

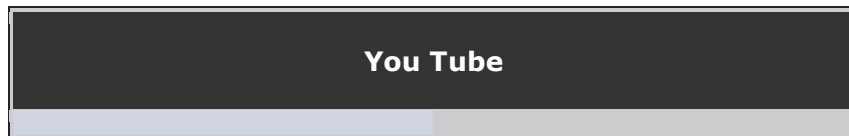
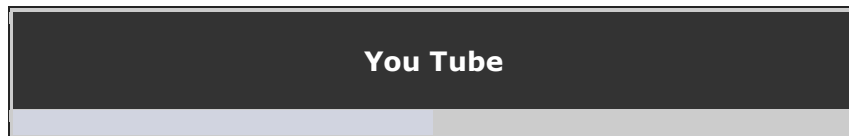
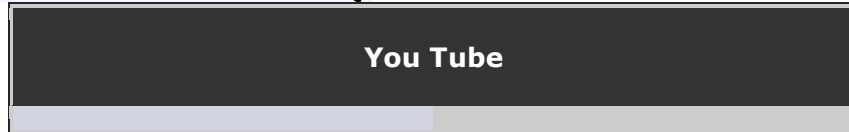
Thanks to *God prefers Diesels*

Checking and changing your timing can be very very very simple, or a five hour cussfest where at times you may even consider giving up.

I won't go into the grisly details of why it took me five hours the first time, just for the timing to slip in the distance it takes to go from 800 to 2000rpm.

Here's the easier version. It took me about 35 minutes.

Here is my three part video to help you along. For any more questions, refer to the written supplement, and the FAQ section. If you have a question, please don't post it here. PM me, and I will answer it and add it to the FAQ.



1. Pull intake, and the entire intercooler tube off the truck.
2. Pull the lines. It takes just a couple minutes, and only hacks bend lines.
3. Pull the oil filler tube. 17mm big nut, 8mm little nut, then it screws out. Next, take your ratchet, stick it in the rest of the oil filler that's still on the timing cover, and turn it counterclockwise. Take it off.
4. Get a 1/2 ratchet with shallow 15mm. Put it on the harmonic balancer.
5. Pull the timing plug out of the pump. It is 15/16. It also has like ten gallons of oil in it, so prepare as you like.(really its only about a pint)
6. Have someone turn the engine clockwise while you look for the pump timing tab to show up. Have them adjust back and forth as necessary to get the pin to slide in easily. You can also buy a more precise tool to stick in the hole if you want. Be careful and don't break the tab or plug! If you have to move the engine for some reason, or are doing something that might move the engine, REMOVE IT!! This goes for the TDC plug as well.
7. When the tab is good, pull the number one delivery valve holder. Don't lose the spring inside of it. Use a magnet, and pull the delivery valve out of the pump.
8. Screw in the dial indicator and adapter tight enough to remain accurate. Zero out the dial indicator. Pull the timing plug if you haven't already.
9. Before doing anything else, calculate where you want the dial indicator to end up. That way if something moves, it won't matter. You will still get the same result.

For every .5* timing, you want the big needle to move one number. Each number represents .1mm. So for every .5* of timing, you want to move .1mm.

For example, my pump was stock at 13.5*. I wanted 16*. To get from 13.5 to 16, there are

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five ".5's". Since each .5 equals .1mm, I needed to go .5mm. I zero out the indicator. The little dial was on 9. Yours might be different, so note the number. No matter which way my pump moved, I needed 9 on the little indicator, and 0 on the big indicator. Nine, zero. Since I was going up .5mm, I wanted to end up with "nine five". That way if something moves a little, it won't matter as long as I end up with nine five.

10. Now, grab the ratchet and move the engine clockwise an extremely small amount. Look up at the dial indicator. Is it on the five? If not, spin accordingly. If it is, great! Just make sure the number on the little indicator is still the same number, or your timing is way off. Luckily you only need to spin the other way to adjust it.

You have the pump where you want it, and you didn't have to touch the shaft threads with anything!!

11. Bust the pump gear nut loose. 1 3/16 socket. Screw it off, and don't lose anything into the engine.

12. Use a puller to pop off the gear. When it's loose, it will make a sound and the puller will go slack. It doesn't take much force either.

13. Locate the timing pin for the engine. If the lock ring is still in place, remove it. It isn't a real snapping with a groove. Just hook a pickset behind it and pull.

14. Pull the plug, clean it, lube it, put it in the hole, and make sure it slides back and forth easily.

15. When it's good, pull it out, stick your finger in there. Have your buddy turn over the engine with the ratchet slowly. You're feeling for a dimple. When you feel it, yell at him to stop. Try not to let it get in the center all the way.

16. Insert plug, and put pressure on it like you're trying to force it farther in the hole. Have buddy slowly turn engine until the plug "pops" in a little deeper. Stop him.

Now the pump is officially timed to your specs. Before, it wasn't actually timed yet, it was just turned where it needed to be. Then you moved the engine back to TDC to finish the job.

This way you can use the engine to turn the pump. If you set the engine on TDC first, bust the gear nut next, how are you going to turn the pump to pin time it, and then set the new timing? Trust me, don't use a rag and a pair of channel locks. Just let the engine safely and easily do the work for you, then when the pump is done, just put the engine back on TDC.

17. Pull the TDC plug out a little until you're sure it's not in the gear anymore.

18. Brake clean the heck out of the pump shaft. Use compressed air to dry it off good, and brakekleen it again. Dry it again. Make damned sure it's clean, or you will friggen regret it, I promise.

19. Put on lock washer, and tighten nut to 155 ft. lbs. Push against the TDC plug while buddy moves the engine a bit until it pops in. You shouldn't need to move it much, because when you torque the gear nut, you need him down there putting counter pressure on it.

20. Once you're sure the engine is at TDC again, look at your dial indicator. Is it still at nine five?(or whatever your number was) If it is, or you feel it's close enough(very close) you're

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set. If not, pull the TDC plug, spin the engine to correct setting, pull timing gear, put engine back at TDC, tighten again.

21. Pull indicator, put in delivery valve if it's clean. Then put in delivery valve holder. Shims go up, and open end of spring goes down if it fell out and you weren't paying attention. Tighten that puppy to 85lbs.

22. Make sure TDC plug is backed out enough, pump plug is flipped around so the metal tip part is facing in, and the slotted part is facing out. Tighten it. Put on oil fill tube. Put on lines. Tighten lines at pump. Put on intake. Get lines at injectors close, but not tight. Remember, you still need to bleed this thing.

23. Don't forget to take the ratchet off the harmonic balancer, and zero out your torque wrench!

24. Bleed injectors as necessary, and fire it up. As long as it doesn't slip, you're fine!

Tools:

- Delivery valve socket
- dial indicator that reads .1mm, and adapter for Cummins pump
- pump gear puller(Blue-Point sells these three things as a set)
- 1/2 ratchet, 15mm(balancer), 15/16(pump plug), 1 3/16(pump gear)
- 3/8 ratchet, 17mm(oil filler), 8mm(oil filler), 10mm(intake, dipstick, injector line holder downers), 11mm(intercooler boot), 13mm(possibly gear puller bolts)
- 3/4 wrench(injector lines)
- 90° pick set(TDC plug retainer)
- 5/16 nutdriver, or flat screwdriver(wastegate line)
- brake cleaner and air if you can.(highly recommended)
- someone to turn over the engine.(you can do it yourself if you have to though)
- 1/2 torque wrench(pump gear 155#, delivery valve holder 85#)

After you've pin timed the pump, and set the dial indicator to zero...

ex. 13.5* stock.

14.0* = .1mm

14.5* = .2mm

15.0* = .3mm

15.5* = .4mm

16.0* = .5mm

16.5* = .6mm

17.0* = .7mm

and so on.

Remember, turn clockwise to advance, counterclockwise to retard!! Don't forget to put the plugs back how they go! This method took me 35 minutes. Don't bother timing the engine first, then the pump. Use the engine to do the pump, then time the engine. It's much simpler!!
