

**OPERATING,
MAINTENANCE &
PARTS MANUAL
SUPPLEMENT**

ARMY TYPE TROLLEY HOIST



ARMY TYPE TROLLEY HOIST

Rated Loads:
Army Type Trolley Hoists 1/4 through 12 tons.

Follow all instructions and warnings for inspecting, maintaining and operating this trolley hoist.

The use of any trolley hoist presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before using this trolley hoist, each operator should become thoroughly familiar with all warnings, instructions and recommendations in this manual supplement. **Retain this manual supplement for future reference and use.**

Forward this manual supplement to operator. Failure to operate equipment as directed in manual supplement may cause injury.



Before installing trolley hoist, fill in the information below.

Rated Load _____

Serial No. _____

Purchase Date _____

GENERAL INFORMATION

SPECIFICATIONS

The Cyclone Hand Hoist has been expanded to include trolley suspended units. The CM Cyclone Army Type Trolley Hoist consists of the light-weight, durable Cyclone Hand Hoist rigidly suspended from a four wheel trolley. To suspend the hoist from the trolley, the upper hook is replaced by a pair of load bars. As a result, the components of the hoist including the lower hook parts are shown and described in Manual No. 646. The manual should also be used for operating instructions, safety procedures, inspections and maintenance procedures, lubrication information, troubleshooting, hoist exploded view, parts list and load chain reeving information.

Cyclone®

CM REPAIR/REPLACEMENT POLICY

All Columbus McKinnon (CM) Cyclone Hand Hoists and Army Type Trolley Hoists are thoroughly inspected and performance tested prior to shipment. If any properly maintained Trolley Hoist develops a performance problem due to a material or workmanship defect, as verified by CM or an authorized service station, repair or replacement of the unit will be made to the original purchaser without charge. This repair/replacement policy applies only to Trolley Hoist installed, maintained and operated as outlined in this manual, and specifically excludes parts subject to normal wear, abuse, improper installation, improper or inadequate maintenance, hostile environmental effects, and unauthorized repairs/modifications.

We reserve the right to change materials or design if in our opinion, such changes will improve our product. Abuse, repair by an unauthorized person, or use of non-CM replacement parts voids the guarantee and could lead to dangerous operation. For full Terms of Sale, see Sales Order Acknowledgment. Also, refer to the back cover of Manual No. 646 for Limitations of Warranties, Remedies and Damages and, Indemnification and Safe Operation.

Army Type Trolley Hoists

This compact trolley hoist features reduced headroom, side clearances and end approach which make it ideal for operation in tight spaces. Integral trolley has hardened universal tread flanged trackwheels which minimize rolling friction. CM's Internal Load Limiter™ automatically guards against damaging overloads without increasing overall dimension. Capacities range from 1/4 thru 12 ton - plain or geared trolley. Adapts to a wide range of beam adjustments.



SPECIFICATIONS

Capacity	Ton	1/4	1/2	1	1-1/2	2	3	4	5	6	8	10	12
Code Plain Trolley		4521	4522	4524	4525	4526	4527	4528	4529	4530	4531	4532	4533
Geared Trolley		4541	4542	4544	4545	4546	4547	4548	4549	4550	4551	4552	4553
Standard Lift	Ft.	8	8	8	8	8	8	8	8	8	8	8	8
Strands of Chain		1	1	1	1	1	2	2	3	3	4	5	5
<small>American Standard Shape Adjustment Ranges †</small> Depth	In.	6-12*	6-12*	6-12*	6-15	6-15	7-15	7-15	8-18	8-18	12-24	12-24	15-24
Flange Width	In.	3 3/8-5 1/2	3 3/8-5 1/2	3 3/8-5 1/2	3 3/8-5 5/8	3 3/8-5 5/8	3 3/8-5 5/8	3 3/8-5 5/8	4 6 1/4	4 6 1/4	5-8	5-8	5 1/2-8
Chain Pull To Lift Full Capacity Load	Lbs.	23	46	69	80	83	85	87	74	89	91	93	95
Chain Overhauled to Lift Load One Foot	Ft.	22 1/2	22 1/2	30	40 1/2	52	81	104	156	156	208	260	312
Minimum Headroom	In.	11 7/16	11 7/16	11 3/4	15 5/16	15 5/16	19	19	22 9/16	23 1/16	29 5/16	29 5/16	31 13/16
Minimum Radius Curve	In.	30	30	30	30	30	48	48	60	60	72	72	96

*1/4 thru 1 ton plain Trolley Hoist can be adapted to 4" & 5" depth - American Standard Shapes (2 5/8"-3" flange widths) - at no extra charge.

† Specify exact beam size when ordering.

TROLLEY INSTALLATION

WARNING

Operating the trolley hoist on a beam that has no rail stops may allow the trolley hoist to fall off the end of the beam.

To Avoid Injury:

Install rail stops at each end of the beam on which the trolley hoist is to operate.

The railstops must be positioned so as to not exert impact force on the hoist portion of the unit or the trolley wheels. They must contact the ends of the trolley side frames.

Due to the variations in beam flange widths, it is suggested that the beam flange width be measured to determine the exact distribution of spacer washers. The distance between track-wheel flanges (dimension "X") should be 1/8 to 3/16 inch greater than the beam flange width for straight runway beams, and 3/16 to 1/4 inch greater than the beam flange width if runway system includes sharp curves. Also, the use of other than CM supplied washers may result in trackwheel to beam flange variations and thus Figure 1 will not apply.

WARNING

If washer spacing recommendations are not followed, trolley hoist may fall from beam.

To Avoid Injury:

Measure the actual beam flange on which the trolley hoist is to operate and use Figure 1 to determine the arrangement of the spacer washers for that flange width.

Immediately after installation, operate trolley with a capacity load over the entire length of runway or monorail system to be sure that all adjustments and operations are satisfactory.

When applying a load, it should be directly under the trolley. Avoid off center loading of any kind. Side loading may spread trolley side frames.

On systems with curves, the edges of the rail at the curved sections should be lightly lubricated with grease.

WARNING

An excessively worn beam flange may fail and allow the trolley hoist to fall from the beam.

To Avoid Injury:

Periodically inspect the beam flange for wear. Replace beam if flange is worn.

Flange 12 Ton Width	DISTRIBUTION OF SPACER WASHERS																			
	1/4, 1/2, & 1				1-1/2 & 2 Ton				3 & 4 Ton				5 & 6 Ton				8, 10 &			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
2-5/8	20	7	7	20																
2-3/4	19	8	8	19																
3	17	10	9	18																
3-1/4	16	11	11	16																
3-3/8	15	12	12	15	16	6	6	16												
3-5/8	14	13	13	14	14	8	7	15	13	0	0	13								
3-7/8	12	15	14	13	13	9	9	13	12	1	2	11								
4	9	16	15	12	12	10	10	12	11	2	3	10	14	0	0	15				
4-1/8	9	16	16	9	11	11	11	11	10	3	3	10	13	1	1	14				
4-5/8	7	20	19	8	8	14	13	9	7	6	6	7	10	4	4	11				
5	6	21	22	5	6	16	15	7	5	8	9	4	8	6	6	9	18	3	3	18
5-1/8	5	22	22	5	5	17	16	6	4	9	9	4	7	7	7	8	17	4	4	17
5-1/4	4	23	23	4	4	18	18	4	3	10	10	3	6	8	8	7	16	5	5	16
5-1/2	1	26	26	1	2	20	20	2	2	11	11	2	5	9	10	5	15	6	7	14
5-5/8					1	21	21	1	1	12	12	1	4	10	11	4	14	7	8	13
6													2	12	13	2	11	10	10	11
6-1/4													1	13	14	1	10	11	12	9
6-3/8																	9	12	12	9
7																	5	16	15	6
7-1/8																	5	16	16	5
7-1/4																	4	17	16	5
7-7/8																	0	21	20	1
8																	0	21	21	0

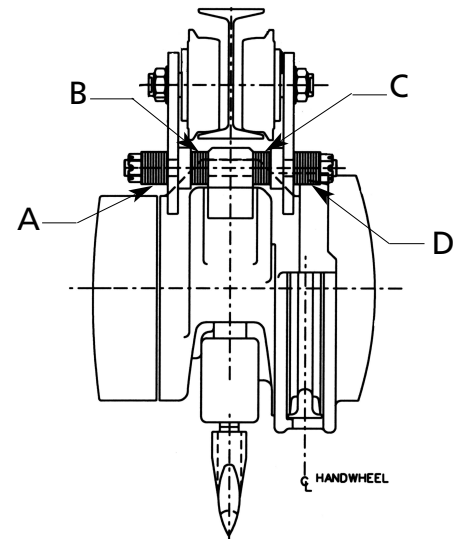


Figure 1

INSPECTION

To maintain continuous and satisfactory operation, a regular inspection procedure must be initiated to replace worn or damaged parts before they become unsafe. Inspection intervals must be determined by the individual application and are based on the type of service to which your hoist will be subjected and the degree of exposure to wear, deterioration or malfunction of the critical components.

The type of service to which the hoist is subjected can be classified as "Normal", "Heavy" and "Severe".

Normal Service. Involves operation with randomly distributed loads within the rated load limit, or uniform loads less than 65% of rated load for not more than 25% of the time.

Heavy Service. Involves operating the hoist within rated load limit which exceeds normal service.

Severe Service. Is normal or heavy service with abnormal operating conditions.

Following are the recommended, minimum intervals of inspection. When the unit is subjected to extra heavy usage or dusty, gritty, moist, or other adverse atmospheric conditions, shorter time intervals must be assigned. During the Periodic Inspection, inspection must be made of all parts for unusual wear, corrosion effect or damage in addition to those specifically mentioned.

Minimum Inspection Schedule

Frequent Inspections. These inspections are visual examinations by the operator or other designated personnel. Records of such inspections are not required. The frequent inspections are to be performed monthly for normal service, weekly to monthly for heavy service, and daily to weekly for severe service and they should include those items listed in Table 1 of Manual No. 646.

Periodic Inspections. These inspections are visual inspections of external conditions by an appointed person. Records of periodic inspections are to be kept to provide the basis for continuing evaluation of the condition of the hoist.

Periodic inspections are to be performed yearly for normal service, semi-annually for heavy service and quarterly for severe service and they are to include those items listed in Table 2 of Manual No. 646.

Any parts that are deemed unserviceable are to be replaced with new parts before the unit is returned to service. It is very important that the unserviceable parts be destroyed and properly disposed of to prevent their possible future use as a repair item.

PARTS LIST

ORDERING INFORMATION

The following information must accompany all correspondence or repair parts orders.

- 1) Hoist capacity.
- 2) Serial Number - this is stamped on the hoist frames as shown below.

For parts orders also specify:

- 1) Quantity desired.
- 2) Key number of part.
- 3) Part name.
- 4) Part number.

When ordering replacement parts, consideration should be given to the need to replace other items: bearings, fasteners, gaskets, etc. Items that may be damaged or lost during disassembly or just unfit for future use because of deterioration from age or service.



WARNING

Using "Commercial" or other manufacturer's parts to repair the Cyclone Hand and Army Type Trolley Hoists may cause load loss.

To Avoid Injury:

Order all replacement parts from CM. Parts may look alike but often CM parts are made of specific materials or processed to achieve specific properties.

Parts should be ordered from CM's Master Parts Depots conveniently located throughout the United States and Canada. Refer to page i of Manual No. 646 to locate the Master Parts Depot nearest you.

CYCLONE ARMY TYPE TROLLEY HOIST PARTS LIST

Key No.	No. Req'd.	Part Name	Capacity - Tons						
			1/4, 1/2 & 1	3/4	1-1/2 & 2	3 & 4	5 & 6	8 & 10	12
			Part Number						
646-264	1	Side Frame-Hoist Handwheel Side-Plain Trolley	46694	46684	46688	46381	46392	46406	46504
	1	Side Frame-Hoist Handwheel Side-Geared Trolley	46375	--	46679	46381	46392	46406	46504
646-265	1	Side Frame-Hoist Geared Side-Plain Trolley	46695	46685	46689	46382	46393	46407	46505
	1	Side Frame-Hoist Geared Side-Geared Trolley	46376	--	46680	46383	46396	46500	46506
646-266	1	Upper Load Bar	46361	46686	46367	46378	46389		
646-267	1	Lower Load Bar	46362		46368	46379	46368		
646-268	2	Suspension Bolt-Plain	46364	46366	46369	46380	46390	70420	
	2	Suspension Bolt-Geared	46374	--	46371	46386	46394	70428	
646-269	4	Suspension Bolt Nut	948803			958818			
646-269A	4	Suspension Bolt Nut Cotter Pin	988343			988368			
646-270	2	Load Bar Screw	946764			946766			
646-270A	2	Load Bar Screw Lockwasher	936850			946767			
646-271	4	Trackwheels (Plain Trolley)	35774		50762	39016	39017	39006	
	2	Trackwheels (Geared Trolley)	39002			39016	39017	39006	39006
	2	Trackwheels (With Gears)	35642			--	--	--	--
646-272	4	Trackwheel Stud-Plain	987790		35838	39375	39377	39379	
		Trackwheel Stud Nut-Plain	982520		948804	988097	982613	988158	
		Trackwheel Stud Lockwasher-Plain	987923		987924	987927	987928	--	
	2	Trackwheel Stud-Plain Side-Geared	36361			39375	39377	39379	
		Trackwheel Stud Nut-Plain Side-Geared	988155			988097	982613	988158	
		Trackwheel Stud Lockwasher-Plain Side-Geared	987926			987927	987928	--	
2	Trackwheel Stud-Geared Side-Geared	36362			39376	39378	39380		
	Trackwheel Stud Nut-Geared Side-Geared	988155			988097	982613	988158		
		Trackwheel Stud Lockwasher-Geared Side-Geared	987926			987927	987928	--	
646-273	2	Capacity Label	946768		946769	46772 46773	46774 46775	46776 46777	46778
646-273A	1	Warning Label	936984						
646-274	--	Trolley Spacer Washers (Specify Amount. Req'd.)	948700		958726				
	--	Hanger Bolt Washers (Specify Amount Req'd)	--			948701			
	--	Chain Anchor Bolt Washers (Specify Amount Req'd)	--			--			958726
646-276	2	Hanger Bolt Nut	--			945835		--	
	4		--			--		945835	
646-276A	2	Hanger Bolt Cotter Pin	--			988382		--	
	4		--			--		988382	
646-277	1	Hanger Assembly	--			46614		46409	
646-278	1	Hanger Sheave	--			45085		45436 (8 Ton)	
	2		--			--		45436 (10 & 12 Ton)	
646-279	2	Hanger Sheave Bearing	--			83670		88542 (10 & 12 Ton)	
	1		--			88542 (8 Ton)			
646-280	2	Hanger Sheave Bearing Retainer	--			45151		--	
646-281	1	Hanger Sheave Snap Ring	--			45765		--	
646-282	2	Sheave Shaft	--			--		46413	
646-283	2	Keeper Plate	--			--		46414	
646-284	4	Keeper Plate Screw	--			--		982693	
646-285	4	Keeper Plate Screw Lockwasher	--			--		982226	
646-286	1	Dead End Block	--			--		46422	
646-287	1	Dead End Pin	--			--		45944	
646-288	1	Chain Anchor	--			--		48021 (10 Ton) 46303	
646-289	1	Sheave Hanger Bottom Plate	--			46415 (8 Ton)			
	2		--			46415 (10 & 12 Ton)			
646-290	4	Sheave Hanger Bottom Plate Screw	--			982706 (8 Ton)			
	8		--			982706 (10 & 12 Ton)			
646-291	1	Hanger Bolt-Plain Trolley	--			46391		--	
	2		--			--		46408	
	1	Hanger Bolt-Geared Trolley	--			46395		--	
	2		--			--		46405	
646-292	1	Chain Anchor Bolt-Plain	--			--		70420	
		Chain Anchor Bolt-Geared	--			--		70428	
646-293	2	Chain Anchor Bolt Nut	--			--		958818	
646-293A	2	Chain Anchor Bolt Cotter Pin	--			--		988368	
646-294	2		--			46416 (8 Ton)			
	2	Hook Block Half	--			46507 (12 Ton)			
	1		--			46502 (10 Ton - Hoist Gear Housing Side)			
	1		--			46503 (10 Ton - Hoist Handwheel Side)			
646-295	1	Hook Block Top Plate	--			--		46307	46305
646-296	6	Top Plate Screw	--			946781 (8 & 10 Ton)			
	8		--			946781 (12 Ton)			
646-297	2	Hook Block Bolt	--			--		946780	
646-298	2	Hook Block Bolt Nut	--			--		948804	
646-299	2	Hook Block Bolt Lockwasher	--			--		987924	
646-300	2	Hook Block Bolt Pipe Spacer	--			--		46420	
646-301	2	Hook Block Sheave	--			--		45436	--
	3		--			--		45436	
646-302	2	Hook Block Sheave Bearing	--			--		88542	--
	3		--			--		88542	

CYCLONE ARMY TYPE TROLLEY HOIST PARTS LIST

Key No.	No. Req'd.	Part Name	Capacity - Tons					
			1/4, 1/2 & 1 12	3/4	1-1/2 & 2	3 & 4	5 & 6	8 & 10
646-303	2	Hook Block Sheave Bolt				Part Number		
	3		--			46421 --		
646-304	4	Sheave Bolt Nut	--			988149 --		
	6		--			988149 --		
646-305	4	Sheave Bolt Lockwasher	--			987924 988149		
	6		--			987924 988149		
646-306	1	Chain Anchor Bolt	--			987924		
646-307	2	Chain Anchor Bolt Nut	46421 (10 Ton Only)					
646-308	2	Chain Anchor Bolt Lockwasher	988149 (10 Ton Only)					
646-309	2	Hook Block Plate - Warning Label	987924 (10 Ton Only)					
646-310	2	Hook Block Capacity Label	--			70283		
646-311	16	Capacity Plate Screw	46917 - (8 Ton), 46916 - (10 Ton), 46915 - (12 Ton)					
646-312	1	Lower Hook	--			988271		
646-313	1	Latch Kit	--			46006 46304		
646-314	1	Hook Trunnion	--			52707 71913		
646-315	1	Hook Thrust Bearing	--			46424		
646-316	1	Hook Nut	--			88511		
646-317	1	Hook Nut Pin	--			945836 82468		
646-318	1	Hook Sleeve	--			983788 82466		
646-319	4	Trackwheel Bearing	--			46425 --		
646-320	8	Trackwheel Cup	82113		82119 82115		--	
646-321	8	Trackwheel Cone	--			88523		
646-322	8	Trackwheel Bearing Washer	--			88519		
646-323	8	Trackwheel Snap Ring	--			81008		
646-324	4	Trackwheel Spacer-Plain Trolley	+			39715		
	2	Trackwheel Spacer-Geared Trolley-Plain	--			39716 39717		81009
	2	Trackwheel Spacer-Geared Trolley-Geared	--			81009		
646-325	4	Trackwheel Stud Washer	+			39386		
646-326	4	Trackwheel Spacer Washer-Geared	81014		81015 81016		--	
	4	Trackwheel Spacer Washer-Plain	82046		--		--	
	4	Trackwheel Spacer Washer	-- 987903		--		--	
646-327	2	Trackwheel Gear	--		82047 82048		--	
646-328	6	Trackwheel Gear Pin	35425		39382 39383		39384	
	4		983777		983778		--	
646-329	4	Trackwheel Gear Screw	--			983781		
646-330	1	Handwheel Shaft & Pinion	+			982687		
646-331	2	Handwheel Shaft Bushing	46677		46676 46398		46501	
646-332	1	Handwheel	82054					
646-333	1	Handwheel Key	33143					
646-334	1	Handwheel Shaft Nut	59967					
646-335	1	Handwheel Shaft Lockwasher	988095					
646-336	1	Hand Chain Guide	986270					
646-337	1	Hand Chain Guide Bushing	46678		58152			
646-338	1	Guide Screw	--			58727		
646-339	1	Guide Screw Nut	--			987065		
646-340	1	Guide Screw Lockwasher	--			945822		
646-341	1	Guide Screw Washer	--			945853		
646-342	AIR	Hand Chain	--			986224		
	AIR	Hand Chain - Zinc Plated	85808					
646-343	1	Hand Chain Connecting Link	619022					
	1	Hand Chain Connecting Link - Zinc Plated	945490					
646-344	1	Capacity Insert	945491					

Part Numbers for packaged lubricants used in Cyclone Hand and Army Type Trolley Hoists

Lubricant Usage	Type of Lubricant	Part Numbers and packaged Quantities of Lubricants
Gears	Grease	28610 (1# can) 28632 (4# can)
Handwheel Threads	Spray	46698 (16 oz.)
Chain	Oil	28608 (1 pt. can) 28619 (1 gal. can)
Trackwheel Bearings	Grease	28610 (1# can) 28632 (4# can)
Trackwheel Gears	*Heavy Cup Grease	--
Handwheel Shaft	*Light Machine Oil	--

*These are not furnished by CM in Packaged Quantities.

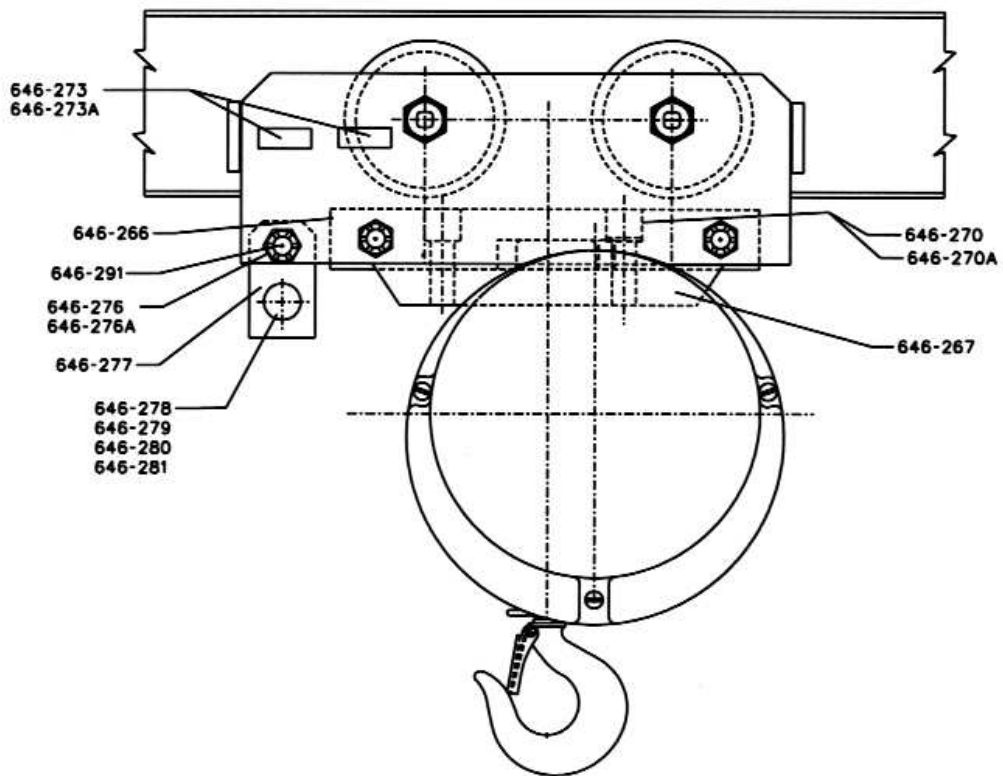
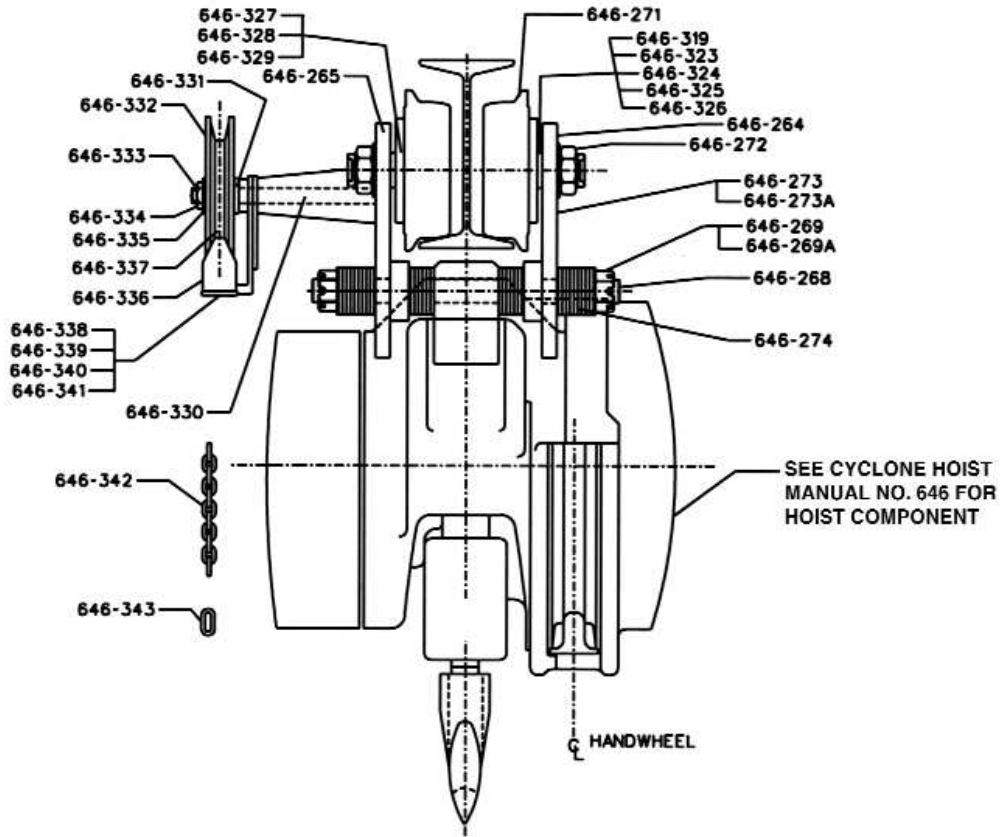
When ordering lubricants, specify the type of lubricant, part number and packaged quantity required.

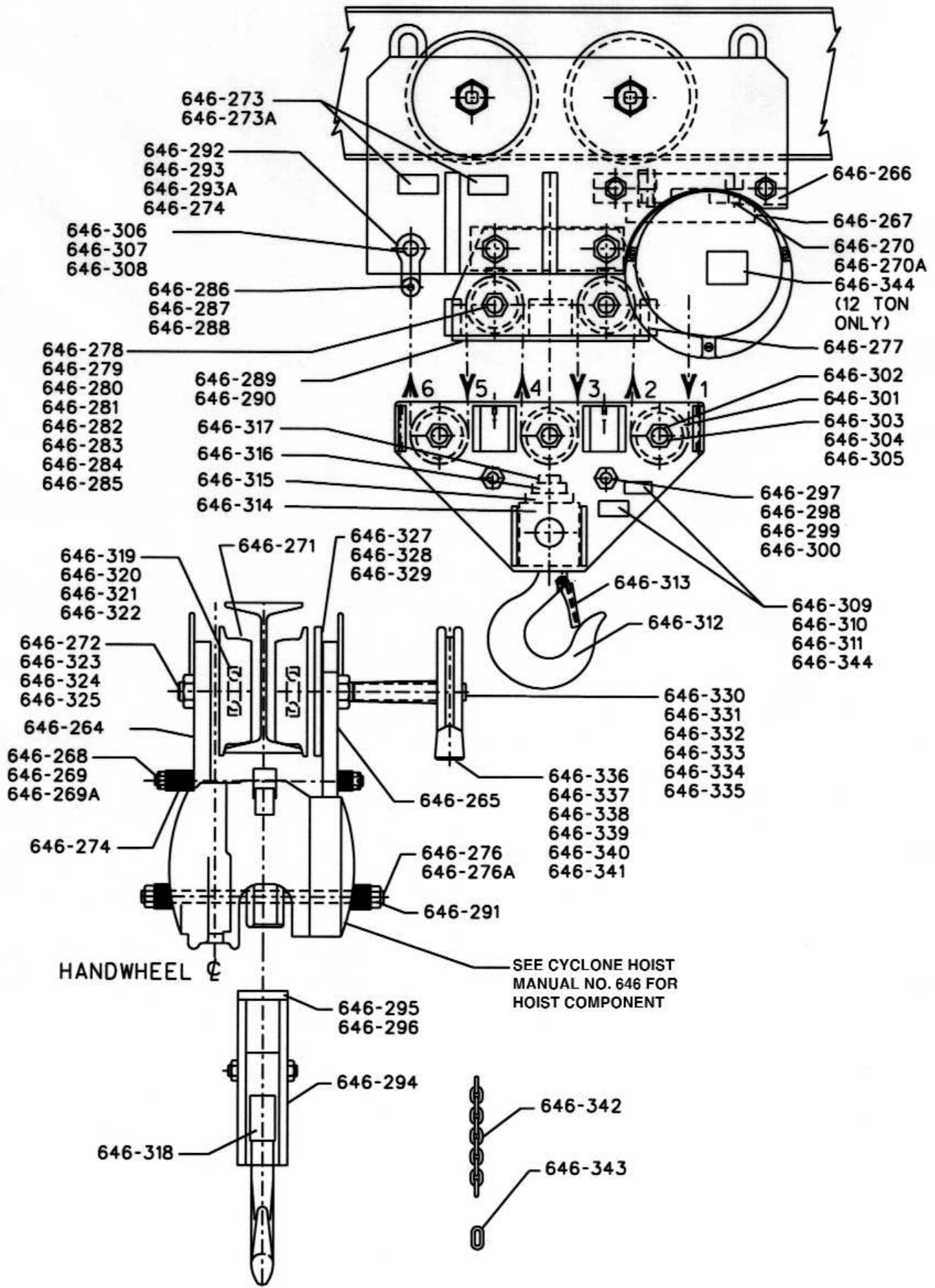
Touch-up Paints for Cyclone Hand and Army Type Trolley Hoists:

1. Hoist. Order *(1) case (12-12 oz. Aerosol Cans) of Orange Touch-up paint Part Number 84190.
2. Trolley. Order *(1) case (12-12 oz. Aerosol Cans) of Black Touch-up paint Part Number 84189.

** Touch-up paints are only available in case quantities.

NOTE: When painting Hoists or Trolleys, also order warning labels, identification labels, etc. that may be coated during painting.





Note: When ordering parts, always furnish hoist model and serial number, motor horsepower, voltage, phase, frequency and rated capacity of hoist on which the parts are to be used.
For the location of the nearest Authorized Repair Station, Contact CM, (see inside front cover of Manual No. 646).

LIMITATION OF WARRANTIES, REMEDIES AND DAMAGES

THE WARRANTY STATED BELOW IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, NO PROMISE OR AFFIRMATION OF FACT MADE BY ANY AGENT OR REPRESENTATIVE OF SELLER SHALL CONSTITUTE A WARRANTY BY SELLER OR GIVE RISE TO ANY LIABILITY OR OBLIGATION.

Seller warrants that on the date of delivery to carrier the goods are free from defects in workmanship and materials.

SELLER'S SOLE OBLIGATION IN THE EVENT OF BREACH OF WARRANTY OR CONTRACT OR FOR NEGLIGENCE OR OTHERWISE WITH RESPECT TO GOODS SOLD SHALL BE EXCLUSIVELY LIMITED TO REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY PARTS WHICH SELLER DETERMINES TO HAVE BEEN DEFECTIVE or if Seller determines that such repair or replacement is not feasible, to a refund of the purchase price upon return of the goods to Seller.

Any action against Seller for breach of warranty, negligence or otherwise, must be commenced within one year after such cause of action occurs.

NO CLAIM AGAINST SELLER FOR ANY DEFECT IN THE GOODS SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE YEAR FROM THE DATE OF SHIPMENT.

Seller shall not be liable for any damage, injury or loss arising out of the use of the goods if, prior to such damage, injury or loss, such goods are (1) damaged or misused following Seller's delivery to carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such law, instructions or recommendations.

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN SECTION 2-715 OF THE UNIFORM COMMERCIAL CODE.

INDEMNIFICATION AND SAFE OPERATION

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the goods. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the goods. In the event of personal injury or damage to property or business arising from the use of the goods, Buyer shall within 48 hours thereafter give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the goods.

WARNING

Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

TO AVOID INJURY:

- Do not alter or modify equipment.
- Do use only factory provided replacement parts.



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