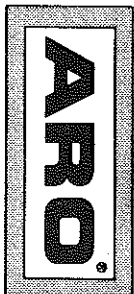


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OPERATORS MANUAL

PARTS LIST AND SERVICE INSTRUCTIONS

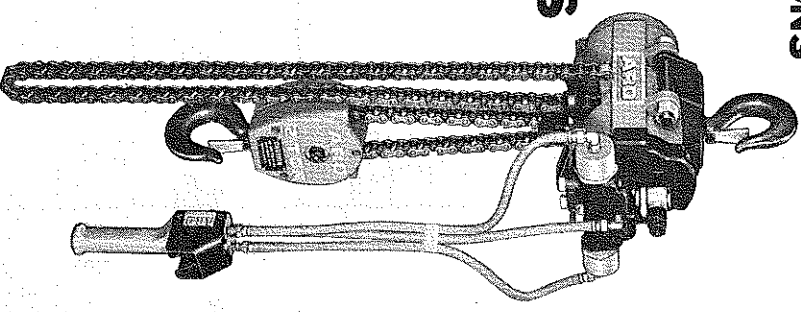
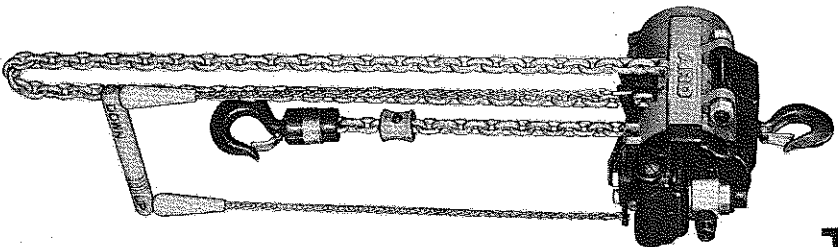
FOR

7790-() AND 7792-()

AIR-POWERED CHAIN HOISTS

LINK & ROLLER CHAIN
MODELS

1 & 2 Ton Capacities



**READ CAREFULLY
BEFORE OPERATING TOOL**

**HOIST EQUIPMENT DESCRIBED HEREIN
IS NOT FOR HUMAN TRANSPORTATION**

**THE ARO CORPORATION
BRYAN, OHIO 43506**

OPERATORS MANUAL

This Parts List and Instruction Manual is composed of eight sections:

GENERAL DESCRIPTION	2
AIR AND LUBE REQUIREMENTS	2
INSTALLATION AND OPERATION	3
INSPECTION AND MAINTENANCE	5
DISASSEMBLY AND REASSEMBLY	7
SPARK-RESISTANT MODELS	21
TROUBLE SHOOTING	24
ACCESSORIES	24

A complete Parts List will be found on the various drawings contained herein.

This manual is provided to serve as an aid in obtaining the maximum service from this hoist.

After carefully reading manual, place in a suitable area where it can be readily referred to.

MODEL IDENTIFICATION

STANDARD ROLLER CHAIN MODELS (STEEL CHAIN & HOOKS)			
MODEL NO.	TYPE CONTROL	UPPER MOUNTING	LBS. CAPACITY
7790-1	PULL CHAIN	43002	2,000
7790-3	PULL CHAIN	NONE *	2,000
7790-5	LEVER PENDENT	43002	2,000
7790-7	LEVER PENDENT	NONE *	2,000
7792-1	PULL CHAIN	43049	4,000
7792-3	PULL CHAIN	NONE *	4,000
7792-5	LEVER PENDENT	43049	4,000
7792-7	LEVER PENDENT	NONE *	4,000
STANDARD LINK CHAIN MODELS (STEEL CHAIN & HOOKS)			
MODEL NO.	TYPE CONTROL	UPPER MOUNTING	LBS. CAPACITY
7790-9	PULL CHAIN	43002	2,000
7790-11	PULL CHAIN	NONE *	2,000
7790-13	LEVER PENDENT	43002	2,000
7790-15	LEVER PENDENT	NONE *	2,000
7792-9	PULL CHAIN	43049	4,000
7792-11	PULL CHAIN	NONE *	4,000
7792-13	LEVER PENDENT	43049	4,000
7792-15	LEVER PENDENT	NONE *	4,000

FOR SPARK-RESISTANT MODELS REFER TO PAGE 21

* FOR TROLLEY MOUNTING - TROLLEY MUST BE ORDERED SEPARATELY

Safe and efficient operation of your ARO HOIST can best be attained by observing proper operating, inspection and maintenance procedures. Allow only competent and qualified people to operate hoist and subject each Hoist to a regular inspection and maintenance procedure. The qualified Hoist operator must be carefully instructed in the safe operation of the Hoist, including a study of the manufacturer's literature, and must thoroughly understand proper methods of hitching loads. The operator should have a good attitude regarding safety.

To aid in a better understanding of proper and safe use of hoists; the publication "Overhead Hoists", ANSI B30.16 1973, can be purchased from the American National Standards Institute, Inc., 1430 Broadway, N.Y., N.Y. 10018.

Your ARO Chain Hoist Model 7790() 1-ton or 7792() 2-ton Chain Hoists are precision built units designed and constructed to give dependable, efficient operation with minimum maintenance.

Both the 1-Ton (907.2 kg) and 2-Ton (1814.4 kg) models are available with either a Link or Roller Type load chain, Pull Chain or Pendant type throttle control and with a Hook on Trolley suspension mounting.

SPARK-RESISTANT MODELS are also available, but have **CAPACITY** ratings of 1,200 pounds (544 kg) 1,500 pounds (680 kg), 2,400 pounds (1088 kg) and 3,000 pounds (1360 kg). The spark-resistant models have a stainless steel roller chain with bronze hooks, or a stainless steel link chain with bronze hooks.

The basic difference in hoist models are in the type of load chain, type of suspension and type of controls. The load

chain on the 1-Ton models is single reeved. On the 2-Ton models the load chain is double reeved through a lower block assembly.

All models feature a rotary vane-type air motor, mechanical brake with bonded lining, a built-in oil reservoir, external valve adjustment for regulating rate of lift or descent (**EXCEPT SPARK-RESISTANT MODELS**: refer to pages 21 thru 23 for spark resistant models) and a 1/2" female n.p.t.f. air inlet with 180° swivel. An adjustable chain stop is furnished with the 1-Ton models and the 2-Ton models have a safety stop mounted atop the lower block assembly. Pull chain controls are 5' long. Pendant controls have 6' lengths of hose with a nylon-sheathed steel strain cable. Standard models have a lift of 10 feet. Hoists for Trolley mounting are furnished without an upper hook assembly; trolley must be ordered separately. A 90° Trolley Adapter is also available allowing the hoist to be mounted parallel with the hoist trolley.

AIR AND LUBE REQUIREMENTS

AIR PRESSURE of 90 p.s.i.g. (6 bar, g) at the air inlet of the tool is required for maximum motor efficiency. If necessary, an air regulator should be installed to maintain this pressure when tool is in operation.

LOWER BLOCK ASS'Y. should be lubricated through grease fitting approximately every 80 hours of operation to provide lubrication for Sprocket or Pocket Wheel.

FILTERED AND OILED AIR will allow the tool to operate more efficiently and yield a longer life to operating parts and mechanisms. A line filter capable of filtering particles larger than 50 microns should be used with a line oiler.

RECOMMENDED HOSE SIZE — 1/2" (13 mm) nominal inside diameter.

FILTER-REGULATOR-LUBRICATOR (F-R-L) assembly Model 28343 is recommended for use with this Air Hoist. The capacity of the individual Filter-Lubricator is adequate to provide clean (40 micron) oiled and regulated air for the hoist.

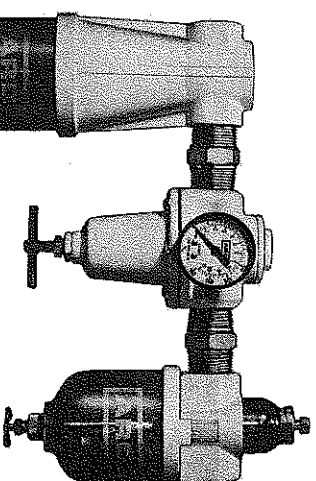
RECOMMENDED LUBRICANTS: Spindle Oil 39843, 1 qt. (.9 liter) container or 39844, 1 gal. (3.8 liter) container for oiler and air inlet; Grease 33153, 5 lb. (2.3 kg) can for lower block and bearings; "O" Ring Lubricant 36460, 4 oz. (113 g) tube for lubrication and installation of "O" Rings; Gear Oil 40164, 1 qt. (.9 liter) container for lubrication of gearing.

LOAD CHAIN LUBRICATION — Chain should be lubricated periodically with heavy "EP" Gear Oil. Occasional cleaning of the chain, under normal operating conditions, will tend to reduce wear and prolong chain and pocketwheel (or sprocket) life. To properly clean, remove chain from hoist (see page 6) and wash in an oil solvent. Lubricate chain.

Under highly contaminated operating conditions, the load chain should be cleaned and relubricated with greater frequency to remove grit, sand and other contaminants.

OIL LEVEL of the built-in reservoir in the Head should be checked after each 40 hours of operation. Fill reservoir full with spindle oil (39844).

OIL LEVEL of gear chamber in Housing should be checked approximately each 160 hours of operation. Drain and refill gear chamber with 6 to 7 oz. (to plug hole level) of gear oil (40164) after approximately 2500 hours of operation.



MODEL 28343
FILTER-REGULATOR-
GAUGE-LUBRICATOR.

INSTALLATION AND OPERATION

INSTALLATION

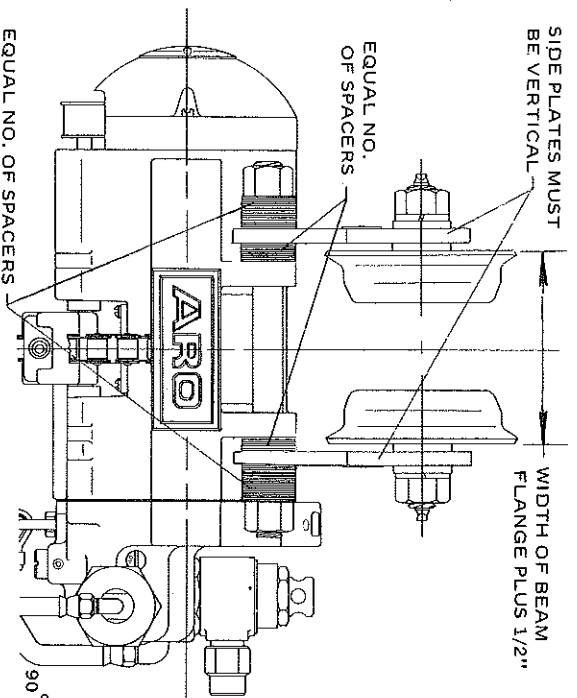
Your ARO Chain Hoist is completely lubricated and load tested before being shipped from factory. To place in service:

HOOK SUSPENDED MODELS — select an overhead support capable of safely supporting combined weight of hoist and its capacity load. Hang hoist being certain the upper hook is firmly seated in center of hook saddle and that the safety latch is properly closed.

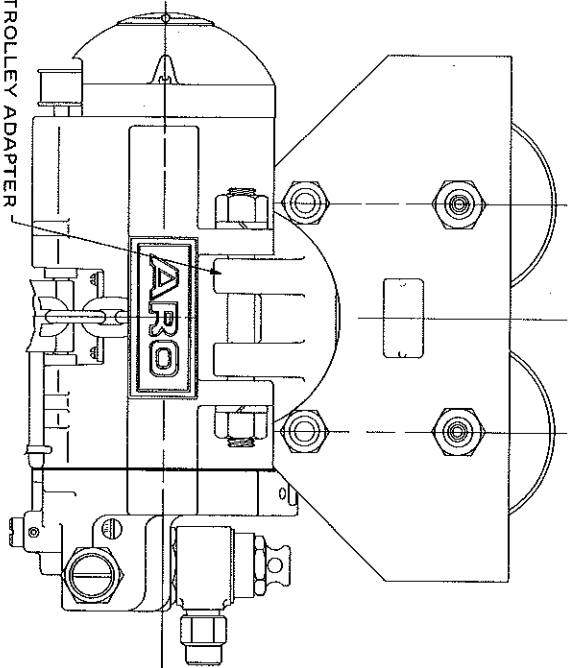
TROLLEY SUSPENDED MODELS — the trolley side plates must be spaced so the trolley wheels will properly engage I-beam on which trolley will be operated. Adjustment for various I-beam sizes is accomplished by arrangement of Spacer Washers on Shaft which connects the trolley side plates. The distance between the outside edges of the trolley wheels should be $1/2$ " greater than the width of the beam flange. The number of spacers used to space side plates out should be the same on each side of shaft or trolley adapter and the remaining spacers must be

equally distributed on the shaft outside the side plates, at each side, figure 1.

When installing Trolley on I-beam be certain side plates are vertical. After installation of Trolley and Hoist on I-beam, operate the Trolley over the entire length of beam with a capacity load suspended a few inches off the floor to make certain of proper installation and operation. Insure I-beam will safely support combined weight of hoist, trolley and capacity load. Minimum turning radius of trolley is 3- $1/2$ feet. Connect hoist to nearest air source using a minimum $1/2$ " I.D. air hose assembly. If hoist is trolley mounted sufficient air hose must be provided to reach from air source to farthest point of trolley travel. Aro Model 7703 Air Hose Trolley Assemblies are recommended to keep air hose elevated and in line with the hoist, figure 3. Hoist shall be installed only in locations that will permit the operator to stand free of the load at all times.



Proper Wheel Spacing

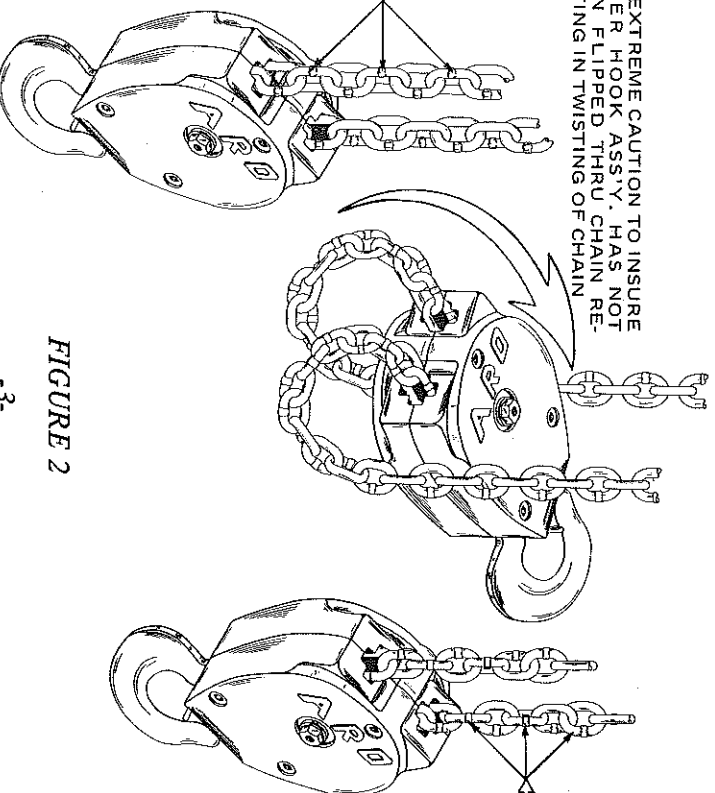


Trolley and 90° Trolley Adapter

FIGURE 1

USE EXTREME CAUTION TO INSURE LOWER HOOK ASS'Y. HAS NOT BEEN FLIPPED THRU CHAIN RESULTING IN TWISTING OF CHAIN

APPEARANCE OF OFF CHAIN THAT HAS NOT BEEN TWISTED — ALTERNATING LINKS FORM A STRAIGHT LINE



APPEARANCE OF TWISTED CHAIN — ALTERNATING LINKS DO NOT FORM A STRAIGHT LINE

FIGURE 2

OPERATE HOIST CAUTIOUSLY to become familiar with the performance of the hoist. Hoist shall be operated from a position that will not be hazardous to the operator should he lose his grip or footing while operating hoist.

To operate hoist. Pull (or depress) controls slowly. Abrupt operation, resulting from "jerking" of controls, should always be avoided.

BEFORE STARTING TO LIFT, insure chain is properly seated in the sprockets (or pocketwheel). Do not lift or move load more than a few inches until load is well balanced in sling or lifting device. Care shall be taken in hoisting to insure that chain is not kinked or twisted and load does not contact any obstruction. Be certain hoist is centered over load to prevent danger of load swinging when lifted. Side or end pulling should always be avoided. Take up slack chain carefully to avoid stress caused by jerking load when lifting.

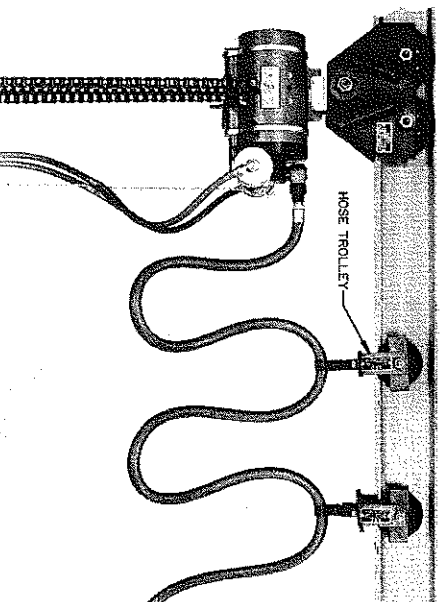
Before lifting a load be certain that safety latch on load hook is properly closed. On 2-Ton Link Chain Models; to avoid jamming of chain in lower block; allow only sufficient slack in chain to permit attaching hook to load.

INSURE LOAD CHAIN IS HANGING PROPERLY and is free of twists, loops or kinks.

DO NOT wrap the hoist chain around the load. The load shall be attached to the hook by means of slings or other approved devices and shall be properly seated in the saddle of the hook.

The rate of lift or descent of any Aro Chain Hoist can be governed manually by the operator. Both the pull chain and pendant controls provide unlimited variation between full speed and the slowest "NCHING" movement. This is accomplished by movement of pull chain handles or pendant control levers. Pulling down on chain control as far as possible or by depressing pendant control levers fully, will result in maximum hoist speed.

On pendant control models the control handle is supported by a strain cable to prevent stress on hoses.



Air Hose Supported by Hose Trolleys

FIGURE 3

The operator shall test the brakes each time a load approaching the rated load is handled by raising the load just enough to clear floor, or supports, and checking for proper brake action and lift continued only if brake is functioning properly.

DO NOT EXCEED RATED LOAD CAPACITY OF HOIST.

DO NOT operate hoist over people.

WARNING: DO NOT USE HOIST FOR HUMAN TRANSPORT.

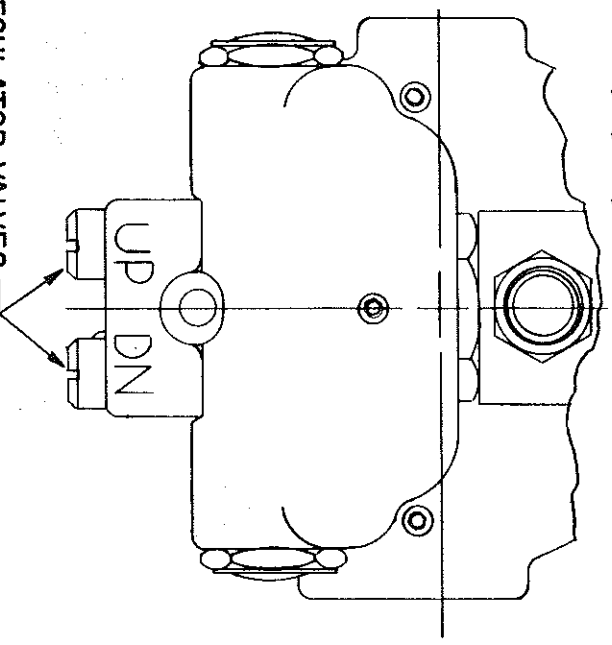
DO NOT leave load suspended for extended or unattended periods.

CAUTION: DO NOT OPERATE HOIST WITHOUT CHAIN STOP ATTACHED PROPERLY TO HOIST LOAD CHAIN. DO NOT USE CHAIN STOP AS A LIMIT SWITCH (to stop hoist when operating in the "up" mode). The chain stop function is to keep the lower hook components (lower block on one-ton models) from striking Control Arm 43133 should an over-run condition ever occur.

The maximum lift rate of a hoist is constant, provided that air pressure and load are also constant. The maximum descent rate of hoist, with the exception of spark-resistant models (see spark-resistant hoist section), can be varied within fixed limits by means of regulating valves located on the underside of the Head Housing.

Hoists are shipped from factory with regulator valves pre-set for slowest rate of descent and fastest rate of lift. If a faster rate of descent is desired, turn regulator valve clockwise by small increments while testing with desired or rated load attached. If a slower rate of lift is desired, turn regulator valve counter-clockwise by small increments while testing with desired or rated load.

WARNING: Maximum lowering speed with rated capacity load is very high. Adjust with care.



REGULATOR VALVES

FIGURE 4

INSPECTION AND MAINTENANCE

INSPECTION

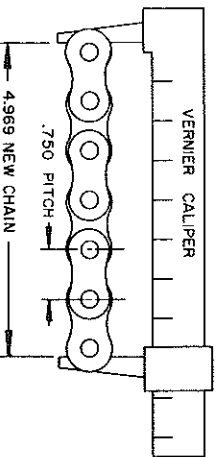
ARO recognizes the need for periodic inspection of hoist components as an important step in preventive maintenance.

The type of application for a hoist varies so greatly it is impractical to recommend an exact time-table for inspection of the hoist. Where hoist is subjected to continuous operation with capacity loads, it is recommended the unit be inspected twice a week. If the application is less demanding, the unit should be inspected twice a month. In general, the frequency of inspection should be determined by the severity of the application. The user of a hoist should be guided by any existing federal, state or local regulations governing the use, testing or inspection of the hoist.

The following points and areas are recommended for inspection:

LOAD CHAIN AND ANCHORS

- a. Visually check for nicked, gouged, twisted, bent, corroded, rusted, worn or broken links. Check ends of chain where chain is anchored to hoist frame and where chain is fastened to lower hook. Check anchors and pins.
- b. Check chain elongation with a vernier caliper as shown in figure 5.



IF VISUAL CHECK REVEALS NO DEFECTS, PROCEED AS FOLLOWS:
LAY USED CHAIN ON FLAT SURFACE AND MEASURE OVER SIX (6) ROLLS, WHILE CHAIN IS PULLED TAUT, AS SHOWN. MEASUREMENT SHOULD BE TAKEN ON PORTION OF CHAIN WHICH HAS MOST PASSED OVER THE SPROCKET.
IF MEASUREMENT TAKEN IS 5.000 INCHES OR MORE, CHAIN SHOULD BE REPLACED.

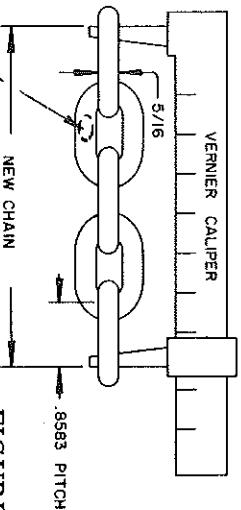


FIGURE 5

DETERMINE TYPE OF IDENTIFICATION MARKINGS EMBOSSED ON LOAD CHAIN AND FIND DIMENSIONS IN TABLE BELOW.

IDENTIFICATION MARKINGS	NEW CHAIN MEASUREMENT	REPLACE CHAIN
★	4.291	4.366
GCS	4.340	4.415

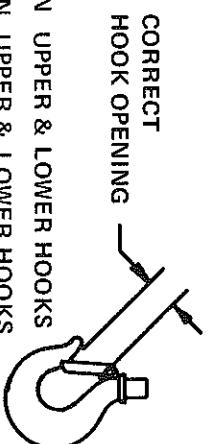
IF VISUAL CHECK REVEALS NO DEFECTS, PROCEED AS FOLLOWS:
LAY USED CHAIN ON FLAT SURFACE AND MEASURE BETWEEN FIVE (5) LINKS AS SHOWN. MEASUREMENT SHOULD BE TAKEN ON PORTION OF CHAIN WHICH HAS MOST PASSED OVER THE POCKET WHEEL.
IF MEASUREMENT TAKEN IS (SEE TABLE) INCHES OR MORE, CHAIN SHOULD BE REPLACED.

IT IS NOT INFERRED that a chain is safe prior to the occurrence of elongation of the chain. It is inferred ONLY, that when said elongation is evident, the chain must be replaced. Other factors, such as those mentioned as a visual check, may render chain unsafe long before replacement due to elongation is necessary.

NOTE: New chain should never be used on a worn pocket wheel, replace chain and pocket wheel as a pair.

HOOKS AND SUSPENSION

- a. Check upper and lower hooks and component parts for bent, worn, cracked, broken or otherwise damaged parts.
- b. On trolley suspended models, check conditions of trolley parts, trolley adapter and component parts. Replace any damaged parts.



1-1/4" ON 1-TON UPPER & LOWER HOOKS
1-3/8" ON 2-TON UPPER & LOWER HOOKS

BRAKE

- a. Check brake linings and component parts.
- b. Check brake operation.

GEARS, BEARINGS AND SPROCKET

- a. Check condition of teeth on gears and motor shaft pinion.
- b. Check condition of sprocket teeth or pockets of pocket wheel.
- c. Check condition of bearings.
- d. Replace any worn or damaged parts.

THROTTLE VALVE HEAD AND GEARS

- a. Check condition of valve body, valves, and "O" rings on valves.
- b. Check condition of gear teeth and bearings.
- c. Replace any worn or damaged parts.

AIR MOTOR

- a. Check end faces of rotor for roughness and blade slots for wear or burrs. A new blade should slide in and out of slots without binding.
- b. Check blades for wear, warpage or other damage.
- c. Check cylinder bore diameter for rough circular grooves from scoring. A badly scored cylinder cannot be restored by honing since it will only enlarge bore diameter, widening seal point between rotor and cylinder, hindering free exhaust of air and result in loss of speed and power.
- d. Check end plates for wear or scoring. Check bearings.
- e. Replace any excessively worn or damaged parts.

AIR HOISTS are made of precision parts and should be handled with reasonable care when servicing. Excessive pressure exerted by a holding device may cause distortion of a part. Apply pressure evenly when disassembling (or assembling) parts which have a press fit. When removing or installing bearings, apply pressure to the bearing race that will be the press fit to the mating part; if this is not practiced, Brinelling of the bearing races may occur making replacement necessary. It is important that the correct tools and fixtures are used when servicing this Air Hoist.

DISASSEMBLY should be done on a clean work bench with a clean cloth spread to prevent the loss of small parts. After disassembly is completed; all parts should be thoroughly washed in a clean solvent, blown dry with air and inspected for wear levels, abuse and contamination.

Double sealed or shielded bearings should never be placed

REMOVAL AND INSTALLATION OF LOAD CHAIN

REMOVAL

LINK CHAIN MODELS – A new chain should never be used on a worn pocketwheel. Replace chain and pocketwheel as a pair. To remove chain; remove Roll Pin (Y178-104) and Clevis (34987) from anchor lug on side of housing releasing end of load chain. On models where a chain basket is employed, remove chain stop (43128) from end of chain. On 2-Ton models opposite end of chain must be removed from Anchor Bracket. Remove Snap Ring (Y145-2) and Pin (42970) to remove chain from Anchor Bracket (43034).

ROLLER CHAIN MODELS – remove Connecting Link from anchor lug on side of housing releasing end of load chain. On models where a chain basket is employed, remove Connecting Link and Stop Ring (34711) from end of chain. On 2-Ton models opposite end of chain must be removed from Anchor Bracket. Remove Screws (Y6-51) with Washers (Y1-516) and Pin (43065) to remove chain from Anchor Bracket (43062).

INSTALLATION

LINK CHAIN MODELS – position hoist in a vise or other suitable holding device (figure 6) and remove Housing Cap,

in solvent unless a good method of re-lubricating the bearing is available. Open bearings may be washed but should not be allowed to spin while being blown dry. When **REPLACEMENT PARTS** are necessary, consult drawing containing part.

BEFORE REASSEMBLING, lubricate parts where required. Use 33153 Grease, or equivalent, in motor bearings and lower block assembly. Use 36460 Lubricant for "O" Ring Assembly. When assembling "O" rings or parts adjacent "O" rings, care must be exercised to prevent damage to the rubber sealing surfaces. A small amount of grease will usually hold steel balls and other small parts in place while assembling.

WHEN ORDERING PARTS, be sure to list **PART NUMBER, PART NAME** and **MODEL NUMBER OF HOIST**. Use only genuine ARO replacement parts.

REMOVAL AND INSTALLATION OF LOAD CHAIN

Brake Spring and Brake Shoes. Turn Brake Wheel by hand to rotate Pocketwheel while carefully feeding chain thru Chain Guide and around Pocketwheel. Pull sufficient chain thru housing to allow end link of chain to be attached to anchor lug on housing.

IMPORTANT NOTICE: The link chain must be positioned around the Pocketwheel so the weld on the standing links of chain face outward from pocketwheel (figure 6). **ALSO**, the end link of chain must be fed over pocketwheel so it will be positioned properly to permit attaching chain to anchor lug on housing without twisting of chain (fig. 21).

WARNING: DO NOT attempt to feed chain over Pocketwheel or Sprocket by air power as chain will be pulled thru at a very fast rate.

ROLLER CHAIN MODELS – remove Housing Cap, Brake Spring and Brake Shoes. Turn Brake Wheel by hand to rotate Sprocket while carefully feeding chain thru guide and around Sprocket. Pull sufficient chain thru housing to allow end link of chain to be attached to anchor lug on housing.

TO ASSEMBLE CHAIN TO LOWER BLOCK ON 2-TON MODELS, SEE PAGES 18 and 19.

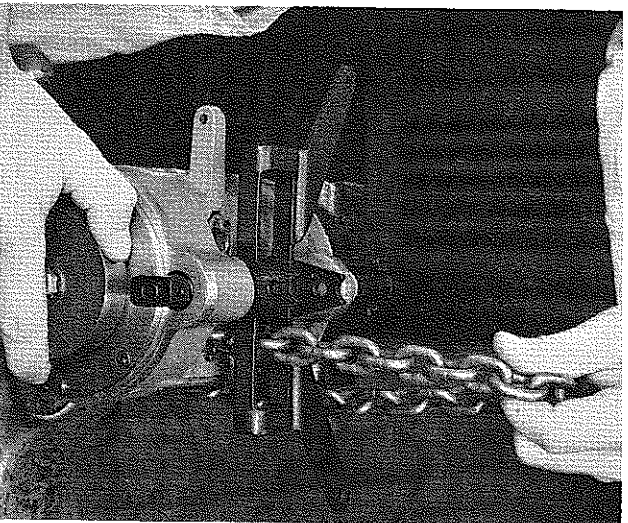
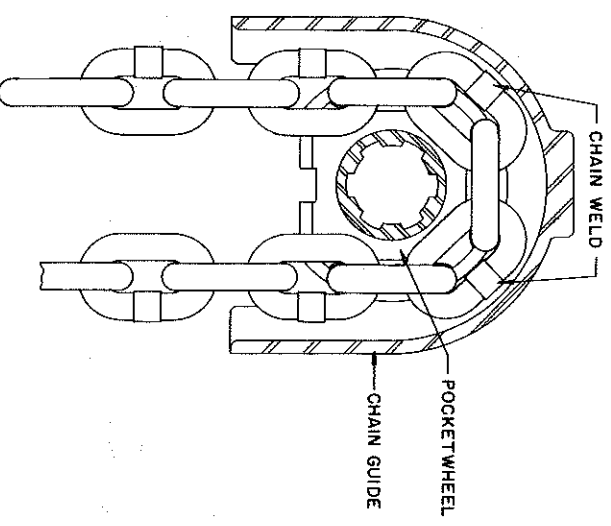


FIGURE 6



DISASSEMBLY AND REASSEMBLY

HOUSING SECTION

To minimize the possibility of parts damage and for convenience, the steps for disassembly or reassembly listed on the following pages are recommended.

REMOVAL OF HOIST

- Lower and disconnect load from hoist.
- Shut off air at source and operate hoist control to bleed air from hoist and line.
- Disconnect air hose at inlet swivel (on pendent control models, remove pendent control hoses also) and remove hoist from overhead suspension. On pull chain models remove pull chains from control arm.
- If chain basket is being used, remove from hoist.
- Remove Pipe Plug (Y227-3) from underside of Housing and drain oil from Housing.
- Remove Oil Plug (30747) and Washer (31389) from side of Head and drain oil from reservoir of Head.
- Place hoist upside-down in vise and clamp securely on upper hook bracket.
- If hoist is to be completely disassembled it is recommended the load chain be removed. For removal of chain see page 6.

HEAD SECTION

- Remove Roll Pin (Y178-56) from Gear (34022) and Control Rod (42978). NOTE: If the Head Assembly is not to be disassembled; Control Rod may be removed with Head, thereby making it unnecessary to re-time Gear (34022) with Throttle Valves. (See "Timing of Head", figure 7). To remove Control Rod with Head, remove Roll Pin (Y178-55) from Control Arm (43133), remove Roll Pin (Y178-60) from Brake Block (34029) and remove Brake Block.
- Remove Screws (Y154-54) and Washers (Y14-10) from Head and remove Head Assembly.
- Remove Gasket (43008).

NOTE: When reassembling Head to Housing see "Reassembly" on page 10.

MOTOR SECTION

- After removal of Head Assembly, the Motor Assembly may be removed from Housing.

BRAKE AND GEARING SECTION

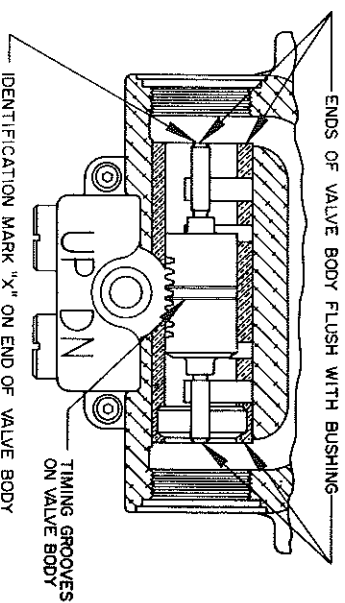
- Remove Screws (Y154-54) and Housing Cap (42979). Slide Brake Spring (42982) part way off Brake Shoes (42994) and remove Brake Spring with Brake Spring Spreader (33541). CAUTION: Remove Brake Spring with due regard as it is assembled with considerable tension. Removing Spring will release Brake Shoes (42994) and steel Balls (Y16-10).
- Align hole in Brake Wheel (43071-1) with hole in End Plate Housing (43118), insert a punch thru holes to hold Brake Wheel from turning and remove Cotter Pin (Y15-32), Nut (Y12-106), and Washer (Y117-616).
- Remove Brake Wheel.
- Remove Roll Pin (Y178-60) and Brake Block (34029).
- Remove Screws (Y99-41) and Washers (30997).
- Remove End Plate Assembly (43003). Place screwdrivers, or similar tool, at opposite sides behind edge of End Plate (43118) and pry out on End Plate to remove from housing.
- Remove Gearing Assembly (42976).

- Follow the disassembly procedures outlined for removal of Head Section, Motor Section and Gearing Section.

NOTE: For further disassembly of a particular section see pages 10 thru 20.

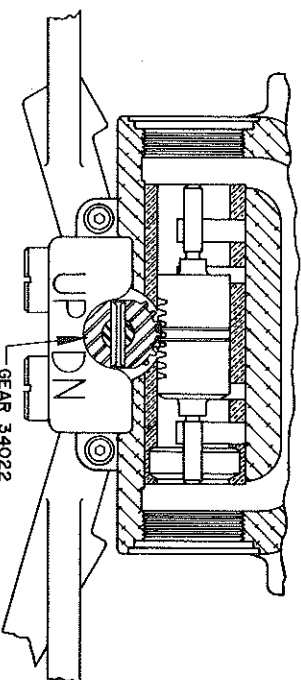
"TIMING OF HEAD"

STEP 1



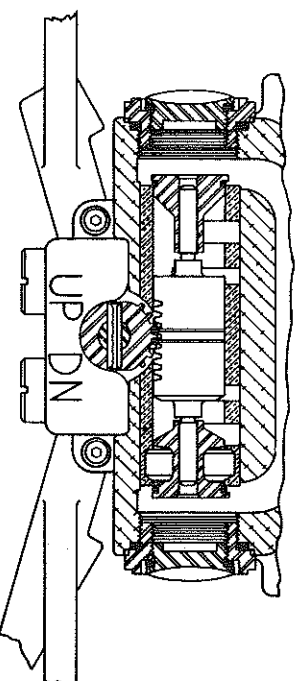
POSITION HOIST SO YOU ARE FACING END WITH AIR INLET. WITH VALVE PARTS AND GEAR 34022 REMOVED, PLACE VALVE BODY IN VALVE OPENING. INSERT FINGER IN EACH END OF VALVE OPENING AND ALIGN ENDS OF VALVE BODY WITH ENDS OF BUSHING.
NOTE: VALVE BODY MUST BE INSTALLED WITH IDENTIFICATION MARK AS SHOWN.

STEP 2



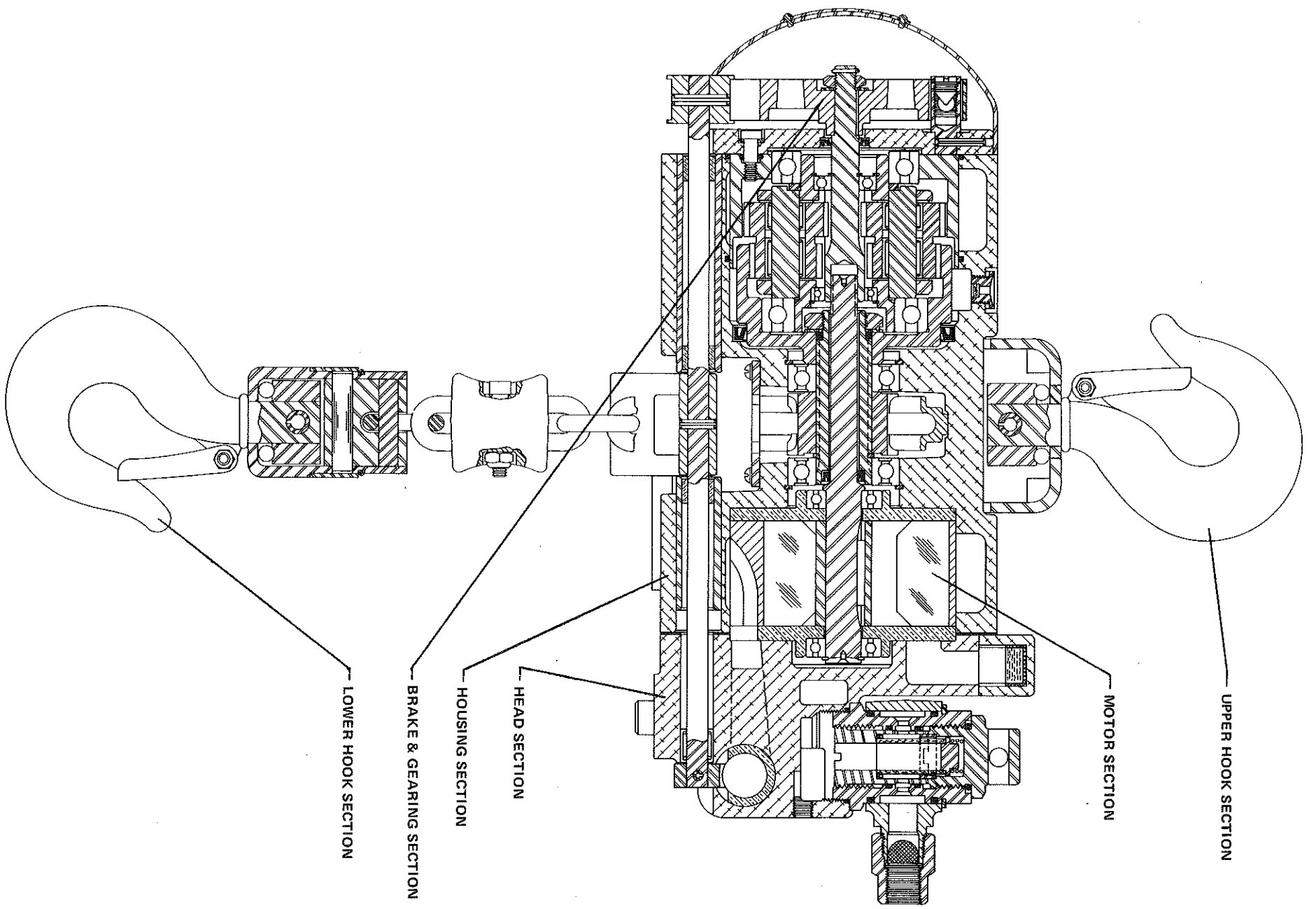
WITH BRAKE RELEASE BLOCK ASSEMBLED TO CONTROL ROD, INSERT ROD THROUGH BRAKE END OF HOUSING, THROUGH CONTROL ARM (43133) AND ON THROUGH HOUSING STOPPING BEFORE ROD PROTRUDES FROM HEAD.
ASSEMBLE GEAR (34022) TO HEAD ALIGNING CENTER TOOTH OF GEAR BETWEEN TWO GROOVE MARKINGS ON THE VALVE BODY AS SHOWN.
ASSEMBLE CONTROL ROD THROUGH GEAR AND SECURE WITH ROLL PIN (Y178-56). SECURE CONTROL ARM TO ROD WITH ROLL PIN (Y178-55).

STEP 3

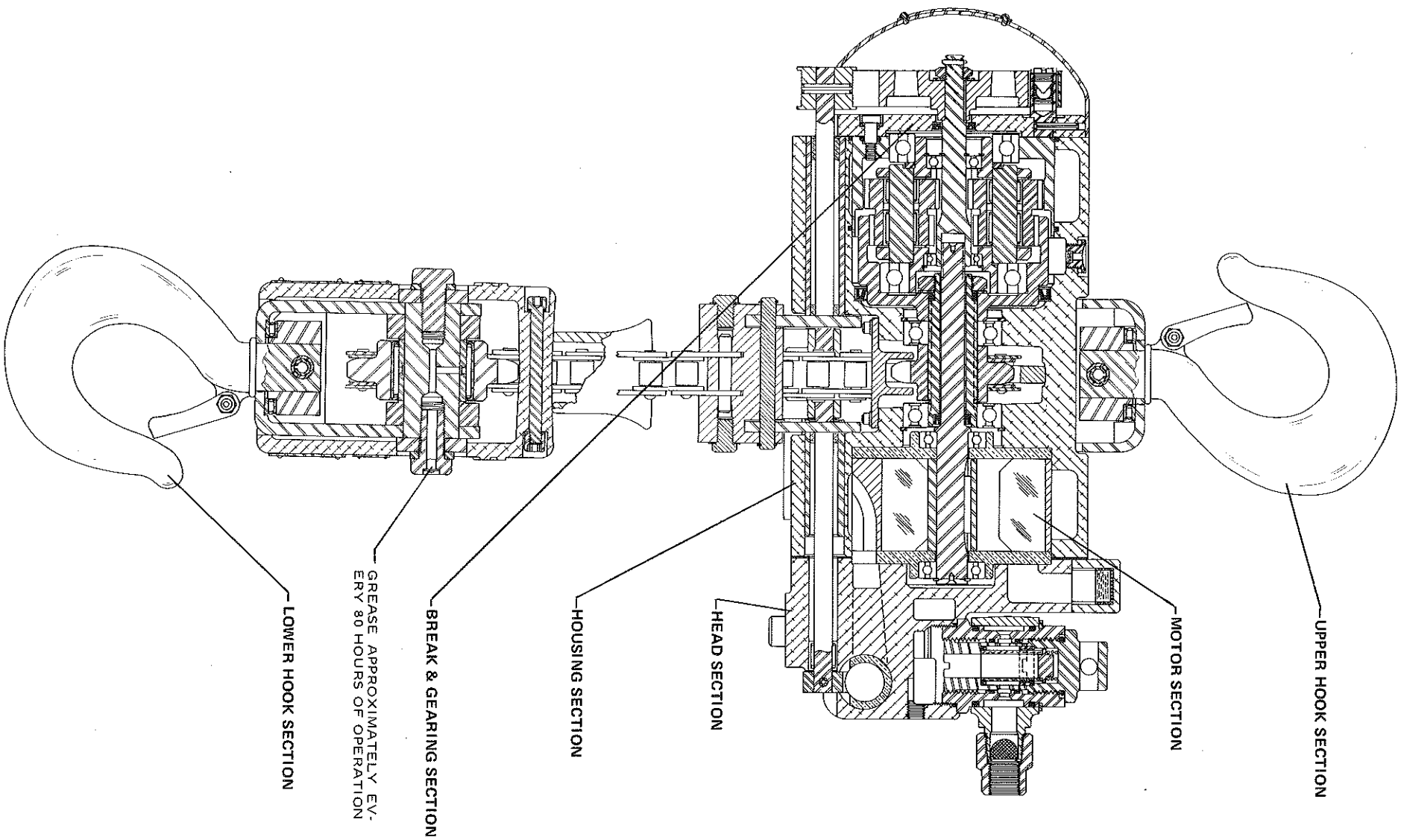


ASSEMBLE BALANCE OF VALVE COMPONENTS.

FIGURE 7



TYPICAL CROSS-SECTION OF 2 TON HOIST



BRAKE AND GEARING SECTION

DISASSEMBLY

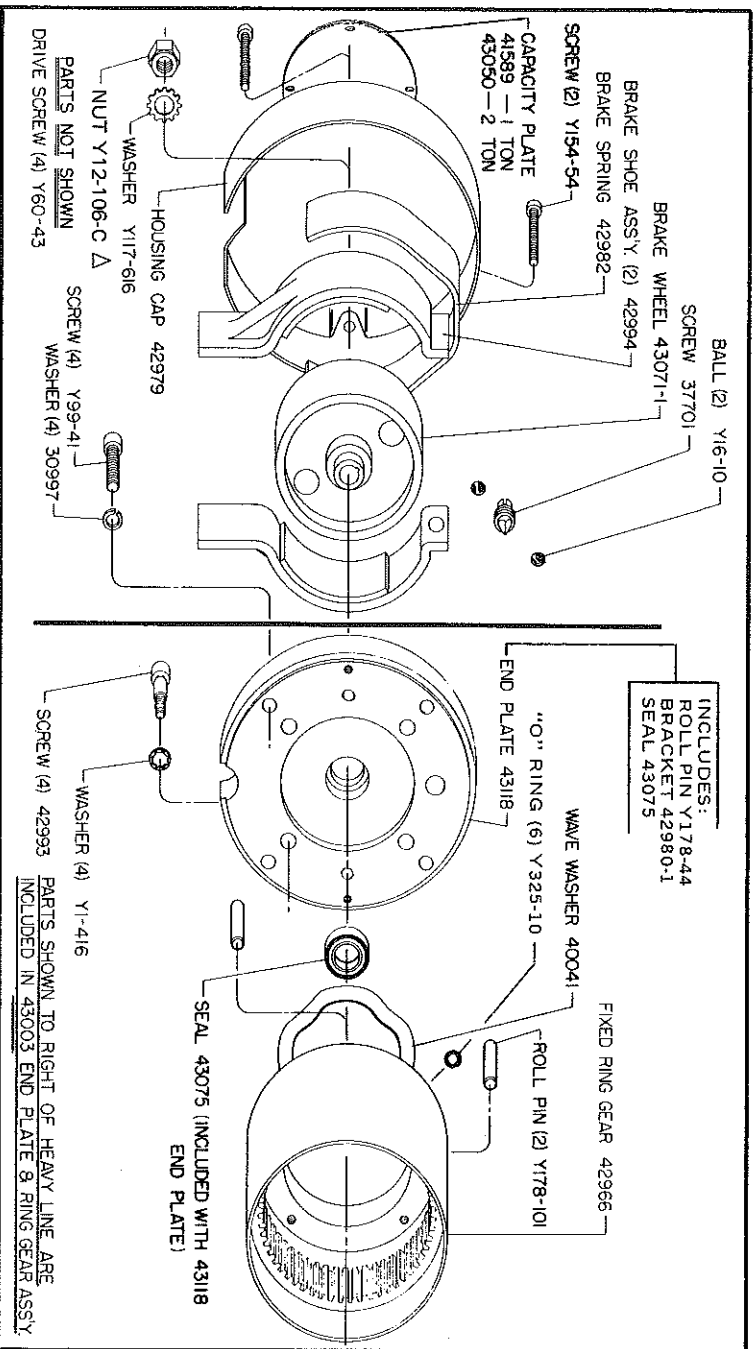
- a. Remove components from Housing Section as outlined on page 7.
- b. To disassemble Gearing Assembly (42976), remove Retaining Rings (42975) and (Y145-18). Push on threaded end of Shaft (43072-1) and remove out opposite end of Gear Carrier. Remove Bearing (42968), Spacer (42974) and Shafts (42973) releasing Gears (42971) and Bearing Races (42364). To remove Bearing (Y65-12), remove Retaining Ring (Y147-112).
- c. Remove Screws (42993) and Washers (Y1-416) to remove fixed Ring Gear (42966) and Wave Washer (40041) from End Plate (43118).

REASSEMBLY

- a. Assemble "O" Rings (Y325-10) to Ring Gear, Wave Washer (40041), and Ring Gear (42966) to End Plate (43118) aligning Roll Pin (Y178-101) with holes in End Plate and secure using Washers (Y1-416) and Screws (42993).
- b. Assemble Gears (42971) and Bearing Races (42364) to Gear Carrier (42965) and secure with Shafts (42973).
- c. Assemble Spacer (42974) to Gear Carrier and align notches in Shafts (42973) with Spacer. Assemble Bearings (42968) and (40048) to Gear Carrier.
- d. Assemble Bearing (41864) to Shaft (43072-1) and assemble to Carrier securing with Retaining Ring (42975). NOTE: Punch marks on Gears (42971) indicating aligned teeth must be aligned with center punch marks on Carrier (42965) when Shaft (43072) is assembled to Carrier. See figure 14. Assemble Bearing (Y65-12) and Retaining Rings (Y147-112) and (Y145-18).
- e. Assuming Ring Gear (42963) and "O" Ring (43012) are assembled to Housing (see Housing Section page 14, paragraphs c, d and e), assemble Gearing Assembly

- f. (42976) into Ring Gear (42963) aligning splines of Gear (42971) with Ring Gear.
- g. Assemble End Plate and Ring Gear Assembly (43003) with "O" Ring (41579) to Gearing Assembly and Housing. Use reasonable care when assembling End Plate over Shaft (43072-1) so as not to cause damage to Seal (43075) in End Plate. Secure (43003) assembly to Housing with washers (30997) and Screws (Y99-41).
- h. Assemble Brake Wheel (43071-1) to Shaft (43072-1) and secure with Washer (Y117-616), Nut (Y12-106) and Cotter Pin (Y15-32).
- i. Assemble Control Rod (42978) through Housing and Control Arm (43133). NOTE: Assemble Control Arm (43133) to Housing with lugs for control chain positioned so they face the "head end" of the hoist. NOTE: On 2-Ton models Hangers (43033) must be assembled to housing at the time the Control Arm and Control Rod are assembled.
- j. Secure Control Arm to Control Rod with Roll Pin (Y178-55). Assemble Brake Block (34029) to Control Rod and secure with Roll Pin (Y178-60).
- k. Assemble Screw (37701) and Steel Balls (Y16-10) to bracket on end plate and position Brake Shoes over Brake Wheel securing with Brake Spring (42982).
- l. Assemble Housing Cap (42979) over brake components and secure with Screws (Y154-54). SEE BRAKE ADJUSTMENT.

NOTE: After hoist has been completely reassembled, replace Pipe Plug (Y227-3) which was removed to drain oil from gear chamber. Remove Oil Filler pipe plug (Y227-3) located at top of housing in mounting lug, and fill gear chamber with 6 to 7 ounces (to plug hole level) of Gear Oil (40164). Replace Pipe Plug. △



△ REV. 3/78

FIGURE 11

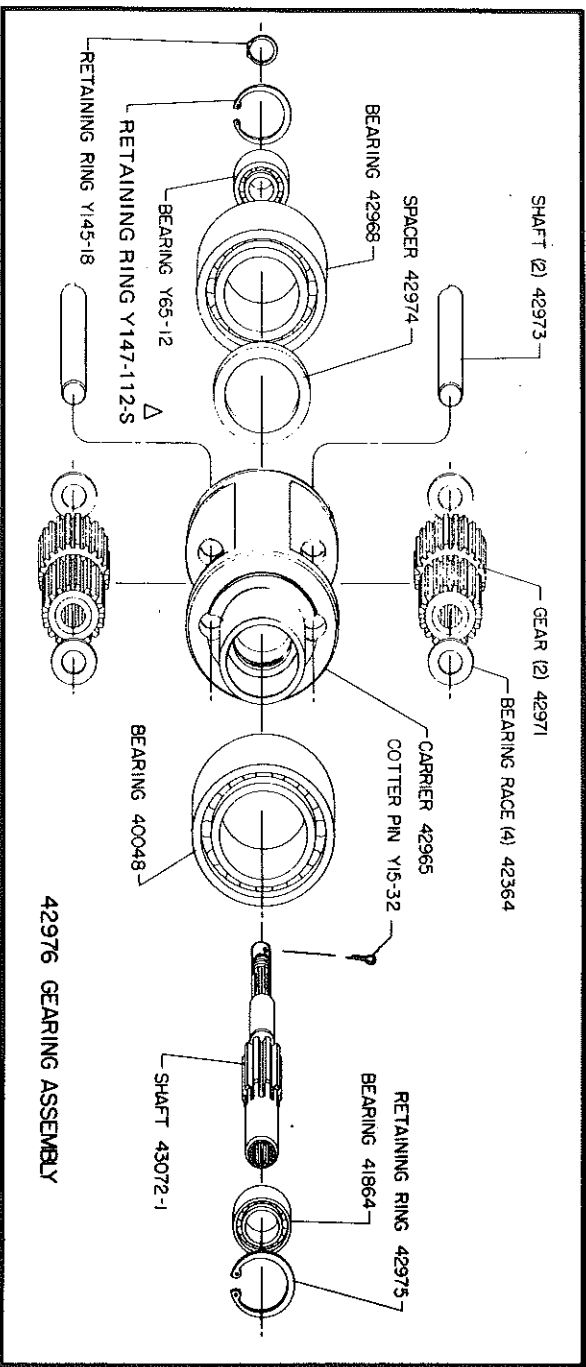


FIGURE 12

BRAKE ADJUSTMENT

To adjust Brake, insert screwdriver thru hole in Housing Cap. Turn Screw (37701) counter-clockwise to tighten brake, clockwise to loosen brake.

Brake adjustment should be made with air turned on and with rated load attached to lower hook. Operate hoist to raise load applying slight pressure to pull chain handle or pendant control. If load starts to lower before it is raised by motor, tighten brake until no slippage is evident. Care should be taken not to tighten brake more than necessary to hold load. If brake is too tight, it will cause erratic hoist control.

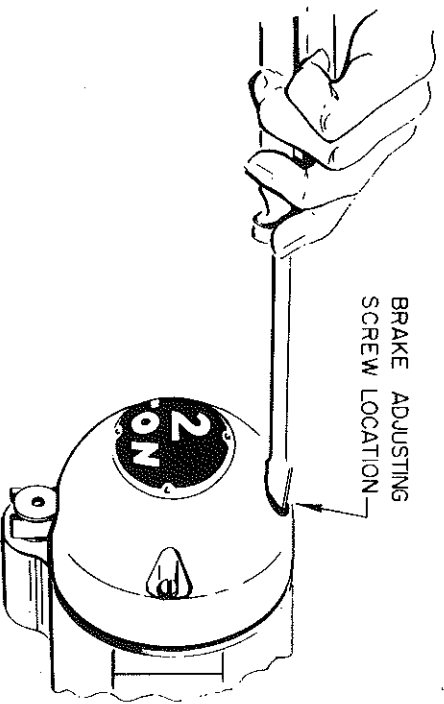


FIGURE 13

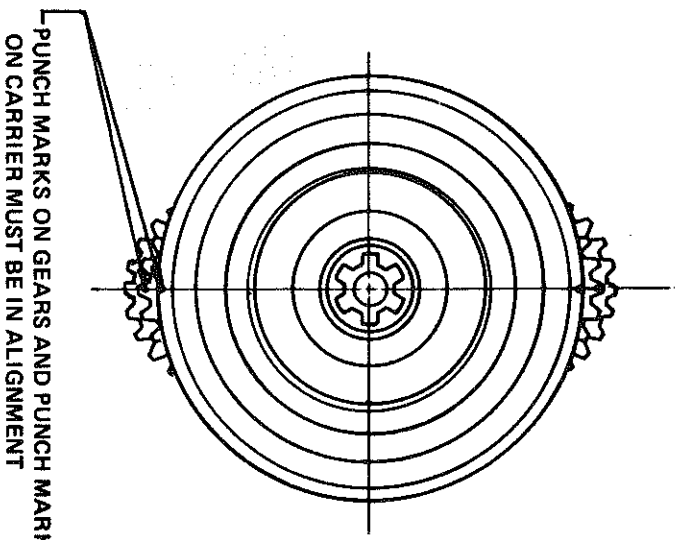
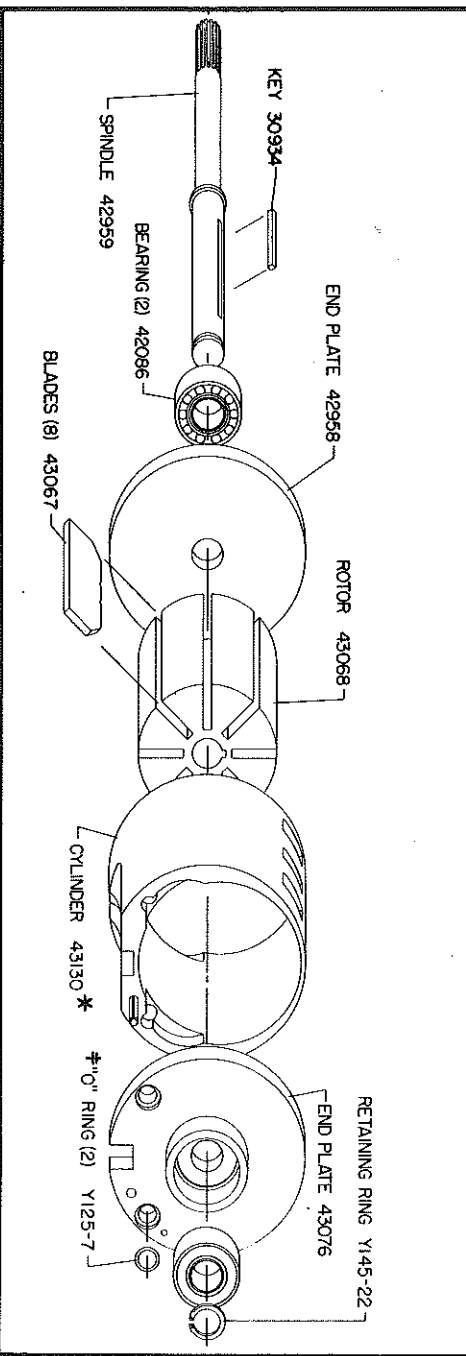


FIGURE 14

MOTOR SECTION

MOTOR ASSEMBLY 42977

† NOT INCLUDED WITH MOTOR ASS'Y
* INCLUDES ROLL PIN Y178-73



DISASSEMBLY

- a. Remove Motor Assembly from housing as outlined on page 7.
- b. Remove Retaining Ring (Y145-22); motor parts may now be disassembled.

REASSEMBLY

- a. Lubricate Bearings (42086) with 33153 grease and assemble into End Plates with the shielded side of bearing facing out.
- b. Assemble End Plate (42958) to Spindle (42959) with Bearing side of End Plate going on Spindle first and slide on until bearing seats against flange on Spindle.

HOUSING SECTION

DISASSEMBLY

- a. LINK CHAIN MODELS; remove Screws (Y154-52) and Retaining Plate (42990). ROLLER CHAIN MODELS; remove Screws (Y154-52) and Chain Stripper (43069).
- b. Place a brass or wood block in sprocket cavity of housing to prevent turning of load shaft and remove Nut (42964), Washer (Y117-875), "O" Ring (Y125-16) and Ring Gear (42963).
- c. Remove Retaining Ring (Y147-200) from "motor end" of Housing and remove Load Shaft (43004) with Bearing (42962) and Retaining Ring (Y145-25) attached.
- d. LINK CHAIN MODELS; remove Pocket Wheel (42961) and Chain Guide (42989). ROLLER CHAIN MODELS; remove Lift Sprocket (43117). Remove Screws (Y154-54) and Washers (Y14-10) releasing Chain Guide (43018).

REASSEMBLY

- a. LINK CHAIN MODELS; Assemble Bearing (42962) into "brake end" of Housing and secure with Retaining Ring (Y147-200). Assemble Chain Guide (42989) and Pocket Wheel (42961) into Housing securing with Retainer Plate (42990), Washers (Y117-10) and Screws (Y154-52).

NOTE: Pocket Wheel (42961) must be assembled to Housing with the side having the part number stamped on it facing the "brake end" of the Housing. ROLLER CHAIN MODELS; Assemble Chain Guide (43018) into Housing securing with Screws (Y154-54) and Washers (Y14-10). Assemble Bearing (42962) into "brake end" of Housing and secure with Retaining Ring (Y147-200). Assemble Lift Sprocket (43117) and Chain Stripper (43069) to Housing securing with Washers (Y117-10) and Screws (Y154-52).

UPPER HOOK SECTION

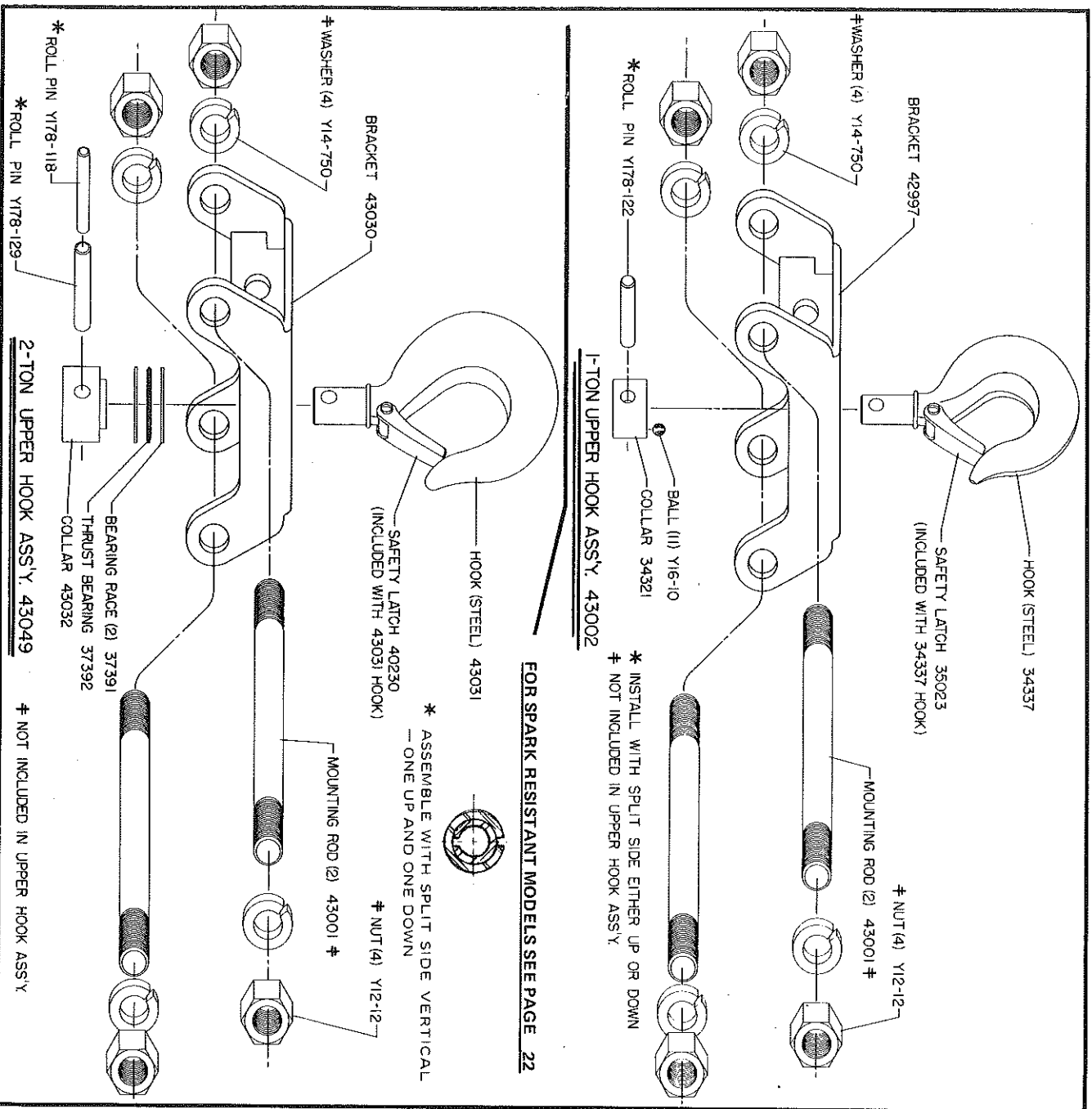


FIGURE 17

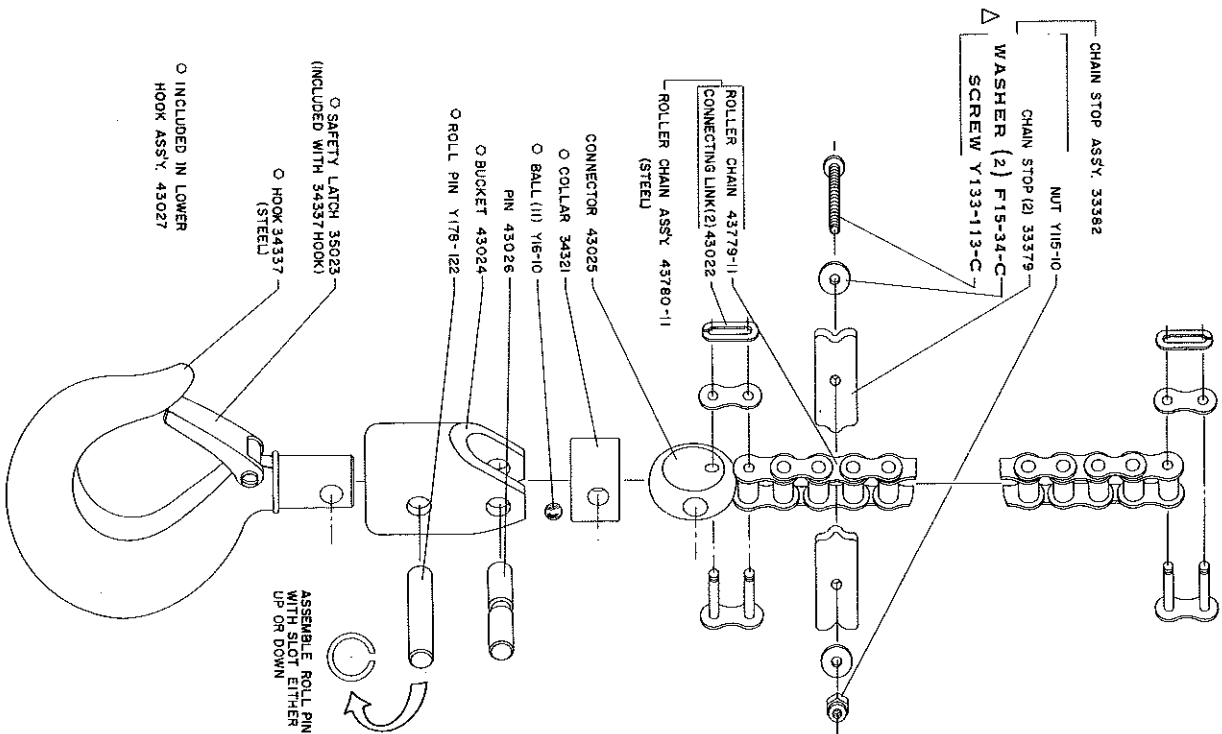
DISASSEMBLY

- a. To remove Upper Hook Assembly from Housing, remove Nuts (Y12-12), Washers (Y14-750) and Bolts (43001).
- b. To remove Hook, remove Roll Pin(s) from Collar (34321), I-Ton models or (43032), 2-Ton models, releasing Collar, Bearings and Hook.

REASSEMBLY

- a. 1-Ton models: Apply a liberal amount of grease in groove of Collar to retain balls (also for lubrication) and assemble Steel Balls (Y16-10) to Collar (34321). Assemble hook through mounting Bracket (42997), assemble Collar with Steel Balls (11) to Hook aligning holes in Hook and Collar and secure with Roll Pin (Y178-122). NOTE: Assemble Roll Pin with split side positioned directly Up or Down.

- b. 2-Ton models: Assemble one (1) bearing Race (37391) to Collar (42032). Apply grease to Bearing (37392), assemble to Collar and assemble other Race (37391) to Collar. Assemble Hook through mounting Bracket (43030), assemble Collar with Bearing to Hook aligning holes in Hook and Collar and secure with Roll Pins (Y178-129) and (Y178-118). NOTE: Install Roll Pins positioning the split side of one Roll Pin directly Up and the other Roll Pin with the split side directly down.
- c. Assemble to Housing with Bolts (43001), Washers (Y14-750) and Nuts (Y12-12) and tighten securely.
- d. Insure Safety Latch (35023 or 40230) is properly installed on Hook.



FOR SPARK-RESISTANT MODELS REFER TO PAGE 22

ROLLER CHAIN MODELS (1 TON)

FIGURE 18

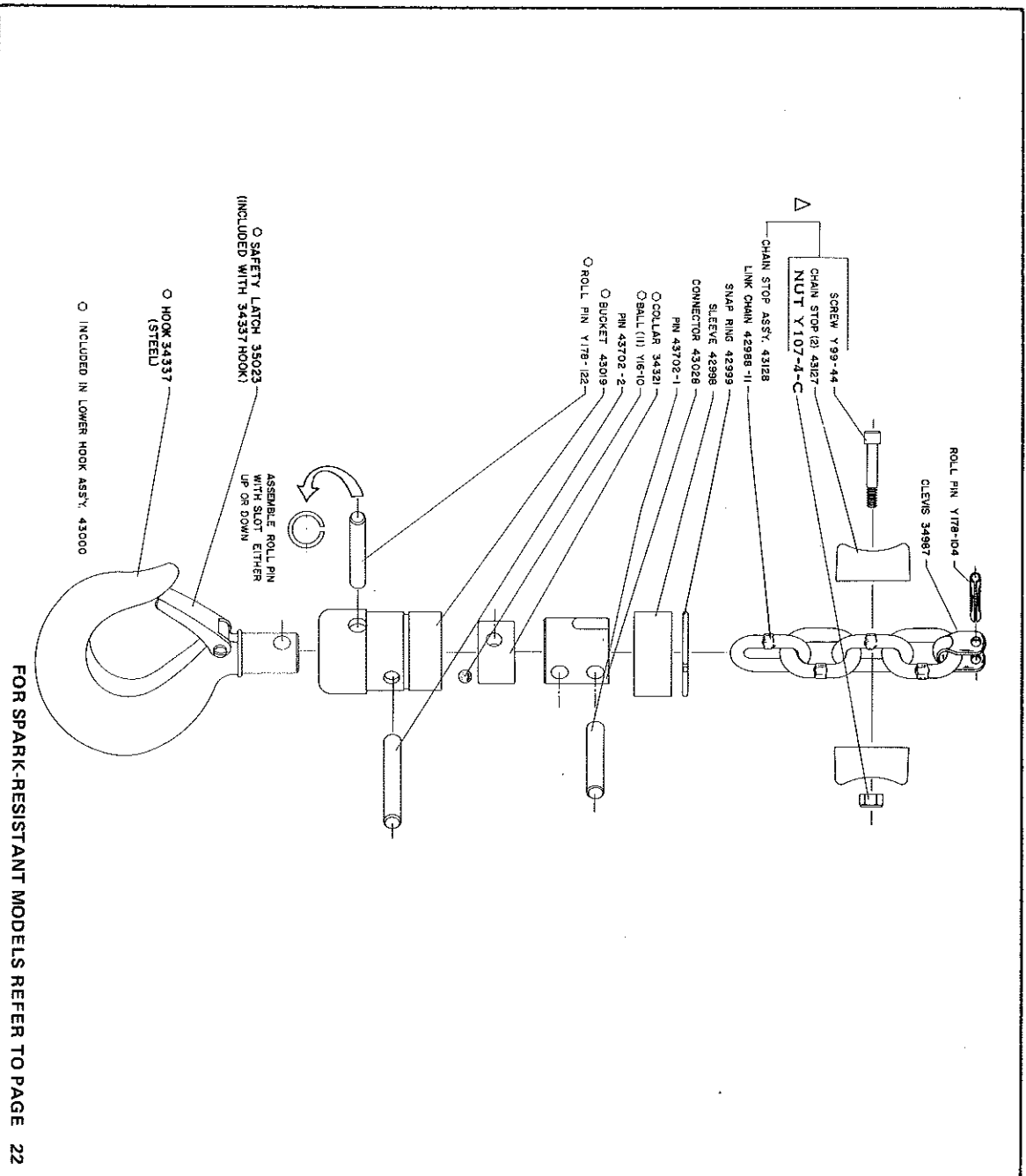
DISASSEMBLY

- a. Remove Connecting Link (43022) releasing roller chain from Connector (43025). Remove Pin (43026) releasing Connector from Bucket (43024)
- b. To remove Hook from Bucket, remove Roll Pin (Y178-122) releasing Collar (34321) and Steel Balls (Y16-10).

REASSEMBLY

- a. Apply a liberal amount of grease to groove of Collar to retain Steel Balls (also for lubrication) and assemble Balls (11) to Collar. Assemble Hook through Bucket (43024), assemble Collar with Steel Balls to Hook aligning holes in Hook and Collar and secure with Roll Pin (Y178-122). NOTE: Assemble Roll Pin with split side directly Up or Down.
- b. Assemble Connector (43025) to Bucket and secure with Pin (43026). Insure hole in Connector to receive Connecting Link is in the up position.
- c. Assemble Chain to Connector using Connecting Link (43022).

LOWER HOOK SECTION



LINK CHAIN MODELS (1 TON)

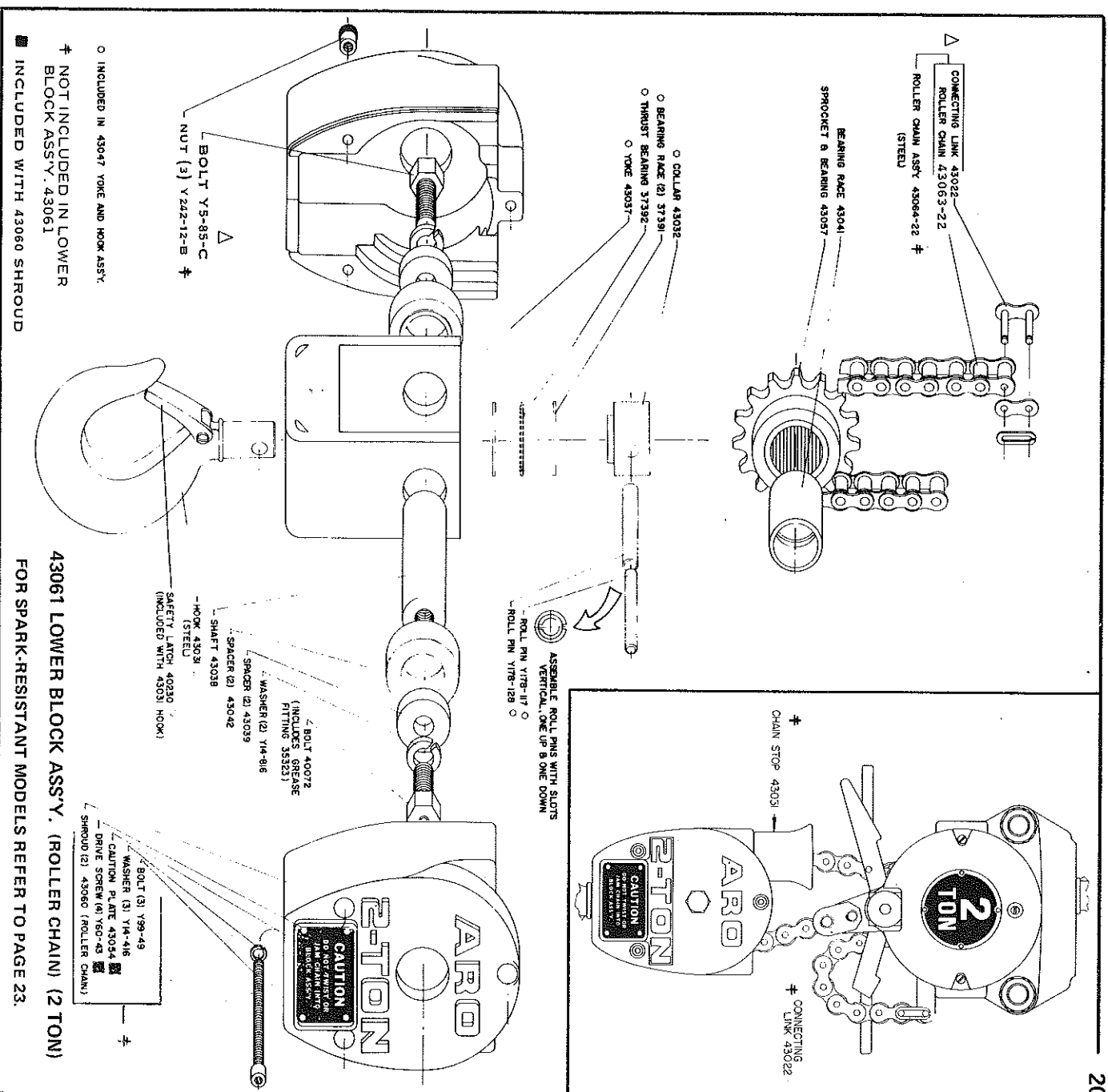
FIGURE 19

DISASSEMBLY

- a. Remove Snap Ring (42999) and Sleeve (42998) from Lower Hook Bucket (43019).
- b. Remove Pin (43702-2) releasing Connector (43028) and remove Pin (43702-1) releasing link chain.
- c. To remove Hook from Bucket, remove Roll Pin (Y178-122).

REASSEMBLY

- a. Apply a liberal amount of grease to groove in Collar (34321) to retain Balls (also for lubrication) and assemble Steel Ball (Y16-10) to Collar. Assemble Hook through Bucket (43019), assemble Collar with Steel Balls (11) to Hook aligning holes in Hook and Collar and secure with Roll Pin (Y178-122).
NOTE: Assemble Roll Pin with split side directly Up or Down.
- b. Slip Snap Ring (42999) and Sleeve (42998) on load chain and assemble end of link chain to Connector (43028) and secure with Pin (43702-1). Assemble Connector to Bucket (43019) aligning holes in Bucket and Connector and secure with Pin (43702-2).
- c. Assemble Sleeve (42998) to Bucket and secure with Snap Ring (42999). Insure Safety Latch is properly installed to Hook.



43061 LOWER BLOCK ASSY. (ROLLER CHAIN) (2 TON)
FOR SPARK-RESISTANT MODELS REFER TO PAGE 23.

FIGURE 20

- DISASSEMBLY**
- Remove Nuts (242-12) and Bolts (Y99-49) releasing Shrouds.
 - Remove Bolts (Y5-85) and (40072) releasing Shaft (43038), Sprocket and components.
 - To remove Hook from Yoke, remove Roll Pins (Y178-128) and (Y178-117).

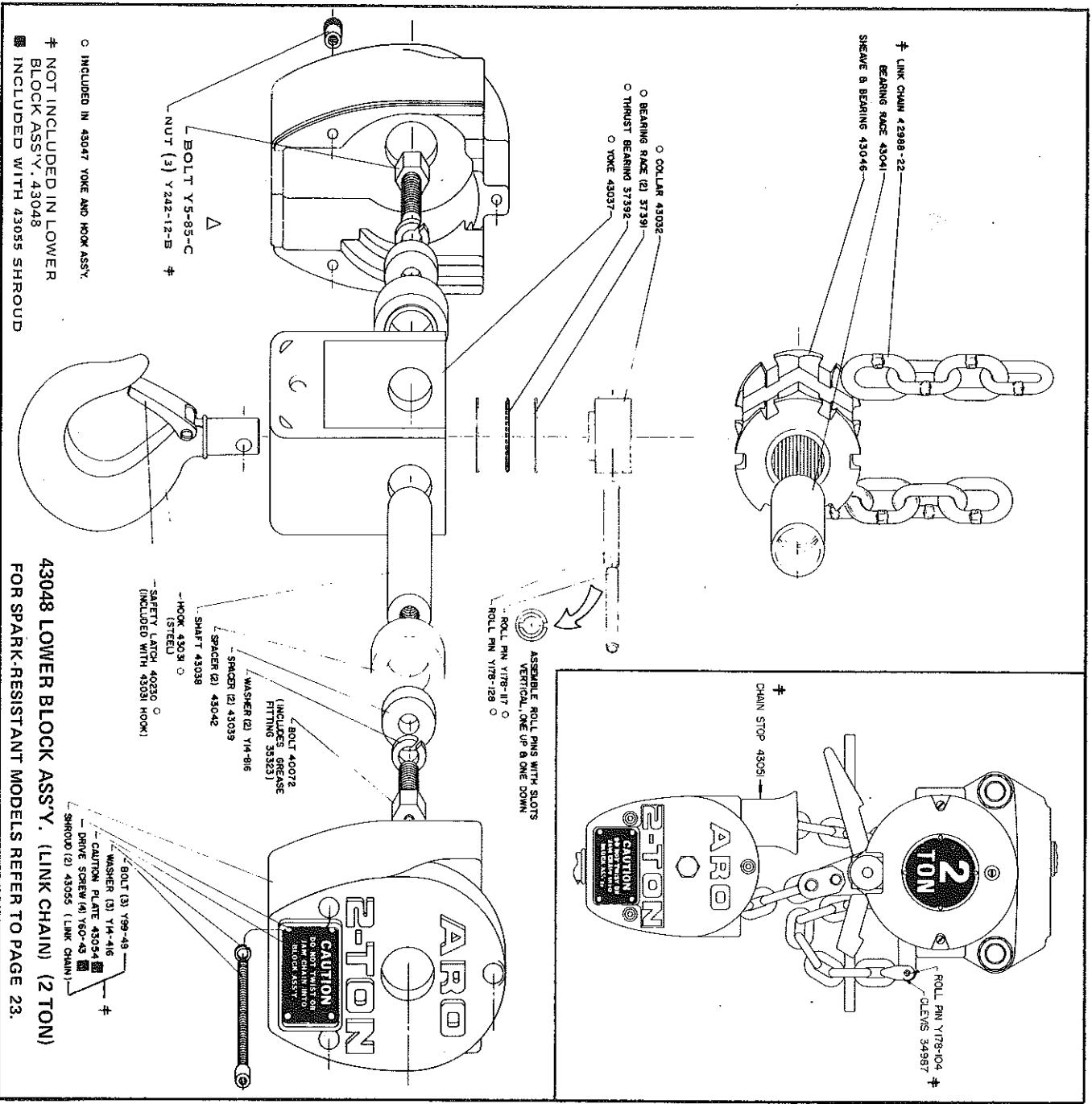
REASSEMBLY

- Assemble Bearing (37392) with Races (37391) to Collar (43032) applying grease 33153 to retain parts to Collar and for lubrication. Assemble Hook to Yoke and assemble Collar with Bearing and Races to Hook securing with Roll Pins (Y178-128) and (Y178-117).
NOTE: Roll Pins (Y178-117) and (Y178-128) must be installed as shown in figure 20 with **SPLIT SIDE** pointing one UP and one DOWN.

- Lubricate Sprocket Bearing with 33153 grease and assemble Sprocket with Bearing Race (43041) and Spacers (43042) to Yoke and secure with Shaft (43038). Secure Shaft in Yoke with Spacers (43039), Washers (Y14-816), Bolts (Y5-85) and (40072).
With end of Chain removed from Anchor Bracket (43062), feed chain through Chain Stop (43051) and around Sprocket. See figure 20 for correct positioning of Chain Stop on Chain.

CAUTION: When feeding chain around Sprocket insure Chain is not twisted. Secure end of Chain to Anchor Bracket (43062). Insure Chain is not twisted and is properly seated in Sprocket and assemble Shroud to Lower Block Assembly and secure with Screws (Y99-49), Washers (Y14-416) and Nuts (Y242-12).

LOWER HOOK SECTION



43048 LOWER BLOCK ASSY. (LINK CHAIN) (2 TON)
FOR SPARK-RESISTANT MODELS REFER TO PAGE 23.

FIGURE 21

DISASSEMBLY

- a. Remove Nuts (Y242-12) and Bolts (Y99-49) releasing Shrouds.
- b. Remove Bolts (Y5-85) and (40072) releasing Shaft (43038), Sheave and components.
- c. To remove Hook from Yoke, remove Roll Pins (Y178-128) and (Y178-117).

REASSEMBLY

- a. Assemble Bearing (37392) with Races (37391) to Collar (43032) applying grease (33153) to retain parts to Collar and for lubrication. Assemble Hook to Yoke and assemble Collar with Bearing and Races to Hook securing with Roll Pins (Y178-128) and (Y178-117).
NOTE: Roll Pins (Y178-117) and (Y178-128) must be installed as shown in figure 21 with **SPLIT SIDE** pointing one UP and one DOWN.

- b. Lubricate Sheave Bearing with 33153 grease and assemble Sheave with Bearing Race (43041) and Spacers (43042) to yoke and secure with Shaft (43038). Secure Shaft in yoke with Spacers (43039), Washers (Y14-816), Bolts (Y5-85) and (40072).
- c. With end of Chain removed from Anchor Bracket (43034), feed Chain through Chain Stop (43051) and around Sheave. See figure 21 for correct positioning of Chain Stop on Chain.

CAUTION: When feeding chain around Sheave insure Chain is not twisted. Secure end of Chain to Anchor Bracket (43034). Insure Chain is not twisted and is properly seated in Sheave and assemble Shroud to Lower Block Assembly and secure with Screws (Y99-49), Washers (Y14-416) and Nuts (Y242-12).

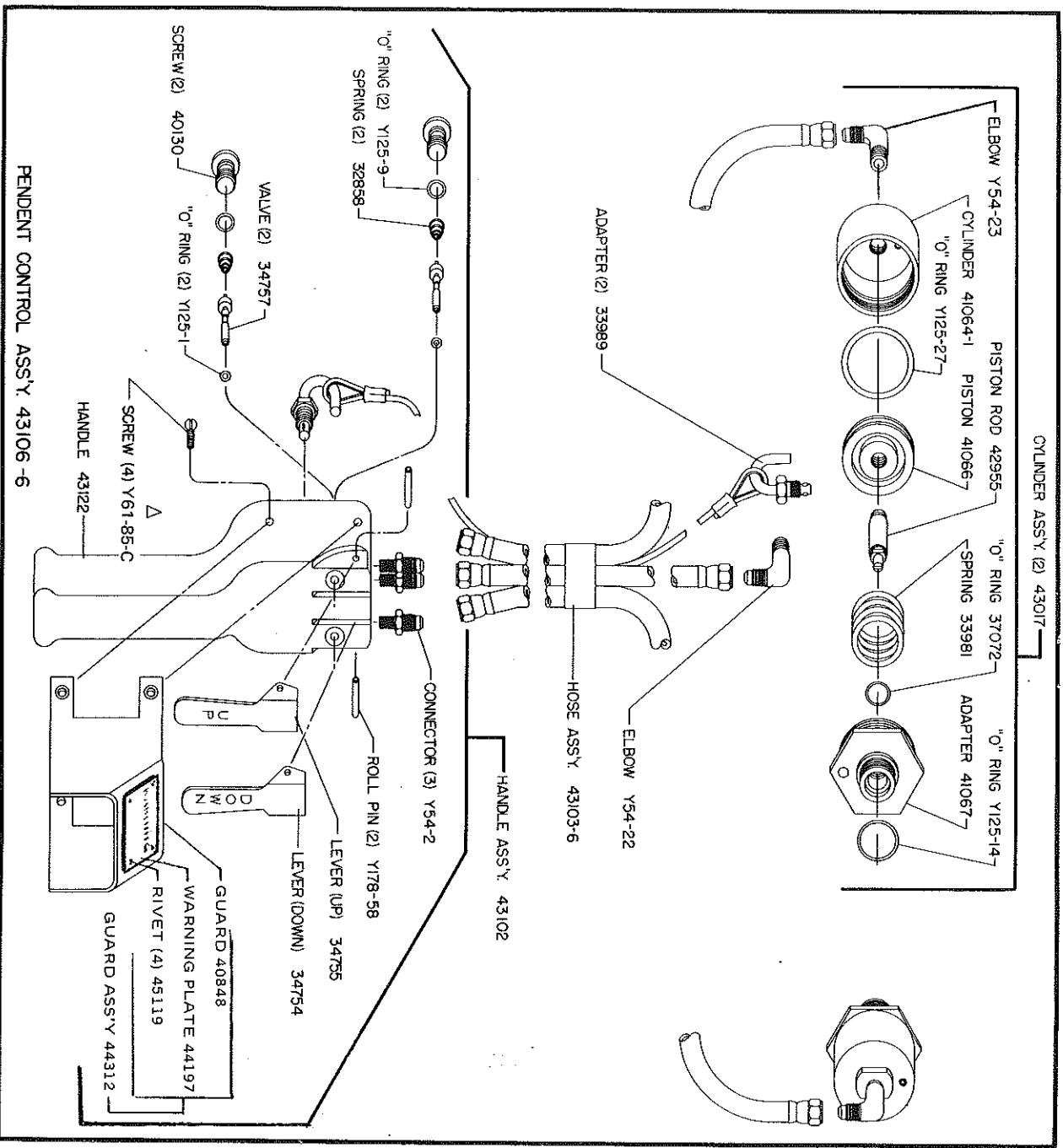


FIGURE 22

DISASSEMBLY

- To remove from hoist, shut off air and disconnect hoses from cylinder assemblies and from Head.
- Remove Adapter (33989) from head, releasing cable.
- To disassemble Cylinders, unscrew and remove from head.
- Remove Adapter (41067), releasing Spring, Piston, Piston Rod and "O" Ring.
- To disassemble control handle, remove Screws (40130) with "O" Rings (Y125-9), releasing Spring (32858), Valves (34757) with "O" Rings (Y125-1).

PENDENT CONTROL

REASSEMBLY

- Assemble "O" Ring (37072) into Adapter (41067).
- Assemble Piston Rod (42955) and "O" Ring (Y125-27) to Piston (41066) and assemble with Spring (33981) into Cylinder (41064-1). Secure with Adapter (41067).
- Assemble with "O" Ring (Y125-14) to head.
- To reassemble control handle, reverse disassembly procedure.

ASSEMBLY OF CONTROLS TO HOIST

- On pull chain control models, control chains must be installed as follows: Facing air inlet end of hoist (with hoist in upright position), chain attached to "UP" end of control handle must be attached to right end of control arm. Chain attached to "DOWN" end of control handle must be attached to left end of control arm — see figure 23.

- On pendent control models, control hoses must be attached to cylinder on head as follows: Facing air inlet of hoist, the hose to "DOWN" lever of control must be connected to cylinder on right hand side of head. Hose to "UP" side of control must be connected to left hand side of the head.

CONTROLS SECTION

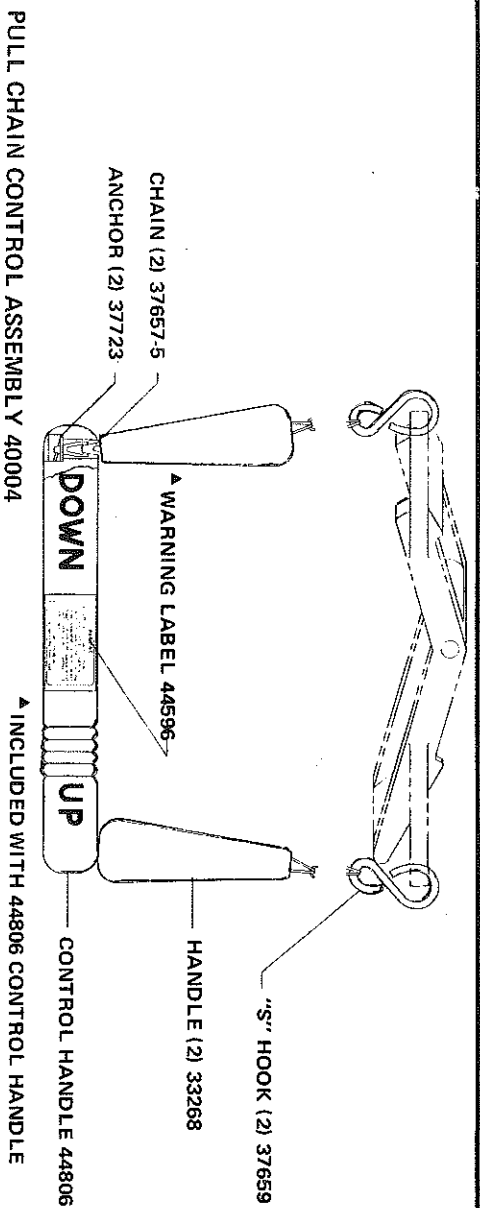


FIGURE 23

SPARK-RESISTANT HOIST SECTION

SPARK RESISTANT MODELS

MODEL NO.	TYPE CONTROL	UPPER MOUNTING	LBS. CAPACITY	TYPE CHAIN AND HOOKS
7790-19	PULL CHAIN	43097	1,200	STAINLESS STEEL ROLLER CHAIN AND BRONZE HOOKS
7790-20		NONE *		
7790-21		43097	1,500	STAINLESS STEEL LINK CHAIN AND BRONZE HOOKS
7790-22		NONE *		
7792-19		43096	2,400	STAINLESS STEEL ROLLER CHAIN AND BRONZE HOOKS
7792-20		NONE *		
7792-21		43096		
7792-22		NONE *		
7792-23		43096	3,000	STAINLESS STEEL LINK CHAIN AND BRONZE HOOKS
7792-24		NONE *		

The Hoist Models listed in table above are furnished with the load chain made of stainless steel. The top and bottom hooks of these hoists are bronze.

spark-resistant hoists are comparable to the standard 2-Ton models (with the exception of the parts shown in the table below and cross-sectional view of Head shown on page 23), but the rates of lift and descent are modified.

Other components of the 1,200 lb. and 1,500 lb. capacity spark-resistant hoists are comparable to the Standard 1-Ton models and the 2,400 lb. and 3,000 lb. capacity

Other part number variations will be noted in the various parts drawings contained in this manual.

PART NAME	STANDARD 1-TON	1,200 LB. CAPACITY	1,500 LB. CAPACITY	STANDARD 2-TON	2,400 LB. CAPACITY	3,000 LB. CAPACITY
AIR INLET ADAPTER	37873	37183-1	37183-1	37873	37183-1	37183-1
CAPACITY PLATE (ON HOUSING CAP 42979)	41589	41628	45278	43050	43116	45279

* FOR TROLLEY MOUNTING - TROLLEY MUST BE ORDERED SEPARATELY

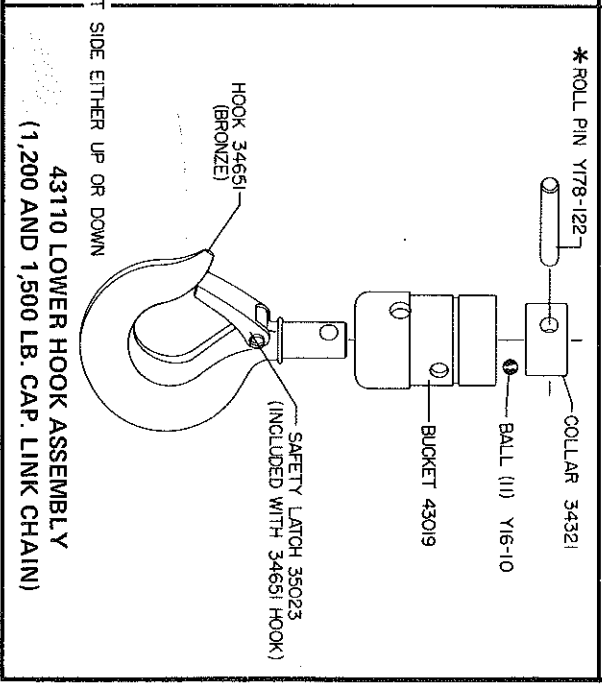
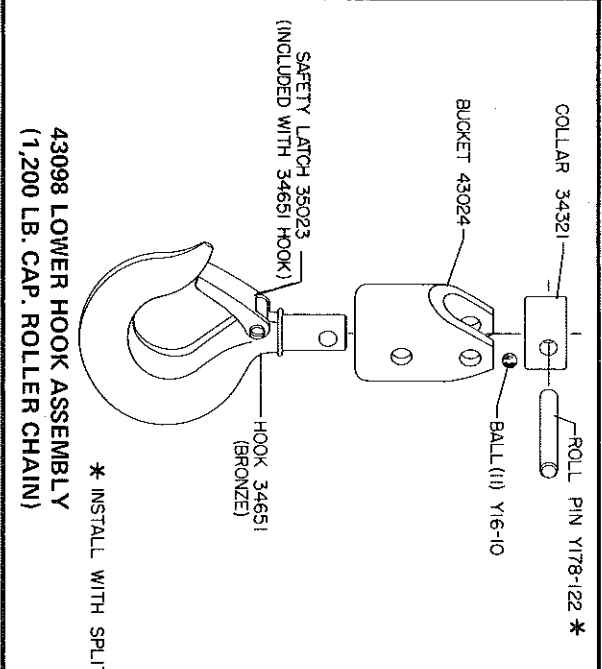
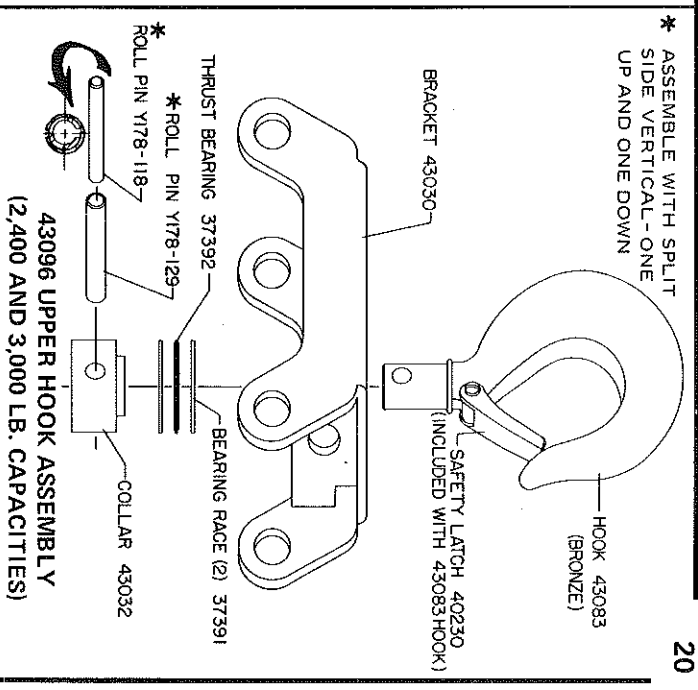
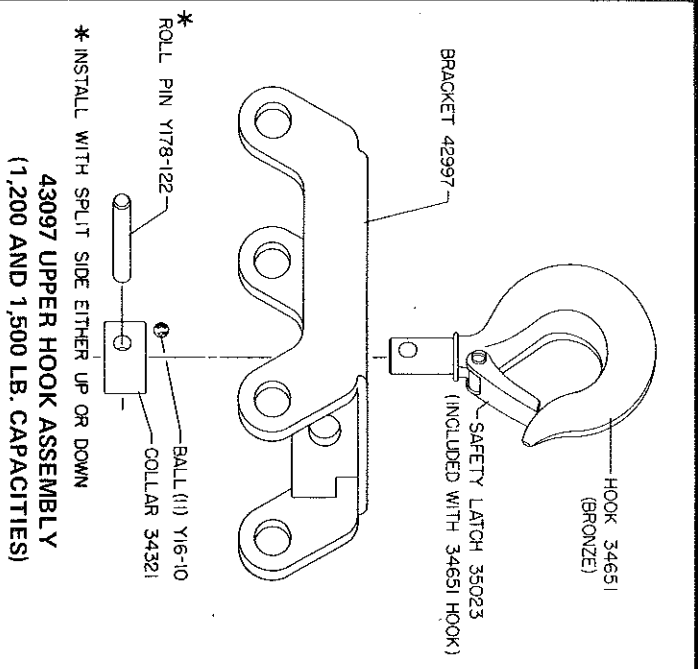


FIGURE 24

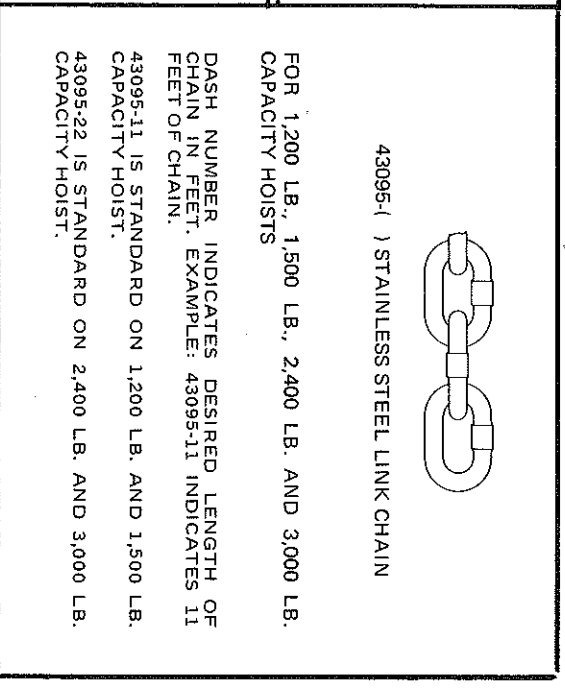
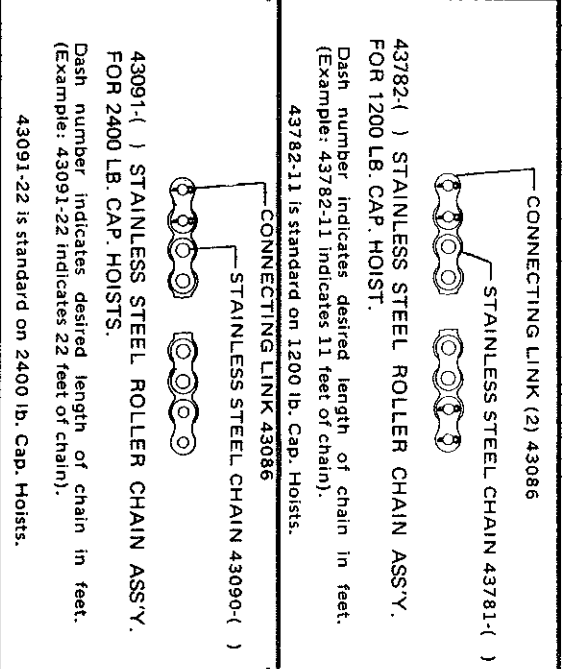


FIGURE 25

SPARK-RESISTANT HOIST SECTION

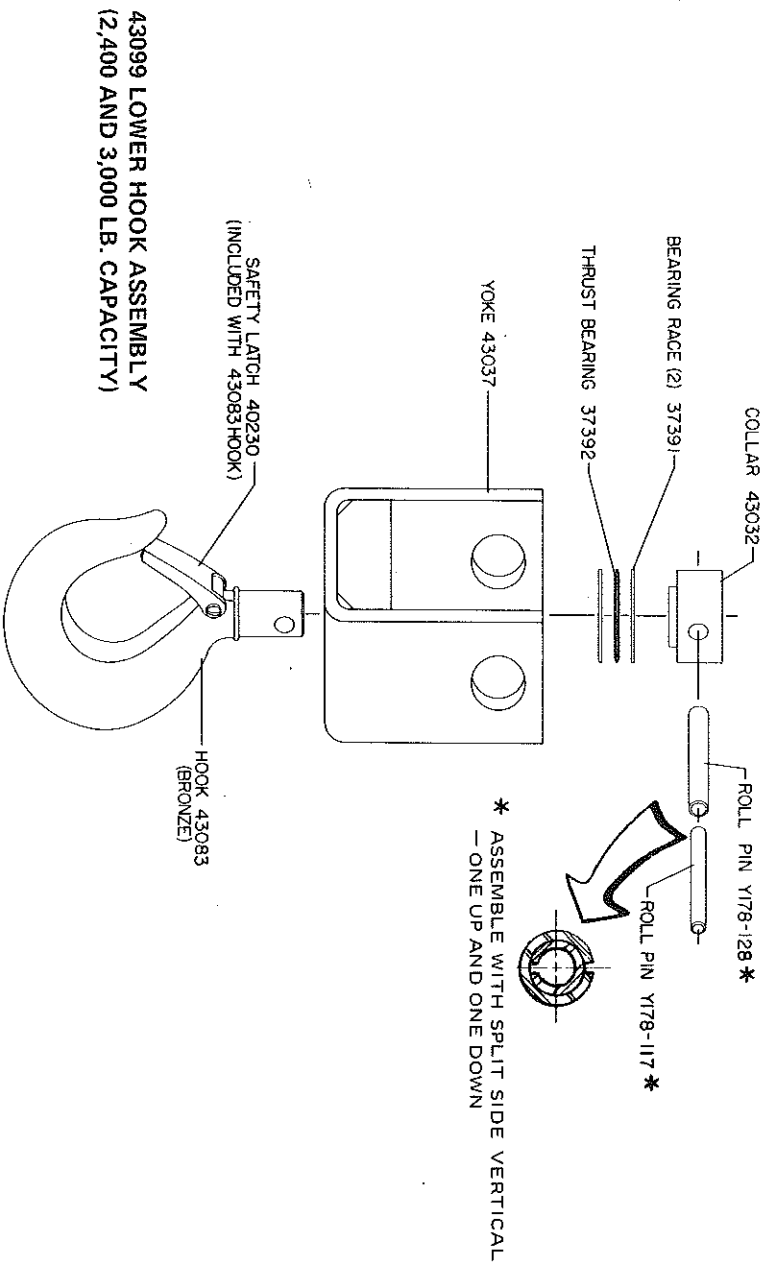


FIGURE 26

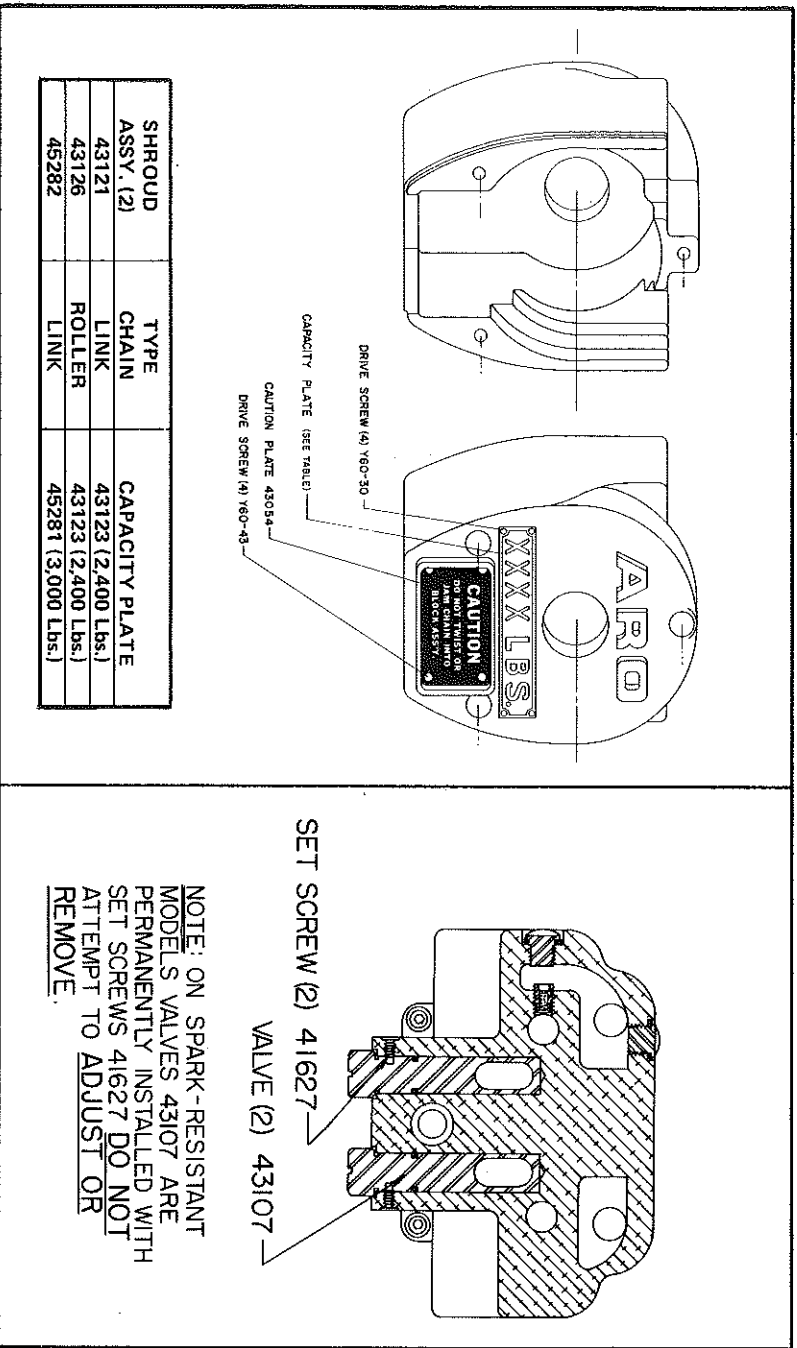


FIGURE 27

SHROUD ASSY. (2)	TYPE	CAPACITY PLATE
43121	CHAIN LINK	43123 (2,400 Lbs.)
43126	ROLLER	43123 (2,400 Lbs.)
45282	LINK	45281 (3,000 Lbs.)

HOIST WILL NOT OPERATE-CHECK FOR:

1. Excessive load.
2. Sufficient air pressure.
3. Clogged air intake screen.
4. Clogged valves.
5. Proper brake adjustment.
6. Proper installation of roll pin in Control Rod and Gear (34022).

UNABLE TO REGULATE HOIST SPEED BY CONTROLS

CHECK FOR:

1. Proper brake adjustment.

HOIST WILL NOT HOLD LOAD IN SUSPENSION-

CHECK FOR:

1. Excessive load.
2. Worn or oily brakelinings.
3. Proper brake adjustment.
4. Proper timing of gears in head.

HOIST LOSES POWER-CHECK FOR:

1. Sufficient air pressure.
2. Clogged air intake screen.
3. Clogged muffler screen or filler.

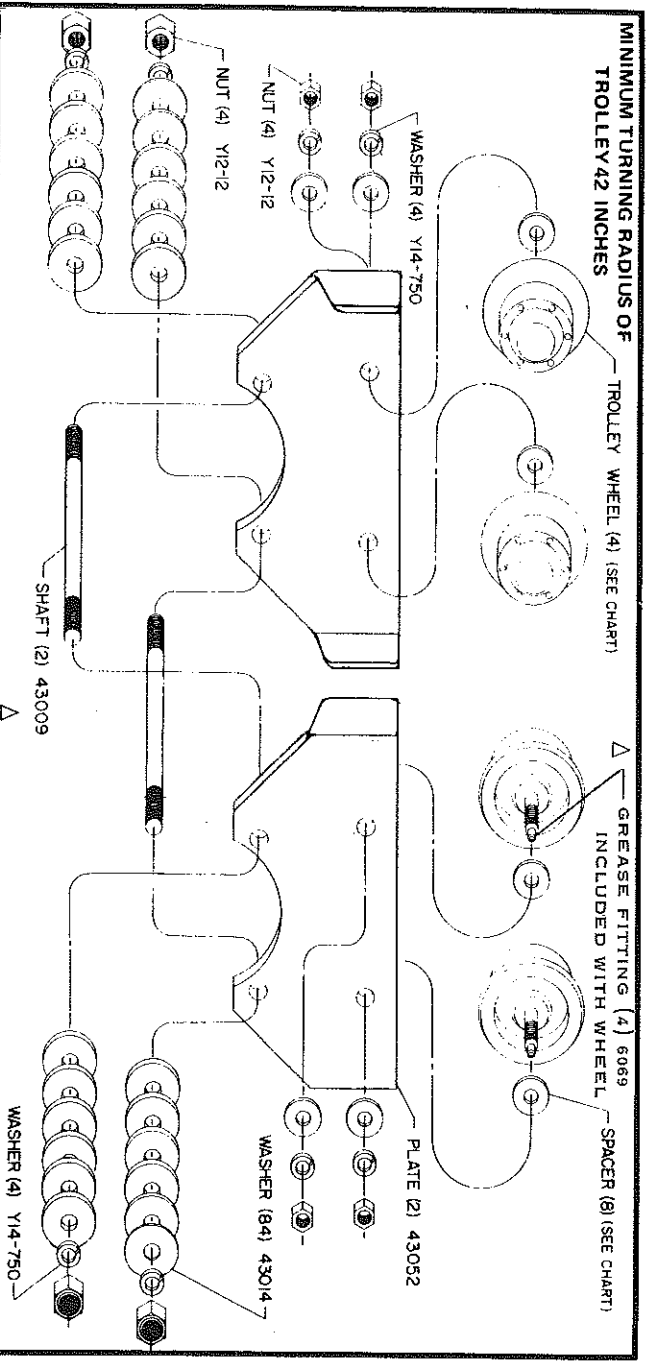
HOIST LIFTING OR LOWERING SPEED DIFFERS FROM RATED SPEED AT FULL LOAD-CHECK FOR:

1. Proper timing of gears in Head.

HOIST CONTROL LEVER WILL NOT RETURN TO HORIZONTAL POSITION-CHECK FOR:

1. Bent control rod.
2. Binding of control rod.
3. Proper brake adjustment.
4. Lack of lubrication in pendent control cylinders.
5. Proper timing of gears in head.

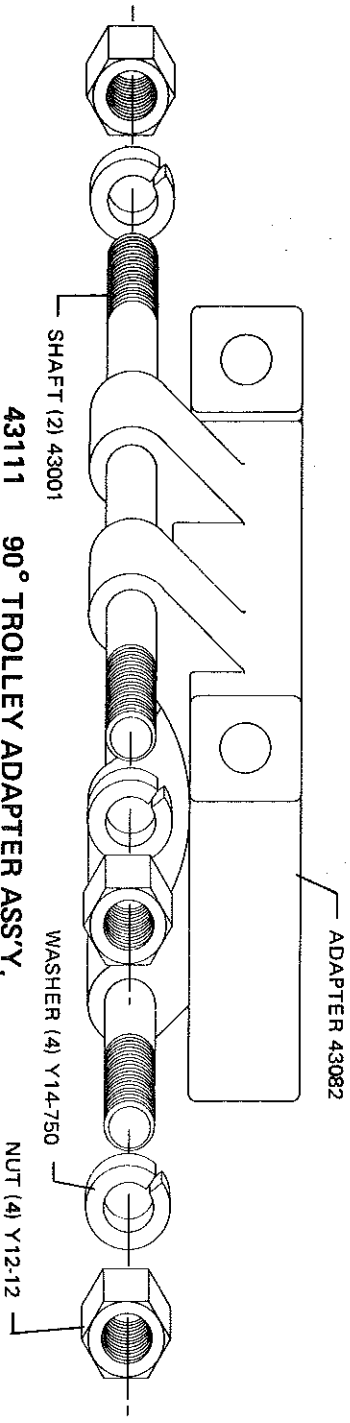
ACCESSORIES



MODEL NO.	CAP. (LBS.)	TROLLEY WHEEL (4)	SPACER	NAMEPLATE (NOT SHOWN)	TYPE BEAM	BEAM SIZE	FLANGE WIDTH
7795	1-TON	41015	41022	44081-1	L-Beam	5" To 12"	3.000" To 5.078"
7795-BC*	1-TON	41015-1***	41022	44081-1	L-Beam	5" To 12"	3.000" To 5.078"
7795-FT**	1-TON	45376	41022	44081-1	H-Beam	5" To 12"	2.600" To 4.900"
7796	2-TON	40149	Y13-12	44081-1	L-Beam	6" To 12"	3.000" To 5.078"
7796-BC*	2-TON	40149-1***	Y13-12	44081-1	L-Beam	6" To 12"	3.000" To 5.078"
7796-FT**	2-TON	45377	Y13-12	44081-1	H-Beam	6" To 12"	3.000" To 4.900"

* SPARK-RESISTANT MODELS, EQUIPPED WITH BERYLLIUM COPPER TREAD WHEELS.
 ** FLAT TREAD WHEEL MODELS FOR USE WITH "H" TYPE BEAMS.
 *** SIDE PLATES ON SPARK-RESISTANT MODELS ARE EQUIPPED WITH SKID BRACKETS (44618-1) AND MOUNTED TO PLATES WITH RIVETS (Y193-33), NOT SHOWN.

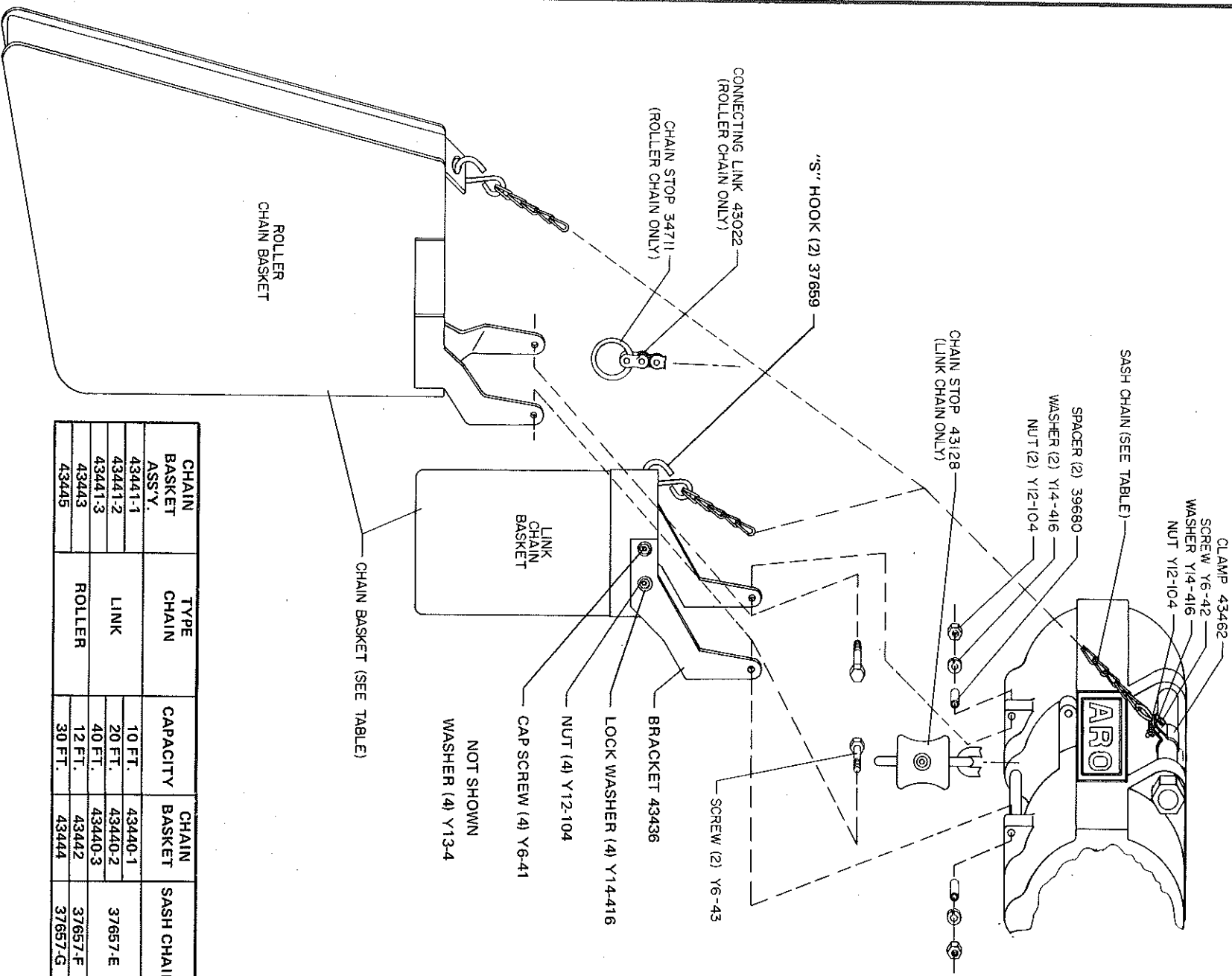
FIGURE 28



43111 90° TROLLEY ADAPTER ASS'Y.

FIGURE 29

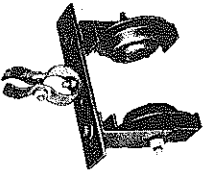
ACCESSORIES



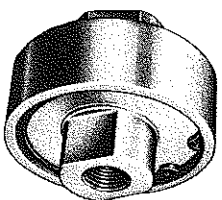
CHAIN BASKET ASS'Y.	TYPE CHAIN	CAPACITY	CHAIN BASKET	SASH CHAIN
43441-1	LINK	10 FT.	43440-1	37657-E
43441-2		20 FT.	43440-2	
43441-3		40 FT.	43440-3	
43443	ROLLER	12 FT.	43442	37657-F
43445		30 FT.	43444	

CHAIN BASKET ASSEMBLY & INSTALLATION
 7790-() & 7792-()

Model 7703 Hose-Carrier Trolley



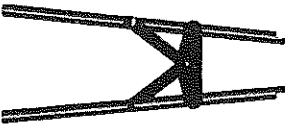
Recommended when hoist is trolley-mounted. Adjustable clamp fits hose in sizes up to 1-1/4" O.D. Can be mounted on the same beam that carries the hoist trolley. Use on I-beams from 3" to 10" high, having minimum width of 2-3/8" and maximum width of 5-3/32". For best results, use one trolley at each 8' hose interval.



37015 Air Filter
(for attachment to Hoist)

Recommended wherever atmospheric dust is excessive. Filters particles 12 to 25 microns large, and supplements regular air line filter-regulator-lubricator. Porous bronze filter element can be removed for cleaning. 3/8"-18 NPTF inlet. Can be attached to hoist after removal of 31649 Adapter and 31648 Screen. Maximum diameter 2-13/16".

33541 Brake Spring Spreader



Specifically designed for brake spring on chain hoists. Develops strong leverage for spreading brake band open when removal is required for service or maintenance.



37657 Sash Chain

For pull-type controls. When ordering, specify desired length in feet by dash number. Order two lengths for each hoist.

Load Chain

STEEL ROLLER CHAIN

FOR 1-TON HOISTS 43779-1). Dash number indicates length of chain in feet. When ordering, figure desired lift footage, add one extra foot for assembly, and specify corresponding dash number. Example: for 10 foot lift order 11 feet of chain (one extra foot for assembly to hoist).

CHAIN ASS'Y. 43064-1) INCLUDES ONE (1) CONNECTING LINK 43022



FOR 2-TON HOISTS 43063-1). Dash number indicates the length of chain in feet. When ordering, figure desired lift footage and multiply by two (2), and add two (2) extra feet for assembly to hoist. Example: for a 10 foot lift; order 20 feet of chain (10 foot lift x 2 = 20 feet) plus an extra two (2) feet for assembly (20 ft. plus 2 ft. = 22 ft. total length of chain for a 10 foot desired lift).

CHAIN ASS'Y. 43780-1) INCLUDES TWO (2) CONNECTING LINKS 43022

STEEL LINK CHAIN



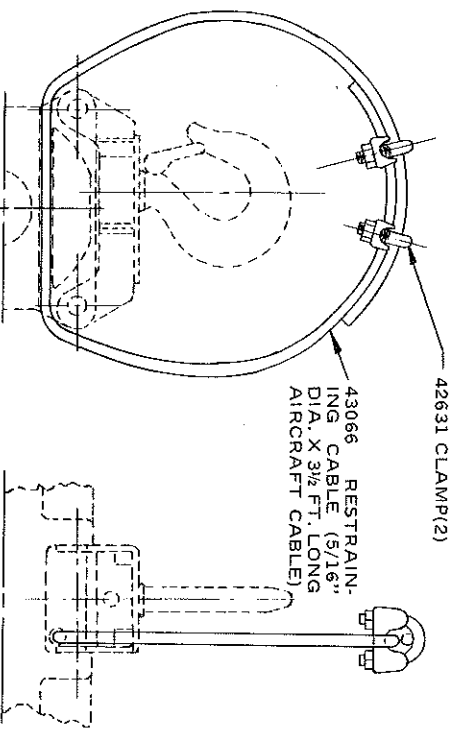
FOR 1-TON AND 2-TON HOISTS. 42988-1) Dash number indicates exact length in feet. For 1-Ton Hoists, order lift footage plus one extra foot for assembly. For 2-Ton Hoists, order twice the lift footage plus two extra feet for assembly. Specify length by dash number. Example: 42988-122), the dash 22 indicates 22 feet of chain.

Air Hose Assemblies



High-pressure hose for connecting air supply to Hoist. 1/2" I.D., with 3/8" NPTF male fittings at each end.

No.	Length
31329-10	10'
31329-25	25'
31329-50	50'



43059 RESTRAINING CABLE ASSY.
FOR USE AS AN ADDED SAFETY PRECAUTION IN HOIST SUSPENSION.
INSERT CABLE THRU HOLE IN HOIST HOUSING AS SHOWN AND AROUND I-BEAM (OR OTHER OVERHEAD SUPPORT CAPABLE OF SAFELY SUPPORTING COMBINED WEIGHT OF HOIST AND ITS CAPACITY LOAD).