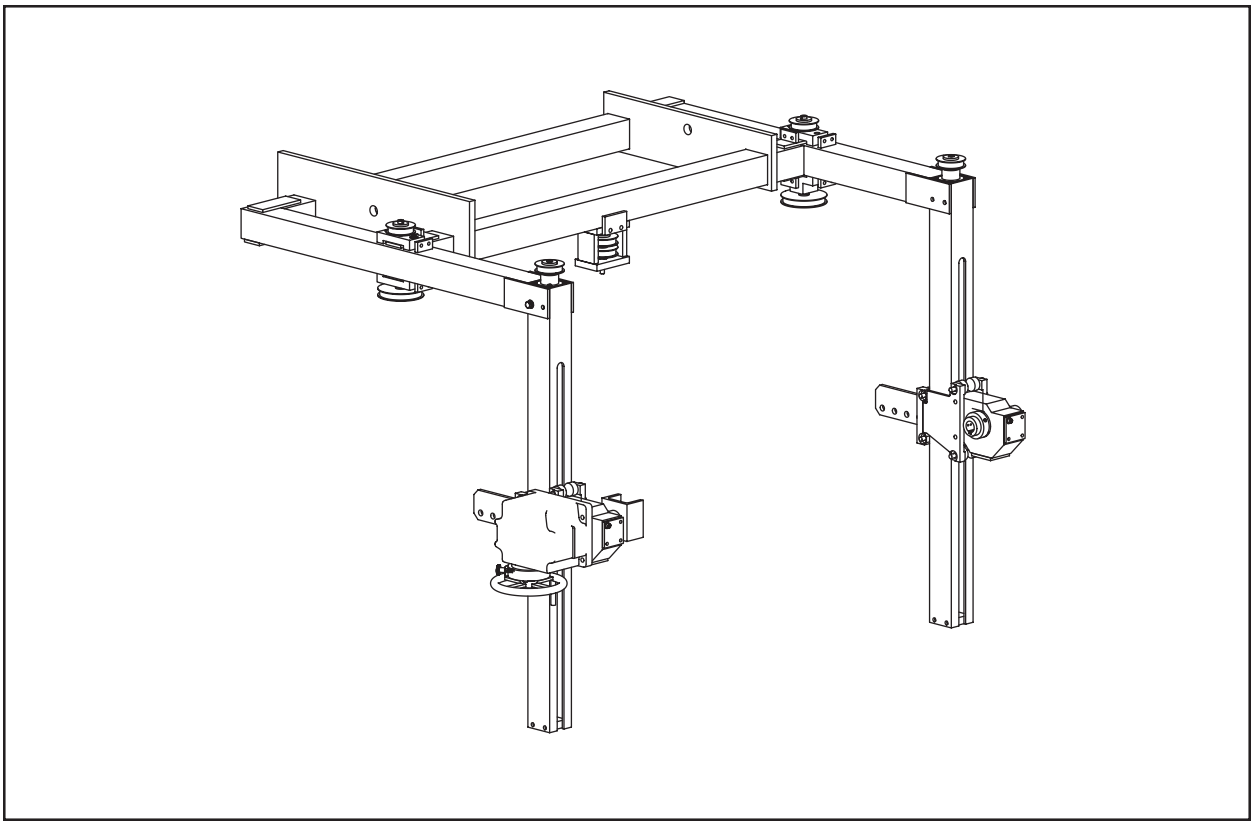
**92-1058 Orig. 021204**
**Model 230B Lifting Frame**



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# SAFETY PRECAUTIONS

## IN GENERAL

When using rotating head cutting equipment, basic safety precautions should always be followed to reduce the risk of personal injury.

Operate this tool only in accordance with specific operating instructions.

| | |
|---|---|
| **WARNING:** | Do not override the deadman switch on the power unit. Locking down, obstructing, or in any way defeating the deadman switch on the power drive unit may result in serious injury. |

## DRESS CONSIDERATIONS

Use standard safety equipment. Hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices should always be used when appropriate.

Use safety glasses. Do not operate cutting tools without eye protection.

Dress properly. Do not wear loose clothing or jewelry. They can be caught in rotating and moving parts. Avoid slippery floors or wear nonskid footwear. If you have long hair, wear protective hair covering to contain it.

## WORK AREA

Keep the work area clean. Cluttered work areas and benches invite injuries.

Consider the work area environment. Keep the area well lit. Keep electrical cords, cables, rags, rigging straps, and etc. clear of rotating equipment. Do not use power-cutting tools in the presence of flammable liquids and gasses.

Keep visitors away. Do not let visitors or untrained personnel at or near operating tools. Enforce eye protection requirements for all observers.

Do not over reach. Keep proper footing at all times.

Stay alert. Watch what you are doing. Use common sense. Do not operate tools when you are tired.

## TOOL CARE

Maintain tools with care. Keep tools in good operating condition. Sharp tool bits perform better and safer than dull tool bits. Well maintained tools function properly when needed.

Check for damaged parts. If a tool has malfunctioned, been dropped or hit, it must be checked for damage. Run no-load tests and feed function checks. Do a complete visual inspection.

Electric motors. Use only with proper AC voltage power sources and observe all normal electric shock hazard procedures.

Do not abuse power and control cords. Pulling or running over cords and cables can result in electrical shock hazards and malfunctions. Keep control and power cords out of all cutting fluids and water.

Hydraulic drives. Observe proper procedures for electrically driven power sources. Avoid damage to hydraulic lines. Keep quick-disconnects clean. Grit contamination causes malfunctions.

Air tools. Check the exhaust muffler. Broken or damaged mufflers can restrict air flow or cause excessive noise. Use air motors only with a filtered, lubricated and regulated air supply. Dirty air, low-pressure air or over pressure air will cause malfunctions, including delayed starting.

## AREA EQUIPMENT

Secure work. Whenever possible use clamps, vises, chains and straps to secure pipe.

Make sure the tool is secured; it is safer to have both hands free to operate the tool.

## TOOL USE

Us the right tool and tool bit for the job. Do not use a tool, which is incorrect for the job you are doing.

Keep the tool bits fully engaged in the tool bit holders. Loose bits are a safety hazard.

Disconnect power supply during setup and maintenance. Use all 'Stop' or Shut off' features available when changing or adjusting tool bits, maintaining the tool, or when the tool is not in use.

Remove adjusting keys and wrenches before applying power to the equipment. Develop a habit of checking the tool before turning it on to make sure that all keys and wrenches have been removed.

Do not force tools. Tools and tool bits function better and safer when used at the feed and speed rate for which they were designed.

Do not reach into rotating equipment. Do not reach into the rotating head stock to clear chips, to make adjustments, or to check surface finish. A machine designed to cut steel will not stop for a hand or an arm.

Handle chips with care. Chips have very sharp edges and are hot. Do not try to pull chips apart with are hands; they are very tough.

Avoid unintentional starts. Do not carry or handle tools with your hand on the operating switches or levers. Do not lay the tool down in a manner that will start the drive. Do not allow the tool to flip around or move when adjusting or changing tool bits.

Store idle tools properly. Disconnect tools from the power source and store in a safe place. Remove tool bits for safe handling of the tool.

# GENERAL DESCRIPTION

This lifting device attaches to the crane in the welding station of the J-lay tower on the Heerema vessel Balder. The lifting device enables either the pipe cut-off clamshell tool or the end preparation tool (230B) to be easily lifted and positioned on the pipe in the tower. The lifting motion is powered by a hand-held drive that has on/off and up/down control. This device attaches to the crane in a way that keeps the orientation of the vertical positioners always aligned with the crane and thus the axis of pipe. The lifting device is attached to the crane by pinning to two of the padeyes on the bottom of the crane. The pipe cut-off clamshell tool is attached to the lifting device with two slings. These slings attach to two lifting rings on the clamshell tool and to plates with four attachment holes on the vertical positioners. The end preparation tool attaches to the lifting device with two pillow blocks. The orientation of the end preparation tool is adjustable to allow operation on the pipe end coming through either the floor or the ceiling of the welding station. This lifting device is made up of three major assemblies, the crane attachment assembly, the yoke assembly, and the vertical positioner assembly.

## Crane Attachment Assembly

The crane attachment assembly secures the lifting device to the crane and maintains the device in alignment with the crane. As the crane stays in alignment with the pipe, the lifting device and end preparation tool will also be in alignment with the pipe. Pins are used to secure the two end plates of the crane attachment assembly to padeyes on the crane. Structural members connect the two end plates creating a secure foundation for the lifting device. The top surface of the forward end plate is in close proximity to the bottom surface of the crane. This keeps the assembly aligned with the crane as the J-lay tower angle is changed.

## Yoke Assembly

The yoke assembly provides the structural connection between the vertical positioner and the crane attachment assembly. This assembly is sized to allow the lifting device to accommodate either the pipe cut-off tool or the end preparation tool. This assembly also contains the power transmission components that connect the vertical position to the vertical positioner drive.

## Vertical Positioner

The vertical positioner consists of two components each of which contains an acme screw and the associated nuts, bearings, and power transmission hardware to securely lift and position either the pipe cut-off clamshell or the end preparation tool. A series of holes allow adjustment in attaching the slings to the pipe cut-off clamshell. Spring-centering pillow blocks provide a compliant attachment of the end preparation tool to the vertical positioner, allowing the tool to be easily aligned with the axis of the pipe. A worm gear driven mechanism is used to provide control of the orientation of the end preparation tool for use on pipes coming through either the ceiling or the floor.

# SPECIFICATIONS

| | |
|---|---|
| Lifting Capacity: | 1600 lbs |
| Range of Motion: | 42" |
| Unloaded Speed of Travel: | |
| High Speed (No Load): | 50 in/min |
| Low Speed (No Load): | 13 in/min |
| Crane Attachment Hole Size: | 1.38" DIA |
| Distance Between Crane Attachment Holes: | 57" |
| Clamshell Attachment Hole Size: | .78" DIA |
| Motor Power Requirements: | 120 VAC, 60 Hz, 16.3 A maximum |

# MAINTENANCE

## Cleaning

The lifting screw surfaces should be inspected periodically for contamination from metal chips and debris. Any contamination should be removed immediately to prevent damage to the screw and nut.

## Lubrication

The lifting screw must always be kept well lubricated with a quality EP grease such as Chevron Ultra Duty Grease EP, NLGI 2. The gearbox of the 230B rotator mechanism must be maintained full of Mobil SHC 634 Bearing and Gear Oil, ISO VG 460, or equivalent.

## Belt Tension

Belt tension should be checked periodically and adjusted as needed to maintain about a 1/2" belt deflection when 10 pounds of force is applied mid-way between the pulleys. When adjusting the belt tension it is important to adjust both the upper and lower tensioning bolts equally to keep the pulley shaft perpendicular to the frame.

# INSTALLATION

Attach the lifting device to the overhead crane using the two 1.38 inch diameter holes in the frame of the lifting device.

230B attachment: Remove the two adjustable length square tubes from the frame of the 230B. Insert the 2 inch diameter pins welded to each of the square tubes in to the two sleeves in the lifting device pillow blocks. One of the square tubes will engage the yolk attached to the rotator mechanism. Lift the 230B and install the frame over the two adjustable length square tubes. Position the 230B so that its center-of-gravity is at the 2 inch diameter pins in the pillow block sleeves. Install the pins that secure the square tubes to the 230B frame.

Clamshell attachment: The clamshell is attached to the lifting device carriage using short slings and shackles. These connect between the lifting eyes on the clamshell and the holes in the 11.5 x 4 x ½ inch thick plates on the lifting device carriage.

# OPERATION

A two-speed, reversible, hand-held drill motor is used power the lifting device. Attached to the drill motor is a 3’ extension with a 1/2" deep-socket. This assembly is held by the operator, who uses the on/off trigger switch, forward/reverse switch, and low/high-speed switch to control the motion of the lifting device. A hand crank is attached to the rotator mechanism to enable changing the orientation of the 230B. A swing-energized locking pin holds the hand crank in position. The pin must be manually pulled out to disengage the lock, allowing the hand crank to be turned. CAUTION: The locking pin must be engaged whenever the hand crank is not in use to prevent uncontrolled rotation of the 230B.

To perform a lifting or lowering operation, the operator sets the drill motor to the desired speed and direction and engages the 1/2" socket over the 1/2" hex protruding from the bottom of the center pulley assembly. The drill motor is then energized, causing the pulleys and timing belts to rotate the two acme screws, resulting in lifting carriage motion. CAUTION: The lifting carriage should not be allowed to run to its hard-stops at either end of its travel. Carriage motion should be stopped once it reaches the area marked with caution tape.

# TROUBLE SHOOTING

**Problem: The Tool Bit Chatters**

The tool bit is loose or overextended.
The tool bit is damaged.
The tool holder is too loose in the slides.
The cutting speed is too fast.
The clamping pads are loose on the pipe or tube.
Cutting fluid is required.
The main bearing pre-load is loose.

**Problem: There is excessive Tool Bit wear**

The pipe or tube material is too hard or abrasive.
The cutting speed is too fast.
Cutting fluid is required.
A dull Tool Bit is causing surface hardening conditions (Stainless pipe or tubing).
There is scale or other foreign matter on the pipe or tube, which is dulling the tool bit at the start of the cut.
The tool bit is incorrect for the material being cut.

**Problem: The surface finish is rough**

The tool bit is dull, chipped, etc.
Metal build-up on the cutting edge of the tool bit is creating a false cutting edge.
Cutting fluid is required.

**Problem: The tool holder is not feeding**

The feed pin is broken or out of position.
The feed sprocket shear pin is broken.
The feed screw is stripped.
The feed nut is stripped.
The slide rails are too tight.

**Problem: There is a loss of air power**

The air supply pressure is too low.
The air filter is plugged.
The air line size is insufficient.
The air line is too long.

**Problem: There is a loss of hydraulic power**

The hydraulic supply pressure is too low.
The hydraulic filter is plugged.
The hydraulic line size is insufficient.
The hydraulic line is too long.

**Problem: The tool bit will not reach the work**

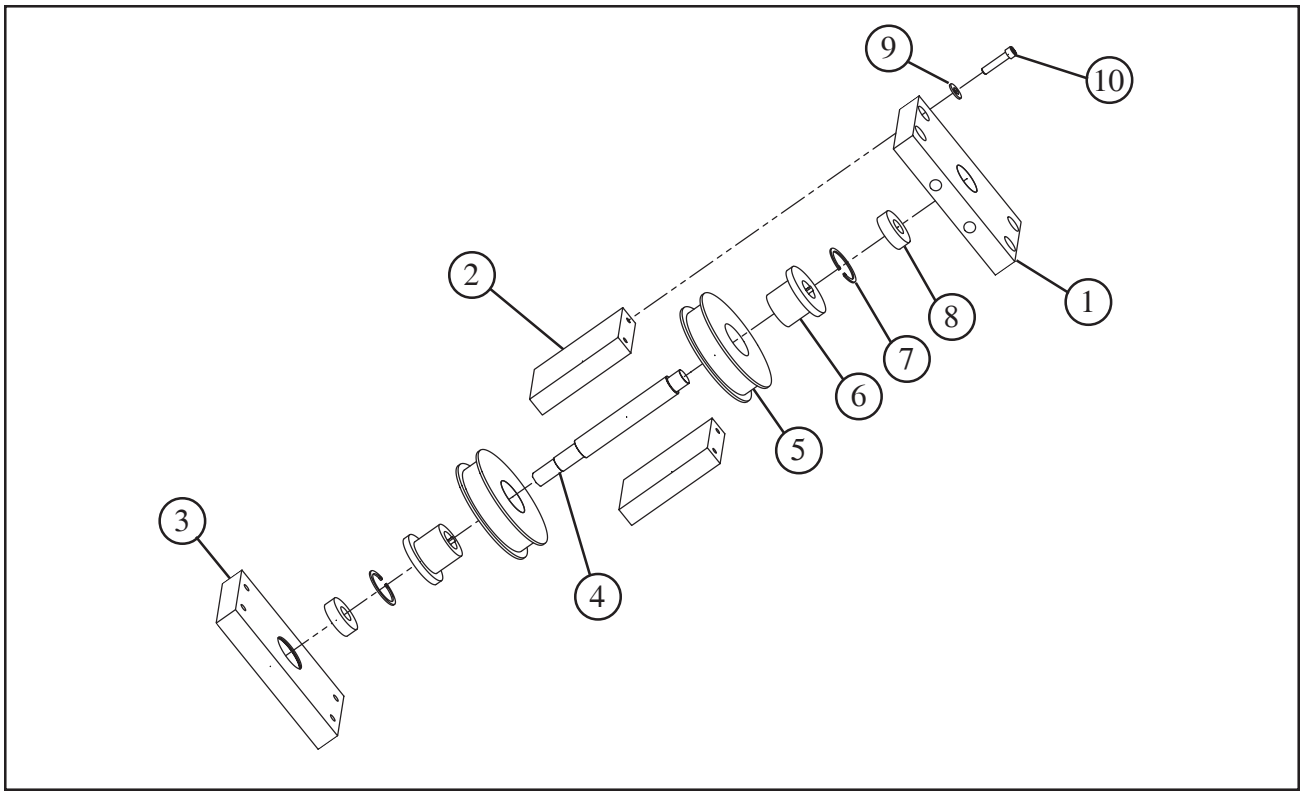
Incorrect tool blocks are installed for the size of the pipe or tube being worked on.
Incorrect tool bit is installed.

**Problem: The hydraulic motor will not start**

The hydraulic power supply is shut off.
The hydraulic motor is damaged and will not run free.

# ILLUSTRATED PARTS BREAKDOWN

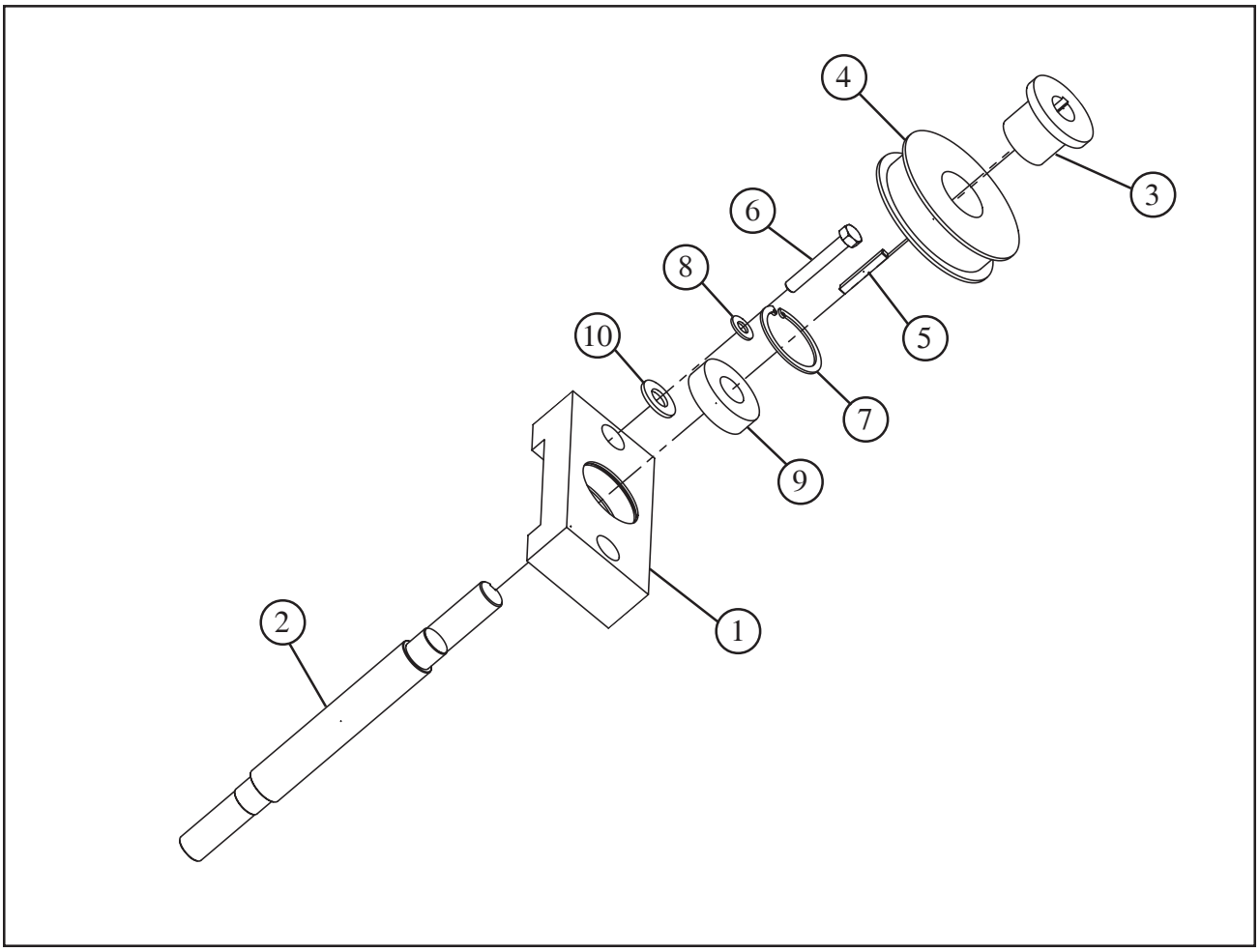
## CENTER PULLEY ASSEMBLY




Parts List, Center Pulley Assembly

| Item No. | Part No. | Description | Qty |
|---|---|---|---|
| 1. | 48-1652 | BLOCK, BASE PLATE | 1 |
| 2. | 24-2131 | PLATE, SIDE, PULLEY ASSY | 2 |
| 3. | 48-1651 | BLOCK, BASE PLATE, WITHOUT HOLES | 1 |
| 4. | 20-0918 | SHAFT, CENTER PULLEY | 1 |
| 5. | 6495K318 | PULLEY, TIMING BELT, 3/8" PITCH, 32 TOOTH | 2 |
| 6. | 6086K13 | BUSHING, SDS, 3/4" BORE | 2 |
| 7. | 98409A233 | RETAINING RING | 2 |
| 8. | 202PP | BEARING, RADIAL | 2 |
| 9. | 90107A029 | WASHER, 1/4", SST | 8 |
| 10. | 92196A543 | SHCS, 1/4-20 X 1 1/8, SST | 8 |

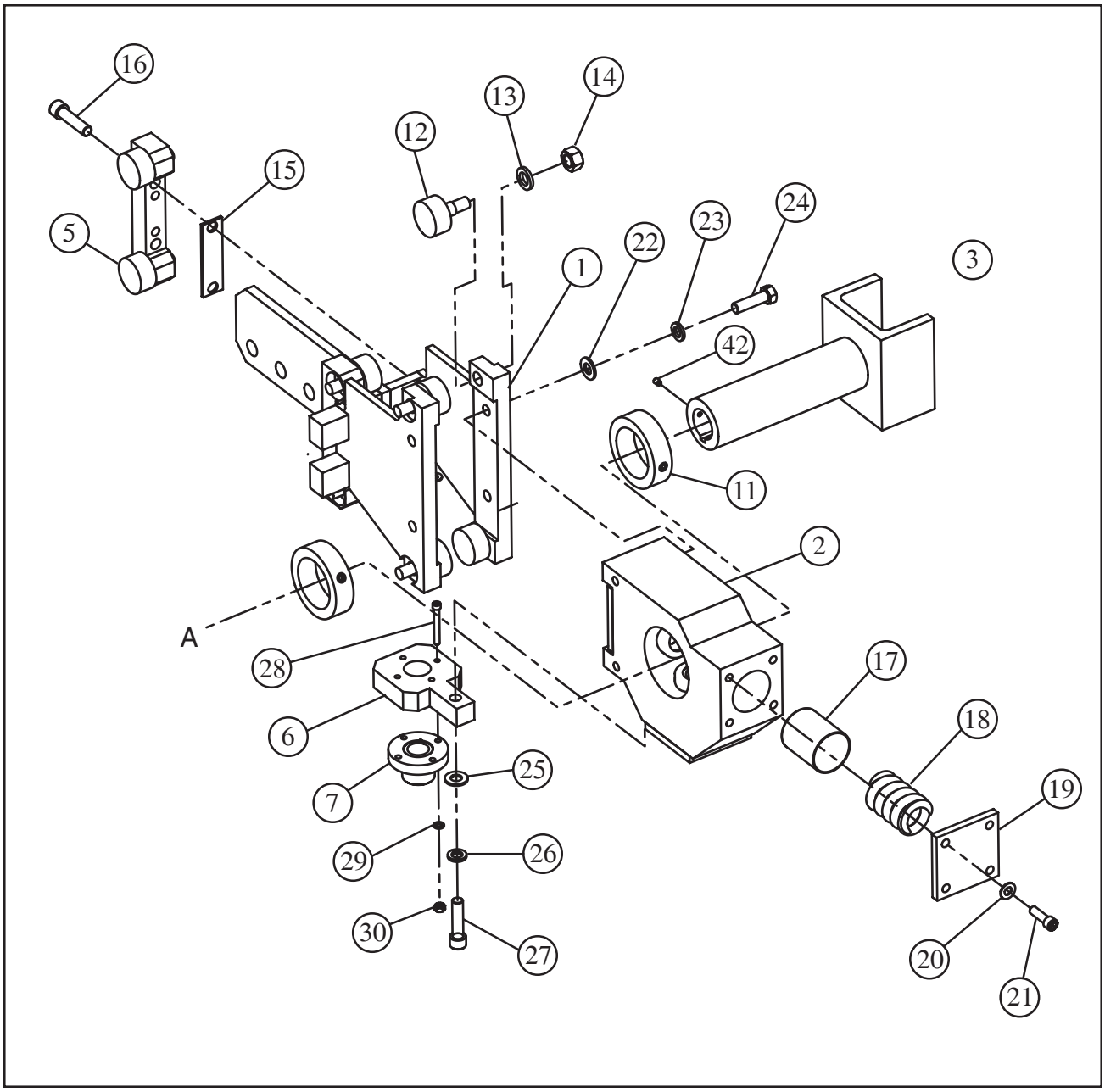
## SIDE PULLEY ASSEMBLY




Parts List, Side Pulley Assembly

| Item No. | Part No. | Description | Qty |
|---|---|---|---|
| 1. | 48-1650 | BLOCK, BOTTOM, PULLEY ASSY | 1 |
| 2. | 20-0919 | SHAFT, PULLEY | 1 |
| 3. | 1610-3/4" | BUSHING, TAPERED, 3/4" BORE | 1 |
| 4. | TB30L075 | PULLEY, TIMING BELT, 3/8 PITCH, 30 TOOTH | 1 |
| 5. | 31-0221 | KEY, 3/16" SQ X 1.5" L | 1 |
| 6. | 93190A591 | HHCS, 5/16-18 X 2, SST | 2 |
| 7. | 98409A244 | RETAINING RING | 1 |
| 8. | 90107A030 | WASHER, 5/16", SST | 2 |
| 9. | 204PP | BEARING, RADIAL | 1 |
| 10. | 91950A033 | WASHER, 1/2", SST | 2 |

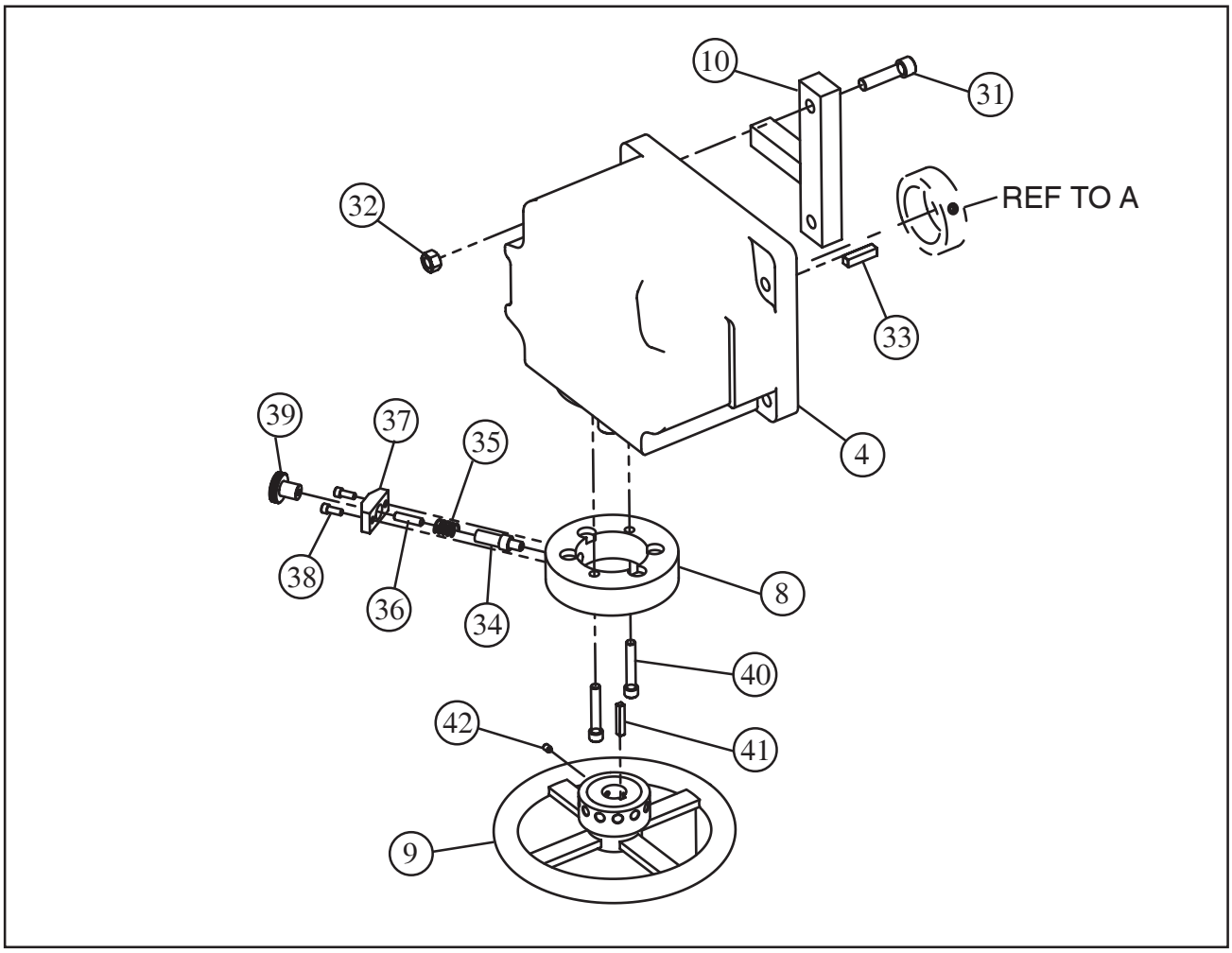
## CARRIAGE ASSEMBLY (1 OF 2)




Parts List, Carriage Assembly

| Item No. | Part No. | Description | Qty |
|---|---|---|---|
| 1. | 71-0053 | FRAME, CARRIAGE | 1 |
| 2. | 48-1646 | BLOCK, PILLOW, MAIN BODY | 1 |
| 3. | 14-0098 | SHAFT, ASSEMBLY, LIFTING FRAME ROTATOR | 1 |
| 4. | HV30-7B-15 | SPEED REDUCER | 1 |

## CARRIAGE ASSEMBLY (2 OF 2)



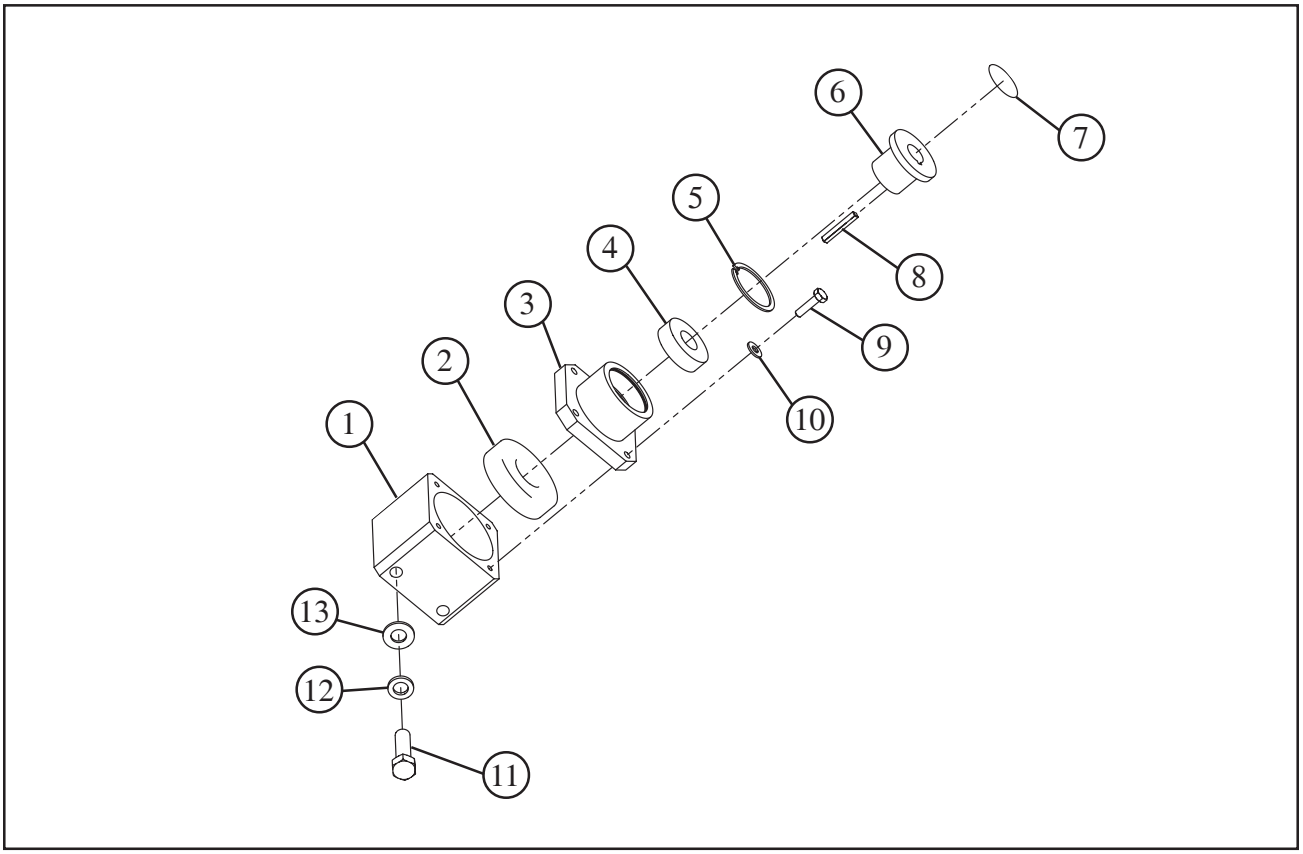

Parts List, Carriage Assembly Continued

| Item No. | Part No. | Description | Qty |
|---|---|---|---|
| 5. | 48-1654 | BLOCK, ROLLER CARRAGE | 2 |
| 6. | 24-2126 | PLATE, ACME, NUT CARRIER | 1 |
| 7. | 35-0661 | NUT, ACME | 1 |
| 8. | 47-1544 | BRACKET, WHEEL LOCK | 1 |
| 9. | 61-0165 | WHEEL, ROTATION | 1 |
| 10. | 71-0054 | FRAME, ANTI-ROTATION WELDMENT | 1 |
| 11. | 6432K47 | COLLAR | 2 |
| 12. | 3649K21 | ROLLER, TRACK, URETHANE COATED | 8 |
| 13. | 92147K035 | LOCKWASHER, 5/8", SST | 8 |

Parts List, Carriage Assembly Continued

| Item No. | Part No. | Description | Qty |
|---|---|---|---|
| 14. | 94804A355 | NUT, 5/8-18, SST | 8 |
| 15. | 24-2140 | PLATE, SHIM, ROLLER CARRIER | 2 |
| 16. | 33-0109 | SCREW, CAP, 1/2-13 X 2" | 4 |
| 17. | 1878K58 | DIE SPRING CAGE | 3 |
| 18. | 9295K93 | DIE SPRING | 3 |
| 19. | 24-2127 | PLATE, COVER, SPRING DIE | 3 |
| 20. | 91950A031 | WASHER, 3/8", SST | 12 |
| 21. | 33-0072 | SCREW, CAP, 3/8-16 X 1 1/4" | 12 |
| 22. | 91950A033 | WASHER, 1/2", SST | 4 |
| 23. | 92147A033 | LOCKWASHER, 1/2", SST | 4 |
| 24. | 92186A718 | HHCS, 1/2-13 X 1.75, SST | 4 |
| 25. | 92147A033 | LOCKWASHER, 1/2", SST | 1 |
| 26. | 92186A718 | HHCS, 1/2-13 X 1.75, SST | 1 |
| 27. | 33-0109 | SCREW, CAP, 1/2-13 X 2" | 1 |
| 28. | 33-0046 | SCREW, CAP, 1/4-20 X 2" | 4 |
| 29. | 92147A029 | LOCKWASHER, 1/4", SST | 4 |
| 30. | 35-0017 | NUT, HEX, 1/4-20 | 4 |
| 31. | 33-0109 | SCREW, CAP, 1/2-13 X 2" | 2 |
| 32. | 35-0021 | NUT, HEX, 1/2-13 | 2 |
| 33. | 31-0067 | KEY, 3/8" SQ X 1.5 | 1 |
| 34. | 32-0656 | PIN, WHEEL LOCK | 1 |
| 35. | 40-0267 | SPRING, COMPRESSION, .60"ODX1" LG X .045WD | 1 |
| 36. | 33-0521 | SCREW, SET, 5/16-18 X 1 1/4, CUP PT | 1 |
| 37. | 48-1206 | BLOCK, PIN RETAINING | 1 |
| 38. | 33-0039 | SCREW, CAP,1/4-20 X 5/8" | 2 |
| 39. | 42-0193 | KNOB, KNURLED, SS | 1 |
| 40. | 33-0240 | SCREW, CAP, 3/8-24 X 2 1/4" | 2 |
| 41. | 31-0074 | KEY, 1/4" SQ X 1.5 | 1 |
| 42. | 33-1458 | SCREW, SET, MOD., 1/4-20 X 3/8, BRASS TIP | 6 |

## SCREW SUPPORT ASSEMBLY




Parts List, Screw Support Assembly

| Item No. | Part No. | Description | Qty |
|---|---|---|---|
| 1. | 48-1645 | BLOCK, UPPER BEARING SUPPORT | 1 |
| 2. | 7306WN | BEARING, ANGULAR CONTACT | 1 |
| 3. | 48-1644 | BLOCK, UPPER, BEARING COVER | 1 |
| 4. | 204PP | BEARING, RADIAL BALL | 1 |
| 5. | 98409A244 | RETAINING RING | 1 |
| 6. | 1610-3/4" | BUSHING, TAPERED, 3/4" BORE | 1 |
| 7. | TB30L075 | PULLEY, TIMING BELT, 3/8 PITCH, 30 TOOTH | 1 |
| 8. | 31-0221 | KEY, 3/6" SQ X 1.5 L | 1 |
| 9. | 93190A542 | HHCS, 1/4-20 X 1 L, SST | 4 |
| 10. | 90107A029 | WASHER, 1/4", SST | 4 |
| 11. | 92186A718 | HHCS, 1/2-13 X 1.75 L, SST | 4 |
| 12. | 92147A033 | LOCKWASHER, 1/2", SST | 4 |
| 13. | 91950A033 | WASHER, 1/2", SST | 4 |