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Form P6112
Edition 5
May, 1978

SERIES HRA AND HLA OVERHEAD CHAIN HOISTS

Size HRA20A (1 Ton Capacity; Roller Chain)
Size HLA20A (1 Ton Capacity; Link Chain)
Size HRA30A (1 1/2 Ton Capacity; Roller Chain)
Size HLA30A (1 1/2 Ton Capacity; Link Chain)
Size HRA40A (2 Ton Capacity; Roller Chain)
Size HLA40A (2 Ton Capacity; Link Chain)
Size HRA60A (3 Ton Capacity; Roller Chain)
Size HLA60A (3 Ton Capacity; Link Chain)
Size HRA20ASR (1 Ton Capacity; Roller Chain; Spark Resistant)
Size HRA40ASR (2 Ton Capacity; Roller Chain; Spark Resistant)

WARNING
THESE HOISTS ARE NOT TO BE USED FOR LIFTING OR LOWERING PEOPLE

HOW TO ORDER

Order all repair parts for your Ingersoll-Rand Tool by the **NAME** and **NUMBER** shown in the Repair Part List section. **Never** use the illustration numbers which appear in the first column.

For prompt service and genuine Ingersoll-Rand parts, place orders with the nearest Ingersoll-Rand Office or Authorized Distributor.

Notice: The use of other than genuine Ingersoll-Rand replacement parts may result in decreased tool performance and increased maintenance, and may, at the Company's option, invalidate all warranties.

PARTS BULLETIN

Refer All Communications to the Nearest Ingersoll-Rand Office or Distributor.

Printed in U.S.A.

Ingersoll-Rand®

OPERATING PRACTICES

The two most important aspects of safe Hoist operation are: (1) Allow only qualified people to operate a Hoist, and (2) Subject each Hoist to a regular inspection and maintenance procedure.

A qualified operator must be physically competent. He must have no health condition which might affect his ability to react, and he must have good hearing, vision and depth perception. The qualified Hoist operator must be carefully instructed in his duties and must understand the operation of the Hoist, including a study of the manufacturer's literature. He must thoroughly understand proper methods of hitching loads. He should have a good attitude regarding safety and should refuse to operate under unsafe conditions.

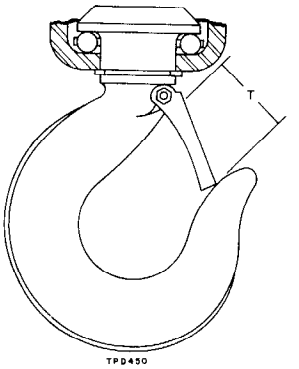
Regular inspection procedures should be set up, rigidly adhered to and recorded by or under the direction of a qualified person. On Hoists in continuous service, inspection should be made at the beginning of each shift. The items to be checked include, but are not limited to:

a. Lubrication according to manufacturer's instructions.

b. **Brakes**: Lift a capacity or near capacity load a few inches off the floor and check ability of braking system to stop and hold the load and without excessive drift.

c. **Chain and Hooks**: Visually inspect the load chain for cleanliness and lubrication as well as wear or other damage.
Note: Excessive wear may not be apparent upon casual observation. The only positive check is to gauge it according to manufacturer's instructions. Refer to **CHAIN REPLACEMENT** on page 10.Never operate a Hoist with dry, worn, damaged or kinked chain.

Hooks should be checked for wear, increase in throat opening, and bending. (**Note**: Increased throat opening or a bent hook indicates overloading or abuse). Replace hooks having a 15% increase in throat or 10% bend. If the safety latch snaps past the tip of the hook, the hook is sprung and must be replaced. Check hook support bearings for lubrication or damage. See that they swivel easily and smoothly



Hoist Size	"T" Throat Opening			
	New Hook		Discard Hook	
	in	mm	in	mm
HRA20A, HLA20A (1-ton Hoist)	1-1/4	32	1-7/16	36
HRA30A, HLA30A (1-1/2-ton Hoist)	1-3/8	35	1-9/16	40
HRA40A, HLA40A (2-ton Hoist)	1-1/2	38	1-3/4	44
HRA60A, HLA60A (3-ton Hoist)	1-7/8	48	2-7/32	57
HRA20ASR (1-ton Spark Resistant Hoist)	1-1/4	32	1-7/16	36
HRA40ASR (2-ton Spark Resistant Hoist)	1-1/2	38	1-3/4	44

Observe the action of Chain feeding through the Hoist. Do not operate a Hoist unless the Chain feeds through the Hoist and Hook Block smoothly and without audible clicking or other evidence of binding or malfunctioning.

d. **Controls**: See that the controls function properly and return to neutral when released. Check the functioning of up and down stops by running the empty hook slowly to both extremes of travel. If the hook does not stop in its normal position, do not operate the Hoist until the cause of the trouble is located and corrected.

e. **General:** Check to see that suspension fastenings are secure, unworn, and undamaged. On trolley-mounted Hoists check that trolley wheels track the rail properly and that wheels and rail are not excessively worn. Be alert for unusual visual or audible signs which could indicate a defect. Do not operate the Hoist until the defect has been determined and corrected.

Periodically, depending upon severity of service, the following items should also be inspected. These are in addition to those previously listed.

a. Check all load-supporting members, including Chain, Pocket Wheel and Chain Guides, for excessive wear or damage.
b. Inspect top and bottom hooks with a magnetic particle or other suitable crack detector.
c. Hook retaining nuts or collars along with their locking members and support bearings should be inspected. Proper inspection will require disassembly.
d. The Hoist should be disassembled and checked for worn gearing, bearings, and shafts. Parts should be cleaned, lubricated and reassembled with all worn parts discarded and replaced.
e. Check all Trolleys for smoothness of operation and wear on supporting members.
f. Check all trolley wheel nuts and suspension bolts for tightness.

OPERATING INSTRUCTIONS

1. Read the manufacturer's instructions before operating the Hoist.
2. Never lift a load greater than the rated capacity of the Hoist.
3. Never use the load chain as a sling.
4. Always stand clear of the load.
5. Never use the Hoist for lifting or lowering people, and never stand on a suspended load.
6. Never carry loads over people.
7. Before each shift, check the Hoist for wear or damage. Check brakes, limit stops, etc.
8. Periodically inspect the Hoist thoroughly and replace worn or damaged parts.
9. Follow the lubrication instructions.
10. Do not attempt to repair load chain or hooks. Replace them when worn or damaged.
11. Never operate a Hoist when the load is not centered under the hook. Do not "side pull" or "yard".
12. Always rig the Hoist properly and carefully.
13. Never operate a Hoist with twisted, kinked or damaged chain.
14. Ease the slack out of the load chain when starting a lift. Do not jerk the Hoist.
15. Keep the load chain clean and well lubricated. Do not drag the load chain or hook on the floor.
16. Be certain there are no objects in the way of a load or hook when moving the Hoist.
17. Be certain the air supply is shut off before performing maintenance work on the Hoist.
18. Avoid swinging the load when moving the Hoist.
19. Keep the load block overhead when not in use.
20. Properly secure an outdoor Hoist before leaving it unattended.
21. Be certain the load is properly seated in the saddle of the hook. Do not tip-load the hook as this leads to spreading and eventual failure of the hook.
22. Do not allow unqualified personnel to operate a Hoist.
23. Avoid collision or bumping of Hoists. Do not swing a suspended load.
24. Do not operate a Hoist if you are not physically fit to do so.
25. Do not do anything you believe may be unsafe.
26. Do not use load chains as a ground for welding. Do not attach a welding electrode to a Hoist or sling chain.
27. Do not divert your attention from the load while operating a Hoist.
28. Do not use up and down stops as a means of stopping a Hoist—these are emergency devices only.
29. Do not leave a load suspended for any extended period.
30. Never splice a hoist chain by inserting a bolt between links, or by any other means.
31. Do not force a chain or hook into place by hammering. Do not insert the point of the hook into a chain link.
32. Do not expose the chain to freezing temperatures, and do not apply sudden loads to a cold chain.

INSTALLING THE HOIST

Make certain the Hoist is properly installed. A little extra time and effort in so doing can contribute a lot toward preventing accidents and helping you get the best service possible.

Always make certain the supporting member from which the Hoist is supsended is strong enough to support the weight of the Hoist plus the weight of a maximum rated load **plus** a generous safety factor of at least 500% of the combined weights.

On Hoists equipped with a Chain Bucket, relocate the "up" stop ring to prevent raising the load into the Chain Bucket. Since double line Hoists are not furnished with an "up" stop ring, the proper up stop parts will have to be installed on Hoists using a Chain Bucket.

If the Hoist is suspended by a Top Hook, the supporting member should rest completely within the saddle of the Hook and be centered directly above the hook shank. Do not use a supporting member that cants the Hoist to one side or the other.

All Ingersoll-Rand Trolleys shipped with a new Hoist are adjusted at the factory to fit the minimum width beam flange on which the Trolley will operate. When disassembling the Trolley for installation on the beam, note the exact arrangement of spacers so that the Trolley can be correctly reassembled.

For installation on a beam flange other than that for which the Trolley is preadjusted, measure the beam flange and temporarily install the Trolley on the Hoist to determine the exact distribution and arrangement of the spacers.

The distance between the wheel flanges should be $3/16$" greater than the width of the beam flange for straight runway beams, and $3/16$" to $1/4$" greater in a runway system that includes sharp curves. The number of spacers between the Trolley Bracket and the mounting lug on the Hoist should be the same in all four locations in order to keep the Hoist centered under the beam. The remaining spacers must be equally distributed on the outside of the Trolley Bracket.

When installing the Hoist and Trolley on the beam, make certain the Trolley Brackets are parallel and vertical. After installation, operate the Trolley over the entire length of beam with a capacity load suspended a few inches off the floor to make certain that adjustment and operation are satisfactory.

We recommend using an air line filter and lubricator unit with any air motor Hoist. Use a unit having at least $1/2$" (13 mm) inlet and outlet, and install it as close to the Hoist as practical. It should never be more than 15 feet from the Hoist inlet connection. Adjust the unit to feed 30 drops per minute while the Hoist is operating at full speed. For best results, we recommend using the Ingersoll-Rand No. NFLRU-8 Filter-Lubricator-Regulator Unit.

Note: All Hoists are shipped from the factory with an initial filling of gear case lubricant suitable for ambient temperatures above 50° F (10° C).

LUBRICATION

After each 40 hours of operation, or as experience indicates, check the oil level in the Motor Housing (1). If the oil level is down to the line on the Sight Glass Window (25), unscrew the Oil Chamber Plug (6) and fill the oil chamber with Ingersoll-Rand Pneu-Lube® Oil No. 10 or a good quality, high-speed spindle oil.

Remove the Pipe Plug (88) from the side of the Gear Case (87). If the oil level is below the pipe tapped hole, remove the Vent Plug (89) from the top of the Gear Case and add a sufficient amount of the recommended gearing lubricant to bring the oil level up to the pipe tapped hole in the side of the Gear Case. **Do not use motor lubricant in the Gear Case.**

For ambient temperatures above 50° F (10° C), use Ingersoll-Rand Extra Heavy Industrial Oil No. 55, or any non-emulsifying, non-detergent, rust-inhibited, oxygen-stable oil meeting AGMA Standard No. 3. Example Mobil DTE* Extra Heavy Turbine Oil or Texaco Regal E**.

For ambient temperatures below 50° F, use Ingersoll-Rand Heavy-Medium Industrial Oil No. 45, or any non-emulsifying, non-detergent, rust-inhibited, oxygen-stable oil meeting AGMA Standard No. 2. Example: Mobil DTE* Heavy-Medium or Texaco Regal PC**.

Caution: Improper, or lack of lubrication in the gearing will result in costly and unnecessary repairs.

After each 160 hours of operation, or as experience indicates, inject 3 to 6 strokes of Ingersoll-Rand Lubricant No. 28 into the Grease Fittings on the Trolley Wheel Shafts.

On initial and replacement installations, it is imperative that load chain and chain attachment pins be kept clean and lubricated at all times. Unlubricated Chain will wear out in a very few capacity lifts. Failure to maintain clean lubricated Chain will void the Manufacturer's Warranty and cause chain wear which will make operation of the Hoist hazardous. Where the Hoist is being used in clean areas, an open chain lubricant or any good EP gear oil may be used. Several excellent types of open chain lubricants are available and can be purchased in convenient aerosol cans.

* Trademark of Mobil Oil Company.

** Trademark of Texaco Oil Company.

The Top Hook and Bottom Hook are both supported on thrust bearings. At each 160 hour checkup, work some Ingersoll-Rand Lubricant No. 28 into each of these bearings. Failure to lubricate these bearings could eventually cause bearing failure. Both Hooks should swivel freely with a rated load.

BUILT-IN OILER ADJUSTMENT

The rate of oil flow from the oil chamber to the motor is properly set at the factory. Correct adjustment is indicated by a slight oil mist in the exhaust. If necessary, check the adjustment by holding a piece of paper up to the exhaust and operating the motor for about 30 seconds. If no oil is collected, or if an excessive amount is emitted, adjust as follows:

Drain the oil from the chamber and remove the Motor Housing Cover (24) from the Motor Housing (1). Rotate the Oiler Adjusting Screw (29) **clockwise to reduce** the oil flow; **counterclockwise to increase** the oil flow. If sufficient flow cannot be obtained, it is an indication that the Oiler Felt (28) is clogged. Remove the Felt, which is located under the Screw, and install a new one.

Lubricator Assembly:

1. Put the end of the Oiler Wick (30) with knot 1/2" from end, into the oiler hole.
2. Insert the Oiler Felt (28).
3. Insert the other end of the Oiler Wick through the hole in the Oiler Adjusting Screw (29).
4. Screw in Oiler Adjusting Screw flush with face.

BRAKE INFORMATION

The brake used in these Hoists is self-adjusting. It is located in the Gear Case (87), and will last for a long period of time if the proper lubricant is maintained at the correct level in the Gear Case. Should the Hoist ever perform erratically in the lowering direction, it is an indication that the facing on one or more of the friction discs may be worn below the oil grooves, and that the entire Brake Disc Stack (99) must be replaced as instructed in the following disassembly and assembly procedures.

Do not under any condition, attempt to replace any individual member of the Brake Disc Pack. The Brake Disc Pack must be replaced only as a unit.

DISASSEMBLY OF GEARING, BRAKE AND SPRAG CLUTCH

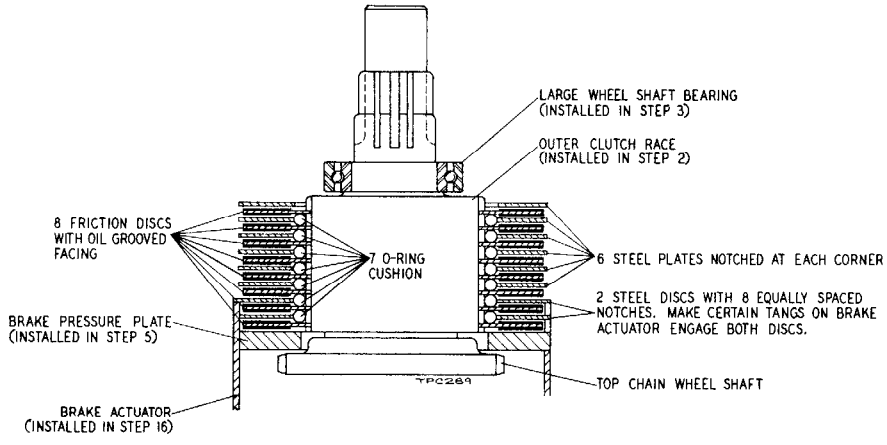
Do not disassemble this unit any further than is necessary to replace or repair a worn or damaged part. Do not remove any member which is a press fit in or on a subassembly unless the removal of that member is necessary for replacement or repair of damaged parts.

1. Remove the down Stop Ring (112) and unfasten the Chain (108 or 110) from the housing boss. Run the motor in the lowering direction until the Chain is removed from the Hoist.
2. Drain the oil from the Gear Case (87).
3. Drive out the Control Shaft Pin (57) that retains the Control Shaft Collar (56) on the Throttle Control Shaft (54).
4. Unscrew the Motor Housing Cap Screws (49), and remove the Motor, as a unit, from the Hoist.
   For Series HRA20, HLA20, HRA40 and HLA40: Withdraw the Drive Shaft (68) and Drive Gear (70).
   For Series HRA30, HLA30, HRA60 and HLA60: Remove the Drive Gear (70).
5. Unscrew and remove the Gear Case Cap Screws (91).
6. In the following sequence, withdraw the Gear Case Cover (92), Gear Case (87), Stationary Cam (95), Ring Gear (96) and the Brake Actuator (97).
7. As a unit, withdraw the Gear Frame Assembly, Pinion Shaft (74) and Wheel Shaft Gear (85).
8. As a unit, withdraw the Top Chain Wheel Shaft (81), Brake Pressure Plate (98), Brake Disc Stack (99), and Outer Clutch Race (101). If necessary, tap the small end of the Top Chain Wheel Shaft (81) with a soft hammer to start it from the Chain Housing (63). Stand this unit on a workbench with the splined-shaft end up.
9. Lift the Complete Brake Disc Stack (99) from the unit. **If the facing on any one of the friction discs is worn below the oil grooves, discard the entire Brake Disc Stack.**
10. Lift off the Brake Pressure Plate (98).
11. Grasp the Outer Clutch Race (101) and, using a soft hammer, lightly strike the small end of the Top Chain Wheel Shaft (81) to remove the Large Wheel Shaft Bearing (84).
12. If the Outer Clutch Race and Sprag Clutch (100) did not come off the Top Chain Wheel Shaft along with the Bearing, slightly rotate the Outer Clutch Race in a clockwise direction and pull it from the Top Chain Wheel Shaft.

13. Slip the Sprag Clutch from the bore of the Outer Clutch Race. If the sprags are worn flat or are loose enough to fall from the cage, discard the Sprag Clutch.

ASSEMBLY OF GEARING, BRAKE AND SPRAG CLUTCH

1. Slide the Sprag Clutch (100), **flanged end first,** into the bore of the Outer Clutch Race (101). **Warning: If the Clutch is installed backwards, the brake will not function.**
2. While slightly rotating the clutch race and clutch assembly in a clockwise direction, slide it, **large open end first,** onto the Top Chain Wheel Shaft (81). If correctly assembled, the Outer Clutch Race can be rotated in a clockwise direction only.
3. Using a sleeve that will contact only the inner ring of the Large Wheel Shaft Bearing (84), press the Bearing onto the Chain Wheel Shaft until it seats against the Outer Clutch Race (101). Stand this unit on a workbench so that the small end of the Top Chain Wheel Shaft is upward.
4. Make certain the Wheel Shaft Seal (82) is in the annular groove in the small end of the Top Chain Wheel Shaft.
5. Slide the 1/4" (6 mm) thick Brake Pressure Plate (98) down over the Outer Clutch Race (101).
6. If the facing on any one of the friction discs is worn below the oil grooves, replace the entire Brake Disc Pack (99A). **IMPORTANT**: The Brake Disc Stack has been greatly improved since these Hoists were originally introduced. If the Brake Actuator (97) is 2-51/64" (71 mm) long, you have the latest style Brake Disc Stack in your Hoist, and need only to replace the Brake Disc Pack. If the Brake Actuator is 2-7/16" (62 mm) long, you have one of the old style Brake Disc Stacks. If this is to be replaced, you must also purchase and install a new Brake Actuator (97) along with a complete Brake Disc Stack.
7. Assemble the members of the Brake Disc Stack on the Outer Clutch Race as shown in the following illustration:



Assembly of Brake Disc Stack

8. Make certain the Chain Housing Seal (64) is installed in the annular undercut in the Chain Housing (63).
9. Place the Chain Housing, motor end down on a workbench. Place a Gear Case Gasket (90) on the face of the Chain Housing.
10. Take the assembled Chain Wheel Shaft, Clutch and Brake Disc Stack unit, and slide it, shaft end first, into the Chain Housing so that the splines on the shaft engage the spline-broached bore of the Chain Wheel, and so that the end of the shaft passes through the Chain Wheel Spacer (103) and enters the bore of the Small Wheel Shaft Bearing (83).
11. **For Series HRA20, 40 and HLA20, 40.** Insert the Drive Shaft Connector (69) into the bore of the Top Chain Wheel Shaft (81).
12. **For Series HRA20, 40 and HLA20, 40.** Note that there is one marked tooth on each Planet Gear (77). Rotate the Planet Gears until the marked teeth are spaced 120° apart outside the gear frame web. Align the marks on the Planet Gears with the three timing marks on the wheel shaft gear and insert the gear frame assembly, small gear end first, into the wheel shaft gear.

    For Series HRA30, 60 and HLA30, 60. Note that there is one marked tooth on each large Planet Gear (77). Rotate the Planet Gears until the marked teeth are spaced 120° apart outside the gear frame web. Align the marks on the Planet Gears with the three timing marks on the wheel shaft gear and insert the gear frame assembly, small gear end first, into the wheel shaft gear.

13. **For Series HRA20, 40 and HLA20, 40.** Slide the assembled wheel shaft gear and gear frame unit onto the splined flange on the Top Chain Wheel Shaft.

    Note: The front Gear Frame Bearing (80) may be a light press fit in the bearing recess in the Chain Wheel Shaft. If necessary, tap the Gear Frame (76) with a soft hammer to seat the Bearing. When properly seated, the small gear end of each Planet Gear (77) is slightly below the face of the wheel shaft gear.

14. **For Series HRA20, 40 and HLA20, 40.** Insert the Pinion Shaft (74), small splined end first, into the bore of the Gear Frame, meshing the teeth on the pinion gear with the Planet Gears.

    For Series HRA30, 60 and HLA30, 60. Place the No. D96374 Pinion Shaft Inserting Tool on the motor end of the Pinion Shaft (74). Insert the Pinion Shaft, motor end first, into the bore of the Gear Frame and the Top Chain Wheel Shaft (81) meshing the teeth on the pinion gear with the Planet Gears.

    Note: The Pinion Shaft Inserting Tool is used to protect the Drive Shaft Oil Seal (82A) located in the motor end of the Top Chain Wheel Shaft.

15. Slide the Brake Actuator (97), long-tang end first, over the assembled gearing. Engage the tangs on the long-tang end of the Actuator with the notches in the Brake Pressure Plate and the two notched circular members of the Brake Disc Stack.
16. Slide the Ring Gear (96), notched end first, onto the Planet Gears, engaging the notches in the Ring Gear with the short tangs on the Brake Actuator (97).
17. Rotate the notched square members of the Brake Disc Stack until the notches are aligned with the four tapped holes in the Chain Housing (63). Make certain the tangs on the Brake Actuator are aligned with the inboard notched circular member of the Brake Disc Stack. **This alignment must be maintained.**
18. Slide the Gear Case (87) over the Brake Disc Stack and against the Gasket, making certain the monogram is positioned right side up and is on the nameplate side of the Hoist.
19. Place the Stationary Cam (95), lobe end first, into the back of the Gear Case so that the lobes on the Cam engage the lobes on the Ring Gear (96).
20. Place the second Gear Case Gasket over the Stationary Cam and against the face of the Gear Case.
21. Align the dowels in the Gear Case Cover (92) with the dowel holes in the Gear Case, and slide the Gear Case Cover over the Stationary Cam. Tap it with a soft hammer until it seats against the Gasket.
22. Install the Gear Case Cap Screws (91), tightening each screw a little at a time to a final torque of 23 ft-lb (31.2 Nm).
23. **For Series HRA20, 40 and HLA20, 40.** Stand the unit on a workbench, gear end down. Insert the Drive Shaft (68) with its assembled Drive Gear (20), splined end first, into the bore of the Top Chain Wheel Shaft (82). Rotate it until it engages the Drive Shaft Connector (69).

    For Series HRA30, 60 and HLA30, 60. Stand the unit on a workbench, gear end down. Assemble the Drive Gear (70) onto the Pinion Shaft (74).

    Note: The smooth side of the Drive Gear (70) must always face the motor end of the Hoist.

24. Position the Housing Gasket (48) on the face of the Chain Housing (63).
25. While holding the Control Shaft Sector (55) in engagement with the Throttle Cam (53), simultaneously place the motor assembly against the face of the Chain Housing, and slide the Control Shaft Sector onto the Control Shaft (54).
26. Install the Motor Housing Cap Screws (49), tightening each one a little at a time until all are tight. Retain the Control Shaft Sector on the Control Shaft with a Control Shaft Pin (57).
27. Check the engagement of the Control Shaft Sector with the Throttle Cam. When in a neutral position, there should be an equal number of disengaged teeth on both sides of center on each member.
28. Reeve the Chain over the Top Chain Wheel (102) and anchor it to the housing boss. Install the down Stop Ring (112) on the eighth link from the anchored end.
29. Lubricate the gearing as instructed under **Lubrication.**

MOTOR MAINTENANCE

Completely disassemble the Motor Housing before attempting to replace a worn Shuttle Valve Bushing (3). Press the old Bushing from the Motor Housing with a $1\frac{3}{16}$" (20 mm) diameter arbor, preferably one with an $1\frac{1}{16}$" (17 mm) diameter pilot. Use the No. 76663 Bushing Inserting Tool to press in the new Bushing. Ream the Bushing to size with Reamer No. 76662. Thoroughly clean the Motor Housing before reassembly.

Use No. 74324 Valve Stem Bushing Inserting Tool to press new Valve Stem Bushings (2) into the Motor Housing (1).

When assembling the Multi-Vane® Motor and installing it in the Motor Housing, proceed as follows:

1. Press the Rear Rotor Bearing (36) into the recess in the Rear End Plate (35). Press this assembly onto the short hub of the Rotor (37) as far as possible without binding the End Plate against the rotor face.
2. Place a Vane (38) in each vane slot in the Rotor. **Important**: Before proceeding with Step 3, read the paragraph **Improved End Plates.**
3. Slip the Cylinder (40) over the Rotor, making certain that the eight holes running longitudinally through the cylinder wall can be aligned with the holes through the Rear End Plate. If the holes cannot be aligned, the Cylinder is inverted; turn it end for end.
4. Press the Front Rotor Bearing (43) into the recess in the Front End Plate (42). Press this assembly onto the long hub of the Rotor.
5. Align the dowel hole in the Cylinder with the dowel hole in each End Plate, and insert the Cylinder Dowel. **Note**: Because the dowel hole in the Front End Plate is not visible when the motor is assembled, the hole location is indicated by a drill point mark on the end plate rim.
6. Slip the rubber Motor Clamp Ring (44) onto the Front End Plate. Apply a little tacky grease to the Ring and End Plate to hold the Ring in position until the motor is installed in the Motor Housing.
7. Place the Motor Housing (1), open face up on the workbench. Align the drill punch mark on the rim of the Front End Plate with a similar mark on the face of the Motor Housing, and insert the assembled motor. Do not drive the motor into the Housing. If properly aligned with the housing bore, it can be pushed into position with the fingers. **Note**: Before the motor reaches full depth, check and make certain the Motor Clamp Ring (44) is still in position on the Front End Plate (42).
8. Apply the Housing Cover Gasket (32) to the housing face.
9. Place the Motor Housing Cover (24) on the Motor Housing (1), entering the end of the Cylinder Dowel (41) into the dowel hole in the Cover, and making certain the free end of the Oiler Wick (30) enters the oil chamber. Insert one Housing Cover Cap Screw (33) through the center hole in the Cover and start it into the Housing. Check the alignment of the other holes in the Cover with those in the Housing. Lightly tap the edge of the Cover with a soft hammer to correct any slight misalignment.
10. Start all of the Housing Cover Cap Screws, tightening each Screw a little at a time until all are tight.

CAP SCREW TORQUE SPECIFICATIONS

When assembling an HRA or HLA Hoist, tighten the following cap screws to the torques shown.

PART NAME AND ILLUSTRATION	Minimum		Maximum	
	ft-lb	Nm	ft-lb	Nm
Top Hook Yoke Screw (154 and 163)	60	81.4	70	95.0
Yoke Anchor Screw (164)	60	81.4	70	95.0
Trolley Adapter Screw (212 and 240)	60	81.4	70	95.0
Trolley Side Adapter Screw (213 and 241)	60	81.4	70	95.0
Gear Case Cap Screw (91)	30	40.7	35	47.5

IMPROVED END PLATES

Beginning July 1966 all HRA and HLA Hoists are furnished with improved End Plates (35 and 42) which provide positive starting of the Hoist and which eliminate the necessity of Vane Springs under the Vanes (38). The improved End Plates can be identified from the old style members by the two crescent shaped grooves machined on the flat face. Old style End Plates did not have these grooves, and are no longer available as a repair part.

Do not use an old style End Plate in conjunction with a new style End Plate. If an old style End Plate must be replaced, order and install both new style End Plates.

Vane Springs remain available as repair parts but are unnecessary when the new End Plates are used. When using Vane Springs, install them in the rotor slots so that the curved section of the Spring contacts the Vane.

AIR STRAINER

Periodically, as experience indicates, remove the Swivel Inlet Body (7) and withdraw the Air Strainer Screen (10) from the Motor Housing (1). Clean the Screen with kerosene or other suitable solvent.

IMPROVED THROTTLE CAM

The new style Throttle Cam (53) and Control Shaft Collar (56) replace the old style Throttle Cam, Control Shaft Sector and Control Shaft Collar to provide better throttle control.

If the Hoist has a geared Throttle Cam and Control Shaft Sector, you have the old style parts. The old style parts are available as repair items and are as follows: Throttle Cam HRA20A-941, Control Shaft Sector HRA20A-254 and Control Shaft Collar HRA20A-33.

To convert to the new style parts you must order a Control Linkage Conversion Kit HRA20A-C941.

Do not use any new style parts in conjunction with old style parts.

IMPROVED GUIDE FOR LINK CHAIN

On Link Chain Hoists, an improved two-piece Chain Guide has superseded the single part previously used. Install the improved Guide as follows:

1. Remove the Link Chain from the Hoist.
2. Unscrew the four Chain Guide Screws and remove the old style Chain Guide.
3. Take the upper, half-ring portion of the new Chain Guide and work it from the bottom of the Hoist up over the Chain Wheel.

   Note: In some instances, the boss in the top of the Chain Housing may cause slight interference. When this happens, remove the Top Hook Yoke and reach in the Housing with a small die grinder or file and trim the bottom of the boss until the upper half of the Chain Guide can be worked into place.
4. Install the bottom half of the Chain Guide, making certain the guide rail on each side of the Guide slides up over each end of the upper half of the Guide. Make certain the chain groove in the upper half of the Guide is aligned with the chain groove in the lower half of the Guide.
5. Install the four Chain Guide Screws and Lock Washers.

   Caution: **Do not use the lower half of a new style Chain Guide without the upper half.**

IMPROVED TOP CHAIN WHEEL SHAFT ASSEMBLY

Effective May 1974, all new HRA and HLA Hoists are equipped with an improved one-piece Top Chain Wheel Shaft Assembly (81) which is completely interchangeable with corresponding old style parts.

On Sizes HRA20A, HLA20A, HRA40A and HLA40A Hoists, the old style parts consisted of an HRA20A-A459 Top Chain Wheel Shaft Assembly and an HRA20A-A798 Wheel Shaft Gear Assembly which included two HRA20A-799 Gear Locating Rings. The HRA20A-A798 and HRA20A-799 remain available as repair parts for Hoists with the old style construction.

On Sizes HRA30A, HLA30A, HRA60A and HLA60A the old style part consisted of a riveted two-piece construction which is no longer available.

CHAIN CARE

Keep the Chain well lubricated as instructed in the section **LUBRICATION**. Never operate a Hoist when the Chain does not flow freely and smoothly into and out of the Top Chain Wheel, or when it makes noises indicative of binding or other malfunctions. Under certain circumstances, particularly when worn or gummy, slack Chain can become tangled and jammed, causing the Chain to break. Chain can also fail to feed properly with an undersize or improperly mounted Chain Bucket.

Periodically (at the beginning of each shift for Hoists in continuous high duty cycle service), the Chain should be examined for cleanliness, lubrication, wear or other damage, and proper and smooth feeding through the Hoist. If the Hoist is deficient in any of these respects, it must not be operated until the deficiency is corrected.

CHAIN REPLACEMENT

Carefully read and follow the instructions in the section **LUBRICATION**. Excessive chain wear cannot be detected by casual observation. The chain is case hardened, and once this case is worn through, wear will progress rapidly and the strength of the chain will be considerably reduced. Further, the Chain will no longer fit the Top Chain Wheel properly, greatly increasing the chance of malfunction and chain breakage.

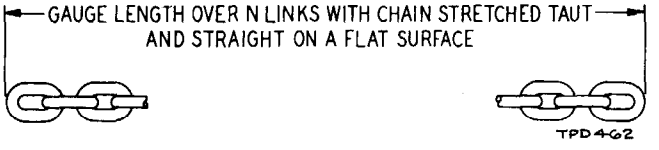
One Top Chain Wheel will outlast several Chains if the Chain is replaced as recommended, whereas the use of a worn Chain will cause the Top Chain Wheel to wear rapidly.

If the Chain is visibly damaged, examine the Top Chain Wheel and Chain Guard. Install a new Top Chain Wheel if the old one is visibly worn; install a new Guard if the old one is broken or distorted.

Caution: Do not use a Top Chain Wheel (102) that is visibly worn or damaged. Using a worn or damaged Top Chain Wheel could result in chain slippage with damage to the Hoist.

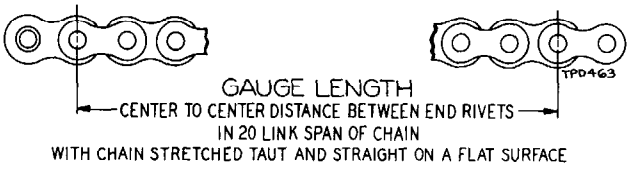
Periodically, as experience indicates, examine the Chain for wear. Be certain to inspect that portion of the Chain which regularly passes over the Top Chain Wheel, since this is the portion that suffers the greatest wear. Check the individual links for striation—that is, minute parallel lines indicating excessive stress or wear.

With the Chain taut, measure the gauge length within the section of greatest wear. If the Chain is worn to the extent that this measurement has reached the discard dimension, install a new Chain. **Always use a genuine Ingersoll-Rand replacement Chain. Never use any other Chain.**



Checking Link Chain for Wear

Hoist on which Chain is used	N Number of Links	Gauge Length			
		New Chain		For Discard	
		in	mm	in	mm
HLA20A, HLA40A	21	18-5/8	473.1	18-7/8	479.4
HLA30A, HLA60A	19	19-15/16	506.4	20-3/16	512.8



Checking Roller Chain for Wear

Hoist on which Chain is used	N Number of Links	Gauge Length			
		New Chain		For Discard	
		in	mm	in	mm
HRA20A, HRA40A	20	15	381.0	15-3/16	385.5
HRA30A, HRA60A	20	20	508.0	20-1/4	514.3
HRA20ASR, HRA60ASR	20	20	508.0	20-1/4	514.3

Caution: An improved one-piece Link Chain Anchor (146) is now used on all HLA40A and HLA60A Hoists. It replaces the original two-piece Chain Anchor, and is the only Chain Anchor furnished as a repair item.

When replacing either a Chain or Chain Anchor on an HLA40A or HLA60A Hoist:

1. If you are replacing a Chain Anchor—regardless of whether the old one is two-piece or one-piece construction—count the number of links in the Chain. Chain used with the one-piece Chain Anchor must have an odd number of links, and must be installed as illustrated on page 11.
2. If you are replacing a Chain, make certain to use the new style one-piece Chain Anchor and make certain the new Chain has an odd number of links. Install the Chain in accordance with the illustration on page 11.

Failure to comply with these instructions will result in a twisted Chain which could cause chain breakage with possible damage to the Hoist.

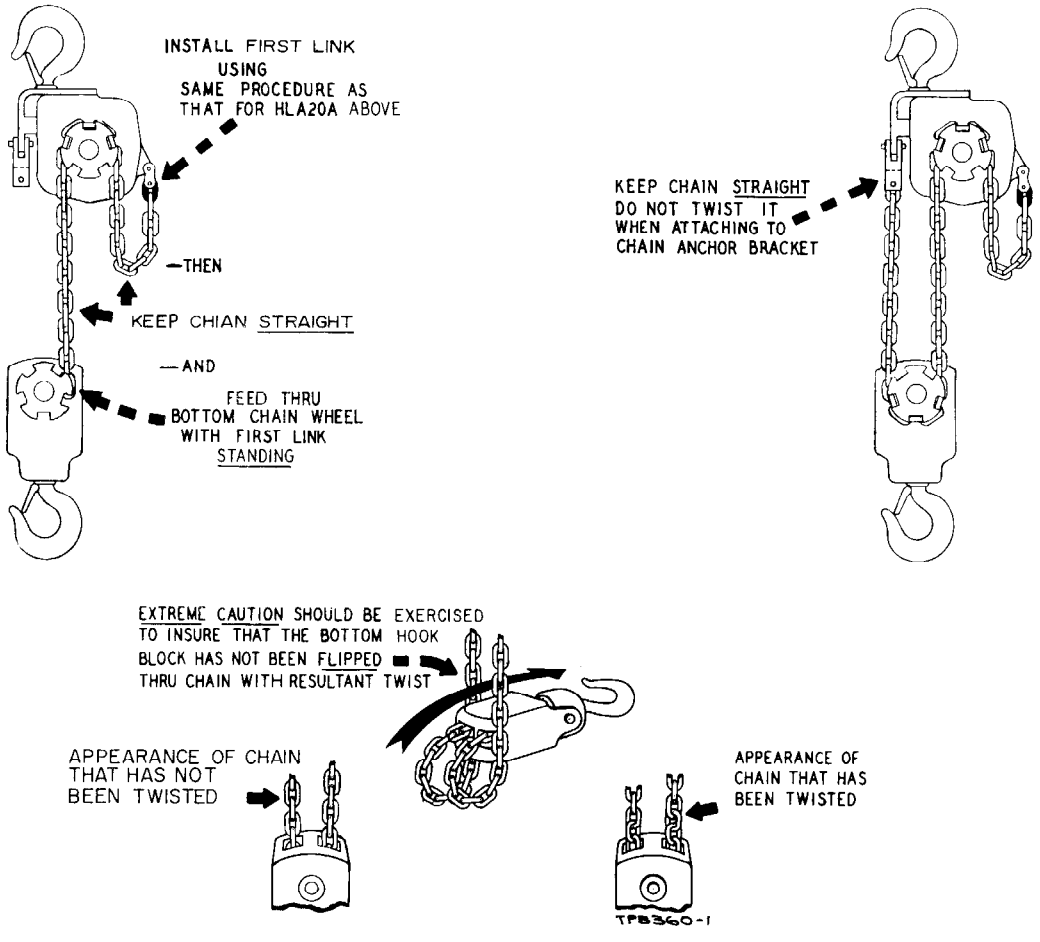
INSTALLATION OF LINK CHAIN IN SERIES HLA HOISTS

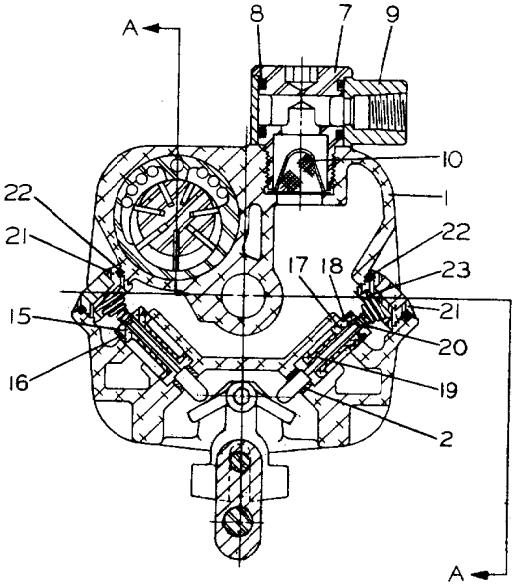
IMPROPER INSTALLATION OF THE CHAIN CAN RESULT IN CHAIN BREAKAGE WITH POSSIBLE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

SIZE HLA20A

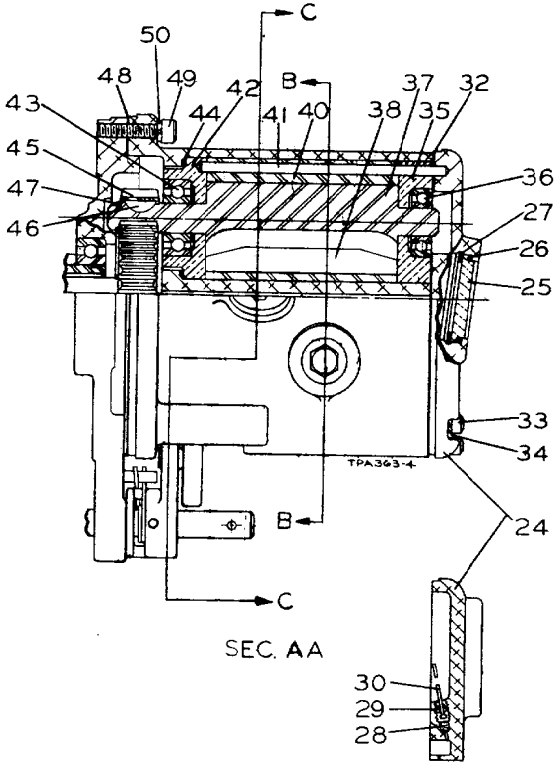
SIZE HLA40A

CHAIN MUST CONSIST OF ODD NUMBER OF LINKS



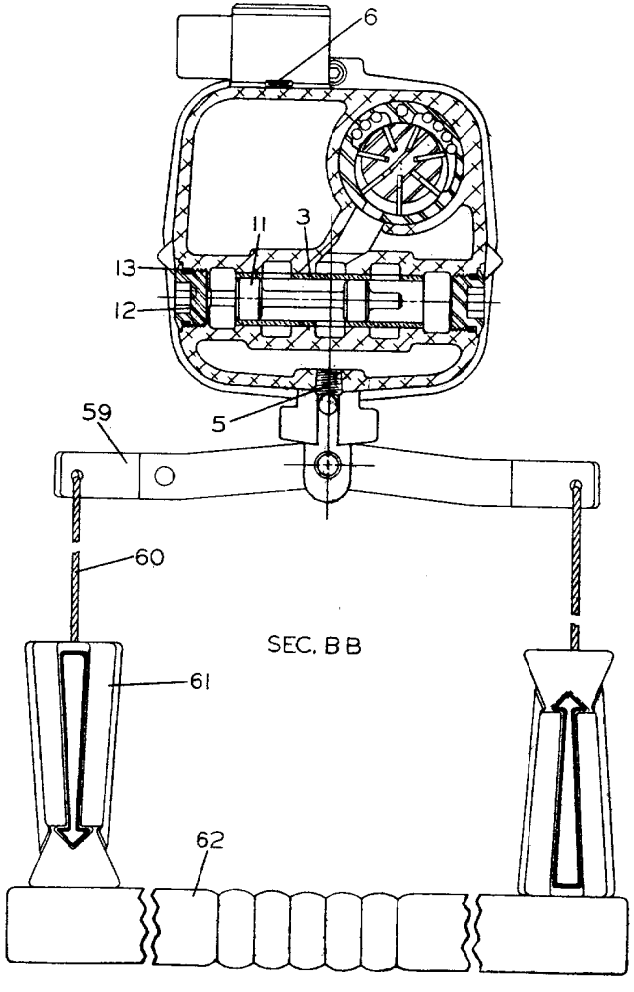


SEC. C C



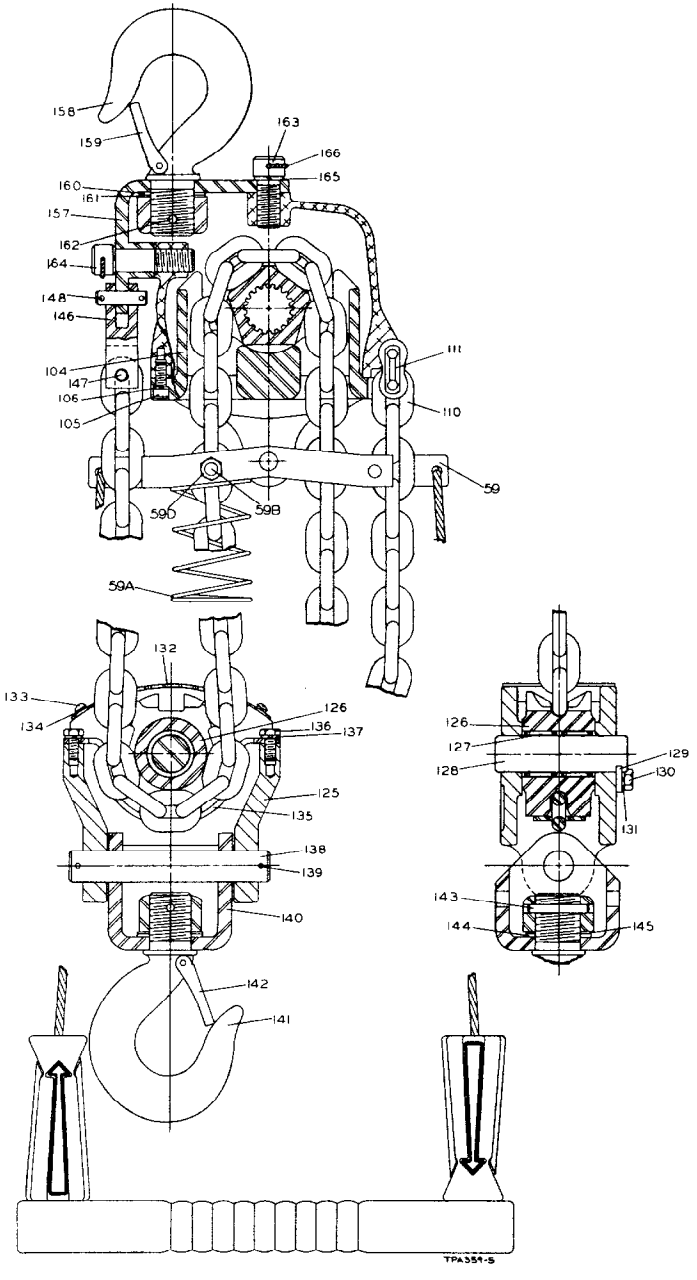
SEC. A A

SEC. SHOWING
OILER PARTS

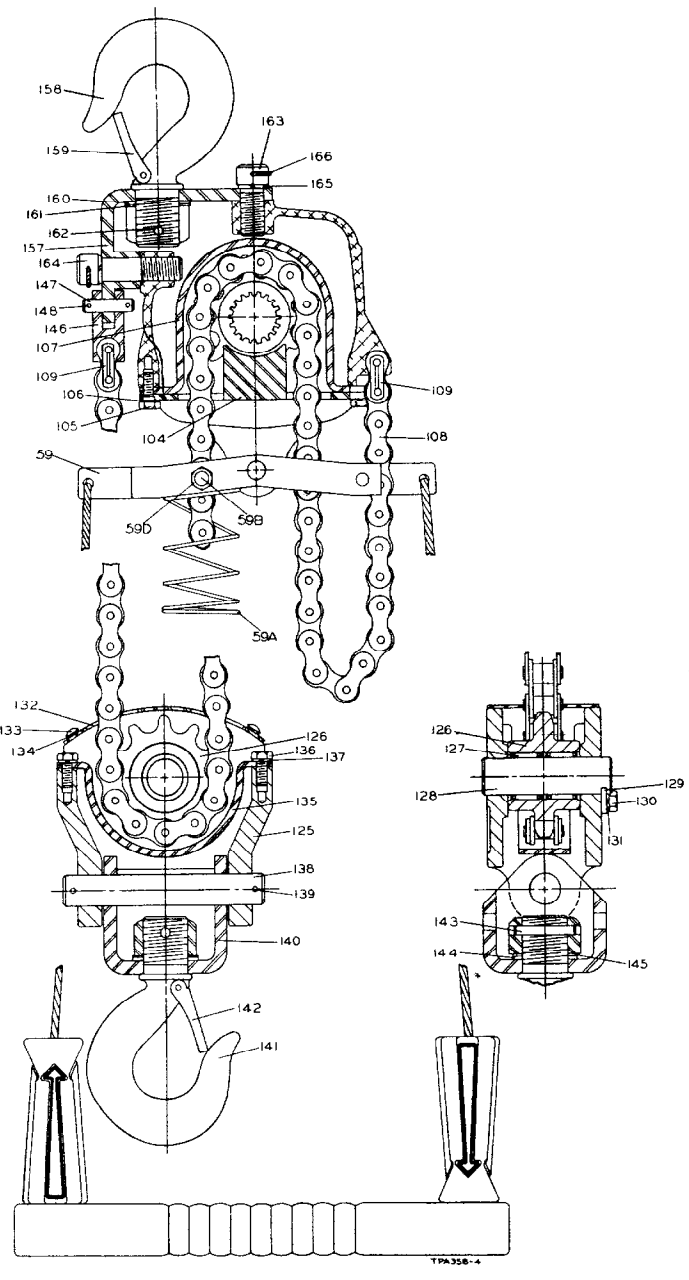


SEC. B B

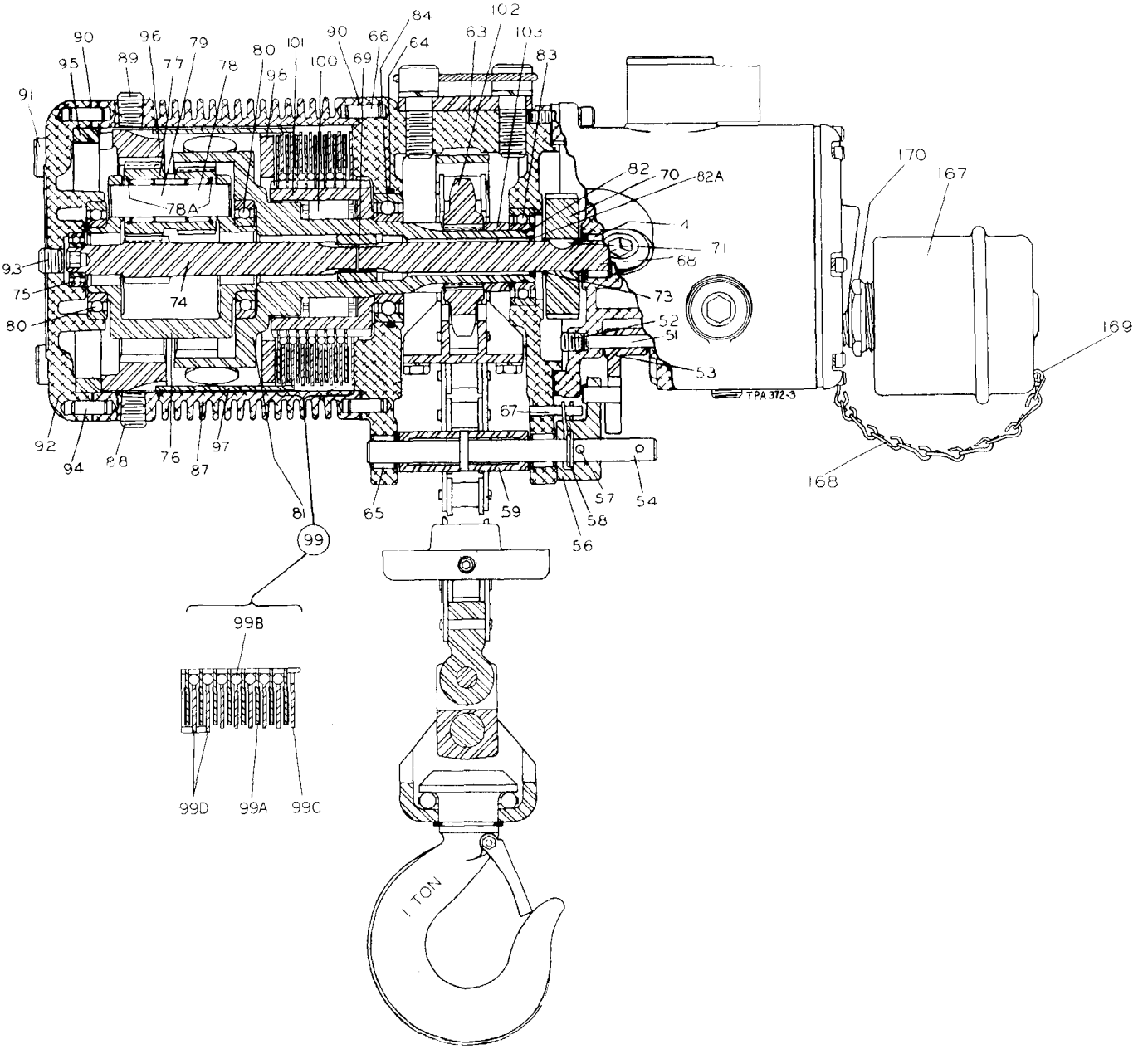
Motor of Series HRA and HLA Overhead Chain Hoists



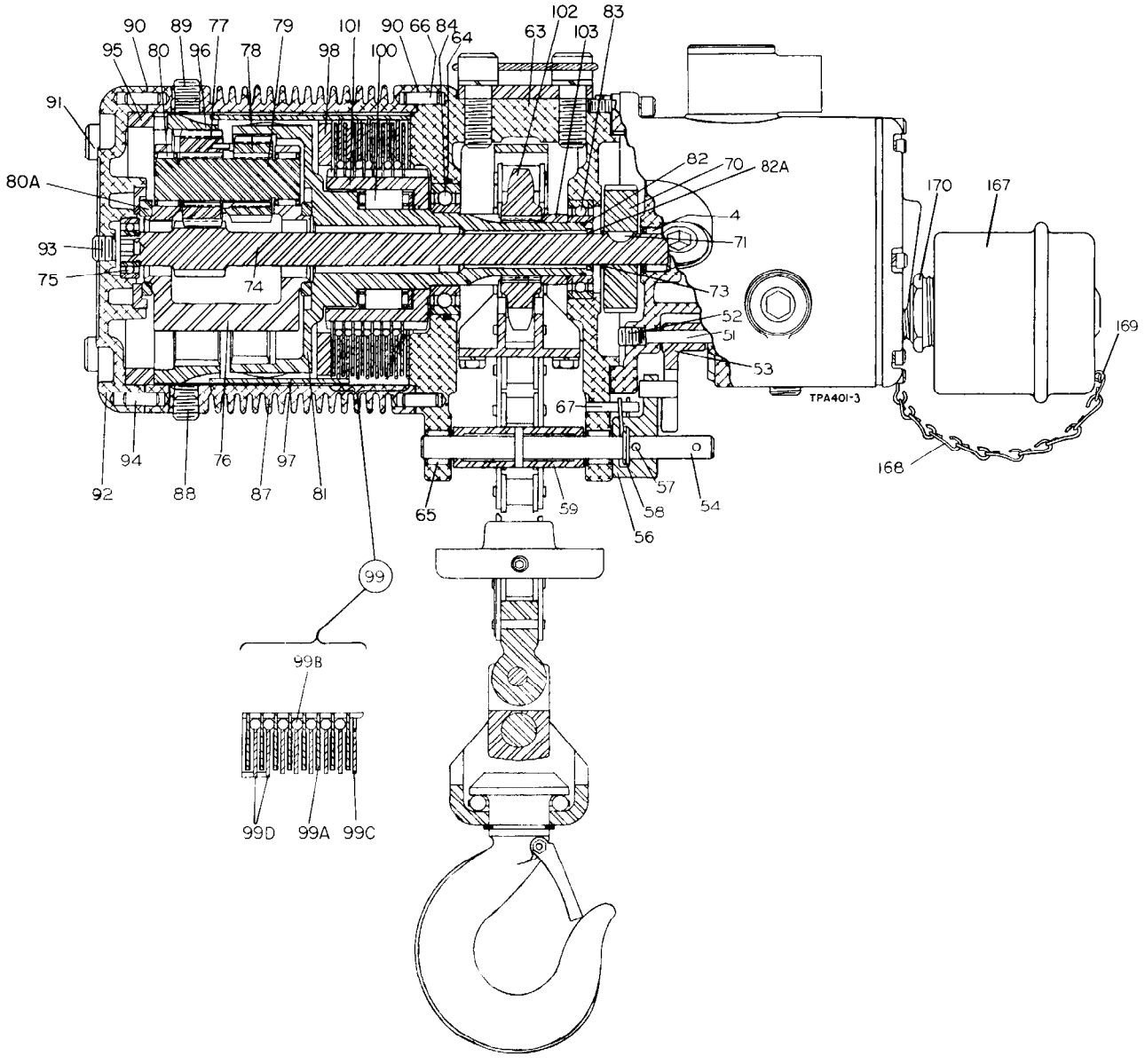
Sizes HLA40A and HLA60A
Overhead Chain Hoists



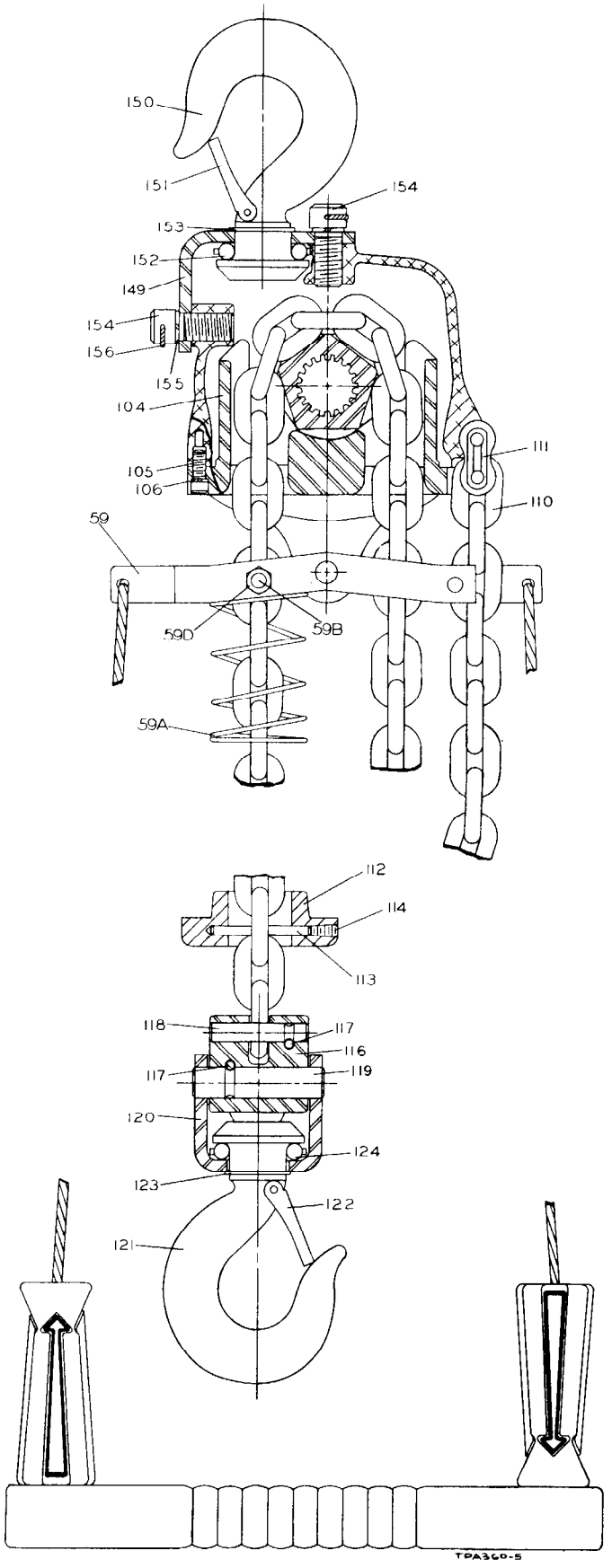
Sizes HRA40A, HRA40ASR, and HRA60A
Overhead Chain Hoists



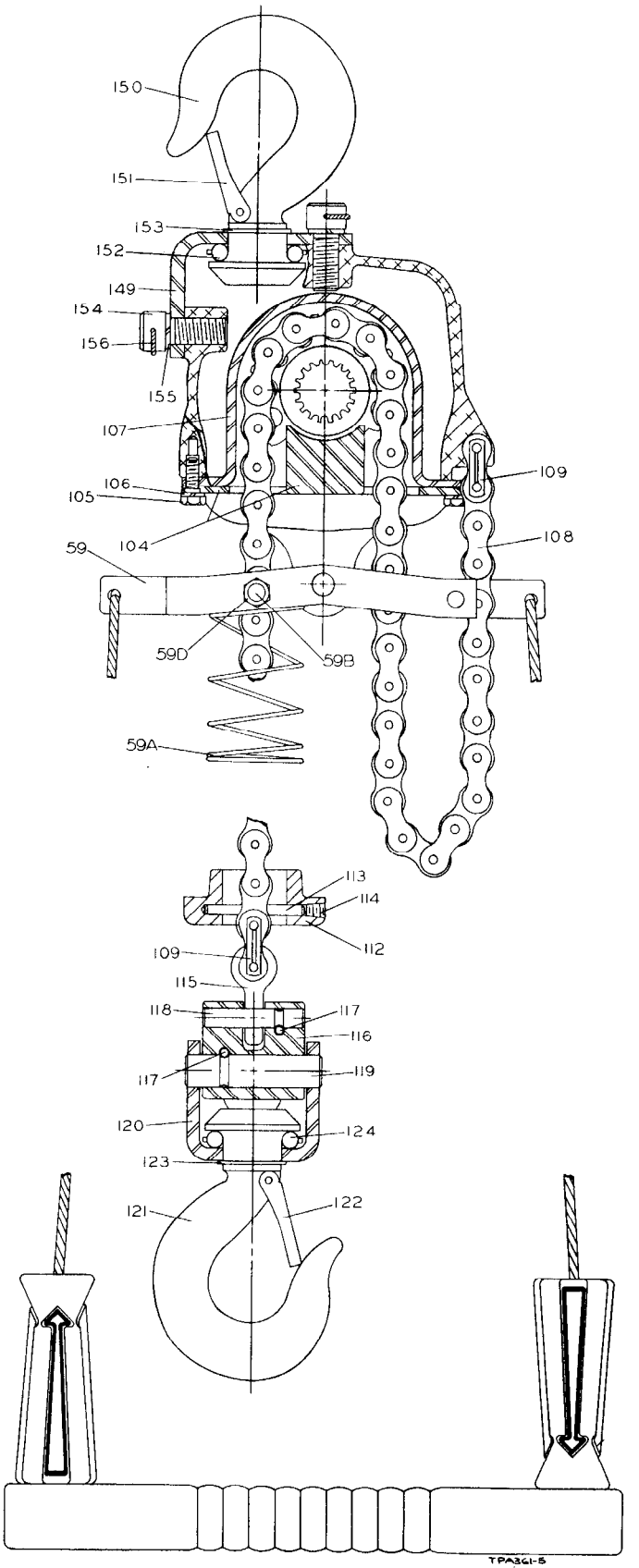
SIZE HRA20A OVERHEAD CHAIN HOIST
(Construction of Gearing, Brake and Clutch Typical of
Sizes HLA20A, HRA20ASR, HRA40A, HLA40A and HRA40ASR)



SIZE HRA30A OVERHEAD CHAIN HOIST
(Construction of Gearing, Brake and Clutch Typical of Sizes HLA30A, HRA60A and HLA60A)



SIZES HLA20A AND HLA30A
OVERHEAD CHAIN HOISTS



SIZES HRA20A, HRA20ASR AND HRA30A
OVERHEAD CHAIN HOISTS

			PART NUMBER FOR ORDERING
		Motor Assembly	HRA20A-A40
	1	Motor Housing Assembly	HRA20A-B40A
	2	Valve Stem Bushing (2)	HRA20A-615
	3	Shuttle Valve Bushing	HRA20A-247S
●	4	Drive Shaft Bearing (Torrington JH-98 or its equivalent)	HRA20A-318
	5	1/8" Pipe Plug	T1SE-368
	6	Oil Chamber Plug	R0H-377
	7	Swivel Inlet Body Assembly	834-165
●	8	Swivel Inlet Seal (2)	MT4-210
	9	Swivel Inlet Sleeve	HRA20A-166
	10	Air Strainer Screen	HRA20A-61
	11	Shuttle Valve	HRA20A-246
	12	Shuttle Valve Cap Assembly (2)	HRA20A-A943A
	13	Cap Seal (one for each Cap)	R4-210
	15	Large Throttle Valve Assembly	HRA20A-A940
●	16	Large Throttle Valve Face	R0AR-210
	17	Small Throttle Valve Assembly	HRA20A-A840
●	18	Small Throttle Valve Face	834-159
	19	Throttle Valve Stem Assembly (2)	HRA20A-A161
●	20	Throttle Valve Stem Seal (one for each Stem Assembly)	R2F-167
	21	Throttle Valve Cap Assembly (2)	HRA20A-A266
	22	Cap Seal (one for each Cap)	R4-210
	23	Throttle Valve Spring (2)	MR-942A
	24	Motor Housing Cover Assembly	HRA20A-A102
	25	Sight Glass Window	HRA20A-116
	26	Sight Glass Seal	HRA20A-117
	27	Sight Glass Retainer	HRA20A-119
	28	Oiler Felt	R1-75
	29	Oiler Adjusting Screw	R1-71A
	30	Oiler Wick	HRA20A-74
●	32	Housing Cover Gasket	HRA20A-984
	33	Housing Cover Cap Screw (9) (No. 10-24 thd. x 3/4" long)	34U-463
	34	Cover Cap Screw Lock Washer (9)	4U-58
● ★	35	Rear End Plate	HRA20A-12
●	36	Rear Rotor Bearing (AFBMA No. 12BC10)	402-22
	37	Rotor	HRA20A-53
●	38	Vane Packet (set of 7 Vanes)	HRA20A-42-7
	40	Cylinder	HRA20A-3
	41	Cylinder Dowel	HRA20A-98
● ★	42	Front End Plate	HRA20A-11
●	43	Front Rotor Bearing (AFBMA No. 12BC02)	R1L-24
	44	Motor Clamp Ring	R0B2J73-359
★	*	Vane Spring (7)	HRA20A-43
	45	Rotor Pinion	
		for Series HRA20, 40 and HLA20, 40	HRA20A-17
		for Series HRA30, 60 and HLA30, 60	HRA30A-17
	46	Pinion Key	HWA20A-405
	47	Pinion Retaining Ring	404-118
●	48	Housing Gasket	HRA20A-739
	49	Motor Housing Cap Screw (5) (1/4"-20 thd. x 7/8" long)	510-638
	50	Housing Cap Screw Lock Washer (5)	8U-58
	51	Throttle Cap Pivot Pin	157H-530
	52	Pivot Pin Retaining Plug	R2-227
▲	53	Throttle Cam	HRA20A-941A
	54	Throttle Control Shaft	HRA20A-255A
▲	56	Control Shaft Collar	HWA10A-33
	57	Control Shaft Pin (2)	R1AF-524
	58	Control Shaft Spring	TVH50A-412
	59	Stop Lever Assembly	HRA20A-A556A
	59A	Bumper Spring	HRE20A-550
	59B	Spring Lock (2)	HRE20A-551
	*	3/8" Lock Washer (2)	D02-321
	59D	3/8"-16 thd. Jam Nut (2)	D02-558

★ **IMPORTANT:** Refer to **Improved End Plates** on page 8 before ordering End Plates or Vane Springs.

▲ Refer to **Improved Throttle Cam** on page 9 before ordering a Throttle Cam (53) or Control Shaft Collar (56).

* Not illustrated.

● To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (●) for every four tools in service.

PART NUMBER FOR ORDERING

	60	Throttle Lever Rope (2)	
		5 ft. long	HRA20A-414
		length as specified	HRA20A-L414
	61	Throttle Handle (2)	MR-415
	62	Throttle Handle Bar	MR-409
	63	Chain Housing Assembly	HRA20A-A300
●	64	Chain Housing Seal	HRA20A-990
●	65	Control Shaft Bearing (Torrington B78X or its equivalent) (2)	34U-367
	66	Housing Dowel (2)	D02-527
	67	Spring Stop Pin	C6H20A-826
	68	Drive Shaft (for Series HRA20, 40 and HLA20, 40)	HRA20A-316
	69	Drive Shaft Connector (for Series HRA20, 40 and HLA20, 40)	HRA20A-317
	70	Drive Gear	
		for Series HRA20, 40 and HLA20, 40	HRA20A-9
		for Series HRA30, 60 and HLA30, 60	HRA30A-9
	71	Gear Key	HWA20A-405
	73	Drive Gear Retaining Ring	RX3-729
○	74	Pinion Shaft	
		for Series HRA20, 40 and HLA20, 40	HRA20A-319
		for Series HRA30, 60 and HLA30, 60	HRA30A-319A
	75	Pinion Shaft Bearing (AFBMA No. 12BC10)	402-22
For Series HRA20, 40 and HLA20, 40		Gear Frame Assembly (for Series HRA20, 40; HLA20, 40)	HRA20A-A8
	76	Planet Gear Frame	HRA20A-8
	77	Planet Gear Assembly	HRA20A-A10
	78 ●	Planet Gear Bearing (Torrington B-108 or its equivalent) (2 for each gear)	R0H-556
	78A	Planet Gear Bearing Retainer (2 for each Gear)	HRA20A-515
	79	Planet Gear Shaft (3)	HRA20A-191
	80 ●	Gear Frame Bearing (AFBMA No. 20BIC00) (2)	834-97
For Series HRA30, 60 and HLA30, 60		Gear Frame Assembly (for Series HRA30, 60; HLA30, 60)	HRA30A-A8
	76	Planet Gear Frame	HRA30A-8
	77	Large Planet Gear (3)	HRA30A-10
	78	Small Planet Gear (3)	HRA30A-110
	79	Planet Gear Shaft (3)	HRA30A-191
	80 ●	Planet Gear Shaft Bearing (6)	R1610-593
	80A	Gear Frame Thrust Washer (2)	HRA30A-554
	81	Top Chain Wheel Shaft Assembly	
		for Series HRA20, 40 and HLA20, 40	HRA20A-A459A
		for Series HRA30, 60 and HLA30, 60	HRA30A-A459A
	82	Wheel Shaft Seal	C321-606
	82A	Drive Shaft Oil Seal	HRA20A-457
●	83	Small Wheel Shaft Bearing (AFBMA No. 25BC10JDD)	HRA20A-987
●	84	Large Wheel Shaft Bearing (AFBMA No. 35BC10JDD)	HRA20A-988
†	*	Wheel Shaft Gear Assembly (for Series HRA20, 40 and HLA20, 40)	HRA20A-A798
†	*	Gear Locating Ring (2) (for Series HRA20, 40 and HLA20, 40)	HRA20A-799
	87	Gear Case Assembly	HRA20A-A353
	88	1/4" Pipe Plug (2)	R0H-377
	89	Vent	P250-546
●	90	Gear Case Gasket (2)	HRA20A-931
	91	Gear Case Cap Screw (4)	HRA20A-354
■	92	Gear Case Cover Assembly	
		for Series HRA20, 40 and HLA20, 40	HRA20A-A352
		for Series HRA30, 60 and HLA30, 60	HRA30A-A352
	93	1/4" Pipe Plug	R0H-377
	94	Gear Case Cover Dowel (2)	D02-527
	95	Stationary Cam	HRA20A-88
	96	Ring Gear	
		for Series HRA20, 40 and HLA20, 40	HRA20A-406
		for Series HRA30, 60 and HLA30, 60	HRA30A-406
	97	Brake Actuator	HRA20A-83
	98	Brake Pressure Plate	HRA20A-84

○ Series HRA30, 60 and HLA30, 60 Hoists now incorporate a new style Pinion Shaft HRA30A-319A (74) of one-piece construction. When replacing a Pinion Shaft in a Hoist incorporating the old style two-piece construction, also discard the Drive Shaft and Drive Shaft Connector. Series HRA20, 40 and HLA20, 40 Hoists incorporate the two-piece construction, consisting of Drive Shaft (68), Drive Shaft Connector (69) and Pinion Shaft HRA20A-319 (74).

■ When ordering a Gear Case Cover specify the complete symbol of the Hoist on which it is to be used.

† Refer to **Improved Top Chain Wheel Shaft Assembly** on page 9.

● To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (●) for every four tools in service.

		PART NUMBER FOR ORDERING
99	Brake Disc Stack	HRA20A-388
99A	Brake Disc Pack (set of 8 faced Discs)	HRA20A-B388
99B	Brake Cushion (7) (replace as a set)	577-216
99C	Brake Plate (9)	HRA20A-389
99D	Brake Engaging Plate (2)	HRA20A-85
100	Sprag Clutch	HRA20A-86
101	Outer Clutch Race	HRA20A-87
102	Top Chain Wheel	
	for Sizes HRA20A and HRA40A	HRA20A-640
	for Sizes HLA20A and HLA40A	HLA20A-740
	for Sizes HRA20ASR and HRA40ASR	HRA20A-R640
	for Sizes HRA30A and HRA60A	HRA30A-640
	for Sizes HLA30A and HLA60A	HLA30A-740
103	Chain Wheel Spacer	HRA20A-974
▲ 104	Chain Guide	
	for Sizes HRA20A, HRA40A, HRA30A and HRA60A	HRA20A-741
	for Sizes HLA20A and HLA40A	HLA20A-741
	for Sizes HRA20ASR and HRA40ASR	HRA30A-741
	for Sizes HLA30A and HLA60A	HLA30A-741
105	Chain Guide Screw (4)	
	for Series HRA20, 40 and HRA30, 60	R3-7
	for Series HLA20, 40 and HLA30, 60	G57T-634
106	Chain Guide Screw Lock Washer (4)	
	for Series HRA20, 40 and HRA30, 60	L01-67
	for Series HLA20, 40 and HLA30, 60	8U-58
107	Chain Guard (for Sizes HRA20A, HRA20ASR, HRA40A, HRA40ASR, HRA30A and HRA60A)	HRA20A-6
108	Roller Chain Assembly	
	for Size HRA20A	
	10 ft. maximum lift	HRA20A-A645
	15 ft. maximum lift	HRA20A-A645-15
	20 ft. maximum lift	HRA20A-A645-20
	25 ft. maximum lift	HRA20A-A645-25
	lift as specified	HRA20A-AB645
	for Size HRA40A	
	10 ft. maximum lift	HRA40A-A645
	15 ft. maximum lift	HRA40A-A645-15
	20 ft. maximum lift	HRA40A-A645-20
	25 ft. maximum lift	HRA40A-A645-25
	lift as specified	HRA40A-AB645
	for Size HRA20ASR	
	10 ft. maximum lift	HRA20A-AR645
	15 ft. maximum lift	HRA20A-AR645-15
	20 ft. maximum lift	HRA20A-AR645-20
	25 ft. maximum lift	HRA20A-AR645-25
	lift as specified	HRA20A-ABR645
	for Size HRA40ASR	
	10 ft. maximum lift	HRA40A-AR645
	15 ft. maximum lift	HRA40A-AR645-15
	20 ft. maximum lift	HRA40A-AR645-20
	25 ft. maximum lift	HRA40A-AR645-25
	lift as specified	HRA40A-ABR645
	for Size HRA30A	
	10 ft. maximum lift	HRA30A-A645
	15 ft. maximum lift	HRA30A-A645-15
	20 ft. maximum lift	HRA30A-A645-20
	25 ft. maximum lift	HRA30A-A645-25
	lift as specified	HRA30A-AB645
	for Size HRA60A	
	10 ft. maximum lift	HRA60A-A645
	15 ft. maximum lift	HRA60A-A645-15
	20 ft. maximum lift	HRA60A-A645-20
	25 ft. maximum lift	HRA60A-A645-25
	lift as specified	HRA60A-AB645

▲ Refer to **Improved Chain Guide** on page 9.

109	Roller Chain Connecting Link (2)	
	for Sizes HRA20A and HRA40A	DRC10-646
	for Sizes HRA20ASR and HRA40ASR	HRA20A-R646
	for Sizes HRA30A and HRA60A	HRA30A-646
110	Link Chain	
	for Size HLA20A	
	10 ft. maximum lift	HLA20A-745
	15 ft. maximum lift	HLA20A-745-15
	20 ft. maximum lift	HLA20A-745-20
	25 ft. maximum lift	HLA20A-745-25
	lift as specified	HLA20A-B745
	for Size HLA40A	
	10 ft. maximum lift	HLA40A-745
	15 ft. maximum lift	HLA40A-745-15
	20 ft. maximum lift	HLA40A-745-20
	25 ft. maximum lift	HLA40A-745-25
	lift as specified	HLA40A-B745
	for Size HLA30A	
	10 ft. maximum lift	HLA30A-745
	15 ft. maximum lift	HLA30A-745-15
	20 ft. maximum lift	HLA30A-745-20
	25 ft. maximum lift	HLA30A-745-25
	lift as specified	HLA30A-B745
	for Size HLA60A	
	10 ft. maximum lift	HLA60A-745
	15 ft. maximum lift	HLA60A-745-15
	20 ft. maximum lift	HLA60A-745-20
	25 ft. maximum lift	HLA60A-745-25
	lift as specified	HLA60A-B745
111	Link Chain Connecting Link	
	for Sizes HLA20A and HLA40A	DRC10-646
	for Sizes HLA30A and HLA60A	HRA30A-646
112	Stop Ring Assembly	
	for Sizes HRA20A, HLA20A, HRA30A and HLA30A	HRA20A-A259
	for Size HRA20ASR	HRA20A-AR259
113	Stop Ring Pin (1 for each Stop Ring)	HRA20A-124
114	Stop Ring Plug (1 for each Stop Ring)	502-95
115	Roller Chain Adapter Link	
	for Size HRA20A	HRA20A-460
	for Size HRA20ASR	HRA20A-R460
	for Size HRA30A	HRA30A-460
▲ 116	Chain Connector (for Sizes HRA20A, HLA20A, HRA20ASR, HRA30A and HLA30A)	HRA20A-461
▲ 117	Roll Pin Retainer (2) (for Sizes HRA20A, HLA20A, HRA20ASR, HRA30A and HLA30A)	5BM-278
118	Chain Connector Pin (for Sizes HRA20A, HLA20A, HRA20ASR, HRA30A and HLA30A)	HRA20A-603
119	Hook Block Pin	
	for Sizes HRA20A, HLA20A, HRA30A and HLA30A	HRA20A-462
	for Size HRA20ASR	HRA20A-R462
120	Hook Block	
	for Sizes HRA20A and HLA20A	HRA20A-463
	for Size HRA20ASR	HRA20A-R463
	for Sizes HRA30A and HLA30A	HRA30A-463
121	Bottom Hook	
	Regular	
	for Sizes HRA20A and HLA20A	HRA20A-377
	for Size HRA20ASR	HRA20A-R377
	for Sizes HRA30A and HLA30A	HRA30A-377
	Bullard-Burnham	
	for Size HRA20A	HRA20A-BB377
	for Size HLA20A	HLA20A-BB377
122	Hook Latch Kit	
	for Sizes HRA20A, HLA20A and HRA20ASR	D01-S123
	for Sizes HRA30A and HLA30A	HRA30A-S123

▲ If the Hoist has a set screw type Retainer, order the Retainer by part number HRA20A-561. If you are ordering a new Chain Connector to replace one having Set Screw Retainer, you must also order two (2) Roll Pin Retainers Number 5BM-278.

		PART NUMBER FOR ORDERING
123	Hook Retaining Ring	
	for Sizes HRA20A, HLA20A and HRA20ASR	HRA20A-375
	for Sizes HRA30A and HLA30A	HRA30A-375
• 124	Hook Bearing (for Sizes HRA20A, HLA20A and HRA20ASR)	HRA20A-379
• 124	Hook Bearing Ball (5/16" dia. steel ball) (16) (for Sizes HRA30A and HLA30A)	G601-65
125	Wheel Block	
	for Sizes HRA40A, HLA40A, HRA60A and HLA60A	HRA40A-378
	for Size HRA40ASR	HRA40A-R378
126	Bottom Chain Wheel Assembly	
	for Size HRA40A	HRA40A-A380
	for Size HLA40A	HLA40A-A380
	for Size HRA40ASR	HRA40A-AR380
	for Size HRA60A	HRA60A-A380
	for Size HLA60A	HLA60A-A380
127	Bottom Chain Wheel Bearing (Torrington B1412 or its equivalent) (2) (for Sizes HRA40A, HLA40A, HRA40ASR, HRA60A and HLA60A)	R2H-606
128	Bottom Chain Wheel Shaft	
	for Sizes HRA40A, HLA40A, HRA60A and HLA60A	HRA40A-382
	for Size HRA40ASR	HRA40A-R382
*	Grease Fitting	130SR-188
129	Wheel Shaft Lock	
	for Sizes HRA40A, HLA40A, HRA60A and HLA60A	MR20-383
	for Size HRA40ASR	C6H20A-R383
130	Shaft Lock Screw (2)	
	for Sizes HRA40A, HLA40A, HRA60A and HLA60A	JC3350-103
	for Size HRA40ASR	C6H20A-R937
131	Shaft Lock Screw Lock Washer (2)	L01-67
132	Wheel Block Cover	
	for Sizes HRA40A, HLA40A, HRA60A and HLA60A	HRA40A-441
	for Size HRA40ASR	HRA40A-R441
133	Wheel Block Cover Screw (4)	
	for Sizes HRA40A, HLA40A, HRA60A and HLA60A	R2-312
	for Size HRA40ASR	HRA40A-R937
134	Cover Screw Lock Washer (4) (for Sizes HRA40A, HLA40A, HRA40ASR, HRA60A and HLA60A)	R2-320
135	Wheel Block Chain Guard	
	for Sizes HRA40A, HRA40ASR and HRA60A	HRA40A-445
	for Sizes HLA40A and HLA60A	HLA40A-445
136	Wheel Block Guard Screw (2) (for Sizes HRA40A, HLA40A, HRA40ASR, HRA60A and HLA60A)	R2N-103
137	Guard Screw Lock Washer (2) (for Sizes HRA40A, HRA40ASR, HRA60A and HLA60A)	L01-67
138	Wheel Block Pin	
	for Sizes HRA40A, HLA40A, HRA60A and HLA60A	HRA40A-464
	for Size HRA40ASR	HRA40A-R464
139	Wheel Block Pin Cotter (2) (for Sizes HRA40A, HLA40A, HRA40ASR, HRA60A and HLA60A)	D02-330
140	Hook Block	
	for Sizes HRA40A and HLA40A	HRA40A-463
	for Size HRA40ASR	HRA40A-R463
	for Sizes HRA60A and HLA60A	HRA60A-463
141	Bottom Hook and Nut Assembly	
	for Sizes HRA40A and HLA40A	HRA40A-AS377A
	for Size HRA40ASR	HRA40A-ASR377A
	for Sizes HRA60A and HLA60A	HRA60A-AS377
142	Hook Latch Kit	
	for Sizes HRA40A, HLA40A and HRA40ASR	D02-S123
	for Sizes HRA60A and HLA60A	D04-S123
143	Hook Pin (for Sizes HRA40A, HLA40A, HRA40ASR, HRA60A and HLA60A	D02-374
144	Hook Bearing	
	for Sizes HRA40A, HLA40A and HRA40ASR	R4810-105
	for Sizes HRA60A and HLA60A	HRA60A-379

* Not illustrated.

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.

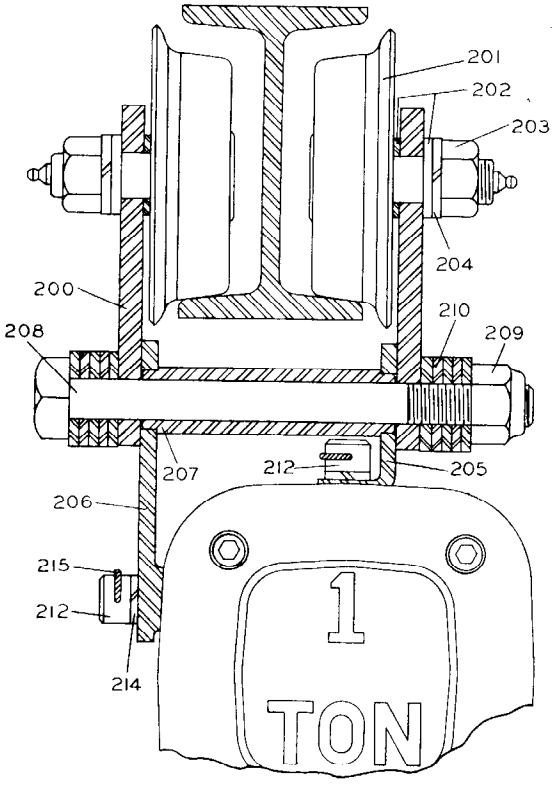
PART NUMBER FOR ORDERING

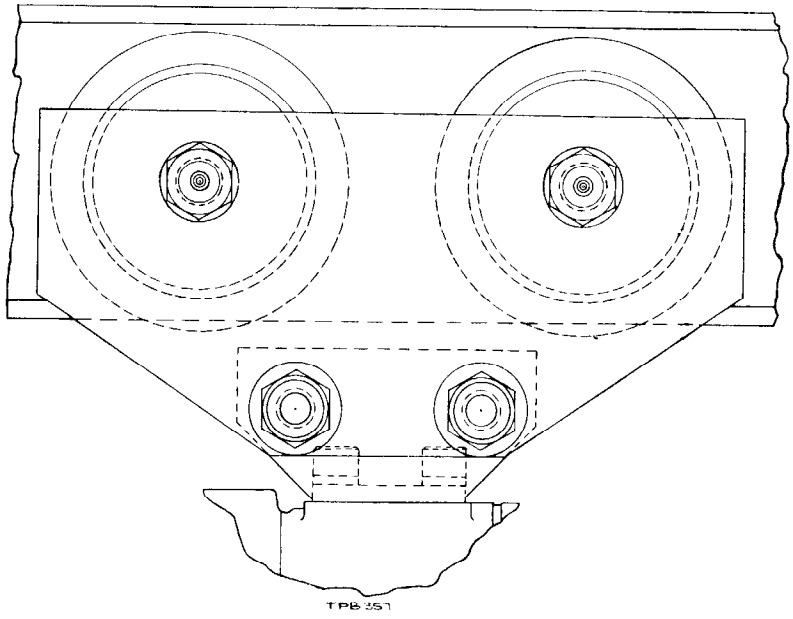
145	Hook Thrust Washer (2)	
	for Sizes HRA40A, HLA40A and HRA40ASR	HRA40A-465
	for Sizes HRA60A and HLA60A	HRA60A-465
146	Chain Anchor	
	for Size HRA40A	HRA40A-373
	for Sizes HLA40A and HLA60A	HLA60A-373
	for Size HRA40ASR	HRA40A-R373
	for Size HRA60A	HRA60A-373
147	Chain Anchor Pin (1 for Sizes HRA40A, HRA40ASR and HRA60A; 2 for Sizes HLA40A and HLA60A)	HRA40A-962
148	Anchor Pin Cotter (2 for Sizes HRA40A, HRA40ASR and HRA60A; 4 for Sizes HLA40A and HLA60A)	D02-524
149	Top Hook Yoke	
	for Sizes HRA20A, HLA20A and HRA20ASR	HRA20A-590
	for Sizes HRA30A and HLA30A	HRA30A-590
150	Top Hook	
	for Sizes HRA20A and HLA20A	HRA20A-377
	for Size HRA20ASR	HRA20A-R377
	for Sizes HRA30A and HLA30A	HRA30A-377
151	Hook Latch Kit	
	for Sizes HRA20A, HLA20A and HRA20ASR	D01-S123
	for Sizes HRA30A and HLA30A	HRA30A-S123
● 152	Hook Bearing (for Sizes HRA20A, HLA20A and HRA20ASR)	HRA20A-379
● 152	Hook Bearing Ball (5/16" dia. steel ball) (16) (for Sizes HRA30A and HLA30A)	G601-65
153	Hook Retaining Ring	
	for Sizes HRA20A, HLA20A and HRA20ASR	HRA20A-375
	for Sizes HRA30A and HLA30A	HRA30A-375
154	Top Hook Yoke Screw (4)	HRA20A-339
155	1/2" Lock Washer (4)	HRA20A-322
156	Lock Wire (12" long) (2)	HRA20A-698
157	Top Hook Yoke Assembly	
	for Sizes HRA40A, HLA40A and HRA40ASR	HRA40A-B590A
	for Sizes HRA60A and HLA60A	HRA60A-B590A
158	Top Hook and Nut Assembly	
	for Sizes HRA40A and HLA40A	HRA40A-377A
	for Size HRA40ASR	HRA40A-A377A
	for Sizes HRA60A and HLA60A	HRA60A-377
159	Hook Latch Kit	
	for Sizes HRA40A, HLA40A and HRA40ASR	D02-S123
	for Sizes HRA60A and HLA60A	D04-S123
160	Hook Bearing	
	for Sizes HRA40A, HLA40A and HRA40ASR	R4810-105
	for Sizes HRA60A and HLA60A	HRA60A-379
161	Hook Thrust Washer (2)	
	for Sizes HRA40A, HLA40A and HRA40ASR	HRA40A-465
	for Sizes HRA60A and HLA60A	HRA60A-465
162	Hook Pin (for Sizes HRA40A, HLA40A, HRA40ASR, HRA60A, and HLA60A)	D02-374
163	Top Hook Yoke Screw (2)	HRA40A-339
164	Yoke Anchor Screw (2)	HRA40A-743
165	1/2" Lock Washer (4)	HRA20A-322
166	Lock Wire (12" long) (2)	HRA20A-698
167	Exhaust Muffler	PDA312-46
168	Muffler Chain	HRA20A-673
169	Chain Retainer	HRA20A-676
170	Muffler Adapter	HRA20A-675
*	Caution Plate	TA-147A
*	Caution Plate Screw (4)	9BM-302
*	Nameplate	PCG107AC-99
*	Nameplate Screw (4)	R4-302

* Not illustrated.

● To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (●) for every four tools in service.

RIGID TROLLEY PARTS
FOR SIZES HRA20A, HLA20A AND HRA20ASR





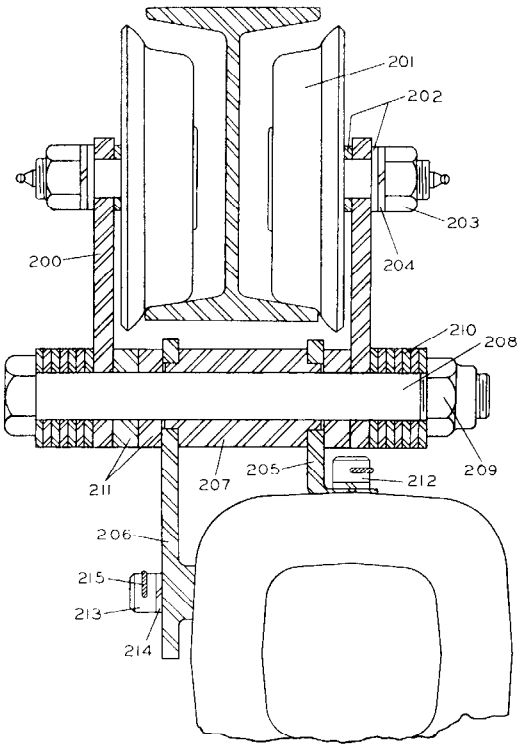
PART NUMBER FOR ORDERING

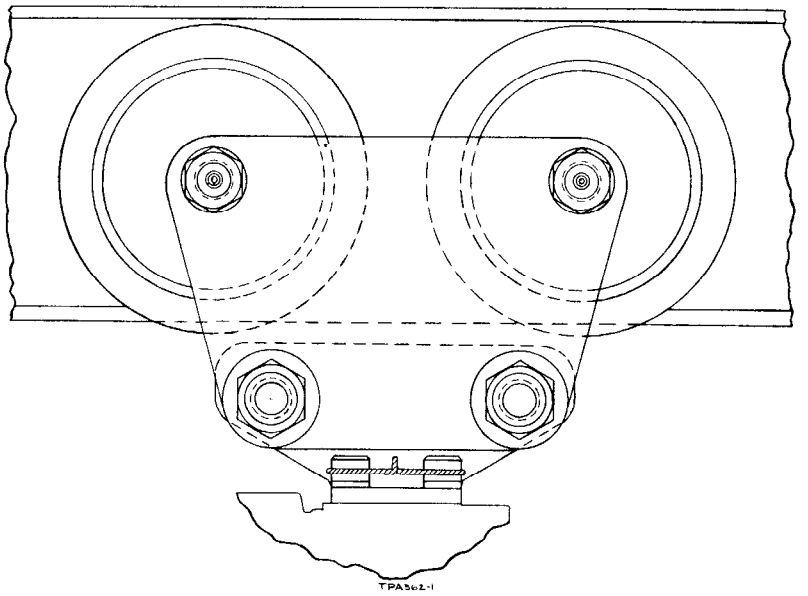
		For I-Beam	For Flat Tread Monorail
	Rigid Trolley Assembly		
	for Sizes HRA20A and HLA20A	HRA20A-A430	HRA20A-A430T
	for Size HRA20ASR	HRA20A-AR430	HRA20A-AR430T
200	Trolley Bracket (2)	MR20-430	MR20-430
201	Trolley Wheel (4)		
	for Sizes HRA20A and HLA20A	MR20-691	MR20-691T
	for Size HRA20ASR	MR20-1691	HRA20A-R691T
202	Trolley Wheel Spacer (8)	21-748	21-748
203	Trolley Wheel Shaft Nut (4)	DU-562	DU-562
204	Trolley Wheel Shaft Lock Washer (4)	D01-692	D01-692
205	Trolley Top Adapter	HRA20A-426	HRA20A-426
206	Trolley Side Adapter	HRA20A-425	HRA20A-425
207	Trolley Adapter Spacer (2)	HRA20A-446	HRA20A-446
208	Trolley Bracket Bolt (2)	D01-694-8	D01-694-8
209	Trolley Bolt Nut (2)	D01-341A	D01-341A
210	1/16" Trolley Bracket Spacer (24)	D01-442-1/16	- - -
212	Trolley Adapter Screw (4)	HRA40A-339	HRA40A-339
214	Adapter Screw Lock Washer (4)	HRA20A-322	HRA20A-322
215	Lock Wire (2)	HRA20A-698	HRA20A-698
*	1/4" Trolley Bracket Spacer (4)	- - -	D01-442-1/4
*	3/8" Trolley Bracket Spacer (4)	- - -	D01-442-3/8
*	Trolley Bracket Spacer (4)	- - -	24-741

* Not illustrated.

NOTE: Trolleys No. HRA20A-A430 and HRA20A-AR430 will operate on 5" to 12" I-Beams having Flanges 3.00" to 5.00" wide. Trolleys No. HRA20A-A430T and HRA20A-AR430T will operate on Flat Tread Monorails having Flanges 3.25" to 4.50" wide. Always specify the type, size and flange width of track on which Trolley is to operate.

RIGID TROLLEY PARTS
FOR SIZES HRA40A, HLA40A AND HRA40ASR





		PART NUMBER FOR ORDERING For I-Beam	For Flat Tread Monorail
	Rigid Trolley Assembly		
	for Sizes HRA40A and HLA40A	HRA40A-A430	HRA40A-A430T
	for Size HRA40ASR	HRA40A-AR430	HRA40A-AR430T
200	Trolley Bracket (2)	HRA40A-430	HRA40A-430
201	Trolley Wheel (4)		
	for Sizes HRA40A and HLA40A	HRA40A-691	HRA40A-691T
	for Size HRA40ASR	HRA40A-R691	HRA40A-R691T
202	Trolley Wheel Spacer (8)	21-748	21-748
203	Trolley Wheel Shaft Nut (4)	DU-562	DU-562
204	Trolley Wheel Shaft Lock Washer (4)	D01-692	D01-692
205	Trolley Top Adapter	HRA40A-426	HRA40A-426
206	Trolley Side Adapter	HRA40A-425	HRA40A-425
207	Trolley Adapter Spacer (2)	HRA40A-446	HRA40A-446
208	Trolley Bracket Bolt (2)	D02-439A-9 1/2	D02-439A-9
209	Trolley Bolt Nut (2)	D02-440B	D02-440B
210	1/6" Trolley Bracket Spacer (32)	D02-442A-1/6	- - -
211	1/2" Trolley Bracket Spacer (6)	D02-442A-1/2	D02-442A-1/2
*	1/4" Trolley Bracket Spacer (4)	- - -	D02-442A-1/4
*	3/8" Trolley Bracket Spacer (4)	- - -	D02-442A-3/8
212	Trolley Adapter Screw (2)	HRA40A-339	HRA40A-339
213	Trolley Side Adapter Screw (2)	HRA40A-743	HRA40A-743
214	Adapter Screw Lock Washer (4)	HRA20A-322	HRA20A-322
215	Lock Wire (2)	HRA20A-698	HRA20A-698

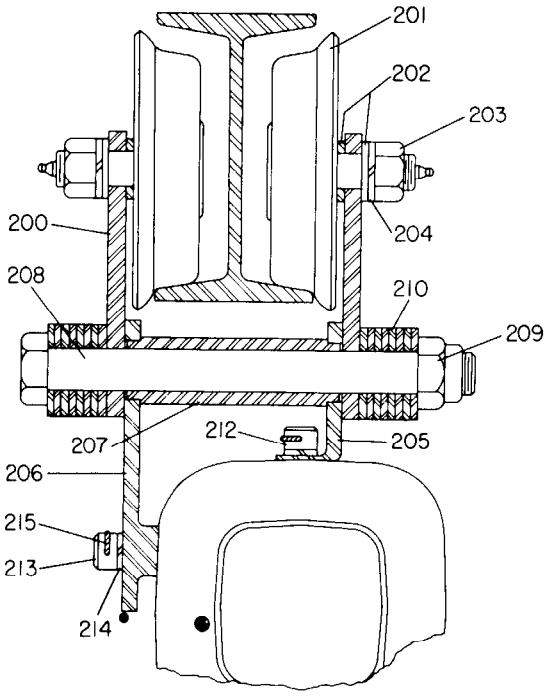
* Not illustrated.

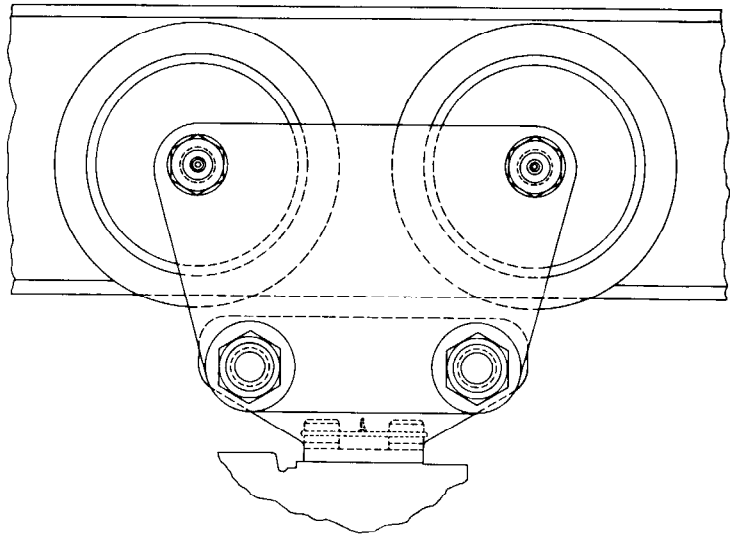
NOTE: Trolleys No. HRA40A-A430 and HRA40A-AR430 will operate on 6" to 18" I-Beams having Flanges 3.33" to 6.00" wide.

Trolleys No. HRA40A-A430T and HRA40A-AR430T will operate on Flat Tread Monorails having Flanges 3.25" to 4.50" wide.

Always specify the type size and flange width of track on which Trolley is to operate.

RIGID TROLLEY PARTS
FOR SIZES HRA30A AND HLA30A





		PART NUMBER FOR ORDERING	
		For I-Beam	For Flat Tread Monorail
	Rigid Trolley Assembly	HRA30A-A430	HRA30A-A430T
200	Trolley Bracket (2)	HRA40A-430	HRA40A-430
201	Trolley Wheel (4)	HRA40A-691	HRA40A-691T
202	Trolley Wheel Spacer (8)	21-748	21-748
203	Trolley Wheel Shaft Nut (4)	DU-562	DU-562
204	Trolley Wheel Shaft Lock Washer (4)	D01-692	D01-692
205	Trolley Top Adapter	HRA40A-426	HRA40A-426
206	Trolley Side Adapter	HRA40A-425	HRA40A-425
207	Trolley Adapter Spacer (2)	HRA30A-446	HRA30A-446
208	Trolley Bracket Bolt (2)	D02-439A-9 1/2	D01C-694-7 1/2
209	Trolley Bolt Nut (2)	D02-440B	D02-440B
210	1/6" Trolley Bracket Spacer (32)	D02-442A-1/6	- - -
*	1/4" Trolley Bracket Spacer (4)	- - -	D02-442A-1/4
*	3/8" Trolley Bracket Spacer (4)	- - -	D02-442A-3/8
212	Trolley Adapter Screw (2)	HRA20A-339	HRA20A-339
213	Trolley Side Adapter Screw (2)	HRA40A-743	HRA40A-743
214	Adapter Screw Lock Washer (4)	HRA20A-322	HRA20A-322
215	Lock Wire (2)	HRA20A-698	HRA20A-698

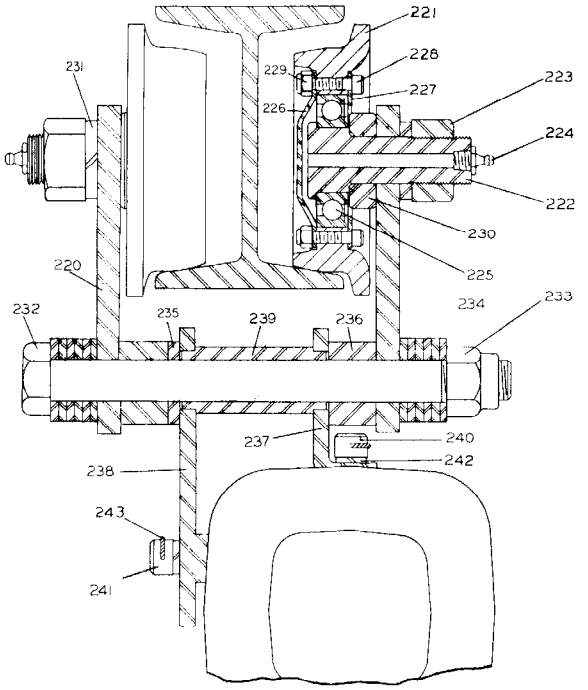
* Not illustrated.

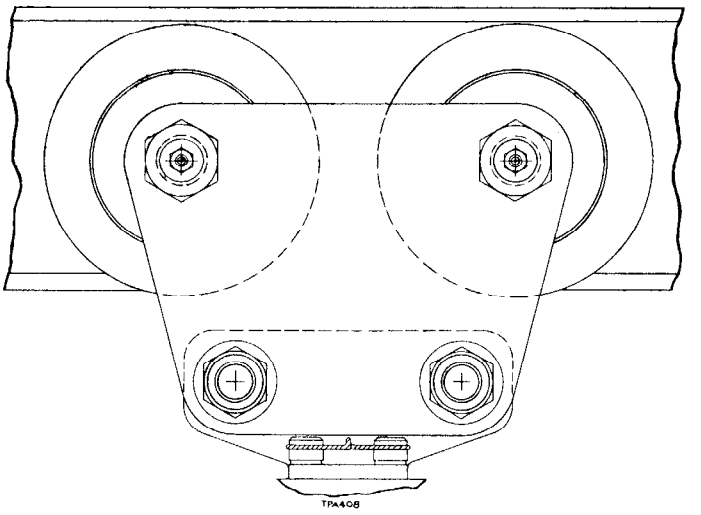
NOTE: No. HRA30A-A430 Trolley will operate on 6" to 8" I-Beams having flanges 3.33" to 6.00" wide.

No. HRA30A-A430T Trolley will operate on Flat Tread Monorails having Flanges 3.25" to 4.50" wide.

Always specify the size, type and flange width of track on which Trolley is to operate.

RIGID TROLLEY PARTS
FOR SIZES HRA60A AND HLA60A





PART NUMBER FOR ORDERING

		For I-Beam	For Flat Tread Monorail
	Rigid Trolley Assembly	HRA60A-A430	HRA60A-A430T
	Assembled Trolley Bracket (2)	IIRA60A-B430	HRA60A-B430T
220	Trolley Bracket (1 for each Assembled Trolley Bracket)	HRA60A-430	HRA60A-430
221	Trolley Wheel (2 for each Assembled Trolley Bracket)	D04-231	D04-T431
222	Trolley Wheel Shaft Assembly (1 for each wheel)	HRA60A-A435	HRA60A-A435
223	Trolley Wheel Shaft Nut (1 for each Shaft)	D04-305	D04-305
224	Grease Fitting (1 for each Shaft)	23-189	23-189
225	Trolley Wheel Bearing (AFBMA No. 35BC02JP) (1 for each wheel)	D04-956	D04-956
226	Bearing Cap (1 for each Wheel)	D04-954	D04-954
227	Bearing Plate (1 for each Wheel)	D04-955	D04-955
228	1/4" Cap Screw (4 for each Wheel)	501-638	501-638
229	1/4" Elastic Stop Nut (4 for each Wheel)	501-639	501-639
230	Trolley Wheel Spacer (1 for each Wheel)	HRA60A-432	HRA60A-432T
231	1" Lock Washer (1 for each Wheel)	D04-960	D04-960
232	Trolley Bracket Bolt (2)	C6H40A-439-11	D02-439A-9
233	Trolley Bolt Nut (2)	D02-440B	D02-440B
234	1/16" Trolley Bracket Spacer (24)	D02-442A-1/6	- - -
235	1/4" Trolley Bracket Spacer (2 for I-Beam Trolley; 6 for Flat Tread Monorail Trolley)	D02-442A-1/4	D02-442A-1/4
*	3/8" Trolley Bracket Spacer (4)	- - -	D02-442A-3/8
236	1/2" Trolley Bracket Spacer (8)	D02-442A-1/2	D02-442A-1/2
237	Trolley Top Adapter	HRA40A-426	HRA40A-426
238	Trolley Side Adapter	HRA40A-425	HRA40A-425
239	Trolley Adapter Spacer (2)	HRA40A-446	HRA40A-446
240	Trolley Adapter Screw (2)	HRA40A-339	HRA40A-339
241	Trolley Side Adapter Screw (2)	HRA40A-743	HRA40A-743
242	Adapter Screw Lock Washer (4)	HRA20A-322	HRA20A-322
243	Lock Wire (2)	HRA20A-698	HRA20A-698

* Not illustrated.

NOTE: No. HRA60A-A430 Trolley will operate on 6" to 18" I-Beams having flanges 3.33" to 6.00" wide.

No. HRA60A-A430T Trolley will operate on Flat Tread Monorails having flanges 3.25" to 4.50" wide.

Always specify size, type and flange width of track on which Trolley is to operate.

HOOK-ON TROLLEY PARTS
FOR SERIES HRA20, HLA20, HRA30, HLA30, HRA40 and HLA40
(Not illustrated)

	PART NUMBER FOR ORDERING	
	For I-Beam	For Flat Tread Monorail
Trolley Assembly		
for Series HRA20 and HLA20	MR20-7928	- - -
for Series HRA20ASR	MR20-B7928	- - -
for Series HRA30, HLA30, HRA40 and HLA40	HRA40A-A700	- - -
for Series HRA40ASR	HRA40A-AR700	- - -
for Series HRA40 and HLA40	- - -	HRA40A-AT700
Trolley Wheel (4)		
for Hook-On Trolley No. MR20-7928	MR20-691	- - -
for Hook-On Trolley No. MR20-B7928	MR20-1691	- - -
for Hook-On Trolley No. HRA40A-A700	HRA40A-691	- - -
for Hook-On Trolley No. HRA40A-AR700	HRA40A-R691	- - -
for Hook-On Trolley No. HRA40A-AT700	- - -	HRA40A-691T

NOTE: The Hook-On Trolley for Sizes HRA20, HLA20 or HRA20ASR will operate on 5" to 12" I-Beams having flanges 3.00" to 5.00" wide.

The Hook-On Trolley for Sizes HRA30, HLA30, HRA40, HLA40 or HRA40ASR will operate on 6" to 18" I-Beams having flanges 3.33" to 6.00" wide.

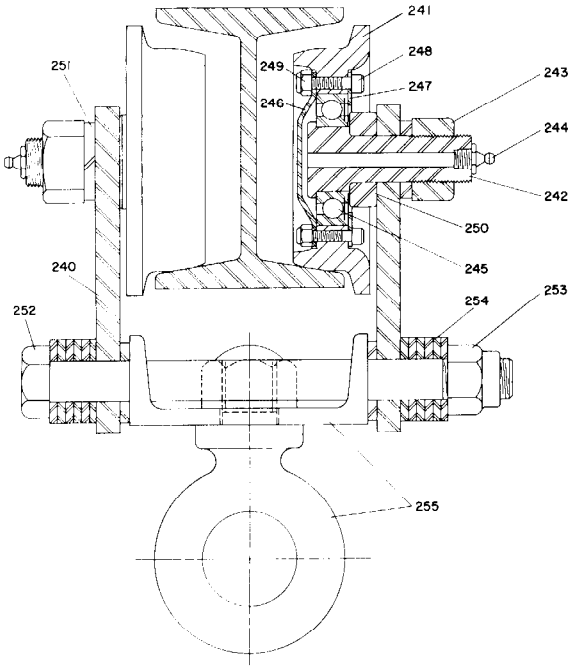
No. HRA40A-AT700 Trolley will operate on Flat Tread Monorails having flanges 3.0" to 5.7" wide.

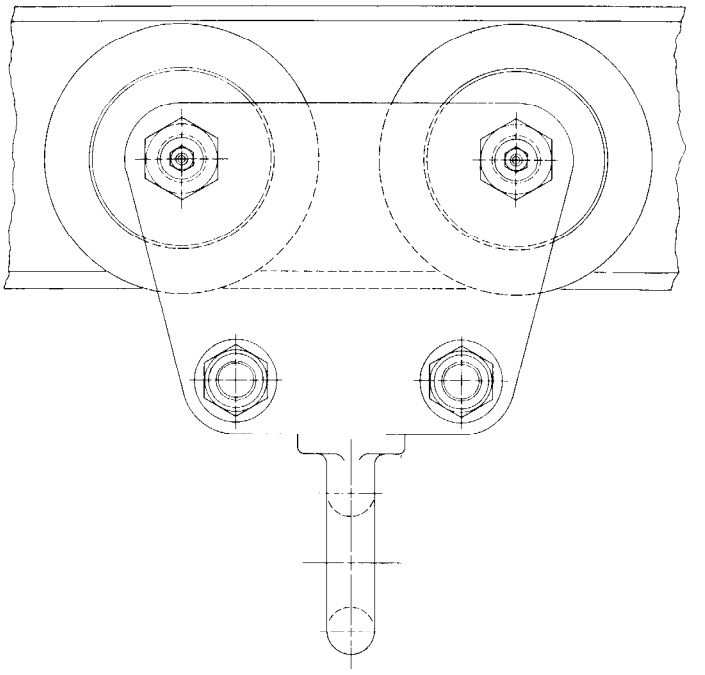
Always specify the type, size and flange width of track on which Trolley is to operate.

MAINTENANCE TOOLS

TOOL NUMBER FOR ORDERING	TOOL NAME FOR ORDERING	OPERATION
34766	Control Shaft Bearing Inserting Tool	Pressing the Control Shaft Bearings (65) into the Chain Housing (63).
74324	Valve Stem Bushing Inserting Tool	Pressing new Valve Stem Bushings (2) into the Motor Housing (1).
76427	Drive Shaft Bearing Inserting Tool	Pressing the Drive Shaft Bearing (4) into the Motor Housing (1).
76662	Shuttle Valve Bushing Reamer	Reaming a new Shuttle Valve Bushing (3) to size after pressing it into the Motor Housing (1).
76663	Shuttle Valve Bushing Inserting Tool	Pressing a new Shuttle Valve Bushing (3) into the Motor Housing (1).
76664	Drive Shaft Bearing Puller	Removing the Drive Shaft Bearing (4) from the Motor Housing (1).
77135	Bottom Chain Wheel Bearing Inserting Tool	Pressing the Bottom Chain Wheel Bearings (127) into the Bottom Chain Wheel (126).
D96374	Pinion Shaft Inserting Tool (for Series HRA30, 60 and HLA30, 60)	Used on motor end of Pinion Shaft (74), to protect the Drive Shaft Oil Seal (82A), when inserting the Pinion Shaft through the Top Chain Wheel Shaft (81).

HOOK-ON TROLLEY PARTS
FOR SIZES HRA60A AND HLA60A





PART NUMBER FOR ORDERING

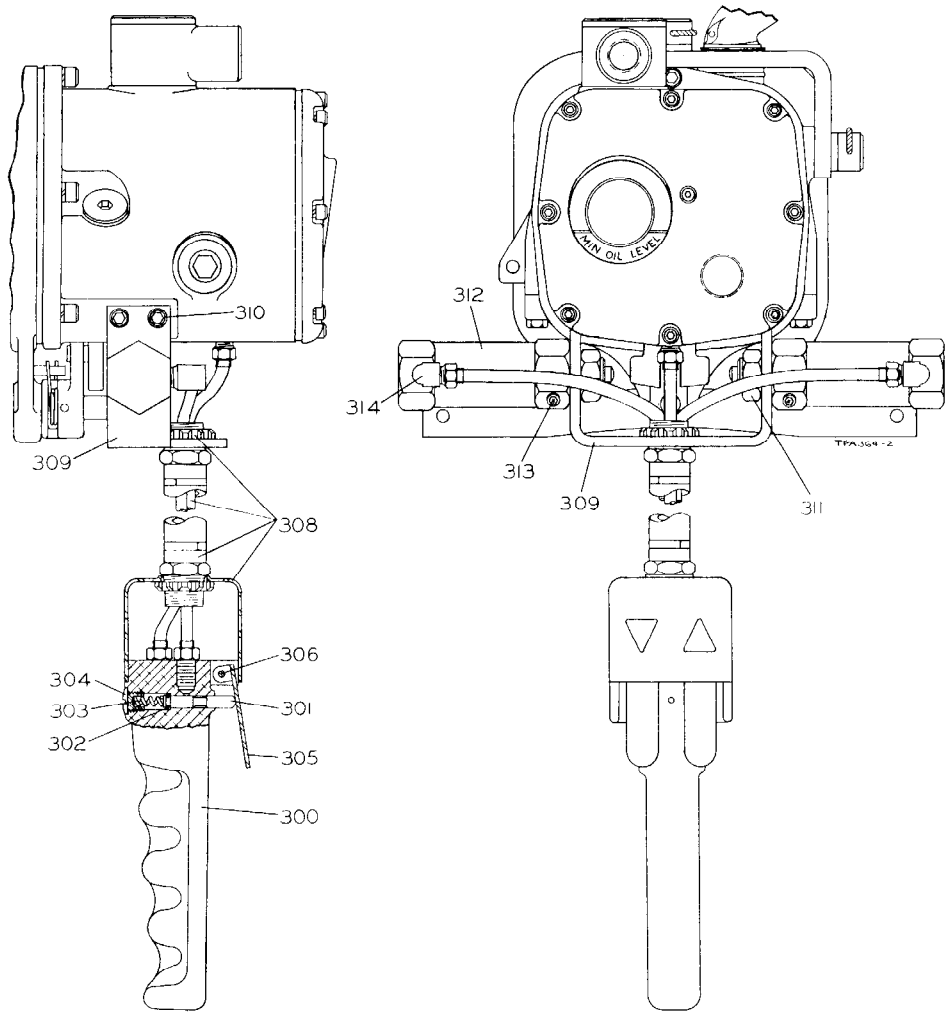
		For I-Beam	For Flat Tread Monorail
	Hook-On Trolley Assembly	HRA60A-A690	HRA60A-AT690
	Assembled Trolley Bracket (2)	HRA60A-B430	HRA60A-B430T
240	Trolley Bracket (1 for each Assembled Trolley Bracket)	HRA60A-430	HRA60A-430
241	Trolley Wheel (2 for each Assembled Trolley Bracket)	D04-231	D04-T431
242	Trolley Wheel Shaft Assembly (1 for each Wheel)	HRA60A-A435	HRA60A-A435
243	Trolley Wheel Shaft Nut (1 for each Shaft)	D04-305	D04-305
244	Grease Fitting (1 for each Shaft)	23-189	23-189
245	Trolley Wheel Bearing (AFBMA No. 35BC02JP) (1 for each Wheel)	D04-956	D04-956
246	Bearing Cap (1 for each Wheel)	D04-954	D04-954
247	Bearing Plate (1 for each Wheel)	D04-955	D04-955
248	1/4" Cap Screw (4 for each Wheel)	501-638	501-638
249	1/4" Elastic Stop Nut (4 for each Wheel)	501-639	501-639
250	Trolley Wheel Spacer (1 for each Wheel)	HRA60A-432	HRA60A-432T
251	1" Lock Washer (1 for each Wheel)	D04-960	D04-960
252	Trolley Bracket Bolt (2)	C6H40A-439-11	C6H40A-439-11
253	Trolley Bolt Nut (2)	D02-440B	D02-440B
254	1/6" Trolley Bracket Spacer (36)	D02-442A-1/6	D02-442A-1/6
255	Trolley Bracket Block	HRA60A-690	HRA60A-690

NOTE: The No. HRA60A-A690 Hook-On Trolley will operate on 8" to 18" I-Beams having flanges 4.00" to 6.00" wide.

The No. HRA60A-AT690 Hook-On Trolley will operate on Flat Tread Monorails having flanges 3.25" to 4.50" wide.

Always specify the type, size and flange width of track on which the Trolley is to operate.

SINGLE MOTOR
PENDENT THROTTLE PARTS



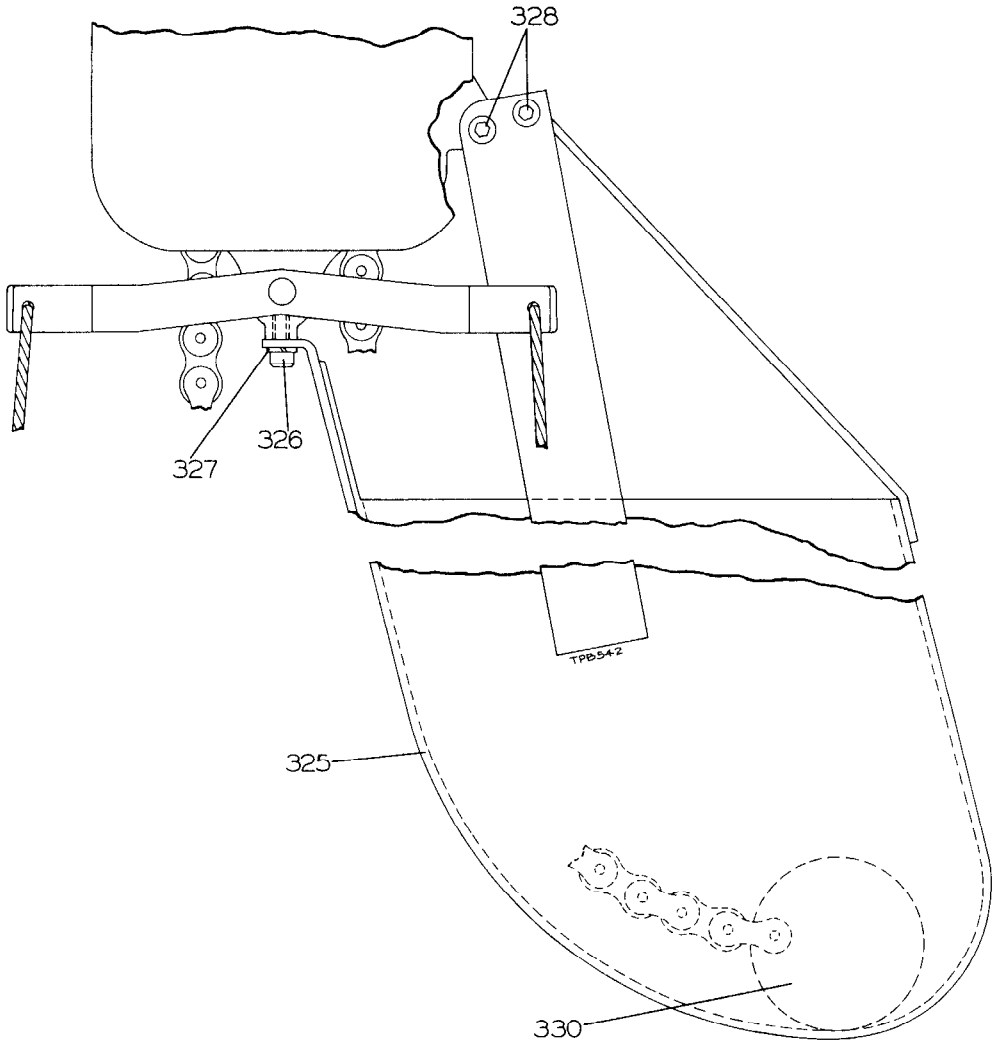
PART NUMBER FOR ORDERING

300	Pendent Throttle Handle Assembly	HWA10A-A269
301	Pendent Throttle Valve Assembly (2)	HWA10A-A264
302	Pendent Throttle Valve Face (1 for each Valve)	R000BR1C-283
303	Pendent Throttle Valve Spring (2)	R0H-51
304	Pendent Throttle Valve Cap (2)	R000A2-266
305	Pendent Throttle Lever (2)	HRA20A-273
306	Throttle Lever Pin	508-98
*	Handle Cover Screw (4)	R2FA-662
*	3/8" to 1/8" Reducing Bushing	HRA20A-82
308	Control Hose Assembly (consists of control hoses, hose nipples, hose clamps, handle cover, sheathing, etc.)	
	Standard Length (5 ft.)	HWA10A-A930
	Length as Specified	HWA10A-AL930
	Pendent Control Bracket Assembly	HWA10A-A274
309	Pendent Control Bracket	HWA10A-274
310	Control Bracket Screw (4)	G57T-634
311	Control Cylinder Nut (2)	B12-249
*	Bracket Screw Lock Washer (4)	8U-58
312	Pendent Control Cylinder Assembly (2)	HRA20A-A265
313	Control Cylinder Vent Plug (1 for each Cylinder)	HRA20A-276
314	Control Cylinder Elbow (2)	HRA20A-275

* Not illustrated.

NOTE: Two- and Three-Motor Pendent Throttle Handles are available. Contact your nearest Ingersoll-Rand Office.

CHAIN BUCKETS



PART NUMBER FOR ORDERING

325	Chain Bucket (Note:- Capacities are shown in feet of chain—not feet of lift. Double-line Hoists require a Chain Bucket with a capacity equal to twice the lift.)	
	for Series HRA	
	10 ft. standard; 10 ft. spark resistant	HRA20A-649-1
	20 ft. standard; 15 ft. spark resistant	HRA20A-649-2
	30 ft. standard; 25 ft. spark resistant	HRA20A-649-3
	60 ft. standard; 50 ft. spark resistant	HRA20A-649-4
	for Series HLA	
	10 ft.	HLA20A-749-1
	20 ft.	HLA20A-749-2
	30 ft.	HLA20A-749-3
	50 ft.	HLA20A-749-4
	80 ft.	HLA20A-749-5
326	Chain Bucket Cap Screw (2)	
	for Chain Housing with round mounting boss	G57T-634
	for Chain Housing with flat mounting boss	34U-667A
*	Flat Washer (4) (for Chain Housing with round mounting boss)	R3-94
327	Lock Washer (2)	10BM-67
328	Chain Bucket Bolt (1 for Series HLA; 1 for Series HRA)	D10-957A
*	Chain Bucket Bolt Nut (1 for Series HLA; 2 for Series HRA)	503-639
330	Stop Ring	
	for Series HLA	HRA20A-A259
	for Series HRA	HRA20A-1259

* Not illustrated.

Important: Before ordering any of the foregoing Chain Buckets or mounting parts, examine the Chain Housing (63) of the Hoist to see whether or not it has been drilled and tapped as shown in the illustration. If the Chain Housing is tapped, note whether the boss containing the tapped hole is flat or round.

Chain Housings that are already tapped and that have the flat mounting boss, as shown in the illustration, are of the latest construction.

If the Chain Housing is not drilled and tapped, press out the Control Shaft Bearings (65). Using a No. 7 (.201") drill, drill a hole on the center line through each boss from which the Bearings were removed. Tap each hole with a 1/4"-20 thd. tap, and press in new Control Shaft Bearings.

Note: Do not attempt to reuse the old Control Shaft Bearings. These are needle-type Bearings and are always damaged in the removal process.

On all Hoists with the round mounting boss, use No. G57T-634 Chain Bucket Cap Screw with two No. R3-94 Flat Washers located between the chain bucket bracket and the mounting boss.

On all Hoists with the flat mounting boss, mount the Chain Bucket as shown in the illustration.

After mounting the Chain Bucket on the Hoist, attach the proper Stop Ring (330) to the end of the Chain and drop it in the Bucket. When the maximum allowable Chain is payed from the Hoist, the Stop Ring contacts the Stop Lever and closes the throttle. Fastening the Stop Ring to the end of the Chain promotes more uniform gathering of the Chain in the Bucket.

DRAWBAR PARTS

These Parts are required for attaching a tractor drawbar to a trolley-mounted Hoist.

(Not illustrated)

	PART NUMBER FOR ORDERING
Drawbar Yoke	
for Series HRA20, HLA20, HRA30 and HLA30	HRA20A-607
for Series HRA40, HLA40, HRA60 and HLA60	HRA40A-607
Drawbar Yoke Pin	HRA20A-617
Yoke Pin Retainer	5UT-281
Drawbar Pin	C6H20A-793
Drawbar Pin Cotter (2)	D02-524

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