

BASIC MAINTENANCE SCHEDULE FOR ICE HANDLING EQUIPMENT

INTRODUCTION

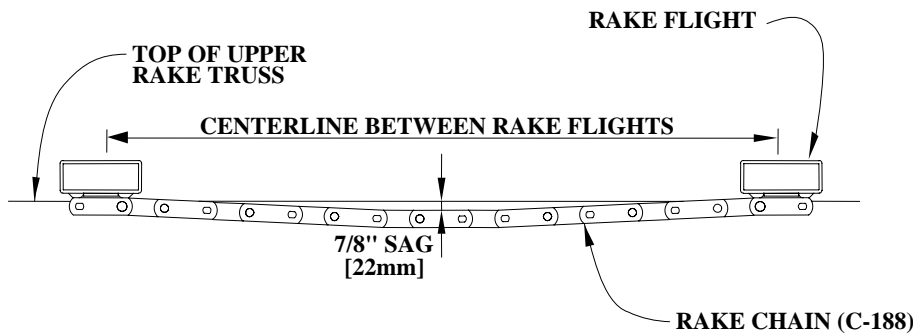
Regular maintenance of North Star ice handling equipment will ensure years of trouble free service. North Star has developed a recommended schedule for maintaining our ice handling equipment which is outlined below and following is a list of recommended lubricants.

DAILY

Daily emptying of the bin is recommended to allow inspection of rake trusses, flights, slide gates, discharge spouts and screw conveyors, and to allow the removal any ice buildup, fused ice lumps or spillage outside the raked area.

EVERY THREE (3) MONTHS

1. Inspect rake flight wear pads. Replace pads when they show wear of 1/8" [3mm], or are 3/8" [10mm] thick.
2. Inspect the rake chain for proper tension as shown below.



This illustration shows the correct tension for C-188 chain (stainless or galvanized), for NH78 chain (plastic) there should be no visible sag at working temperature.

EVERY SIX (6) MONTHS

1. Check oil level in all gear reducers. Add oil if necessary, see list for recommendations.
2. Grease all bearings.
3. Grease flexible coupling halves located on each side of fluid coupling.
4. Apply oil to roller chain and check tension. Adjust if necessary to maintain tension.
5. Grease flexible coupling located between primary reducer and secondary reducer.
6. Check that the rake is level. Take up on the cables, if required.
7. Check tension of all belts. Adjust if necessary to maintain tension.
8. Wipe the rake truss angle surfaces with an oily rag to maintain a slick surface.

ANNUALLY (EVERY 12 MONTHS, IN ADDITION TO ALL OF THE ABOVE)

1. Change oil in all gear reducers.
2. Inspect wear of the rake drive and idle end sprockets. Replace if required.

LUBRICATION LIST

PART	LUBRICANT TYPE	MANUFACTURER AND PRODUCT
RAKE DRIVE		
Gear Reducer	GEAR OIL	MOBIL MOBILUBE HD 80W-90
Drive Motor	LOW TEMP GREASE	EXXON BEACON P-290
Flex Coupling	FLEX COUPLING GREASE	MOBIL MOBILITH EP-1
Bearings (Drive End and Idle End)	LOW TEMP GREASE	EXXON BEACON P-290
Fluid Coupling	FLUID COUPLING OIL	MOBIL MOBIL DELVAC 1210 (SAE 10W)
HOIST DRIVE		
Worm Gear Reducer	WORM GEAR OIL	MOBIL 600W Super Cylinder Oil 460
Bearings	LOW TEMP GREASE	EXXON BEACON P-290
Chain Tensioner	LOW TEMP GREASE	EXXON BEACON P-290
Drive Chain	GEAR OIL	MOBIL MOBILUBE HD 80W-90
Drive Motor	LOW TEMP GREASE	EXXON BEACON P-290
BIN DOOR OPERATOR		
Worm Gear Reducer (07/09)	WORM GEAR OIL	MOBIL 600W Super Cylinder Oil 460
Worm Gear Reducer	PAG WORM GEAR OIL	MOBIL Glygoyle HE 460
Bearings	LOW TEMP GREASE	EXXON BEACON P-290
Drive Chain	GEAR OIL	MOBIL MOBILUBE HD 80W-90
Drive Motor	LOW TEMP GREASE	EXXON BEACON P-290

Equivalent products are usually available from other manufacturers.