



BENCH MOTION MODEL

OPERATOR'S MANUAL



TABLE OF CONTENTS

1. SPECIFICATIONS	3
2. CONTACT INFORMATION	4
3. GENERAL SAFETY	5
4. MOTION SAFETY	7
5. GENERAL SETUP	8
6. DETAILED MECHANICAL SETUP	9
7. OPERATOR MENU SYSTEM	11
8. MECHANICAL ILLUSTRATION	22
9. ELECTRICAL SYSTEM DIAGRAM	43
10. PNEUMATIC SYSTEM DIAGRAM	46
11. TROUBLESHOOTING GUIDE	47

NOTE: THIS MANUAL AND ITS CONTENTS MAY BE REVISED TO REFLECT THE MOST CURRENT INFORMATION. PLEASE CHECK FOR THE LATEST VERSION OF THE GAME MANUAL ON THE RAW THRILLS WEBSITE: WWW.RAWTHRILLS.COM

Electrical Power

	Game:	Air Compressor:
Domestic	120 VAC @ 60 Hz, 5 amps	120 VAC @ 60 Hz, 10 amps
International	240 VAC @ 50 Hz, 2.5 amps	240 VAC @ 50 Hz, 5 amps
Japan	100 VAC @ 50 Hz, 5 amps	120 VAC @ 60 Hz, 10 amps

Important Multi-Power Supply Notice: Jurassic Park Motion models are equipped with two independently switched and fused AC supply line cords. Make sure ALL power supply switches and line cords are turned "OFF" and disconnected before servicing. To prevent electrical hazards and overloading, do not use extension cords.

DC Power Fuse Guide

ELECTRICAL SAFETY NOTICE: Replace fuse with equivalent rating as specified. Do not replace fuse with a lower or higher rating than specified. Modifications to this device voids safety design and warranty.

RIO PCB FUSE GUIDE:

- +5 VDC - 3 amp Slow Blow (RIO MCU, START BUTTON)
- +12 VDC - 5 amp Slow Blow (COIN DOOR, COOLING FANS, DASH LED)
- +12 VDC - AUDIO POWER USES A THERMAL FUSE, RIO F3

CABINET FUSE GUIDE:

(NOTE: FUSES ARE MOUNTED ON THE TOP LEFT SIDE OF THE PC COMPARTMENT. F1 IS LOCATED CLOSEST TO RIO PCB)

- F1 - PLAYER 1 GUN POWER , 5 amp Slow Blow (each gun coil is also fused separately on the gun harness, 2 amp SB)
- F2 - PLAYER 2 GUN POWER , 5 amp Slow Blow (each gun coil is also fused separately on the gun harness, 2 amp SB)
- F3 - DINO HEAD BACKLIGHT, 5 amp Slow Blow (On Certain Models only)
- F4 - JURASSIC PARK GATE LOGO, 5 amp Slow Blow
- F5 - BENCH LED T-MOLD, 5 amp Slow Blow

Temperature

32° to 100° Fahrenheit (0° to 38° Celsius)

Humidity

Must not exceed 95% relative humidity or where visible condensation is present.

Cabinet Dimensions

Component	Height	Width	Depth
Assembled 42" Bench Motion Model	72.25 in. / 184 cm (no Dino Topper)	44.50 in. / 113 cm	80 in. / 203 cm

Contact Information

For an authorized distributor near you, check the Raw Thrills website at www.rawthrills.com

Contact Betson Enterprise Headquarters or your local Betson office for sales, technical information, warranty or repair.

Betson Enterprises Headquarters

303 Paterson Plank Rd.

Carlstadt, NJ 07072

(800) 524-2343 or (201) 438-1300

fax (201) 438-4837

www.betson.com



Safety

OPERATION

Before operating game, read this manual. Failure to properly install and operate this game could result in malfunction or accident. Operate the game in accordance with the manual.

TRANSPORTING

Cabinet is very heavy and contains fragile components. Use appropriate care when moving or transporting cabinet. Avoid rough handling.

HANDLING COMPONENTS

Many components are extremely sensitive to handling, environmental and Electrostatic Discharge (ESD) events—especially the computer. Do not handle it roughly. Before servicing, call your distributor and inquire about the PC warranty. Use proper ESD procedures when servicing. Protect components from harmful environmental conditions, such as extreme temperatures, excessive moisture or other damaging effects.

DISCONNECT POWER

Always turn off ALL power and unplug ALL AC line cords on the unit before servicing or making adjustments, unless otherwise instructed. Installing or repairing components while power is on can damage the components and void the warranty.

GROUNDING

Avoid electrical shock. Do not plug in AC power until you have inspected and properly grounded the unit. Only plug into a grounded, three-wire outlet. Do not use a “cheater” plug or cut off the ground pin on the line cord.

ELECTRICAL SHOCKS

There is no isolation transformer in the cabinet. Disconnect AC power before servicing. However, be aware that lethal voltages can remain in the electronic components even when AC power is disconnected. Use extreme caution when servicing. Verify that there is a working ground connection. If the unit sustains water damage, cease using it immediately and unplug AC power.

LCD DISPLAY

Extremely high voltages exist in the LCD at all times. These high voltages exist even when the LCD is off and the AC line cord is disconnected. These voltages are extremely lethal and will cause death. The LCD contains no user serviceable parts. Do not attempt to service the LCD.

POWER SELECTOR

Before installing game, ensure the voltage on the PC is set properly. There is a 115/230 VAC selector switch that must be set for the correct voltage for your site.

CONNECTORS

Ensure all connectors mate properly. If connectors do not slip in easily, do not force them. Connectors are often keyed and only connect one way. Check for correct orientation. Positive locking connectors are commonly used and require a locking tab to be pressed down to unlock and free the connector.

Operator's Manual

COMPUTER

The computer contains sensitive components, including a hard drive. Do not handle it roughly. Call your distributor before servicing its internal components. Ask about warranty information as it relates to the PC.

Do not turn the PC power switch on or off. It should remain permanently in the ON position.

Cycle AC power on or off with the cabinet power switch.

A dongle has been inserted into one of the USB ports. This is required for game play.

Do not remove the dongle except for troubleshooting purposes.

POWER CORD

If the power cord is damaged or lost, replace it with an identical cord as supplied by the manufacturer or an authorized service agent. Do not use extension cords.

WATER JETS

Do not install or operate game within operating perimeter of a water jet. Do not clean equipment using water jet.

Game must be installed in a manner that limits access to the rear portion of the cabinet to service personnel only.

Do not allow liquids behind the game to avoid spills which could cause damage or present a hazardous condition.

VENTILATION

It is critical that the game is installed in a manner that allows for proper ventilation and air flow.

Game must be installed so that there is a minimum amount of clearance between the wall or another game to allow good air circulation through the game cooling fan and vents.

HAZARD TO EPILEPTICS

A small portion of the population has an epileptic condition that may cause seizures. Affected persons experience seizures while watching some television pictures or playing certain video games. People who have not had seizures may still have an undetected epileptic condition. If anyone in your family has experienced epilepsy symptoms (seizures or loss of awareness), consult your physical before using video games. While children play video games, an adult should observe. Be alert to the following symptoms: dizziness, altered vision, eye or muscle twitching, involuntary movements, loss of awareness, disorientation or convulsions. If you or anyone experiences these symptoms, discontinue use immediately and consult your physician.

MANUAL

Keep this manual available and ready for use. If the game fails to function properly, turn off the machine and unplug the AC line cord. Contact your local distributor. Your warranty, when applicable, lasts 60 days from your purchase date. You may not reproduce this document or any of its contents without written authorization from Raw Thrills™, Inc.

SPECIFICATIONS

For reasons such as performance, this product's specifications may change without notice. Federal patent, copyright and other intellectual property laws protect the content, devices and design of the game and its equipment.

Motion Cabinet Safety

CAUTION

- This machine features moving parts and should only be serviced by a trained and experienced technician.
- Turn off all power and air supply before servicing the machine.
- Keep area around the machine clear and free of objects that present a trip hazard. Allow for plenty of room for players to safely enter and exit the machine.
- Observe ALL of the following guidelines to prevent injury, accident or damage.
 - Maximum of two persons on the machine at any time.
 - If a player fatigues or experiences motion sickness or is unable to continue the game for any reason, stop the game motion immediately by pressing the STOP button. Allow the person to rest and exit the game with assistance if needed.
 - Remain seated for the entire duration of the game. Do not stand or exit while the game is moving. Press the STOP button before exiting the game.
 - Keep hands and legs inside the game at all times while in motion. Remain in the game until game comes to a complete stop.
 - Do not attempt to reach for objects on the floor or near the game when it is moving. Stay clear and stand at a safe distance while game is in motion.
 - Small children should always be accompanied by a parent or guardian.
 - Do not grab the gun to pull yourself up when exiting. The guns will move and can cause you to lose balance.
- The machine is equipped with safety features which the operator and the player need to be familiar with:
 - Motion STOP button is located between player 1 and 2 start buttons. This button will stop the motion feature once pressed.
 - Bellows around the moving part of the machine prevent access between the base and the moving part. Make sure that the bellows are not damaged or showing signs of excessive wear that could lead to failure. Replace the bellows when this occurs. Use only tamper proof screw fasteners as specified.
 - The machine is designed so that there is no unintended movement in the absence of a logic signal as might be experienced during a power outage. Make sure that the machine is safe to operate before turning power back ON.
- Critical parts should be maintained and inspected regularly for safe operation. If those critical parts are damaged, broken, or installed incorrectly, replace them or install correctly. Use only manufacturer's specified parts for continued safety and reliability. Call your distributor to order replacement parts.

General Cabinet Setup

SAFETY NOTICE:

Installing this product requires two individuals able to lift heavy objects safely. You may also be required to climb a ladder or step stool as part of the installation process. Make sure that you are familiar with the manual contents, game setup and operation before you begin the installation process. Do not push or pull the on the guns or decorative items such as the marquee or bench logo to move the game. Doing so can damage the gun mechanism or decorative items. Be aware of your surroundings and individuals around you during the installation process for your safety and the safety of others. Work only in an area with sufficient lighting and a clean and level surface.

Unpack Cartons

1. Place the shipping crates on a flat stable surface.
2. Cut the banding straps and remove the cardboard lids. Note: Strap brackets and fasteners are packed in a plastic bag and secured to the crate with the banding straps. Set aside hardware bag for later use.
3. Lift off the large cardboard container surrounding the cabinet and any shipping cleats.
4. With at least two people and a dolly, remove the cabinet from the shipping pallet. See model specific assembly diagram. A fork lift or similar device might be required to lower the motion bench assembly from the pallet.
5. Remove the coin door key from the coin return chute.
6. Open the top coin door.
7. Locate the key for the top and bottom back doors and the cash box.
8. Remove the items inside cash box: AC power cable, a bag of screws and tools, marquee power cable, this manual.
9. **Refer to detailed Mechanical Assembly instructions on the next page.**

Check Electrical Settings (For Units Shipped From Different Location)

1. Verify the correct voltage in the nearest AC outlet.
2. Verify the AC outlet ground connection is present and working.
3. Open the lower back door of the monitor assembly.
4. Verify the voltage selector switch is set to correct AC voltage for all power supplies. This step is recommended if the unit has been moved or shipped from another locality.
5. Route the line cord so that the plug is near the AC outlet and out of the way of foot traffic.
6. Connect air supply hose to regulator. Air regulator is located in the compartment next to PC and electronics compartment. Do not turn on air supply until cabinet has been fully assembled.
7. Replace the lower back door of the monitor assembly.

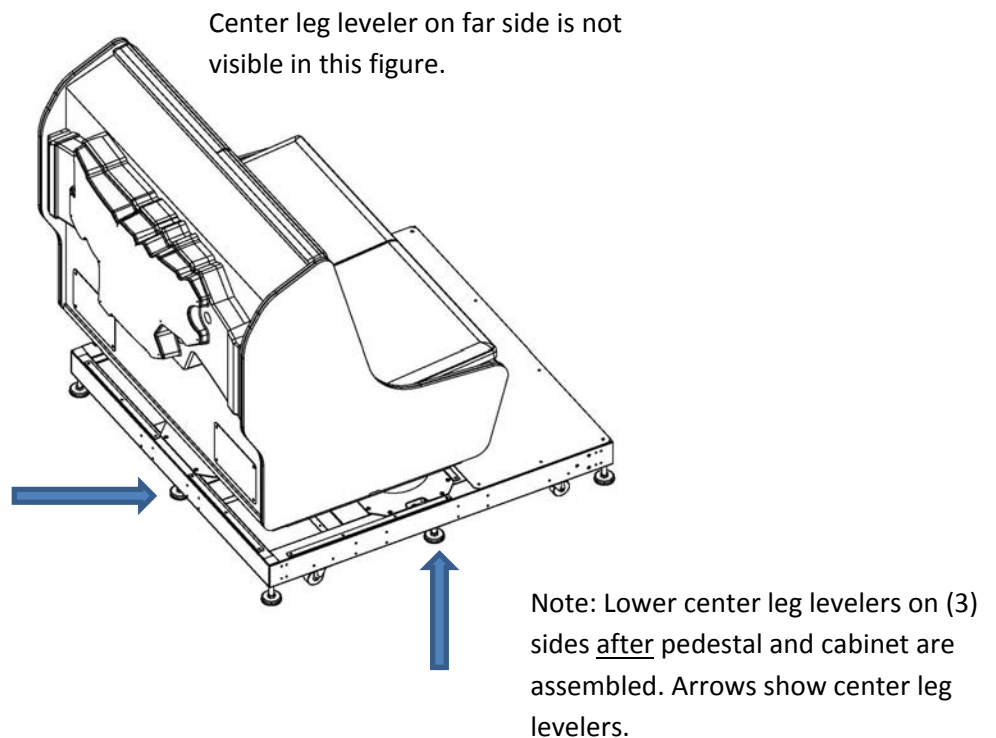
Start Up Game

1. Plug in line cord to AC outlet.
2. Turn the power switch to ON.
3. Check that none of the components are excessively hot or emitting foul odors.
If not, turn off AC power and disconnect line cord. Refer to the diagnostic section of this manual.
4. Once software loads, you will be asked to calibrate the guns.
If not, enter the service menu by pressing the TEST button located on the bracket inside the top coin door.

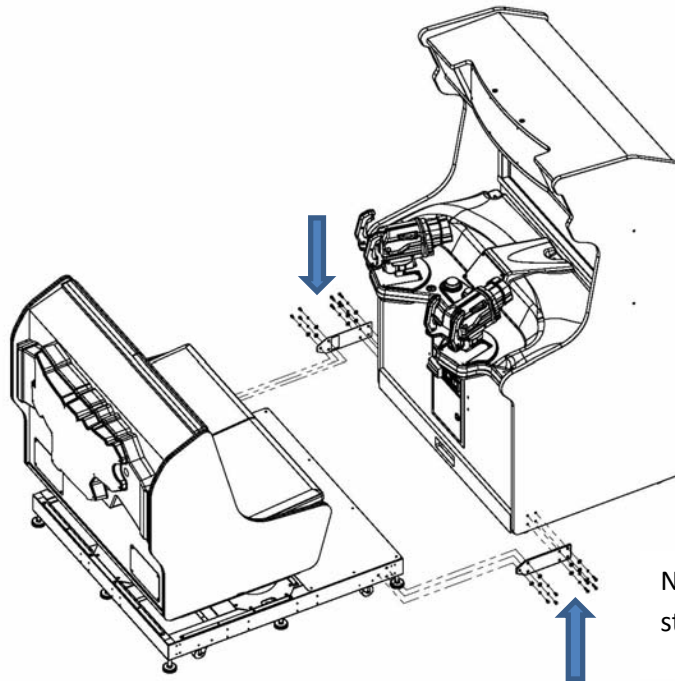
Detailed Cabinet Mechanical Setup

BENCH MOTION MODEL MECHANICAL ASSEMBLY DETAILS

NOTE: It is recommended to keep all pedestal mounting screws "finger-tight" until all screws have been installed for alignment and leveling purposes. Once aligned, all screws should be securely tightened such that the split-lock washers have been flattened.



1: To ease the leveling process of the pedestal, only use the (4) "corner" leg levelers for leveling; the (3) other leg levelers will be lowered once the pedestal and cabinet are assembled. 5/8" and 3/4" open-end wrenches (for the locking hex nut and leg leveler nut, respectively) will be needed to adjust pedestal leg levelers as strap brackets are being installed.



Note: Arrows show pedestal strap brackets and hardware.

2: Locate (2) pedestal strap brackets and the following hardware: (8) black tamper proof Torx machine screws, 1/4-20 thread, 1-1/4" length and (8) 1/4" black split-lock washers and (8) 1/4" black flat washers. Using a T-27 tool, attach these brackets to each side of cabinet such that they are finger-tight.

3: Move pedestal in place between these brackets and connect harness from cabinet to panel mount connector on pedestal and install tubing from cabinet into bulkhead fitting on pedestal, making sure that both connections are pushed in fully and can't be separated by simply pulling on the connector or tubing. Tuck the excess slack of the harness and tubing into the cabinet as you guide the pedestal into position between the strap brackets. Install (6) black tamper proof Torx machine screws, 1/4-20 thread, 1/2" length and (6) 1/4" black split-lock washers and (6) 1/4" black flat washers through brackets and into PEM nuts on pedestal sides using T-27 tool, leveling the cabinet and pedestal along the way such that all hardware can be installed.

4: Once all hardware is installed finger-tight and the cabinet and pedestal are level, fully tighten the screws with T-27 tool until the split-lock washers are flattened. Lower the remaining (3) leg levelers of the pedestal using 5/8" and 3/4" open-end wrenches. All leg levelers must be in contact with the floor before operation.

Operator Menu System

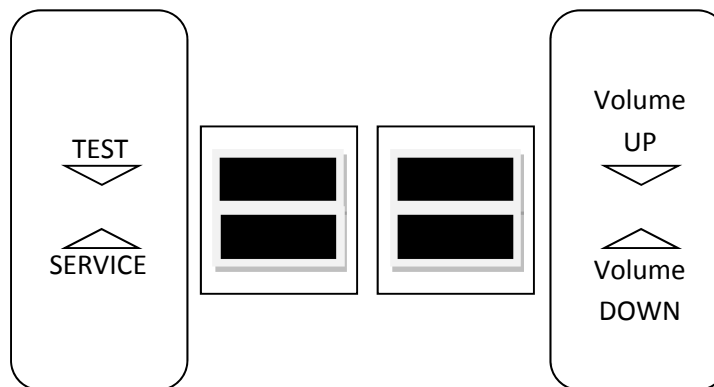
Menu Interface

The Service Panel has two rocker type momentary ON buttons. Press the switch UP/DOWN toward the direction of the function you wish to perform. Pressing the TEST button at any point while the game is running will enter the diagnostic menu. This menu can be navigated with the service panel or the gun.

An on-screen message acknowledges changes or when you exit a selection without making a change.

At the bottom of each screen, there is a brief description of the highlighted menu option.

Navigating with Service Panel Switches



- TEST enters diagnostic system or select highlighted menu option
- SERVICE exit current menu
- VOLUME DOWN moves down through menu or setting choices
- VOLUME UP moves up through menu or setting choices

Navigating with Gun

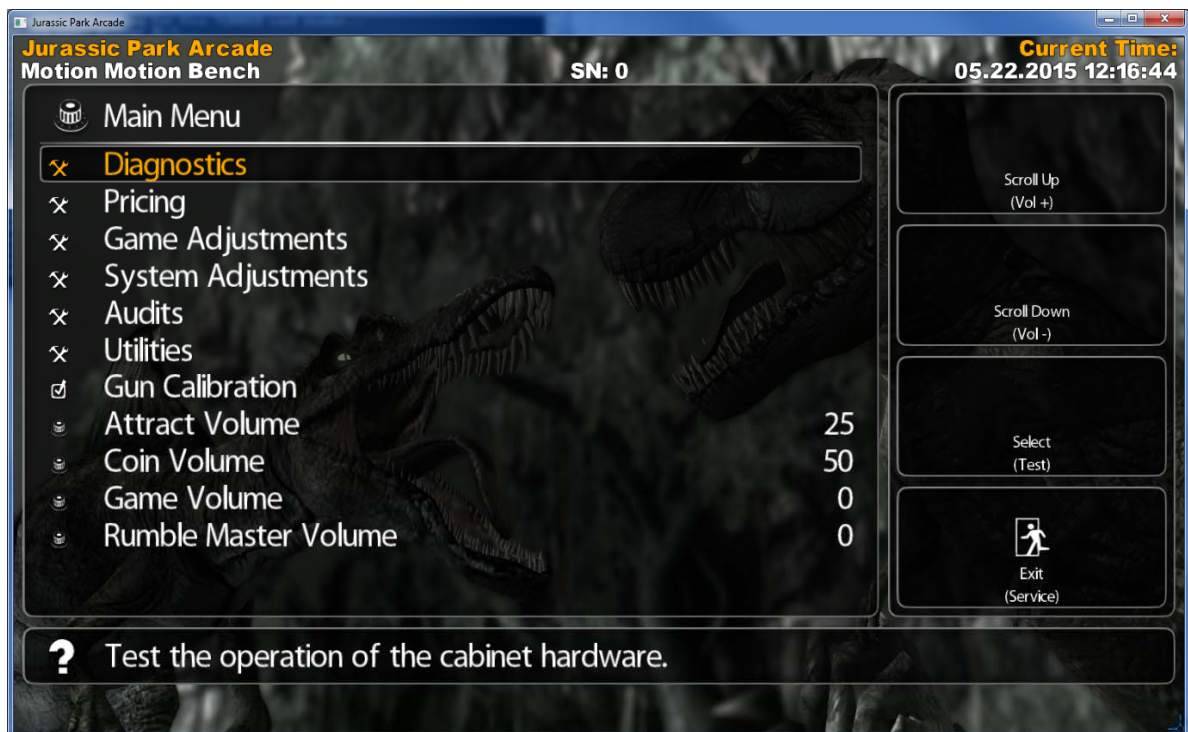
- The menu interface can be navigated with the gun by aiming and shooting.
- Shooting the right side options will perform the indicated action.
- Shoot scroll up or scroll down to highlight menu options.
- Shoot select to enter the highlighted menu or perform the highlighted option.
- Shoot exit to return to the prior menu or exit the diagnostic system.

Menu Screens and Descriptions

Main Menu

- **Diagnostics** - verify game inputs and outputs are functional
- **Pricing** - view and adjust various pricing and denomination options
- **Game Adj** - setup and manage game parameters
- **System Adj** - setup and manage system parameters
- **Audits** - view various hardware and software information ie. collection and play data
- **Utilities** - reset tables, credits, audits. Perform factory reset and CRC software check.
- **Gun Cal** - calibrate and verify gun functionality
- **Game Vol** - adjust game and attract volume
- **Rumble Vol** - adjust seat vibration intensity

**This document will be updated periodically to improve accuracy and usability.
Please visit: rawthrills.com to get the latest version of this manual.**



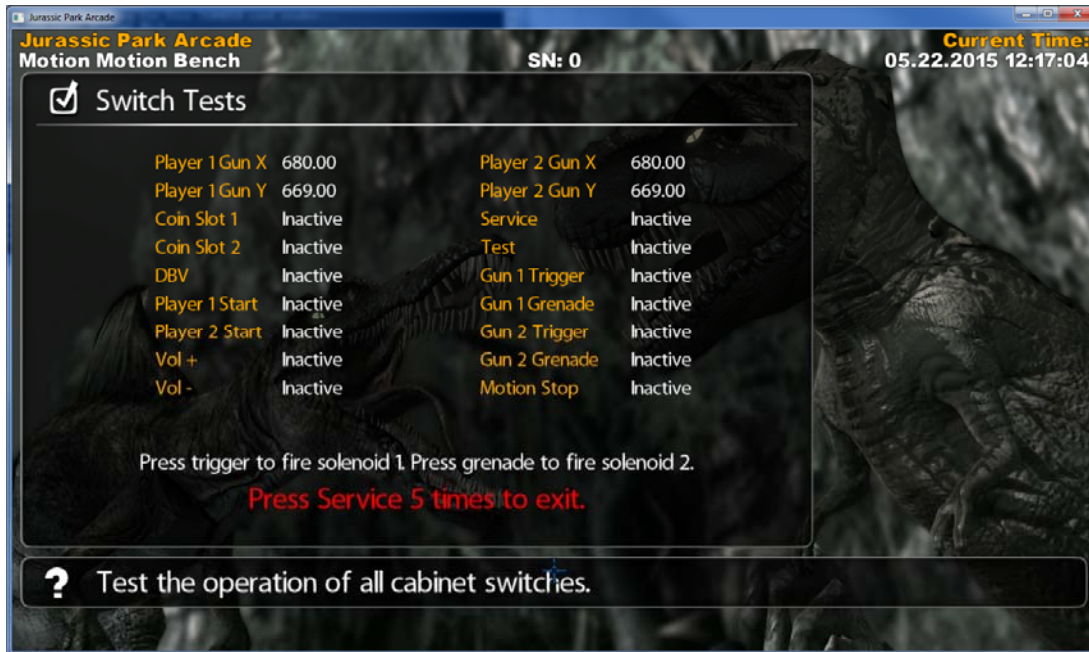
Operator's Manual

Main Menu

Diagnostics

Switch Tests

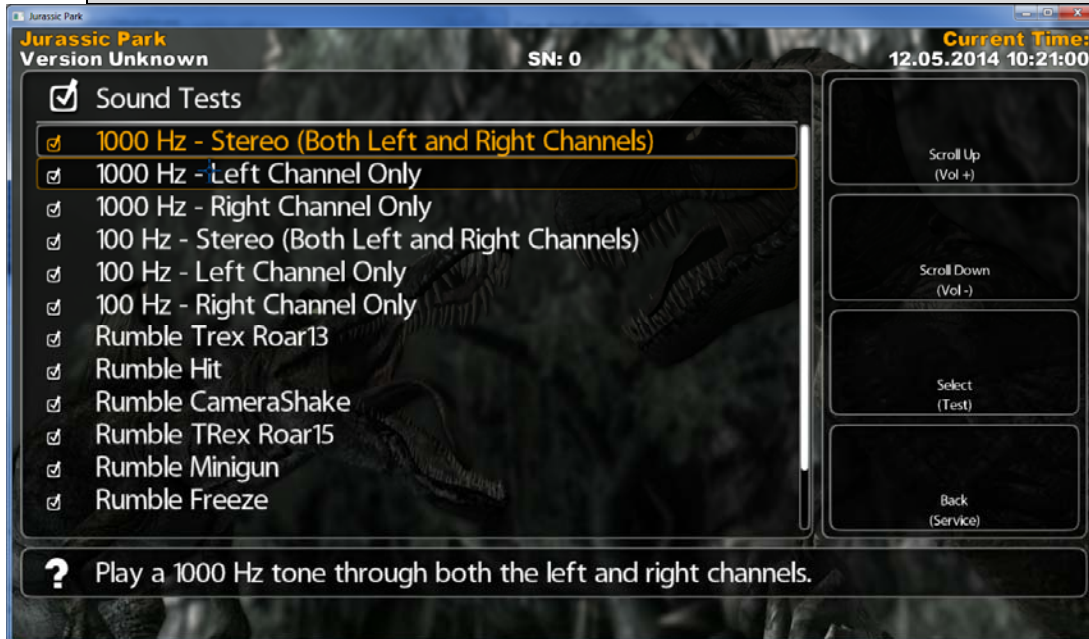
Periodic checks of all game inputs are key to maximizing earnings, customer enjoyment and safety.



Main Menu

Diagnostics

Sound Test



Scroll down to access additional audio test items: Rumble Electro, Rumble Shotgun, Rumble Hit Volume.

Operator's Manual

Main Menu

Diagnostics

Light Tests

Increase your game's curb appeal while also offering the best visual experience for players and prospective customers by making sure that all controlled lighting effects are working. Dino Head is available on certain models only.



Main Menu

Diagnostics

Watchdog Tests

The watchdog function is a critical part of making sure that the game is able to recover from a lock-up condition automatically. This is especially critical in unattended locations.



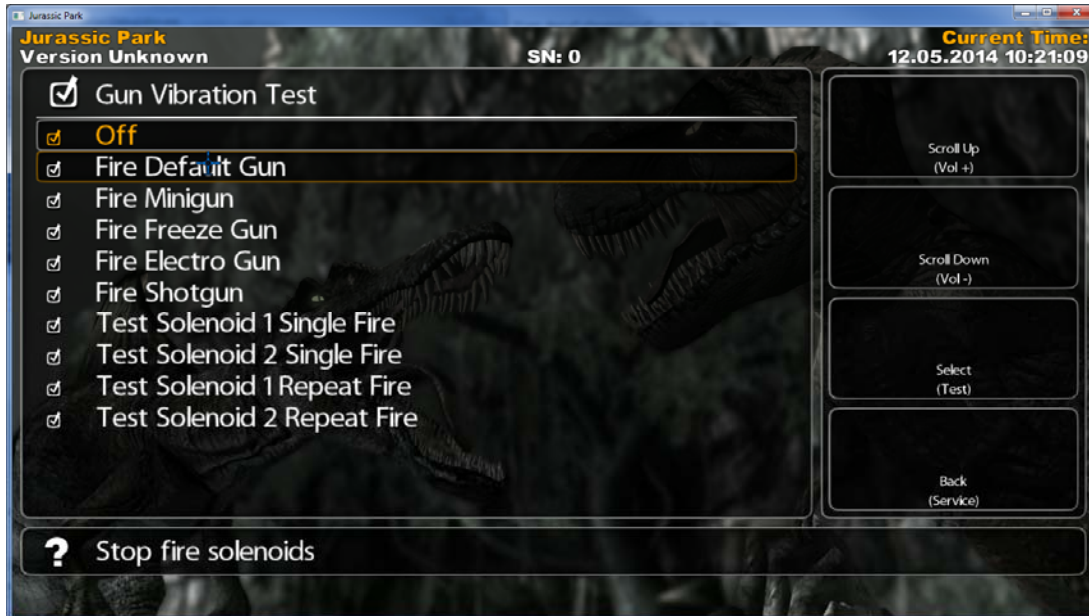
Operator's Manual

Main Menu

Diagnostics

Gun Vibration Tests

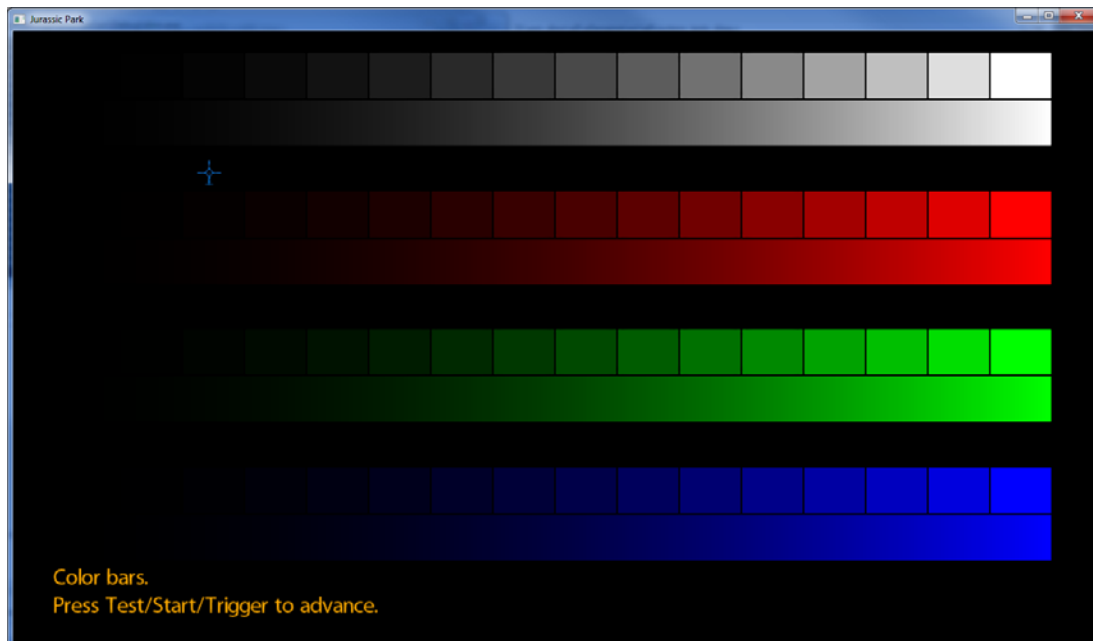
The gun mechanical feedback system is designed with unique features that enhance the player's experience. Verify that gun vibration special effects are functional.



Main Menu

Diagnostics

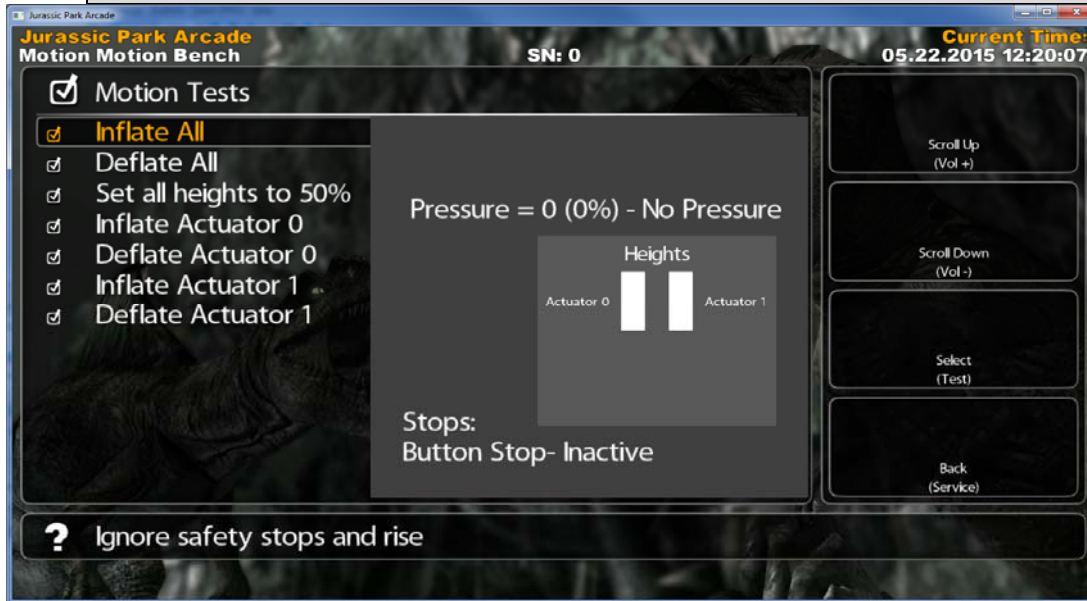
Color Bar LCD Display Test



Main Menu

Diagnostics

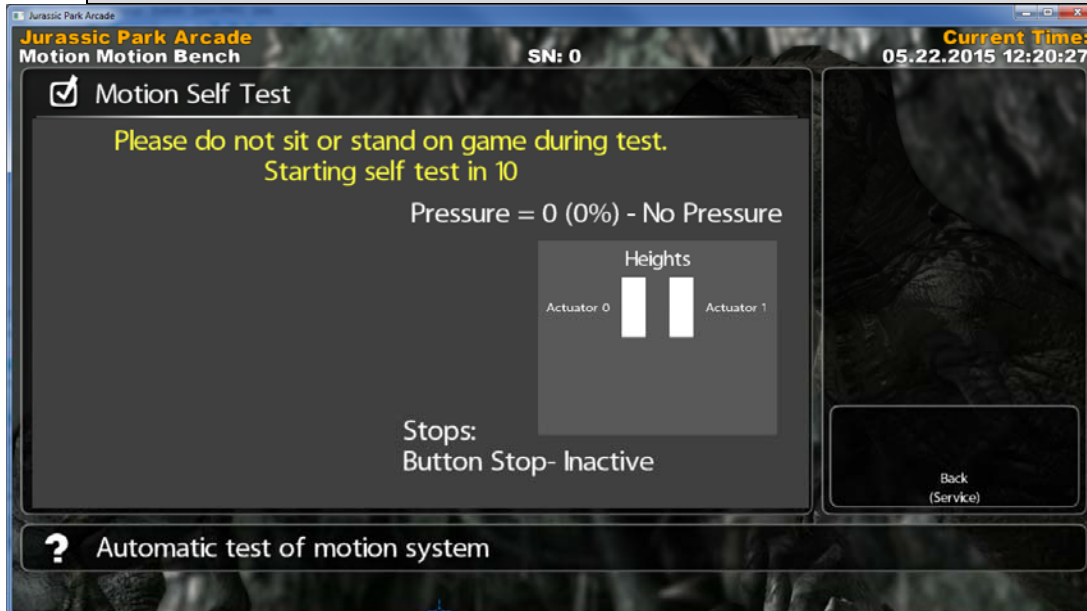
Motion Tests (Jurassic Park Arcade Bench Motion Models Only)



Main Menu

Diagnostics

Motion Self Tests (Jurassic Park Arcade Bench Motion Models Only)



⚠ WARNING

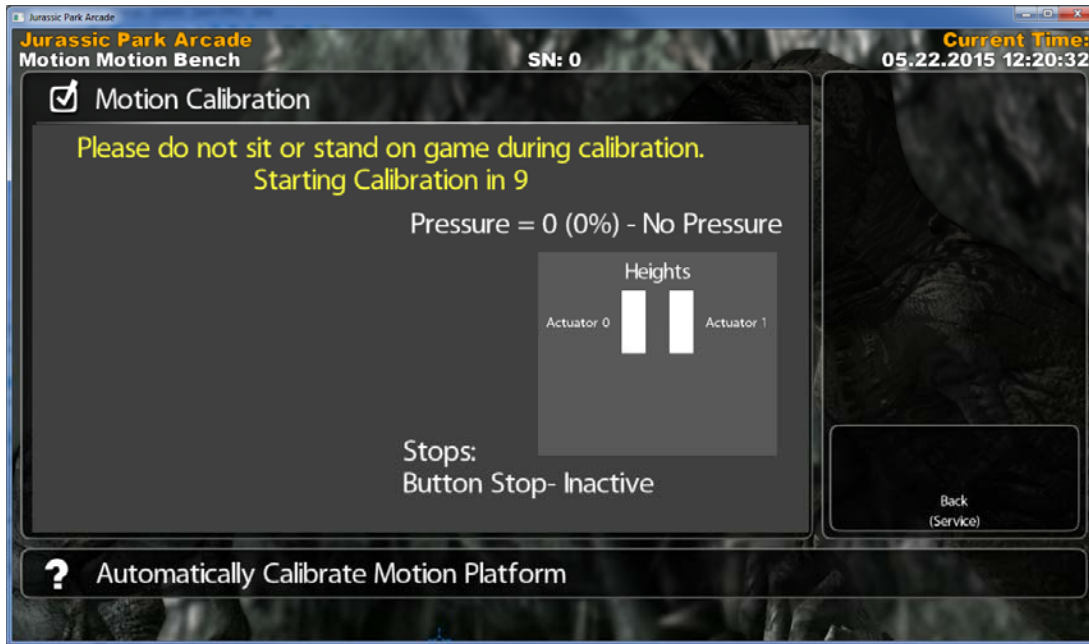
- Stay clear of moving parts! Calibration and Self-Test is performed automatically. Follow on-screen directions for accurate results.

Operator's Manual

Main Menu

Diagnostics

Motion Calibration (Jurassic Park Arcade Bench Motion Models Only)

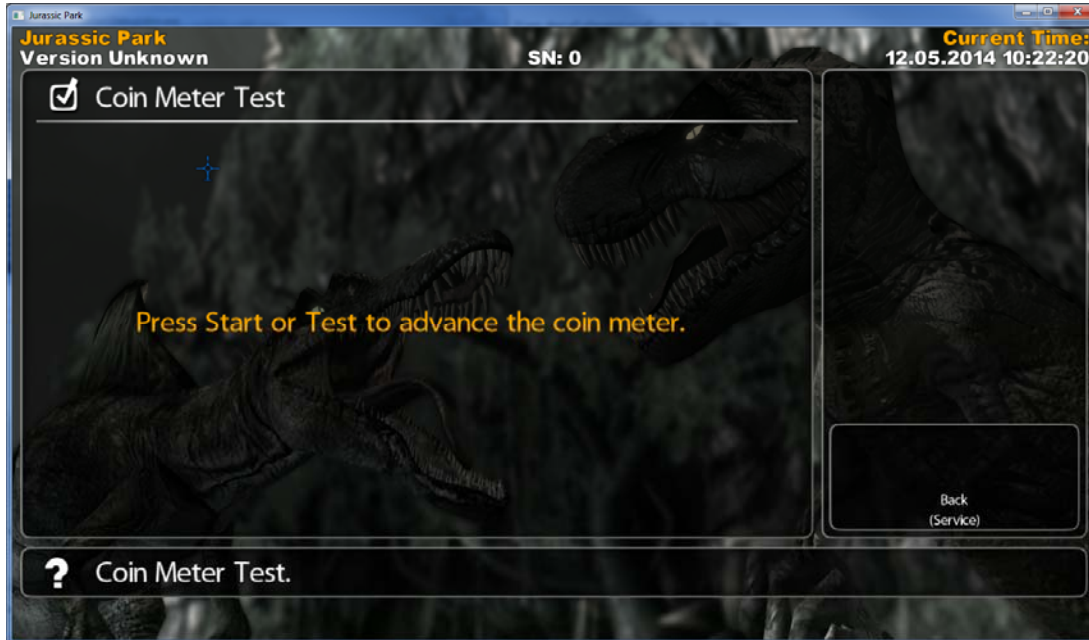


! WARNING

- Stay clear of moving parts! Calibration and Self-Test is performed automatically. Follow on-screen directions for accurate results.

Main Menu
Diagnostics
Coin Meter Tests

This unit has a common meter for coin and DBV accounting. Replace with 5VDC meter only.



Main Menu
Pricing

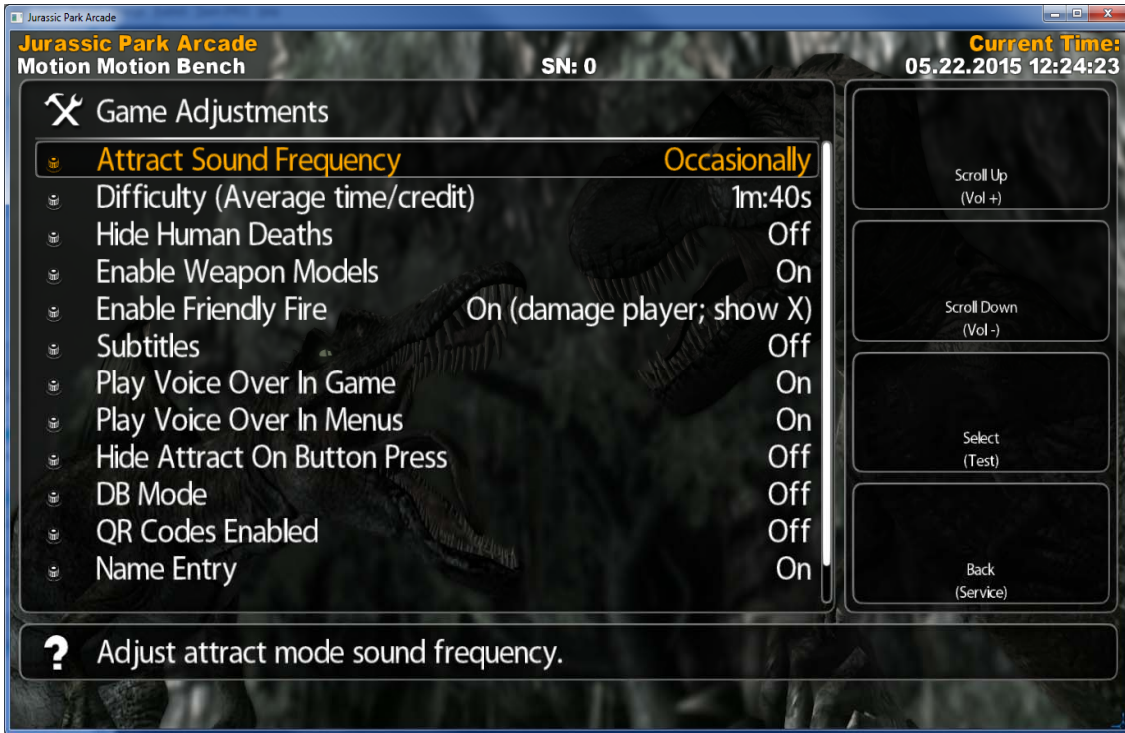
Adjust game pricing and crediting parameters. Customize pricing for best location earnings.



Main Menu

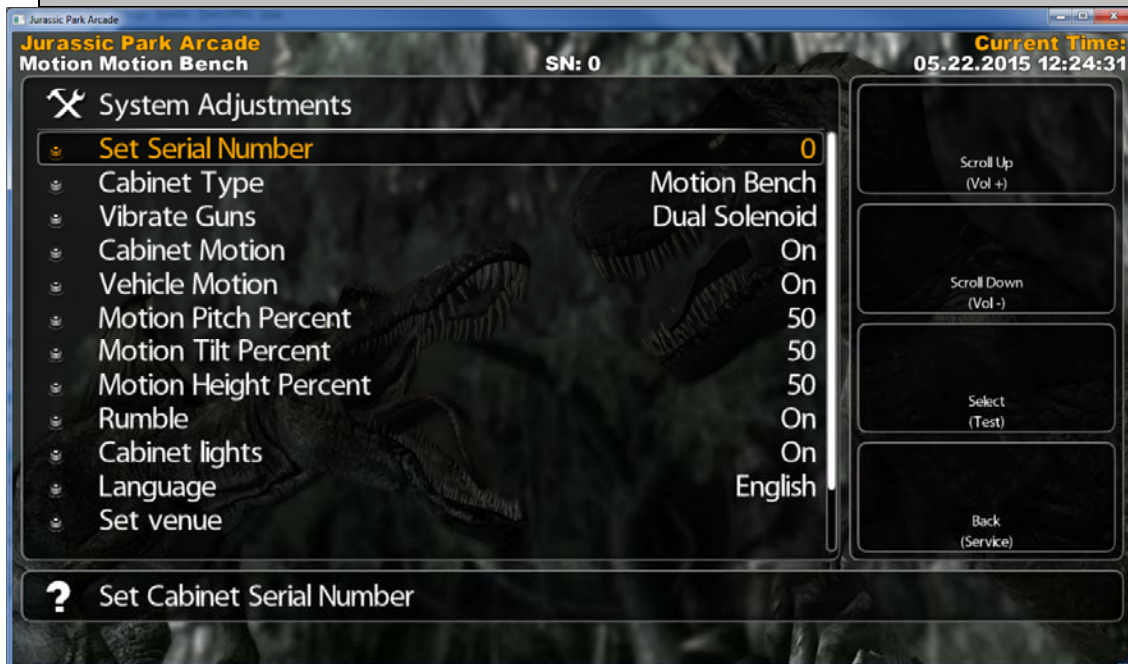
Game Adjustments

Adjust in-game parameters. Customize in-game features to suit customer base and location.



Main Menu

System Adjustments



Operator's Manual

Main Menu

Audits

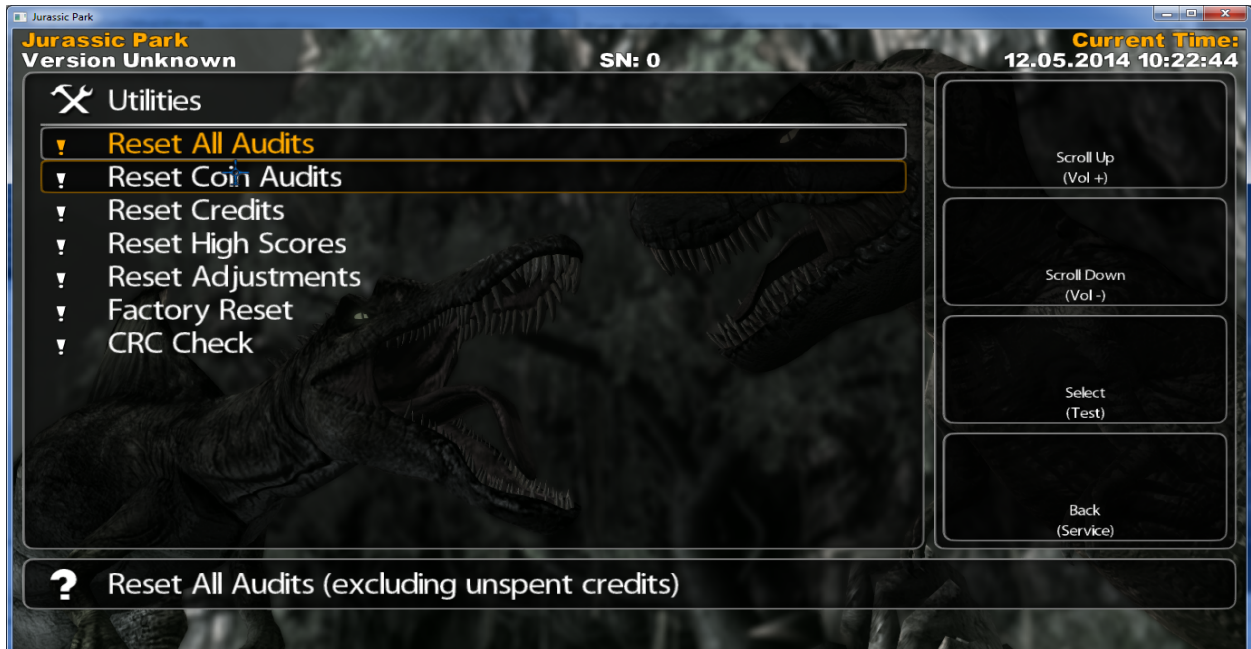
Monitor game audits to make informed decisions in determining key game settings. ie. pricing, game length.



Main Menu

Utilities

Resetting Audit information is recommended whenever you change a game parameter in order to accurately track changes in earnings.

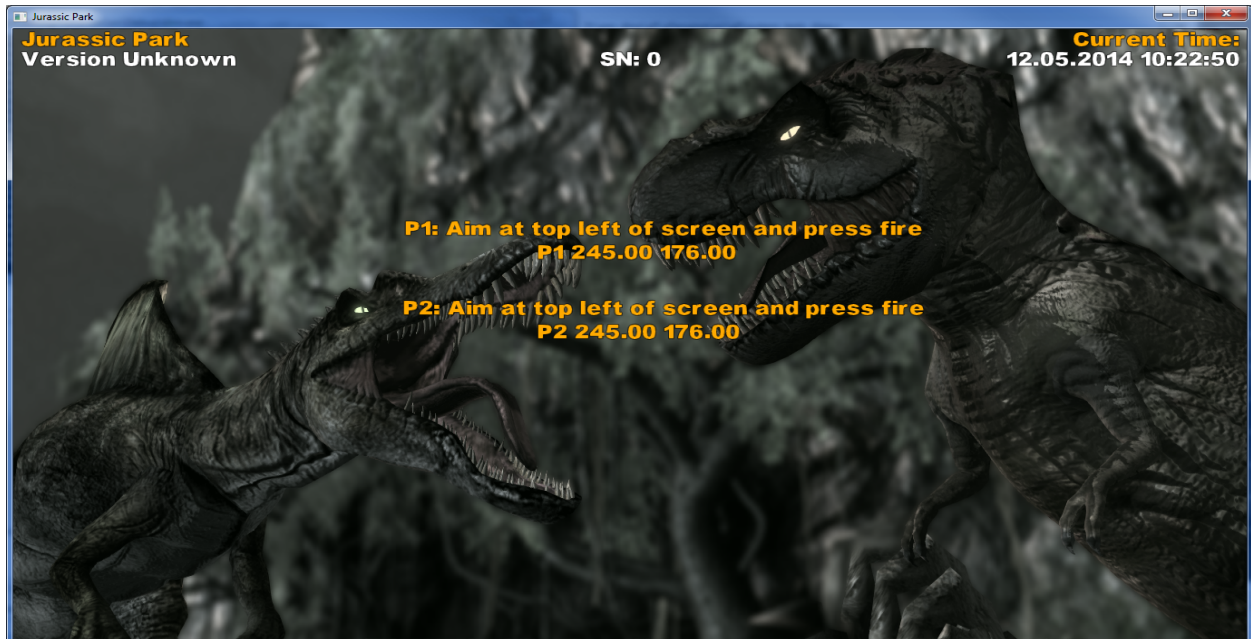


Operator's Manual

Main Menu

Gun Calibration

Maximize your game's earning potential by making sure that the guns are periodically calibrated and all switch inputs are functional.



MECHANICAL AND ELECTRICAL DIAGRAMS

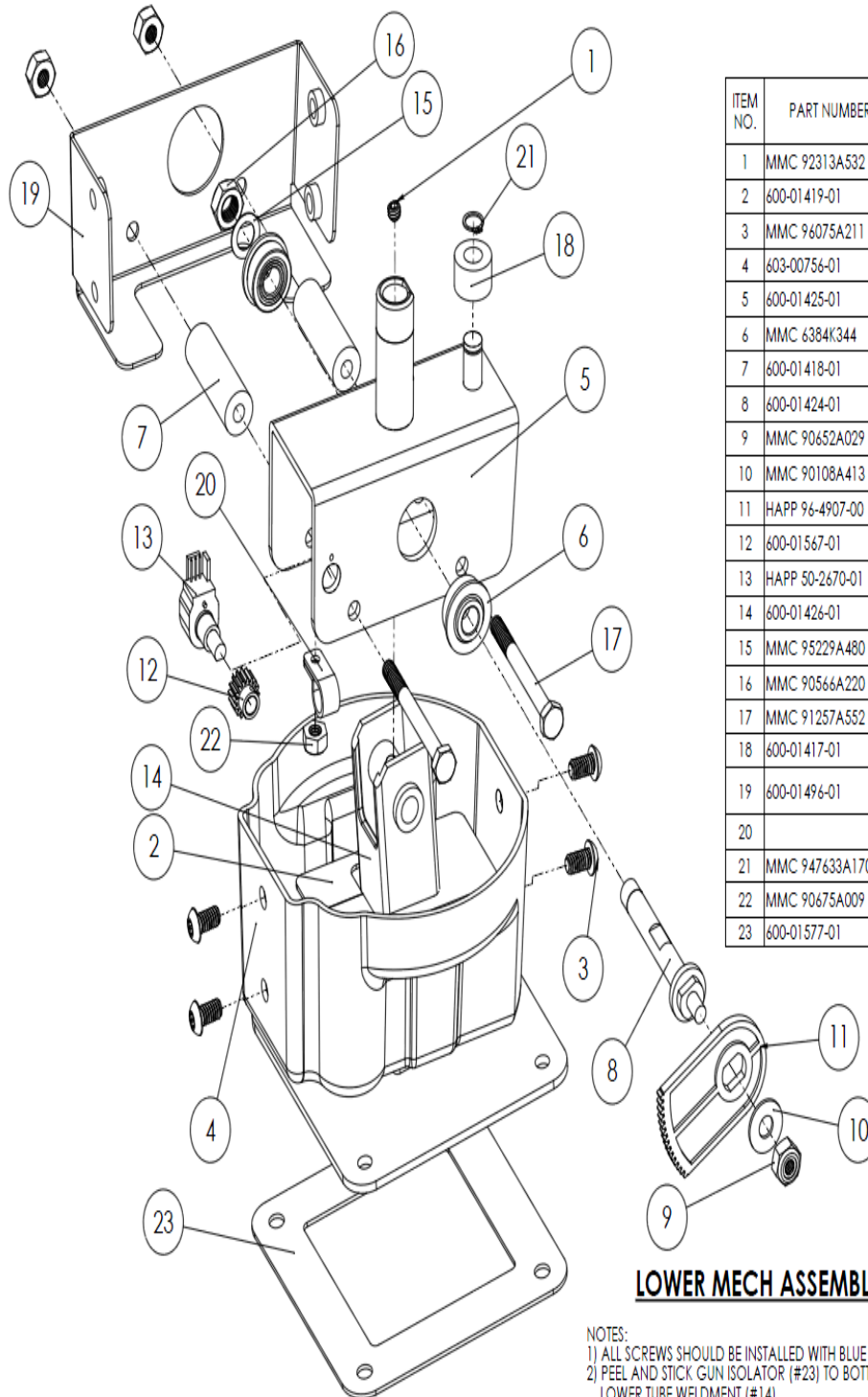
REV.	DESCRIPTION	DATE
A	RELEASED	10/18/14
B	REVISED	1/9/15

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1		UPPER VACFORM ASSEMBLY	1
2	SEE PAGE 3	SHAKER ASSEMBLY	1
3		GRIP ASSEMBLY	2
4	600-01422-01	PIN PLATE	1
5	600-01423-01	COVER BRACKET	1
6	600-01495-01	FRONT VACFORM BRACKET	1
7	600-01411-01	GRIP PLATE WELDMENT	1
8	600-01420-01	LARGE GEAR	1
9	600-01491-01	POT BRACKET	1
10	MMC 96075A211	1/4-20 X 1/2" BLK TP SCREW	18
11	MMC 96075A183	10-32 X 3/8" BLK TP SCREW	10
12	MMC 90273A827	10-32 X 3/8" FLAT HEAD SCREW	6
13	MMC 91251A337	10-32 X 5/16" CAP SCREW	8
14	MMC 6384K369	3/4" FLANGED BEARING	2
15	MMC 90126A036	3/4" WASHER	1
16	MMC 91342A240	3/4" LOCKNUT	1
17		CABLE CLAMP	2
18	600-01567-01	SMALL POT GEAR	1
19	HAPP 50-2670-01	POT - 5K	1
21	SEE PAGE 2	LOWER MECH ASSEMBLY	1

TOP ASSEMBLY

NOTES:
 1) ALL SCREWS SHOULD BE INSTALLED WITH BLUE LOCTITE 242 or 243.
 2) THE 3/4" LOCKNUT (16) IS TIGHTENED UNTIL THE TOP IS FLUSH WITH THE TOP OF THE TUBE IN THE LOWER MECH ASSEMBLY (21).

RAW THRILLS INC.	
TITLE:	JP GUN MAIN ASSEMBLY
TOL. X: ±.001	MARKING:
Y: ±.005	DATE:
Z: ±.005	REV: SEE NOTES
HOLE: ±.001/-.002	DATE:
ANGLE: ±.05°	PART NO.:
SHEET: 1 of 1	REV: B



REV.	DESCRIPTION	DATE
A	RELEASED	10/18/14
B	REVISED	1/9/15

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	MMC 92313A532	1/4-20 x 3/16" SET SCREW	1
2	600-01419-01	PINCH COVER	1
3	MMC 96075A211	1/4-20 X 1/2" BLK TP SCREW	4
4	603-00756-01	LOWER VACFORM	1
5	600-01425-01	ROCKER BRACKET	1
6	MMC 6384K344	3/8" FLANGED BEARING	2
7	600-01418-01	TUBE STOP BUMPER - 5/8" OD	2
8	600-01424-01	SIDE PIN	1
9	MMC 90652A029	1/4-20 THIN LOCKNUT	3
10	MMC 90108A413	1/4-20 WASHER	1
11	HAPP 96-4907-00	SEGMENT GEAR	1
12	600-01567-01	POT GEAR	1
13	HAPP 50-2670-01	POT - 5K	1
14	600-01426-01	LOWER TUBE WELDMENT	1
15	MMC 95229A480	3/8" WASHER	1
16	MMC 90566A220	3/8" THIN LOCKNUT	1
17	MMC 91257A552	1/4-20 x 2 1/2" HEX HEAD - GRADE 8	2
18	600-01417-01	SHORT STOP BUMPER - 3/4" OD	1
19	600-01496-01	LOWER VACFORM MOUNTING BRACKET	1
20		CABLE CLAMP	1
21	MMC 947633A170	RETAINING CLIP	1
22	MMC 90675A009	8/32" KEPS NUT	1
23	600-01577-01	GUN ISOLATOR	1

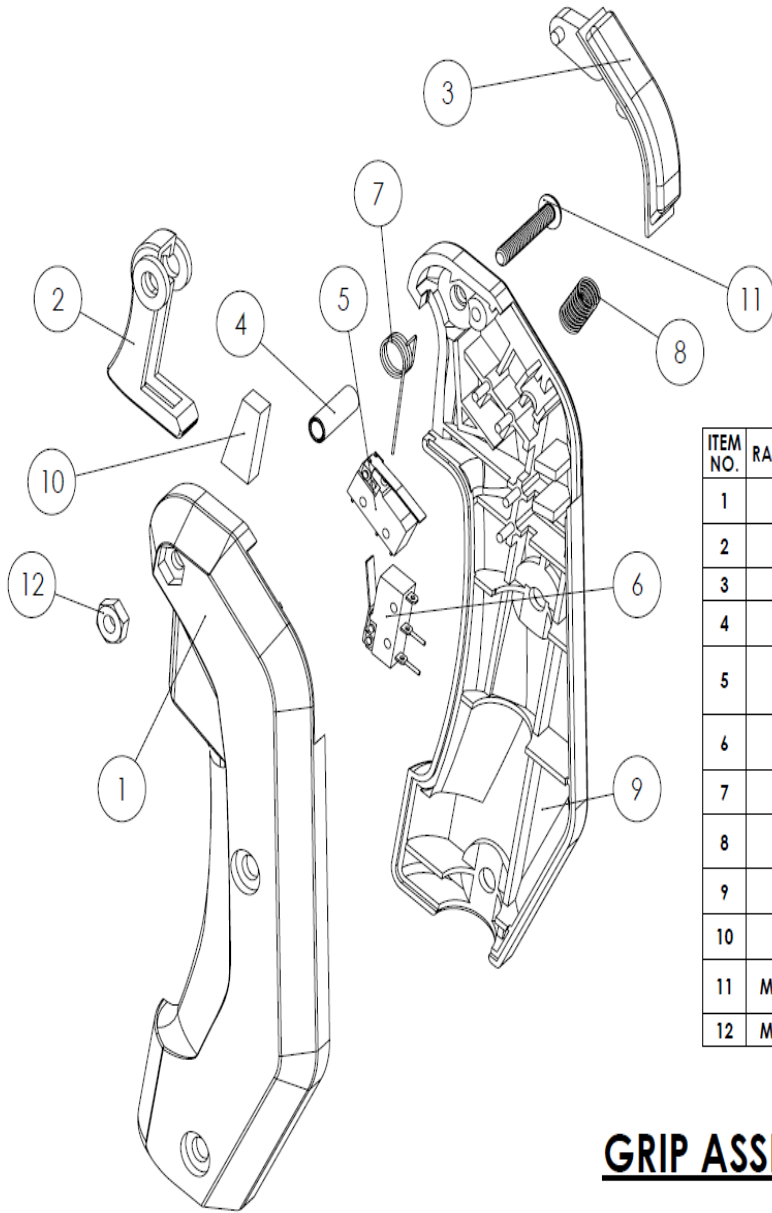
LOWER MECH ASSEMBLY

NOTES:
 1) ALL SCREWS SHOULD BE INSTALLED WITH BLUE LOCTITE 242 or 243.
 2) PEEL AND STICK GUN ISOLATOR (#23) TO BOTTOM OF LOWER TUBE WELDMENT (#14)

RAW THRILLS INC.	
TITLE: JP GUN MAIN ASSEMBLY	
TOL. X: ±.003	MATERIAL:
Y: ±.015	
Z: ±.015	
HOLD. ±.003-0.005	FINISH: SEE NOTES
ANGLE: ±.5°	
	PART NO:
SHEET: 1 of 1	REV: B

00 in

REV.	DESCRIPTION	DATE
A	RELEASED	11/17/10

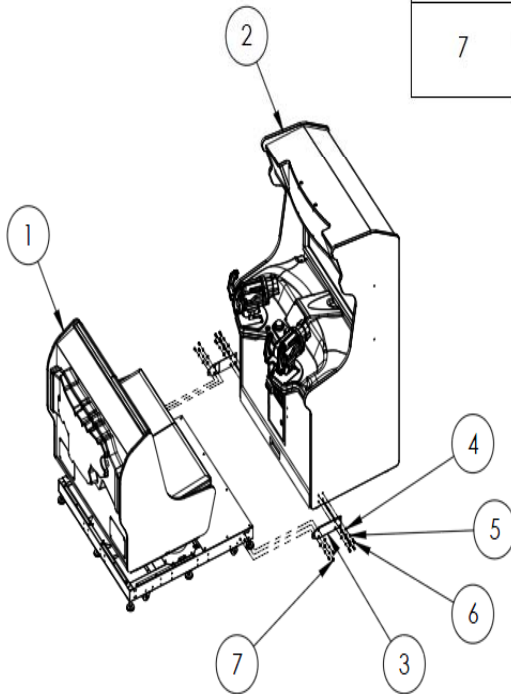


ITEM NO.	RAW PART NUMBER	HAPP NUMBER	DESCRIPTION	QTY.
1	608-00201-01	95-1294-00	GRIP, LEFT HALF	1
2	608-00204-01	95-1295-00	TRIGGER, RED	1
3	608-00203-01	95-1439-00	LARGE THUMB BUTTON	1
4	608-00205-01	95-1315-00	SHAFT, TRIGGER	1
5	608-00216-01	95-0259-00	SWITCH ASSY FOR THUMB SWITCH	1
6	608-00215-01	95-0028-00	SWITCH ASSY. FOR TRIGGER	1
7	608-00206-01	95-1297-00	SPRING, TORSION	1
8	608-00207-01	95-1298-00	SPRING, COMPRESSION	1
9	608-00202-01	95-1293-00	GRIP, RIGHT HALF	1
10	608-00218-01	96-0110-00	TRIGGER BUMPER	1
11	MMC 96075A147	43-0378-00	SCREW, #8-32 x 1 TP BLACK	1
12	MMC 86537A140	43-1124-00	HEX NUT #8-32 BLACK	1

GRIP ASSEMBLY

RAW THRILLS INC.	
TITLE:	GRIP ASSEMBLY
SOLUTION:	
DATE:	
SCALE:	
ANGLES:	
REV:	A

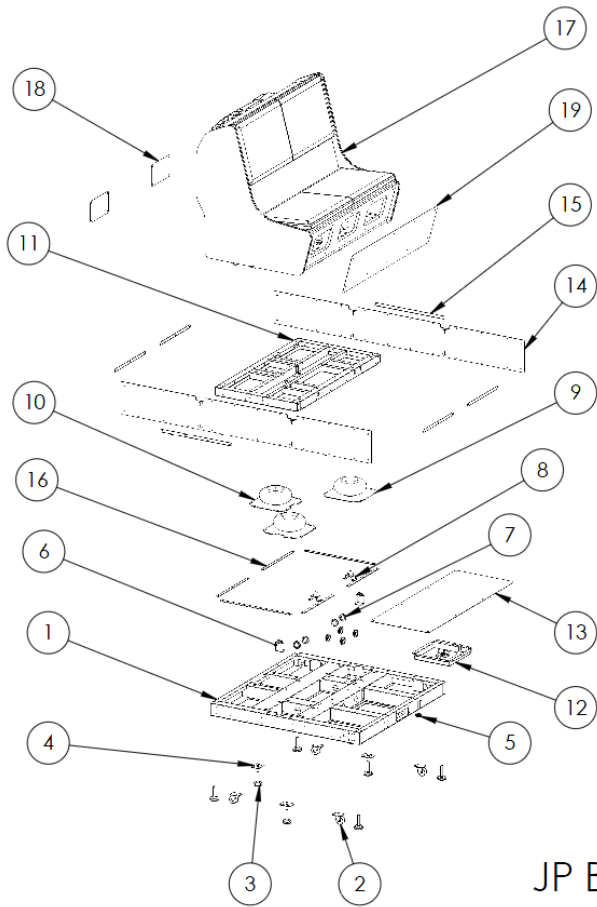
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	JP_Bench_Motion_Platform_&_Bench_Assy	JP Bench - Pedestal Assembly	1
2	JP_Bench_Motion_Front_Assy	JP Bench - Front Assembly	1
3	600-01455-01	Pedestal Strap Bracket	2
4	McMaster-Carr - 97416A119	Black-Oxide Steel SAE Flat Washer, 1/4" Screw Size, 0.281" ID, 0.625" OD	14
5	McMaster-Carr - 93711A500	Black Oxide 18-8 Stainless Steel Split Lock Washer for Socket Head Cap Screw, 1/4" Screw Size, 0.260" ID	14
6	McMaster-Carr - 96075A223	Alloy Steel Pin-in-Torx Button Socket Cap Screw, Black-Oxide, 1/4"-20 Thread, 1" Length	8
7	McMaster-Carr - 96075A211	Alloy Steel Pin-in-Torx Button Socket Cap Screw, Black-Oxide, 1/4"-20 Thread, 1/2" Length	6



Jurassic Park - Bench Motion Assembly (42")



Operator's Manual



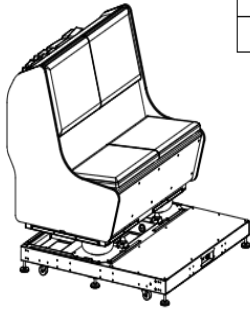
Not Shown:
McMaster-Carr - 5648K71: Green Polyurethane Tubing
(3/8" OD, 1/4" ID, various lengths)
McMaster-Carr - 5648K74: Green Polyurethane Tubing
(1/4" OD, 1/8" ID, various lengths)

JP Bench - Pedestal Assembly
(BOM on next page)

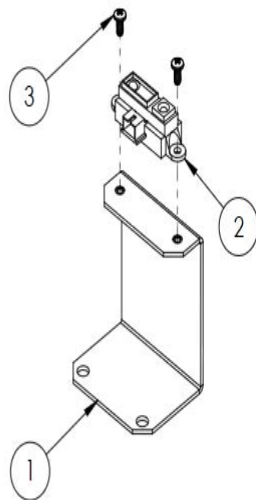


JP Bench
Pedestal Assembly
BOM

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	608-00200-01	Base Platform Assembly	1
2	Pedestal Caster	2" Wheel, 2-7/16" Mounting Height	4
3	Pedestal Leg Leveler	1/2"-13 Thread, 4" Length	7
4	600-01351-01	Leg Leveler Bracket	3
5	McMaster-Carr - 5111K736	Push-to-Connect Tube Fitting for Air & Water, Through-Wall Straight Connector for 3/8" Tube OD, Brass	1
6	JP_Bench_Height_Sensor_Assy	Height Sensor Assembly	2
7	603-00747-01	GRO150121A (Essentra): Black PVC Open Hole Grommet	8
8	JP_Bench_Stop_Assy	Stop Assembly	2
9	Air_Spring_Actuator_&Fitting_Assy	Air Spring Actuator Assembly	2
10	Solution_Filled_Air_Spring_Isolator_&Fitting_Assy	Solution-Filled Air Spring Isolator Assembly	1
11	JP_Bench_Top_Platform_Sub-Assy	JP Bench - Top Platform Assembly	1
12	JP_Bench_Valve_Mounting_Assy	Actuator Valve Mounting Assembly	1
13	600-01450-01	Front Cover Plate	1
14	600-01575-01	Rubber Safety Wrap	2
15	600-01646-01	Rubber Wrap Plate Long	4
16	600-01647-01	Rubber Wrap Plate Short	8
17	JP_Bench_Sub_Assy	JP Bench - Bench Assembly	1
18	600-01489-01	Rear Bench Access Plate	2
19	600-01439-01	Front Bench Access Plate	1



Not Shown:
McMaster-Carr - 5648K71: Green Polyurethane Tubing (3/8" OD, 1/4" ID, various lengths)
McMaster-Carr - 5648K74: Green Polyurethane Tubing (1/4" OD, 1/8" ID, various lengths)

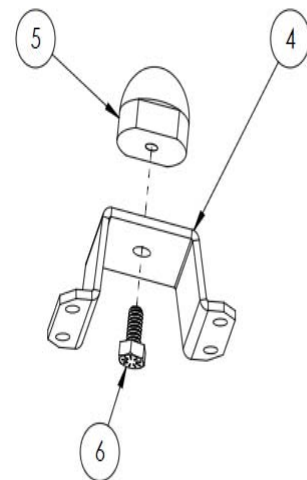


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	600-01442-01	Height Sensor Bracket	1
2	500-00175-01	GP2Y0A41SK0F (Sharp): Analog Output Distance Measuring Sensor Unit, 4-30cm sensing distance	1
3	McMaster-Carr - 90272A106	Zinc-Plated Steel Pan Head Phillips Machine Screw, 4-40 Thread, 1/4" Length	2

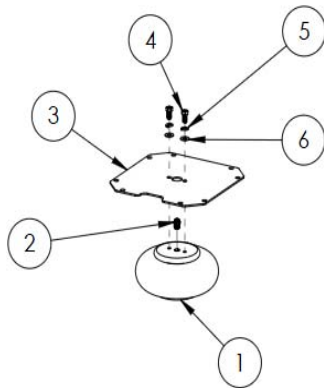
Height Sensor Assembly



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	600-01453-01	Pivot Stop Bracket	1
5	600-01497-01	Round Stop	1
6	McMaster-Carr - 90201A109	Extreme-Strength Grade 9 Steel Cap Screw, 1/4"-20 Fully Threaded, 1/2" Long, Zinc-Plated	1



Stop Assembly

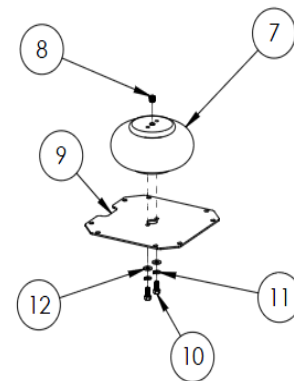


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	800-00050-01	YI-FS 100-10 CI 1/4 NPT (ContiTech): Single Convuluted Air Spring, 1/4" NPT, Clamped Plates	1
2	McMaster-Carr - 5779K109	Push-to-Connect Tube Fitting for Air, Straight Adapter for 1/4" Tube OD x 1/4 NPT Male	1
3	600-01641-01	Air Spring Plate	1
4	McMaster-Carr - 92620A622	High-Strength Grade 8 Steel Cap Screw, 3/8"-16 Fully Threaded, 3/4" Long, Zinc-Plated	2
5	McMaster-Carr - 91102A760	Zinc-Plated Steel Split Lock Washer, 3/8" Screw Size, 0.385" ID, 0.680" OD	2
6	McMaster-Carr - 90126A031	Zinc-Plated Steel SAE Flat Washer, 3/8" Screw Size, 0.406" ID, 0.812" OD	2

Air Spring Actuator Assembly

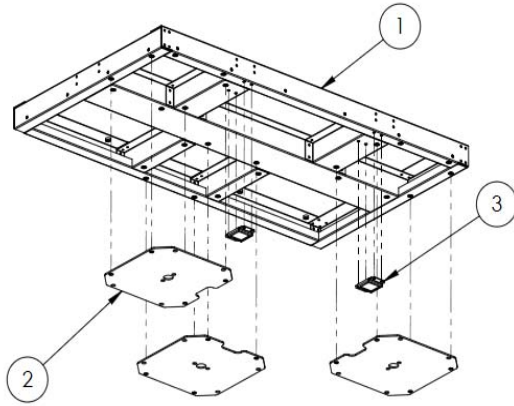


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
7	800-00050-01	YI-FS 100-10 CI 1/4 NPT (ContiTech): Single Convuluted Air Spring, 1/4" NPT, Clamped Plates	1
8	McMaster-Carr - 44605K232	Steel, Hex-Socket Plug, 1/4 Pipe Size	1
9	600-01641-01	Air Spring Plate	1
10	McMaster-Carr - 92620A622	High-Strength Grade 8 Steel Cap Screw, 3/8"-16 Fully Threaded, 3/4" Long, Zinc-Plated	2
11	McMaster-Carr - 91102A760	Zinc-Plated Steel Split Lock Washer, 3/8" Screw Size, 0.385" ID, 0.680" OD	2
12	McMaster-Carr - 90126A031	Zinc-Plated Steel SAE Flat Washer, 3/8" Screw Size, 0.406" ID, 0.812" OD	2



Solution-Filled Air Spring Isolator Assembly (fill air spring to 3-3/4" with Cryo-Tek Original or 100)

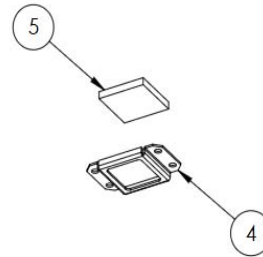
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	608-00212-01	Top Platform Assembly	1
2	600-01641-01	Air Spring Plate	3
3	JP_Bench_Stop_Pad_Assy	Stop Pad Assembly	2



JP Bench - Top Platform Assembly

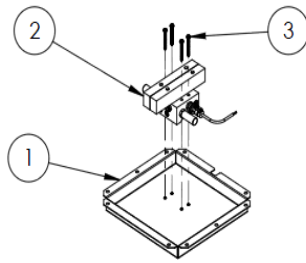


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	600-01452-01	Stop Pad Bracket	1
5	600-01454-01	Stop Pad	1



Stop Pad Assembly

Operator's Manual

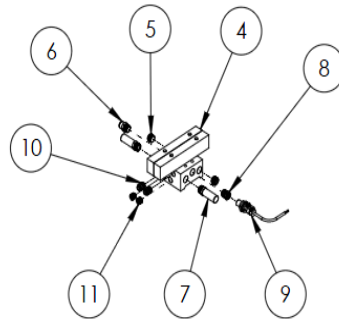


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	600-01443-01	Valve Pan	1
2	JP_Bench_Valve_&_Fitting_Assy	Actuator Valve Manifold Assembly	1
3	McMaster-Carr - 90316A849	18-8 Stainless Steel Hex Washer Head Slotted Machine Screw, 10-32 Thread, 2" Length	4

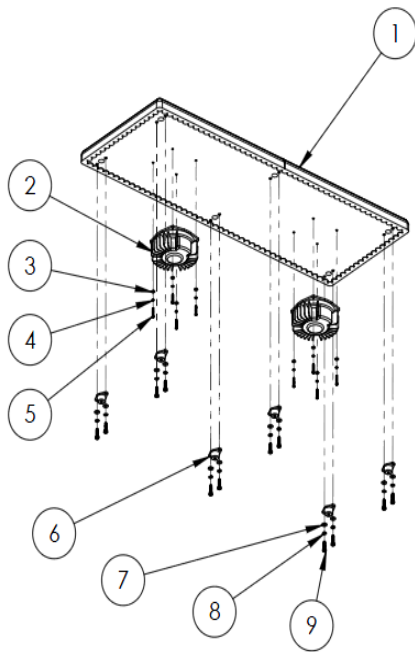


Actuator Valve Mounting Assembly

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	604-00047-01	M4KB330-08-02-DC12V (CKD); 2 Station Solenoid Valve Manifold	1
5	McMaster-Carr - 44605K233	Steel, Hex-Socket Plug, 3/8 Pipe Size	2
6	McMaster-Carr - 5779K117	Push-to-Connect Tube Fitting for Air, Straight Adapter for 3/8" Tube OD x 3/8 NPT Male	1
7	McMaster-Carr - 1213T12	High-Noise Reducing Mufflers, Plastic, 3/8 NPT Male, 177 scfm, 2-5/16" High	2
8	McMaster-Carr - 50785K630	Medium-Pressure Brass Threaded Pipe Fitting, 3/8 Male x 1/4 Female Pipe Size, Hex Reducing Bushing	1
9	500-00195-01	M7129-200PG-500000 (Measurement Specialties): Analog Radiometric Pressure Sensor	1
10	McMaster-Carr - 5779K109	Push-to-Connect Tube Fitting for Air, Straight Adapter for 1/4" Tube OD x 1/4 NPT Male	2
11	McMaster-Carr - 44605K232	Steel, Hex-Socket Plug, 1/4 Pipe Size	2



Actuator Valve Manifold Assembly

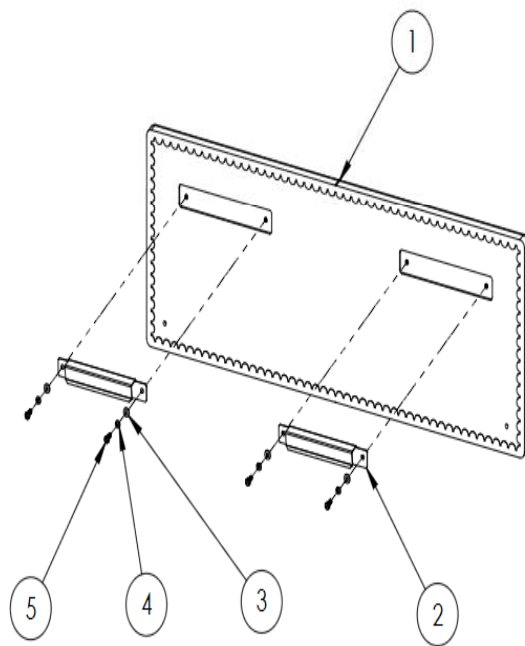


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	600-01444-01	Bench Pad Assembly	1
2	807-00012-00	AST-2B-4 (Aura Sound): Pro Bass Shaker Tactile Transducer, 4 Ohm, 50 W (RMS)/100 W (Max)	2
3	McMaster-Carr - 90126A009	Zinc-Plated Steel SAE Flat Washer, Number 8 Screw Size, 0.188" ID, 0.438" OD	8
4	McMaster-Carr - 91102A009	Zinc-Plated Steel Split Lock Washer, Number 8 Screw Size, 0.174" ID, 0.293" OD	8
5	McMaster-Carr - 93075A199	Zinc-Plated Steel Hex Head Machine Screw, 8-32 Thread, 1" Length	8
6	McMaster-Carr - 64875K393	Bolt-Down Vibration-Damping Mount, Fail Safe, 1/4"-20 Thread, 115 lb Capacity	6
7	McMaster-Carr - 90126A029	Zinc-Plated Steel SAE Flat Washer, 1/4" Screw Size, 0.281" ID, 0.625" OD	12
8	McMaster-Carr - 91102A029	Zinc-Plated Steel Split Lock Washer, 1/4" Screw Size, 0.260" ID, 0.487" OD	12
9	McMaster-Carr - 92865A542	Medium-Strength Grade 5 Zinc-Plated Steel Cap Screw, 1/4"-20 Fully Threaded, 1" Long	12

Padded Bench Seat Assy



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	600-01445-01	Back Pad Assembly	1
2	600-01644-01	Seat Clip	2
3	McMaster-Carr - 90126A029	Zinc-Plated Steel SAE Flat Washer, 1/4" Screw Size, 0.281" ID, 0.625" OD	4
4	McMaster-Carr - 91102A029	Zinc-Plated Steel Split Lock Washer, 1/4" Screw Size, 0.260" ID, 0.487" OD	4
5	McMaster-Carr - 92865A540	Medium-Strength Grade 5 Zinc-Plated Steel Cap Screw, 1/4"-20 Fully Threaded, 3/4" Long	4

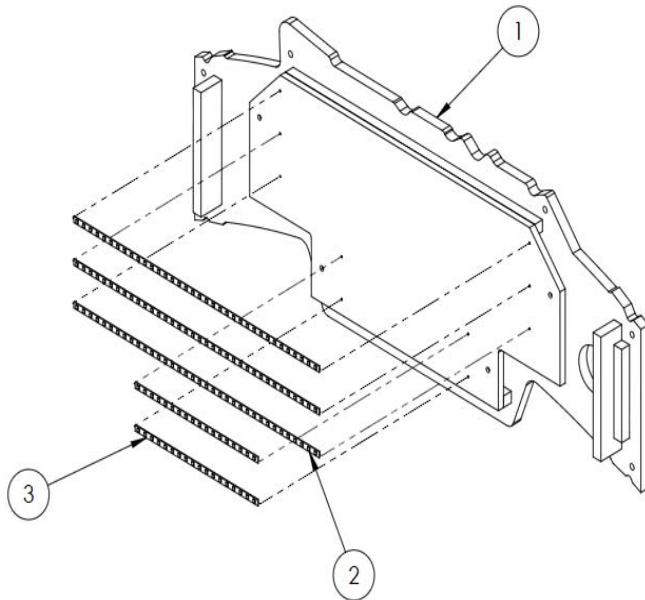


Padded Seat Back Assy



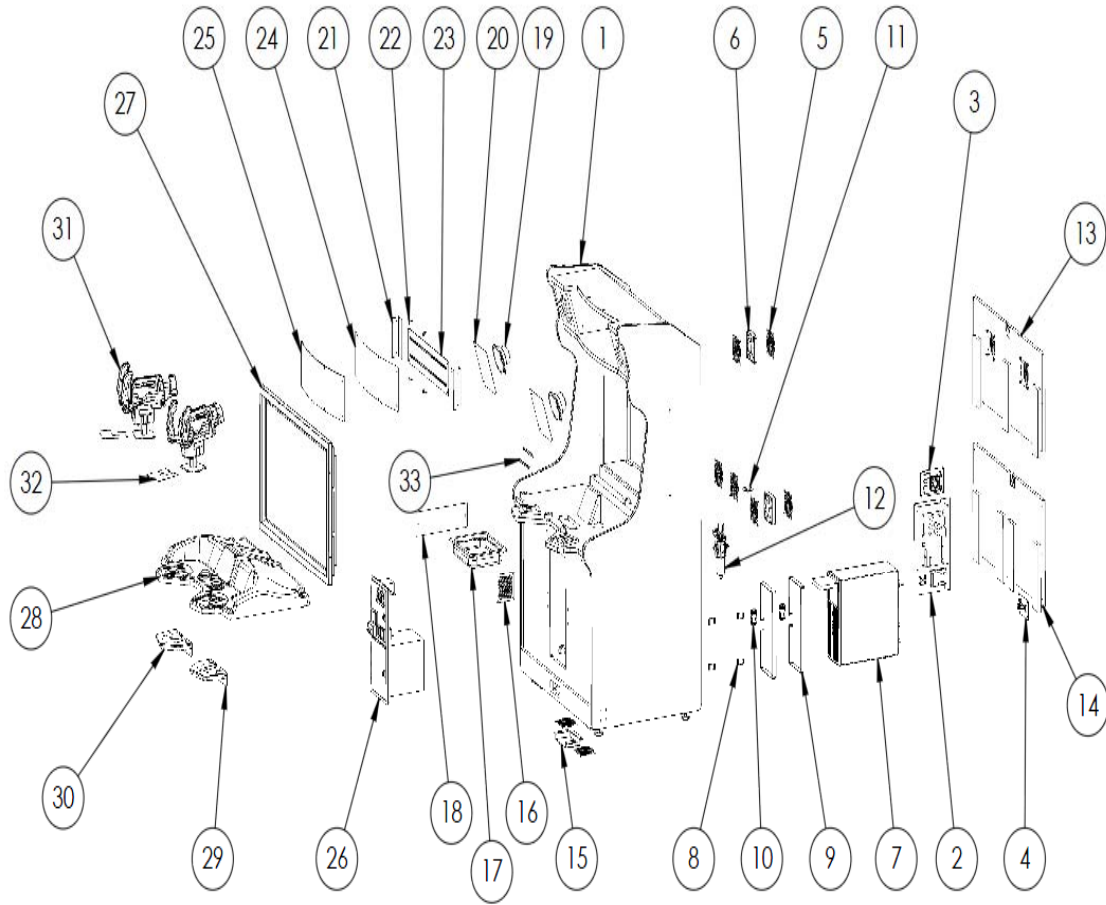
Operator's Manual

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	601-00740-01	Gate Logo Mounting Assembly	1
2	500-00162-01 (60 CM)	White Flexible LED Tape, w/ FOAM	3
3	500-00162-01 (30 CM)	White Flexible LED Tape, w/ FOAM	2



Gate Logo Mounting Assembly

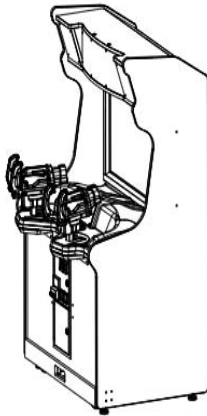




JP Bench - Front Assembly
(BOM on next page)

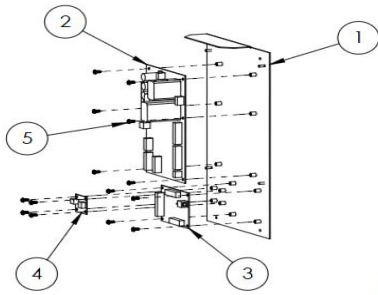


JP Bench
Front Assembly
BOM



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	601-00700-01	LCD Cabinet	1
2	JP_RIO_Hardware_Assy	RIO Assembly (with Mounting Plate)	1
3	JP_AMP_Assy	Amplifier Assembly (with Mounting Plate)	1
4	AC_Plate_Assy	AC Switch Plate Assembly	1
5	800-00001-00	120mm Wire Fan Guard	8
6	820-00012-00	Cooling Fan (standard size): 12VDC, 3W, 80CFM	2
7	HP705	(or approved equivalent PC)	1
8	600-00891-01	Securing Nylon Strap Plate	4
9	McMaster-Carr - 87425K76	PC Mounting Nylon Strip: 0.075" Thick, 1" Width, Black (56" Length)	2
10	McMaster-Carr - 29705T86	Plastic Buckle for Webbing NO Sew Squeeze-Release for 1" Wide Webbing	2
11	500-00064-01	LED Puck Light White (w/holes) - Black Face	1
12	Regulator_Assy	Regulator Assembly	1
13	Upper_Back_Door_Assy	Upper Back Door Assembly	1
14	Lower_Back_Door_Assy	Lower Back Door Assembly	1
15	600-01490-01	Under Cab Wire Plate	1
16	600-00110-01	Cabinet Perf Side Vent	1
17	600-01437-01	JP Bench - Drip Tray	1
18	600-01438-01	Drip Tray Access Plate	1
19	2-1-10-00-00-000	Goldwood: 5.25", 8 Ohm Full Range Speaker	2
20	600-01451-01	Perf Speaker Grill	2
21	600-01433-01	Marquee Side Bracket	2
22	600-01434-01	Marquee Top/Bottom Bracket	4
23	Translite_LED_Assy	Marquee LED Assembly	1
24	606-01043-01	Above Monitor Translite	1
25	600-01432-01	Marquee PETG	1
26	800-00005-01	Happ: Mid-Width Coin Door Assembly	1
27	JP_42_Monitor_Assy	42" Monitor Assembly	1
28	JP_Control_Panel_Assy	Control Panel Assembly	1
29	Gun_Support_Gusset_Assy_R	Right Gun Gusset Assembly	1
30	Gun_Support_Gusset_Assy_L	Left Gun Gusset Assembly	1
31	JP_Gun_Assy	Gun Assembly	2
32	600-01486-01	Dash Gun Cover Plate	2
33	500-00162-01 (15 CM)	White Flexible LED Tape, w/ FOAM	2

Operator's Manual

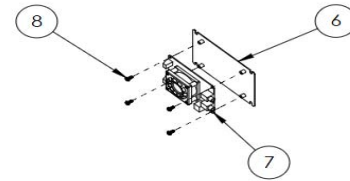


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	600-01501-01	RIO Mounting Plate (w/ Motion Control PCB)	1
2	500-00040-01	RIO PCB	1
3	500-00144-03	Motion Control PCB	1
4	500-00194-01	5V, 5A Switching Regulator PCB (12V input)	1
5	McMaster-Carr - 90316A192	18-8 Stainless Steel Hex Washer Head Slotted Machine Screw, 8-32 Thread, 3/8" Length	14

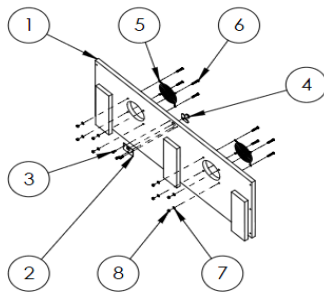
RIO Assembly (with Mounting Plate)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
6	600-01617-01	Amp Mounting Plate	1
7	500-00191-01	Sure Amp PCB	1
8	McMaster-Carr - 90316A192	18-8 Stainless Steel Hex Washer Head Slotted Machine Screw, 8-32 Thread, 3/8" Length	4



Amplifier Assembly (with Mounting Plate)

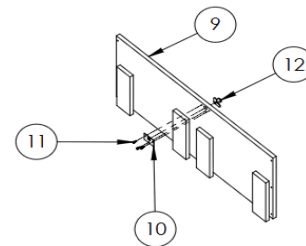


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	601-00717-01	Upper Back Door	1
2	600-00043-01	Lock Retainer Plate	1
3	McMaster-Carr - 90054A196	Hex Washer Head Screw for Sheet Metal, Zinc-Plated Steel, Slotted, Number 8 Size, 5/8" Length	3
4	150-00001-00	Standard Door Lock Assembly (for 3/4" Panels)	1
5	800-00001-00	120mm Wire Fan Guard	2
6	McMaster-Carr - 90272A835	Zinc-Plated Steel Pan Head Phillips Machine Screw, 10-32 Thread, 1-1/4" Length	8
7	McMaster-Carr - 90126A011	Zinc-Plated Steel SAE Flat Washer, Number 10 Screw Size, 0.219" ID, 0.500" OD	8
8	McMaster-Carr - 90631A411	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size, 3/8" Wide, 15/64" High	8

Upper Back Door Assembly

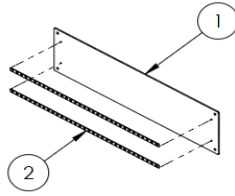


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
9	601-00739-01	Lower Back Door	1
10	600-00043-01	Lock Retainer Plate	1
11	McMaster-Carr - 90054A196	Hex Washer Head Screw for Sheet Metal, Zinc-Plated Steel, Slotted, Number 8 Size, 5/8" Length	3
12	150-00001-00	Standard Door Lock Assembly (for 3/4" Panels)	1



Lower Back Door Assembly

Operator's Manual

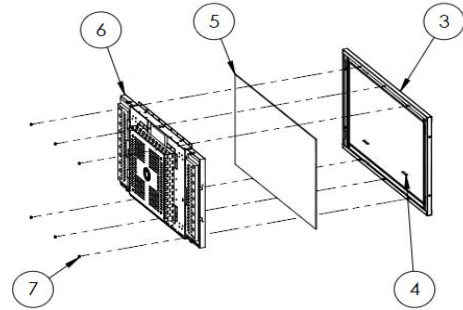


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	600-01485-01	Translite LED Panel	1
2	500-00162-01 (55 CM)	White Flexible LED Tape, w/ FOAM	2

Marquee LED Assembly

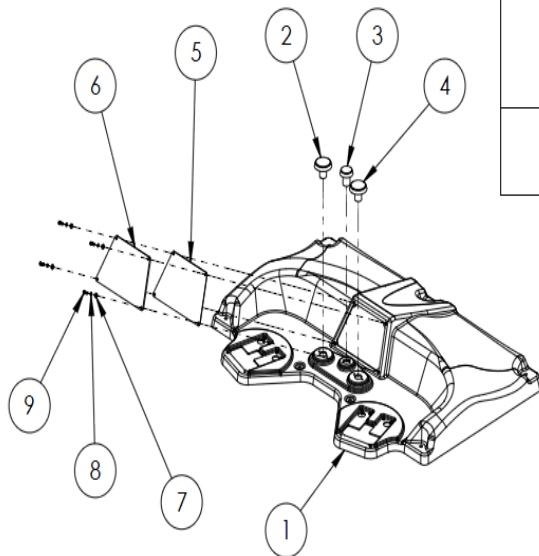


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
3	608-00156-01	42" Monitor Frame Weldment	1
4	Foam Tape	Black: 1/4"W x 1/8" T x 2"L	2
5	600-00073-01	42" LCD Display Glass (Tempered)	1
6	809-00004-01	42" HD Monitor	1
7	McMaster-Carr - 90675A011	Zinc-Plated Steel Hex Nut with Tooth Washer, 10-24 Thread Size, 3/8" Nut Width, 5/32" Overall Height	6



42" Monitor Assembly

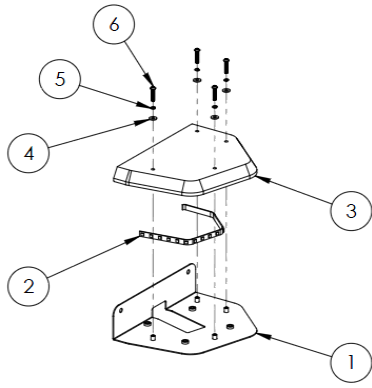
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	603-00751-01	JP Bench Control Panel Vacform	1
2	702-00015-01	Happ: Large Round Red Pushbutton with Locking Lampholder (6VDC White LED), .187 Gold MS - START	1
3	702-00062-01	Happ: Medium Round Yellow Pushbutton with Locking Lampholder (6VDC White LED), .187 Gold MS - STOP	1
4	702-00019-01	Happ: Large Round Blue Pushbutton with Locking Lampholder (6VDC White LED), .187 Gold MS - START	1
5	606-01044-01	Control Panel Translite	1
6	600-01436-01	Control Panel PETG	1
7	McMaster-Carr - 97416A113	Black-Oxide Steel SAE Flat Washer, Number 8 Screw Size, 0.188" ID, 0.438" OD	4
8	McMaster-Carr - 93711A300	Black Oxide 18-8 Stainless Steel Split Lock Washer for Socket Head Cap Screw, Number 8 Screw Size, 0.174" ID	4
9	McMaster-Carr - 96075A143	Alloy Steel Pin-in-Torx Button Socket Cap Screw, Black-Oxide, 8-32 Thread, 3/4" Length	4



Control Panel Assembly



Operator's Manual

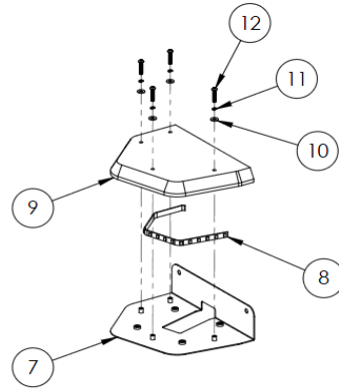


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	600-01440-01	Gun Gusset Bracket R	1
2	500-00131-01 (30 CM)	RGB Flexible LED Strip	1
3	603-00744-01	Gun Gusset Edgeglow R	1
4	McMaster-Carr - 97416A115	Black-Oxide Steel SAE Flat Washer, Number 10 Screw Size, 0.219" ID, 0.500" OD	4
5	McMaster-Carr - 93711A400	Black Oxide 18-8 Stainless Steel Split Lock Washer for Socket Head Cap Screw, Number 10 Screw Size, 0.200" ID	4
6	McMaster-Carr - 96075A195	Alloy Steel Pin-in-Torx Button Socket Cap Screw, Black-Oxide, 10-32 Thread, 1" Length	4

Right Gun Gusset Assembly

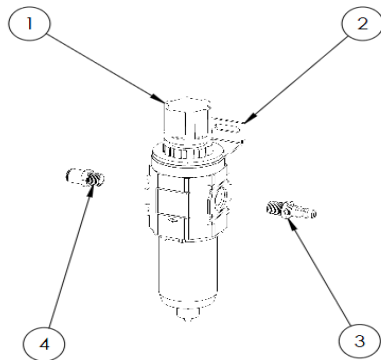


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
7	600-01441-01	Gun Gusset Bracket L	1
8	500-00131-01 (30 CM)	RGB Flexible LED Strip	1
9	603-00745-01	Gun Gusset Edgeglow L	1
10	McMaster-Carr - 97416A115	Black-Oxide Steel SAE Flat Washer, Number 10 Screw Size, 0.219" ID, 0.500" OD	4
11	McMaster-Carr - 93711A400	Black Oxide 18-8 Stainless Steel Split Lock Washer for Socket Head Cap Screw, Number 10 Screw Size, 0.200" ID	4
12	McMaster-Carr - 96075A195	Alloy Steel Pin-in-Torx Button Socket Cap Screw, Black-Oxide, 10-32 Thread, 1" Length	4



Left Gun Gusset Assembly

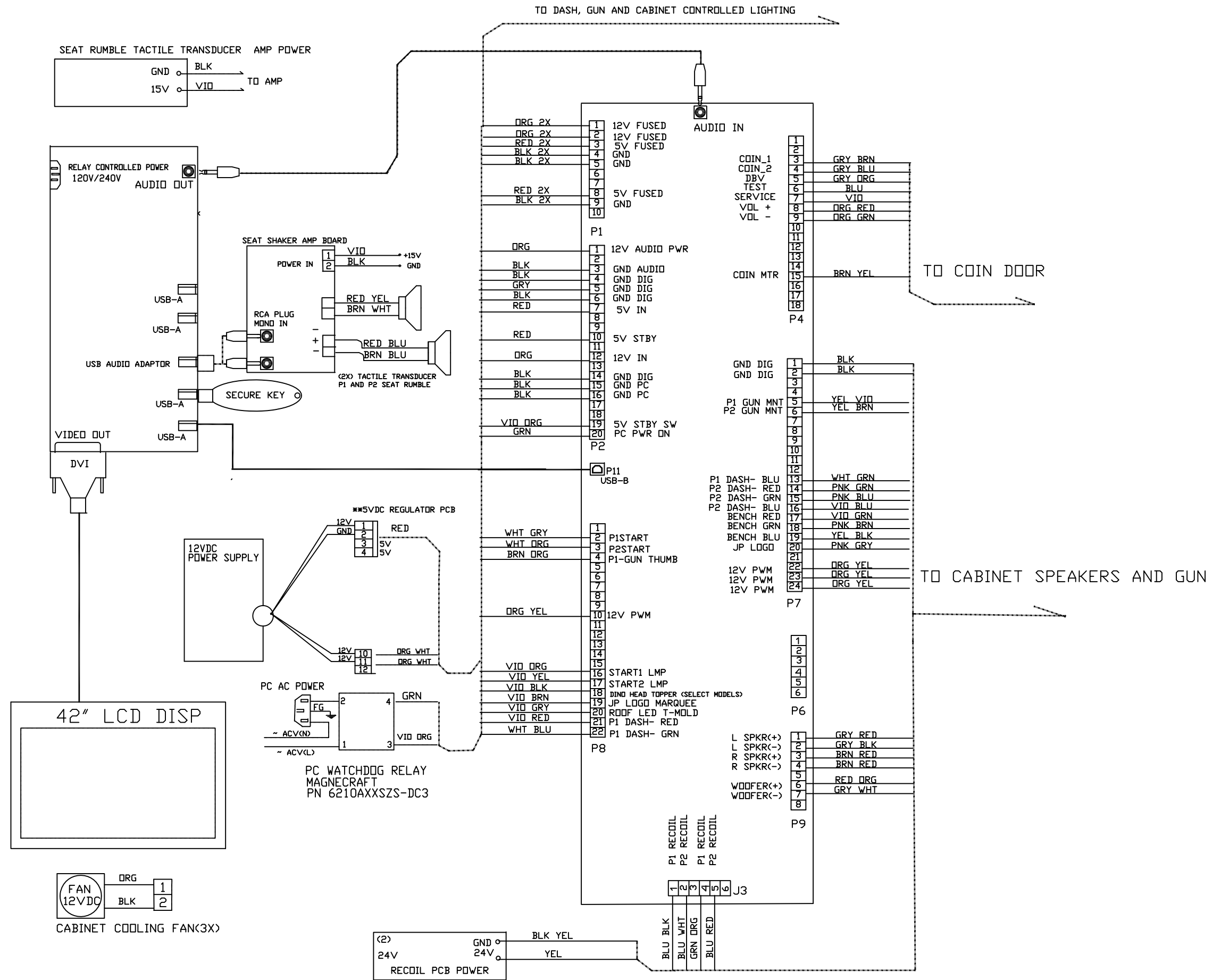
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	604-00046-01	CKD W3000-8N-W-F1: 1/4" NPT 5 micron Filter/ Regulator	1
2	604-00048-01	CKD B330: L Style Mounting Bracket	1
3	McMaster-Carr - 6718K26	Stainless Steel Industrial-Shape Hose Coupling, Plug, 1/4" NPTF Male, 1/4 Coupling Size	1
4	McMaster-Carr - 5779K116	Push-to-Connect Tube Fitting for Air, Straight Adapter for 3/8" Tube OD x 1/4 NPT Male	1



Regulator Assembly



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TO MCU P8, P10 , RIO J3 AND 24V POWER SUPPLY

GUN RECOIL FUSE NOTE:
 FUSES ARE ON GUN HARNESS.
 EACH GUN COIL IS FUSED SEPARATELY
 EACH GUN USES TWO COILS. SEE GUN ILLUSTRATION
 2AMP SLO-BLO FUSE ONLY.

P1
GUN

GRN YEL X2	1	FIELD GND
BLK	2	GND
BRN ORG	3	THUMB SW
BRN GRN	4	TRIGGER SW
BLK RED X2	5	A/D GND
BLK RED	6	A/D GND
RED BLK X2	7	A/D 5V+
RED BLK	8	A/D 5V+
GRN WHT	9	GUN X-AXIS
GRN BLK	10	GUN Y-AXIS
BLK GRN	11	COIL#1 SIG
BLK ORG	12	COIL#2 SIG
YEL ORG	13	24V+ COIL POWER
	14	N.C.

P2
GUN

GRN YEL X2	1	FIELD GND
BLK	2	GND
BRN GRN	3	THUMB SW
BRN VIO	4	TRIGGER SW
BLK RED X2	5	A/D GND
BLK RED	6	A/D GND
RED BLK X2	7	A/D 5V+
RED BLK	8	A/D 5V+
GRN BLU	9	GUN X-AXIS
GRN ORG	10	GUN Y-AXIS
BLK GRN	11	COIL#1 SIG
BLK PNK	12	COIL#2 SIG
YEL ORG	13	24V+ COIL POWER
	14	N.C.

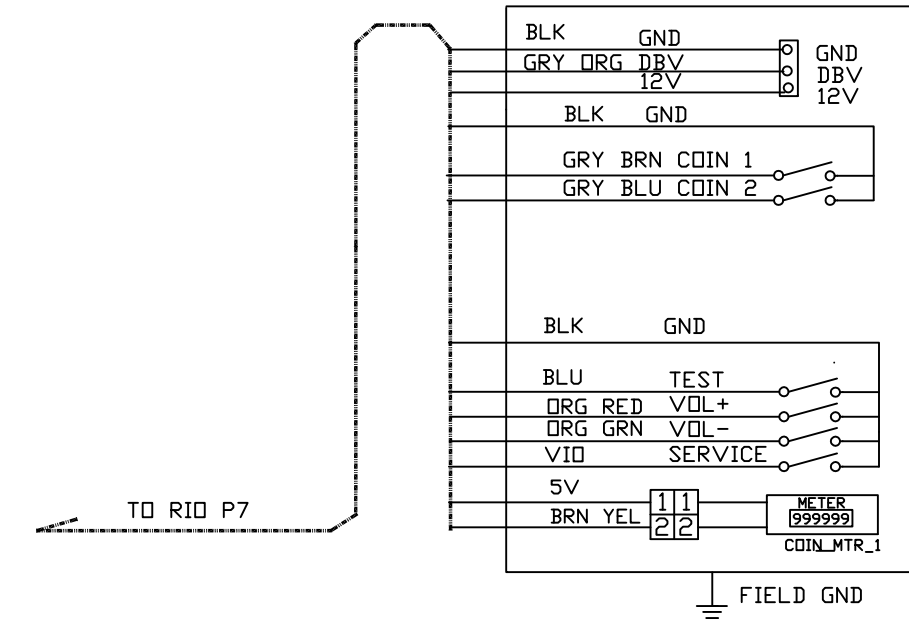
P1 RECOILPCB	
BLK YEL	1 COIL GND
YEL ORG	2 24V
YEL ORG	3 COIL V+
BLK GRN	4 COIL V_SIG
BLU BLK	5 RECOIL SIG
BLK	6 SIG GND

P2 RECOILPCB	
BLK YEL	1 COIL GND
YEL RED	2 24V
YEL RED	3 COIL V+
BLK GRN	4 COIL V_SIG
BLU WHT	5 RECOIL SIG
BLK	6 SIG GND

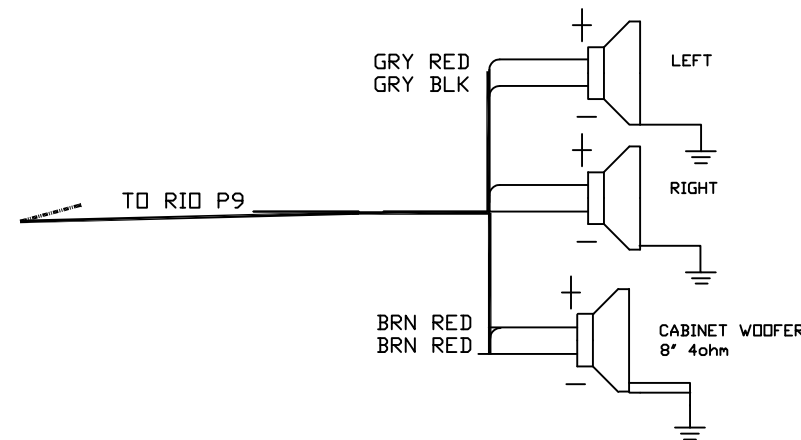
P1 RECOILPCB	
BLK YEL	1 COIL GND
YEL RED	2 24V
YEL	3 COIL V+
BLK ORG	4 COIL V_SIG
GRN ORG	5 RECOIL SIG
BLK	6 SIG GND

P2 RECOILPCB	
BLK YEL	1 COIL GND
YEL RED	2 24V
YEL RED	3 COIL V+
BLK PNK	4 COIL V_SIG
BLU RED	5 RECOIL SIG
BLK	6 SIG GND

NOTE: FOR CONTINUED SAFETY
 USE ONLY SPECIFIED FUSE
 RATING.



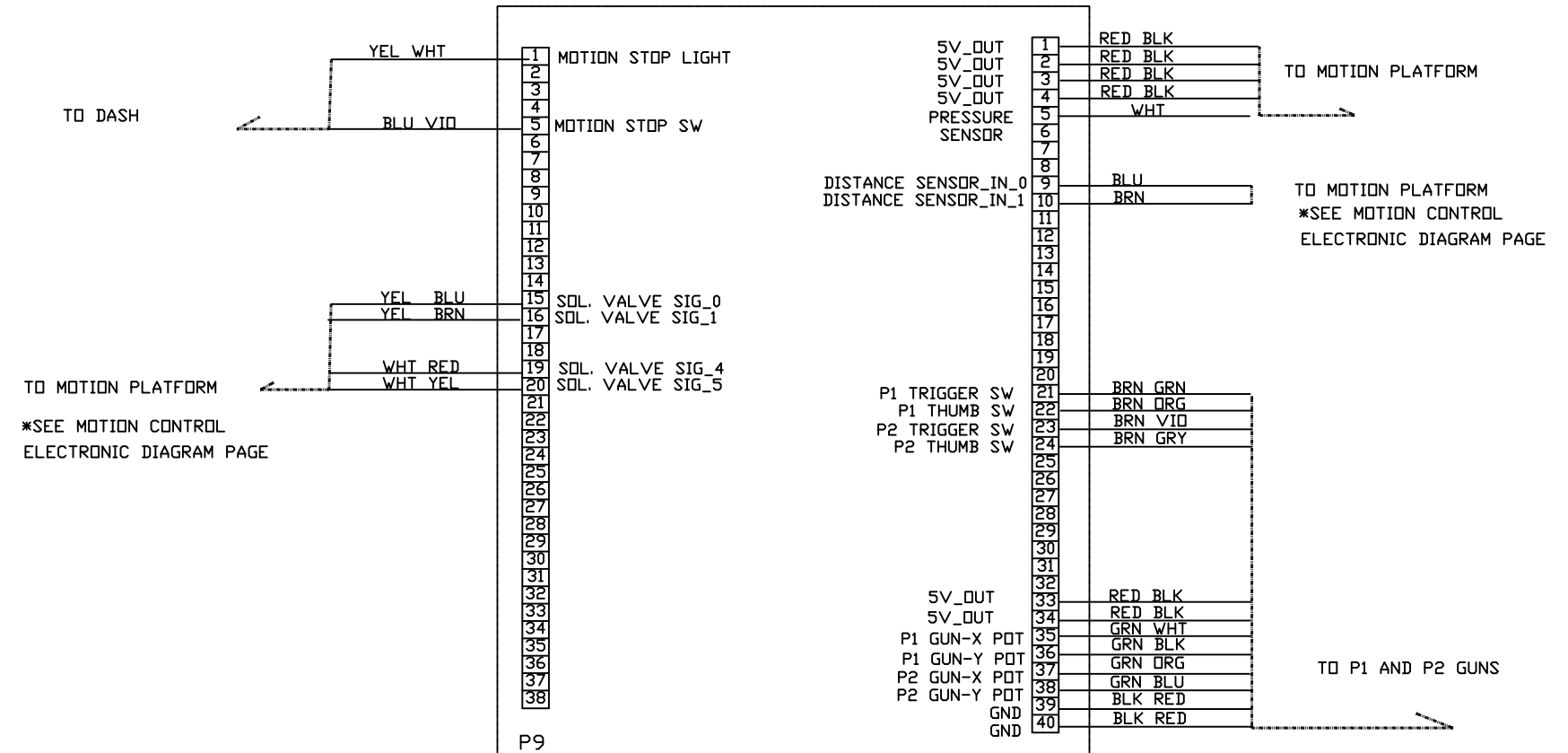
COIN DOOR



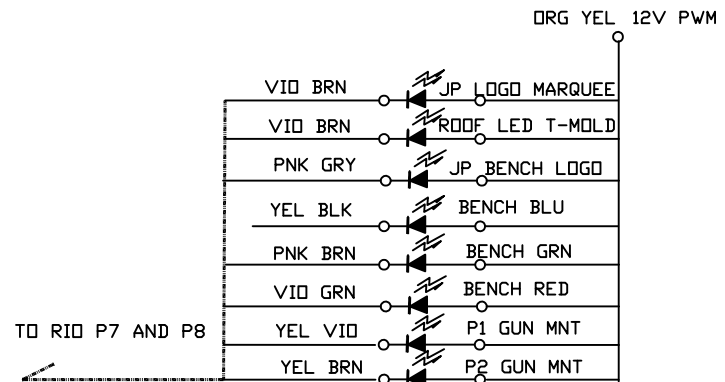
TOP LCD CABINET

UNDER BENCH

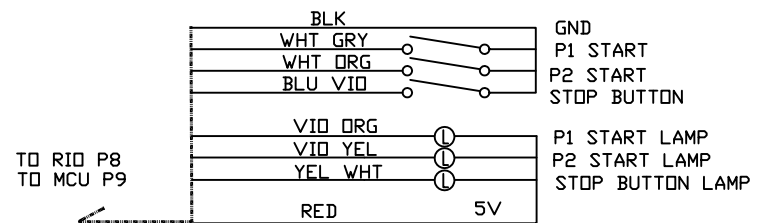
USB MOTION CONTROLLER PCB (UMC)



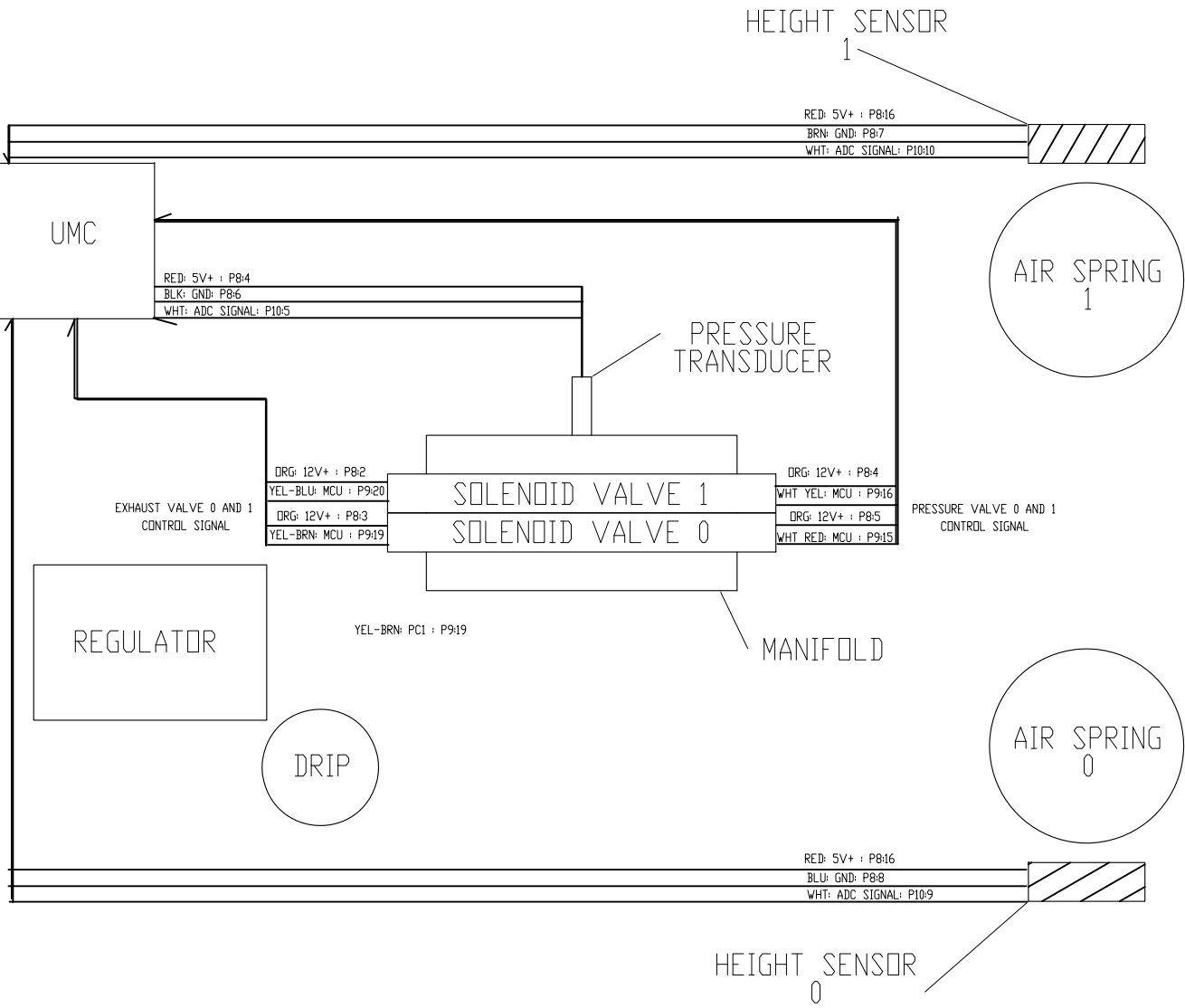
CABINET CONTROLLED LIGHTING



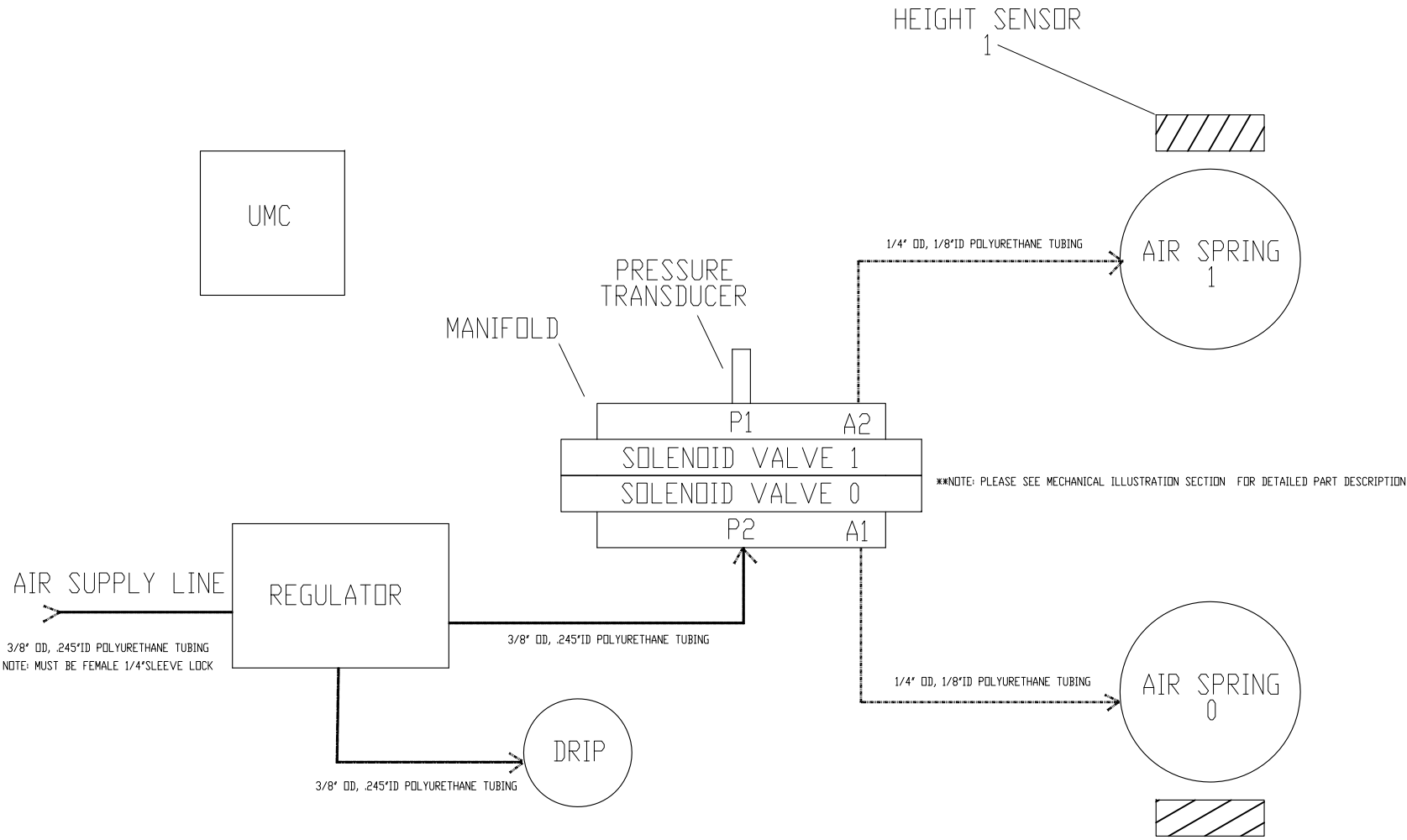
DASH BUTTONS



MOTION CONTROL ELECTRONIC DIAGRAM

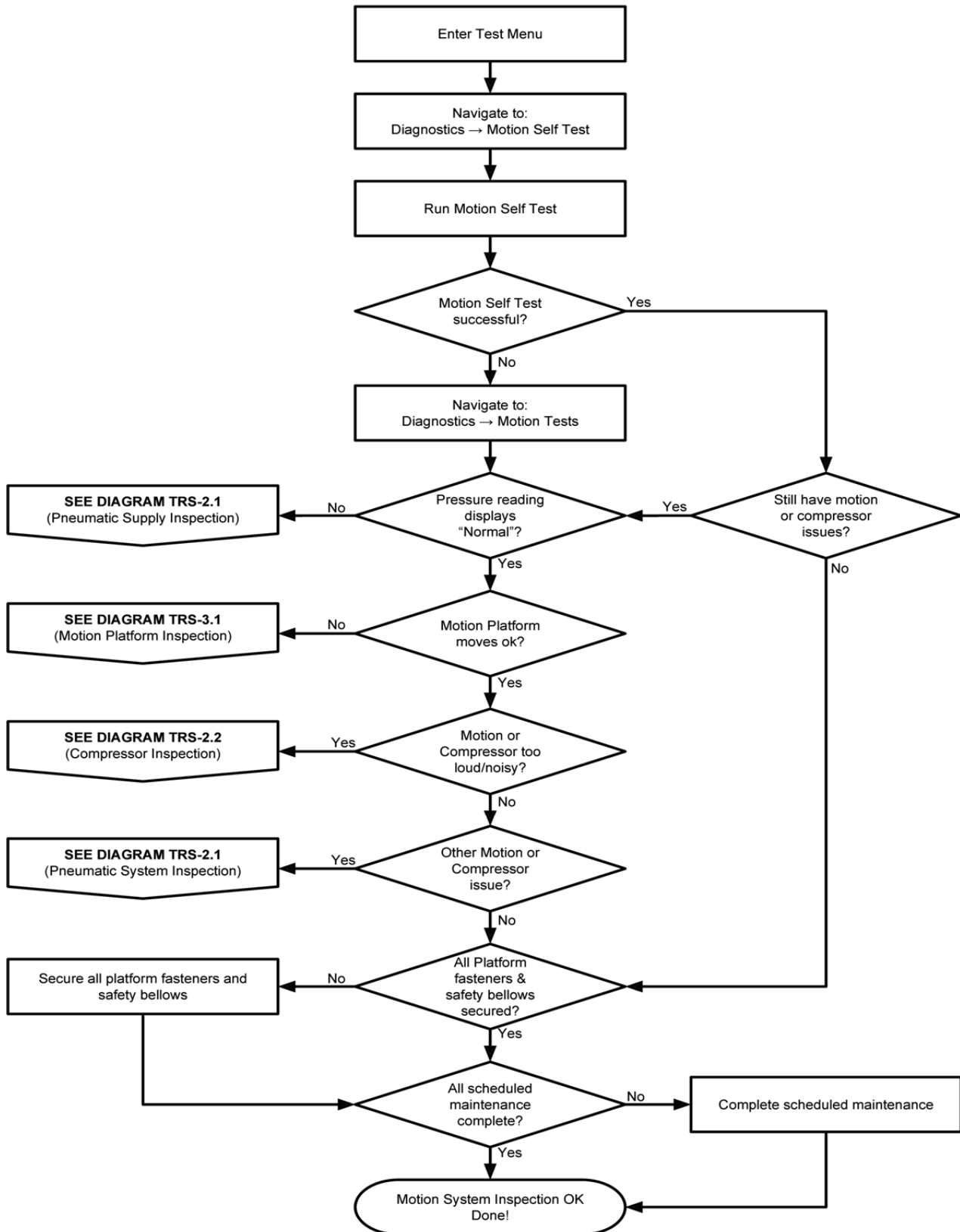


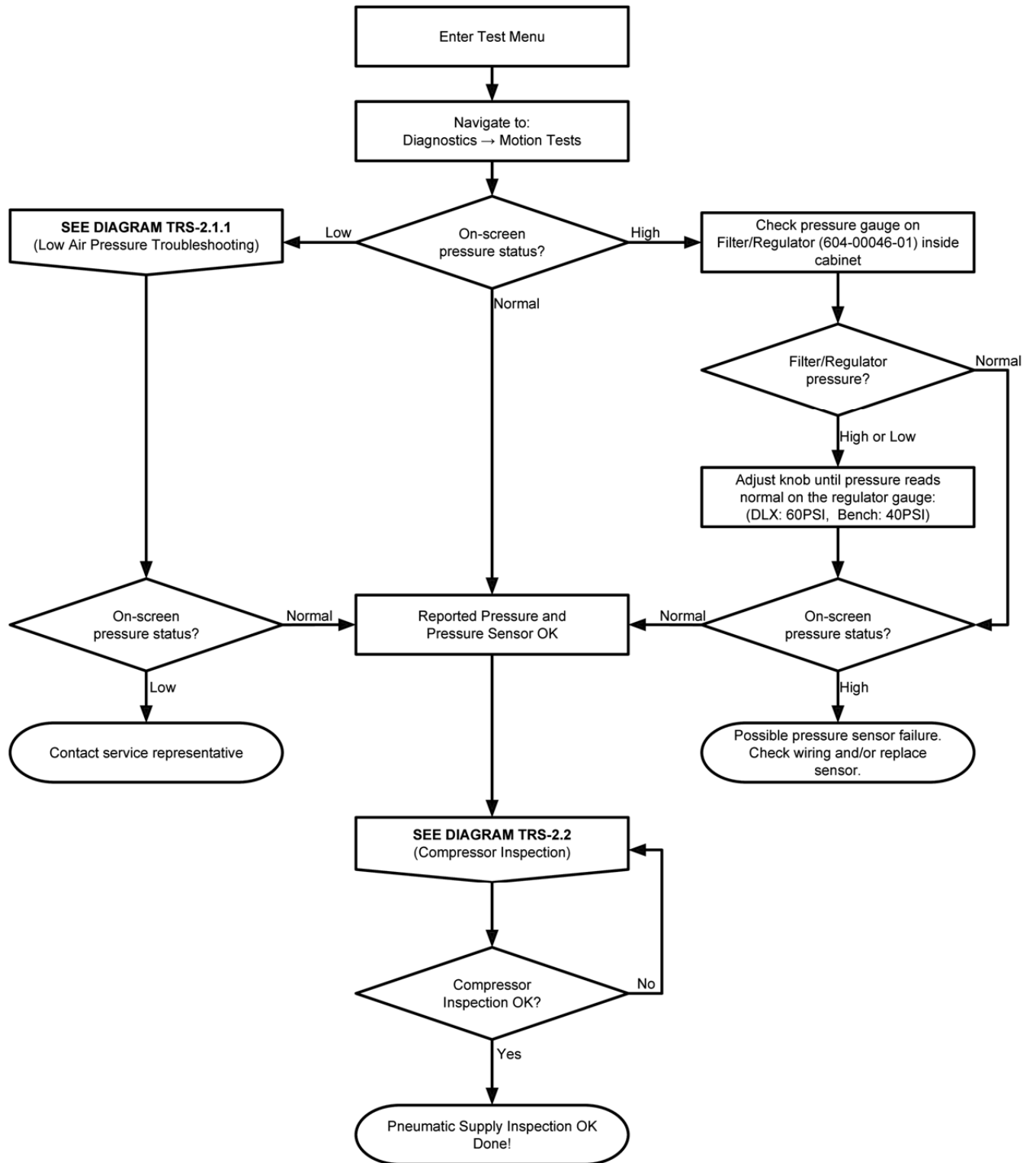
MOTION CONTROL PNEUMATIC DIAGRAM

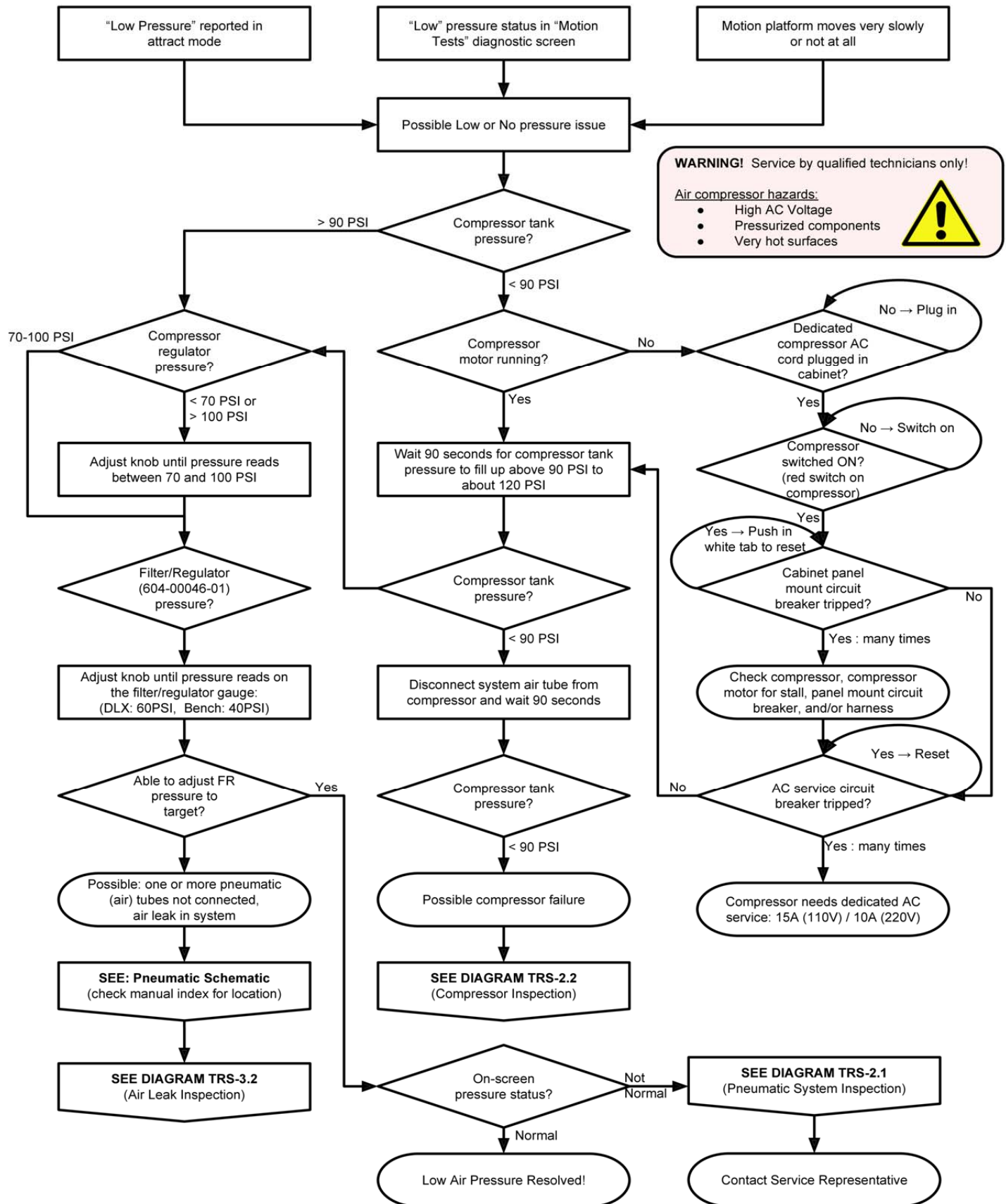


Motion System Troubleshooting Guide

Category	Topic	Figure
General	Main Motion Inspection & Troubleshooting Guide	TRS-1.1
Compressor & Air Supply	Pneumatic Supply Inspection	TRS-2.1
	Motion pressure errors reported on screen	TRS-2.1
	High Air Pressure	TRS-2.1
	Low Air Pressure	TRS-2.1.1
	No Air Pressure	TRS-2.1.1
	Compressor inspection	TRS-2.2
	Compressor is very loud	TRS-2.2
	Compressor runs continuously	TRS-2.2
	Compressor does not turn on	TRS-2.2
Motion Functionality	Motion Platform Inspection	TRS-3.1
	General Air Leak Inspection	TRS-3.2
	Motion Platform Air Leak Inspection	TRS-3.2.1
	Motion Functionality Inspection	TRS-3.3
	Motion platform does not move at all	TRS-3.3
	Individual motion actuator does not move	TRS-3.3
	Individual motion actuator moves up, but not down	TRS-3.3
	Individual motion actuator moves down, but not up	TRS-3.3
	Motion software settings	TRS-3.3.1
	Individual motion actuator moves erratically	TRS-3.3.2
Height sensor not responding	TRS-3.3.2	
Height sensor displays erratic values	TRS-3.3.2	
Motion Speed	Motion Speed Troubleshooting	TRS-4.1
	Motion platform moves very fast	TRS-4.1
	Motion platform moves very slow	TRS-4.1
	Individual motion actuator moves very slow	TRS-4.1

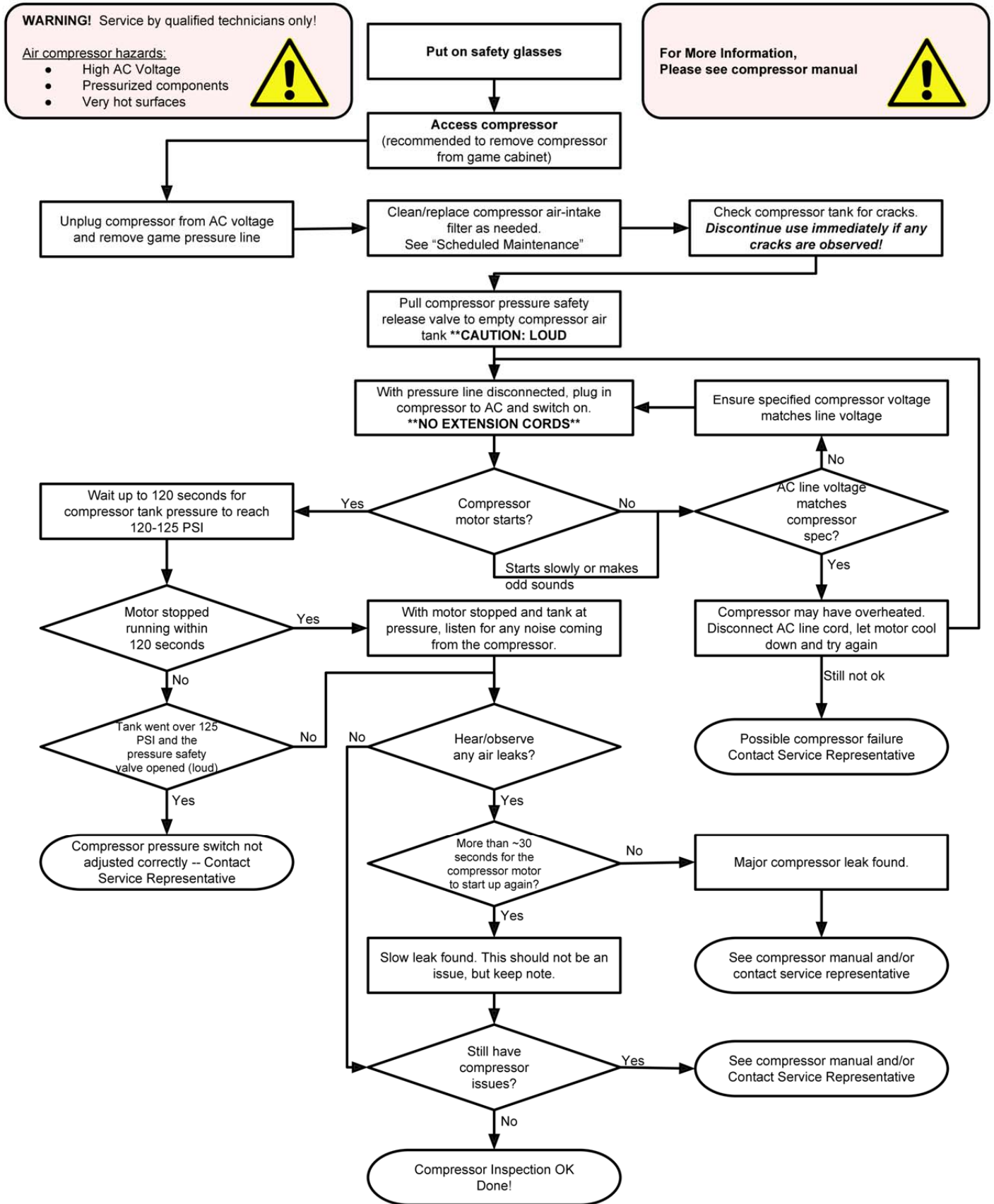


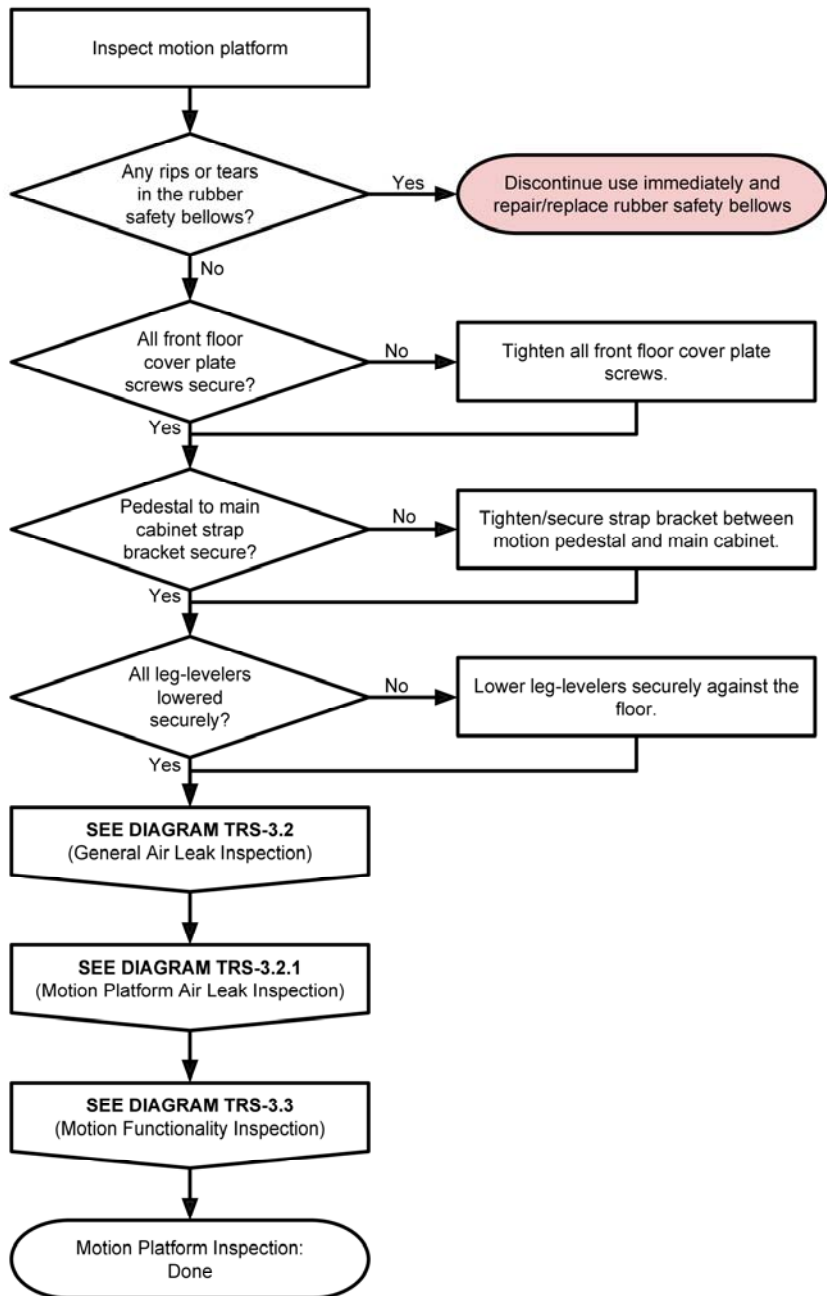


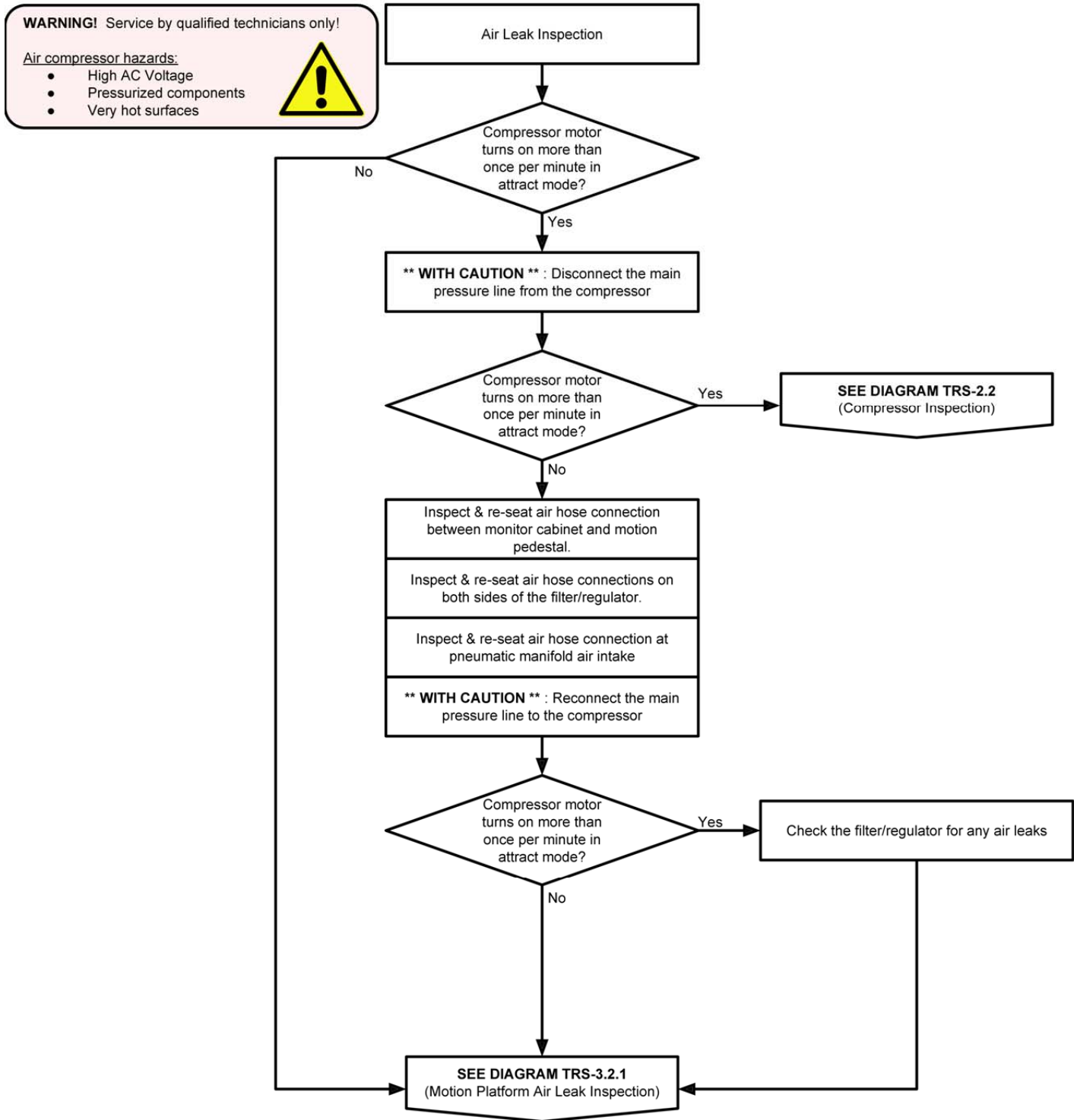


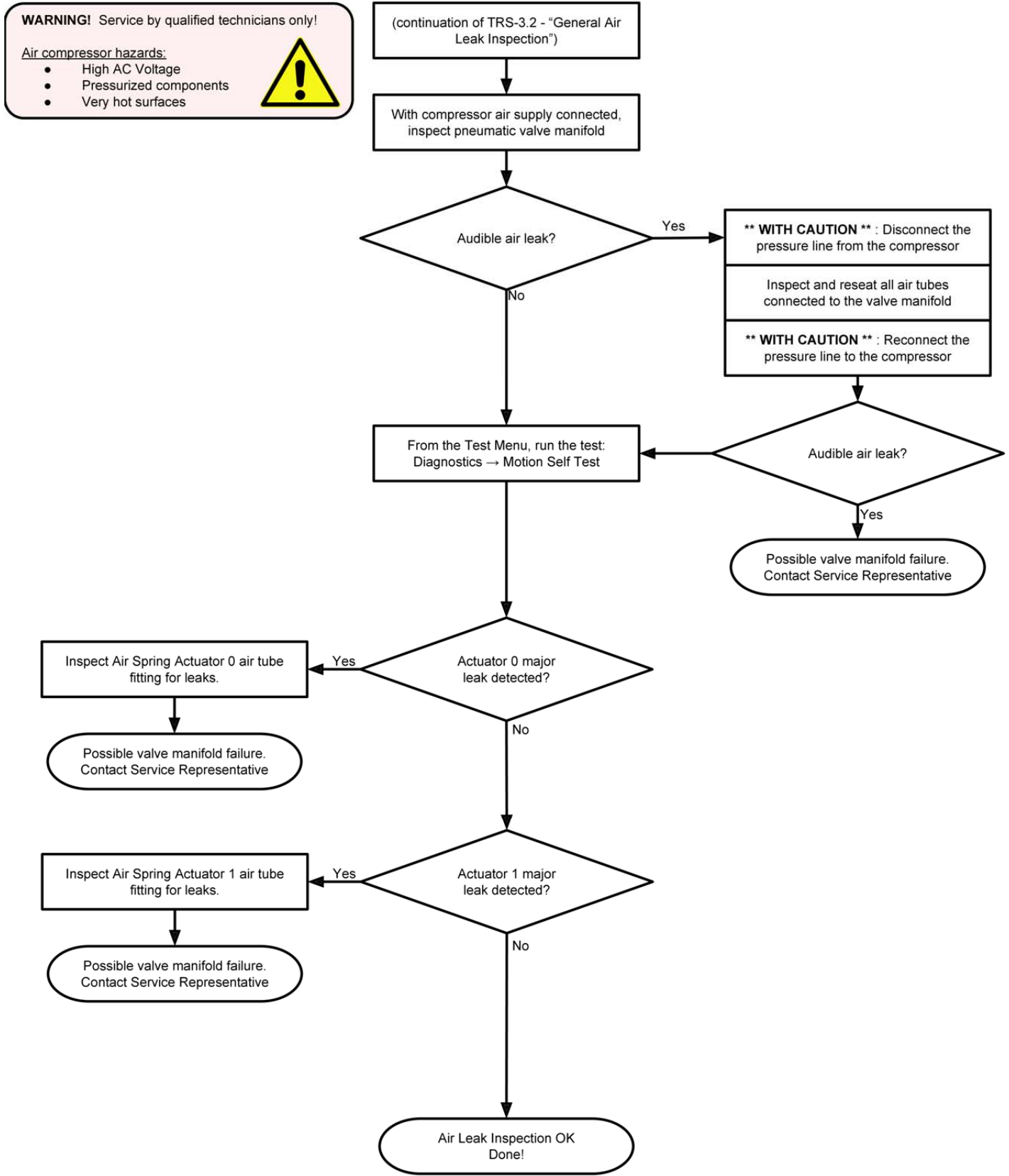
Compressor Inspection

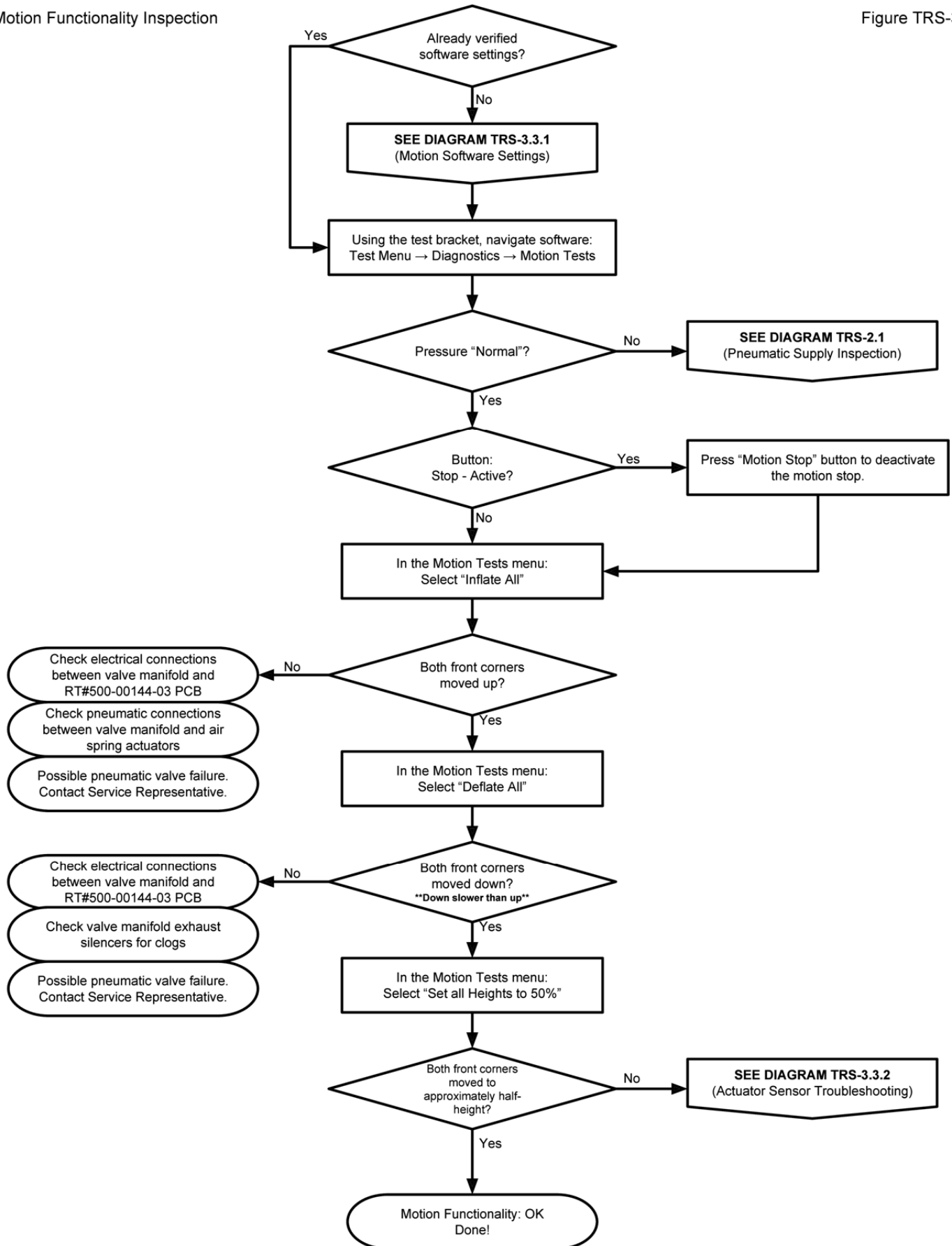
Figure TRS-2.2

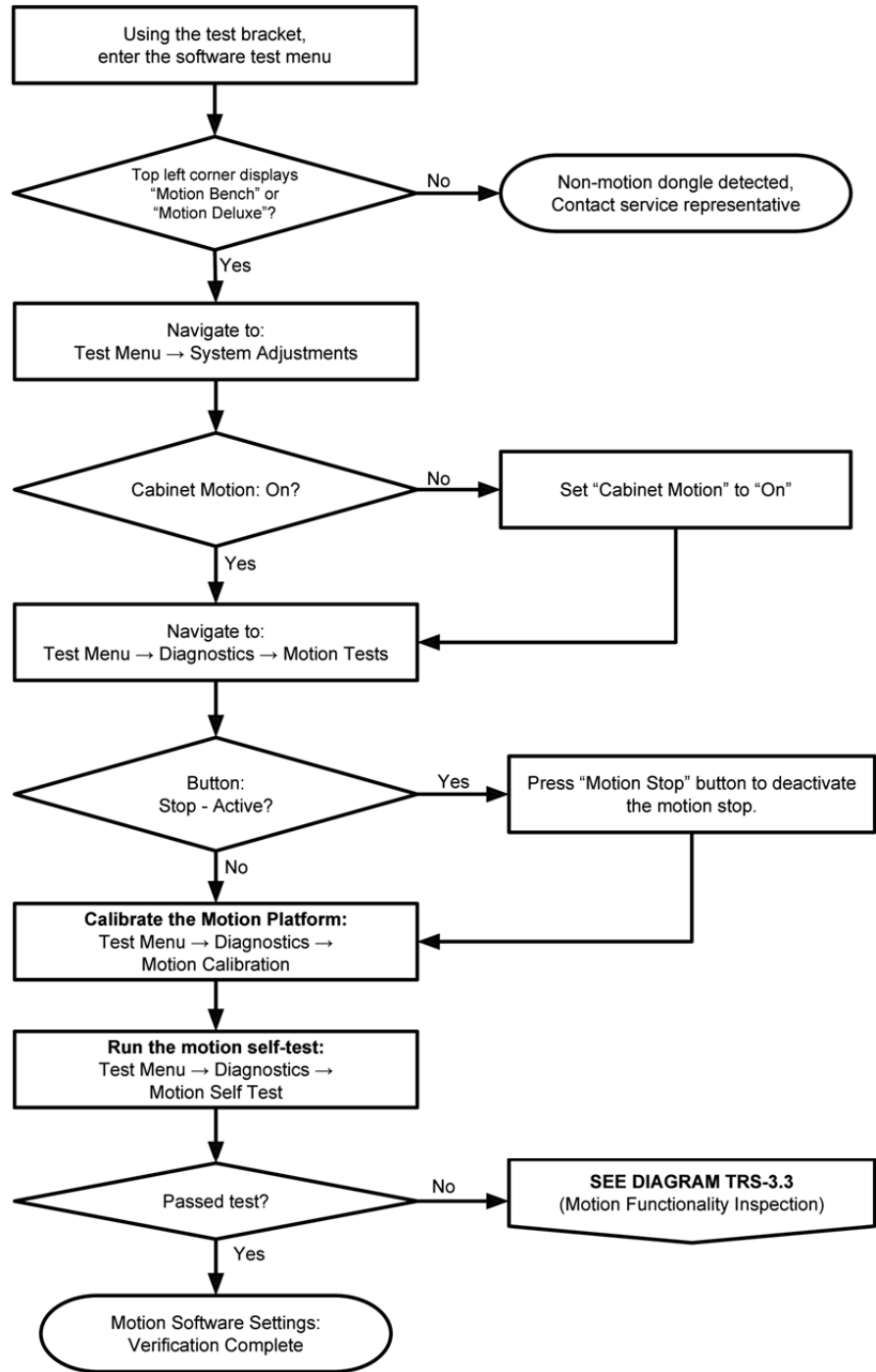


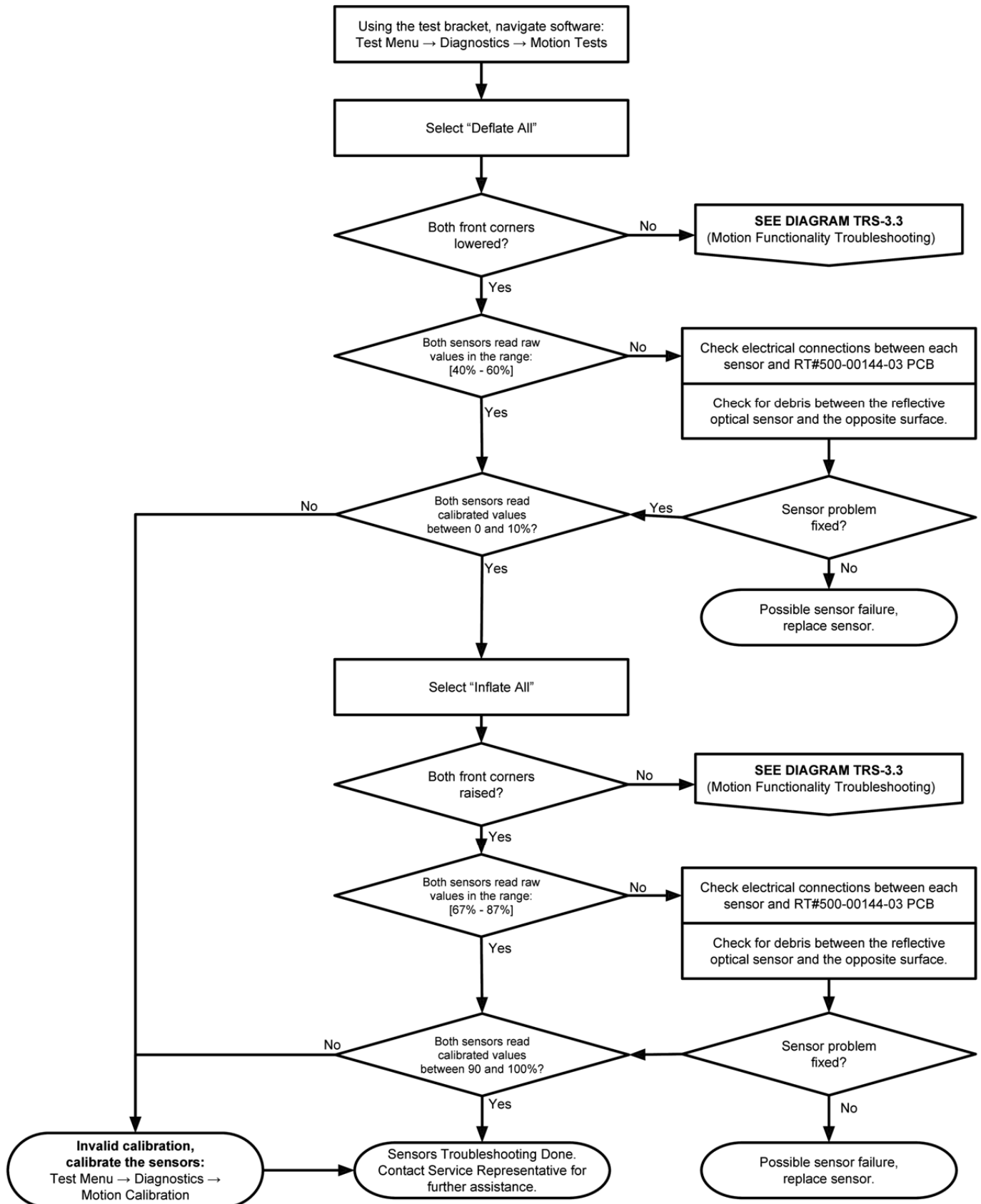












Motion Speed Troubleshooting

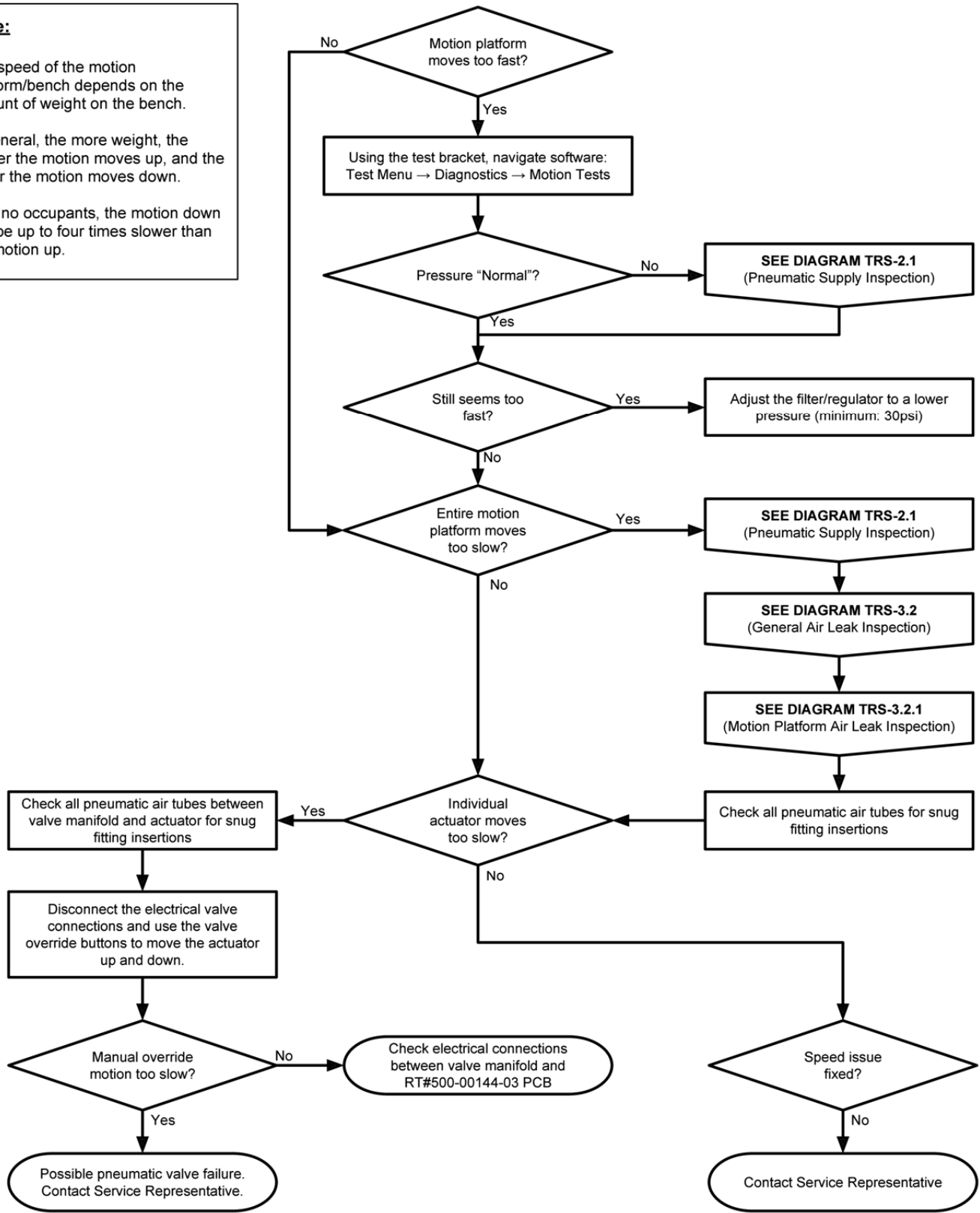
Figure TRS-4.1

Note:

The speed of the motion platform/bench depends on the amount of weight on the bench.

In general, the more weight, the slower the motion moves up, and the faster the motion moves down.

With no occupants, the motion down can be up to four times slower than the motion up.



NOTES:

