Building connections that last™

ASC Engineered Solutions

Shop-Gruv™ Automated Roll Groover

Installation, Operation, and Maintenance Manual

NAP
An ASC Engineered Solution

Description

The **NAP Shop-Gruv** is an automated shop grooving machine designed to groove 1"to 24" pipe with wall thicknesses up to ⅜" by grooving on the bottom of the pipe. Shop-Gruv utilizes a servo-controlled electric actuator to perform the grooving process which equates to greater positional accuracy and repeatability than a standard hydraulic system. The actuator can be adjusted 0.001" increments for fine tuning.

Shop-Gruv holds three different roller sets (tools) at once, which gives the operator the ability to groove a larger range of pipe sizes without having to change out a tool. The pre-loaded tools can be replaced by tools with different pipe ranges if needed.

A touchscreen is used to select between tool sizes, perform the grooving process, and adjust the groove depth as well as other grooving parameters.

With the standard setup, the operator selects the desired pipe size to be grooved, and the pipe is grooved using a list of preset parameters that is specific to the selected pipe size. Shop-Gruv can also perform auto-measuring of the pipe size which will enable the machine to detect the pipe size and schedule of the pipe to be grooved.

Caution

Read and understand all safety precautions contained in this manual before operating the machine. Failure to do so may result in personal injury.

Note: ASC Engineered Solutions continuously endeavors to improve our products; your equipment may not completely match the contents of this manual. This manual is accurate at the time of publication. ASC Engineered Solutions will not accept liability for any inaccuracies or omissions.

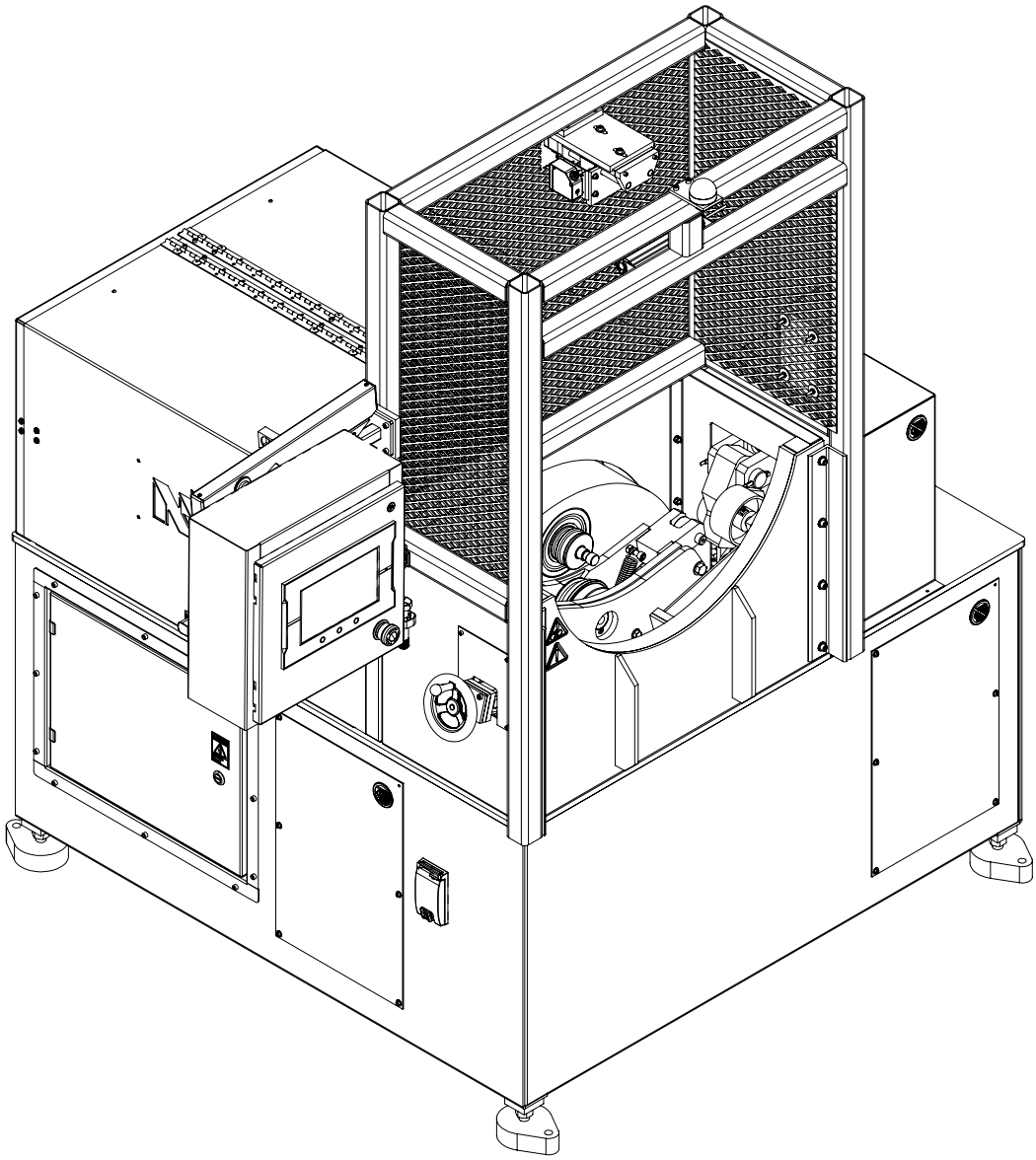


Table of Contents

CAUTION – GENERAL

NOT OPERATE MACHINE UNTIL INSTRUCTION MANUAL HAS BEEN READ.
USE FORKLIFT OR MANUAL LIFT TO MOVE MACHINE SECTIONS INTO PLACE DURING ASSEMBLY.
THERE IS A RISK OF PERSONAL INJURY IF ATTEMPTED TO LIFT OR MOVE BY HAND.
BE SURE MACHINE IS CONNECTED TO BUILDING SAFETY GROUND.
BE SURE TO DISCONNECT THE POWER BEFORE PERFORMING MACHINE MAINTENANCE.
DO NOT OPERATE MACHINE WITH GUARDS REMOVED.
DO NOT OPERATE MACHINE IN A MANNER FOR WHICH IT WAS NOT INTENDED.

CAUTION – ELECTRIAL

HIGH VOLTAGES PRESENT INSIDE THE CONTROL CABINET, WELDER POWER UNIT AND PLASMA POWER UNIT.
TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT ATTEMPT TO OPEN THESE ENCLOSURES.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY..

CAUTION – MOVING PARTS

MOVING PARTS CONTAINED BEHIND GUARDS.
DO NOT TOUCH MOVING PARTS.
SEVERE PINCHING AND/OR DISMEMBERMENT MAY OCCUR.

CAUTION – EAR PROTECTION

DO NOT OPERATE MACHINE WITHOUT PROPER HEARING PROTECTION.
THE MEASURED NOISE LEVEL EXCEEDS THE 80 dB(A) THRESHOLD AT THE WELD HEAD.

CAUTION – GLOVES

GLOVES MUST BE WORN AT ALL TIMES WHILE OPERATING THIS MACHINE.
FAILURE TO WEAR GLOVES COULD RESULT IN PERSONAL INJURY.

CAUTION – DO NOT REMOVE GUARDS

MOVING PARTS CONTAINED BEHIND GUARDS.
DO NOT OPERATE MACHINE WITH GUARDS REMOVED.

CAUTION – MANDATORY

THE MACHINE MUST BE LOCKED OUT BEFORE PROCEEDING.

1 Installation

1.1 Shop-Gruv Shipment Check List

- Shop-Gruv Machine
- Box #1
  - Roller Pin Removal Tool
  - Spare Tension Springs (3)

1.2 Shop-Gruv Shipment Check List

Power: 240 VAC 3-Phase, 33 Amp
Air: 100 psi (¼" NPT Female)

1.3 Installation Instructions

Upon receiving the machine, carefully uncrate and inspect for physical damage, caused during shipping. Remove the lag bolts that secure the machine to the pallet and move the machine with a forklift. The forks can go under the bottom frame members of the machine. Place the machine in the required location.

Please note that the machine should not be placed closer than 3ft (915mm) to any object that will interfere with the maintenance of the electrical panel. Anchoring of the machine to the floor is to be done in accordance with shop requirements.

Adjust the leveling feet to the required height and level the machine as follows. Loosen the ¾" hex nuts on the leveling stud and rotate the leveling stud to raise or lower the machine. Tighten the hex nuts when the machine is set. See Section 1.4 Installation Dimensions Section A-A for mounting hole locations.

Connect 100 psi shop air to the pneumatic connection, at the rear of the machine.

The following is to be done by qualified service personnel only. Connect 240 VAC 3 Phase power into the power control cabinet, located on the right side of the machine. The power cable should enter the disconnect box through the strain relief fitting on the back of the machine. Please note that any opening in the cabinet must not reduce the Ingress Protection rating of the box. Purchaser is to provide the power cord to connect from their power source to the machine.

1.4 Installation Instructions

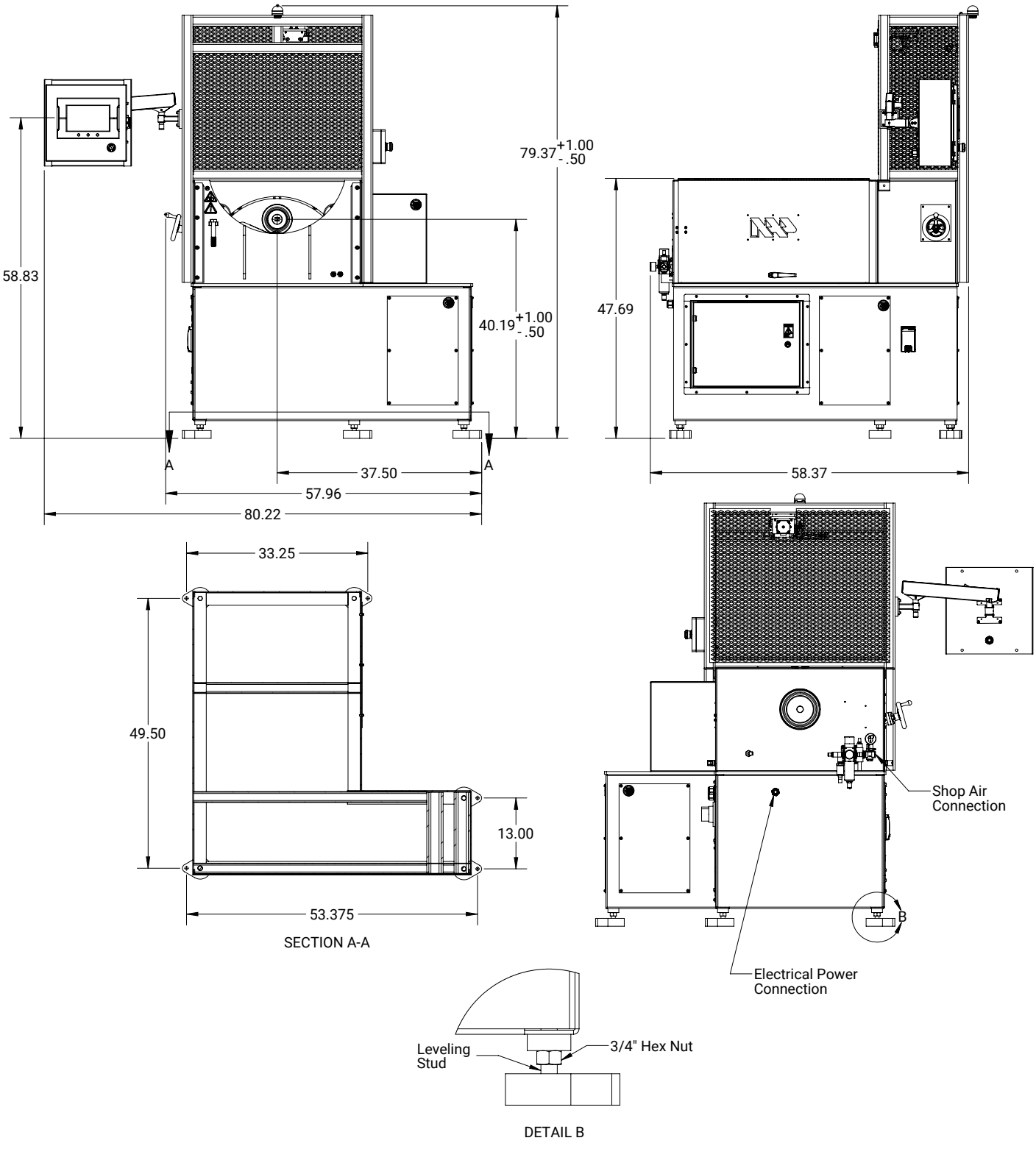
Anchor with (5) ⅜" bolts through holes in leveling feet. See Section A-A below for hole locations.

See diagram on page 6.

1 Installation

1.4 Installation Instructions

Anchor with (5) ⅜" bolts through holes in leveling feet. See Section A-A below for hole locations.



2 Safety

2.1 E-Stop Buttons

There are two E-Stop buttons located on the machine. These are red mushroom-shaped buttons with a yellow background. The first E-Stop button is located on the left side of the machine under the touchscreen. The second E-Stop button is located on the right side of the machine mounted on the safety tower. When either E-Stop button is pressed, all motion on the machine is stopped, the motor drives enter a safe state, and the air pressure is dumped from the machine. Before the machine can be reset, the E-Stop must be rotated counter-clockwise until the button is released.

2.2 Door Switches

There are two RFID door switches located on the inside of each rear door. When either door is opened, all motion on the machine is stopped, the motor drives enter a safe state, and the air pressure is dumped from the machine. Before the machine can be reset, both doors must be closed.

2.3 Indicator Light

A RYG light is located at the top of the safety tower and is used to indicate the state of the machine. The three states of the machine are as follows:

1. Green, slow blink – Machine is not in motion or in process of any kind.
2. Yellow, fast blink – Machine is in motion or in process.
3. Red, slow blink – Machine is in an error state.

2.4 Work Light

An LED work light is located at the top inside of the safety tower. The work light is operated by a toggle switch with three settings: High, Low, and Off. It is recommended that the work light be kept on the High setting for maximum visibility while operating the groover.

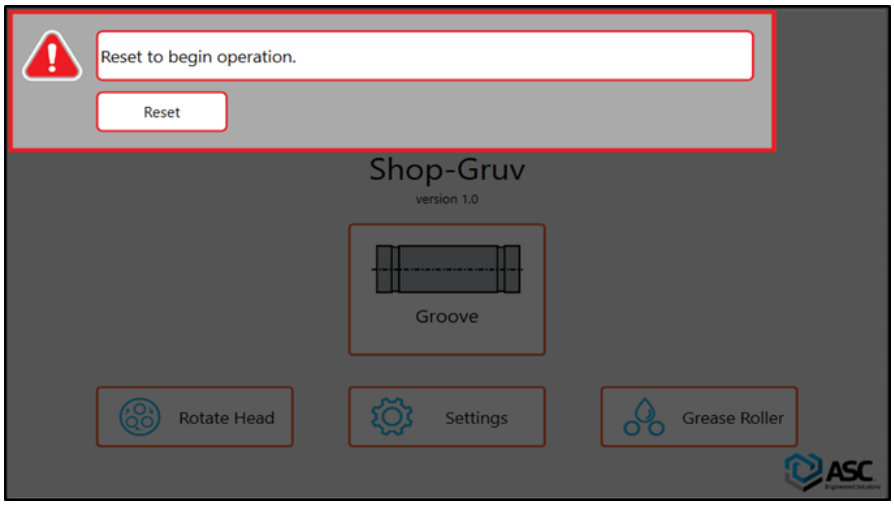
3 Operation

3.1 Start Procedure

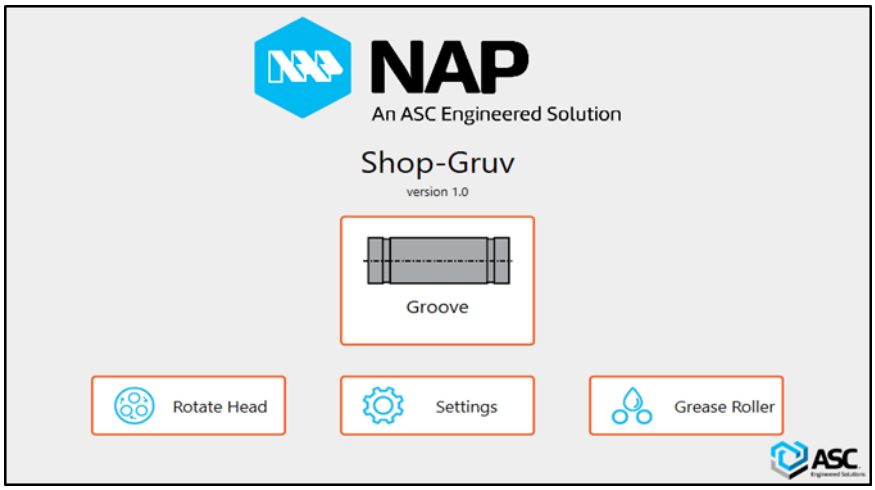
Turn the red air pressure relief valve 90° clockwise to enable the pneumatic supply to the machine. Turn the main power on with the Main Circuit Breaker on the right Power Control Cabinet and allow the system to boot up. The screen will show the Home screen indicating that the machine is ready.

There will be an error message displayed on the Home screen requesting the operator to “Reset to begin operation” and the indicator light will be blinking red. Press the Reset button to continue. The Ram will move to the home position. The indicator light will blink green when the machine is ready to groove.

3.1.1 Reset (Screen)



3.1.2 Home (Screen)▪



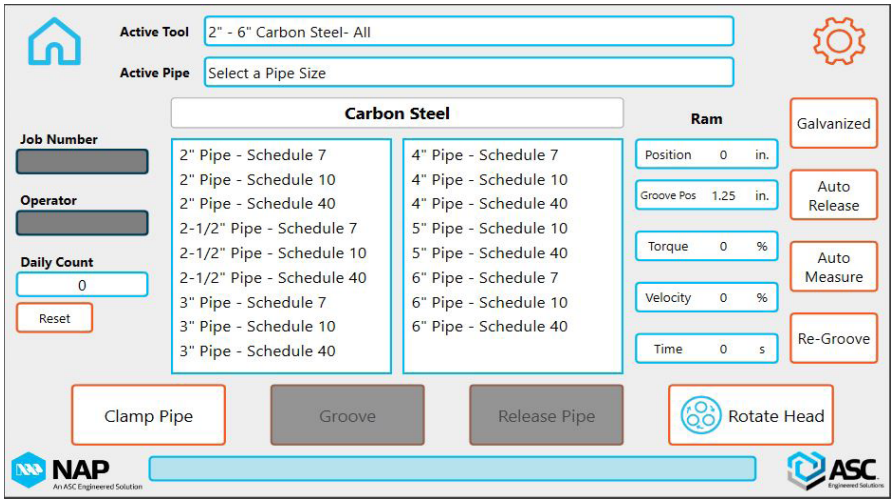
Buttons

- **Groove** Displays the Groove screen.
- **Rotate Head** Displays the Rotate Head popup screen.
- **Settings** Displays the Settings screen.
- **Grease Roller** Lowers the groove arm to allow access to the lower roller pin grease fitting.

3 Operation (continued)

3.2 Groove

3.2.1 Screen (Select Pipe)



Buttons

- **Clamp Pipe** Raises the lower groove roller and clamps the pipe. The pipe cannot be grooved until the pipe is clamped.
- **Groove** Initiates the Groove cycle. Once the pipe is clamped, the Groove button is enabled allowing the operator to groove the pipe.
- **Release Pipe** Releases the pipe when clamped. Once the pipe is clamped, the Release Pipe button is enabled allowing the operator to release the pipe and cancel the groove process. When the Groove cycle is in progress, the Release Pipe button is again disabled. Once the Groove cycle is complete, the Release Pipe button is enabled to allow the operator to release the pipe.
- **Rotate Head** Allows the operator to rotate to one of the other two tools in the machine.
- **Galvanized** Toggle button to change the pipe material from carbon steel pipe to galvanized pipe. The button turns orange when in the ON state. This is important when grooving galvanized pipe so that the appropriate pipe settings are used during the grooving process.
- **Auto Release** The Auto Release function bypasses the need to press the Release Pipe button when the groove is complete. The pipe will be released automatically.
- **Auto Measure** Displays the Auto Measure screen.
- **Re-Groove** Displays the Re-Groove popup screen. Allows the operator to adjust the groove depth.

3 Operation (continued)

3.2 Groove

3.2.2 Operation (Select Pipe)

1. Select the appropriate pipe size from the list of pipe sizes displayed on the touchscreen. The list displayed on the touchscreen will only show pipe sizes that are associated with the Active Tool (the Active Tool is the tool that is located in the grooving position.) The lower roller will move to a position specific to the selected pipe size to allow enough room for the pipe wall to fit between the upper and lower roller.

2. Raise the pipe so that the bottom inside surface of the pipe is roughly level with the bottom surface of the upper groove roller. Ensure that the guide wheels are wide enough so that the pipe can slide into the machine. Use the hand wheel on the left side of the machine if adjustment is needed.

3. Insert the pipe into the machine. The bottom of the pipe should be inserted between the upper and lower groove roller so that the end face of the pipe contacts the back flange on the upper roller. See Figure 3.2A for proper pipe placement. Do not slam the pipe into the machine or roller.

4. With pipe held against the flange of the upper roller, press the Clamp Pipe button on the touchscreen. The lower roller will move up and clamp the pipe. Once the pipe is clamped, the Groove button will light up indicating that the pipe is ready to groove. The pipe should be level after clamping.

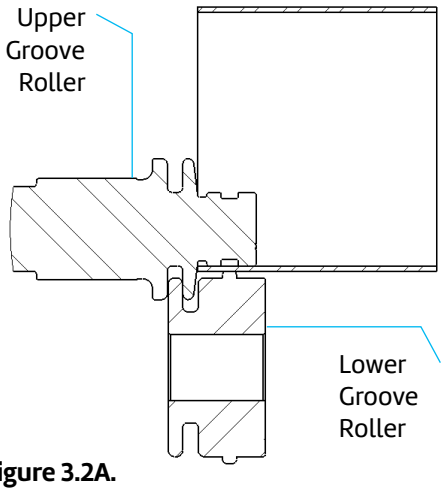


Figure 3.2A.
Correct location of pipe between groove rollers.

5. Before grooving, tighten the guide wheels against the pipe using the hand wheel on the left side of the machine. The guide wheels should be tight enough against the pipe so that there is no play in either wheel.

6. Remove both hands from the pipe and press the Groove button on the touchscreen. The machine will begin grooving the pipe. When complete, the pipe will stop rotating and the Release Pipe button will light up indicating that the pipe is ready to be released.

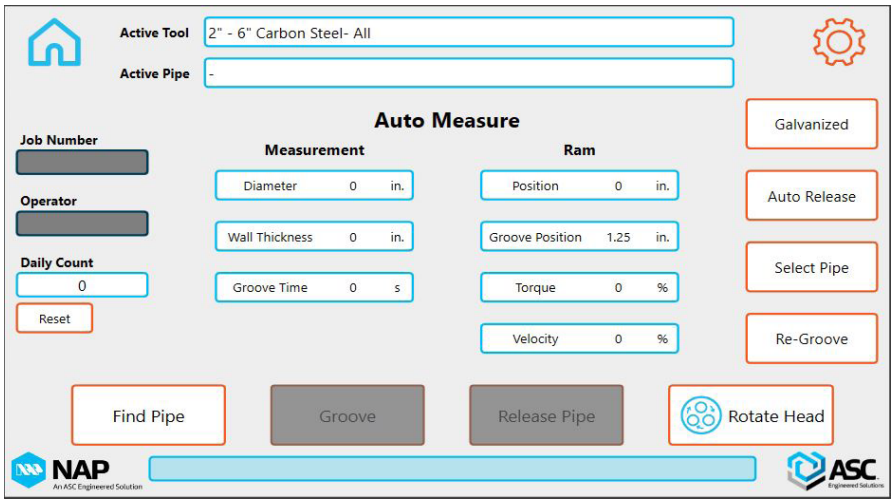
7. Press the Release Pipe button to unclamp the pipe. If the Auto Release function is turned on (solid orange) the machine will automatically release the pipe after the pipe stops rotating.

8. Loosen the guide wheels, remove the pipe from the machine, and check the groove. If the groove diameter is within spec, repeat steps 2-8 for pipes of the same size and schedule. If a new pipe size or schedule is to be grooved, repeat steps 1-8 for the new pipe size. If the groove diameter is out of spec, see Section 3.3 Regroove to adjust the groove depth and/or re-groove the pipe. If the pipe to be grooved does not fall within the acceptable pipe range of the Active Tool, see Section 3.4 Rotate Head to rotate to a different tool size or Section 3.6 Tool Change to change one of the resident tools to a different tool size

3 Operation (continued)

3.2 Groove

3.2.3 Screen (Auto)



Buttons (refer to the previous section for all other button and icon descriptions)

- **Find Pipe** Initiates the Find Pipe process. During this process, the machine clamps the pipe and calculates the pipe size..

**Refer to the previous section for all other button and icon descriptions.*

3.2.4 Operation (Auto Measure)

1. Raise the pipe so that the bottom inside surface of the pipe is roughly level with the bottom surface of the upper groove roller. Ensure that the guide wheels are wide enough so that the pipe can slide into the machine. Use the hand wheel on the left side of the machine if adjustment is needed.

2. Insert the pipe into the machine. The bottom of the pipe should be inserted between the upper and lower groove roller so that the end face of the pipe contacts the back flange on the upper roller. See Figure 3A in Section 3.2.2 for proper pipe placement. Do not slam the pipe into the machine or roller.

3. With pipe held against the flange of the upper roller, press the Find Pipe button on the touchscreen. The lower roller will move up and clamp the pipe. Once the pipe is clamped, the machine will calculate the nominal diameter and schedule of the pipe. The material of the pipe is determined by the material designation of the active tool. Exception: If the active tool material is carbon steel and the Galvanized button is turned on, the pipe material will be changed to galvanized steel.

The calculated pipe size will be displayed in the Active Pipe display box. Check to make sure that the calculated pipe size matches the actual pipe size and material. After the pipe size is calculated, the Groove button will light up indicating that the pipe is ready to groove. The pipe should be level after clamping.

If the measured pipe size does not fall within the range of one of one of the programmed diameter/ schedule/material combinations, the machine will report an error on the screen.

See Section 7. Troubleshooting.

3 Operation (continued)

3.2 Groove

3.2.4 Operation (Auto Measure) continued

4. Before grooving, tighten the guide wheels against the pipe using the hand wheel on the left side of the machine. The guide wheels should be tight enough against the pipe so that there is no play in either wheel. The rollers should maintain a firm upward force on the pipe during grooving.

5. Remove both hands from the pipe and press the Groove button on the touchscreen. The machine will begin grooving the pipe. When complete, the pipe will stop rotating and the Release Pipe button will light up indicating that the pipe is ready to be released.

6. Press the Release Pipe button to unclamp the pipe. If the Auto Release function is turned on (solid orange) the machine will automatically release the pipe after the pipe stops rotating.

7. Loosen the guide wheels, remove the pipe from the machine, and check the groove. If the groove diameter is within spec, repeat steps 1-7 for all pipe sizes that fall within the acceptable pipe range of the Active Tool. See Section 5. Tool and Pipe Combinations. If the groove diameter is out of spec, see Section 3.3 Re-Groove to adjust the groove depth and/or re-groove the pipe. If the pipe to be grooved does not fallwithin the acceptable pipe range of the Active Tool, see Section 3.4 Rotate Head to rotate to a differentroller set or Section 3.6 Tool Change to change one of the resident tools to a different tool size.

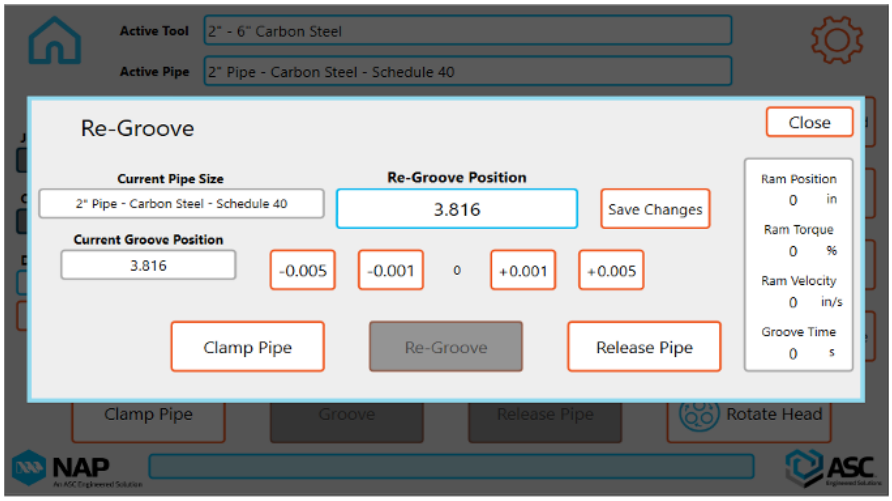
3 Operation (continued)

3.3 Re-Groove (Adjust Groove Depth)

The Re-Groove function is used to adjust the groove depth setting for the current pipe size and/or re-groove the pipe if the groove is too shallow. The Re-Groove Position and Current Groove Position refer to the linear position of the ram (linear actuator) along its axis and not the actual groove depth. Adjustments made to the Re-Groove Position do NOT equate to the same change in the groove depth. For example, adding 0.005" to the Re-Groove Position will not add 0.005" to the groove depth. It is important to note that changes made to the Current Groove Position only affect the Groove Position setting for the pipe size shown in the Current Pipe Size box. All other pipe sizes will not be affected.

For reference only, the operator can assume a roughly 2:1 ratio between the change in Re-Groove position to the change in actual groove depth. It is important to note that this ratio is largely a function of roller size, pipe size, material, groove force, and groove speed and should not be considered exact for all pipe size and roller combinations.

3.2.1 Screen



Buttons

- **Clamp Pipe** Raises the lower groove roller and clamps the pipe. The pipe cannot be re-grooved until the pipe is clamped.
- **Re-Groove** Initiates the Groove cycle. Once the machine has clamped the pipe, the Re-Groove button is enabled allowing the operator to re-groove the pipe.
- **Release Pipe** Releases the pipe when clamped. Once the machine has clamped the pipe, the Release Pipe button is enabled allowing the operator to release the pipe and cancel the groove process. When the Re-Groove cycle is in progress, the Release Pipe button is again disabled. Once the Re-Groove cycle is complete, the Release Pipe button is enabled to allow the operator to release the pipe.

3 Operation (continued)

3.3 Re-Groove (Adjust Groove Depth)

3.2.1 Screen Continued

Button

- **–0.005 – Subtracts 0.005"** from the Re-Groove position.
- **–0.001 – Subtracts 0.001"** from the Re-Groove position.
- **+0.001 – Adds 0.001"** to the Re-Groove position.
- **+0.005 – Adds 0.005"** to the Re-Groove position.
- **Save Changes** Saves the Re-Groove position value to the Groove Position value for the pipe size indicated in the Current Pipe Size display box.
- **Close** Exits the Re-Groove popup screen.

3.2.1 Adjust Groove Depth

Button

- **–0.005 – Subtracts 0.005"** from the Re-Groove position.
- **–0.001 – Subtracts 0.001"** from the Re-Groove position.
- **+0.001 – Adds 0.001"** to the Re-Groove position.
- **+0.005 – Adds 0.005"** to the Re-Groove position.
- **Save Changes** Saves the Re-Groove position value to the Groove Position value for the pipe size indicated in the Current Pipe Size display box.
- **Close** Exits the Re-Groove popup screen.

3 Operation (continued)

3.3 Re-Groove (Adjust Groove Depth)

3.3.1 Operations

Adjust Groove Depth

1. Upon opening the Re-Groove screen, the Current Pipe Size and Current Groove Position will be displayed on the left side of the screen in the gray display boxes. The Re-Groove position will initially match that of the Current Groove Position.

2. To adjust the groove depth, use the -0.005, -0.001, +0.001, and +0.005 buttons to add or subtract from the Re-Groove Position.

3. Once changes are made, the operator must press the Save Changes button in order to save the Re-Groove Position value to the Current Groove Position value before closing the Re-Groove screen. Otherwise, the Current Groove Position will remain the same and the changes will be lost. After saving, the current groove position will be updated to the new value.

Re-Groove

1. Use the -0.005, -0.001, +0.001, and +0.005 buttons to add or subtract from the Re-Groove Position.

2. Once changes are made, press the Clamp Pipe button to clamp the pipe.

3. Once clamped, tighten the guide wheel against the pipe. The pipe should be level.

4. Press the Re-Groove button to groove the pipe using the Re-Groove Position value. When the Re-Groove Position is reached, the pipe will stop rotating, and the operator can release the pipe with the Release Pipe button.

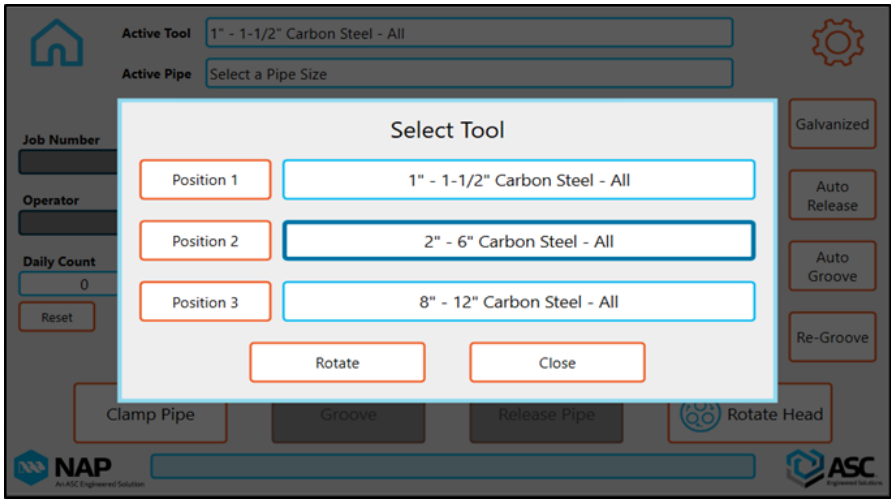
5. Loosen the guide wheels, remove the pipe, and check the groove diameter. If the groove diameter is within specification, press Save Changes to save the Re-Groove Position value to the Current Groove Position value. If not in spec, repeat steps 1-5 until the desired groove diameter is reached.

3 Operation (continued)

3.4 Rotate Head

Shop-Gruv comes with three pre-installed groove rollers, each capable of grooving a different range of pipe diameter/schedule/material combinations. See Section 5. Tool and Pipe Combinations. Each groove roller is installed in one of the three positions located in the circular spindle head. The Rotate Head function is used to rotate the spindle head to a different position so that the operator can utilize one of the other two roller sets installed in the machine without the need to physically replace a roller set each time a different roller size is needed.

3.4.1 Screen



Buttons

- **Position 1** Sets Position 1 as the target position for rotation.
- **Position 2** Sets Position 2 as the target position for rotation.
- **Position 3** Sets Position 3 as the target position for rotation.
- **Change** Position Initiates the Head Rotation process.
- **Close** Exits the Rotate Head screen.

3.4.2 Operation

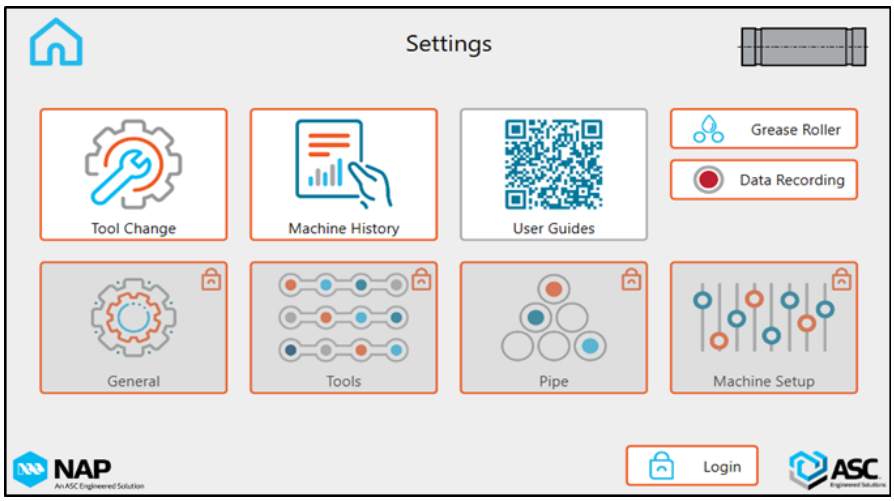
1. When the pipe to be grooved does not fall within the applicable pipe range of the Active Tool, press the Rotate Head button. A screen will pop up showing the three tool sizes that are installed in the machine. The Active Tool will be identified by a dark blue border.

2. Select the Position button that corresponds to the desired tool size. The button will turn orange to identify the selected position. If the required tool size is not displayed in one of the three positions, a Tool Change is required. See Section 4.1 Tool Change.

3. Once a position is selected, press the Rotate button. The spindle head will rotate to the selected position. All buttons will turn gray and be disabled.

4. When the rotation is complete, the buttons will light up indicating that they are enabled. The operator can either close the screen and continue grooving or repeat steps 2-4 to rotate to another position.

4 Settings



Icons

- **House** (Top Left) Returns the operator to the Home Screen.
- **Grooved Pipe** (Top Right) Returns the operator to the Groove screen.

Buttons

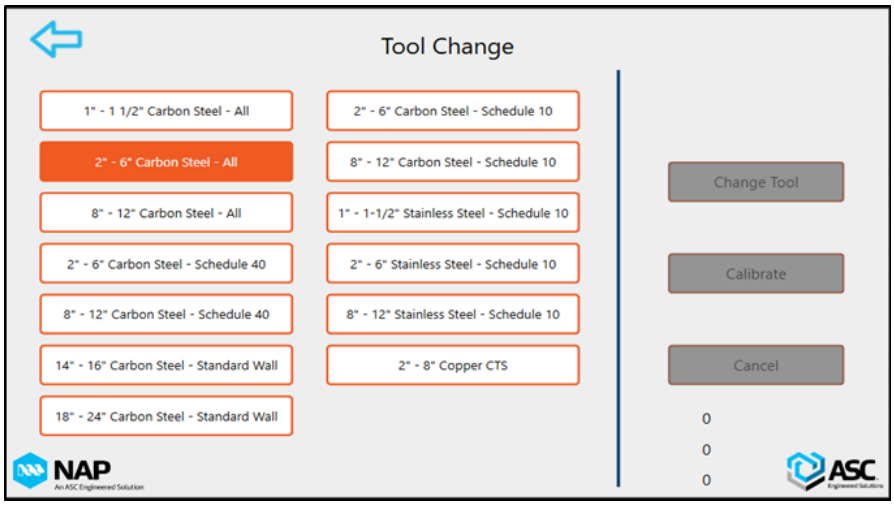
- **Tool Change** Displays the Tool Change screen. See Section 4.1 Tool Change.
- **Machine History** – Displays the Machine History screen. See Section 4.2 Machine History.
- **Grease Roller** Lowers the groove arm to allow access to the lower roller grease fitting. *See Section 6. Recommended Maintenance.*
- **Data Recording** Enables the Data Recording function. See Section 4.3 Data Recording.
- **General** Displays the General Settings screen. Password Protected.
- **Tool Settings** Displays the Tool Settings screen. Password Protected.
- **Pipe Settings** Displays the Pipe Settings screen. Password Protected.
- **Machine Setup** Displays the Machine Setup screen. Password Protected.
- **Login** Displays the Login popup to allow input of Username and Password. See Section 4.4 Security.

4 Settings

4.1 Tool Change

The Tool Change screen is used when the operator needs to replace one of the resident tool sizes with another tool of a different size. The Active Tool is the only tool that can be changed during this process, so it is necessary to use the Rotate Head process to rotate to the desired position for replacement before beginning the tool change process outlined in this section.

4.1.1 Screen



Buttons (refer to the previous section for all other button and icon descriptions)

- **Tool Buttons** The buttons on the left show the different tool sizes that are available. These buttons are used to identify the new tool that the operator will change to.
- **Change Tool** Initiates the Change Tool process.
- **Calibrate** Initiates the Calibration process.
- **Cancel** Cancels the Change Tool process.

4 Settings (continued)

4.1.2 Operation

Upon opening the Tool Change screen, the button representing the tool size that is currently installed in the Active position will be highlighted in orange. The Change Tool, Calibrate, and Cancel buttons on the right will be disabled until a new tool size is selected from the list.

1. To begin the Tool Change process, select the new tool size that needs to be installed in the machine. The Change Tool button will be enabled when a new tool size is selected.

2. Press Change Tool. The ram and groove arm will drop out of the way to allow for the tool change. When the ram stops, a message will appear on the screen indicating that it is safe to change out the tool.

3. For redundancy, press the red ESTOP button under the touchscreen to disable the motor drives.

4. Open the motor cover door on the left side of the machine by rotating the lock handle counterclockwise and gently lifting the door up until the weight is fully supported by the support chain.

5. Using a 3⁄16" hex key (Allen wrench), remove the shaft collar that is securing the upper roller shaft to the spindle head assembly. *See Figure 4.1A.*

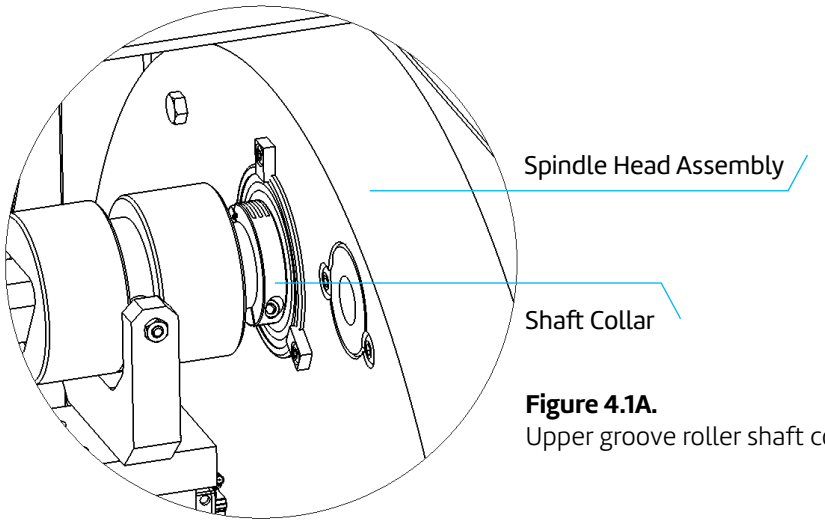


Figure 4.1A.
Upper groove roller shaft collar location.

6. Move to the front of the machine and remove the upper roller shaft.

7. Locate the retention screw positioned directly under the lower groove roller shaft. A flat edge is machined into the screw head. Using a 1⁄8" hex key, rotate the screw counterclockwise (roughly an 1⁄8 – 1⁄4 turn) so that the flat edge faces the 12 o'clock position. This will allow removal of the lower groove roller pin.

See Figure 4.1B.

4 Settings (continued)

4.1.2 Operation

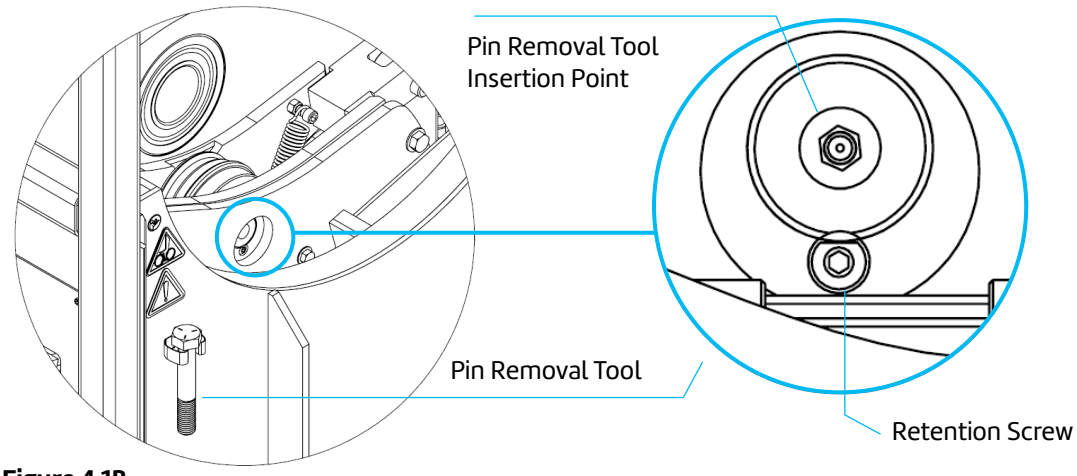


Figure 4.1B.
Retention screw location and orientation for lower groove roller pin removal.

9. Locate the pin removal tool on the front of the machine. Screw the pin removal tool into the lower groove roller pin until seated. While holding the lower groove roller with one hand, remove the pin by pulling outward. Lift up and remove the lower roller from the groove arm.

10. Ensure that both the new lower roller bushings and roller pin are clean and free of debris. Use a rag to wipe down both surfaces if needed.

11. Position the new lower roller between the groove arm plates and align the center hole with the holes in the groove arm. The flange on the roller should be toward the back of the machine and should align with the flanges in the upper roller shaft when installed.

12. Insert the pin into the groove arm and roller with the notch facing the 6 o'clock position. Push until the shoulder of the pin seats against the back of the groove arm. The front of the groove arm plate and pin should be flush, and the notch should be aligned with the retention screw. Using a 1/8" hex key, rotate the retention screw clockwise until finger tight. Make sure that the pin is retained by the screw head. Do not overtighten.

13. Insert the new upper roller shaft into spindle head assembly until the shaft fully seats against the bearing. Move to the open motor compartment and fix the shaft collar onto the roller shaft using a 3⁄16" kex key. Tighten the hex screw until snug and then loosen an 1⁄8 – 1⁄4 turn so that the collar can freely rotate around the shaft. It is important for the collar to freely rotate so that the operator can gain access to the hex head next time a tool change is performed. Close the door.

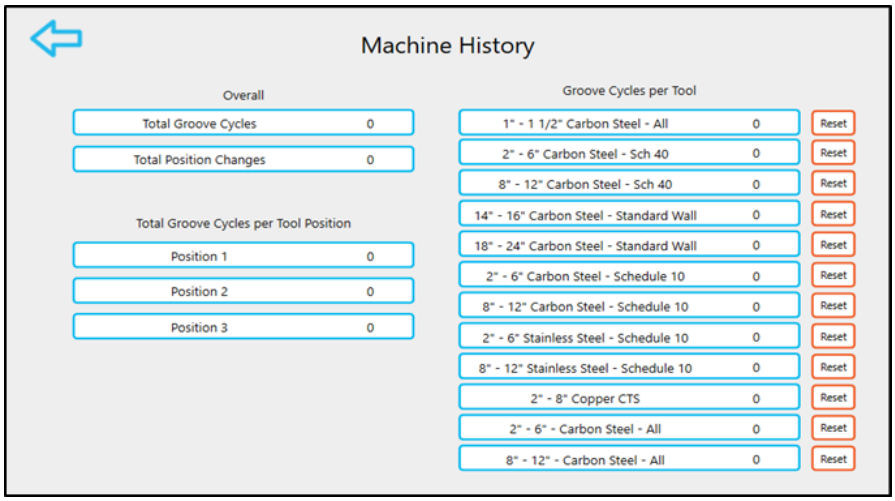
14. Move to the front of the machine and release the ESTOP. On the touchscreen, press the Reset button in the top right corner, then press Calibrate. The lower groove roller will be raised until it contacts the upper groove shaft. When complete, the lower roller will move to its home position for grooving.

15. Press the Back arrow to navigate back to Settings.

4 Settings (continued)

4.2 Machine History

The Machine History screen is used to track the total number of cycles the machine has performed throughout its life. This information will primarily be used by the manufacturer to track bearing and tool life as well as the overall machine life. When a tool set is replaced due to wear, a Reset button is available for that tool size so the count can be reset when the tool is replaced.



4.3 Data Recording

The Data Recording function allows the operator to record the data of all grooves to an SD card that is inserted into the PLC. An SD card must be inserted into the SD slot of the PLC for this function to operate properly. When the Data Recording function is on, the PLC will create a .csv file associated with the current Job Number that is displayed on the Groove screen. The name of the file will be whatever is entered into the Job Number field. If the Job Number is changed, a new file will be created with the new Job Number as the file name. The information that will be recorded is as follows:

Job Number	Operator	Tool Size	Groove Type	Pipe Size	Ram Groove Position	Groove Trime

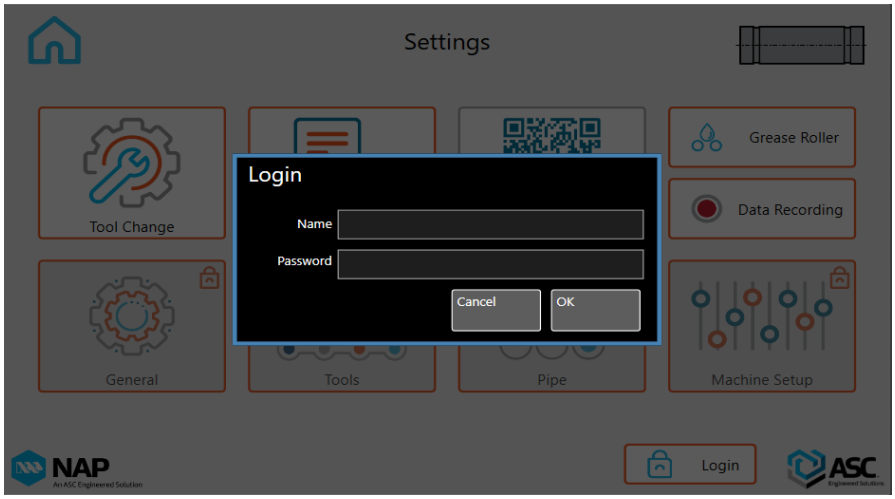
Categories

- **Job Number** – Name of file. Change by selecting the Job Number field on the Groove screen.
- **Operator** Name/number of the operator that is using the machine. Change by selecting the Operator field on the Groove screen.
- **Tool Size** Tool size that was used to create the groove.
- **Groove Type** Groove or Regroove
- **Pipe Size** Pipe size that was grooved.
- **Ram Groove Position** Current Ram Groove Position setting for the groove or regroove.
- **Groove Time** Time from when the Groove button is pressed to when the groove cycle is complete.

4 Settings (continued)

4.4 Security

On the Settings screen, buttons that are grayed out with an orange lock icon in the top right corner are password protected. These buttons are used to access screens that are primarily used by NAP during machine setup and testing. Pressing the Login button will display a popup screen that will request input of a username and password. Contact NAP if there is a need to gain access to one of these screens.



5 Tool and Pipe Combinations

Nominal Size	Nominal Size Pipe	Wall	Material
1" – 1-½" Carbon Steel – All Roller Shaft: GMT-001 Outside Roller: GMT-005	1" – 1½"	Schedule 7	Carbon Steel
			Galvanized
		Schedule 10	Carbon Steel
			Galvanized
			Stainless Steel
		Schedule 40	Carbon Steel
			Galvanized
1¼" – 1-½" Carbon Steel – All Roller Shaft: GMT-011 Outside Roller: GMT-005	1" – 1½"	Schedule 7	Carbon Steel
			Galvanized
		Schedule 10	Carbon Steel
			Galvanized
		Schedule 40	Carbon Steel
			Galvanized
2" – 6" Carbon Steel – All Roller Shaft: GL11114 Outside Roller: GMT-008	2" – 6"	Schedule 7	Carbon Steel
			Galvanized
		Schedule 10	Carbon Steel
			Galvanized
		Schedule 40	Carbon Steel
			Galvanized
8" – 12" Carbon Steel – All Roller Shaft: GL11119 Outside Roller: GMT-010	8" – 12"	Schedule 10	Carbon Steel
			Galvanized
		Schedule 40	Carbon Steel
			Galvanized
2" – 6" Carbon Steel – Schedule 40 Roller Shaft: GL11114 Outside Roller: GL11110	2" – 6"	Schedule 40	Carbon Steel
			Galvanized
8" – 12" Carbon Steel – Schedule 40 Roller Shaft: GL11119 Outside Roller: GL11117	8" – 12"	Schedule 40	Carbon Steel
			Galvanized
14" – 16" Carbon Steel – Standard Roller Shaft: GL11337 Outside Roller: GL11335	14" – 16"	Standard Wall	Carbon Steel
18" – 24" Carbon Steel – Standard Roller Shaft: GMT-003 Outside Roller: GMT-006	18" – 24"	Standard Wall	Carbon Steel
2" – 6" Carbon Steel – Schedule 10 Roller Shaft: GL11530 Outside Roller: GL11527	2" – 6"	Schedule 10	Carbon Steel
			Galvanized
			Stainless Steel
8" – 12" Carbon Steel – Schedule 10 Roller Shaft: GL11540 Outside Roller: GL11539	8" – 12"	Schedule 10	Carbon Steel
			Galvanized
			Stainless Steel
2" – 8" Copper CTS – Standard Roller Shaft: GL13801 Outside Roller: GL13799	2" – 8"	Type L	Copper

6. Recommended Maintenance

6.1 Lubrication

It is important to apply grease regularly to all grease points on the machine at the recommended intervals to maintain proper function of the machine and prevent damage. Unless otherwise specified, grease should be applied with a grease gun. The following subsections outline the schedule and location of all lubrication points on the machine. Failure to adhere the following requirements will result in component failure and machine downtime.

Recommended Grease: Molykote G-0051 FM White EP Bearing Grease (McMaster-Carr #1208K33)

6.1.1 Schedule

The recommended lubrication schedule is outlined in Table 6.1.

Table 6.1 Lubrication Schedule

Location	Reference Section	Type of Bearing	Interval
Lower Roller Pin	6.1.2 Figure 6.1A	Garlock DU PTFE Coated Bushing & 1144 TGP Shaft	Daily / When Directed (See Section 6.1.2)
Guide Wheel Assembly	6.1.3 Figure 6.1C	4" Dia. Steel Wheels Needle Bearings	Weekly
Yoke Assembly	6.1.4 Figure 6.1D	1¾" Dia. Radial Ball Bearing Pillow Block	Quarterly
Yoke Assembly	6.1.4 Figure 6.1D	Rotation Slide Shaft & Sliding Rotation Coupling	Daily, by hand
Yoke Assembly	6.1.4 Figure 6.1D	Slide Carriage Bearing Unit	Monthly
Spindle Lock Assembly	6.1.5 Figure 6.1E	Lock Rod 1144 TGP Shaft	Bi-Weekly

6. Recommended Maintenance (continued)

6.1.2 Lower Roller Pin

The lower roller pin is the most critical lubrication point on the machine. It is important to keep this pin lubricated throughout daily use to help prevent damage to the pin and bushings inside the lower groove roller. When grease is required, navigate to the Home screen or Settings screen, and press the Grease Roller button. The ram will drop down until the groove arm rests against the support pin. The roller pin will align with the hole in the front plate. Insert the tip of the grease gun into the lubrication access hole in the roller pin (See Figure 6.1A) until the grease gun is securely connected to the grease fitting. Pumping 3–4 times will be enough to lubricate the pin and roller. Remove the grease gun and press the Grease Roller button again to raise the groove arm back up to the home position and continue operation. Lubrication intervals for the lower roller pin are listed below.

1. Daily – Grease the roller pin every morning on machine startup.

2. When Directed – After a set number of groove cycles, the machine will notify the operator to grease the lower roller. Press the Acknowledge button on the screen and immediately grease the roller before continuing.

3. Head Rotation and Tool Change – Immediately after a head rotation or tool change, grease the roller before grooving.

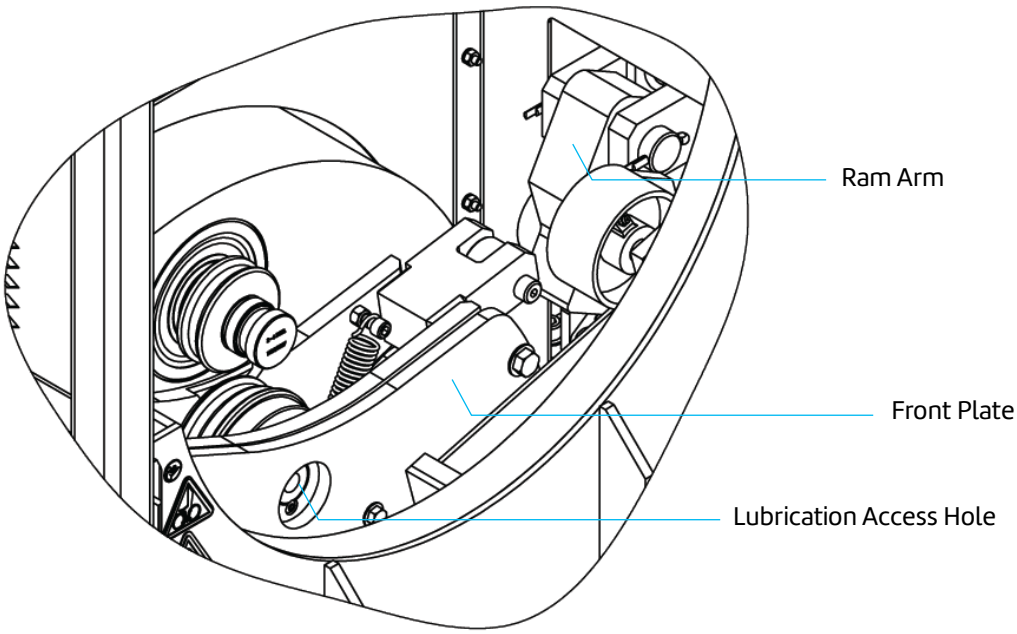


Figure 6.1A.
Lubrication access hole in lower roller pin.

6. Recommended Maintenance (continued)

6.1.3 Guide Wheels

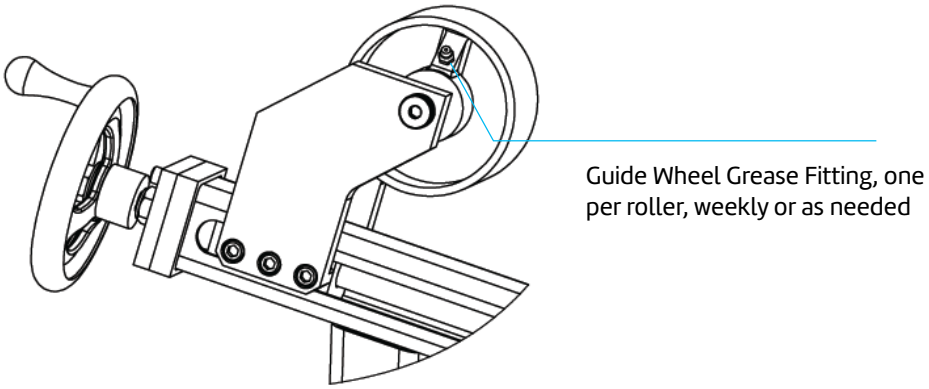


Figure 6.1C.
Guide wheel grease fitting location

6.1.4 Yoke Assembly

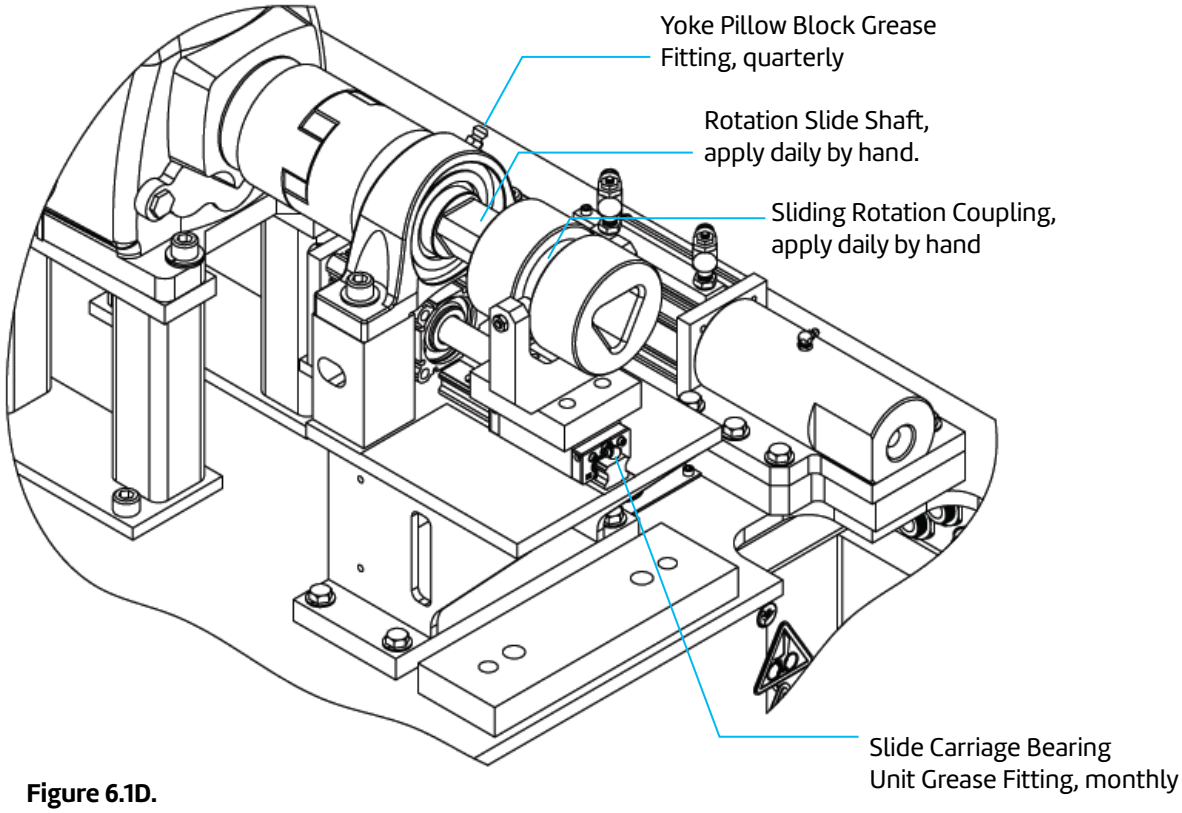


Figure 6.1D.
Yoke Assembly grease fitting locations.

6. Recommended Maintenance (continued)

6.1.5 Lock Assembly

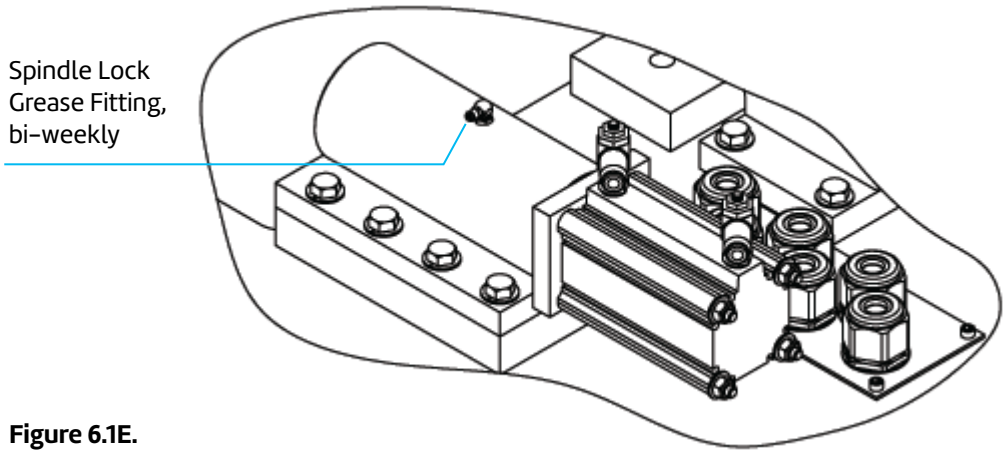


Figure 6.1E.
Lock Assembly grease fitting location.

6.2 Switches and Sensors

It is recommended to periodically wipe down all proximity switches and the measurement sensor to remove any debris that may cause the switch or sensor to not function properly.

6.3 Groove Arm Tension Springs

To increase the life of the tension springs on the groove arms, it is recommended to lower the groove arm before turning off power to the machine. Before shutting off power to the machine, navigate to the Home Screen or Settings screen and press the Grease Roller button. This will drop the groove arm down and remove tension from the spring. The machine is now ready to turn off. Leaving the spring under tension for extended periods of inactivity will decrease the spring life.

If one of the springs becomes loose or damaged, it is time to replace the spring. Navigate to the Home screen or Settings screen and press the Grease Roller button to drop the groove arm down and remove tension from the spring. Using a set of pliers or vise grips, unhook the spring from the bolt located inside the groove arm. The spring can now be removed. Install a new spring in the same manner.

6.4 Regular Spare Parts Listing

Original Supply Quantity	Description	Part Number
1	High Pressure / Temp Grease	MSC-665
6	Extension Springs	MSC-653

7. Troubleshooting

7.1 Error Messages

1. Loss of air pressure. Check air supply. – Air is turned off, or air pressure is too low.

2. Pipe not in range of active tool. – The calculated pipe size does not fall within the allowable pipe size range of the active tool. Rotate head to change tool to appropriate tool size for the pipe to be grooved.

3. Pipe size not found. – The calculated pipe size does not call within the range of any of the programmed pipe sizes. Adjustments to the pipe range may be required. Call NAP Sales representative for assistance.

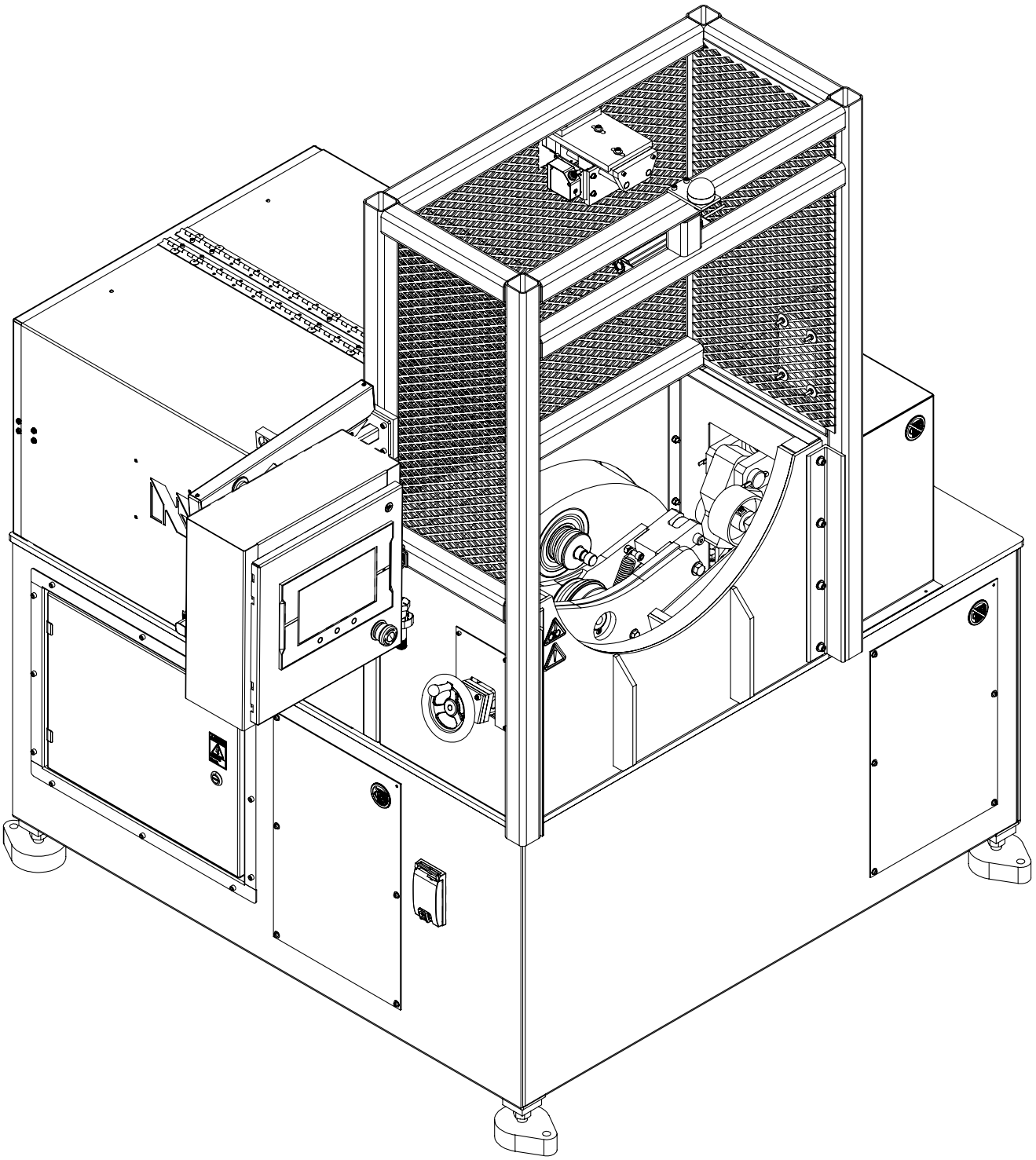
7.2 Head Rotate Cycle

1. Manually rotate upper roller to seat yoke. – With one hand, grasp the upper groove roller shaft and rotate clockwise or counterclockwise until the yoke is seated. The operator will hear and feel the yoke seat onto the tool. When the yoke is seated, the message will disappear.

2. Check Yoke – The yoke is stuck and/or has not cleared the tooling. Press the ESTOP and lubricate or adjust the yoke assembly as needed for smooth operation. Contact NAP Sales representative for assistance.

3. **Check Lock** – The lock is stuck or has not fully released from the spindle head. Press the ESTOP and lubricate or adjust the lock assembly as needed for smooth operation. Contact NAP Sales representative for assistance.

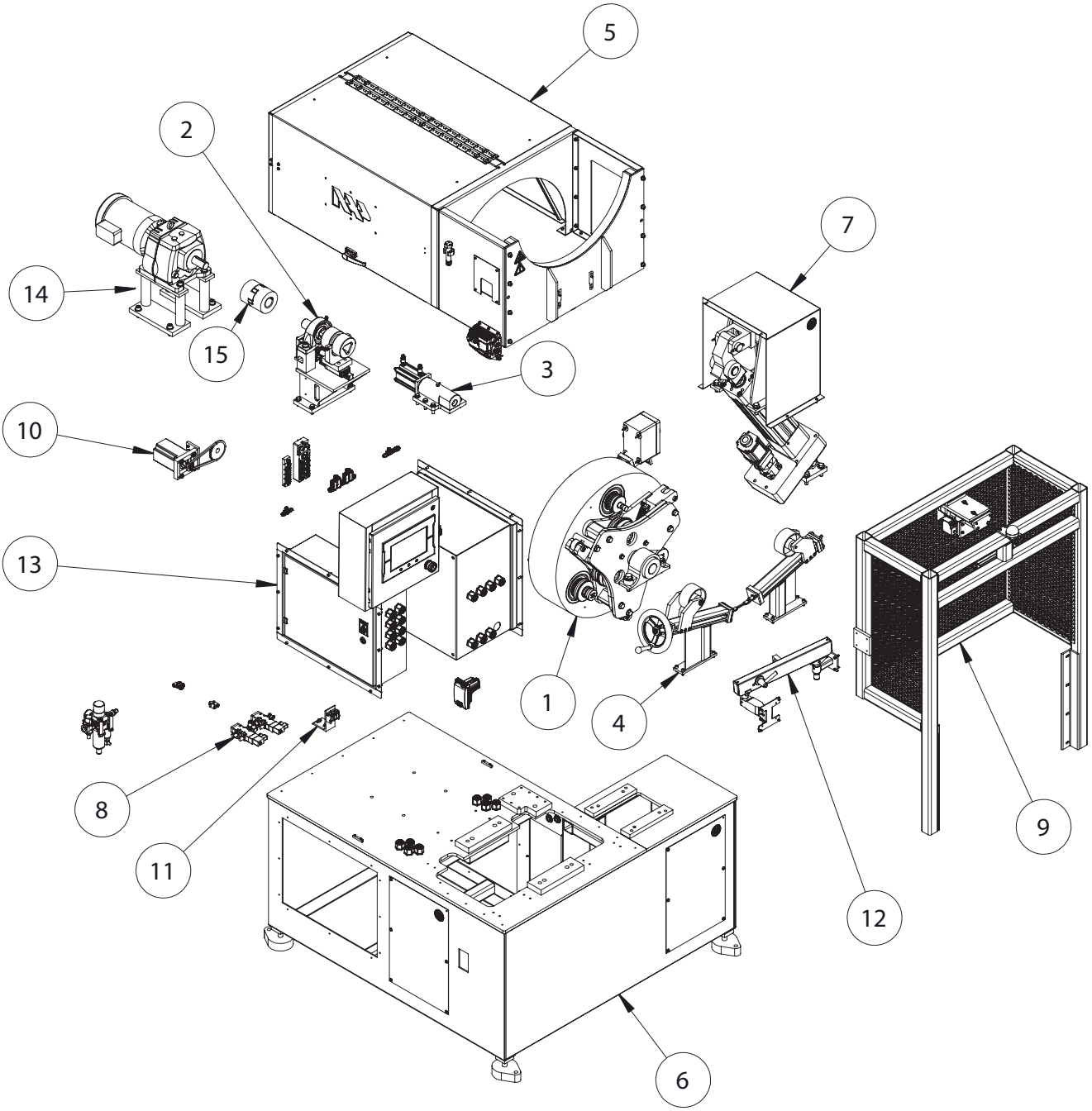
8. Assembly and Shop–Gruv Parts List



8. Assembly and Shop–Gruv Parts List

8.1 Shop–Gruv Main Assembly (GAS)

Schematic



8. Assembly and Shop-Gruv Parts List

8.1 Shop-Gruv Main Assembly (GAS)

Parts List

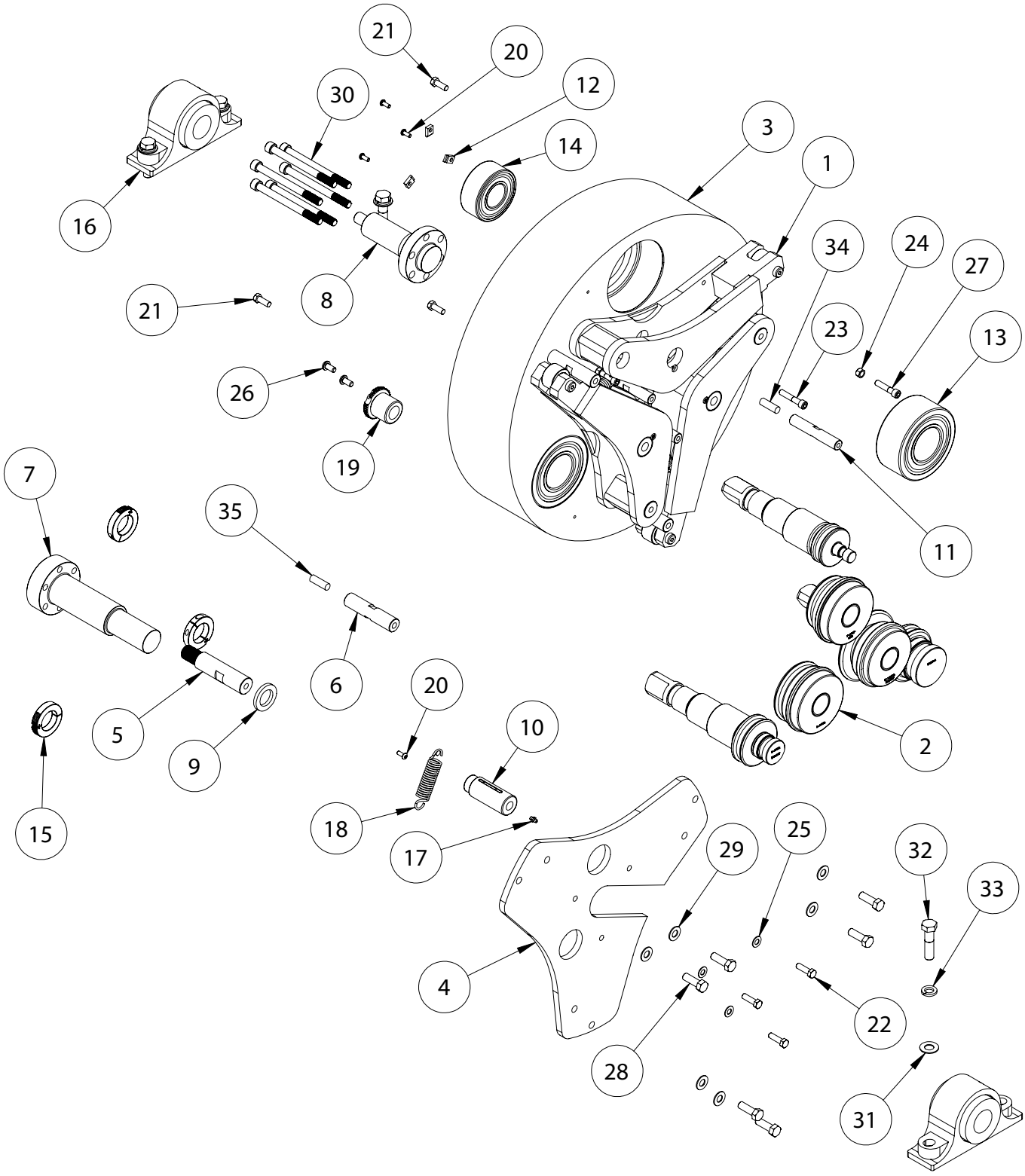
Shop-Gruv Assembly (GAS) Parts List

Item No.	Part Number	Qty.	Description
1	GAS-01	1	3 Head Rotating Spindle Assembly
2	GAS-02	1	Yoke Assembly
3	GAS-03	1	Spindle Lock Assembly
4	GAS-04	1	Guide Wheel Assembly
5	GAS-05	1	Top Enclosure Assembly
6	GAS-06	1	Groover Base
7	GAS-07	1	Spindle Ram Assembly
8	GAS-08	1	Pneumatic Assembly
9	GAS-09	1	Pipe Sensor Assembly
10	GAS-10	1	Spindle Rotation Assembly
11	GAS-11	1	Spindle Position Assembly
12	GAS-12	1	HMI Swing Arm Assembly
13	GAS-13	1	Electrical Assembly
14	GAS-14	1	Rotation Motor Assembly
15	GAS-15	1	Shaft Coupling Assembly

8. Assembly and Shop-Gruv Parts List

8.2 Spindle Assembly (GAS-01)

Schematic



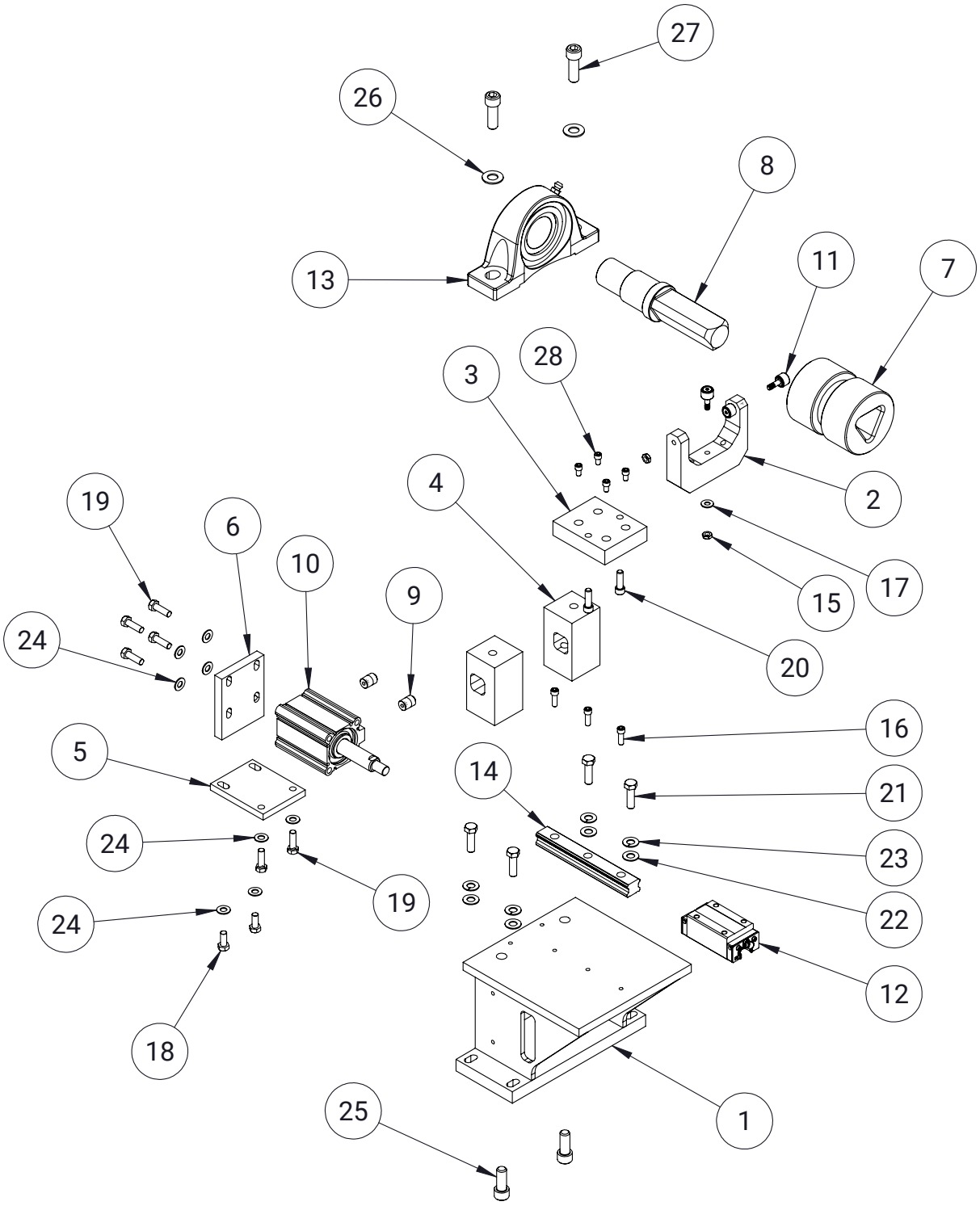
8. Assembly and Shop-Gruv Parts List

8.2 Spindle Assembly (GAS-01)

Parts List

Spindle Assembly (GAS-01) Parts List

Item No.	Part Number	Qty.	Description
1	GAS-0101	3	Pivot Arm
2	GAS-0102	1	Tooling Assembly
3	GMP-004	1	Rotation Plate
4	GMP-005	1	Face Plate
5	GMP-006	3	Pivot Pin
6	GMP-007	3	Support Pin
7	GMP-008	1	Front Rotation Shaft
8	GMP-009	1	Rear Rotation Shaft
9	GMP-011	3	Spacer
10	GMP-013	3	Roller Pin
11	GMP-127	3	Support Pin
12	GMP-132	9	Bearing Keeper Block
13	GL-11053	3	Double Angular Bearing, 5313 MFF
14	GL-11054	3	Double Angular Bearing, 5309MFF
15	GL11194	3	Hinged One-Piece Clamp-ON Shaft Collar
16	BRG-1042	2	Pillow Block Bearing
17	20-MSC-602	3	Grease Fitting - M6
18	MSC-653	3	Extension Spring
19	MSC-654	3	1" OD Drill Bushing
20	20-FAS-F01	12	BHSHCS ¼-20 x 0.625 x 0.625 - Black Oxide
21	20-FAS-H01	3	HHCS ⅜-16 x 1.000 x 1.000 - YZN Gr8
22	20-FAS-H02	3	HHCS ⅜-16 x 1.250 x 1.250 - YZN Gr8
23	FAS-H13	3	SHCS ⅜-16 X 2.000 X 1.250 - Black Oxide
24	FAS-H19	6	⅜-16 Hex Nut, YZN, GR8
25	FAS-H22	15	⅜" Flat Washer, Zn
26	20-FAS-H28	6	BHSHCS ⅜-24 x 0.750 x 0.750 - Black Oxide
27	FAS-H34	3	SHCS ⅜ -16 X 1.750 X 1.250 - Black Oxide
28	20-FAS-I01	6	HHCS ½ -13 x 1.500 x 1.500 - YZN Gr8
29	FAS-I22	6	½" Flat Washer, Zn
30	FAS-I35	6	½ - 20 x 6" Lg. SHCS, 1-1/2" Thread
31	FAS-J05	4	⅝" Flat Washer, Zn
32	FAS-J06	4	HHCS ⅝"-11 x 2.500 x 1.500 - YZN Gr8
33	FAS-J10	4	⅝" Split Lock Washer, Zn
34	20-RRAT-3_8-16 B7	3	⅜"-16 AT x 1.50" Long
35	20-RRAT-1_2-13 B7	3	½"-13 AT x 1.500" Long


27
26
8
13
11
7
3
28
4
2
19
6
10
9
17
15
24
20
16
5
14
21
24
23
19
22
24
12
18
25
1

8. Assembly and Shop-Gruv Parts List

8.3 Yoke Assembly (GAS-02)

Parts List

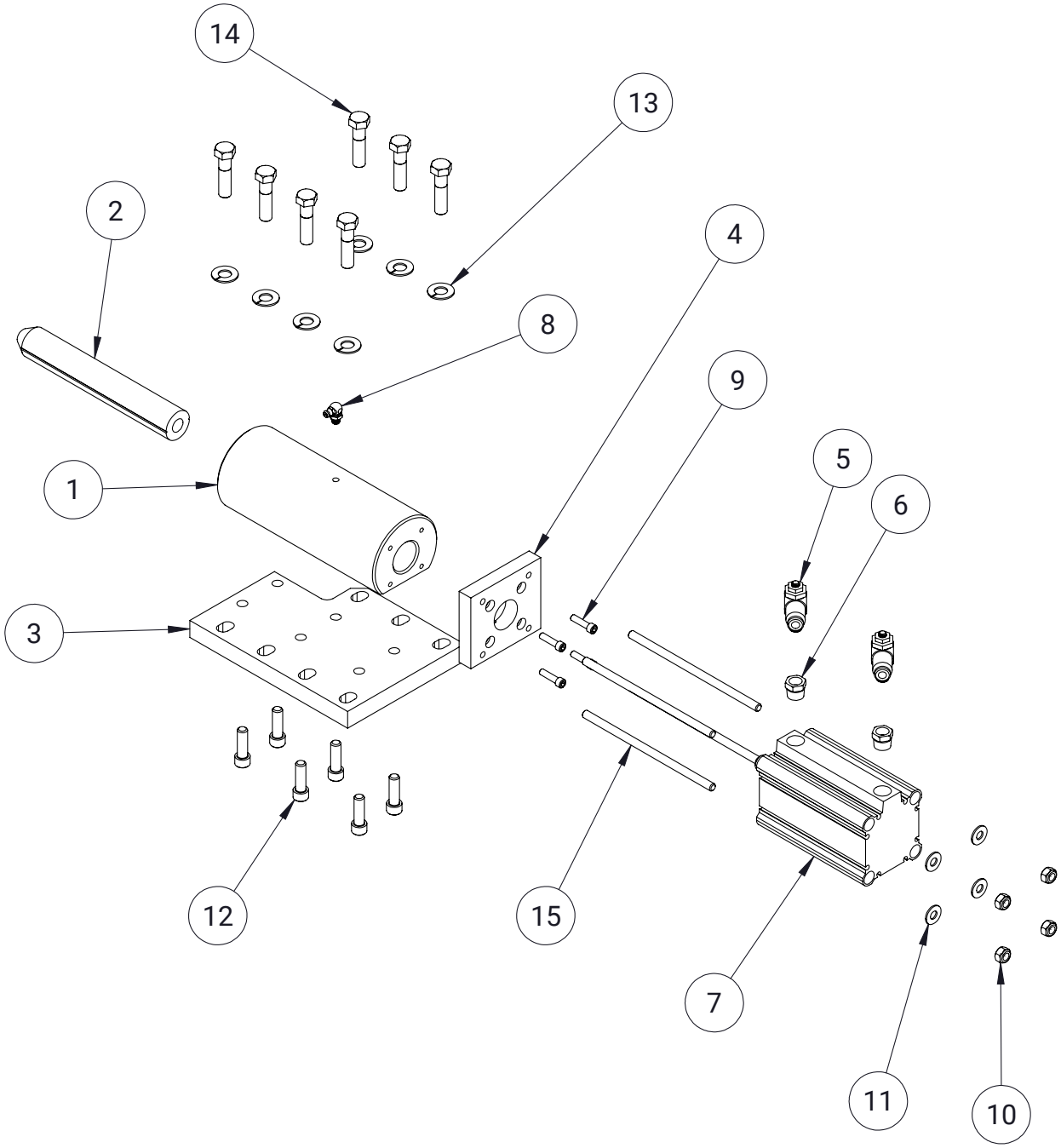
Yoke Assembly (GAS-02) Parts List

Item No.	Part Number	Qty.	Description
1	GAS-0201	1	Yoke Mount Weldment
2	GMP-014	1	Coupling Yoke
3	GMP-015	1	Slide Plate
4	GMP-017	2	Bearing Spacer
5	GMP-018A	1	Cylinder Mount
6	GMP-018B	1	Cylinder Mount
7	GMP-034	1	Sliding Rotation Coupling
8	GMP-036	1	Rotation Slide Shaft
9	20-AIR-413	2	1/4T X 1/4NPT Male Connector
10	AIR-602	1	Pneumatic Cylinder 50mm Bore X 50mm Stroke
11	BRG-1036	3	Cam Roller, 1/4-28
12	BRG-1043	1	Carriage Assembly
13	BRG-1044	1	1-3/4" Dia. Pillow Block Bearing
14	BRG-1050	1	Rail
15	FAS-F19	3	1/4-28 Hex Jam Nut, ZN
16	FAS-F24	3	SHCS 1/4-20 X 0.750 X 0.750 - Black Oxide
17	FAS-F38	1	1/4" Flat Washer, Zn
18	20-FAS-G03	2	HHCS 5/16-18 x 0.750 x 0.750 - YZN Gr8
19	20-FAS-G04	6	HHCS 5/16-18 x 1.000 x 1.000 - YZN Gr8
20	FAS-G08	2	SHCS 5/16-18 X 1.000 X 1.000 - Black Oxide
21	20-FAS-H02	4	HHCS 3/8-16 x 1.250 x 1.250 - YZN Gr8
22	FAS-H22	4	3/8" Flat Washer, Zn
23	FAS-H23	4	3/8" Split Lock Washer, Zn
24	FAS-G21	8	5/16" Flat Washer, Zn
25	FAS-I17	2	SHCS 1/2-13 X 1.250 X 1.250 - Black Oxide
26	FAS-I22	2	1/2" Flat Washer, Zn
27	FAS-I32	2	SHCS 1/2-13 X 1.5 X 1.5 - Black Oxide
28	FAS-M21	4	SHCS M6-1.0 X 10 X 10 - Black Oxide

8. Assembly and Shop–Gruv Parts List

8.4 Lock Assembly (GAS–03)

Schematic



8. Assembly and Shop-Gruv Parts List

8.4 Lock Assembly (GAS-03)

Parts List

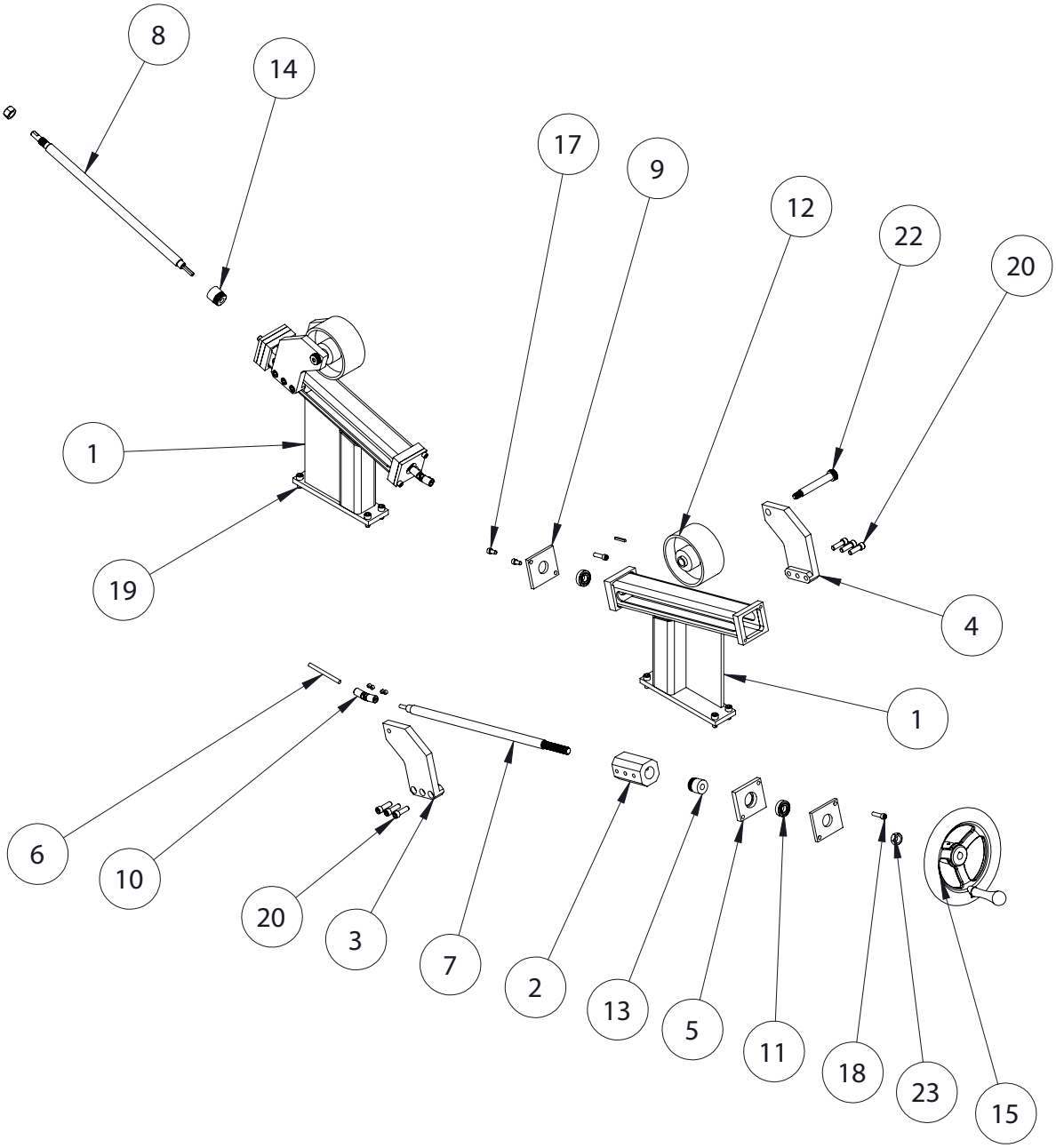
Lock Assembly (GAS-03) Parts List

Item No.	Part Number	Qty.	Description
1	GMP-031	1	Lock Housing
2	GMP-032	1	Lock Rod
3	GMP-033	1	Lock Mount Plate
4	GMP-120	1	Cylinder Adapter Plate
5	20-AIR-412	2	Flow Control Valve, 1/8 NPT x 1/4T
6	20-AIR-433	2	1/8 FNPT X 1/4 MNPT Reducer Bushing
7	AIR-600	1	Pneumatic Cylinder 50mm Bore x 75mm Stroke
8	MSC-608	1	Zinc-Plated Steel Grease Fitting
9	FAS-E18	4	SHCS 10-24 X 0.750 X 0.750 - Black Oxide
10	FAS-F29	4	1/4-20 Hex Lock Nut, ZN
11	FAS-F38	4	1/4" Flat Washer, Zn
12	FAS-G08	6	SHCS 5/16-18 X 1.000 X 1.000 - Black Oxide
13	FAS-H23	7	3/8" Split Lock Washer, Zn
14	20-FAS-H31	7	HHCS 3/8-16 x 1.500 x 1.000 - YZN Gr8
15	20-RRAT-1_4-20 B7	4	1/4"-20 AT x 5.500" Long

8. Assembly and Shop-Gruv Parts List

8.5 Guide Wheel Assembly (GAS-04)

Schematic



8. Assembly and Shop-Gruv Parts List

8.5 Guide Wheel Assembly (GAS-04)

Parts List

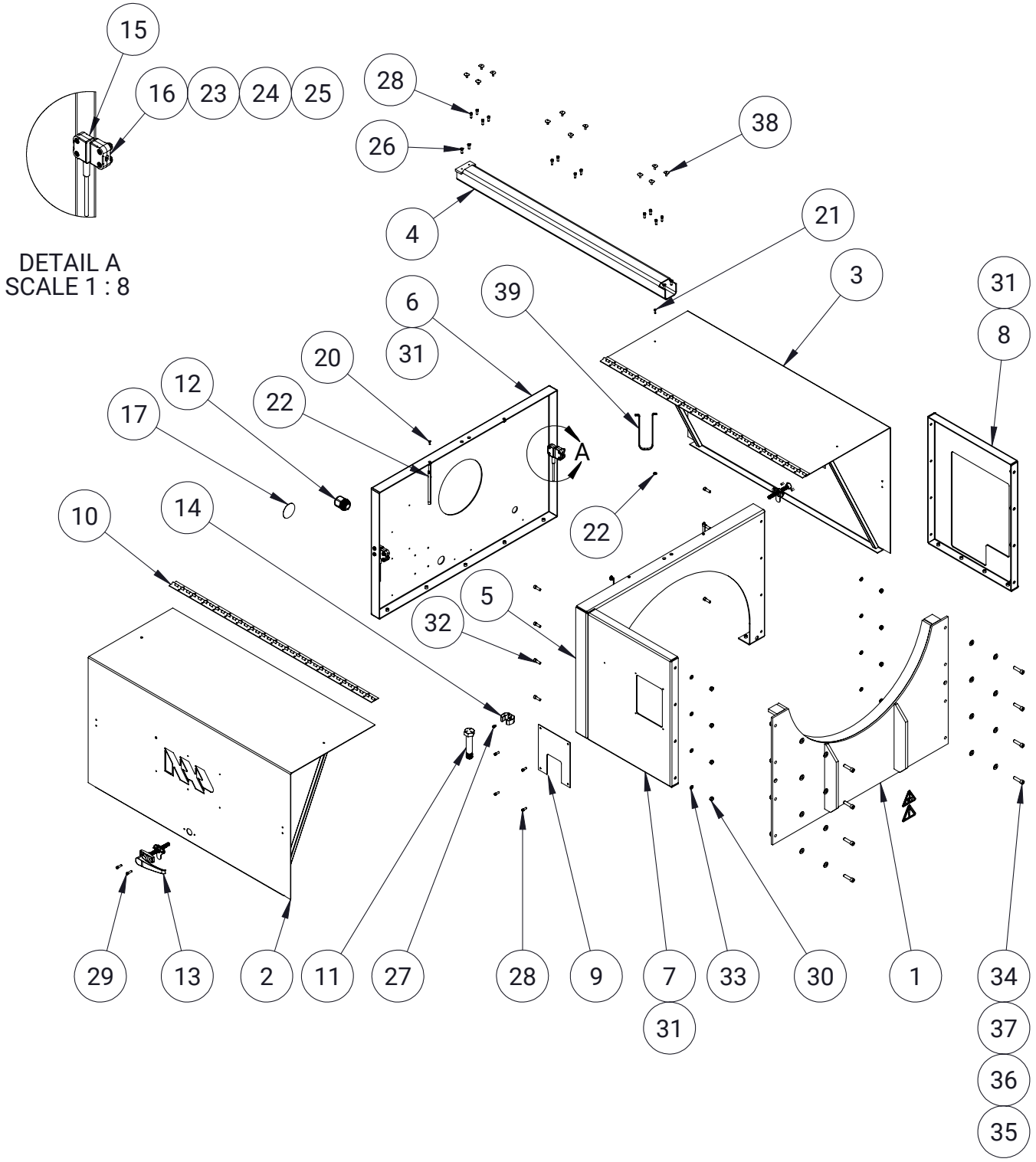
Guide Wheel Assembly (GAS-04) Parts List

Item No.	Part Number	Qty.	Description
1	GAS-0402	2	Guide Wheel Weldment - Right
2	GMP-038	2	Nut Mount
3	GMP-039	2	Guide Plate L.H.
4	GMP-040	2	Guide Plate R.H.
5	GMP-045A	2	Guide Tube End Plate
6	GMP-046	1	Union Joint Shaft
7	GMP-068	1	Adjustment Screw R.H. Threads
8	GMP-069	1	Adjustment Screw L.H. Threads
9	GMP-092	4	Bearing Plate
10	20-WMP-1542	2	Universal Joint
11	20-BRG-907	4	Bearing
12	20-BRG-937	2	4" STEEL WHEEL
13	20-BRG-941	1	Brass Acme Nut
14	BRG-1045	1	Brass Acme Nut L.H. Threads
15	MSC-662	1	Hand Wheel - 7inch
16	20-FAS-F50	8	SHSS 1/4-28 X 0.250 LG.
17	FAS-F23	4	SHCS 1/4-20 X 0.500 X 0.500 - Black Oxide
18	FAS-F25	4	SHCS 1/4-20 X 1.000 X 1.000 - Black Oxide
19	FAS-G10	8	SHCS 5/16-18 X 0.750 X 0.750 - Black Oxide
20	FAS-G31	12	SHCS 5/16-24 X 1.000 X 1.000 - Black Oxide
21	FAS-I14	1	1/2-13 Hex Nut, YZN, GR8
22	FAS-I36	2	1/2" Dia. X 3" Lg. S.H.S.B.
23	FAS-I37	2	1/2-13 Jam Nut, ZN, GR5
24	1.000" Long	1	Keystock - 1/8" (Oversized) - 1.000" LG.

8. Assembly and Shop-Gruv Parts List

8.6 Top Enclosure Assembly (GAS-05)

Schematic



8. Assembly and Shop-Gruv Parts List

8.6 Top Enclosure Assembly (GAS-05)

Parts List

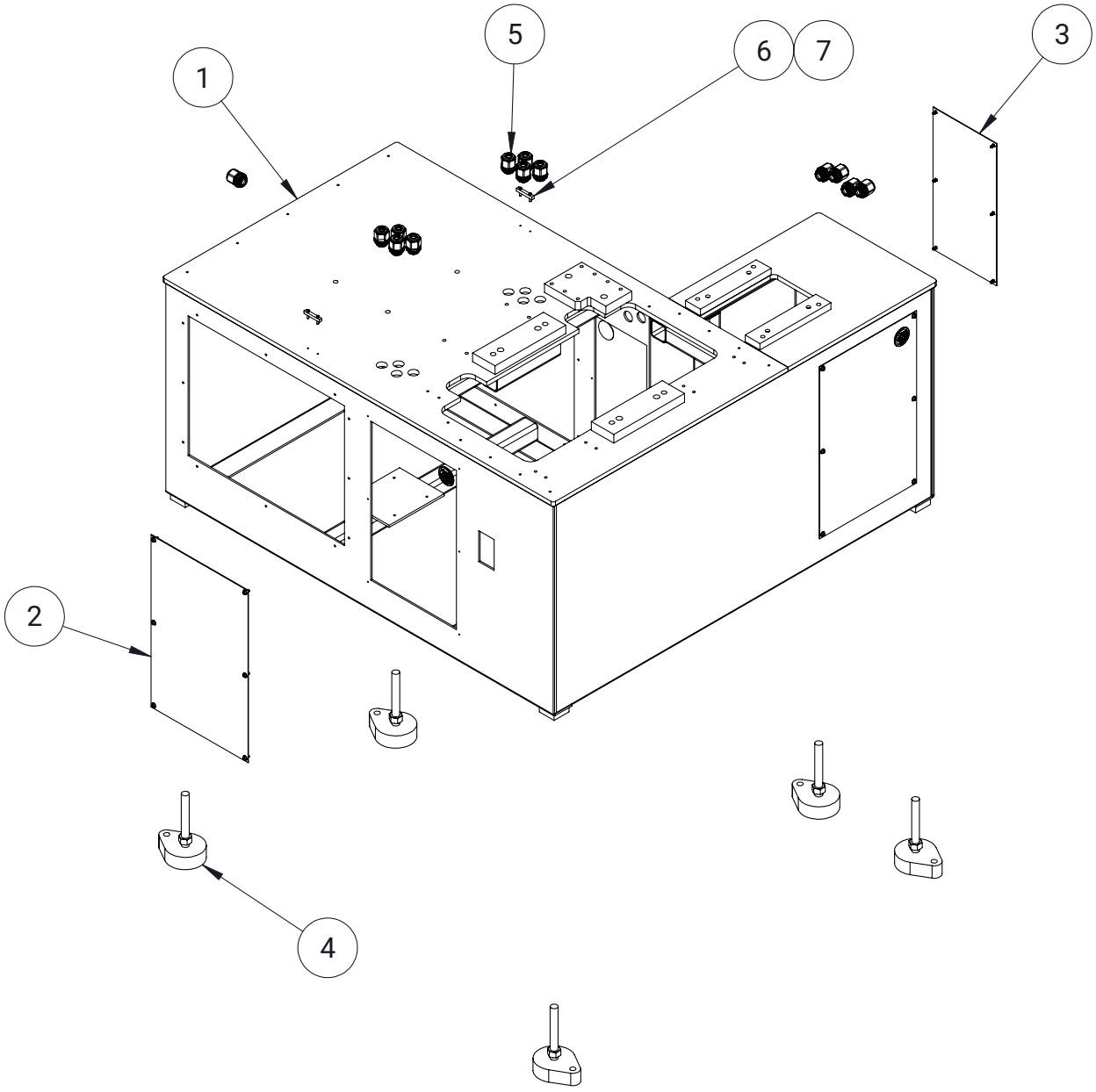
Top Enclosure Assembly (GAS-05) Parts List

Item No.	Part Number	Qty.	Description
1	GAS-0501	1	Front Guard Weldment
2	GAS-0502	1	Left Door
3	GAS-0502	1	Right Door
4	GAS-0503	1	Mid Support Weldment
5	GMP-047	1	Mid Guard Panel
6	GMP-048	1	Rear Guard Panel
7	GMP-051	1	Left Guard Plate
8	GMP-052	1	Right Guard Plate
9	GMP-059	1	Cover
10	GMP-075	2	Door Hinge 35" Lg.
11	GMP-104	1	Shaft Removal Tool
12	20-EPP-0329	1	3/4" Cord Grip Connector
13	MSC-655	2	L-Handle
14	MSC-661	1	Shaft Removal Tool Holder
15	PLC-345	2	Safety Switch Parallel
16	PLC-346	2	Safety Interlock Switch
17	20-SWT-IS6011-PB	1	ISO Symbol - Lock Out
18	20-SWT-IS6014-PB	1	ISO Symbol - Caution - General
19	SWT-IS1035-PB	1	Hand Entanglement/Rollers Label
20	FAS-C03	4	FHSHCS 6-32 x 0.375 x 0.375 - Black Oxide
21	FAS-C06	4	RSLMS, 6-32 X 0.500 LG.
22	FAS-C12	8	6-32 Hex Nut, ZN
23	FAS-D10	8	SHCS 8-32 X 0.750 X 0.750 - Black Oxide
24	FAS-D15	8	8-32 Hex Nut, ZN
25	FAS-D16	8	#8 Flat Washer, Zn
26	FAS-E06	4	FHSHCS 10-24 x 0.500 x 0.500 - Black Oxide
27	FAS-E10	1	SHCS 10-24 X 0.250 X 0.250 - Black Oxide
28	FAS-E16	16	SHCS 10-24 X 0.500 X 0.500 - Black Oxide
29	FAS-E21	4	SHCS 10-32 x 0.625 - Black Oxide
30	FAS-F18	8	1/4-20 Hex Nut, YZN, GR8
31	FAS-F23	15	SHCS 1/4-20 X 0.500 X 0.500 - Black Oxide
32	FAS-F24	8	SHCS 1/4-20 X 0.750 X 0.750 - Black Oxide
33	FAS-F40	8	1/4" Split Lock Washer, Zn
34	FAS-G12	8	SHCS 5/16-18 X 1.250 X 1.250 - Black Oxide
35	FAS-G19	8	5/16-18 Hex Nut, YZN, GR8
36	FAS-G22	16	5/16" Split Lock Washer, Zn
37	FAS-G21	16	5/16" Flat Washer, Zn
38	FAS-RIVET #3	12	3/16 X 1/8"-1/4" Aluminum Blind Rivet
39	Sash Chain	4	Sash Chain 12" Long

8. Assembly and Shop–Gruv Parts List

8.7 Base Assembly (GAS–06)

Schematic



8. Assembly and Shop-Gruv Parts List

8.7 Base Assembly (GAS-06)

Parts List

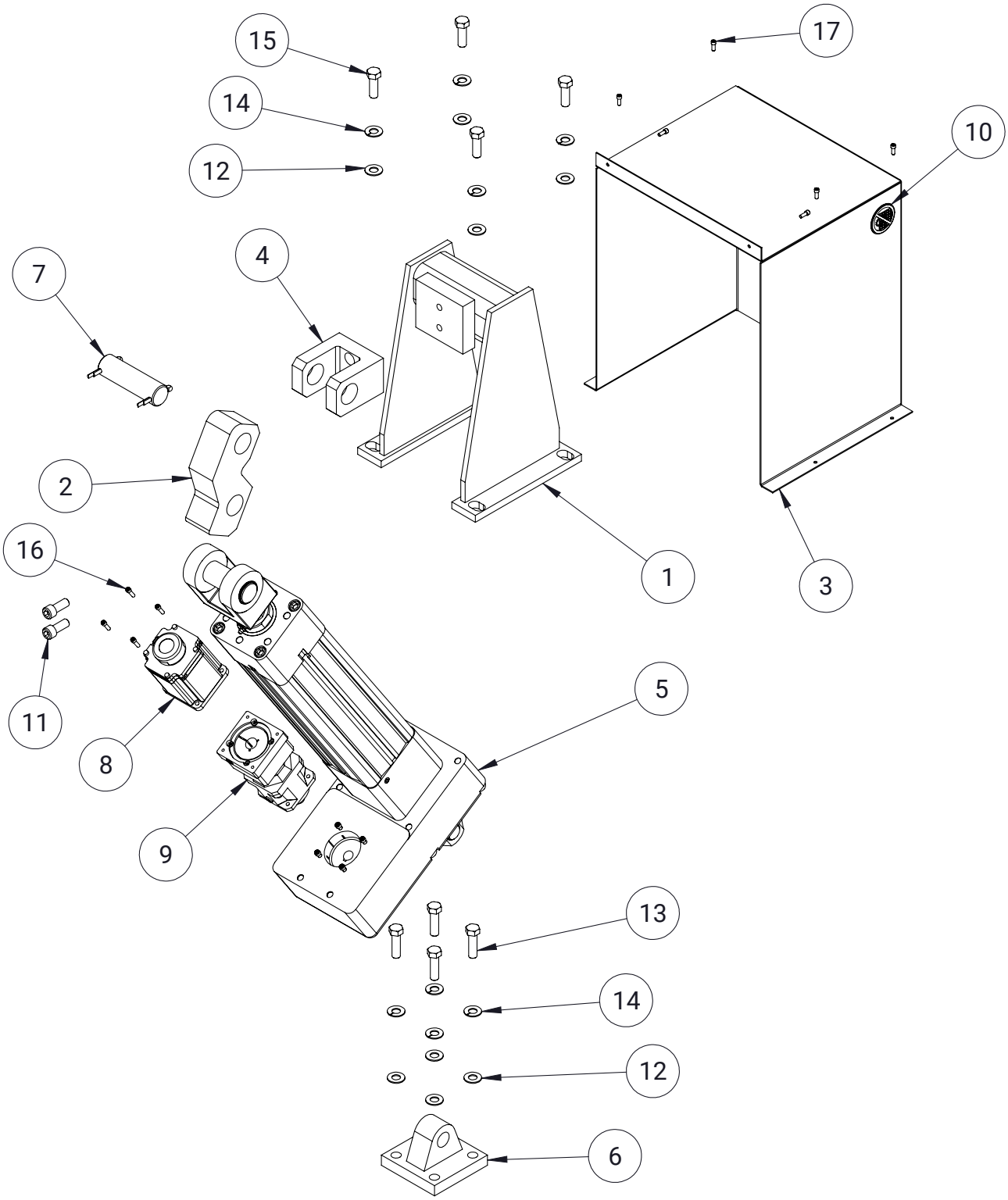
Base Assembly (GAS-06) Parts List

Item No.	Part Number	Qty.	Description
1	GAS-0605	1	Groover Base Weldment
2	GAS-0603	4	Door Panel
3	GAS-0604	1	Door Panel Small
4	20-MSC-559	5	Adj Nylathane Foot
5	20-EPP-0329	13	3/4" Cord Grip Connector
6	WMP-1601	2	Pipe Car Rail Joint
7	FAS-D10	4	SHCS 8-32 X 0.750 X 0.750 - Black Oxide
8	20-SWT-IS6061-PB	5	ISO Symbol - Guards Removed

8. Assembly and Shop-Gruv Parts List

8.8 Ram Assembly (GAS-07)

Schematic



8. Assembly and Shop-Gruv Parts List

8.8 Ram Assembly (GAS-07)

Parts List

Ram Assembly (GAS-07) Parts List

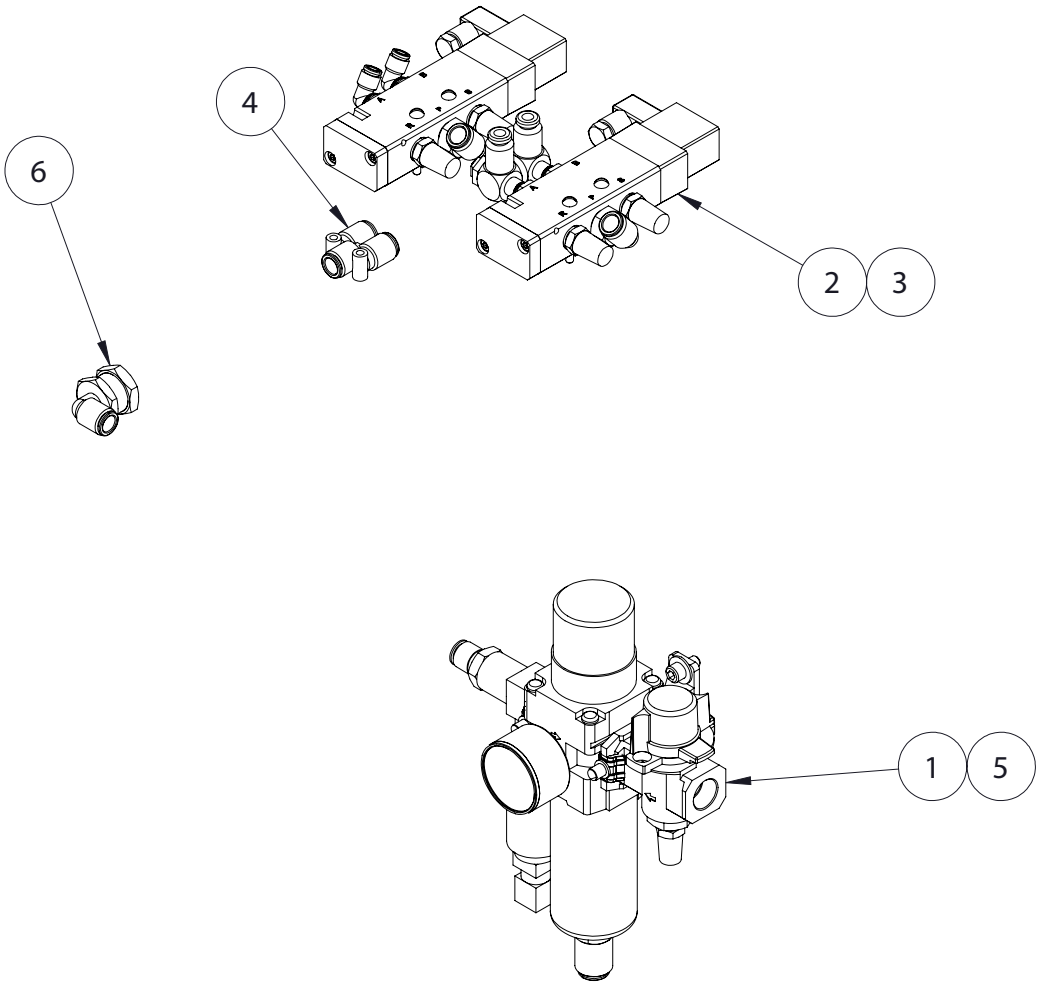
Item No.	Part Number	Qty.	Description
1	GAS-0701	1	Load Arm Mount Weldment
2	GMP-060	1	Ram Load Arm
3	GMP-061	1	Ram Enclosure
4	GMP-077	1	Ram Load Arm Pivot Mount
5	ACT-001	1	Ram Actuator
6	MSC-657	1	Clevis Mount
7	MSC-658	1	Pivot Pin
8	MTR-132	1	Servo Motor, 1S series, 750W
9	MTR-133	1	Gear Drive
10	20-SWT-IS6061-PB	1	ISO Symbol - Guards Removed
11	FAS-I17	2	SHCS 1/2-13 X 1.250 X 1.250 - Black Oxide
12	FAS-I22	8	1/2" Flat Washer, Zn
13	20-FAS-I02	4	HHCS 1/2-13 x 1.750 x 1.750 - YZN Gr8
14	FAS-I23	8	1/2" Split Lock Washer, Zn
15	20-FAS-I01	4	HHCS 1/2-13 x 1.500 x 1.500 - YZN Gr8
16	FAS-M23	4	SHCS M5-0.8 X 18 X 18 - Black Oxide
17	FAS-E16	6	SHCS 10-24 X 0.500 X 0.500 - Black Oxide

8. Assembly and Shop–Gruv Parts List

8.9 Pneumatic Assembly (GAS–08)

8.9.1 Main Assembly (GAS–08)

Schematic



8. Assembly and Shop-Gruv Parts List

8.9 Pneumatic Assembly (GAS-08)

8.9.1 Main Assembly (GAS-08)

Parts List

Pneumatic Assembly (GAS-08) Parts List

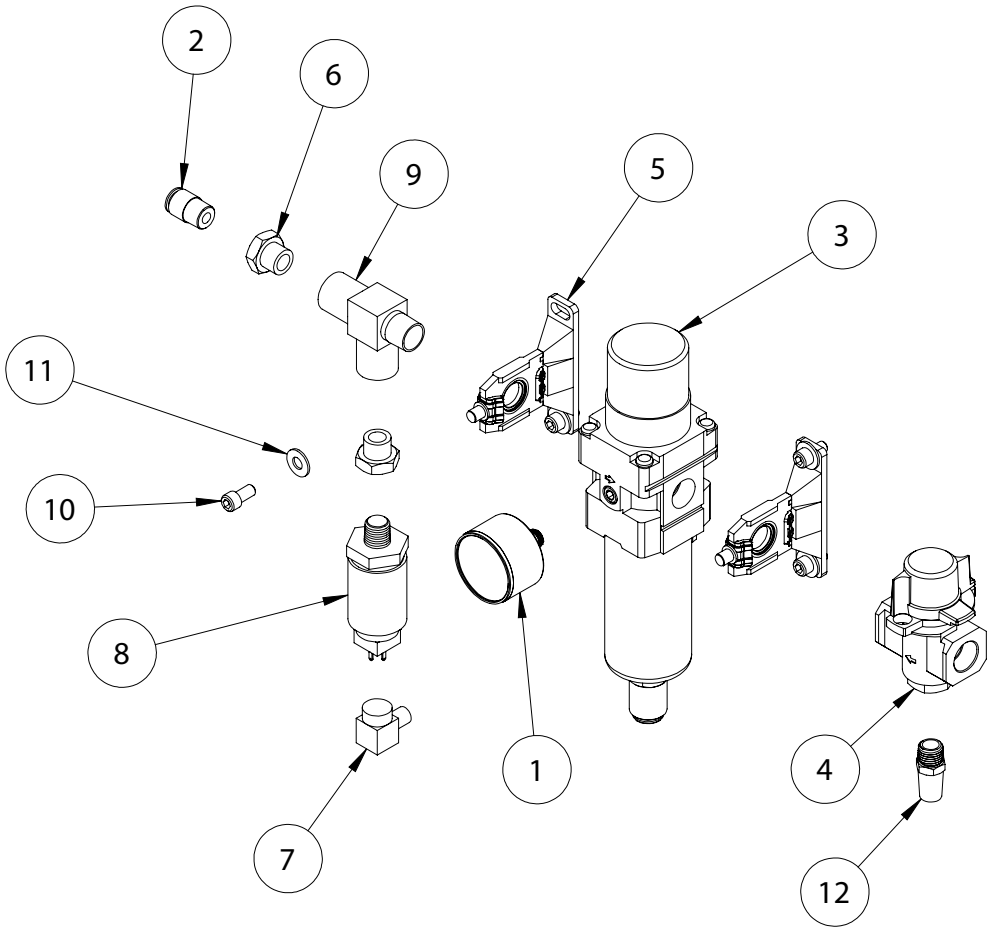
Item No.	Part Number	Qty.	Description
1	GAS-0801	1	Pneumatic Regulator Assembly
2	GAS-0802	1	Pneumatic Valve Assembly
3	20-AIR-403	1	1/4" Air Line, 6' Lg.
4	20-AIR-561	1	Union Y, 3/8"
5	AIR-562	1	3/8 OD 1/4 ID Airline, 24"
6	20-AIR-558	1	Bulkhead Male Elbow, 3/8"

8. Assembly and Shop-Gruv Parts List

8.9 Pneumatic Assembly (GAS-08)

8.9.2 Regulator Assembly (GAS-0801)

Schematic



8. Assembly and Shop-Gruv Parts List

8.9 Pneumatic Assembly (GAS-08)

8.9.2 Regulator Assembly (GAS-0801)

Parts List

Ram Assembly (GAS-07) Parts List

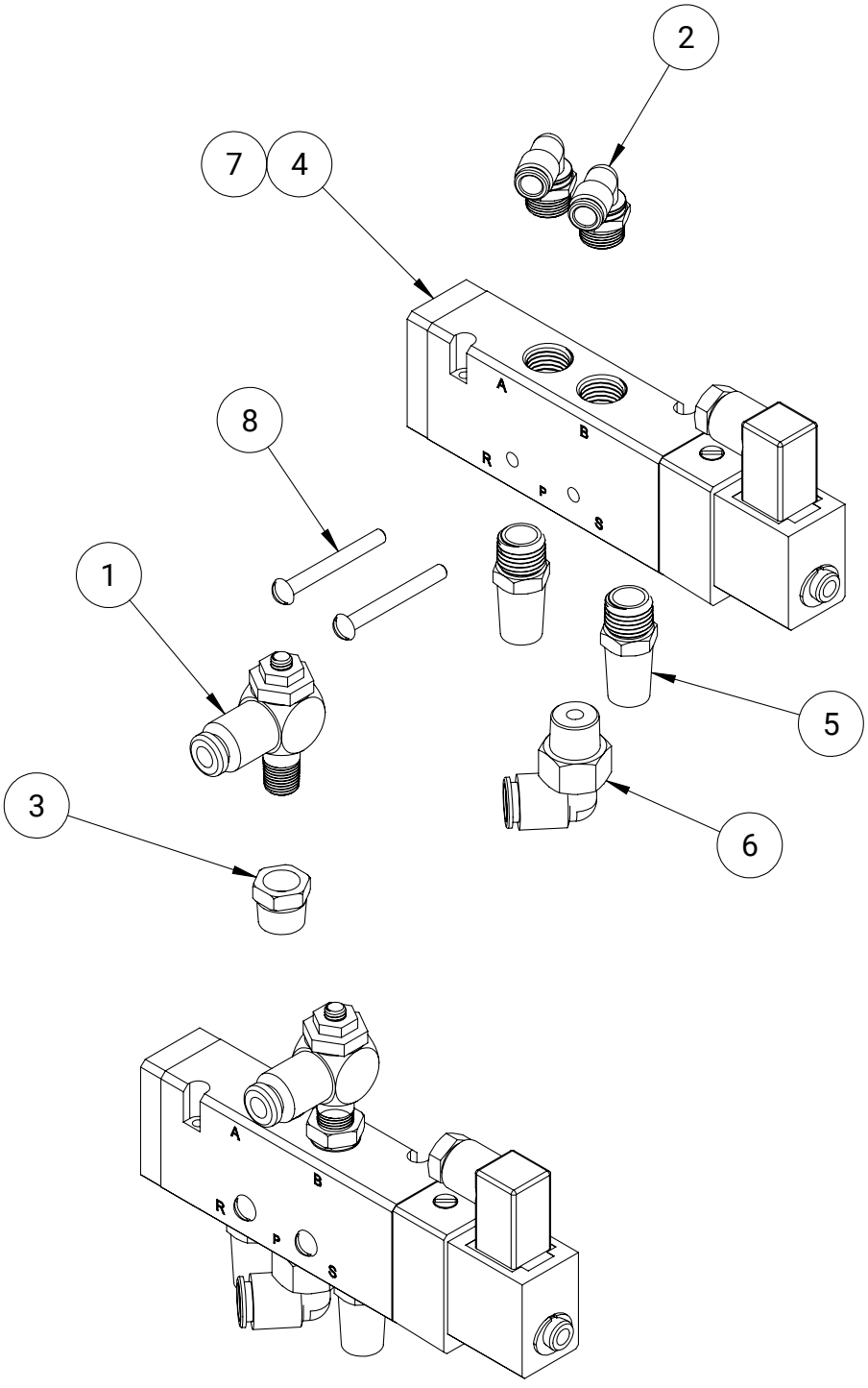
Item No.	Part Number	Qty.	Description
1	AIR-460	1	Pressure Gauge 0-160 psi
2	20-AIR-559	1	Hex Soc Hd Male Connector, 1/4" NPT - 3/8" Tube
3	AIR-565	1	Air Regulator/Filter
4	AIR-566	1	Pressure Relief Valve
5	AIR-567	2	Mounting Bracket
6	20-AIR-569	2	Reducer, 38" NPT, 1/4" NPT
7	EPP-0319	1	Linear Transducer DIN Connector
8	EPP-0359	1	Pressure Switch
9	HYD-205	1	Male Run Tee, 3/8" NPT
10	FAS-F23	4	SHCS 1/4-20 X 0.500 X 0.500 - Black Oxide
11	FAS-F38	4	1/4" Flat Washer, Zn
12	20-AIR-546	1	1/4" NPT Silencer

8. Assembly and Shop–Gruv Parts List

8.9 Pneumatic Assembly (GAS–08)

8.9.3 Valve Assembly (GAS–0802)

Schematic



8. Assembly and Shop-Gruv Parts List

8.9 Pneumatic Assembly (GAS-08)

8.9.3 Valve Assembly (GAS-0802)

Parts List

Pneumatic Valve Assembly (GAS-0802) Parts List

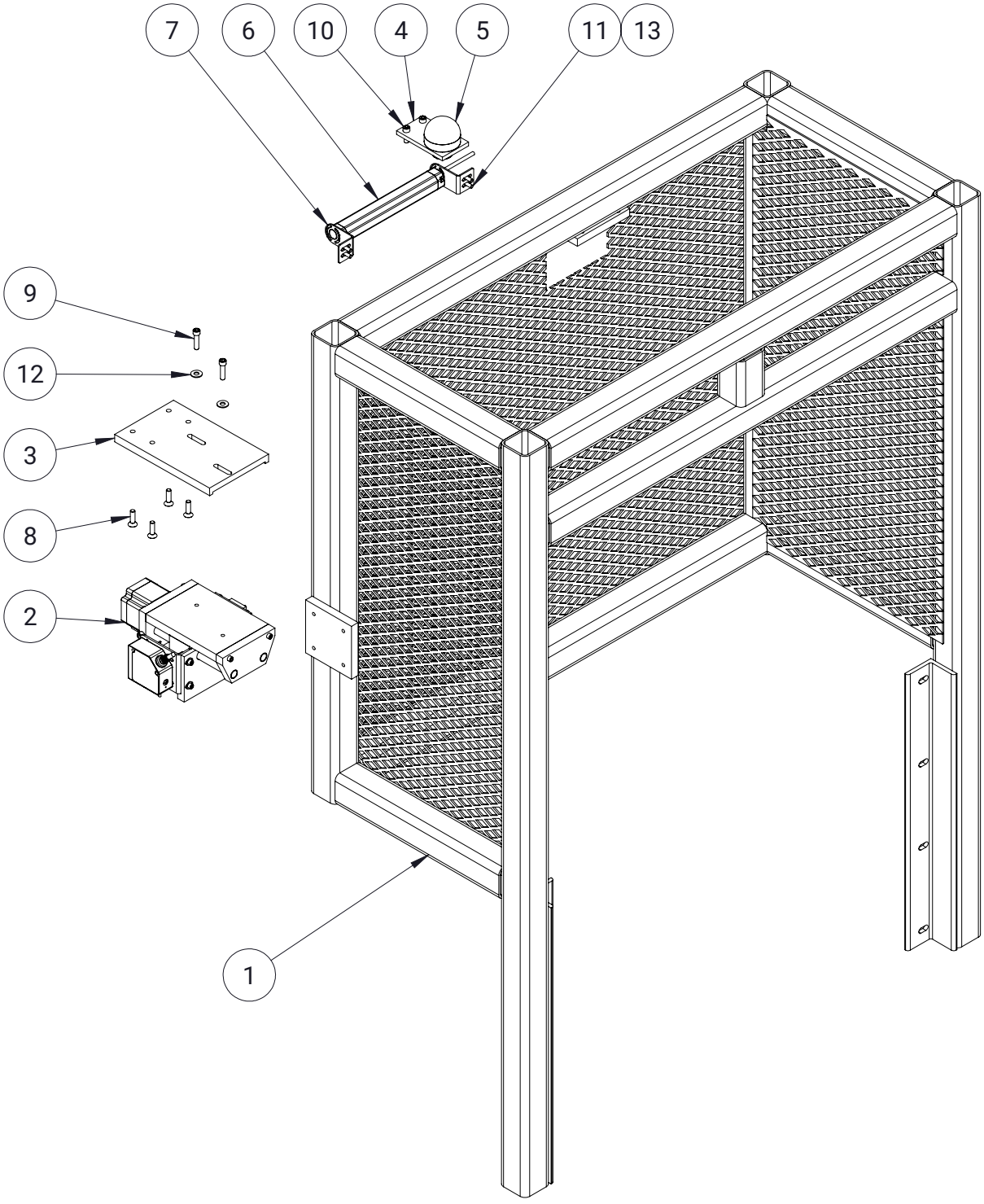
Item No.	Part Number	Qty.	Description
1	20-AIR-412	2	Flow Control Valve, 1/8 NPT x 1/4 T
2	20-AIR-416	2	1/4 T x 1/4 P Male Elbow
3	20-AIR-433	2	1/8 FNPT X 1/4 MNPT Reducer Bushing
4	AIR-541	2	2 Position Air Valve
5	AIR-546	4	1/4" NPT Silencer
6	20-AIR-573	2	Male Elbow, 1/4" NPT - 3/8" Tube
7	PLC-339	2	11mm DIN to M12 Male Cable, 1m
8	FAS-D08	4	RSLMS, 8-32 X 1.500 LG.

8. Assembly and Shop-Gruv Parts List

8.10 Tower Assembly (GAS-09)

8.10.1 Main Assembly (GAS-09)

Schematic



8. Assembly and Shop-Gruv Parts List

8.10 Tower Assembly (GAS-09)

8.10.1 Main Assembly (GAS-09)

Parts List

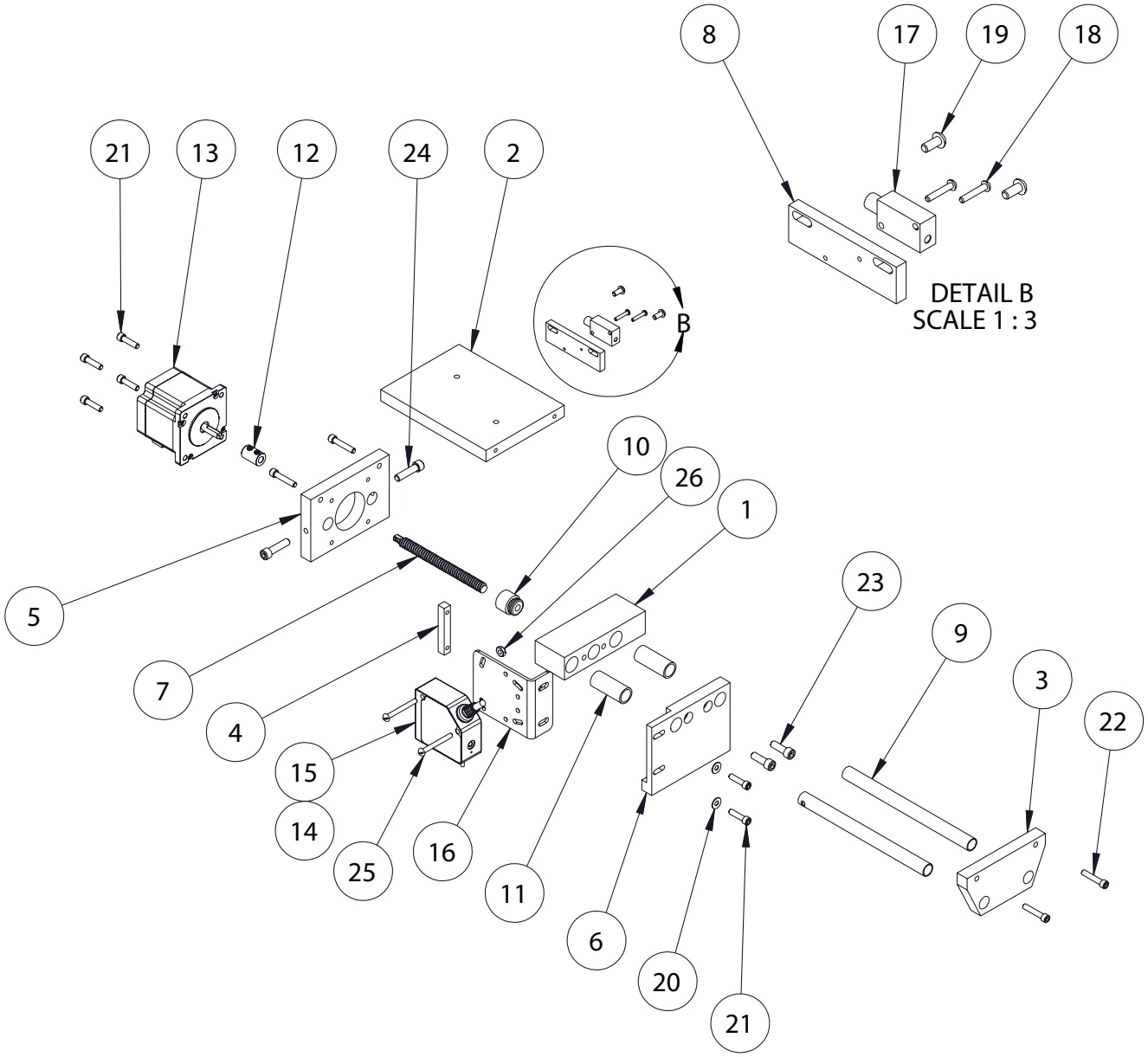
Tower Assembly (GAS-09) Parts List

Item No.	Part Number	Qty.	Description
1	GAS-0901	1	Pipe Sensor Weldment
2	GAS-0902	1	Sensor Shuttle Assembly
3	GMP-083	1	Shuttle Mount Plate
4	GMP-125	1	Modified $^{1}/_{4}$-20 x $^{5}/_{8}$" Lg. BHSHCS
5	PLC-341	1	LED Indicator Light
6	PLC-354	1	LED Work Light
7	MSC-659	1	Work Light Brackets
8	FAS-F05	4	FHSHCS $^{1}/_{4}$-20 x 0.750 x 0.750 - Black Oxide
9	FAS-F25	2	SHCS $^{1}/_{4}$-20 X 1.000 X 1.000 - Black Oxide
10	FAS-F24	2	SHCS $^{1}/_{4}$-20 X 0.750 X 0.750 - Black Oxide
11	FAS-E16	4	SHCS 10-24 X 0.500 X 0.500 - Black Oxide
12	FAS-F38	2	$^{1}/_{4}$" Flat Washer, Zn
13	FAS-E30	4	#10 Flat Washer, Zn

8. Assembly and Shop-Gruv Parts List

8.10.2 Sensor Shuttle Assembly (GAS-0902)

Schematic



8. Assembly and Shop-Gruv Parts List

8.10.2 Sensor Shuttle Assembly (GAS-0902)

Parts List

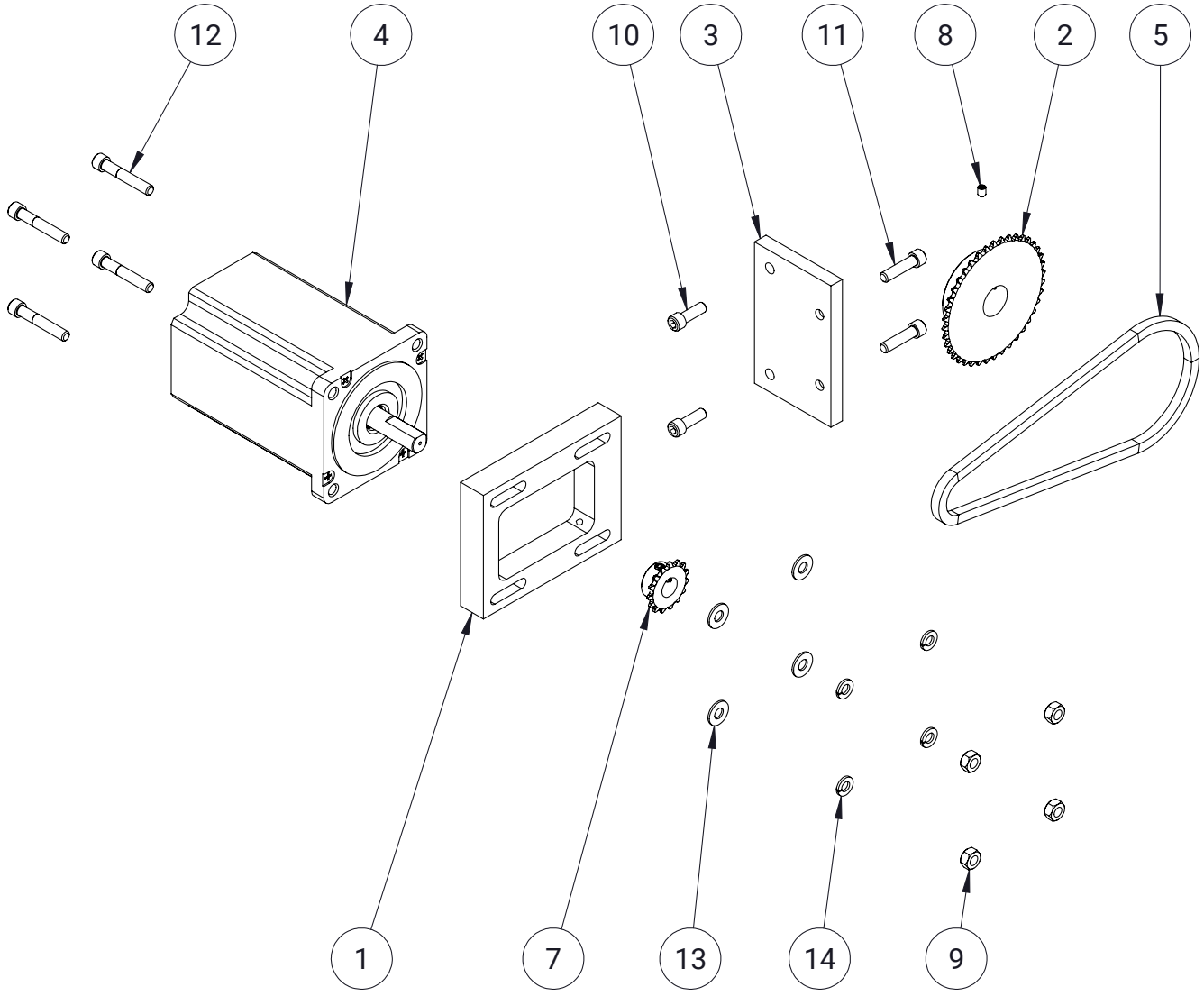
Sensor Shuttle Assembly (GAS-0902) Parts List

Item No.	Part Number	Qty.	Description
1	GMP-010	1	Slide Block
2	GMP-012	1	Top Mount Plate
3	GMP-016	1	End Plate
4	GMP-025	1	Bolt Block
5	GMP-027	1	Motor Mount Plate
6	GMP-029	1	Sensor Bracket Mount Plate
7	GMP-037	1	Lead Screw
8	GMP-082	1	Proximity Switch Mount Plate
9	20-BMP-6508	2	SLIDE ROD
10	20-BRG-939A	1	3/8-10 ACME Bronze Nut
11	BRG-1048	2	Oil Embedded Sleeve Bearing
12	BRG-1049	1	Shaft Coupling
13	20-MTR-120	1	Stepper Motor
14	PLC-342	1	5M Sensor Double Ended Cordset
15	SWT-0099	1	Laser Displacement Sensor, 1m
16	SWT-0101	1	LE Mounting Bracket
17	20-SWT-0102	1	Proximity Switch
18	FAS-B03	2	RSLMS, 4-40 X 0.625 LG.
19	FAS-D03	2	RSLMS, 8-32 X 0.375 LG.
20	FAS-D16	2	#8 Flat Washer, Zn
21	FAS-E18	6	SHCS 10-24 X 0.750 X 0.750 - Black Oxide
22	FAS-E26	4	SHCS 10-24 X 1.000 X 1.000 - Black Oxide
23	FAS-F24	2	SHCS 1/4-20 X 0.750 X 0.750 - Black Oxide
24	FAS-F25	2	SHCS 1/4-20 X 1.000 X 1.000 - Black Oxide
25	FAS-D08	2	RSLMS, 8-32 X 1.500 LG.
26	FAS-D15	2	8-32 Hex Nut, ZN

8. Assembly and Shop–Gruv Parts List

8.11 Spindle Rotation Assembly (GAS–10)

Schematic



8. Assembly and Shop-Gruv Parts List

8.11 Spindle Rotation Assembly (GAS-10)

Parts List

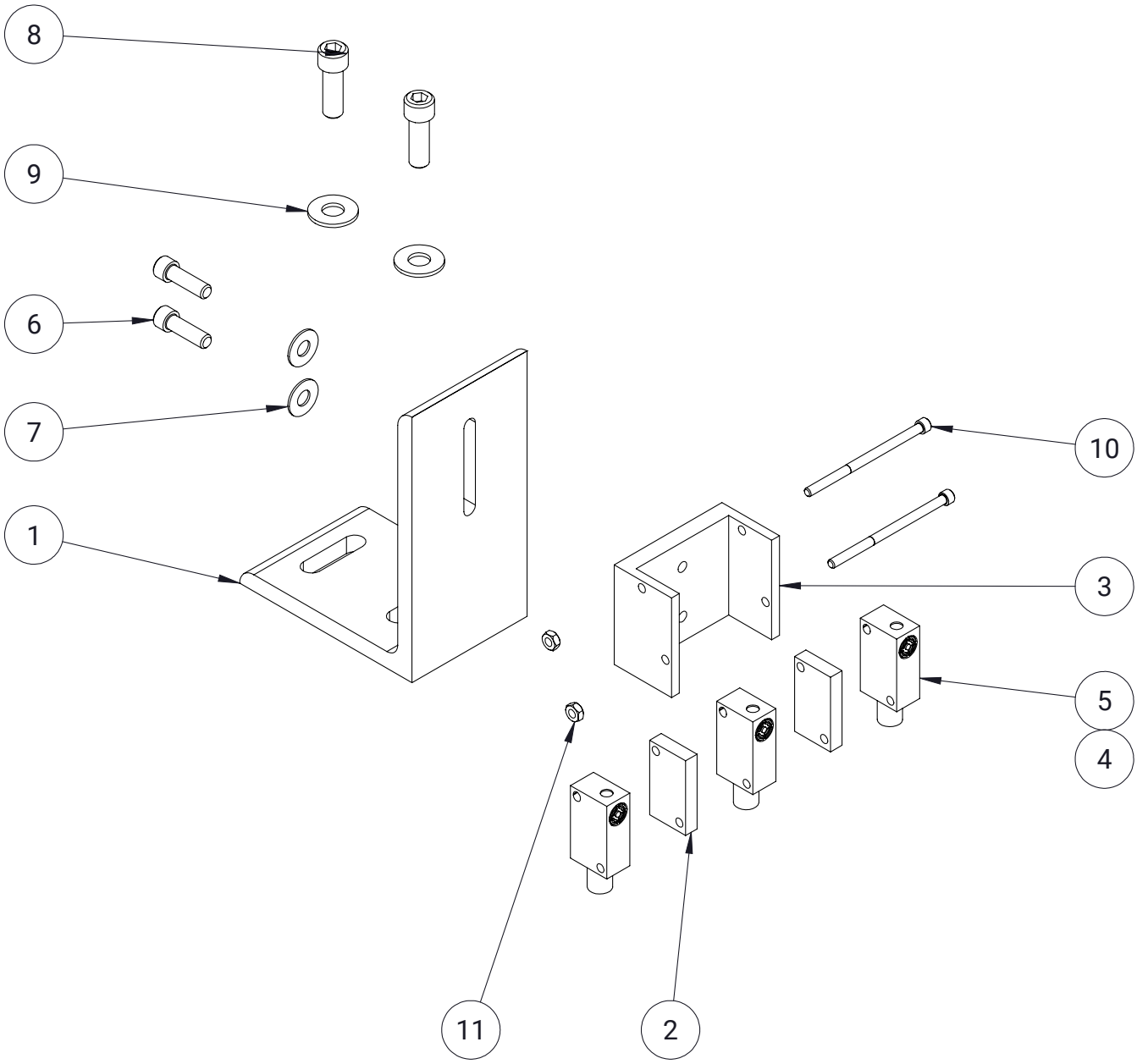
Spindle Rotation Assembly (GAS-10) Parts List

Item No.	Part Number	Qty.	Description
1	GMP-030	1	Stepper Motor Mount
2	GMP-078	1	Shaft Sprocket
3	GMP-087	1	Mount Plate
4	MTR-135	1	High Torque Stepper Motor
5	PLY-310 - 19	1	#25 Roller Chain, 19" Long
6	20-PLY-311	1	#25 Master Link
7	PLY-538	1	Finished-Bore Sprocket #25 Chain
8	20-FAS-E27	2	SHSS #10-24 X 0.250 LG.
9	FAS-F18	4	1/4-20 Hex Nut, YZN, GR8
10	FAS-F24	2	SHCS 1/4-20 X 0.750 X 0.750 - Black Oxide
11	FAS-F25	2	SHCS 1/4-20 X 1.000 X 1.000 - Black Oxide
12	FAS-F27	4	SHCS 1/4-20 X 1.500 X 1.000 - Black Oxide
13	FAS-F38	4	1/4" Flat Washer, Zn
14	FAS-F40	4	1/4" Split Lock Washer, Zn

8. Assembly and Shop-Gruv Parts List

8.12 Spindle Position Assembly (GAS-11)

Schematic



8. Assembly and Shop-Gruv Parts List

8.12 Spindle Position Assembly (GAS-11)

Parts List

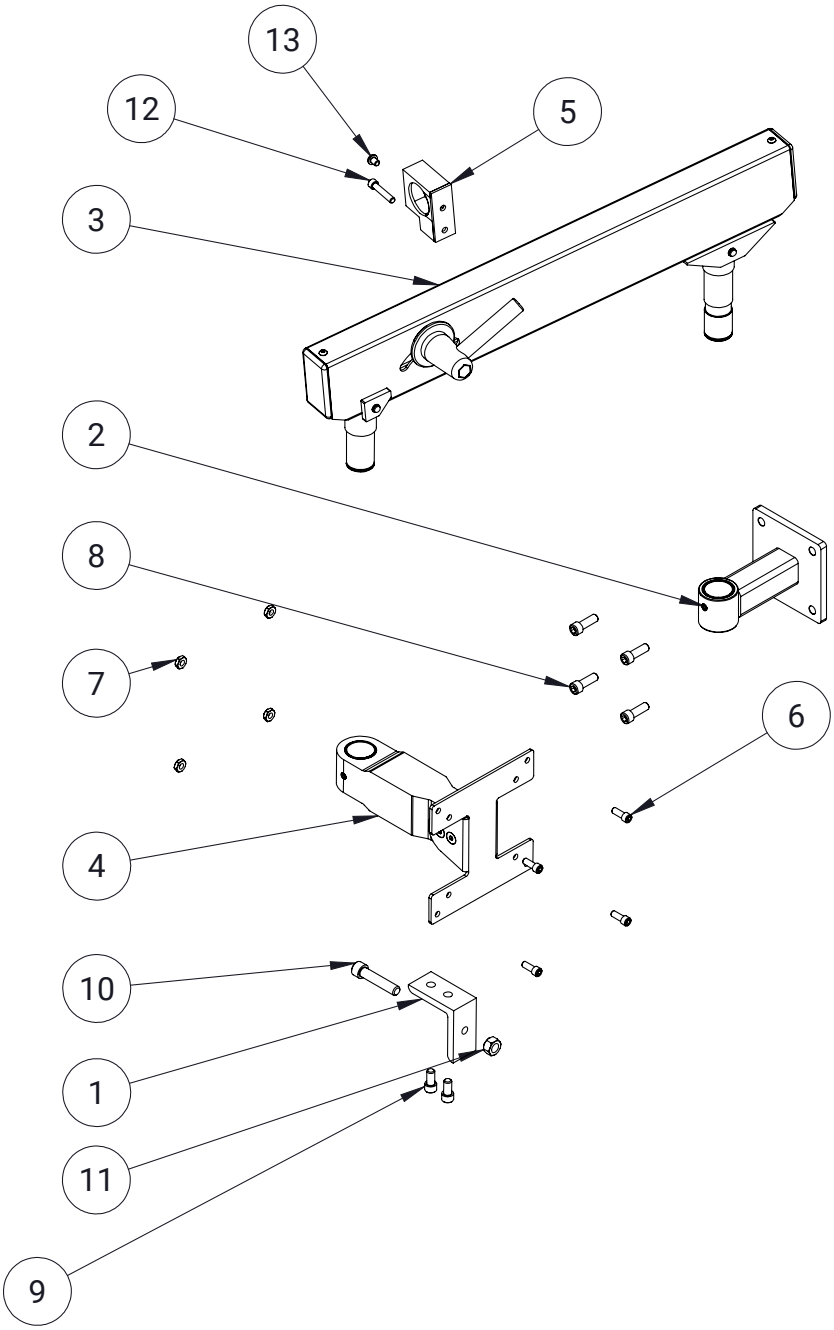
Spindle Position Assembly (GAS-11) Parts List

Item No.	Part Number	Qty.	Description
1	GMP-080	1	Switch Mount Angle
2	GMP-081	2	Switch Spacer
3	WMP-1110	1	Switch Mount
4	PLC-331	3	5M Double Ended Cordset
5	SWT-0102	3	Proximity Switch
6	FAS-E17	2	SHCS 10-24 X 0.625 X 0.625 - Black Oxide
7	FAS-E30	2	#10 Flat Washer, Zn
8	FAS-F24	2	SHCS 1/4-20 X 0.750 X 0.750 - Black Oxide
9	FAS-F38	2	1/4" Flat Washer, Zn
10	FAS-P01	2	SHCS M3-0.5 X 50 X 18 - Black Oxide
11	FAS-P02	2	M3-0.5 Hex Nut, Plain

8. Assembly and Shop-Gruv Parts List

8.13 Swing Arm Assembly (GAS-12)

Schematic



8. Assembly and Shop-Gruv Parts List

8.13 Swing Arm Assembly (GAS-12)

Parts List

Swing Arm Assembly (GAS-12) Parts List

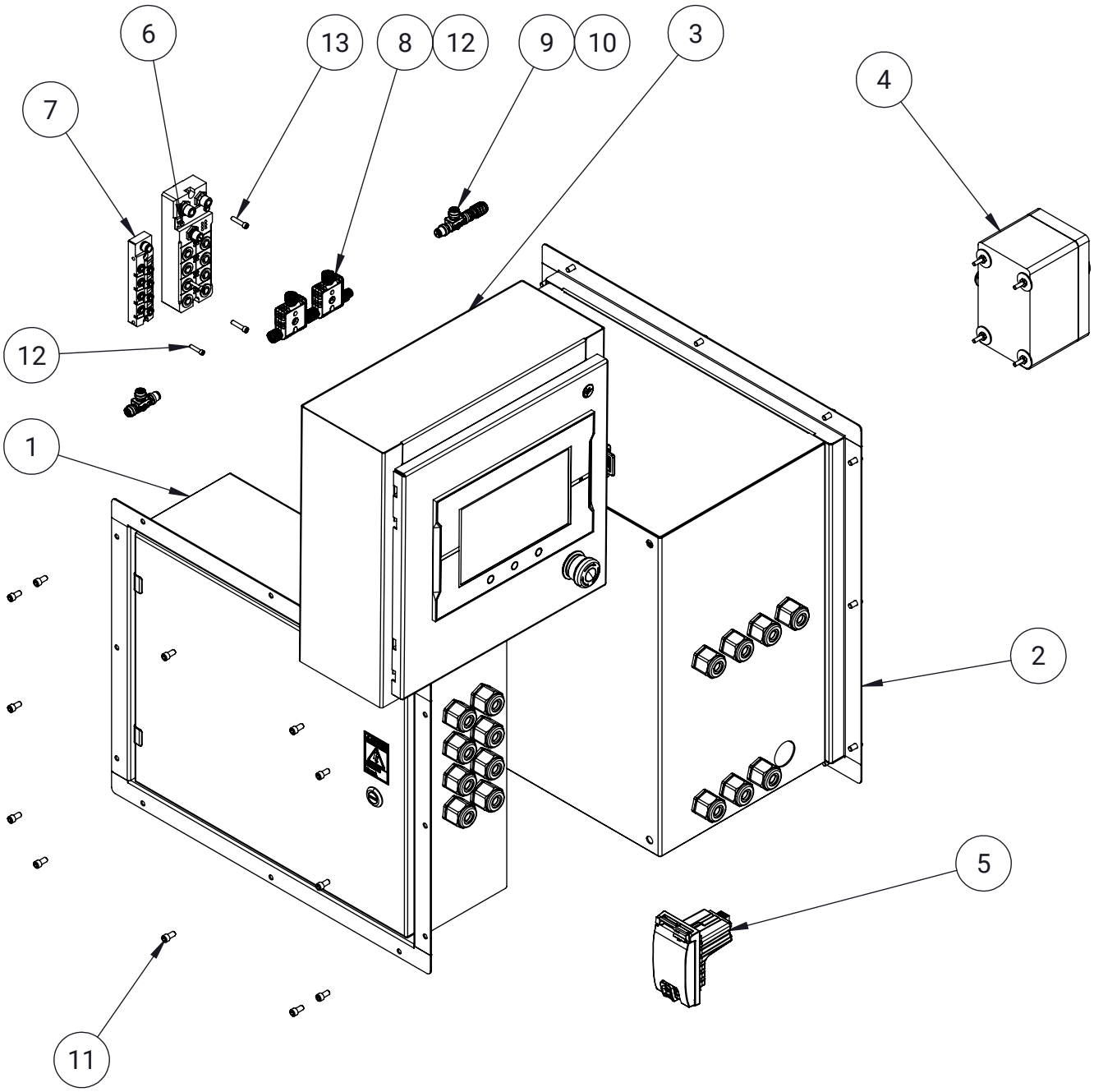
Item No.	Part Number	Qty.	Description
1	GMP-140	1	Swing Arm Angle Bracket
2	EPP-0443	1	Mounting Plate Arm End
3	EPP-0444	1	Positioning Arm Connector
4	EPP-0445	1	Monitor Mounting Arm End
5	20-EPP-0365	1	3/4" Conduit Snap Strap
6	FAS-E16	4	SHCS 10-24 X 0.500 X 0.500 - Black Oxide
7	FAS-E23	4	10-24 Hex Nut, ZN
8	FAS-F24	4	SHCS 1/4-20 X 0.750 X 0.750 - Black Oxide
9	FAS-F23	2	SHCS 1/4-20 X 0.500 X 0.500 - Black Oxide
10	FAS-G11	1	SHCS 5/16-18 X 1.500 X 1.500 - Black Oxide
11	FAS-G19	1	5/16-18 Hex Nut, YZN, GR8
12	FAS-E26	1	SHCS 10-24 X 1.000 X 1.000 - Black Oxide
13	20-FAS-E01	1	BHSHCS 10-24 x 0.250 x 0.250 - Black Oxide

8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.1 Main Assembly (GAS-13)

Schematic



8. Assembly and Shop-Gruv Parts List

8.14.1 Main Assembly (GAS-13) Schematic

Parts List

Electrical Assembly (GAS-13) Parts List

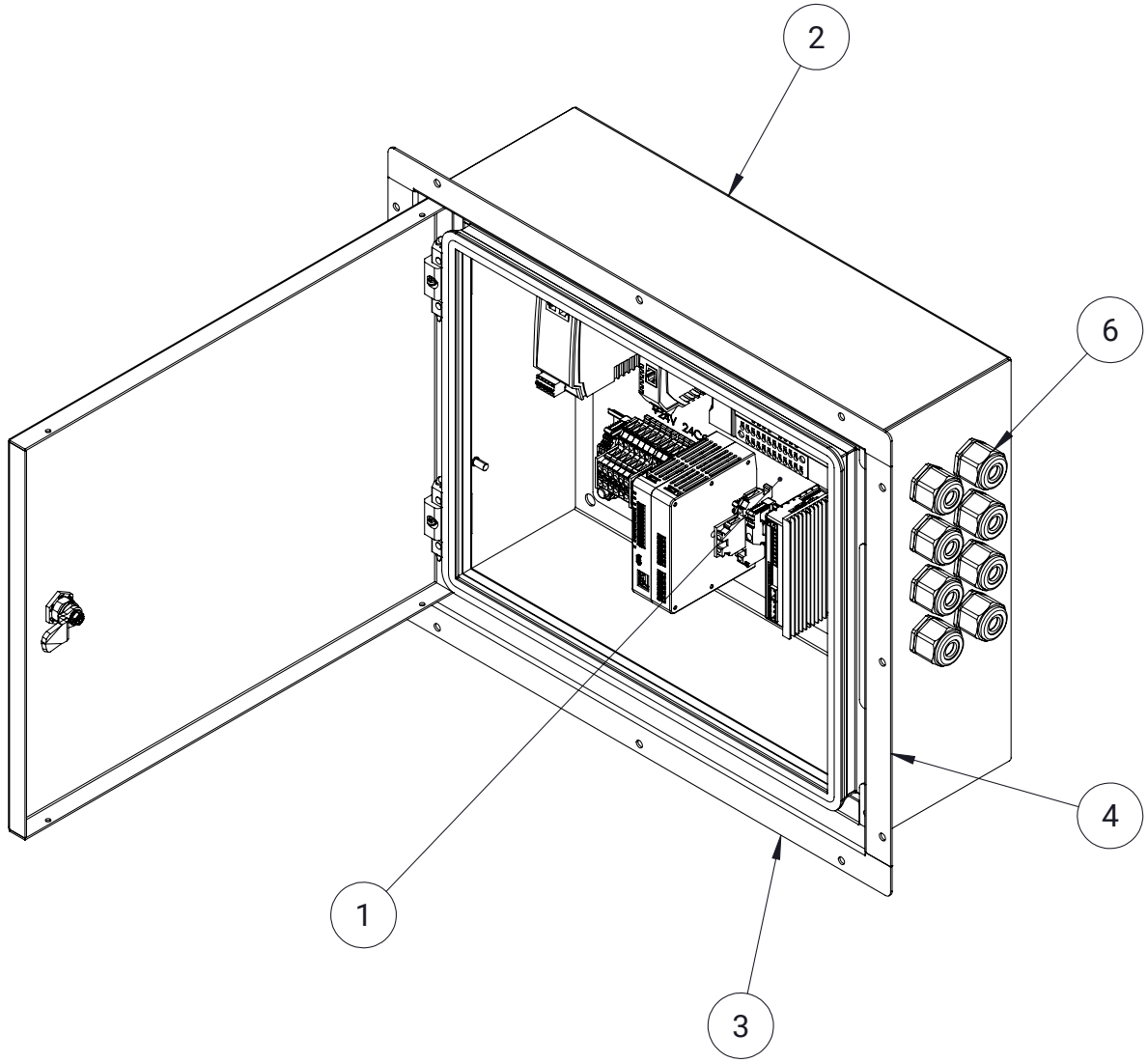
Item No.	Part Number	Qty.	Description
1	GAS-1301	1	Control Cabinet Assembly
2	GAS-1302	1	Power Cabinet Assembly
3	GAS-1303	1	HMI Assembly
4	GAS-1306	1	Emergency Stop Button Assembly
5	EPP-0442	1	NAP Standard Part File
6	PLC-325	1	IO Link Master
7	PLC-326	1	IO Link Discrete Input Module
8	PLC-347	2	ISD Connect
9	PLC-348	2	RFID T-Adapter
10	PLC-349	1	M12 Termination Plug
11	FAS-F23	24	SHCS $^{1}/_{4}$-20 X 0.500 X 0.500 - Black Oxide
12	FAS-D10	6	SHCS 8-32 X 0.750 X 0.750 - Black Oxide
13	FAS-E22	2	SHCS 10-32 x 0.875 - Black Oxide

8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.2 Control Cabinet Assembly (GAS-1301)

Schematic



8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.2 Control Cabinet Assembly (GAS-1301) Schematic

Parts List

Electrical Assembly (GAS-13) Parts List

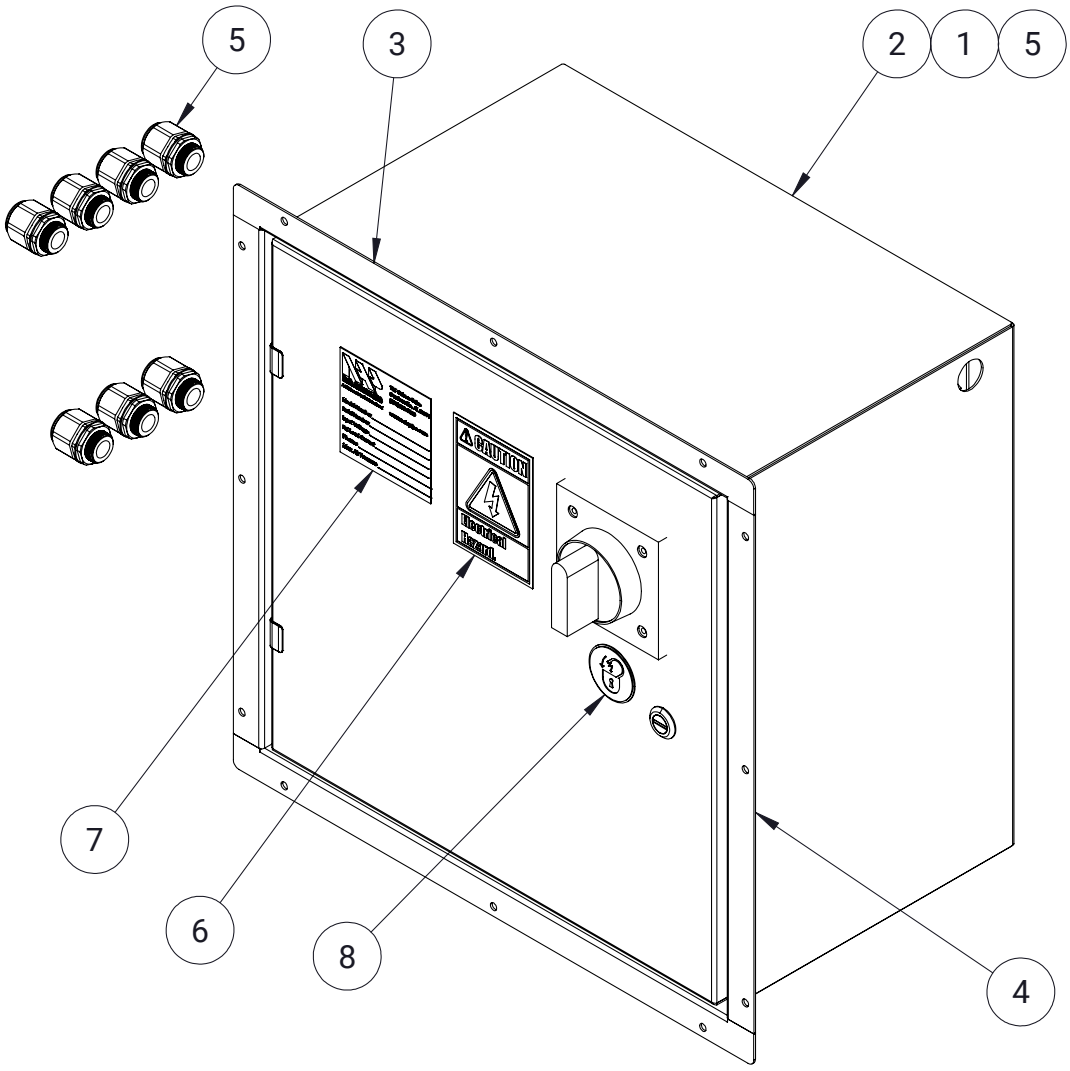
Item No.	Part Number	Qty.	Description
1	GAS-1304	1	Control Subpanel Assembly
2	EPP-0435	1	Electrical Enclosure 16H x 20W x 6D
3	EPP-0437	1	Flush Mount Brackets, 20" Wide
4	EPP-0438	1	Flush Mount Brackets, 16" High
5	20-EPP-0257	1	ELECTRICAL HAZARD LABEL, SMALL
6	20-EPP-0329	8	3/4" Cord Grip Connector

8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.3 Power Cabinet Assembly (GAS-1302)

Schematic



8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.3 Power Cabinet Assembly (GAS-1302)

Parts List

Power Cabinet Assembly (GAS-1302) Parts List

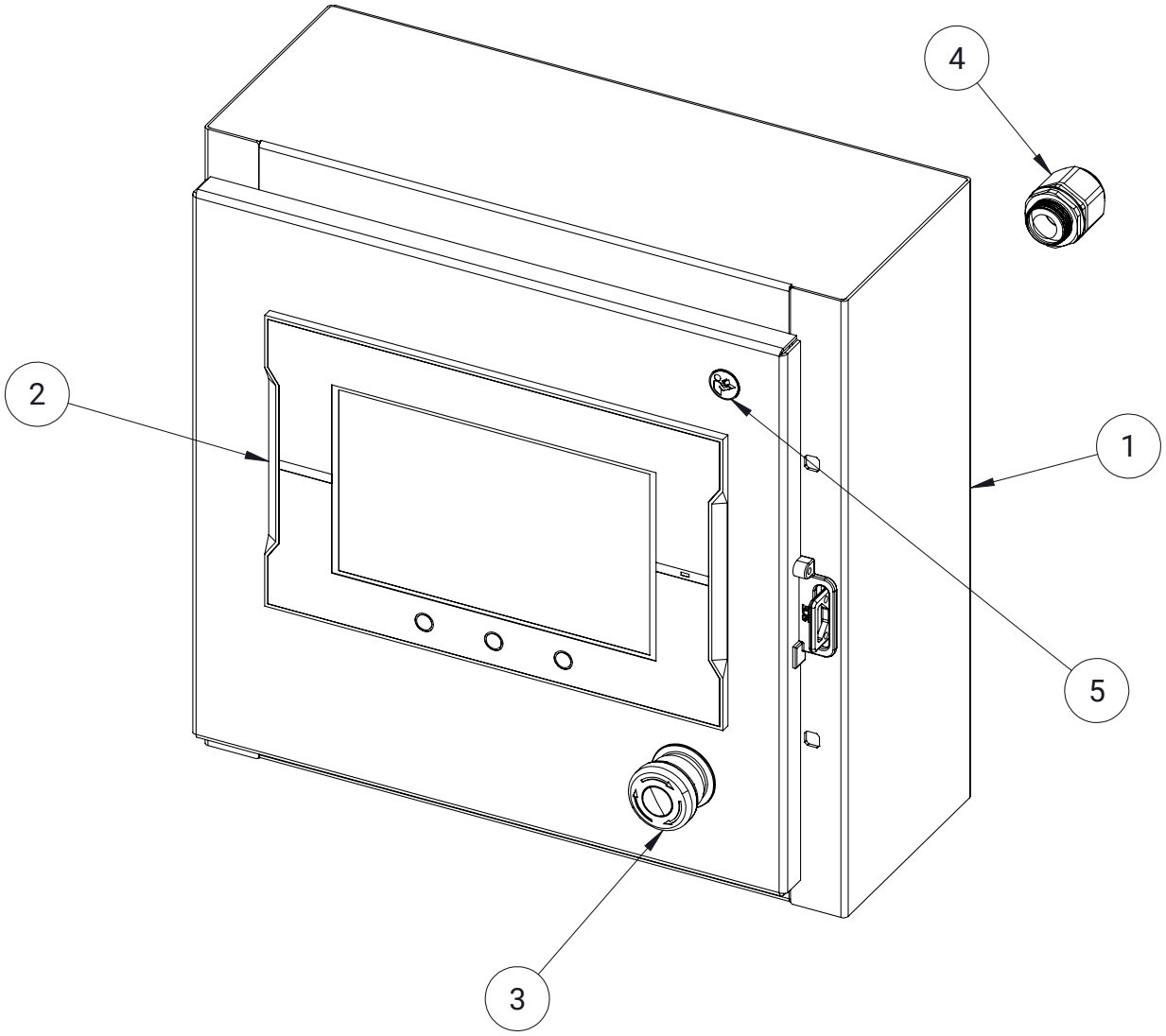
Item No.	Part Number	Qty.	Description
1	GAS-1305	1	Power Subpanel Assembly
2	EPP-0439	1	Electrical Enclosure 20H x 20W x 12D
3	EPP-0437	1	Flush Mount Brackets, 20" Wide
4	EPP-0440	1	Flush Mount Brackets, 20" High
5	20-EPP-0329	9	3/4" Cord Grip Connector
6	20-EPP-0258	1	Electrical Hazard Label
7	20-MSC-512A	1	Serial Plate, New Sticker Style
8	20-SWT-IS6011-PB	1	ISO Symbol - Lock Out

8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.4 HMI Assembly (GAS-1303)

Schematic



8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.4 HMI Assembly (GAS-1303)

Parts List

8.14.4 HMI Assembly (GAS-1303)

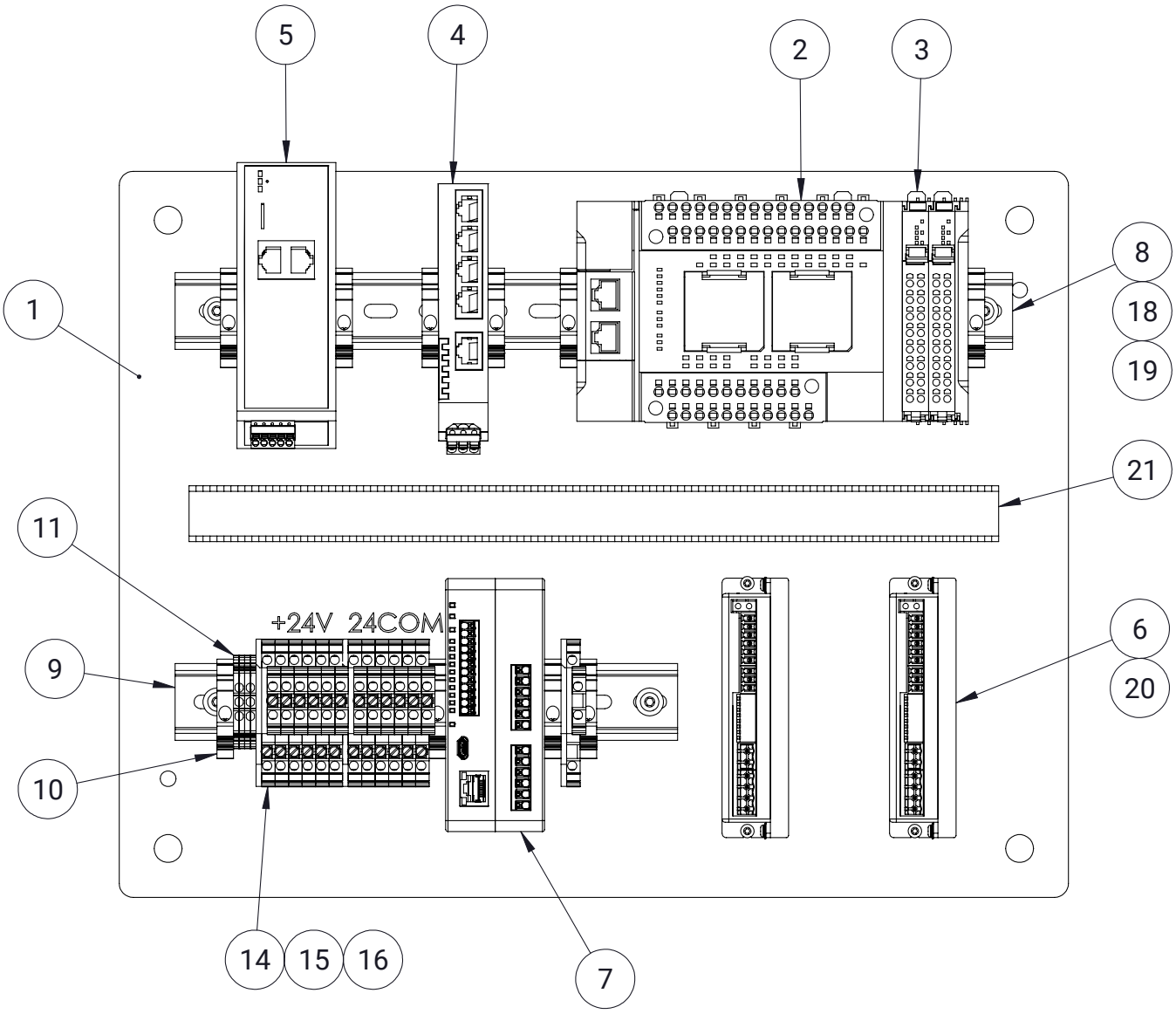
Item No.	Part Number	Qty.	Description
1	20-EPP-0398	1	16x16x6 Enclosure
2	20-PLC-303	1	HMI NA series 9"
3	PLC-344	1	E-Stop Push Button 2NC
4	20-EPP-0329	1	$^{3}/_{4}$" Cord Grip Connector
5	SWT-IS6126-PD	1	Consult Operator's Manual Label

8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.5 Control Subpanel Assembly (GAS-1304)

Schematic



8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.5 Control Subpanel Assembly (GAS-1304)

Parts List

Control Cabinet Subpanel Assembly (GAS-1304) Parts List

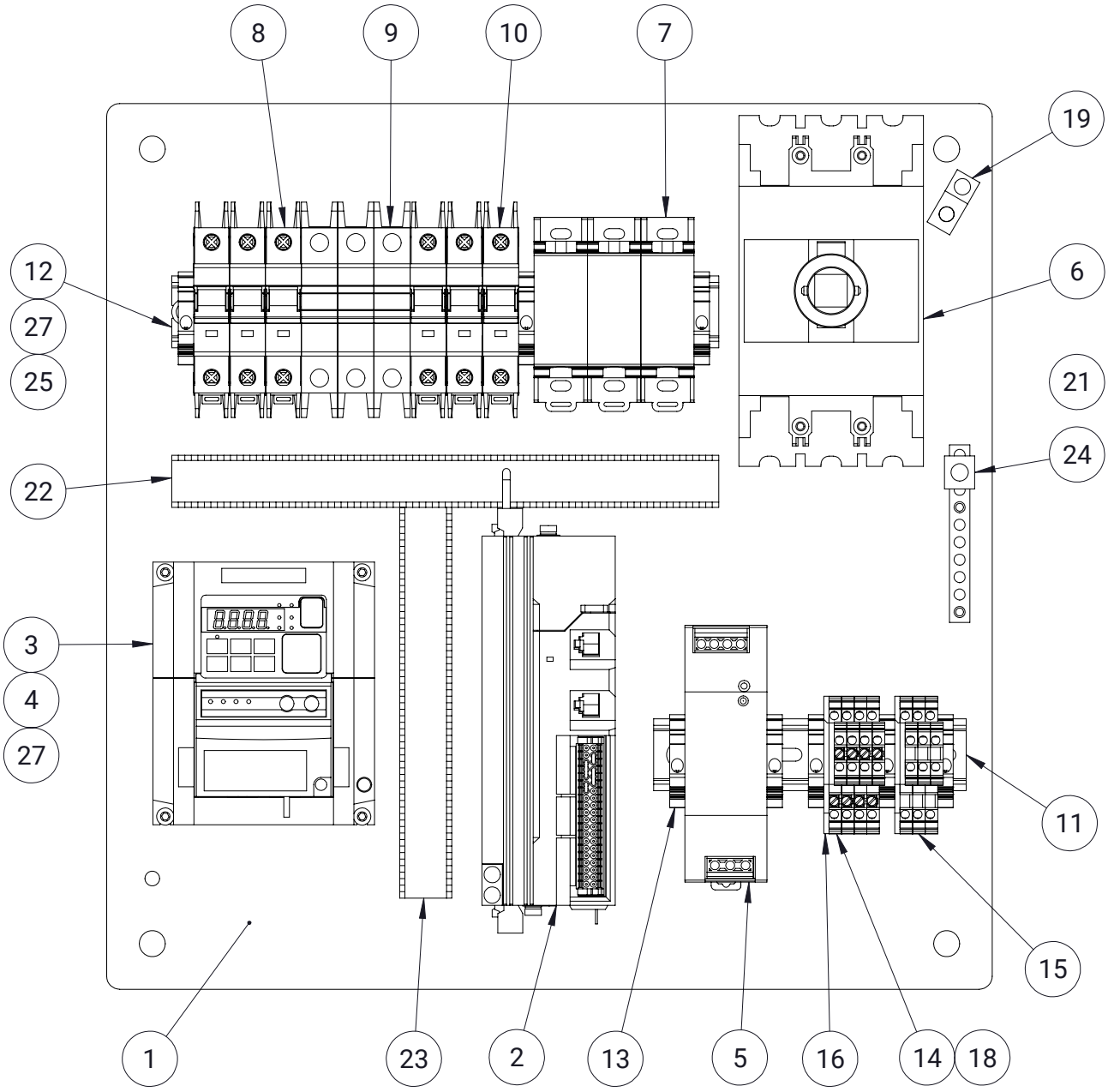
Item No.	Part Number	Qty.	Description
1	EPP-0436	1	Electrical Subpanel, 20" x 16"
2	PLC-317	1	NX1P CPU, 40IO, 4 Axis
3	PLC-319	2	Pulse Output Unit, Open Collector Output
4	PLC-302	1	Ethernet Switch, 5 port
5	PLC-320	1	VPN Gateway, TC Cloud Client
6	20-DRV-185	2	Microstepping Stepper Drive
7	PLC-343	1	Safety Controller
8	20-PLC-210	1	DIN Rail 35mm - 15Inch
9	20-PLC-210	1	DIN Rail 35mm - 9Inch
10	20-PLC-209	9	Wei End Section
11	20-PLC-255	2	Ground Terminal Block
12	20-PLC-307	3	Ethernet Patch Cable, 1m , Yel
13	PLC-323	1	Ethernet Cable, 15ft
14	20-PLC-237	6	MO Double Terminal Block, Grey
15	20-PLC-238	2	MO Double Terminal Block End Plate
16	20-PLC-237-BLUE	6	Double Terminal Block, Blue
17	20-EPP-0309	4	Terminal Block Jumpers, 6
18	20-EPP-0311	1	Cable Tray 1" Wide x 2" High - 14.5inch
19	FAS-E02	4	BHSHCS 10-24 x 0.500 x 0.500 - Black Oxide
20	FAS-E30	4	#10 Flat Washer, Zn
21	FAS-C02	4	BHSHCS 6-32 x 0.625 x 0.625 - Black Oxide

8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.5 Power Subpanel Assembly (GAS-1305)

Schematic



8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.5 Power Subpanel Assembly (GAS-1305)

Parts List

Power Subpanel Assembly (GAS-1305) Parts List

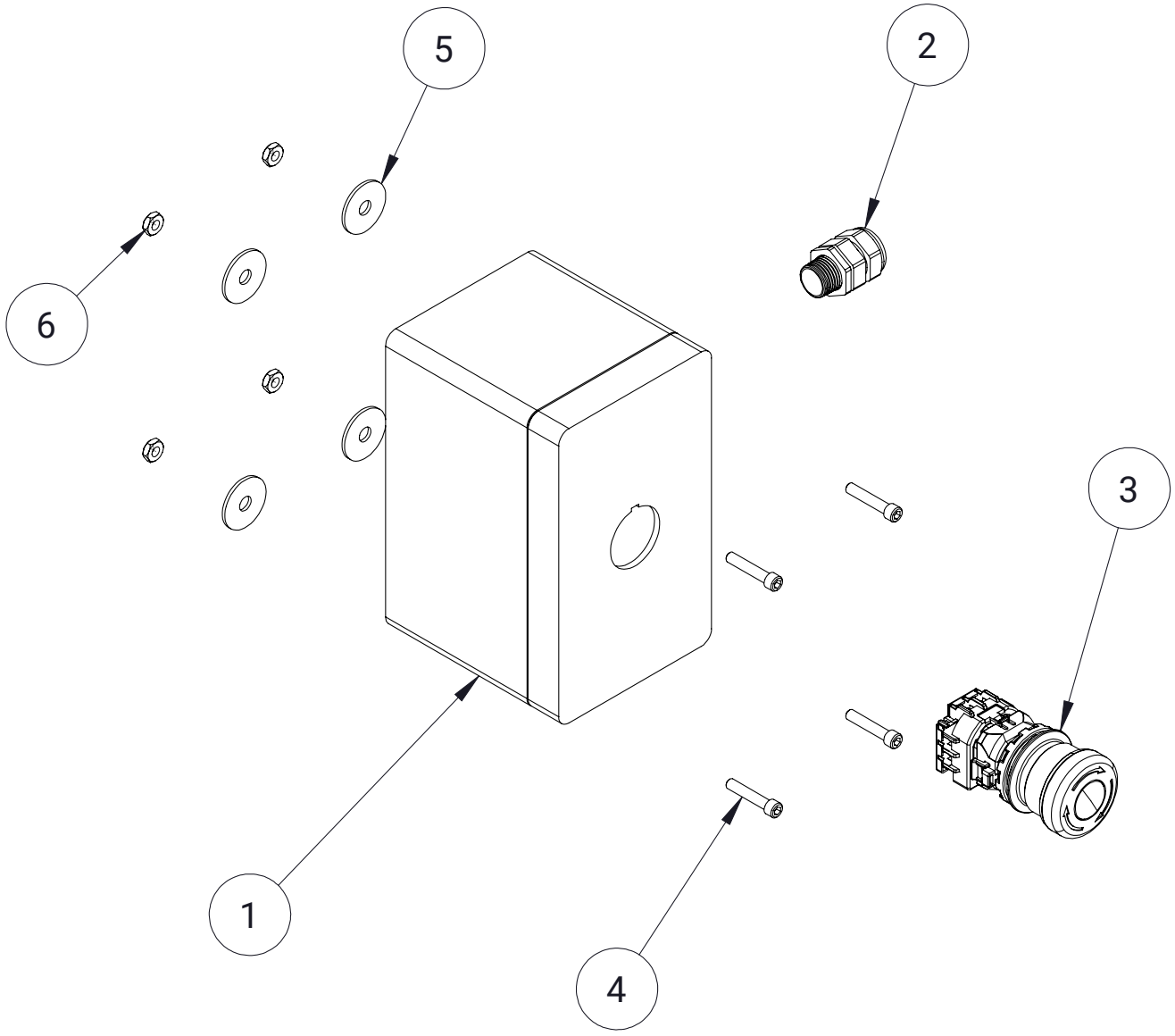
Item No.	Part Number	Qty.	Description
1	EPP-0441	1	Electrical Subpanel, 20H x 20W
2	DRV-203	1	Servo Drive, 1S series, 800 W, 240V 3-phase
3	DRV-204	1	AC VFD, 240V 3-phase, 2 HP, 1.5 kW
4	DRV-205	1	EtherCAT Communication Module
5	20-PLC-265	1	Power Supply, 24V, 5A
6	20-PLC-298	1	MCCB, 3P, 20A
7	20-PLC-289	3	Distribution Block 175A, 1-In, 4-Out
8	20-PLC-285	3	Circuit Breaker, 1P, 3A
9	20-PLC-288	1	Circuit Breaker, 3P 15A
10	PLC-322	1	Circuit Breaker, 3P, 16A
11	20-PLC-210	1	DIN Rail 35mm - 6Inch
12	20-PLC-210	1	DIN Rail 35mm - 10.5Inch
13	20-PLC-209	8	Wei End Section
14	20-PLC-237	4	MO Double Terminal Block, Grey
15	20-PLC-237-BLUE	3	Double Terminal Block, Blue
16	20-PLC-238	2	MO Double Terminal Block End Plate
17	20-PLC-304	1	EtherCAT Cable, 0.5m, 18 inch
18	20-EPP-0309	4	Terminal Block Jumpers, 2
19	20-EPP-0164	1	Cable Lug
20	20-EPP-0276	1	ROTARY HANDLE
21	20-EPP-0396	1	Shaft for BW9V0CA Rotary Handle, 24"
22	20-EPP-0311	1	Cable Tray 1" Wide x 2" High - 10.5inch
23	20-EPP-0311	1	Cable Tray 1" Wide x 2" High - 7.5inch
24	EPP-0447	1	Ground Bar
25	FAS-E30	5	#10 Flat Washer, Zn
26	FAS-D22	4	BHSHCS 8-32 x 0.500 x 0.500 - Black Oxide
27	FAS-E02	7	BHSHCS 10-24 x 0.500 x 0.500 - Black Oxide

8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.6 E-Stop Button Assembly (GAS-1306)

Schematic



8. Assembly and Shop-Gruv Parts List

8.14 Electrical Assembly (GAS-13)

8.14.6 E-Stop Button Assembly (GAS-1306)

Schematic

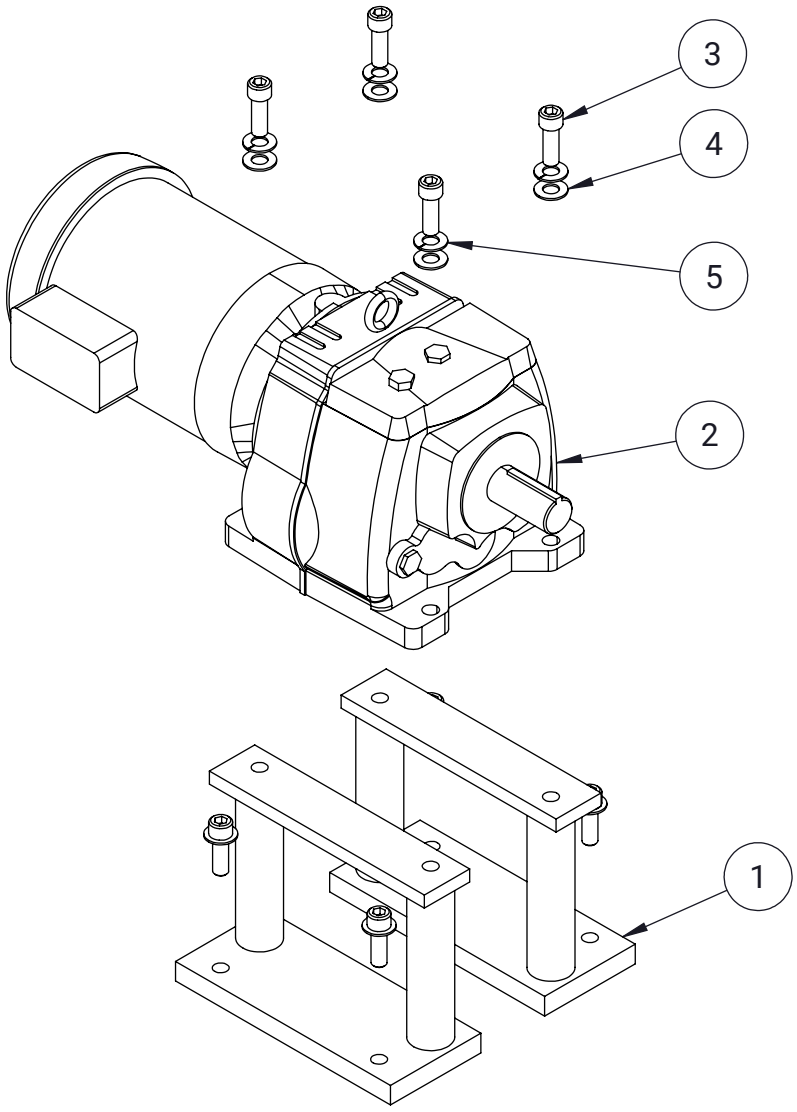
E-Stop Button Assembly (GAS-1306) Part List

Item No.	Part Number	Qty.	Description
1	20-EPP-0179	1	L&T SWITCH BOX
2	20-EPP-0135	1	SMALL STRAIN RELIEF, 1/2" NPT, .39"-.56" Dia Cord
3	PLC-344	1	E-Stop Push Button 2NC
4	FAS-E26	4	SHCS 10-24 X 1.000 X 1.000 - Black Oxide
5	FAS-F59	4	1/4" Flat Washer, Zn
6	FAS-E23	4	10-24 Hex Nut, ZN

8. Assembly and Shop-Gruv Parts List

8.15 Rotation Motor Assembly (GAS-14)

Schematic



8. Assembly and Shop-Gruv Parts List

8.15 Rotation Motor Assembly (GAS-14)

Parts List

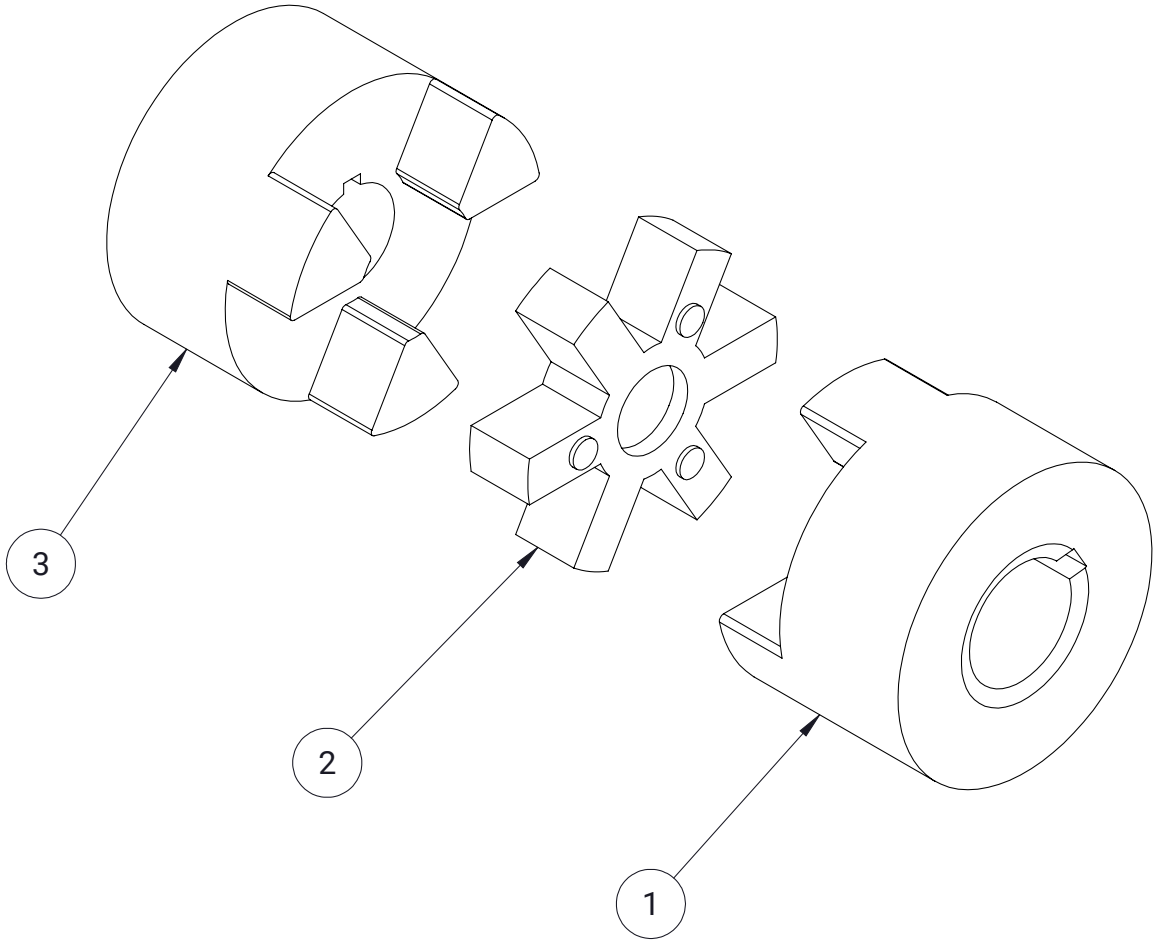
Rotation Motor Assembly (GAS-14) Part List

Item No.	Part Number	Qty.	Description
1	GAS-1401	2	Motor Support Weldment
2	MTR-134	1	Browning Series 3000 Motor-Gearbox
3	FAS-I31	8	SHCS ½-20 X 1.500 X 1.500 - Black Oxide
4	FAS-I22	8	½" Flat Washer, Zn
5	FAS-I23	4	½" Split Lock Washer, Zn

8. Assembly and Shop-Gruv Parts List

8.16 Shaft Coupling Assembly (GAS-15)

Schematic



8. Assembly and Shop-Gruv Parts List

8.16 Shaft Coupling Assembly (GAS-15)

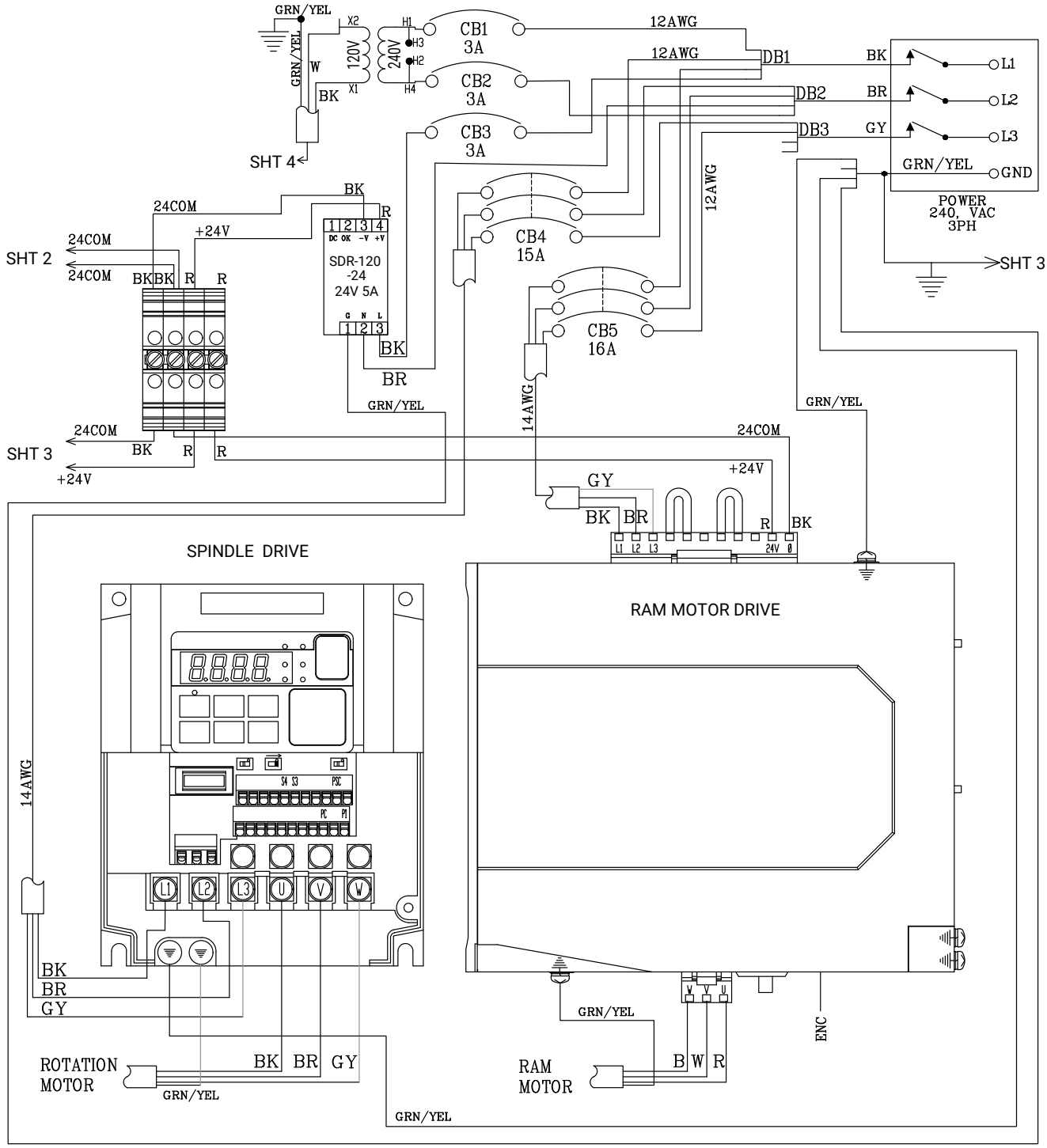
Parts List

Shaft Coupling Assembly (GAS-15) Parts List

Item No.	Part Number	Qty.	Description
1	GL-11171	1	Shaft Coupling Modified
2	Gl-11173	1	Hytrel Spider
3	GL-11172	1	Shaft Coupling Body Unmodified

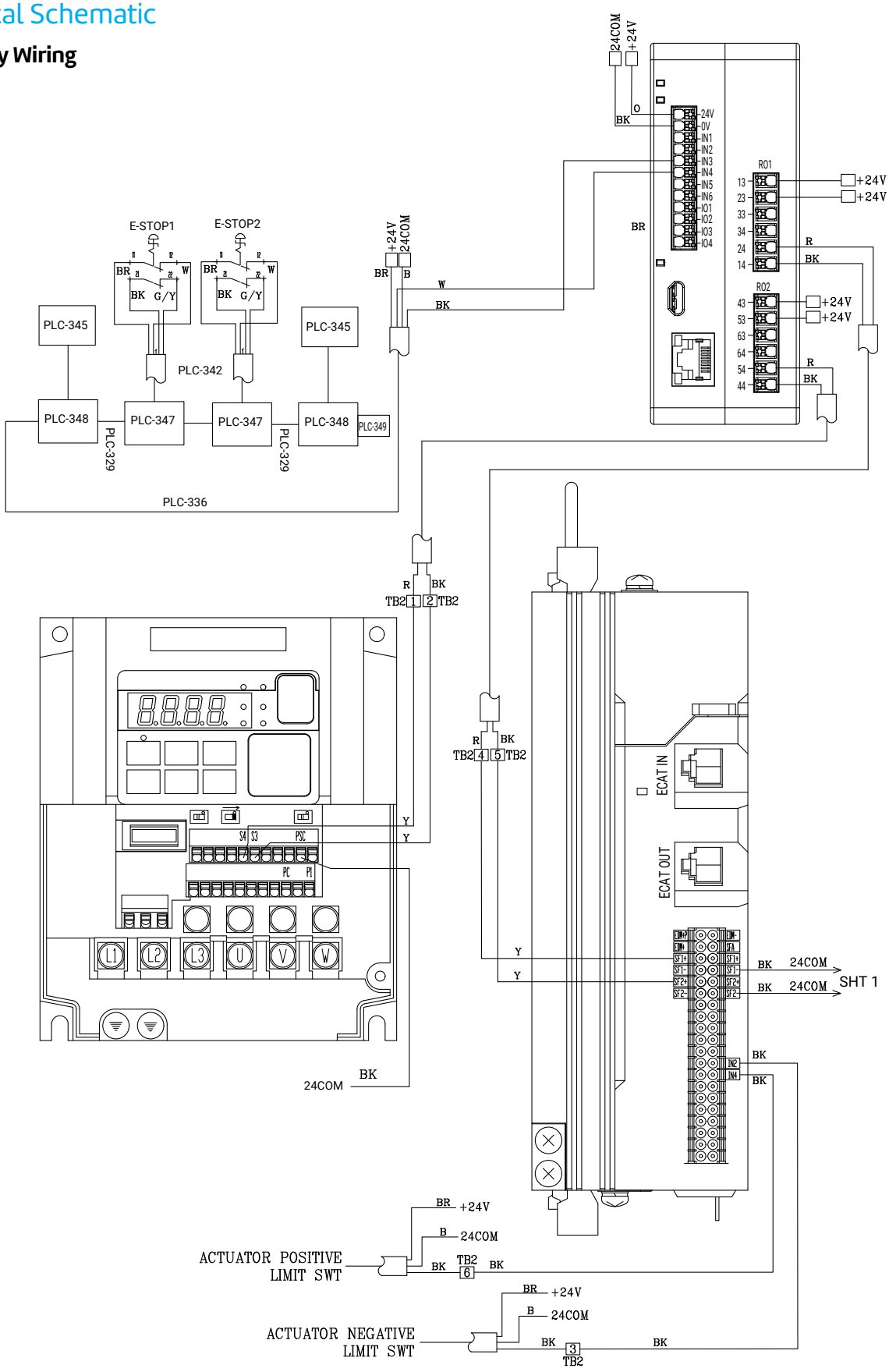
9. Electrical Schematic

9.1 Power Circuit Wiring



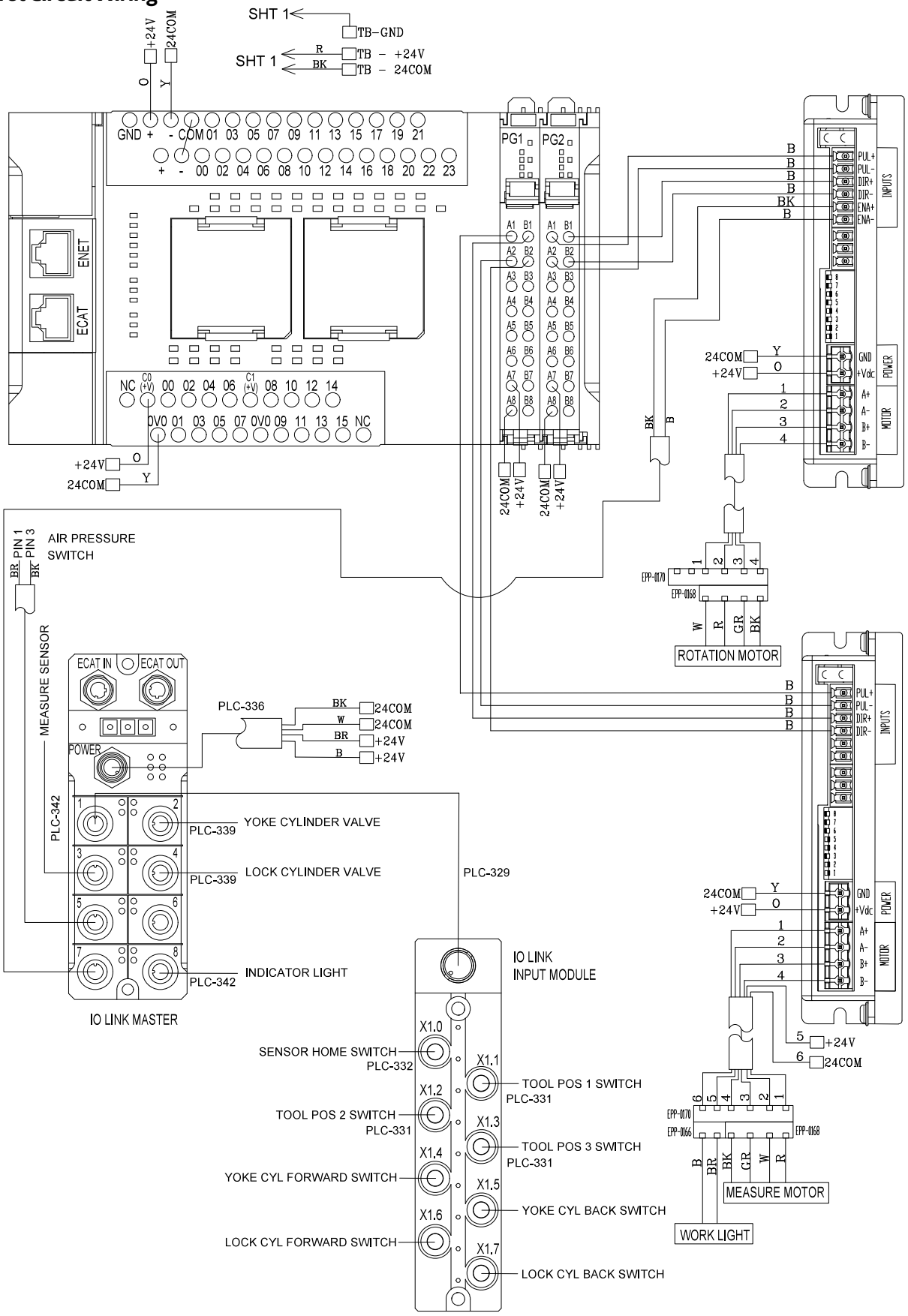
9. Electrical Schematic

9.2 Safety Wiring



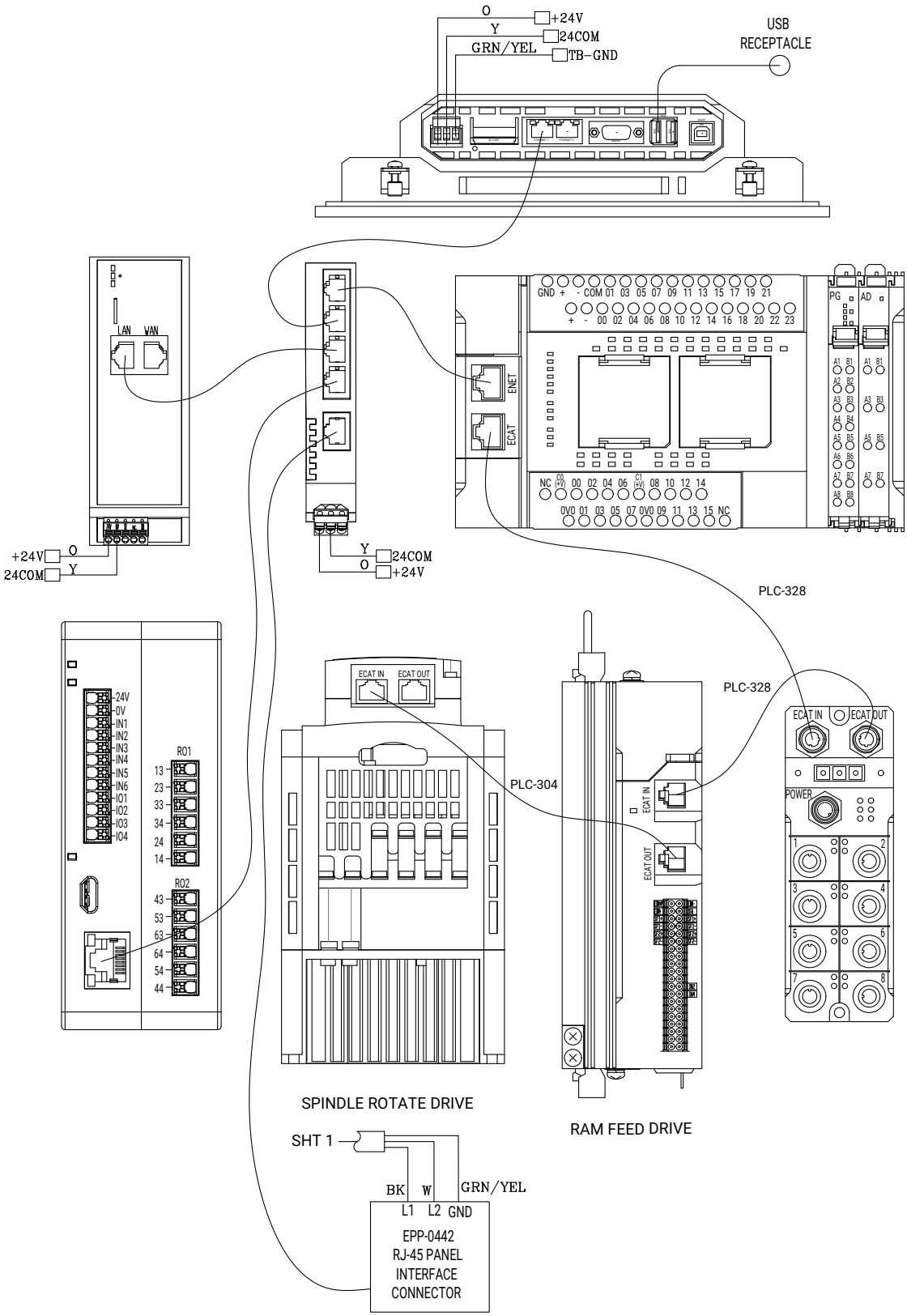
9. Electrical Schematic

9.3 Control Circuit Wiring



9. Electrical Schematic

9.4 Ethernet / EtherCAT Wiring



Contact

ASC Engineered Solutions
18 Grimes Drive Guntersville, AL 35976
Phone: (256) 582-8800
Email: NAPservice@asc-es.com
Web: www.asc-es.com/brand/north-alabama-pipe

Notes:

Notes:

Notes:

ASC Engineered Solutions
18 Grimes Drive Guntersville, AL 35976
Phone: (256) 582-8800
Email: NAPservice@asc-es.com
Web: www.asc-es.com/brand/north-alabama-pipe

About ASC Engineered Solutions

ASC Engineered Solutions is defined by quality—in its products, services and support. With more than 2,000 employees, the company's portfolio of precision-engineered piping support, valves and connections provides products to more than 4,000 customers across industries, such as mechanical, industrial, fire protection, oil and gas, and commercial and residential construction. Its portfolio of leading brands includes ABZ Valve®, AFCON®, Anvil®, Anvil EPS, Basic-PSA, Beck®, Catawissa, Cooplet®, FlexHead®, FPPI®, Gruvlok®, J.B. Smith, Merit®, North Alabama Pipe, Quadrant®, SCI®, Sharpe®, SlideLOK®, SPF®, SprinkFLEX®, Trenton, and VEP With headquarters in Oak Brook, IL, ASC also has ISO 9001:2015 certified production facilities in PA, TN, IL, TX, AL, LA, KS, and RI.

asc-es.com

Building connections that last™

ASC Engineered Solutions

ASC-MAN-NAP Shop-Gruv-v01.indd | 07.23