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RING MAINTENANCE TIP #9
THE IMPORTANCE OF TRAVELER FIT AND WEIGHT IN RING SPINNING AND TWISTING

REVIEW: Ring Tip #1 covered the extreme importance of regular chemical cleaning of the ring's internal structure. Ring Tip #2 covered the importance of the external cleaning of the surfaces of the ring, holder, rails, and separators. Ring Tip #3 covered the avoidance of ring breakage. Ring Tip #4 covered avoiding ring breakage with sintered rings. Ring Tip #5 dealt with reducing ring heat and the plant electric bill. Ring Tip #6 reviewed controlling ring oil usage with sintered rings. Ring Tip #7 covered the non-recommended addition of chemical ring cleaners to ring oil. Ring Tip #8 covered periodic wick replacement for sintered and solid steel rings.

Ranking right behind the importance of achieving an internally and externally clean ring (performed by Epic Ring Service in reconditioning) is the proper traveler fit and weight in obtaining the highest productivity at the lowest electric (KW) cost. Ring spinning and twisting typically account for over 50% of all power usage by the plant. Ring spinning alone will account for just under 40% of all power use in a plant with 2 for 1 twisting. In ring twisting plants (e.g., tire cord), twisting can exceed 70% of all KW usage.

In general, a somewhat typical plant with rings requiring cleaning can expect a power reduction (frame plus air-conditioning) of about 20% from cleaning and rebuilding their lubricated rings, and about a 12% total KW reduction by optimizing traveler fit and weight. Specific results vary from plant to plant.

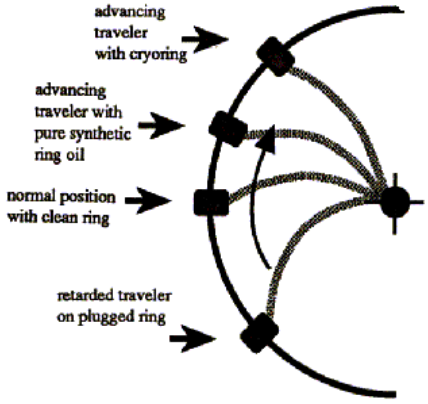
Not only does cleaning/rebuilding and traveler optimization produce large power savings, many productivity gains are obtained, including: **FEWER ENDS DOWN, LONGER RING LIFE, LESS SCRAP YARN, LONGER TRAVELER LIFE, AND HIGHER YARN QUALITY (fewer breaks in bundle)**.

AS THE RING LOSES LUBRICITY FROM PLUGGED PORES/PASSAGEWAYS AND FOULED WICKS, the plant gradually reacts to the loss of lubricity by changing traveler weight. (See diagram) The traveler receives oil only intermittently. This creates a drag on the traveler, making the traveler effectively heavier. The plant reacts by reducing traveler weight to maintain desired tensions.

When the ring is cleaned and rebuilt (restoring even lubrication), the typical action is to increase traveler weight to compensate for the elimination of drag.

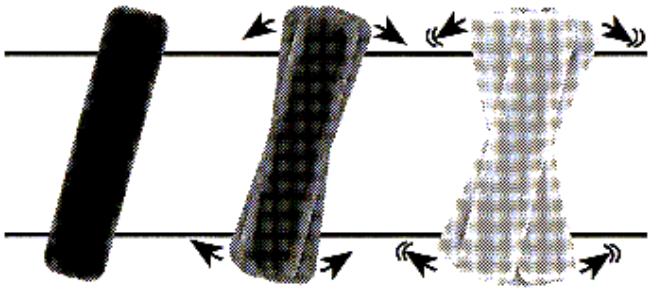
This in not true in all cases, particularly if a pure synthetic ring oil is used. In the case of the synthetic ring oil, which is "slipperier" than petroleum, the traveler tends to advance forward and picks up centrifugal weight. In this case, traveler weight must be reduced to produce the desired tensions.

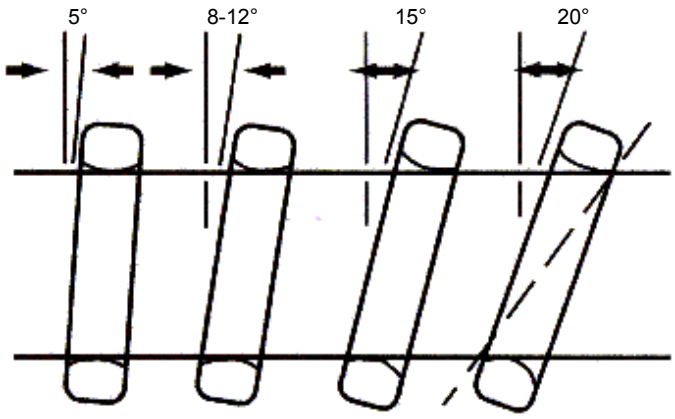
Thus, traveler weight depends on ring condition in terms of its clean or unclean condition and type of ring oil used.



TRAVELER FIT: Not only is weight important, but traveler fit for your particular yarns and running conditions is extremely important to high productivity. There are many yarn styles: A, B, C, metal-inserts, finbacks, etc. See your traveler suppliers. Two major factors involved in finding the near ideal traveler are traveler angle, and obtaining a nearly steady traveler.

TRAVELER STEADINESS: The first step to try to find travelers that, by watching them with a strobe, produce a relatively clear or steady image. Some travelers will show so much shaking (with resultant tension spikes damaging the yarn bundle and eventually leading to breaks) that you cannot really see the traveler. The near perfect traveler will provide a very crisp image under the strobe. (See diagram on right)





TRAVELER RUNNING ANGLE: A traveler that is too tight between the horns will stand upright and the ring will tend to cut into both horns causing low traveler life. A traveler that is too loose on the ring will tend to chatter severely, causing tension spikes and a high frequency of ends-down. (See diagram on left). In most cases, it has been found that a running angle of 8 to 12° is close to ideal. Trying to measure traveler angle involves focusing on the traveler with a strobe and trying to observe traveler angle with a protractor.

A QUICK WAY OF EVALUATING OR SCREENING TRAVELER STYLES, WEIGHTS, FITS AND RUNNING ANGLES in an effort to optimize traveler performance: In general it is best to start a traveler examination from the know quantity of a cleaned (or new) ring. Ask your traveler suppliers to supply perhaps four samples of each style of traveler in quite a few different weights, perhaps +/- 20% to the weight you are now using. You may end up with 30 to 40 sets of 4 travelers. Have a strobe, protractor and tensometer available. A temperature sensor or pyrometer is very helpful in measuring ring temperatures. You can expect that some travelers will be totally unsuitable for your use. So, you will have some scrap yarn, break some ends, and may chafe some yarn.

Going down the frame, put each set of 4 samples on. Start the frame. Immediately, you may get some broken ends and chafed yarn, but most of the positions will probably stay up and running. With those up-positions, try to measure comment on:

- ☞ Tension at that stage in package build, noting that tension will be highest at the start of the cycle
- ☞ Observe with a strobe the relative clarity or shakiness of the traveler
- ☞ Observe with a strobe and protractor the approximate running angle of the traveler. Feel the package for softness and hardness
- ☞ Size of balloon as too small or too great
- ☞ Read ring temperatures at various stages of package build; temperatures will rise fairly rapidly early in cycle and gradually increase toward off

Tabulate your findings. Chances are that you may find perhaps 4 to 8 candidate travelers (in terms of style, fit or weight) that look much better in overall performance than the traveler previously used for that yarn under that set of running conditions.

At that point, you will probably want to get an additional quantity of perhaps 30 to 40 of your best candidates and run another screening on a larger sample to try to reduce your candidate list down to 2 to 3 of the best travelers. You are now ready for whole frame, long-term testing to pick the best possible traveler. You may want to add comparative KW or KVA readings to these final tests.

In summary, the rewards of a clean/rebuilt ring and traveler optimization are extremely high in terms of large KW savings, overall efficiency and productivity.

If you did not receive Ring Maintenance Tips #1, 2, 3, 4, 5, 6, 7 and/or 8, contact Epic.

November, 1991
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