-00 | CARTON, SHIPPING, , K12, , 120V | 1 | | |
| PM-000441-00 | INSERT, TOP, , K12, , 120V | 1 | | |
| PM-000442-00 | INSERT, BOTTOM, , K12, , 120V | 1 | | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| PM-000447-00 | POLYBAG, , , K10/K12, 870X845X.05MM, | 1 | | |
| TD-000276-00 | HOOKUP DRAWINGS, K-SERIES, | 1 | | |
| TD-000337-00 | WARNING SHEET, PWRD AMP/PWRD LOUDSPEAKER, | 1 | | |
| WC-000361-GP | POWER CORD, 120V, IEC V-LOCK, 18AWG, 3M, , NEMA 5-15, , | 1 | | |
| WC-000362-GP | POWER CORD, 240V, IEC V-LOCK, 0.75MM, 3M, , CEE 7/7, , | 1 | | |
| WP-003304-01 | SPEAKER ASSY, 12", K12, BLK, , UNIV SPLY, FULL RNG, 2-WAY, PWRD | 1 | | |

# 14.6 WP-003304-01, K12 speaker assembly

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000850-01 | HANDLE, , BLK, SPEAKERS, | 2 | | |
| CH-000870-00 | PLATE, HANDLE BACKING, , K-SERIES, | 4 | | |
| CH-001142-01 | THREADED INSERT, M5, STEEL, BLK OXIDE, , | 2 | | |
| CH-001143-01 | THREADED INSERT, M10, STEEL, BLK OXIDE, , | 3 | | |
| ~~CH-001151-01~~ | GRILLE, W/NO LOGO, BLK, K12, 1.0MM | 1 | | Use grille assembly, PA-000246-01 |
| LB-000942-00 | LABEL, HOLE COVER, .976" DIA, , BLK | 2 | | |
| LB-000942-01 | LABEL, HOLE COVER, .700" DIA, , , , | 3 | | |
| MS-000415-GP | ACOUSTIC WOOL, 300*490*30, , , | 3 | | |
| MS-000480-00 | FELT PAD, POLE MOUNT, K-SERIES, , | 6 | | |
| MS-000496-00 | SPACER, LED, , , | 1 | | |
| MS-000543-00 | GASKET, PE600MM X 10MM X 1.0MM THK, , , | 2 | | |
| MS-000593-00 | STRIP GASKET, , 5X500, EVA, , | 0 | | |
| MS-000604-00 | GASKET, STRIP, K-SERIES, , | 2 | | |
| NW-000161-00 | NUT, HEX FLG SERR, M5, , STL, CLR, ZINC CR3, | 20 | | |
| NW-000168-00 | WSHR, RTNR, M8, , STL, CLR, ZINC CR3, | 2 | | |
| NW-000169-00 | WSHR, SPLKG, M6, , , , , STL, CLR, ZINC CR3, | 4 | | |
| NW-000170-00 | WSHR, FLT, M6, , , , , STL, CLR, ZINC CR3, | 4 | | |
| NW-000208-00 | NUT, HEX, M8, , , BLK OXIDE, , | 2 | | |
| NW-000209-00 | NUT, HEX, M14, , STL, BLK OXIDE, , | 3 | | |
| PL-000062-GP | GASKET, 1000X10X2MM, EVA B, , , | 1 | | |
| PL-000593-01 | FOOT, ROUND, K10, , BLK, | 2 | | |
| PL-000599-01 | FOOT, REAR, K12, , BLK, | 1 | | |
| ~~PL-000602-01~~ | POLE CUP, DUAL ANGLE, K12, , BLK, | 1 | | Use pole cup assembly, SG-000566-TS |
| PL-000603-01 | POLE CUP, SELECTOR, ANGLE, K-SERIES, , BLK, | 1 | | |
| PL-000604-01 | POLE CUP, RETAINER, SELECTOR, K-SERIES, , BLK, | 1 | | |
| PL-000608-01 | FLARE, PORT, RIGHT, K12, , BLK, | 1 | | |
| PL-000625-01 | FLARE, PORT, LEFT, , BLK, K12 | 1 | | |
| PL-000659-01 | LOGO, K12, , , BLK, | 1 | | |
| PL-000676-01 | FOOT, LONG, BTM, K12, , BLK, | 1 | | |
| PL-000678-01 | FOOT, LONG, TOP, K12, , BLK, | 1 | | |
| PL-000855-01 | GASKET, BELT, BAFFLE/BUCKET, K12, , BLK, | 1 | | |
| QD-000312-GP | LED, 3MM, BLUE SP, SLR343BB T 225419 ROHM, , , | 1 | | |
| SB-000075-01 | BUCKET, , K12, , BLK, | 1 | | Not available |
| ~~SB-000080-01~~ | BAFFLE, , K12, , BLK, | 1 | | Use baffle assembly, SB-000157-TS |
| SC-000097-GP | SCR, PHH, PNH, , , , , M5, 35 L, STL, BLK, ZINC CR3, | 3 | | |
| SC-000288-00 | SCR, PHH, PHN, MACH, , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 18 | | |
| SC-000300-00 | SCR, PHH, PNH, MACH, , , , M5, 17 L, STL, BLK, ZINC CR3, | 7 | | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| SC-000303-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 12 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000304-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M4, 18 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000305-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 20 L, STL, BLK, ZINC CR3, | 10 | | |
| SC-000306-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 25 L, STL, BLK, ZINC CR3, | 13 | | |
| SC-000307-00 | SCR, HEXHD, CAP, CAP, , , , M6, 25 L, STL, BLK, ZINC CR3, | 4 | | |
| SP-000182-00 | WOOFER, , , 12", PAPER, FERRITE, , K12/KW122 | 1 | | |
| SP-000184-00 | COMPRESSION DRIVER, , , 1.75", PETP, NEODYMIUM, , K/KW SERIES | 1 | | Diaphragm available, SR-000145-00 |
| WC-000458-00 | WIRE HARNESS, , , , K12, , | 1 | | |
| WP-003309-00 | CHASSIS ASSY, MAIN, K12, , UNIVERSAL SUPPLY | 1 | | |

# 14.7 WP-00330x-00, BOP module assembly (K8, K10, K12 only)

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000856-00 | CHASSIS, MAIN, BUCKET, BOP-2CH, | 1 | | |
| CH-000880-00 | CLAMP, TRANSISTOR, , BOP-2CH, | 2 | | |
| CH-00088x-00 | PANEL, INPUT, BOP-2CH, , | 1 | | x is a wildcard<br>2 = K8, 3 = K10, 4 = K12 |
| CH-001025-00 | SHIELD, LINE FILTER, SHORT, KW SERIES, | 1 | | |
| CO-000386-00 | JACK, IEC, 3 POS, FEMALE, LOCKING | 1 | | |
| LB-001062-00 | LABEL, RCM LOGO, REGULATORY CERTIFICATION MARK, , (AUSTRALIA & NEW ZEALAND) | 1 | | |
| NW-000034-00 | WSHR, SPLKG, , M3, 3.4 ID, 6.2 OD, 0.7 THK, STL, CLR, ZINC CR3, | 4 | | |
| NW-000140-00 | NUT, HEX KEPS W/TOOTH WSHR, M4, , STL, CLR, ZINC, | 1 | | |
| NW-000147-00 | NUT, HEX, M3, , STL, CLR, ZINC CR3, | 4 | | |
| NW-000173-00 | WSHR, FLT, M3, , 3.2 ID, 8.0 OD, 1.0 THK, STL, BLK, ZINC CR3, | 8 | | |
| PL-000627-00 | SPRINGSEAT, TRANSISTOR, BOP, NYLON, , | 2 | | |
| PL-000836-00 | KNOB, , HOUSE OF K, PLASTIC, BLACK, | 2 | | |
| PL-000845-00 | INSULATOR, TRANSISTOR, 1.525" X .950", SIL-PAD, , | 4 | | |
| SC-000205-00 | SCR, PHH, PNH SERR BSE, PLASTITE, TAPPING, , , M4X1.75, 10 L, STL, BLK, ZINC CR3, WAXED, | 12 | | |
| SC-000229-00 | SCR, PHH, PNH, MACH, , , , M3, 8 L, STL, BLK, PHOS W/6219, | 4 | | |
| SC-000230-00 | SCR, PHH, FLH, TPG, TYPE AB, , , #4-24, 3/8 L, STL, BLK, ZINC CR3, | 2 | | |
| SC-000240-00 | SCR, PHH, PNH, MACH, , , , M3.5X0.6, 20 L, STL, NI-HARDENED, , 450 - 550-HV HARDNESS | 2 | | |
| SC-000241-00 | SCR, PHH, PNH, MACH, , , , M3.5, 8 L, STL, NI, HARDENED, , 450 - 550-HV HARDNESS | 14 | | |
| SC-043051-PP | PHILLIPS, PANHEAD, #4-20, 0.313" L, BLACK, STEEL "PLASTITE" | 11 | | |
| SW-000016-SW | AC SWITCH, SPST, 20A, 125VAC, | 1 | | |
| WC-000466-00 | CABLE ASSY, AC, 16 AWG, 3 CONDUCTOR, BOP-2CH, 5.50" L, | 1 | | |
| WC-000467-00 | WIRE ASSY, AC SWITCH, 16 AWG, 1 CONDUCTOR, BOP-2CH, 5.00" L, BROWN | 1 | | |
| WP-000367-00 | FAN ASSY, , BOP-2CH, , | 1 | | |
| WP-00331x-00 | PCB ASSY, , K, , UNIVERSAL SUPPLY | 1 | | x is a wildcard<br>1 = K8, 2 = K10, 3 = K12 |

# 14.8 WP-00331x-00, BOP PCB assembly (K8, K10, K12 only)

x is a wildcard. 1 = K8, 2 = K10, 3 = K12

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CA-010002-30 | 10PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 2 | C10, C11 | |
| CA-018002-30 | 18PF, 5 PCNT, 50V, CERAMIC NPO, SMT, | 2 | C59, C61 | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CA-110001-10 | 100PF, 5 PCNT, 500V, MICA, DIPPED, | 2 | C126, C127 | |
| CA-110002-30 | 100PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 4 | C75, C76, C77, C78 | |
| CA-112001-30 | 120PF, 5 PCNT, 200V, CERAMIC NPO, 0805, | 12 | C1, C19, C20, C22, C28, C29, C30, C31, C58, C60, C8, C9 | |
| CA-122002-30 | 220PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 7 | C117, C49, C51, C93, C94, C95, C96 | |
| CA-122011-00 | 220PF, 10 PCNT, 250VAC, CERAMIC, DISC, Y1CAP | 1 | C52 | |
| CA-168003-30 | 680PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 2 | C72, C73 | |
| CA-222001-00 | 0.0022UF, 20 PCNT, 250VAC, CERAMIC Y5U, DISC, YCAP | 3 | C104, C105, C124 | |
| CA-233003-30 | 0.0033UF, 10 PCNT, 50V, CERAMIC X7R, 0805, | 2 | C122, C50 | |
| CA-239002-30 | 0.0039UF, 5 PCNT, 50V, CERAMIC COG/NPO, 0805, | 2 | C6, C7 | |
| CA-322013-30 | 0.022UF, 10 PCNT, 500V, CERAMIC X7R, 1206, | 6 | C111, C114, C130, C132, C53, C57 | |
| CA-347008-10 | 0.047UF, 10 PCNT, 250V, FILM, BOX, | 5 | C2, C32, C36, C46, C89 | |
| CA-368007-30 | 0.068UF, 10 PCNT, 100V, CERAMIC X7R, 0805, | 1 | C55 | |
| CA-410001-00 | 0.1UF, 20 PCNT, 250VAC, FILM, BOX STYLE, X2CAP | 1 | C108 | |
| CA-410012-30 | 0.1UF, 10 PCNT, 25V, CERAMIC X7R, 0805, | 33 | C100, C106, C107, C118, C12, C120, C121, C138, C21, C26, C27, C3, C33, C39, C41, C47, C5, C63, C64, C68, C69, C70, C71, C74, C82, C83, C84, C85, C86, C90, C91, C92, C99 | |
| CA-410027-10 | 0.1UF, 5 PCNT, 100V, FILM, BOX STYLE, | 3 | C109, C119, C131 | |
| CA-468005-10 | 0.68UF, 5 PCNT, 100V, FILM, BOX, | 3 | C125, C34, C35 | |
| CA-468006-00 | 0.68UF, 5 PCNT, 250V, POLYPROPYLENE, BOX, | 3 | C116, C149, C4 | |
| CA-468007-00 | 0.68UF, 20 PCNT, 250V, FILM, BOX STYLE, X2 CAP | 2 | C101, C102 | |
| CA-510007-30 | 1.0UF, 20 PCNT, 16V, CERAMIC Y5V, 0805, | 6 | C115, C128, C137, C148, C38, C44 | |
| CA-610011-30 | 10UF, 20 PCNT, 16V, ELECTROLYTIC, SMT, NON-POLAR | 5 | C54, C79, C80, C97, C98 | |
| CA-610021-30 | 10UF, 20 PCNT, 25V, CERAMIC CAP, 1206, | 19 | C103, C110, C13, C14, C15, C16, C17, C18, C23, C24, C37, C48, C56, C65, C66, C67, C81, C87, C88 | |
| CA-710004-10 | 100UF, 20 PCNT, 25V, ELECTROLYTIC, , LOW ESR | 5 | C129, C133, C134, C42, C62 | |
| CA-747011-00 | 470UF, 20 PCNT, 400V, ELECTROLYTIC, SNAP IN, | 2 | C112, C113 | |
| CA-810009-10 | 1000UF, 20 PCNT, 16V, ELECTROLYTIC, , | 3 | C145, C25, C45 | |
| CA-818001-00 | 1800UF, 20 PCNT, 100V, ELECTROLYTIC, 22MM X 40MM SNAP IN, | 2 | C135, C136 | |
| CO-000009-ZT | ZTAB, 0.25" TAB, 1 POS, MALE, AUTO INSERTABLE | 2 | J14, J15 | |
| CO-000155-00 | HEADER, 0.1" CENTERS, 2 POS (1X2), MALE, RAMP LOCK | 1 | J5 | |
| CO-000168-00 | XLR, COMBO, 3 POS, FEMALE, VERTICAL W/LATCH | 2 | J10, J8 | |
| CO-000329-00 | WIRE HOLDER, RIBBON CABLE, 10 POS, FEMALE, | 1 | | |
| CO-000355-00 | TERMINAL STRIP, , 10 POS (2X5), MALE, | 1 | J7 | |
| CO-000371-00 | JACK, PHONO, 2 POS, FEMALE, VERTICAL | 1 | J12 | |
| CO-000413-00 | HEADER, 4.2MM CENTERS, 10 POS (2X5), MALE, | 1 | J3 | |
| CO-000421-00 | XLR, , 3 POS, MALE, VERTICAL PLASTIC SHELL | 3 | J11, J13, J9 | |
| CO-000422-00 | JACK, EURO, 3 POS, MALE, VERTICAL BLACK TALL | 1 | J6 | |
| CO-000426-00 | WIRE TRAP, RIBBON CABLE, 10 POS, FEMALE, RELEASABLE | 1 | J2B | |
| CY-000009-30 | 12.288MHZ, HC49SM, | 1 | Y1 | |
| HW-000007-HW | FUSE CLIP, PC MOUNT, , , TIN PLATED BRASS, 5MM | 2 | | |
| IC-000048-30 | OPAMP, DUAL, MC33078, , | 5 | U1, U14, U17, U18, U19 | |
| IC-000157-30 | REGULATOR, SHUNT, ZR431, , | 1 | U6 | |
| IC-000200-30 | RESET, MICROPROCESSOR, MAX809S, , | 1 | U12 | |
| IC-000279-30 | COMPARATOR, DUAL, LM319, SMT, | 2 | U2, U4 | |
| IC-000315-00 | SENSOR, TEMPERATURE, LM19CIZ, , | 1 | U9 | |
| IC-000382-30 | DSP 28/56 BIT, , ADAU1701, , | 1 | U10 | |
| IC-000407-30 | EEPROM, 8KX8, 24C64A, SMT, I2C | 1 | U11 | |
| IC-000412-30 | CONTROLLER, ACTIVE CLAMP PWM, UCC2893, SMT, | 1 | U15 | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| IC-000413-30 | DRIVER, MOSFET HALF BRIDGE, IRS20957, SMT, | 2 | U5, U7 | |
| IC-000420-30 | VOLTAGE REGULATOR, +3.3V, NCP1117ST33, SOT223, | 1 | U8 | |
| IC-000425-30 | OPTO COUPLER, TRANSISTOR OUTPUT, MOC205R2V-M, SMT, VDE APPROVAL | 1 | U3 | |
| IC-000431-30 | VOLTAGE REGULATOR, +12V, LM78L12A, SO-8, | 1 | U16 | |
| IC-000505-30 | COMPARATOR, DUAL, LM393A, SO-8, VIO = 2MV MAX | 1 | U13 | |
| MS-000115-30 | FUSE, 1.0A, 24V, 1206, SLO | 3 | F2, F3, F4 | |
| MS-000487-00 | GASKET, PCB CONNECTOR, SPEAKER, BOP-2CH, , | 1 | | |
| MS-10.250-FU | FUSE, 10A, 250V, 5MM X 20MM, FAST | 1 | F1 | |
| PC-003311-00 | PCB, K-SERIES, , MAIN AMP, | 1 | | |
| PL-000628-00 | SPACER, T-1 LED, 0.85", PLASTIC, BLACK, | 6 | | |
| PL-000643-00 | SPACER, LED/TO-92, .115" (3MM), PVC, BLACK, | 1 | | |
| PL-000686-00 | SPACER, ROUND, 0.063"ID X 0.156"OD X 0.510"L, NYLON, , | 1 | | |
| PT-250006-00 | GAIN, 5K, 20 PCNT, , 21 DETENT, GX SERIES | 2 | VR1, VR2 | |
| QD-000052-00 | LED, , , , GRN, , DIFFUSED, 40DEG, T1 | 3 | LD4, LD6, LD7 | |
| QD-000053-00 | LED, , , , YEL, DIFFUSED, 40DEG, T1 | 1 | LD3 | |
| QD-000054-00 | LED, , , , RED, , DIFFUSED, 40 DEG, T1 | 1 | LD1 | |
| QD-000102-30 | DIODE, 75V, 0.075A, , IMBD4148, SOT-23, 4NS | 12 | D1, D13, D15, D16, D2, D22, D25, D27, D35, D40, D45, D7 | |
| QD-000103-30 | TRANSISTOR NPN, 40V, 0.2A, 0.2W, MMST3904, SOT-23, | 5 | Q1, Q11, Q12, Q17, Q6 | |
| QD-000104-30 | TRANSISTOR PNP, 40V, 0.2A, 0.2W, MMST3906, SOT-23, | 3 | Q10, Q8, Q9 | |
| QD-000105-30 | TRANSISTOR NPN, 300V, 0.2A, 0.2W, MMBTA42, SOT-23, | 1 | Q15 | |
| QD-000108-30 | DIODE, 200V, 0.2A, , BAS21, SOT-23, 50NS | 6 | D10, D11, D12, D14, D29, D9 | |
| QD-000187-00 | LED, , , , BLU, DIFFUSED, 40DEG, T1 | 1 | LD2 | |
| QD-000189-30 | DIODE SCHOTTKY, 30V, 0.2A, , BAT54S, SOT-23, | 3 | D17, D37, D4 | |
| QD-000282-30 | DIODE RECTIFIER ULTRAFAST, 200V, 1A, , ES1D, SMA, | 9 | D28, D3, D31, D32, D36, D43, D5, D6, D8 | |
| QD-000363-30 | DIODE, SCHOTTKY, 30V, 2.0A, , MBR230, SOD-123, | 4 | D23, D24, D38, D39 | |
| QD-000372-00 | BRIDGE RECTIFIER, , , , KBU1005, IN-LINE, 600V 10A | 1 | BR1 | |
| QD-000373-00 | MOSFET N-CHANNEL, 200V, 18A, 100W, IRFB4020, TO-220AB, | 4 | Q2, Q3, Q4, Q5 | |
| QD-000391-00 | DIODE RECTIFIER, 600V, 8A, , FFP08S60S, TO-220, 15NS STEALTH II | 2 | D33, D34 | |
| QD-000394-10 | TRANSISTOR NPN, 50V, 2A, 0.9W, 2SC2655, TO-92MOD, | 2 | Q16, Q7 | |
| QD-000455-00 | MOSFET N-CHANNEL, 600V, 10A, 90W, STP11NM60ND, TO-220, | 1 | Q13 | |
| QD-000456-00 | MOSFET-N-CHANNEL, 600V, 29A, 210W, STW34NM60N, TO-247, | 1 | Q14 | |
| RD-000511-00 | STICKER, FIRMWARE, .35" X .65", , , | 0 | | |
| RE-.15002-30 | 1.5, 5 PCNT, 1W, THICK FILM, 2512, 200V | 4 | R16, R174, R184, R56 | |
| RE-.28701-30 | 2.87, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R121, R155, R49, R51 | |
| RE-000300-NR | NTC, 2.5 OHMS, 8 AMPS, , , INRUSH LIMIT 90J | 1 | R140 | |
| RE-001003-30 | 10, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 10 | R157, R168, R169, R182, R183, R196, R197, R198, R199, R200 | |
| RE-001006-30 | 10, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 3 | R125, R165, R72 | |
| RE-001960-30 | 19.6, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 4 | R60, R61, R62, R63 | |
| RE-002100-30 | 21, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 13 | R1, R102, R103, R12, R15, R2, R38, R39, R52, R53, R54, R55, R57 | |
| RE-010002-30 | 100, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 11 | R100, R101, R131, R132, R139, R175, R187, R58, R59, R64, R82 | |
| RE-010018-10 | 100, 5 PCNT, 2W, METAL OXIDE FP, MINI, | 3 | R161, R162, R166 | |
| RE-024301-30 | 243, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R180, R181, R185, R186 | |
| RE-030002-10 | 300, 5 PCNT, 2W, METAL OXIDE FP, MINI, | 1 | R159 | |
| RE-047502-30 | 475, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R108, R28, R68, R79 | |
| RE-076801-30 | 768, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 1 | R153 | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| RE-110002-30 | 1.00K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 9 | R158, R167, R18, R20, R21, R24, R29, R7, R87 | |
| RE-111301-30 | 1.13K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 12 | R106, R107, R163, R164, R171, R177, R23, R25, R30, R31, R73, R77 | |
| RE-122103-30 | 2.21K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 14 | R117, R119, R13, R151, R17, R178, R179, R33, R35, R6, R70, R83, R85, R86 | |
| RE-136502-30 | 3.65K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 7 | R160, R44, R45, R66, R76, R78, R9 | |
| RE-145302-30 | 4.53K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R36, R37, R5, R67 | |
| RE-156200-30 | 5.62K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 11 | R10, R42, R43, R88, R89, R90, R91, R92, R93, R94, R95 | |
| RE-163402-30 | 6.34K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 5 | R148, R32, R34, R8, R81 | |
| RE-210001-BM | 10.0K, 1 PCNT, 1/4W, METAL FILM, , | 2 | R19, R22 | |
| RE-210003-30 | 10.0K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 15 | R109, R110, R113, R114, R115, R116, R126, R127, R14, R154, R4, R46, R47, R69, R74 | |
| RE-211005-00 | 11K, 5 PCNT, 1W, METAL OXIDE FP, , | 5 | R144, R145, R146, R147, R65 | |
| RE-211303-30 | 11.3K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 1 | R141 | |
| RE-214001-30 | 14.0K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R120, R130, R40, R41 | |
| RE-217803-30 | 17.8K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R124, R137, R176, R75 | |
| RE-220002-30 | 20.0K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 9 | R104, R105, R111, R112, R84, R96, R97, R98, R99 | |
| RE-229402-30 | 29.4K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 1 | R150 | |
| RE-256002-10 | 56K, 5 PCNT, MINI-1W, METAL OXIDE, FP, | 1 | R170 | |
| RE-263401-30 | 63.4K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 3 | R143, R149, R173 | |
| RE-282501-30 | 82.5K, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 5 | R152, R156, R172, R188, R189 | |
| RE-310002-30 | 100K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 5 | R11, R138, R142, R71, R80 | |
| RE-315002-30 | 150K, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 6 | R135, R136, R26, R27, R48, R50 | |
| RE-324302-30 | 243K, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 2 | R133, R134 | |
| RE-410005-30 | 1.0M, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 2 | R122, R123 | |
| SW-000111-00 | SWITCH, DPDT, SLIDE, PCB MOUNT 0.805" TERMINALS | 1 | SW3 | |
| SW-000112-00 | SWITCH, DP3T, SLIDE, PCB MOUNT 0.805" TERMINALS | 2 | SW1, SW2 | |
| SW-000168-00 | SWITCH, 3PDT, PCB MOUNT 0.805" TERMINALS, | 1 | SW4 | |
| WC-000398-00 | RIBBON CABLE, , 26 AWG, 10 CONDUCTOR, , 8.0 IN INSULATION, | 1 | J2A | |
| WC-1.1022-JW | WIRE, JUMPER, 22 GA, , BOP, 1.1, WHT | 1 | W1 | |
| XF-000100-30 | FERRITE BEAD, 100MHZ, 600 OHM, 200MA, 2012 | 8 | L10, L3, L4, L5, L6, L7, L8, L9 | |
| XF-000360-30 | TRANSFORMER, CURRENT SENSE, , , , , , 100:1 BOP-2CH | 1 | T1 | |
| XF-000361-30 | TRANSFORMER, GATE DRIVE, , , , BOP-2CH, , | 1 | T3 | |
| XF-000362-00 | TRANSFORMER, SWITCHING, 200KHZ, E42/21/20, 1000W, BOP-2CH, , | 1 | T2 | |
| XF-000364-00 | INDUCTOR, , TOROID T94-2, 30UH, BOP-2CH, , | 2 | L1, L2 | |
| XF-000376-00 | INDUCTOR, COMMON MODE, TOROID, 4MH, BOP, , 50/60HZ 6.3A | 2 | L11, L12 | |
| XF-000391-00 | INDUCTOR, 60HZ PFC, TOROID, 774UH, BOP, , 4 TO 6 PIN BASE | 1 | L13 | |

# 14.9 FG-003306-01 (120V) or FG-003326-01 (230V), KSub

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000960-00 | ASSEMBLY, POLE, 35MM, M20, , | 1 | | |
| CO-000436-00 | PLUG, EURO, 3 POS, MALE, GRN | 1 | | |
| LB-000751-00 | LABEL, GRILLE TAG, , KSUB, | 1 | | |
| LB-000783-00 | LABEL, CALIFORNIA CARB RULE, , , | 1 | | |
| PM-000270-GP | POLYBAG MANUAL, 240X360X0.05, , , , | 1 | | |
| PM-000443-00 | CARTON, SHIPPING, , KSUB, , 120V | 1 | | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| PM-000444-00 | INSERT, TOP, , KSUB, , 120V | 1 | | |
| PM-000445-00 | INSERT, BOTTOM, , KSUB, , 120V | 1 | | |
| PM-000449-00 | POLYBAG, , , KSUB, 1120X500X.04MM, | 1 | | |
| PM-000491-00 | INSERT, , , KSUB, , | 1 | | |
| PM-000516-00 | BAG, , POLYPROPYLENE, K-SERIES, 800MM X 160MM, .3MM THK | 1 | | |
| TD-000276-00 | HOOKUP DRAWINGS, K-SERIES, | 1 | | |
| TD-000337-00 | WARNING SHEET, PWRD AMP/PWRD LOUDSPEAKER, | 1 | | |
| WC-000361-GP | POWER CORD, 120V, IEC V-LOCK, 18AWG, 3M, , NEMA 5-15, , | 1 | | |
| WC-000362-GP | POWER CORD, 240V, IEC V-LOCK, 0.75MM, 3M, , CEE 7/7, , | 1 | | |
| WP-003306-01 | SPEAKER ASSY, , KSUB, BLK, , UNIV SPLY, PWRD | 1 | | |

# 14.10 WP-003306-01, KSub speaker assembly

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000850-01 | HANDLE, , BLK, SPEAKERS, | 2 | | |
| CH-000870-00 | PLATE, HANDLE BACKING, , K-SERIES, | 4 | | |
| CH-000889-00 | POLE MOUNT, THREADED, M20, KSUB, | 1 | | |
| MS-000074-GP | ACOUSTIC WOOL, 200X600X30, , , | 4 | | |
| MS-000259-GP | CASTER, SWIVEL, 3 INCH, , | 4 | | |
| MS-000593-00 | STRIP GASKET, , 5X500, EVA, , | 6 | | |
| MS-000604-00 | GASKET, STRIP, K-SERIES, , | 1 | | |
| NW-000171-00 | WSHR, SPLKG, M5, , , , , STL, CLR, ZINC CR3, | 16 | | |
| NW-000172-00 | WSHR, FLT, M5, , , 18 OD, , STL, CLR, ZINC CR3, | 16 | | |
| PL-000062-GP | GASKET, 1000X10X2MM, EVA B, , , | 10 | | |
| PL-000445-GP | FEET, HPR SUBS, , RUBBER, , | 4 | | |
| PL-000479-GP | LED HOLDER, FOR HPR, , , , | 1 | | |
| PL-000638-01 | BAFFLE SIDE/PORT, KSUB, , , , | 2 | | |
| PL-000640-01 | HANDLE BACK CUP, KSUB, , , , | 2 | | |
| PL-000659-01 | LOGO, K12, , , BLK, | 1 | | |
| QD-000312-GP | LED, 3MM, BLUE SP, SLR343BB T 225419 ROHM, , , | 1 | | |
| SB-000089-01 | ENCLOSURE, , KSUB, , , | 1 | | |
| SC-000097-GP | SCR, PHH, PNH, , , , , M5, 35 L, STL, BLK, ZINC CR3, | 4 | | |
| SC-000252-00 | SCR, PHH, PNH, WOOD, , , , M5, 12 L, STL, BLK, ZINC CR3, | 4 | | |
| SC-000253-00 | SCR, PHH, PNH, WOOD, , , , M5, 40 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000256-00 | SCR, PHH, PNH, TPG, PLASTITE, , , , M5, 45 L, STL, BLK, ZINC CR3, | 8 | | |
| SC-000283-00 | SCR, PHH, PNH, MACH, , , , M5, 25 L, CLASS 4.6, BLK, ZINC, CR3 | 36 | | |
| SC-000288-00 | SCR, PHH, PHN, MACH, , , , M5, 20 L, STL CLASS 4.6, BLK, ZINC CR3, | 18 | | |
| SP-000183-00 | WOOFER, 12", PAPER, FERRITE, , KSUB | 2 | | |
| WC-000493-00 | WIRE HARNESS, , , , KSUB, , | 1 | | |
| WP-003310-00 | CHASSIS ASSY, MAIN, KSUB, , UNIVERSAL SUPPLY | 1 | | |

# 14.11 WP-003310-00, KSub BOP module assembly

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000856-00 | CHASSIS, MAIN, BUCKET, BOP-2CH, | 1 | | |
| CH-000880-00 | CLAMP, TRANSISTOR, , BOP-2CH, | 2 | | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CH-000885-00 | PANEL, INPUT, BOP-2CH, KSUB, | 1 | | |
| CH-001025-00 | SHIELD, LINE FILTER, SHORT, KW SERIES, | 1 | | |
| CO-000386-00 | JACK, IEC, 3 POS, FEMALE, LOCKING | 1 | | |
| LB-001062-00 | LABEL, RCM LOGO, REGULATORY CERTIFICATION MARK, , (AUSTRALIA & NEW ZEALAND) | 1 | | |
| NW-000034-00 | WSHR, SPLKG, , M3, 3.4 ID, 6.2 OD, 0.7 THK, STL, CLR, ZINC CR3, | 4 | | |
| NW-000140-00 | NUT, HEX KEPS W/TOOTH WSHR, M4, , STL, CLR, ZINC, | 1 | | |
| NW-000147-00 | NUT, HEX, M3, , STL, CLR, ZINC CR3, | 4 | | |
| NW-000173-00 | WSHR, FLT, M3, , 3.2 ID, 8.0 OD, 1.0 THK, STL, BLK, ZINC CR3, | 8 | | |
| PL-000627-00 | SPRINGSEAT, TRANSISTOR, BOP, NYLON, , | 2 | | |
| PL-000836-00 | KNOB, , HOUSE OF K, PLASTIC, BLACK, | 1 | | |
| PL-000845-00 | INSULATOR, TRANSISTOR, 1.525" X .950", SIL-PAD, , | 4 | | |
| SC-000205-00 | SCR, PHH, PNH SERR BSE, PLASTITE, TAPPING, , , M4X1.75, 10 L, STL, BLK, ZINC CR3, WAXED, | 12 | | |
| SC-000229-00 | SCR, PHH, PNH, MACH, , , , M3, 8 L, STL, BLK, PHOS W/6219, | 4 | | |
| SC-000230-00 | SCR, PHH, FLH, TPG, TYPE AB, , , #4-24, 3/8 L, STL, BLK, ZINC CR3, | 2 | | |
| SC-000240-00 | SCR, PHH, PNH, MACH, , , , M3.5X0.6, 20 L, STL, NI-HARDENED, , 450 - 550-HV HARDNESS | 2 | | |
| SC-000241-00 | SCR, PHH, PNH, MACH, , , , M3.5, 8 L, STL, NI, HARDENED, , 450 - 550-HV HARDNESS | 14 | | |
| SC-043051-PP | PHILLIPS, PANHEAD, #4-20, 0.313" L, BLACK, STEEL "PLASTITE" | 8 | | |
| SW-000016-SW | AC SWITCH, SPST, 20A, 125VAC, | 1 | | |
| WC-000466-00 | CABLE ASSY, AC, 16 AWG, 3 CONDUCTOR, BOP-2CH, 5.50" L, | 1 | | |
| WC-000467-00 | WIRE ASSY, AC SWITCH, 16 AWG, 1 CONDUCTOR, BOP-2CH, 5.00" L, BROWN | 1 | | |
| WP-000367-00 | FAN ASSY, , BOP-2CH, , | 1 | | |
| WP-003314-00 | PCB ASSY, , KSUB, , UNIVERSAL SUPPLY | 1 | | |

# 14.12 WP-003314-00, KSub BOP PCB assembly

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CA-010002-30 | 10PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 2 | C10, C11 | |
| CA-018002-30 | 18PF, 5 PCNT, 50V, CERAMIC NPO, SMT, | 2 | C59, C61 | |
| CA-110001-10 | 100PF, 5 PCNT, 500V, MICA, DIPPED, | 2 | C126, C127 | |
| CA-110002-30 | 100PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 4 | C75, C76, C77, C78 | |
| CA-112001-30 | 120PF, 5 PCNT, 200V, CERAMIC NPO, 0805, | 12 | C1, C19, C20, C22, C28, C29, C30, C31, C58, C60, C8, C9 | |
| CA-122002-30 | 220PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 7 | C117, C49, C51, C93, C94, C95, C96 | |
| CA-122011-00 | 220PF, 10 PCNT, 250VAC, CERAMIC, DISC, Y1CAP | 1 | C52 | |
| CA-168003-30 | 680PF, 5 PCNT, 50V, CERAMIC NPO, 0805, | 2 | C72, C73 | |
| CA-222001-00 | 0.0022UF, 20 PCNT, 250VAC, CERAMIC Y5U, DISC, YCAP | 3 | C104, C105, C124 | |
| CA-233003-30 | 0.0033UF, 10 PCNT, 50V, CERAMIC X7R, 0805, | 2 | C122, C50 | |
| CA-239002-30 | 0.0039UF, 5 PCNT, 50V, CERAMIC COG/NPO, 0805, | 2 | C6, C7 | |
| CA-322013-30 | 0.022UF, 10 PCNT, 500V, CERAMIC X7R, 1206, | 6 | C111, C114, C123, C130, C132, C57 | |
| CA-347008-10 | 0.047UF, 10 PCNT, 250V, FILM, BOX, | 5 | C2, C32, C36, C46, C89 | |
| CA-368007-30 | 0.068UF, 10 PCNT, 100V, CERAMIC X7R, 0805, | 1 | C55 | |
| CA-410001-00 | 0.1UF, 20 PCNT, 250VAC, FILM, BOX STYLE, X2CAP | 1 | C108 | |
| CA-410012-30 | 0.1UF, 10 PCNT, 25V, CERAMIC X7R, 0805, | 32 | C100, C106, C107, C118, C12, C120, C121, C138, C21, C26, C27, C3, C33, C39, C41, C47, C5, C63, C64, C68, C69, C70, C71, C74, C82, C83, C84, C85, C86, C90, C91, C92 | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| CA-410027-10 | 0.1UF, 5 PCNT, 100V, FILM, BOX STYLE, | 2 | C109, C119 | |
| CA-468005-10 | 0.68UF, 5 PCNT, 100V, FILM, BOX, | 3 | C125, C34, C35 | |
| CA-468006-00 | 0.68UF, 5 PCNT, 250V, POLYPROPYLENE, BOX, | 2 | C116, C149 | |
| CA-468007-00 | 0.68UF, 20 PCNT, 250V, FILM, BOX STYLE, X2 CAP | 2 | C101, C102 | |
| CA-510007-30 | 1.0UF, 20 PCNT, 16V, CERAMIC Y5V, 0805, | 6 | C115, C128, C137, C148, C38, C44 | |
| CA-610011-30 | 10UF, 20 PCNT, 16V, ELECTROLYTIC, SMT, NON-POLAR | 5 | C54, C79, C80, C97, C98 | |
| CA-610021-30 | 10UF, 20 PCNT, 25V, CERAMIC CAP, 1206, | 19 | C103, C110, C13, C14, C15, C16, C17, C18, C23, C24, C37, C48, C56, C65, C66, C67, C81, C87, C88 | |
| CA-710004-10 | 100UF, 20 PCNT, 25V, ELECTROLYTIC, , LOW ESR | 5 | C129, C133, C134, C42, C62 | |
| CA-747011-00 | 470UF, 20 PCNT, 400V, ELECTROLYTIC, SNAP IN, | 2 | C112, C113 | |
| CA-810009-10 | 1000UF, 20 PCNT, 16V, ELECTROLYTIC, , | 3 | C145, C25, C45 | |
| CA-818001-00 | 1800UF, 20 PCNT, 100V, ELECTROLYTIC, 22MM X 40MM SNAP IN, | 2 | C135, C136 | |
| CO-000009-ZT | ZTAB, 0.25" TAB, 1 POS, MALE, AUTO INSERTABLE | 2 | J14, J15 | |
| CO-000155-00 | HEADER, 0.1" CENTERS, 2 POS (1X2), MALE, RAMP LOCK | 1 | J5 | |
| CO-000168-00 | XLR, COMBO, 3 POS, FEMALE, VERTICAL W/LATCH | 2 | J10, J8 | |
| CO-000329-00 | WIRE HOLDER, RIBBON CABLE, 10 POS, FEMALE, | 1 | | |
| CO-000355-00 | TERMINAL STRIP, , 10 POS (2X5), MALE, | 1 | J7 | |
| CO-000413-00 | HEADER, 4.2MM CENTERS, 10 POS (2X5), MALE, | 1 | J3 | |
| CO-000421-00 | XLR, , 3 POS, MALE, VERTICAL PLASTIC SHELL | 2 | J11, J9 | |
| CO-000422-00 | JACK, EURO, 3 POS, MALE, VERTICAL BLACK TALL | 1 | J6 | |
| CO-000426-00 | WIRE TRAP, RIBBON CABLE, 10 POS, FEMALE, RELEASABLE | 1 | J2B | |
| CY-000009-30 | 12.288MHZ, HC49SM, | 1 | Y1 | |
| HW-000007-HW | FUSE CLIP, PC MOUNT, , , TIN PLATED BRASS, 5MM | 2 | | |
| IC-000048-30 | OPAMP, DUAL, MC33078, , | 4 | U1, U14, U17, U19 | |
| IC-000157-30 | REGULATOR, SHUNT, ZR431, , | 1 | U6 | |
| IC-000200-30 | RESET, MICROPROCESSOR, MAX809S, , | 1 | U12 | |
| IC-000279-30 | COMPARATOR, DUAL, LM319, SMT, | 2 | U2, U4 | |
| IC-000315-00 | SENSOR, TEMPERATURE, LM19CIZ, , | 1 | U9 | |
| IC-000382-30 | DSP 28/56 BIT, , ADAU1701, , | 1 | U10 | |
| IC-000407-30 | EEPROM, 8KX8, 24C64A, SMT, I2C | 1 | U11 | |
| IC-000412-30 | CONTROLLER, ACTIVE CLAMP PWM, UCC2893, SMT, | 1 | U15 | |
| IC-000413-30 | DRIVER, MOSFET HALF BRIDGE, IRS20957, SMT, | 2 | U5, U7 | |
| IC-000420-30 | VOLTAGE REGULATOR, +3.3V, NCP1117ST33, SOT223, | 1 | U8 | |
| IC-000425-30 | OPTO COUPLER, TRANSISTOR OUTPUT, MOC205R2V-M, SMT, VDE APPROVAL | 1 | U3 | |
| IC-000431-30 | VOLTAGE REGULATOR, +12V, LM78L12A, SO-8, | 1 | U16 | |
| IC-000505-30 | COMPARATOR, DUAL, LM393A, SO-8, VIO = 2MV MAX | 1 | U13 | |
| MS-000115-30 | FUSE, 1.0A, 24V, 1206, SLO | 3 | F2, F3, F4 | |
| MS-000487-00 | GASKET, PCB CONNECTOR, SPEAKER, BOP-2CH, , | 1 | | |
| MS-10.250-FU | FUSE, 10A, 250V, 5MM X 20MM, FAST | 1 | F1 | |
| PC-003311-00 | PCB, K-SERIES, , MAIN AMP, | 1 | | |
| PG-000213-00 | APPLICATION CODE, , KSUB, , | 0 | | |
| PL-000121-00 | SPACER, LED/TO-92, 0.18", PVC, BLACK, | 1 | | |
| PL-000628-00 | SPACER, T-1 LED, 0.85", PLASTIC, BLACK, | 4 | | |
| PL-000643-00 | SPACER, LED/TO-92, .115" (3MM), PVC, BLACK, | 1 | | |
| PL-000686-00 | SPACER, ROUND, 0.063"ID X 0.156"OD X 0.510"L, NYLON, , | 1 | | |
| PT-250006-00 | GAIN, 5K, 20 PCNT, , 21 DETENT, GX SERIES | 1 | VR1 | |
| QD-000052-00 | LED, , , , GRN, , DIFFUSED, 40DEG, T1 | 2 | LD4, LD7 | |
| QD-000054-00 | LED, , , , RED, , DIFFUSED, 40 DEG, T1 | 1 | LD1 | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| QD-000102-30 | DIODE, 75V, 0.075A, , IMBD4148, SOT-23, 4NS | 12 | D1, D13, D15, D16, D2, D22, D25, D27, D35, D40, D45, D7 | |
| QD-000103-30 | TRANSISTOR NPN, 40V, 0.2A, 0.2W, MMST3904, SOT-23, | 5 | Q1, Q11, Q12, Q17, Q6 | |
| QD-000104-30 | TRANSISTOR PNP, 40V, 0.2A, 0.2W, MMST3906, SOT-23, | 2 | Q10, Q8 | |
| QD-000105-30 | TRANSISTOR NPN, 300V, 0.2A, 0.2W, MMBTA42, SOT-23, | 1 | Q15 | |
| QD-000108-30 | DIODE, 200V, 0.2A, , BAS21, SOT-23, 50NS | 6 | D10, D11, D12, D14, D29, D9 | |
| QD-000187-00 | LED, , , , BLU, DIFFUSED, 40DEG, T1 | 1 | LD2 | |
| QD-000189-30 | DIODE SCHOTTKY, 30V, 0.2A, , BAT54S, SOT-23, | 3 | D17, D37, D4 | |
| QD-000282-30 | DIODE RECTIFIER ULTRAFAST, 200V, 1A, , ES1D, SMA, | 9 | D28, D3, D31, D32, D36, D43, D5, D6, D8 | |
| QD-000363-30 | DIODE, SCHOTTKY, 30V, 2.0A, , MBR230, SOD-123, | 4 | D23, D24, D38, D39 | |
| QD-000372-00 | BRIDGE RECTIFIER, , , , KBU1005, IN-LINE, 600V 10A | 1 | BR1 | |
| QD-000373-00 | MOSFET N-CHANNEL, 200V, 18A, 100W, IRFB4020, TO-220AB, | 4 | Q2, Q3, Q4, Q5 | |
| QD-000391-00 | DIODE RECTIFIER, 600V, 8A, , FFP08S60S, TO-220, 15NS STEALTH II | 2 | D33, D34 | |
| QD-000394-10 | TRANSISTOR NPN, 50V, 2A, 0.9W, 2SC2655, TO-92MOD, | 2 | Q16, Q7 | |
| QD-000455-00 | MOSFET N-CHANNEL, 600V, 10A, 90W, STP11NM60ND, TO-220, | 1 | Q13 | |
| QD-000456-00 | MOSFET-N-CHANNEL, 600V, 29A, 210W, STW34NM60N, TO-247, | 1 | Q14 | |
| RD-000511-00 | STICKER, FIRMWARE, .35" X .65", , , | 0 | | |
| RE-.15002-30 | 1.5, 5 PCNT, 1W, THICK FILM, 2512, 200V | 4 | R16, R174, R184, R56 | |
| RE-.28701-30 | 2.87, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R121, R155, R49, R51 | |
| RE-000002-30 | 0, , , THICK FILM, 0805, JUMPER | 5 | R106, R107, R154, R3, R74 | |
| RE-000300-NR | NTC, 2.5 OHMS, 8 AMPS, , , INRUSH LIMIT 90J | 1 | R140 | |
| RE-001003-30 | 10, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 10 | R157, R168, R169, R182, R183, R196, R197, R198, R199, R200 | |
| RE-001006-30 | 10, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 3 | R125, R165, R72 | |
| RE-001960-30 | 19.6, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 4 | R60, R61, R62, R63 | |
| RE-002100-30 | 21, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 13 | R1, R102, R103, R12, R15, R2, R38, R39, R52, R53, R54, R55, R57 | |
| RE-010002-30 | 100, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 9 | R100, R101, R139, R175, R187, R58, R59, R64, R82 | |
| RE-010018-10 | 100, 5 PCNT, 2W, METAL OXIDE FP, MINI, | 3 | R161, R162, R166 | |
| RE-024301-30 | 243, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R180, R181, R185, R186 | |
| RE-047502-30 | 475, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 3 | R28, R68, R79 | |
| RE-076801-30 | 768, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 1 | R153 | |
| RE-110002-30 | 1.00K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 9 | R158, R167, R18, R20, R21, R24, R29, R7, R87 | |
| RE-111301-30 | 1.13K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 10 | R163, R164, R171, R177, R23, R25, R30, R31, R73, R77 | |
| RE-122103-30 | 2.21K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 14 | R117, R118, R13, R151, R17, R178, R179, R33, R35, R6, R70, R83, R85, R86 | |
| RE-136502-30 | 3.65K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 7 | R160, R44, R45, R66, R76, R78, R9 | |
| RE-145302-30 | 4.53K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R36, R37, R5, R67 | |
| RE-156200-30 | 5.62K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 11 | R10, R42, R43, R88, R89, R90, R91, R92, R93, R94, R95 | |
| RE-163402-30 | 6.34K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R148, R32, R34, R8 | |
| RE-210001-BM | 10.0K, 1 PCNT, 1/4W, METAL FILM, , | 2 | R19, R22 | |
| RE-210003-30 | 10.0K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 10 | R113, R114, R115, R116, R127, R14, R4, R46, R47, R69 | |
| RE-211005-00 | 11K, 5 PCNT, 1W, METAL OXIDE FP, , | 5 | R144, R145, R146, R147, R65 | |
| RE-211303-30 | 11.3K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 1 | R141 | |
| RE-214001-30 | 14.0K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R120, R130, R40, R41 | |
| RE-217803-30 | 17.8K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 4 | R124, R137, R176, R75 | |

| Part Number | Description | Qty. | Reference | Comment |
|---|---|---|---|---|
| RE-220002-30 | 20.0K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 9 | R104, R105, R111, R112, R84, R96, R97, R98, R99 | |
| RE-229402-30 | 29.4K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 1 | R150 | |
| RE-256002-10 | 56K, 5 PCNT, MINI-1W, METAL OXIDE, FP, | 1 | R170 | |
| RE-263401-30 | 63.4K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 3 | R143, R149, R173 | |
| RE-282501-30 | 82.5K, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 4 | R152, R172, R188, R189 | |
| RE-310002-30 | 100K, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 6 | R11, R138, R142, R71, R80, R81 | |
| RE-315002-30 | 150K, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 6 | R135, R136, R26, R27, R48, R50 | |
| RE-324302-30 | 243K, 1 PCNT, 1/8W, THICK FILM, 1206, 200V | 2 | R133, R134 | |
| RE-410005-30 | 1.0M, 1 PCNT, 1/10W, THICK FILM, 0805, 100V | 1 | R123 | |
| SW-000111-00 | SWITCH, DPDT, SLIDE, PCB MOUNT 0.805" TERMINALS | 2 | SW1, SW3 | |
| SW-000112-00 | SWITCH, DP3T, SLIDE, PCB MOUNT 0.805" TERMINALS | 1 | SW2 | |
| WC-000398-00 | RIBBON CABLE, , 26 AWG, 10 CONDUCTOR, , 8.0 IN INSULATION, | 1 | J2A | |
| WC-1.1022-JW | WIRE, JUMPER, 22 GA, , BOP, 1.1, WHT | 1 | W1 | |
| XF-000100-30 | FERRITE BEAD, 100MHZ, 600 OHM, 200MA, 2012 | 6 | L10, L3, L4, L7, L8, L9 | |
| XF-000360-30 | TRANSFORMER, CURRENT SENSE, , , , , , 100:1 BOP-2CH | 1 | T1 | |
| XF-000361-30 | TRANSFORMER, GATE DRIVE, , , , BOP-2CH, , | 1 | T3 | |
| XF-000362-00 | TRANSFORMER, SWITCHING, 200KHZ, E42/21/20, 1000W, BOP-2CH, , | 1 | T2 | |
| XF-000364-00 | INDUCTOR, , TOROID T94-2, 30UH, BOP-2CH, , | 2 | L1, L2 | |
| XF-000376-00 | INDUCTOR, COMMON MODE, TOROID, 4MH, BOP, , 50/60HZ 6.3A | 2 | L11, L12 | |
| XF-000391-00 | INDUCTOR, 60HZ PFC, TOROID, 774UH, BOP, , 4 TO 6 PIN BASE | 1 | L13 | |

# Contact information

Service manuals and other service documents are available for download from www.qscservice.com. If you need any further information regarding this service procedure, please contact QSC Technical Services at the addresses or numbers below.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