

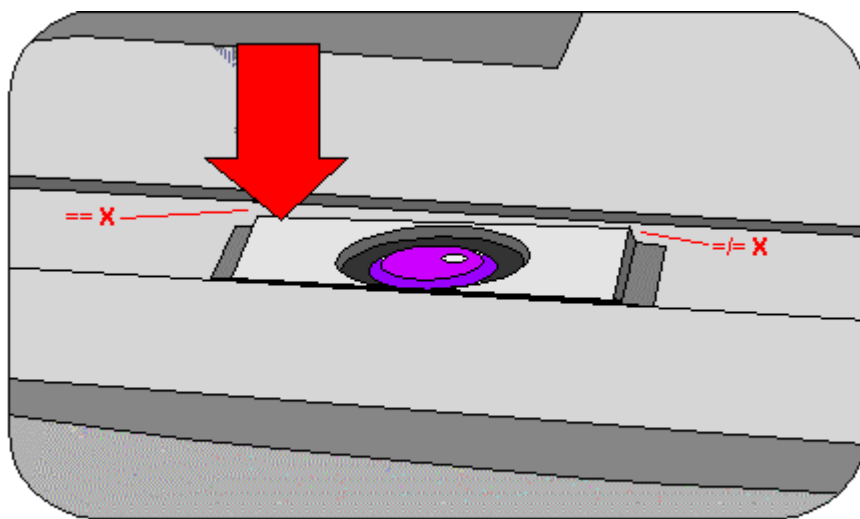
PLAYSTATION CD LASER REPAIR:

For information on adjusting a PS2 laser '[Click here!](#)'

The most common fault with the machine is skipping or not reading disks, this problem gets worse as the machine gets warm. This occurs when the laser optics can't track or read the data on the disk. The problem is more apparent with gold (copied) disks. The SCPH 1000, 1001, 1002 models are the worst for this problem. They used plastic parts in the laser (described later) which become worn after which the machine would struggle reading disks. The later versions of these machines (SCPH 1000, 1001, 1002) came with a laser unit that used die cast alloy parts which were much better wearing. However, the 'skipping' problem potentially can occur in ALL models due to normal wear and tear.

In models 550x and later, try adjusting the 'ribbon cable pot' first, BEFORE adjusting the other 'pots'. The ribbon cable pot can be found on the orange ribbon cable on the side of the laser unit. Only a partial clockwise turn is required. Usually, 'pot' adjustment **IS NOT NECESSARY** after doing the '[Sled](#)' repair.

If you have an early machine you can see on the following zoomed picture a laser that has a worn sled unit that needs repair, as you can see one side of the laser is sitting lower than the other, this causes focusing problems which cause the skipping. Usually this difference is far to small to see with the naked eye, but is still enough to cause problems.



The 'lense cover' is NOT parallel with the 'drive cover', re; red arrow.
This causes 'FMV' and / or 'loading' problems.

Lens Servo Adjustment....

If your machine tends to play better when you turn it upside down or on it's side then it is a sure candidate for laser wear and adjustment. **If it does not work anymore even when turned upside**

down then no amount of adjustment to the pots will help. You will need to repair the laser unit see "[Modifying the laser](#)"

The first thing you try is to adjust the bias and gain controls, on earlier machines this will only provide a temporary cure as the plastic sled may be in need of repair. Adjustment usually provides good results on the later machines that have the alloy sled.

These controls have the following effect....

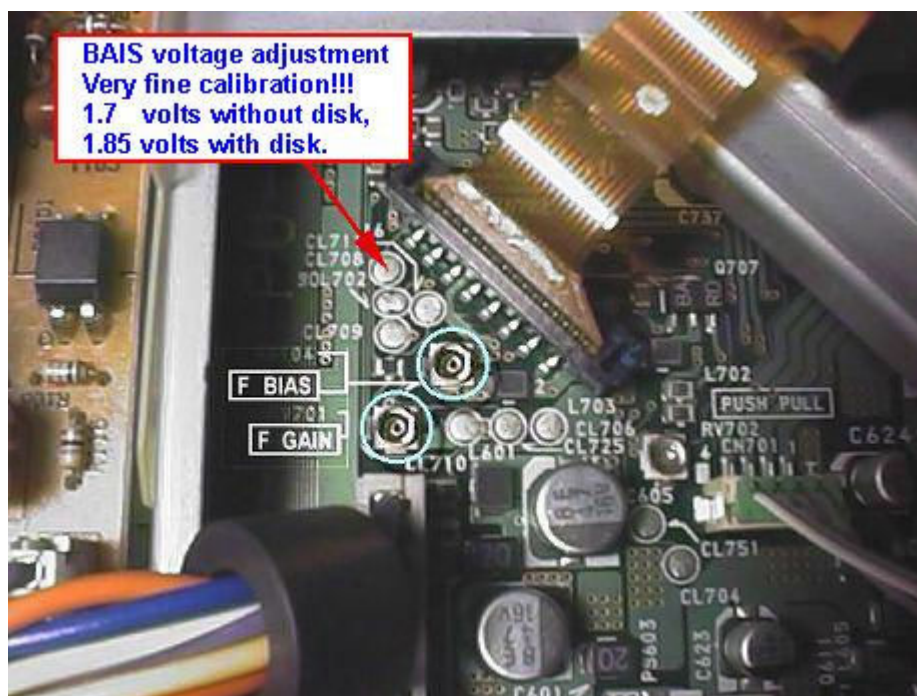
BIAS : This control sets the default DC voltage flowing through the servo coils in the laser that move the laser lens up and down, basically it sets the default distance between the surface of the disk and the lens. This adjustment is the one that has most effect when adjusting to cure problems.

GAIN : This control sets the voltage that is added or subtracted from the bias voltage by the servo circuits for a given fluctuation. So when you have a slightly warped disk the lens can bob up and down and follow the surface accurately, if this setting is not correct the laser will not accurately track warped disks.

Adjusting the bias control slightly clockwise will increase the bias voltage and therefore move the laser slightly closer to the disk, this is usually sufficient to cure the problem for most machines. With an earlier machine that has a worn laser this may not cure the problem, the laser will either have to be replaced or repaired/modified.

Setting the laser servo to its correct position.

If you have messed around and twiddled the bias and gain pots and your machine no longer operates correctly you can try to set the controls up to there normal position by using a digital multimeter. Connect the ground on your meter to the metal shielding and the positive probe to the following test point near the laser connector (100x models only).

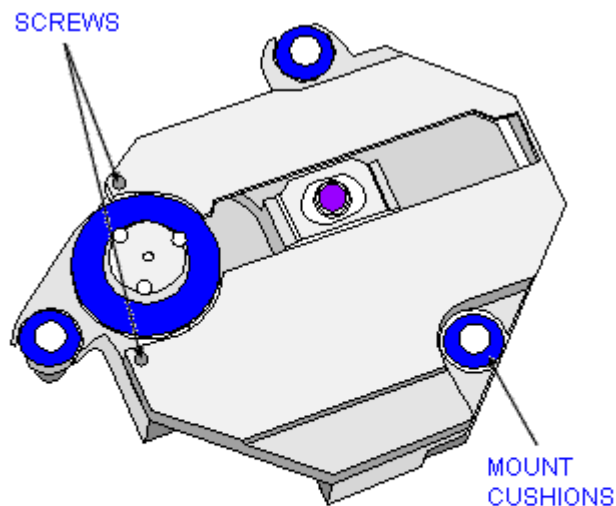


With the machine switched on (beware of live parts in the power supply) and no disk I.E. door switch up, set the voltage at this point to 1.70 volts, on a good laser this should be the correct voltage however if your laser is worn you might need to increase this slightly say 1.73 volts. Once you have set the bias put a disk onto the spindle press the door switch (you may need an assistant to do this) the voltage should rise to something like 0.15 volts higher than with no disk (E.G. 1.85) if its too high or too low adjust the gain control till it is somewhere between those values. Your machine should now behave itself again.

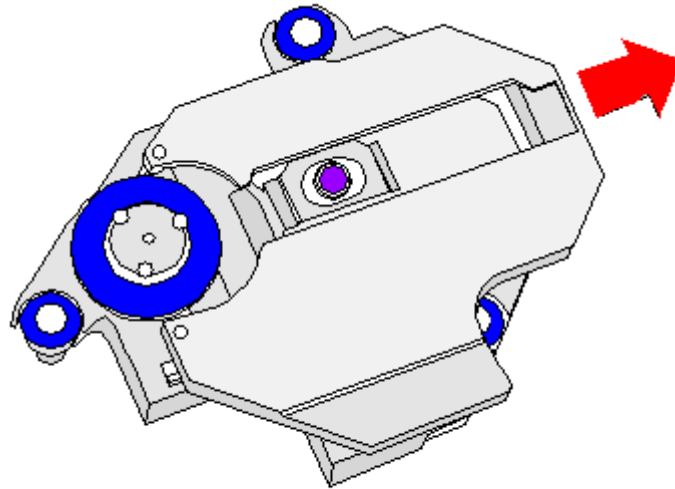
Modifying the laser.

Modifying the laser is quite tricky so I suggest only real electronics engineers attempt this. Basically the modification has to lift the side of the laser that has dropped because of sled wear. The best way to achieve this is to disassemble the laser and add a small piece of thin sheet metal between the sled parts... see the diagrams later. Only one thing is crucial to make your CD-ROM Drive work again, the sled that carries the optics (lens) must be level or parallel with the CD. All you need to do is devise something to make it level again.

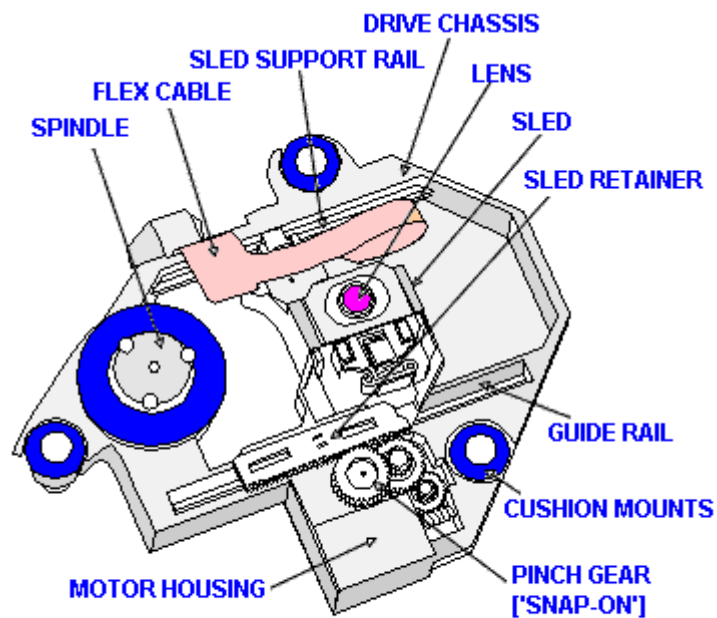
Firstly disassemble your machine and remove the laser as per the instructions for installing the chip. Once you have removed the laser turn the worm gear on the underside to move the lens into the mid position, otherwise the lens will get in the way of the cover if it is left in its rest position when disassembling the laser.



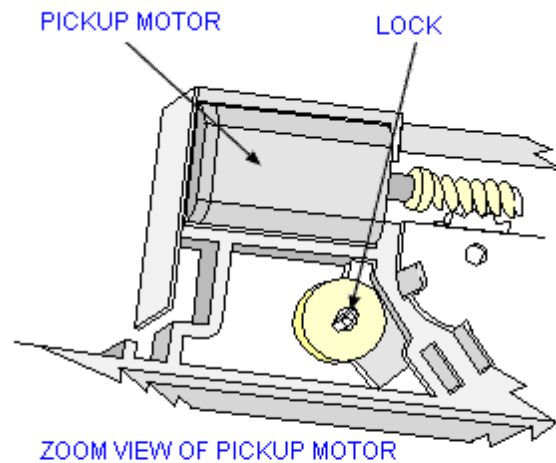
With the lens "mid-distance" from the spindle, remove the two cover screws. Remove the '4-wire' connector from the mainboard. If needed, the rubber mounts can be removed. Now carefully remove the cover.



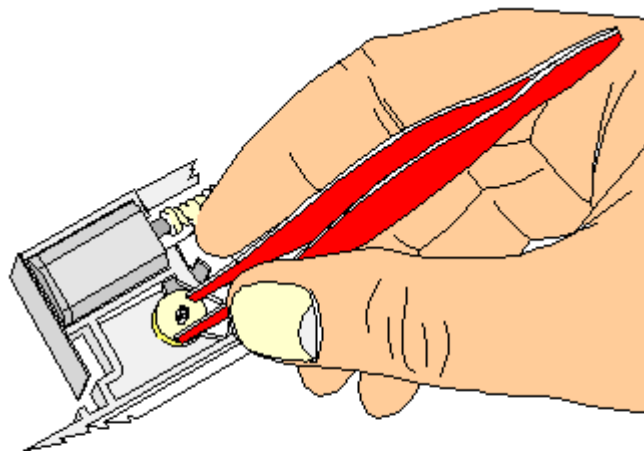
Slide the lens cover in the direction indicated.
Starting from the back; remove the cover carefully.



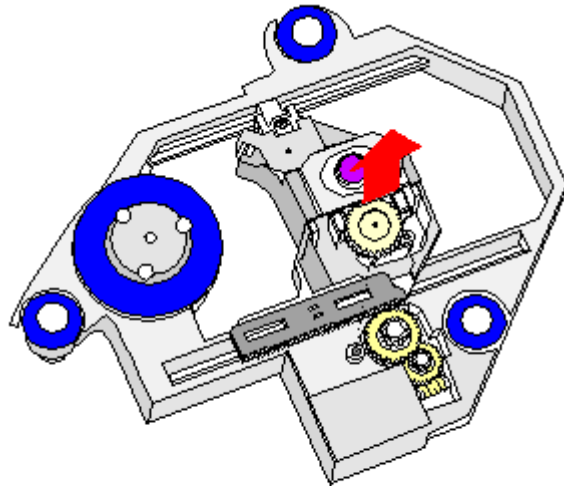
**PSX CDROM DRIVE HOUSING
[WITH COVER REMOVED]**



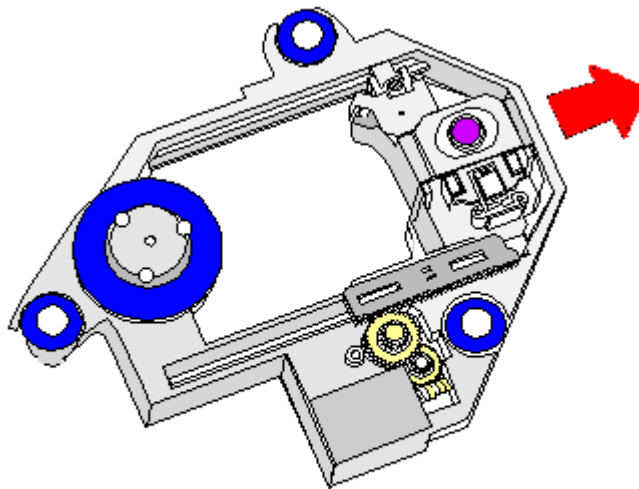
Turn the Drive Unit over to locate the 'PickUp' motor. Next to the motor, is the 'snap-on' Pinion Gear, and the 'axle lock'.



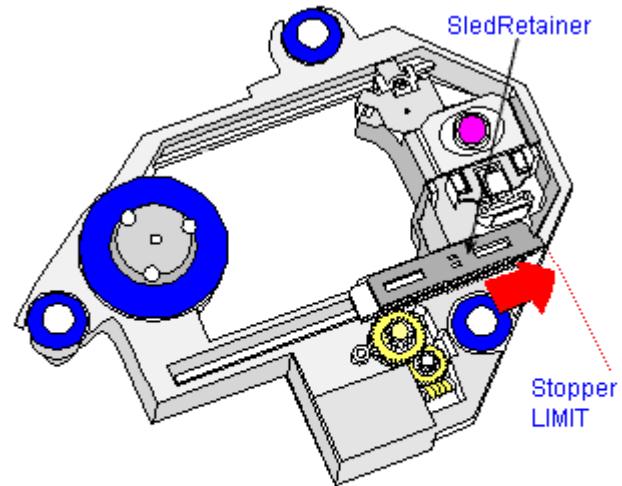
4. Remove the snap-on pinion using a pair of tweezers by unlocking the axle lock from the drive frame. Push while doing this to make sure it can be removed from the other side. Sometimes the pinion just "pops off" - so watch out, in case it ends up getting lost.



AFTER unlocking the shaft of the Pinion Gear -
remove the Pinion Gear from the Drive Frame.



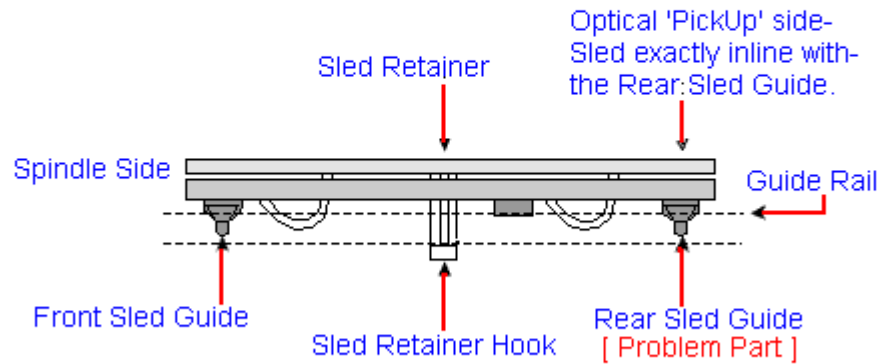
6. With the pinion gear removed - you can freely slide
the sled along its rails. Now you can carefully slide it
to the position indicated above.



Slide the 'Sled Retainer' [you may have to use -
-slight force] in the direction indicated, upto the
safety 'stopper'.

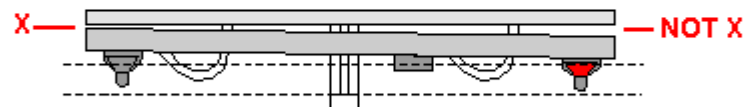
SLED side view, assembled onto the Drive.

SLED of a good & working CDROM Drive.

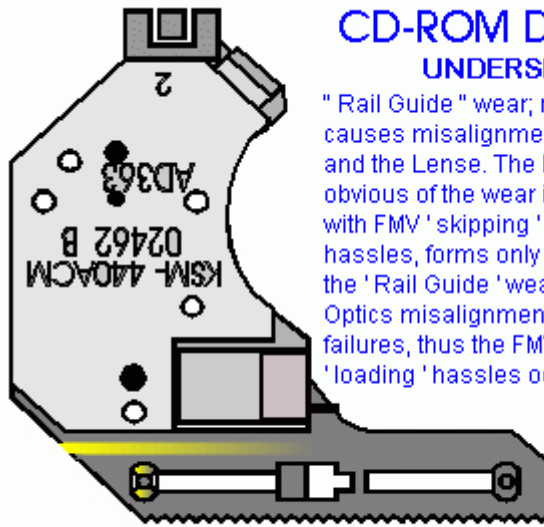


The Front / Rear weight distribution ratio is about 20 / 80.
The load is greater on the Rear Guide, and therefore causes wear faster than at the Front Guide.

Sled of a Full Motion Video "skipping" and "Boot hesitant"
[malfunctioning] CDROM Drive.



When the Rear Sled Guide wears down, the Rear sits -
lower on the Rails than at the Front. This "UnLevelness" -
causes 'Data Read' failures.

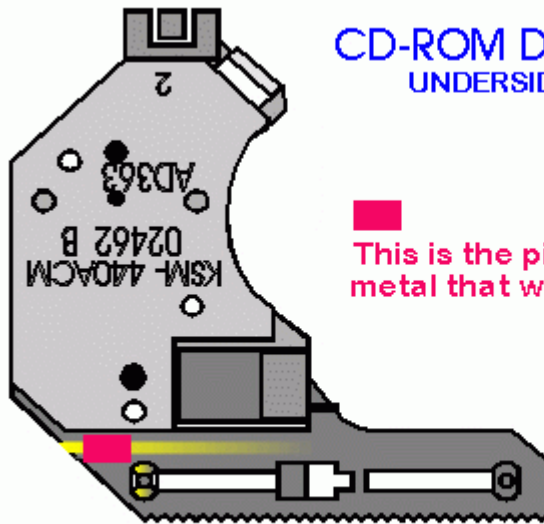


CD-ROM DRIVE SLED UNDERSIDE VIEW

"Rail Guide" wear; near the Optics Unit causes misalignment between the CD and the Lens. The long one; the most obvious of the wear in PlayStations, with FMV 'skipping' and / or 'loading' hassles, forms only as a "by-wear" of the 'Rail Guide' wear. Optics misalignment causes data read failures, thus the FMV 'skipping' and 'loading' hassles occur.

 = Indicate Wear Points

To fix the problem we need to make the above sled perfectly horizontal again, the simplest way to do this is to add a **small** piece (approx. **3mm by 5mm**) of sheet metal around **0.3mm** thick to the sled unit at the position shown in the diagram below. You can use the metal cover from an old floppy disk and then cut it with a sharp pair of scissors. The piece can be glued in place with a tiny amount of super glue.

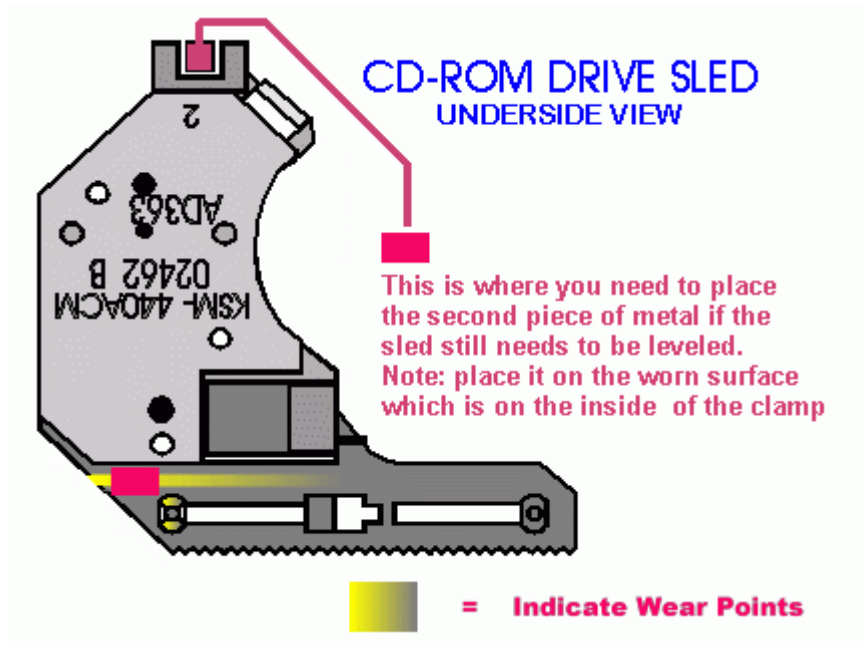


CD-ROM DRIVE SLED UNDERSIDE VIEW

 This is the piece of sheet metal that we need to add.

 = Indicate Wear Points

Sometimes, it is necessary to place a second piece of metal, on the other side of the sled, in order to make the sled "level". If this is done, then you may also need to use the edge of a razor blade to shave off a small amount of the "Sled support rail" to enable the sled to continue to slide freely and not get jammed as it moves to read the audio tracks on the outside of a CD.



While the glue sets re-lubricate the sled rails with some decent quality grease, white lithium if possible silicon grease is also good. You can then reassemble your laser assembly and set up the BIAS control again. Your machine should now work fine.