Form OMMMINER
Edition 1
November 1988

# OPERATION AND MAINTENANCE MANUAL
# for BEEBE

## MODEL MINER 36
## 3 TON (Single Line)
## 6 TON (Double Line)
## AIR CHAIN HOIST

FOR TOP PERFORMANCE AND MAXIMUM DURABILITY OF PARTS, OPERATE THIS HOIST AT 90 psig (6.2 bar/620 kPa) with 3/4" (19 mm) MINIMUM AIR SUPPLY HOSE.

## WARNING

Do not use this hoist for moving, lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this Hoist in accordance with American National Standards Institute Code (ANSI/ASME B30.16) and any other applicable codes and regulations.

Read all the enclosed instructions and warning labels before installing, operating or repairing this hoist.

Refer all Communication to the Nearest Ingersoll-Rand Material Handling Products Office or Distributor.

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INGERSOLL-RAND®
MATERIAL HANDLING PRODUCTS

## SAFETY SUMMARY

**WARNING:** Do not use this hoist for moving, lifting, supporting, or transporting people or lifting or supporting loads over people.

**WARNING:** The supporting structures and load-attaching devices used in conjunction with this hoist must provide an adequate safety factor to handle the rated load, plus the weight of the hoist. If in doubt, consult a qualified structural engineer.

The National Safety Council, Accident Prevention Manual for Industrial Operations, Eighth Edition and other recognized safety sources make a common point: Employees who work near cranes or assist in hooking on or arranging a load should be instructed to keep out from under the load. From a safety standpoint, one factor is paramount: conduct all lifting operations in such a manner that if there were an equipment failure, no personnel would be injured. This means keep out from under a raised load and keep out of the line of force of any load.

To the best of our knowledge, INGERSOLL-RAND Material Handling Products hoists are manufactured in accordance with the latest standards in effect at time of manufacture.

However, contrary to common belief, the Occupational Safety and Health Act of 1970, as we understand it, generally places the burden of compliance with the user, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are, rather, connected with the final installation: "It is the owner's responsibility and user's responsibility to determine the suitability of a product for any particular use. Check all applicable industry, trade association, federal, state and local regulations. Read all operating instructions and warnings before operation."

Rigging: It is the responsibility of the operator to exercise caution, use common sense and be familiar with proper rigging techniques. See ANSI/ASME B30.9 for rigging information, American National Standards Institute, 1430 Broadway, New York, NY 10018.

**NOTICE:** Using other than genuine INGERSOLL-RAND Material Handling Products parts will result in the void of warranty.

Hoist returned with opened, bent or twisted hooks, or without chain and hooks, will not be repaired or replaced under warranty.

## PARTS ORDERING INFORMATION

The use of replacement parts other than INGERSOLL-RAND Material Handling Products will invalidate the Company's warranty. For prompt service and genuine INGERSOLL-RAND Material Handling Products parts, provide your nearest Distributor with the following:

1. Complete model number and serial number as it appears on the nameplate. The model number is Miner 36.
2. Part number and part name as shown in manual.
3. Quantity required.

# IMPORTANT NOTICE

It is our policy to promote safe delivery of all orders.

This shipment has been thoroughly checked, packed and inspected before leaving our plant and receipt for it in good condition has been received from the carrier. Any loss or damage which occurs to this shipment while enroute is not due to any action or conduct of the manufacturer.

**VISIBLE LOSS OR DAMAGE**
If any of the goods called for on the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt.

**CONCEALED LOSS OR DAMAGE**
When a shipment has been delivered to you in apparent good condition, but upon opening the crate or container, loss or damage has taken place while in transit, notify the carrier's agent immediately.

**DAMAGE CLAIMS**
You must file claims for damage with the carrier. It is the transportation company's responsibility to reimburse you for repair or replacement of goods damaged in shipment. Claims for loss or damage in shipment must not be deducted from the Beebe invoice, nor should payment of Beebe invoice be withheld awaiting adjustment of such claims as the carrier guarantees safe delivery.

You may return products damaged in shipment to us for repair, which services will be for your account and form your basis for claim against the carrier.

# General Warranty

Beebe International, Inc. ("Manufacturer") extends the following warranty to the original purchaser ("Purchaser") of each new product ("Product") manufactured or sold by it.

(a) Manufacturer warrants Product to be free from defects in material and workmanship under normal use and service for a period of one year from Manufacturer's original sale.

(b) Manufacturer's liability and Purchaser's sole remedy under this warranty, and for any and all other claims arising out of the purchase and use of Product, including any alleged negligence on the part of Manufacturer, is limited to repair or replacement, at Manufacturer's option, of such defective Product or part thereof, provided that the defective Product or part thereof is returned to Manufacturer's factory or authorized service center, **transportation prepaid,** and that examination by Manufacturer discloses that the Product is defective under the terms of this warranty.

(c) Manufacturer does not warrant components of products provided by other manufacturers. However, to the extent possible, Manufacturer will pass along to Purchaser applicable warranties of such other manufacturers.

(d) This warranty is conditioned upon installation and use of Product in accordance with Manufacturer's operating instructions. This warranty is IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. **Manufacturer shall have no liability or obligation as to any Product which has been misused, altered or changed in any way, including without limitation use of a *"cheater" handle* for extra leverage on hoists or pullers, conversion of hand winches or hoists to power operations,* or use of any Product for lifting, lowering or moving persons.**

(e) MANUFACTURER SHALL IN NO EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES arising from the sale, delivery or use of Products.

Manufacturer neither assumes nor authorizes any person to assume for it any other liability or obligation in connection with sale and use of Products other than stated above. **Caution:** Purchaser and user are cautioned to examine specific, local or other regulations, including American National Standard Regulations, which may apply to a particular type of product before installing or putting to use.

***Except power rewinding pursuant to operating instructions***

**Please Note:** Units purchased without chain and/or hooks must have Beebe chain and hooks installed before the warranty is valid.

**BEEBE INTERNATIONAL, INC.**
2724 SIXTH AVENUE SOUTH, SEATTLE, WASHINGTON 98134
PHONE (206) 624-0466, TELEX: 328795, P.O. BOX 24046
TELEFAX: 206 447-0715

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**WARNING:** The supporting structures and load-attaching devices used in conjunction with this hoist must provide an adequate safety factor to handle the rated load, plus the weight of the hoist. If in doubt, consult a qualified structural engineer.

When attaching hook to rigging or load, make sure safety latch is engaged.

### Air Supply

Always use an air filter and lubricator with the hoist. Install the lubricator as close to the hoist inlet as practical. Operate the hoist at 57 to 90 psig (4 to 6.2 bar/400 to 620 kPa). Do not exceed 120 psig (8.2 bar/820 kPa). The diameter of the air supply hose and the filter and lubricator must be at least 3/4 in. (19 mm). When the air supply hose is connected to the hoist, drip about 10 drops of nondetergent SAE 10 or 20W oil into the hoist inlet port.

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# SAFETY INSTRUCTIONS
# WARNING -- READ THESE INSTRUCTIONS

1. Only allow qualified people (trained in safety and operation) to operate the hoist.
2. Only operate a hoist if you are physically fit.
3. When a "DO NOT OPERATE" sign is placed on the hoist controls, do not operate the hoist until the sign has been removed by designated personnel.
4. Before each shift, the operator should inspect the hoist for wear or damage.
5. Never use a hoist which inspection indicates is defective.
6. Periodically, inspect the hoist thoroughly and replace worn or damaged parts.
7. Lubricate the hoist regularly.
8. Do not use hoist if safety latch on a hook has been sprung or broken.
9. Check that the safety latches are engaged before using.
10. Never splice a hoist chain by inserting a bolt between links.
11. Only attach loads less than or equal to the rated capacity of the hoist. See warning labels attached to the hoist.
12. Never use the hoist chain as a sling.
13. Do not "side pull" or "yard."
14. Never operate a hoist with twisted, kinked, "capsized" or damaged load chain.
15. Do not force a chain or hook into place by hammering.
16. Never insert the point of the hook into a chain link.
17. Be certain the load is properly seated in the saddle of the hook.
18. Do not support the load on the tip of the hook.
19. Never run the load chain over a sharp edge. Use a sheave.
20. When using two hoists to move one load, select two hoists both having rated capacities equal to or more than the load. This provides adequate safety in the event of a sudden load shift or failure of one hoist.
21. Pay attention to the load at all times when operating the hoist.
22. Make sure all people are clear of the load path. Do not lift a load over people.
23. Never use the hoist for moving, lifting or lowering people, and never allow anyone to stand on a load.
24. Ease the slack out of the chain and sling when starting a move. Do not jerk the load.
25. Never leave an attached load unattended.
26. Never weld or cut a load attached to the hoist.
27. Never use the hoist chain as a welding electrode.
28. Do not operate hoist if chain jumping, excessive noise, jamming, overloading, or binding occurs.
29. Keep the load from hitting the load chain.
30. Always keep hands and clothing free from the controls.
31. Always rig the hoist properly and carefully.
32. Turn off, depressurize and disconnect the air lines before performing any maintenance.
33. Avoid collision or bumping of hoist.
34. After use, properly secure hoist and loads.

## OPERATION

The three most important aspects of hoist operation are: (1) Follow all safety instructions when operating hoist, (2) Allow only qualified people to operate a hoist and (3) Subject each hoist to a regular inspection and maintenance procedure.

### Hoist Movement

Lifting and lowering a load is controlled by the pendant. When the 6 ton hook block is being inhauled, the 3 ton hook is paying out and vise versa.

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## 4. Troubleshooting

| Troubles | Major causes | Troublesshooting |
|---|---|---|
| Motor does not operate. Slow rotation or no rotation of motor. | • Insufficient air pressure. | • Increase air pressure. |
| | • Supplied air volum is insufficient. | • Increase compressor output. |
| | • Inner diameter of piping is too small. | • Enlarge inner diameter. |
| | • Strainer in the adapter at air inlet port is clogged. | • Clean. |
| | • Silencer is clogged. | • Replace with new silencer. |
| | • Powder or dust in the motor. | • Clean motor and lubricate. Clean air filter and replace filter element. |
| | • Vane is enlarged because of wet atmosphere or long term of maintenance. | • Replace vane. Discharge drain water from air filter. Or clean and replace filter element. |
| | • Vane is burnt owing to the dry operation. | • Clean the motor and polish the vane and replace if required. Supply oil to lubricator or clean the lubricator. |
| | • Vane is worn or damaged. | • Replace the vane. |
| | • Main valve does not open. | • Tighten the connecting bolt on the respective part or disassemble and check. |
| | • Control lever is bent or damaged. | • Replace the control lever. |
| | • Brake does not open. | • Clean air circuit of the brake. Thereafter, perform leakage test. |
| | • Reduction gear: Wrong assembly or gear, bearing, etc. are worn or broken. | • Disassembly and check are required. Replace the worn or broken parts. |
| Brake does not work. | • Lining is worn. | • Replace with new brake disc. |
| | • Oil on the lining. | • Clean. Replace oil seal if required. |
| | • Air exhaust hole of the brake cover is clogged. | • Clean.( See the section "Inspection of Brake".) |
| | • Main valve does not return to the neutral position. | • Chekc the operation system, e.g., bending of control lever. Disassemble and inspect the valve housing if required. |

When hoist is malfunctioning, stop operation immediately and perform suitable troubleshooting.

Careless repair causes damage to the hoist. Therefore, be careful when repairing.

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# INSPECTION

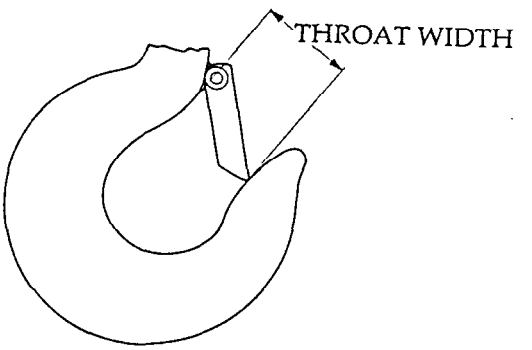
There are two types of inspection, the frequent inspection performed by the operator and periodic inspections performed by qualified personnel.

**Frequent Inspection**

On hoists in continuous service, frequent inspection should be made at the beginning of each shift. In addition, visual inspections should be conducted during regular service for any damage or evidence of malfunction.

1. OPERATION. Check for visual signs or abnormal noises which could indicate a defect. Make sure all controls function properly and return to neutral when released. Check chain feed through the hoist and bottom block. If chain binds, jumps, or is excessively noisy or "clicks," clean and lubricate the chain. If problem persists, replace the chain. Do not operate the hoist until all defects have been corrected.
2. UPPER AND LOWER LIMIT. Test operation at slow speed with empty hook. If the hook does not stop in its normal position for either upper or lower limit, adjust or repair.
3. PNEUMATIC SYSTEM. Check air lines, valves and other components for leakage. Repair if necessary.
4. HOOK. Check for wear or damage, increase throat width, bent shank or bending of hook. Replace hooks with 15% increase in throat width or 10% bend. If the hook latch snaps past the tip of the hook, the hook is sprung and must be replaced.

| Model No.: | Throat Width: in. | (mm) |
|---|---|---|
| Miner 36 (3 Ton Bottom) | 1.56 | 39.5 |
| Miner 36 (6 Ton Bottom) | 2.07 | 52.5 |
| Miner 36 (6 Ton Top) | 2.07 | 52.5 |




Check hook support bearings for lubrication and damage. Make sure they swivel easily and smoothly. Repair and lubricate as necessary.

5. HOOK LATCH. Make sure the hook latch is present and operating. Replace if necessary.
6. CHAIN. Examine each of the links for bending, cracks in weld areas or shoulders, transverse nicks and gouges, weld splatter, corrosion pits, striation -- minute parallel lines and chain wear, including bearing surfaces between chain links. Replace a chain that fails any of the inspections. Check chain lubrication and lubricate if necessary. See "Load Chain" under "LUBRICATION."

NOTE: Excessive wear or stretching may not be apparent from visual observation. Also, inspect chain by measuring five links in accordance with instructions under "Periodic Inspection."

NOTE: A worn load chain may cause the load sheave to wear rapidly. Inspect the load sheave and replace if damaged or worn.

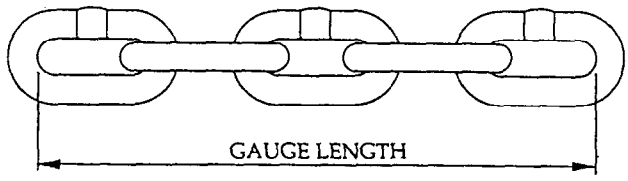
7. CHAIN REEVING. Ensure welds on standing links are away from load sheave. Reinstall chain if necessary. Make sure chain is not capsized, twisted or kinked. Adjust as required.
8. LUBRICATOR AND FILTER. If plastic bowls are used on the filter or lubricator, check for cracks, clouding or other damage. Replace if cracked or damaged.

## Periodic Inspection

According to ANSI/ASME B30.16-1987, frequency of periodic inspection depends on the severity of usage: NORMAL, yearly; HEAVY, semiannually; SEVERE, quarterly. Disassembly may be required for HEAVY or SEVERE usage. Keep accumulative written records of periodic inspections to provide a basis for continuing evaluation. Inspect all the items in a frequent inspection. Also inspect the following:

1. FASTENERS. Check rivets, cotter pins, cap screws and nuts on hook blocks and hoist body. Replace if missing and tighten if loose.
2. ALL COMPONENTS. Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts, bearings, sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
3. HOOK. Inspect hook for cracks using magnetic particle or other suitable method. Remove cover and inspect hook retaining nut and key or other hook retaining parts. Tighten or repair, if necessary.
4. CHAIN SHEAVES. Check for damage or excessive wear. Replace if necessary.
5. MOTORS. Check for satisfactory performance. If performance is poor, disassembly the components and check for worn vanes, gearing, bearings and shafts. The parts should be cleaned, lubricated and reassembled. Replace worn parts.
6. BRAKES. Ensure proper operation. 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 without excessive drift. If external inspection indicates the need, disassemble. Brake discs must be uniform and of sufficient thickness. Check friction surface of brake plates for wear, deformation or foreign deposits. Clean or replace if necessary.
7. SUPPORTING STRUCTURE. Check for distortion, wear and continued ability to support load.
8. TROLLEY. If a trolley is used, check that the trolley wheels track the beam properly and that clearance between wheels and beam is correct. Check trolley for smoothness of operation. Adjust or repair as necessary.
9. LABELS. Check for presence and legibility. Replace if necessary.
10. LOAD CHAIN END ANCHORS. Ensure both ends of load chain are securely attached. Secure if loose, repair if damaged, replace if missing. See "MAINTENANCE" for proper means of chain attachment.
11. LOAD CHAIN. Measure the chain for stretching by suspending a light load (50 to 100 pounds) from the hoist and measuring across five links sections all along the chain. When any five links in the working length reaches or exceeds the discard length, replace the entire chain. Always use a genuine INGERSOLL-RAND Material Handling Products replacement chain. For regular and nickle-diffused load chains:

| Model: No.: | Size: (mm) | Normal Length: in. | (mm) | Discard Length: in. | (mm) |
|---|---|---|---|---|---|
| Miner 36 | 13 | 7.087 | 180.0 | 7.228 | 183.6 |




12. CHAIN CONTAINER. Check for excessive wear. Replace if necessary.

# LUBRICATION

## Load Chain

WARNING: Failure to maintain clean and well lubricated load chain will void the manufacturer's warranty.

1. Lubricate load chain weekly, or more frequently, depending on severity of service.
2. In an corrosive environment, lubricate more frequently than normal.
3. Lubricate each link of the chain and apply new lubricant over existing layer.
4. Also lubricate hook and safety latch pivot points.
5. Use BEEBE Lubri-Link or a SAE 50 to 90W EP oil.
6. Clean chain to remove rust or abrasive dust build-up. After cleaning, lubricate the chain.

CAUTION: Do not use an acid-based solvent to clean the chain.

## Lubricator

Check fluid level daily, add nondetergent SAE 10 or 20W motor oil as necessary. Adjust lubricator drip rate to 19 to 26 drops per minute. To adjust the optional INGERSOLL-RAND lubricator, turn the adjustment screw on top of lubricator counterclockwise to increase drip rate, clockwise to decrease drip rate. Annually, disassemble and clean lubricator bowl of dirt and other foreign material. Blow out internal passages.

## Filter

Check filter with manual petcock daily and drain when necessary. Replace filter element when it becomes dirty or plugged. Annually, disassembly and clean filter bowl, also blow out filter element in reverse direction of normal air flow.

## Disassembly

1. Coat all motor parts with a light film of SAE 10 or 20W nondetergent motor oil before assembling.
2. Clean and lubricate with new grease the chain wheel bearing and hook thrust bearing on the bottom hook blocks.
3. Repack gear reducers and fill the space between the small internal gear and the housing with grease.
4. Clean the inner mechanism of the brake and lubricate with lithium safonified silicon grease, NLGI Class No. 2, like Molykote Grease 33.

## Recommended Lubricant Chart

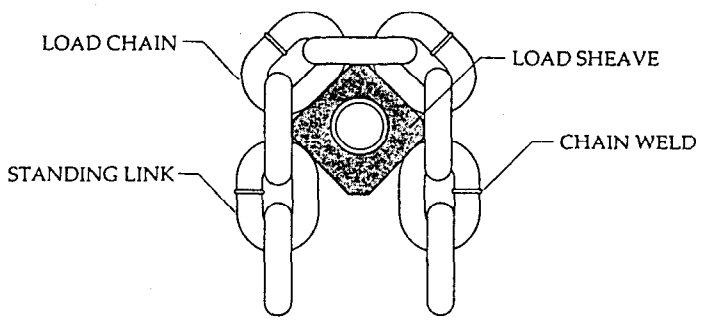
| Mfg.: | Air Motor: (Lubricator) | Gear Reducer: (Including Reducer Bearing) | Other Bearings: |
|---|---|---|---|
| Esso | Arox 22<br>Teresso 32 | Lithtan EP 0 | Beacon EP 2 |
| Mobil | Almo Oil No. 525 | Mobilux EP 0 | Mobilux EP 0 |
| Shell | Tellus Oil C32<br>Torcula Oil 32 | Alvania Grease EPR0 | Alvania Grease EP 2 |

## MAINTENANCE

**WARNING:** Never perform maintenance on the hoist while it is supporting a load.
**WARNING:** Before performing maintenance, tag controls: DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.
**WARNING:** Turn off, depressurize and disconnect the air lines before performing any maintenance.
**WARNING:** Only allow qualified service personnel to perform maintenance.
**WARNING:** Test hoist to 125% of its rated capacity before returning to service.

**Chain Replacement** (See Assembly Drawing for details of chain reeving)
**NOTE:** Do not remove the old chain from the hoist. Old chain is used to feed new chain through hoist.

1. Run 6 ton bottom block to six inches above the lowest point of travel and support.
2. Remove the 3 Ton hook.
3. Make a "C" link in NEW chain by grinding through one side of the end link. (If old chain was installed correctly, this assures that end link will be in correct alignment.)
4. Hook "C" link to old chain thus joining both chains. BE SURE WELDS of "standing" links on the new chain are facing away from the hoist load sheave.

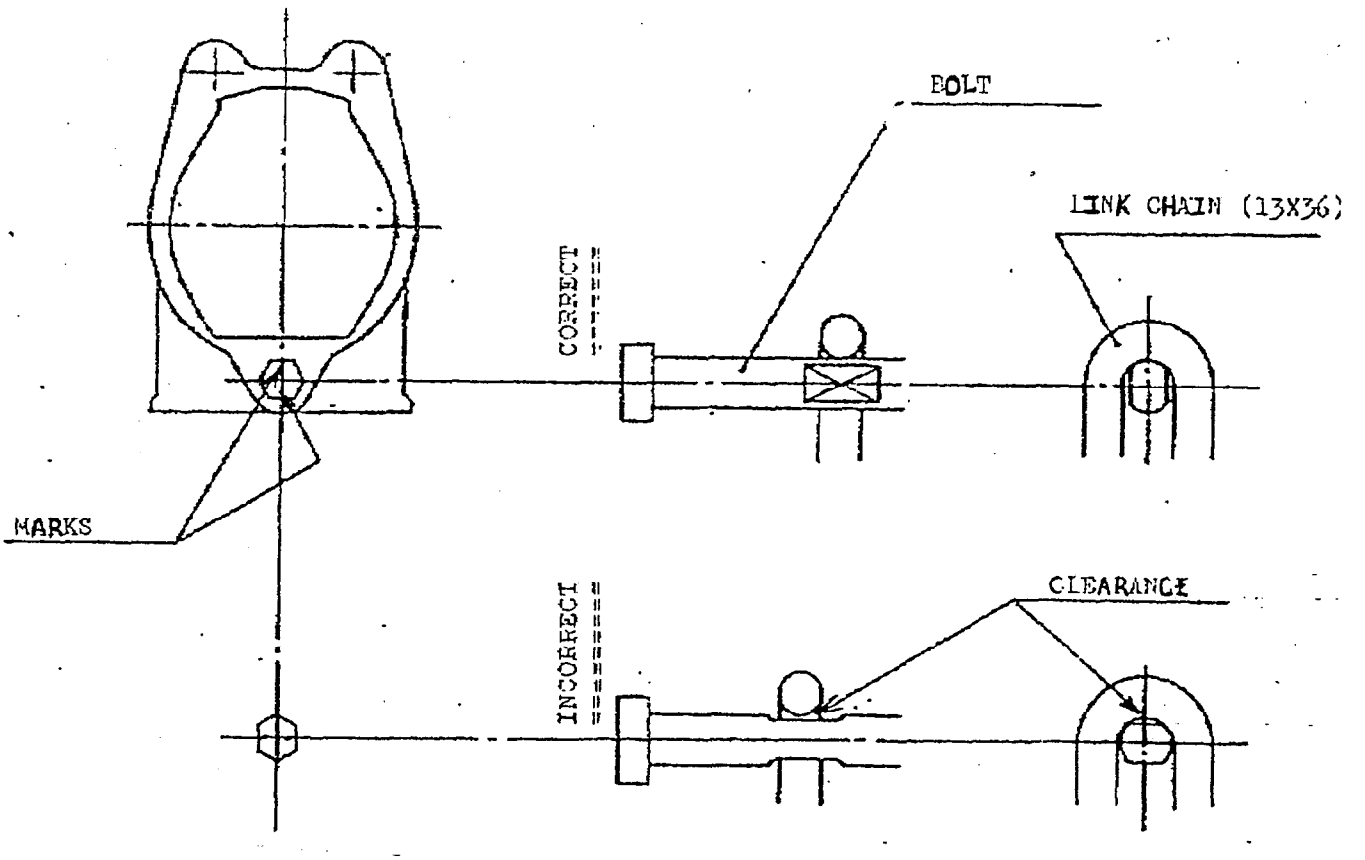



5. Check that first link of new chain is started such that it will correctly attach to chain anchor.
6. Carefully "jog" the down button for the 6 ton hook block until the new chain runs sufficiently out the other side (24 to 36 inches).
7. Manually pull new chain through 6 ton hook block using old chain.
8. Attach end of new chain to anchor bolt on hoist. See "Correct Installation of Anchor Bolt." Check that chain is not twisted, kinked, "capsized" or damaged. Remove one link to untwist, if required.
9. Attach 3 ton hook.

**Correct Installation of Anchor Bolt**

When attaching the end link of the load chain on the six ton side, position the anchor bolt so that the marks on the head of the bolt are perpendicular to the hoist body as shown in the figure.

If the bolt is installed with the marks horizontal or otherwise tilted from vertical, there will be a clearance between the bolt and the inside of the link chain and the end link may wear out prematurely.



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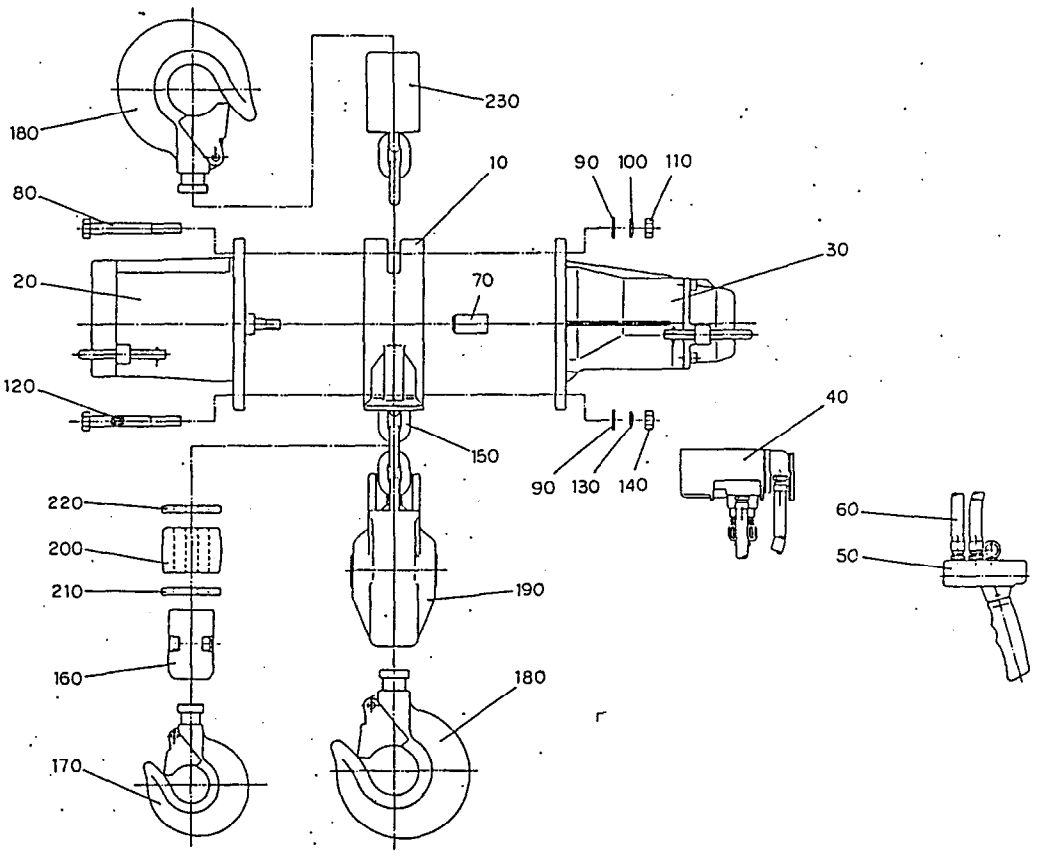
Main Assembly (Miner 36)

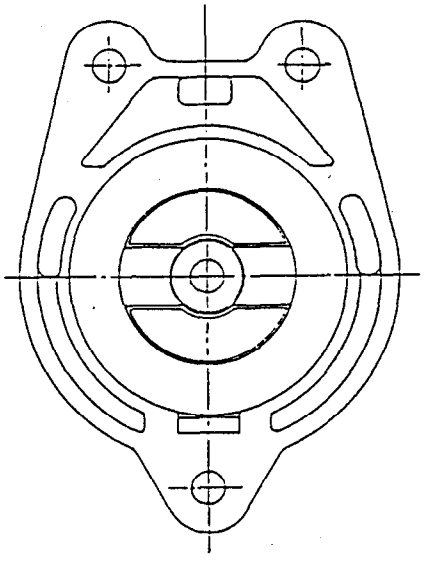
| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 10 | Mid Section | 1 | 5373442 |
| 20 | Gear Box | 1 | 5373443 |
| 30 | Motor | 1 | 5373444 |
| 40 | Control Valve | 1 | 5373445 |
| 50 | Push Button Valve | 1 | 5373446 |
| 60 | E-Type Control | 1 | 5373447 |
| 70 | Coupling | 1 | 5373371 |
| 80 | Hexhead Bolt | 2 | 5373524 |
| 90 | Plain Washer | 3 | 5373559 |
| 100 | C.D. Washer | 2 | 5373418 |
| 110 | Hex Nut | 2 | 5373415 |
| 120 | Bolt | 1 | 5373489 |
| 130 | C.D. Washer | 1 | 5373564 |
| 140 | Hex Nut | 1 | 5373558 |
| 150 | Link Chain (Specify length) | 1 | Contact Factory |
| 160 | Load Sheave | 1 | 5373448 |
| 170 | Hook 3 T | 1 | 5373545 |
| 180 | Hook 6 T | 2 | 5373525 |
| 190 | Bottom Block 6 T | 1 | 5373449 |
| 200 | Buffer | 1 | 5373529 |
| 210 | Buffer Disc | 1 | 5373490 |
| 220 | Buffer Disc | 1 | 5373469 |
| 230 | Suspension | 1 | 5373450 |

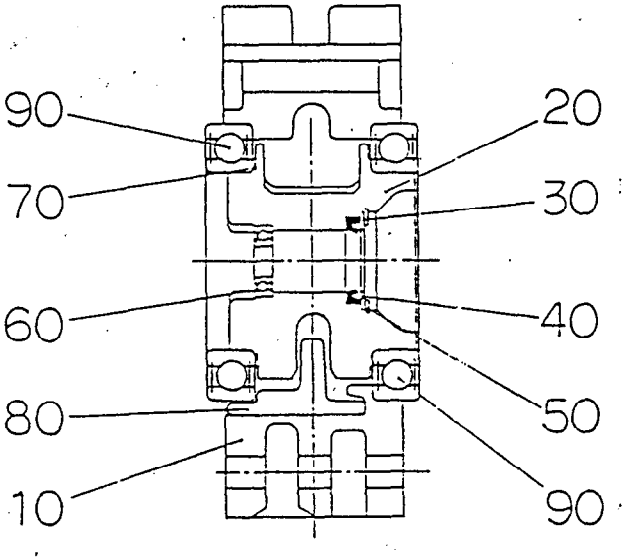


Mid Section (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 10 | Housing | 1 | 5373454 |
| | Chain Wheel Set (Includes Pc's 20,30,40 & 50) | 1 | 5373360 |
| 20 | Chain Wheel | 1 | Not Sold Separately |
| 30 | Rotary Shaft Seal | 1 | 5373547 |
| 40 | Washer | 1 | 5373548 |
| 50 | Retainer Ring, C-Type | 1 | 5373569 |
| 60 | Ball Bearing | 1 | 5373578 |
| 70 | O-Ring | 1 | 5373575 |
| 80 | Chain Guide | 1 | 5373470 |
| 90 | Ball Bearing | 2 | 5373581 |

Note: See main assembly parts list for part number for entire assembly.





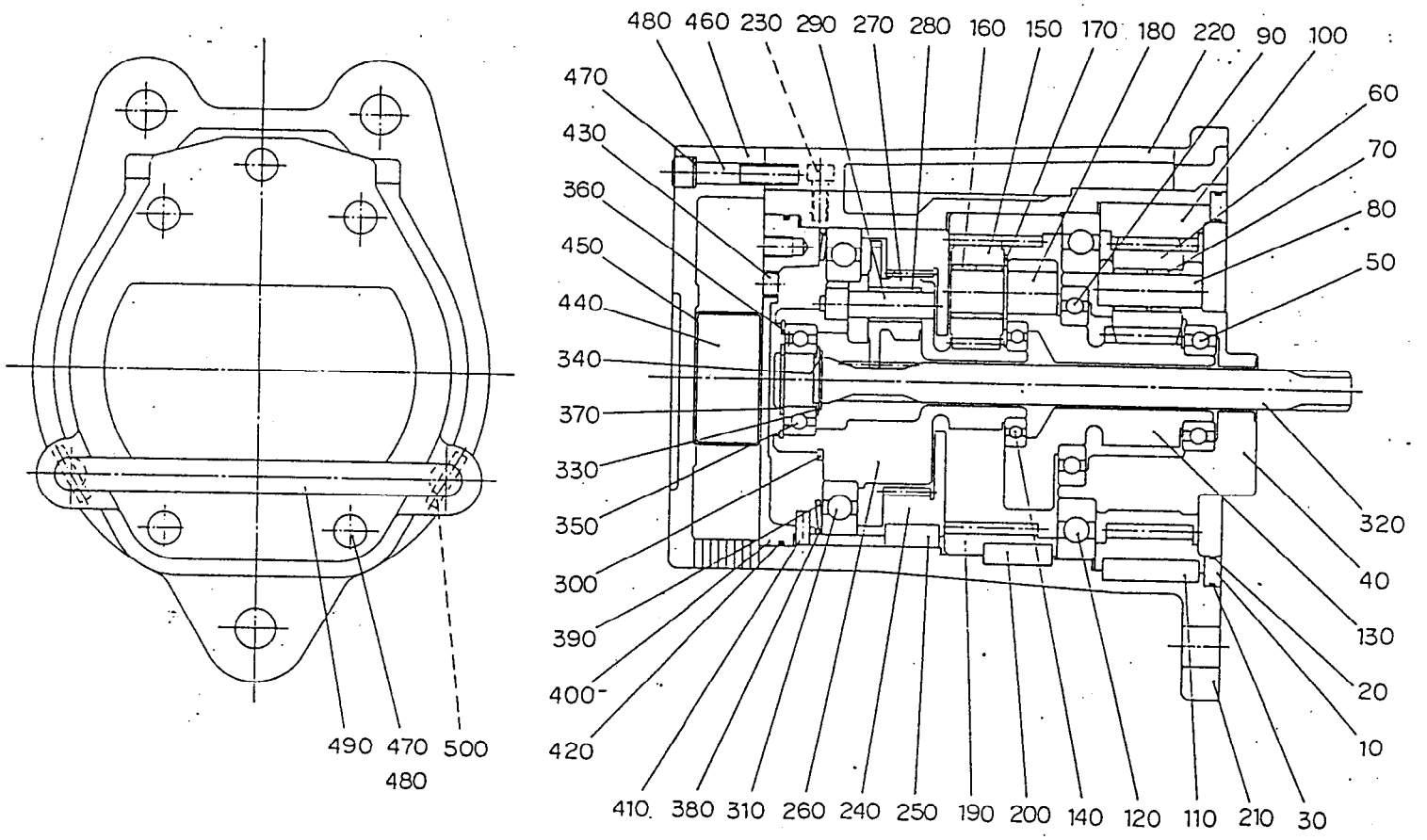
Gear Box (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 10 | Spacer | 1 | 5373549 |
| 20 | O-Ring | 1 | 5373576 |
| 30 | O-Ring | 1 | 5373577 |
| 40 | Planet Shaft | 1 | 5373313 |
| 50 | Ball Bearing | 1 | 5373580 |
| 60 | Gear Wheel | Set of 3 | 5373527 |
| 70 | Needle Cage | 6 | 5373455 |
| 80 | Shaft | 3 | 5373528 |
| 90 | Ball Bearing | 1 | 5373584 |
| 100 | Internal Gear | 1 | 5373550 |
| 110 | Key | 1 | 5373530 |
| 120 | Ball Bearing | 1 | 5373586 |
| 130 | Planet Shaft | 1 | 5373531 |
| 140 | Ball Bearing | 1 | 5373583 |
| 150 | Gear Wheel | Set of 2 | 5373532 |
| 160 | Needle Cage | 4 | 5373493 |
| 170 | Washer | 2 | 5373533 |
| 180 | Shaft | 2 | 5373534 |
| 190 | Internal Gear | 1 | 5373535 |
| 200 | Key | 1 | 5373536 |
| 210 | Gear Housing | 1 | 5373451 |
| 220 | Muffler | 1 | 5373457 |
| 230 | Cap Screw | 4 | 5373393 |
| 240 | Internal Gear | 1 | 5373537 |
| 250 | Key | 1 | 5373538 |
| 260 | Planet Shaft | 1 | 5373539 |
| 270 | Double Gear Wheel | Set of 2 | 5373540 |
| 280 | Needle Cage | 4 | 5373518 |
| 290 | Shaft | 2 | 5373541 |
| 300 | Retaining Ring, C-Type | 1 | 5373567 |
| 310 | Ball Bearing | 1 | 5373585 |
| 320 | Shaft | 1 | 5373462 |
| 330 | Spacer | 1 | 5373542 |
| 340 | Retainer Ring, C-Type | 1 | 5373565 |
| 350 | Ball Bearing | 1 | 5373579 |
| 360 | Retainer Ring, C-Type | 1 | 5373568 |
| 370 | Retainer Ring, C-Type | 1 | 5373566 |
| 380 | Ring | 1 | 5373495 |
| 390 | Coned Disc Spring | 1 | 5373543 |
| 400 | Spacer | 1 | 5373463 |
| 410 | Spring Pin | 1 | 5373423 |
| 420 | O-Ring | 1 | 5373437 |
| 430 | Plug | 1 | 5373588 |
| | Silencer Set (Includes Pc's 440 & 450) | 1 | 5373471 |
| 440 | Silencer | 4 | Not Sold Separately |
| 450 | Support | 2 | Not Sold Separately |
| 460 | Gear Box Cover | 1 | 5373456 |

Gear Box (Miner 36) (Cont.)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 470 | C.D. Washer | 5 | 5373561 |
| 480 | Cap Screw | 5 | 5373399 |
| 490 | Handle | 1 | 5373587 |
| 500 | Spring Pin | 2 | 5373424 |

Note: See main assembly parts list for part number for entire assembly.



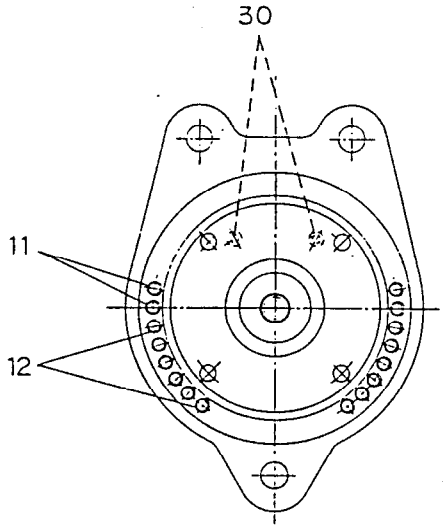
Motor (Miner 36)

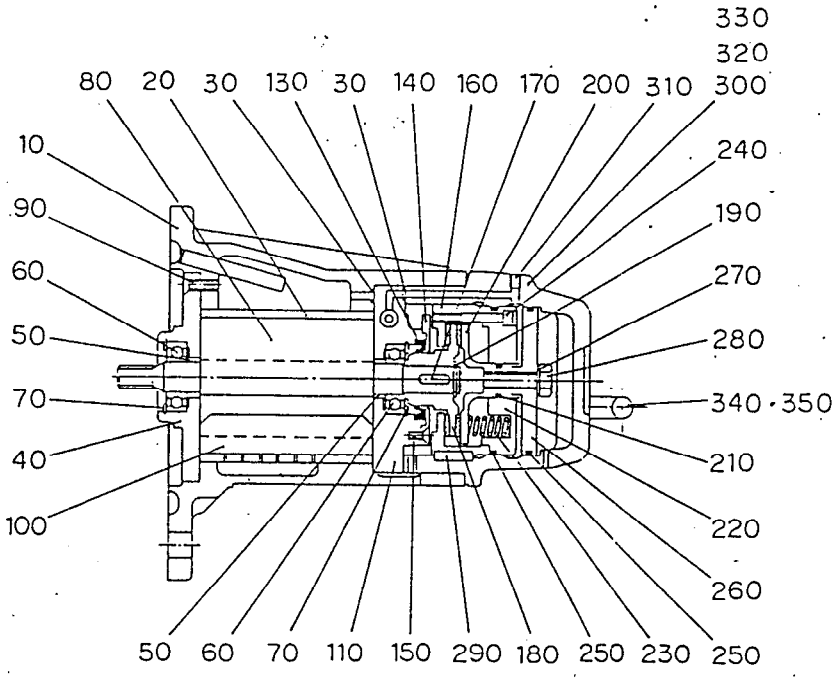
| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| | Motor Housing Complete (Including Pc's 10,11,12 & 20) | 1 | 5373464 |
| 10 | Motor Housing | 1 | Not Sold Separately |
| 11 | Pipe | 4 | Not Sold Separately |
| 12 | Pipe | 12 | Not Sold Separately |
| 20 | Cylinder | 1 | Not Sold Separately |
| 30 | O-Ring | 7 | 5373573 |
| | End Plate Set (Gear Side) (Includes Pc's 40,50,60 & 70) | 1 | 5373472 |
| 40 | End Plate | 1 | Not Sold Separately |
| 50 | Spacer | 1 | Not Sold Separately |
| 60 | Ball Bearing | 1 | 5373582 |
| 70 | Retainer Ring | 1 | 5373331 |
| 80 | Rotor | 1 | 5373465 |
| 90 | Countersunk Head Cap Screw | 1 | 5373407 |
| 100 | Vane | Set of 5 | 5373496 |
| | End Plate Set (Brake Side) (Include Pc's 110,50,60,70 ,111,112, 113 & 120) | 1 | 5373473 |
| 110 | End Plate | 1 | Not Sold Separately |
| 50 | Spacer | 1 | Not Sold Separately |
| 60 | Ball Bearing | 1 | 5373582 |
| 70 | Retainer Ring | 1 | 5373331 |
| | Shuttle Valve Set (Pc's 111,112 & 113) | 1 | 5373497 |
| 111 | Ball | 1 | Not Sold Separately |
| 112 | Plug | 1 | Not Sold Separately |
| 113 | Spring Pin | 1 | Not Sold Separately |
| 120 | Spring Pin | 1 | 5373425 |
| 130 | Rotary Shaft Seal | 1 | 5373498 |
| 140 | Cover | 1 | 5373474 |
| 150 | Countersunk Head Cap Screw | 3 | 5373410 |
| 160 | Brake Cylinder | 1 | 5373466 |
| 170 | Key | 1 | 5373499 |
| 180 | Brake Disc | 1 | 5373475 |
| 190 | Retainer Ring, C-Type | 1 | 5373419 |
| 200 | Pressure Plate | 1 | 5373476 |
| 210 | O-Ring | 1 | 5373428 |
| 220 | Cylinder Cover | 1 | 5373467 |
| 230 | Brake Spring | Set of 6 | 5373500 |
| 240 | Cap Screw | 3 | 5373392 |
| 250 | O-Ring | 2 | 5373501 |
| 260 | Brake Piston | 1 | 5373477 |
| 270 | C.D. Washer | 1 | 5373562 |
| 280 | Hex Head Bolt | 1 | 5373390 |
| 290 | Key | 1 | 5373502 |
| 300 | Brake Housing | 1 | 5373458 |
| 310 | Set Screw | 1 | 5373461 |

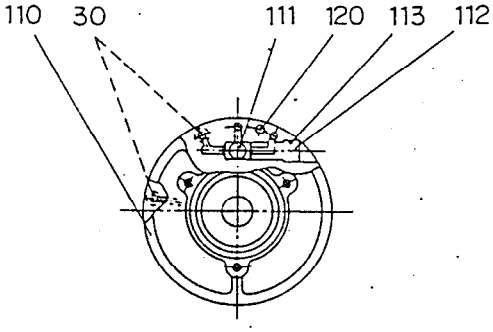
Motor (Miner 36) (Cont.)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 320 | C.D. Washer | 4 | 5373561 |
| 330 | Cap Screw | 4 | 5373554 |
| 340 | Handle | 1 | 5373587 |
| 350 | Spring Pin | 2 | 5373416 |

Note: See main assembly parts list for part number for entire assembly.



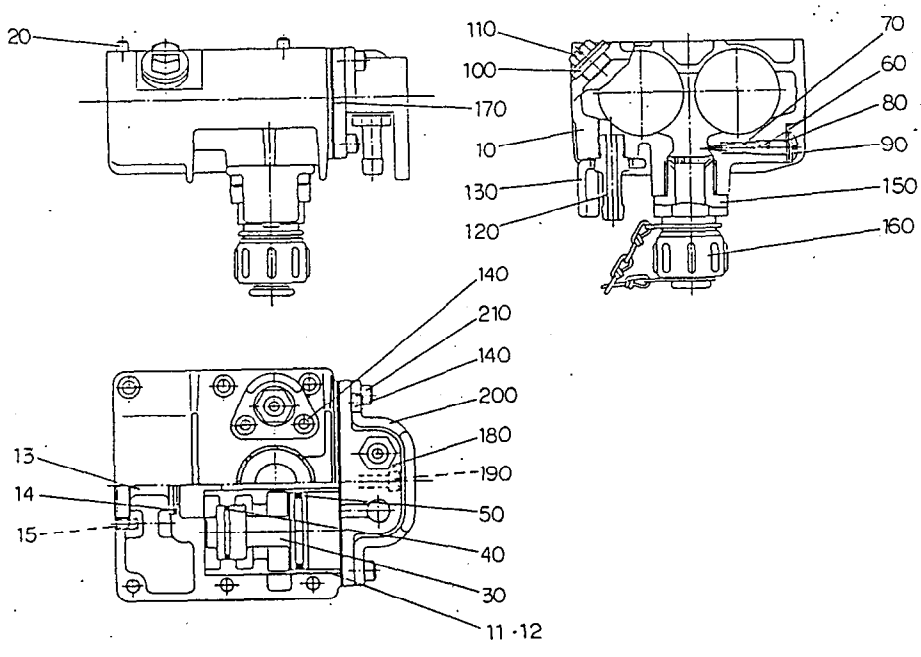



Control Valve (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| | Valve Housing Complete (Including Pc's 10,11,12,13,14 & 15) | 1 | 5373478 |
| 10 | Valve Housing | 1 | Not Sold Separately |
| 11 | Sleeve R | 1 | Not Sold Separately |
| 12 | Sleeve L | 1 | Not Sold Separately |
| 13 | Plug | 1 | Not Sold Separately |
| 14 | O-Ring | 1 | Not Sold Separately |
| 15 | Set Screw | 1 | Not Sold Separately |
| 20 | Spring Pin | 2 | 5373426 |
| 30 | Valve Cone | 2 | 5373479 |
| 40 | O-Ring | 2 | 5373503 |
| 50 | O-Ring | 2 | 5373430 |
| 60 | Needle Valve | 1 | 5373480 |
| 70 | O-Ring | 1 | 5373431 |
| 80 | Packing | 1 | 5373504 |
| 90 | Plug | 1 | 5373505 |
| 100 | Packing | 2 | 5373506 |
| 110 | Plug | 2 | 5373507 |
| 120 | Hose Nippler | 3 | 5373589 |
| 130 | Protection Shield | 4 | 5373481 |
| 140 | Cap Screw | 1 | 5373395 |
| 150 | Nipple | 1 | Not Sold Separately |
| 160 | Cap | 1 | Not Sold Separately |
| 170 | Gasket | 1 | 5373482 |
| 180 | Valve Flange | 1 | 5373468 |
| 190 | Cap Screw | 1 | 5373553 |
| 200 | Protection Shield | 1 | 5373483 |
| 210 | Cap Screw | 2 | 5373552 |

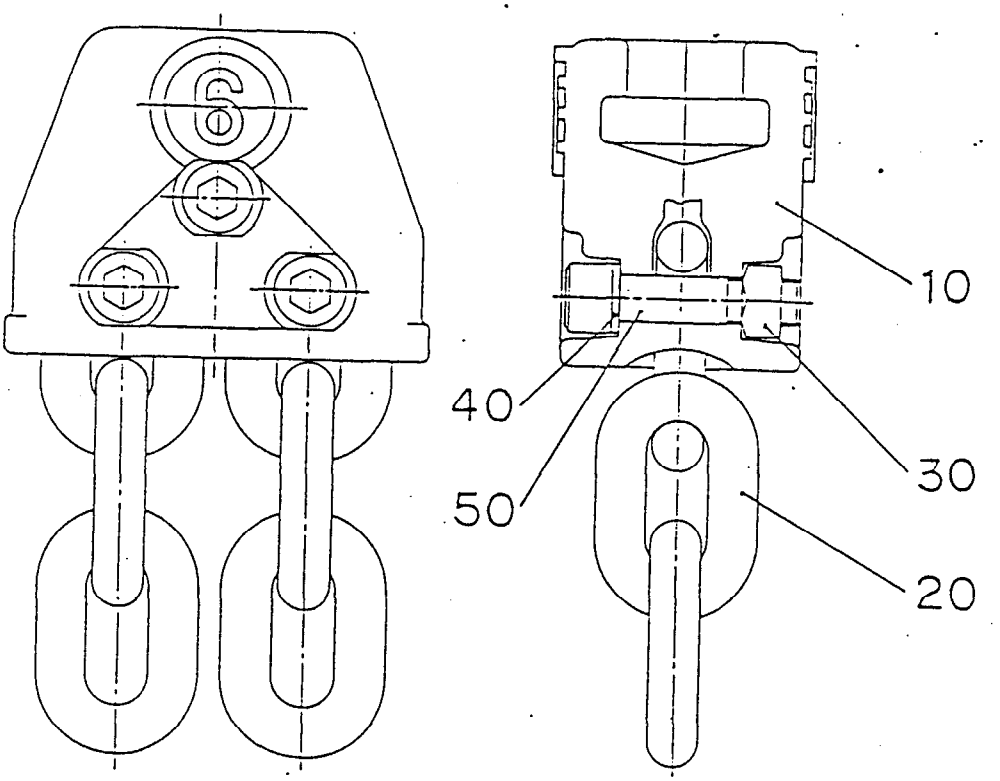
Note: See main assembly parts list for part number for entire assembly.



Suspension (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 10 | Susp. Hook Holder Half | 2 | 5373460 |
| 20 | Chain Piece | 2 | Not Sold Separately |
| 30 | Hex Nut | 3 | 5373557 |
| 40 | C.D. Washer | 3 | 5373563 |
| 50 | Cap Screw | 3 | 5373523 |

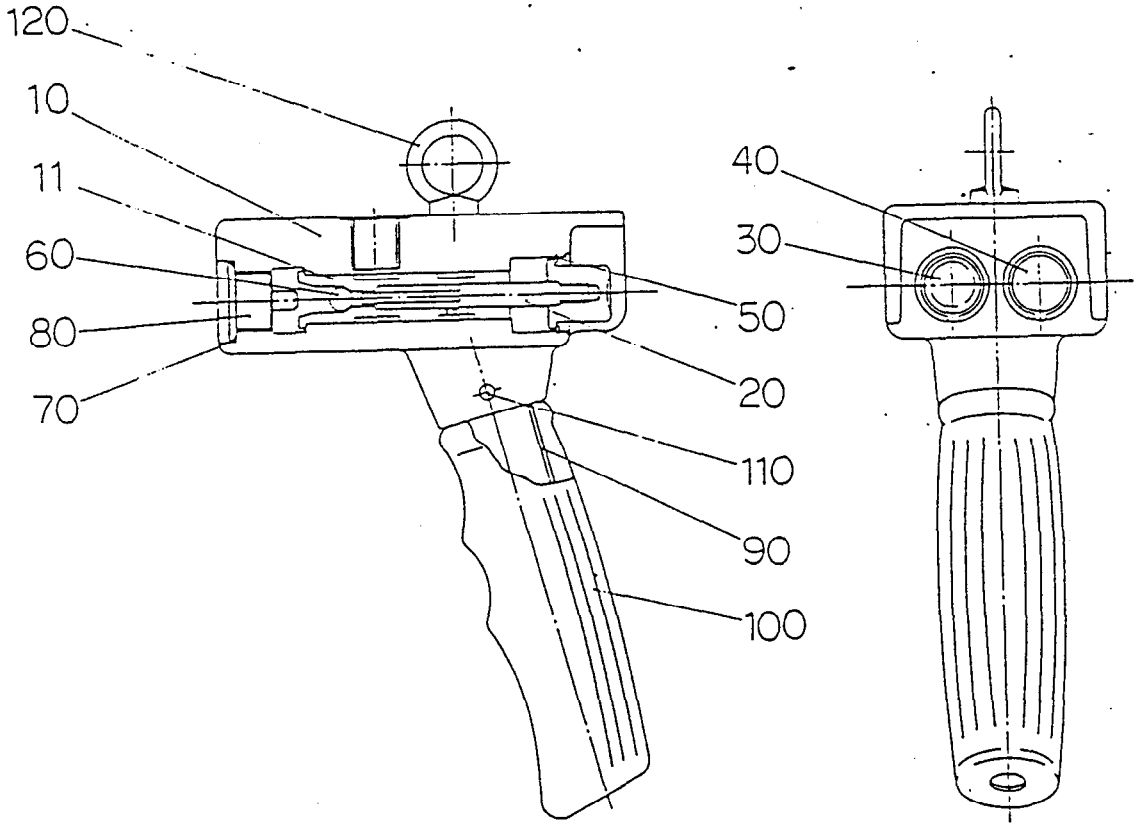
Note: See main assembly parts list for part number for entire assembly.



Pushbutton Valve (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| | Valve Housing Complete (Includes Pc's 10 & 11) | 1 | 5373508 |
| 10 | Valve Housing | 1 | Not Sold Separately |
| 11 | Liner | 2 | Not Sold Separately |
| 20 | Valve Pin | 2 | 5373509 |
| 30 | Push Button, Concave | 1 | 5373510 |
| 40 | Push Button, Convex | 1 | 5373511 |
| 50 | Retainer Ring | 2 | 5373512 |
| 60 | Ball | 2 | 5373513 |
| 70 | O-Ring | 1 | 5373432 |
| 80 | Plug | 1 | 5373514 |
| 90 | Handle | 1 | 5373515 |
| 100 | Grip | 1 | 5373516 |
| 110 | Spring Pin | 1 | 5373422 |
| 120 | Eyebolt | 1 | 5373517 |

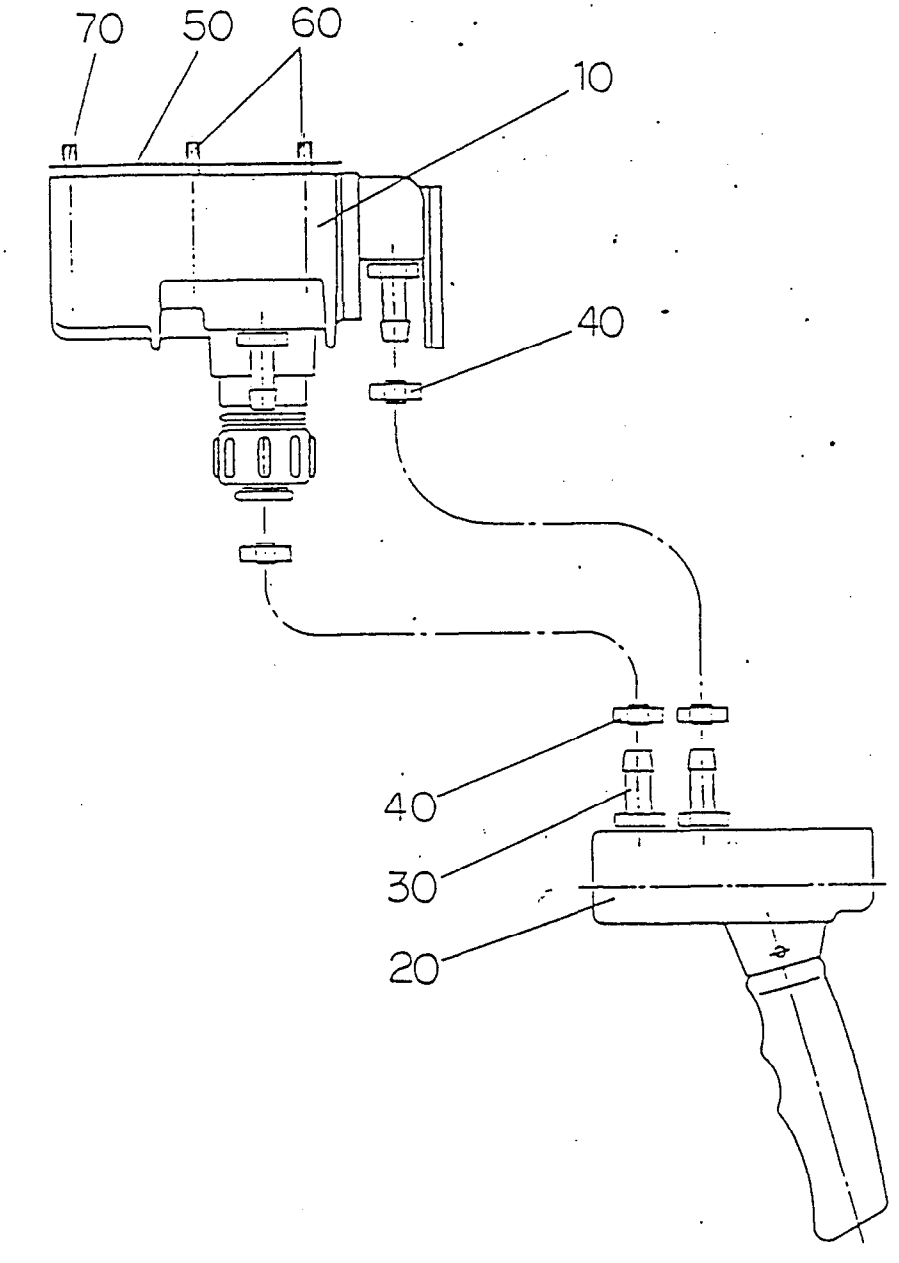
Note: See main assembly parts list for part number for entire assembly.



E-Type Control (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 10 | Control Valve | 1 | 5373440 |
| 20 | Push Button Valve | 1 | 5373441 |
| 30 | Hose Nipple | 3 | 5373589 |
| 40 | Hose Clip | 6 | Not Sold Separately |
| 50 | Gasket | 1 | 5373484 |
| 60 | Cap Screw | 4 | 5373397 |
| 70 | Cap Screw | 2 | 5373522 |

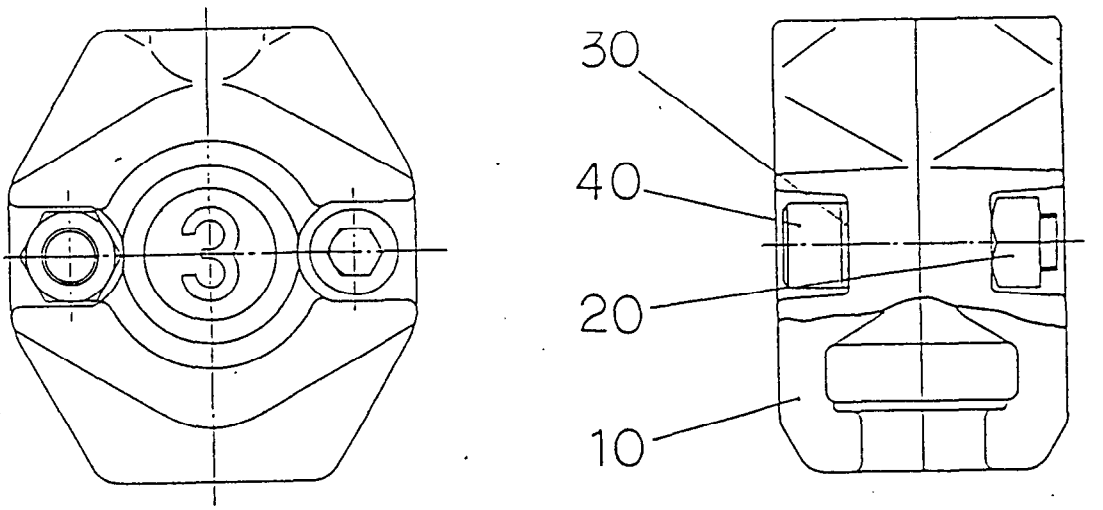
Note: See main assembly parts list for part number for entire assembly.



Load Sleeve (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 10 | Hook Holder Half | 2 | 5373459 |
| 20 | Hex Nut | 2 | 5373557 |
| 30 | C.D. Washer | 2 | 5373563 |
| 40 | Cap Screw | 2 | 5373404 |

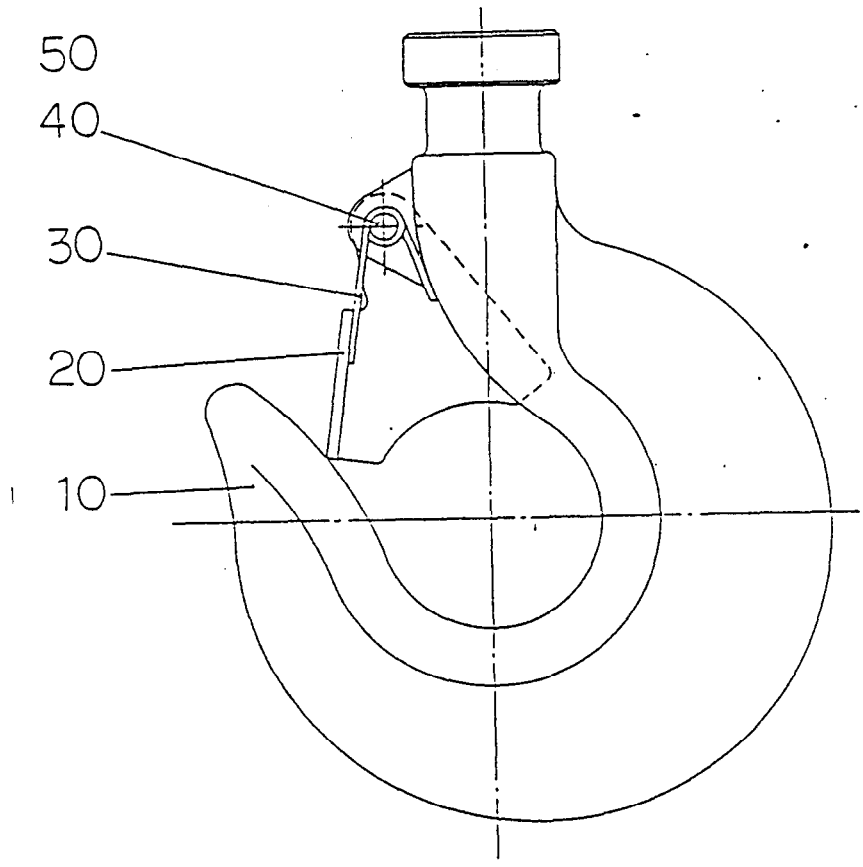
Note: See main assembly parts list for part number for entire assembly.



Hook (Miner 36)

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. | |
|---|---|---|---|---|
| | | | 3 TON | 6 TON |
| 10 | Hook | 1 | Not Sold Separately | Not Sold Separately |
| | Hook Latch Set | 1 | 5373546 | 5373526 |
| 20 | Hook Latch | 1 | Not Sold Separately | Not Sold Separately |
| 30 | Hook Spring | 1 | Not Sold Separately | Not Sold Separately |
| 40 | Hook Pin | 1 | Not Sold Separately | Not Sold Separately |
| 50 | Screw | 2 | Not Sold Separately | Not Sold Separately |

Note: See main assembly parts list for part number for entire assembly.



6 Ton, Bottom Block

| ITEM NO. | DESCRIPTION OF PART | QTY TOTAL | PART NO. |
|---|---|---|---|
| 10 | Hook Case Half | 2 | 5373452 |
| 20 | Ball Bearing | 2 | 5373590 |
| 30 | Chain Wheel | 1 | 5373551 |
| 40 | Hex Nut | 3 | 5373557 |
| 50 | C.D. Washer | 3 | 5373563 |
| 60 | Cap Screw | 3 | 5373556 |

Note: See main assembly parts list for part number for entire assembly.