山彦 YAMAHIKO Musical Instrument Pickup Systems by Sonaresearch

Contact Pickup System for Piano

MODEL:CPS-PF1R, CPS-PF1S, CPS-PF1P

Owner's Manual

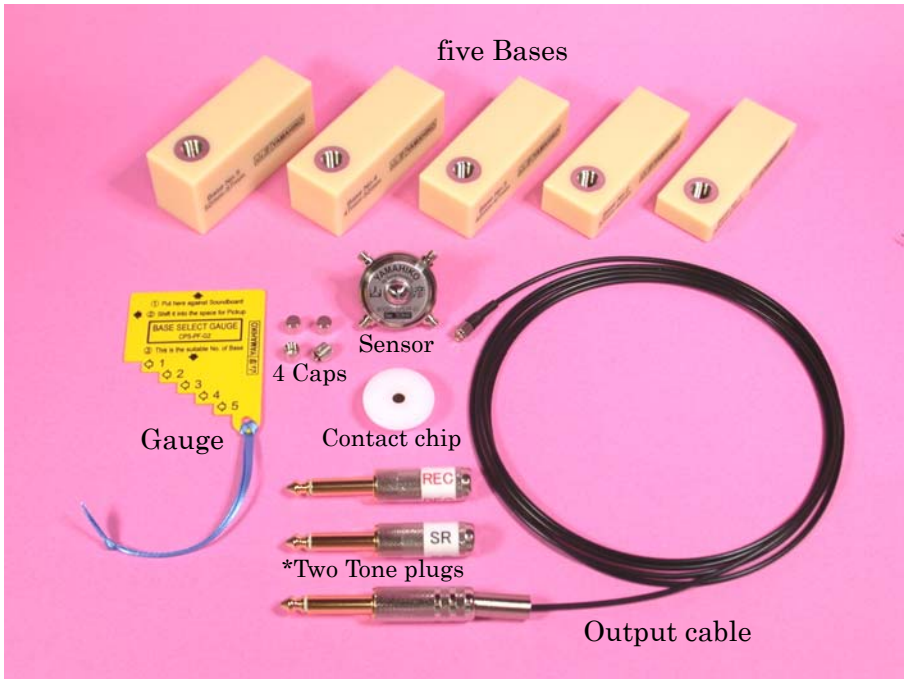
Contents

CPS-PF1P "Plug model"

Characteristics

- **YAMAHIKO Piano Pickup system** has
  the **"Recording model** (CPS-PF1R)**"** it have flat freq. response for recording,
  the **"SR model** (CPS-PF1S)**"** it have high boosted freq. response for PA (Sound Reinforcement) application and
  the **"Plug model** (CPS-PF1P)**"** it is possible to switching the tone of "Recording model" or the tone of "SR model" with tone plugs easily.
- High selectivity on piano sound without taking other noises
- Forth mode pick-up system(FMPS) realizes high fidelity and high S/N
- Stable positioning realizes high fidelity sound for long time
- Easy to set on/off in short time
- Very seldom to damage the piano by the setting of the pick-up
- No need to use adhesive tape
- No spot or scratch on the surface after setting it off
- Able to set both on grand and upright pianos
- Tone variety depending on the set-in position
- Stereo-like sound expected when using several pick-ups simultaneously
- Low noise due to self-vibration-preventing construction in the connecting part of the pick-up body and the output cables

Components of the pickup set



*Tone plugs are include only in CPS-PF1P “Plug model”

Storage wooden box

Preface

Many pianists are facing the problem that their performances become difficult since they can hardly listen to their own piano sound in loud sound ensemble such as with electric instruments. It is very hard for them to solve this problem by themselves because an ordinary microphone would likely cause another problem like howling.

The existing pick-up systems for piano in the market are very useful with its less howling margin and capabilities of amplifying without over-dominating sound around the piano. But still many products might have the following unsolved problems:

- Unnatural reproduction of sound tones compared with those via microphone
- Unstable sound for long time use
- Spot or scratch would remain on the surface after removed
- The piano owner, afraid of spot/scratch trouble would possibly refuse to utilize it
- Out of order after a number of uses

By introducing the new concept of Forth Mode Pick-up System (FMPS), we have succeeded to develop the new pick-up system without the above troubles even in the frequent uses by the professional pianists.

It would promise that they could obtain ideal self-monitoring environment when they use our compact pick-up system.

It can be easily set in the piano by the players themselves in short time without damaging the instrument if carefully set as explained in the next clauses.

About the construction of a piano instrument

Before we go into the detailed explanation of our piano contact pick-up system (hereafter call it "the pick-up"), some knowledge on the piano construction would be indispensable, though the names (how to call them) of each part might be more or less different among piano manufacturers.

The following figure shows you the side view of a grand piano.

The pick-up is to be placed between *soundboard* and *brace*, which please bear in mind referring the figure-1.

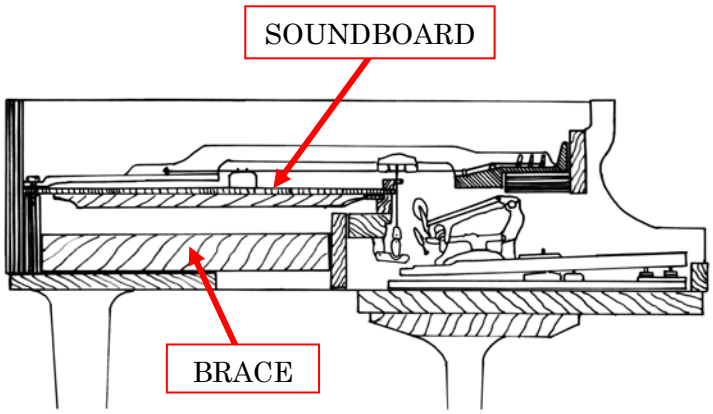


Figure-1

Next, here we show the side view of an upright piano.

The pick-up is to be placed between soundboard and backpost. (see figure-2)

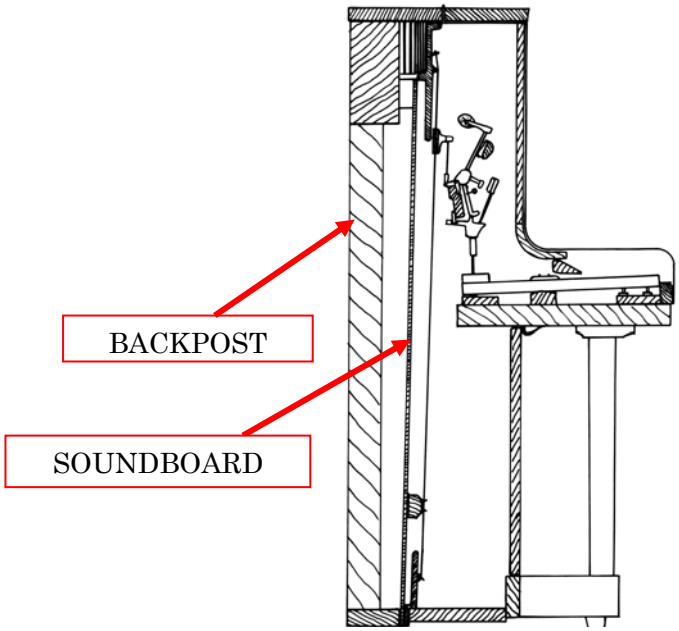


Figure-2

Technical explanation

Adoption of FMPS

Many of existing piano pick-up systems collects the vibration of the piano from the parts *in full sound vibration* which will be then output as the electric signal.

On the contrary, our pick-up takes the vibration of the piano from the soundboard and *least-vibrating* parts e.g. brace and backpost. It changes the *force* arose between soundboard and brace/backpost into electric signals, which reproduce very natural and stable sound. Some sound modification by equalizer and reverberator would probably make even higher quality of sound than that via microphone.

Sound variations and stereo effects

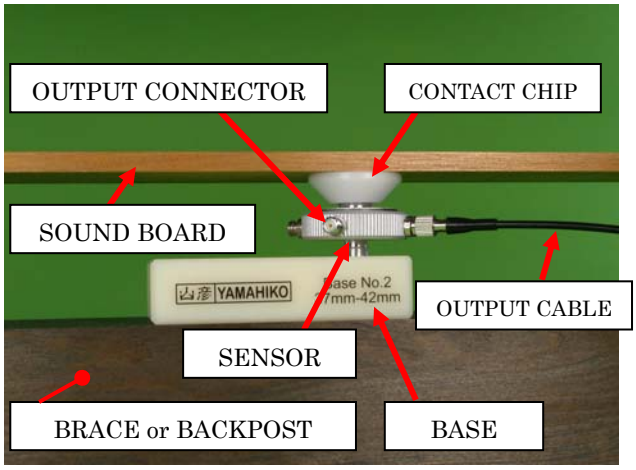
Simultaneous setup of more than 2 pick-ups is possible since they can be positioned anywhere between soundboard and brace/backpost, by which you can obtain stereo-like sound or several sound variations depending on the setup positions. Even 2~3 pick-ups enable you to obtain the well-balanced stereo sound through the wide range of piano notes.

Product explanation

The pick-up can be set both on grand and upright piano, between the soundboard and brace (grand) or backpost (upright).

The pick-up consists of the following parts:

- **Contact chip** (on the soundboard)
- **Sensor** (exchanging the vibration into electric signals)
- **Base** (to support sensor)
- **Output cable** (to transmit the electric signals with high fidelity)



picture-1

For further details, please refer to the next clauses (cf. picture-1)

Contact chip

This is like a half of globe that has small half-globe hollow in lower part connecting the upper part of **the sensor** part. It promises its thorough touch on the soundboard in any angles without scratching it, as well as maximum transmission of the vibration into **the sensor** part.

The **contact chip** has a magnet inside that always keeps itself on **the sensor** part during the set-up operation.

Sensor

This exchanges the vibration coming through **the contact chip**, into electric signals with high fidelity.

In every 90 degrees angle, it has the **output connectors**, so that you can select the most convenient one to put the output cable during the set-up operation.

The sensor is thoroughly shielded to be suffered from least magnetic effects.

Output cable

This is well protected not to add any electric signals by the self-vibration on the original sound signals during the transmission to the amplifier.

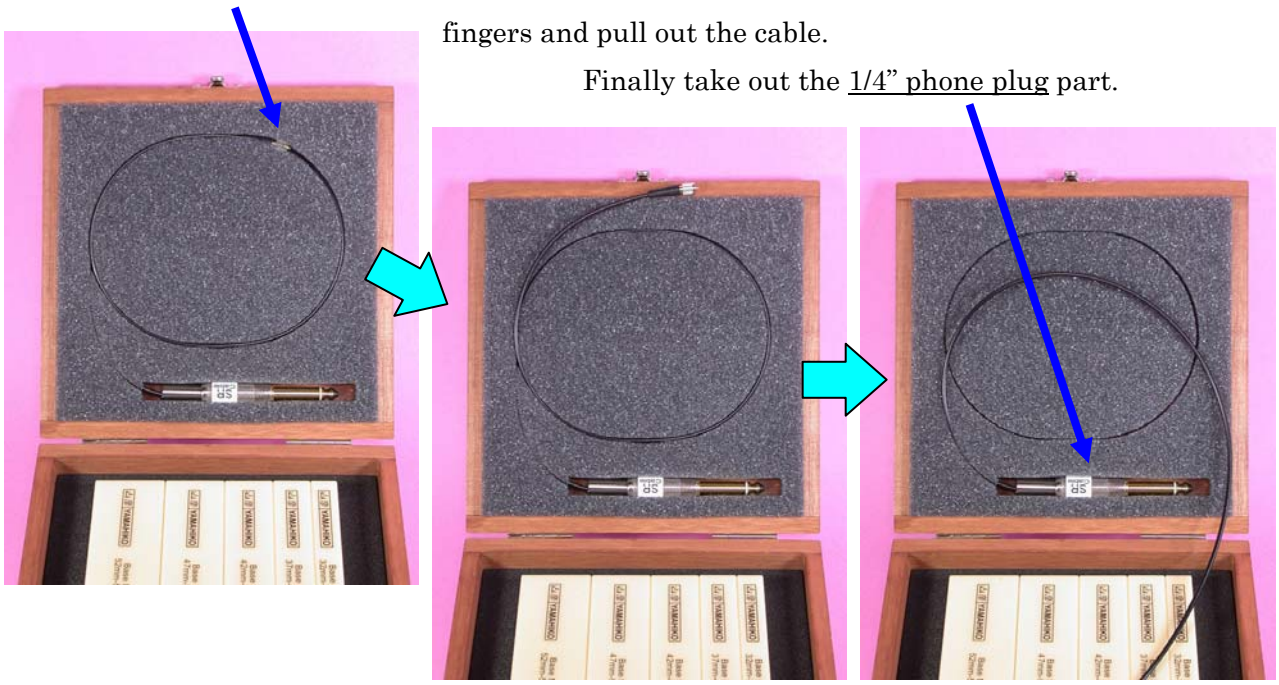
As mentioned above, it is easy to connect it to **the sensor** since you can put it on any convenient **output connector** of the sensor part.

The output cable is stored in the cushion of the lid of the wooden storage case.

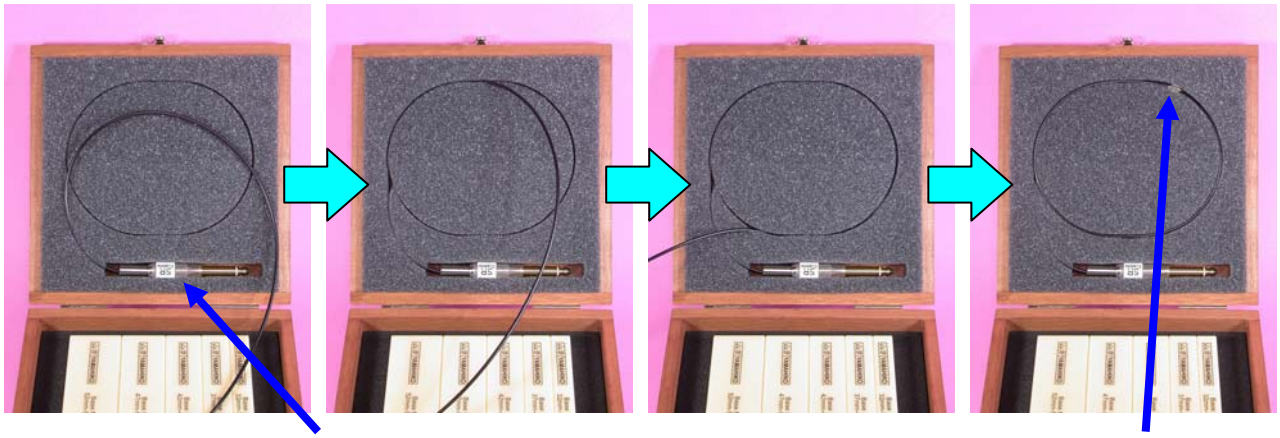
① How to take out the output cable

Grasp the miniature plug in the groove of the cushion sponge with your fingers and pull out the cable.

Finally take out the 1/4" phone plug part.



② Storage of output cable



At first, insert the 1/4 phone plug into the cushion and snap the cables into the grooves of the cushion in sequence as shown in the picture.

Finally it is completed by inserting the miniature plug into the groove of the cushion.

Base

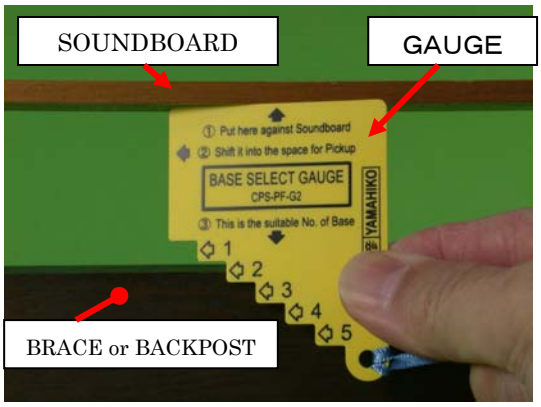
Five bases are prepared in different thickness so that you can select the most suitable one for the set-up space of your instrument. (cf. How to set it in the instrument)

Metal dust proof cap

When attaching a pickup permanently to a piano such as a live house, the included metal connector cap protects the connector not connected with the output cable from dust and moisture. In the case of short-term use in concert etc., there is no problem even if it does not use. When using pickups in places with high electromagnetic noise, using this metal connector cap helps reduce noise.

How to set it in the instrument

These pictures show you how to set the pick-up into the soundboard and brace or backpost. (The simple model for your clearer views on the operation)



First of all, measure the space between soundboard and brace/backpost to select **the base** part with most suitable thickness. The yellow "**base select gauge**" will indicate the best fit **base** when you insert it between the sound board and brace or backpost.

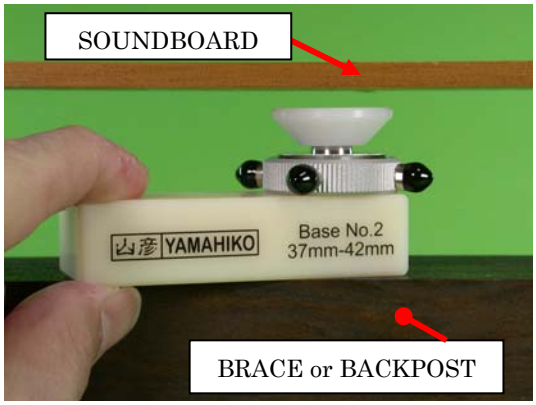
As shown in the left picture, the **base select gauge** will find the suitable No. of the base.
In the left case, the **gauge** stops in No.2, the **base** with printed "No.2" will fit the instrument.

Then put **the sensor** into the selected **base**, screwing it into the hole of the **base** until the bottom part of **the sensor** touches on the surface of **the base.**

!! Caution!! Do it carefully, otherwise you might break the screw.

When the Pickup is install and detach frequently, you can not use **dust caps** of **output connectors.** Now metal caps will attached as **dust caps** different from this photos.
(These dust caps protect non-connected mini connectors of pickup body from the dust, when you permanently install to piano.)

And **Contact chip** is installed.
Now you are ready to go to the next step.



Then turn **the sensor** part left to pull it up until the **contact chip** *lightly* touches the soundboard and stop it. Remember which **output connector** (any one out of four) faces in approximately best direction for cable connection.

<Warning>

Do not remove the **assembly** when it touches the soundboard, otherwise you will scratch or damage the soundboard or brace/backpost.

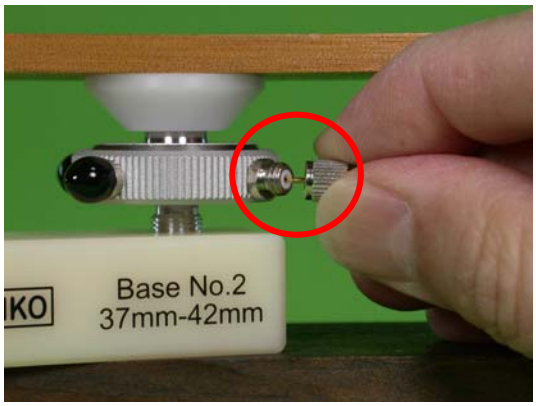
Turn **the sensor** left for *more 90 degrees* (remember that four **output connectors** are ready in every 90 degrees) to push up **the contact chip** onto the soundboard more tightly and stably.

!! Caution!! Do not turn the Sensor too much.

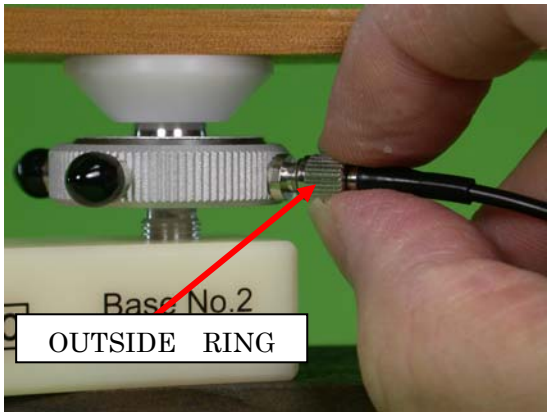
<Warning>

In this operation some tension would be added on the soundboard, so that you should be very careful not to damage the soundboard by the pick-up whether by **too much turning** (= pushing up or forth) or by removing it when it touches on any of the surfaces of the instrument.

The dust protection cap of the output connector at the position where the output cable is connected easily is removed.



Then connect the **output cable** into **the sensor**. Insert the center pin of the **output cable** into the center hole of the **output connector**.



Screw the outside ring of the **output cable** to fix it to the **output connector** of the **sensor.**

All operation has been completed and now you are ready to use it.

Specifications

Electrical Specification

Unbalance output

Recommend to use high input impedance (4.7 mega ohms or more) direct box.

(ex.COUNTRYMAN TYPE85,BOSS DI-1)

Sensor frequency response：20Hz to 10KHz ±3dB(10M ohm terminated)

Maximum output voltage：2Vp-p

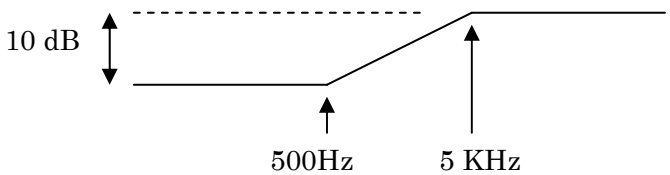
Output cable

Length: 2m(6.5ft)

output plug：1/4" Phone plug

Passive EQ is built into the Phone plug.

The **Recording model** has a flat frequency response. The **SR model** has the frequency response that high boosted from 500Hz to 5 KHz by 10dB.

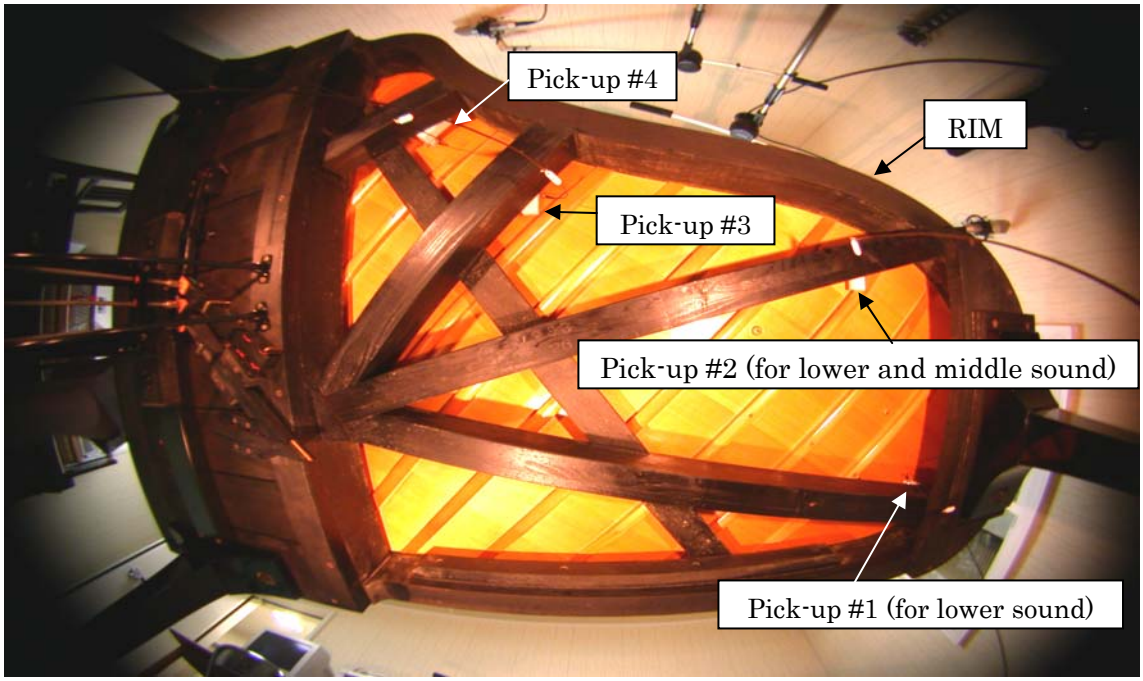


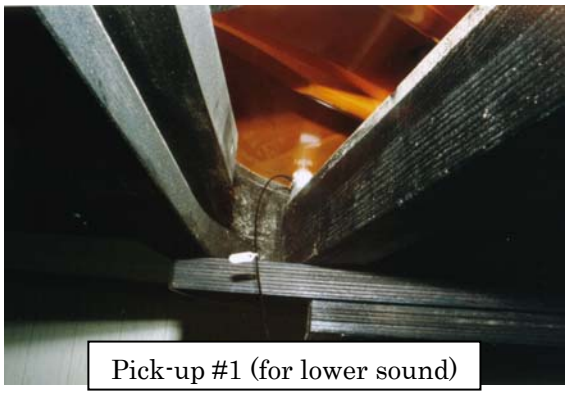
Frequency response of **SR** model

Recommendation

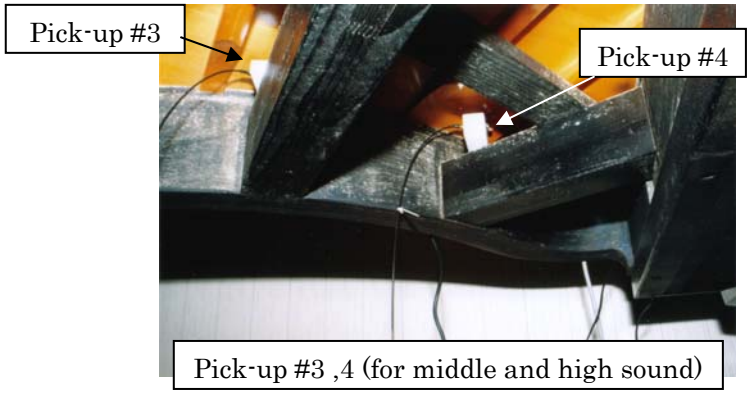
1. Use high impedance amplifier or Direct Box.(ex.COUNTRYMAN TYPE85,BOSS DI-1)
2. The following picture shows four pickups installed into the grand piano. An enough sound can be obtained with two pickups in case of almost. It is recommended to try at the position of # 2 and # 4 first. # 4 corresponds from #1 from the bass to the high pitched sound respectively. #1 to #4 corresponds low pitch to high pitch sound respectively.

You will be able to adjust the installation position according to your favor and purpose.




Pick-up #1 (for lower sound)


Pick-up #2 (for lower and middle sound)



Pick-up #3 ,4 (for middle and high sound)

Recommend to use direct box

Tips at piano Pickup installation position

The Picked up sound changes by the position where Contact chip of this Pickup touches Soundboard.

When a piano sound is picked up, the following problem is the most popular.

The sound of a certain key is picked up by a large volume.

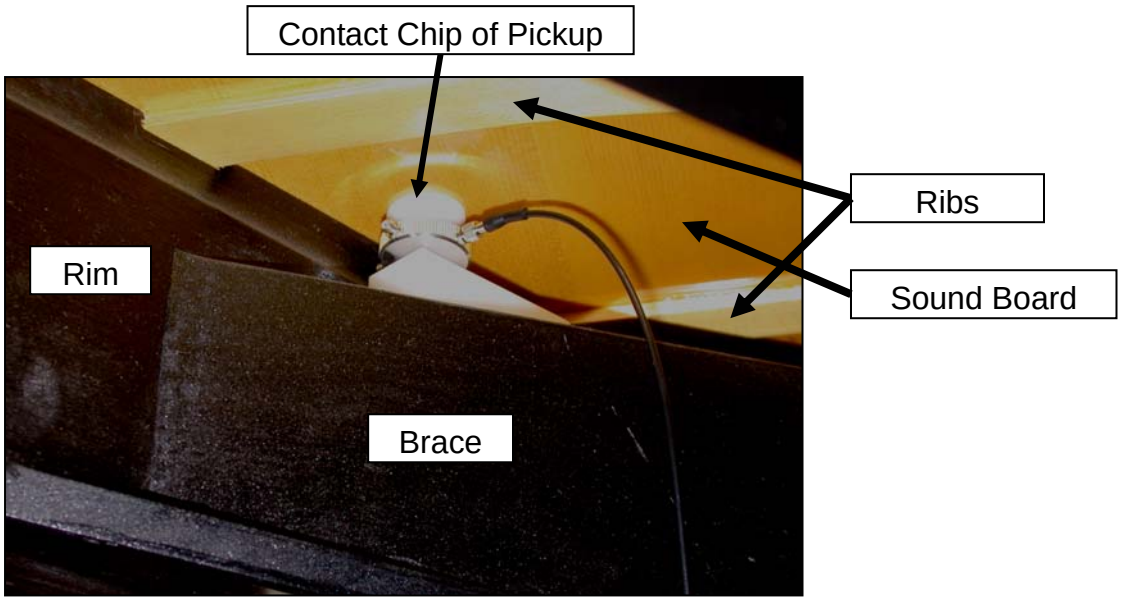
Tips of this problem solving are shown as follows.

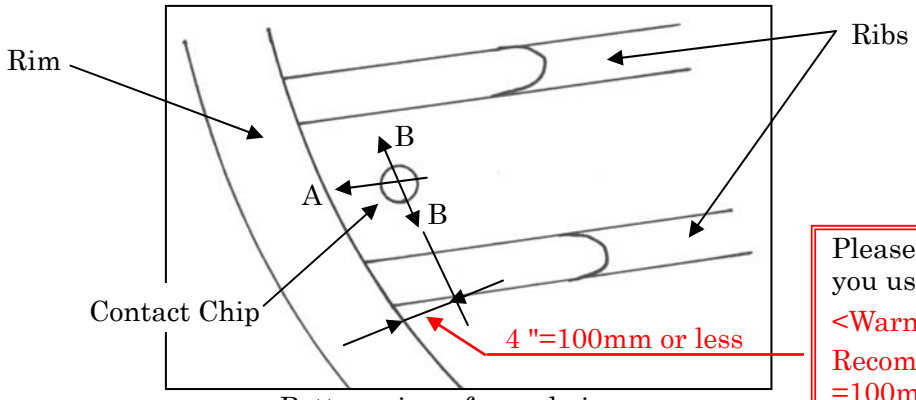
There is a tendency improved by the position of Contact chip close to Rim of Piano. (Refer to arrow A of Figure 1)

There is a tendency improved by the position of Contact chip far from Rib of Piano. (Refer to arrow B of Figure 1)

It is good to locate Contact chip at the center of Rib and Rib because many Ribs are in Soundboard.

These photograph and figure saw the piano from the under.





Bottom view of grand piano

Figure 1

Please try 2 inch=50mm when you use first time.

<Warning>

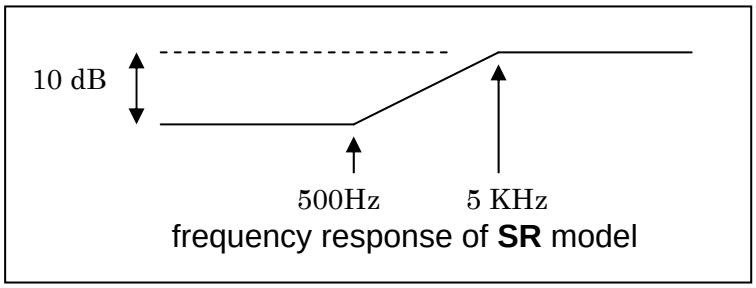
Recommend strongly 4 inches =100mm or less to minimize the alteration for acoustic sound and the pitch of the piano.

How to use the “Tone Plug Model” (for CPS-PF1P)

Outline

YAMAHIKO Piano Pickup system has the “Recording model (CPS-PF1R)” has a flat freq. response for recording, and the “SR model (CPS-PF1S)” has the freq. response that high boosted from 500Hz to 5 KHz by 10dB for PA (Sound Reinforcement) application. These differences are made by passive EQ built into the phone plug of output cable.

“Tone Plug Model (CPS-PF1P)” possible to switch it's tone, either “Recording model tone” or “SR model tone” with tone plugs.



Attention! This tone plug system needs DI (Direct Box) with parallel output Jack.

How to use this tone plug model

This "Tone Plug Model" contains **out put cable "DIRECT Cable"**, **tone plug "REC"** and **tone plug "SR"**. The “**REC**” marked Recording plug has a flat frequency response. The “**SR**” marked SR plug has the frequency response that high boosted from 500HZ to 5KHz by 10dB.

Connection example

(Explained as an example of the case where COUNTRYMAN TYPE85 DI is used.)

1. Connect **Direct Cable** from a Piano Pickup with an **“INST.”** Jack.
2. Connect **Tone plug** that you chose with an **“AMP.”** Jack which is a **parallel output Jack**.

   The tone can be switched for connected tone plug's tone.

   Connect similarly when you use other DIs.

Attention!

It is necessary to connect REC or SR tone plug.

If No plug used, DI does the clip and make distorted sound, because the output voltage of the Pickup become very large.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