

ROLLER CHAIN INSTALLATION AND MAINTENANCE

Handling, installation, alignment, tensioning, lubrication, wear measurement and troubleshooting for ANSI and BS roller chain drives. Follow these procedures to obtain the full service life the chain was designed to give.

DOCUMENT	FAMILY	TYPE	APPLIES TO
UNIK-AC-IM-002	ANSI & BS CHAIN	INSTALLATION & MAINTENANCE	ROLLER CHAIN DRIVES

SAFETY FIRST – READ BEFORE HANDLING A CHAIN

- The following precautions must be taken before disconnecting and removing a chain from a system, prior to replacement, repair or length alteration.
- Always shut off the power switch to isolate the equipment before installing, removing, lubricating or servicing a chain system.
 - Always wear safety glasses when connecting and disconnecting chain.
 - Always loosen tensioning devices.
 - Support the chain to prevent uncontrolled movement of the chain and its parts.
 - Do not attempt to connect or disconnect a chain unless you know the chain construction.
 - Use the correct extractor tools. Tools must be in good condition and properly used.
- Consult the manufacturer or an authorized distributor for complete assembly or disassembly procedures.
 - Avoid crank link joints on high-speed or heavily loaded applications.
 - Never reuse individual components, or a damaged chain or chain part.
 - Roller chain requires lubrication — see section 07.
 - Guards must be provided on all chain and sprocket installations in the USA in accordance with ANSI/ASME B15.1-2000 *Safety standards for mechanical power transmission apparatus* and ANSI/ASME B20.1-2003 *Safety standards for conveyor and related equipment*, or other applicable safety standards. When revisions of these standards are published, the updated editions apply.

Failure to follow these practices could result in damage, serious injury or death.

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01

INTRODUCTION AND EQUIPMENT

Uniking has more than 100 years of combined experience in the operation and maintenance of roller chain.

Involvement with designers, manufacturers and users of all types of equipment has enabled Uniking to develop this guide, designed to pass on the preferred methods of correct handling, adjustment, installation and maintenance of roller chain drives, resulting in maximum chain life.

The notes given here are general recommendations and should be followed in the selection and installation of a chain drive so that satisfactory performance and drive life may be ensured. Should you require any further information, please contact our technical sales staff.

EQUIPMENT NEEDED

- A chain extractor sized to the chain pitch, to break the chain.
- A drift punch, for joining any chain up to 2.5 in pitch.
- Millwrighting equipment — lifting tackle, slings, wedges, packing — for medium and heavy chain

drives.

OTHER USEFUL EQUIPMENT

- A quantity of inner and outer links.
- Straight edges, or a strong, fine line.
- Spirit level and plumb line.
- A selection of hammers, files, key blanks, etc.

BEFORE INSTALLATION — CHECK

- Chain pitch matches the sprocket pitch.
- Sprockets are serviceable; replace them if the teeth are hooked or worn (see section 12).
- Sprocket teeth are clean and free of old lubricant and debris.
- The connecting link (or master link) is on hand and of the correct type for the duty.
- The chain has an even number of pitches wherever possible (see section 10).

02

PREPARATION OF SHAFTS AND SPROCKETS

Check the equipment to ensure that general transmission requirements are correct — for example flexible couplings, flywheel and the means of drive adjustment.

Check the condition and rigidity of the shafts and bearings, particularly if there has been considerable previous service with an alternative method of transmission. Replace or correct if necessary.

Driver and driven shafts should be checked to ensure they are level and parallel to each other. This also applies to the idler shaft, if present. Use a spirit level and an adjustable comparator bar or micrometer between shafts at extreme points on each side of the drive. Correct any parallelism errors and mark a permanent data line for the adjustable shaft.

Place sprockets or respective shafts in approximate alignment and fit the keys in accordance with correct engineering practice. Do not secure the keys at this stage.

Care must be taken with sprockets of split design to ensure perfect adjoining of the faces of each half. Proceed with the key fitting after the halves are finally bolted together, otherwise the key can prevent correct assembly and subsequently result in malgearing.

Verify that key heads will not project beyond the width of any chain case.

IMPORTANT

Sprockets should always be designed to sit as close to the supporting bearings as possible.

03

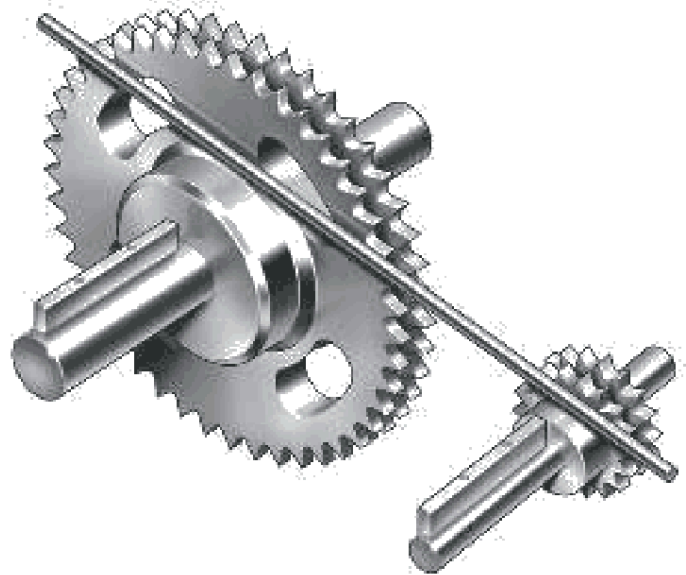
CHECKING SPROCKET ALIGNMENT

Accurate alignment of shafts and sprocket tooth faces provides a uniform distribution of load across the entire chain width and contributes substantially to maximum drive life.

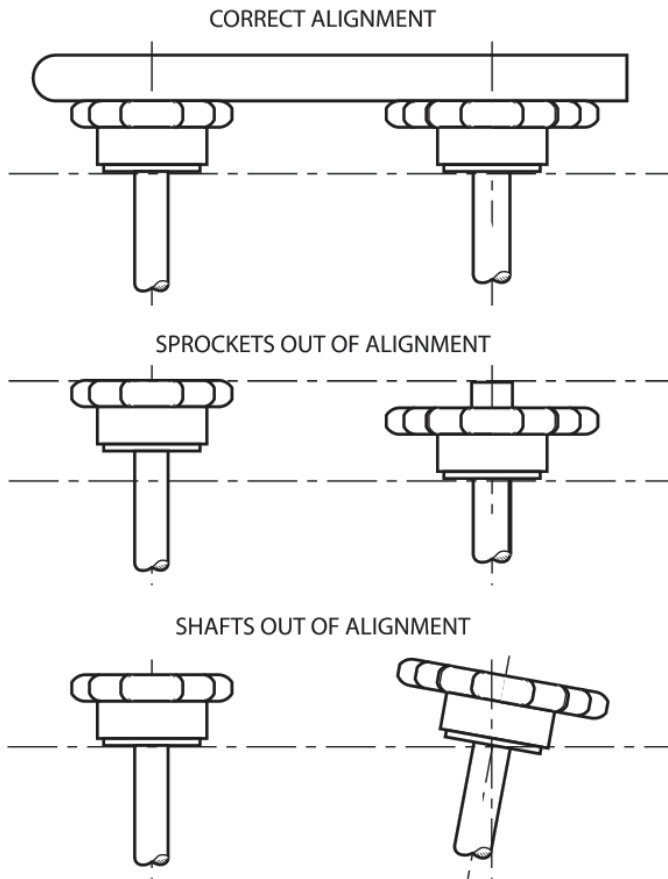
Use a straightedge across the machined faces of the sprockets in several different positions, if possible, as a check against wobble. A nylon or similar line is a good substitute for a straightedge, particularly on longer center distances.

Should endwise "float" of the shafts be present, make due allowance so that sprocket alignment is correct at the mid position of the float.

When alignment is correct within the closest practical limits, drive the keys home and take a final check on sprocket alignment.



CHECKING SPROCKET AND SHAFT ALIGNMENT ACROSS THE MACHINED FACES



CORRECT ALIGNMENT · SPROCKETS OUT OF ALIGNMENT · SHAFTS OUT OF ALIGNMENT

04

INSTALLING THE CHAIN

Chain should not be assembled onto the sprockets until attention has been paid to:

1. Cleanliness of the sprocket teeth, particularly if debris of an abrasive nature (cement dust, weld spatter, etc.) has been prevalent while work was in progress.
2. Temporary positioning of the lower section of a chain case, if present. In restricted spaces, maneuvering of large sections is often simplified by using the spaces between shafts that will later be occupied by the chain.

Ensure the chain is clean and free of debris and place it around the sprockets, observing the instructions in section 11 where matched strands are involved.

In chain with two or more strands, joining is most easily accomplished at the mid-span of the drive, drawing the chain ends together with a chain clamp or rope tackle block. Ensure that the strength of the drawing tackle is sufficient to hold the chain; chain weights are listed in the product catalogue. When inserting the joining link of multi-strand chain, ensure the intermediate plates are assembled. Do not detach the drawing tackle until the link is completely assembled — when only partially inserted through the inner link, the weight of the chain on release can splay or distort unsupported bearing pins.

Adjust the chain using the data mark described in section 02 to retain shaft parallelism, then set the slack as described in section 06.

INSTALLATION SEQUENCE

1. Place the chain over both sprockets.
2. Bring the chain ends together on the slack side.
3. Insert the connecting link pins through the chain ends.
4. Install the connecting plate over the pins.
5. Secure the connecting link with its spring clip, cotters or rivets.
6. Verify the chain engages all sprocket teeth smoothly.

CHAIN CASES

- Position the chain case bottom sections with the shafts concentric in their cavities.
- Manufacture suitable mountings and brackets to ensure rigidity.
- Assemble the oil supply and return pipe system, and the drive to the oil pump.
- Assemble the top section(s) of the chain case.
- Fill the oil sump and check delivery to the chain.

05

CONNECTING LINKS AND RIVETING

When assembling a connecting link with a slip-fit outer plate, the plate must be pushed down on the pins far enough to permit insertion of the fastener. Always ensure that the closed end of the spring clip faces the direction of rotation.

On a press-fit connecting link, drive the outer plate down far enough on the pins to allow insertion of the two split pins, but not so far as to create a tight joint. Correct assembly achieves three things:

- The clearances between the link plates across the chain width are maintained. An outer plate driven too far down the pins squeezes the joint so that no lubrication can reach the bearing surfaces, and prevents the chain articulating freely around the sprockets.

RIVETING CHAIN ENDLESS — ROLLER CHAINS UP TO 2.5 IN PITCH (63.5 MM)

- Insert the bearing pins of the outer link through the inner link of the chain to be joined. On multi-strand chain, assemble the intermediate plates at the same time.
- Provide support for the outer link while assembling the separate outer plate. This has a force fit and is driven onto the bearing pins using a hollow punch, alternately on each pin. Drive up to the shoulder on shouldered bearing pins; where there is no shoulder, drive the plate to the point of similar clearance between outer and inner links as in the adjacent chain.

- A smooth gearing action with a minimum of whipping.
- With the split pins or spring clip snugly positioned against the side plate, and the closed end of a spring clip fitted in the right direction, there is less tendency for them to work loose and fall off.

CRITICAL

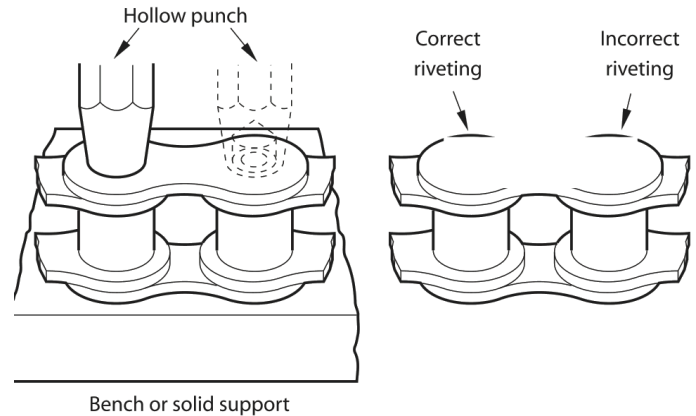
The closed end of the spring clip must face the direction of travel — the opening trails. Fitted the wrong way round, vibration can dislodge the clip and the chain can separate.

SAFETY — CHOICE OF JOINT

Slip-fit connecting links should not be used where high speed or arduous conditions are encountered. In these, or equivalent circumstances where safety is essential, a press-fit connecting link must be used.

For high-speed drives, or drives operating in arduous conditions, a properly riveted outer link should always be used for optimum security in preference to any other form of chain joint. Other connecting and offset links should be restricted to light-duty, non-critical applications in drives where an odd number of pitches is absolutely unavoidable.

- Still supporting the outer link, rivet the bearing pin ends, taking care to finish with a neat uniform spread similar in appearance to the machine-riveted pins in the adjacent chain. The force required to spread the pin end varies with the pitch of the chain; excessive riveting force should always be avoided. Except where final chain joining in position is necessary, the work should be carried out on a bench.
- Check that the newly fitted link articulates freely in the adjacent inner link.



HOLLOW PUNCH ON A BENCH OR SOLID SUPPORT · CORRECT AND INCORRECT RIVETING

No link that relies on a press fit for assembly should be reused after removal. A new link should always be employed.

06

TENSIONING AND ADJUSTMENT

To maximize chain life, some form of chain length adjustment must be provided, preferably by moving one of the shafts (see diagram three). If shaft movement is not possible, an adjustable idler sprocket engaging with the unloaded strand of the chain is recommended.

For a chain of average center distance ($30-50 \times$ chain pitch), correct adjustment is reached when the midpoint of the longest span can be moved by hand through dimension 'A' shown in diagram one. Over-tensioning should be avoided in all cases.

The chain should be adjusted regularly so that, with one strand tight, the slack strand can be moved a distance 'A' at its midpoint. To accommodate any eccentricities of mounting, the adjustment should be tested through a complete revolution of the large sprocket.

Adjustment is achieved either by moving one of the shafts or by using an idler sprocket. The amount of adjustment provided by either method should be sufficient to take up chain wear amounting to two pitches, or 2 % elongation above nominal chain length, whichever is the smaller.

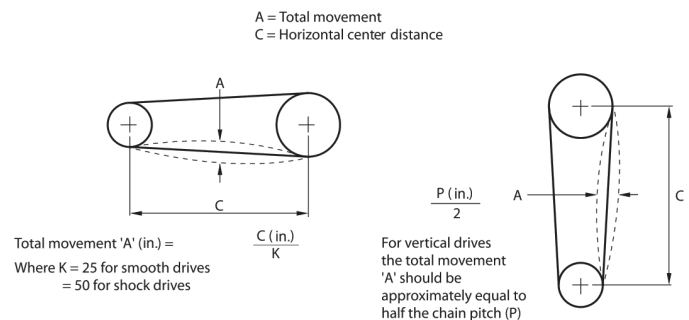


DIAGRAM ONE — TOTAL MOVEMENT 'A' AT THE MIDPOINT OF THE LONGEST SPAN

IDLER SPROCKETS

When used for adjustment, an idler sprocket should be positioned on the unloaded side of the chain, preferably nearer to the driven sprocket, and gear with the outside of the chain. It should have an initial chain lap of at least three teeth, and a free length of chain of not less than four pitches between it and the nearest sprocket.

Generally, the number of teeth in an idler sprocket should not be less than that of the smallest sprocket, and care should be taken to ensure that its speed does not exceed the maximum recommended. Where necessary, several sprockets can be used on a single drive, meeting all possible needs for adjustment.

All mountings for idler sprockets should be rigid, and where manual adjustment is provided the moving member must be securely locked in position after adjustments have been made.

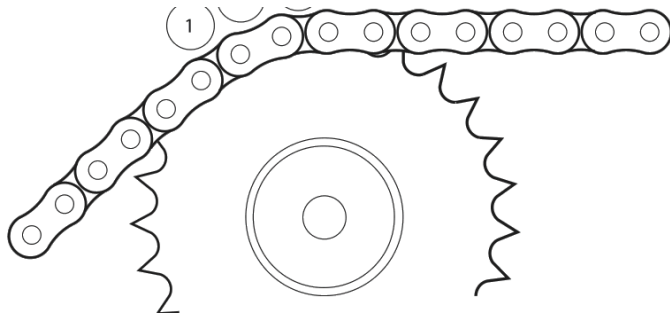


DIAGRAM TWO – IDLER SPROCKET ON THE UNLOADED STRAND

AUTOMATIC ADJUSTMENT

Automatic adjustment can also be provided, but it generally demands a special study of the conditions so that a suitable design can be provided.

TEST RUN

1. Regulate the oil delivery to the chain.
2. Eliminate any oil weeps from the chain case and pipework.

3. Check for any unusual noise or vibration.

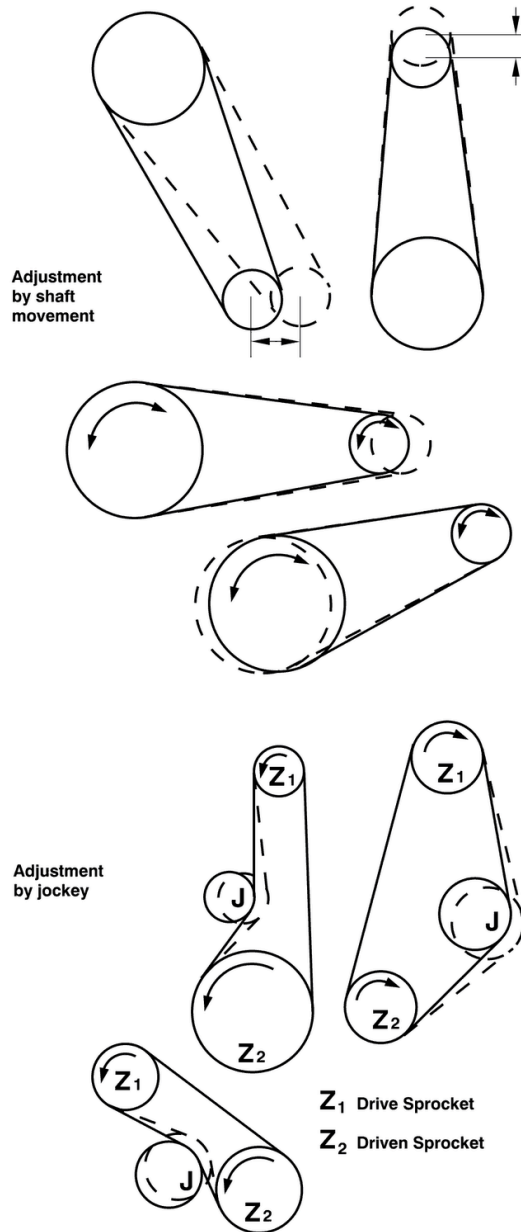


DIAGRAM THREE – ADJUSTMENT BY SHAFT MOVEMENT AND BY JOCKEY (IDLER) SPROCKET.
Z₁ DRIVE SPROCKET · Z₂ DRIVEN SPROCKET · J JOCKEY

07

LUBRICATION

Chain drives should be protected against dirt and moisture and lubricated with a good-quality, non-detergent petroleum-based oil. A periodic change of oil is desirable. Heavy oils and greases are generally too stiff to enter the chain working surfaces and should not be used.

Care must be taken to ensure that the lubricant reaches the bearing area of the chain. Direct the oil into the clearances between the inner and outer link plates, preferably at the point where the chain enters the sprocket on the bottom strand.

The table below gives the correct lubricant viscosity for various ambient temperatures. For the majority of applications in this temperature range, a multigrade SAE 20/50 oil is suitable.

AMBIENT °F	AMBIENT °C	SAE	BS 4231
23 to 41	-5 to +5	20	46 to 68
41 to 104	5 to 40	30	100
104 to 122	40 to 50	40	150 to 220
122 to 140	50 to 60	50	320

LUBRICATING METHODS

There are four basic methods of lubricating a chain drive. The method recommended for a given drive is shown in the chain rating charts, which are determined by chain speed and the power transmitted.

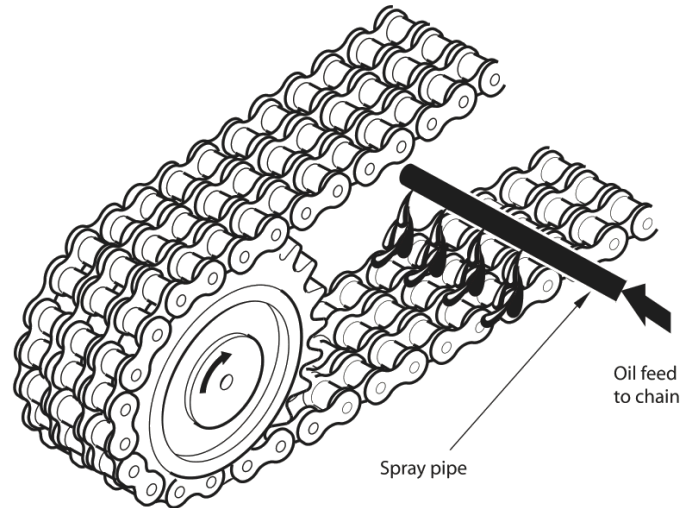
Type 1 • Manual. Oil is applied periodically with a brush or oil can, preferably once every eight hours of operation. Volume and frequency should be sufficient to keep the chain wet with oil and allow penetration of clean lubricant into the chain joints. Applying lubricant by aerosol can be satisfactory under some conditions, provided the aerosol lubricant is of a type approved for the application — one that penetrates into the pin, bushing and roller clearances and resists both draining when the chain is stationary and centrifugal flinging when it is moving.

Type 2 • Drip. Oil drips are directed between the link plate edges from a drip lubricator. Volume and frequency should be sufficient to allow penetration of lubricant into the chain joints.

Type 3 • Bath or disc. With oil bath lubrication, the lower strand of chain runs through a sump of oil in the drive housing; the oil level should cover the chain at its lowest point during operation. With slinger disc lubrication, an oil bath is used but the chain operates above the oil level — a disc picks up oil from the sump and deposits it on the chain by means of deflection plates. Such discs should be designed to have peripheral speeds between 590 and 7,350 ft/min.

Type 4 • Stream. A continuous supply of oil from a circulating pump or central lubricating system is directed onto the chain. Ensure the spray holes are in line with the chain edges, and position the spray pipe so that the oil is delivered onto the chain just before it engages with the

driver sprocket. This ensures the lubricant is centrifuged through the chain and assists in cushioning roller impact on the sprocket teeth. Stream lubrication also provides effective cooling and impact damping at high speeds, so the method of lubrication specified should be closely followed.



TYPE 4 — SPRAY PIPE DELIVERING OIL TO THE CHAIN AHEAD OF THE DRIVER SPROCKET

USE OF GREASE

The use of grease is not recommended. If grease lubrication is essential:

- Limit chain speed to approximately 13 ft/sec (4 m/sec).
- Applying normal greases to the outside surfaces of a chain only seals the bearing surfaces and will not work into them, which causes premature chain failure. Grease must be heated until fluid and the chain immersed and allowed to soak until all air bubbles cease to rise.
- Chains lubricated this way need regular cleaning and regreasing at intervals, depending on the drive, power and speed.

ABNORMAL AMBIENT TEMPERATURES

For elevated temperatures up to 482 °F (250 °C), dry lubricants such as colloidal graphite or MoS₂ in white spirit or poly-alkaline glycol carriers are most suitable. At low temperatures between -40 °F and 23 °F (-40 °C and -5 °C), special low-temperature initial greases and subsequent oil lubricants are necessary. Lubricant suppliers will give recommendations.

EFFECT OF TEMPERATURE

Chain and chain case temperature is an important factor to control. Depending on the severity of the drive service and continuity of use, special attention to the lubrication method may be required. Chain temperatures above 212 °F (100 °C) should be avoided where possible due to

lubricant limitations, although chain can generally give acceptable performance up to approximately 482 °F (250 °C) in some circumstances. One way of improving the effectiveness of the lubrication and its cooling effect is to increase the oil volume — up to 1.2 gallons per minute (4.5 litres per minute) per chain strand — and incorporate a method of external cooling for the oil.

08

MAINTENANCE SCHEDULE AND STORAGE

Regular chain maintenance is important to obtain maximum life. In a correctly sized and installed drive, chain can be expected to last for approximately 15,000 hours. The following schedule is suggested.

AFTER 3 MONTHS

- Check chain adjustment and rectify if necessary.
- Change the oil and oil filter, and clear the sump.

ANNUALLY

- Carry out the above checks.
- Check for wear on the sideplates.
- Check for chain elongation (section 09).
- Check cleanliness of components and remove any accumulation of dirt or foreign material.
- Check shaft and sprocket alignment.
- Check for wear on the sprockets.
- Check the condition of the lubricant.

ANNUALLY — LUBRICATION SYSTEM

- Feed pipes are not clogged.
- The lubrication schedule is being followed (manual lubrication).
- Drip rate is sufficient (drip system).
- Oil level is correct (drip, bath and disc systems).
- The pump is working (stream system).

CHAIN PROTECTION AND STORAGE

A new chain should always be stored in its box and/or bag until installation. Chain is lubricated at the factory, but that lubrication will not stand up to outdoor conditions, particularly in a saltwater atmosphere. Unprotected, lubricated chains become contaminated with grit and other materials that harm the chain and tend to clog strainers, filters and oil lines. A roller chain is a precision-made series of bearings that will perform best if handled and stored in correct conditions.

09

MEASURING CHAIN WEAR

A direct measure of chain wear is the extension in excess of the nominal length of the chain. Chain wear can therefore be ascertained by length measurement, as follows.

- Lay the chain — which should terminate at both ends with an inner link (roller link) — on a flat surface. Anchor it at one end and attach a turnbuckle and a spring balance to the other end.
- Apply a tension load by means of the turnbuckle amounting to:

CHAIN	MEASURING LOAD
Single strand	$(25.4 \times P)^2 \times 0.173 \text{ lbs}$
Double strand	$(25.4 \times P)^2 \times 0.351 \text{ lbs}$
Triple strand	$(25.4 \times P)^2 \times 0.524 \text{ lbs}$

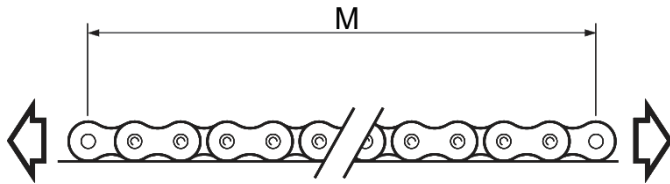
where P is the pitch in inches. For extended pitch chains (chains having the same breaking load and twice the pitch), apply the measuring load for the equivalent short pitch chain.

- As an alternative to a turnbuckle and spring balance, the chain may be hung vertically with the equivalent weight attached to the lower end.
- Measure length 'M' in inches, then calculate the percentage extension:

Percent elongation =

$$[M - (X \times P)] \div (X \times P) \times 100$$

where X = number of pitches measured and P = pitch in inches



LENGTH 'M' MEASURED OVER A WHOLE NUMBER OF PITCHES, CHAIN UNDER MEASURING LOAD

As a general rule, the useful life of the chain is terminated and the chain should be replaced when the percentage extension reaches 2 % (1 % in the case of extended pitch chains). For drives with no provision for adjustment the rejection limit is lower, depending on the speed and layout; a usual figure is between 0.7 % and 1.0 % extension.

CHAIN WEAR GUIDE

A simple-to-use chain wear guide is available from Uniking for most popular chain pitches. Contact your sales office for details.

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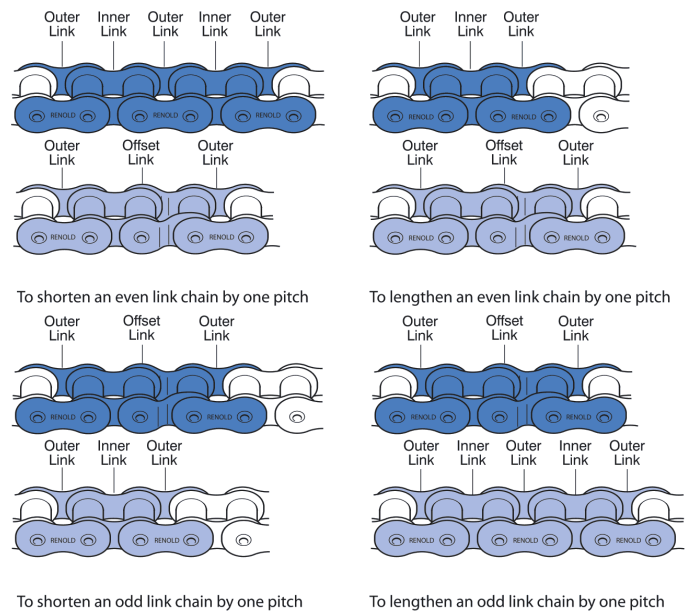
CHAIN LENGTH ALTERATIONS

All drives should be designed, whenever possible, with sufficient overall adjustment to ensure the use of an even number of pitches throughout the useful life of the chain. Offset links should never be used on highly loaded or high-speed chain drives.

In less arduous conditions, where the use of an offset link is unavoidable, the diagrams show how length alteration can be accomplished:

- A chain with an even number of links requires the incorporation of an offset link to effect an alteration of one pitch.
- A chain with an odd number of links incorporates an offset link, which must be removed to effect an alteration of one pitch.
- By removing the parts shown in dark shading and substituting those in light shading, a chain can be shortened or lengthened by one pitch.

No link that relies on a press fit for assembly should be reused after removal. A new link should always be employed.



SHORTENING AND LENGTHENING EVEN-LINK AND ODD-LINK CHAIN BY ONE PITCH

11

PAIRING AND MATCHING CHAINS

Any application in which two or more strands of roller chain operate side by side in a common drive or conveying arrangement may involve the need for either pairing or matching.

LENGTH MATCHING FOR CONVEYING AND SIMILAR APPLICATIONS

- The chains are accurately measured in handling lengths between 10 and 25 feet, as appropriate, and then selected to provide two (or more) strand drives with overall length uniformity within close limits. Such uniformity will not necessarily apply to intermediate sections along the chains, but the actual length of all intermediate sections, both along and across the drive, will not vary by more than normal manufacturing limits. Attachment chains are usually manufactured to specific orders, generally completed in one production run, so length differences of intermediate sections will be small.
- Chains are supplied in sets that are uniform in overall length within reasonably fine limits. Chain sets supplied against different orders at different times may not have exactly the same lengths as those supplied originally, but will vary by no more than the normal tolerance of 0.0 %, +0.15 %.

PITCH MATCHING ROLLER CHAINS

Pitch-matched chains are built up from shorter subsections (usually 1 to 2 feet long) which are first measured and then graded for length. All subsections in each grade are of closely similar length, and those forming any one group across the set of chains are selected from the same length grade. The requisite number of groups are then connected to form a pitch-matched set of chains or, if too long for convenient handling, a set of handling sections for the customer to assemble. Suitable tags are fixed to the chains to ensure they are connected together in the correct sequence.

IDENTIFICATION OF HANDLING LENGTHS

Long chains are made up in sections, each numbered on the end links. Sections should be joined so that end links with similar numbers are connected. When chains run in

sets of two or more strands, each strand is stamped on the end links of each section with a letter in addition to being numbered. Correct consecutive sections for each strand must be identified from the end links and joined up as indicated. By these means the actual length of any intermediate portion of one strand corresponds closely with the transversely equivalent portion on the other strands, generally within 0.002 in, depending on the chain pitch size.

STRAND	HANDLING LENGTH 1	HANDLING LENGTH 2	HANDLING LENGTH 3
A strand	A-A1	A1-A2	A2-A3
B strand	B-B1	B1-B2	B2-B3
C strand	C-C1	C1-C2	C2-C3

PITCH MATCHING ATTACHMENTS FITTED TO CHAINS

With the sole exception of extended bearing pins, it is not possible to match the pitch of holes in attachments themselves to within very fine limits, because of the additional tolerances involved in bending, holing and similar operations.

COLOR CODING

For customers who wish to match their chains, Uniking color codes short lengths of chain within specified tolerance bands. Red, yellow and green paint marks indicate the lower, mid and upper thirds of the tolerance band. For finer tolerance bands, additional colors can be used; a maximum of five colors is normally more than adequate.

COLOR	TOLERANCE
Red	0.05 %
Yellow	0.10 %
Green	0.15 %
Blue	For finer tolerances
White	For finer tolerances

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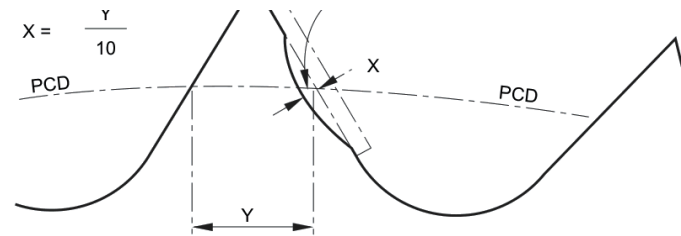
REPAIR AND REPLACEMENT

SPROCKETS

Examination of the tooth faces indicates the amount of wear that has occurred. Under normal circumstances this is evident as a polished worn strip about the pitch circle diameter on each of the sprocket teeth.

If the depth of this wear 'X' has reached an amount equal to 10 % of the 'Y' dimension, steps should be taken to replace the sprocket. Running a new chain on sprockets with this amount of tooth wear will cause rapid chain wear.

In normal operating conditions with correct lubrication, the amount of wear 'X' will not occur until several chains have been used.



SPROCKET TOOTH WEAR — REPLACE WHEN X REACHES $Y \div 10$

CHAIN

Chain repair should not, as a rule, be necessary. A correctly selected and maintained chain should gradually wear out over a period of time (approximately 15,000 hours), but it should not fail. A length extension check as detailed in section 09 will give an indication of the service life remaining.

If a transmission chain sustains damage due to an overload, a jam-up, or by riding over sprocket teeth, it should be carefully removed from the drive and given a thorough visual examination. Remove the lubricating grease and oil to make the job easier.

Depending on the damage, it may be practicable to effect temporary repairs using replacement links. This is not, however, a guarantee that the chain has not been overstressed and so made vulnerable to a future failure. The best policy is to remove the source of trouble and fit a new chain. If a chain has failed two or more times, it is certain to fail again in time and should be replaced immediately; further repair and use is not recommended.

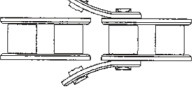
The entire chain should be replaced, because:

- The cost of downtime to the system or machine often outweighs the cost of replacing the chain.
- A new, or even used, portion of chain or links assembled into the failed chain will cause whipping and load pulsation. This is likely to produce rapid chain failure and will accelerate wear of both the chain and its sprockets.

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TROUBLESHOOTING GUIDE

CONDITION OR SYMPTOM	POSSIBLE CAUSE	SUGGESTED REMEDY
Rusted chain	Exposed to moisture Water in lubricant Inadequate lubrication	Replace with nickel-plated or stainless steel chain. Change the lubricant and protect the lubrication system from water; replace the chain if necessary. Provide or re-establish proper lubrication.
Wear on roller link plates and on one side of the sprocket tooth surface	Sprocket misalignment	Inspect chain and sprockets for damage; re-align sprockets and shafts.
Chain clings to the sprocket teeth	Excessive sprocket wear Sprocket misalignment	Inspect the chain for damage and replace the sprockets. Inspect chain and sprockets for damage; re-align sprockets and shafts.
Chain climbs the sprocket teeth	Excessive chain slack Excessive chain wear Excessive sprocket wear Extreme overload	Re-tension the chain. Replace the chain. Inspect the chain for damage and replace the sprockets. Inspect the drive, replace the chain and eliminate the cause of the overload.
Excessive noise	Obstruction Loose casing or shaft mounts Excessive chain slack Excessive chain or sprocket wear Sprocket misalignment Inadequate lubrication Chain pitch too large Too few sprocket teeth	Inspect and remove the obstruction; replace the chain if necessary. Tighten fasteners. Re-tension the chain. Replace the chain; inspect for damage and replace the sprockets. Re-align sprockets and shafts. Inspect the chain, clean it and establish correct lubrication. Redesign the drive using a smaller chain pitch (multiple strands) if possible. Check whether larger sprockets can be used; if not, redesign using a smaller pitch.
Missing or broken cotters	Cotters installed improperly Excessive vibration Excessive chain speed	Install new cotters. Reduce vibration; use larger sprockets if possible. Reduce speed if possible, or redesign for smaller-pitch chain (multiple strands).
Broken link plates  ULTIMATE STRENGTH FAILURE	Extreme overload	Replace the chain and inspect all drive components for damage; replace damaged components and eliminate the cause of the overload.

CONDITION OR SYMPTOM	POSSIBLE CAUSE	SUGGESTED REMEDY
 FATIGUE FAILURE	Loading greater than the chain's dynamic capacity	Inspect the drive to determine the cause of the high load and eliminate it if possible; redesign using a higher-capacity chain if it cannot be eliminated.
 STRESS CORROSION CRACKING	Exposure to severe corrosion combined with high interference fits Hydrogen embrittlement from improper plating of the chain	Protect the chain from corrosion or use stainless steel products. Never plate chains — order plated chain from the manufacturer.
Pin failures  BROKEN PINS	Extreme overload	Replace the chain and inspect all drive components for damage; replace damaged components and eliminate the cause of the overload.
 PIN GALLING	Inadequate lubrication	Replace the chain and lubricate properly.
 TURNED PINS	Overload	Replace the chain and inspect all drive components for damage; replace damaged components and eliminate the cause of the overload.

CHAIN SUPPLY AND SUPPORT

Uniking Canada supplies ANSI and BS roller chain, sprockets and accessories, with cross-reference and identification support for existing drives. For help selecting a chain, matching an existing one, or reviewing a drive that is giving trouble, contact us at info@unikingcanada.com or **514.886.5270**.

This document gives general recommendations for ANSI and BS roller chain drives. Drive-specific ratings, chain weights and lubrication selection charts are given in the relevant Uniking product catalogue. Where equipment manufacturers' instructions differ, those instructions take precedence.