

Chapter 5. Troubleshooting

The most valuable assistance you will ever get is from an experienced technician who has been working on projectors for many years. But these individuals are rare and becoming rarer, so you may have to fall back on your own projector's handbook or technical manual, which appear in *Part 4* and *Part 5*. If all else fails, the following general principles apply. Good luck.

Additional contributions to this chapter are very welcome.

Getting started

1. Moving parts don't move freely

Machines that have been lying idle for a while tend to gum up, that is, the lubricants in their gears and bearings lose viscosity, become sticky and act like glue in the works.

Check all moving parts, shafts, rollers and bearings for freedom of movement. If necessary, remove the parts, clean and re-lubricate them. Test them before moving on to the next job.

2. Which arm does what?

On a strange projector and working without a manual it might be difficult sorting out which arm does what. Use the following procedure to solve the mystery.

Make sure the projector is not set in reverse or rewind. Check all knobs, levers and switches for labels that might help. Put an empty reel on each arm. Open the gate. Rotate the inching wheel. Note if the claw moves forwards ie out then downwards. If it doesn't, rotate the inching wheel in the opposite direction. Note this as 'forwards' for the future. Continue to rotate the inching wheel forwards and note which reel turns. This is the take up reel. At the same time, note which way it rotates. This is the direction film will load during a screening.

Getting the film ready

1. Inside out film

Film that is wound inside out, ie with the perforations on the wrong (far) edge of the film when you load the reel on to projector's feed spindle, should be rewound on the rewind bench.

Put the loaded reel on the feed (left) spindle so that it comes off the top to the right (clockwise). Now load the take up reel anticlockwise (instead of clockwise, which is what you would normally do) and wind in an anticlockwise direction. The perforations will stay on the far edge of the film and when you finish the film will be the right way around. Check to see if the head of the film is out. If not, rewind as normal, and it will be ready to thread.

Threading

Take-up reel not rotating on test

Possible causes: (a) take-up mechanism might just be 'lazy' for a few revolutions or (b) take-up arm mechanism is faulty.

Remedies:

(a) If time is short, fervently hope the take-up is just being lazy. Start the projector motor, without switching on lamp or sound. Keep a hand on the take up reel and assist it manually. It may take off by itself after a few seconds, in which case stop, unthread, roll back the film by hand and rethread. After the screening, dismantle the take-up arm and fix the problem.

If this doesn't work, switch to the backup projector and defer further work until you have time to do it properly.

(b) Check take-up arm components: belt (stretched, faulty, cracked or broken) may need replacing; oil could be causing belt and/or pulleys to slip: clean all components thoroughly; clutch may be slipping: inspect, clean and replace parts as necessary; drive pulley may be slipping: check the pulley on the drive shaft is not slipping.

During the screening

1. Loss of loops

Possible causes: (a) a badly made splice or an old splice may have created irregular spaces between perforations, causing the claw to disengage from perforations, (b) torn or damaged perforations.

Remedies:

(a) Replace splice

(b) Repair with full width tape or perforation repair tape. If damage cannot be repaired and it is very short, say only a few frames, remove it and splice, or if it occurs at the beginning of a reel, start screening after the damaged section. If the damage occurs well into a reel and is too long to cut, leave it as it is, stop screening before the damaged section, move on to a clean section of film and rethread. Report all damage and repairs when you return the film.

Chatter (or clatter) is an indication that the claw is having trouble engaging the perforations. Be ready to shut down and reset the loops.

Resetting the bottom loop can sometimes be done without shutting down, provided there is enough slack in the top loop. Below the gate, flick the film down with a pencil (not a finger!) and the loop may hold. This is worth trying several times before having to shut down.

If you have to shut down, you don't need to rethread or even open the gate to reset the loops. Just open the shoe on the feed sprocket and feed some film through, creating enough slack for the loops. If the film doesn't slide freely through the gate, disengage the claw by rotating the inching wheel forward until it disengages then try again. Reset the loops, test by rotating the inching wheel, and resume screening.

If the problem recurs, you may have to unthread and inspect the film for damage eg perforation tears or repairs that continue into the feed reel and are likely to cause more trouble. Perforation damage is repaired with special white tape that is obvious when you first inspect the film. During your preliminary inspection, if you see a lot of white tape along the edge, you know you could be in for a bad session. Before you rethread you will have to decide whether to skip some footage or risk further interruptions to the screening.

2. The film runs through the projector satisfactorily, but the screen image judders at regular intervals.

Possible cause: (a) The film is old and warped, and the perforations may be slightly enlarged. (b) The projector transport mechanism may need adjusting.

Remedy:

(a) Some projectors are better than others at running damaged film. Find a projector that keeps the film under tight control during its journey along the film path.

Tip: Place a fingertip under the bottom loop and gently press upwards. This procedure can stabilize the image and reduce the alarming level of noise. But if it goes on for any length of time it can be extremely tedious.

(b) Refer your projector to a technician. If no technician is available, refer to your technical manual, which hopefully is in *Part 5*. Good luck.

3. Dull picture

Possible causes: (a) Poor quality screen; (b) Lamp is on the way out; (c) Damaged reflector; (d) Badly adjusted lamp; (e) Peripheral light affecting screen; (e) Throw is too long; (f) Wrong lamp; (g) dirty lens.

Remedies:

(a) Replace the screen with a better quality product.

(b) Replace the lamp.

(c) If the lamp and reflector are incorporated in one unit, replace the unit. If the reflector is separate, try cleaning and polishing it, using isopropyl alcohol, but don't rub too hard.

(d) In or close to the lamphouse you should find a knob that adjusts the lamp's alignment. Try moving the lamp in very small increments until it is right.

(e) Unnecessary light, and daylight seeping through curtains and blinds can play havoc with the quality of the screen image. You may not be able to do much about daylight creeping in, but you can make sure all unnecessary lights are turned off. Try switching the lamp to its high power position.

(f) If the throw is too long, you may be able to improve the screen image by switching the lamp to its high power position.

(f) Replace the lamp.

(g) Clean lens with a lens tissue or lens cloth. Do not use a dry cloth or ordinary household tissue.

4. Glare on screen

Cause: The screen is reflecting too much light. This is not a problem with commercial screens, but it can happen if the wrong paint is chosen for a wall used as a screen. Good quality non-reflective white ceiling paint gives satisfactory results.

Remedy: Get some good quality non-reflective flat white paint and give the screen area at least two coats.

5. Screen image has fuzzy edges

Possible causes: (a) Lamp aperture edges are not sharp; (b) Screen image is slightly too small; (c) Poorly masked screen area.

Remedies:

(a) Clean all gate aperture edges and pressure plate aperture edges (eight edges in all) with cotton buds dipped in isopropyl alcohol. If this doesn't work, inspect the aperture with a loupe or large magnifying glass. Remove hard deposits with a plastic or wooden scraper. Never use metal to clean anything on the film path.

(b) Increase the distance between projector and screen and reframe as necessary until the edges of the image are sharp.

(c) Make the mask the exact size needed. Note: Old prints sometimes have edges that move all over the place and are impossible to get right. If you can't live with this, the only solution is to bring your masking in so that the image edges are consistently stable.

6. Focus not sharp or difficult to adjust

Possible causes: (a) Screen too far off square to the lens; (b) Focus mechanism needs attention; (c) Pressure plate too loose in gate; (d) Dirty lens; (e) Badly warped or curled film.

Remedies:

(a) Re-align the screen or the projector, or both.

(b) Repair the mechanism.

(c) Adjust the pressure plate springs in very small increments until you are satisfied.

(d) Clean the lens with a lens tissue or lens cloth.

(e) Adjust the pressure plate as in (c) above; a different projector may produce a better result.

7. Broken drive belt

When a drive belt breaks on a belt driven projector, the film will stop moving but the lamp will keep burning. If the film is not shielded from the heat of the lamp, some loss of film is inevitable, but you can limit the damage to a single frame if you are alert and shut down quickly. Replace the belt.

8. Film is very loose on take-up reel

Possible causes: (a) Badly buckled or warped film (b) The take-up sprocket is loose and feeding film irregularly to the take-up reel (c) the take-up clutch is slipping.

Remedies:

(a) If the take-up starts to get uneven or sloppy, you can help it along with a finger on the reel. If the wind becomes really floppy you will have to shut down, take the film to the rewind bench, mark the place on either or both reels and rewind the floppy film back on to the feed reel. Rewind again on to the take-up reel until you get to the place you marked.

(b) Before you rethread, check the take-up sprocket for looseness and tighten if necessary.

Note: If the film is buckled you may need to keep helping the take-up reel after restarting.

(c) Use the same procedure as for (a) above. Repairing the clutch may take some time, so it might be better to switch to another projector for the remainder of the film.

9. Blown lamp or exciter lamp

Blowing a lamp is an occupational hazard. It can happen at any time and there's not much you can do to prevent it happening, apart from keeping a log and changing a lamp before its estimated lifetime runs out. But this is likely to be wasteful, as exciter lamps seem to keep going for ever, and it's quite a shock when one decides to quit.

Fortunately lamps don't blow very often, and when they do it is mostly at startup. In either event, shut down and replace the lamp. This won't delay proceedings for more than a minute or so, especially if you are at the start of the film and the lamp is only warm. Removing hot lamps can be a bit trickier. Never touch any part of a replacement lamp with your fingers. Always use a cotton glove or a soft cloth.

Sound

1. No sound

Possible causes: (a) Amplifier not turned on (b) Amplifier not working or faulty amplifier switch, (c) blown exciter lamp, (d) blown fuse.

Remedies:

(a) Switch amplifier on.

(b) If amplifier is switched on and there is still no sound, the problem could require expert attention. After eliminating other possibilities, switch to another projector and refer the problem to a qualified technician.

(c) Check exciter lamp and replace if necessary.

(d) Check fuse and replace if necessary.

2. Low sound level

Cause: Dirty exciter lamp, lens or solar cell.

Remedy: Clean the exciter lamp, lens and solar cell with a puffer and small lens brush. These parts pick up dust and other particles from the film and should be puffed and brushed regularly. Do not, under any circumstances, dismantle the exciter lamp lens and solar cell assembly, unless you are an expert.

3. 'Motorboating'

Sometimes called 'machine gunning', a continuous popping noise. This indicates the exciter lamp is focused on perforations. The film has two sets of perforations, one along each edge. It is silent. Turn volume down.

4. Sound wavers or is muffled

Possible causes: (a) Exciter lamp has passed its use by date. (b) Incorrect exciter lamp.

Remedies:

(a) Replace exciter lamp.

(b) Check you are using the lamp specified for your projector. If not, replace it with the right one.

5. 'Wow'

Wow is caused by variations in the speed of the film as it passes over the sound drum. Check the pinch roller which keeps the film pressed against the sound drum. It may not be turning freely. Remove the roller, and clean and lubricate it and the shaft. While you are there, ensure the flywheel spins freely and continues to rotate without stopping suddenly.

6. Sound, especially dialogue, is out of sync with screen image

The bottom loop is too large. The exciter lamp should strike the soundtrack 26 frames ahead of the lamp aperture. If the bottom loop is too large, the sound will be late arriving at the exciter lamp. Shut down and reduce the size of the bottom loop. This can be up to 3 frames either side of the optimum 26 without noticeably affecting sound/image synchronization.