

# LEE MOULD PROBLEM?.... A SUREFIRE FIX!

By "MTWeatherman"



## INTRODUCTION

I like Lee moulds for their price, light weight, and general bullet designs (most are copies of well-tested designs from over the years). I have disliked them because they have rarely dropped bullets to my satisfaction and frequently suffered from poor bullet fill-out. Perhaps I'm unlucky or simply too picky but of the more than a dozen Lees I now own (8mm, 9mm, .357, .40 S&W, and .44) only two worked to my satisfaction out of the box. (We're talking single and two cavity moulds here. It should be noted that far fewer problems are reported with the Lee six cavity moulds). Generally, if I wanted good bullet fill-out, I needed a high casting temperature and bullets would stick. If I wanted a good release, a lower temperature was required and fill-out became a problem...most noticeable as rounded edges on the driving bands or a poorly filled-out base. Two moulds wouldn't yield a good bullet at all no matter the temperature and one wouldn't release a bullet no matter how the handle bolt was whacked...the bullet had to be pried out with an awl applied to the base.

You say, "With all those problems why do you keep buying Lees?" Well, it's simple. I also own Lyman, RCBS, and Saeco moulds and all have worked well out of the box...I like them. However, check the first sentence of this article. Now disregard the second sentence, for, with about an hours work, I've found a way to improve the casting quality of the Lee to the level of the other commercial manufactures. Compare the price of the Lee to any of the others (don't forget the handle purchase) and you'll discover it's pretty good pay for your time. I developed this method after experience with my third Lee mould

(the one requiring an awl for bullet release). I was ready to throw it away and swear off Lees, when I hit upon the following technique. I used it to greatly improve my first two Lees and on those I have purchased since. It works!

## TAKE YOUR MOULD FOR A TEST DRIVE...YOU MAY BE LUCKY

Follow Lee's instructions carefully. Look for any obvious burrs in the cavity and remove them by scraping with a sharp knife. Clean and lube the mould per instructions (this is important or you'll have problems). Smoke the mould if you wish and begin casting. Did the bullets fill out completely with sharp edges on the driving bands and a well formed base? Did you have to whack the handle nut more than once to get bullet release? If your first answer is yes and the second no, consider yourself lucky. You need read no further although I'll wager the technique will still yield a noticeable improvement for you.

## THINGS YOU'LL NEED

For a complete overhaul you'll need a large Phillips screwdriver, a variable speed drill with a 3/32 and screwdriver bit, Comet cleanser, graphite mould release or a dry graphite spray, a cloth, and an old toothbrush. Assuming you have the drill, your biggest investment will be the graphite mould release, but it will be a one time purchase as you will have enough to do hundreds of moulds. Reloading supply companies carry the graphite mould release while a dry graphite spray is available at many auto parts stores.

## TECHNIQUE OVERVIEW

In my opinion, Lee moulds have three main flaws. All suffer from poor venting and bad handle-to-block fit. It's inherent in the design. A good number have poorly finished cavities which are rough and some may have machining marks.

With any mould, an off-center cavity is always possible, but it's rare. I've never had one personally and personally know no one who has. I've heard second hand of someone who had one...and it wasn't a Lee. You'll know you have one when you can't get a bullet out of one side of the mould without just about carving it out. There's no fix for this. You need to contact the manufacturer and get a new mould.

Poor venting can be cause of the poor bullet fill-out...and Lees are prone to this. However, first make sure the cavity is well degreased, that your alloy is not an issue...i.e. its not contaminated and is hot enough.

Bad handle-to-block fit can adversely affect the mould opening and closure. Blocks that don't meet squarely can result in an out-of-round bullet and finning where the blocks meet. A mould that doesn't open squarely can cause poor bullet release. In most cases excessive wear of the mould faces will result due to the aluminum faces rubbing against each other as the mould opens and closes.

A badly finished cavity with burrs, rough spots, and machining marks is the usual cause of the bullets sticking in the cavity (although too high a temperature of the mould or alloy can cause this also).

The poor venting and cavity finishing can be fixed. You can compensate for bad handle-to-block fit.

I perform the entire technique on each mould as I prefer to do the “fix” once and once only as nothing is lost except for a bit extra time. However, based on your problem, you can do each fix separately. For that reason, the problems and fixes are separated out. However, I would recommend that the “fix” for venting and handle alignment problems be used for each mould. The cavity finishing “fix” is desirable since it can only improve bullet release, however, may not be a necessity for your mould. It does appear to me that Lee, recently, has better quality control on their cavities than they did earlier.

## THE TECHNIQUE

### PREPARATION

If you have bullet release problems, cast two well-filled-out bullets for a single cavity mould or four for a double cavity. Hopefully, it won't take too many blows on the handle bolt to release them. You'll likely only need one set of bullets. The other one or two are spares Place the bullets back in the mould and carefully (you don't want to drill your mould) drill a 3/32 inch hole about 1/4 inch deep into the base of each bullet. Don't use the sprue plate hole as a guide for drilling...you may ruin it if the drill bit slips. Leave the sprue plate open.

### VENTING PROBLEM FIX

While the mould is still hot, use the Phillips screwdriver to loosen the sprue plate screw so that the sprue plate just falls free when turned on its side. This may require some force and careful use of a vise to hold the blocks is desirable. I've found that if I do this while the blocks are cold, the sprue plate tends to be too loose when hot. Do not loosen the screw too much as you will likely not be able to tighten it again and have it hold...it's a one way street. If it's loosened too much you will then need to tap a screw into the side of the block to hold the sprue plate screw in place. This is a desirable improvement to a Lee mould but if care is used, should not be necessary. Note: The Lee mould pictured at the top, has had this screw tapped in.

Now remove the bolt holding the handles together. Spray each mould face with a light coat of graphite release. If you plan to fix the cavities, make sure each cavity is covered with graphite also and give each cavity a second coat when dry. When dry and with a cloth, a little water, and comet clean the block faces. The fine vent lines will stand out...filled with graphite. Take the carbide scribe and run it down each vent line, deepening and widening it (not too much but enough to be noticeable) between the cavity and edge of the block. Note: the purpose of the graphite is to highlight the vent lines especially those which do not connect with the cavity or edge and also to serve as a guide when re cutting the lines...when the black is gone you're into the metal. Note: You'll likely need to use the graphite as a venting guide only on your first mould. You'll develop a “feel” for it on additional moulds and will have a previously fixed mould with which to compare it. You might be comfortable enough with a scribe to open the lines without graphite on your first try...if so have at it.

If you do not intend to fix the cavity, make sure the cavity has no burrs left from the procedure, clean the mould release from the cavities if you wish, and put the handles back together. The loosening of the sprue plate helps venting at the bullet base and the opening of the vent lines takes care of the rest. You're done!

## BAD HANDLE-TO-BLOCK FIT FIX (compensation)

If you intend to do the cavity fix, go to the next section before reading this one.

The best fix for this is to lay the back of the mould on a flat surface when opening and closing the mould. I use a six gallon bucket with rags in it for air cooled bullets. For quenched bullets, I tie a cloth with a slit in the middle over it and fill the bucket with water. In both cases, I lay a 1x4 inch board across the back of the bucket and lay the back of the mould on it. This solves alignment and wear problems when closing the mould and aids in bullet release when opening it.

A second method ( if your technique makes use of a flat surface inconvenient) is, when closing, to turn the mould sideways so that the open sprue plate is pointing downward. When the mould is closed turn it back to horizontal and use as usual. This helps to solve alignment problems when closing but obviously doesn't address opening issues.

## BADLY FINISHED CAVITY FIX

If you're doing the full treatment, this section should follow the venting fix section. However, for those who don't intend to do this one, it seemed appropriate to put it last.

If you completed the venting section, your mould should now have a double coat of graphite release in the mould cavities. If not, spray two coats in the cavities and let it dry. Screw about a 1 inch long screw into the hole you drilled in one of the bullets (a Phillips or hex head works best to keep the driver bit from slipping), wet the bullet, and sprinkle some Comet on it. Place the bullet into a bullet cavity and, with a drill at slow speed and the mould closed on the bullet, rotate the bullet in the cavity. Continue until the mould fully closes on the bullet. Use another bullet for the other cavity and repeat. Now rinse the moulds and with a toothbrush, clean them. Carefully inspect the mould cavities. Burrs and high spots that were previously unnoticed will be seen as bright spots surrounded by black... depressions as black surrounded by white mould metal. With a sharp knife, scrape the burrs and high spots off and smooth any sharp depressions that represent an imperfection. Go back and repeat the Comet trick twice more for each cavity, clean, and inspect the mould once more. If necessary, scrape imperfections with the knife again. Most of the graphite will now be gone. Some may remain but will be highly polished and filling imperfections. It is an aid, not a hindrance, so leave it. You now have a repaired and polished cavity...it will drop quality bullets with the best of them.

If you didn't do the venting fix, make sure you clean out the vent lines with the tooth brush. Put the handles back together. You're done!

As an aside, I discovered the use of graphite for repairing a mould by accident. In desperation, I tried using it to help mould #3 release bullets. It didn't help. I then decided to try polishing the cavity once more and discovered its true value. The mould had a machining mark left under one of the cuts for the

driving band. I simply couldn't see it without the graphite. A little touch up with an Exacto knife and the graphite remaining in the cut solved the problem. That "impossible mould" now works beautifully.

## A FEW TIPS ON USING A LEE MOULD

Don't use mould release to solve release problems...they lie elsewhere. The effect is to reduce cavity and bullet size. Since many Lee moulds are near minimum specifications, you may wind up with an undersize bullet as a result. Smoking the mould isn't necessary either.

Keep the mould lubricated. It should be lubricated at the start of each casting session, not just when new, and when the mould doesn't easily open during an extended casting session. If the mould isn't adequately lubricated, premature wear will result. Be careful to keep the lubricant from getting into the vent lines or you may have fill-out problems.

The sprue plate may score the top of the mould. Loosing the sprue plate will help reduce this but may not eliminate it. The best fix is to remove the sprue plate and with a fine file or sharpening stone, slightly round off the forwarding moving edge of the sprue plate. However, once it's done, it likely will require tapping a screw into the block to hold the sprue plate back in place. With a little care, however, all but about ½ inch of the plate near the sprue screw can be touched up with the sprue plate in place.

For mould fill-out, Lee moulds prefer higher casting temperatures than iron moulds. I've found that a "fixed mould" (opened vent lines) will deliver good fill-out at lower temperatures than a stock one and usually run my melt at 700-725 degrees when "fixed". You'll likely need closer to 800 degrees on a stock one. If you do have fill-out problems, try raising your casting temperature as a first step. If your smoothly operating mould suddenly begins to stick bullets, let the mould cool a bit and perhaps cut the melt temperature to see if release improves. Too high a mould or alloy temperature can create release problems.

Except for perhaps the first bullet or two, I don't use a wooden dowel to strike the sprue plate to cut the sprue. To me, hammering on a plate held into aluminum by a single screw is simply asking for trouble. A better solution is to use an insulated leather glove. Once the mould is up to operating temperature, it's easy to cut the sprue by applying the necessary pressure to the sprue plate with your gloved thumb. Also, with a "fixed" mould I now longer have to whack the handle bolt with that dowel. Bullets should readily fall out of the mould when opened. If one doesn't, simply brushing the bullet base away from the mould with a gloved thumb does the trick. Use of the glove speeds casting and avoids the risk of mould damage.

## CONCLUSION

Lee moulds lack the finishing quality found in the more expensive moulds. That finishing costs money and is why Lee moulds also lack the higher price. If you're willing to put in a bit of your own finishing on a Lee, you can raise its casting quality to equal that of its much more expensive competitors. Notice, I didn't say mould quality or durability. Competitors will always have the edge there. Aluminum can never be as durable as iron but that doesn't mean that most can't get a lifetime of bullets, with care, out of a Lee. Lees also lack the close handle to mould tolerance that

the higher end manufacturers provide, but that doesn't mean you can't compensate for it...

Hope this helps. Good casting and straight shooting!