GD-HOIST

Technical Manual

Hoist Inspection and Maintenance Guide

Inspection Record For:

Hoist Model No.: _____

Hoist Serial No.: _____

⚠ **WARNING! Failure to follow these inspection procedures can cause personal injury and property damage.**

Table of Contents

GD-HOIST

Hoist Model: _____ Hoist Serial Number: _____

HOOKS

	Yes	No
Cracks _____	☐	○
Wear _____	☐	○
Bent _____	☐	○
Spreading _____	☐	○
Freely Rotate _____	○	☐
Safety Latch _____	○	☐

CHAIN

	Yes	No
Bent _____	☐	○
Cracked _____	☐	○
Twisted _____	☐	○
Distorted _____	☐	○

BRAKES

	Yes	No
Slipping Under Load _____	☐	○
Excessive Pad Lining Wear _____	☐	○
Excessive Load Drift _____	☐	○

SUPPORTING STRUCTURE

	Yes	No
Continued ability to support Imposed loads _____	○	☐

SPROCKETS & GUIDES

	Yes	No
Worn Excessively _____	☐	○
Cracked or Worn _____	☐	○

LUBRICATION

	Yes	No
All points lubricated as Specified in lube chart _____	○	☐

HOUSING

	Yes	No
Cracks _____	☐	○
Loose Hardware _____	☐	○

OPERATION CONTROLS

	Yes	No
Operating Properly _____	○	☐

LIMIT STOPS

	Yes	No
Operating Properly _____	○	☐

CAUTION PLATE

	Yes	No
Visible and Legible _____	○	☐

⚠ **CAUTION: If any squares (☐) are checked, do not operate the hoist until repairs have been made.**

Remarks and repairs made: _____

_____

_____

_____

Signature: _____ Date: _____ Clock Number: _____

Roller and Link Chain Air Hoist Preventive Maintenance Schedule

The periods between inspections will vary due to a wide range of duty cycles and operating conditions encountered with this type of equipment. The following inspection periods are based on average duty with single shift operation *(40 hours per week)* under normal environmental conditions. If the hoist is used in heavier applications, or under adverse environmental conditions, it should be inspected more frequently.

Daily Inspection

Check for the following items before operating the hoist:

1. **Air Connections:** Worn hoses & loose connections.
2. **Hooks:** Cracks, deformation, or damage from chemicals. The bottom hook must swivel freely. Check safety latches; replace bent or broken parts. *NOTE: A latch will not work properly on a hook with a bent or worn tip.* Replace hooks when the hook's maximum deformation indicator measures dimension shown in the chart below or whose tip has been bent more than 10 degrees out of plane from hook body or is in any other way distorted or bent. Also see ANSI B30.10 for additional information.
3. **Controls:** Check all controls and operating mechanism for proper operation.
4. **Limit Stops:** Upper and lower limit stops for proper operation. The limit stop operation check shall be determined by tests under no-load conditions and under slowest speeds obtainable, both directions; also test at maximum speeds.
5. **Chain:** Nicks, gouges, corrosion, twists and distorted links.
6. **Suspension Members:** Hook assemblies for rotation; trolley wheels and load bars for improper spacing or loose fasteners.
7. **Brakes:** With a rated load on the hook, check for excessive hook drift when control is released. Check the brake for proper adjustment.
8. *Hardware:* Check for damaged or missing parts. *NOTE: Bent or twisted hooks indicate overloading or abuse of the unit. Other load bearing components of the hoist or trolley should be inspected if overloading is apparent.*

⚠ **CAUTION: Do not operate the hoist if it is functioning improperly or if damage is noted.**

Monthly Inspection

1. Check all items listed under **Daily Inspection**.
2. **Chain:** If chain binds, jumps, or is noisy, check for cleanliness and proper lubrication. If problem persists, inspect chain for wear and stretch, worn sprocket or chain guide.
3. **Load and Idler Sprockets:** Worn sprockets should be replaced. Worn sprockets can greatly reduce the life of the hoisting chain.
4. **Hardware:** Check for loose bolts, nuts and rivets.
5. **Motor Brake:** The motor brake should be checked for excessive wear or uneven lining wear. Replace the brake lining if worn to 3/32". If the drum is scored, it should be replaced. Replace disc brake pads if glazed from excessive heat or if run out of adjustment. If disc or disc driver is scored or grooves are worn in them, they must be replaced.

Annual Inspection

1. All **Daily Inspection** and **Monthly Inspection** items.

2. **Hooks:** At least once per year, a dye penetrate, magnetic particle, or other suitable crack-detecting inspection should be performed.

3. **Load Bearing Parts:** Check for worn, cracked or distorted parts; hook blocks, suspension housing, yokes, suspension bolts, shafts and bearings on the hoist and trolley *(if equipped)*.

4. **Supporting Structure or Trolley:** If used, should be checked for continued ability to support imposed loads.

Inspection Record Logs

9 and 10 of this document are inspection record logs and are to be filled out and signed by the person making the inspection.

Function Testing

After repair of the hoist, test with a light load for proper function. Load test the unit with 125% of the rated capacity by lifting and lowering through a short distance.

Inspection Records

In addition to compliance with OSHA standard 1910.179, Tool House recommends written, dated and signed inspection records be made monthly on hooks, chains and brakes. Records should be readily available.

Tool House incorporates markings forged into the hook which addresses two Crosby "Quic-Check" features, deformation indicators and angle indicators.

Deformation Indicators

Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a Quic-Check measurement to determine if the throat opening has changed, indicating abuse or overloading.

Use a measuring device *(i.e. tape measure)* to measure the distance between these marks. The marks should align to either an inch or half-inch increments on the measuring device. If the measurement does not meet these criteria, the hook should be inspected further for possible damage.

Angle Indicators

Indicates the maximum included angle allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other angles between two sling legs.

Table "A" lists the Deformation Indicator dimensions for determining hook replacement.

Table "A"

Hoist Series	Hoist Capacity (lbs)	Crosby Hook Code	Normal Deformation Indicator (in.)	Maximum Deformation Indicator (in.)	Upper Hook Replacement Latch	Lower Hook Replacement Latch	Upper Bullard Replacement Latch Kit	Lower Bullard Replacement Latch Kit
7	275	DC	1.5	1.725	540832	542390	---	---
K5	550/1100	FC/FA/FB	1.5	1.725	A27352	540832	526567	526566
K5	2200	HC	2.0	2.300	542388	542388	526567	526567
K1	2200	IC/IA	2.5	2.875	542386	542386	528618	528618
K1	3300	IC/IA	2.5	2.875	542386	542386	528618	528618
K1	4400	IC/IA	2.5	2.875	542386	542386	528618	528618
K1	6600	CM#7/D	2.5	2.875	542389	542389	528618	528618
K1	8800	CM#7/D	2.5	2.875	542389	542389	528618	528618
P1 *	300/500/1000	FC/FA/FB	1.5	1.725	---	542390	---	526566
P1	300/500/1000	FC/FA/FB	1.5	1.725	540832	540832	526566	526566
P1 (SR)	500		1.5	1.725	A27305	A27305	---	---
P1 (SR)	1000		1.5	1.725	542406	542406	---	---
P1	2000		1.5	1.725	542388	542388	526567	526567
P2	1100/2200	HC	2.0	2.300	542388	542388	526567	526567
P2 (SR)	1500	HB	2.0	2.300	542406	542406	526567	526567
P2 (SR)	3000	IB	2.5	2.875	542407	542407	528618	528618
P2	4400	Valcan #7	NA	NA	542386	542386	528618	528618
P3	2200	HA	2.0	2.300	542386	542386	528618	528618
P3	4300	HA	2.0	2.300	542386	542386	528618	528618
P3	8000	JC	3.0	3.450	542389	542389	528618	528618

*Note: Trolley mounted models
SR = Spark Resistant

Link Chain Inspection & Maintenance Guide: Includes Severely Worn Links In A Localized Zone

Inspection:

Clean the chain with solvent to allow a visual inspection for defects. Chain will wear more in the area that travels over the sprocket wheel when the chain is loaded and areas that rub on other surfaces. Very short lifts will produce inner link wear in a small number of links that cannot be detected using the standard 19-25 link chain gages.

With the chain slack, perform a link by link inspection making sure to expose and examine all surfaces of the chain. It is especially important to look at the bearing areas of the chain (inside surface of the link ends), as these are the areas that experience the greatest wear and are normally hidden by the adjacent links. The chain should be examined for:

☑ **Nicks**   ☑ **Gouges**
☑ **Twists**   ☑ **Cracks**
☑ **Stretch**   ☑ **Excessive Wear**

If any of these conditions are present, the chain should be immediately removed from service.

There are three ways to check for excessive wear. Wear is most prevalent in the section of chain that is going over the sprocket wheel of the hoist. Always check the area of the chain that is going over the sprocket wheel for wear.

1) Normal Service: The overall length of chain shown in Table "B" should be measured in chain that travels over the sprocket wheel in normal use. This measures the outside to outside length of chain when approximately a 50-lb. Load is applied to the chain, see Figure 1. Tool House does offer gages to make this measurement easy. The gage part numbers are shown in Table "B".

Table "B"

Hoist Series	Gage Number	Diameter of Chain Stock	Number of Links in Gage	Maximum Length Allowable	Bulk Chain Replacement Number
K7	536167	0.197	25	15.386	532394 Standard
P1	536168	0.218	25	16.313	20676 Standard 31445 Zinc Plated
K5	536169	0.250	25	19.363	522893 Standard 536462 Zinc Plated
P2	536170	0.281	25	20.602	20592 Standard 29962 Zinc Plated
P2 *	None	0.281	25	21.005 *	541397 Spark Resistant
P3N	536171	0.312	21	18.875	507245 Zinc Plated
K1 / P3	536172	0.375	19	20.203	542040 Standard 513131 Zinc Plated

2) Short Lift: If the duty application is a short travel distance, the chain may wear in a localized area. In this case, or if severe localized wear is observed for any other reason, the maximum allowable length over the number of links shown in Table "C" should be used as out of service criteria. These measurements can typically be made with dial calipers. The measurement method is the same as shown in Figure 1.

Table "C"

Hoist Series	Diameter of Chain Stock	Number of Links To Be Measured	Maximum Length Allowable	Bulk Chain Replacement Number
K7	0.197	13	8.178	532394 Standard
P1	0.218	13	8.675	20676 Standard 31445 Zinc Plated
K5	0.250	13	10.288	522893 Standard 536462 Zinc Plated
P2	0.281	13	10.967	20592 Standard 29962 Zinc Plated
P2 *	0.281	13	11.177 *	541397 Spark Resistant
P3N	0.312	13	11.905	507245 Zinc Plated
K1 / P3	0.375	11	11.987	542040 Standard 513131 Zinc Plated

*Note: Material is Stainless Steel and will wear faster than Case Harden Alloy Steel. This Stainless Steel chain has a working load of 1500 lbs. single reeved and 3000 lbs. double reeved. **DO NOT OVERLOAD!**

3) Single Link: No individual single link should be used if worn so that the inner link length is greater than the dimension shown in Table "D". This measurement is taken as shown in Figure 2, and is not done under any load. This measurement is typically made with dial calipers.

Table "D"

Hoist Series	Diameter of Chain Stock	Number of Links To Be Measured	Inner Link Maximum Length Allowable	Bulk Chain Replacement Number
K7	0.197	1	0.604	532394 Standard
P1	0.218	1	0.639	20676 Standard 31445 Zinc Plated
K5	0.250	1	0.760	522893 Standard 536462 Zinc Plated
P2	0.281	1	0.807	20592 Standard 29962 Zinc Plated
P2 *	0.281	1	0.825 *	541397 Spark Resistant
P3N	0.312	1	0.875	507245 Zinc Plated
K1 / P3	0.375	1	1.034	542040 Standard 513131 Zinc Plated

*Note: Material is Stainless Steel and will wear faster than Case Harden Alloy Steel. This Stainless Steel chain has a working load of 1500 lbs. single reeved and 3000 lbs. double reeved. **DO NOT OVERLOAD!**

Replace if chain is worn beyond any of the maximum length allowable limits as shown in Tables "A", "B", or "C". Before returning the chain to service, apply penetrating oil and graphite (per instructions on Tool House' # 535577 8-oz. Tube). Excess oil from the chain can be removed to minimize dripping.

CAUTION: DO NOT assume that the load chain is safe solely because it measures below the dimension shown in the table. Nicked, gouged or twisted chain must also be replaced. High cycles, fast starts and quick stops can cause shock loading in excess of the standard working load which can cause stress cracks in the chain. In these types of applications, also check the chain by use of NDT (nondestructive tests) – MT (magnetic particle inspection) or PT (liquid penetrant inspection). When in doubt, replace the chain with only Tool House (GD Hoist) chain. **DO NOT ATTEMPT TO REPAIR CHAIN!**

DO NOT use a new chain on a worn sprocket. Replace worn chain and worn sprocket as a pair. On hoists with spark resistant (stainless steel) chain you will replace the chain many times before you will see wear on the sprocket because the chain is much softer than the hardness on the sprocket wheel.

Replacement:

To insert a new chain, remove the hook assembly from the chain. Attach a link, with one side cut out, to the end of the old chain. Attach the new chain to the other end of the open link, making sure the link welds on the new chain are in the same position as the link welds on the old chain. Operate the hoist slowly, drawing the new chain into the sprocket. The link weld must be in the upstanding position (link weld away from the sprocket wheel inner groove), see Figure 3. After the new chain has been run over the sprocket, remove the old chain and open link. Attach the hook assembly to the new chain.

On double reeved models, be sure there is no twist in the chain. Run the hoist "UP" until only about three feet of chain remains on the load end side. This will minimize the chance of introducing a twist between the hook block and the hoist. Allow the chain to hang free to remove twists. Insert the chain into the lower block (upstanding link first). Upstanding links will have the weld toward the lower sprocket inner groove. Insert the last link into the slot in the upper hook or trolley assembly adapter, making sure there is no twist. The last link of the chain may have to be cut if a twist is apparent. Fasten to the hook or trolley assembly adapter securely with the chain adapter bolt and nut.
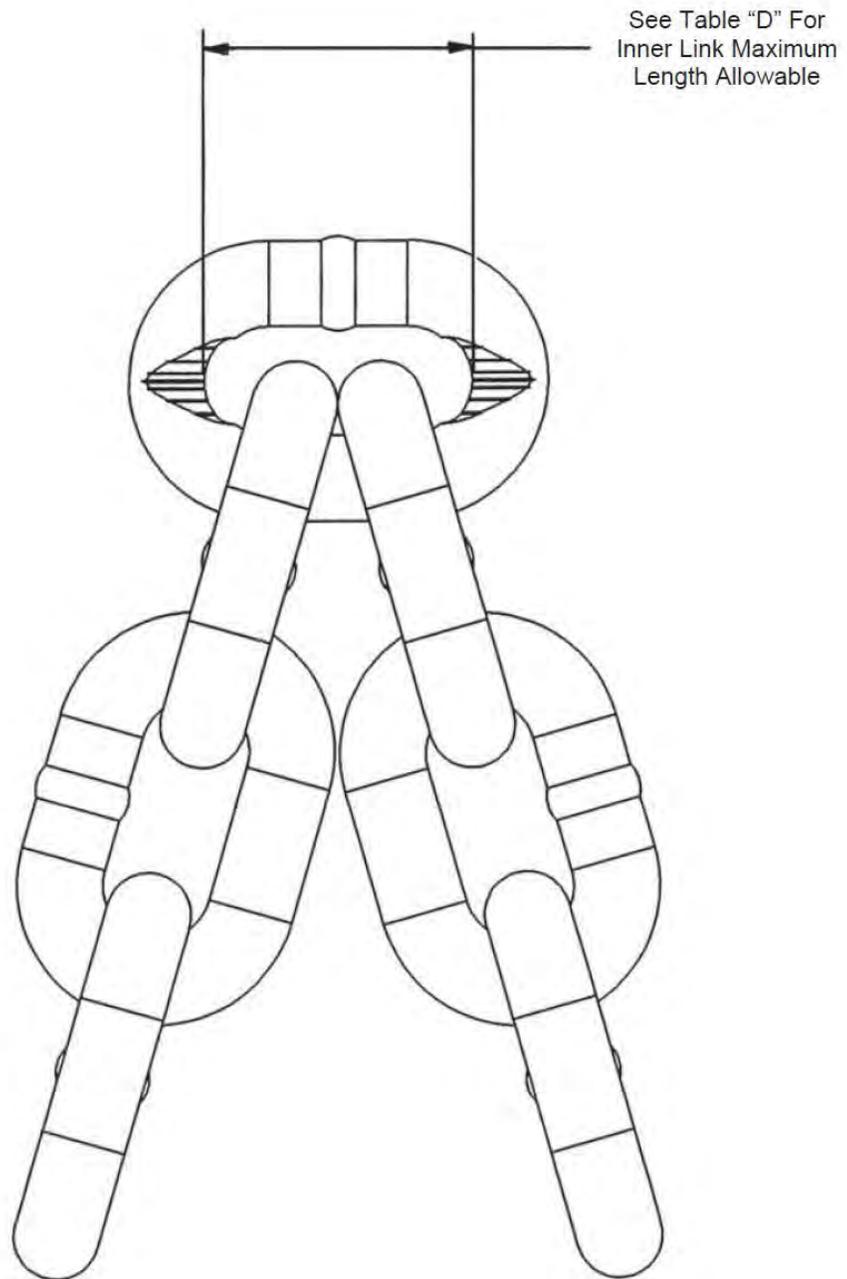
Figure 1 – Chain Link Gages

Note: P1 series hoist link chain and hook assembly shown, other hoist series are similar.
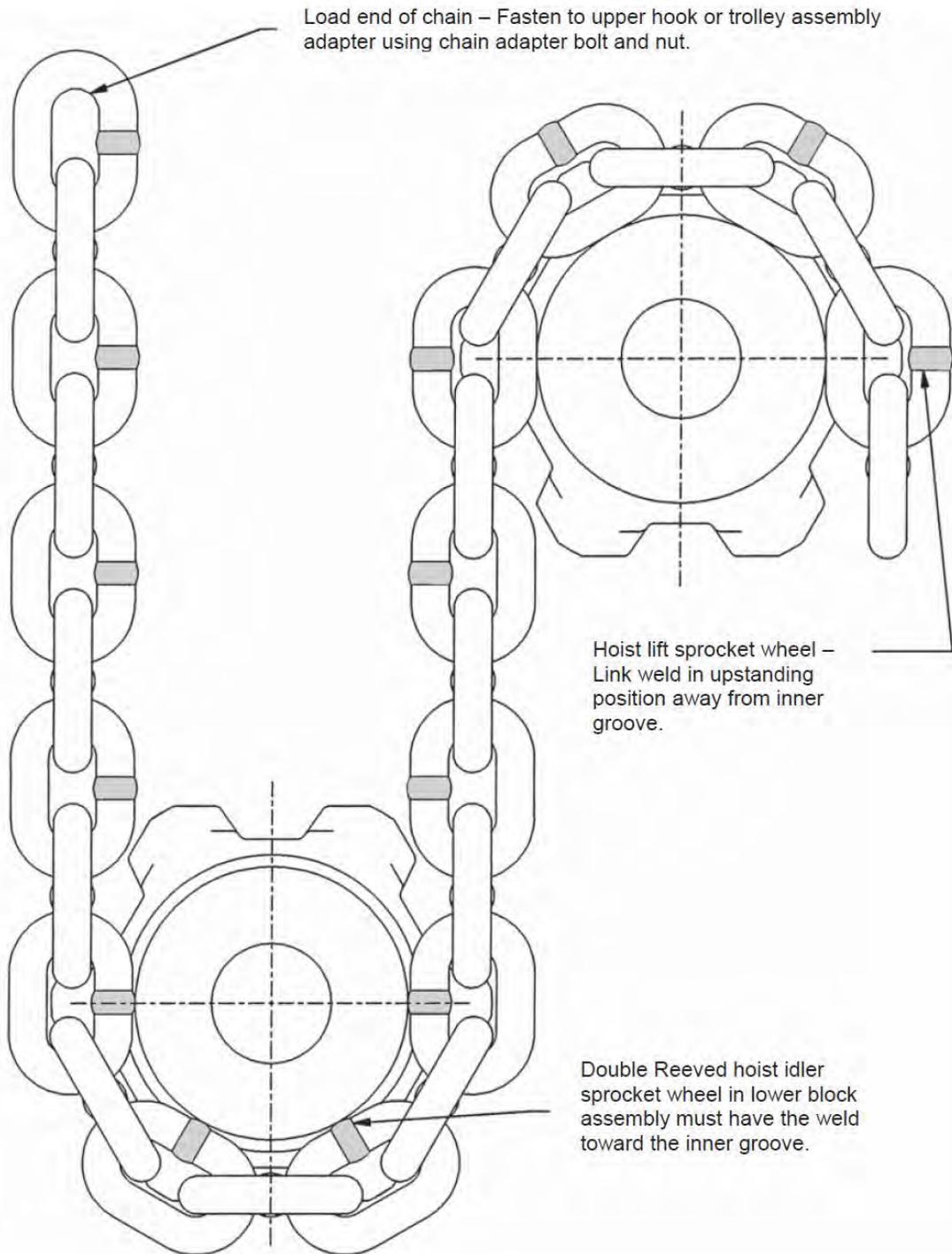

Chain Can Wear More Before Replacement

Gage Fits: Replace Chain

Chain Worn To Much: Replace Chain

Gage Length Dimension

Chain Gage See Table "A"

50 Lbs.

50 Lbs.

50 Lbs.
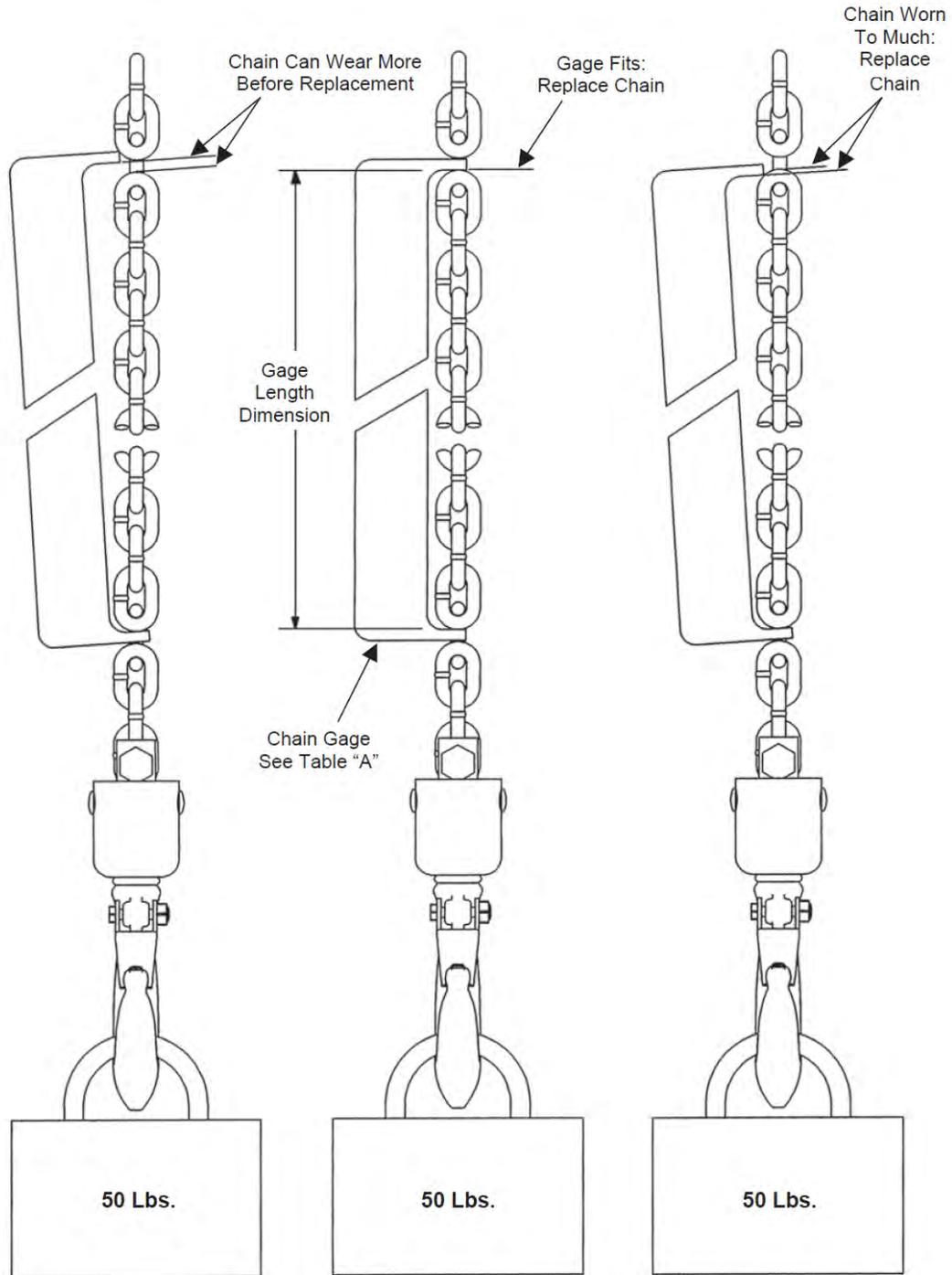
Figure 2 – Single Link Measurement

See Table "D" For
Inner Link Maximum
Length Allowable

Figure 3 – Double Reeved Chain Assembly

Note: P2 series hoist sprocket wheel and link chain shown, other hoist series are similar.

Load end of chain – Fasten to upper hook or trolley assembly adapter using chain adapter bolt and nut.

Hoist lift sprocket wheel – Link weld in upstanding position away from inner groove.

Double Reeved hoist idler sprocket wheel in lower block assembly must have the weld toward the inner groove.

Inspection Record:

1. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

2. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

3. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

4. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

5. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

6. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

7. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

8. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

9. Date:_____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

10. Date: _____ Person inspecting hoist: _____ S/N: _____

    Comments: _____

GD-HOIST

Inspection Check List:

Hoist Model: _____ Hoist Serial Number: _____

HOOKS

	Yes	No
Cracks _____	☐	◯
Wear _____	☐	◯
Bent _____	☐	◯
Spreading _____	☐	◯
Freely Rotate _____	◯	☐
Safety Latch _____	◯	☐

CHAIN

	Yes	No
Bent _____	☐	◯
Cracked _____	☐	◯
Twisted _____	☐	◯
Distorted _____	☐	◯

BRAKES

	Yes	No
Slipping Under Load _____	☐	◯
Excessive Pad Lining Wear _____	☐	◯
Excessive Load Drift _____	☐	◯

SUPPORTING STRUCTURE

	Yes	No
Continued ability to support Imposed loads _____	◯	☐

SPROCKETS & GUIDES

	Yes	No
Worn Excessively _____	☐	◯
Cracked or Worn _____	☐	◯

LUBRICATION

	Yes	No
All points lubricated as Specified in lube chart _____	◯	☐

HOUSING

	Yes	No
Cracks _____	☐	◯
Loose Hardware _____	☐	◯

OPERATION CONTROLS

	Yes	No
Operating Properly _____	◯	☐

LIMIT STOPS

	Yes	No
Operating Properly _____	◯	☐

CAUTION PLATE

	Yes	No
Visible and Legible _____	◯	☐

⚠ **CAUTION: If any squares (☐) are checked, do not operate the hoist until repairs have been made.**

Remarks and repairs made: _____

_____

_____

_____

Signature: _____ Date: _____ Clock Number: _____

FOR QUESTIONS, TECHNICAL AND WARRANTY SUPPORT:

GD-HOIST

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