



# DIAMOND® ROLLER CHAIN

**For Agricultural and Construction Equipment**







## FABRICATION

While roller chain would appear to be a simple product, the number of components in a ten foot section of 40 pitch chain totals 1,200 parts. Taking into consideration the horsepower, high speed and extreme operating conditions, the potential for failure is tremendous.

Diamond Chain designs each component to exacting dimensional standards and has a rigorous quality control system in place to ensure that only qualified pieces reach the final assembly stage.



			
<b>PLATES:</b> Inner and outer plates go through a four stage pitch hole process to create a maximum bearing area that is straight, smooth, and burr-free.	<b>PINS:</b> Precision grinding ensures consistent fit and smooth travel.	<b>ROLLERS:</b> Seamless roller design and dimensional control allows for extrusion with near perfect roundness.	<b>BUSHINGS:</b> Dimensional control enables bushings to be extruded with uniform wall thickness and concentricity for smooth travel. Near perfect roundness increases the effective bearing area for the pin.



## HEAT TREATMENT

The Diamond Chain Company heat treats components using dedicated carburizing furnaces set to precise temperatures. Through strict control of both atmosphere and quench, chain components receive maximum carbon penetration for a high carbon surface and low carbon core. This process ensures consistent depth of case hardening increasing strength, durability, and wear resistance.



## SHOT PEENING

The Diamond Chain Company uses proprietary shot peening machinery. The machinery was developed and custom made to ensure consistent intensity and coverage of components during the shot peen process, assuring that components receive the same level of treatment for consistent compressive surface stress which helps to increase fatigue resistance.



## LUBRICATION

The Diamond Chain Company understands the importance of proper lubrication and the impact on wear life. Diamond Chain uses both a proprietary lubrication formula and “hot dip” process on all lubricated roller chains. The “hot dip” process ensures complete coverage of components while the proprietary lubrication maintains maximum continuing surface retention following the treatment. Special additives in the lubrication further enhance corrosion protection and extend wear life.



## PRELOADING

The final stage of the manufacturing and assembly process for each Diamond Chain Company roller chain is the preloading process. Preloading approximates the recommended maximum loading during usage and is done to firmly seat pins and bushings in place and eliminate any initial elongation that may take place.





## DIAMOND U.S.A. MADE ROLLER CHAIN – CNH PART NUMBERS

CHAIN SIZE	P/N 10' ROLLS	P/N 50' ROLLS	P/N 100' ROLLS	P/N CONN. LINK	P/N OFFSET LINK	P/N ROLLER LINK
35	1789DX	B91537X	1132025R1X	241-3313	241-3713	241-3113
41	475879R91X	B91539X	1132026R1X	241-2314	241-2714	241-2114
40	1790DX	B91538X	1132027R1X	25195	73341314	241-1114
50	1791DX	B91540X	1740DX	87034815	241-1715	241-1115
60	73341310	B91541X	1132028R1X	241-1316	73341313	241-1116
60H	73341311	B91542X	1741DX	785210	241-4716	241-4116
80	73341315	1132180R1X	N/A	241-1418	241-1718	140774
80H	73341316	1132181R1X	N/A	632415	241-4718	241-4118
100	B93424X	B93427X	N/A	B93425	B93426	NA
100H	73341320	B96620	N/A	241-44110	241-47110	241-41110
120	B504416X	N/A	N/A	B504418	B504417	B504419
120H	B96621	B96622	N/A	N/A	N/A	N/A
140H	B500769X	B96623	N/A	B500770	B500771	N/A
160H	B500772X	B96624	N/A	B500773	B500774	N/A
40-2	B91407X	B91547X	B91408X	B91409	B91410	241-1114
50-2	73341321	1132080R1X	N/A	241-1325	241-1725	241-1115
60-2	73341322	B92566X	N/A	B92567	B92568	241-1116
60H-2	73341319	B90938X	N/A	241-4326	241-4726	241-4116
80H-2	21350R1X	N/A	N/A	241-4428	241-4728	241-4118
2040	569088R91X	B91543X	1132029R1X	242-138	73341318	242-118
2050	569089R91X	B91544X	1743DX	242-1310	242-1710	242-1110
2060	569090R91X	B91545X	1132030R1X	242-1312	242-1712	242-1112
2060H	1798DX	B91546X	1132031R1X	86637776	242-4712	242-4112
C2050	27815R91X	B96623	N/A	242-1310	242-1710	242-1110
C2060	569090R91X	N/A	N/A	242-1312	242-1712	242-1112
C2100H	N/A	B504413X	N/A	B504415	B504414	N/A

Note: All bulk chain part numbers are “per foot”.

Example: part number 1791DX is 1-foot of #50 chain, ordered in multiples of 10.



## PROPER CHAIN LUBRICATION

Roller chain consists of a series of connecting traveling metallic bearings, which must be properly lubricated to obtain the maximum service life of the chain. Although many slow speed drives operate successfully with little or no lubrication beyond the initial factory lubrication, proper lubrication will greatly extend the useful life of every chain drive.

### The chain drive requires lubrication for six purposes:

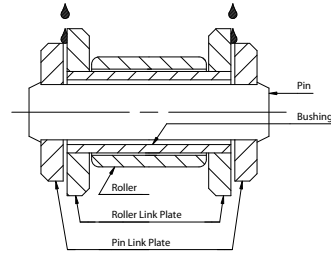
1. To resist wear of the pin-bushing joint.
2. To cushion impact loads.
3. To dissipate any heat generated.
4. To flush away foreign materials.
5. To lubricate chain-sprocket contact surfaces.
6. To retard rust or corrosion.

A good grade of clean petroleum oil without additives, free flowing at the prevailing temperatures, should be used. Some additives leave a varnish or gum deposit which prevents the oil from entering chain joints. Heavy oils and greases are generally too stiff to enter the chain joints and should not be used.

With proper lubrication, a separating wedge of lubrication is formed between the pins and bushings in the chain joints much like that formed in journal bearings. The viscosity of the lubricant greatly affects its film strength, and its ability to separate moving parts. The highest viscosity oil which will flow between the chain linkplates and fill the pin-bushing areas will provide the best wear life. This is essential to minimize metal to metal contact and, if supplied in sufficient volume, the lubricant also provides effective cooling and impact dampening at higher speeds.

Chain drives should be protected from abrasive and corrosive conditions and the oil supply kept free of contamination. Periodic oil changes are desirable.

**Note:** Oil should be applied to the lower span of chain on the upper edges of linkplates since access of oil to pin-bushing joints is possible only through the clearances between the roller chain linkplates.



Oil applied to rollers only cannot reach pin-bushing joints, and therefore, cannot retard chain elongation due to wear. The lengthening of chains in service results from wear on pin and bushing surfaces, not rollers. When lubricating multiple strand chain, it is important that lubricant be directed to each row of chain linkplates. In conveyor applications, oil should be directed between the rollers and bushings as well as between the chain linkplates.

### The table indicates the lubricant viscosity recommended for various surrounding temperatures:

Recommended Grade	Operating Temperature F°
SAE 5	-50 to +50
SAE 10	-20 to +80
SAE 20	+10 to +110
SAE 30	+20 to +130
SAE 40	+30 to +140
SAE 50	+40 to +150

# ROLLER CHAIN INSPECTION

All chain drives should receive regular maintenance. Each drive should be inspected after the initial 100 hours of operation. Thereafter, most drives may be inspected at 500 hour intervals. However, drives subject to shock loads or severe operating conditions, such as most ag chains, should be inspected at 200 hour intervals, or as recommended in your operator's manual.

**At each inspection, the following items should be checked and corrected, if necessary:**

**1. Check Lubrication** — On slow speed drives, where manual lubrication is used, be sure the lubrication schedule is being followed. If the chain is covered with dirt and debris, clean the chain with kerosene.

**WARNING! NEVER USE GASOLINE OR OTHER HIGHLY FLAMMABLE SOLVENTS TO CLEAN A CHAIN. A FIRE MAY RESULT.**

If drip lubrication is used, check for adequate oil flow and proper application to the chain. With bath or pump lubrication, check oil level and add oil if needed. Check oil for contamination and change oil if needed. Change oil after the first 100 hours of operation and each 500 hours thereafter. If pump lubrication is used, check each orifice to be sure it is clear and is directing oil onto the chain properly.

**2. Check Chain Tension** — Check chain tension and adjust as needed to maintain the proper sag in the slack span. If elongation exceeds the available adjustment, remove two pitches and reconnect the chain.

**3. Check Chain Wear** — Measure the chain wear elongation and if elongation exceeds functional limits or is greater than 3% (.36 inches in one foot) replace the entire chain. Do not connect a new section of chain to a worn chain because it may run rough and damage the drive. Do not continue to run a chain worn beyond 3% elongation because the chain will not engage the sprockets properly and it may damage the sprockets.

**4. Check Sprocket Tooth Wear** — Check for roughness or binding when the chain engages or disengages from the sprocket. Inspect the sprocket teeth for reduced tooth section and hooked tooth tips. If these conditions are present, the sprocket teeth are excessively worn and the sprocket should be replaced. Do not run new chain on worn sprockets as it will cause the new chain to wear rapidly. Conversely, do not run a worn chain on new sprockets as it will cause the new sprockets to wear rapidly.




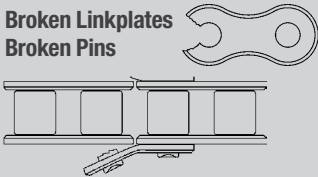

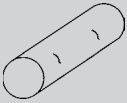
**5. Check Sprocket Alignment** — If there is noticeable wear on the inside surface of the chain roller linkplates, the sprockets may be misaligned. Realign the sprockets as outlined in the installation instructions to prevent further abnormal chain and sprocket wear.

**6. Check for Drive Interference** — Check for interference between the drive and other parts of the equipment. If there is any, correct it immediately. Interference can cause abnormal and potentially destructive wear on the chain or the interfering part. If the edges of the chain linkplates impact against a rigid part, linkplate fatigue and chain failure can result.

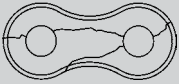


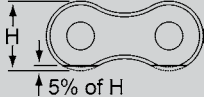
**Note:** Check for and eliminate any buildup of debris or foreign material between the chain and sprockets. A relatively small amount of debris in the sprocket roll seat can cause tensile loads great enough to break the chain if forced through the drive.

**7. Check for Failure** — Inspect the chain for binding, cracked, broken or deformed parts. If any of these conditions are found, REPLACE THE ENTIRE CHAIN, even though portions of the chain appear to be in good condition. In all likelihood, the entire chain has been damaged.

## TROUBLESHOOTING GUIDE

CONDITION/SYMPTOM	POSSIBLE CAUSE	WHAT TO DO
<b>Tight Joints</b> 	Dirt or foreign material in chain joints.	Clean and re-lubricate chain.
	Inadequate lubrication.	Replace chain. Re-establish proper lubrication.
	Misalignment.	Replace sprockets and chain if needed. Realign sprockets.
	Internal corrosion or rust.	Replace chain. Eliminate cause of corrosion or protect chain.
	Overload bends pins or spreads roller linkplates.	Replace chain. Eliminate cause of overload.
<b>Rusted Chain</b>	Exposed to moisture.	Replace chain. Protect from moisture.
	Water in lubricant.	Change lubricant. Protect lubrication system from water. Replace chain.
	Inadequate lubrication.	Provide or re-establish proper lubrication. Replace chain if needed.
<b>Turned Pins</b> 	Overload.	Replace chain. Eliminate cause of overload.
	Inadequate lubrication.	Replace chain. Re-establish proper lubrication.
<b>Enlarged Holes</b> 	Overload.	Replace chain. Eliminate cause of overload.
<b>Broken Linkplates Broken Pins</b> 	Extreme Overload.	Replace chain. Replace sprockets if indicated. Eliminate cause of overload or redesign drive for larger pitch chain.
<b>Broken, Cracked or Deformed Rollers</b> 	Speed too high.	Replace chain. Reduce speed.
	Sprockets too small.	Replace chain. Use larger sprockets, or possibly redesign drive for smaller pitch chain.
	Chain riding too high on sprocket teeth.	Replace chain. Re-tension chain more often.
<b>Pin Galling</b> 	Speed or load too high.	Reduce speed or load. Possibly redesign drive for smaller pitch chain.
	Inadequate lubrication.	Provide or re-establish proper lubrication.
<b>Chain Climbs Sprocket Teeth</b>	Excess chain slack.	Re-tension chain.
	Excessive chain wear.	Replace and re-tension chain.
	Excessive sprocket wear.	Replace sprockets and chain.
	Excessive overload.	Replace chain. Eliminate cause of overload.

# TROUBLESHOOTING GUIDE

CONDITION/SYMPTOM	POSSIBLE CAUSE	WHAT TO DO
Missing or Broken Cotters	Cotters installed improperly.	Install new cotters per manufacturer's instructions.
	Vibration.	Replace chain. Reduce vibration. Use larger sprockets.
	Excessively high speed.	Replace chain. Reduce speed. Redesign drive for smaller pitch chain.
Exposed Chain Surfaces Corroded or Pitted	Exposure to corrosive environment.	Replace chain. Protect from hostile environment.
Cracked Linkplates (Stress Corrosion) 	Exposure to corrosive environment combined with stress from press fits.	Replace chain. Protect from hostile environment.
Cracked Linkplates (Fatigue) 	Load is greater than chain's dynamic capacity.	Replace chain. Reduce dynamic loading or redesign drive for larger chain.
Battered Linkplate Edges 	Chain striking an obstruction.	Replace chain. Eliminate interference.
Worn Linkplate Contours 	Chain rubbing on casing, guide, or obstruction.	Replace chain if 5% or more of height worn away. Re-tension chain. Eliminate interference.
Excessive Noise	Chain striking an obstruction.	Replace chain. Eliminate interference.
	Loose casing or shaft mounts.	Tighten fasteners.
	Excess chain slack.	Re-tension chain.
	Excessive sprocket wear.	Replace and re-tension chain.
	Sprocket misalignment.	Replace chain and sprockets, if needed. Realign sprockets.
	Inadequate lubrication.	Replace chain if needed. Re-establish proper lubrication.
	Chain pitch too large.	Redesign drive for smaller pitch chain.
	Too few sprocket teeth.	Check to see if larger sprockets can be used. If not, redesign drive.
Wear on Inside of Roller Linkplates and One Side of Sprockets	Sprocket misalignment.	Replace sprockets and chain if needed. Realign drive. Re-tension chain.
Chain Clings to Sprocket	Excessive sprocket wear.	Replace sprockets and chain.
	Sprocket misalignment.	Replace sprockets and chain if needed. Realign sprockets.





When purchasing roller chain, it may be tempting to consider lower-priced or import options. The actual chain price is only a small piece of the cost to repair. Increased maintenance, reduced chain life, poor machine performance and the cost of down-time can quickly turn any savings into a higher cost of ownership. Save your time, money and equipment by using CNH Original Parts, USA-made roller chain manufactured by Diamond Chain Company.



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