



TEREX-TELELECT

Product Advisory

PA-1009-02

DATED: December 9, 2002

REVISED:

MODEL (S): Hi Ranger, 4, 5, & 6H Series units

SUBJECT: Chain Maintenance

This Service Bulletin is to serve as a reminder of the maintenance requirements of compensating chains and platform leveling chains.

Acceptable service life of compensating and platform leveling chains can only be achieved if proper maintenance is performed. It is critically important that lubrication procedures are performed with the compensating chain in a relaxed state every 30 days, as outlined in the attached maintenance manual section

Proper storage of the boom, prior to road travel, is a key factor in achieving acceptable compensating chain life ("folding for travel" procedure from operators manual attached). Proper storage of the booms allows the compensation chain to relax. High impact loads due to shocks induced by rough road conditions or stiff truck suspensions are not transmitted into the lift train. If the chain remains under constant tension, during road travel, lubrication is squeezed out of the critical pin/bushing area that may result in galling. Allowing the chain to relax during road travel allows lubrication to redistribute to the critical contact areas of the chain.

The proper lubricant for a chain in this application is **SAE 30 non-detergent motor oil**. This lubricant provides excellent wear characteristics if applied as recommended. The lubrication specification has changed over the years. Therefore we are offering replacement maintenance manual sections for all customers with Hi Ranger 4, 5, & 6H series units (Sample copy attached).

A legible chain maintenance warning decal is required on all units with a compensating chain (Sample attached). Terex Telelect will provide this decal at no charge to all users of 4, 5, and 6H series units for a period of six (6) months from the date of this bulletin.

To receive this free decal, folding for travel procedure, and chain maintenance section please fax the unit model and s/n to Terex Telelect service department with the correct mailing address. Please allow a minimum of 30 days for mailing.

We are pleased to announce that we are now able to offer **SAE 30W Chain and Cable lubricant** in an aerosol can. This lubricant is a premium **SAE 30W non-detergent lubricant** with corrosion inhibitor to provide the required lubrication qualities with a corrosion inhibitor to minimize corrosion of exposed portions of chains and cables. This lubricant is available in case lots of 12 cans per case. Each can contains 22 fluid ounces of lubricant. This lubricant may be ordered through our parts department by ordering p/n 471317.

Should you have any questions or comments concerning this bulletin, please contact the TEREX Telelect Service Department at (605) 882-4000.

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FOLDING FOR TRAVEL

You must follow the proper storage procedure to relieve the tension in the lift system for traveling.

1. Lowering boom into rest use either:
 - a. Lower the Lower Boom into the boom rest.
 - b. Lower the Upper Boom into its rest.
 - c. Hold the Upper Boom control in the stow direction for 5 seconds after Upper Boom is in the rest.

OR

- a. Lower the Lower Boom to a height of 6 to 12 inches above the Lower Boom rest while keeping the Upper Boom out of its rest.
 - b. Lower the Upper Boom into its rest.
 - c. Lower the Lower Boom into its rest.
2. In both cases, secure the Upper Boom in its rest with the hold down system.
 3. Lock the Lower Boom in its rest if equipped.

Failure to stow properly will shorten service life of the Upper Boom lift train, including compensating chain.



The fiberglass upper boom must be completely seated in the saddle with no tension remaining in the lift cable, and the boom hold-down must be locked before travel. If the boom is allowed to bounce in the saddle, the fiberglass becomes crazed and shattered next to the saddle, eventually allowing the boom to buckle. Buckling of the fiberglass boom would cause serious injury or death.



Do not travel with tools or other items stored in the platform. Loose items may damage the platform during road travel.

It is essential to follow the correct procedure whenever booms are folded for travel:



Do not fold upper boom against lower boom unless lower boom is within 6" to 12" of the boom support saddle. If lower boom is above this dimension excessive slack in the upper boom lift cable could occur. If below this dimension, the lift cable assembly may become too tight. Both of which if combined with other malfunctions may result in serious personal injury or death.

Failure to fold the boom properly, as described above may create slack in the lift cable or cause the cable to become too tight. In either case, serious personal injury or death could occur if other malfunctions coincide with the slack or tightness.

BOOM STORAGE PROCEDURE

You must follow the proper storage procedure on 5F, 5H, 5TC, and 6H models.

1. Lowering booms into rest use either:
 - a. Lower the lower boom into the boom rest
 - b. Lower the Upper Boom into its rest
 - c. Hold the Upper Boom control in the stow direction for 5 seconds after Upper Boom is in the rest.
- or--
- a. Lower the Lower Boom to a height of 6 to 12 inches above the lower boom rest while keeping the Upper Boom out of its rest.
 - b. Lower the Upper Boom into its rest.
 - c. Lower the Lower boom into its rest.
2. In both cases secure the Upper Boom in its rest with the hold down system.
3. Lock the Lower Boom in its rest if equipped.

Failure to Stow properly will shorten service life of the Upper Boom lift train.

H24972B

Storage Procedure Decal p/n H24972

WARNING

CHAIN MAINTENANCE

INSPECT AND APPLY AMPLE LUBRICANT (SAE 30 NON-DETERGENT MOTOR OIL, PREHEATED TO 60° TO 100° F) EVERY 30 DAYS AT EACH PIN, BETWEEN INNER AND OUTER PLATES, AND BETWEEN INNER SIDE PLATES AND ROLLERS.

DO NOT APPLY GREASE AS A CHAIN LUBRICANT.

INADEQUATE LUBRICATION WILL CAUSE PREMATURE CHAIN WEAR AND POSSIBLE CHAIN BREAKAGE ALLOWING THE BOOM TO FREE FALL OR ALLOWING THE BUCKET TO TILT CAUSING POSSIBLE DAMAGE, INCLUDING SERIOUS PERSONAL INJURY AND/OR DEATH.

SEE SERVICE MANUAL FOR DETAILED INSTRUCTIONS FOR INSPECTIONS AND SERVICING REQUIREMENTS.

H22791B

Chain Maintenance Decal p/n H22791

CHAIN MAINTENANCE

Chain life is generally considered to have expired when the chain exceeds its service life period or does not engage properly with the sprocket due to damage of its parts or elongation. The chain is replaced when these conditions occur.

The service life of a chain can be influenced by a variety of factors. The following information discusses the care and maintenance required to help insure the chain's integrity. Because the chain is a critical linkage it is essential that it receive proper care and maintenance. The key to proper care and maintenance is a systematic inspection, proper cleaning, and proper lubrication. To help prevent premature wear or damage, the following points should be checked. Observe the chain and sprockets for these items.

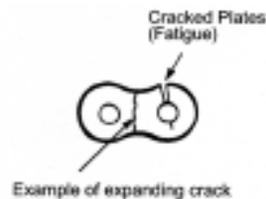
Items to Observe

1. Abnormal noise.
2. Vibration of the chain.
3. Chain rising on the sprocket.
4. Chain winding around the sprocket.
5. Stiff bending of chain, or kinks.
6. Amount and state of lubrication.
7. The appearance of the chain. Check for dirt, corrosion, damage on the outside surface of roller, contact marks, turned pins, cracks, etc. Also check the inside and edge surfaces of the link plate and edge surface of the pin.
8. Damage on the sprocket tooth surface and side surface of tooth and engaging area.
9. Bending of chain and rotation of roller.

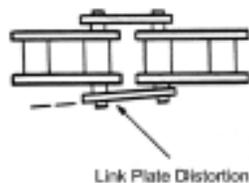
Inspection

Chains must be inspected per guidelines outlined in the inspection section of this manual. To properly inspect, each link must be examined. It may require repositioning boom to see all links clearly. Signs of chain deterioration to be looked for are as follows:

1. A crack or complete break of a link plate, particularly an outer plate on either side of the chain. Replace chain immediately.



2. Distortion or spreading of an outside link plate, evidenced by increased clearance between overlapping link plates and roller. This indicates a hidden break in a pin. (See illustration below) Replace chain immediately.



- Looseness between the riveted ends of a chain pin and the outer link plates. If a pin has broken, the normally rigid riveted joint may loosen, leaving visible clearance around the exposed ends on the pin. (See illustration below) Replace chain immediately.



Clearance at Riveted Chain Pin

- The pin head rivets should be examined to determine if the V-flats are still in correct alignment. Chain with rotated or displaced heads or abnormal pin protrusion indicates deformed pin or bushing fit. (See illustration below) Replace chain immediately.



Turned Pin

- Seizing and galling of rollers. All rollers must rotate freely by hand. If chain joints or rollers are seized, but not yet damaged, lubricate per instruction in "Lubrication" Section. (See below)
- Worn or misaligned idler sprocket(s) or sector sprocket(s). Worn idler sprocket bearing, sprocket hinge pin or abnormal wear on sprocket teeth can cause chain overload and accelerate the wear rate. Replace the sprocket when teeth show excessive wear or are hook-shaped. Replace sprocket bearing or hinge pin if worn. (See illustration below)

Hooked Teeth



- Inspect for accumulation of foreign matter such as dirt, grit, dust, etc., which can close off the clearance at the suggested points of lubrication. If accumulation is evident, the chains should be cleaned by flushing and brushing with a suitable solvent such as diesel fuel or kerosene to remove all foreign material and then re-lubricated thoroughly. If the accumulation is severe, the chain should be removed and purged of foreign matter by soaking and flushing in suitable solvent, followed by immersion in proper lubricant before reinstallation.
- DO NOT exceed the service life period of the chain. The maximum service life of a compensating chain (if equipped) should never exceed five years. The maximum service life of a leveling chain (if equipped) is determined by measuring chain elongation. All chains which exceed the maximum elongation must be replaced.

Lubrication

One of the most important but often overlooked factors causing premature wear or breakage is inadequate lubrication. In addition to reducing internal friction, maintaining a film of lubricant on all chain surfaces will inhibit rusting and corrosion.

Under normal operating conditions, especially in dusty environments, lubricated chains will accumulate a paste-like build-up of grime. This build-up should never be permitted to accumulate sufficiently to seal off the clearances, thereby restricting the lubricant to the bearing areas. At periodic intervals, this build-up must be removed by cleaning, and the chain immediately re-lubricated. DO NOT steam clean or use de-greasers; use a brush and a safe petroleum solvent such as diesel fuel or kerosene.



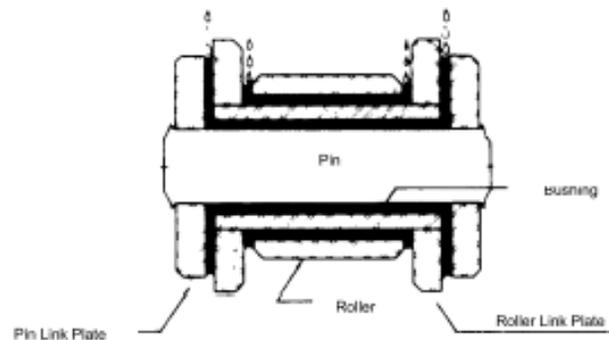
Lack of lubrication will result in galling and corrosion of the chain pins, and can cause breakage of the pins, with resulting failure of the leveling or boom lift system, and may result in serious personal injury or death.

The internal bearings between the pins and rollers in the chain should be lubricated on the unit per the lubrication chart and/or Quick Reference Guide with SAE 30 non-detergent oil.

Lubricant should be room temperature to provide better penetration to the chain joints.

Apply ample lubricant at each pin, between inner and outer side plates, and between inner side plates and roller (See illustration below). DO NOT, under any circumstance, apply grease lubricant to the chain, as grease will not penetrate to the pin bearings.

Lack of lubrication in the pin bearings is usually indicated by squealing or groaning sound when the boom is operated.



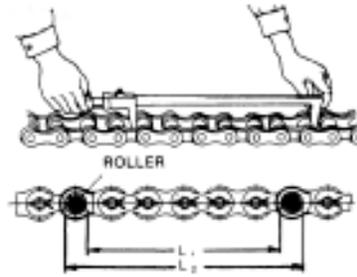
If lubrication has been neglected to the point of causing any chain joint to seize, the entire chain must be removed from the unit, thoroughly cleaned with a safe solvent, such as diesel fuel or kerosene, then soaked overnight in a container of recommended lubricant, providing that the chain has been thoroughly inspected for the absence of any kind of damage. Replace the chain if any defects are found.

Measuring Chain Elongation (See figure below)

1. The chain should be measured by stretching it slightly.
2. Measure, using a vernier caliper, the distance from the inside (L1) outside (L2) of the rollers over the measured links.
3. To get measurement (L). $L = (L1 + L2)/2$
4. Chain elongation can then be calculated:

$$\text{Chain Elongation} = \frac{\text{Measured Length} - \text{Standard Length}}{\text{Standard Length}} \times 100(\%)$$

$$\text{Standard Length} = \text{Chain Pitch} \times \text{Number of Links}$$



NOTE: When measuring, use at least 6 to 10 links to help keep any measuring error to a minimum. When measurement cannot be done with a vernier, it is possible, though less accurate, to use a tape measure. If a tape measure is used, the measured length should be as long as possible.

Maximum Allowable Chain Elongation is 1.5%

Standard Length and 1.5% Elongation

Pitch		0.750	1.000	1.250	1.500	2.250	2.500	3.000
Chain size		60	80	100	120	180	200	240
6 Link Measure	Original	4.500	6.000	7.500	9.000	13.500	15.000	18.000
	1.5% Elongation	4.568	6.090	7.613	9.135	13.703	15.225	18.270
10 Link Measure	Original	7.500	10.000	12.500	15.000	22.500	25.000	30.000
	1.5% Elongation	7.613	10.150	12.668	15.225	22.838	25.375	30.450

Chain Accessories

Check for damage to any metal fittings. It is also important to make sure any metal fittings are as secure as possible. Loose fitting attachments may reduce the life of the chain.

Replacement of Chains

1. When replacing a chain, replace the entire chain. DO NOT replace links or build lengths of chain from individual components.
2. Replace only with a chain of the proper strength and construction.
3. DO NOT paint the chain. Although paint may help inhibit external corrosion, it will seal off critical clearances and restrict oil from reaching the internal pin surfaces where it is needed for adequate joint lubrication. Always protect chain from paint when painting unit, especially during new unit installation or unit transfer.
4. Protection from corrosion is important in storage as well as in service. A factory lubricant has been applied to new chains. After installation, the recommended lubricant must be used.
5. Ensure that other component parts, sprocket, bearing and idler assembly are installed properly per Maintenance and Service Manuals.