



Vertical
Stacking
System
for both
Floor and
Roof
Lines.

SQ-1 INTELLIGENT STACKERS

Operators Manual

ALWAYS DISCONNECT AND LOCK OUT ANY POWER SOURCES WHEN ADJUSTING OR REPAIRING ANY EQUIPMENT!

FOREWORD

This manual explains the proper maintenance of Square 1 Design Intelligent Stacking System as well as the daily lubrication and periodic inspection procedures. Please read this manual thoroughly even though you may already be familiar with other Square 1 Design equipment, because it contains the most current information about the Square 1 Design Intelligent Stacking System. This manual has been based on the standard Square 1 Design Intelligent Stacking System. If you have any questions on modifications to your equipment, please contact Square 1 Design., or your sales representative. Square 1 Design reserves the right to make any changes or modifications to this manual or its Intelligent Stacking System without giving notice and without incurring obligation.

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BEFORE INITIAL OPERATION

- **Please read this manual thoroughly.** This will give you a better understanding of a Square 1 Design Intelligent Stacking System and permit you to operate it correctly and safely.
- **Identify and inform ALL employees who will operate or be near the Square 1 Design equipment of all concerns in this manual and on the production floor.** It is very important from both the employers and manufactures standpoint that employee's safety comes above all else. The employer should make sure any employee who either operates or works near the equipment has been properly trained and given written notice of all safety concerns on the production floor.
- **Always perform pre-operation checks and periodic maintenance.** This will help prevent sudden malfunctions (due to poorly maintained equipment), improve work efficiency and help insure safe working conditions.

GENERAL DESCRIPTION

The Square 1 Design Intelligent Stacking System is a vertical stacking machine. It is designed to be used in conjunction with a conveyor system to increase the assembly speed of finished wood trusses. The standard Square 1 Design Intelligent Stacking System operates at a constant Lifting Capacity between 760-1,660 lbs. and a Stacking Capacity between 10,000-12,000 lbs. depending on configuration. The Square 1 Design Intelligent Stacking System's heavy-duty design will allow it to lift even the longest of Trusses with ease. The model # and serial # are located inside the Electrical panel of the Square 1 Design Intelligent Stacking System. This information will be needed when contacting Square 1 Design for service information. Any information that is needed can be obtained by contacting you sales representative or:

Square 1 Design & Manufacture Inc.

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Shelbyville, IN 46176

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OPERATION OF THE INTELLIGENT STACKING SYSTEM

The Square 1 Design Intelligent Stacking System is very simple to operate and maintain. Square 1 Design suggests that operation of Square 1 Design equipment proceed in the following manor:

1. Everyone near the machine read the manual so general safety guidelines can be identified.
2. Everyone near the machine identify the safety devices and how they operate.
3. Perform daily, weekly, and monthly safety and maintenance analysis.
4. Correct any problems before operation of the equipment is started.
5. Check the area before beginning to be certain no employees are near the machine.

SAFETY AND MAINTENANCE

Employee safety is to key concern at Square 1 Design Manufacturing and should also be at your production facility. It is important to stress safety concerns around any type of production equipment because serious injury can occur without the proper training and supervision. Square 1 Design & Manufacture Inc. suggests that any employee who will operate or work around this equipment be given the opportunity to read this manual and receive training from qualified personnel at your facility. With the proper maintenance the equipment and work area become much safer. Square 1 Design & Manufacture Inc. has the following list of general safety and maintenance guidelines that should accompany any safety standards your company has established.

SAFETY GUIDELINES

1. **Cleanliness:** The area surrounding the Square 1 Design Intelligent Stacking System must be checked daily for any obstructions such as loose lumber or plates that could jam any area of the machine.
2. **Operate new equipment with special caution:** People are sometimes overconfident that the new equipment will work just like old equipment. This is not always true, and a special caution should be taken around the new equipment.
3. **Proper equipment use:** Individuals working on or near the Square 1 Design Equipment, to prevent injury, should wear the proper equipment. Loose fitting clothing that can be caught in the machine or on the Stacker itself should **NOT** be worn. Safety glasses **MUST** be worn for the protection of the employees. Employees without the proper equipment should not be allowed near the Square 1 Design Intelligent Stacking System. It is management's responsibility to enforce these guidelines, as well as the employee's responsibility to make sure these guidelines are enforced.
4. **Emergency Stops should be identified and proven to be in proper working order.** All employees who will be working on or near the Square 1 Design Intelligent Stacking System should know how the safety features work and confirm the machine is operating properly. If

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any employee notices the equipment may be malfunctioning in any way, a supervisor is to be notified and the power to the equipment is to be locked down until the problem can be rectified.

5. **Disconnect and lock out all power sources before any maintenance or repair is to take place.** It is important for the equipment's power to be disconnected and locked out to prevent accidental start-ups whether by another employee or workers error.
6. **Follow the safety checklist every day.** The following checklist should be followed every day to ensure employees safety and a safe work environment.

SAFETY CHECKLIST

Daily:

- A. Check Emergency Stop to assure they are working properly.
- B. Check to make sure the machine stops properly when the Emergency Stops are activated.
- C. Check for unusual noises, overheating, oil leaks, or other unusual machine characteristics.
- D. Check bearings for wear.
- E. Visually inspect motors and gearboxes for excessive dirt, heat, or vibration.
- F. Check gearbox oil levels (fill as required)
- G. Check ventilation openings to assure they are not clogged by dirt or dust.
- H. Check the area around the machine for cleanliness.
- I. Check to be sure everyone around the machine is wearing the proper equipment.
- J. Perform daily maintenance
- K. Be sure area is clear of people when starting the machine.

Weekly:

- A. Check all bolts, nuts and set screws and tighten as require.
- B. Check drive train tension and adjust if necessary.
- C. Check oil level in drive unit and add proper amount if necessary.
- D. Use compressed air to remove sawdust and dirt build-up on the system and around the bearings. *

***Wear eye protection when using the compressed air.**

MAINTENANCE

As mentioned earlier, keeping the equipment well maintained makes the work environment safer and allows reliable production for many years. Maintenance of the Square 1 Design Intelligent Stacking System consists of lubricating the machine and chain, then tightening the nuts and bolts. The following is a maintenance schedule **MUST** be followed.

Motors: The gearboxes on each motor have sight gauges for oil levels; insure that both motors are kept at the correct level.

Chain: A non-detergent petroleum-based oil every 18 hours should be used.

Greased Fittings: General-purpose grease should be used every 8 hours or as needed.

Nuts and Bolts: All nuts and bolts must be checked and tightened before operation of the Intelligent Stacking System.

General Operation

Operation of the Square 1 Design Intelligent Stacking System requires the operator to not only pay attention to his safety but to every other employee's safety as well. The entire work area must be inspected before operation of the machine.

After the safety inspection, the operator should review the functions of the control buttons. There are 4 buttons on the standard gantry that allow the operator to run the machine. They are as follows:

1-Red Stop Button This button is used in situations where immediate breaking is required. When this button is pressed power is cut off to the motors. When this power is cut the fail-safe, brakes activate stopping the Lift Arms. More Emergency Stop buttons can be added to accommodate the length of the system outside. **Caution should be taken to stop the machine prior to an obstacle because the machine's weight may keep it moving for a few seconds after the brakes have activated.**

1-Forward Button This button moves the machine in forward motion.

1-Reverse Button This button moves the machine in reverse motion.

1-Selector Switch This selects between manual and automatic mode.

On PLC Controlled System these same buttons are available but will be on the PLC screen.

Along with general machine operation the operator must also perform several daily operational adjustments. This section lists these adjustments and instructs the user on how to perform them.

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DRIVE TRAIN ADJUSTMENT

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Square 1 Design Intelligent Stacking Systems have a drive train on the Powered Pedestals. This consists of a cam and a pitman arm connected to the shaft of the motor.

CHAIN ADJUSTMENT

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The idler sprocket may then be adjusted by turning the threaded bolt clockwise to increase tension, counter clockwise to decrease tension. These are located on both the front and rear of each Pedestal. Care must be taken to keep the sprocket in line with the other sprockets. A little slack is desirable as it allows the chain links to seat themselves on the sprocket teeth. This will reduce wear on the sprocket and bearings.

After the adjustment is complete, the locknut must be tightened to maintain proper tension.

LIFT ARMS

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The Square 1 Design Intelligent Stacking System has two or more Vertical Lift Arms depending on the unit size that lift the truss. They are attached by 4 shoulder bolts with 15/16" nuts. These should be level when the Stacker is in the home position.

REPAIR AND REPLACEMENT

In the case that a part of the machine is not working properly, this section lists how to remove and replace the correct part from Square 1 Design Intelligent Stacking System. If parts are needed it is recommended that you contact Square 1 Design & Manufacture Inc. at the address listed [on page 14](#).

ELECTRICAL

The following sections cover the electrical portions of the Square 1 Design Intelligent Stacking System.

Exhibits listed throughout this section contain a parts list and breakout of each item. Replacement parts are available as individual components or as complete units. Square 1 Design machines use SO multi-conductor cable with sealed fittings. Any repairs should be done using the same materials.

PROXIMITY SENSORS

There are 2 a minimum of Proximity Sensors on each machine. Proximity Sensors are available through Square 1 Design & Manufacture Inc. If they should need to be replaced contact Square 1 Design & Manufacture Inc. to make sure they are installed properly.

REMOVAL OF PROXIMITY SENSORS

The Proximity Sensors are set to work with the Start and Stop of the Stacker. Remove the nuts holding the sensor in place. The wiring can now be disconnected, and a new sensor can be installed using the schematic as a guide. Reverse the instructions to reinstall the Proximity Sensor.

Test and make sure Proximity Sensor is working properly before attempting to use the machine.

CONTROL PANEL

This unit is available as a complete control panel, a starter, or component parts for starters. Refer to the Electrical Schematic provided for parts list, breakout, and schematic to determine the information needed.

REMOVAL OF CONTROL PANEL

To remove the control panel, first disconnect the wiring inside the box to all motors, switches and input voltage. Remove the conduit locknuts inside and pull the conduit free from the panel.

The control panel can now be removed by unfastening the 4 nuts and bolts mounting it to the mounting bracket.

Reverse the order to install the panel.

Refer to the schematic that came with your machine for the rewiring.

Make sure the machine is operating correctly prior to running production.

MOTOR

The motor is available as a complete unit or in component parts.

MOTOR REMOVAL

The motor may be removed and replaced by the same method. Begin by disconnecting the electrical connections inside the connection box mounted on the side of the motor.

Unscrewing 4 nuts holding the cover on the connection box can do this. The connection box cover is connected to the conduit. It can be set aside for reassembly.

Remove the cam by removing the 2 set screws, and the connected Pitman Arm. Then the 4 bolts holding the motor mounting plate. Be careful as the motor and gearbox are very heavy and should be supported before removing the bolts.

Reverse the procedure to remount the motor.

Refer to the schematic provided to make the electrical connections.

Make sure the machine runs properly before running the machine in production.

MECHANICAL

The following section covers the mechanical portion of the Square 1 Design Intelligent Stacking System.

Exhibits listed throughout this section contain parts lists and breakouts of common replacement parts. Some replacement parts are available as individual components and other are available only as a complete unit. Contact Square 1 Design & Manufacture Inc. or you sales representative for more information.

DRIVE ASSEMBLY

The drive assembly contains several component parts that are available as replacements.

CHAIN REMOVAL

Locate the master link in the chain making sure it is in a location with easy access.

Reduce the tension on the chain. Remove the master link by unsnapping the retaining clip and removing the link plate. Slide the master link out of the chain.

Reverse the procedure for reassembly.

Make sure the machine is operating correctly prior to running production

IDLER SPROCKET REMOVAL

Loosen the chain to remove tension.

Remove the chain from the carriage.

Remove the 4 bolts holding the bearings in place.

To remove the sprocket, loosen the 2 set screws holding the shaft in position in the bearings.

Reverse the procedure for reassembly and grease before starting up.

Make sure the machine is operating correctly prior to running production.

BEARING REMOVAL

You will need to remove the chain before beginning this process.

Once the chain has been removed loose the set screws on both the sprockets and the bearings.

You will need to knock out the shaft with a punch tool with a similar I.D.

You will need to remove the sprockets before starting the bearing removal.

First, unfasten the 2 bolts to remove the bearing side supports

Check the bearing housing for damage. If the bearing has worn through the housing it will have to be replaced.

Check the shaft for burrs before reassembly. Reverse the procedure to reassemble and reseal all fittings before start-up.

Make sure the machine is operating correctly prior to running production.

PM Schedule for Square 1 Design Intelligent Stacking System

Prior to performing any PM's please follow your companies Lock Out/Tag Out Procedure to prevent injury.

Weekly PM Schedule

- Grease Stacker.
- Check chain tension.
- Verify that all Proximity Switches working properly and are tight.
- Hand check set screws located on sprockets

Quarterly PM Schedule

- All monthly PM's should be completed.
- Check to make sure that no electrical connections have come loose.

Annual PM Schedule

- All monthly PM's should be completed.
- All Quarterly PM's should be completed.

WARRANTY

Square 1 Design & Manufacture, Inc. warrants the equipment manufactured by it, to be free from defects in materials or workmanship for one (1) year from the date of delivery to the original purchaser. This is provided the equipment had been properly installed, operated, used, cared for, adjusted, cleaned and lubricated by the owner. All equipment claimed to be defective shall be returned to Square 1 Design & Manufacture, Inc. charges prepaid. All collect shipments will be refused. If upon inspection Square 1 Design & Manufacture Inc. determines to its satisfaction, that any part of the equipment is defective, Square 1 Design & Manufacture, Inc, at its option, correct the defect by repair or replacement. This warranty shall not apply if the original equipment had been altered or modified by any person other than Square 1 Design & Manufacture Inc. This Warranty shall not apply to starters, motors, gear reducers, or microswitches that are component parts of the equipment. Those separate component parts are governed by separate warranties of the respective component manufacturers, which warranties of the respective component manufacturers which warranties may be shorter than or longer than the one (1) year warranty granted by Square 1 Design & Manufacture, Inc. upon request by the owner. Any repairs are available from Square 1 Design & Manufacture Inc. upon request by owner. Any repair or replacement of such component parts shall be governed solely by manufacturer, and it shall be owner's responsibility to enforce any warranty claims directly with such component part manufacturer.

EXCEPTION FOR THIS WARRANTY AS EXPRESSLY STATED, SQUARE 1 DESIGN & MANUFACTURE, INC. MAKES NO OTHER WARRANT EXPRESSED OR IMPLIED. ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS HEREBY DISCLAIMED.

Square 1 Design & Manufacture Inc. shall not be liable for damages, direct, consequential, or incidental, or for delays, if such occur as a result of defects in material or workmanship.

SQUARE 1 DESIGN & MANUFACTURE INC.

PURCHASE DATE: _____

MODEL NUMBER: _____

SERIAL NUMBER: _____

ORDERING REPLACEMENT PARTS:

Replacement parts can be ordered by calling, emailing, or faxing:

Square 1 Design & Manufacture Inc.

1 Clark Road

Shelbyville, IN 46176

Phone: +1-866-647-7771

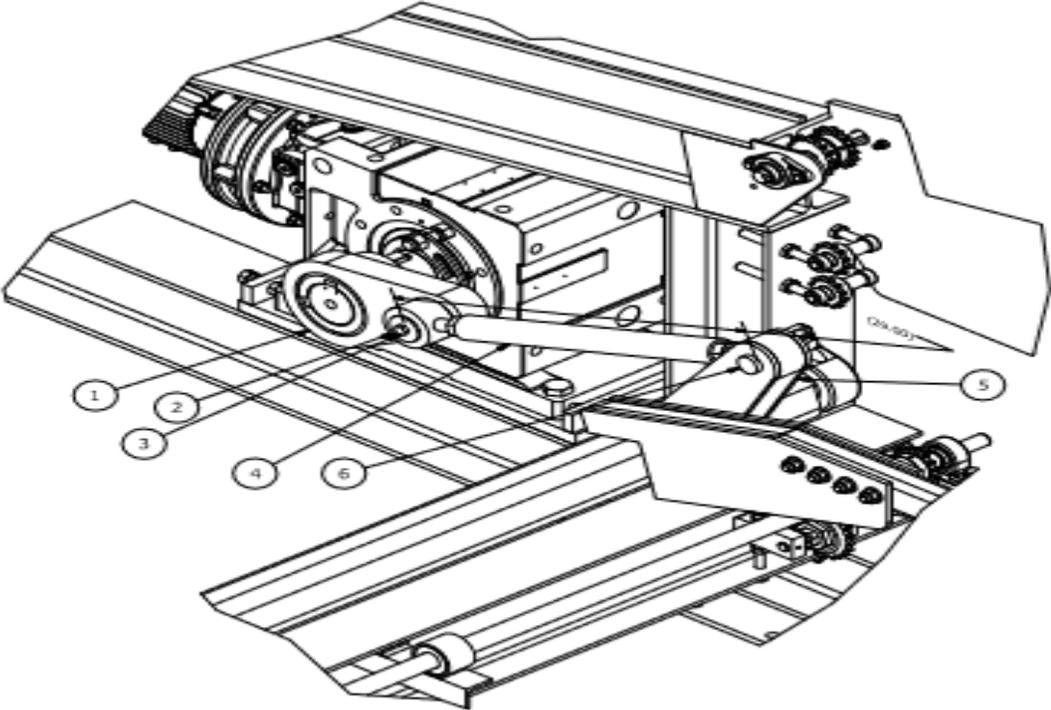
Fax: +1-866-646-5771

www.Square1Design.com

Sales@square1design.com

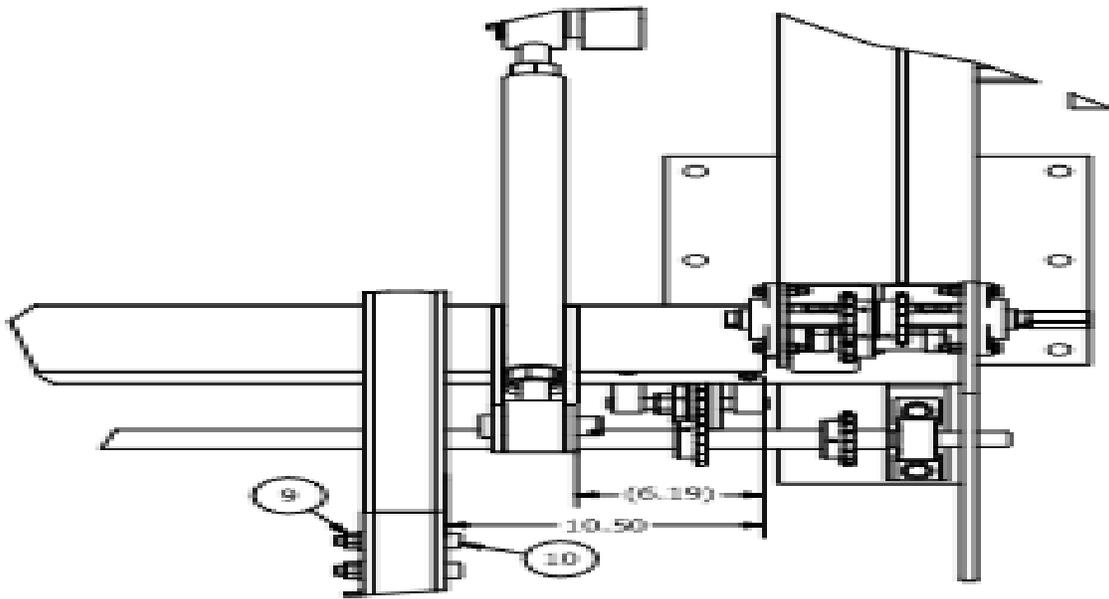
When ordering parts, you must include the serial and model #'s of your Square 1 Design Intelligent Stacking System.

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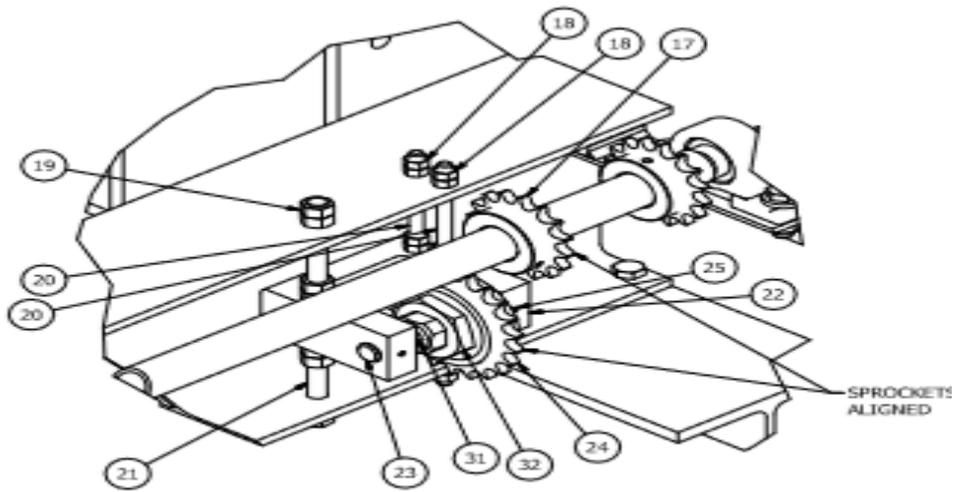


DETAIL AF

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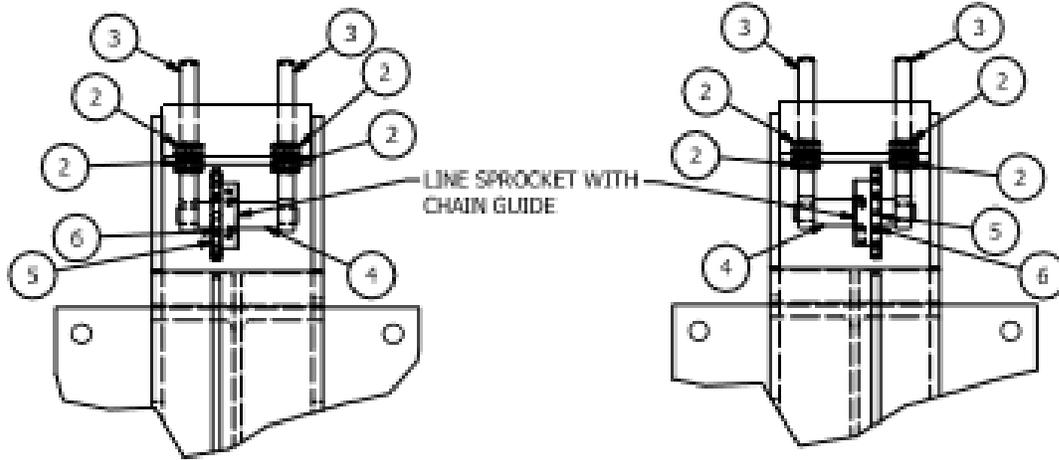


DETAIL AE



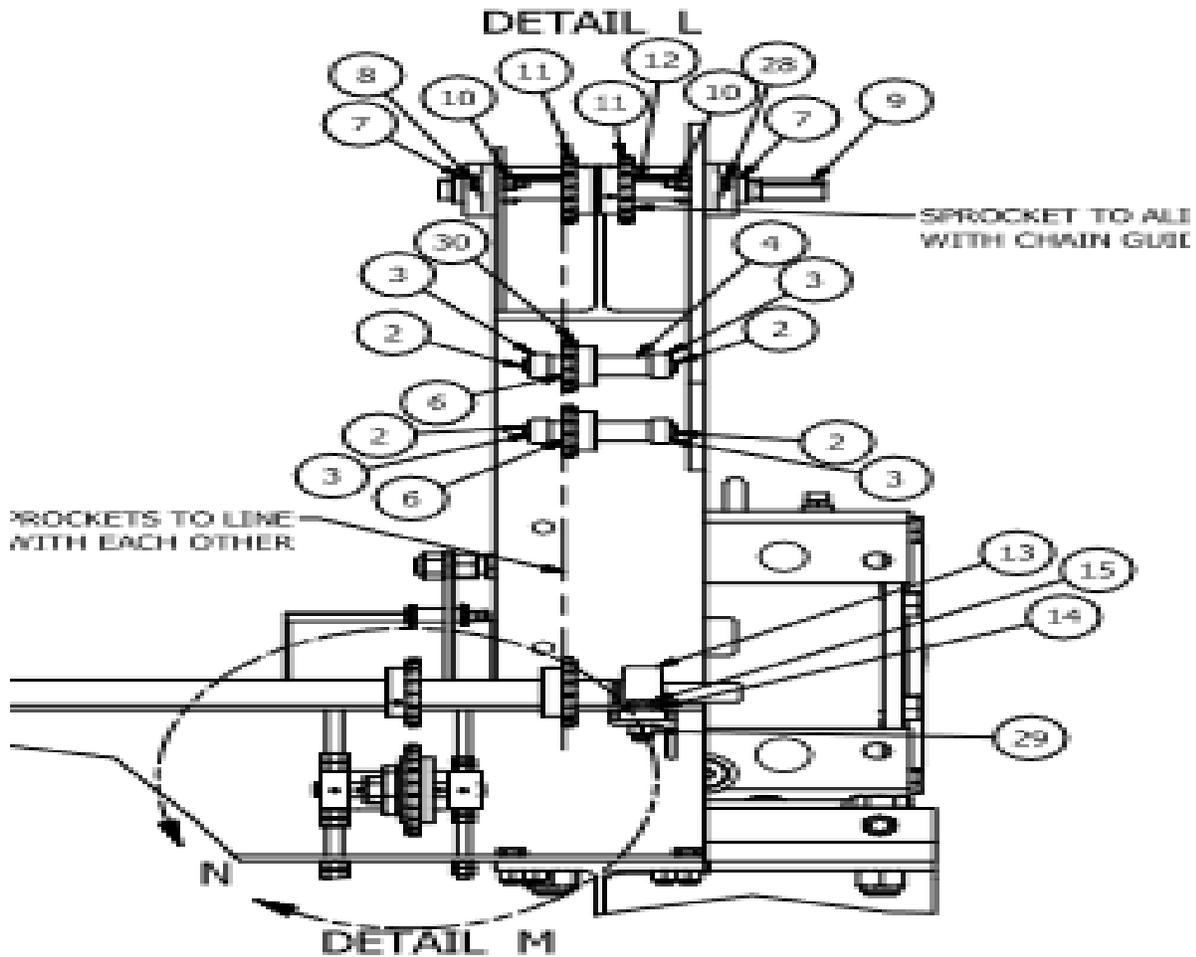
DETAIL N

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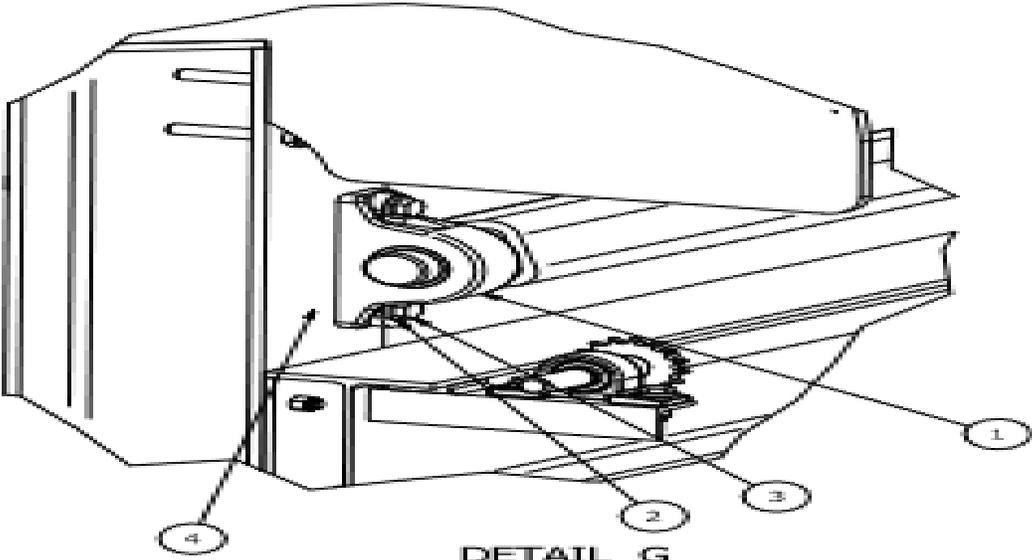


DETAIL J (12)

DETAIL K



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Part Number	Location	Page Location
STK-AW-0069	Cam Arm	Detail AF; Number 1
STK-ABW-0013	Pitman Arm Assembly	Detail AF; Number 4
Motor for Stacker	Motor for Stacker Unit	Detail AF
ELAC-0128	24v Motor Stop Sensor; 3 Wire	Located on mount on Motor
*ELAC-0160	120v Motor Stop Sensor; 2 Wire	Located on mount on Motor
ELAC-0128	24v Motor Start Sensor; 3 Wire	Located on End Stop
*ELAC-0161	120v Motor Start Sensor; 2 Wire	Located on End Stop
SPRO-0003	Sprocket Located on 1.375 Tube	Detail N; Number 17
SPRO-0031	Torque Limiter	Detail N; Number 32
SPRO-0004	Sprocket on Torque Limiter	Detail N; Number 24
SPRO-0005	Sprocket for Adjustment on Rear of Pedestal	Detail K; Number 6
FAST-0001	Eye Bolt on Front and Rear of Pedestal	Detail K; Number 2
SPRO-0030	Sprockets for Chain Adjustment on Front of Pedestal	Detail L; Number 10
SPRO-0009	Sprocket on Front of Pedestal. Connected to Chain on Carriage	Detail L; Number 19
BEAR-0005	Bearing on Front of Pedestal. Connected to Chain on Carriage	Detail L; Number 14
STK-03-011-SM	Shaft for Slack Adjustment	Detail L; Number 10
STK-AW-0015	Crank Arm Shaft Weldment; Located on the Front of the Pedestal	Detail L; Number 14
BEAR-0003	Bearings Located on Beam	Detail M; Number 13
BEAR-0006	Bearing Located on Drive Tube	Detail G; Number 1
CHAIN-0009	Chain for Stacker	
CHAIN-0006	Master Link for Stacker	
CHAIN-0014	Offset Link for Stacker	
*Please Specify Sensor Voltage as some SQ-1 Stackers may vary.		