# RB544 SP HD Round baler

# **SERVICE MANUAL**

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## **SERVICE MANUAL**

**Fixed Chamber** 

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## **Advice**

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All repair and maintenance works listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given; and using, whenever appropriate, the special tools.

Anyone who carries out the above operations without complying with the instructions shall be responsible for the subsequent damages.

The manufacturer and all the organizations of it's distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages due to the anomalous behavior of parts and/or components not approved by the manufacturer himself, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages due to an anomalous behavior of parts and/or components not approved by the manufacturer.

The information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information may not be updated due to modifications of a technical or commercial type, as well as to suit the laws and regulations of different countries.

In case of questions, refer to your Sales and Service Networks.

## **Foreword**

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances. Your CASE IH dealer can also provide assistance.

### **Helpful hints**

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere.
   Your CASE IH dealer or air-conditioning specialist has a special extractor for this purpose and can recharge the system properly.
- · Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

### **Battery recycling**

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE IH strongly recommends that you return all used batteries to a CASE IH dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.

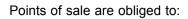


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#### Mandatory battery recycling

NOTE: The following requirements are mandatory in Brazil.

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.



- · Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

## Safety rules

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#### LEGAL OBLIGATIONS

This machine may be equipped with special guarding or other devices in compliance with local legislation. Some to these require active use by the operator. Therefor, check local legislations on the usage of this machine.

#### ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of non compliance to simple and fundamental safety principles. For this reason, IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED by applying the fundamental safety principles, acting with the necessary caution and care.

Accidents may occur with all types of machine, regardless of how well the machine in question was designed and built.

### **A** CAUTION

**Unexpected machine movement!** 

- 1. Disengage all drives.
- 2. Engage parking brake.
- 3. Lower all attachments to the ground, or raise and engage all safety locks.
- 4. Shut off engine.
- 5. Remove key from key switch.
- 6. Switch off battery key, if installed.
- 7. Wait for all machine movement to stop.

Failure to comply could result in minor or moderate injury.

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# SAFETY REQUIREMENTS FOR FLUID POWER SYSTEMS AND COMPONENTS - HY-DRAULICS (EUROPEAN STANDARD EN982)

- Flexible hose assemblies must not be constructed from hoses which have been previously used as part of a hose assembly.
- · Do not weld hydraulic pipes: when flexible hoses or piping are damaged, replace them immediately.
- It is forbidden to modify a hydraulic accumulator by machining, welding or any other way.
- Before removing hydraulic accumulators for servicing, the liquid pressure in the accumulators must be reduced to zero.
- Pressure check on hydraulic accumulators must be carried out by a method recommended by the accumulator manufacturer.
- Take care not to exceed the maximum allowed pressure of the accumulator. After any check or adjustment, check
  for leakages or gas in the hoses or tubes.

#### SAFETY RULES

General guidelines

- Carefully follow specified repair and maintenance procedures.
- When appropriate, use P.P.E (Personal Protective Equipment)
- Do not wear rings, wristwatches, jewellery, unbuttoned or loose articles of clothing such as: ties, torn clothing, scarves, open jackets or shirts with open zips that may remain entangled in moving parts. It is advised to wear approved safety clothing, e.g.: non-slip footwear, gloves, safety goggles, helmets, etc.
- Do not carry out repair operations with someone sitting in the driver's seat, unless the person is a trained technician who is assisting with the operation in question.
- Do not operate the machine or use any of the implements from different positions, other than the driver's seat.

- Do not carry out operations on the machine with the engine running, unless specifically indicated.
- Bring all hydraulic cylinders to the home positions (down, retracted, etc.) before engine shut down.
- Stop the engine and check that the hydraulic circuits are pressure-free before removing caps, covers, valves, etc.
- All repair and maintenance operations must be carried out using extreme care and attention.
- Service steps and platforms used in the workshop or elsewhere should be built according to the applicable standards and legislation.
- Disconnect the Power Take-Off (PTO) and label the controls to indicate that the machine is being serviced.
- Brakes are inoperative when manually released for repair or maintenance purposes. Use blocks or similar devices to secure the machine in these conditions.
- Only use specified towing points for towing the machine. Connect parts carefully. Make sure that all pins and/or locks are secured in position before applying traction. Never remain near the towing bars, cables or chains that are operating under load.
- When loading or unloading the machine from the trailer (or other means of transport), select a flat area capable of
  sustaining the trailer or truck wheels. Firmly secure the machine to the truck or trailer and lock the wheels in the
  position used by the carrier.
- Electric heaters, battery-chargers and similar equipment must only be powered by auxiliary power supplies with efficient ground insulation to avoid electrical shock hazards.
- Always use suitable hoisting or lifting devices when raising or moving heavy parts.
- · Keep bystanders away.
- Never use gasoline, diesel oil or other inflammable liquids as cleaning agents. Use non-inflammable, non toxic commercially available solvents.
- · Wear safety goggles with side guards when cleaning parts with compressed air.
- Never use open flames for lighting when working on the machine or checking for leaks.
- When carrying out checks with the engine running, request the assistance of an operator in the driver's seat. The operator must maintain visual contact with the service technician at all times.
- If operating outside the workshop, position the machine on a flat surface and lock in position. If working on a slope, lock the machine in position. Move to a flat area as soon as is safely possible.
- Maintenance and repair operations must be carried out in a clean and dry area. Clean up any water or oil spillage immediately.
- Do not create piles of oil or grease-soaked rags as they represent a serious fire hazard. Always store rags in a closed metal container.
- Before engaging the machine, make sure that there are no persons within the machine or implement range of action.
- Empty your pockets of all objects that may fall accidentally unobserved into the machine inner compartments.
- When metal parts are sticking out, use protective goggles or goggles with side guards, helmets, special footwear and gloves.
- When welding, use protective safety devices: tinted safety goggles, helmets, special overalls, gloves and footwear.
   All persons present in the area where welding is taking place must wear tinted goggles. NEVER LOOK DIRECTLY AT THE WELDING ARC WITHOUT SUITABLE EYE PROTECTION.

### Machine start-up.

- Never run the engine in confined spaces that are not equipped with adequate ventilation for exhaust gas extraction.
- · Never place the head, body, limbs, feet, hands or fingers near rotating and moving parts.

#### Hydraulic systems and fuel injection systems

- A liquid leaking from a tiny hole may be almost invisible but, at the same time, be powerful enough to penetrate
  the skin. Therefore, NEVER USE HANDS TO CHECK FOR LEAKS but use a piece of cardboard or paper for this
  purpose. If any liquid penetrates skin tissue, call for medical aid immediately. Failure to treat this condition with
  correct medical procedure may result in serious infection or death.
- In order to check the pressure in the system use suitable instruments.

#### Wheels and tires

- Make sure that the tires are correctly inflated at the pressure specified by the manufacturer. Periodically check the rims and tires for damage.
- Stand away from (at the side of) the tire when checking inflation pressure.
- Do not use parts of recovered wheels as incorrect welding brazing or heating may weaken and eventually cause damage to the wheel.
- Never cut or weld a rim mounted with an inflated tire.
- Deflate the tire before removing any objects that may be jammed in the tire tread.
- Never inflate tires using inflammable gases, as this may result in explosions and injury to bystanders.

#### Removal and installation

- Lift and handle all heavy parts using suitable hoisting equipment. Make sure that parts are sustained by appropriate
  hooks and slings. Use the hoisting eyebolts for lifting operations. Extra care should be taken if persons are present
  near the load to be lifted.
- Handle all parts carefully. Do not put your hands or fingers between parts. Wear suitable safety clothing safety goggles, gloves and shoes.
- Avoid twisting chains or metal cables. Always wear safety gloves when handling cables or chains.
- Damaged or bent chains or cables are unreliable. Do not use them for lifting or towing. Always use suitable protective gloves when handling chains or cables.
- Chains should always be safely secured. Make sure that the hitch-up point is capable of sustaining the load in question. Keep the area near the hitch-up point, chains or cables free of all bystanders.
- Metal cables tend to fray with repeated use. Always use suitable protective devices (gloves, goggles, etc.) when handling cables.

## **Basic instructions**

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#### SHIMMING

For each adjustment operation, select adjusting shims and measure individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value indicated on each shim.

#### ROTATING SHAFT SEALS

For correct rotating shaft seal installation, proceed as follows:

- before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes
- · thoroughly clean the shaft and check that the working surface on the shaft is not damaged
- position the sealing lip facing the fluid; with hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will deviate the fluid towards the inner side of the seal
- coat the sealing lip with a thin layer of lubricant (use oil rather than grease) and fill the gap between the sealing lip and the dust lip on double lip seals with grease
- · insert the seal in its seat and press down using a flat punch, do not tap the seal with a hammer or mallet
- whilst inserting the seal, check that it is perpendicular to the seat; once settled, make sure that it makes contact with the thrust element, if required
- · to prevent damaging the seal lip on the shaft, position a protective guard during installation operations

## **O-RING SEALS**

Lubricate the O-RING seals before inserting them in the seats, this will prevent them from overturning and twisting, which would jeopardise sealing efficiency.

#### **SEALING COMPOUNDS**

Apply one of the following sealing compounds on the mating surfaces marked with an X: RTV SILMATE, RHODORSIL CAF 1 or LOCTITE PLASTIC GASKET. Before applying the sealing compound, prepare the surfaces as follows:

- · remove any incrustations using a metal brush
- thoroughly de-grease the surfaces using one of the following cleaning agents: trichlorethylene, petrol or a water and soda solution

#### **COTTER PINS**

When fitting split cotter pins, ensure that the pin notch is positioned in the direction of the force required to stress the pin. Spiral cotter pins do not require special positioning.

# PROTECTING THE ELECTRONIC/ ELECTRICAL SYSTEMS DURING CHARGING OR WELD-ING

To avoid damage to the electronic/electrical systems, always observe the following:

- 1. Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
- 2. Never short any of the charging components to ground.
- Always disconnect the ground cable from the battery before arc welding on the combine or on any header attached to the combine.
  - · position the welder ground clamp as close to the welding area as possible
  - if welding in close proximity to a computer module, then the module should be removed from the combine
  - never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding
    is in progress
- 4. Always disconnect the negative cable from the battery when charging the battery in the combine with a battery charger.

**NOTICE:** If welding must be performed on the unit, either the combine or the header (if it is attached), the battery ground cable must be disconnected from the combine battery. The electronic monitoring system and charging system will be damaged if this is not done.

Remove the battery ground cable. Reconnect the cable when welding is completed.

#### 

Battery acid causes severe burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote - EXTERNAL: flush with water. INTERNAL: drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetables oil. Call physician immediately. EYES: flush with water for 15 minutes and get prompt medical attention.

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#### SPARE PARTS

Only use "CNH Original Parts" or " CASE IH Parts".

Only genuine spare parts guarantee the same quality, duration and safety as original parts, as they are the same parts that are assembled during standard production. Only "CNH Original Parts" or " CASE IH Parts" can offer this guarantee.

When ordering spare parts, always provide the following information:

- · machine model (commercial name) and serial number
- part number of the ordered part, which can be found in the "Microfiches" or the "Service Parts Catalogue", used for order processing

#### **TOOLS**

The tools that CASE IH suggests and illustrate in this manual have been:

- specifically researched and designed for use with CASE IH machines
- · essential for reliable repair operations
- · accurately built and rigorously tested so as to offer efficient and long-lasting operation

By using these tools, repair personnel will benefit from:

- · operating in optimal technical conditions
- · obtaining the best results
- · saving time and effort
- · working in safe conditions

**NOTE:** Wear limit values indicated for certain parts should be considered to be recommended, but not binding. The terms "front", "rear", "right-hand" and "left-hand" (when referred to different parts) are determined from the rear, facing in the direction of travel of the machine during operation.

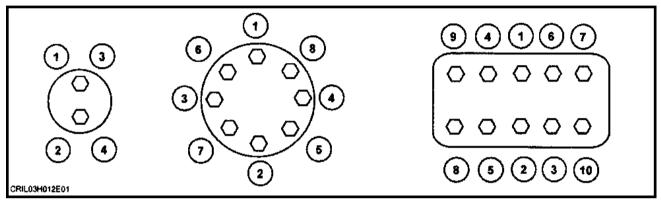
## **Torque**

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# Minimum hardware tightening torques (in N m or lb in /lb ft) for normal assembly applications unless otherwise stated

**NOTICE:** Shown below is the suggested initial torque tightening sequences for general applications, tighten in sequence from item 1 through to the last item of the hardware.

The minimum hardware tightening torque on drawings, in specifications etc. have priority. The applicable CNH Standard is ENS7001.



DF5019-1

#### Metric hardware

Metric har	dware			-			
	Class	8.8 in N m (lb in	or lb ft)	Class 10.9 in N m (lb in or lb ft)			
Nominal Size	Plated nut	Lock nut	Hardened nut	Plated nut	Lock nut	Hardened nut	
M3	1.3 N·m	0.7 N·m	1.2 N·m	1.8 N·m	0.9 N·m	1.6 N·m	
	(11.5 lb in)	(6.2 lb in)	(10.6 lb in)	(15.9 lb in)	(8.0 lb in)	(14.2 lb in)	
M4	2.9 N·m	1.6 N·m	2.6 N·m	4.2 N·m	2.3 N·m	3.7 N·m	
	(25.7 lb in)	(14.2 lb in)	(23.0 lb in)	(37.2 lb in)	(20.4 lb in)	(32.7 lb in)	
M5	5.9 N·m	3.2 N·m	5.3 N·m	8.5 N·m	4.6 N·m	7.6 N·m	
	(52.2 lb in)	(28.3 lb in)	(46.9 lb in)	(75.2 lb in)	(40.7 lb in)	(67.3 lb in)	
M6	10.1 N·m	5.5 N·m	9.1 N·m	14.5 N·m	7.9 N·m	13 N·m	
	(89.4 lb in)	(48.7 lb in)	(80.5 lb in)	(10.7 lb ft)	(69.9 lb in)	(9.6 lb ft)	
M8	24.5 N·m	13.5 N·m	22 N·m	35.1 N·m	19.3 N·m	31.5 N·m	
	(18.1 lb ft)	(10.0 lb ft)	(16.2 lb ft)	(25.9 lb ft)	(14.2 lb ft)	(23.2 lb ft)	
M10	48.7 N·m	26.8 N·m	43.8 N·m	69.5 N·m	38.2 N·m	62.5 N·m	
	(35.9 lb ft)	(19.8 lb ft)	(32.3 lb ft)	(51.3 lb ft)	(28.2 lb ft)	(46.1 lb ft)	
M12	85 N·m	46.7 N·m	76.5 N·m	121 N·m	66.5 N·m	108.9 N·m	
	(62.7 lb ft)	(34.4 lb ft)	(56.4 lb ft)	(89.2 lb ft)	(49.0 lb ft)	(80.3 lb ft)	
M14	135 N·m	74.2 N·m	121.5 N·m	193 N·m	106.1 N·m	173.7 N·m	
	(99.6 lb ft)	(54.7 lb ft)	(89.6 lb ft)	(142.3 lb ft)	(78.3 lb ft)	(128.1 lb ft)	
M16	210 N·m	115.5 N·m	189 N·m	301 N·m	165.5 N·m	270.9 N·m	
	(154.9 lb ft)	(85.2 lb ft)	(139.4 lb ft)	(222 lb ft)	(122.1 lb ft)	(199.8 lb ft)	
M18	299 N·m	164.4 N·m	269.1 N·m	414 N·m	227.7 N·m	372.6 N·m	
	(220.5 lb ft)	(121.3 lb ft)	(198.5 lb ft)	(305.4 lb ft)	(167.9 lb ft)	(274.8 lb ft)	
M20	425 N·m	233.72 N·m	382.5 N·m	587 N·m	322.8 N·m	528.3 N·m	
	(313.5 lb ft)	(172.4 lb ft)	(282.1 lb ft)	(432.9 lb ft)	(238.1 lb ft)	(389.7 lb ft)	
M22	579 N·m	318.4 N·m	521.1 N·m	801 N·m	440.5 N·m	720.9 N·m	
	(427 lb ft)	(234.8 lb ft)	(384.3 lb ft)	(590.8 lb ft)	(324.9 lb ft)	(531.7 lb ft)	
M24	735 N·m	404.2 N·m	661.5 N·m	1016 N·m	558.8 N·m	914.4 N·m	
	(542.1 lb ft)	(298.1 lb ft)	(487.9 lb ft)	(749.4 lb ft)	(412.1 lb ft)	(674.4 lb ft)	
M27	1073 N·m	590.1 N·m	967.5 N·m	1486 N·m	817.3 N·m	1337 N·m	
	(791.4 lb ft)	(435.2 lb ft)	(713.6 lb ft)	(1096 lb ft)	(602.8 lb ft)	(986.1 lb ft)	
M30	1461 N·m	803.5 N·m	1315 N·m	2020 N·m	1111 N·m	1818 N·m	
	(1077.6 lb ft)	(592.6 lb ft)	(969.9 lb ft)	(1489.9 lb ft)	(819.4 lb ft)	(1340.9 lb ft)	

# IDENTIFICATION HEX CAP SCREW AND CARRIAGE BOLTS















SAE GRADE 2

SAE GRADE 5

SAE GRADE 8

REGULAR NUTS

SAE GRADE 5 HEX NUTS

SAE GRADE 8
HEX NUTS

## **LOCKNUTS**



GRADE IDENTIFICATION

**GRADE A: NO NOTCHES** 

GRADE B: ONE CIRCUMFERENTIAL NOTCH GRADE C: TWO CIRCUMFERENTIAL NOTCHES



**GRADE IDENTIFICATION** 

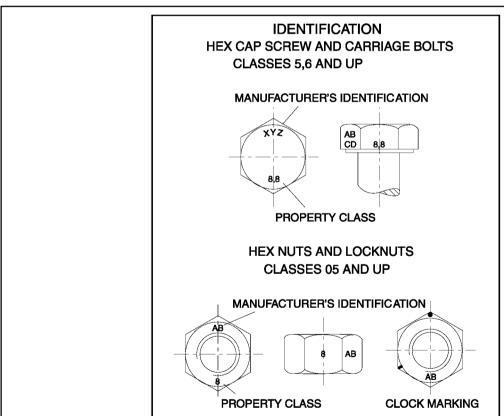


GRADE IDENTIFICATION GRADE A: NO MARKS GRADE B: THREE MARKS GRADE C: SIX MARKS

ZEIL06CS0136F0A

ZEIL06CS0135F0A

ZEIL06CS0136F0A



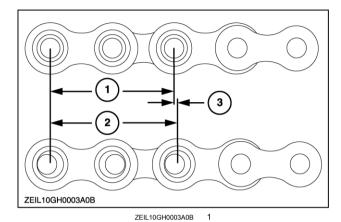
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## **Basic instructions - Chain Wear Tables - Roller Chains**

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#### Chain Wear

The individual joints in a roller chain articulate as they enter and leave the sprockets. This articulation results in wear on the pins and bushings. A material is worn away from these surfaces the chain will gradually elongate.



Chains do not "stretch" - material is removed from pin and bushing.

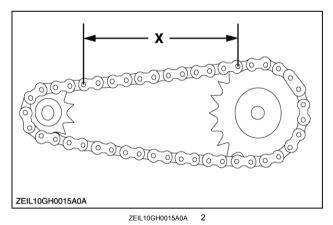
(1): 2x pitch

(2): 2x pitch + wear

(3): elongation due to pin and bushing wear.

Elongation is normal and may be minimized by proper lubrication and drive maintenance. The rate of wear is dependent upon: the relationship between the load and the amount of bearing area between pin and bushing, the material and surface condition of the bearing surfaces, the adequacy of lubrication and the frequency and degree of articulation between pins and bushings.

The latter is determined by the quantity of sprockets in the drive, their speeds, the number of teeth and the length of the chain in pitches.



Measurement of Chain For Wear Elongation

Relatively accurate wear measurements can be made by using the above illustration. Measure as closely as possible from the center of one pin to the center of another. The more pitches (pins) contained within the measurement increase the accuracy. If the measured value exceeds the nominal by more than the allowable percentage the chain should be replaced.

The maximum allowable wear elongation is approximately **3** % for most industrial applications, based upon sprocket design. The allowable chain wear in percent can be calculated using the relationship: 200/ **(N)**, where **(N)** is the number of teeth in the large sprocket.

This relationship is often useful since the normal maximum allowable chain wear elongation of **3** % is valid only up to 67 teeth in the large sprocket. In drives having fixed center distances, chains running in parallel or where smoother operation is required, wear should be limited to approximately **1.5** %.

For example, if 40 pitches (40 pins) of a #40 chain were measured and the result was **523 mm** (**20.6 in**) or greater (using **3** % as the maximum allowable wear), the chain should be replaced. Anything less than **523 mm** (**20.6 in**) would still be acceptable by most industrial standards.

### **WEAR LIMITS ON ROLLER CHAIN**

Strand Length	No. 40 Chain (08A)		No. 50 Chain (10A)		No. 60 Chain (12A)		No. 80 Chain (16A)	
in Pitches	New	Replace	New	Replace	New	Replace	New	Replace
40P	508 mm	523 mm	635 mm	654 mm	762 mm	787 mm	1016 mm	1047 mm
	(20.0 in)	(20.6 in)	(25.0 in)	(25.7 in)	(30.0 in)	(31.0 in)	(40.0 in)	(41.2 in)
50P	635 mm	654 mm	793 mm	817 mm	952 mm	981 mm	1270 mm	1308 mm
	(25.0 in)	(25.7 in)	(31.2 in)	(32.2 in)	(37.5 in)	(38.6 in)	(50.0 in)	(51.5 in)
60P	762 mm	784 mm	952 mm	981 mm	1143 mm	1177 mm	1524 mm	1568 mm
	(30.0 in)	(30.9 in)	(37.5 in)	(38.6 in)	(45.0 in)	(46.3 in)	(60.0 in)	(61.7 in)
70P	889 mm	914 mm	1111 mm	1144 mm	1333 mm	1371 mm	1778 mm	1828 mm
	(35.0 in)	(36.0 in)	(43.7 in)	(45.0 in)	(52.5 in)	(54.0 in)	(70.0 in)	(72.0 in)
80P	1016 mm	1047 mm	1270 mm	1308 mm	1524 mm	1568 mm	2032 mm	2095 mm
	(40.0 in)	(41.2 in)	(50.0 in)	(51.5 in)	(60.0 in)	(61.7 in)	(80.0 in)	(82.5 in)
90P	1143 mm	1177 mm	1428 mm	1473 mm	1714 mm	1765 mm	2286 mm	2355 mm
	(45.0 in)	(46.3 in)	(56.2 in)	(58.0 in)	(67.5 in)	(69.5 in)	(90.0 in)	(92.7 in)
100P	1270 mm	1308 mm	1578 mm	1635 mm	1905 mm	1962 mm	2540 mm	2616 mm
	(50.0 in)	(51.5 in)	(62.1 in)	(64.4 in)	(75.0 in)	(77.2 in)	(100.0 in)	(103.0 in)

### STANDARD ROLLER CHAIN SIZES - NEW CHAINS

Chain No.	150 Chain No.	Pitch	Width	Roller Diameter
40	08A	12.7 mm (0.5 in)	7.9 mm (0.3 in)	7.9 mm (0.3 in)
50	10A	15.8 mm (0.6 in)	9.5 mm (0.4 in)	10.1 mm (0.4 in)
60	12A	19 mm (0.7 in)	12.7 mm (0.5 in)	11.9 mm (0.5 in)
80	16A	25.4 mm (1.0 in)	15.8 mm (0.6 in)	15.8 mm (0.6 in)
100	20A	31.7 mm (1.2 in)	19 mm (0.7 in)	19 mm (0.7 in)
120	24A	38.1 mm (1.5 in)	25.4 mm (1.0 in)	22.2 mm (0.9 in)
140	28A	44.4 mm (1.7 in)	25.4 mm (1.0 in)	25.4 mm (1.0 in)
160	32A	50.8 mm (2.0 in)	31.7 mm (1.2 in)	28.5 mm (1.1 in)
180	*	57.1 mm (2.2 in)	35.7 mm (1.4 in)	35.7 mm (1.4 in)
200	40A	63.4 mm (2.5 in)	38.1 mm (1.5 in)	39.6 mm (1.6 in)

<sup>\*</sup> No. 150 Number does not exist.

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