Motoman®

AutoSorter-III™

AUTOMATED TUBE PROCESSOR

Operator's Manual

Part Number: 154591-1CD
Revision: 0

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Chapter 1
Introduction

The Motoman AutoSorter – III™ is a fully integrated pre- and post-analytical sample-processing system providing hands-free sample handling, processing and preparation. The unit increases productivity and efficiency in your sample processing tasks by automating labor-intensive tasks such as sample identification, decapping, centrifuging, and out sorting.

Sample tubes can be sorted, decapped, centrifuged, oriented and archived with absolutely no intervention from lab personnel necessary. The customizable architecture enables AutoSorter – III™ to accommodate any personality rack. A bar code scanner eliminates any need to manually pre-sort samples. With an easy-to-use graphic user interface and Windows® based operating system, operators merely load and unload samples and move on to other vital functions with less exposure to biohazards and repetitive motion injuries.

Features include:

Random Sample Loading – eliminates need to sort and orient tubes by specimen type.

Receipt/Check-In – system scans the bar coded label on specimen tube for positive identification. Records of processed tubes are sent to the facility's Laboratory Information System (LIS) network.

Hands-Free Decapping – for safer, more efficient handling and preparation of a wide variety of tube caps.

Automated Centrifuging – sort and place specimen tubes in centrifuge trays for centrifuging by integrated Hettich centrifuge unit.

Sorting – sorts sample tubes to customer specified analyzer rack and orients bar codes in proper position for analysis.

1.1 About This Document

This manual is intended as an introduction and overview for personnel who are familiar with the operation of their laboratory and Microsoft® Windows®/PC usage. For more detailed information, refer to the manuals listed in Section 1.4.

This User's Manual provides an overview of the Motoman AutoSorter – III™ system. For detailed information on specific system components listed in this document, please refer to the documentation package included with your AutoSorter – III™ system (refer to Section 1.4).

This User's Manual contains the following chapters –

CHAPTER 1 - INTRODUCTION

This chapter introduces the AutoSorter – III™ User's Manual, provides an overview of the AutoSorter – III™ system, lists reference documents that are included with the documentation package, and provides Motoman Customer Support contact information.

CHAPTER 2 – SAFETY

Chapter 2 provides general safety information regarding operation of the AutoSorter – III™ Automated Specimen Processor.

CHAPTER 3 – EQUIPMENT DESCRIPTION

Chapter 3 provides a more detailed description of AutoSorter – III™ systems and subsystems than that provided in Chapter 1 of this document.

CHAPTER 4 – INSTALLATION

Chapter 4 provides basic installation procedures for the AutoSorter – III™ Automated Specimen Processor.

CHAPTER 5 – OPERATION

Chapter 5 provides basic operating procedures for the AutoSorter – III™ Automated Specimen Processor. This section also provides procedures for start-up, loading, normal operation, fault recovery, and shutdown.

CHAPTER 6 – MAINTENANCE/TROUBLESHOOTING

Chapter 6 provides basic maintenance and troubleshooting procedures for the AutoSorter – III™ Automated Specimen Processor.

APPENDIX A – ILLUSTRATED PARTS LIST

Appendix A contains the illustrated parts list for AutoSorter – III™.

1.2 AutoSorter – III™ Overview

The AutoSorter – III™ Automated Specimen Processor is a fully integrated specimen processor. Integrated casters provide easy locating and integral weldments on the AutoSorter – III™ frame accept anchoring hardware to secure the unit at a desired location.

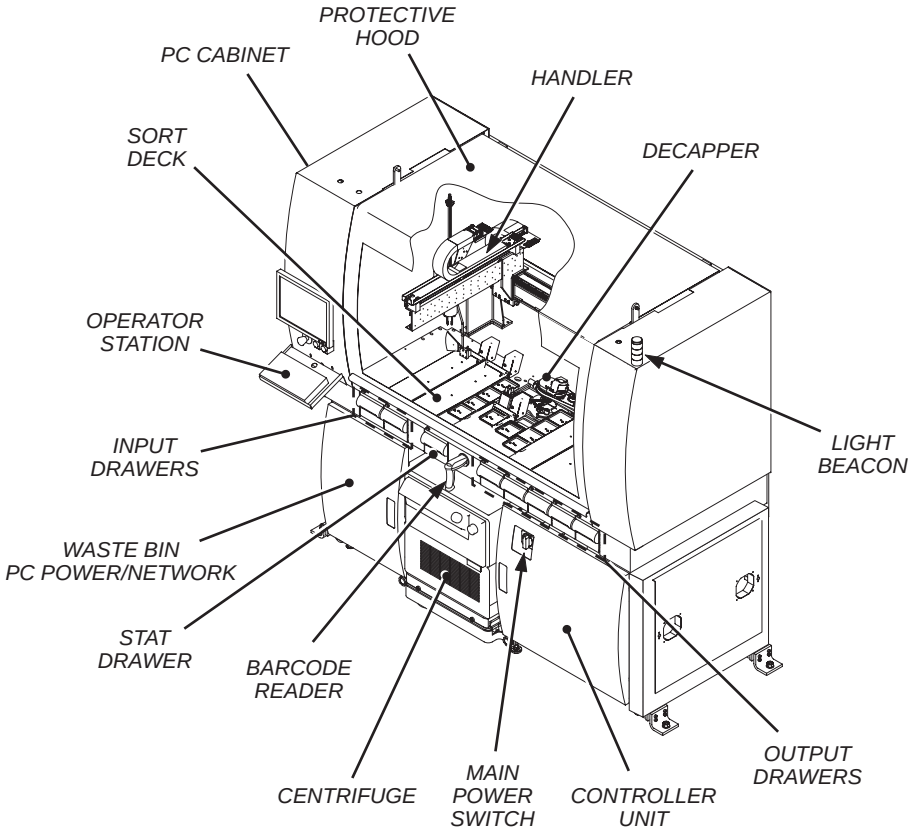


Figure 1 AutoSorter-III Automated Specimen Processor - Typical Configuration

1.2.1 System Layout

The AutoSorter – III™ has been designed to accommodate standard building access points such as elevators, hallways, and doorways, making installation extremely flexible (some disassembly may be required to for 36 inch wide access points). The AutoSorter – III™ sort deck and handlers are isolated from unauthorized access by a protective cabinet and hood assembly (see Figure 1). The cabinet and hood assembly also protects the sort deck from dust and other contaminants.

Hospital/lab technologist(s) interaction with the AutoSorter – III™ typically involves the following tasks –

- Lab personnel use the PC and computer keyboard to initialize and setup AutoSorter – III™ operation.
- Lab personnel load and unload specimen trays.

While the AutoSorter – III™ completes its programmed tasks, hospital/lab personnel are free to move on to other duties, such as manual assays, that require their specialized laboratory skills. Human intervention is typically not required during completion of the AutoSorter – III™ programmed tasks.

1.2.2 Major Components

The AutoSorter – III™ Automated Specimen Processor includes the following major components:

- Two Specimen Handlers
- System Controller
- PC based operator station
- Integrated cabinet with protective hood
- Bar code readers
- Centrifuge
- Specimen decapper
- Specimen grippers
- Input Drawers
- Output Drawers
- STAT drawer
- Safety Equipment -
    - Protective hood and interlock
    - Safety light beacon
    - Emergency Stop button (E-Stop)
    - Computer Back-up Power

1.2.3 System Configurations

The following system configurations are available for the AutoSorter – III™:

- Sort, Decap, Centrifuge (SDC) (P/N 154426-1)
- Sort, Decap (SD) (P/N 154919-1)

1.2.4 System Requirements

Table 1 Technical Specifications

Electrical Requirements	
Electrical Consumption	approx. 10.8 kVA
Current	10 Amps @ 208 VAC Max
Circuit	Dedicated and noise free
Voltage	208/230 VAC, 3 phase
Frequency	50/60 Hz [+/-1%]
Ground Requirements	Resistance, 100 Ohms
Conformity	UL conformity
Air Requirements	
Environmental Requirements	
Ambient Temperature	15 ~ 30° C, 60-85° F
Ambient Humidity	10 ~ 90% relative humidity, no condensation
Dimensions	
Width	2,308 mm (91 in.)
Depth	1,250 mm (49 in.)
Height (Door Closed)	2,051 mm (81 in.)
Height (Door Open)	2,620 mm (103 in.)
Approximate Weight, SD	950 Kg (2,100 lbs.)
Approximate Shipping Weight, SD	1,140 Kg (2,500 lbs.)
Approximate Weight, SDC	1,142 Kg (2,520 lbs.)
Approximate Shipping Weight, SDC	1,360 Kg (3,000 lbs.)
Space Requirements	
Floor Space	3.8 m x 2.75 m (12.5 ft. x 9.0 ft.)

1.3 Learning AutoSorter – III™

Motoman provides a variety of options to help you to learn to use your AutoSorter-III automated tube processor, including training and technical support. Additional resources, including technical support information, can be found at the Motoman website (www.motoman.com).

1.3.1 Motoman Technical Education Center (MTEC)

The Motoman Technical Education Center offers over 56 different courses including Basic Programming, Advanced Programming, Maintenance, Concurrent I/O, Purchasable Options, and Customized Training. Web-based or Computer-based training is also available for selected topics.

Motoman training courses provide classroom instruction combined with hands-on training (normally 2-student-per-robot ratio). Class size is limited to provide a more effective and enhanced learning environment.

With three U.S. facilities and more than 60 training robots, Motoman offers the most complete training package in the industry. Since MTEC is an authorized provider for the International Association for Continuing Education and Training (IACET), each student who receives at least 70% on the final exam will receive Continuing Education Units (CEUs). These CEUs are transferable college credits, which are awarded based on contact hours of the course. The Motoman Technical Education Center is the first robotic training facility with IACET accreditation and is also approved for training of veterans.

Motoman offers training at our headquarters in West Carrollton, Ohio and at our remote facilities in Irvine, California; Wixom, Michigan; Mississauga, Canada; and Aguascalientes, Mexico. Motoman also performs On-Site training at customer sites if required but recommends training at Motoman as the environment is more conducive to effective learning.

For more information, visit our website (http://www.motoman.com/support/training/training.htm).

1.4 Reference Documentation

In addition to this Operator's Manual, you may need to refer to the following reference documentation (included with your AutoSorter – III™ documentation package) –

- Yaskawa *Machine Controller MP2300 User's Manual*
- Hettich *Operator's Manual for Rotanta 46 RSC Robotic Centrifuge* (P/N AB4817N)

1.5 Contact Information — Motoman Customer Support

If you need assistance with any aspect of your AutoSorter – III™ system, please contact Motoman Customer Support at the following 24-hour telephone number –

937. 847. 3200

For routine technical inquiries, you can also contact Motoman Customer Support at the following e-mail address –

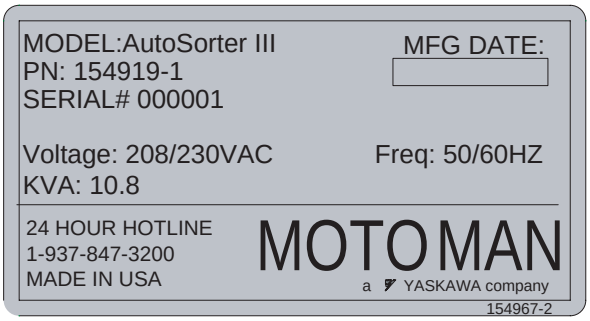
techsupport@motoman.com

When using e-mail to contact Motoman Customer Support, please provide a detailed description of your issue, along with complete contact information. Please allow approximately 24 to 36 hours for a response to your inquiry.

Note: Please use e-mail for routine inquires only. If you have an urgent or emergency need for service, replacement parts, or information, you must contact Motoman Customer Support at the telephone number shown above.

Please have the following information ready before you call –

- SYSTEM — AutoSorter-III
- SOFTWARE VERSION — Located on the main log
- SERIAL NUMBER — Located inside the controller cabinet door
- SALES ORDER NUMBER — Located inside the controller cabinet door
- Description of difficulty (note any error messages)



It is your responsibility to decontaminate components of AutoSorter – III™ before requesting service by a Motoman Field Service Representative or returning parts to Motoman for repair. Motoman will NOT accept any items which have not been decontaminated where it is appropriate to do so. If any parts are returned, they must be enclosed in a sealed plastic bag stating that the contents are safe to handle and are not contaminated.

Notes

Chapter 2
Safety

2.1 Introduction

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, or laws relating to safety and safe operating conditions for each installation are met and followed.

We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems (ANSI/RIA R15.06-1999). You can obtain this document from the Robotic Industries Association (RIA) at the following address:

Robotic Industries Association
900 Victors Way
P.O. Box 3724
Ann Arbor, Michigan 48106
TEL: (734) 994-6088
FAX: (734) 994-3338
www.roboticsonline.com

Ultimately, well-trained personnel are the best safeguard against accidents and damage that can result from improper operation of the equipment. The customer is responsible for providing adequately trained personnel to operate, program, and maintain the equipment. **NEVER ALLOW UNTRAINED PERSONNEL TO OPERATE, PROGRAM, OR REPAIR THE EQUIPMENT!**

We recommend approved Motoman training courses for all personnel involved with the operation, programming, or repair of the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

2.2 Standard Conventions

This manual includes the following alerts – in descending order of severity – that are essential to the safety of personnel and equipment. As you read this manual, pay close attention to these alerts to insure safety when installing, operating, programming, and maintaining this equipment.

DANGER!
Information appearing under the DANGER caption concerns the protection of personnel from an immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.

WARNING!
Information appearing in a WARNING concerns the protection of personnel and equipment from potential hazards that can result in personal injury or loss of life in addition to equipment damage.

CAUTION!
Information appearing in a CAUTION concerns the protection of personnel and equipment, software, and data from hazards that can result in minor personal injury or equipment damage.

Note: Information appearing in a Note provides additional information which is helpful in understanding the item being explained.

2.3 General Safeguarding Tips

All operators, programmers, hospital/lab personnel, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation of this equipment, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this equipment.
- Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.
- The system must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- In accordance with ANSI/RIA R15.06-1999, section 4.2.5, Sources of Energy, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

2.4 Mechanical Safety Devices

The safe operation of this equipment is ultimately the user's responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06-1999 safety standards, and other local codes that may pertain to the installation and use of laboratory equipment. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety equipment is provided as standard:

- Safety barriers
- Door interlocks
- Emergency stop palm buttons located on operator station

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.

2.5 Installation Safety

Safe installation is essential for protection of people and equipment. The following suggestions are intended to supplement, but not replace, existing federal, local, and state laws and regulations. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. Installation tips are as follows:

- Be sure that only qualified personnel familiar with national codes, local codes, and ANSI/RIA R15.06-1999 safety standards are permitted to install the equipment.
- Provide sufficient room to permit safe teaching and maintenance procedures.

2.6 Programming, Operation, and Maintenance Safety

All operators, programmers, hospital/lab personnel, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this equipment should be permitted to program, or maintain the system. All personnel involved with the operation of the equipment must understand potential dangers of operation.

- Inspect the equipment to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Be sure that all safeguards are in place. Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Check the E-Stop button on the operator station for proper operation before programming. The equipment must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.

- Back up all programs and jobs onto suitable media before program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.
- Any modifications to the controller unit can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to the controller unit. Making any changes without the written permission of Motoman will VOID YOUR WARRANTY!
- Some operations require standard passwords and some require special passwords. Special passwords are for Motoman use only. YOUR WARRANTY WILL BE VOID if you use these special passwords.
- The equipment allows modifications of the software for maximum performance. Great care must be taken when making these modifications. All modifications made to the software will change the way the equipment operates and can cause severe personal injury or death, as well as damage the handlers and other parts of the system. Double-check all modifications under every mode of operation to ensure that you have not created hazards or dangerous situations.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Use proper replacement parts.
- Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.

2.7 Fire Safety

Certain electrical circuits within this equipment are protected by fuses against over-current conditions. For continued protection against risk of fire, replace fuses only with the same type and rating specified.

2.8 Chemical and Biological Safety

Normal operation of this equipment sometimes involves the use of reagents which are toxic, flammable, or biologically harmful. When using such reagents, observe the following precautions:

- Infectious samples must be handled according to good laboratory procedures and methods to prevent the spread of disease.
- Observe all cautionary information printed on the original solution containers prior to their use.
- All waste solutions must be disposed of according to your facility's waste disposal procedures.

- Liquid transfers may generate aerosols. Take all necessary precautions when using biohazardous, pathologic, toxic, or radioactive materials.
- Objects dropped onto deck, accidental tool release, or other accidental collisions may result in splashing of liquids; therefore, take appropriate safety precautions, such as the use of safety glasses when working with potentially hazardous liquids.
- Use an appropriate containment environment when using hazardous materials.
- Observe the appropriate cautionary procedures as defined by your safety officer when using flammable solvents in or near a powered-up instrument.

2.9 Cleaning Safety

Contact your laboratory safety officer and refer to the guidelines in the section titled "Chemical and Biological Safety" before cleaning equipment that may have been exposed to hazardous solutions.

2.10 Maintenance Safety

Turn the power OFF and disconnect and lockout/tagout all electrical circuits before making any modifications or connections.

Perform only the maintenance described in this manual and in the AutoSorter – III™ Maintenance and Troubleshooting Guide. Maintenance other than specified in these manuals should be performed only by Motoman-trained, qualified personnel.

It is your responsibility to decontaminate components of the AutoSorter – III™ before requesting service by a Motoman Field Service Representative or returning parts to Motoman for repair. Motoman will NOT accept any items which have not been decontaminated where it is appropriate to do so. If any parts are returned, they must be enclosed in a sealed plastic bag stating that the contents are safe to handle and are not contaminated.

2.11 Summary of Warning Information

This manual is provided to help you establish safe conditions for operating your equipment. Specific considerations and precautions are also described in the manual, but appear in the form of Dangers, Warnings, Cautions, and Notes.

It is important that you operate your equipment in accordance with this instruction manual and any additional information which may be provided by Motoman. Address any questions regarding the safe and proper operation of your equipment to Motoman Customer Support.

Notes

Chapter 3
Equipment Description

3.1 Specimen Handlers

The typical AutoSorter – III™ uses two specimen handlers specifically designed for specimen handling applications. The specimen handlers operate cooperatively within four degrees of freedom (DOF) X, Y, Z, and theta, moving specimens between input drawers, centrifuge, decapper, and output drawers. Either specimen handler is capable of operating in stand-alone mode, providing full functionality (at reduced throughput) should maintenance or failure affect the other handler.

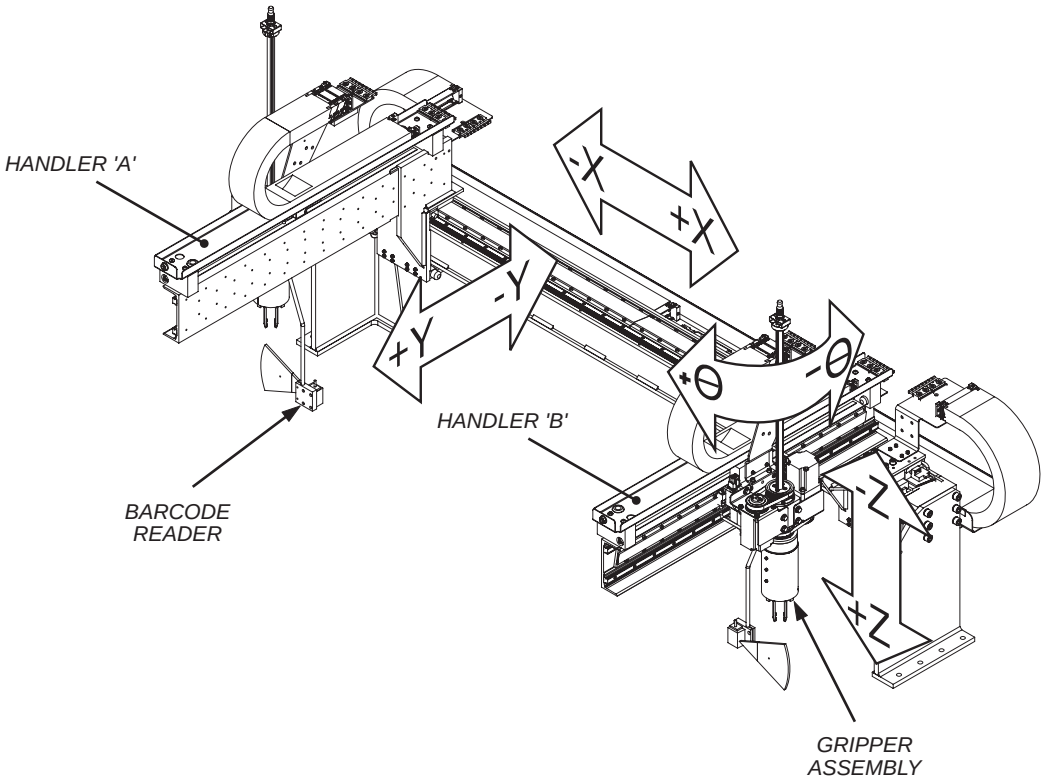
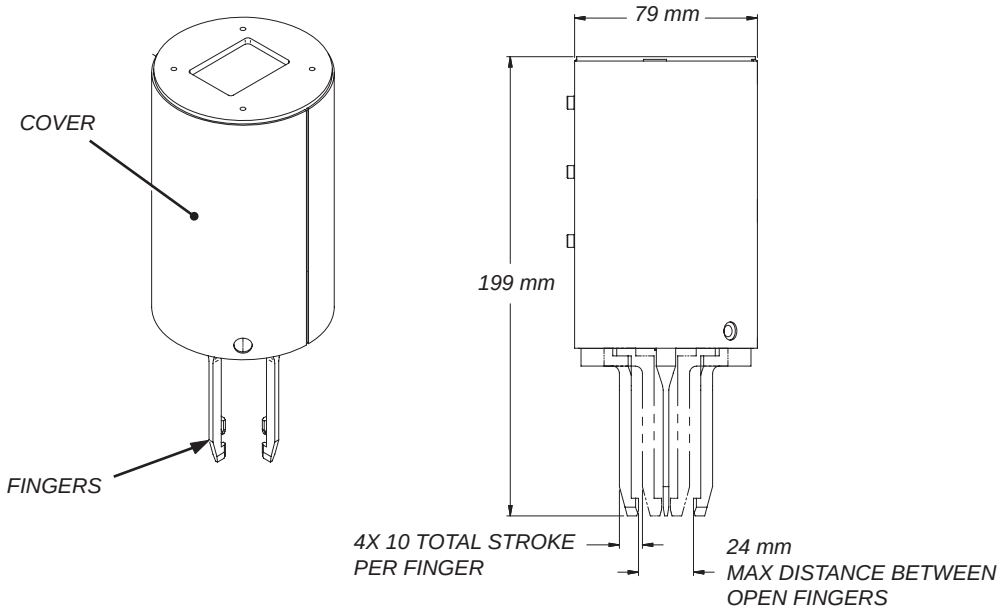


Figure 2 Specimen Handlers

3.1.1 Grippers

Each specimen handler uses a four fingered gripper designed to accommodate varying test tube diameters (10-16 mm diameter) and centrifuge buckets. Specimen tubes are grasped by closing the fingers and holding with a specified closing force. The force is determined by monitoring the motor current. Tube diameter is determined by monitoring the finger stroke.



3.1.2 Bar Code Readers

Each specimen handler has an integrated bar code reader. The handler picks up a specimen from the input rack and rotates it to permit reading of the bar code. The system scans the bar coded label on each specimen tube for positive identification. The specimen ID (SID) is compared to a local database (which is periodically updated from the Laboratory Information System (LIS)) for processing instructions. Records of processed specimens are sent to the facility's LIS network.

3.2 Motion Control Unit

The motion control unit (see Figure 2) features the Yaskawa MP2300 compact machine controller. The MP2300 machine controller easily handles multiple tasks and can process large-capacity programs at high speeds, and carry out complete synchronous control of multiple axes. Communication between the PC and controller unit is accomplished using Modbus/TCP protocol over built-in Ethernet. For additional information on the Motoman MP2300 controller, please refer to the Machine Controller MP2300 User's Manual that is included with your AutoSorter – III™ documentation package.

3.3 Operator Station

The operator station is the main control for the AutoSorter – III™ unit as well as the interface to the AutoSorter – III™ software.

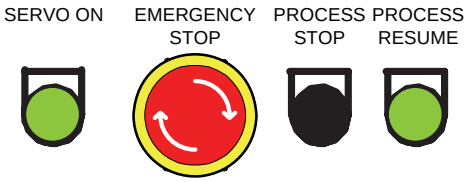


Figure 3 Operator Station Controls

3.3.1 PC

The AutoSorter – III™ computer is used to run the AutoSorter – III™ software as well as additional diagnostic and troubleshooting programs. The PC links the local Specimen ID (SID) database with the Laboratory Information System (LIS) for processing instructions.

3.3.2 Servo ON

The green SERVO ON push button places the system in servo on ready mode allowing the controller to begin the sorting process.

3.3.3 Emergency Stop (E-Stop)

Pressing the E-Stop push button stops all system motion, and the door interlock is released.

3.3.4 Process Stop

Pressing the red PROCESS STOP button stops equipment operation and interrupts the job until the operator presses the green PROCESS RESUME button to resume operation. Servo motor power remains ON. Operation resumes at the point in the program where the PROCESS STOP state was initiated. System power remains on. The PROCESS STOP button performs the same function as the PAUSE button located on the AutoSorter – III™ software screen.

3.3.5 Process Resume

The green PROCESS RESUME button is used to clear the PROCESS STOP state and resume operation. The Process Stop and Process Resume buttons are typically used to briefly interrupt operation for minor system adjustments. The PROCESS RESUME button performs the same function as the RESUME button located on the AutoSorter – III™ software screen.

3.4 Sort Deck

The AutoSorter – III™ sort deck holds the specimen trays, racks, centrifuge buckets and specimen tubes during processing. Stainless steel construction enables ease of cleaning and decontamination. Input and output drawers are configurable to permit use of most popular instrument racks, including Siemens, Olympus, Hitachi/Roche, Sysmex and Motoman.

3.4.1 Input Drawers

The typical AutoSorter – III™ unit has two input drawers capable of holding a variety of different specimen racks. These drawers can be configured to hold new unsorted tubes, reject tubes or any combination required. Each specimen rack is uniquely identified using bar code labels located on the side of the rack. The specimen racks have a molded plastic insert designed to hold the sample upright for automated handling. Control buttons located at the front of each drawer allow for loading of racks with specimens, and removal of empty racks.

3.4.2 STAT Drawer

The STAT drawer is typically used for servicing high priority samples. The STAT drawer has two trays capable of holding racks of 30 specimen tubes each. The racks have a molded plastic insert designed to hold the sample upright for automated handling.

3.4.3 Output Drawers

The typical AutoSorter – III™ unit has five user-defined output drawers designed to accommodate a variety of instrument specific racks of varying configurations. Output racks are arranged in drawers, permitting the use of generic and/or instrument-specific racks as targets. Each rack is uniquely identified using bar code labels located on the side of the rack. Racksites are also identified using bar code labels on the bottom of the output drawer. The output racks may be changed as necessary to facilitate specimen mix, conversion to use of a new instrument, etc. The output drawer may be accessed at any time to allow a rack of specimens to be removed. Control buttons located at the front of each drawer allow for loading of new racks, and removal of filled racks.

3.5 Handheld Bar Code Reader

AutoSorter – III™ uses a handheld bar code reader to scan each new drawer as it is loaded. Each tray loaded into the system must have its own bar code label. When the tray is loaded, the operator scans the tray bar code with the handheld bar code reader. This data is then loaded into the local database.

3.6 Centrifuge

AutoSorter – III™ uses the Hettich Rotanta 46 RSC Robotic Centrifuge. The Hettich Rotanta 46 RSC Robotic Centrifuge is a refrigerated centrifuge with PC control and rotor positioning. The centrifuge reaches a speed of 6,200 minimum, or a maximum of 6,446 RCF with a capacity of 4 x 250 ml, 24 x MTP, 4 DWP or comparable systems. The centrifuge is mounted to a dockable centrifuge cart for ease of service and maintenance. Refer to the Hettich *Operator's Manual for Rotanta 46 RSC Robotic Centrifuge* (P/N AB4817N), for detailed information.

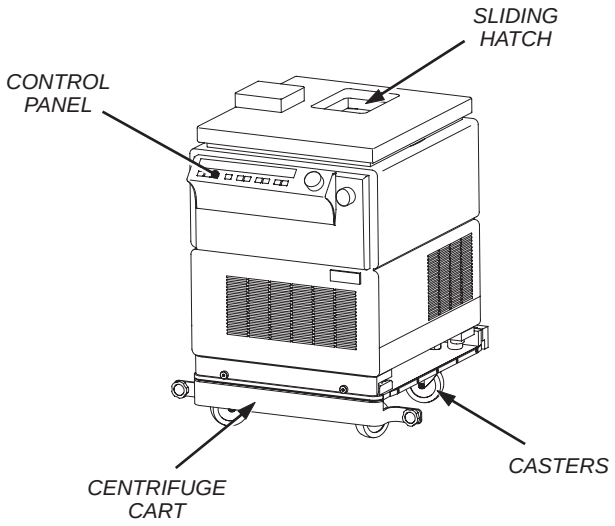


Figure 4 Centrifuge

Specimens requiring centrifugation are first loaded to one of the available centrifuge racks. The racks are weighed, and loaded to maintain balance within the allowable range of the centrifuge. The centrifuge racks are loaded until the centrifuge completes its cycle, at which time the centrifuge is unloaded, and reloaded with racks of specimens awaiting centrifugation. Once the centrifuge has completed it's cycle, the racks of centrifuged tubes are unloaded, and each specimen is transferred to decapping, or directly to its sort target if decapping is not required.

3.6.1 Centrifuge Rack

The centrifuge racks are used to load and unload sample tubes in and out of the centrifuge. Each bucket can hold 18 sample tubes.

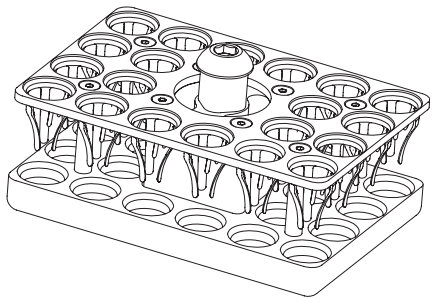


Figure 5 Sample Centrifuge Rack

3.6.2 Balance Weights

The centrifuge has an imbalance tolerance of approximately 40 grams. To meet this balance requirement, balance weights are used maintain equal bucket weights. A balance weight holder is mounted on the sort deck and contains various weights (30-50 grams).

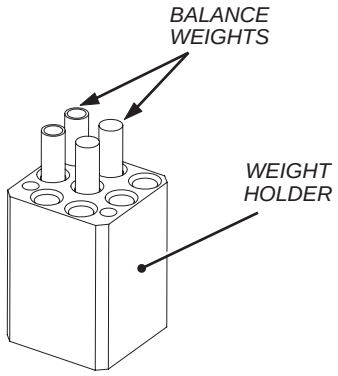


Figure 6 Balance Weight Holder

3.7 Decapping Station

The decapping station uses a servo controlled, three position index plate, and servo-controlled decapping head to remove specimen caps. The decapping station can remove both stopper and screw type caps. The handler places a specimen tube into the index plate input position. The index plate rotates the specimen tube under the decapping head where the cap is removed. The index plate then rotates the specimen to the output position to be picked up by the handler. Removed caps are dropped through a chute to the hazardous waste bin located beneath the sort deck. Specimen cross contamination is minimized by isolating the decapping head and managing air flow using a HEPA filtration system.

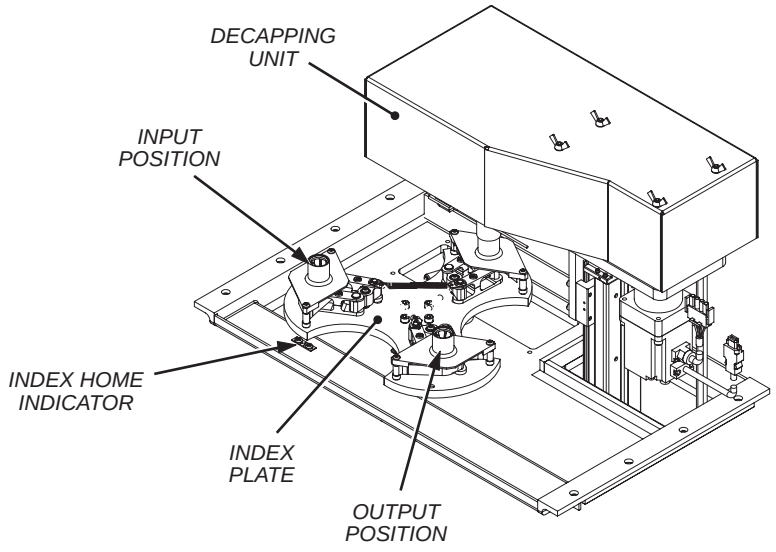


Figure 7 Decapping Station

3.7.1 HEPA Filtering System

A HEPA filtering system is attached to the decapping unit to minimize cross contamination and exposure to biohazards during the decapping process. HEPA filters are critical in the prevention of the spread of airborne bacterial and viral organisms and, therefore, infection.

3.7.2 Decap Hazardous Waste Bin

Removed caps are collected in a hazardous waste bin located beneath the sort deck. Access to the waste bin is achieved through the front door, located beneath the operator station. The waste bin is mounted on a sliding drawer for easy access through the left front door. Sensors on the waste bin indicate when the bin is full as well as if the bin has been removed.

3.8 Safety Features

The AutoSorter – III™ system includes a total safety environment. When all standard safety precautions are observed, the safety equipment helps to ensure safe operation of the work cell. The ANSI/RIA R15.06-1999 Robot Safety Standard stipulates that the user is responsible for safeguarding.

Note: Users are responsible for determining whether the provided safeguards are adequate for laboratory conditions. Users must also ensure that safeguards are maintained in working order.

3.8.1 Service Hood

WARNING!
Never operate the AutoSorter – III™ with the service hood open.

The service hood provides protection from motion hazards. The service hood automatically locks when servo power is ON. The system will not operate unless the door is closed and locked.

3.8.2 Emergency Stop (E-Stop)

In addition to the safety features described above, the AutoSorter – III™ has a strategically placed E-Stop push button. This is an operator-actuated device that immediately stops all system motion and software when activated. A software dialog appears and the red light on the light beacon lights indicating an E-stop condition. The service hood is automatically unlocked once the system is stopped.

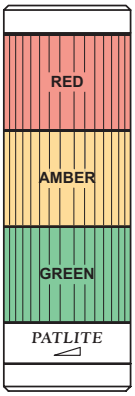
To resume operation after an E-Stop, proceed as follows:

1. Reset the activated E-Stop (1/4-turn clockwise turn). The light beacon changes to green.
2. Close the protective hood and ensure that it is properly latched.
3. Press the Servo On button.
4. Press the Process Resume button to resume operation.

3.8.3 Light Beacon Assembly

The AutoSorter – III™ Automated Specimen Processor features an advisory light beacon assembly. The light beacon assembly is mounted on top of the AutoSorter – III™ cabinet and is visible from a considerable line-of-sight distance.

The light beacon assembly consists of a red lamp, an amber lamp, and a green lamp. Illumination of these lamps provides laboratory personnel with a visual indication of both normal and abnormal AutoSorter – III™ operational status.



LIGHT BEACON FUNCTIONS		
LAMP	**STATUS**	**INDICATION**
RED	STEADY ON	SYSTEM SHUTDOWN BY SAFETY E-STOP TRIGGER
AMBER	NOT USED	NOT USED
GREEN	STEADY ON	PROCESS RUNNING
	FLASHING	SYSTEM REQUIRES OPERATOR ATTENTION

3.9 AutoSorter – III™ Software

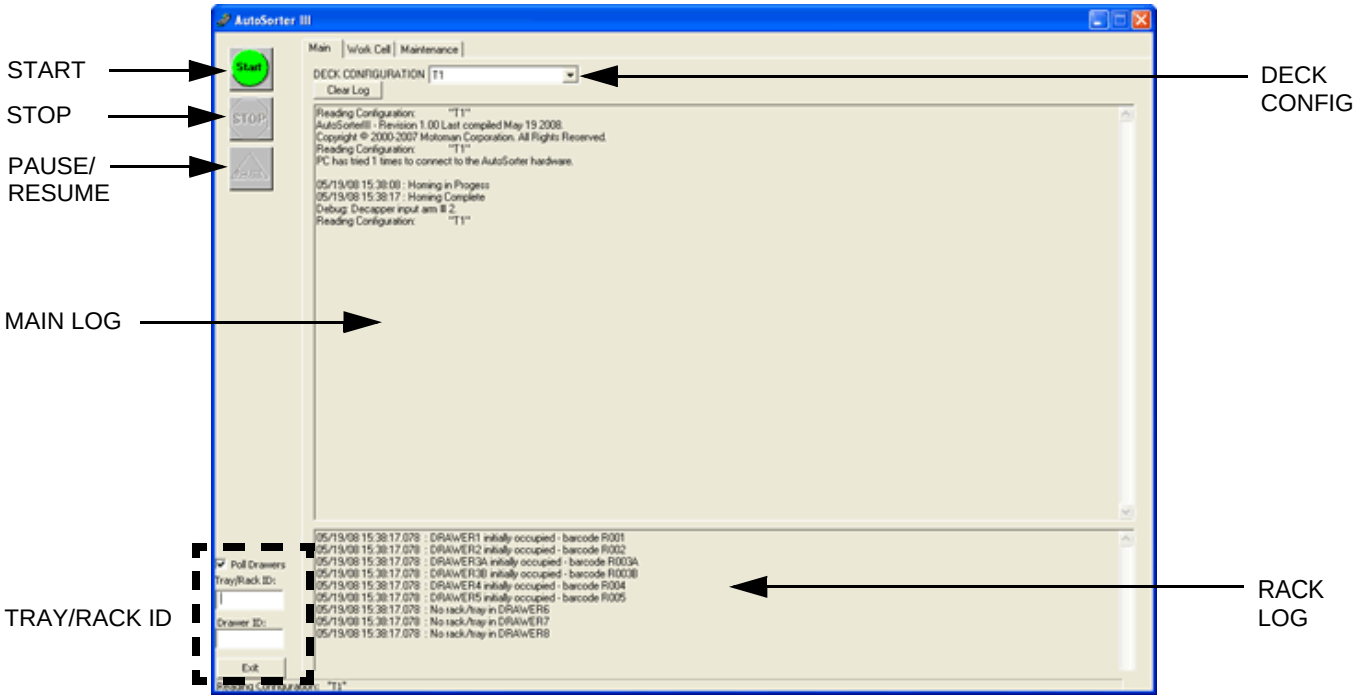
Training and day-to-day operation are well addressed with easy-to-use graphic user interfaces and Windows - ® based operating system.

The AutoSorter – III™ Automated Specimen Processor uses an Oracle database to track and manage all samples that are processed. ODBC or HL7 connectivity provides access to your LIS for specimen processing instructions. Likewise, it allows pre- and post-clinical specimen processing status and archive information to be reported back to these systems. Additionally the system records the target rack bar code (if provided) and row/column location.

Note: This tracking is very useful in providing archive consolidation of post-clinical specimens, as well as maintaining traceability of specimens through the pre-clinical sequence.

3.9.1 Main Tab

The Main tab contains all the basic operation controls and settings.



Start

The Start button begins the operation cycle. AutoSorter – III™ begins processing specimen tubes according to the specified deck configuration.

Stop

The Stop button ends the operation cycle. AutoSorter – III™ stops processing specimen tubes.

Pause/Resume

The Pause button pauses the operation cycle. Pressing the PAUSE button stops operation and interrupts the job until the operator presses the RESUME button to resume operation. Operation resumes at the point in the program where the PAUSE state was initiated.

Note: The software PAUSE and RESUME buttons perform the same function as the hardware PROCESS STOP and PROCESS RESUME buttons located on the *AutoSorter – III*™ operator station.

Tray/Rack ID

The Tray/Rack ID window records the identification number of the tray or rack as it is scanned into the system. Tray/Rack identification numbers can also be manually entered, bypassing the handheld bar code scanner.

Drawer ID

The Drawer ID window records the identification number of the drawer as it is scanned into the system. Drawer identification numbers can also be manually entered, bypassing the handheld bar code scanner.

Exit

The Exit button closes the AutoSorter – III™ application.

Deck Configuration

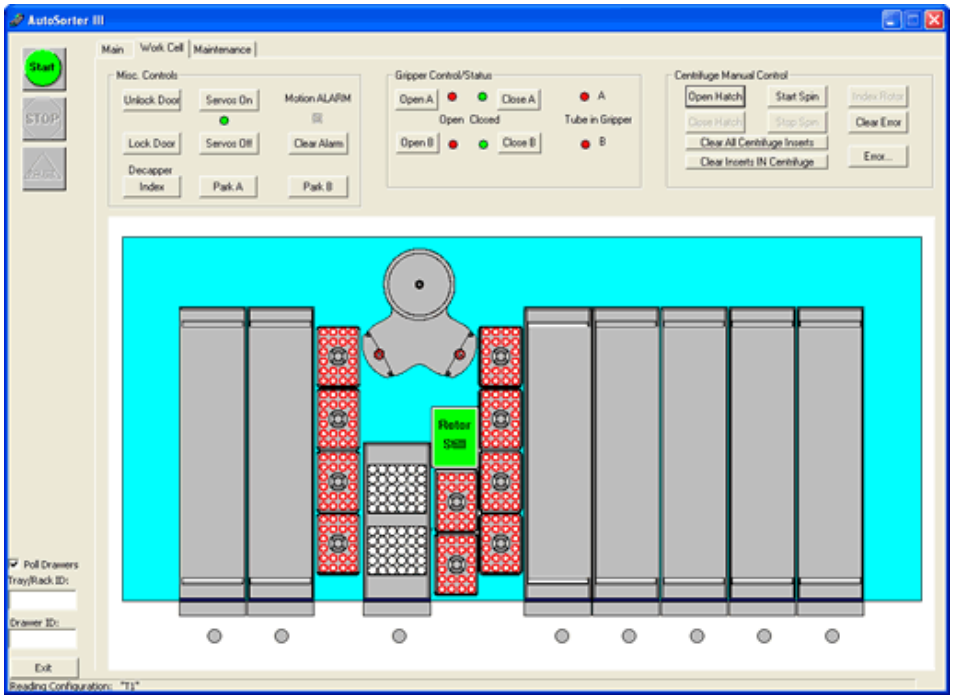
The Deck Configuration dropdown menu allows the operator to select the appropriate deck configuration from a list of pre-programmed configurations. Each deck configuration file has been programmed to reflect the variety of instrument specific racks and varying configurations.

Clear Log

The Clear Log button clears the main log window.

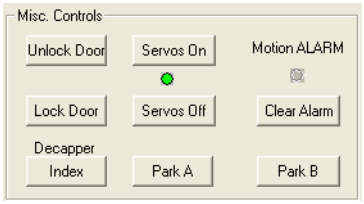
3.9.2 Work Cell Tab

The Workcell tab contains real-time monitoring of the sort deck as well as limited control of servo motor power, door locks, grippers, decapper index, and centrifuge. Monitoring of substation processes can also be performed from the Work Cell tab.



3.9.2.1 Misc. Controls

The Misc. Controls area contains control buttons for servo motor power, door locks, as well as the decapper and specimen handlers.



Unlock Door

The Unlock Door button unlocks the protective hood allowing access to the sort deck. Servo motor power is removed from the system.

Lock Door

The Lock Door button locks the protective hood closing all access to the sort deck.

Servos On

The Servos On button applies the necessary servo motor power to manually manipulate the AutoSorter – III™ components directly from the Work Cell tab.

Servos Off

The Servos Off button removes servo motor power from the AutoSorter – III™ unit.

Motion Alarm

The Motion Alarm indicator light notifies the operator when there is a motion alarm. Additional information regarding the alarm can typically be found in the system log located on the Main tab.

Clear Alarm

The Clear Alarm button is used to clear motion alarms.

Decapper Index

The Decapper Index button initiates a index sequence. The index plate rotates the input station into the decapping unit. Any tube located in the decapper unit is rotated out to the output station.

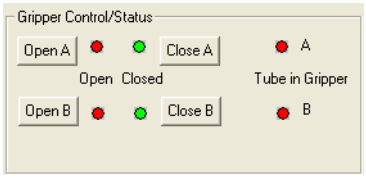
Park A

The Park A button returns the A specimen handler to the Park position at the rear corner of the sort deck.

Park B

The Park B button returns the B specimen handler to the Park position at the rear corner of the sort deck.

3.9.2.2 Gripper Control/Status



The Gripper Control/Status area allows the user to monitor and control the status of each gripper. Grippers can be opened and closed. Red and green indicators monitor the status in real-time.

Open A

The Open A button opens the gripper on Handler A.

Close A

The Close A button closes the gripper on Handler A.

Open B

The Open B button opens the gripper on Handler B.

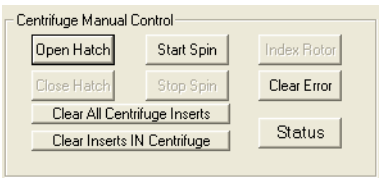
Close B

The Close B button closes the gripper on Handler B.

Tube in Gripper

The Tube in Gripper indicators verify correct gripping of specimen tubes.

3.9.2.3 Centrifuge Manual Control



The Centrifuge Manual Control area manually controls the centrifuge unit. The hatch can be opened and closed, spin cycle started and stopped, and errors monitored.

Open Hatch

The Open Hatch button opens the centrifuge hatch. The centrifuge hatch lid can only be opened when the rotor is at rest and power is ON. The lid cannot be opened during power failure. An emergency release must be executed by hand. Refer to vendor documentation for additional information.

DANGER!
To avoid serious injury and or damage to the equipment:
- Never attempt to perform an emergency release with power ON. Disconnect centrifuge from main power.
- Never open hatch lid while rotor is still in motion.
- Only use the plastic release pin provided for emergency release.
Refer to vendor documentation for additional safety precautions.

Close Hatch

The Close Hatch button closes the centrifuge hatch lid.

Start Spin

The Start Spin button initiates a centrifuge spin cycle.

Stop Spin

The Stop Spin button stops the centrifuge spin cycle.

Clear All Centrifuge Inserts

The Clear All Centrifuge Inserts button deletes all centrifuge data of those inserts in queue awaiting centrifuge.

Clear Inserts IN Centrifuge

The Clear Inserts IN Centrifuge button deletes centrifuge data of those inserts currently loaded in the centrifuge.

Index Rotor

The Index Rotor button rotates the centrifuge rotor. The specimen buckets are held in the two or four designated programmable positions under the hatch, enabling easy loading and unloading of the centrifuge buckets.

Clear Error

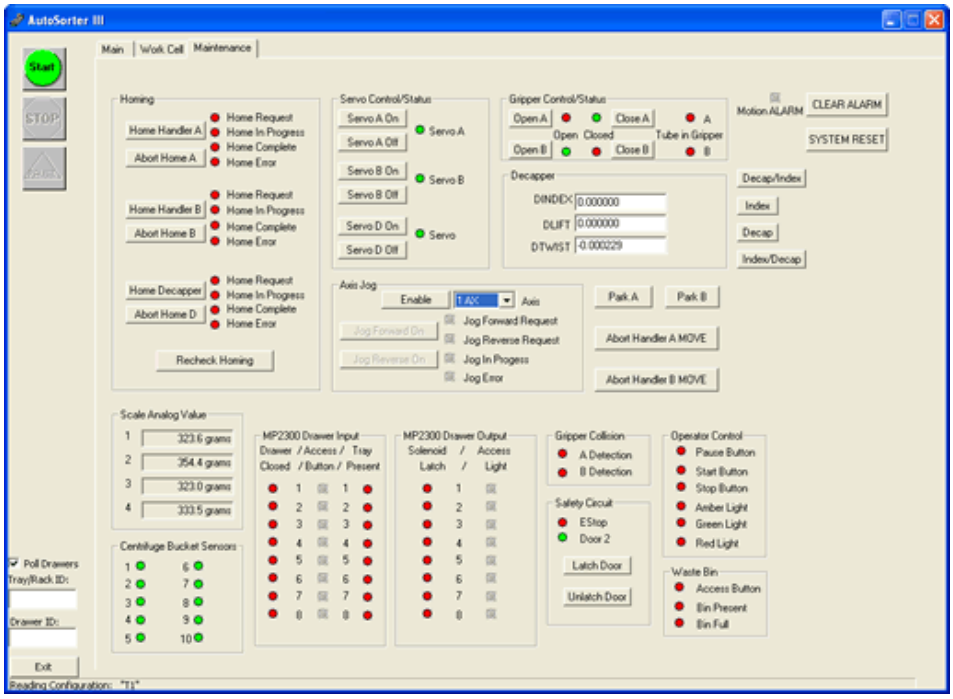
The Clear Error button is used to clear centrifuge errors from the system.

Status

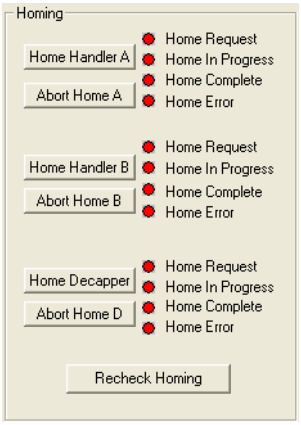
The Status button displays the current centrifuge status.

3.9.3 Maintenance Tab

The Maintenance tab provides detailed monitoring and manual control of various AutoSorter – III™ substations including; monitoring and manual control of servo power, grippers, decapper and centrifuge; homing of the specimen handlers, and monitoring of specimen drawers and basic system operation.



3.9.3.1 Homing



Home position calibration is an operation in which the physical position of the handler and absolute encoder position coincide. Although this operation is performed prior to system startup, handler crashes and other deviations may require this operation to be performed again. The Homing area allows the user to home each handler and decapper individually or as a group. Red and green indicator lights follow the process and report errors or completion of homing task.

Home Handler A

The Home Handler A button initiates the homing sequence for Handler A.

Abort Home A

The Abort Handler A button stops the homing process.

Home Handler B

The Home Handler B button initiates the homing sequence for Handler B.

Abort Home B

The Abort Home B button stops the homing process.

Home Decapper

The Home Decapper button initiates the homing sequence for the decapper.

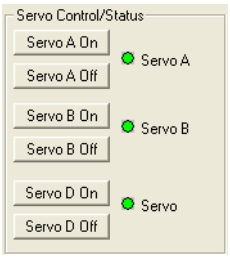
Abort Home D

The Abort Home D button stops the homing process.

Recheck Homing

The Recheck Homing button initiates the homing sequence for the entire AutoSorter – III™ unit. Both handlers and the decapper unit are homed.

3.9.3.2 Servo Control/Status



The Servo Control/Status area allows the user to manually control servo power to both handlers and the decapper. Red and green indicator lights monitor servo power to each handler and the decapper.

Servo A On

The Servo A On button applies servo power to Handler A only.

Servo A Off

The Servo A Off button removes servo power from Handler A only.

Servo B On

The Servo B On button applies servo power to Handler B only.

Servo B Off

The Servo B Off button removes servo power from Handler B only.

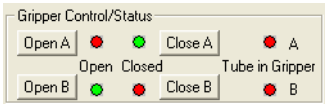
Servo D On

The Servo D On button applies servo power to the decapper only.

Servo D Off

The Servo D Off button removes servo power from the decapper only.

3.9.3.3 Gripper Control/Status



The Gripper Control/Status area allows the user to monitor and control the status of each gripper. Grippers can be opened and closed. Red and green indicators monitor the status in real-time.

Open A

The Open A button opens the gripper on Handler A.

Close A

The Close A button closes the gripper on Handler A.

Open B

The Open B button opens the gripper on Handler B.

Close B

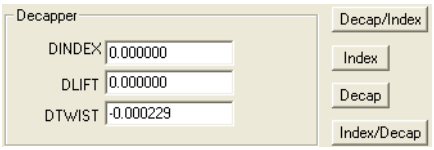
The Close B button closes the gripper on Handler B.

Tube in Gripper

The Tube in Gripper indicators verify correct gripping of specimen tubes.

3.9.3.4 Decapper

The Decapper area allows the user to manually activate various components of the decapper substation.



DINDEX

The DINDEX window displays.

DLIFT

The DLIFT window displays.

DTWIST

The DTWIST window displays.

Decap/Index

The Decap/Index button initiates a full decap/index sequence. The decapping unit performs the decap sequence and then the index plate rotates the specimen to the output target.

Index

The Index button rotates the input target into the decapping unit.

Decap

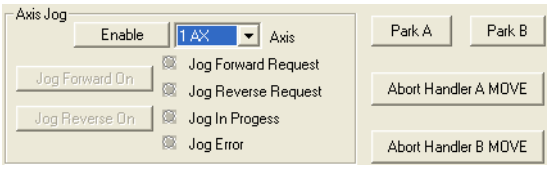
The Decap button initiates a decap sequence.

Index/Decap

The Index/Decap button initiates a full index/decap sequence. The index plate rotates the input target into the decapping unit and the decapping unit performs a decap sequence.

3.9.3.5 Axis Jog

The Axis Jog area allows the user to manually jog various components of the AutoSorter – III™ unit including the specimen handlers, grippers, and decapper.



Enable Axis

The Enable Axis dropdown menu allows the user to select which axis will be enabled.

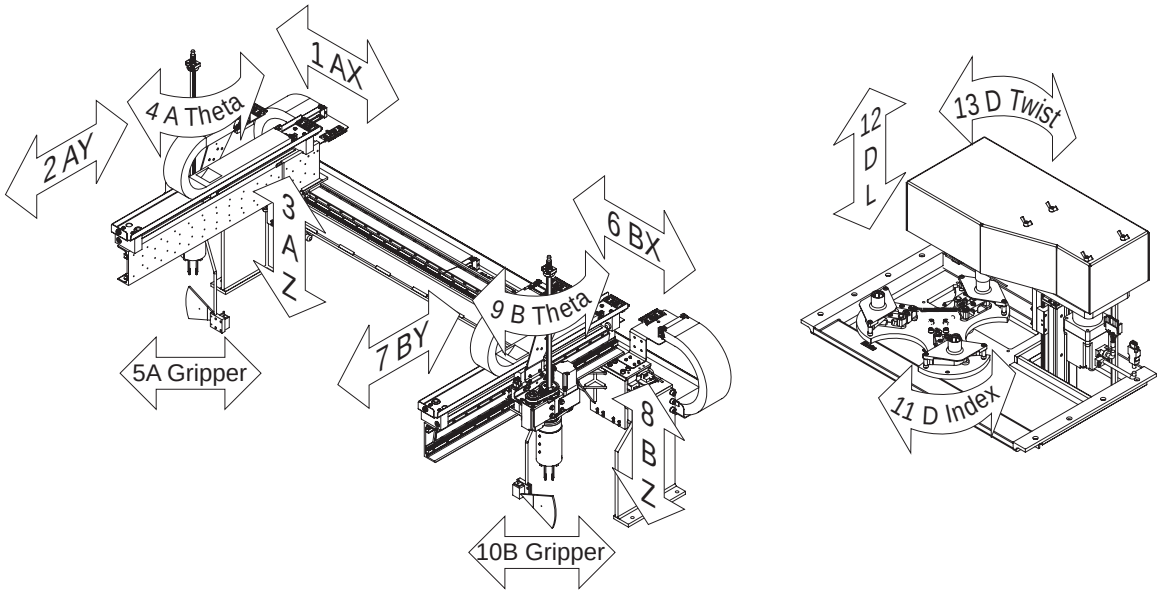


Figure 8 Jog Axes

Jog Forward On

The Jog Forward On button moves the selected axis forward in the positive direction.

Jog Reverse On

The Jog Reverse On button moves the selected axis backwards in the negative direction.

Park A

The Park A button returns the A specimen handler to the Park position at the rear corner of the sort deck.

Park B

The Park B button returns the B specimen handler to the Park position at the rear corner of the sort deck.

Abort Handler A MOVE

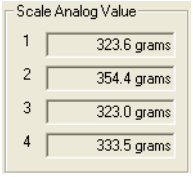
The Abort Handler A MOVE button stops all A specimen handler motion.

Abort Handler B MOVE

The Abort Handler B MOVE button stops all B specimen handler motion.

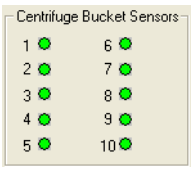
3.9.3.6 Scale Analog Value

The Scale Analog Value area measures the weight, in grams, of each of four centrifuge buckets. Centrifuge buckets must be weighed and loaded to maintain balance within the allowable range of the centrifuge.



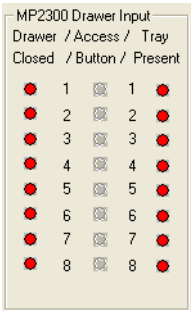
3.9.3.7 Centrifuge Bucket Sensors

The Centrifuge Bucket Sensors indicate placement of the centrifuge buckets in up to ten locations, depending on your system's configuration.



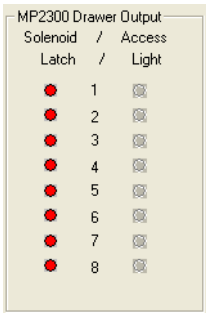
3.9.3.8 MP2300 Drawer Input

The MP2300 Drawer Input area monitors drawer conditions for up to eight input drawers, depending on your system's configuration. Drawer closed, tray present, and access button activation are all monitored from this location.



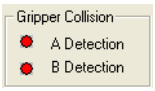
3.9.3.9 MP2300 Drawer Output

The MP2300 Drawer Output area monitors drawer conditions for up to eight output drawers, depending on your system's configuration. Solenoid latch, and access light activation are all monitored from this location.



3.9.3.10 Gripper Collision

The Gripper Collision area monitors gripper collision for both the A and B specimen handlers.



3.9.3.11 Safety Circuit

The Safety Circuit area monitors safety circuit conditions including E-Stop and Door Latch. The access door can be latched or unlatched from this location using the Latch Door and Unlatch Door buttons.

3.9.3.12 Operator Control

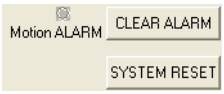
The Operator Control area monitors Start, Stop, and Pause conditions as well as light beacon operator status.

3.9.3.13 Waste Bin

The Waste Bin area monitors the condition of the waste bin including bin presence, full, and access.

3.9.3.14 Motion ALARM

The motion alarm indicator light monitors the system for motion alarm occurrences.



CLEAR ALARM

The CLEAR ALARM buttons clears minor motion alarms such as gripper collisions. Press the CLEAR ALARM button after the alarm condition has been cleared.

SYSTEM RESET

The SYSTEM RESET buttons clears major motion alarms. The SYSTEM RESET is equivalent to cycling power OFF and ON.

Note: The system must be rehomed following a system reset.

3.10 AutoSorter – III™ Specifications

Table 2 Technical Specifications

General Characteristics	
Sorting Throughput	600 tubes per hour (max)
Sample Tube Types Processed	Most standard collection tubes: BD, Sarstedt, Greiner, Terumo Accepts most 3, 5, 7 or 10ml tubesAble to handle sample tubes with: - Hemogard - Rubber stopper - Screw cap type closure
Sample Identification	Laser bar code reader Positive ID via bar code; able to handle all standard bar code formats including: - Interleaved Pharmacode 2 of 5 - Codabar (NW 7) EAN 128 - Code 39 UPC - Code 128 - Code 93 - ISBT Code 128 EAN
Sample Bar Code Orientation	Automatically orients bar code labels to correct position in analyser racks
Standard Input	2 input drawers - 150 tubes each 1 STAT drawer - two trays, 30 tubes each up to 17 mm in diameter
Output Area	5 output sorting drawers capable of holding up to 1,080 samples depending on configuration of user defined trays
"Error" Sorting	User defined: can sort out "exception tubes" due to no bar code read, no test order download, etc.
Automated Archive Preparation	Transfers tube to any sorting location; records and transfers an archive rack number and location (XY) information
Decapping	
Sample Tube Closures	BD Vacutainer™ and Hemoguard™, Sarstedt Monovette™ and screw top closures
Automated Decapping	User defined: Selective on a tube-by-tube basis
Data Processor	
Graphic User Interface	Windows® XP icon driven user interface
Program Storage	$\geq$ 20 GB (hard drive); CD-ROM drive

Table 2 Technical Specifications

Database	Data containing sample ID with XY plot in tray transferred to LIS
Software	Windows® XP-based software Oracle Database Graphic User Interface
Electrical Requirements	
Electrical Consumption	approx. 10.8 kVA
Current	10 Amps @ 208 VAC Max
Circuit	Dedicated and noise free
Voltage	208/230 VAC, 3 phase
Frequency	50/60 Hz [+/-1%]
Ground Requirements	Resistance, 100 Ohms
Environmental Requirements	
Ambient Temperature	15 ~ 30° C, 60-85° F
Ambient Humidity	10 ~ 90% relative humidity, no condensation
Dimensions	
Width	2,308 mm (91 in.)
Depth	1,250 mm (49 in.)
Height	2,051 mm (81 in.)
Weight	500 Kg (1,000 lbs.)
Approximate Weight, SD	950 Kg (2,100 lbs.)
Approximate Shipping Weight, SD	1,140 Kg (2,500 lbs.)
Approximate Weight, SDC	1,142 Kg (2,520 lbs.)
Approximate Shipping Weight, SDC	1,360 Kg (3,000 lbs.)
Space Requirements	
Floor Space	3.8 m x 2.75 m (12.5 ft. x 9.0 ft.)

Notes

Chapter 4
Installation

4.1 Overview

The AutoSorter – III™ Automated Specimen Processor is a fully integrated pre- and post-analytical sample-processing system providing hands-free sample handling, processing and preparation. The AutoSorter – III™ is intended for installation by trained Motoman personnel. Therefore, this manual does not provide all of the information necessary for installation of the AutoSorter – III™. Rather, it provides instructions for all of the procedures which can be performed by the user. Installation instructions for the various accessories available for AutoSorter – III™ are provided in the respective vendor manuals.

CAUTION!
The AutoSorter-III system should be installed by qualified personnel who are familiar with the installation and set-up of complex laboratory equipment.

CAUTION!
Be sure to handle all system components with care. While the AutoSorter-III system is not extremely fragile, it is a sophisticated robotic system that can be damaged by rough handling.

Installation of the AutoSorter – III™ should be performed by personnel who are familiar with this Motoman product. Follow established safety procedures at all times throughout the installation process. Failure to use safe work practices can result in damage to the equipment and injury to the workers. Always comply with established safety procedures throughout the installation process (refer to Chapter 2).

Follow all requirements found in UL standards, UL 61010-1, Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.

4.2 System Requirements

All system components and most hardware items required for installation of the AutoSorter – III™ system are included with your shipment. The customer may be required to supply some items, such as hand tools and special anchor bolts. This chapter will assist you in identifying the items required to prepare your laboratory.

4.2.1 Electrical Requirements

DANGER!
Local electrical service connection to the AutoSorter – III™ system must be performed by a qualified, licensed electrician. Electrical and grounding connections must comply with the National Electrical Code (NEC), as well as all state and local electrical codes.

Table 3 Electrical Requirements

Electrical Consumption	approx. 10.8 kVA
Current	10 Amps
Circuit	Dedicated and noise free
Voltage	208/230 VAC, 3 phase
Frequency	50/60 Hz [+/-1%]
Ground Requirements	Resistance, less than 100 Ohms

AutoSorter – III™ should be connected directly to a power source known to be free of erratic power loads, spikes, and electromagnetic interference. Power lines reserved for instrument use should have adequate reserve capacity. Normal loading should not exceed 50% of nominal capacity to allow for start up loads and the addition of new instruments.

4.2.2 Weight and Space Requirements

The AutoSorter – III™ (and accessories) must be installed on a flat surface capable of supporting 3000 lbs (or approximately 1361 kg). The surface must be level and stable. Allow an additional 1.2 - 1.5 m (4 to 5 ft.) on all sides of the system to provide the clearance needed for installation and servicing.

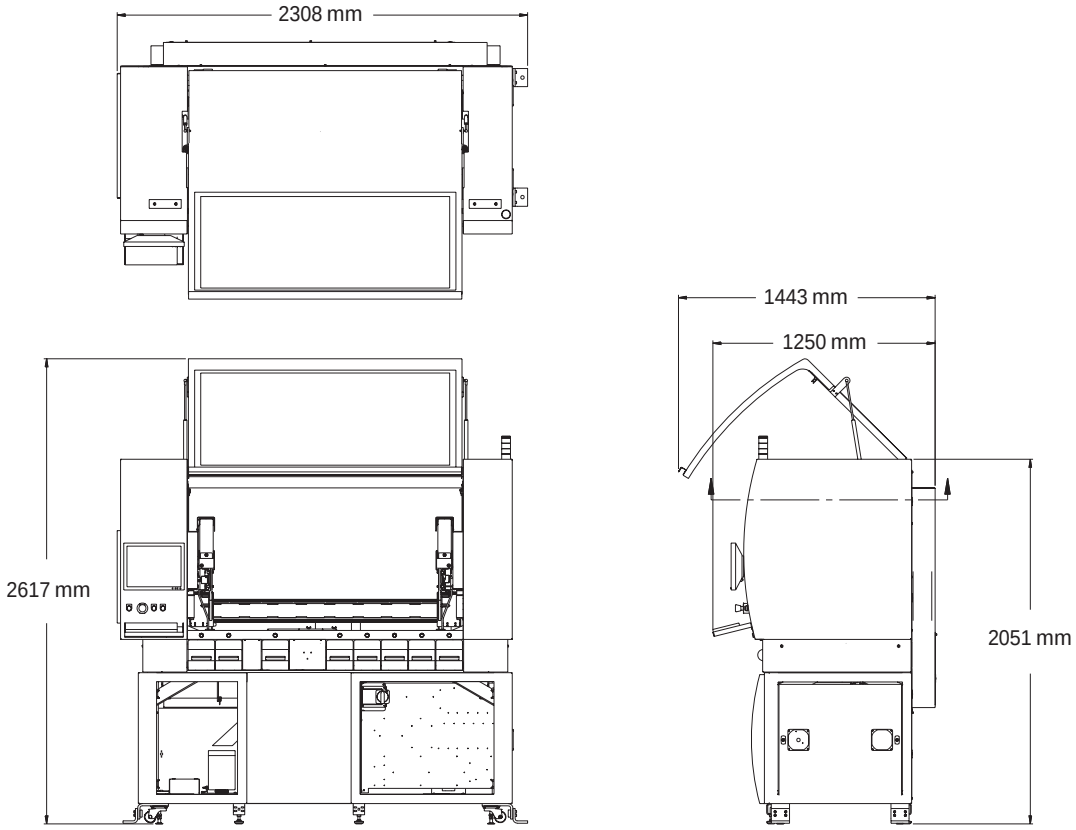


Figure 9 General System Dimensions

4.3 Unpacking the AutoSorter – III™

System components are attached to wooden shipping skids and/or wooden blocks at the factory, prior to shipment to the customer. The customer is responsible for removing the shipping skids and/or blocks and inspecting the components for shipping damage.

Note: If you notice any equipment damage, notify your shipping contractor as soon as possible.

In general, your Motoman personnel will unpack the AutoSorter – III™ for initial installation. However, if you should need to unpack the system before the installation appointment, use the following procedure.

DANGER!
Forklift truck operation should be performed only by licensed personnel. Never place any part of your body under a suspended load or move a suspended load over any part of another person's body. Careless handling may result in severe personal injury or death.

Unpack the AutoSorter – III™ from the shipping container as follows:

1. Unbolt the AutoSorter – III™ unit from the shipping pallet.
2. Discard or recycle the shipping skids and other shipping materials.

WARNING!
The AutoSorter – III™ unit weighs approximately 1300 kg (2870 lbs). Ensure that your lifting device is rated to safely handle this load.

3. Using a forklift or overhead crane, lift the AutoSorter – III™ unit from the shipping skid.

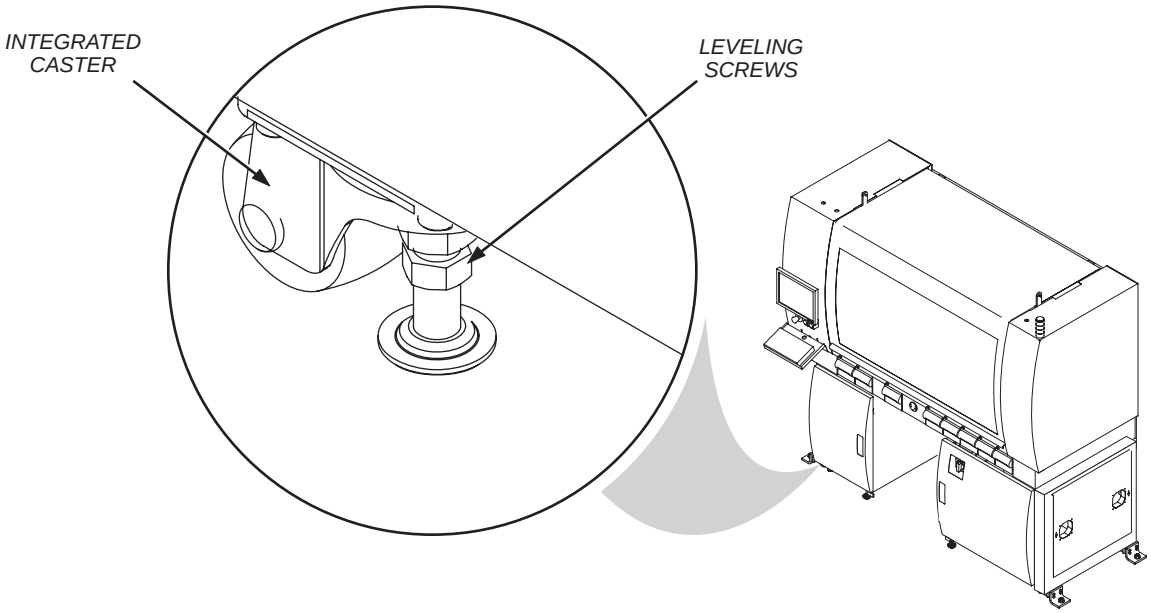
4.4 Installing the AutoSorter – III™ Unit

WARNING!
The AutoSorter – III™ unit weighs approximately 1300 kg (2870 lbs). Use caution when moving the AutoSorter – III™ unit on inclines to avoid damage to the equipment or injury to personnel.

AutoSorter-III has been designed to accommodate most building access points such as elevators, hallways, and doorways, making installation extremely flexible. However, some disassembly may be required to access locations with less than 36 inches of clearance. Integrated castors allow easy movement of the AutoSorter – III™ unit by two to three people.

The AutoSorter-III unit should be firmly fixed to the floor or foundation rigid enough to support the unit. The surface of the floor should be level and even. Integrated levelling pads are used to raise the unit off the casters and to provide proper level.

1. Raise the leveling screws high enough to provide adequate clearance for the integrated castors.



2. Using the integrated castors, move the AutoSorter-III unit into position. Allow an additional 1.2 - 1.5 m (4 to 5 ft) on all sides of the system to provide the clearance needed for installation and servicing.

3. Lower the leveling screws and raise the unit off the integrated casters to provide adequate clearance for the centrifuge.

4.4.1 Installing the Centrifuge (Option)

The centrifuge is shipped attached to the integrated centrifuge cart and separate from the main AutoSorter – III™ unit. It is attached to a wooden shipping skid and/or wooden blocks at the factory, prior to shipment to the customer. The customer is responsible for removing the shipping skids and/or blocks and inspecting the components for any shipping damage. The centrifuge power and communication cables remain routed within the main AutoSorter – III™ unit during shipping.

Note: If you notice any equipment damage, notify your shipping contractor as soon as possible.

In general, Motoman personnel will install the centrifuge along with the rest of your AutoSorter – III™ unit. However, if you are installing the centrifuge, use the following procedures.

WARNING!
The centrifuge unit weighs approximately 230 kg (510 lbs). Use caution when moving the centrifuge to avoid damage to the equipment or injury to personnel.

1. Unbolt the centrifuge unit from the shipping pallet.
2. Discard or recycle the shipping skids and other shipping materials.

CAUTION!
Do not lift the centrifuge by the front panel!

3. Using at least four people, hold the centrifuge on both sides and lift the unit from the shipping skid.
4. Locate the centrifuge power and communication cables.
5. Route the power and communication cables to the back of the centrifuge.

Note: The AutoSorter unit must be raised off it's integrated casters before the centrifuge can be installed.

6. Using the integrated castors on the centrifuge cart, roll the centrifuge into place between the controller unit and side cabinet.

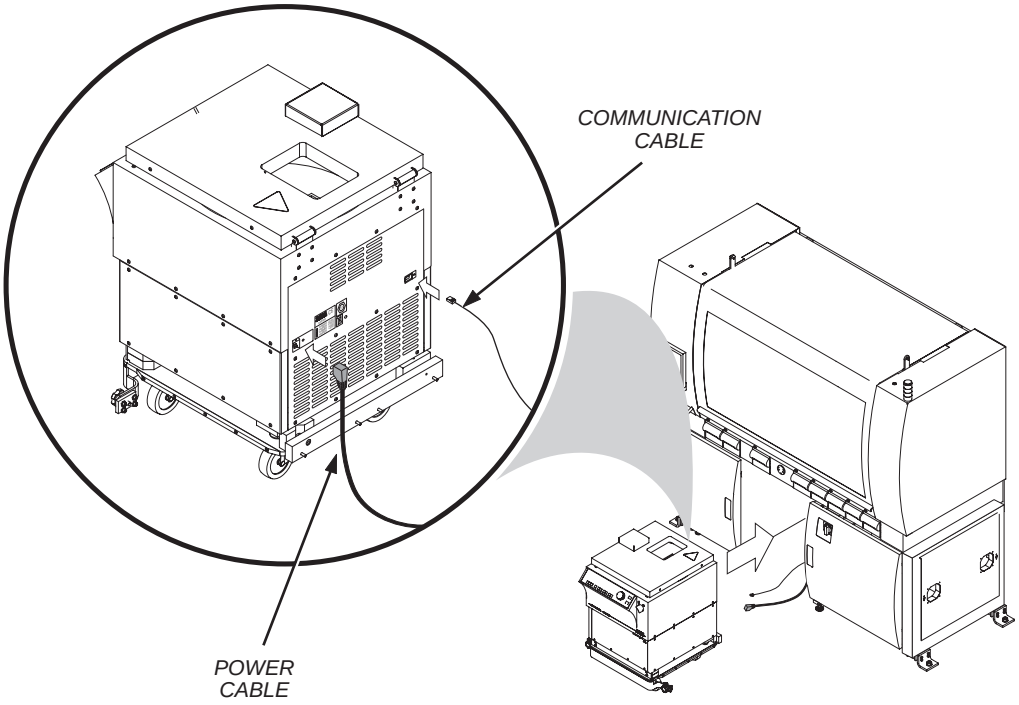


Figure 10 Installing the Centrifuge

7. Bolt the centrifuge cart loosely to the AutoSorter – III™ frame using the integrated bolts. Do not tighten until after the unit has been properly leveled.

4.4.2 Leveling and Anchoring the AutoSorter-III Unit

With the centrifuge in place, the unit must be properly leveled and anchored as required for your installation. Contact your laboratory safety officer and refer to the guidelines in Section 2 for information regarding your specific installation.

1. Place a spirit-level on the center rear of the sort deck.
2. Adjust the left to right level using the leveling screws on either end of the back of the unit.
3. Place a spirit-level on left side of the sort deck (point A).
4. Adjust the front to back level using the leveling screw on the front left corner.
5. Place a spirit-level on right side of the sort deck (point B).
6. Adjust the front to back level using the leveling screw on the front right corner.
7. With the unit level, lower the four support screws, located in the middle of the unit, until they touch the ground and then turn an additional half turn.

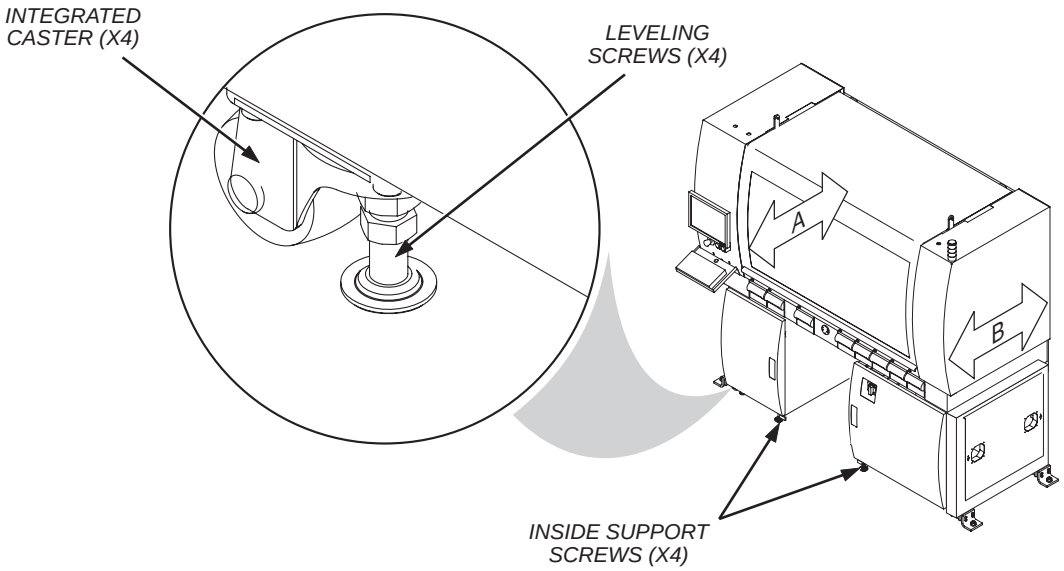


Figure 11 Leveling the Unit

8. Anchor the unit to the floor as required for your installation.
9. Tighten the anchor adjustment screws.
10. Tighten centrifuge mounting bolts securely to the AutoSorter – III™ frame.

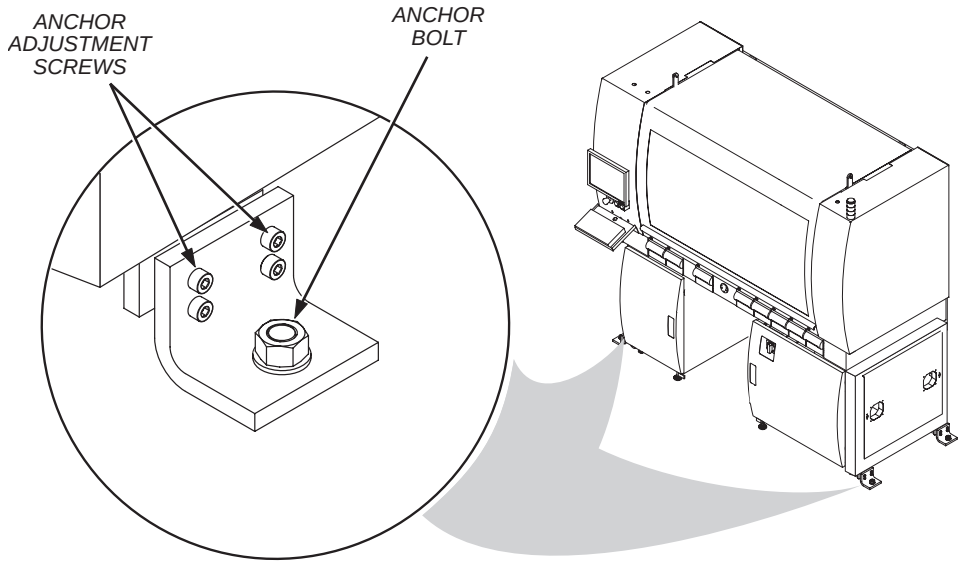


Figure 12 Anchoring the Unit

4.5 Installing the Computer

The computer is shipped in it's original packaging. The computer power and communication cables remain routed within the AutoSorter – III™ unit during shipping.

1. Unpack the computer from it's shipping box.
2. Discard or recycle the shipping box and other packing materials.
3. Open the PC cabinet located on the top left side of the AutoSorter – III™ unit.
4. Remove any packing material from the PC cabinet and place the computer in the PC cabinet.

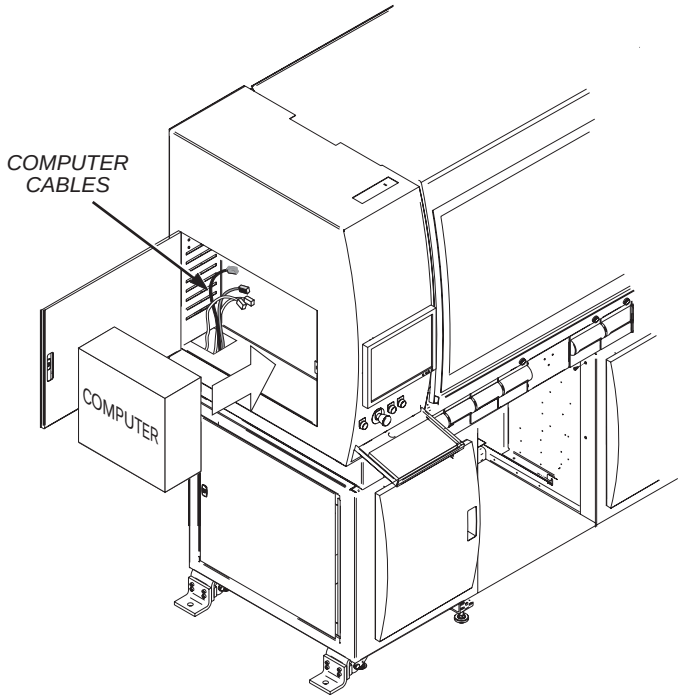


Figure 13 Computer Installation

5. Mount the monitor to the front of the cabinet (as required) using hardware provided.
6. Place the keyboard on the keyboard tray in front of the operator station.
7. Make all necessary power and communication cable connections according to vendor documentation provided.
8. Close the PC cabinet.

4.6 Connecting to Local Electrical Service

DANGER!
Local electrical service connection to the AutoSorter – III™ system must be performed by a qualified, licensed electrician. Electrical and grounding connections must comply with the National Electrical Code (NEC), as well as all state and local electrical codes.

Note: AutoSorter – III™ is configured for 3-phase 208/230V AC primary power. For additional information, refer to the electrical drawings and schematics that are included with your equipment documentation package.

After all system components have been properly installed and interconnected, connect local electrical service to the AutoSorter – III™.

The power line should connect directly to a power source known to be clear of erratic power loads, spikes, and electromagnetic interference. Power lines reserved for instrument use should have adequate reserve capacity. Normal loading should not exceed 50% of nominal capacity to allow for start up loads and the addition of new instruments.

1. Install 3-phase power wiring to the power block located behind the controller unit.
2. Terminate the ground wire to the ground block.

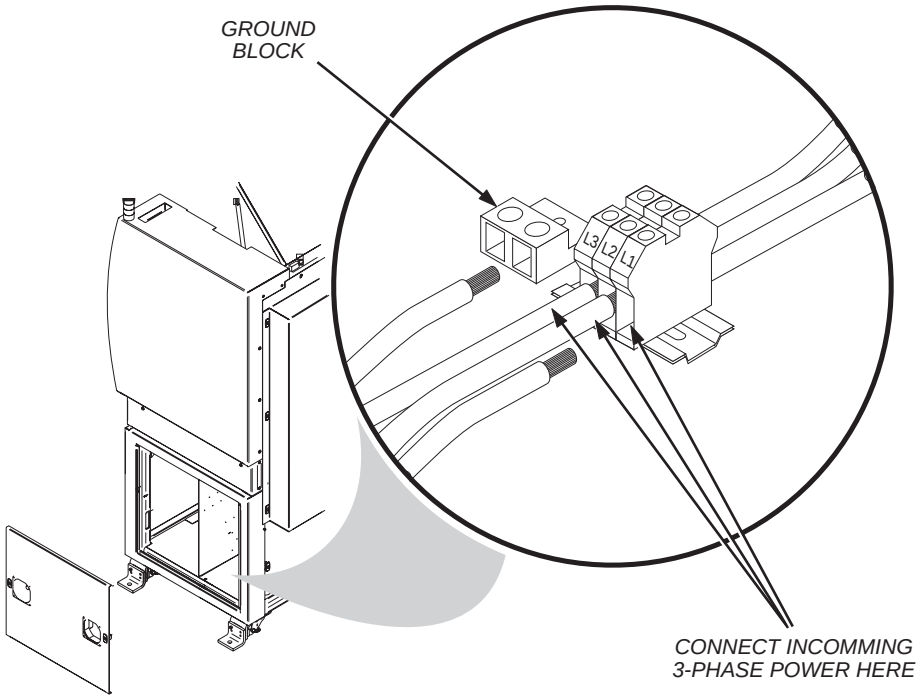


Figure 14 Power Wiring

4.7 Safety/Operation Check

Before installing the personality racks for your application, take a few minutes to perform a safety/operation check:

1. Ensure that all shipping material has been removed from the system.
2. Check that the work cell door hatch is closed and latched.
3. Check that all cable connections are tight.
4. Ensure that the centrifuge is installed correctly. Refer to centrifuge manual included in your documentation package.
5. Verify that incoming line power matches the input power specified on the sticker on the front of the unit.

Your AutoSorter – III™ is now ready for power-up. The system should be operated only by personnel who are familiar with the operation of this system and laboratory safety requirements. Turn the main power ON, and continue the safety/operation check.

6. Check operation of the E-Stop push button.
7. Check operation of Process Stop and Process Resume buttons.
8. Check Door/Hatch Interlock.

4.8 Installation of Personality Racks and Fixtures

Your AutoSorter – III™ system is now ready for the installation of personality racks and fixtures for your application. Installation of personality racks and fixtures should be performed by personnel who are familiar with the operation of this system. Personality racks and fixtures are supplied by the customer.

4.9 Configuring Your AutoSorter – III™ Software

The AutoSorter – III™ software is used to control the AutoSorter – III™ workstation (and its devices) from the operator station computer. During the configuration process, you can specify the tools, labware, and devices for your system as well as enable communication between the integrated Oracle database and the Laboratory Information System (LIS).

4.10 Homing/Alignment

Proper alignment is critical to the performance of AutoSorter – III™. Home position calibration is an operation in which the physical position of the handler and absolute encoder position coincide. Although this operation is performed at system startup, handler crashes and other deviations may require this operation to be performed again. The Homing area in the Maintenance tab allows the user to home each handler and decapper individually or as a group. Red and green indicator lights follow the process and report errors or completion of homing task.

Chapter 5
Operation

5.1 Overview

The Motoman AutoSorter – III™ is a fully integrated pre- and post-analytical sample-processing system providing hands-free sample handling, processing and preparation. Two specimen handlers sort specimen tubes from the operator loaded infeed drawers to personality racks for various analytical equipment. Centrifuging and decapping processes are performed as specified for each individual specimen.

Incoming specimens are prepared for processing simply by loading them into an input rack (in random order). The input rack is in turn loaded into an input drawer. The system is started from the PC at the operator station. Once the correct deck configuration program is selected, the operator starts the system from the PC. The handler picks up a specimen from the input rack and rotates it to permit reading of the bar code. The specimen ID (SID) is compared to a local database (which is periodically updated from the LIS) for processing instructions. The processing instructions direct the specimen processing sequence, which may include any combination of centrifugation, decapping and/or sorting to target racks.

Operator duties include:

- Loading specimen trays/racks into the input drawers
- Unloading empty trays/racks from the input drawers
- Unloading populated archive trays from the output drawers
- Removing test tubes that have been rejected due to no-read/no-database bar code scan.
- Emptying removed caps collected in the hazardous waste bin

5.2 Programming

The operation of this system is programming dependent. The following operating instructions are based on one possible configuration of this system. Your system configuration and job structure may differ slightly from that presented here; however, basic operation will be the same.

Any changes made to your system configuration and/or job structure will alter the operation of this equipment. Modifications should only be performed by personnel who have received operator training from Motoman, and who are familiar with the operation of this Motoman system. If you have questions concerning the configuration of your system, please contact Motoman Customer Support (refer to Section 1.4).

5.3 Daily Operation

The procedures below represent the typical operating sequence from power up to shutdown. Your basic operating procedures may vary, depending on your situation.

- Perform start-up procedures (refer to Section 5.3.1).
- Perform operation cycle (refer to Section 5.2.4).
- Perform system shutdown (refer to Section)

5.3.1 Start the System

Procedure –

1. Set MAIN POWER switch on the controller unit to ON.

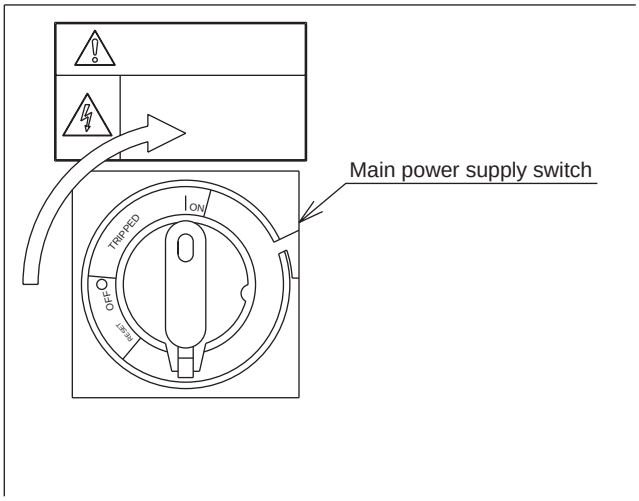
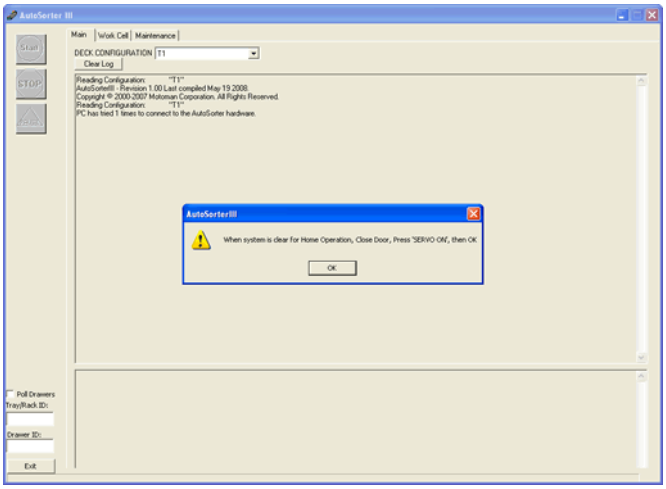


Figure 15 Turning ON Main Power

CAUTION!
Read and understand the vendor supplied centrifuge instructions shipped with your system before initial operation. Only personnel who have read and understood the centrifuge operating instructions should be allowed to operate the device.

2. Set POWER switch on centrifuge to ON; centrifuge pilot light turns on.
3. Set power on both PC and monitor to ON.
4. Start AutoSorter – III™ software from the PC Start Menu or Desktop icon. A dialog box appears requesting the sort deck be cleared for operation.



5. Make sure the sort deck is clear for safe operation.
6. Make sure the grippers are not holding a specimen.
7. Make sure the enclosure door is closed and latched.
8. Make sure E-Stop button on the Operator Station is released.
9. Place system in ready mode by pressing the SERVO ON button on the Operator Station.
10. Click [OK]. AutoSorter – III™ automatically begins the homing/alignment process.

5.3.2 Perform Operation Cycle

DANGER!
Before operating AutoSorter – III™, verify correct operation of the system E-Stop button. Check that the green light beacon goes out and the red light comes on when the emergency stop button is pressed. Injury or damage to machinery may result if the system cannot be stopped in case of an emergency.

WARNING!
Before operating AutoSorter – III™, verify correct deck configuration selection from dropdown menu. Operating AutoSorter – III™ with the incorrect deck configuration will cause damage to system components as well as specimen samples.

5.3.2.1 Loading the Infeed Drawer(s)

1. Select the correct deck configuration from the dropdown menu for your application.
2. Prepare incoming specimens for processing simply by loading them into an input rack (in random order).
3. Scan the bar code on the input specimen rack using the handheld bar code scanner. The specimen rack number appears in the Tray/Rack ID window of the AutoSorter – III™ software.
4. Scan the bar code on an empty input drawer. The input drawer number appears in the Drawer ID window of the AutoSorter – III™ software.
5. Insert the specimen rack into the input drawer and press the lockdown button. The rack and drawer are securely locked in place.

Note: It is important that the specimen racks are inserted properly with the bar codes facing out so the bar code reader can log the specimen rack in the data base. If the rack is not oriented properly it will not be recognized by the system.

5.3.2.2 Loading the Outfeed Drawer(s)

1. Scan the bar code on the output personality rack using the handheld bar code scanner. The output personality rack number appears in the Tray/Rack ID window of the AutoSorter – III™ software.

WARNING!
Depending on your configuration, there may be several different personality racks loaded into a single drawer. Be sure to correctly load and scan both the personality racks and racksite bar codes according to your deck configuration to avoid damage to equipment.

2. Scan the bar code on the correct output drawer. The output drawer number appears in the Drawer ID window of the AutoSorter – III™ software.
3. Insert the personality rack into the output drawer.
4. Load all personality racks correctly into output drawer according to deck configuration and press the lockdown button. The racks and drawer are now securely locked in place.
5. Press the START button on the PC screen. AutoSorter – III™ begins processing the tubes.

Note: If AutoSorter – III™ does not start, ensure that the racks are properly oriented and that they are fully seated.

Automated Operation –

1. Each specimen tube bar code is scanned to determine sort location as well as additional process requirements such as centrifuging and decapping.

Note: If the specimen tube bar code is missing, invalid, or cannot be read, AutoSorter – III™ deposits the sample into the designated reject drawer.

2. If the specimen requires centrifuging, it is placed into a centrifuge rack and waits for additional specimens requiring centrifuging.
    a. The centrifuge racks are weighed, and loaded to maintain balance within the allowable range of the centrifuge. Balance weights are used to offset balance of centrifuge baskets.
3. If the specimen requires decapping, it is placed in the input station of the decapper.
    a. The specimen is rotated into the decapping unit where the tube is decapped and the cap discarded into the biohazard waste bin.
    b. The specimen is moved to the output station to be removed by the specimen handler.
4. After all substation processes are complete, the specimen handler places the specimen tube into the specified output rack for the required analytical equipment.
5. The local database is updated with archive tray ID, sample tray location, and sample ID. Data is uploaded to the host laboratory LIS as designated.
6. When the personality rack is filled, the output drawer light blinks and the light beacon flashes green, indicating operator attention is required.
7. The personality rack can be removed from the drawer and is ready for further processing according to your laboratory procedures.

5.3.2.3 Removing a Full Reject Rack

When a Reject rack is filled, the light beacon flashes green indicating operator attention is required. The system displays a dialog box of how to handle the reject rack. The operator must replace the full rack with an empty one. Do not click on Stop or the program will not register the rack change. To replace a full reject rack, proceed as follows:

1. Click the Stop or Pause button on the PC screen, or press the PROCESS STOP button. AutoSorter – III™ stops processing the tubes and the specimen handlers return to the Park position.
2. Press the drawer lock button to unlock the drawer.
3. Remove the full reject rack and replace with an empty rack, scanning both the reject rack as well as the racksite as required.
4. Reset any E-Stop conditions and press the Process Resume or Start button if Stop button was pressed. AutoSorter – III™ resumes processing of specimens tubes.

5.3.3 Shut Down the System

Procedure –

1. Click on the Stop button on the PC screen. AutoSorter – III™ stops processing the tubes. The specimen handlers return to the Home position.
2. Press the E-Stop button.
3. Click on the Exit button to close the AutoSorter-III application.
4. Shut down the PC.
5. Set POWER switch on centrifuge to OFF; centrifuge pilot light turns off.
6. Set MAIN POWER switch on the controller unit to OFF.

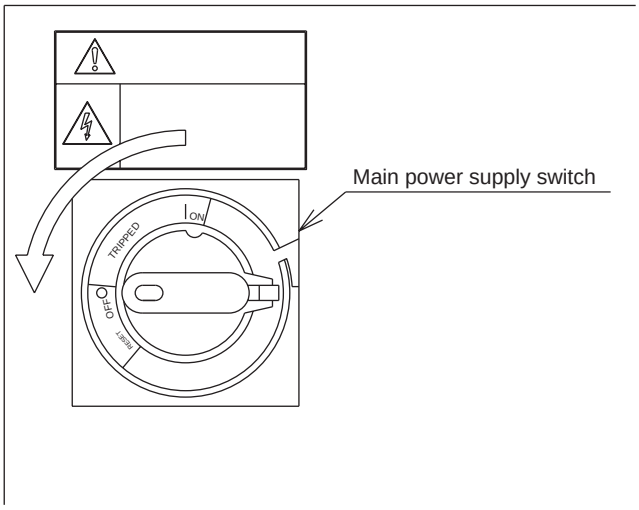


Figure 16 Turning OFF Main Power

AutoSorter – III™ is now shut down.

5.4 System Recovery

When a system error or alarm occurs, you must clear the error or alarm to return the system to normal operation. The paragraphs below describe the different types of alarms and errors you may encounter and how to remedy them when you do. AutoSorter – III™ uses on-screen dialog boxes to guide the user through most error and alarm recovery.

5.4.1 Controller Alarms

Controller alarms typically cause the system to stop and require operator intervention to recover. Depending on the error, the operator may need to reset the system, recalibrate home position, or cycle power. AutoSorter – III™ onscreen dialog boxes guide the user through these controller errors.

5.4.2 Hardware Alarms and Errors

Hardware alarms and errors are typically caused by physical conditions of the unit including:

- Collision of handler or gripper
- Drawer improperly closed
- Protective hood not properly closed and latched
- Waste bin improperly seated or full

To clear a hardware alarm or error:

1. Correct the condition that caused the alarm or error.
2. Press the Clear Alarm button on the Work Cell or Maintenance tab.
3. Press SERVO ON button on the Operator Station.
4. Press the Start or Resume button on the computer screen.

5.4.2.1 E-Stop Condition

An E-Stop can occur under any of the following conditions –

- Pressing the E-Stop push button on the Operator Station
- Opening the access door

Procedure –

1. Correct the condition that caused the E-Stop.
2. Clear an E-Stop condition by performing any of the following actions that apply –
    - Release the E-Stop push button.
    - Close the AutoSorter – III™ access door.
3. Press SERVO ON button on the Operator Station.
4. 4. Press the Start or Resume button on the computer screen.

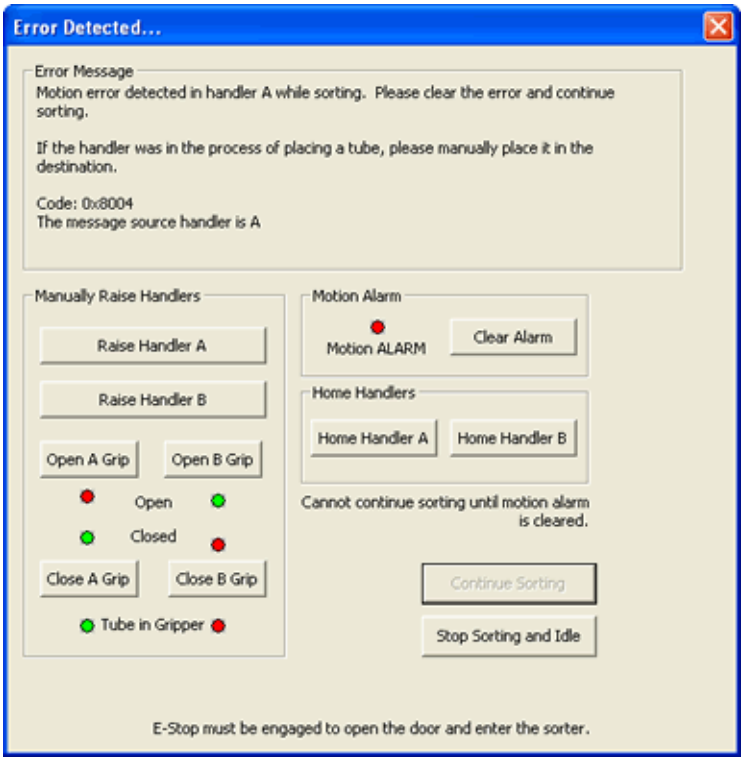
The AutoSorter – III™ cell is now ready to continue operation.

5.4.3 Gripper Collision Override

AutoSorter – III™ includes two Motoman specimen handlers with servo grippers that incorporate a shock sensor assembly. The shock sensor assembly protects the servo gripper from damage in the event of a collision (crash) involving the gripper and a component or part within the work cell. A slight deflection of the gripper activates a SHOCK SENSOR signal that triggers an error message and stops motion. To clear the error message, you must move the specimen handler clear of the impact.

Procedure –

1. Upon gripper collision or other motion error, the system stops and the following dialog appears:

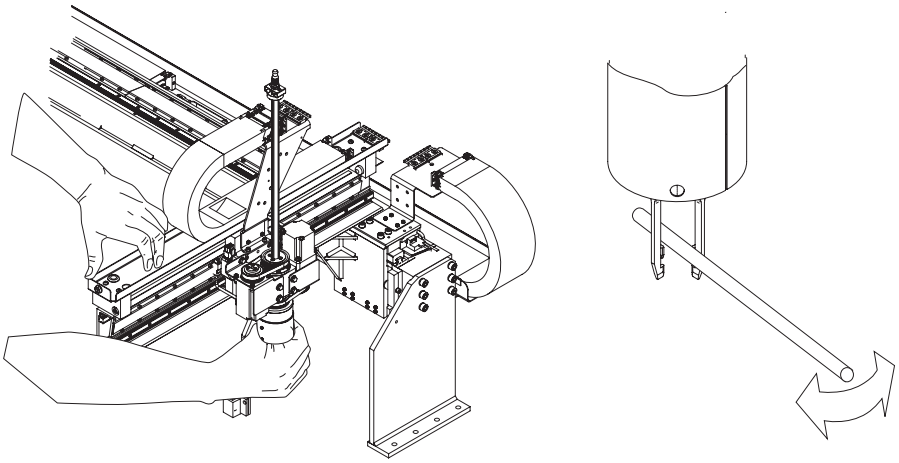


2. Visually inspect the system to determine the cause of the error. Is it safe to move the handler using the Manually Raise Handlers control buttons in the Error Detect dialog? Is cleanup required?
3. If it is safe to move the handler without causing further damage to the specimens or equipment, use the Manually Raise Handlers control buttons in the Error Detect dialog to move the handler away from the impact site. Skip to step 5.
4. If you determine that it is unsafe to move the handler without further intervention, you will need to remove motor power before entering the unit.
   a. Press the E-Stop button to remove motor power and unlock the door.
   b. Open the unit door to access sort deck.

WARNING!
Do not force the handler axes or gripper. Apply smooth, even force to move the axes or gripper fingers. While the handler and grippers are not extremely fragile, they can be damaged by rough handling.

c. Manually correct the collision or cause of motion error. Physically move the handler and gripper as required to correct the collision or cause of motion error.

Note: A small pen or plastic rod can be used to manually open the gripper fingers.



d. Close and latch the door.

e. Reset the E-Stop button. Motor power returns.

5. From the Error Detect dialog, clear the alarm condition using Clear Alarm button. AutoSorter – III™ is now ready to continue operation.
6. Visually inspect the system to determine if it is safe to continue sorting or if further maintenance or cleanup is required.
7. Press the Continue Sorting button on the Error Detect dialog to continue operation or press the Stop Sorting and Idle button to pause the system for further maintenance.

5.4.4 Software Alarms and Errors

Software alarms and errors are typically resolved by following the onscreen dialog boxes that guide the user through these alarms and errors.

Notes

Chapter 6
Maintenance/Troubleshooting

Maintenance of the AutoSorter – III™ system and components must be performed by authorized personnel who are familiar with the AutoSorter – III™ system. Be sure to read and understand the documentation for a particular component before doing actual repair maintenance or preventive maintenance on that component. Be sure that you understand the maintenance procedures, have the proper tools at hand, and comply with safety precautions given in Chapter 2.

Maintenance intervals given in this chapter are recommendations only. Adjust the frequency and level of repair maintenance and preventive maintenance to suit your specific equipment schedules and laboratory environment.

For periodic maintenance procedures and schedules for the individual components of your AutoSorter – III™ system, refer to the documentation package that is included with your system (refer to Section 1.3).

It is your responsibility to decontaminate components of AutoSorter – III™ before requesting service by a Motoman Field Service Representative or returning parts to Motoman for repair. Motoman will NOT accept any items which have not been decontaminated where it is appropriate to do so. If any parts are returned, they must be enclosed in a sealed plastic bag stating that the contents are safe to handle and are not contaminated.

The AutoSorter – III™ system should not require extensive regular maintenance, other than making operational choices, and emptying the biohazard waste bin.

For users requiring more detailed troubleshooting and maintenance procedures, RobotPro software for AutoSorter – III™ is available. Contact Motoman customer support for more information.

Table 4 Periodic and Preventive Maintenance

Frequency	Component	Procedure
Daily (or on condition)	Sensors	Wipe down with alcohol pad to prevent misreading of tubes and racks.
	Cooling fans in controller unit	Verify proper operation.
	Safety door latch	Verify proper operation
	Working area, sort deck, and handlers	Clean the work area of dust and/or spatter. Check system components for damage.
Monthly (or on condition)	Servo Grippers	Check finger pads for wear and replace as needed.
	Sort Deck	Clean sort deck of dust and/or spatter. Check system components for damage.
	System Mounting Bolts	Tighten loose bolts. Replace as necessary.
	HEPA filter	Clean or replace
	Centrifuge Rotor	Clean and grease according to vendor documentation.
	MP2300 Battery	Check BAT indicator on the MP2300 Module. If lit, replace the battery with a replacement (ZZK000064) within two weeks (see Section 6.5.2).
Annually (or on condition)	Encoder Backup Battery	Replace the encoder backup battery according to battery alarm.
	Belts	Visually inspect for proper tension and excessive wear.

6.1 Replacing Gripper Fingers

If damage occurs to a gripper finger it should be replaced. Contact Motoman customer service.

6.2 Cleaning

Once a month (or more often, as required) you should thoroughly clean the work surface. Contact your laboratory safety officer and refer to the guidelines in the Section 2 titled "Chemical and Biological Safety" if you will be cleaning spill trays that may have been exposed to hazardous solutions.

6.2.1 Cleaning Sensors

AutoSorter – III™ relies on a series of optical sensors and bar code readers to accurately track racks and specimens as they are processed through the system. On a daily maintenance interval, these sensors and bar code readers should be wiped down with an alcohol pad to prevent or minimize misreading of the tubes and racks.

6.2.2 Cleaning Centrifuge

Regular cleaning and decontamination of the centrifuge prevents specimen contamination as well as part corrosion. Refer to the vendor documentation shipped with your AutoSorter – III™ unit for specific maintenance instructions and scheduling.

6.3 Emptying the Biohazard Waste Bin

As the decap process occurs, caps are discarded through a chute into a biohazard waste bin. When full the biohazard bag should be removed, disposed of properly, and replaced with a new one.

6.4 Recovery from a Crash

Occasionally a specimen handler may place a tube incorrectly. The result may be enough to engage a sensor that stops handler motion and shuts off motor power. When that occurs, the Maintenance Tab can be used to recover.

6.5 Battery Replacement

Battery packs are located throughout the system. Each servo motor contains a backup battery for encoder absolute data. The MP2300 controller unit contains a battery pack as well, for backup of all programs and system data.

CAUTION!
Be sure to replace the batteries with the power turned ON. Replacing the batteries with the power turned OFF will result in the loss of all programs and data stored in memory.

6.5.1 Servo Motor Battery

Each servo motor has a replaceable battery. This battery is used to back up encoder absolute data, and prevent encoder data from being lost when power is interrupted (e.g., when power is turned OFF).

Battery life for accumulated power interruptions is one year. Battery life is typically five years from the date of purchase. These values, however, differ according to the operating conditions, including ambient temperature.

If the battery alarm occurs on the AutoSorter – III™ software, replace the battery with a replacement battery (P/N 479348-2) within two weeks. Any delay in battery replacement will result in loss of data. To replace the battery, proceed as follows:

1. Make sure power is ON.
2. Locate motor battery location (refer to Appendix A, 154200-1, and 153445-1).
3. Remove any protective electrical tape.
4. Disconnect the battery cable connections.
5. Firmly connect the replacement battery cable to the connectors on the motor.
6. Replace protective electrical tape around connections.

6.5.2 MP2300 Module Battery

The MP2300 Module has one replaceable battery. This battery is used to back up data, preventing data stored in memory from being lost when power is interrupted (e.g., when power to the unit is turned OFF).

Battery life for accumulated power interruptions is one year. Battery life is typically five years from the date of purchase. These values, however, differ according to the operating conditions, including ambient temperature.

If the BAT indicator on the MP2300 Module lights, replace the battery with a replacement battery (ZZK000064) within two weeks. Any delay in battery replacement will result in loss of data.

Before replacing the battery, backup all programs and data from the memory of the MP2300 Module to floppy disks or hard disk. The saved programs and data can used if the programs and data are accidentally deleted during battery replacement.

To replace the battery, proceed as follows:

1. Make sure that the RDY indicator on the MP2300 Module is lit.
2. Open the battery cover on the front of the MP2300 Module.
3. Disconnect the battery cable from the connector on the MP2300 Module, then remove the battery from the battery holder.
4. Firmly connect the replacement battery cable to the connector on the Basic Module. Then, place the replacement battery into the battery holder.
5. Make sure that the BAT indicator on the Basic Module is not lit.
6. Close the cover.

Appendix A
Illustrated Parts List

A.1 Introduction

A.1.1 Arrangement

Appendix B is arranged as follows –

- Appendix B.1 – Introduction
- Appendix B.2 – Illustrated Parts List (IPL)

A.1.2 General

The Illustrated Parts List (IPL) identifies, describes, and illustrates detail parts of the AutoSorter – III™ positioner.

A.1.3 Purpose

The IPL provides parts identification and descriptive information for use in provisioning, purchasing, storing, and issuing spare parts.

A.2 Illustrated Parts List (IPL)

The Illustrated Parts List contains illustrations (exploded views) and associated parts list tables that show detail parts of a particular component, assembly, or subassembly.

A.2.1 IPL Layout

The IPL is arranged so that the illustration (exploded view) for an assembly appears directly above the parts list table for that illustration. This format presents the illustration and its associated parts list table on a single page regardless of the document output format (PDF or printed hardcopy).

When this single-page format is not possible, due to a large illustration or an extensive parts list table, the parts list table will be listed on the facing page.

A.2.2 Item Categories Not Included in the IPL

The following item categories are not included in the IPL –

1. Standard hardware items (attaching parts) such as nuts, screws, washers, etc. These are commercially available to the customer.
2. Bulk items and consumables such as wire, cable, sleeving, tubing, certain fluids, etc. These are commercially available to the customer.
3. Permanently attached parts that lose their identity because they are welded, soldered, riveted, etc., to other parts, assemblies, or subassemblies.

A.2.3 Parts List Table Structure

Each figure's parts list table contains the following data columns –

- FIGURE & ITEM NUMBER

  An entry in this column gives the item number for a part shown in the associated illustration (exploded view). The item number listed in this column is the same as the item number shown on the illustration. Item numbers on the illustration are identified by a circled number and leader line that points to the particular part (item) on the illustration.

Note: Items not shown in the illustration, but listed in the parts table, are indicated by a dash (–) prefix to the item number. Example — a right-hand (RH) part, that is otherwise identical to the illustrated left-hand (LH) part. The RH part would not be shown in the illustration, but would be shown in the parts table with the dash prefix.

- MOTOMAN PART NUMBER

  An entry in this column gives the Motoman part number for an item. Refer to this number when ordering or referencing the part.

- DESCRIPTION

  An entry in this column gives the description (nomenclature) for an item number or part number.

- QTY

  An entry in this column gives the total quantity of an item or part number required for an assembly or subassembly in which the part appears. The quantity given in this column may or may not be the total quantity required for the complete end item. The abbreviation "REF" in this column indicates a reference to the top assembly in the figure.

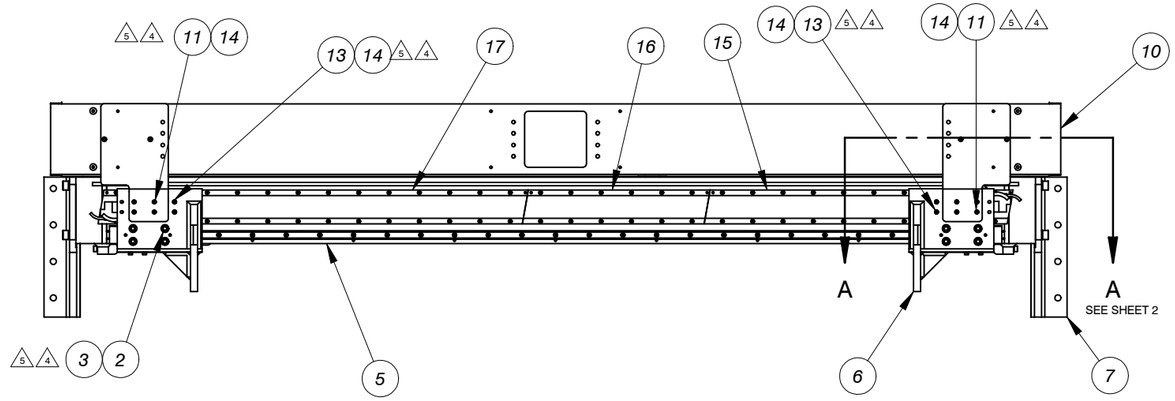
NOTES:

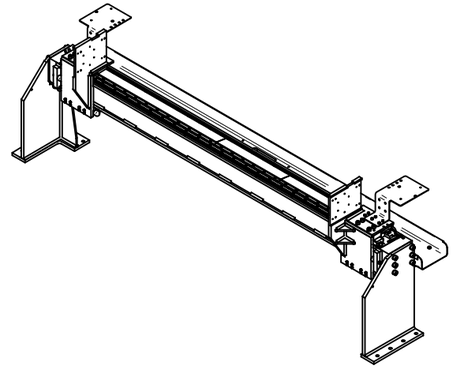
1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. UNFINISHED STEEL SURFACES TO BE COATED WITH RUST INHIBITOR PER MOTOMAN DESIGN STANDARD SSGW-077, PARA. 3.3.2

△4 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED

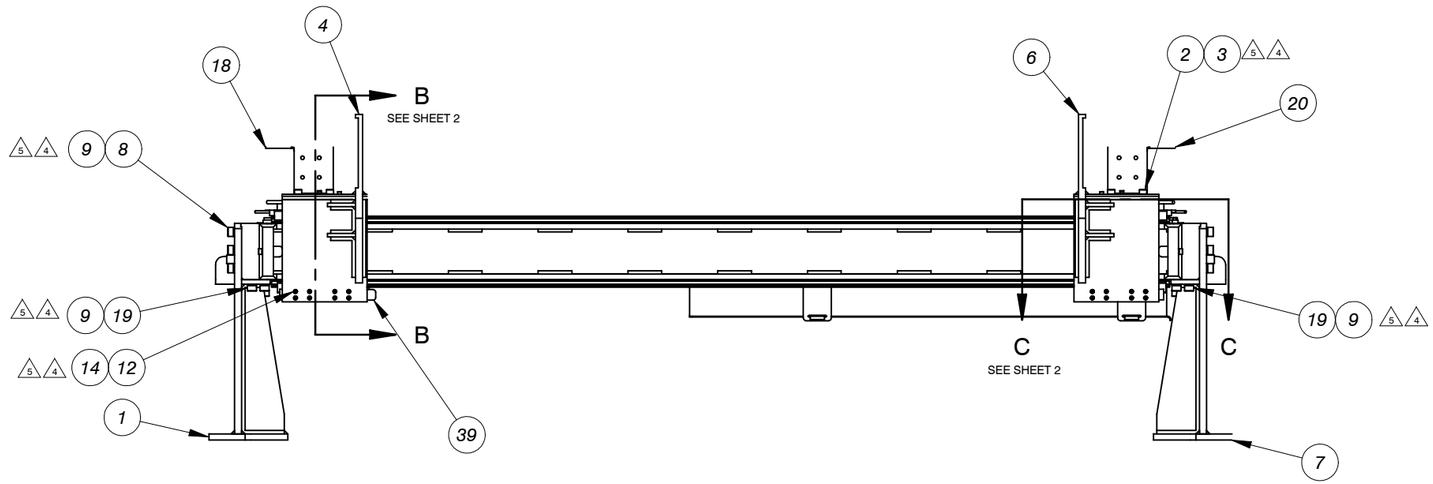
△5 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

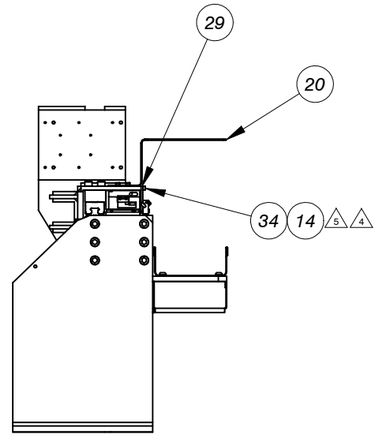
6. PERMANENT MARK WITH MOTOMAN PART NUMBER 153445-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.





ISOMETRIC VIEW
1:10
REFERENCE ONLY





SEE SEPARATE BOM

REVISION STATUS OF SHEETS					
SHT.	1	2	3	4	-
REV.	1	0	0	0	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0443	5/7/08	JL
2			
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12			

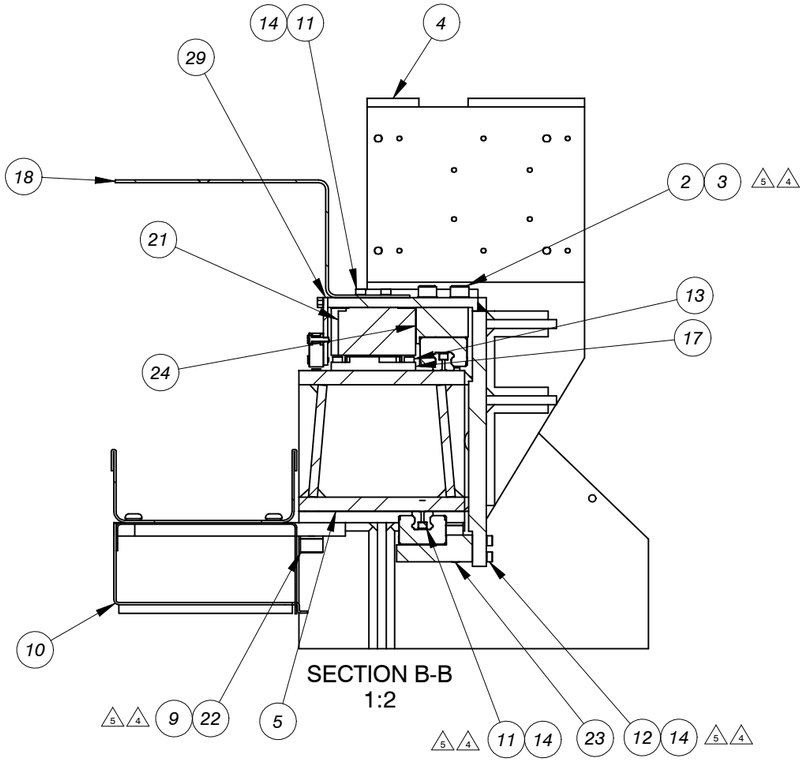
FILE NAME: 153445.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 166
DRAWN: reynojo
CHECKED: JL 3/28/08
APPROVAL: GHS 3/27/08
APPROVAL:
APPROVAL:
RELEASE: KAT 4/3/08
114.8 kg

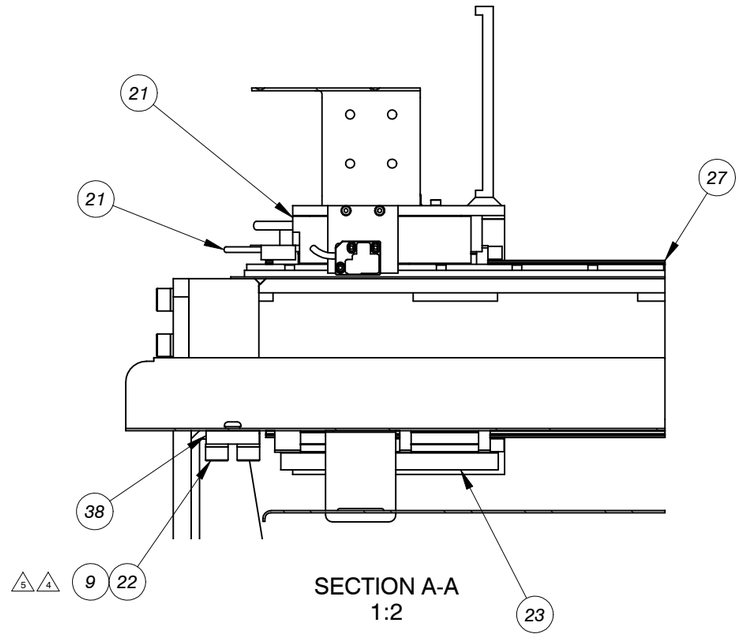
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: DRIVE ASSY,X-AXIS AUTO SORTER

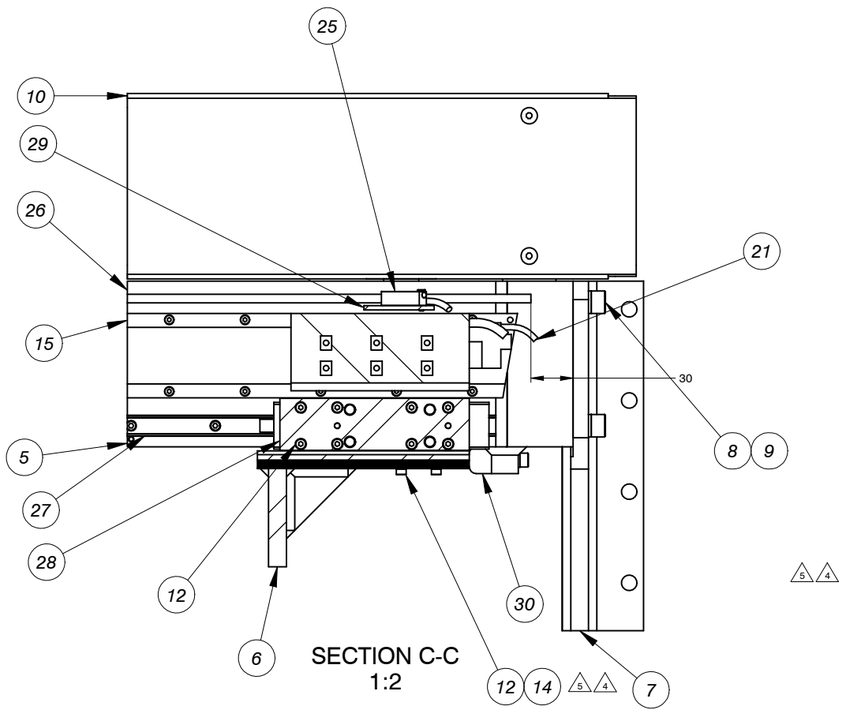
DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 4
A1	0	1:5	153445	



SECTION B-B
1:2



SECTION A-A
1:2



SECTION C-C
1:2

CHANGE RECORD			
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FILE NAME: 153445.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0, 0.00 ± 0.1, 0.0 ± 0.4, ANGLES ± 30'
PROJECTION:

DESIGNED: GHS/WDK
NOUN CODE: 166
DRAWN: reynojo
CHECKED: JL 3/28/08
APPROVAL: GHS 3/27/08
APPROVAL:
APPROVAL:
RELEASE: KAT 4/3/08
114.8 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: DRIVE ASSY,X-AXIS AUTO SORTER

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 4
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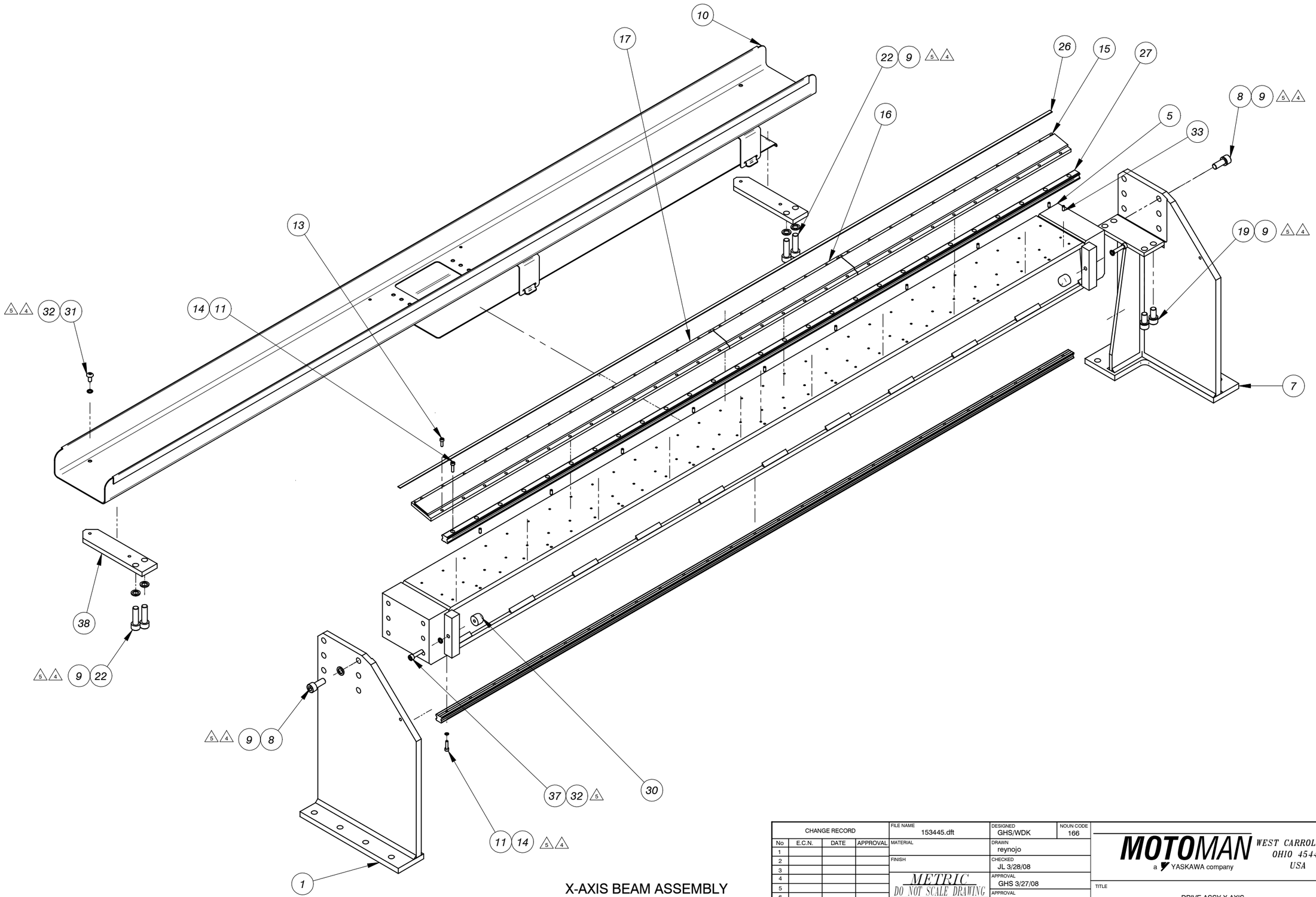

X-AXIS BEAM ASSEMBLY
1:3

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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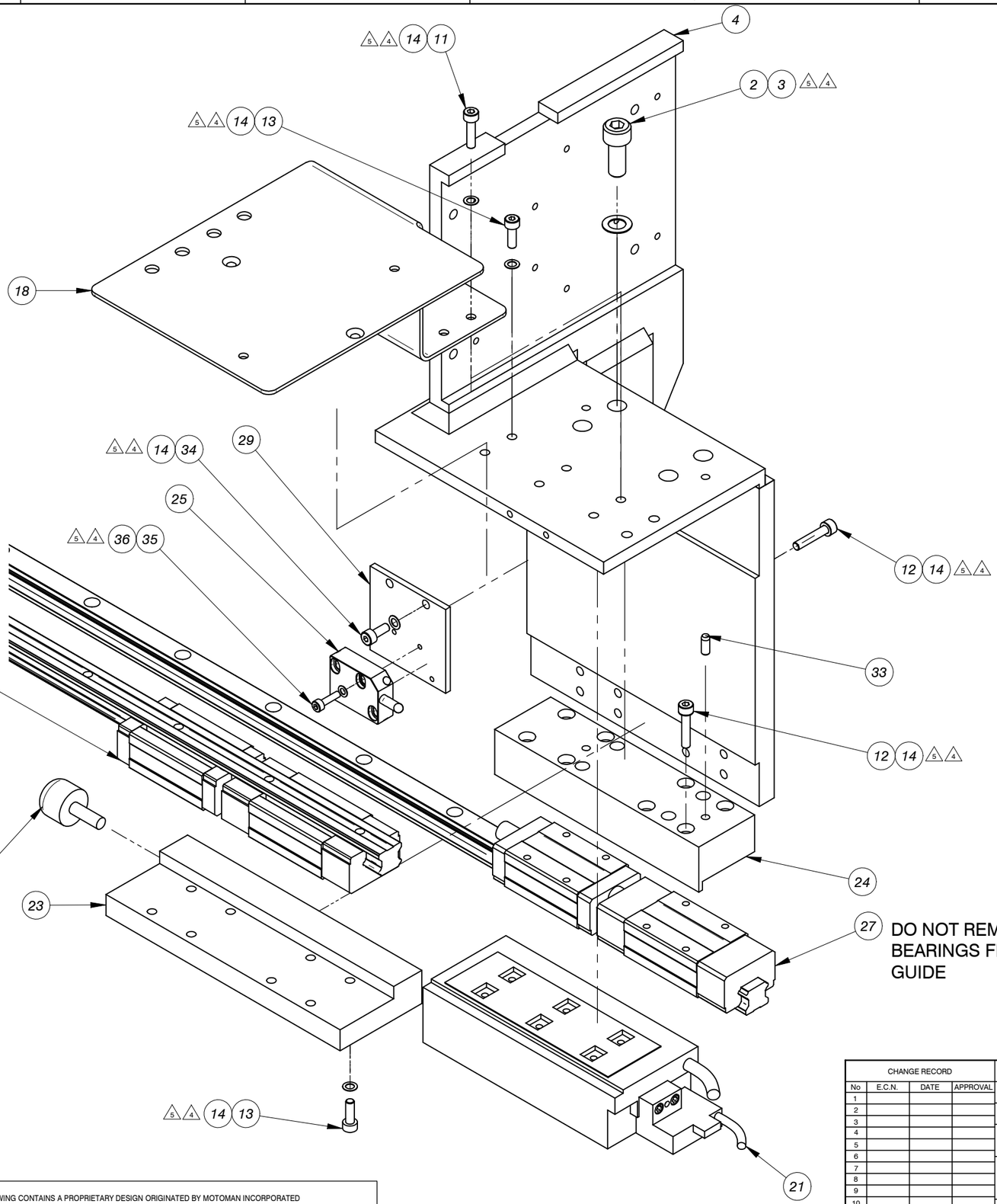
FILE NAME: 153445.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 166
DRAWN: reynojo
CHECKED: JL 3/28/08
APPROVAL: GHS 3/27/08
APPROVAL:
APPROVAL:
RELEASE: KAT 4/3/08
114.8 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: DRIVE ASSY,X-AXIS AUTO SORTER

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 4
A1	0	1:5	153445	



CONFIDENTIAL: THIS DRAWING CONTAINS A PROPRIETARY DESIGN ORIGINATED BY MOTOMAN INCORPORATED NEITHER IT NOR THE INFORMATION APPEARING HEREON SHALL BE DISCLOSED, USED, OR DUPLICATED FOR ANY PURPOSE UNLESS SPECIFICALLY AUTHORIZED BY MOTOMAN INCORPORATED. THIS DRAWING IS THE PROPERTY OF MOTOMAN INCORPORATED AND SHALL BE RETURNED TO IT UPON REQUEST. ALL PATENT RIGHTS RELATING HERETO ARE SPECIFICALLY RESERVED.

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME: 153445.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
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DECIMAL: 0. ± 1.0, 0.00 ± 0.1, 0.0 ± 0.4; ANGLES ± 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 166
DRAWN: reynojo
CHECKED: JL 3/28/08
APPROVAL: GHS 3/27/08
APPROVAL:
APPROVAL:
RELEASE: KAT 4/3/08
114.8 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: DRIVE ASSY,X-AXIS AUTO SORTER

DWG SIZE: A1 | DWG REV: 0 | SCALE: 1:5 | DWG NO: 153445 | SHEET 4 OF 4

Table A.1 153445-1, DRIVE ASSY, X-AXIS

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154820-1	RISER,A-HANDLER SIDE	1
2	140337-4	SCREW,SHC,M8X20,SST,CLASS 12.9	8
3	132609-5	WASHER,CONICAL SPRING,M8,SST	8
4	154821-1	BRACKET,ADAPTOR,X-Y,A-HANDLER	1
5	154822-1	BEAM,SUPPORT,X-AXIS	1
6	154821-2	BRACKET,ADAPTOR,X-Y,B-HANDLER	1
7	154820-2	RISER,B-HANDLER SIDE	1
8	140340-3	SCREW,SHC,M10X25,SST	12
9	132609-6	WASHER,CONICAL SPRING,M10,SST	20
10	154414-1	TRAY ASSY,E-CHAIN,X AXIS	1
11	132524-18	SCREW,SHC,M4X16,SST	62
12	132524-19	SCREW,SHC,M4X20,SST	32
13	132524-9	SCREW,SHC,M4X12,SST	80
14	132609-2	WASHER,CONICAL SPRING,M4,SST	111
15	153321-3	TRACK,MAGNETIC,LINEAR MOTION	1
16	153321-2	TRACK,MAGNETIC,LINEAR MOTION	1
17	153321-1	TRACK,MAGNETIC,LINEAR MOTOR	1
18	154196-1	BRACKET,E-CHAIN,X AXIS,A HAND	1
19	132524-11	SCREW,SHC,M10X20,SST	4
20	154196-2	BRACKET,E-CHAIN,X AXIS,B HAND	1
21	153328-1	MOTOR,LINEAR,80N,200V,SIGMAIII	2
22	140340-5	SCREW,SHC,M10X35,SST	4
23	154823-3	PLATE,ADAPTR,SLIDE,LOWER	2
24	154823-1	PLATE,ADAPTR,SLIDE,UPR,A-HNDLR	1
25	154826-1	SENSOR,READ HEAD,ENCODER (OBS)	2
26	154827-1	GAGE,OPTICAL SCALE,1650	1
27	154890-1	SLIDE ASSY,WITH CARRIER	2
28	154823-2	PLATE,ADAPTR,SLIDE,UPR,B-HNDLR	1
29	154500-1	PLATE,MTG,READHEAD	2
30	153561-1	BUMPER,RUBBER	2
31	140331-4	SCREW,BHSC,M6X12,SST	4
32	132609-4	WASHER,CONICAL SPRING,M6,SST	6
33	154834-2	PIN,DOWEL,4MM DIA X 10MM,SST	13
34	132524-10	SCREW,SHC,M4X10,SST	4

Table A.1 153445-1, DRIVE ASSY, X-AXIS

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
35	140351-7	SCREW,SHC,M3X15,SST	4
36	132609-1	WASHER,CONICAL SPRING,M3,SST	4
37	140333-7	SCREW,SHC,M6X25,SST,CLASS 12.9	2
38	154824-1	PLATE,MTG,X-ENERGY CHAIN	2
39	153561-2	BUMPER,RUBBER,M6 X 1 STUD	1

NOTES:

1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. UNFINISHED STEEL SURFACES TO BE COATED WITH RUST INHIBITOR PER MOTOMAN DESIGN STANDARD SSGW-077, PARA. 3.3.2

△4 TORQUE TO 3.6 NM

△5 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

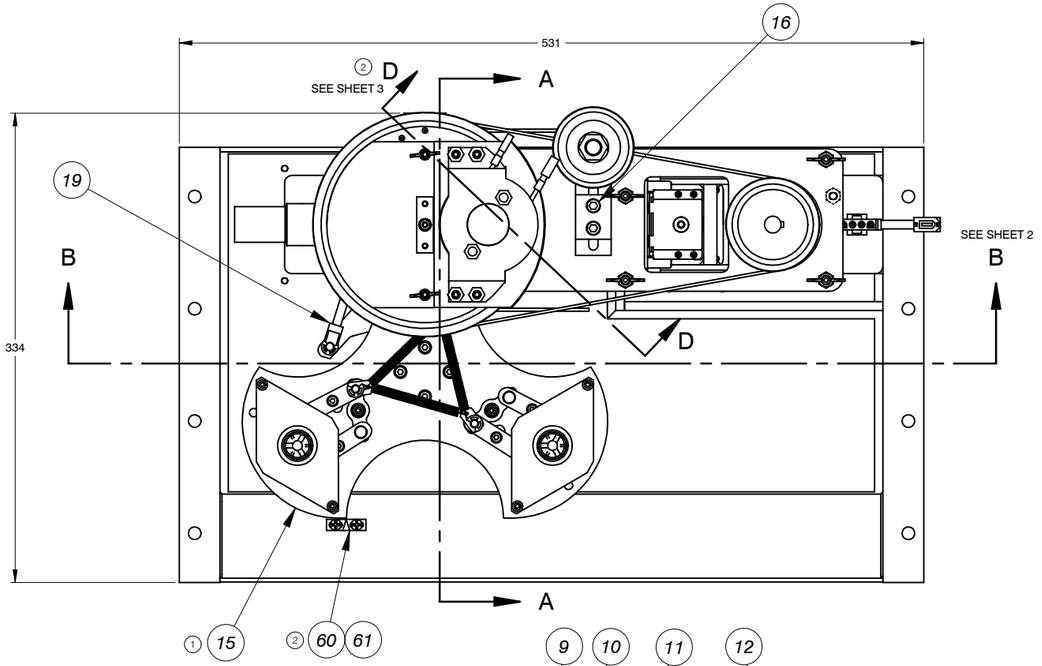
△6 TORQUE TO 1.3 NM

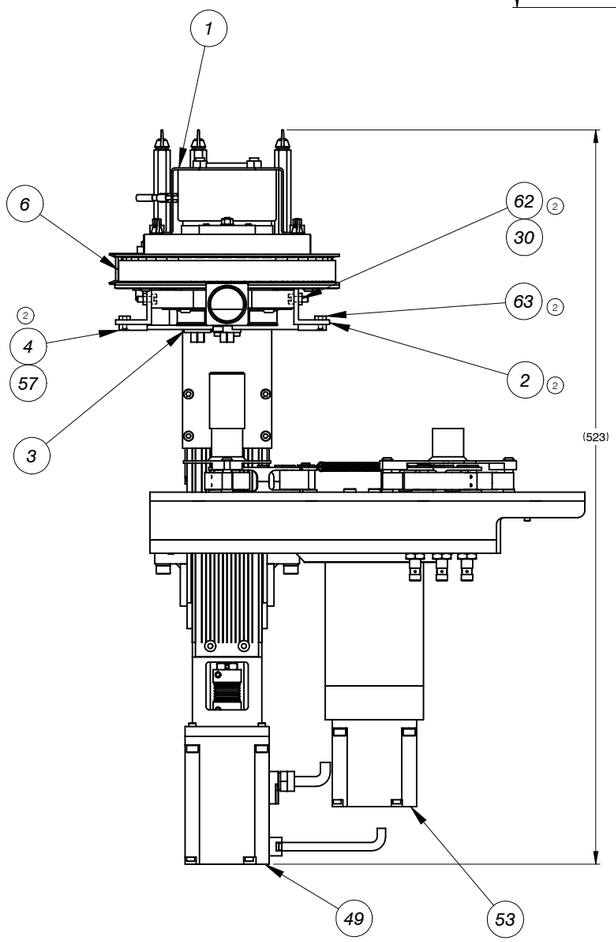
△7 TORQUE TO 12.2 NM

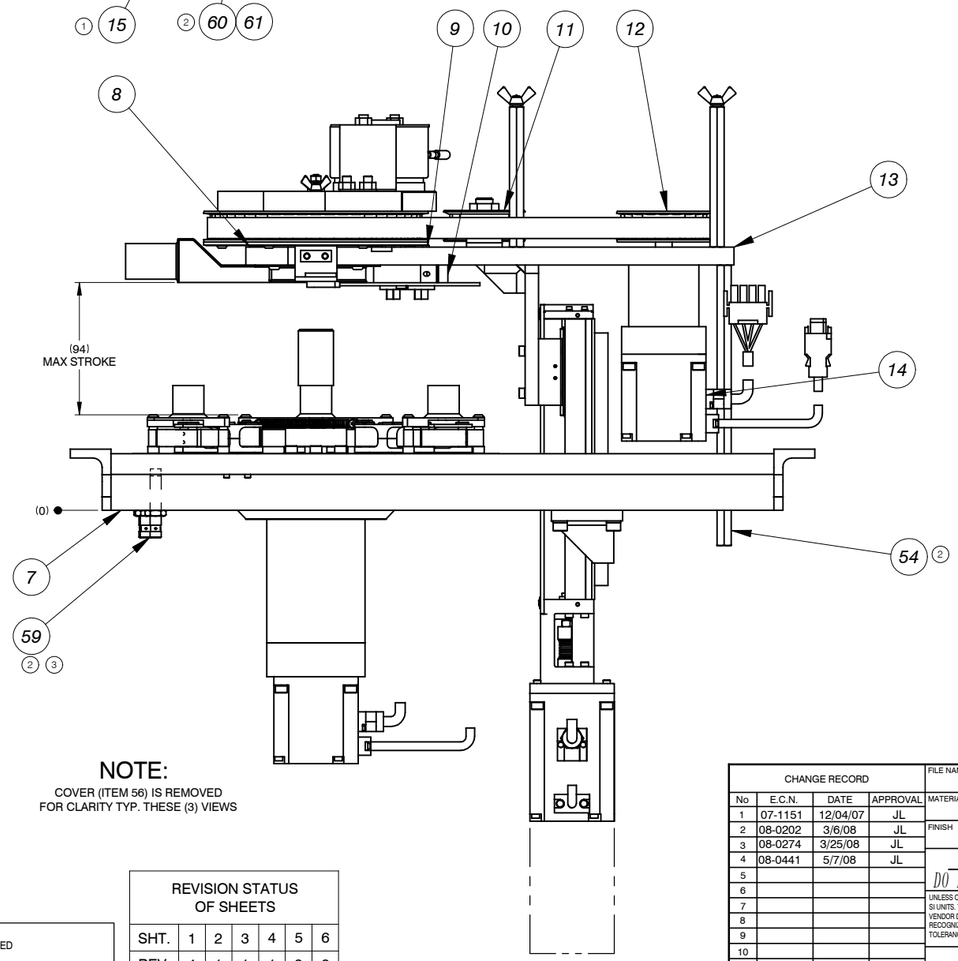
8. PERMANENT MARK WITH MOTOMAN PART NUMBER 154110-1, DRAWING REVISION, AND VENDOR CODE. BAG ITEM #38 HOMING ALIGNMENT TOOL AND ITEM #5 GAGE BLOCK.

(2) △9 FOR RECOMMENDED ASSEMBLY SEQENCE SEE SHEET 6.

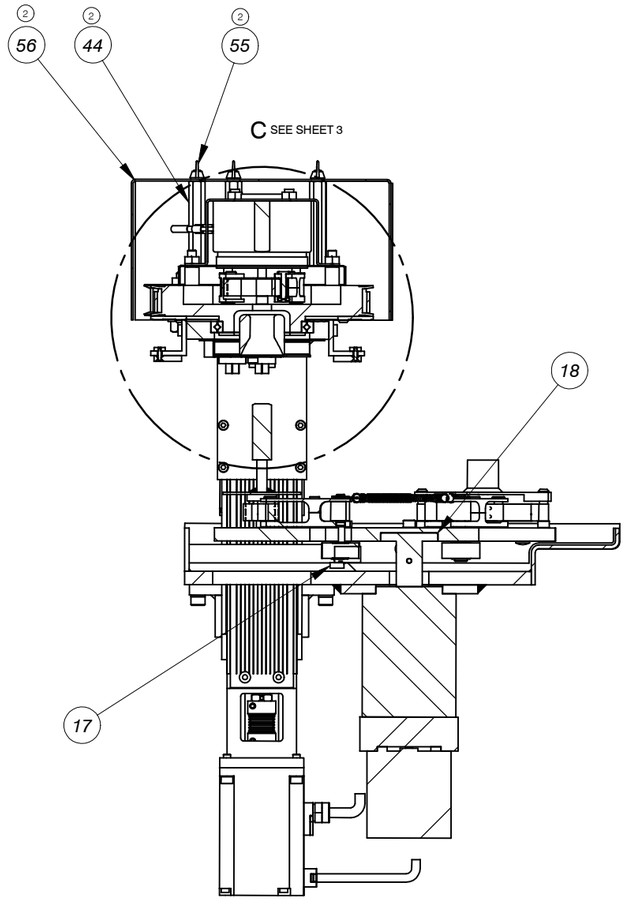
(2) △10 LABEL AS SHOWN.







NOTE:
COVER (ITEM 56) IS REMOVED FOR CLARITY TYP. THESE (3) VIEWS



SECTION A-A

REVISION STATUS OF SHEETS						
SHT.	1	2	3	4	5	6
REV.	4	1	1	1	3	2

SEE SEPARATE BOM

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	07-1151	12/04/07	JL
2	08-0202	3/6/08	JL
3	08-0274	3/25/08	JL
4	08-0441	5/7/08	JL
5			
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12			

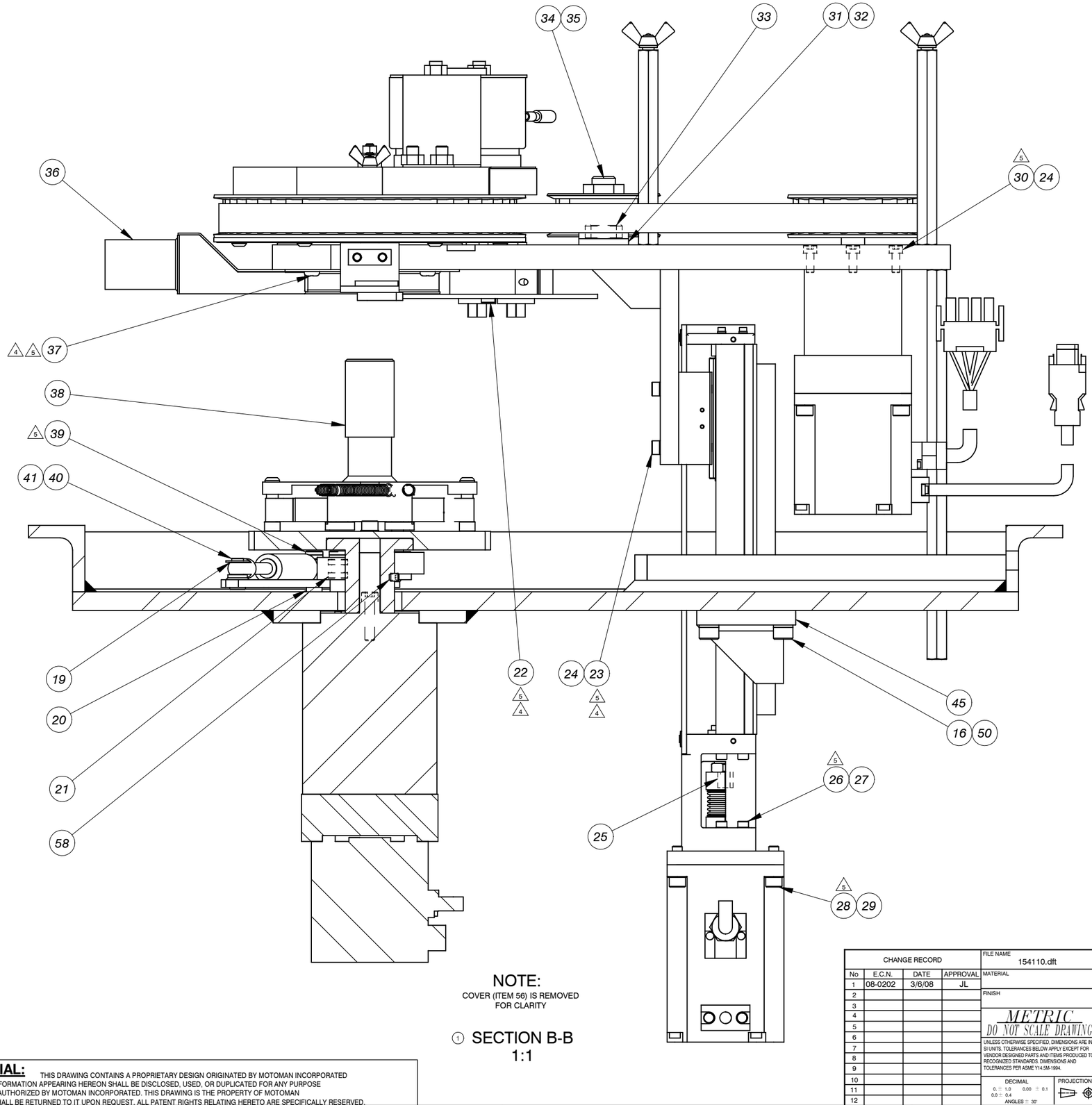
FILE NAME 154110.dft
MATERIAL
FINISH
METRIC DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0.= 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED WDK/GHS
NOUN CODE 486
DRAWN reynojo
CHECKED JL 11/20/07
APPROVAL GHS 11/19/07
APPROVAL
APPROVAL
RELEASE KAT 11/27/07
27.1 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
STATION, DECAPPING AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 6
A1	3	1:2	154110	



NOTE:
COVER (ITEM 56) IS REMOVED FOR CLARITY

① SECTION B-B
1:1

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0202	3/6/08	JL
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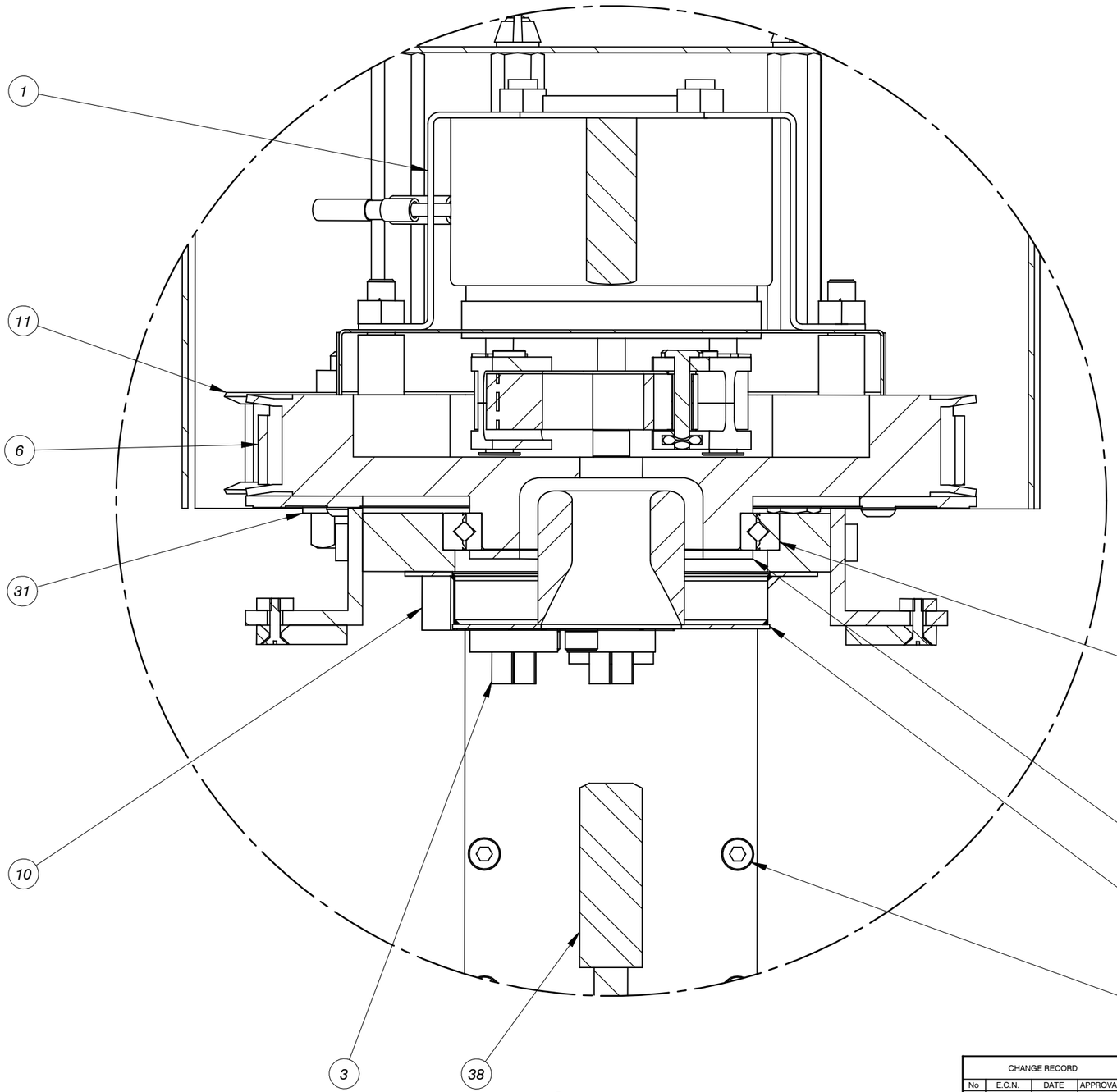
FILE NAME 154110.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED WDK/GHS
NOUN CODE 486
DRAWN reynojo
CHECKED JL 11/20/07
APPROVAL GHS 11/19/07
APPROVAL
APPROVAL
RELEASE KAT 11/27/07
27.1 kg

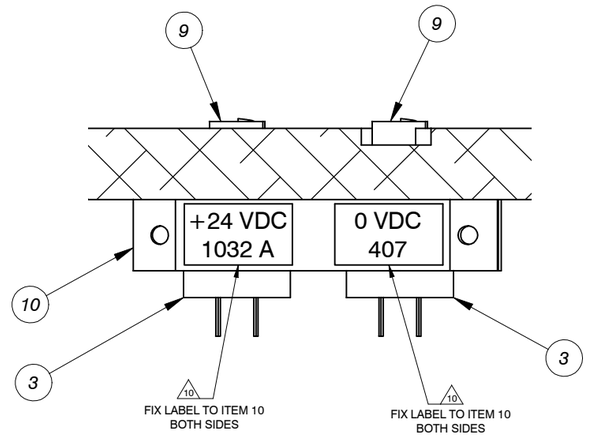
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
STATION, DECAPPING
AUTO SORTER III

DWG SIZE A1 | DWG REV 1 | SCALE 1:2 | SE | DWG NO 154110 | SHEET 2 OF 6



① DETAIL C
2:1



① SECTION D-D
2:1

CHANGE RECORD			
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12			

FILE NAME: 154110.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
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DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED: WDK/GHS
NOUN CODE: 486
DRAWN: reynojo
CHECKED: JL 11/20/07
APPROVAL: GHS 11/19/07
APPROVAL:
APPROVAL:
RELEASE: KAT 11/27/07
27.1 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
STATION, DECAPPING
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 6
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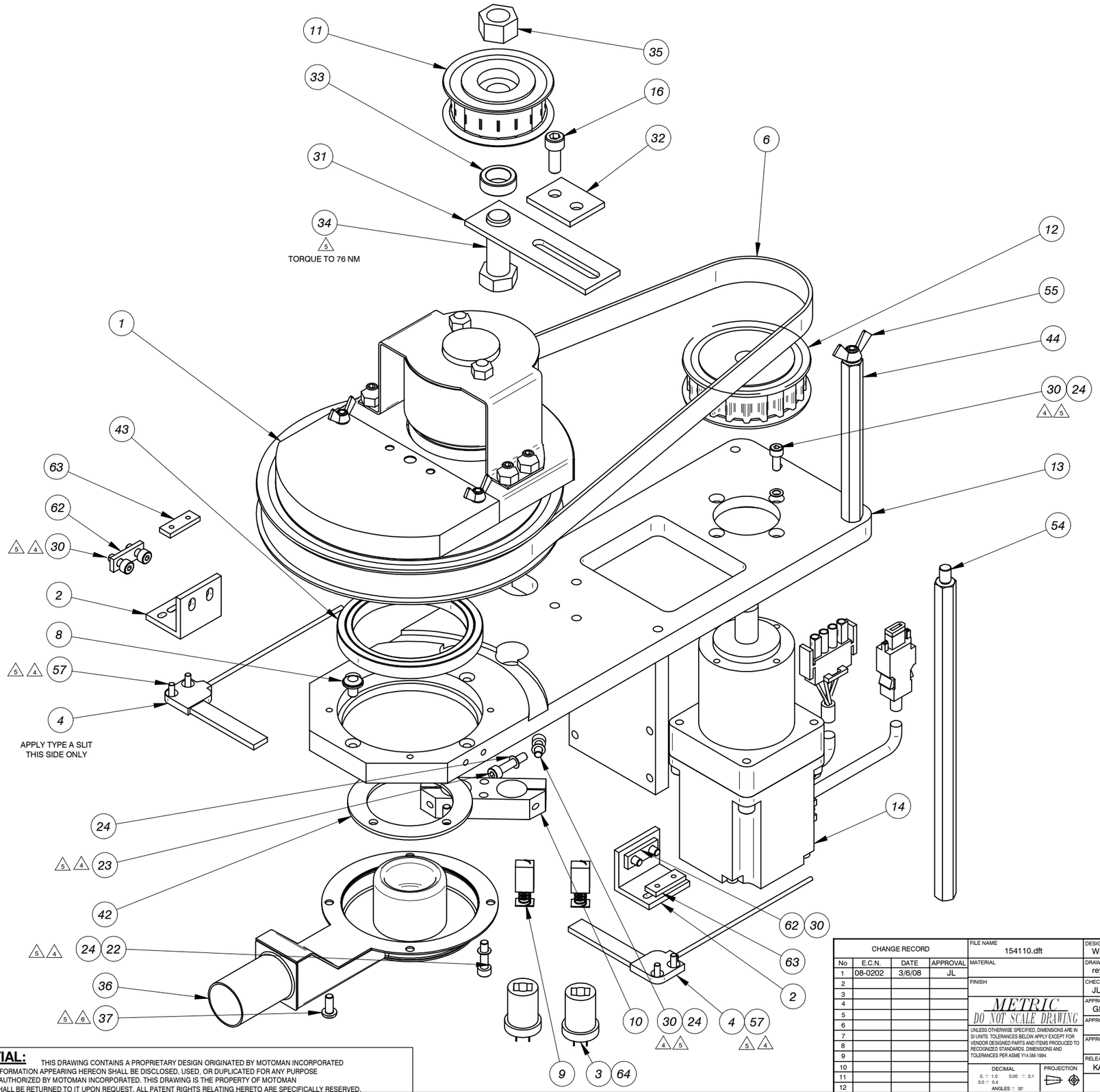

① EXPLODED ASSEMBLY VIEW
1:1
DECAPPER DRIVE

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0202	3/6/08	JL
2			
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FILE NAME: 154110.dft
MATERIAL:
FINISH:
METRIC
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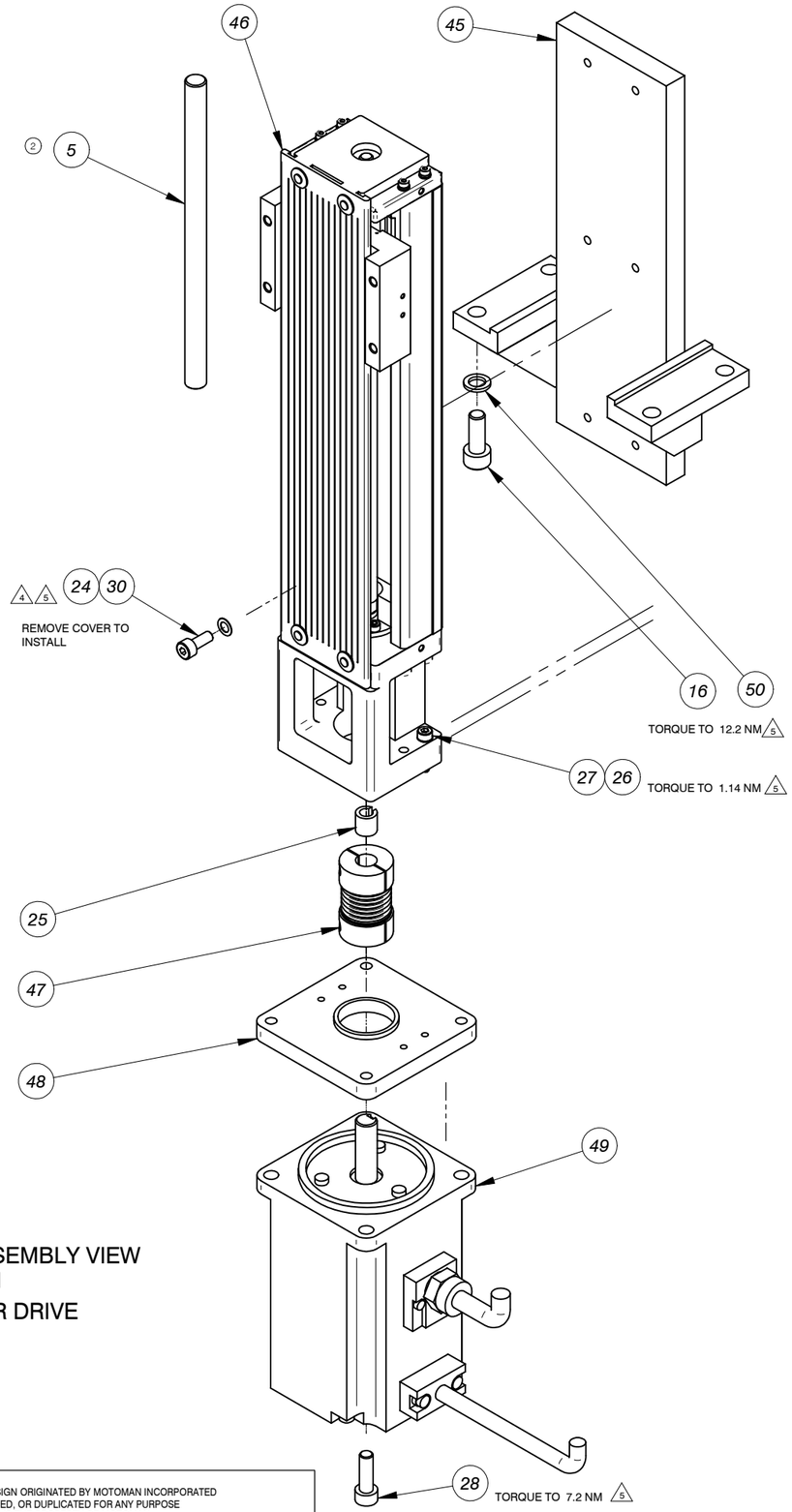
DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED: WDK/GHS
NOUN CODE: 486
DRAWN: reynojo
CHECKED: JL 11/20/07
APPROVAL: GHS 11/19/07
APPROVAL:
APPROVAL:
RELEASE: KAT 11/27/07
27.1 kg

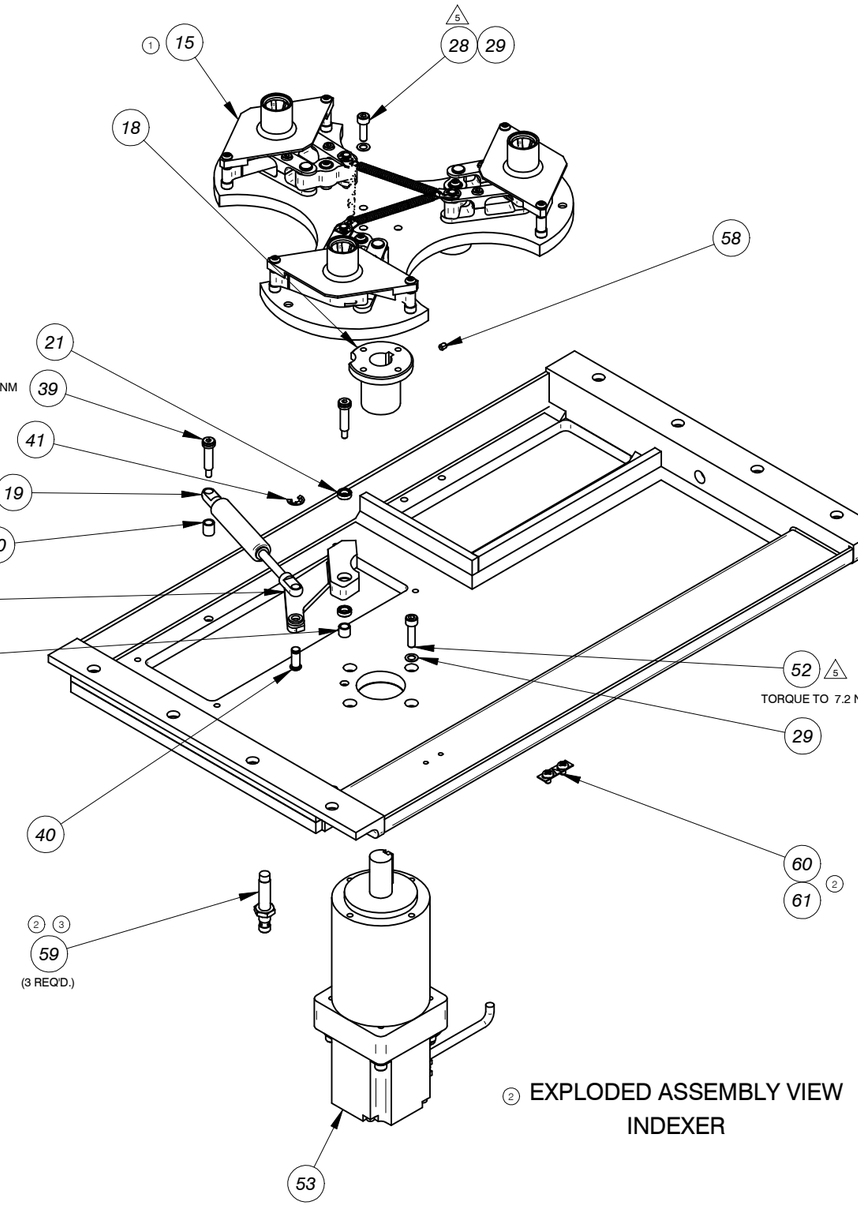
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: STATION, DECAPPING AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 6
A1	1	1:2	154110	



② EXPLODED ASSEMBLY VIEW
1:1
"Z" MOTOR DRIVE



② EXPLODED ASSEMBLY VIEW
INDEXER

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CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	07-1151	12/04/07	JL
2	08-0202	3/6/08	JL
3	08-0274	3/25/08	JL
4			
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FILE NAME 154110.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED WDK/GHS
NOUN CODE 486
DRAWN reynojo
CHECKED JL 11/20/07
APPROVAL GHS 11/19/07
APPROVAL
APPROVAL
RELEASE KAT 11/27/07
27.1 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
STATION, DECAPPING
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 5 OF 6
A1	3	1:2	154110	

Table A.2 154110-1, DECAPPING STATION

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154112-1	GRIPPER ASSY,CAP	1
2	154702-1	MOUNT,SENOR,DECAPPER	2
3	153830-1	HOLDER ASSY,BRUSH,SLIP RING	2
4	154705-1	SENSOR,THRU BEAM, WIDE AREA	1
5	154796-1	GAGE BLOCK,HOME,DECAPPER	1
6	153798-1	BELT,T10,15MM WIDE	1
7	154116-1	TRAY,MOUNTING,DECAPPER	1
8	153714-1	SCREW.BJSC.,5X0.8X8,FLANGED	4
9	153831-1	BRUSH,SLIP RING	2
10	154123-1	PLATE,MTG,BRUSH	1
11	153712-1	PULLEY,IDLER,T10	1
12	153711-1	PULLEY,T10,20 TEETH	1
13	154113-1	MOUNT,GRIPPER	1
14	154087-1	MOTOR ASSY,ALTERED,SERVO,100W	1
15	154111-1	TABLE,INDEXER,GRIPPER,TUBE	1
16	140335-5	SCREW,SHC,M6X16,SST	6
17	154118-1	PLATE,CAM	1
18	154126-1	HUB,PLATE,GRIPPER,TUBE	1
19	153934-1	SPRING,SHOCK,GAS	1
20	153937-1	SPACER,SPRING,GAS	1
21	153717-1	BEARING,6MMID,DEEP GROOVE	2
22	132524-18	SCREW,SHC,M4X18,SST	2
23	132524-19	SCREW,SHC,M4X20,SST	4
24	132609-2	WASHER,CONICAL SPRING,M4,SST	18
25	154124-1	SLEEVE,COUPLING ADAPTOR	1
26	140351-8	SCREW,SHC,M3X16,SST	4
27	132609-1	WASHER,CONICAL SPRING,M3,SST	4
28	140330-4	SCREW,SHC,M5X14,SST	8
29	132609-3	WASHER,CONICAL SPRING,M5,SST	12
30	132524-10	SCREW,SHC,M4X10,SST	11
31	154216-1	PLATE,ADAPTER,IDLER PULLEY	1
32	154217-1	PLATE,WASHER	1
33	154052-1	SPACER,PULLEY	1

Table A.2 154110-1, DECAPPING STATION

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
34	131272-3	SCREW,HHC,M12X35,ZP,CLASS 8.8	1
35	130440-7	NUT,HEX,M12,ZP	1
36	154042-1	CUP,VACUUM	1
37	139225-1	SCREW,BHSC,M4X10,SST	8
38	154219-1	TOOL,ALIGNMENT,HOMING	1
39	153930-1	SCREW,SHOULDER,6 DIAXM5X20,SST	2
40	153935-1	PIN,6 DIA X 15	1
41	153938-1	RING,RETAINING,5 I.D.	1
42	154117-1	PLATE,CAPTURE,ROLLER,CROSS	1
43	153709-1	BEARING,ROLLER,CROSSED,60MMID	1
44	154703-1	SPACER,HEX,M6 THD AND TAP,SST	4
45	154043-1	MOUNT,WELDMENT,SLIDE	1
46	153676-1	SLIDE,LINEAR,SERVO,W/COVER	1
47	153795-1	COUPLING,MOTOR,MISUMI	1
48	154121-1	PLATE,ADAPTER,MOTOR,Z-STAGE	1
49	154086-1	MOTOR ASSY,ALTERED,SERVO,100W	1
50	132609-4	WASHER,CONICAL SPRING,M6,SST	4
51	153937-2	SPACER,SPRING,GAS	1
52	140330-6	SCREW,SHC,M5X20,SST	4
53	154088-1	MOTOR ASSY,ALTERED,SERVO,100W	1
54	154703-2	SPACER,HEX,M6 THD AND TAP,SST	1
55	154704-1	NUT,WING,M6,SST	4
56	154701-1	COVER,DECAPPING STATION	1
57	139985-5	SCREW,FHP,M3X10,SST	4
58	152989-1	SCREW,SET,M4X5,FLAT POINT	1
59	143765-5	SENSOR,PROX,8mm,PNP,3mm RANGE	3
60	130022-4	LABEL,ARROW,SMALL,INDIVIDUA	1
61	140352-4	SCREW,BHSC,M4X6,SST	2
62	154800-1	PLATE,WASHER,SENSOR MTG	2
63	154799-1	PLATE,NUT,SENSOR MTG	2
64	154346-1	CABLE ASSY,DECAPPER SOLENOID	1

NOTES:

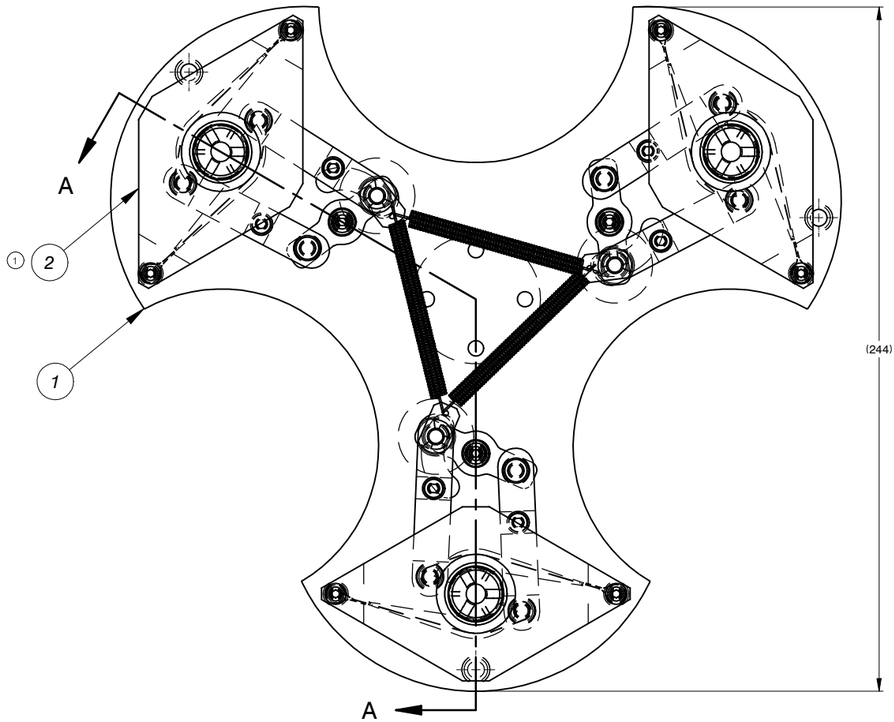
1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. UNFINISHED STEEL SURFACES TO BE COATED WITH RUST INHIBITOR PER MOTOMAN DESIGN STANDARD SSGW-077, PARA. 3.3.2

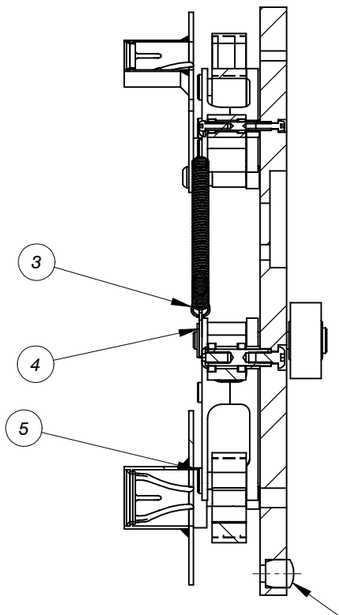
△4 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED

△5 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154111-1, AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.

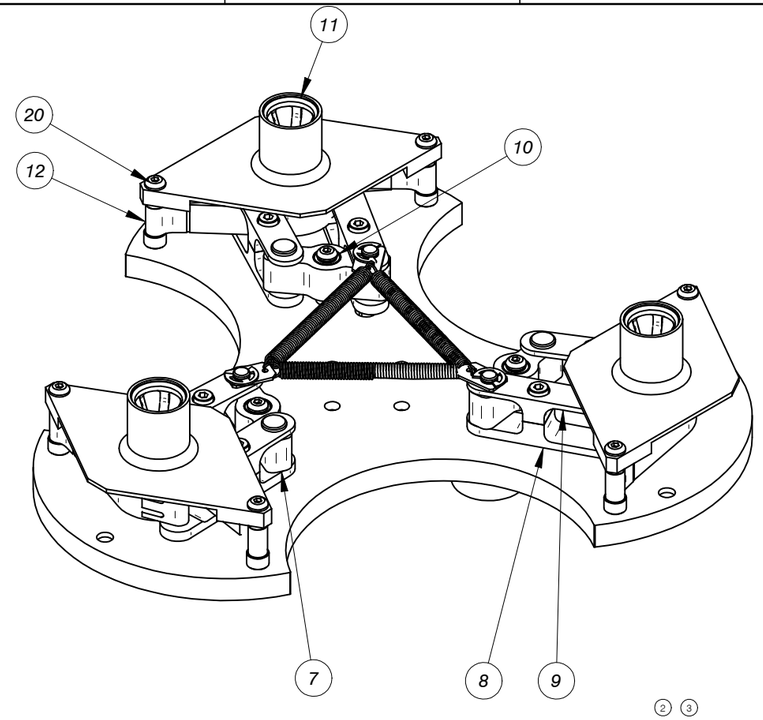
(2) (7) △ FOR RECOMMENDED ASSEMBLY SEQENCE SEE SHEET 3.





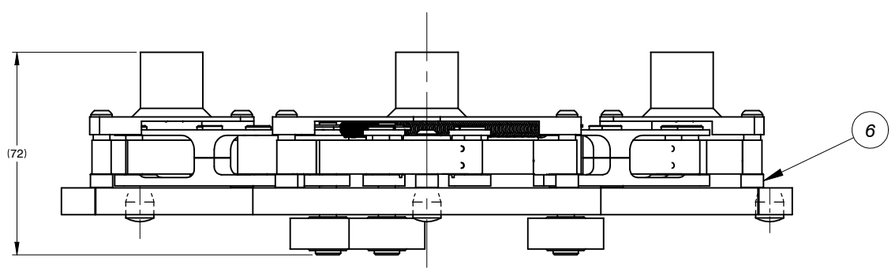
SECTION A-A

(TYP 3 PLACES)



ISOMETRIC VIEW

(REFERENCE ONLY)



SEE SEPARATE BOM

REVISION STATUS OF SHEETS					
SHT.	1	2	3	-	-
REV.	3	1	3	-	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	07-1150	12/04/07	JL
2	08-0159	2/28/08	JL
3	08-0275	3/25/08	JL
4			
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12			

FILE NAME 154111.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL: 0. ± 1.0, 0.00 ± 0.1, 0.0 ± 0.4; ANGLES ± 30'

PROJECTION

DESIGNED WDK/GHS

NOUN CODE 508

DRAWN WDK

CHECKED JL 11/16/07

APPROVAL GHS 11/16/07

APPROVAL

APPROVAL

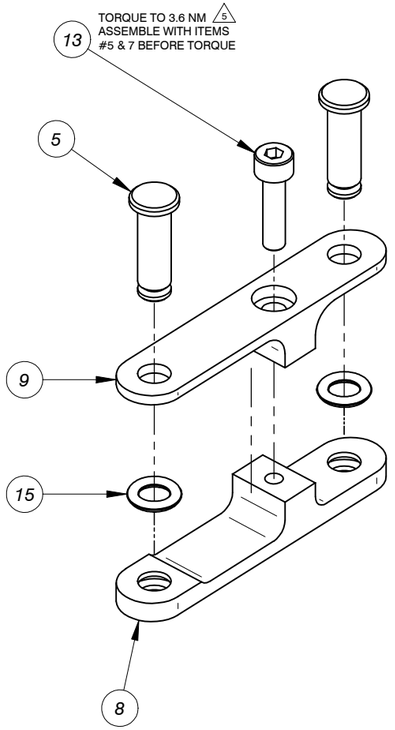
RELEASE KAT 11/21/07

1.6 kg

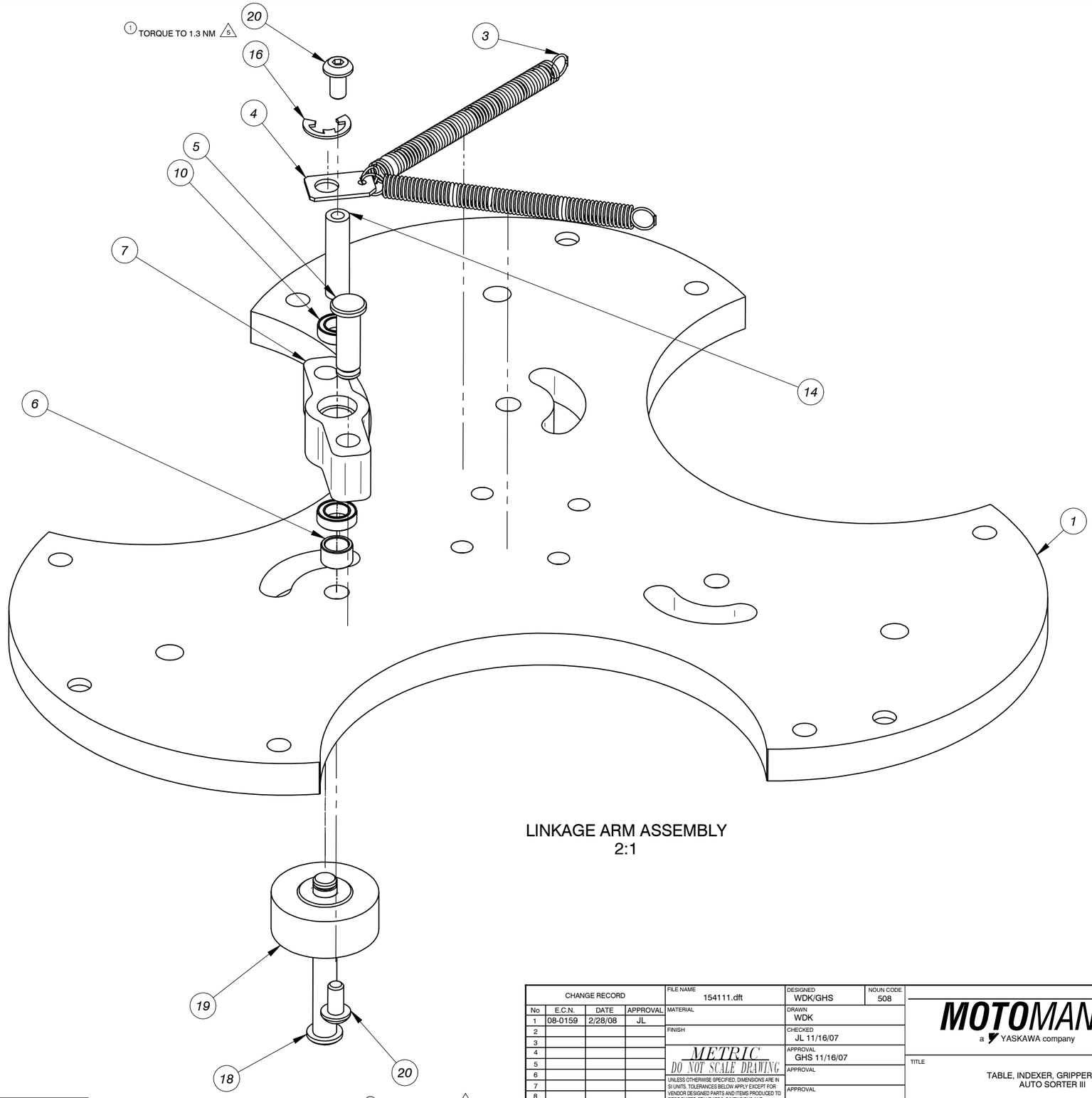
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
TABLE, INDEXER, GRIPPER, TUBE
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 3
A1	3	1:1	154111	



LINKAGE FINGER ASSEMBLY
2:1



LINKAGE ARM ASSEMBLY
2:1

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0159	2/28/08	JL
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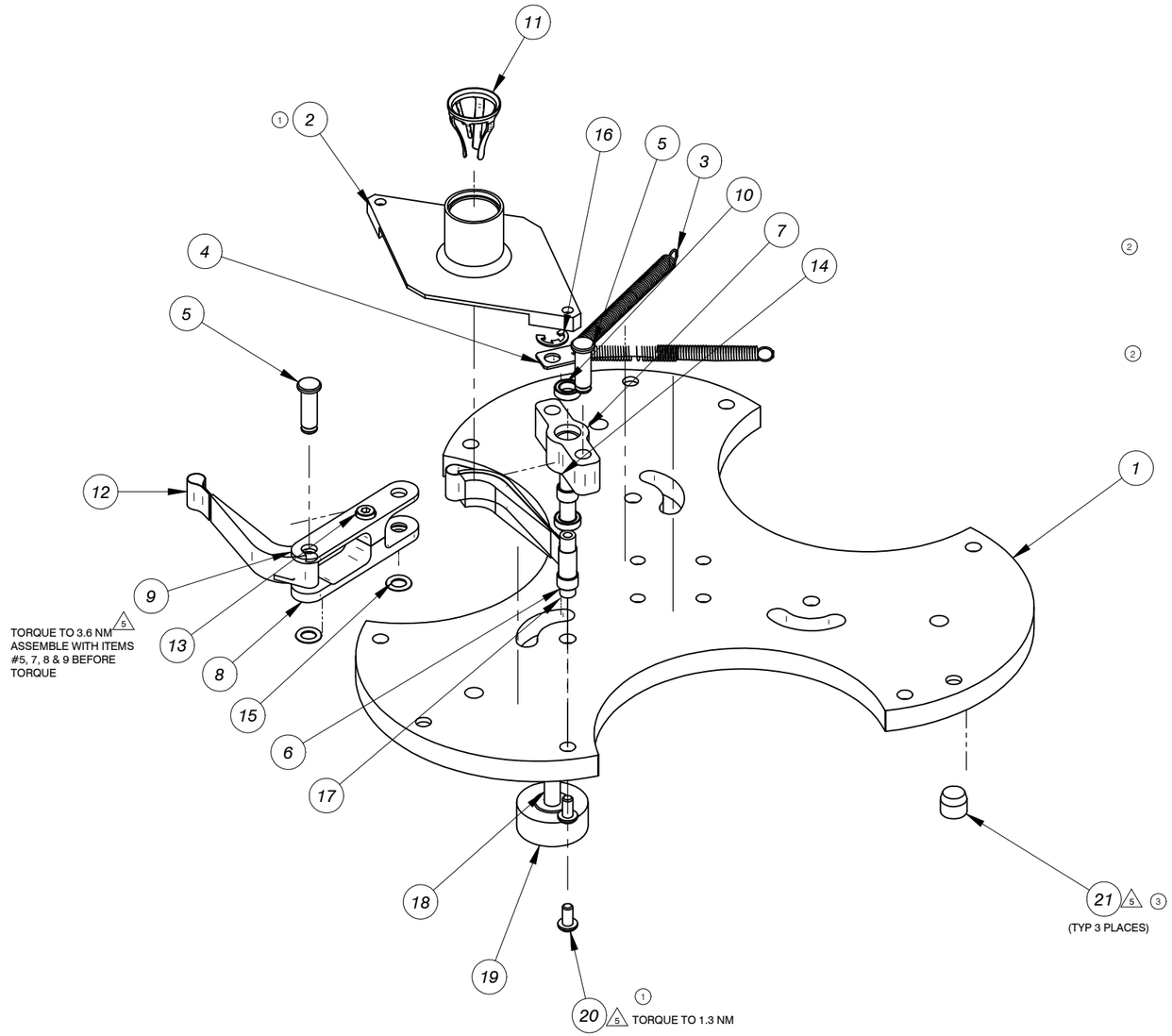
FILE NAME 154111.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED WDK/GHS
NOUN CODE 508
DRAWN WDK
CHECKED JL 11/16/07
APPROVAL GHS 11/16/07
APPROVAL
APPROVAL
RELEASE KAT 11/21/07
1.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
TABLE, INDEXER, GRIPPER, TUBE
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 3
A1	1	1:1	154111	



EXPLODED ASSEMBLY VIEW

① △2 154111 Recommend assembly sequence:

Drive Linkage (3)

1. Install bearings 10 into links 7.
2. Install O rings 15 into lower links 8.
3. Assemble 1 each, pins 5 with links 7, 8, & 9. Note the second links will be assembled later.
4. Secure links 8 & 9 with screw 13. Insure the linkage rotates easily on 7, and pin 5 does not bind on the free end.

Index Plate

1. Install pins 14 (qty 9) into plate 1. Light arbor press may be required.
2. Secure pins with screws 20.
③ 3. Install dowel pin 21 into plate, press fit required, apply loctite 242 (qty 3 each).

Tube Location (3)

1. Slide spacer 6 over link pin and install link 7 assembly. Secure with screw 20.
2. Position link 7 so the hole is over the curve slot in plate 1.
3. Slide bearing onto pin 18 and install from the lower side of the plate, through the curved slot, link 8, the hole in link 7, and link 9.
4. Slide spring retainer 4 over the end of pin 18 and secure with clip 16.
5. Install pin 5 on the free end.
6. Secure links 8 & 9 with screw 13. Insure the linkage rotates easily on 7, and pin 5 does not bind on the free end.
7. Remove pins 5 from link fingers.
8. Slide spacers 6 over gripper finger pins 14 and install grippers 12. Insure proper position of grippers.
9. Secure free gripper ends with pins 5 in link fingers. Insure smooth and free operation of mechanism.
10. Install guide cover and secure with screws 20.
11. Install tube guide 11.
12. Repeat process for the other 2 locations.
13. Install return springs 3.

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	07-1150	12/04/07	JL
2	08-0159	2/28/08	JL
3	08-0275	3/25/08	JL
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12			

FILE NAME 154111.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED WDK/GHS
NOUN CODE 508
DRAWN WDK
CHECKED JL 11/16/07
APPROVAL GHS 11/16/07
APPROVAL
APPROVAL
RELEASE KAT 11/21/07
1.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
TABLE, INDEXER, GRIPPER, TUBE
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 3
A1	3	1:1	154111	

Table A.3 154111-1 - TABLE, INDEXER, GRIPPER, TUBE

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154125-1	PLATE,TOP,GRIPPER,TUBE	1
2	154127-1	LOCATOR WELDMENT,TUBE	3
3	153800-1	SPRING,EXTENSION,MISUMI	3
4	153799-1	PLATE,SPRING,MISUMI	3
5	153718-1	PIN,O-RING	9
6	153716-1	WASHER,PRECISION	9
7	154128-2	LINKAGE,ARM	3
8	154130-6	FINGER,LINKAGE,BOTOM	6
9	154130-5	FINGER,LINKAGE,TOP,TUBE GRIP	6
10	153717-1	BEARING,6MMID,DEEP GROOVE	6
11	153988-1	INSERT,TUBE,TEST	3
12	154129-1	GRIPPER,SPRING	6
13	132524-18	SCREW,SHC,M4X16,SST	6
14	153715-3	SHAFT,6MM X 23.5	3
15	153719-1	SEAL,O-RING,6MM	12
16	153938-1	RING,RETAINING,5 I.D.	3
17	153715-2	PIN,6DIA,TAPPED ENDS	6
18	153720-2	PIN,PIVOT,6 DIA	3
19	153721-1	BEARING,CAM FOLLOWER	3
20	140352-1	SCREW,BHSC,M4X8,SST	18
21	132652-29	PIN,DOWEL,M10x10,SST	3

NOTES:

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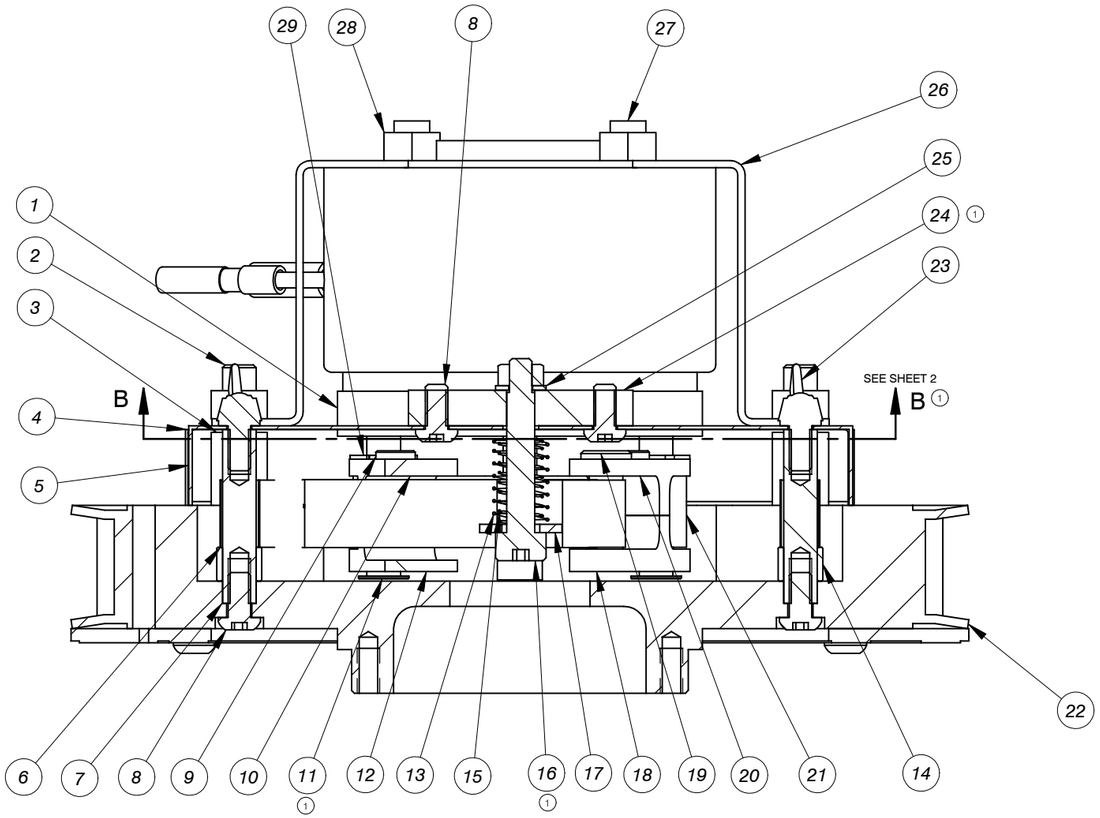
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. UNFINISHED STEEL SURFACES TO BE COATED WITH RUST INHIBITOR PER MOTOMAN DESIGN STANDARD SSGW-077, PARA. 3.3.2

△4 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED

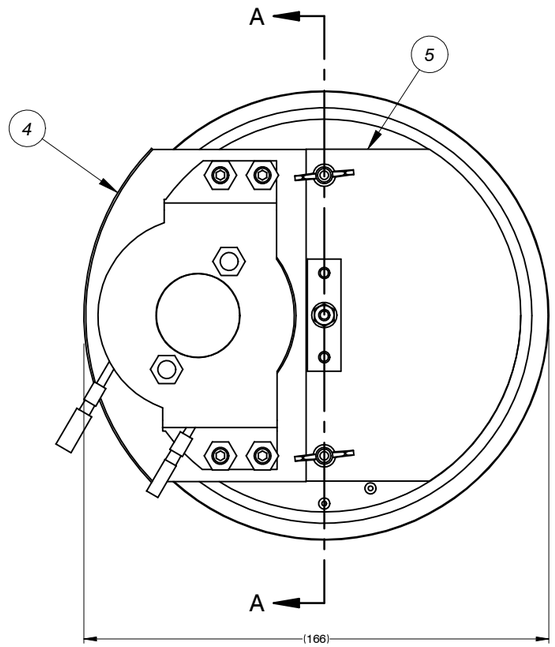
△5 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

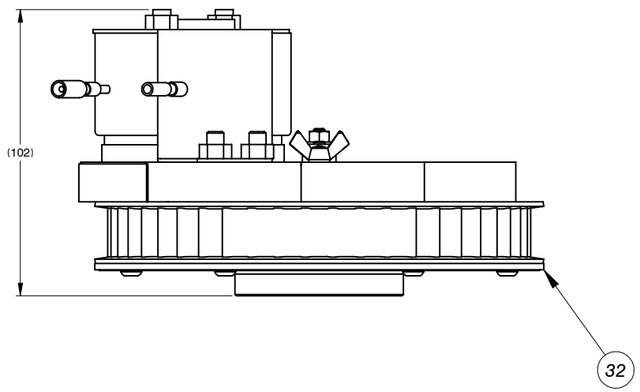
6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154112-1, AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.

(1) △7 FOR RECOMMENDED ASSEMBLY SEQENCE SEE SHEET 2.



(1) SECTION A-A
2:1
ROTATED 90 DEG. C/W





SEE SEPARATE BOM

REVISION STATUS OF SHEETS					
SHT.	1	2	3	-	-
REV.	1	1	1	-	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0160	2/28/08	JL
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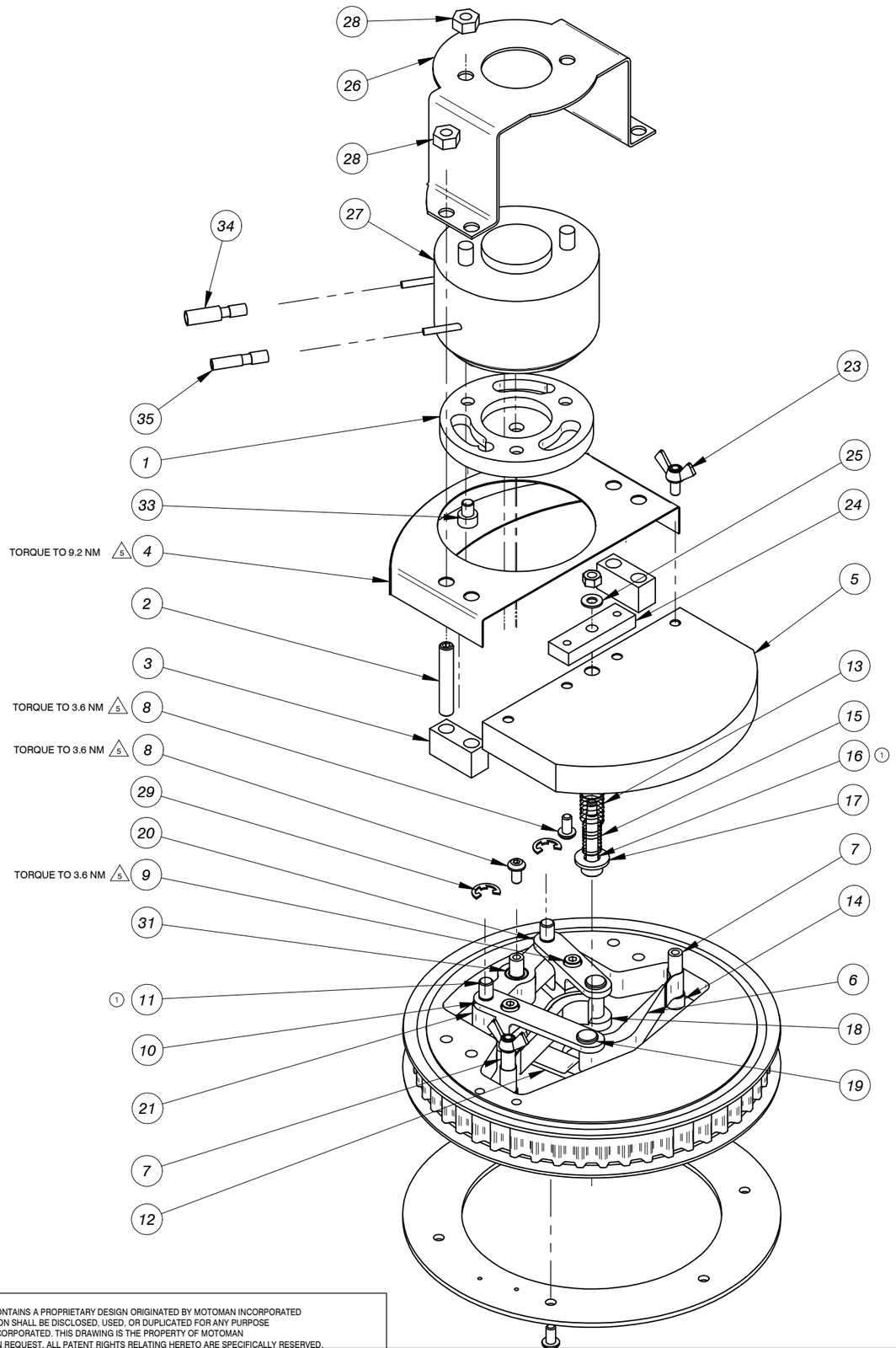
FILE NAME: 154112.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0, 0.00 ± 0.1, 0.0 ± 0.4; ANGLES ± 30'
PROJECTION

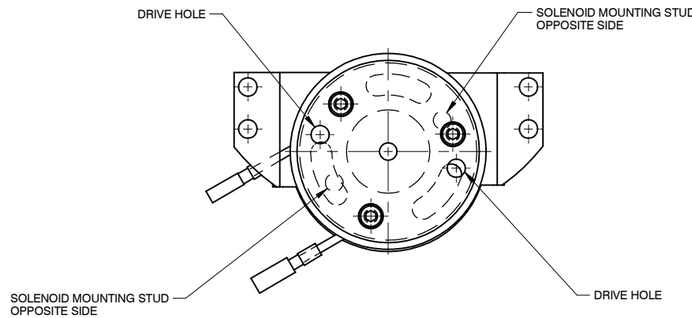
DESIGNED: WDK/GHS — NOUN CODE: 229
DRAWN: WDK
CHECKED: JL 11/16/07
APPROVAL: GHS 11/16/07
APPROVAL:
APPROVAL:
RELEASE: KAT 11/21/07
2.4 kg

MOTOMAN a YASKAWA company — WEST CARROLLTON, OHIO 45449 USA

TITLE: GRIPPER ASSY, CAP AUTO-SORTER II

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 3
A1		1:1	154112	





1 DRIVE HOLE ORIENTATION
SECTION B-B
1:1

△7 1 154112 Recommended assembly sequence:

Preliminary Assemblies:

Solenoid Drive
1. Trim leads on solenoid 27, to approximately 80 mm and secure connectors 34 and 35.
2. Remove nuts provided on 27, mount to 26, and secure with 28. Insure proper location of leads.
3. Secure drive plate 1 to 27. Insure proper orientation of drive holes.

Drive Linkage
1. Install bearings 31 into link 21.
2. Install O rings 30 into lower links 12 and 18.
3. Assemble pins 11 and 19 with links 10, 12, & 21. Secure pin 11 with 29.
4. Secure links with screw 9. Insure the linkage rotates easily on 11, and pin 19 does not bind.
5. Assemble links 18 and 20 in similar fashion.

Cover
1. Secure guide block 24 to cover 4 with screws 8.
2. Install the stripper pin 16 springs 13&15 and washers and secure with nut.
3. Insure stripper works freely.

Main Assembly
1. Install threaded studs 2 into main pulley 22.
2. Install guide pins 7 into 22 and secure with screws 8.
3. Slide spacer 14 over drive linkage guide pin 7.
4. Install drive linkage on guide pin. Insure proper position of long and short link fingers.
5. Install spacer blocks 3, solenoid cover 4, solenoid drive, and secure with nuts 28.
6. Remove pins 19 from link fingers.
7. Slide spacers 14 over gripper finger pins 7 and install grippers 6. Insure proper position of grippers.
8. Secure free gripper ends with pins 19 in link fingers. Insure smooth and free operation of mechanism. The spring loaded rest position should be open.
9. Install the cover and secure with wing nuts 23.
10. Turn the assembly over and install the slip ring 32 using 8.

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0160	2/28/08	JL
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FILE NAME 154112.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
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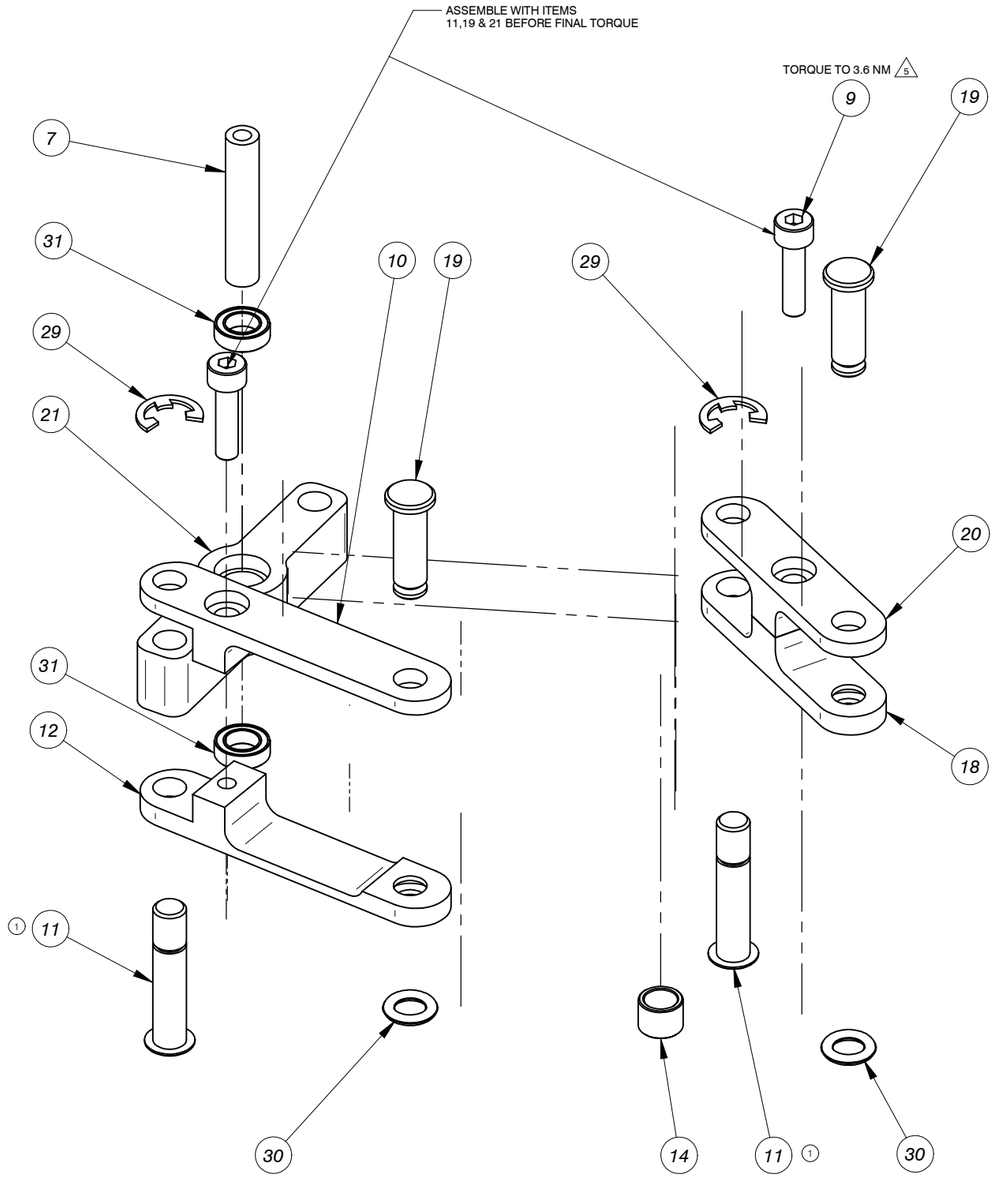
DECIMAL 0.□ 1.0 0.0□ 0.1 0.0□ 0.4 ANGLES □ 30'
PROJECTION

DESIGNED WDK/GHS
NOUN CODE 229
DRAWN WDK
CHECKED JL 11/16/07
APPROVAL GHS 11/16/07
APPROVAL
APPROVAL
RELEASE KAT 11/21/07
2.4 kg

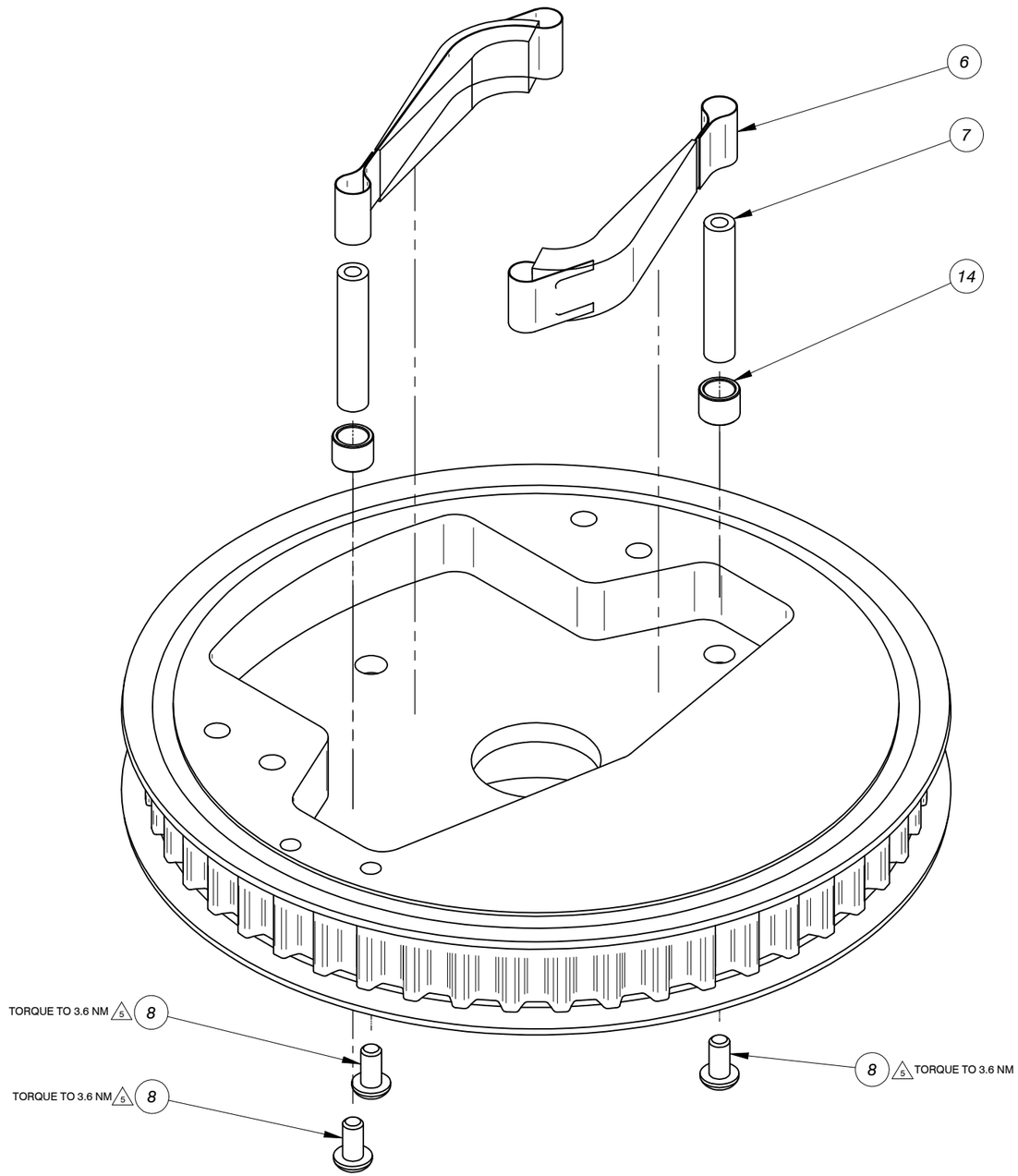
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
GRIPPER ASSY, CAP
AUTO-SORTER II

DWG SIZE A1 | DWG REV | SCALE 1:1 | SE | DWG NO 154112 | SHEET 2 OF 3



LONG AND SHORT LINKAGE FINGER ASSEMBLY
2:1



PULLEY AND GRIPPER SPRING ASSEMBLY
2:1

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0160	2/28/08	JL
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FILE NAME: 154112.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0, 0.0 ± 0.1, 0.0 ± 0.4, ANGLES ± 30'
PROJECTION

DESIGNED: WDK/GHS
NOUN CODE: 229
DRAWN: WDK
CHECKED: JL 11/16/07
APPROVAL: GHS 11/16/07
APPROVAL:
APPROVAL:
RELEASE: KAT 11/21/07
2.4 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: GRIPPER ASSY, CAP AUTO-SORTER II

DWG SIZE: A1 | DWG REV: | SCALE: 1:1 | SE | DWG NO: 154112 | SHEET 3 OF 3

Table A.4 154112-1 - GRIPPER ASSY, CAP

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154131-1	PLATE,SOLENOID,GRIPPER,CAP	1
2	139269-2	SCREW,SET,FLAT POINT,M6X35 SST	4
3	154136-1	SPACER,SOLENOID MOUNTING	2
4	154133-1	COVER,SEAL,FRONT	1
5	154134-1	PLATE,SEAL,REAR	1
6	154129-1	GRIPPER,SPRING	2
7	140352-1	SHAFT,6MM DIA X 31	3
8	132524-18	SCREW,BHSC,M4X8,SST	12
9	154130-3	SCREW,SHC,M4X16,SST	2
10	154130-3	FINGER,LINKAGE,TOPLONG	1
11	154135-1	PIN,PIVOT,CUSTOM	2
12	154130-4	FINGER,LINKAGE,LOWERLONG	1
13	154260-1	SPRING,COMPRESSION,10IDX15LG	1
14	153716-1	WASHER,PRECISION	3
15	154260-2	SPRING,COMPRESSION,8IDX15LG	1
16	154698-1	PIN,PRECISION,M5X25,SST	1
17	132527-1	WASHER,FLAT,M6,SST	1
18	154130-2	FINGER,LINKAGE,LOWERSHORT	1
19	153718-1	PIN,O-RING	2
20	154130-1	FINGER,LINKAGE,TOPSHORT	1
21	154128-1	ARM,LINKAGE	1
22	153710-1	PULLEY,T10W/100DIAHUB	1
23	153723-1	BOLT,WING	2
24	154218-1	PLATE,BUSHING	1
25	132527-3	WASHER,FLAT,M4,SST	1
26	154132-1	BRACKET,MOUNTING,SOLENOID	1
27	153708-1	SOLENOID,ROTARY	1
28	707295-1	NUT,HEX,M6,18-8SST	6
29	153938-1	RING,RETAINING,5I.D.	2
30	153719-1	SEAL,O-RING,6MM	2
31	153717-1	BEARING,6MMID,DEEPGROOVE	2

Table A.4 154112-1 - GRIPPER ASSY, CAP

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
32	154347-1	SLIP-RINGASSY,DECAPPER	1
33	479296-2	SCREW,SHC,M5X6,CLASS12.9	3
34	472066-3	TERMINAL,BULLET,INSULATED,	2
35	472067-3	TERMINAL,QUICKDISC,RECEPTACLE	2

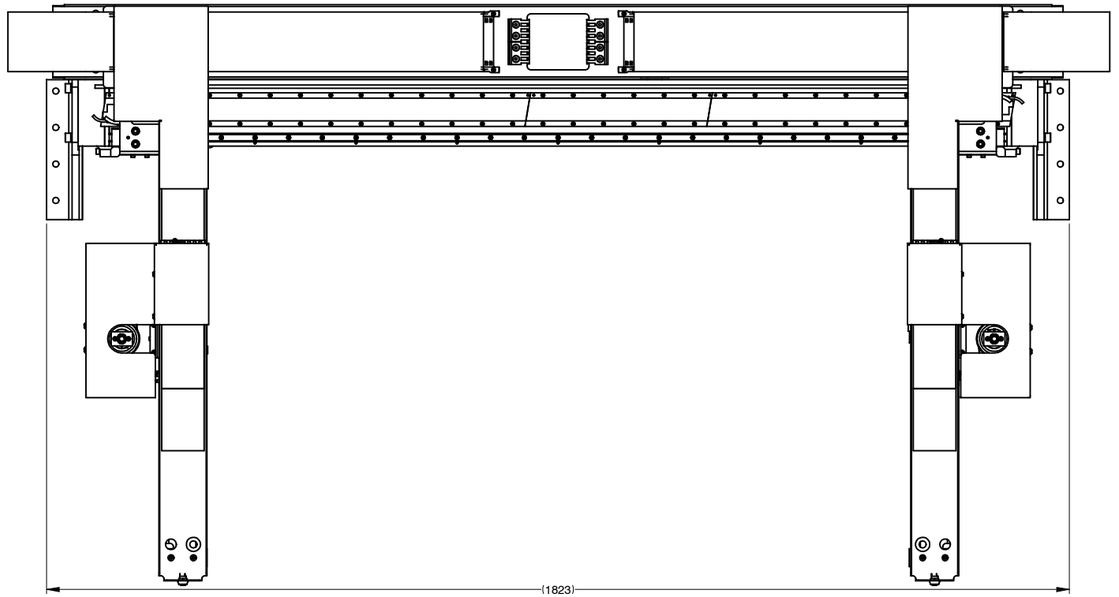
NOTES:

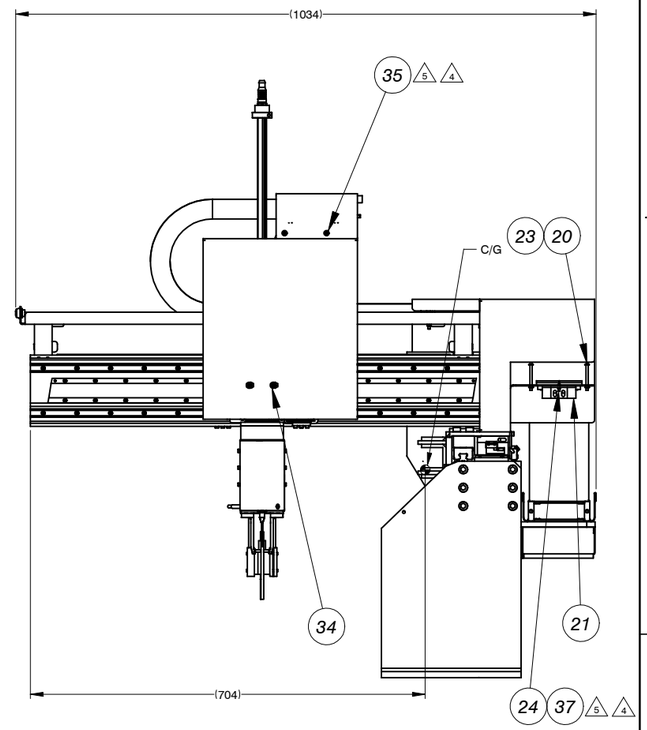
1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. UNFINISHED STEEL SURFACES TO BE COATED WITH RUST INHIBITOR PER MOTOMAN DESIGN STANDARD SSGW-077, PARA. 3.3.2

△4 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED

△5 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154193-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.





SEE SEPARATE BOM

REVISION STATUS OF SHEETS					
SHT.	1	2	3	-	-
REV.	0	0	0	-	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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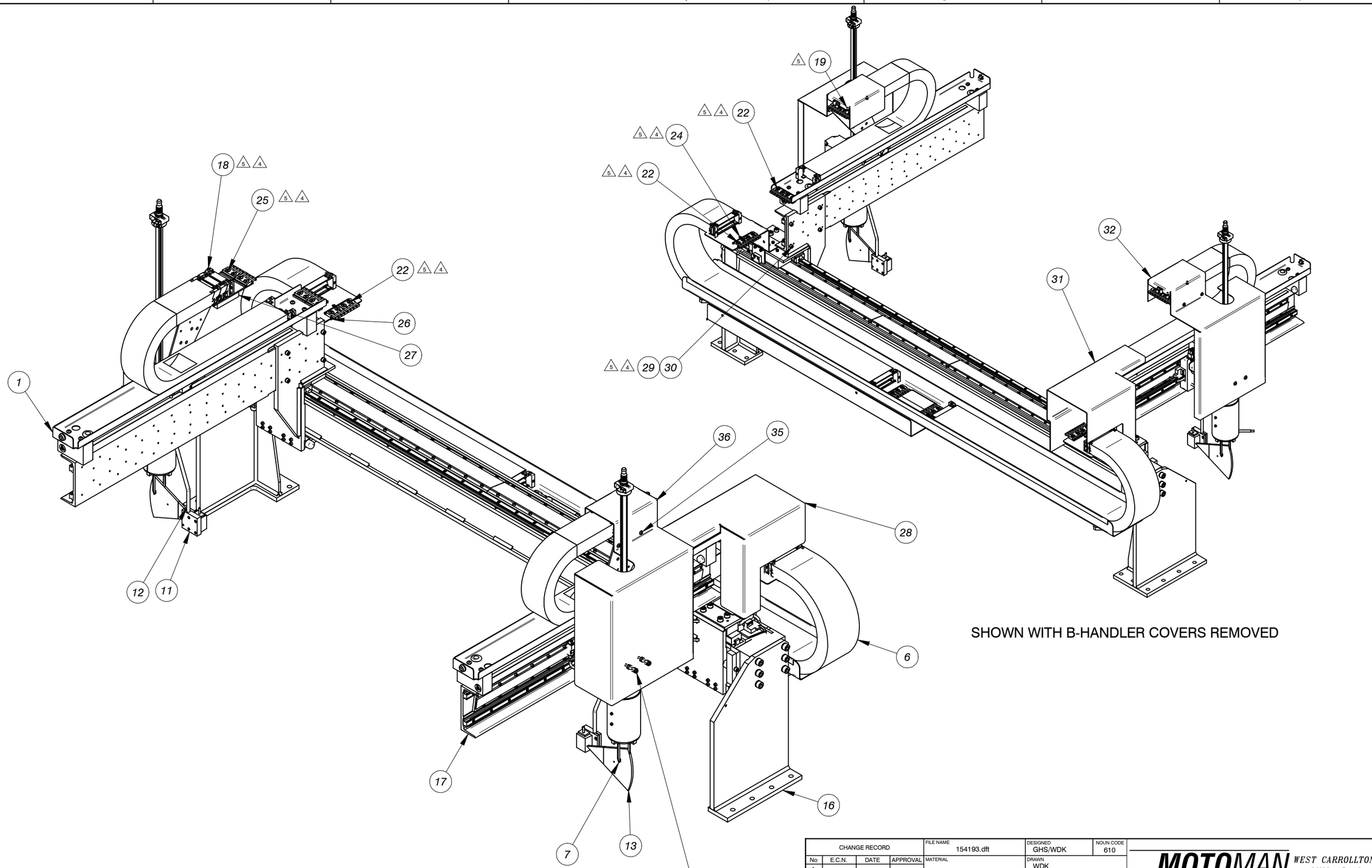
FILE NAME 154193.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED GHS/WDK
NOUN CODE 610
DRAWN WDK
CHECKED JL 5/2/08
APPROVAL GHS 5/5/08
APPROVAL
APPROVAL
RELEASE KAT 5/5/08
166.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,MOTION,XYZ AXIS
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 3
A1	0	1:5	154193	



SHOWN WITH A-HANDLER COVERS REMOVED

SHOWN WITH B-HANDLER COVERS REMOVED

CONFIDENTIAL: THIS DRAWING CONTAINS A PROPRIETARY DESIGN ORIGINATED BY MOTOMAN INCORPORATED NEITHER IT NOR THE INFORMATION APPEARING HEREON SHALL BE DISCLOSED, USED, OR DUPLICATED FOR ANY PURPOSE UNLESS SPECIFICALLY AUTHORIZED BY MOTOMAN INCORPORATED. THIS DRAWING IS THE PROPERTY OF MOTOMAN INCORPORATED AND SHALL BE RETURNED TO IT UPON REQUEST. ALL PATENT RIGHTS RELATING HERETO ARE SPECIFICALLY RESERVED.

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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11			
12			

FILE NAME 154193.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'

PROJECTION

DESIGNED GHS/WDK

NOUN CODE 610

DRAWN WDK

CHECKED JL 5/2/08

APPROVAL GHS 5/5/08

APPROVAL

APPROVAL

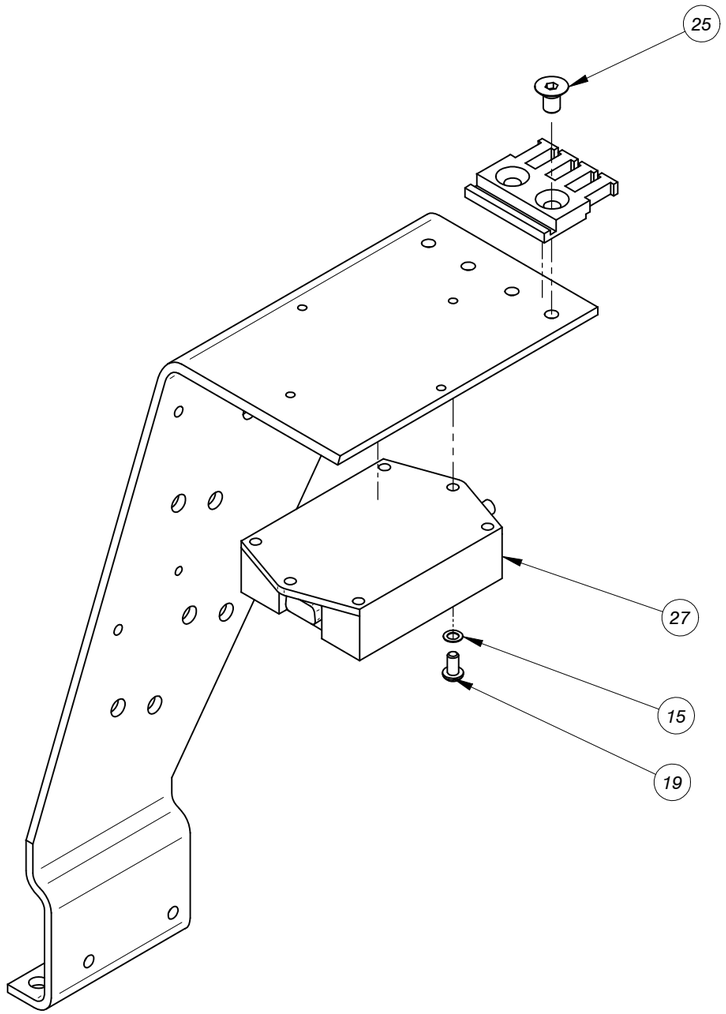
RELEASE KAT 5/5/08

166.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,MOTION,XYZ AXIS
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 3
A1	0	1:5	154193	



SERIAL CONVERTER MTG (ITEM 27)

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
2			
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12			

FILE NAME 154193.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'

PROJECTION

DESIGNED GHS/WDK

NOUN CODE 610

DRAWN WDK

CHECKED JL 5/2/08

APPROVAL GHS 5/5/08

APPROVAL

APPROVAL

RELEASE KAT 5/5/08

166.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,MOTION,XYZ AXIS
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 3
A1	0	1:5	154193	

Table A.5 154193-1 - SYSTEM, MOTION, XYZ AXIS

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154200-1	ARM ASSY,Y-AXIS,"A"SIDE	1
2	130431-3	CLAMP,WIRE,PLASTIC,P-STYLE	4
3	132525-1	SCREW,BHSC,M5X12,SST	4
4	154917-1	SCREW,HHC,M5X20,SST,	2
5	152936-3	NUT,HEX,M5,SST	2
6	153539-1	CARRIERASSY,E-CHAINW/CABLES	2
7	154228-1	GRIPPERASSY,ZETAMOUNT	2
8	145896-5	PIN,HOMING,AUTOSORTERIII	1
9	140351-7	SCREW,SHC,M3X15,SST	8
10	132609-1	WASHER,CONICALSPRING,M3,SST	8
11	154227-1	MOUNT,BARCODE	2
12	154483-1	POST,MOUNTING,BARCODEREADER	2
13	712110-1	SCANNER,BARCODE,RASTER,RS232	2
14	132524-10	SCREW,SHC,M4X10,SST	4
15	132609-2	WASHER,CONICALSPRING,M4,SST	8
16	153445-1	DRIVE ASSY,X-AXIS	1
17	154201-1	ARM ASSY,Y-AXIS,B-HANDLER	1
18	132524-22	SCREW,SHC,M4X40,SST	4
19	140352-1	SCREW,BHSC,M4X8,SST	4
20	130423-12	SCREW,BHSC,M4X45	12
21	153329-2	CONVERTER,SERIAL,LINEARMOTOR	2
22	140332-4	SCREW,FHSC,M6X16,SST	24
23	472361-2	NUT,LOCK,M4	12
24	132525-5	SCREW,BHSC,M3X10,SST	4
25	140332-3	SCREW,FHSC,M6X12,SST	8
26	154825-1	PLATE,NUT,M6	6
27	153329-3	CONVERTER,SERIAL,LINEARMOTOR	2
28	154952-2	COVER,WIRE,E-CHAIN,B-HANDLER	1
29	132609-4	WASHER,CONICALSPRING,M6,SST	12
30	140333-1	SCREW,SHC,M6X8,SST,CLASS12.9	12
31	154952-1	COVER,WIRE,E-CHAIN,A-HANDLER	1
32	154969-1	COVER,WIRE,Y-AXIS,A-HANDLER	1
33	155011-1	SPACER,COVER,WIRE,Y-AXIS	4

Table A.5 154193-1 - SYSTEM, MOTION, XYZ AXIS

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
34	140331-2	SCREW,BHSC,M6X8,SST	4
35	140328-1	SCREW,BHSC,M5X5,SST	4
36	154969-2	COVER,WIRE,Y-AXIS,B-HANDLER	1
37	472361-3	NUT,LOCK,M3	4

NOTES:

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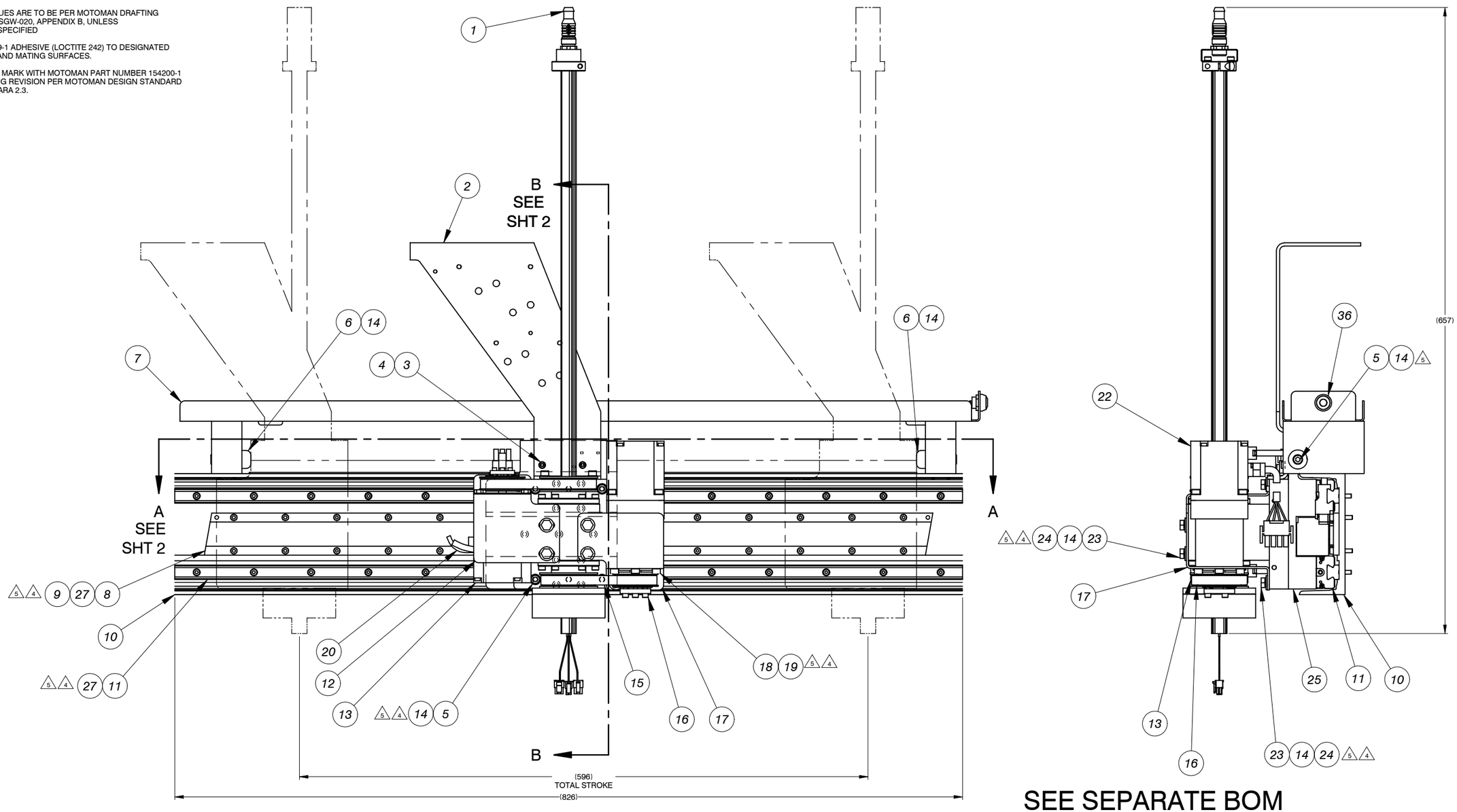
3. UNFINISHED STEEL SURFACES TO BE COATED WITH RUST INHIBITOR PER MOTOMAN DESIGN STANDARD SSGW-077, PARA. 3.3.2

△4 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED

△5 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154200-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.



SEE SEPARATE BOM

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0439	5/7/08	JL
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REVISION STATUS OF SHEETS						
SHT.	1	2	3	4	5	
REV.	1	0	0	0	0	

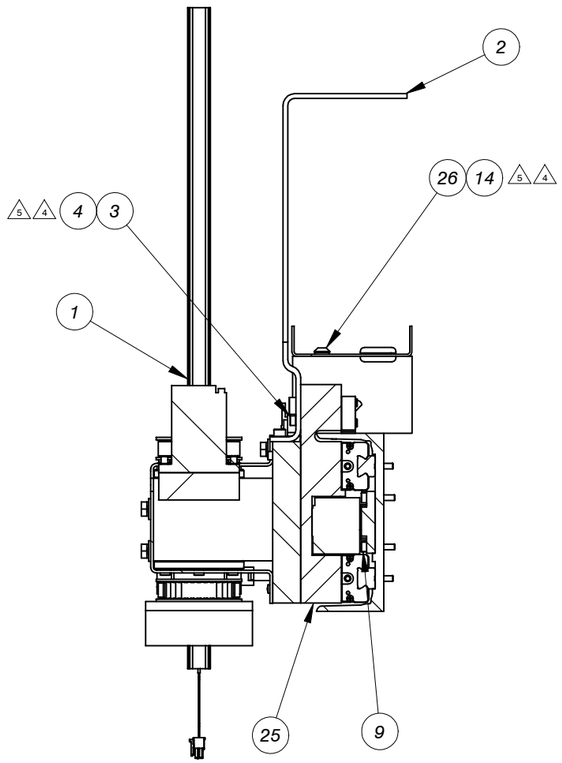
FILE NAME: 154200.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 015
DRAWN: keesewe
CHECKED: JL 3/17/08
APPROVAL: GHS 3/18/08
APPROVAL:
APPROVAL:
RELEASE: KAT 3/19/08
17.9 kg

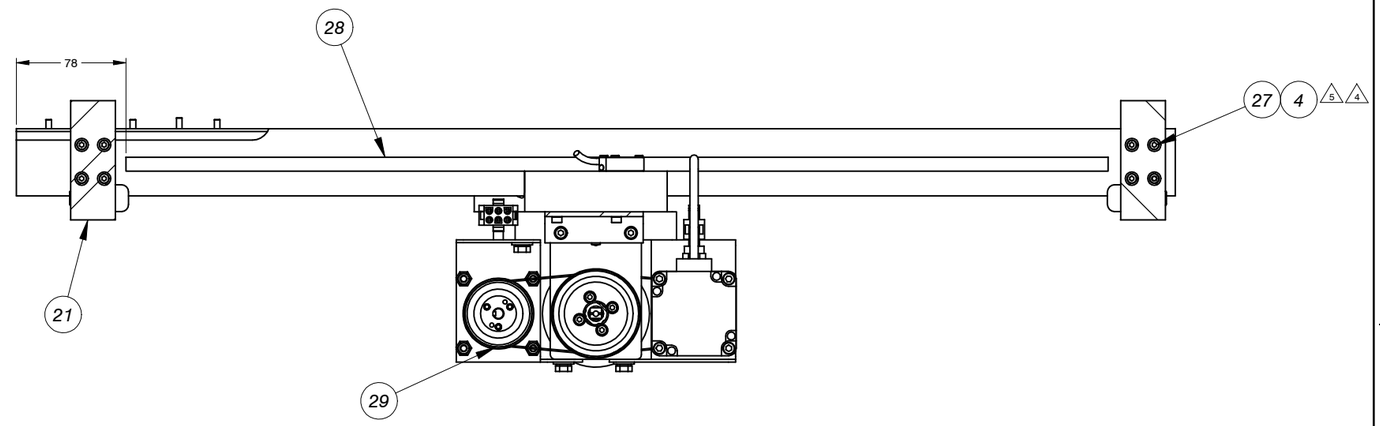
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: ARM ASSY, Y-AXIS, A-HANDLER AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 5
A1	0	1:2	154200	



SECTION B-B
1:2



SECTION A-A
1:2

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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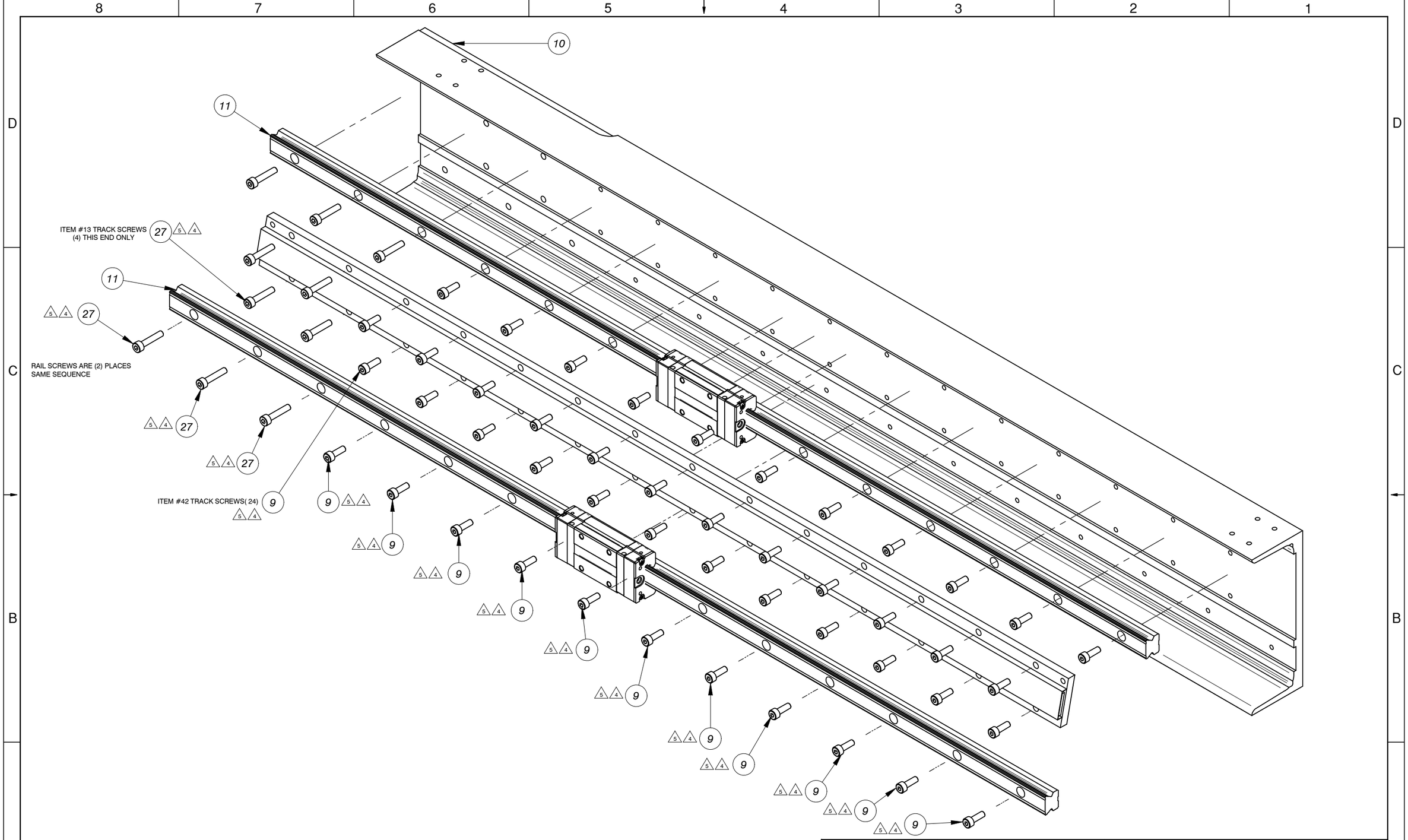
FILE NAME: 154200.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 015
DRAWN: keesewe
CHECKED: JL 3/17/08
APPROVAL: GHS 3/18/08
APPROVAL:
APPROVAL:
RELEASE: KAT 3/19/08
17.9 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ARM ASSY, Y-AXIS, A-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 5
A1	0	1:2	154200	



CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME: 154200.dft

MATERIAL:

FINISH:

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'

PROJECTION

DESIGNED: GHS/WDK NOUN CODE: 015

DRAWN: keesewe

CHECKED: JL 3/17/08

APPROVAL: GHS 3/18/08

APPROVAL:

APPROVAL:

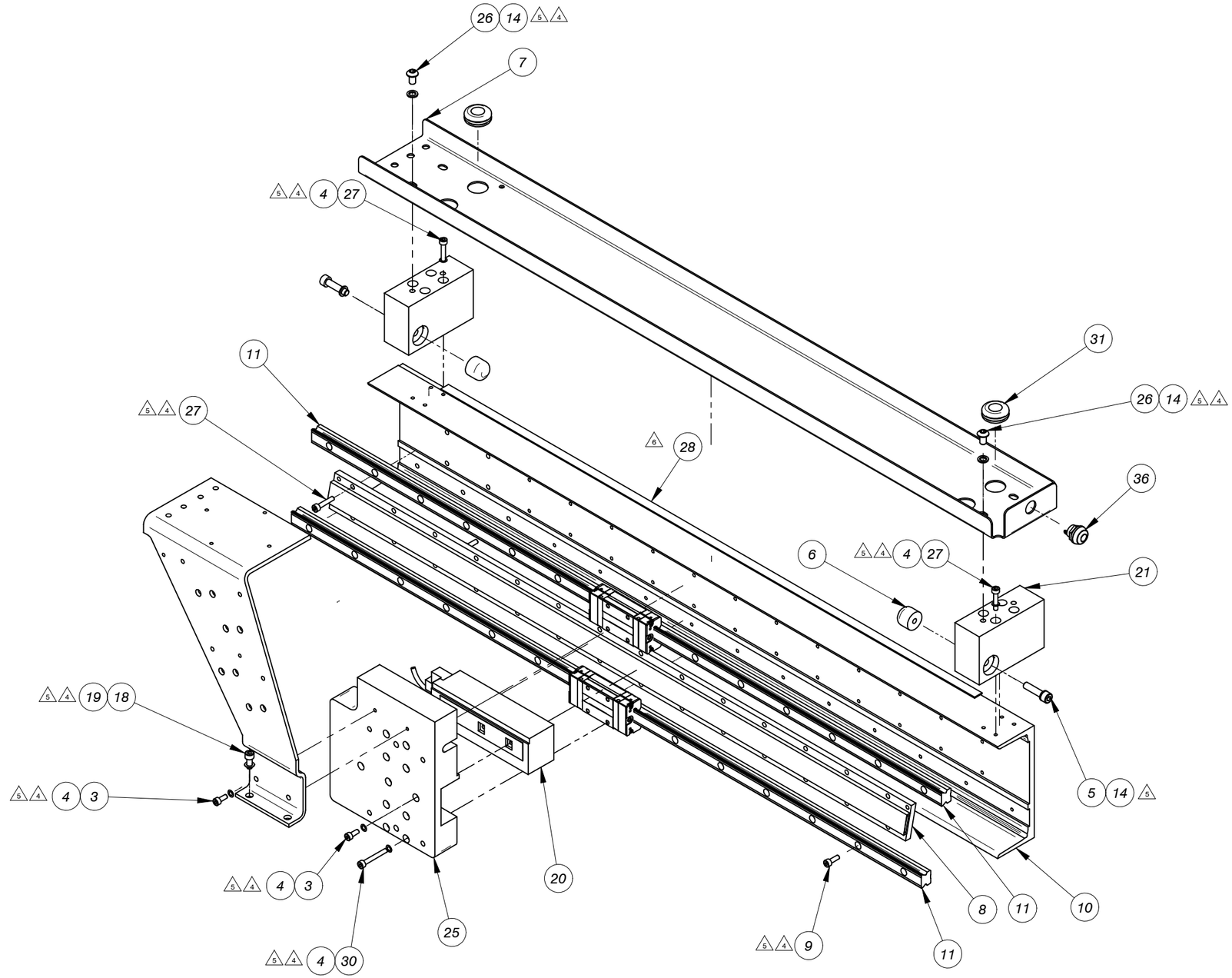
RELEASE: KAT 3/19/08

17.9 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: ARM ASSY, Y-AXIS, A-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 5
A1	0	1:2	154200	



CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME 154200.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

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DECIMAL 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'

PROJECTION

DESIGNED GHS/WDK

NOUN CODE 015

DRAWN keesewe

CHECKED JL 3/17/08

APPROVAL GHS 3/18/08

APPROVAL

APPROVAL

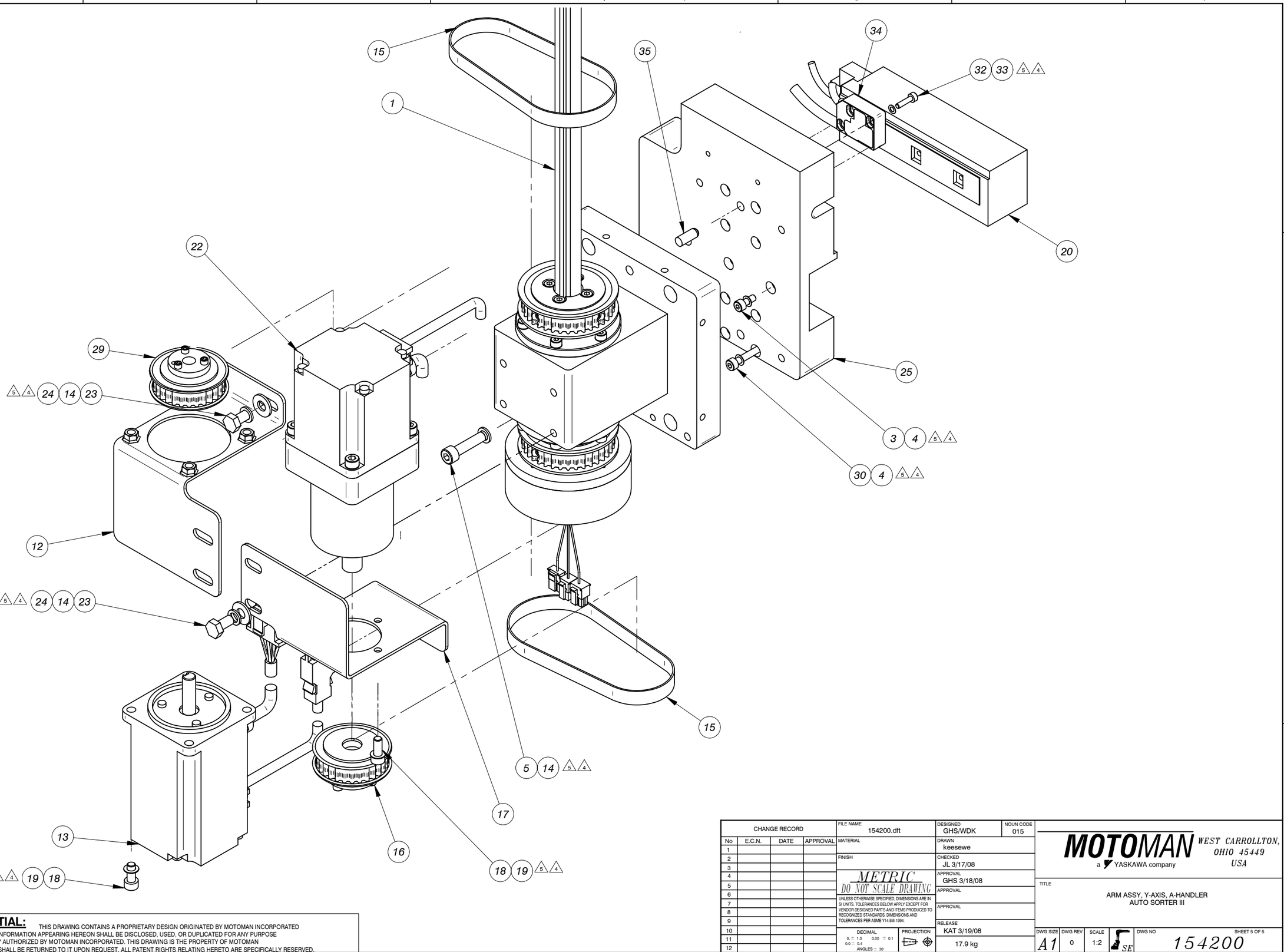
RELEASE KAT 3/19/08

17.9 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ARM ASSY, Y-AXIS, A-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 5
A1	0	1:2	154200	



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CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME: 154200.dft
MATERIAL:
FINISH:
METRIC
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DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 015
DRAWN: keesewe
CHECKED: JL 3/17/08
APPROVAL: GHS 3/18/08
APPROVAL:
APPROVAL:
RELEASE: KAT 3/19/08
17.9 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ARM ASSY, Y-AXIS, A-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 5 OF 5
A1	0	1:2	154200	

Table A.6 154200-1, ARM ASSY, Y-AXIS, A-HANDLER

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154206-1	DRIVE ASSY,ZETA	1
2	154191-1	BRACKET,E-CHN,Y-AXIS,A HNDLR	1
3	132524-10	SCREW,SHC,M4X10,SST	5
4	132609-2	WASHER,CONICAL SPRING,M4,SST	21
5	140333-7	SCREW,SHC,M6X25,SST,CLASS 12.9	6
6	153561-1	BUMPER,RUBBER	2
7	154204-1	TRAY,ENERGY CHAIN,Y-AXIS	1
8	153318-1	TRACK,MAGNETIC,LINEAR MOTOR	1
9	132524-9	SCREW,SHC,M4X12,SST	46
10	154759-1	RAIL,GUIDE,Y-AXIS,A HANDLER	1
11	153559-1	SLIDE ASSY,W/CARRIER	2
12	154223-1	BRACKET,MOTOR,Z-AXIS	1
13	154413-1	MOTOR ASSY,ALTERED,SERVO,100W	1
14	132609-4	WASHER,CONICAL SPRING,M6,SST	16
15	153651-1	BELT,TIMING,T5X10X300	2
16	153652-1	GEAR,TIMING,75,28 TOOTH	1
17	154222-1	BRACKET,THETA MOTOR	1
18	140330-3	SCREW,SHC,M5X12,SST	10
19	132609-3	WASHER,CONICAL SPRING,M5,SST	10
20	153328-3	MOTOR,LINEAR,40N,200V,SIGMAIII	1
21	154182-1	SPACER,TRAY,ENERGY CHAIN	2
22	154087-1	MOTOR ASSY,ALTERED,SERVO,100W	1
23	151704-4	SCREW,HHC,M6X12,SST	6
24	132527-1	WASHER,FLAT,M6,SST	6
25	154343-1	CARRIAGE,Y-AXIS,"A" HANELER	1
26	140331-3	SCREW,BHSC,M6X10,SST	4
27	132524-19	SCREW,SHC,M4X20,SST	18
28	154827-2	GAGE,OPTICAL SCALE,700	1
29	153653-1	GEAR,TIMING,T5,28 TOOTH	1
30	132524-23	SCREW,SHC,M4X30,SST	8
31	137798-4	GROMMET,RUBBER,1/2	2
32	140351-7	SCREW,SHC,M3X15,SST	3

Table A.6 154200-1, ARM ASSY, Y-AXIS, A-HANDLER

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
33	132609-1	WASHER,CONICAL SPRING,M3,SST	3
34	154826-1	SENSOR,READ HEAD,ENCODER (OBS)	1
35	132652-15	PIN,DOWEL,M6X16	2
36	152149-2	SWITCH ASSY,MOMENTARY,PUSHBUT	1

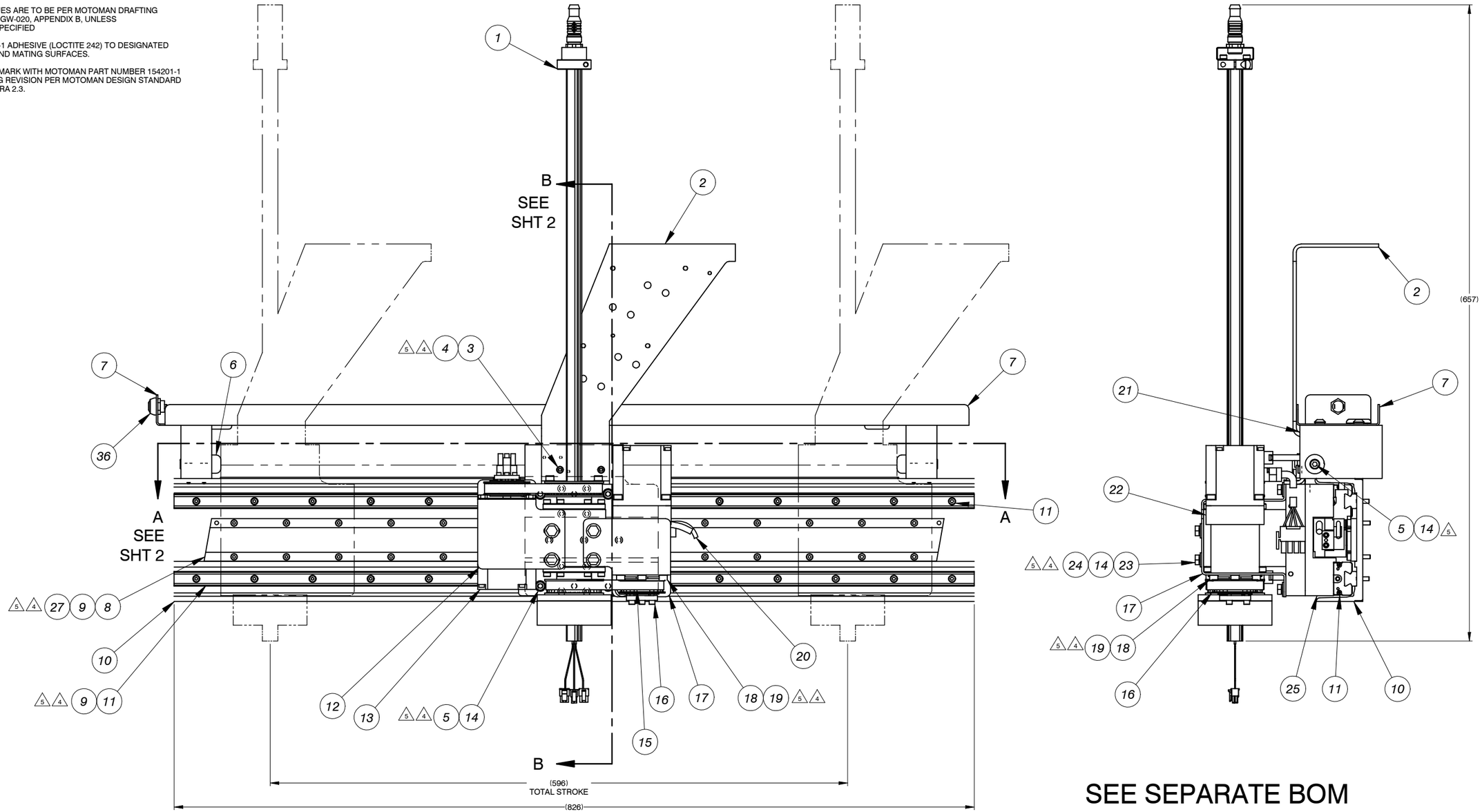
NOTES:

1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. UNFINISHED STEEL SURFACES TO BE COATED WITH RUST INHIBITOR PER MOTOMAN DESIGN STANDARD SSGW-077, PARA. 3.3.2

△4 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED

△5 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154201-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.



SEE SEPARATE BOM

REVISION STATUS OF SHEETS						
SHT.	1	2	3	4	5	
REV.	1	0	0	0	0	

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0440	5/7/08	JL
2			
3			
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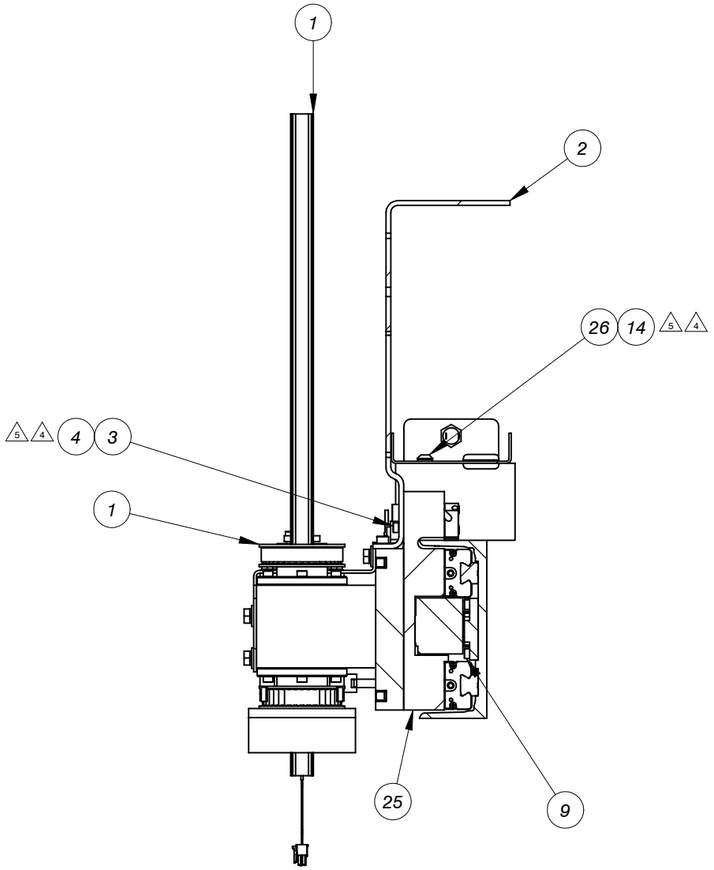
FILE NAME 154201.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED GHS/WDK
NOUN CODE 015
DRAWN keesewe
CHECKED JL 3/17/08
APPROVAL GHS 3/18/08
APPROVAL
APPROVAL
RELEASE KAT 3/19/08
17.9 kg

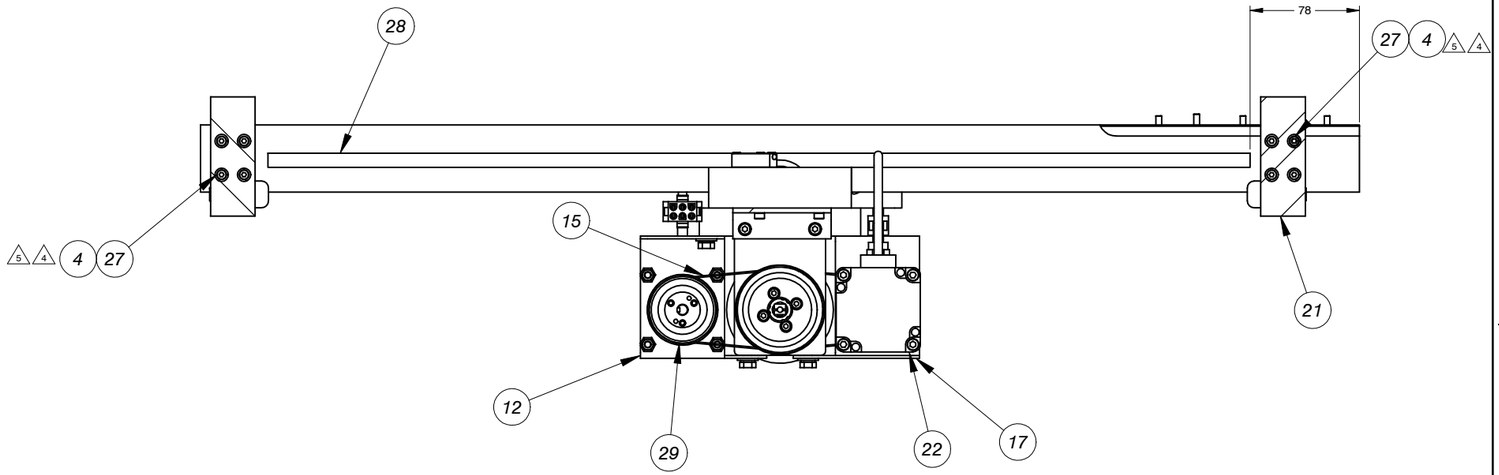
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ARM ASSY, Y-AXIS, B-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 5
A1	0	1:2	154201	



SECTION B-B
1:2



SECTION A-A
1:2

CONFIDENTIAL: THIS DRAWING CONTAINS A PROPRIETARY DESIGN ORIGINATED BY MOTOMAN INCORPORATED NEITHER IT NOR THE INFORMATION APPEARING HEREON SHALL BE DISCLOSED, USED, OR DUPLICATED FOR ANY PURPOSE UNLESS SPECIFICALLY AUTHORIZED BY MOTOMAN INCORPORATED. THIS DRAWING IS THE PROPERTY OF MOTOMAN INCORPORATED AND SHALL BE RETURNED TO IT UPON REQUEST. ALL PATENT RIGHTS RELATING HERETO ARE SPECIFICALLY RESERVED.

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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12			

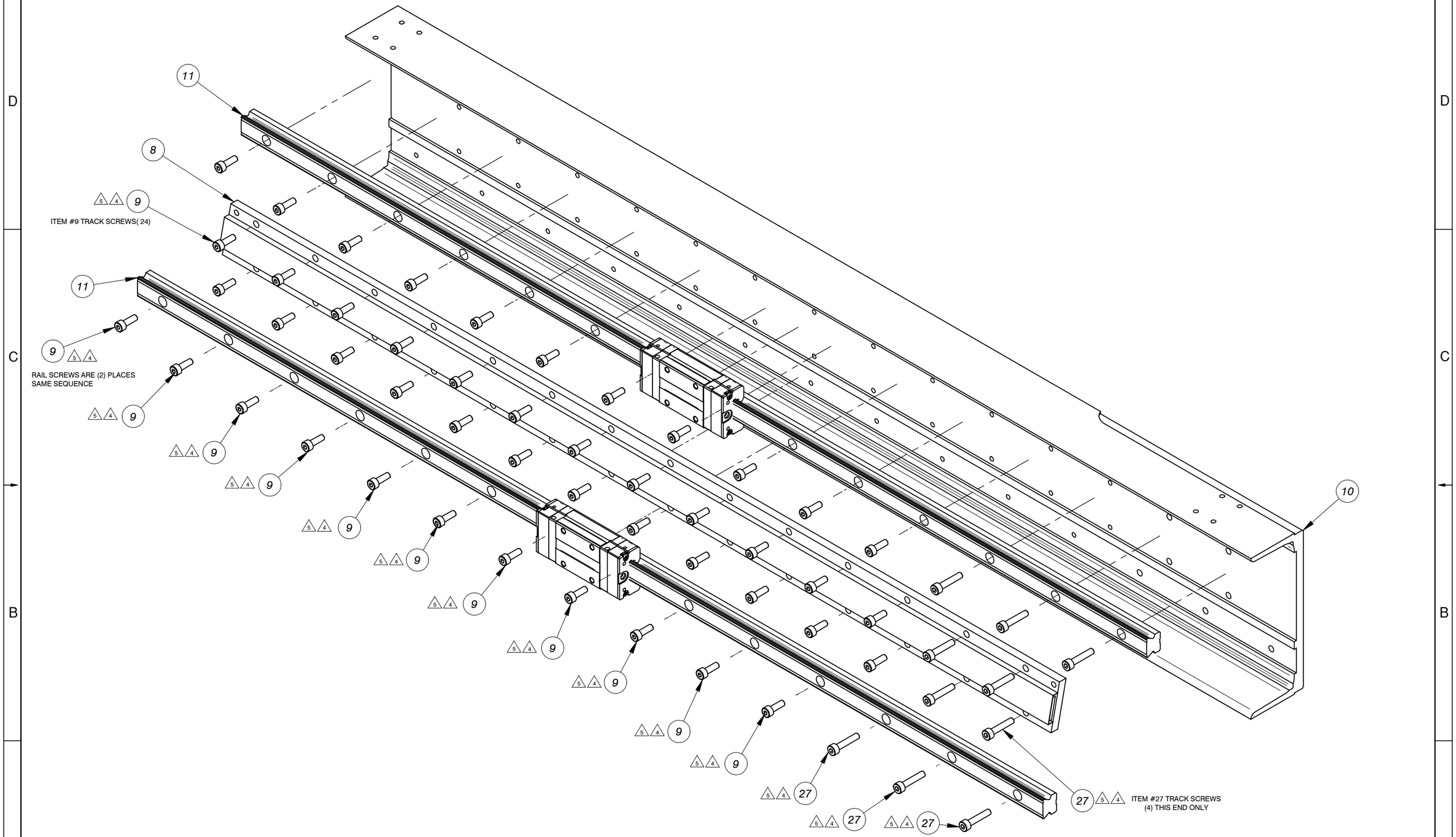
FILE NAME: 154201.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 015
DRAWN: keesewe
CHECKED: JL 3/17/08
APPROVAL: GHS 3/18/08
APPROVAL:
APPROVAL:
RELEASE: KAT 3/19/08
17.9 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ARM ASSY, Y-AXIS, B-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 5
A1	0	1:2	154201	



CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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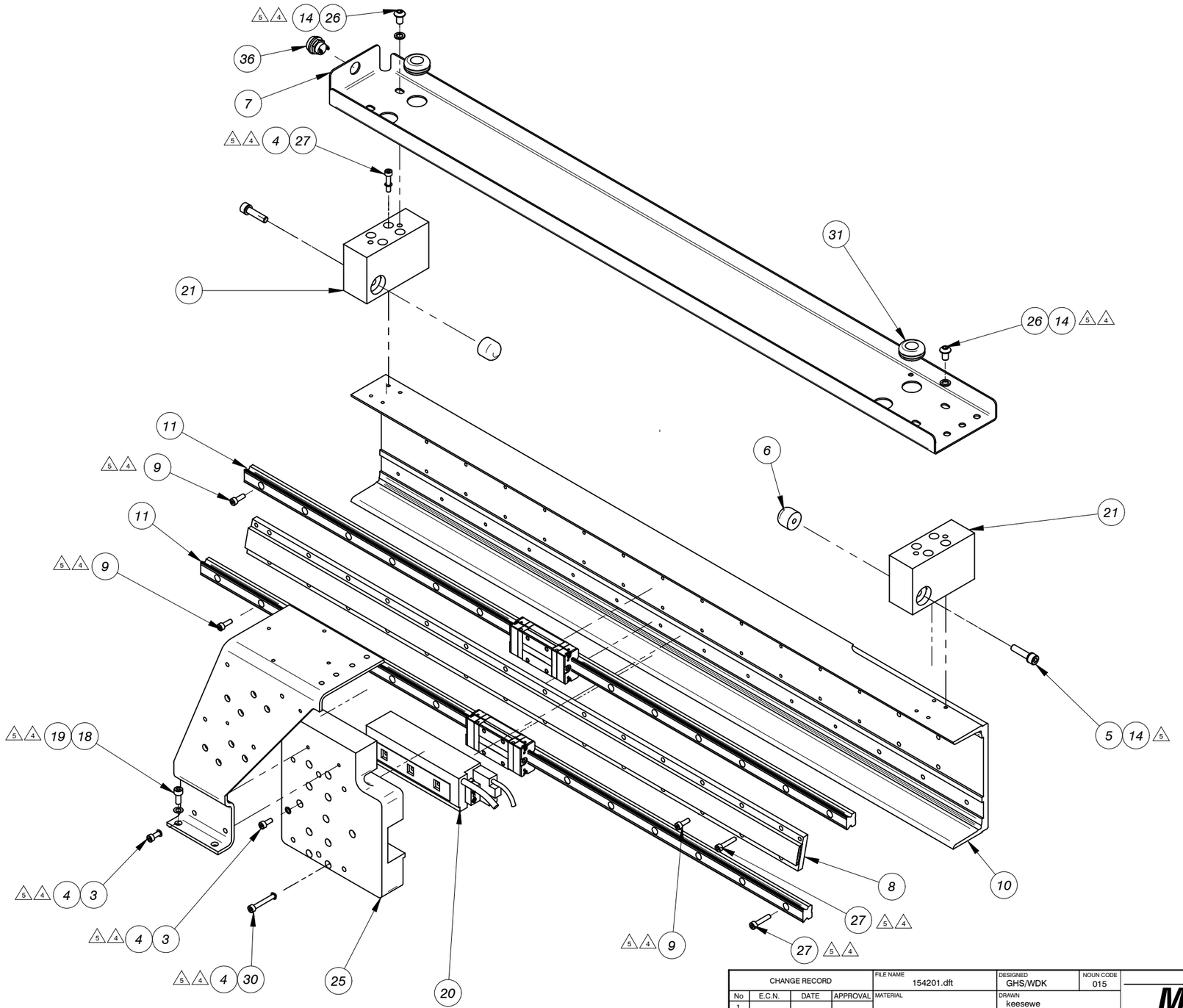
FILE NAME: 154201.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK
NOUN CODE: 015
DRAWN: keesewe
CHECKED: JL 3/17/08
APPROVAL: GHS 3/18/08
APPROVAL:
APPROVAL:
RELEASE: KAT 3/19/08
17.9 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: ARM ASSY, Y-AXIS, B-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 5
A1	0	1:2	154201	



CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME 154201.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL ± 1.0 ± 0.1 ± 0.4 ANGLES ± 30' | PROJECTION

DESIGNED GHS/WDK | NOUN CODE 015

DRAWN keesewe

CHECKED JL 3/17/08

APPROVAL GHS 3/18/08

APPROVAL

APPROVAL

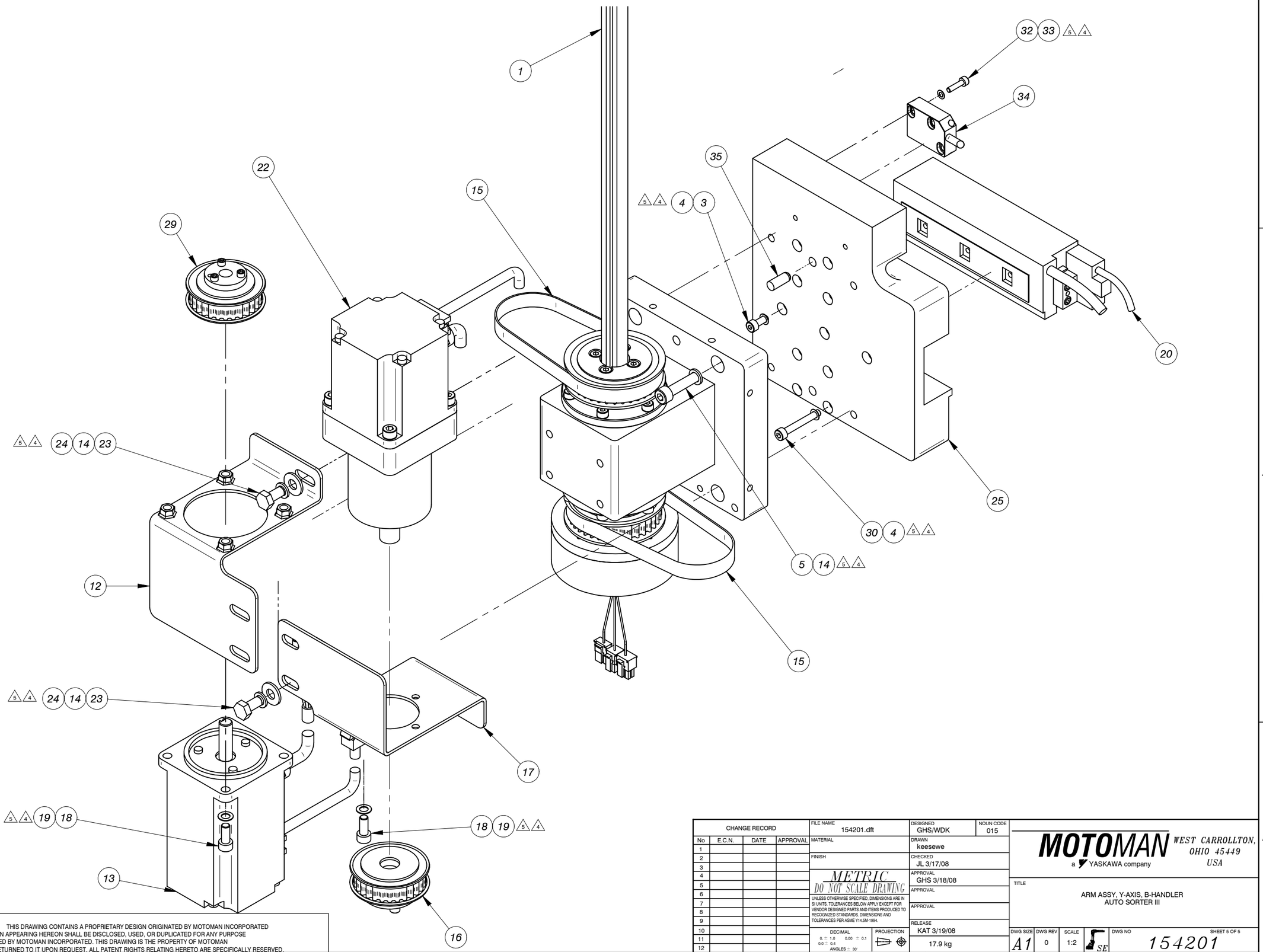
RELEASE KAT 3/19/08

17.9 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ARM ASSY, Y-AXIS, B-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 5
A1	0	1:2	154201	



CONFIDENTIAL: THIS DRAWING CONTAINS A PROPRIETARY DESIGN ORIGINATED BY MOTOMAN INCORPORATED NEITHER IT NOR THE INFORMATION APPEARING HEREON SHALL BE DISCLOSED, USED, OR DUPLICATED FOR ANY PURPOSE UNLESS SPECIFICALLY AUTHORIZED BY MOTOMAN INCORPORATED. THIS DRAWING IS THE PROPERTY OF MOTOMAN INCORPORATED AND SHALL BE RETURNED TO IT UPON REQUEST. ALL PATENT RIGHTS RELATING HEREIO ARE SPECIFICALLY RESERVED.

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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11			
12			

FILE NAME: 154201.dft

MATERIAL:

FINISH:

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30' | PROJECTION

DESIGNED: GHS/WDK | NOUN CODE: 015
DRAWN: keesewe
CHECKED: JL 3/17/08
APPROVAL: GHS 3/18/08
APPROVAL:
APPROVAL:
RELEASE: KAT 3/19/08
17.9 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ARM ASSY, Y-AXIS, B-HANDLER
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 5 OF 5
A1	0	1:2	154201	

Table A.7 154201-1, ARM ASSY, Y-AXIS, B-HANDLER

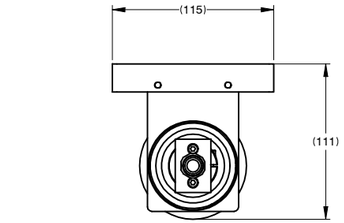
FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154206-1	DRIVE ASSY,ZETA	1
2	154191-2	BRACKET,ECHN,Y-AXIS,B HNDLR	1
3	132524-10	SCREW,SHC,M4X10,SST	5
4	132609-2	WASHER,CONICAL SPRING,M4,SST	22
5	140333-7	SCREW,SHC,M6X25,SST,CLASS 12.9	6
6	153561-1	BUMPER,RUBBER	2
7	154204-1	TRAY,ENERGY CHAIN,Y-AXIS	1
8	153318-1	TRACK,MAGNETIC,LINEAR MOTOR	1
9	132524-9	SCREW,SHC,M4X12,SST	46
10	154759-2	RAIL,GUIDE,Y-AXIS,B HANDLER	1
11	153559-1	SLIDE ASSY,W/CARRIER	2
12	154223-1	BRACKET,MOTOR,Z-AXIS	1
13	154413-1	MOTOR ASSY,ALTERED,SERVO,100W	1
14	132609-4	WASHER,CONICAL SPRING,M6,SST	16
15	153651-1	BELT,TIMING,T5X10X300	2
16	153652-1	GEAR,TIMING,75,28 TOOTH	1
17	154222-1	BRACKET,THETA MOTOR	1
18	140330-3	SCREW,SHC,M5X12,SST	10
19	132609-3	WASHER,CONICAL SPRING,M5,SST	10
20	153328-3	MOTOR,LINEAR,40N,200V,SIGMAIII	1
21	154182-1	SPACER,TRAY,ENERGY CHAIN	2
22	154087-1	MOTOR ASSY,ALTERED,SERVO,100W	1
23	151704-4	SCREW,HHC,M6X12,SST	6
24	132527-1	WASHER,FLAT,M6,SST	6
25	154343-2	CARRIAGE,Y-AXIS,"B" HANDLER	1
26	140331-3	SCREW,BHSC,M6X10,SST	4
27	132524-19	SCREW,SHC,M4X20,SST	19
28	154827-2	GAGE,OPTICAL SCALE,700	1
29	153653-1	GEAR,TIMING,T5,28 TOOTH	1
30	132524-23	SCREW,SHC,M4X30,SST	8
31	137798-4	GROMMET,RUBBER,1/2	2
32	140351-7	SCREW,SHC,M3X15,SST	3

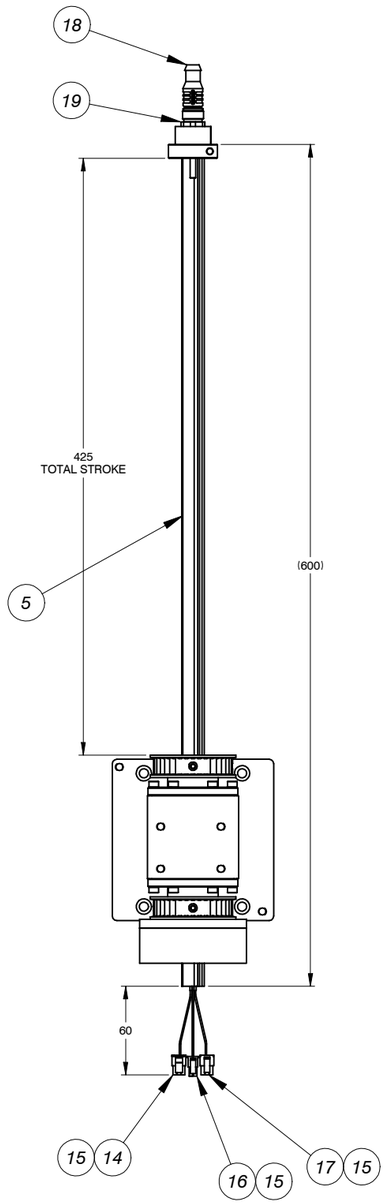
Table A.7 154201-1, ARM ASSY, Y-AXIS, B-HANDLER

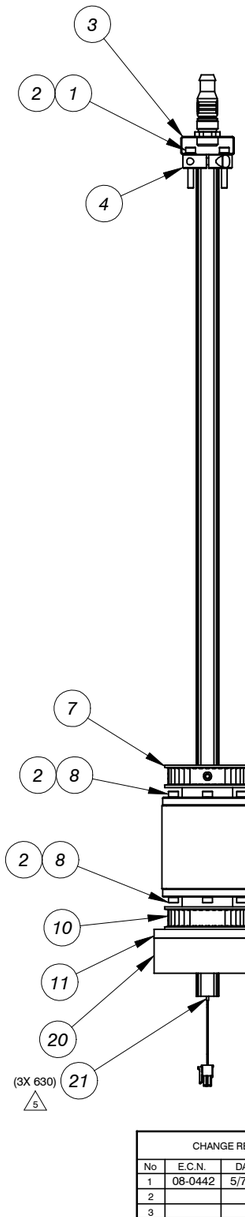
FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
33	132609-1	WASHER,CONICAL SPRING,M3,SST	3
34	154826-1	SENSOR,READ HEAD,ENCODER (OBS)	1
35	132652-15	PIN,DOWEL,M6X16	2
36	152149-2	SWITCH ASSY,MOMENTARY,PUSHBUT	1

NOTES:

1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED
4. APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.
5. SEPARATE CONDUCTORS INTO THREE GROUPS ACCORDING TO WHICH CONNECTOR ASSIGNED, COVER WITH SHRINK TUBING AND INSTALL IN SHAFT.
6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154206-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.







SEE SEPARATE BOM

PL28A			PL29B
1	#24 AWG WHT	GRIP/U	1
2	#24 AWG BRN	GRIP/U	2
3	#24 AWG YEL	GRIP/U	4
4	#24 AWG GRN	GRIP/U	3
PL29C			
1	#24 AWG GRA	GRIP/PG5V	5
2	#24 AWG PNK	GRIP/PG0V	6
3	#24 AWG BLU	GRIP/PS	7
4	#24 AWG RED	GRIP//PS	8
5	#24 AWG ORN	SHIELD	9
PL30A			
1	#24 AWG TAN	+24VDC	10
2	#24 AWG BLK	0VDC	11
3	#24 AWG VIO	SIGNAL	12

REVISION STATUS OF SHEETS					
SHT.	1	2	-	-	-
REV.	1	0	-	-	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0442	5/7/08	JL
2			
3			
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12			

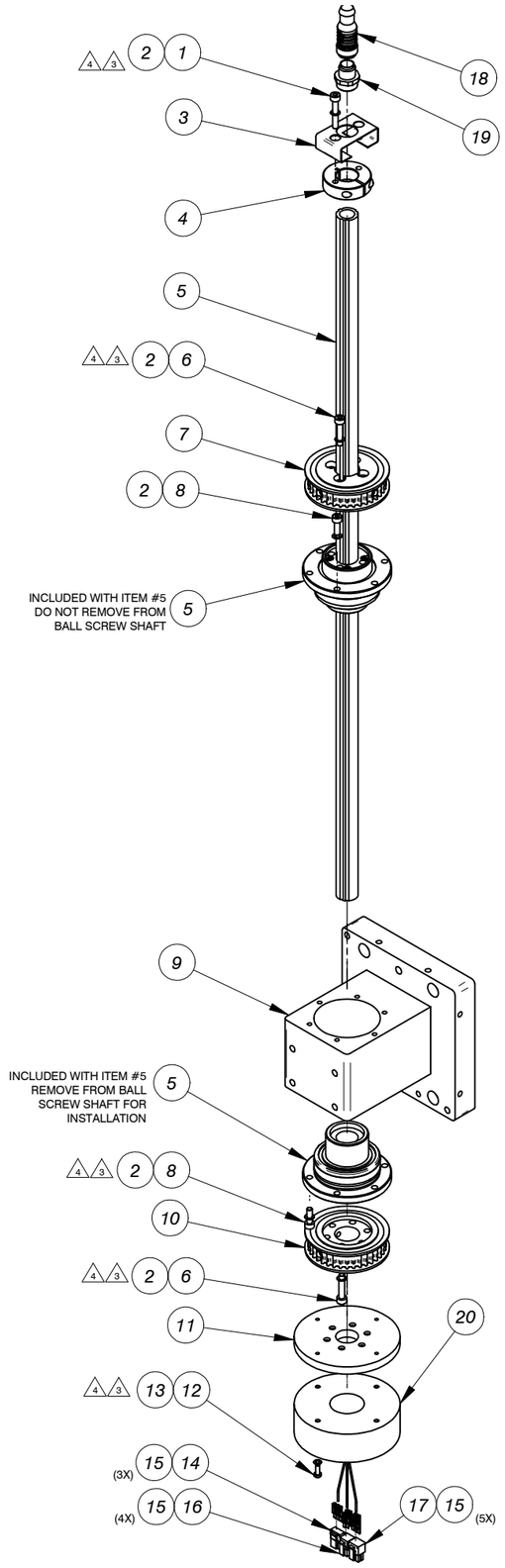
FILE NAME 154206.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED GHS/WDK
NOUN CODE 166
DRAWN reynojo
CHECKED JL 3/11/08
APPROVAL GHS 3/11/08
APPROVAL
APPROVAL
RELEASE KAT 3/12/08
3.0 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
DRIVE ASSY, ZETA
AUTO SORTER III

DWG SIZE A1 | DWG REV 0 | SCALE 1:2 | SE | DWG NO 154206 | SHEET 1 OF 2



EXPLODED VIEW

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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8			
9			
10			
11			
12			

FILE NAME 154206.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'

PROJECTION

DESIGNED GHS/WDK

NOUN CODE 166

DRAWN reynojo

CHECKED JL 3/11/08

APPROVAL GHS 3/11/08

APPROVAL

APPROVAL

RELEASE KAT 3/12/08

3.0 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
DRIVE ASSY, ZETA
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 2
A1	0	1:2	154206	

Table A.8 154206-1, DRIVE ASSY, ZETA

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	132524-20	SCREW,SHC,M4X25,SST	2
2	132609-2	WASHER,CONICALSPRING,M4,SST	24
3	154225-1	BRACKET,WIRESUPPORT,Z-AXIS	1
4	153777-1	COLLAR,SHAFT	1
5	153562-1	BALL SPLINE,16mmX600LONG	1
6	132524-19	SCREW,SHC,M4X20,SST	10
7	154221-1	PULLEY,ALTERED,Z_AXIS	1
8	132524-9	SCREW,SHC,M4X12,SST	12
9	154207-1	MOUNT,HUB,ZETA	1
10	154220-1	PULLEY,ALTERED,THETA	1
11	154224-1	PLATE,RETAINER,BELLOWS	1
12	132525-4	SCREW,BHSC,M3X8,SST	4
13	132609-1	WASHER,CONICALSPRING,M3,SST	4
14	149100-2	CONNECTOR,3SOCKET,CRIMP	1
15	149104-1	CONTACT,SOCKET,MICRO-FIT,CRIMP	12
16	149099-2	CONNECTOR,PCBOARD,MICRO-FIT	1
17	149099-3	CONNECTOR,PCBOARD,MICRO-FIT	1
18	154344-1	CABLE ASSY,PWR/ENC/IO,GRIPPER	1
19	154484-1	CABLE,EURO,RECEPT,12COND	1
20	154214-1	BELLOWS,ZETACOVER	1
21	146125-10	TUBING,SHRINKABLE,3/16,BLACK	1890

NOTES:

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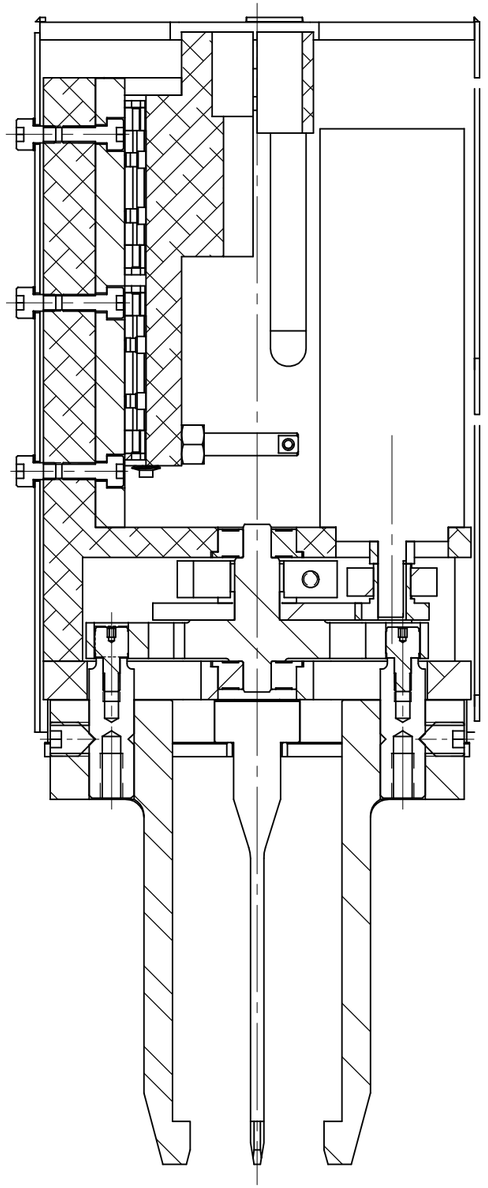
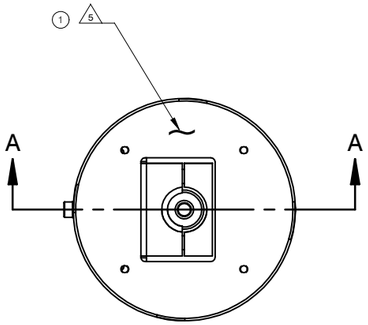
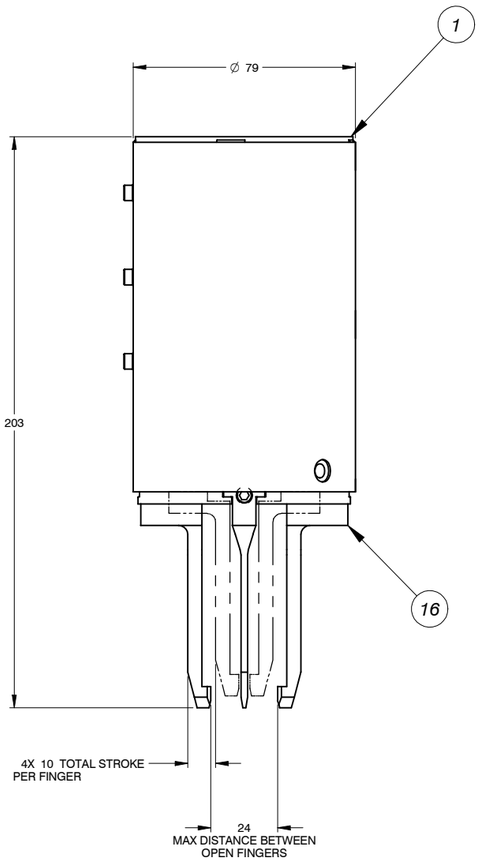
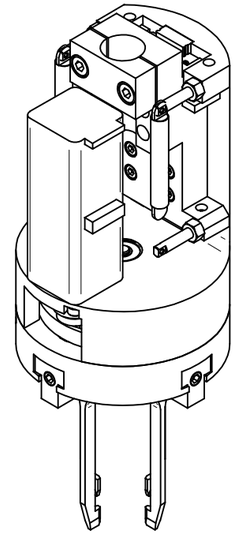
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED
4. APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.
1. 5. PERMANENT MARK WITH MOTOMAN PART NUMBER 154228-( ) AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.



1 SECTION A-A
2:1

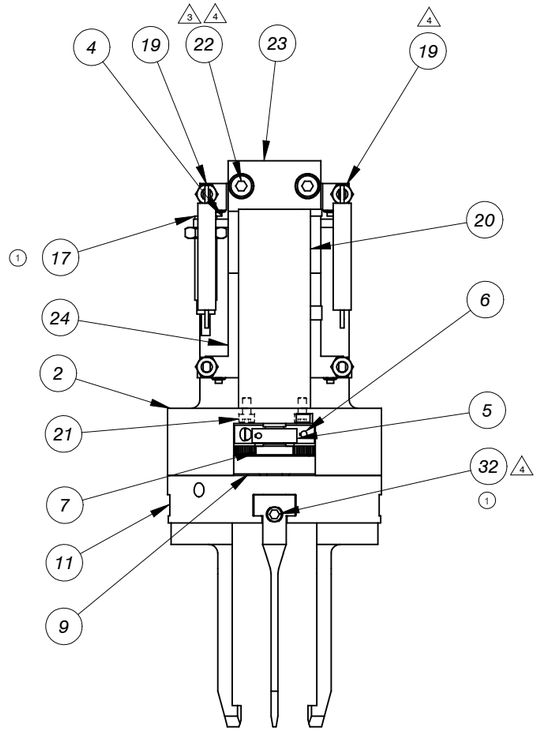






ISOMETRIC VIEW

REFERENCE ONLY
SHOWN WITH ITEM #1 (COVER) REMOVED



VIEW SHOWN WITH ITEM #1 (COVER) REMOVED

SEE SEPARATE BOM

REVISION STATUS OF SHEETS					
SHT.	1	2	-	-	-
REV.	1	1	-	-	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0252	3/19/08	JL
2			
3			
4			
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6			
7			
8			
9			
10			
11			
12			

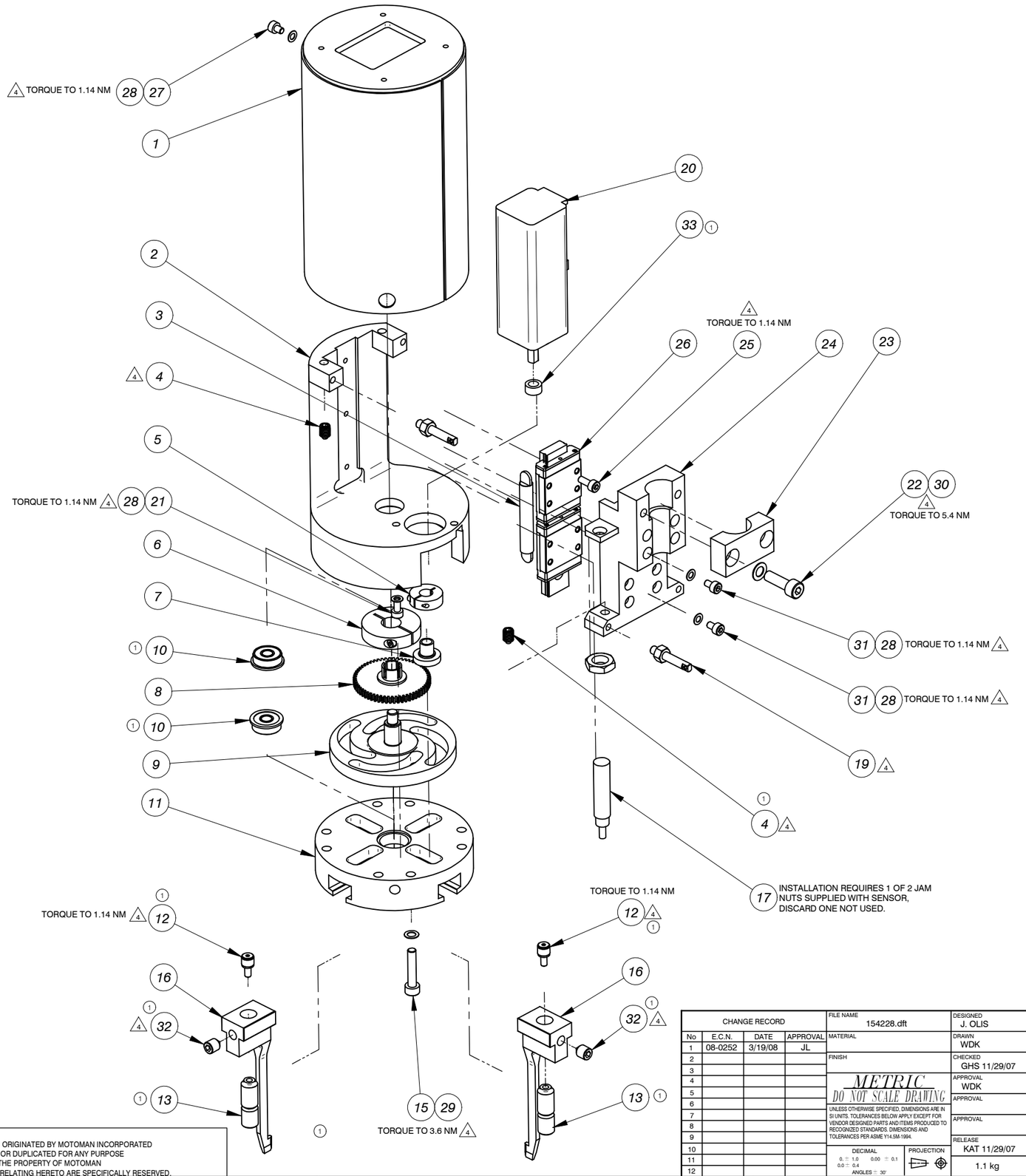
FILE NAME 154228.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED J. OLIS
NOUN CODE 229
DRAWN WDK
CHECKED GHS 11/29/07
APPROVAL WDK
APPROVAL
APPROVAL
RELEASE KAT 11/29/07
1.1 kg

MOTOMAN a YASKAWA company
1701 Kaiser Ave,
Irvine, CA 92614
phone (949)263-2640
fax (949)263-2644

TITLE
GRIPPER ASSY, ZETA MOUNT
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 2
A1	1	1:1	154228	



CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1	08-0252	3/19/08	JL
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

FILE NAME 154228.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30' | PROJECTION

DESIGNED J. OLIS | NOUN CODE 229
DRAWN WDK
CHECKED GHS 11/29/07
APPROVAL WDK
APPROVAL
APPROVAL
RELEASE KAT 11/29/07
1.1 kg

MOTOMAN a YASKAWA company
1701 Kaiser Ave, Irvine, CA 92614
phone (949)263-2640
fax (949)263-2644

TITLE
GRIPPER ASSY, ZETA MOUNT
AUTO SORTER III

DWG SIZE A1 | DWG REV 1 | SCALE 1:1 | DWG NO 154228 | SHEET 2 OF 2

Table A.9 154228-1 - GRIPPER MOUNT, ZETA ASSY.

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154232-1	COVER, GRIPPER, ZETA	1
2	154234-1	BRACKET, SLIDE, GRIPPER	1
3	154239-1	SPRING, EXTENSION, 3.06 LOAD	2
4	154241-1	SCREW,SET,HEX SOCKET,SST	4
5	154252-1	CLAMP,GEAR HUB,CIRCULAR	1
6	154248-1	CLAMP,GEAR HUB,CIRCULAR	1
7	154251-1	GEAR,SPUR,PINION,CLAMP HUB,SST	1
8	154249-1	GEAR,SPUR,CLAMP HUB,SST	1
9	154246-1	CAM,FINGER,GRIPPER ASSY	1
10	154819-1	BEARING,BALL,FLANGE,SST	2
11	154254-1	HOUSING,FINGER SLIDE	1
12	154275-2	CAM FOLLOWER,6MM	4
13	154844-1	PIN,CAM MTG,GRIPPER FINGER	4
15	132524-19	SCREW,SHC,M4X20,SST	8
16	154243-1	SLIDE,FINGER,GRIPPER	4
17	154428-1	SWITCH,ALTERED,PROX,8MM	1
19	154237-2	SPRING ANCHOR,M4 X 25	4
20	154427-1	MOTOR ASSY,ALTERED,SERVO,20W	1
21	140351-3	SCREW,SHC,M3X6,SST	2
22	140330-4	SCREW,SHC,M5X16,SST,CLASS 12.9	2
23	154273-1	PLATE,SHAFT,CLAMP	1
24	154235-1	BRACKET,BEARING	1
25	140351-4	SCREW,SHC,M3X8,SST	3
26	154238-1	GUIDE,LINEAR,CAGED BALL	1
27	140351-4	SCREW,SHC,M3X8,SST	3
28	132609-1	WASHER,CONICAL SPRING,M3,SST	13
29	132609-2	WASHER,CONICAL SPRING,M4,SST	8
30	132609-3	WASHER,CONICAL SPRING,M5,SST	2
31	140351-2	SCREW,SHC,M3X5,SST	8
32	154841-1	SCREW,SET,M6x1.0 X 8.0,SST	4
33	154866-1	COLLAR,SPACER,GRIPPER DRIVE	1

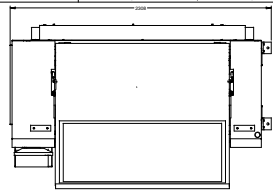
NOTES:

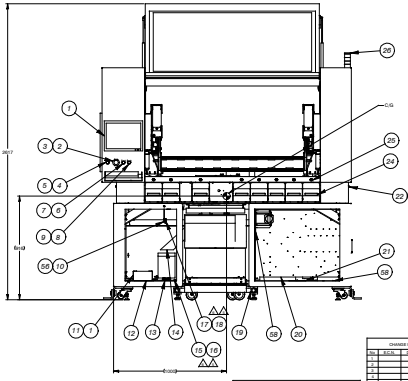
1. ALL DIMENSIONS ARE REFERENCE ONLY.
   FOR POSITIONER TABLE TOOLING CONSTRUCTION DIMENSIONS, CONTACT MOTOMAN, INC.
2. GENERAL INSTALLATION: REFER TO MANUAL
3. CONNECT POWER/CONTROL CABLES: REFER TO MANUAL OR PANEL DRAWING 154721-1
4. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.

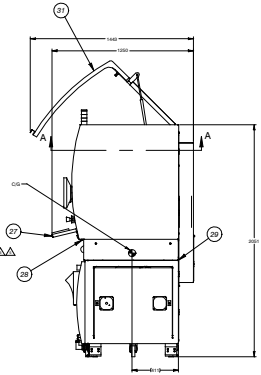
⚠ APPLY 13419-1 ADHESIVE (LOCTITE 243) TO DESIGNATED FASTENERS AND MATING SURFACES.

⚠ TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGM-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED.

7. PERMANENT MARK WITH MOTOMAN PART NUMBER 154919-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGM-077 PARA 2.5.







SEE SEPARATE BOM

REVISION STATUS OF SHEETS										
SHT	1	2	3	4	5	6	7	-	-	-
REV	0	0	0	0	0	0	0	-	-	-

CHANGE RECORD					
No.	ECN.	DATE	APPROVED	MATERIAL	
1					
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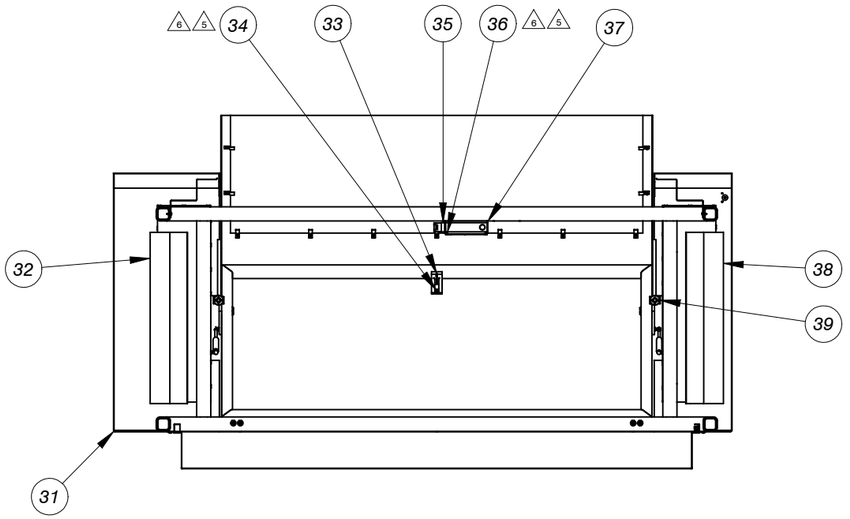
12					

PART NAME	154426-2R
DRAWN	GHS/WDK,JO
CHECK	WDK
ISSUED	JL,SJ/1.08
APPROVED	GHS,SJ/1.08
MATERIAL	
FINISH	
APPROVED	
WEIGHT	1141.4 kg
SCALE	1:10
SIZE	A1
DRAWING NUMBER	154426
SHEET	1 OF 1
REV NO.	0

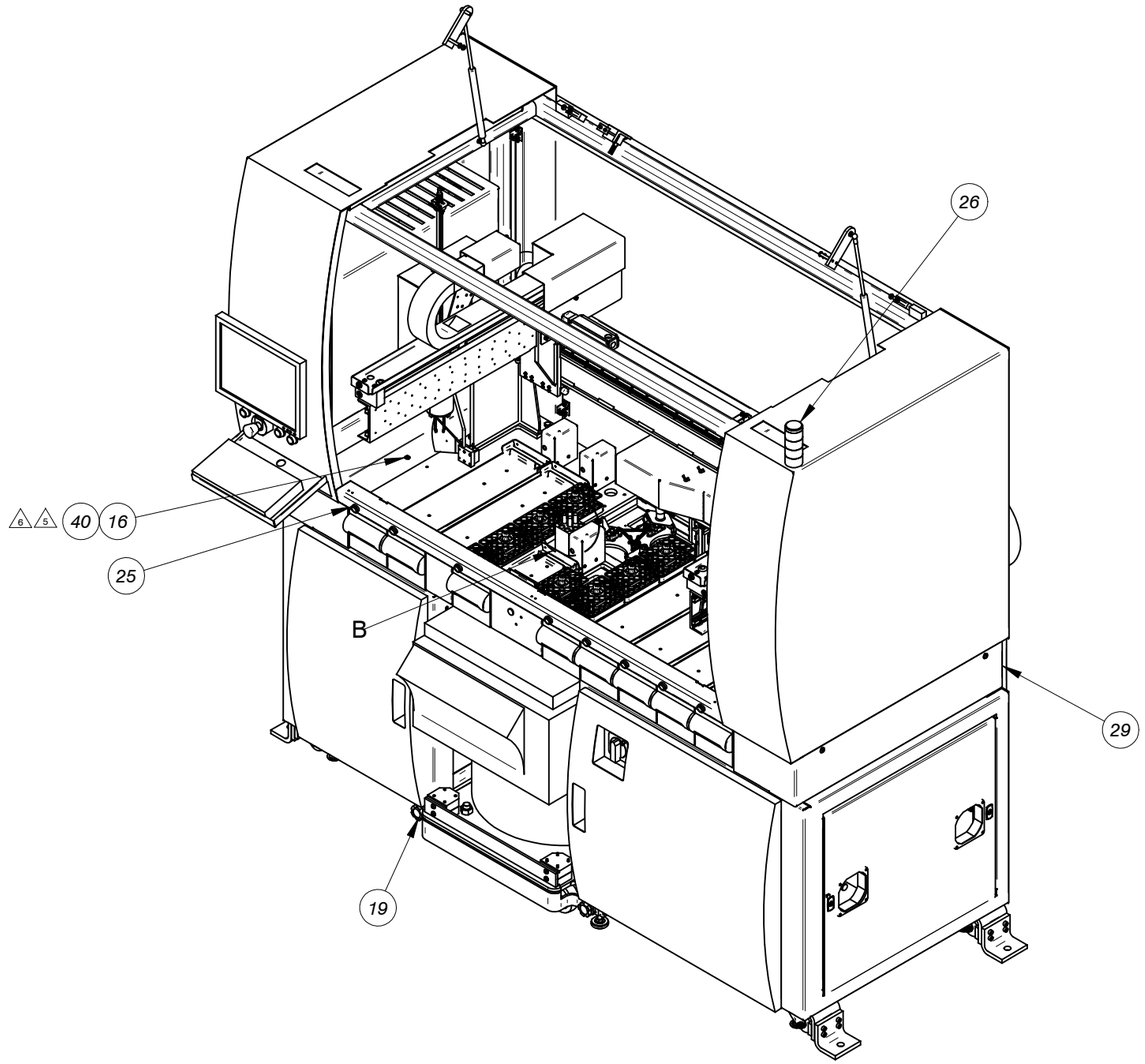
METRIC DO NOT SCALE DRAWING

MOTOMAN WEST CARROLLTON OHIO 4549 USA
a YASKAWA company

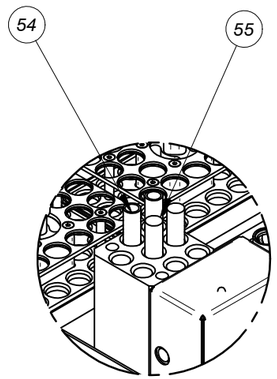
TITLE: SYSTEM,AUTOSORTER III DUAL ARM,DECAPPER,CENTRIFUGE



SECTION A-A
1:10
ROTATED 90°



ISOMETRIC VIEW
1:8
SHOWN WITH
HINGING DOOR REMOVED
REFERENCE ONLY



DETAIL B
1:2

CONFIDENTIAL: THIS DRAWING CONTAINS A PROPRIETARY DESIGN ORIGINATED BY MOTOMAN INCORPORATED NEITHER IT NOR THE INFORMATION APPEARING HEREON SHALL BE DISCLOSED, USED, OR DUPLICATED FOR ANY PURPOSE UNLESS SPECIFICALLY AUTHORIZED BY MOTOMAN INCORPORATED. THIS DRAWING IS THE PROPERTY OF MOTOMAN INCORPORATED AND SHALL BE RETURNED TO IT UPON REQUEST. ALL PATENT RIGHTS RELATING HERETO ARE SPECIFICALLY RESERVED.

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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12			

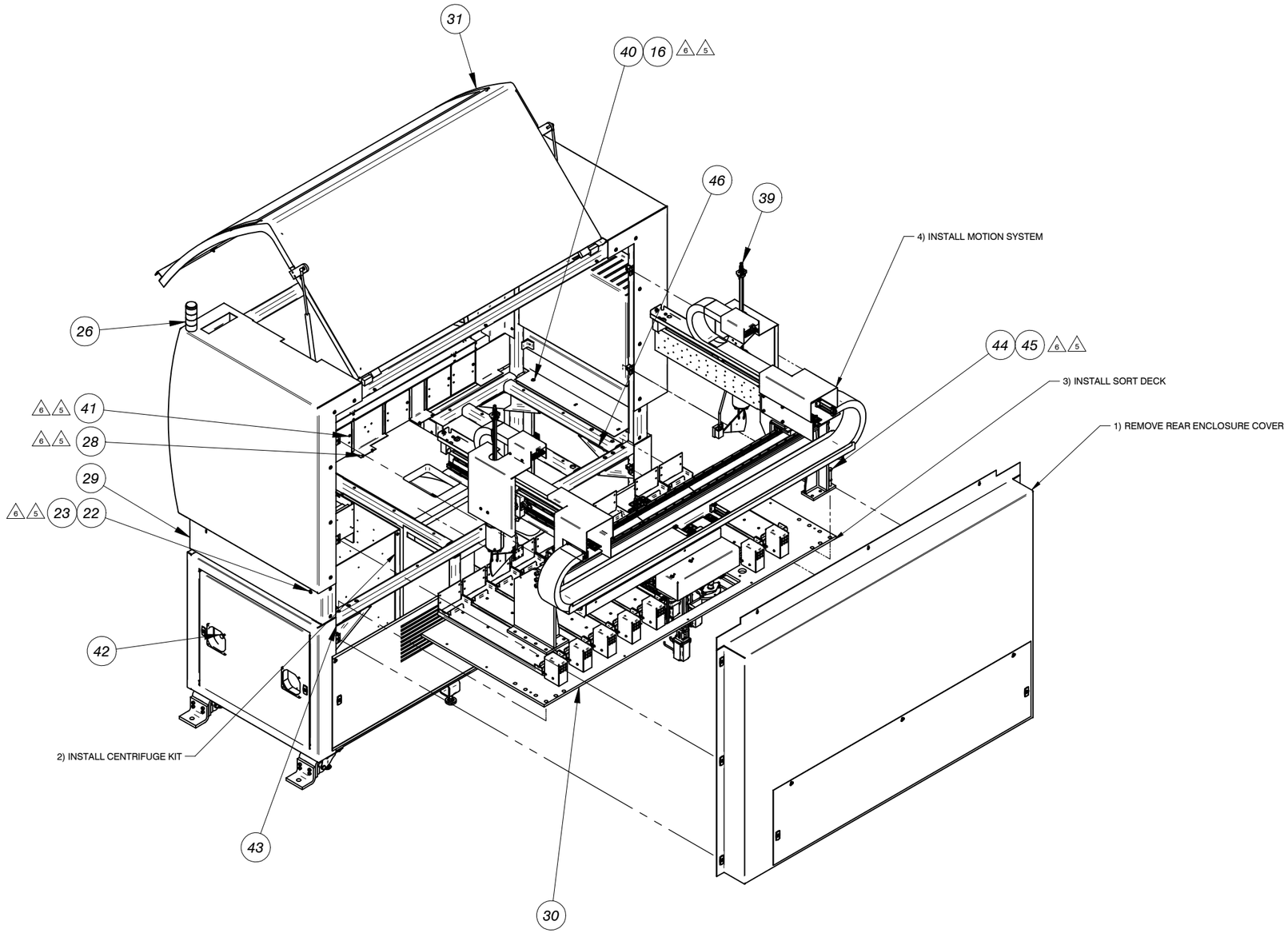
FILE NAME: 154426.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0, 0.0 ± 0.1, 0.0 ± 0.4, ANGLES ± 30'
PROJECTION

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK
CHECKED: JL 5/21/08
APPROVAL: GHS 5/21/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/22/08
1141.4 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE: A1
DWG REV:
SCALE: 1:10
DWG NO: 154426
SHEET 2 OF 7



SORT DECK AND MOTION SYSTEM INSTALL
1:10

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME: 154426.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
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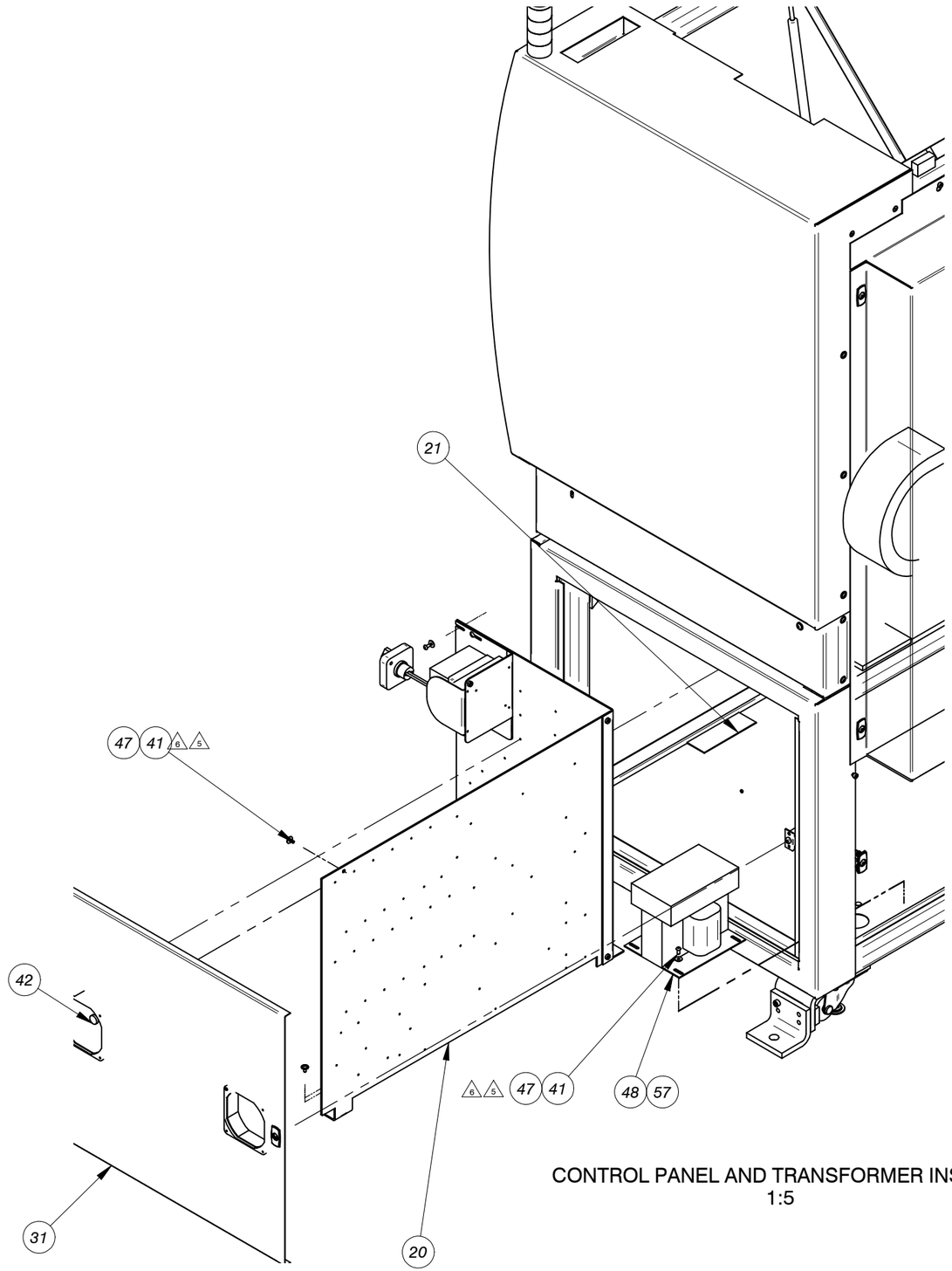
DECIMAL: 0. ± 1.0, 0.00 ± 0.1, 0.0 ± 0.4, ANGLES ± 30'
PROJECTION

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK
CHECKED: JL 5/21/08
APPROVAL: GHS 5/21/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/22/08
1141.4 kg

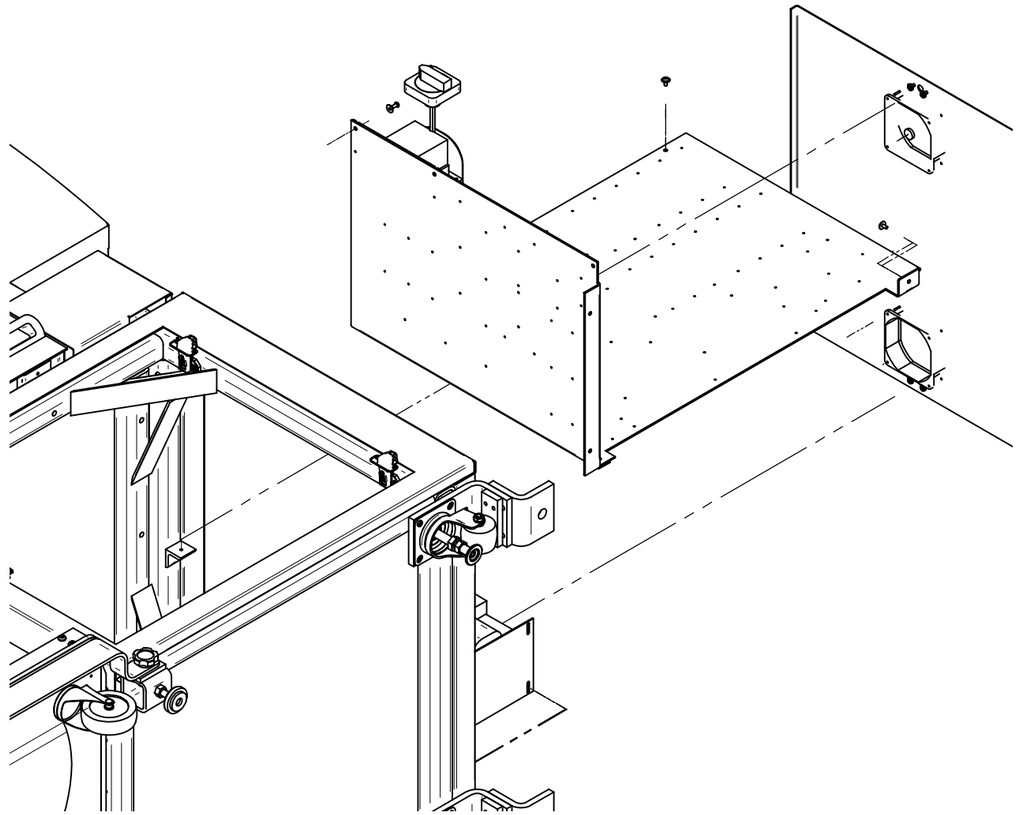
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 7
A1		1:10	154426	



CONTROL PANEL AND TRANSFORMER INSTALL
1:5



VIEW SHOWING CONTROL PANEL MOUNTING

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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12			

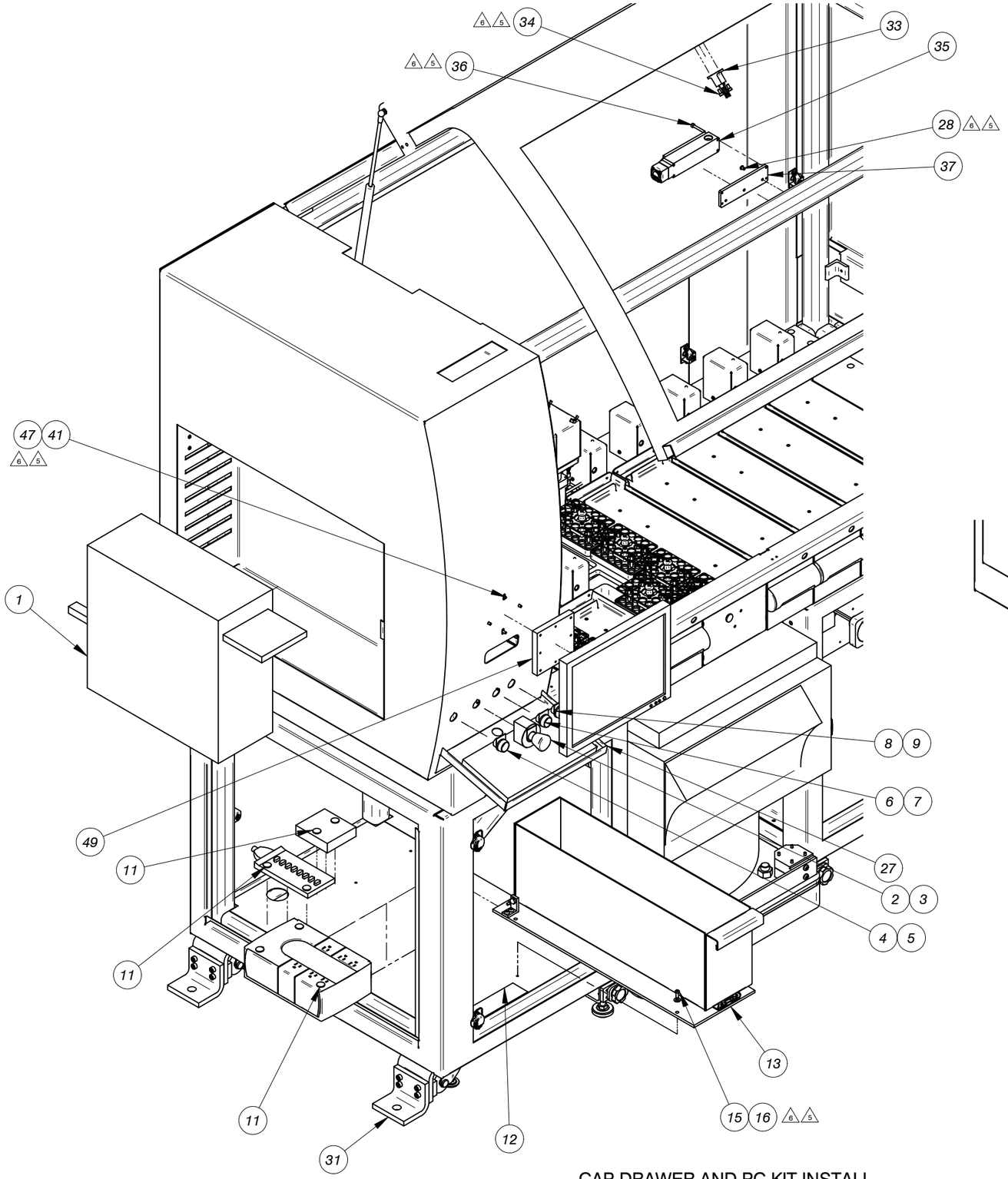
FILE NAME: 154426.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK
CHECKED: JL 5/21/08
APPROVAL: GHS 5/21/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/22/08
1141.4 kg

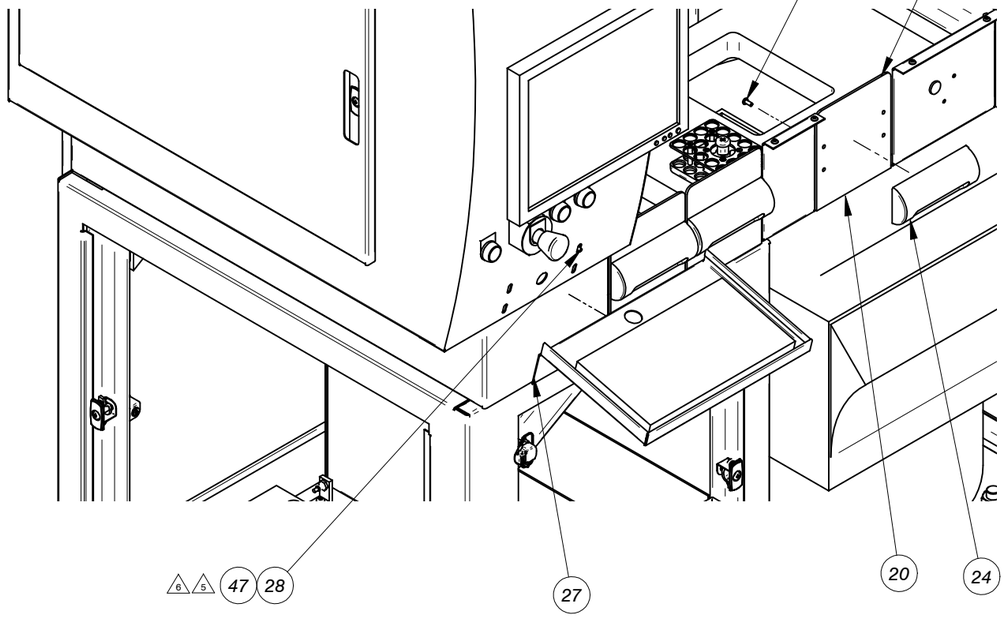
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 7
A1		1:10	154426	



CAP DRAWER AND PC KIT INSTALL
1:5



KEYBOARD TRAY AND DRAWER HANDLE INSTALL
1:4

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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12			

FILE NAME: 154426.dft
MATERIAL:
FINISH:
METRIC DO NOT SCALE DRAWING
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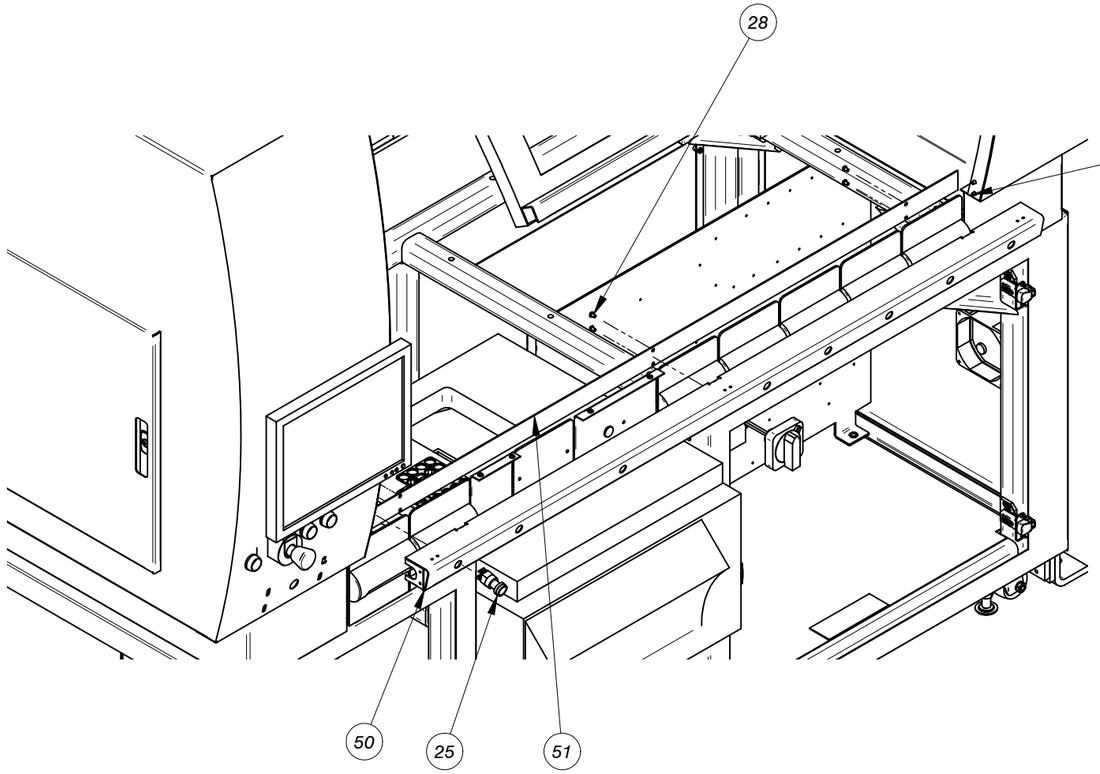
DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK
CHECKED: JL 5/21/08
APPROVAL: GHS 5/21/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/22/08
1141.4 kg

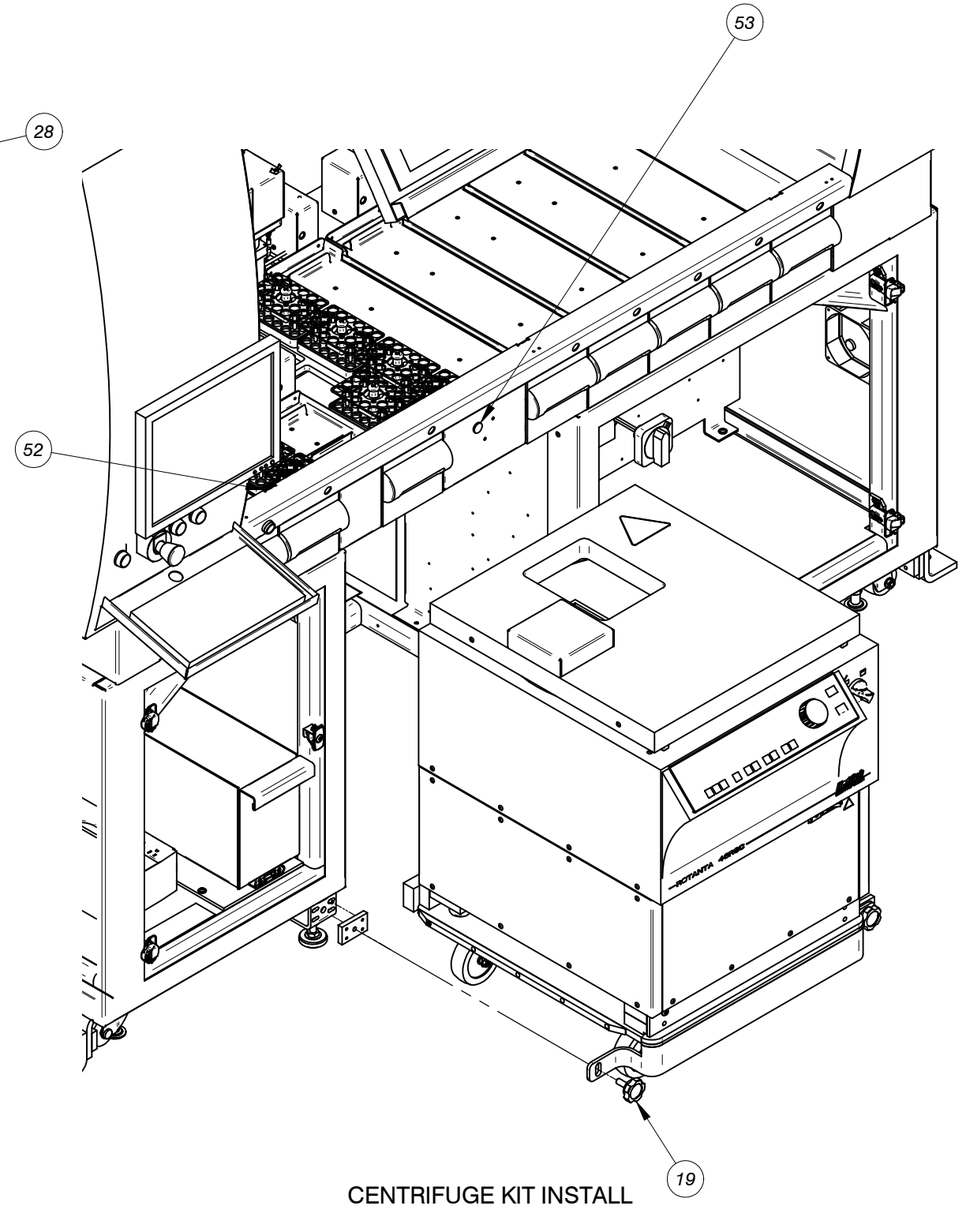
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 5 OF 7
A1		1:10	154426	



BUTTON BAR INSTALLATION
1:5



CENTRIFUGE KIT INSTALL
1:5

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
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FILE NAME 154426.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
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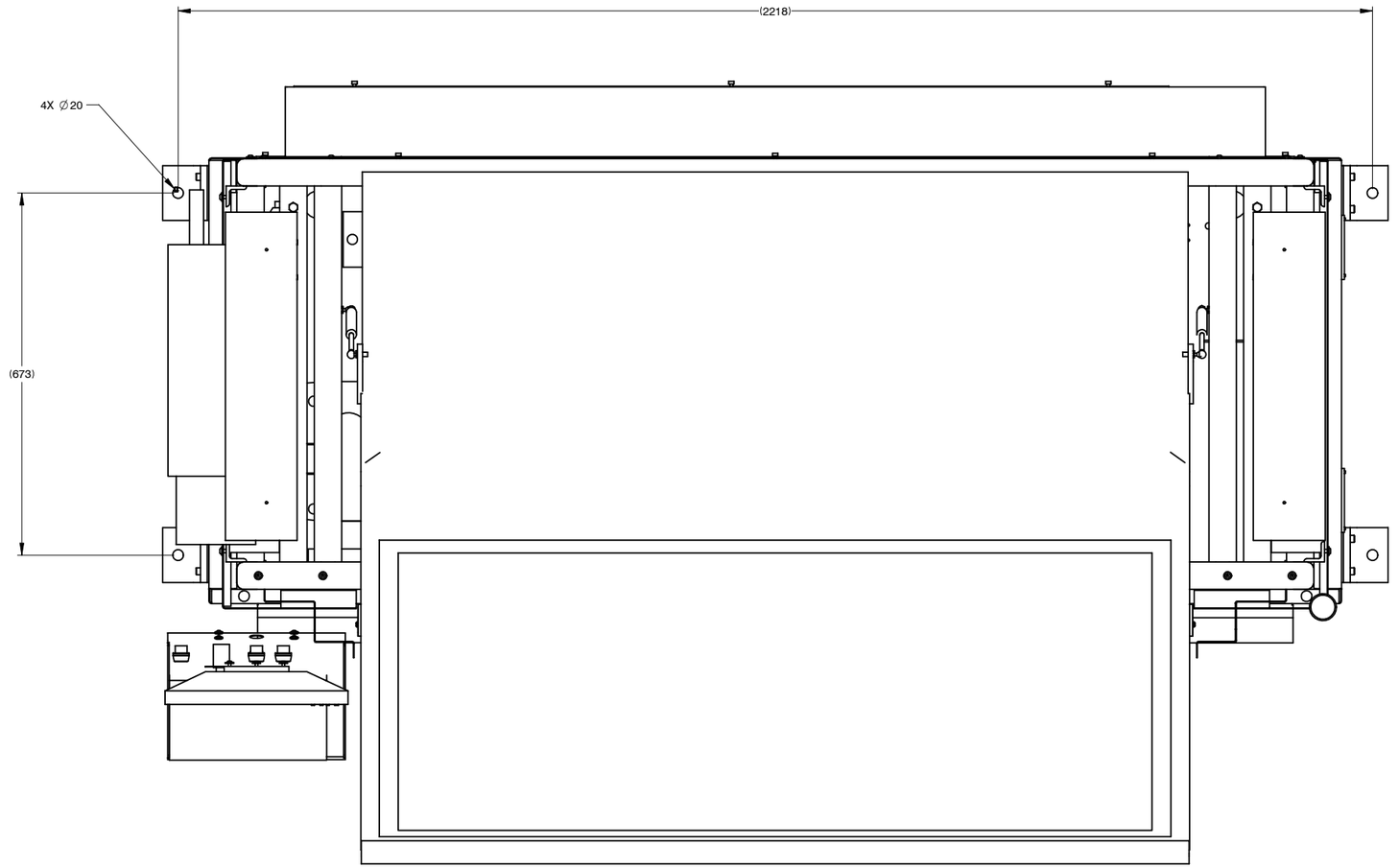
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED GHS/WDK/JO
NOUN CODE 610
DRAWN WDK
CHECKED JL 5/21/08
APPROVAL GHS 5/21/08
APPROVAL
APPROVAL
RELEASE KAT 5/22/08
1141.4 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 6 OF 7
A1		1:10	154426	



VIEW OF MACHINE LAG POINTS
1:5
SHOWN WITH ENCLOSURE SIDE
COVERS REMOVED FOR CLARITY

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
1			
2			
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12			

FILE NAME: 154426.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK
CHECKED: JL 5/21/08
APPROVAL: GHS 5/21/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/22/08
1141.4 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 7 OF 7
A1		1:10	154426	

Table A.10 154426-1, SYSTEM, AUTOSORTER III DUAL ARM, DECAPPER, CENTRIFUGE

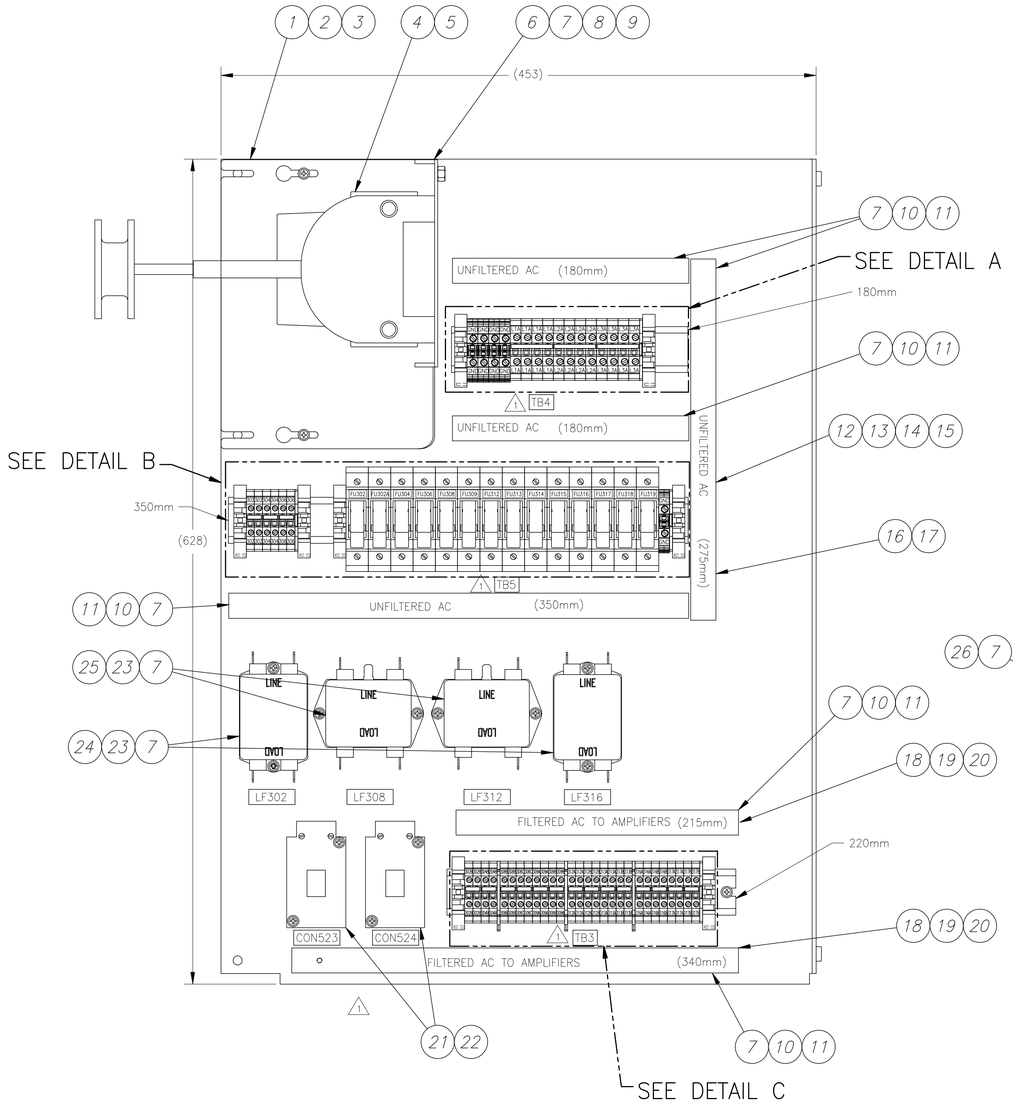
FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154868-1	COMPUTERKIT,AUTOSORTERIII	1
2	701577-2	SWITCH,PUSHBUTTON,NON-ILL,40MM	1
3	154569-9	NAMEPLATE,LEGEND,ESTOP	1
4	705727-5	SWITCH,PUSHBUTTON,ILLUMINATED	1
5	154569-5	NAMEPLATE,LEGEND,OPERATOR	1
6	149325-2	SWITCH,PUSHBUTTON,FLUSHHEAD	1
7	154569-20	NAMEPLATE,LEGEND,OPERATOR	1
8	149325-3	SWITCH,PUSHBUTTON,FLUSHHEAD	1
9	154569-21	NAMEPLATE,LEGEND,OPERATOR	1
10	154393-1	BRACKET,SENSOR,FULL	1
11	148862-1	TAPE,VELCRO,HOOK&LOOP,5/8"	515
12	154694-1	LABEL,FUSE,POWERDISTRIBUTION	1
13	154999-1	DRAWER ASSY,USEDCAPS	1
14	154394-1	TUBE,CHUTEASSY	1
15	140331-5	SCREW,BHSC,M6X16,SST	4
16	132527-1	WASHER,FLAT,M6,SST	10
17	153936-2	SENSOR,REFLECTIVE,PNP	1
18	132524-9	SCREW,SHC,M4X12,SST	2
19	154977-1	ACCESSORYKIT,CENTRIFUGE	1
20	154720-1	PANEL ASSY,PWRDIST/CONTROL	1
21	154695-1	LABEL,FUSE,CONTROLPANEL	1
22	140331-4	SCREW,BHSC,M6X12,SST	4
23	145277-4	WASHER,FLAT,M6X16,OD,ZP	4
24	154153-1	HANDLE,DRAWER	8
25	155038-1	SWITCH,PUSHBUTTON,ILLUM,WHITE	8
26	154589-1	LIGHT ASSY,BEACON,RED/AMB/GRN	1
27	154382-1	TRAY,KEYBOARD,ENCLOSURE	1
28	132525-8	SCREW,BHSC,M5X8,SST	25
29	154963-1	COVER KIT,SORTDECK/ENCLOSURE	1
30	154964-1	PLATFORMASSY,SORT,DECAP,CENT	1
31	154923-1	ENCLOSUREASSY,BASIC	1
32	154573-2	LIGHT ASSY,FLOURESCENTSTRIP	1
33	154284-1	ACTUATOR,FLEXIBLE,IE10-R2	1

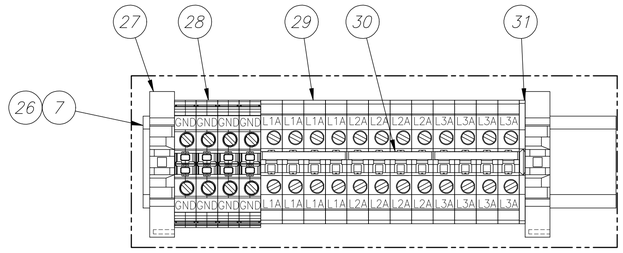
Table A.10 154426-1, SYSTEM, AUTOSORTER III DUAL ARM, DECAPPER, CENTRIFUGE

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
34	140330-11	SCREW,SHC,M5X45,SST	2
35	154429-1	SWITCH.ALTERED,INTERLOCK	1
36	140330-9	SCREW,SHC,M5X35,SST,CLASS12.9	4
37	154389-1	PLATE,LOCK,MOUNTING	1
38	154573-1	LIGHT ASSY,FLOURESCENTSTRIP	1
39	154193-1	SYSTEM,MOTIONXYZAXIS	1
40	140331-3	SCREW,BHSC,M6X10,SST	6
41	132525-1	SCREW,BHSC,M5X12,SST	49
42	154577-1	CORD ASSY,DUALFAN,610MM	1
43	154402-1	BAR,MOUNT,HANDLER,1	2
44	155035-1	SCREW,HHC,M10X90,SST	12
45	132609-6	WASHER,CONICALSPRING,M10,SST	12
46	154403-1	BAR,MOUNT,HANDLER,2	2
47	145277-3	WASHER,FLAT,M5X15,OD,ZP	21
48	153803-2	TRANSFORMER,CONTROL,1.5KVA	1
49	154383-1	MOUNT,MONITOR,ENCLOSURE	1
50	154359-1	BAR,BUTTON,ENCLOSURE	1
51	154360-1	BAR,BUTTON,COVER	1
52	154980-1	INSERT,CENTRIFUGE,20TUBE	1
53	707398-1	BRACKET,MOUNT,HOLSTER,BARCODE	1
54	154165-2	WEIGHT,50GRAMS,AUTOSORTERIII	2
55	154165-1	WEIGHT,30GRAM	2
56	139219-2	SCREW,BHSC,M5X10,SST	2
57	154094-2	RAIL ASSY,MAINPOWER,A/S	1
58	154696-1	LABEL,VOLTAGEIDENTIFICATION	2

NOTES:

1. LABEL AS SHOWN.
2. BAG EXTRA SCREWS, FUSES, DISCONNECT OPERATOR AND CABLES, ITEMS 112, 113 AND 114 AND ATTACH TO ASSEMBLY.
3. PERMANENT MARK WITH MOTOMAN PART NUMBER 154720-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA. 2.3.





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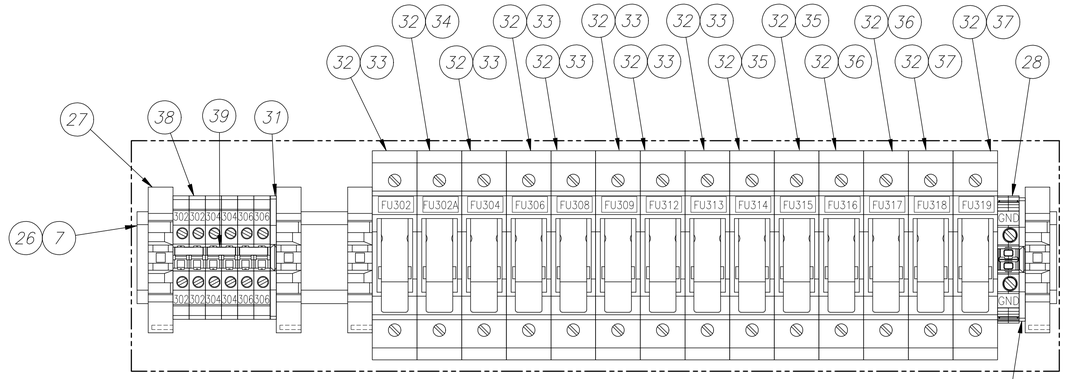

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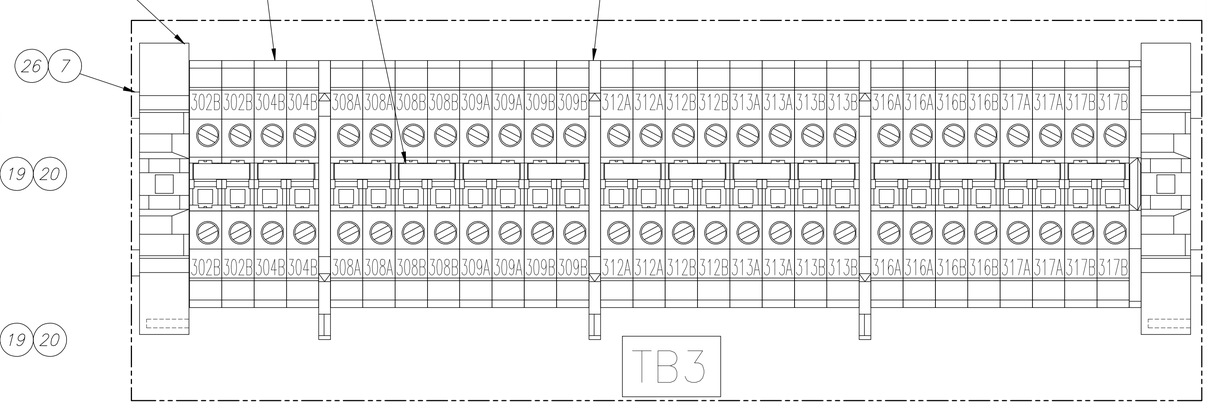

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SEE SEPARATE BOM

REVISION STATUS OF SHEETS																									
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CHANGE RECORD			
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FILE NAME 154720S01.DWG
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994
DECIMAL: 0. ± 1.0, 0.00 ± 0.1, 0.0 ± 0.4; ANGLES ±30'
PROJECTION

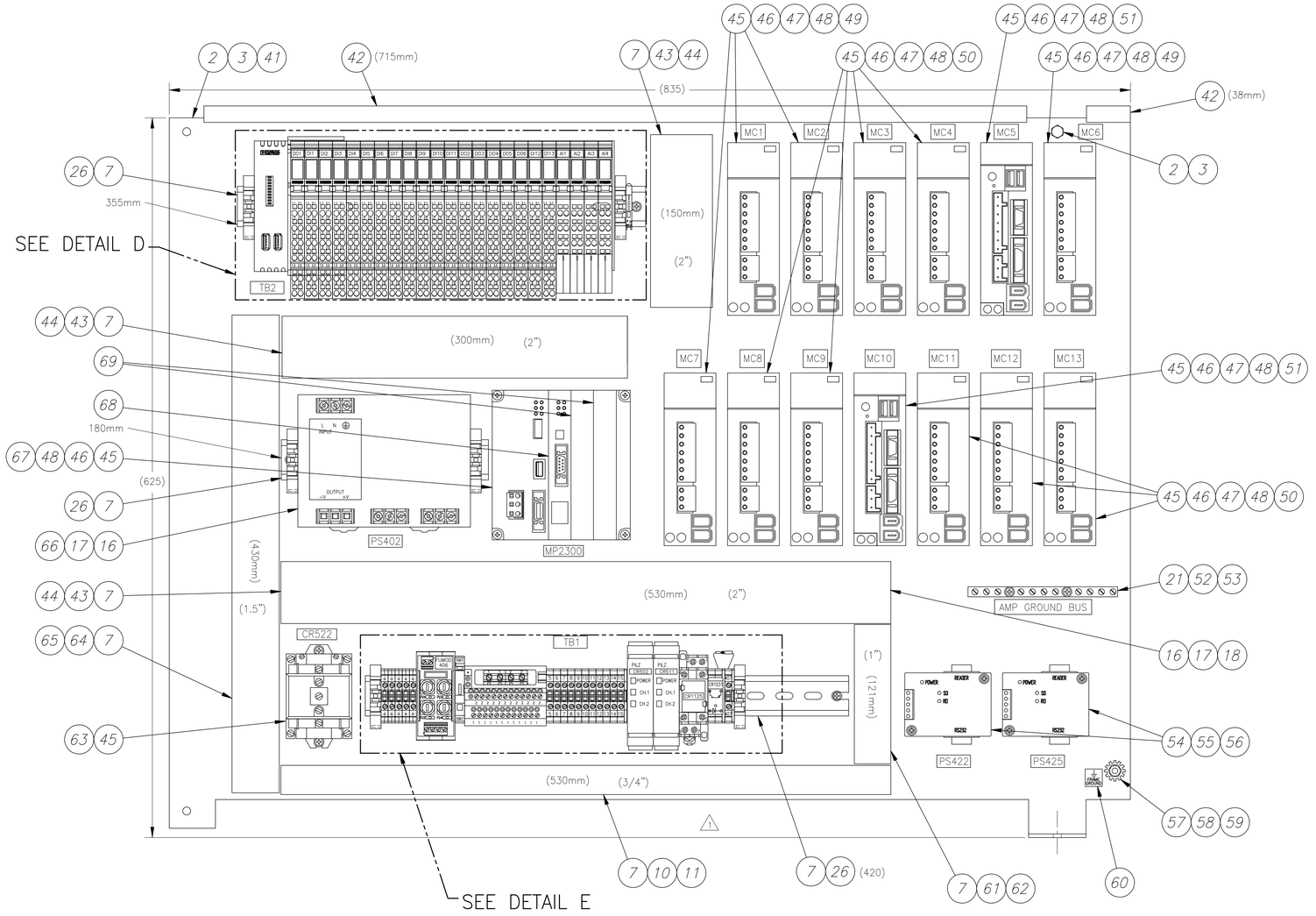
DESIGNED DGC — NOUN CODE 329
DRAWN DGC 3/5/08
CHECKED RK 4/8/08
APPROVAL TMB 4/8/08
APPROVAL
APPROVAL
RELEASE KAT 4/9/08

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PANEL ASSY,POWER DIST/CONTROL
A/S III,SORT/DECAP/CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET
A1	0	1:2	154720	1 of 25

revised Mar-2005



CONFIDENTIAL: THIS DRAWING CONTAINS A PROPRIETARY DESIGN ORIGINATED BY MOTOMAN INCORPORATED. NEITHER IT NOR THE INFORMATION APPEARING HEREON SHALL BE DISCLOSED, USED, OR DUPLICATED FOR ANY PURPOSE UNLESS SPECIFICALLY AUTHORIZED BY MOTOMAN INCORPORATED. THIS DRAWING IS THE PROPERTY OF MOTOMAN INCORPORATED AND SHALL BE RETURNED TO IT UPON REQUEST. ALL PATENT RIGHTS RELATING HERETO ARE SPECIFICALLY RESERVED.

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FILE NAME 154720S02.DWG
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
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DECIMAL 0. ± 1.0, 0.0 ± 0.4, 0.00 ± 0.1; ANGLES ±30'
PROJECTION

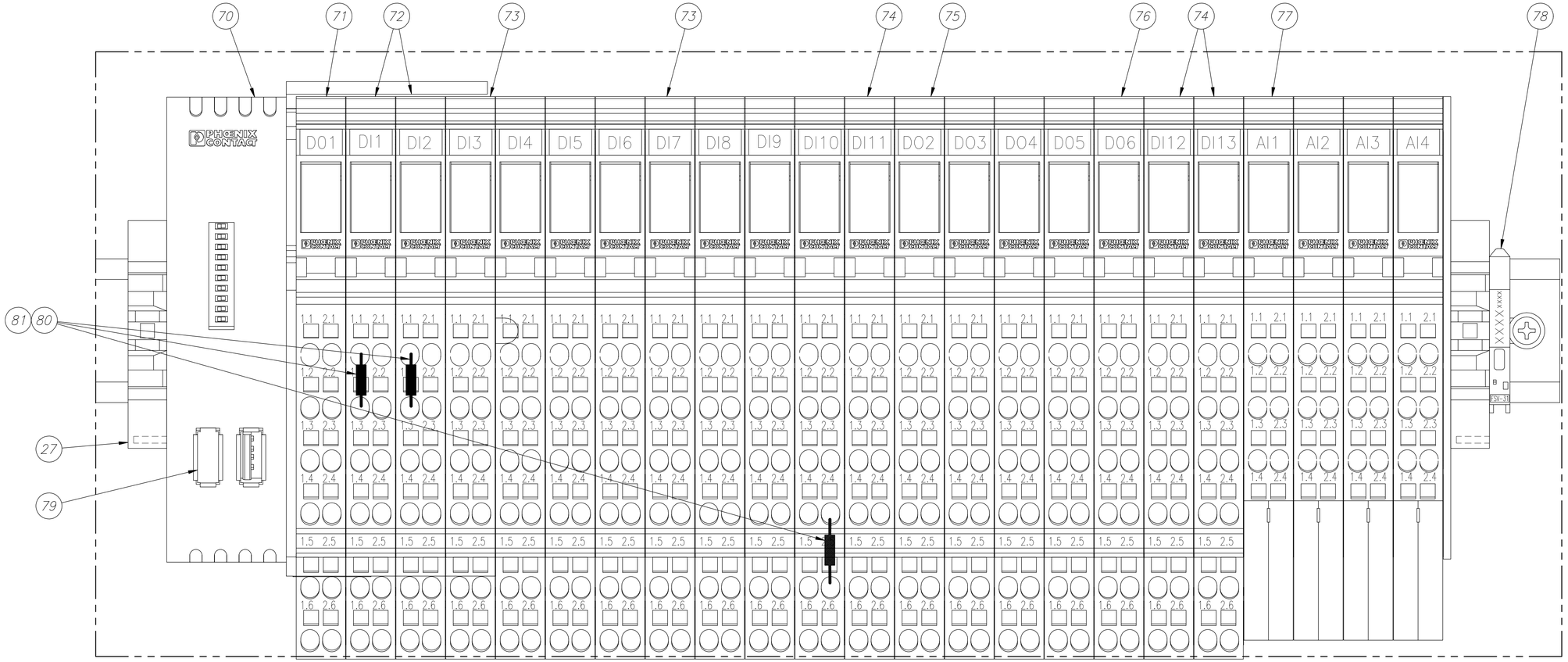
DESIGNED DGC — NOUN CODE 329
DRAWN DGC 3/5/08
CHECKED RK 4/8/08
APPROVAL TMB 4/8/08
APPROVAL
APPROVAL
RELEASE KAT 4/9/08

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PANEL ASSY,POWER DIST/CONTROL
A/S III,SORT/DECAP/CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET
A1	0	1:2	154720	2 of –

revised Mar-2005



⚠ DETAIL D
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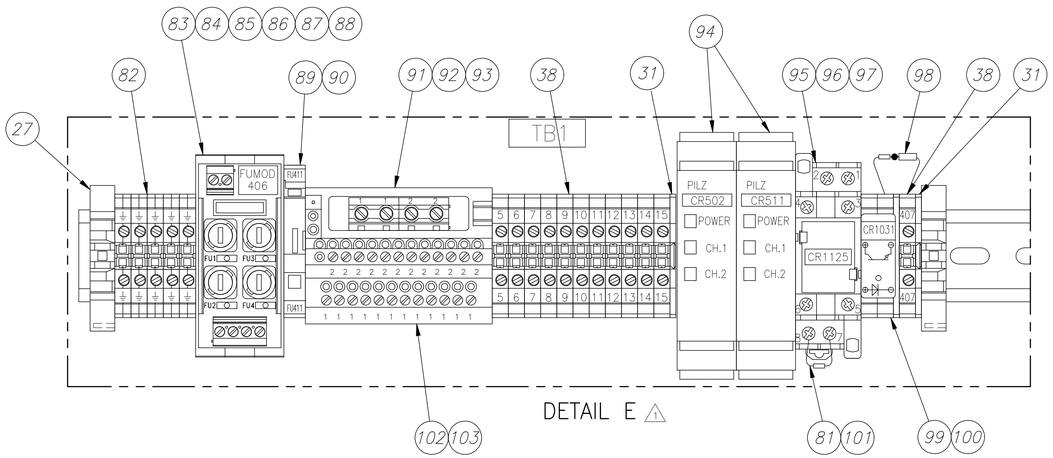

DETAIL E ⚠

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CHANGE RECORD			
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FILE NAME: 154720S03.DWG
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FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994
DECIMAL: 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4
ANGLES ±30'
PROJECTION

DESIGNED: DGC — NOUN CODE: 329
DRAWN: DGC 3/5/08
CHECKED: RK 4/8/08
APPROVAL: TMB 4/8/08
APPROVAL:
APPROVAL:
RELEASE: KAT 4/9/08

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: PANEL ASSY,POWER DIST/CONTROL A/S III,SORT/DECAP/CANTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET
A1	0	1:1	154720	3 of –

revised Mar-2000

Table A.11 154720-1 - PANEL ASSY, POWER DIST/CONTROL, MECHATROLINK I/O

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154089-1	PANEL,EQUIPMTG,LEFTSIDE	1
2	137566-1	SCREW,HHC,M6X20,ZP,CLASS8.8	9
3	479148-4	WASHER,LOCK,M6	9
4	153127-1	SWITCH,DISCONNECT,MAIN,NX100	1
5	703070-1	FUSE,CLASSJ,30AMP,600VAC	6
6	148661-1	BRACKET,SAFETYSWITCH	1
7	137146-3	SCREW,PPH,M4X10,JISB1188	60
8	146143-1	WIRE,10AWG,BLACK,UL1015/1230	-
9	146143-3	WIRE,10AWG,GRN/YLW,UL1015/1230	-
10	146336-1	DUCT,WIRING,3/4X2,WHITE	-
11	146335-1	DUCT COVER,3/4,WHITE	-
12	146147-1	WIRE,18AWG,BLACK,UL1015/1230	-
13	146147-3	WIRE,18AWG,GRN/YLW,UL1015/1230	-
14	146145-4	WIRE,14AWG,RED,UL1015/1230	-
15	146145-5	WIRE,14AWG,WHITE,UL1015/1230	-
16	146145-1	WIRE,14AWG,BLACK,UL1015/1230	-
17	146145-3	WIRE,14AWG,GRN/YLW,UL1015/1230	-
18	146146-1	WIRE,16AWG,BLACK,UL1015/1230	-
19	146147-4	WIRE,18AWG,RED,UL1015/1230	-
20	146147-5	WIRE,18AWG,WHITE,UL1015/1230	-
21	137146-5	SCREW,PPH,M4X16,JISB1188	6
22	153880-1	CONTACTOR,SAFETY,4-POLE	2
23	131654-8	TERMINAL,QUICKDISCONNECT,FEM	20
24	153821-1	FILTER,RFI,10A,120/250VAC	2
25	149853-1	FILTER,RFT,20AMP,250VAC	2
26	146232-1	RAIL,DIN,35MM	-
27	151267-1	CLAMP,END,DINRAIL	12
28	151419-1	TERMINAL,DIN,GROUND,8MM	5
29	151418-1	TERMINAL,DIN,8MM,SINGLELEVEL	12
30	151420-3	BAR,JUMPER,DIN,4TERMINAL,8MM	3
31	151266-1	PLATE,END,TYPED-UT2.5/10	6
32	131116-1	FUSE HOLDER,DINMTG,	14
33	700619-18	FUSE,CLASSCC,15AMP,600VAC	14

Table A.11 154720-1 - PANEL ASSY, POWER DIST/CONTROL, MECHATROLINK I/O

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
34	700619-20	FUSE,CLASSCC,4AMP,600VAC	2
35	700619-21	FUSE,CLASSCC,5AMP,600VAC	4
36	700619-5	FUSE,CLASSCC,8AMP,600VAC	4
37	130295-17	FUSE,CLASSCC,12AMP,600VAC	4
38	151270-1	TERMINAL,DIN,6MM,SINGLELEVEL	46
39	151269-1	BAR,JUMPER,DIN,2TERMINAL,6MM	17
40	151265-1	PLATE,SPACER,SEPARATION	3
41	154090-1	PANEL,MAINEQUIPMENT	1
42	149091-2	TRIM,VINYL,PUSH-ON,BLACK,1/8	-
43	146336-11	DUCT,WIRING,2X2,WHITE	-
44	146335-4	DUCT COVER,2",WHITE	-
45	137146-4	SCREW,PPH,M4X12,JISB1188	32
46	140694-2	CABLE,MECHATROLINKII,USB-USB	14
47	143152-4	TERMINAL,RING,22-16AWG,#8/M4	14
48	153702-1	FILTER,FERRITECORE	14
49	153327-1	AMPLIFIER,SIGMAIII,200W,200V	4
50	153327-2	AMPLIFIER,SIGMAIII,100W,200V	7
51	153455-1	AMPLIFIER,30W,SIGMAIII,100VAC	2
52	700662-1	BAR,GROUND,10PT,COPPER	1
53	146146-3	WIRE,16AWG,GRN/YLW,UL1015/1230	-
54	153580-1	POWER SUPPLY,5VDC,SCANNER	2
55	133953-1	SCREW,PPH,M4X25	4
56	130956-2	SPACER,STANDOFF,M4X1/2,M-F	4
57	130527-5	WASHER,LOCK,IET,1/4,ZP	1
58	131281-1	NUT,HEX,1/4-20,GREEN	1
59	143153-7	TERMINAL,RING,16-14AWG,1/4/M6	1
60	405548-1	LABEL,FRAMEGROUND	1
61	146336-4	DUCT,WIRING,1X2,WHITE	-
62	146335-2	DUCT COVER,1",WHITE	-
63	153881-1	RELAY,SAFETYCONTROL,4-POLE	1
64	146335-3	DUCT COVER,1.5",WHITE	-
65	146336-8	DUCT,WIRING,1.5X2,WHITE	-
66	152937-4	POWER SUPPLY,24VDC,20AMP	1
67	153325-1	CONTROLLER,MACHINE,DIGITAL	1

Table A.11 154720-1 - PANEL ASSY, POWER DIST/CONTROL, MECHATROLINK I/O

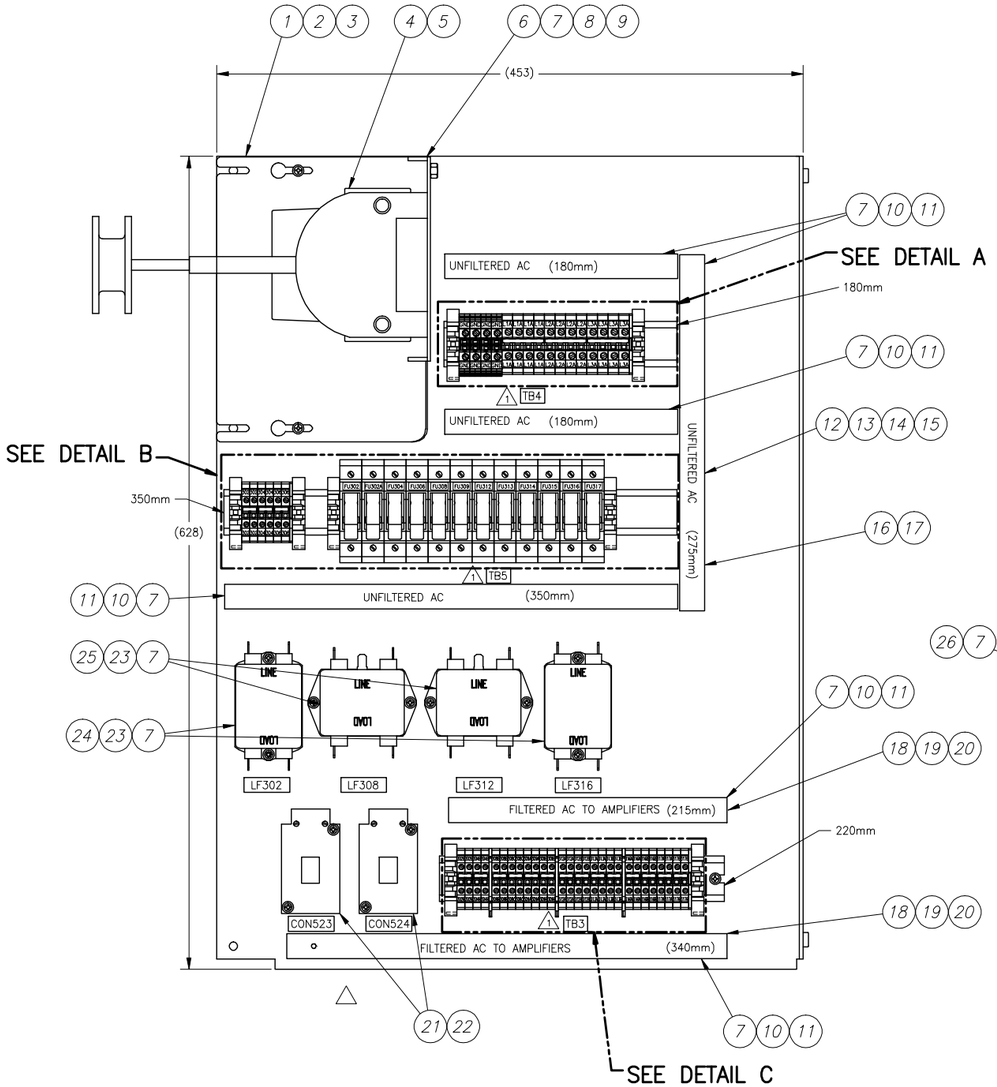
FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
68	153326-2	MODULE,COMM,ETHERNET/RS232	1
69	154905-1	COVER,EMPTYCARDSLOT,MP2300	2
70	153769-1	MODULE,COMMUNICATION	1
71	153769-9	CONNECTOR,EXTENDEDDBLSIGNAL	1
72	153769-8	CONNECTOR,EXTENDEDDBLSIGNAL	2
73	153769-5	BLOCK,TERM,16DIGITALINPUT	2
74	153769-7	BLOCK,TERM,4DIGITALINPUT	3
75	153769-4	BLOCK,TERM,16DIGITALOUTPUT	1
76	153769-6	BLOCK,TERM,4OUTPUT	1
77	153769-3	BLOCK,TERM,4ANALOGINPUT	1
78	153989-1	AMPLIFIER,THRU-BEAM	1
79	153319-1	RESISTOR,TERMINATOR	1
80	130484-73	RESISTOR,1/2W,5%,1.0KOHM	3
81	146345-2	TUBING,20AWG,PVC	-
82	151271-1	TERMINAL,DIN,GROUND,6MM	5
83	149280-1	MODULE,FUSE,MASTER,24VDC	1
84	149593-1	FUSE,ELECTRONIC,10AMP,32VDC	2
85	703093-3	FUSE,ELECTRONIC,1AMP,250V	2
86	703039-12	FUSE,ELECTRONIC,.6AMP,250VAC	2
87	703039-13	FUSE,ELECTRONIC,.4AMP,250VAC	2
88	703039-7	FUSE,GMA,6AMP	2
89	153132-1	FUSE HOLDER,DINMTG,5X20	1
90	703039-10	FUSE,GMA,8AMP	2
91	146144-2	WIRE,12AWG,BLUE,UL1015/1230	-
92	146144-7	WIRE,12AWG,WHTBLU,UL1015/1230	-
93	707247-1	MODULE,POWERDIST,2POLE,24OUT	1
94	154068-1	RELAY,SAFETY,2NO,1NO	2
95	139480-1	SOCKET,RELAY,CONTROL	1
96	479056-1	RELAY,MINIATURE,24VDC,DPDT	1
97	471701-1	RETAINER,RELAY,	2
98	154349-1	DIODE ASSY,NOISESUPPRESSION	1
99	154048-1	MODULE,RELAY,POWER,SOLIDSTATE	1
100	154049-1	BLOCK,BASETERMINATION,RELAY	1
101	1CZ-93B	DIODE,1N5395	1

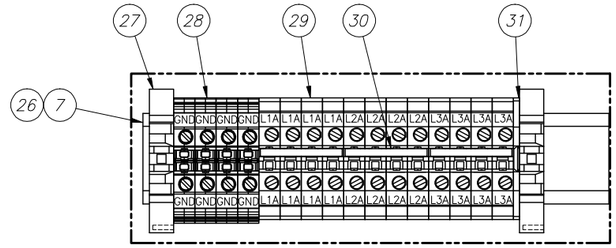
Table A.11 154720-1 - PANEL ASSY, POWER DIST/CONTROL, MECHATROLINK I/O

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
102	146147-2	WIRE,18AWG,BLUE,UL1015/1230	-
103	146147-7	WIRE,18AWG,WHT/BLU,UL1015/1230	-
104	706927-1	CABLE,EURO,FEMALE,8/24AWG	1
105	154600-1	CABLE ASSY,PUSHBUTTONBAR	1
106	154590-1	CABLE ASSY,LIGHT,BEACON	1
107	154175-1	CABLE,QUICKDISCONNECT	22
108	154189-1	CABLE ASSY,DRAWERSOLENOID	8
109	154265-1	CABLE,M12CONNECTOR,5M	1
110	154172-1	CABLE,SENSOR,RIGHTANGLE,7M	8
111	154345-1	CABLE ASSY,LOADCELL	4
112	154186-1	CABLE ASSY,ENCODER,SERVOMTR	3
113	154184-1	CABLE ASSY,POWER,SERVOMTR	2
114	154185-1	CABLE ASSY,POWER,SERVOMTR	1
115	154578-1	CABLE ASSY,FANPOWER,DUAL	1
116	154604-1	CABLE ASSY,PUSHBUTTON,OPERATOR	1
117	154632-1	CABLE ASSY,I/O,SERVOAMP,CN1	2

NOTES:

1. LABEL AS SHOWN.
2. BAG EXTRA SCREWS, FUSES, DISCONNECT OPERATOR AND CABLES, ITEMS 110, 111 AND 112 AND ATTACH TO ASSEMBLY.
3. PERMANENT MARK WITH MOTOMAN PART NUMBER 154721-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA. 2.3.





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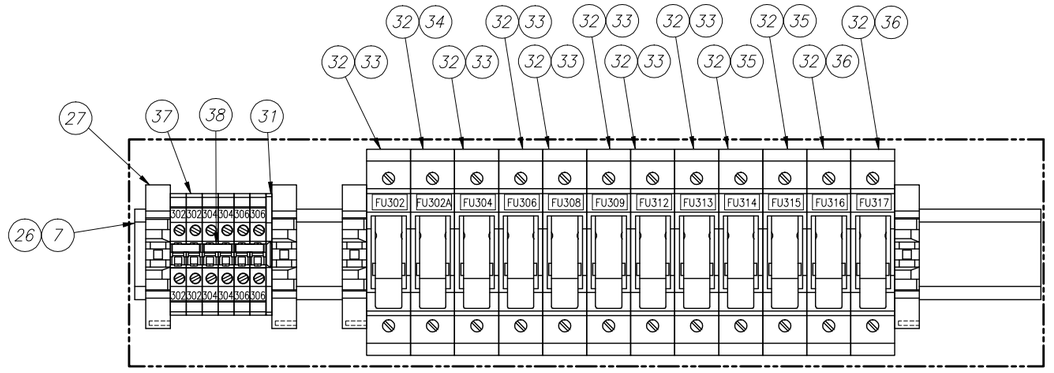

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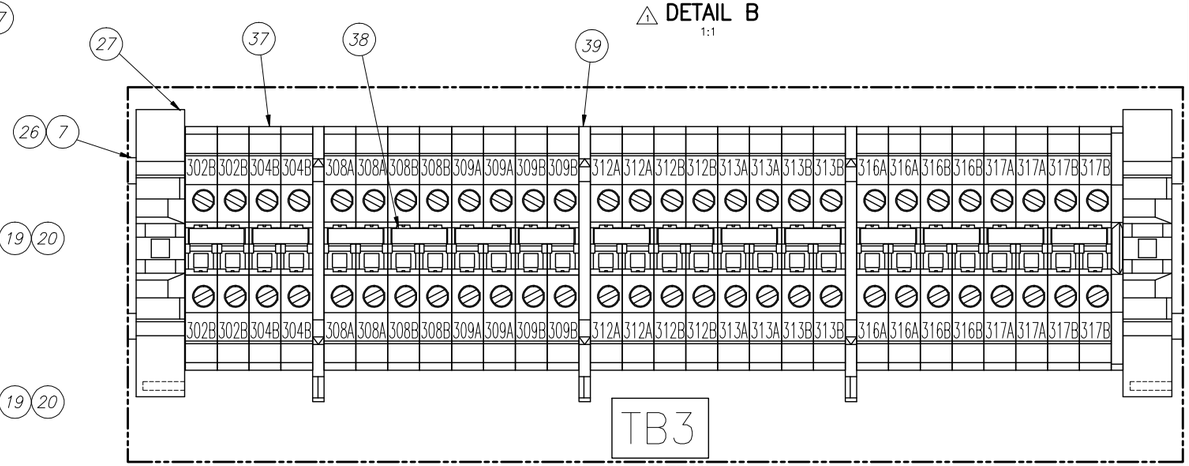

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SEE SEPARATE BOM

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FILE NAME 154721S01.DWG
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
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DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ±30'
PROJECTION

DESIGNED DGC NOUN CODE 329
DRAWN DGC 3/11/05
CHECKED RK 3/27/08
APPROVAL TMB 3/27/08
APPROVAL
APPROVAL
RELEASE TRA 3/28/08

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PANEL ASSY,POWER DIST/CONTROL
A/S III,SORT/DECAP

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET
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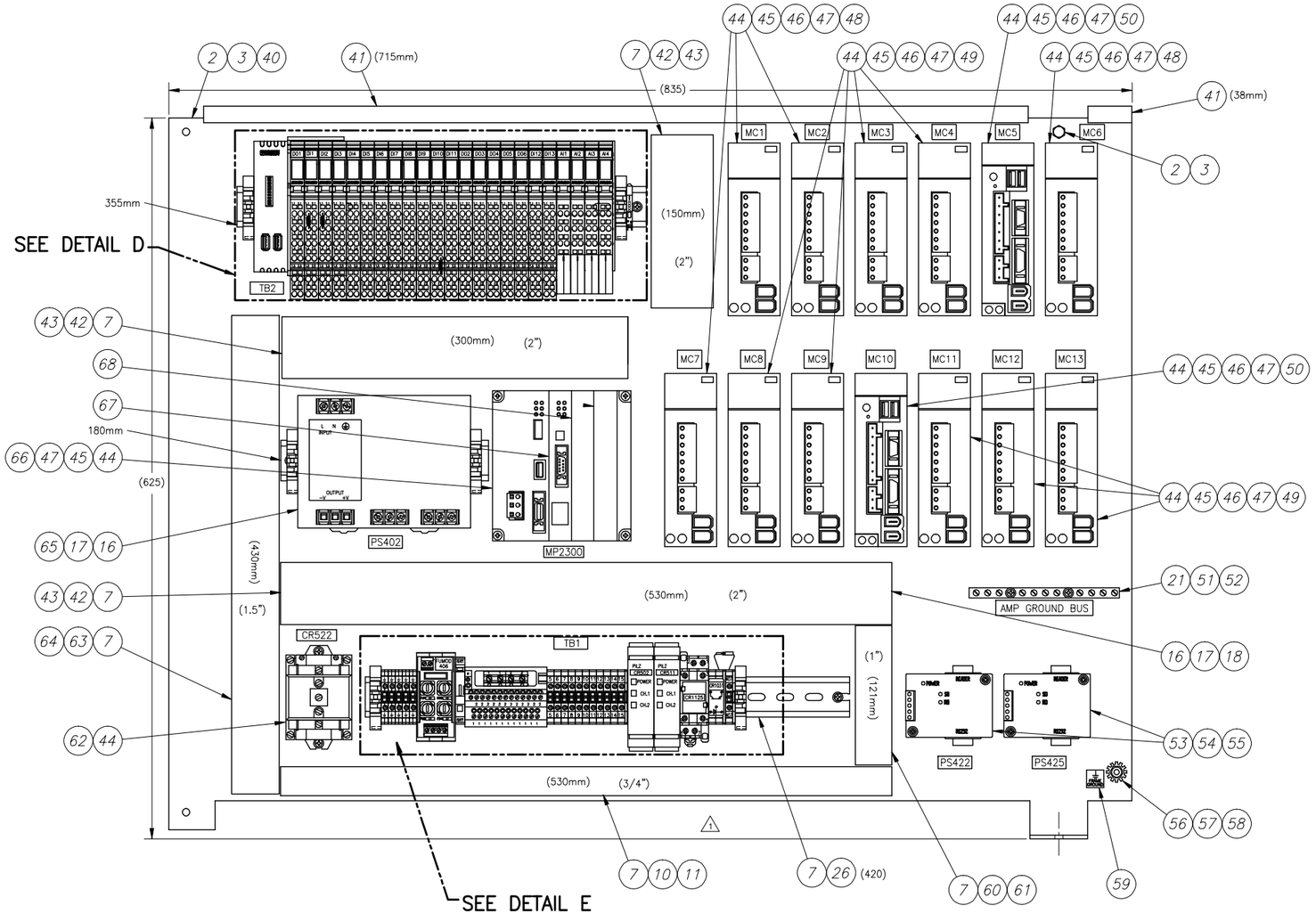

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METRIC
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DECIMAL 0. ± 1.0 0.0 ± 0.4 0.00 ± 0.1 ANGLES ±30'
PROJECTION

DESIGNED DGC NOUN CODE 329
DRAWN DGC 3/11/08
CHECKED RK 3/27/08
APPROVAL TMB 3/27/08
APPROVAL
APPROVAL
RELEASE TRA 3/28/08

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WEST CARROLLTON, OHIO 45449 USA

TITLE
PANEL ASSY,POWER DIST/CONTROL
A/S III,SORT/DECAP

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 of –
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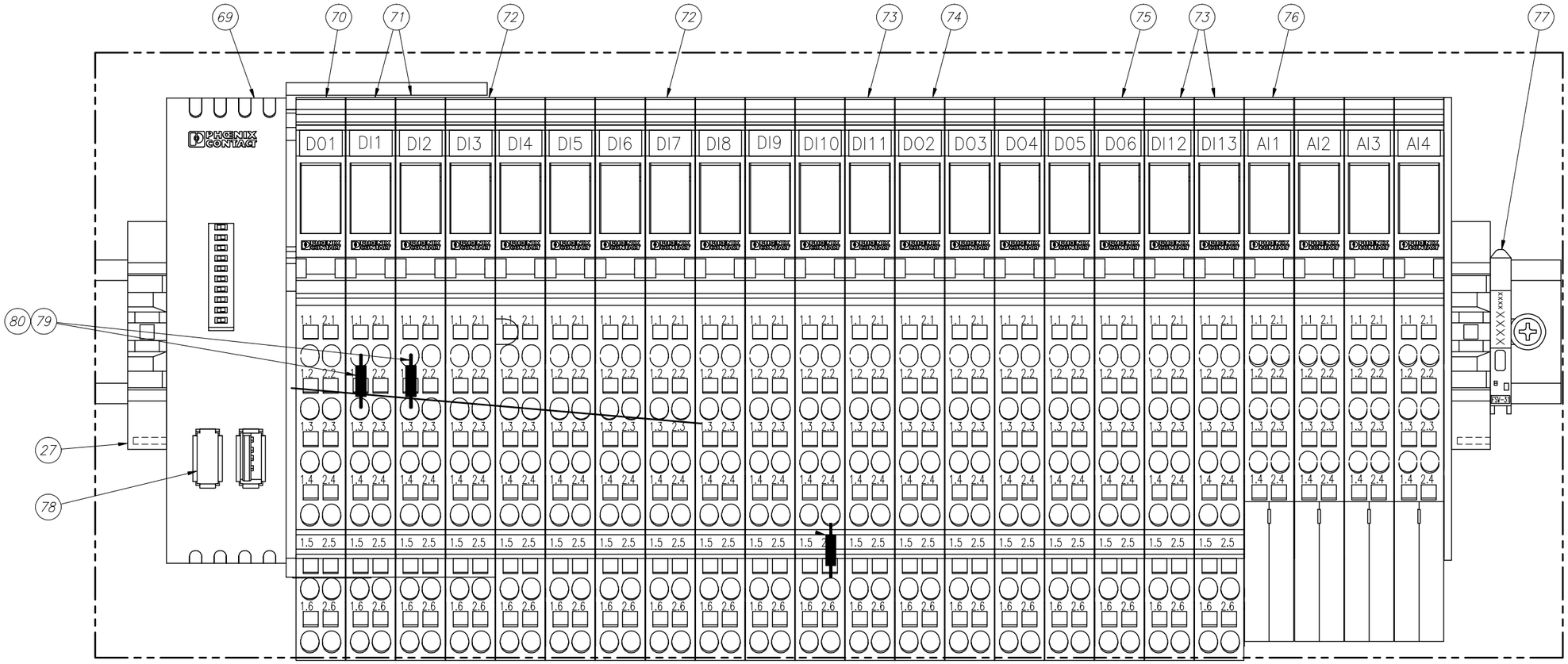

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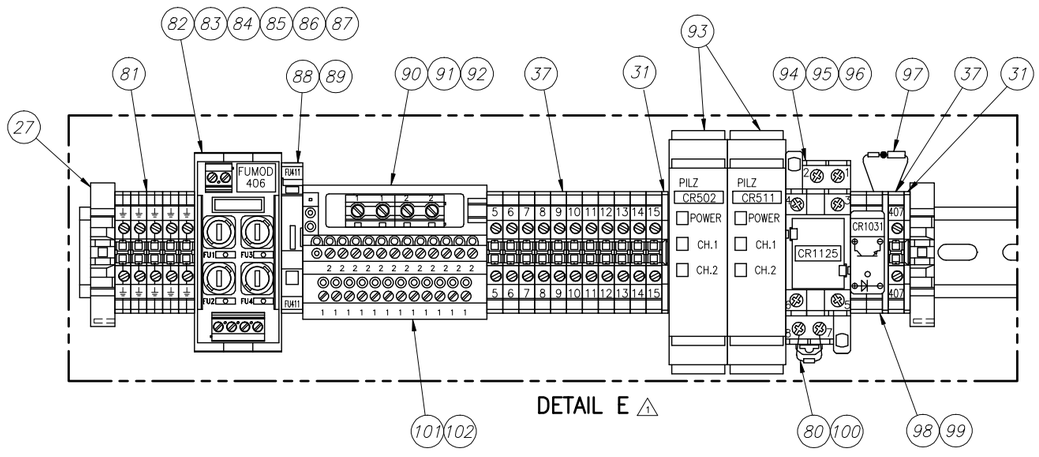

DETAIL E ⚠1

CONFIDENTIAL: THIS DRAWING CONTAINS A PROPRIETARY DESIGN ORIGINATED BY MOTOMAN INCORPORATED. NEITHER IT NOR THE INFORMATION APPEARING HEREON SHALL BE DISCLOSED, USED, OR DUPLICATED FOR ANY PURPOSE UNLESS SPECIFICALLY AUTHORIZED BY MOTOMAN INCORPORATED. THIS DRAWING IS THE PROPERTY OF MOTOMAN INCORPORATED AND SHALL BE RETURNED TO IT UPON REQUEST. ALL PATENT RIGHTS RELATING HERETO ARE SPECIFICALLY RESERVED.

CHANGE RECORD			
No.	E.C.N.	DATE	APPROVAL
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FILE NAME: 154721S03.DWG
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994
DECIMAL: 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4; ANGLES ±30'
PROJECTION

DESIGNED: DGC — NOUN CODE: 329
DRAWN: DGC 3/11/08
CHECKED: RK 3/27/08
APPROVAL: TMB 3/27/08
APPROVAL
APPROVAL
RELEASE: TRA 3/28/08

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PANEL ASSY,POWER DIST/CONTROL
A/S III,SORT/DECAP

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET
A1	0	1:1	154721	3 of –

Table A.12 154721-1 - PANEL ASSY, POWER DIST/CONTROL, A/S III, SORT/DECAP

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154089-1	PANEL,EQUIPMTG,LEFTSIDE	1
2	137566-1	SCREW,HHC,M6X20,ZP,CLASS8.8	9
3	479148-4	WASHER,LOCK,M6	9
4	153127-1	SWITCH,DISCONNECT,MAIN,NX100	1
5	703070-1	FUSE,CLASSJ,30AMP,600VAC	6
6	148661-1	BRACKET,SAFETYSWITCH	1
7	137146-3	SCREW,PPH,M4X10,JISB1188	60
8	146143-1	WIRE,10AWG,BLACK,UL1015/1230	-
9	146143-3	WIRE,10AWG,GRN/YLW,UL1015/1230	-
10	146336-1	DUCT,WIRING,3/4X2,WHITE	-
11	146335-1	DUCT COVER,3/4,WHITE	-
12	146147-1	WIRE,18AWG,BLACK,UL1015/1230	-
13	146147-3	WIRE,18AWG,GRN/YLW,UL1015/1230	-
14	146145-4	WIRE,14AWG,RED,UL1015/1230	-
15	146145-5	WIRE,14AWG,WHITE,UL1015/1230	-
16	146145-1	WIRE,14AWG,BLACK,UL1015/1230	-
17	146145-3	WIRE,14AWG,GRN/YLW,UL1015/1230	-
18	146146-1	WIRE,16AWG,BLACK,UL1015/1230	-
19	146147-4	WIRE,18AWG,RED,UL1015/1230	-
20	146147-5	WIRE,18AWG,WHITE,UL1015/1230	-
21	137146-5	SCREW,PPH,M4X16,JISB1188	6
22	153880-1	CONTACTOR,SAFETY,4-POLE	2
23	131654-8	TERMINAL,QUICKDISCONNECT,FEM	20
24	153821-1	FILTER,RFI,10A,120/250VAC	2
25	149853-1	FILTER,RFT,20AMP,250VAC	2
26	146232-1	RAIL,DIN,35MM	-
27	151267-1	CLAMP,END,DINRAIL	12
28	151419-1	TERMINAL,DIN,GROUND,8MM	4
29	151418-1	TERMINAL,DIN,8MM,SINGLELEVEL	12
30	151420-3	BAR,JUMPER,DIN,4TERMINAL,8MM	3
31	151266-1	PLATE,END,TYPED-UT2.5/10	5
32	131116-1	FUSE HOLDER,DINMTG,	12
33	700619-18	FUSE,CLASSCC,15AMP,600VAC	14

Table A.12 154721-1 - PANEL ASSY, POWER DIST/CONTROL, A/S III, SORT/DECAP

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
34	700619-20	FUSE,CLASSCC,4AMP,600VAC	2
35	700619-21	FUSE,CLASSCC,5AMP,600VAC	4
36	700619-5	FUSE,CLASSCC,8AMP,600VAC	4
37	151270-1	TERMINAL,DIN,6MM,SINGLELEVEL	46
38	151269-1	BAR,JUMPER,DIN,2TERMINAL,6MM	17
39	151265-1	PLATE,SPACER,SEPARATION	3
40	154090-1	PANEL,MAINEQUIPMENT	1
41	149091-2	TRIM,VINYL,PUSH-ON,BLACK,1/8	-
42	146336-11	DUCT,WIRING,2X2,WHITE	-
43	146335-4	DUCT COVER,2",WHITE	-
44	137146-4	SCREW,PPH,M4X12,JISB1188	32
45	140694-2	CABLE,MECHATROLINKII,USB-USB	-
46	143152-4	TERMINAL,RING,22-16AWG,#8/M4	14
47	153702-1	FILTER,FERRITECORE	14
48	153327-1	AMPLIFIER,SIGMAIII,200W,200V	4
49	153327-2	AMPLIFIER,SIGMAIII,100W,200V	7
50	153455-1	AMPLIFIER,30W,SIGMAIII,100VAC	2
51	700662-1	BAR,GROUND,10PT,COPPER	1
52	146146-3	WIRE,16AWG,GRN/YLW,UL1015/1230	-
53	153580-1	POWER SUPPLY,5VDC,SCANNER	2
54	133953-1	SCREW,PPH,M4X25	4
55	130956-2	SPACER,STANDOFF,M4X1/2,M-F	4
56	130527-5	WASHER,LOCK,IET,1/4,ZP	1
57	131281-1	NUT,HEX,1/4-20,GREEN	1
58	143153-7	TERMINAL,RING,16-14AWG,1/4/M6	1
59	405548-1	LABEL,FRAMEGROUND	1
60	146336-4	DUCT,WIRING,1X2,WHITE	-
61	146335-2	DUCT COVER,1",WHITE	121
62	153881-1	RELAY,SAFETYCONTROL,4-POLE	1
63	146335-3	DUCT COVER,1.5",WHITE	430
64	146336-8	DUCT,WIRING,1.5X2,WHITE	430
65	152937-4	POWER SUPPLY,24VDC,20AMP	1
66	153325-1	CONTROLLER,MACHINE,DIGITAL	1
67	153326-2	MODULE,COMM,ETHERNET/RS232	1

Table A.12 154721-1 - PANEL ASSY, POWER DIST/CONTROL, A/S III, SORT/DECAP

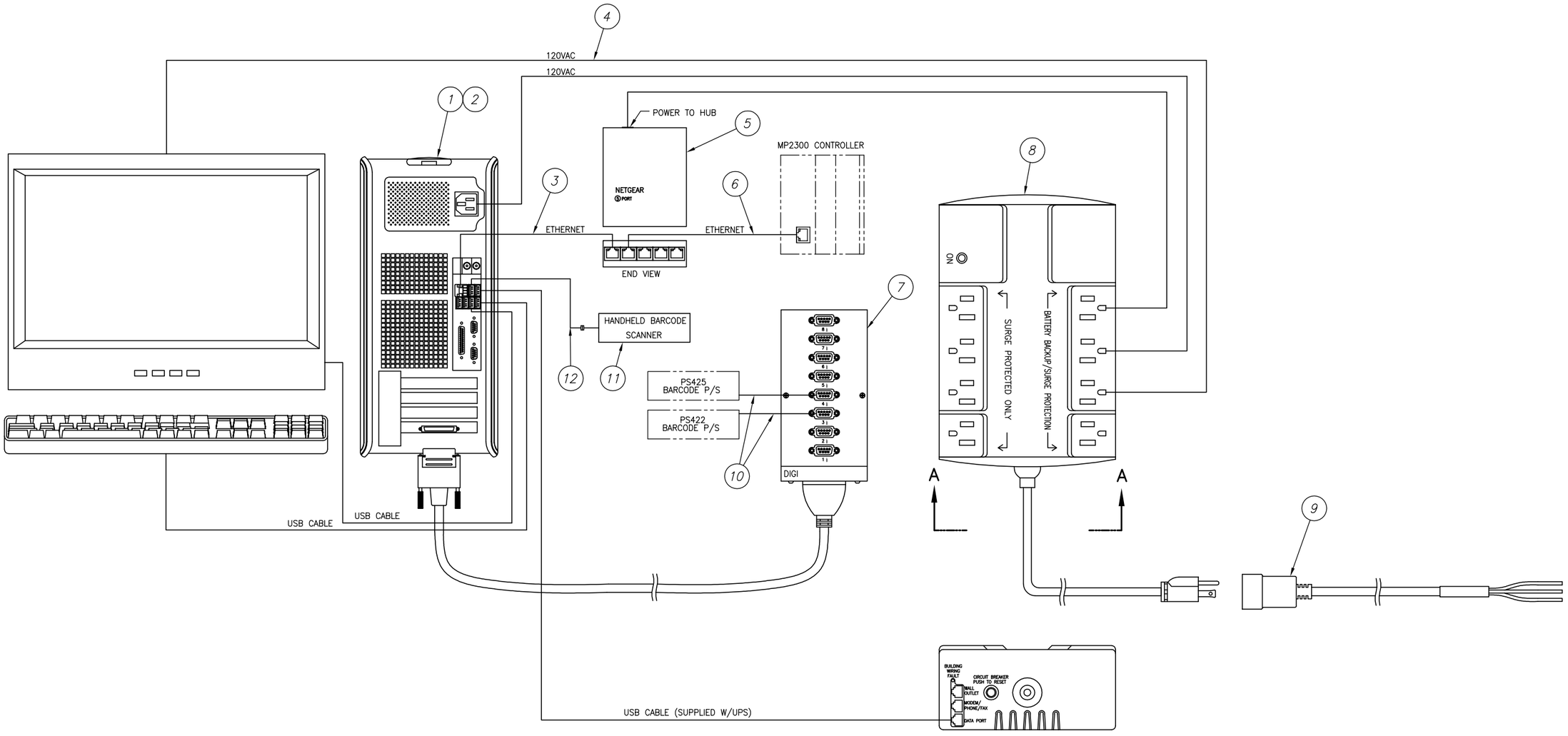
FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
68	154905-1	COVER,EMPTYCARDSLOT,MP2300	2
69	153769-1	MODULE,COMMUNICATION	1
70	153769-9	CONNECTOR,EXTENDEDDBLSIGNAL	1
71	153769-8	CONNECTOR,EXTENDEDDBLSIGNAL	2
72	153769-5	BLOCK,TERM,16DIGITALINPUT	2
73	153769-7	BLOCK,TERM,4DIGITALINPUT	3
74	153769-4	BLOCK,TERM,16DIGITALOUTPUT	1
75	153769-6	BLOCK,TERM,4OUTPUT	1
76	153769-3	BLOCK,TERM,4ANALOGINPUT	1
77	153989-1	AMPLIFIER,THRU-BEAM	1
78	153319-1	RESISTOR,TERMINATOR	1
79	130484-73	RESISTOR,1/2W,5%,1.0KOHM	3
80	146345-2	TUBING,20AWG,PVC	90
81	151271-1	TERMINAL,DIN,GROUND,6MM	5
82	149280-1	MODULE,FUSE,MASTER,24VDC	1
83	149593-1	FUSE,ELECTRONIC,10AMP,32VDC	2
84	703093-3	FUSE,ELECTRONIC,1AMP,250V	2
85	703039-12	FUSE,ELECTRONIC,.6AMP,250VAC	2
86	703039-13	FUSE,ELECTRONIC,.4AMP,250VAC	2
87	703039-7	FUSE,GMA,6AMP	2
88	153132-1	FUSE HOLDER,DINMTG,5X20	1
89	703039-10	FUSE,GMA,8AMP	2
90	146144-2	WIRE,12AWG,BLUE,UL1015/1230	-
91	146144-7	WIRE,12AWG,WHTBLU,UL1015/1230	-
92	707247-1	MODULE,POWERDIST,2POLE,24OUT	1
93	154068-1	RELAY,SAFETY,2NO,1NODELAYED	2
94	139480-1	SOCKET,RELAY,CONTROL	1
95	479056-1	RELAY,MINIATURE,24VDC,DPDT	1
96	471701-1	RETAINER,RELAY,	2
97	154349-1	DIODE ASSY,NOISESUPPRESSION	1
98	154048-1	MODULE,RELAY,POWER,SOLIDSTATE	1
99	154049-1	BLOCK,BASETERMINATION,RELAY	1
100	1cz-93b	DIODE,1N5395	1
101	146147-2	WIRE,18AWG,BLUE,UL1015/1230	-

Table A.12 154721-1 - PANEL ASSY, POWER DIST/CONTROL, A/S III, SORT/DECAP

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
102	146147-7	WIRE,18AWG,WHT/BLU,UL1015/1230	-
103	706927-1	CABLE,EURO,FEMALE,8/24AWG	1
104	154600-1	CABLE ASSY,PUSHBUTTONBAR	1
105	154590-1	CABLE ASSY,LIGHT,BEACON	1
106	154175-1	CABLE,QUICKDISCONNECT	12
107	154189-1	CABLE ASSY,DRAWERSOLENOID	8
108	154265-1	CABLE,M12CONNECTOR,5M	1
109	154172-1	CABLE,SENSOR,RIGHTANGLE,7M	8
110	154186-1	CABLE ASSY,ENCODER,SERVOMTR	3
111	154184-1	CABLE ASSY,POWER,SERVOMTR	2
112	154185-1	CABLE ASSY,POWER,SERVOMTR	1
113	154578-1	CABLE ASSY,FANPOWER,DUAL	1
114	154604-1	CABLE ASSY,PUSHBUTTON,OPERATOR	1
115	154632-1	CABLE ASSY,I/O,SERVOAMP,CN1	2

NOTES:

1. ENSURE THAT ALL VENDOR SUPPLIED DOCUMENTAION IS INCLUDED WITH THIS KIT.
2. TAG KIT AND PERMANENT MARK WITH MOTOMAN PART NUMBER 154868-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARP 2.3.



VIEW A–A

SEE SEPARATE BOM

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME 154868.DWG
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ±30'
PROJECTION

DESIGNED TB NOUN CODE 091
DRAWN DGC 3/18/08
CHECKED RK 3/27/08
APPROVAL TMB 3/27/08
APPROVAL
APPROVAL
RELEASE TRA 3/28/08

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
COMPUTER KIT,AUTOSORTER III W/ACCESSORIES

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET
A1	0	1:2	154868	1 of 1

Table A.13 154868-1 - COMPUTER KIT, AUTOSORTER III W/ ACCESSORIES

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154805-1	COMPUTER,MINI-TOWER,OPTIPLEX	1
2	712111-1	BOARD,PC,PCI,RS232,8PORT	1
3	704148-3	CABLE,RJ45,CAT5E,GREY,7FT.	1
4	154761-1	CORD,POWER,MOLDED,120VAC	1
5	703752-8	HUB,NETWORK,5PORT,10/100mbps	1
6	704148-7	CABLE,NETWORK,CAT5e,PATCH,GREY	1
7	712112-1	MODULE,RS232,8PORT,DB9M,DTE	1
8	149173-1	POWER SUPPLY,UPS,350VA,200W	1
9	154867-1	CABLE ASSY,POWER,120VAC	1
10	154020-2	CABLE ASSY,NULLMODEL,DB9	2
11	707396-1	SCANNER,BARCODE,FUZZYLOGIC	1
12	707397-1	CABLE,USB,7FT,STRAIGHT	1

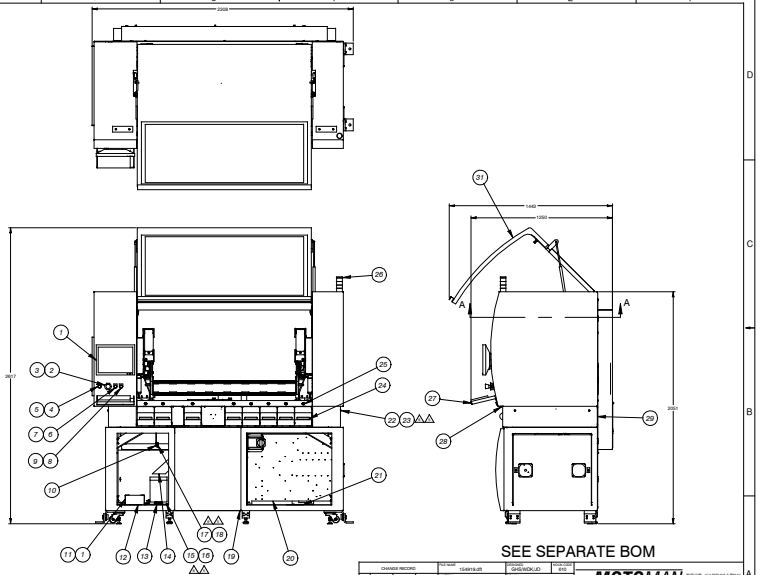
NOTES:

1. ALL DIMENSIONS ARE REFERENCE ONLY.
   FOR POSITIONER TABLE TOOLING CONSTRUCTION DIMENSIONS, CONTACT MOTOMAN, INC.
2. GENERAL INSTALLATION: REFER TO MANUAL
3. CONNECT POWER/CONTROL CABLES: REFER TO MANUAL OR PANEL DRAWING 154721-1
4. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.

△1 APPLY 13419-1 ADHESIVE (LOCTITE 243) TO DESIGNATED FASTENERS AND MATING SURFACES.

△2 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGM-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED.

7. PERMANENT MARK WITH MOTOMAN PART NUMBER 154919-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGM-077 PARA 2.5.



SEE SEPARATE BOM

REVISION STATUS OF SHEETS										
SHT	1	2	3	4	5	6	-	-	-	-
REV	0	0	0	0	0	0	-	-	-	-

CHANGE RECORD										
No.	E.C.N.	DATE	APPROVED							
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PART NAME	154919-2R
DRAWN	GHS/MDK,JD
DATE	MDK 6/13/08
CHECKED	JL 5/16/08
APPROVED	GHS 5/16/08
MATERIAL	
WEIGHT	
APPROVED	
APPROVED	EAT 5/16/08
	965.6 kg

SCALE CODE	010
	METRIC DO NOT SCALE DRAWING
	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ± INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5M
	NEXT ASSEMBLY
	APPLICATION
	USED ON
	NEXT ASSEMBLY

MOTOMAN WEST CARROLLTON OHIO 4549 USA
A YASKAWA company

TITLE: SYSTEM,AUTOSORTER III DUAL ARM,DECAPPER,CENTRIFUGE

SIZE	DWG NO	REV	SCALE	SHEET 1 OF 6
A1	154919	0	1:10	

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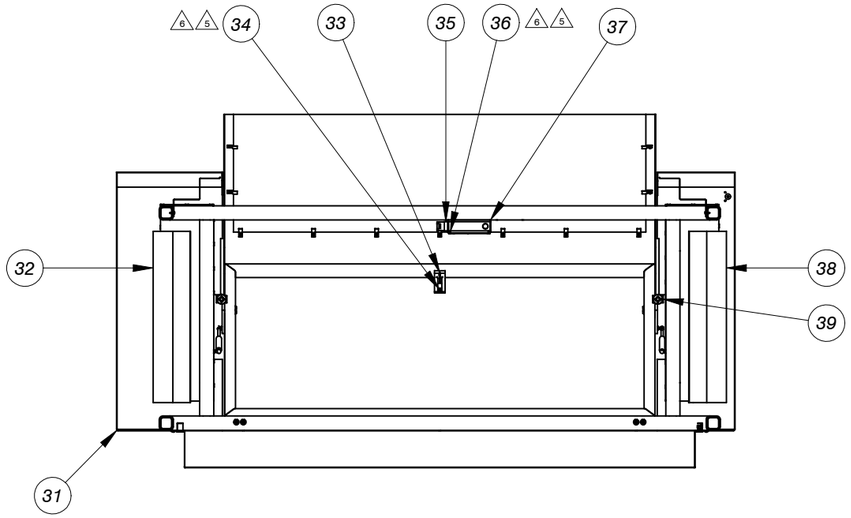
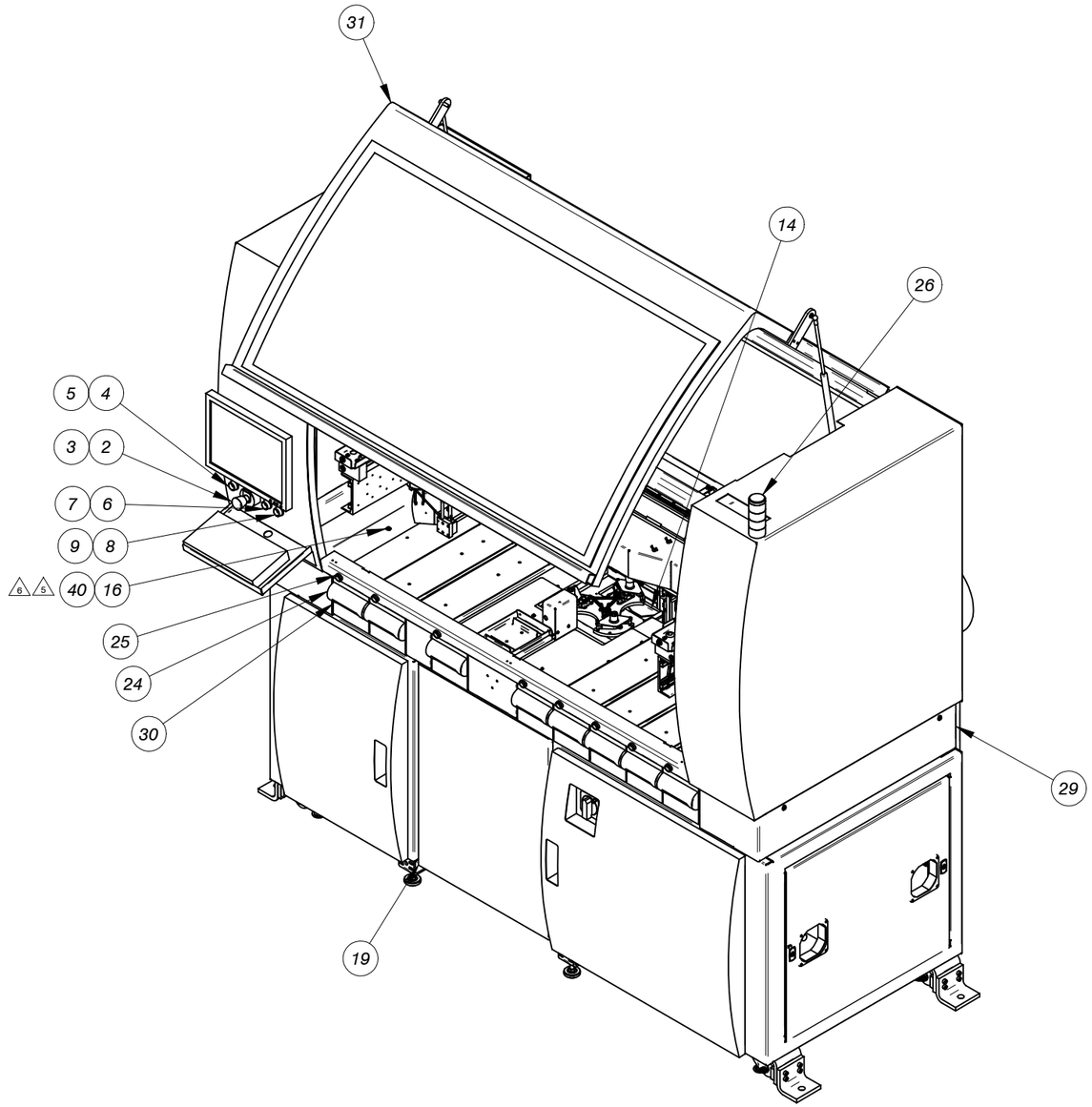


SECTION A-A
1:10
ROTATED 90°



ISOMETRIC VIEW
1:8
REFERENCE ONLY

CHANGE RECORD			
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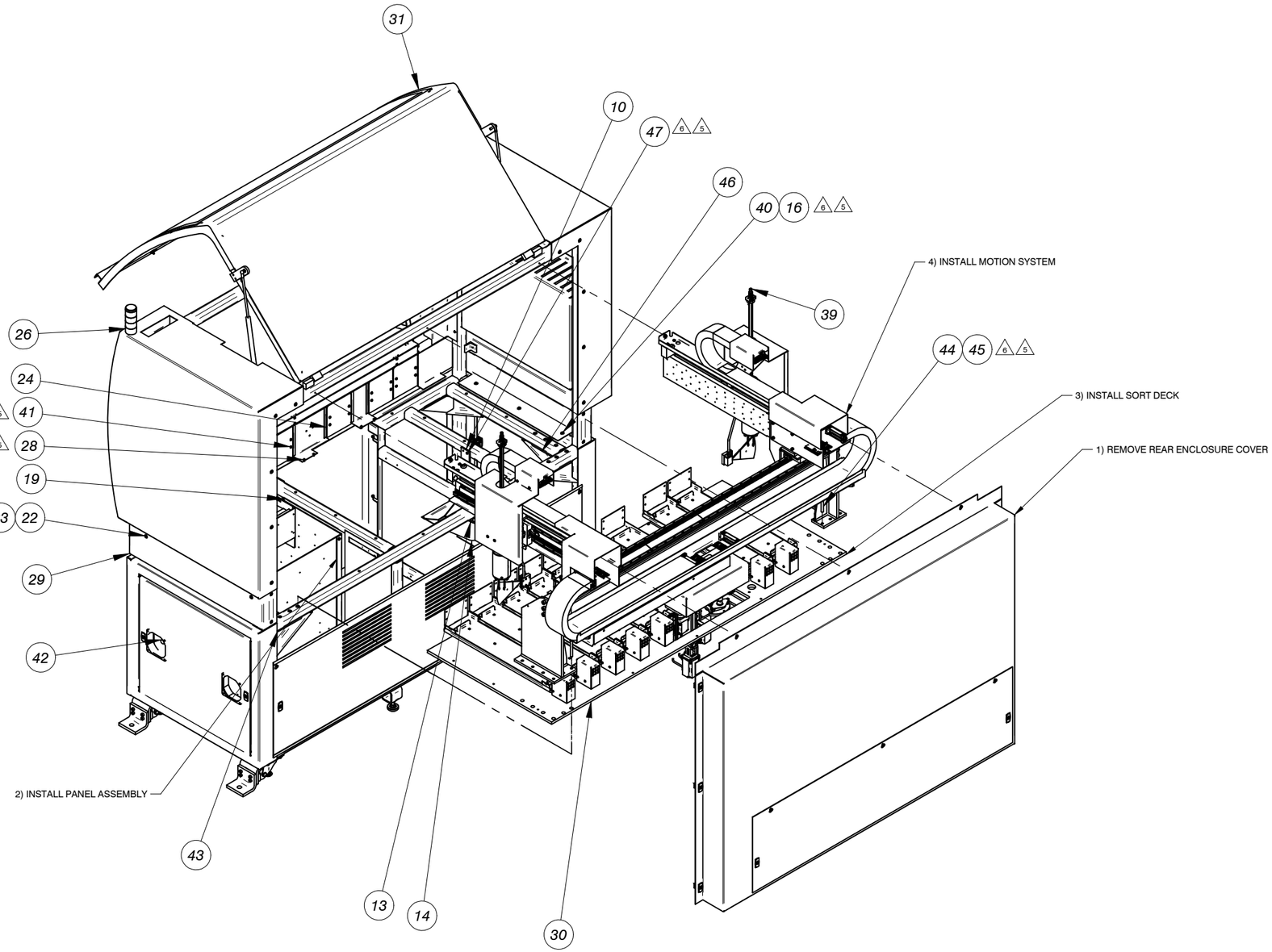
FILE NAME: 154919.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION:

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK 5/13/08
CHECKED: JL 5/16/08
APPROVAL: GHS 5/16/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/16/08
945.6 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 6
A1	0	1:10	154919	



SORT DECK AND MOTION SYSTEM INSTALL
1:10

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CHANGE RECORD			
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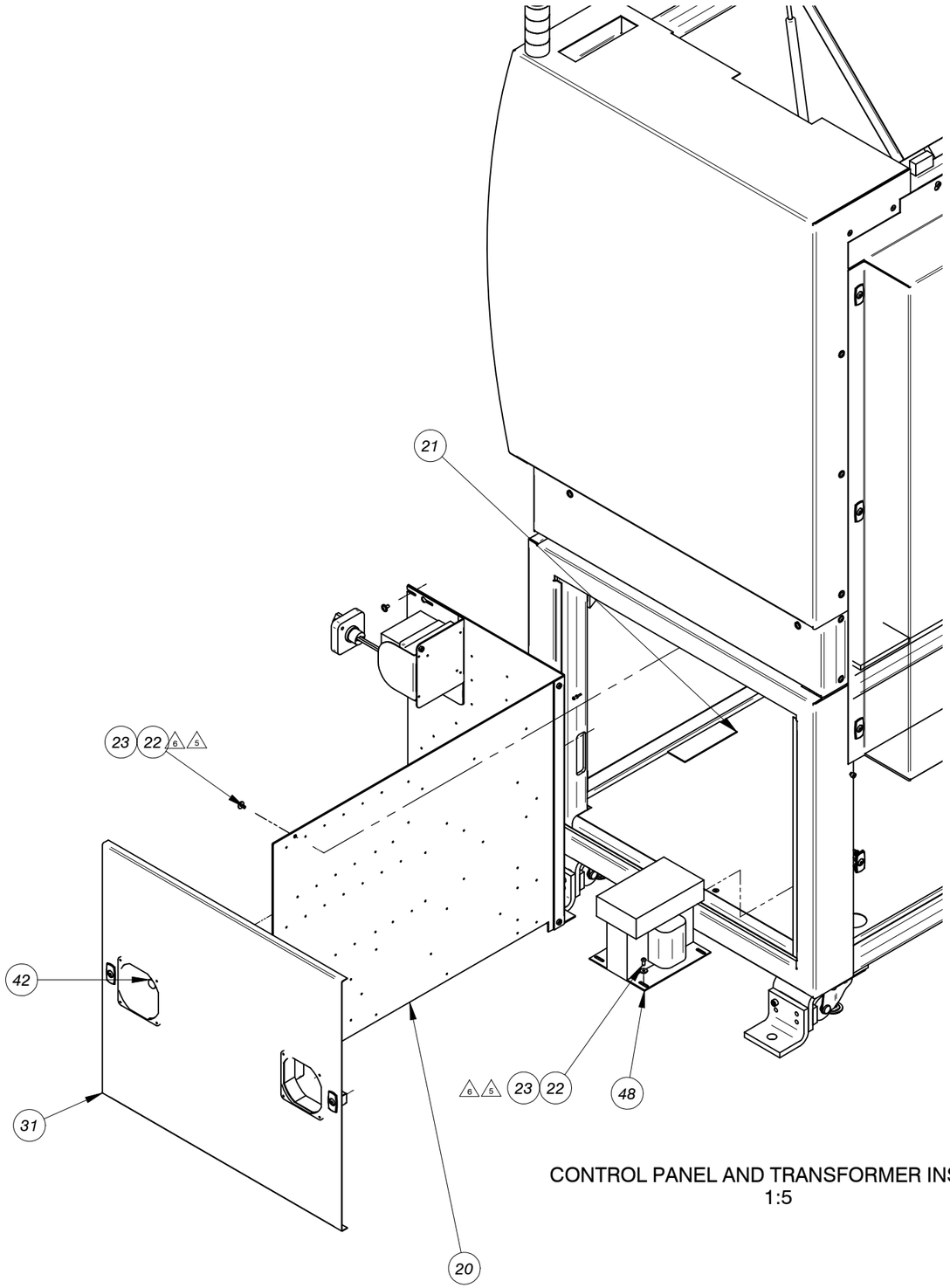
FILE NAME 154919.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED GHS/WDK/JO
NOUN CODE 610
DRAWN WDK 5/13/08
CHECKED JL 5/16/08
APPROVAL GHS 5/16/08
APPROVAL
APPROVAL
RELEASE KAT 5/16/08
945.6 kg

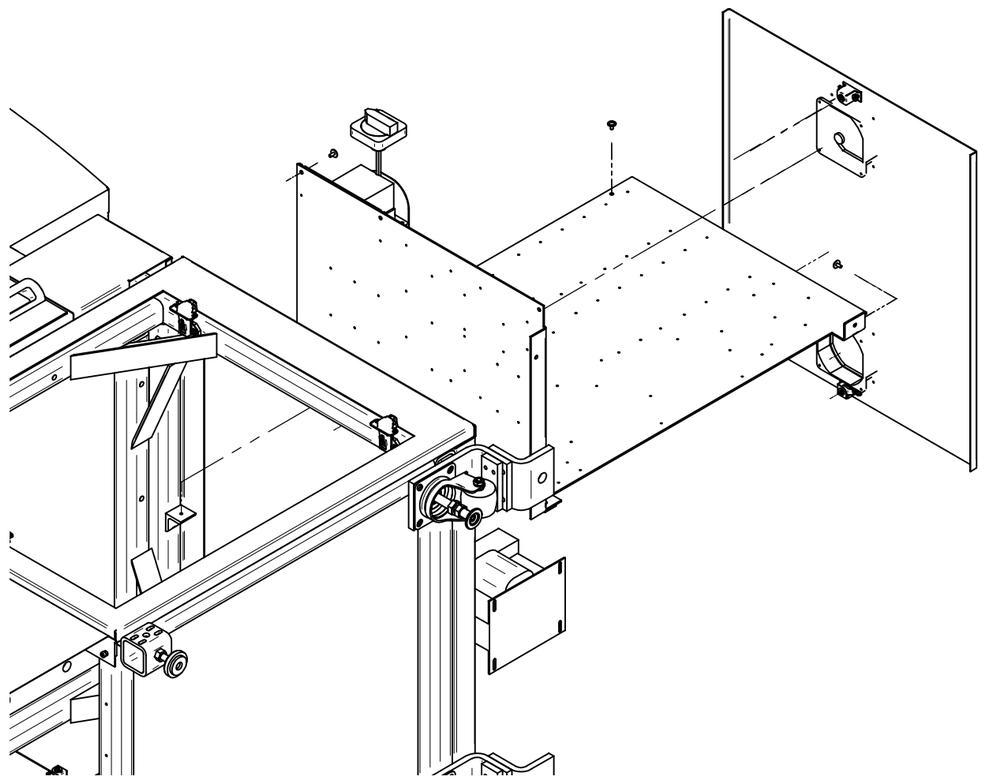
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 6
A1	0	1:10	154919	



CONTROL PANEL AND TRANSFORMER INSTALL
1:5



VIEW SHOWING CONTROL PANEL MOUNTING

CHANGE RECORD			
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FILE NAME 154919.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL
0. = 1.0 0.00 = 0.1
0.0 = 0.4
ANGLES = 30'

PROJECTION

DESIGNED GHS/WDK/JO
NOUN CODE 610
DRAWN WDK 5/13/08
CHECKED JL 5/16/08
APPROVAL GHS 5/16/08
APPROVAL
APPROVAL
RELEASE KAT 5/16/08
945.6 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 6
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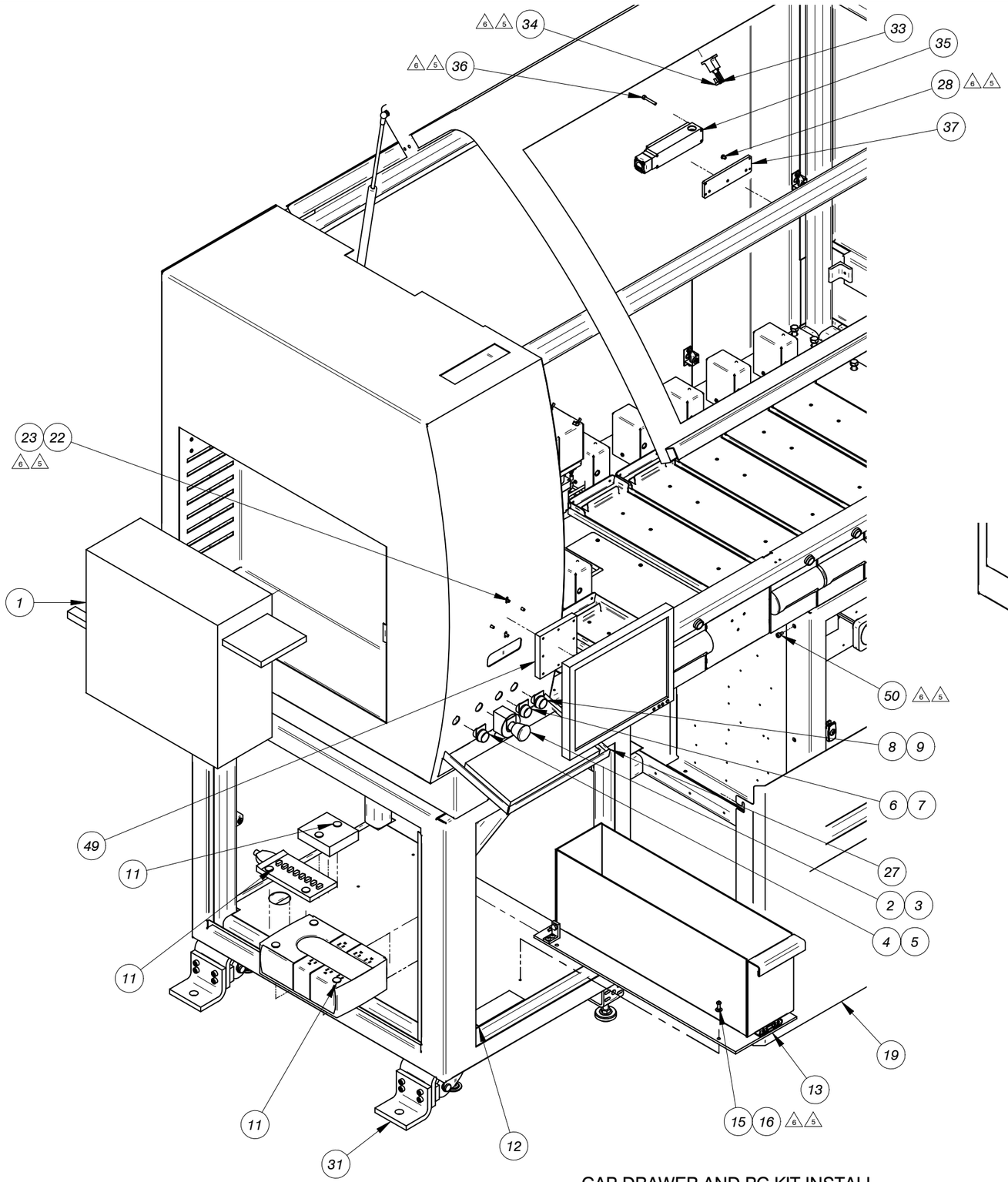
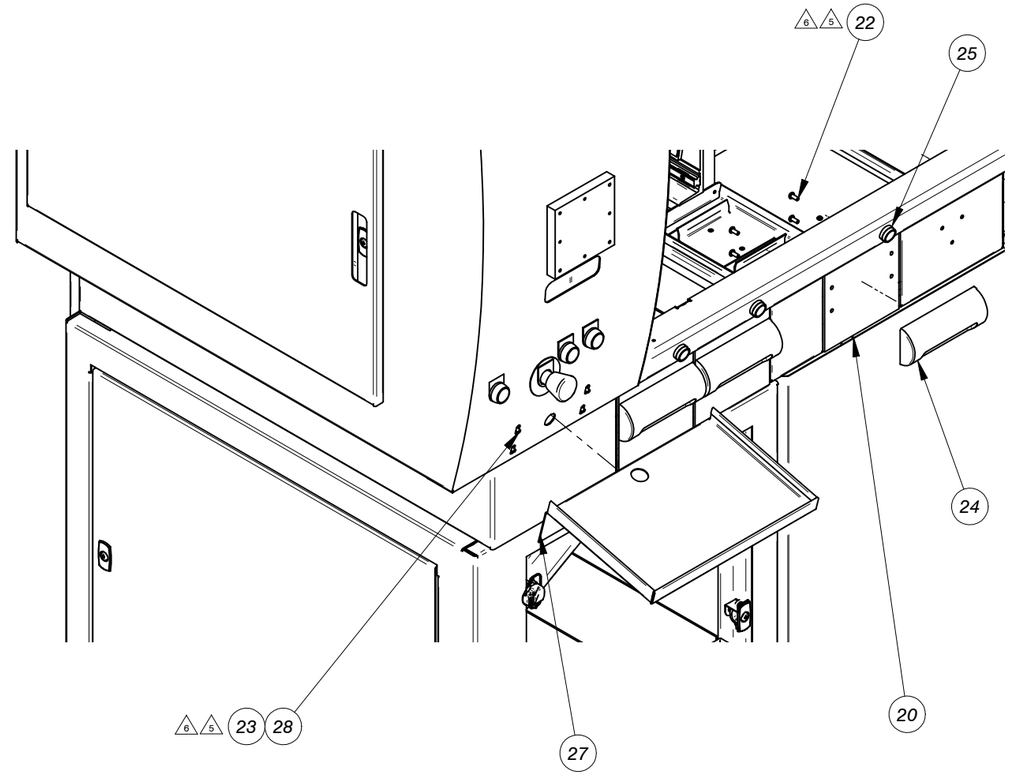


CAP DRAWER AND PC KIT INSTALL
1:5



KEYBOARD TRAY AND DRAWER HANDLE INSTALL
1:4

CHANGE RECORD			
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FILE NAME: 154919.dft
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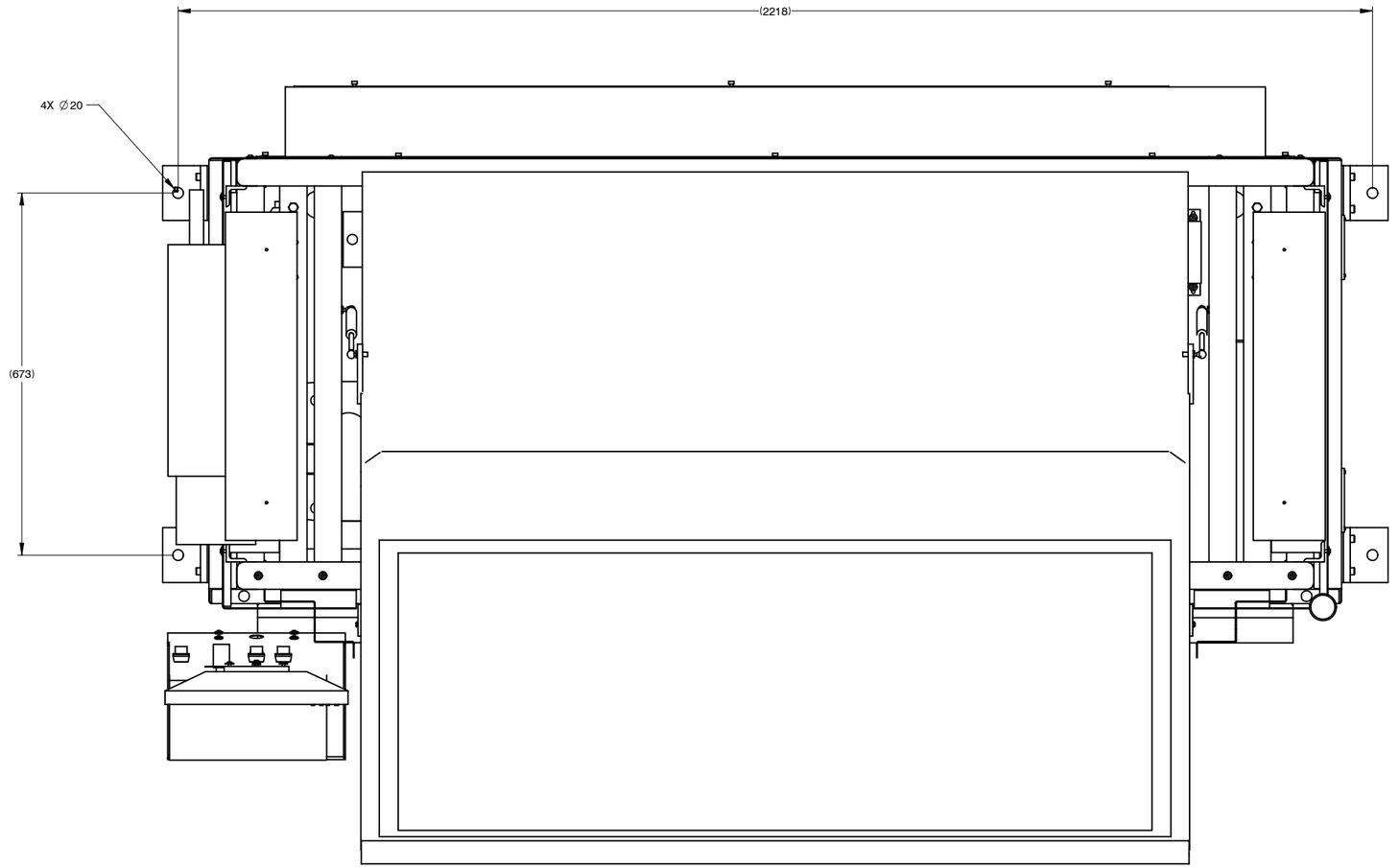
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK 5/13/08
CHECKED: JL 5/16/08
APPROVAL: GHS 5/16/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/16/08
945.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 5 OF 6
A1	0	1:10	154919	



VIEW OF MACHINE LAG POINTS
1:5
SHOWN WITH ENCLOSURE SIDE
COVERS REMOVED FOR CLARITY

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME: 154919.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION

DESIGNED: GHS/WDK/JO
NOUN CODE: 610
DRAWN: WDK 5/13/08
CHECKED: JL 5/16/08
APPROVAL: GHS 5/16/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/16/08
945.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: SYSTEM,AUTOSORTER III
DUAL ARM,DECAPPER,CENTRIFUGE

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 6 OF 6
A1	0	1:10	154919	

Table A.14 154919-1 - SYSTEM, AUTOSORTER III, DUAL ARM, DECAPPER, CENTRIFUGE

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154868-1	COMPUTERKIT,AUTOSORTERIII	1
2	701577-2	SWITCH,PUSHBUTTON,NON-ILL,40MM	1
3	154569-9	NAMEPLATE,LEGEND,ESTOP	1
4	705727-5	SWITCH,PUSHBUTTON,ILLUMINATED	1
5	154569-5	NAMEPLATE,LEGEND,OPERATOR	1
6	149325-2	SWITCH,PUSHBUTTON,FLUSHHEAD	1
7	154569-20	NAMEPLATE,LEGEND,OPERATOR	1
8	149325-3	SWITCH,PUSHBUTTON,FLUSHHEAD	1
9	154569-21	NAMEPLATE,LEGEND,OPERATOR	1
10	154393-1	BRACKET,SENSOR,FULL	1
12	154694-1	LABEL,FUSE,POWERDISTRIBUTION	1
13	154999-1	DRAWERASSY,USEDCAPS	1
14	154394-1	TUBE,CHUTEASSY	1
15	140331-5	SCREW,BHSC,M6X16,SST	4
16	132527-1	WASHER,FLAT,M6,SST	7
17	153936-2	SENSOR,REFLECTIVE,PNP	1
18	132524-9	SCREW,SHC,M4X12,SST	2
19	155054-1	COVER,ENCLOSURE,FRONT	1
20	154721-1	PANEL ASSY,PWRDIST/CONT,DUAL	1
21	154695-1	LABEL,FUSE,CONTROLPANEL	1
22	132525-1	SCREW,BHSC,M5X12,SST	53
23	145277-3	WASHER,FLAT,M5X15,OD,ZP	25
24	154153-1	HANDLE,DRAWER	8
25	155038-1	SWITCH,PUSHBUTTON,ILLUM,WHITE	8
26	154589-1	LIGHT ASSY,BEACON,RED/AMB/GRN	1
27	154382-1	TRAY,KEYBOARD,ENCLOSURE	1
28	132525-8	SCREW,BHSC,M5X8,SST	21
29	154963-1	COVER KIT,SORTDECK/ENCLOSURE	1
30	154965-1	PLATFORMASSY,DECAP,SORT	1
31	154923-1	ENCLOSUREASSY,BASIC	1
32	154573-2	LIGHT ASSY,FLOURESCENTSTRIP	1
33	154284-1	ACTUATOR,FLEXIBLE,IE10-R2	1
34	140330-11	SCREW,SHC,M5X45,SST	2

Table A.14 154919-1 - SYSTEM, AUTOSORTER III, DUAL ARM, DECAPPER, CENTRIFUGE

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
35	154429-1	SWITCH.ALTERED,INTERLOCK	1
36	140330-9	SCREW,SHC,M5X35,SST,CLASS12.9	4
37	154389-1	PLATE,LOCK,MOUNTING	1
38	154573-1	LIGHT ASSY,FLOURESCENTSTRIP	1
39	154193-1	SYSTEM,MOTIONXYZAXIS	1
40	140331-3	SCREW,BHSC,M6X10,SST	3
41	132609-3	WASHER,CONICALSPRING,M5,SST	34
42	154577-1	CORD ASSY,DUALFAN,610MM	1
43	154402-1	BAR,MOUNT,HANDLER,1	2
44	155035-1	SCREW,HHC,M10X90,SST	12
45	132609-6	WASHER,CONICALSPRING,M10,SST	12
46	154403-1	BAR,MOUNT,HANDLER,2	2
47	139219-2	SCREW,BHSC,M5X10,SST	2
48	153803-2	TRANSFORMER,CONTROL,1.5KVA	1
49	154383-1	MOUNT,MONITOR,ENCLOSURE	1
50	154277-1	SCREW,SHOULDER,M5,10mmSHOULDE	6

NOTES:

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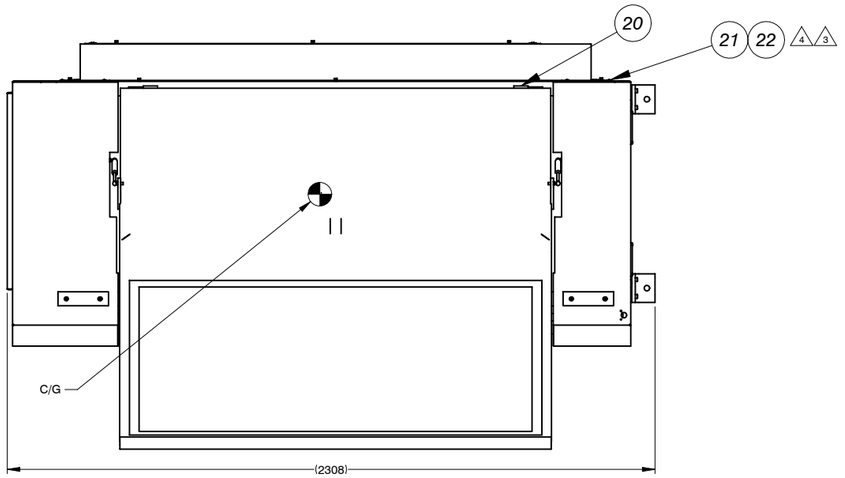
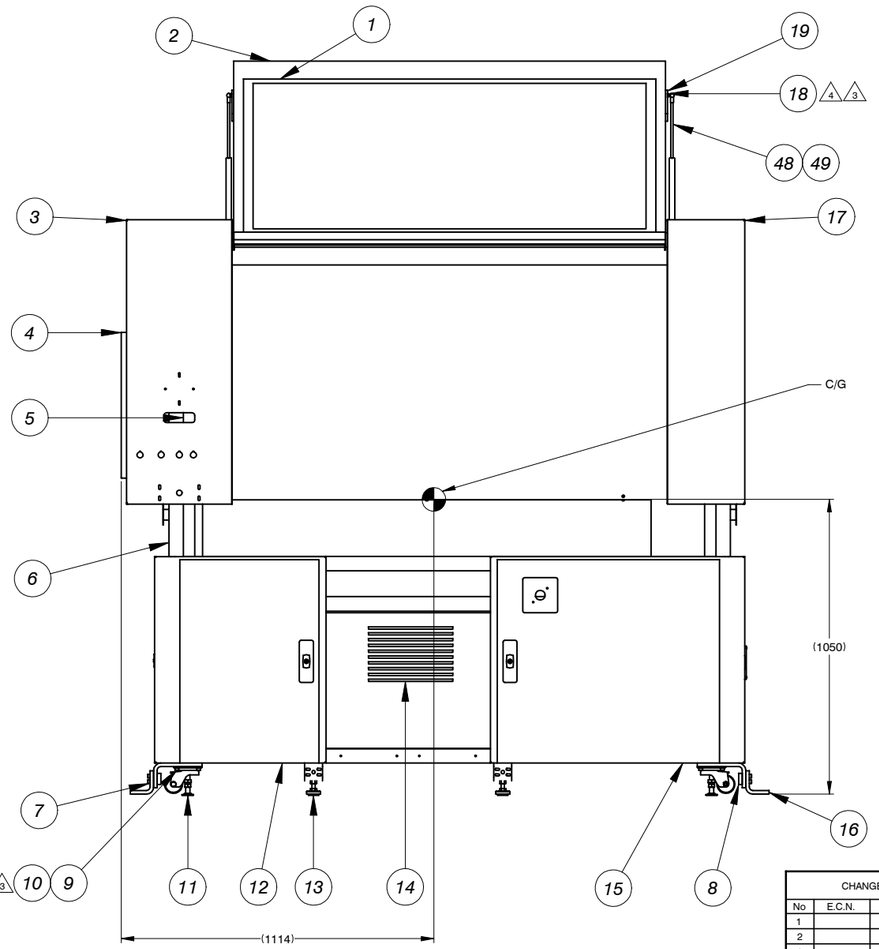
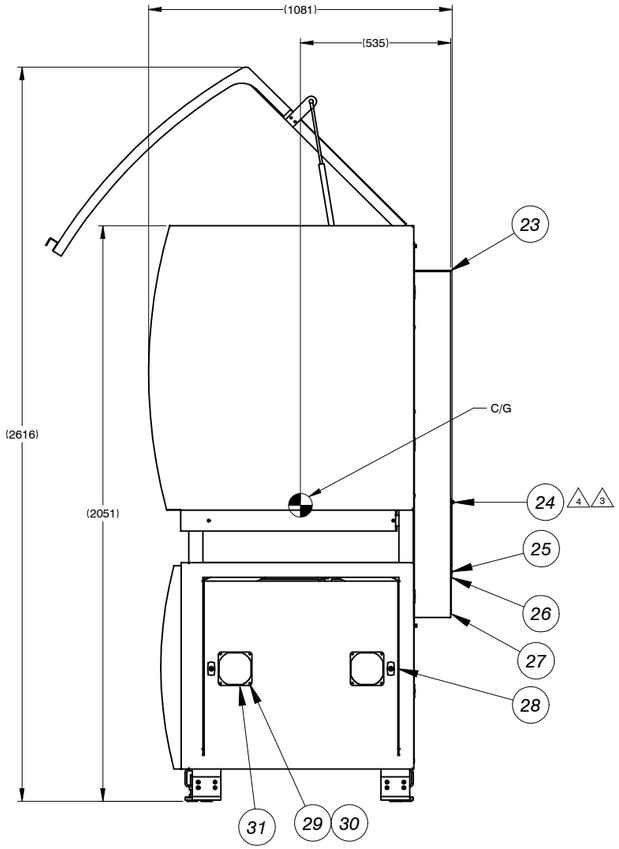
3. TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED
4. APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.
6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154200-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.







REVISION STATUS OF SHEETS					
SHT.	1	2	3	4	-
REV.	0	0	0	0	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME 154923.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
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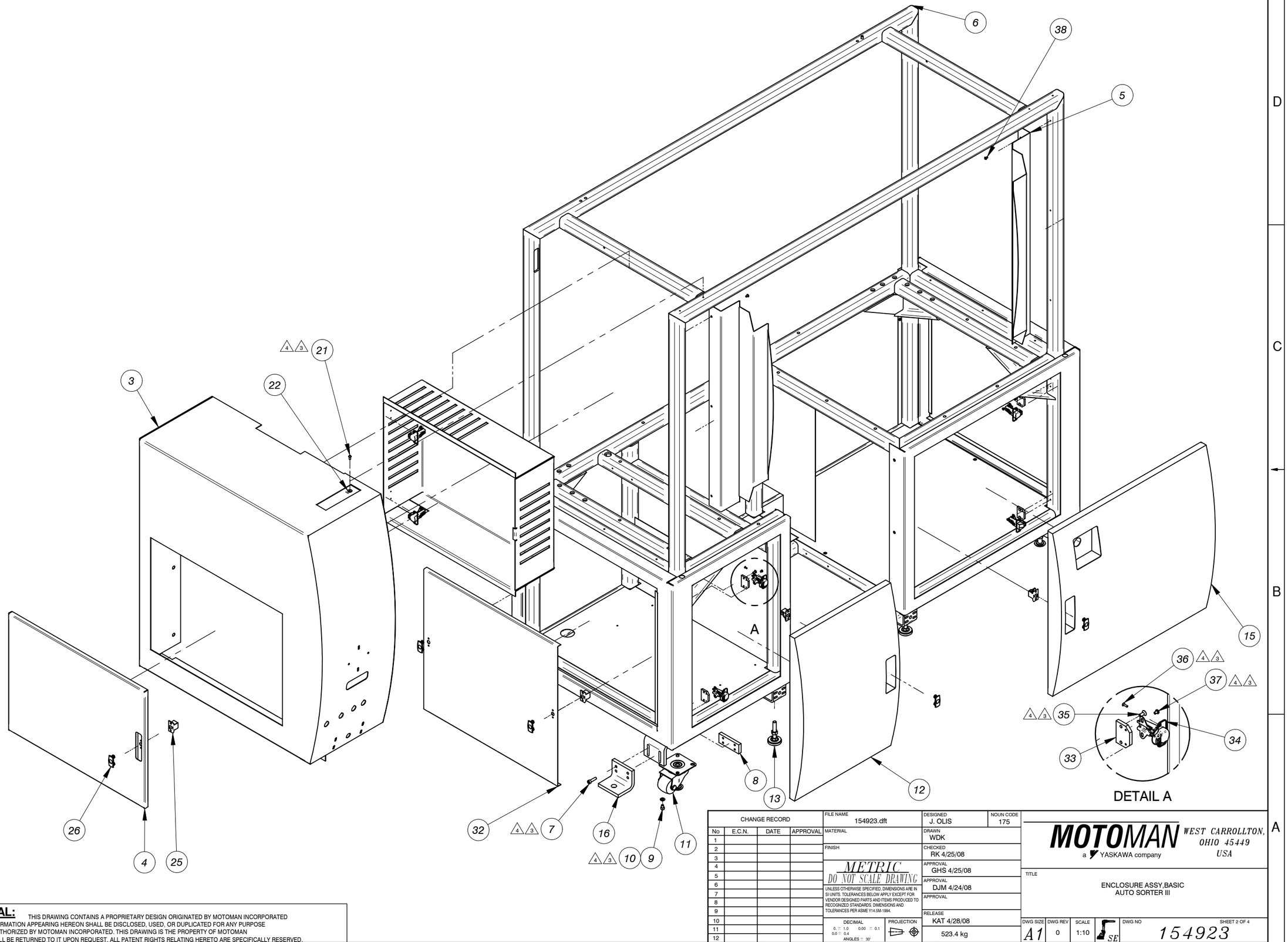
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED J. OLIS
NOUN CODE 175
DRAWN WDK
CHECKED RK 4/25/08
APPROVAL GHS 4/25/08
APPROVAL DJM 4/24/08
APPROVAL
RELEASE KAT 4/28/08
523.4 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ENCLOSURE ASSY,BASIC AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 4
A1	0	1:10	154923	



CHANGE RECORD			
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FILE NAME: 154923.dft

MATERIAL:

FINISH:

METRIC
DO NOT SCALE DRAWING

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DECIMAL: 0. ± 1.0, 0.0 ± 0.1, 0.0 ± 0.4; ANGLES ± 30'

PROJECTION

DESIGNED: J. OLIS

NOUN CODE: 175

DRAWN: WDK

CHECKED: RK 4/25/08

APPROVAL: GHS 4/25/08

APPROVAL: DJM 4/24/08

APPROVAL:

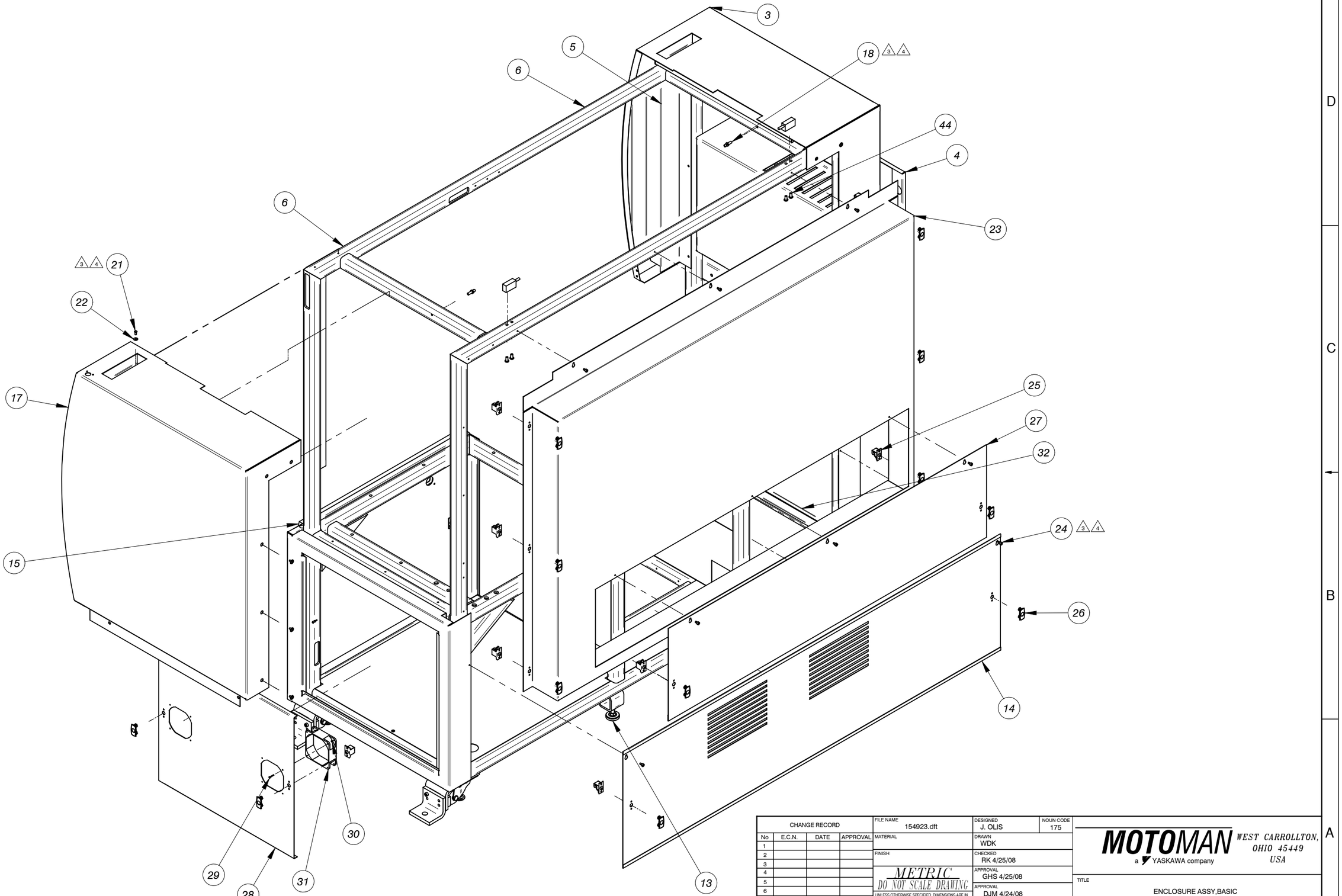
RELEASE: KAT 4/28/08

523.4 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: ENCLOSURE ASSY,BASIC AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 4
A1	0	1:10	154923	



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CHANGE RECORD			
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FILE NAME: 154923.dft

MATERIAL:

FINISH:

METRIC
DO NOT SCALE DRAWING

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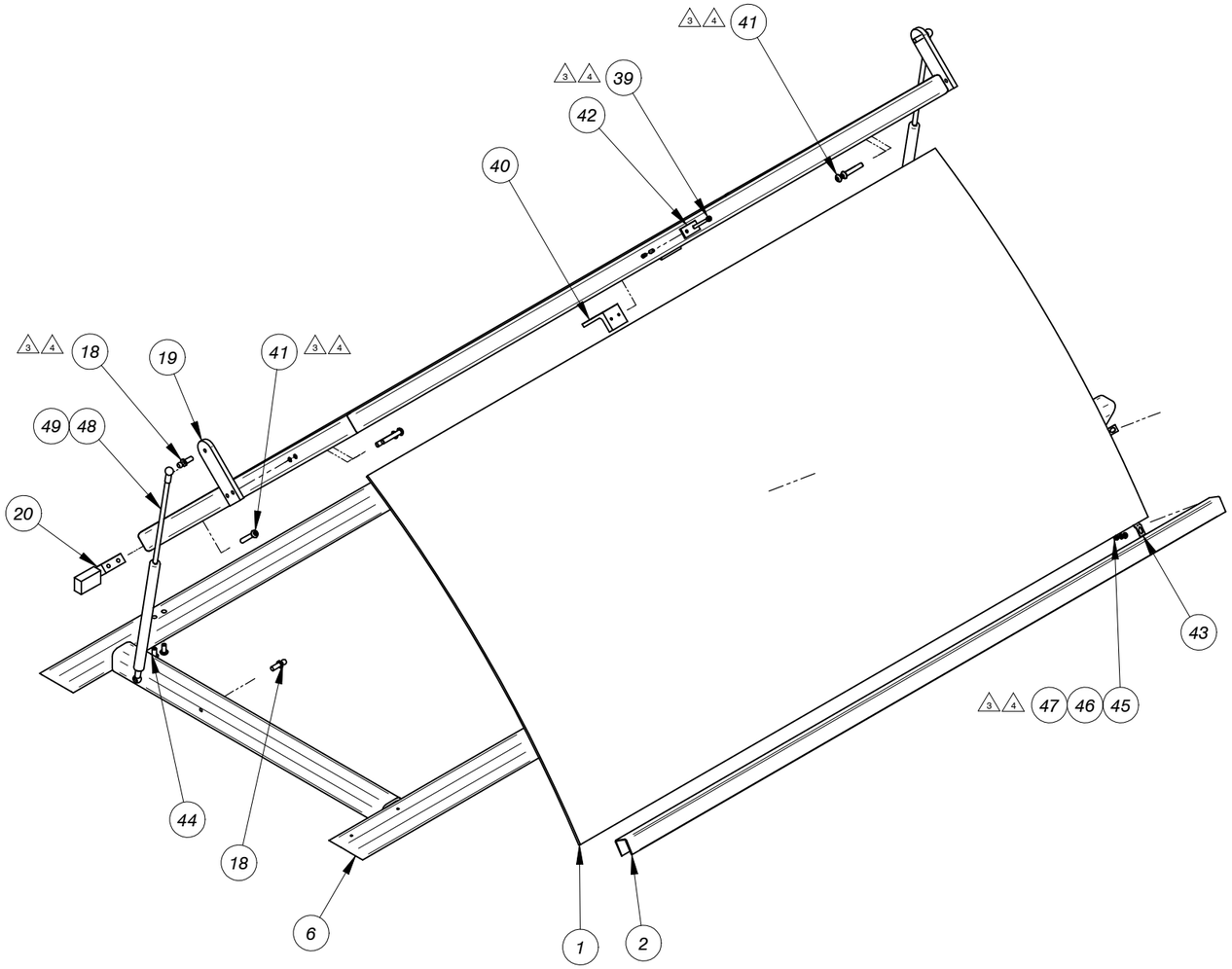
DECIMAL: 0. ± 1.0, 0.00 ± 0.1, 0.0 ± 0.4, ANGLES ± 30' | PROJECTION

DESIGNED: J. OLIS | NOUN CODE: 175
DRAWN: WDK
CHECKED: RK 4/25/08
APPROVAL: GHS 4/25/08
APPROVAL: DJM 4/24/08
APPROVAL:
RELEASE: KAT 4/28/08
523.4 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: ENCLOSURE ASSY,BASIC AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 4
A1	0	1:10	154923	



VIEW SHOWN WITHOUT STEEL SKIN COVER
FOR CLARITY

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME: 154923.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0, 0.0 ± 0.1, 0.0 ± 0.4, ANGLES ± 30'
PROJECTION

DESIGNED: J. OLIS
NOUN CODE: 175
DRAWN: WDK
CHECKED: RK 4/25/08
APPROVAL: GHS 4/25/08
APPROVAL: DJM 4/24/08
APPROVAL:
RELEASE: KAT 4/28/08
523.4 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ENCLOSURE ASSY,BASIC
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 4
A1	0	1:10	154923	

Table A.15 154923-1 - ENCLOSURE ASSY, BASIC

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154392-1	WINDOW,HINGING,COVER	1
2	154387-1	COVER,HINGING	1
3	154370-1	COVER,LEFT,UPPER,ENCLOSURE	1
4	154379-1	DOOR,PC,ENCLOSURE	1
5	154385-1	COVER,WIRE,ENCLOSURE	2
6	154399-1	FRAME,BASE,ENCLOSURE	1
7	140337-6	SCREW,SHC,M8X30,SST	16
8	154384-1	BAR,THREADED,TIEDOWN	4
9	140337-1	SCREW,SHC,M8X10,SST	16
10	132527-5	WASHER,FLAT,M8,SST	16
11	154280-1	CASTER,FOOT,LEVELING	4
12	154378-1	DOOR,FRONT,LEFT,ENCLOSURE	1
13	154282-1	FOOT,LEVELING,12mmX100mm	4
14	154364-1	COVER,REAR,LOWER,ENCLOSURE	1
15	154380-1	DOOR,FRONT,RIGHT,ENCLOSURE	1
16	154381-1	BRACKET,DOWN,TIE,FLOOR	4
17	154372-1	COVER,RIGHT,UPPER,ENCLOSURE	1
18	154279-1	STUD,BALL,10mmBALL,SST	4
19	154390-1	SHOCK,EXTENSION,COVER	2
20	154271-1	HINGE,LIFT-OFF,303SST	2
21	132525-1	SCREW,BHSC,M5X12,SST	14
22	145277-3	WASHER,FLAT,M5X15,OD,ZP	14
23	154371-1	COVER,REAR,UPPER,ENCLOSURE	1
24	154277-1	SCREW,SHOULDER,M5,10mmSHOULDE	8
25	154262-1	LATCH,COMPRESSION,HEX,STEEL	17
26	154263-1	PLATE,TRIM,COMPRESS_LATCH	17
27	154366-1	COVER,MIDDLE,PANEL,ENCLOSURE	1
28	154376-1	DOOR,RIGHT,BOTTOM,SIDE	1
29	140349-7	SCREW,BHSC,M3X20,SST	8
30	472361-3	NUT,LOCK,M3	8
31	708044-1	FAN,24VDC,94.2CFM,3.5W,116MM	2
32	154375-1	DOOR,LEFT,BOTTOM,SIDE	1
33	154377-1	PLATE,HINGE,MOUNT,DOOR	4

Table A.15 154923-1 - ENCLOSURE ASSY, BASIC

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
34	154270-1	HINGE,ENCLOSURE,304SST	6
35	140329-3	SCREW,FHSC,M5X12,SST	8
36	140350-2	SCREW,FHSC,M3X8,SST	8
37	140352-4	SCREW,BHSC,M4X6,SST	12
38	132525-8	SCREW,BHSC,M5X8,SST	6
39	140330-12	SCREW,SHC,M5X50,SST	2
40	154388-1	BRACKET,LATCH	1
41	140335-9	SCREW,BHSC,M8X45,SST	8
42	154391-1	PLATE,WASHER,COVER	1
43	154386-1	BRACKET,WINDOW,ENCLOSURE	20
44	140335-3	SCREW,BHSC,M8X16,SST	4
45	149590-1	NUT,LOCK,M5,NYLONINSERT,ZP	17
46	132609-3	WASHER,CONICALSPRING,M5,SST	17
47	132527-2	WASHER,FLAT,M5,SST	17
48	154272-2	SPRING,SHOCK,GAS,100POUND	2
49	154278-1	SOCKET,BALL,10mm,M6,FEMALETHD	4

NOTES:

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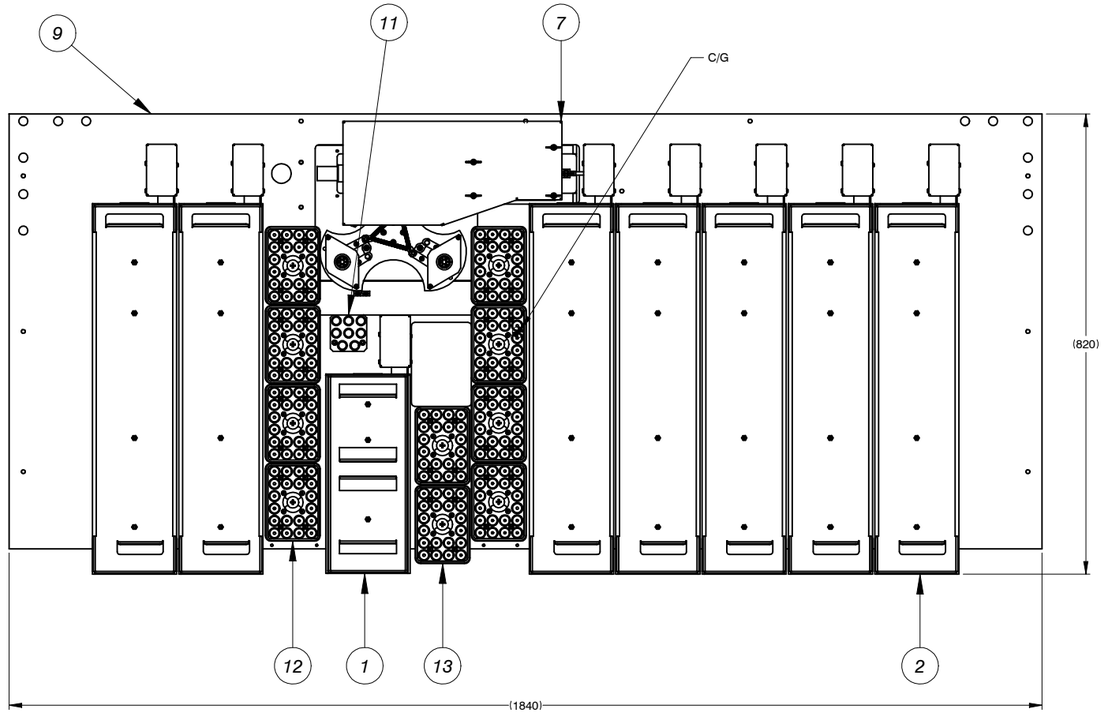
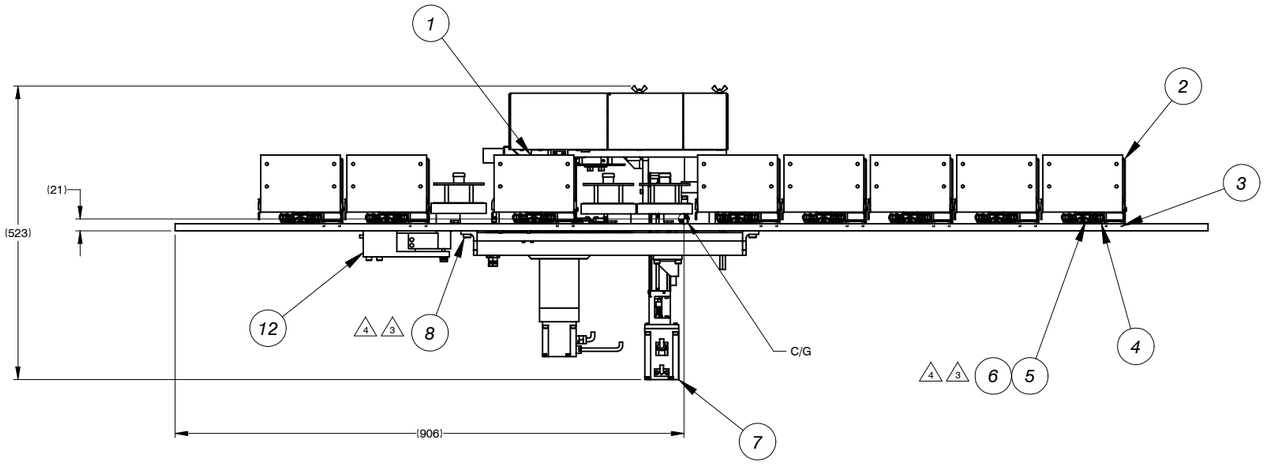
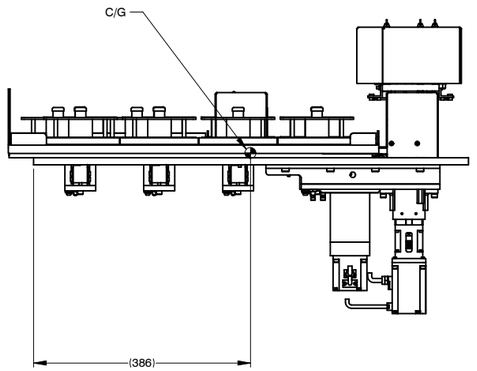
4. APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.
6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154964-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.







SEE SEPARATE BOM

REVISION STATUS OF SHEETS					
SHT.	1	2	3	4	-
REV.	0	0	0	0	-

CHANGE RECORD			
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FILE NAME 154964.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
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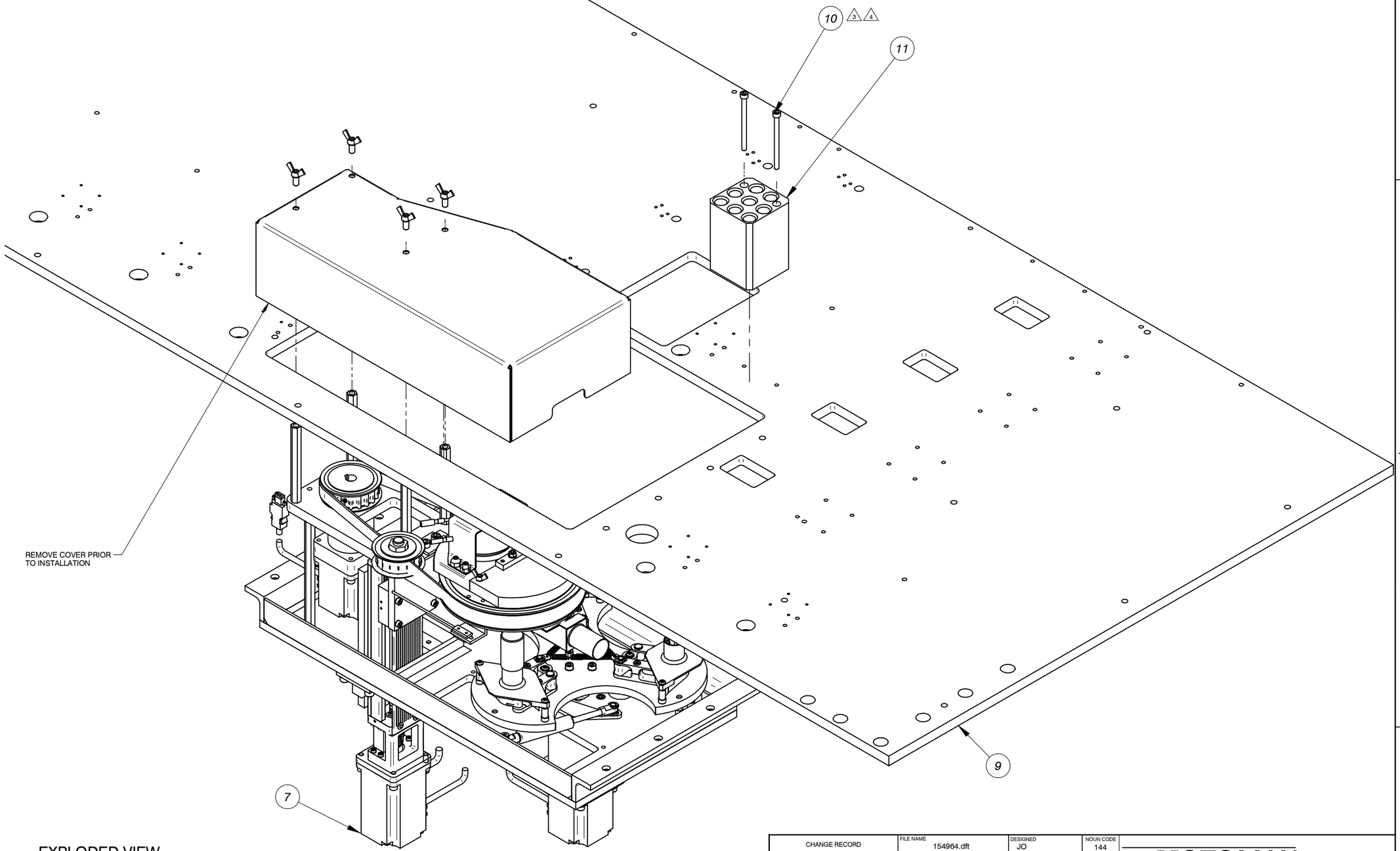
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED JO
NOUN CODE 144
DRAWN WDK
CHECKED JL 5/21/08
APPROVAL GHS 5/21/08
APPROVAL
APPROVAL
RELEASE KAT 5/22/08
144.7 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PLATFORM ASSY,SORT,DECAP,CENT AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 4
A1	0	1:1	154964	



EXPLODED VIEW
1:2

DECAPPER INSTALL
REFERENCE ONLY

CHANGE RECORD			
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FILE NAME: 154964.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
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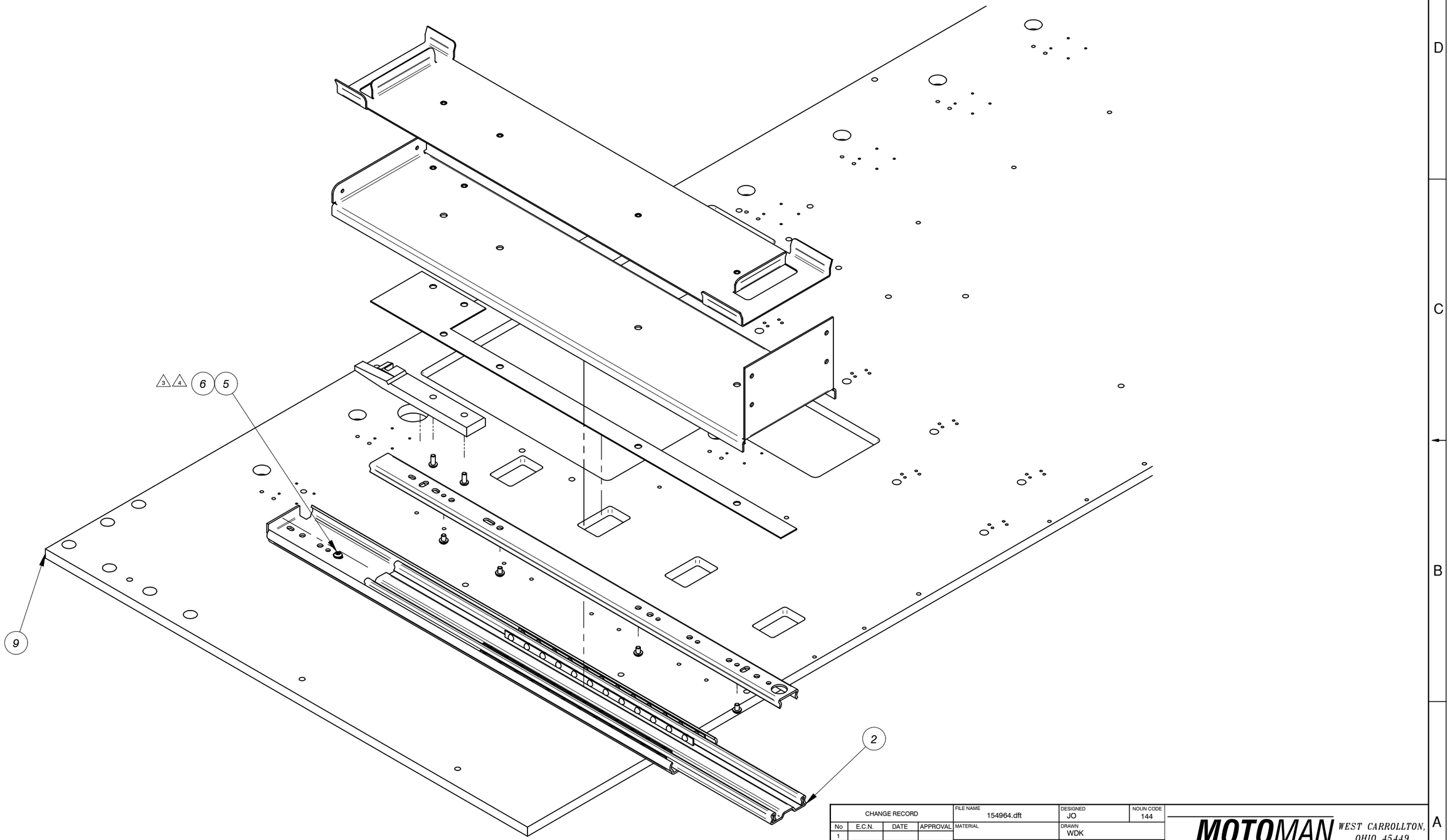
DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION

DESIGNED: JO
NOUN CODE: 144
DRAWN: WDK
CHECKED: JL 5/21/08
APPROVAL: GHS 5/21/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/22/08
144.7 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: PLATFORM ASSY,SORT,DECAP,CENT
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 4
A1	0	1:1	154964	



EXPLODED VIEW
1:2
DRAWER INSTALL
REFERENCE ONLY

CHANGE RECORD			
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FILE NAME: 154964.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
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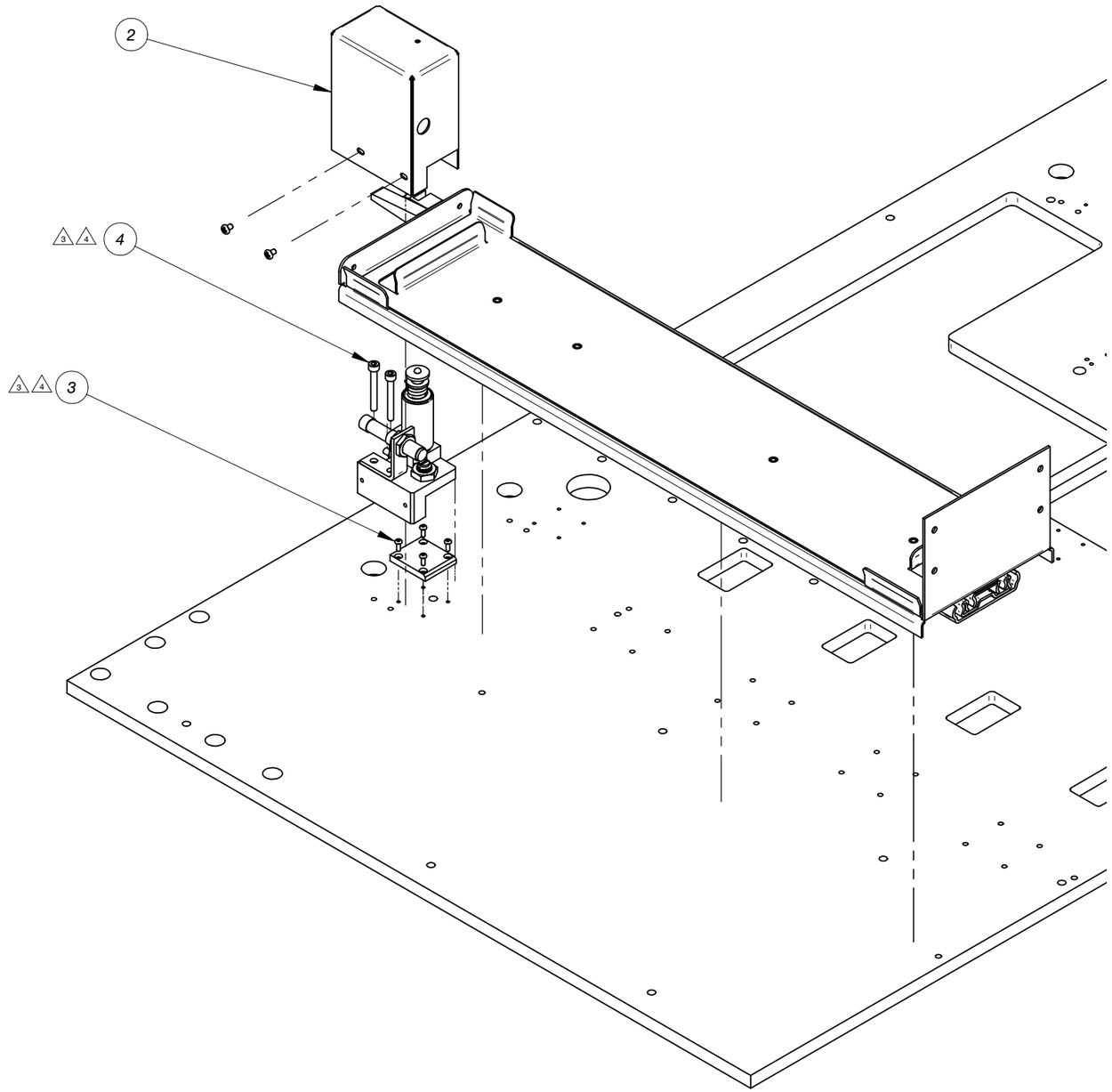
DECIMAL: 0. = 1.0 0.00 = 0.1 0.0 = 0.4 ANGLES = 30'
PROJECTION:

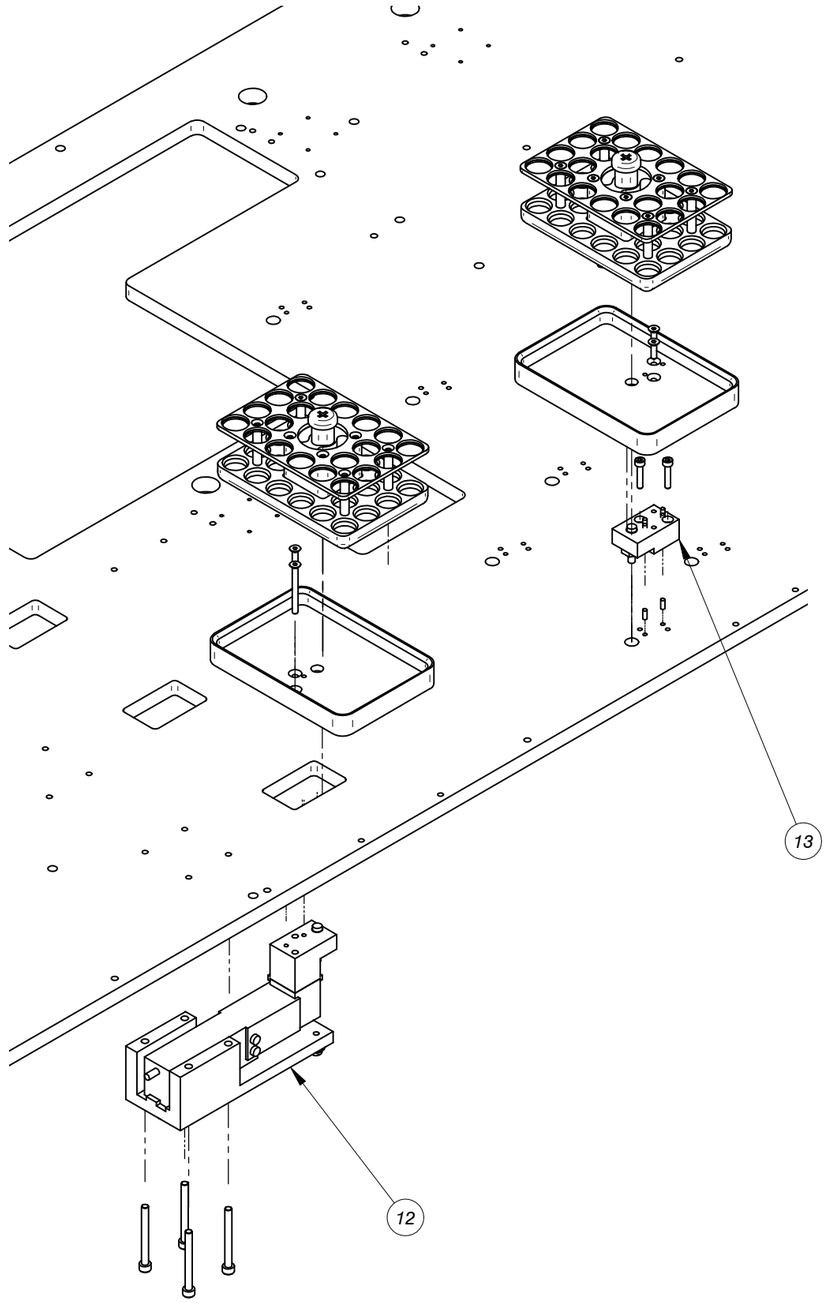
DESIGNED: JO
NOUN CODE: 144
DRAWN: WDK
CHECKED: JL 5/21/08
APPROVAL: GHS 5/21/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/22/08
144.7 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: PLATFORM ASSY,SORT,DECAP,CENT AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 4
A1	0	1:1	154964	





EXPLODED VIEW
1:2

DRAWER LOCK INSTALL
REFERENCE ONLY

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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12			

FILE NAME 154964.dft

MATERIAL

FINISH

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL
0. ± 1.0 0.00 ± 0.1
0.0 ± 0.4
ANGLES ± 30'

PROJECTION

DESIGNED JO
NOUN CODE 144
DRAWN WDK
CHECKED JL 5/21/08
APPROVAL GHS 5/21/08
APPROVAL
APPROVAL
RELEASE KAT 5/22/08
144.7 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PLATFORM ASSY,SORT,DECAP,CENT
AUTO SORTER III

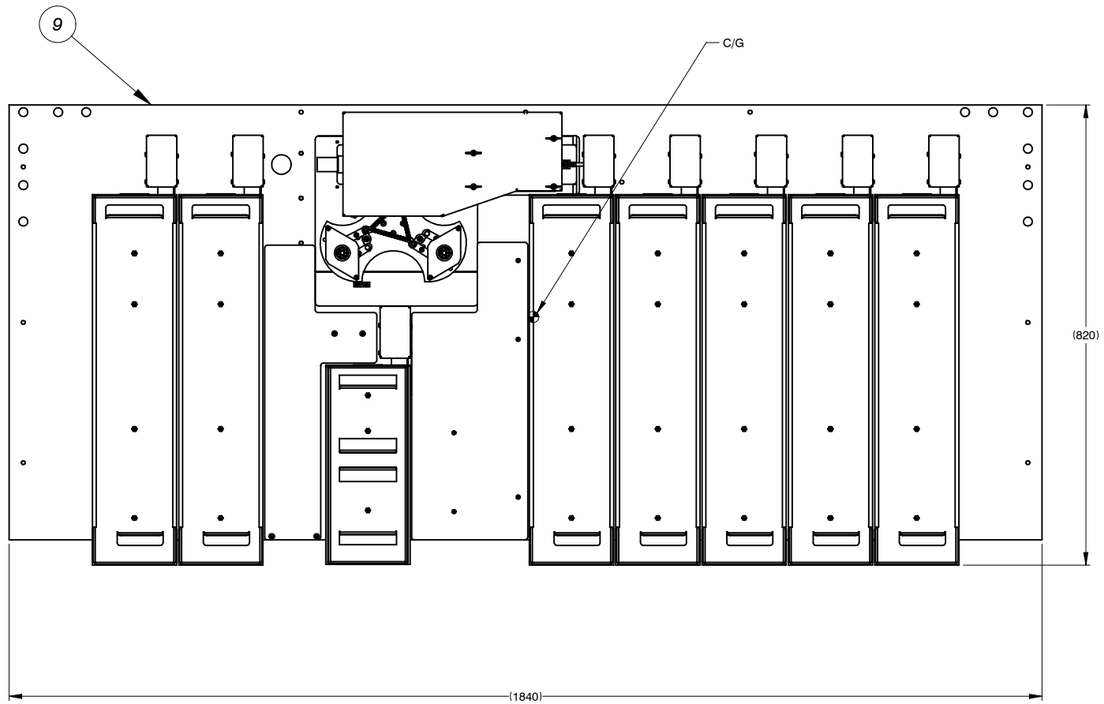
DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 4
A1	0	1:1	154964	

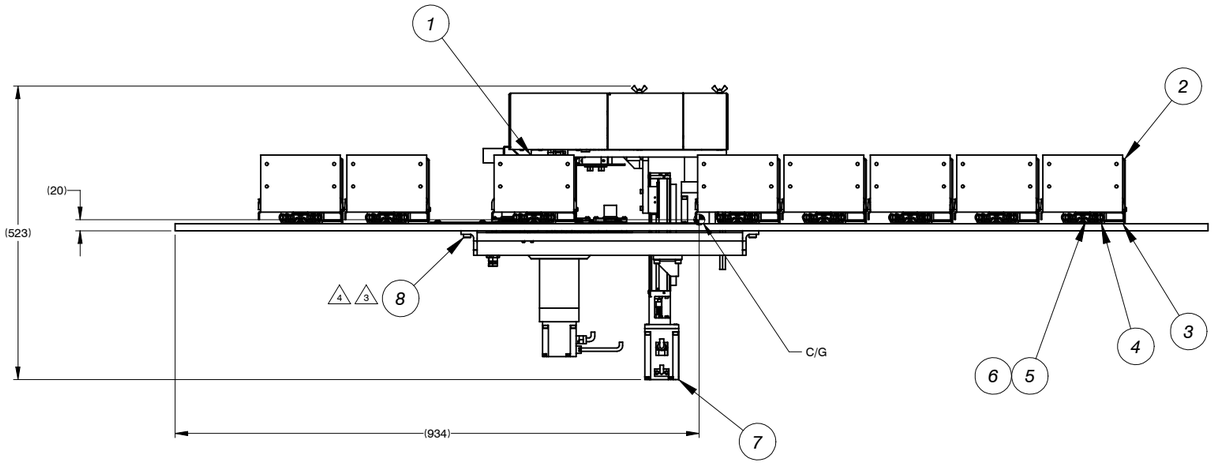
Table A.16 154964-1 - PLATFORM ASSY, SORT, DECAP, CENT

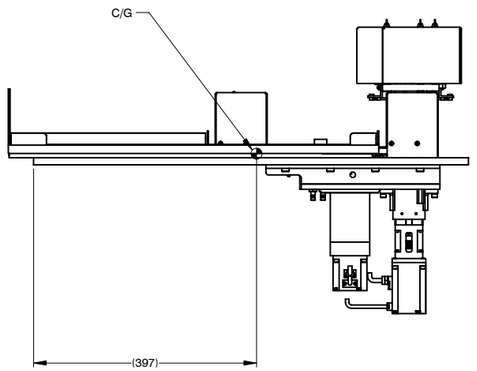
FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154975-1	DRAWERKIT,WITHLOCK,150WX355L	1
2	154975-2	DRAWERKIT,WITHLOCK,150WX660L	7
3	132525-4	SCREW,BHSC,M3X8,SST	32
4	140330-10	SCREW,SHC,M5X40,SST	16
5	132525-8	SCREW,BHSC,M5X8,SST	16
6	132527-2	WASHER,FLAT,M5,SST	16
7	154110-1	STATION,DECAPPING	1
8	140337-3	SCREW,SHC,M8X16,SST	8
9	154160-1	PLATE,DECK,SORT	1
10	140330-14	SCREW,SHC,M5X70,SST	2
11	154164-1	FIXTURE,WEIGHTHOLDER	1
12	154979-1	LOCATORKIT,CENTRIFUGEW/SCALE	4
13	154978-1	LOCATORKIT,CENTRIFUGEINSERT	6

NOTES:

1. ALL DIMENSIONS ARE REFERENCE ONLY.
2. BECAUSE MOTOMAN INC IS CONSTANTLY IMPROVING PRODUCTS, MOTOMAN RESERVES THE RIGHT TO CHANGE DESIGN AND/OR SPECIFICATIONS WITHOUT NOTICE.
3. TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED
4. APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.
6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154200-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.







SEE SEPARATE BOM

REVISION STATUS OF SHEETS						
SHT.	1	2	3	4	-
REV.	0	0	0	0	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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12			

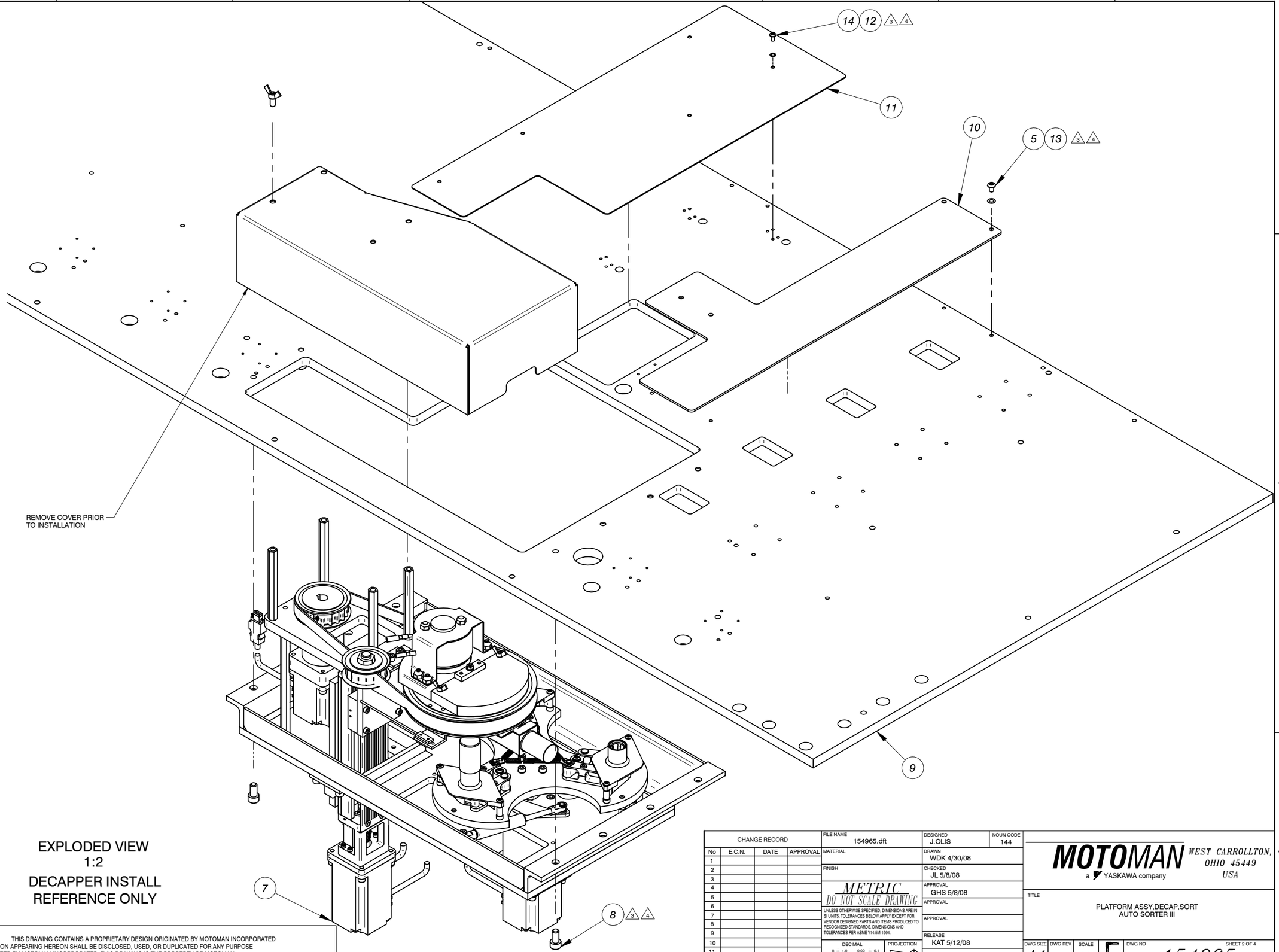
FILE NAME 154965.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL 0. ± 1.0 0.00 ± 0.1 0.0 ± 0.4 ANGLES ± 30'
PROJECTION

DESIGNED J.OLIS
NOUN CODE 144
DRAWN WDK 4/30/08
CHECKED JL 5/8/08
APPROVAL GHS 5/8/08
APPROVAL
APPROVAL
RELEASE KAT 5/12/08
134.0 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PLATFORM ASSY,DECAP,SORT
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 4
A1	0	1:1	154965	



EXPLODED VIEW
1:2

DECAPPER INSTALL
REFERENCE ONLY

CHANGE RECORD			
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FILE NAME: 154965.dft
MATERIAL:
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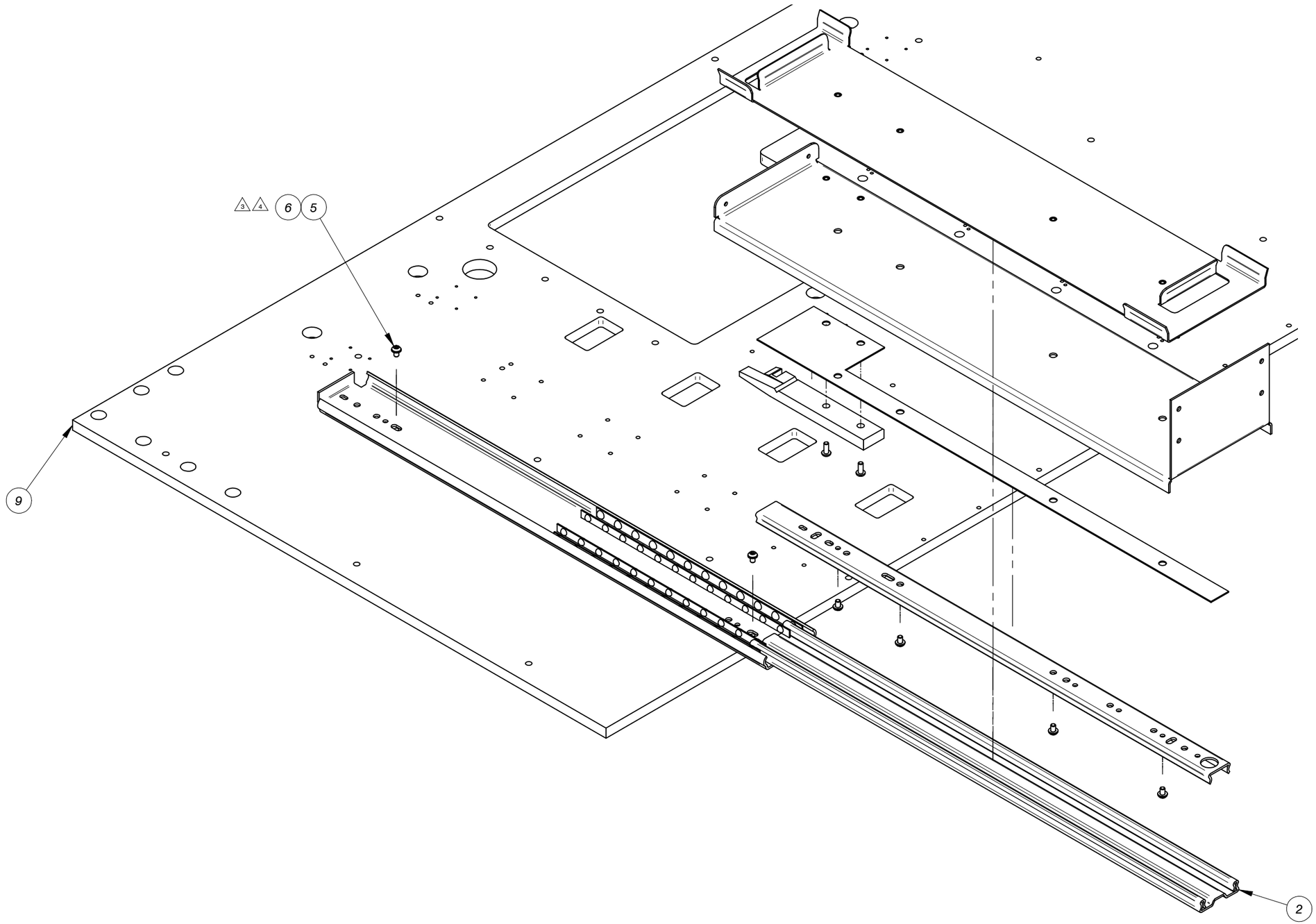
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0, 0.0 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION

DESIGNED: J.OLIS
NOUN CODE: 144
DRAWN: WDK 4/30/08
CHECKED: JL 5/8/08
APPROVAL: GHS 5/8/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/12/08
134.0 kg

MOTOMAN
a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
PLATFORM ASSY,DECAP,SORT
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 4
A1	0	1:1	154965	



EXPLODED VIEW
1:2
DRAWER INSTALL
REFERENCE ONLY

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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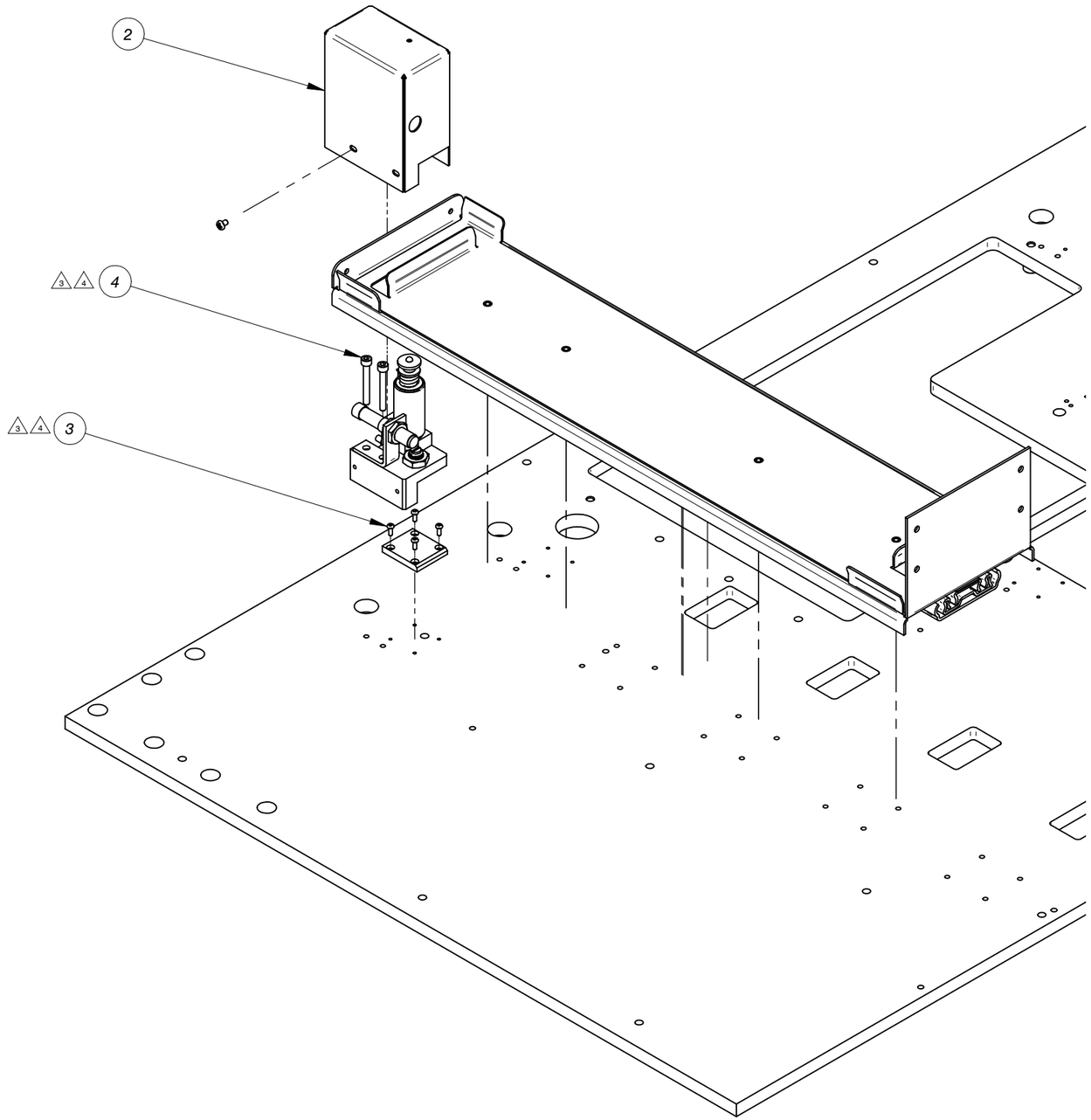
FILE NAME: 154965.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'
PROJECTION

DESIGNED: J.OLIS
NOUN CODE: 144
DRAWN: WDK 4/30/08
CHECKED: JL 5/8/08
APPROVAL: GHS 5/8/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/12/08
134.0 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: PLATFORM ASSY,DECAP,SORT AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 3 OF 4
A1	0	1:1	154965	



EXPLODED VIEW
1:2

DRAWER LOCK INSTALL
REFERENCE ONLY

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME: 154965.dft

MATERIAL:

FINISH:

METRIC
DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

DECIMAL: 0. = 1.0, 0.00 = 0.1, 0.0 = 0.4, ANGLES = 30'

PROJECTION:

DESIGNED	NOUN CODE
J.OLIS	144

DRAWN: WDK 4/30/08

CHECKED: JL 5/8/08

APPROVAL: GHS 5/8/08

APPROVAL:

APPROVAL:

RELEASE: KAT 5/12/08

134.0 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: PLATFORM ASSY,DECAP,SORT AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 4 OF 4
A1	0	1:1	154965	

Table A.17 154965-1 - PLATFORM ASSY, DECAP, SORT

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	154975-1	DRAWER KIT,WITHLOCK,150WX355L	1
2	154975-2	DRAWER KIT,WITHLOCK,150WX660L	7
3	132525-4	SCREW,BHSC,M3X8,SST	32
4	140330-10	SCREW,SHC,M5X40,SST	16
5	132525-8	SCREW,BHSC,M5X8,SST	20
6	132527-2	WASHER,FLAT,M5,SST	16
7	154110-1	STATION,DECAPPING	1
8	140337-3	SCREW,SHC,M8X16,SST	8
9	154160-1	PLATE,DECK,SORT	1
10	155052-1	COVER,SORTDECK,LEFT	1
11	155053-1	COVER,SORTDECK,RIGHT	1
12	132609-2	WASHER,CONICALSPRING,M4,SST	5
13	132609-3	WASHER,CONICALSPRING,M5,SST	4
15	140352-1	SCREW,BHSC,M4X8,SST	5

NOTES:

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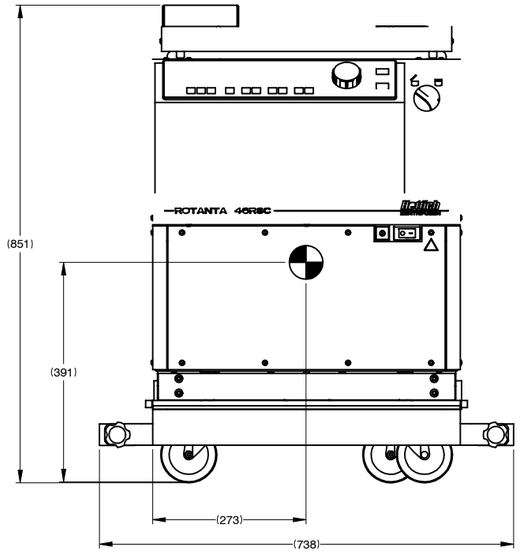
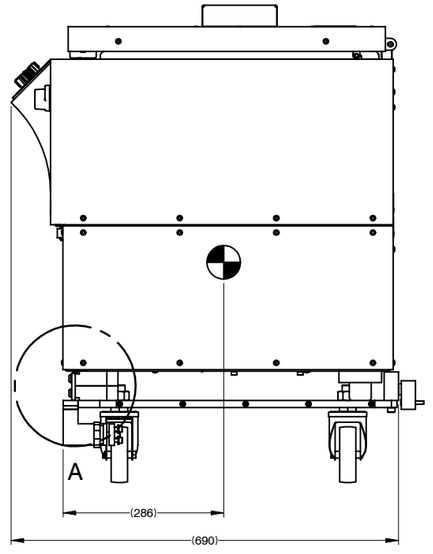
△3 TORQUE VALUES ARE TO BE PER MOTOMAN DRAFTING STANDARD SSGW-020, APPENDIX B, UNLESS OTHERWISE SPECIFIED.

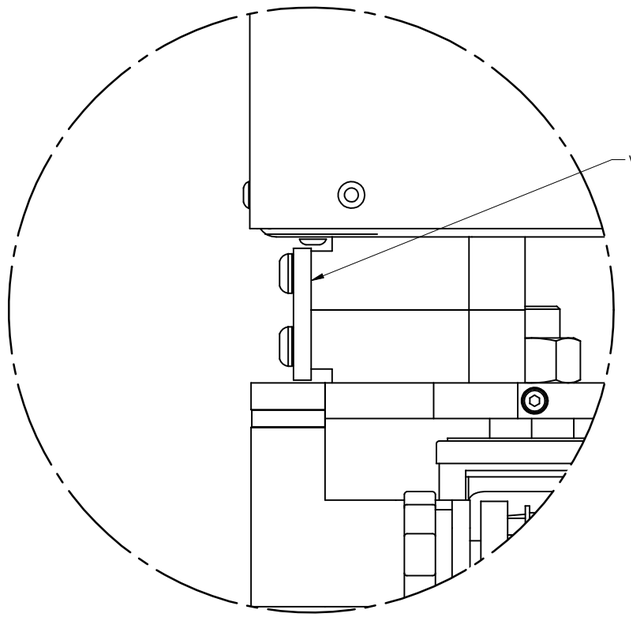
△4 APPLY 133419-1 ADHESIVE (LOCTITE 242) TO DESIGNATED FASTENERS AND MATING SURFACES.

△5 ITEM #23 MOUNTS TO ENCLOSURE FRAME.

6. PERMANENT MARK WITH MOTOMAN PART NUMBER 154977-1 AND DRAWING REVISION PER MOTOMAN DESIGN STANDARD SSGW-077 PARA 2.3.







DETAIL A
1:1

SEE SEPARATE BOM

REVISION STATUS OF SHEETS						
SHT.	1	2	-	-	-
REV.	0	0	-	-	-

CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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FILE NAME 154977.dft
MATERIAL
FINISH
METRIC
DO NOT SCALE DRAWING
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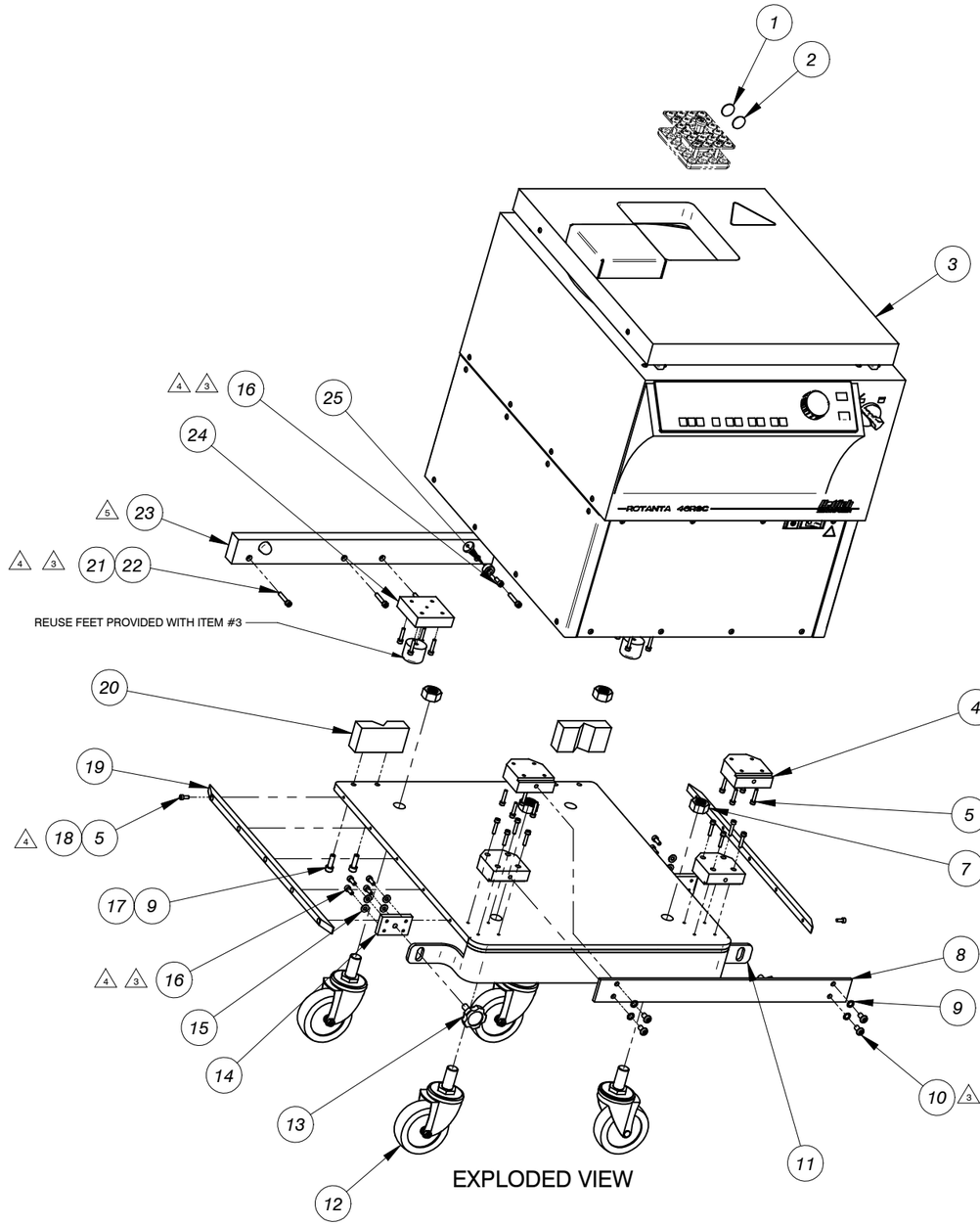
DECIMAL 0.□ = 1.0 0.0□ = 0.1 0.0□ = 0.4 ANGLES = 30'
PROJECTION

DESIGNED JO
NOUN CODE 002
DRAWN JDR 5/14/08
CHECKED JL 5/16/08
APPROVAL GHS 5/15/08
APPROVAL
APPROVAL
RELEASE KAT 5/19/08
183.6 kg

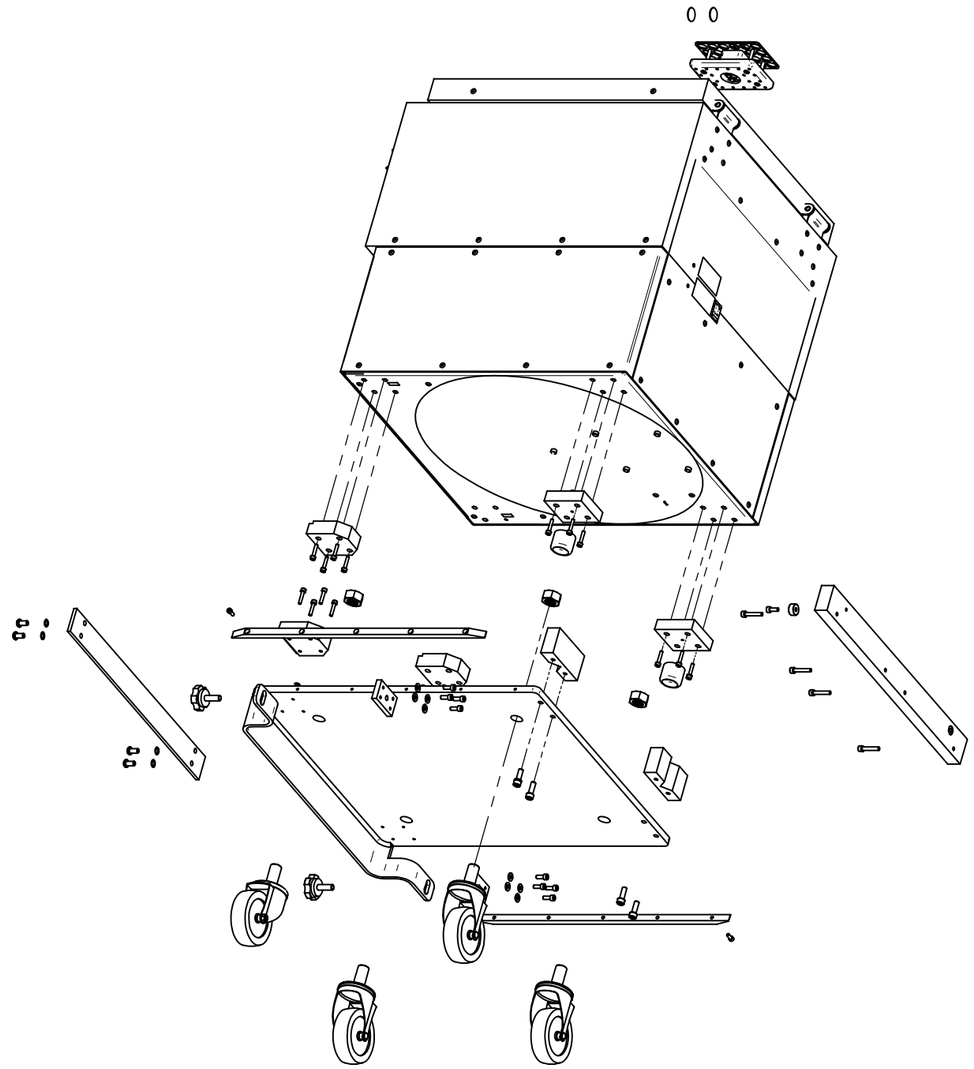
MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE
ACCESSORY KIT,CENTRIFUGE
AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 1 OF 2
A1	0	1:5	154977	



EXPLODED VIEW



REVERSE EXPLODED VIEW

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CHANGE RECORD			
No	E.C.N.	DATE	APPROVAL
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12			

FILE NAME: 154977.dft
MATERIAL:
FINISH:
METRIC
DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN SI UNITS. TOLERANCES BELOW APPLY EXCEPT FOR VENDOR DESIGNED PARTS AND ITEMS PRODUCED TO RECOGNIZED STANDARDS. DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
DECIMAL: 0. ± 1.0, 0.0 ± 0.1, 0.0 ± 0.4, ANGLES ± 30'
PROJECTION

DESIGNED: JO
NOUN CODE: 002
DRAWN: JDR 5/14/08
CHECKED: JL 5/16/08
APPROVAL: GHS 5/15/08
APPROVAL:
APPROVAL:
RELEASE: KAT 5/19/08
183.6 kg

MOTOMAN a YASKAWA company
WEST CARROLLTON, OHIO 45449 USA

TITLE: ACCESSORY KIT,CENTRIFUGE AUTO SORTER III

DWG SIZE	DWG REV	SCALE	DWG NO	SHEET 2 OF 2
A1	0	1:5	154977	

Table A.18 154977-1 - ACCESSORY KIT, CENTRIFUGE

FIGURE & ITEM NUMBER	MOTOMAN PART NUMBER	DESCRIPTION	QTY
1	153828-1	ADAPTERPLATE,BUCKETROTOR	1
2	153829-1	CARRIER,BUCKET	4
3	153827-1	ACCESSORY,CENTRIFUGE,TESTTUBE	1
4	154353-1	LOCATOR,FRONTMOUNT	4
5	132609-3	WASHER,CONICALSPRING,M5,SST	24
6	140330-7	SCREW,SHC,M5X25,SST	24
7	155062-1	NUT,HEX,M20x2.5,SST	4
8	154354-1	PLATE,FRONTLOCATOR	1
9	132609-5	WASHER,CONICALSPRING,M8,SST	8
10	140335-3	SCREW,BHSC,M8X16,SST	4
11	154352-1	PLATE,BASE,CENTRIFUGE	1
12	154281-1	CASTER,100mmWHEEL,SCREWIN	4
13	154283-2	KNOB,FIVELOBED,10mmTHREAD	2
14	154363-1	ADJUSTER,MOUNT,CENTRIFUGE	2
15	132527-1	WASHER,FLAT,M6,SST	8
16	140333-6	SCREW,SHC,M6X20,SST	9
17	140337-5	SCREW,SHC,M8X25,SST,CLASS12.9	4
18	140330-3	SCREW,SHC,M5X12,SST	10
19	154358-1	GUIDE,CENTRIFUGECART	2
20	154355-1	LOCATOR,REAR	2
21	132609-4	WASHER,CONICALSPRING,M6,SST	4
22	140333-8	SCREW,SHC,M6X30,SST,CLASS12.9	4
23	154356-1	PLATE,REAR,BALLPIN	1
24	154357-1	SPACER,REAR,LEGS	2
25	155040-1	BUTTON,STOP,CARRIER,CENTRIFUGE	1

Index

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