TIMING GUIDE FOR TM53 COMPACT SQUARE BALER

This timing guide is for the TM53 Square Baler made by Sitrex (manufacturer model Abbriata M60 Super). Throughout this timing guide, reference is made to figures in sections 6 and 7 of the Sitrex Use and Maintenance Manual (the original manual included with the machine) and is intended to help clarify instructions in that manual. All references made in this guide refer to the latest version of the manual and component and part terminology used in this guide are the same used in that manual. Before beginning the timing process, it is important to read sections 6 and 7 of the Sitrex Use and Maintenance Manual to familiarize yourself with the parts and components referred to throughout this timing guide.

Important: Before beginning, go to the Tractor Tools Direct website and download or print the latest version of the Sitrex Use and Maintenance Manual. This is the link address to this manual. https://tractortoolsdirect.com/content/Hay_Balers/M60%20Owner%27s%20Manual%202021-09-27.pdf

The timing process for the Abbriata M60 Super square baler is a very straightforward process that can be accomplished by the most novice owner. It is important to complete each step in the sequence outlined here before moving on to the next. Read through the timing guide and locate each (Fig.) reference in the Sitrex Use and Maintenance Manual before beginning.

In this guide reference is made to turning the flywheel in a counterclockwise direction. For these purposes, **counterclockwise is designated with the user standing in front of the baler looking at the flywheel**, in other words, the top of the flywheel should be moving in the direction of the pickup. When in doubt, refer to the arrow on the flywheel in Fig. 7.7 in the Sitrex Use and Maintenance Manual.

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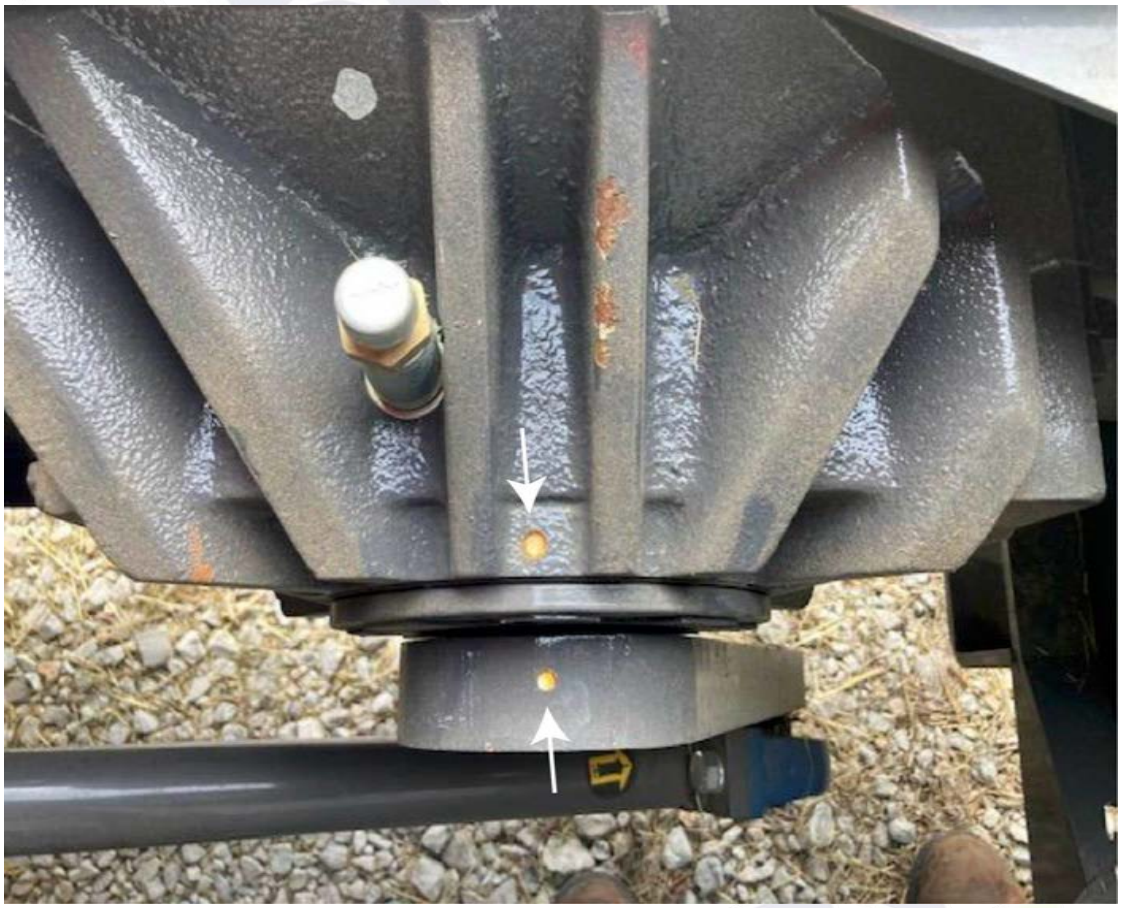
Begin by removing panels 1, 2 and 3 (Ref. picture below) covering the drive chains on the left side of the baler. Remove the retaining bolt from the knotter cover, 4 (see picture below) and open the cover. Remove shield 5 (see picture below) covering gathering forks. Remove the retaining bolt from panel 6. (Ref. picture below) and open the panel (secure it with a bungee cord or something similar).

Remove the knob that retains shield 7 and secure it in the open position with the support stand.

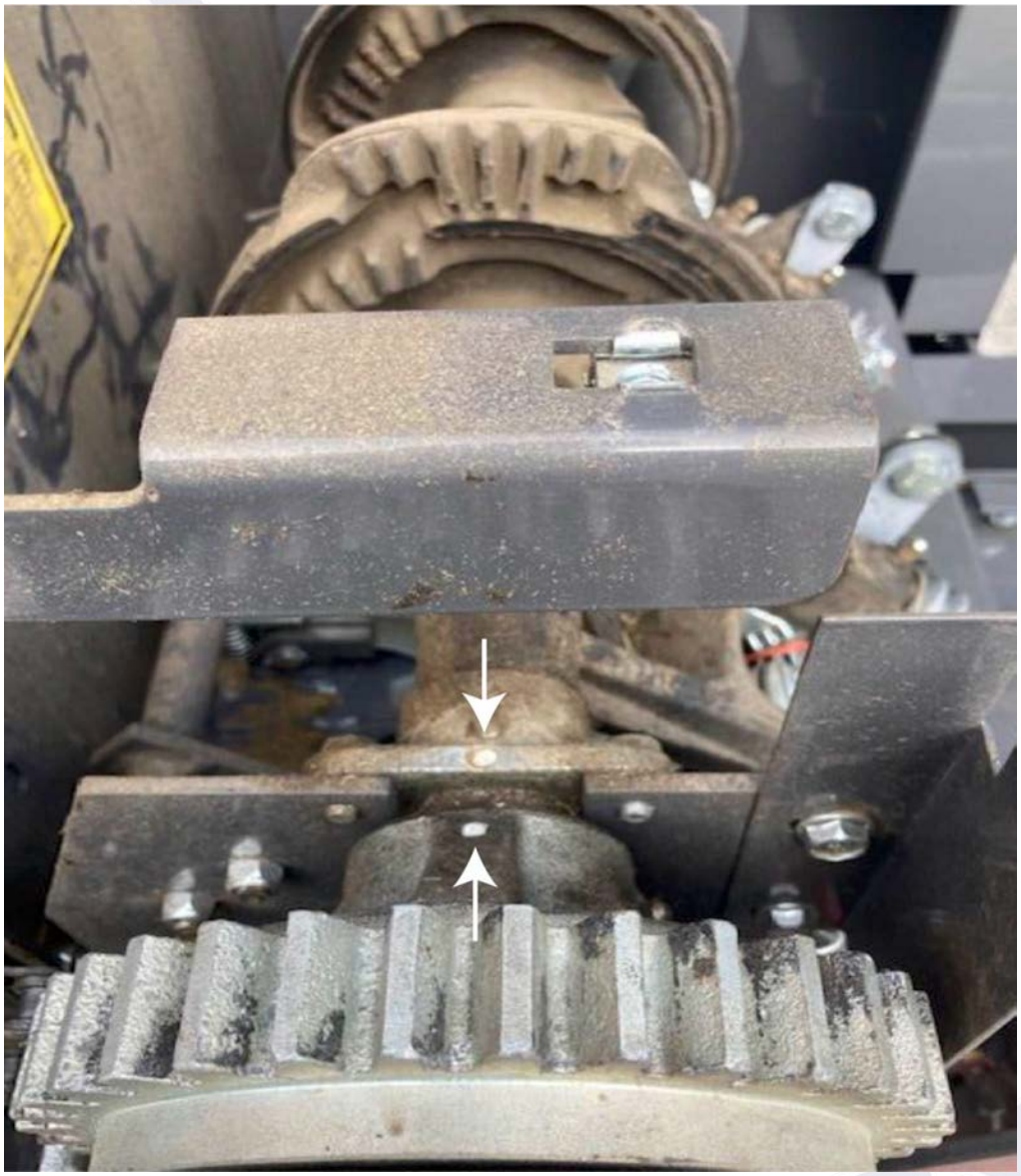
Begin by checking that all the safety shear bolts are intact. The TM53 baler has 4 shear bolts. See section 6.4 in the Sitrex Use and Maintenance Manual for the location of the shear bolts. Replace any broken shear bolts prior to proceeding.

1. Rotate the flywheel in a counterclockwise direction to the initial timing position, with the two timing marks aligned as shown in the picture below. The dot on the crank arm aligns with the dot on the plunger carriage gearbox housing.



2. With the crank arm in this position, the timing dots on the fork drive sprockets should align with the dots on the frame, as seen in the picture below.

3. Check that the timing dots on the bell gear ref. 3 and on the frame are aligned. See below and also Fig. 7.7 in the Sitrex Manual.



If all components are found to be in time, the timing process is not required. If any components are found to be out of time, proceed with the timing process. Prior to beginning the timing process, remove all hay from the bale chamber.

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IMPORTANT: THE TIMING OF THE TM53 SQUARE BALER IS COMPLETED IN TWO STAGES:

A. THE TIMING OF THE FEEDER FORKS WITH THE CARRIAGE.

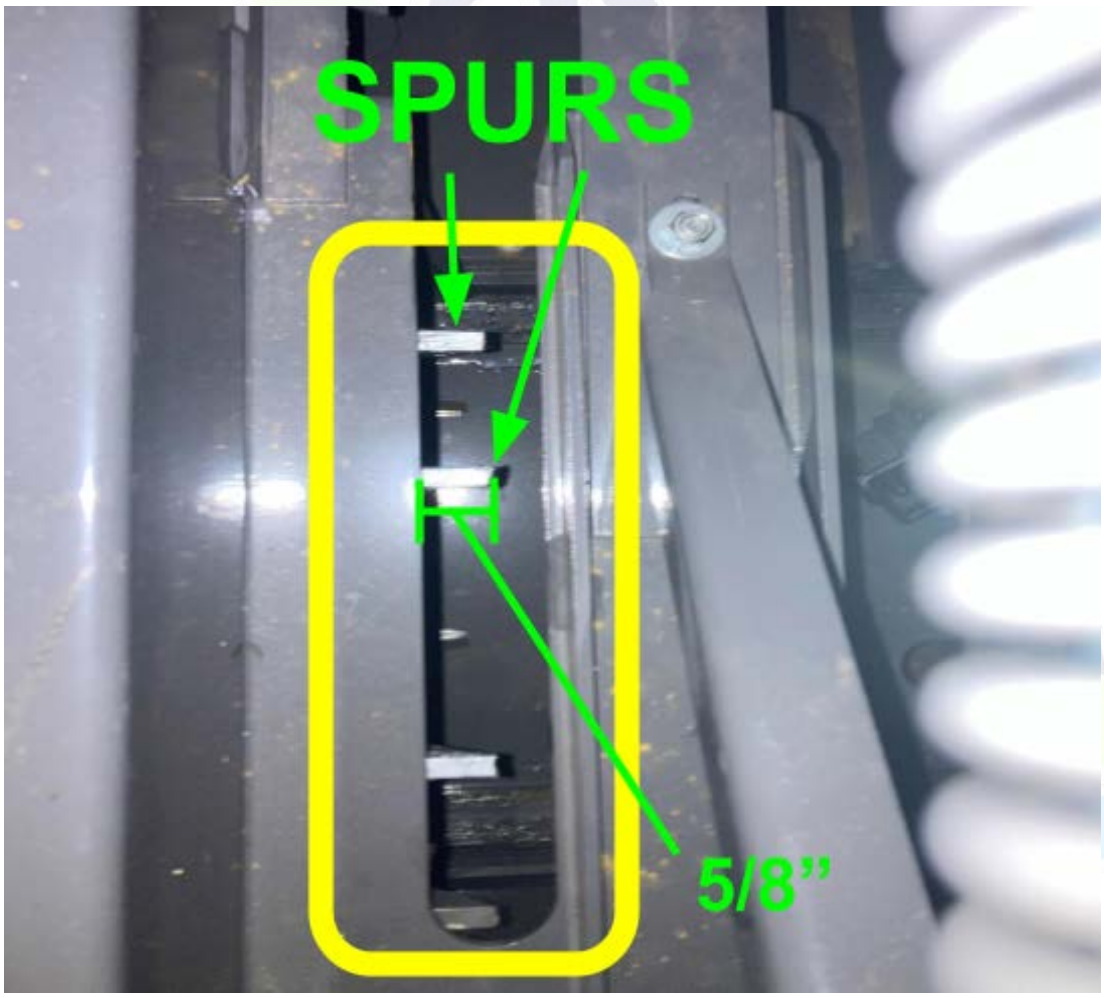
B. TIMING OF THE TWINE NEEDLES WITH THE CARRIAGE.

COMPLETE THE ENTIRE TIMING PROCESS IN THE SEQUENTIAL ORDER OUTLINED BELOW.

DO NOT ATTEMPT TO TIME ONE COMPONENT GROUP WITHOUT TIMING THE OTHER.

A. Timing of Forks to Carriage

1) Roll the flywheel in a counterclockwise direction (Fig. 7.7, Sitrex Manual) until the spurs on the carriage plunger head protrude 5/8” into the feeder fork passage slot.



2) Remove the allen head bolts from the chain drive sprocket (Ref. 1, Fig. 7.3, Sitrex Manual), to allow free rotation of the feeder fork control gear of the double gear 2.
3) Position the incline side of the first feeder fork (the side closer to the bale compression chamber), so that it has a distance of 2 ½" to 3 ¾" from the spur on the plunger head (circled in white below & shown in Fig. 7.4, Sitrex Manual). The feeder fork is well above the spur so you will use a vertical line of sight to accomplish this, or attach a straight edge to the fork that extends down.

4) Install the allen head bolts into the holes in the chain drive sprocket (Ref. 1, Fig. 7.3, Sitrex Manual) that are most closely aligned. If rotation of the sprocket is required, be sure the feeder fork is kept within the tolerable distance (2 ½" to 3 ¾") from the plunger spur edge described in step 2.

5) Once the first feeder fork has been timed with the carriage as described above, roll the flywheel in a counterclockwise direction until the feeder fork drive arm (Ref. 1, Fig. 7.6, Sitrex Manual) is in a vertical position as shown in Fig. 7.6 (Sitrex Manual). Check the position of the second feeder fork. The position of the second feeder fork should be perpendicular to the first feeder fork (Fig. 7.6, Sitrex Manual, referencing the **M60 Super**).

6) **If repositioning of the second feeder fork is necessary**, relieve tension on the feeder fork drive chain (Ref. 3, Fig. 7.6, Sitrex Manual) by loosening the retaining bolt on the tensioning idler sprocket and slide the sprocket away from the chain.

7) To allow removal of the chain from the second feeder fork sprocket, locate and remove the master link (shown below) from the chain by removing the spring clip from the grooves in the pins. You can use a pair of pliers to pry the split end open, or tap the spring clip off with a flathead screwdriver. If the spring clip is bent, do not reuse it - purchase a new master link instead.

8) Move the second feeder fork into the correct position as outlined in the Sitrex Manual (see Fig. 7.6, **M60 Super**).

9) Reinstall the chain onto the second feeder fork drive sprocket, reinstall the master link, and pull the tensioning idler firmly against the chain until approximately 1 1/8" of deflection is measured in the longest span of chain. Tighten the retaining bolt.

B. Timing of Twine Needles to Carriage

Once the feeder forks/carriage timing has been completed, the timing of the twine needle with the carriage can be carried out as follows:

1. Remove the master link from the knotter drive chain (Ref. 1, Fig. 7.7, Sitrex Manual, and also see step A. 6. above). Remove the knotter drive chain from the knotter drive sprocket (Ref 3, Fig 7.7, Sitrex Manual).

   Note: do not remove the chain from sprocket 7.

2. Put the needles in the rest position by bringing the needle holder arm (Ref. 5, Fig. 7.7, Sitrex Manual) back to the end of the stroke.

3. Engage the knotter by bringing the sector lever arm (Ref. 4, Fig. 7.7, Sitrex Manual), to its maximum height by rotating the bale star wheel 6. Then manually rotate the bell gear 3 counterclockwise until it locks in the dragging position of the knotter shaft.

4. Continue to rotate the bell gear (Ref. 3, Fig. 7.7, Sitrex Manual) counterclockwise until the needle holder arm is lowered so that the needle tips are level with the lower edge of the bale chamber.

5. Turning the flywheel counterclockwise, bring the carriage into position so that the front spurs (Ref. C, Fig. 7.7, Sitrex Manual), are approximately ¼" from the needle tips positioned previously.

6. With the needles and the carriage thus positioned, with the master link, connect the chain (Ref. 1, Fig. 7.7, Sitrex Manual), without moving the gears 7 and 3 from the position in which they are to set needle position.

7. Pull the chain tensioner (Ref. 2, Fig. 7.7, Sitrex Manual), firmly against the chain to allow approximately 1/8" deflection measured in the longest span of the chain. Ensure that there is no movement between the gears.

8. Once the chain has been reinstalled and tensioned, recheck the clearance of the needle end and the plunger spur.

C. Final Steps

- When the sequence of operations A and B has been performed, the machine has been fully timed and is in phase.
- Manually rotate the flywheel several times in a counterclockwise direction to check for any clearance issues.

ATTENTION! Due to normal use, the chains can stretch and slacken, potentially allowing the chains to jump teeth on the drive sprockets and causing components to get out of time. To minimize the chance of the components getting out of time due to the slackening of the chains, always keep the chains under tension using the tensioners and lubricating the chains as specified in section 6 of the Sitrex Use and Maintenance Manual.