

# Magneto Timing – How to Do It

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Proper timing of a magneto is essential to good operation of the engine. The following two processes provide information on how to determine the proper mounting of any magneto on a Deere tractor, and once it is mounted, how to fine-tune the timing. Note that Wico C and XH series magnetos allow independent adjustment of the impulse (or starting) timing; neither Fairbanks Morse or Edison Splitdorf magnetos have this option. Further information and pictures can be found by scrolling down to [2008 GOG Magneto Workshop](#) on the home page of this web site ([www.jd2cylservice.com](http://www.jd2cylservice.com)). Also note that the #1 cylinder is on the flywheel side and the #2 cylinder is on the pulley side.

## First Process: Mount Magneto on Tractor

- Remove spark plugs from both sides
- Rotate flywheel so #1 piston is at top dead center (TDC) on compression stroke
  - Feel air rushing out the plug hole when coming up on compression stroke
  - Magneto drive slot should be horizontal at TDC
- Hold magneto in a vise in the same orientation as on tractor
  - Connect plug wires from magneto to spark plugs – ground spark plug cases to vise
  - Rotate drive cup with wrench until spark occurs at plugs
  - Drive cup lugs will be ~ horizontal when spark occurs
- Not all magnetos provide a spark every impulse
  - Rotate enough times until you KNOW which plug fires first, followed by spark at second plug 1/2 turn later
  - Rotate until spark occurs at first plug, and stop
  - Put magneto on tractor without rotating drive cup
    - Be sure to use a gasket between the magneto and governor case
- Install spark plugs and plug wires – wire that sparked at first plug to #1, second to #2

## Second Process: Setting Running and Impulse (Starting) Timing

- Measure circumference of flywheel
  - About 66" for unstyled Model A
- Calculate distances for different timing advances
  - Distance = circumference  $\times$  deg adv/360
    - Example for early A
      - $D(25^\circ) = 66 \times 25/360 = 4.583'' \sim 4 \frac{19}{32}''$
      - $D(30^\circ) = 66 \times 30/360 = 5.500'' = 5 \frac{1}{2}''$
      - $D(35^\circ) = 66 \times 35/360 = 6.417'' \sim 6 \frac{13}{32}''$
      - $D(40^\circ) = 66 \times 40/360 = 7.333'' \sim 7 \frac{11}{32}''$
- Measure off and chalk these distances CCW starting at the flywheel LH Impulse mark
- Locate a timing light and battery to run it
  - Hook spark sensor to #1 plug wire
- Start tractor, being careful not to obliterate chalk marks on flywheel

- With the timing light in the plane of the flywheel center and mark on transmission case, see which flywheel chalk mark lines up with case mark
  - RPM does not matter
- Get about  $\pm 10^\circ$  change by rotating magneto
  - If the  $35^\circ$  mark lines up and you want  $30^\circ$  timing, rotate magneto forward
    - Forward retards spark, back advances spark
- After running time is correct, set start timing for Wico C and XH magnetos
  - Stop engine, remove timing light, mark position of magneto on governor case so it can be replaced accurately
  - Rotate flywheel, note where impulse occurs relative to LH Impulse mark
  - Adjust Impulse Stop Ring for spark at TDC (or  $1^\circ$ - $3^\circ$  ATDC)
    - If magneto impulses after LH Impulse has passed mark, impulse stop ring will be rotated CW
    - Remove magneto, loosen four screws holding impulse stop ring, rotate stop ring, tighten screws
    - Each cast-in mark in case near top of stop ring is  $5^\circ$
  - Replace magneto, lining up with mark, check impulse time, if not correct, redo last steps
- Now both running and starting timing are set to proper values.
- If rotation of magneto does not provide desired run timing
  - Change drive cup, or
  - Lift governor box, rotate governor drive gear 1 tooth
    - Backward – spark occurs 12-15 deg later (retard spark)
    - Forward – spark occurs earlier (advance spark)
- If timing light shows spark jumping in time
  - Loose distributor rotor
  - Worn bushings
  - Loose point pivot pin