PianoDisc

Mute Rail for Grand Pianos

Installation Guide

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Introduction

Adding a mute rail…..

A mute rail is a mechanical configuration of parts that will mechanically silence your piano. The hammer motion is stopped just before hitting the stings. If the mute rail is installed correctly it will not change but preserve the feel of the acoustic piano. This opens a whole new range of possibilities.

This is how it works……

By moving a small lever underneath the keyboard, a special mute rail is activated so that the hammers no longer hit the strings when the keys are depressed. Also, sensors under keys (from our MIDI controller kit which is provided as a separate option) makes the piano play digitally using sounds that are generated from a sound card. The piano can be heard in one of two ways: Through headphones for private performance or through amplified speakers. The PianoDisc mute rail is a feature that is intended for use with TFT MIDI record and the use of a sound generator module.

Intention of this manual…..

This installation manual will guide you though the process of fitting the PianoDisc mute rail on virtually any grand piano. Along with any training seminar you might attend, this guide should be an invaluable resource.

PianoDisc encourages technicians to comment on this installation manual by contacting us at the address listed on the previous page.

Technical assistance is available Monday through Friday 8 AM to 5 PM Pacific time.
Phone: 1 (800) 566-3472

Illustration List

Step 1 Gather Tools

The following is a list of tools that will needed to install a mute rail on a grand Piano.

1/4” Ratchet and socket
1/4” Hex Nut Driver
Torx Screw Driver, T-15 and T-10
Slow speed drill
3/8" (9.6mm) Drill Bit
1/4" (6.35mm) Drill Bit
1/2" (13mm) Drill Bit
Hack Saw
Fine Metal File
(2) Needle nose vise grips
Tape Measure
Cutting oil
Dummy Mute Rail (supplied by PianoDisc)
Phillips screwdriver #1 and #2 tip

Step 2 Disassemble the piano

A. Remove the fallboard and keyslip.

B. Remove the action from the piano. Be careful that your hands do not apply pressure on the end keys. This will cause hammers to break while removing the action from the cavity.

Step 3 Measure the Piano

> **Note**
>
> The piano must be measured for clearance of the mute rail prior to installation. On the following page see figure 1.

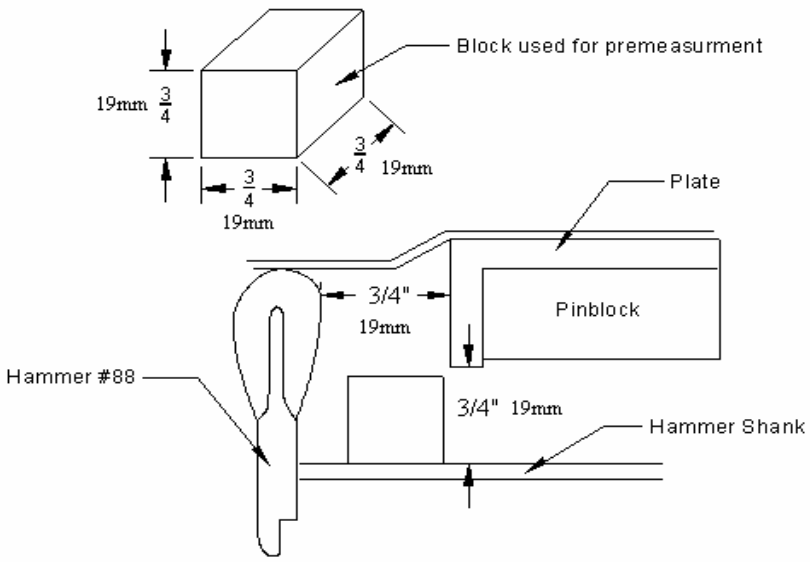


Figure 1 Measuring for clearance

Note

A measurement of under 19mm indicates some modification may be necessary on the mute rail and/or the plate for the mute mil to fit the piano. Contact PianoDisc technical support for more information.

A. Measure distance between the back of hammer #88 and the pinblock and/or plate. A measurement of 19mm ensures a good fit for the mute rail.

B. Measure between the pinblock and/or plate and hammer shank #88. A measurement of 19mm ensures a good fit for the mute rail.

Step 4 Mute rail construction

Note

At this point, it would be a good idea to familiarize yourself with the mute rail parts nomenclature. Drawings that list all the parts you will be working with can be found on the following pages.

Mute Rail Parts

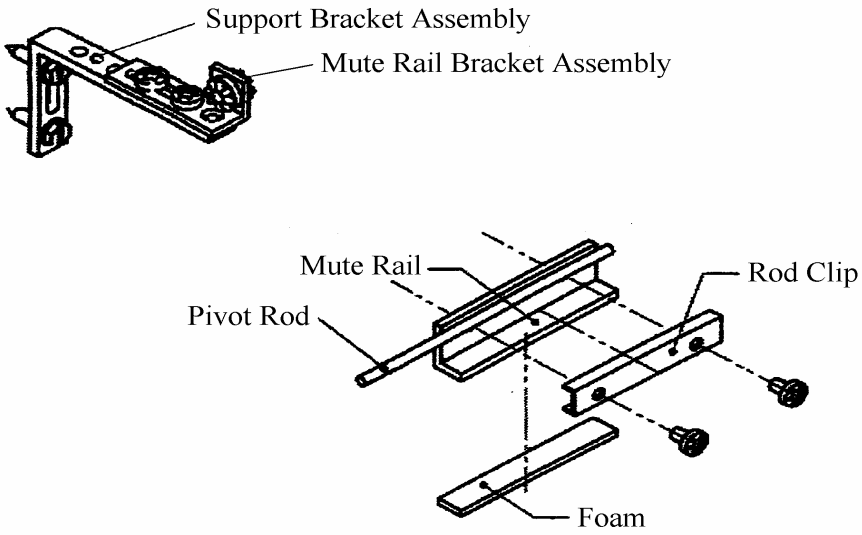


Figure 2

Cable Lever Parts

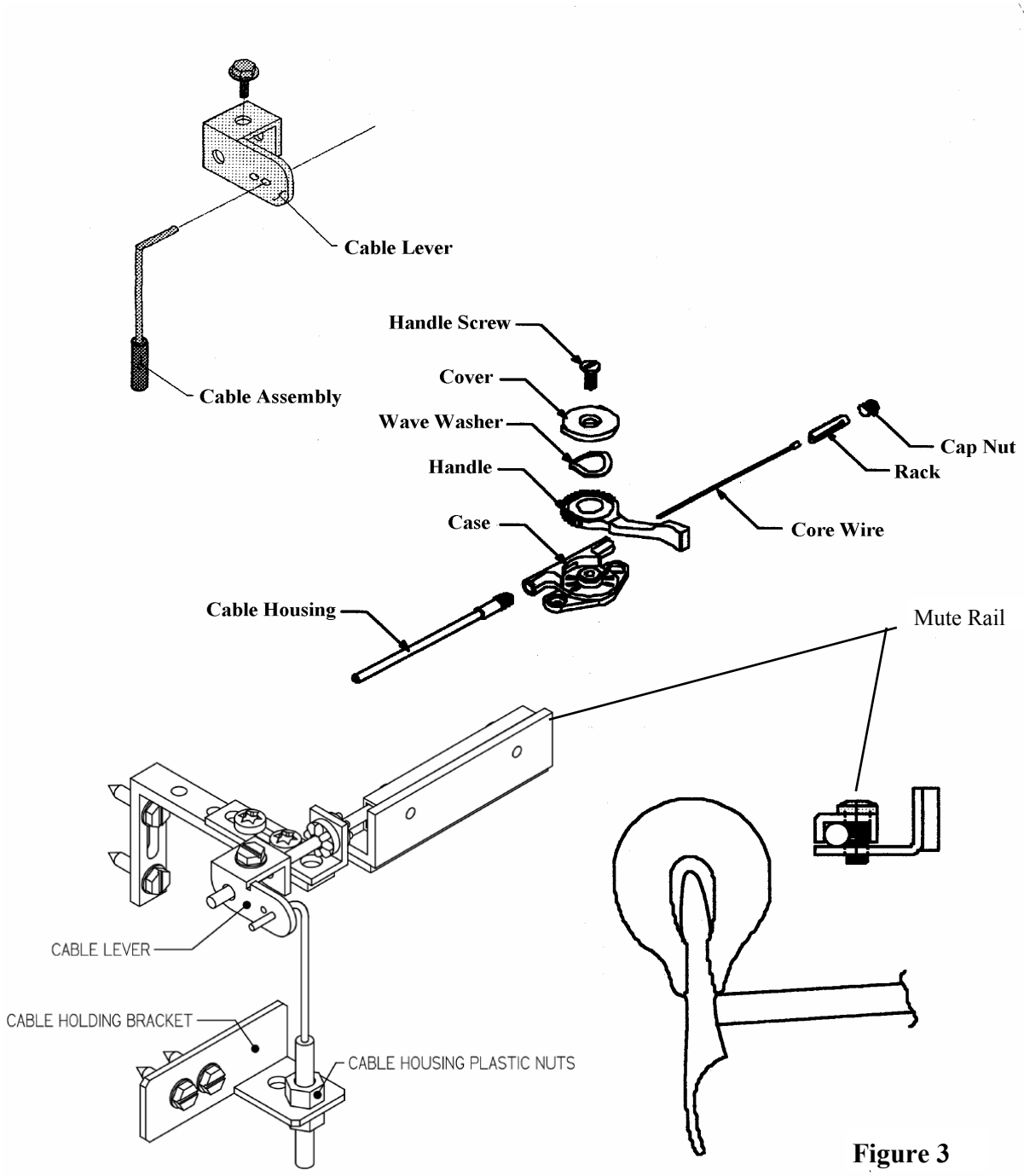


Figure 3

A. At this point the rails will be cut to their appropriate lengths that correspond to each section (bass, tenor, and treble) of the piano. This is how you measure each section: Lay the rails over the bass, tenor and treble sections. Then, mark the sections with a black marker pen. The rails should extend 1/4" (6mm) beyond the first and last hammer shank of each section. Follow the carpenters rule: " measure twice and cut once". Also note that it's always better to leave some overhang than to cut the rail too short. If it is necessary you can cut more latter. Figure 4 shows how the rails are marked.

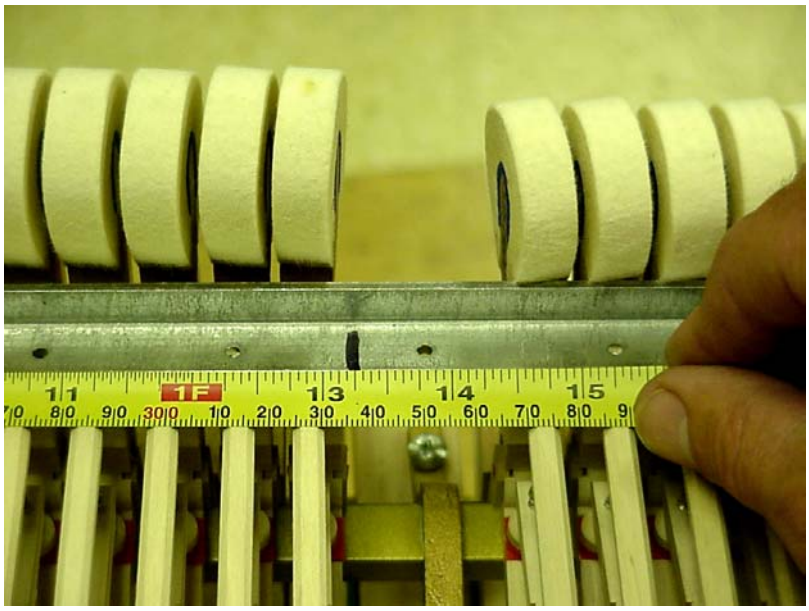


Figure 4 Marking rail

Figure 5 Rail sectional overhang

B. With a hack saw cut the rails, where indicated by the location marks of the previous step. File and/or grind off the ends to flatten, round off sharp edges, and remove burrs. Place the cut pieces over each section of the action to verify proper length.

C. Attach clips to the mute rail. But, temporarily leave them loose for later assembly of the pivot rods and mute rail sections. With the rails resting on the hammer shanks, measure the required lengths of pivot rod that will be used to connect the sections together. Cut the pivot rods to the measured lengths.

Step 5 Mute rail assembly without horn

A. Place a blue grommet in the four mute rail brackets. See the following figure 6.

Figure 6 Rail grommet insertion

> **Note**
>
> The mounting bracket at key 88 will usually use a different set of holes. This is because of the raised part of the belly rail. For proper fit some trimming of the mounting bracket may be required.

C. The mute rail must be controlled for side movement. This is accomplished by placing a press fit plastic tube on the pivot rod on both sides of the rail bracket at key 88. The two pieces of plastic collars are supplied in the kit. To press fit the plastic collar onto the pivot rod, place a hole the size of the pivot rod on your work bench. Glue a flat washer over the hole for good support. See the following figure 7.

Figure 7 Collar press hole

D. Assemble the complete mute rail using the action shanks for spacing the sections. Also mount the cable lever to the pivot rod at the bass section so it will travel from 2-5 o'clock position. See figure 9.

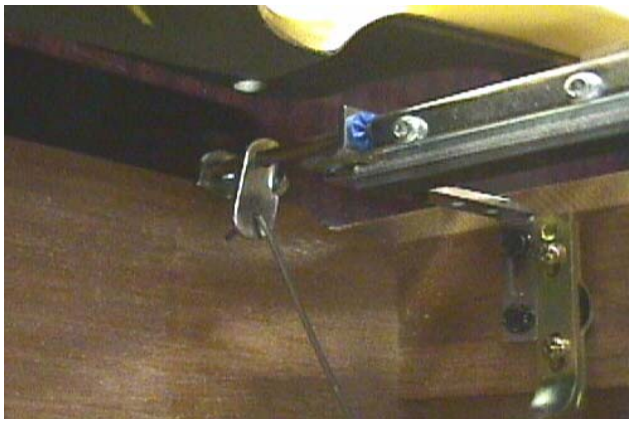


Figure 9 Cable lever mount on pivot rod

Note

There is usually a difference of distance between the hammer shank to the string from the bass to tenor section. This can present a problem with letoff. You will find that it is easier to deal with this problem after the rail is fully installed and operational.

For pianos without a horn, skip steps 6 and 7. Continue to step 8.

Step 6 Mute rail installation for pianos with horn

The horn of the piano can be described as a downward projecting part of the plate that extends to the belly rail at the cross point of the bass and tenor sections. If the piano has a horn, most likely the horn will be in the way of the mute rail. If this is the case it will be necessary to drill an access hole through the plate horn.

Note

For determining horn hole location, a dummy mute rail must be used. For dummy mute rail assembly instructions refer to appendix A.

Step 7 Determining horn location

A. Mount the dummy mute rail to the belly rail in the bass section with the pivot rod flush with the bottom of the pin block.

B. Put the action back into the piano with the end blocks in place.

C. With a thin shank straight slot screw driver, place the mute rail in the "on" position.

D. Play the first and last note in the bass section slowly to check for the clearance between hammer and mute rail. With the screw driver, slide the mute rail to acquire 1/8" (3 mm) clearance.

E. While playing the last bass note (next to the horn) with a medium blow, bend the bracket up to where you hear the hammer is hitting the string. Then bend the bracket down slightly to keep the hammer from hitting the string. The rail should be in the approximate area of letoff position. This is the ideal place to drill the hole thru the horn.

F. When marking horn, remove the rail, leaving the support bracket next to the horn in place. Stick a pencil through the grommet hole and mark the hole location.

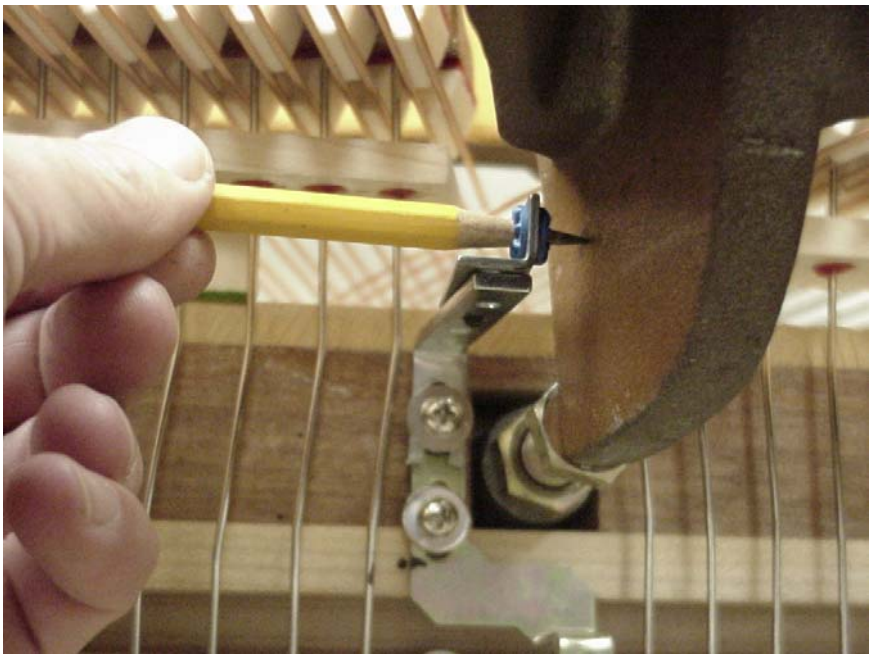


Figure 9 Marking pivot rod horn hole location

G. Mark the location with a center punch and mask off area to catch the metal shavings.

H. Start with a1/4" (6 mm) drill bit and drill a hole thru the horn using a slow speed with cutting oil. Now step up to a 3/8" (9.5 mm) drill bit and then finish with a 1/2"(13 mm) drill bit.

Step 8 Mute rail assembly with horn

> **Note**
>
> The assembly procedure is similar to those found on pianos without a horn. So, follow the assembly directions of Step 8 except for the rail bracket at the bass/ tenor break location.

A. At the bass/tenor break (horn location) the rail bracket will be mounted to the horn. See figure 10.

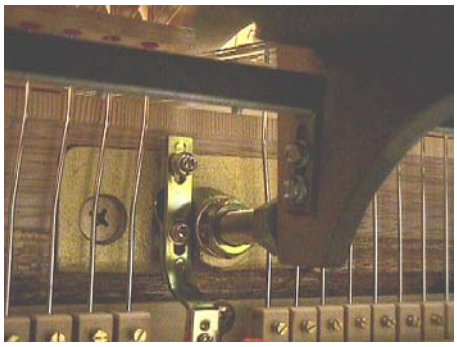


Figure 10 Bracket to horn mount

B. Cut off the "L" part of the mute rail bracket so that the bracket will mount flush to the horn. Insert a blue grommet into the bracket. See figure 12.

Figure 12 Rail bracket horn mount modification

C. Assemble the tenor/treble section using the action stack for spacing. Then mount the tenor/treble assembly in the piano. When mounting the section the pivot rod should be flush with the bottom of the pin block.

D. Now, with the rail brackets on the bass mute rail section, place the pivot rod thru the horn hole to mate up with the tenor section. Place a screw thru the mounting bracket at key #1 into the belly rail. Hold the mounting bracket at the horn where the pivot rod is flush with the pin block and mark the location to place a screw. See figure 12

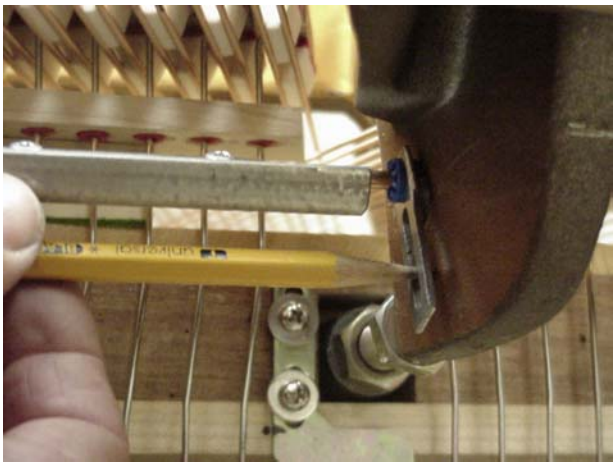


Figure 12 Bracket mount horn marking

E. Center punch the location on the horn to be drilled. Drill a 9/64" (3.5 mm) hole into the horn with cutting oil. Place the 8/32 self taping screw, with oil, into the hole. Drive the screw in by hand or with a drill at slow speed.

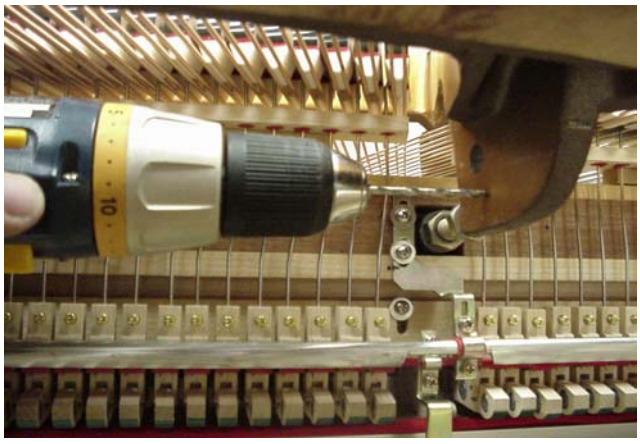


Figure 13 Drilling hole in horn for bracket mount

Step 9 Installation of cable assembly

Note

The cable lever can be mounted on either side of the piano under the keybed. Normally the left hand side is used. If the right side is used, the cable can be reversed to come out the plugged end.

A. Mount the cable lever to the bottom of the keyed about 1/4" (6 mm) in from the edge of the keybed.

B. Calculate where to drill a hole thru the belly rail at a slight downward angle directly below the cable lever. It is important to have the cable in line with the cable lever. See figure 14.

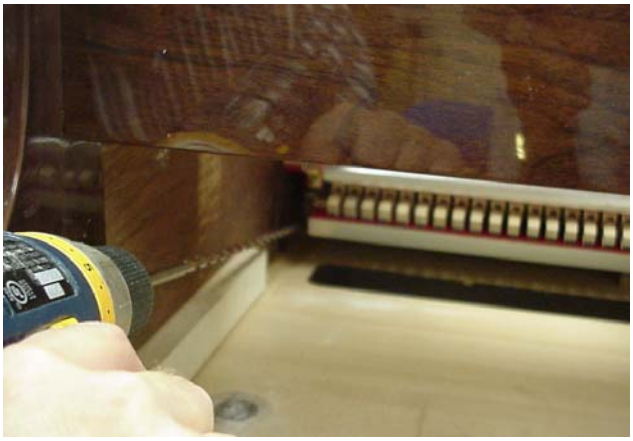


Figure 14 Belly rail cable guide hole

C. Drill a 1/4" (6 mm) hole with a 18" (457 mm) long drill bit from the inside of the piano thru the belly rail.

D. Feed the cable thru the hole into the piano. Pull the excess into the piano and mark on the cable housing where to cut. Maintain 5" (127 mm) to 6" (153 mm) of clearance from the cable lever and the cable housing bracket.

E. Remove the cable from the piano and remove the cable housing by unscrewing from the cable handle. Pull the housing off and cut the cable housing with wire cutters. Clean the end of the cable with the grinder wheel.

F. Place the cable housing back on the cable core and screw back onto the cable handle. Feed the cable back into the belly rail hole and place a plastic nut I" (25 mm) on the cable housing. Place the cable bracket on the cable housing choosing the appropriate hole for the best line up to the cable lever. Place the other plastic nut on the cable housing to secure the bracket. Be careful to not over tighten.

G. Secure the cable bracket to the rim with 3/4" (19 mm) hex head screws supplied in kit. It may be necessary to use a wood spacer to acquire a good alignment with the cable lever.

H. Place the cable handle in the off position (facing out) and the mute rail in the off position. Hold the cable core 1/2" (13 mm) past the hole on the cable lever and cut the wire with wire cutters. Using two slip joint pliers or vise grip pliers, carefully bend the cable core 90° at the cable lever hole location. Place the cable into the cable lever hole and adjust the mute rail position if necessary.

I. There are two plastic cable claps in the kit to secure the cable housing under the piano.

Step 10 Mute rail shimming and foam cushion

> **Note**
>
> The object here is to check for the problem of one section of hammers contacting the string before another section while touching the rail in the on position.

A. Place the mute rail in the on position.

B. At the bass/tenor break, reach down between the strings with a "L" shaped tool and pull up the first tenor hammer, by the shank, to meet the mute rail.

C. Now, if necessary, bend the mute rail slightly to where the hammer touches the string the same time the hammer shank touches the mute rail. Use a string hook to bend the mounting bracket up and a straight slot screwdriver to bend it down.

D. Now reach down between the strings and pull up the last bass hammer to meet the mute rail.

E. While holding the hammer to the mute rail, measure the distance from the hammer crown to the string. In most pianos the measurement is 1/16" (1.59 mm). I have a gage I check the clearance with. It is just a "L" shaped 1/16" (.0625) rod.

F. What ever the measurement is at the last bass hammer, this amount must be added to the tenor section to create the same distance from the hammer to string when the mute rail is in the on position.

Note

On most pianos this problem exist between the bass and tenor section. Generally the same size shim will extend to key 88. But, it is necessary to check between the tenor/treble break also. I have found a piano I had to place two 1/16" (1.59 mm) shims in the treble section while only one shim in the tenor.

G. Rotate the mute rail to the off position and remove the action from the piano. Locate the 1/16" (1.59 mm) shim stock in the kit and apply to the mute rail

H. Now place the foam cushion to the complete mute rail.

Step 11 Mute rail fine adjustment

A. Install the action into the piano with the end blocks in place. Place the mute rail in the on position.

B. Check to see if the mute rail is horizontal or flush with the hammer shanks.

C. Play key # I with moderate blow. If the hammer hits the string, bend the mounting bracket down slightly to achieve no contact with the string. If the hammer does not hit the string, bend the mounting bracket up slightly with a string hook to get as high as possable without making contact with the string. Because the cable bracket is located at key #1, it may be necessary to re-adjust the horizontal plane of the mute rail. This can be done by loosening the rod clip on the mute rail at the #I hammer location and adjust as necessary.

Note

The object is to get the mute rail as high as possible, without the hammer touching the string on a moderate blow.

D. Now using the same method of adjustment, adjust the three other brackets.

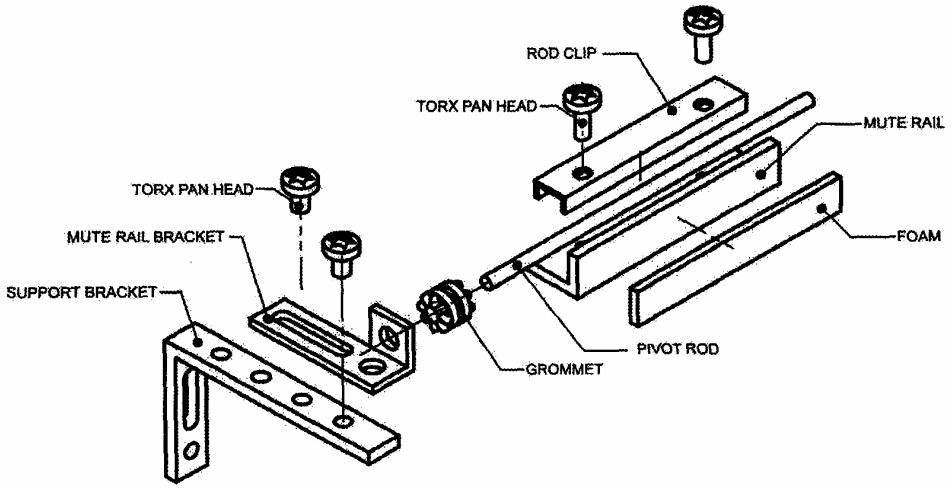
E. With the rail adjustment finished, remove the action and install the second screw on each mounting bracket. Check all other screws for tightness.

> **Note**
>
> Letoff must always be set to the mute rail in the on position.

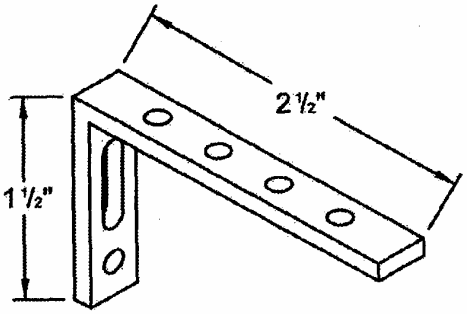
Parts List

Parts Description	Part No.	QTY
ASSEMBLY,CABLE,QUIET TIME, 4	1400-12045	1
QT COMPLETE HARDWARE BAGGRAND REV A	QTHDWRGR	1
QUIETTIMERAILMOUNT, GRAND	**QTRAILMTGRAND**	
BRACKET, QUIETTIME BRACE	1900-13019	4
RAIL BRACKET, QUIETTIME	1900-13033	4
GROMMET,E-A-R	1600-12207	4
SCREW,8-32 x 1/4 TORX PHL,T	1500-12232	8
SPACER.155 X I/2 X 1/4R NYLON	1500-12184	1
6x3/4 SLOT HEXHEAD AB, BLK-ZI	1500-12066	8
QUIETTIME RAILHARDWARE, GRAND	**QTRAILHDWRGRD**	
FOAM,52"x3/8"x .093" MUTE	1600-12220	1
SHIM, 36"x 3/8", MUTERAIL	1600-12221	1
SHIM SHEET, MUTE RAIL, QUIET	1600-12000	1
SCREW, 6-32 x 3/8 TORX, Pan,Tap	1500-12219	12
CLIP, PIVOT ROD, QUIET TIME	1900-10004	6
QUIETTIME LINKAGE HARDWARE REV A	**QTLINKHARDWARE**	
SCREW, 8-32 I/4"THREAD FORMIN	1500-12234	1
CABLE LEVER QUIETTIME	1900-13044	1
QUIETTIME CABLE ASSY HARDWARE	**QTCABLEHDWR**	
CLAMP, CABLE, 22HDCC1720	1400-12044	2
SCREW, 6 x I BUGLE DRYWALL	1500-12223	2
HOLDER, CABLEASSEMBLY	1900-11050	1
NUT, CABLEHOUSING-PLASTIC	1500-12000	2
SCREW, 6 x I/2 UNSL HEX SELFDRLL	1500-12226	4
QT MISCELLANEOUS HARDWARE BAG	**QTMISCHDWR**	
CLAMP, CABLE,FLATRIBBON,FCC	1400-12047	10
CLAMP, CABLE, ROUND,CCS25-S8	1400-12046	6
SCREW, 6 x 3/8 SLOT HEXHEAD SHEET	1500-12225	6
TEMPLATE, QUIETTIME ROD LOC	1200-12207	1
MUTERAIL GRAND, 22"	**MUTERAILGRD22**	
MUTERAIL, GRAND, 52"	1950-12133	1
MUTERAIL GRAND, 30"	**MUTERAILGRD30**	
MUTERAIL, GRAND, 52"	1950-12133	1
INSTALL GUIDE QT - GRANDPIANO	**QTINSTGUIDEGRD**	1

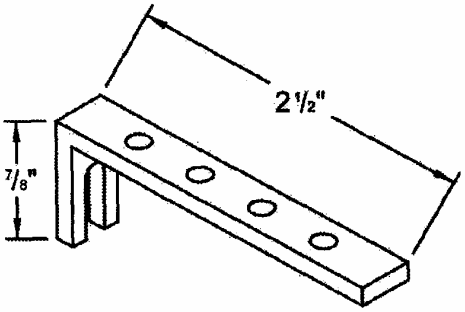
Dummy Mute Rail Parts

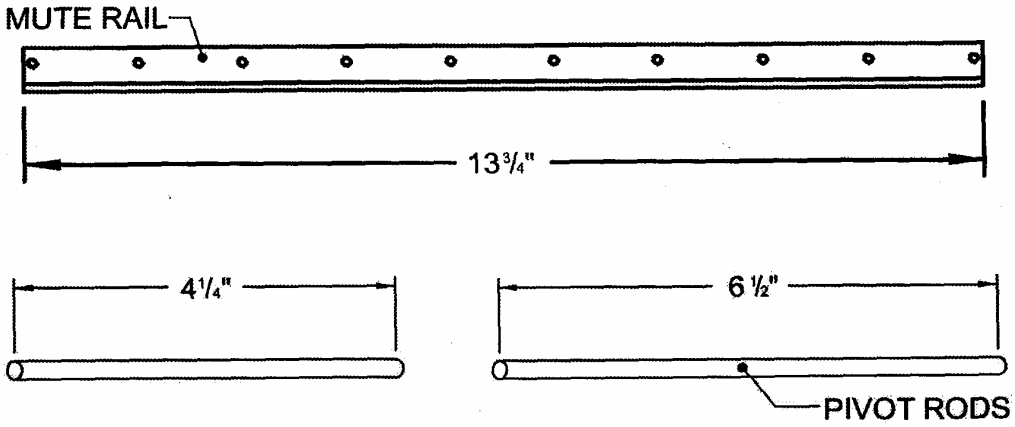


SUPPORT BRACKET (1)



SUPPORT BRACKET (2)





Dummy mute rail assembly

Note

The dummy mute rail is used to establish the exact location of where you are going to drill the hole on the horn. The previous page shows a diagram of the dummy mute rail parts nomenclature and measurements. The dummy mute rail consists of only one section of rail (the bass section).

Assembly instructions…

A. Cut a section of low profile rail measuring 13 3/4” long.

B. Cut (2) pivot rods. One to the length measurement of 6 1/2” and the other to 4 1/2” long. The longer pivot rod is cut for use on the side that will be mounted toward the horn of the plate.

C. Modify support bracket number 2 to the measurements shown on the diagram of the previous page. Notice that the bracket vertical measurement is 7/8” long.

D. A total of (2) support brackets are used on the dummy mute rail. Support bracket number 1 is located and mounted directly onto the belly rail in the lower bass section. The other bracket is mounted next to the last damper in the bass section. Sometimes it is necessary to piggyback the mute rail support bracket to the sostinuto bracket due to lack of space clearance. If this is the case then longer screws may be necessary for the piggyback mount of the two brackets.