

WALT DISNEY WORLD®

PROJECT RED

TURTLE

OPERATIONS AND REPAIR MANUAL



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Revision History

Date	Version	Description	Author
03/01/2024	1.0	First iteration	Bridget Reilly Beauchamp, Brieaunna Avery
04/29/2024	1.1	Addition of Comprehensive Materials	Bridget Reilly Beauchamp, Brieaunna Avery
06/11/2024	2.2	Final Iteration before installation	Bridget Reilly Beauchamp, Betsy Falk

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1 Introduction and Preface

1.1 General Project Information

1.1.1 Notes from Monkey Boys Productions

This character is designed for use in collaboration with Walt Disney World/Disney's Hollywood Studios for use in the Voyage of the Little Mermaid Theater. All information contained herein was prepared for Monkey Boys Productions, LLC and is property of the Disney Corporation and not to be used in any way without their consent.

1.1.2 From the Disney Scope of Work, section 1.2-1.4:

General Resort Overview

Movie magic comes to life at Disney's Hollywood Studios. This park features 8 sections: Hollywood Boulevard, Echo Lake, Grand Avenue, Sunset Boulevard, Commissary Lane, Star Wars: Galaxy's edge, Toy Story Land and Animation Courtyard.

General Venue Overview

Project Red will take place in the Voyage of the Little Mermaid (VOLM) Theater located within the One Man's Dream building next to Animation Courtyard in Disney's Hollywood Studios. The VOLM Theatre is a 400-seat theatre with a small, elevated stage with access between the house and backstage on Stage Left. All elements must fit through a double door at most due to limited load in infrastructure.

General Show Overview

A reimaged retelling of the classic film seen through the unique perspective of Ariel, a 16-year-old girl. Through cutting edge technology, mixed media, puppetry, and live actors, we follow Ariel's journey as she boldly pursues her dream to be part of the human world above, even if it means leaving her under the sea home.

1.2 Item Description

1.2.1 Summarized from the Disney Scope of Work, Section 4.12.1:

"The Turtle is a body worn puppet performed by a single puppeteer. The puppet is worn by the performer - lanyard style - with simple straps at the turtle's feet that Velcro around the performer's shins. This will allow the puppet to mimic the movement of the performer's feet and legs. The legs should be attached to the puppets body utilizing bungee cord to allow for added flexibility at the joint as the performer enters and exits stage. The turtle's arms are controlled by arm rods located at each of the turtle's 'wrists'."

1.2.2 Basis of Engineering

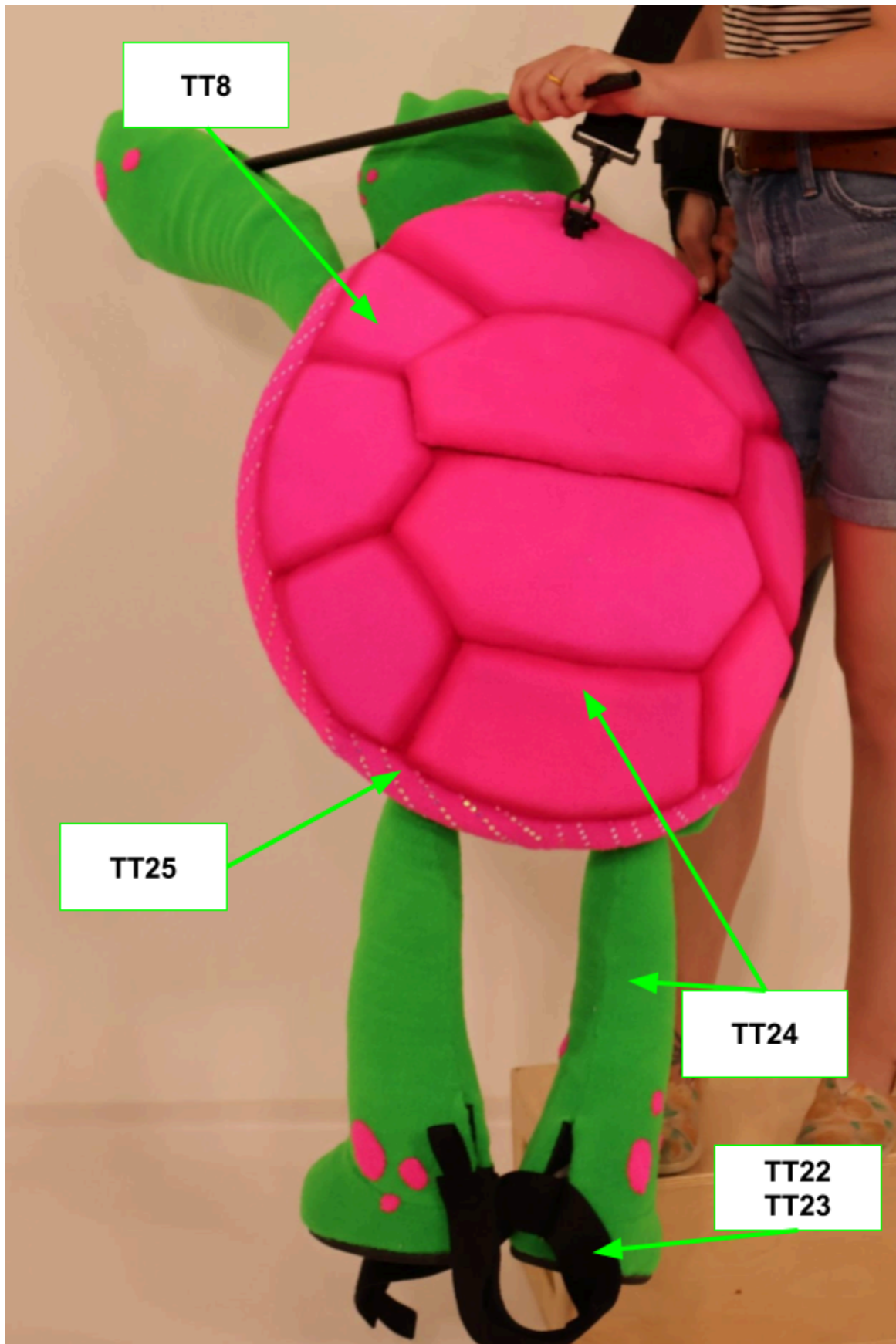
The turtle is built of a combination of L200 closed-cell foam and laminated poly foam. He is covered in uv-reactive fleece with painted details with vacuformed plastic eyes. His arms and legs are attached to a central aluminum skeleton using bungees to allow them to stretch and move. Both arms have carbon fiber arm rods that extend out from the back, and the legs attach to the performer's foot using both Velcro and elastic. The entire turtle is suspended from the performer's body using a neck lanyard. The connection is flexible, and the harness is adjustable to allow for different performers to wear it.

2 Construction and Assembly

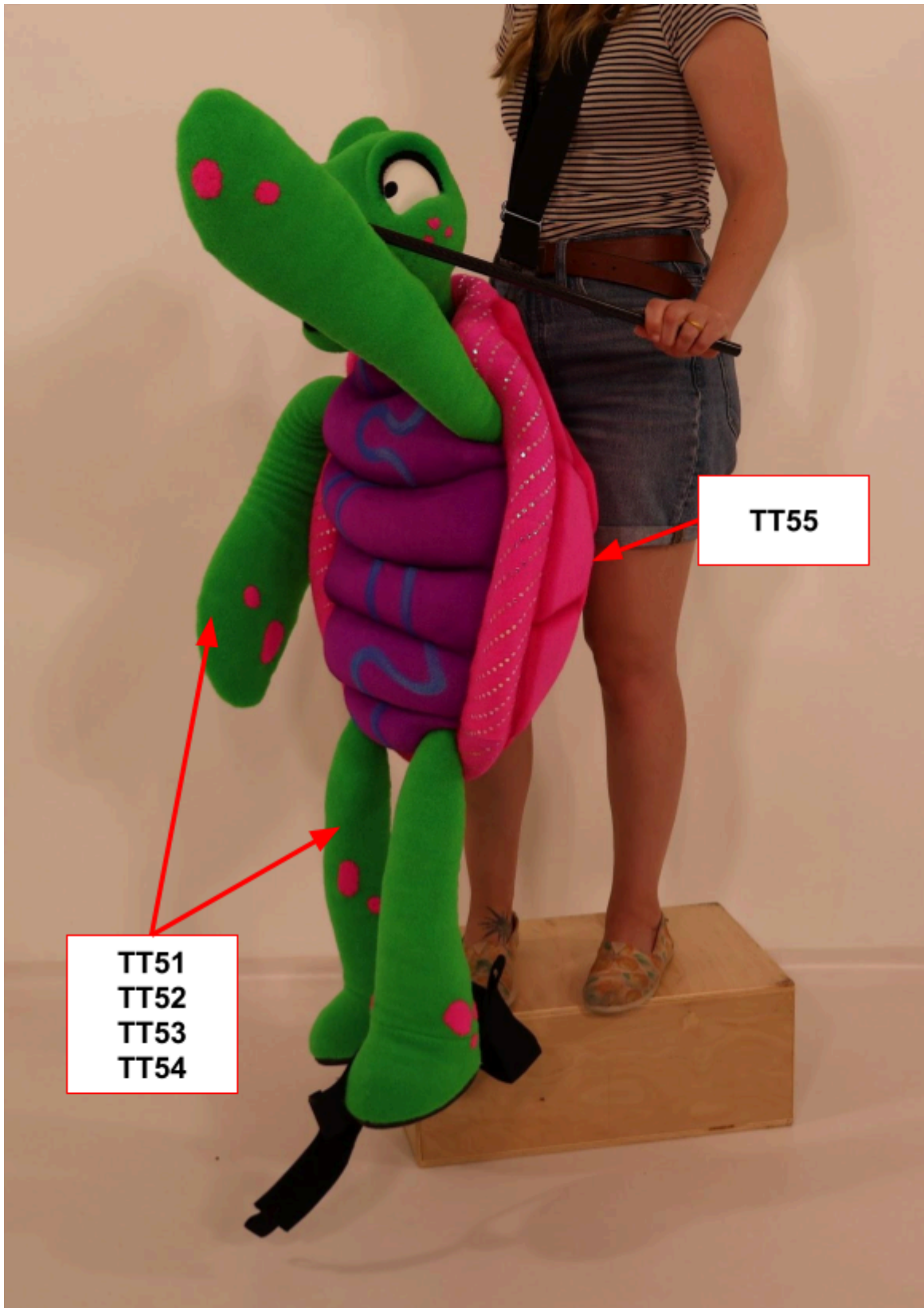
2.1 Front View



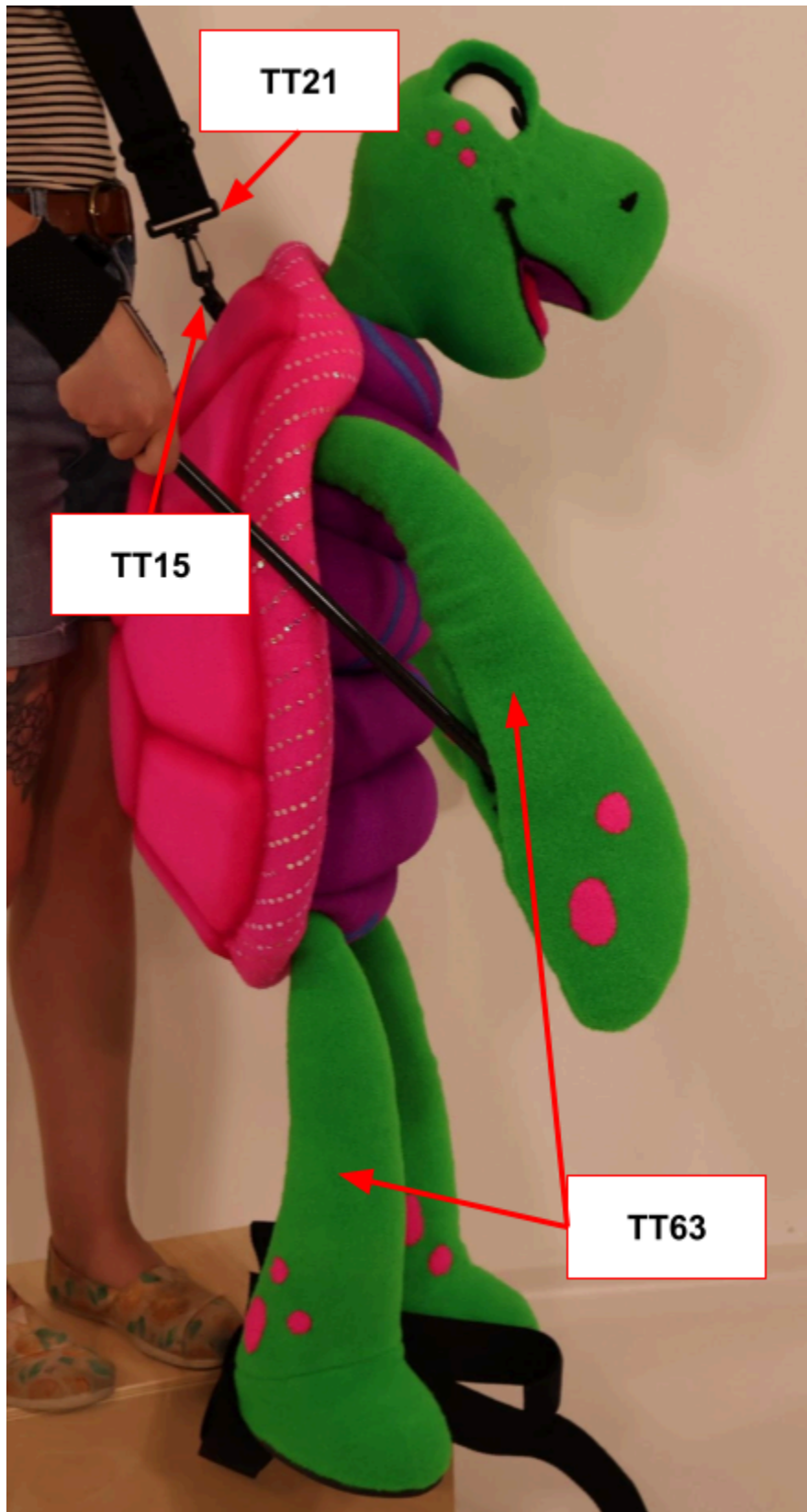
2.2 Rear View



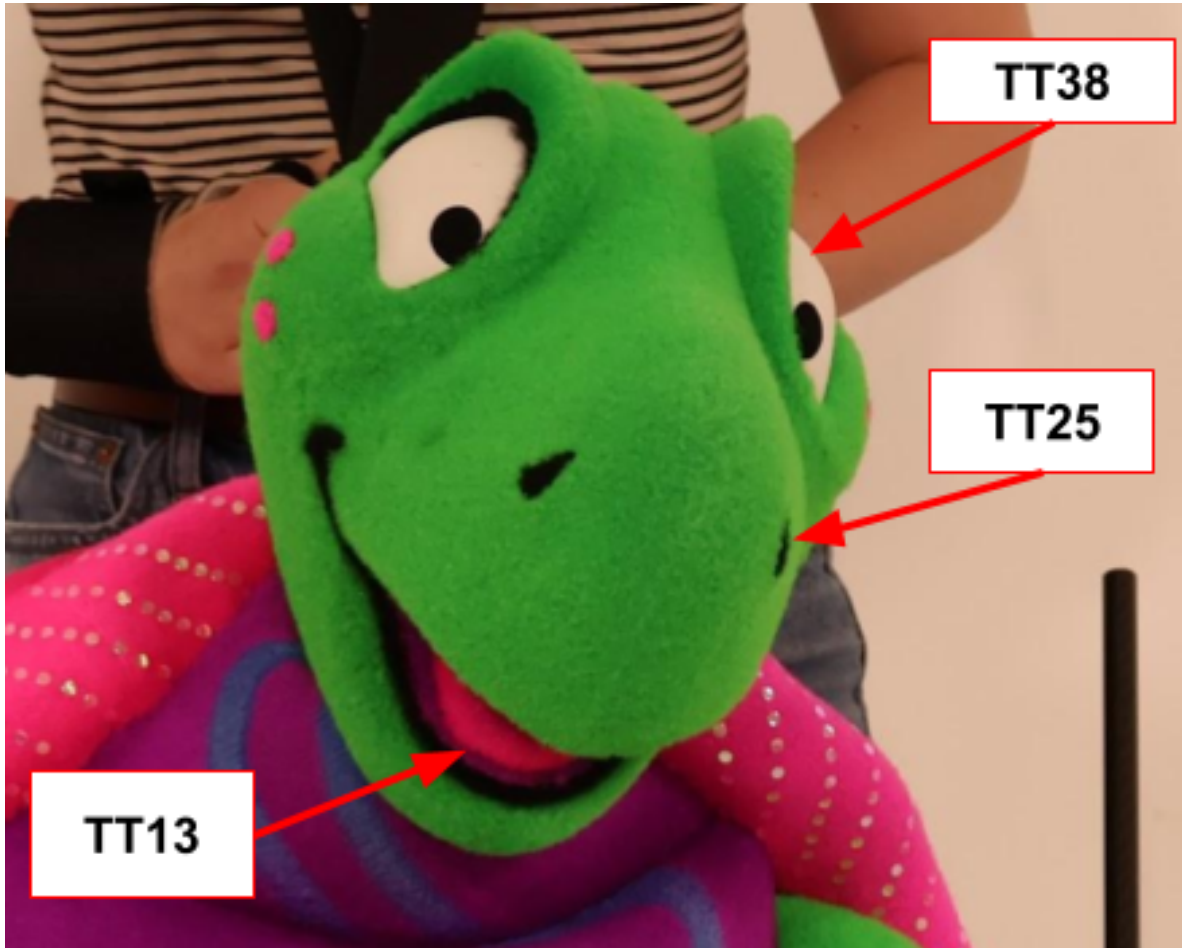
2.3 Left view



2.4 Right View



2.5 Closeup of Face



2.6 UV View



3 Description of Operating Modes

3.1 Operating Modes

3.1.1 Assembly

3.1.2 Storage

The puppet will be stored on a stand during the show.

Between performances, the puppet should be covered with its custom cover in order to protect it from the elements.

At no point should a puppet be stacked on top of or underneath another puppet or prop.

3.1.3 Performance

The puppet is operated by a single performer. They should be able to do all performing actions without assistance.

3.2 Operating Procedures

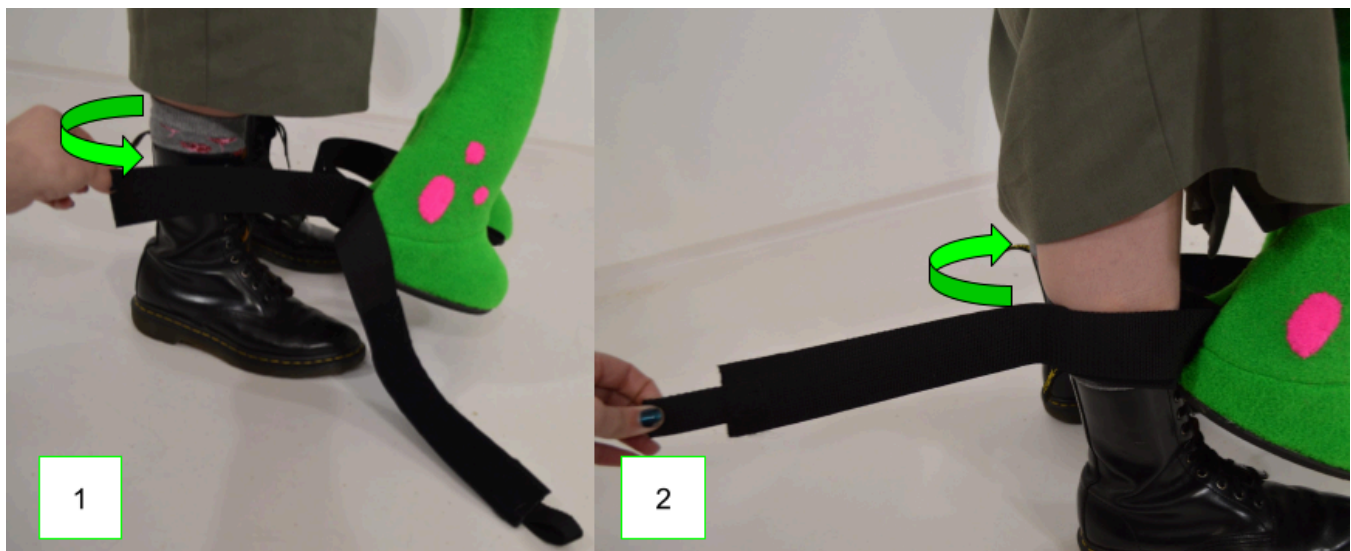
3.2.1 Removing the puppet from the stand

***Please ensure that you have clean hands before handling this puppet. ***

1. Remove the lanyard from the rear hook of the stand.
2. Lift the Turtle off of the front of the stand with both hands.
3. Cradling the puppet with one hand, use the other to clip the lanyard to the shackle on the back of the shell.
4. Hold the lanyard in both hands and slip it over your head, with the Turtle facing away from you.

3.2.2 Action: Attaching Legs to Performer

1. Snugly wrap the soft-sided velcro counterclockwise around the inside of your leg.
2. Holding the soft side in place, wrap the hard side clockwise from the outside of your leg. The velcro should be tight enough for the Turtle leg to stay in place while performing.



3.2.3 Action: Moving Arms

To make the turtle's hands come together to appear as if he is clapping, twist the arm rods outward toward the outside of the body.

3.2.4 Placing puppet on stand

To place the puppet on its stand, reverse the actions described in section 3.2.1

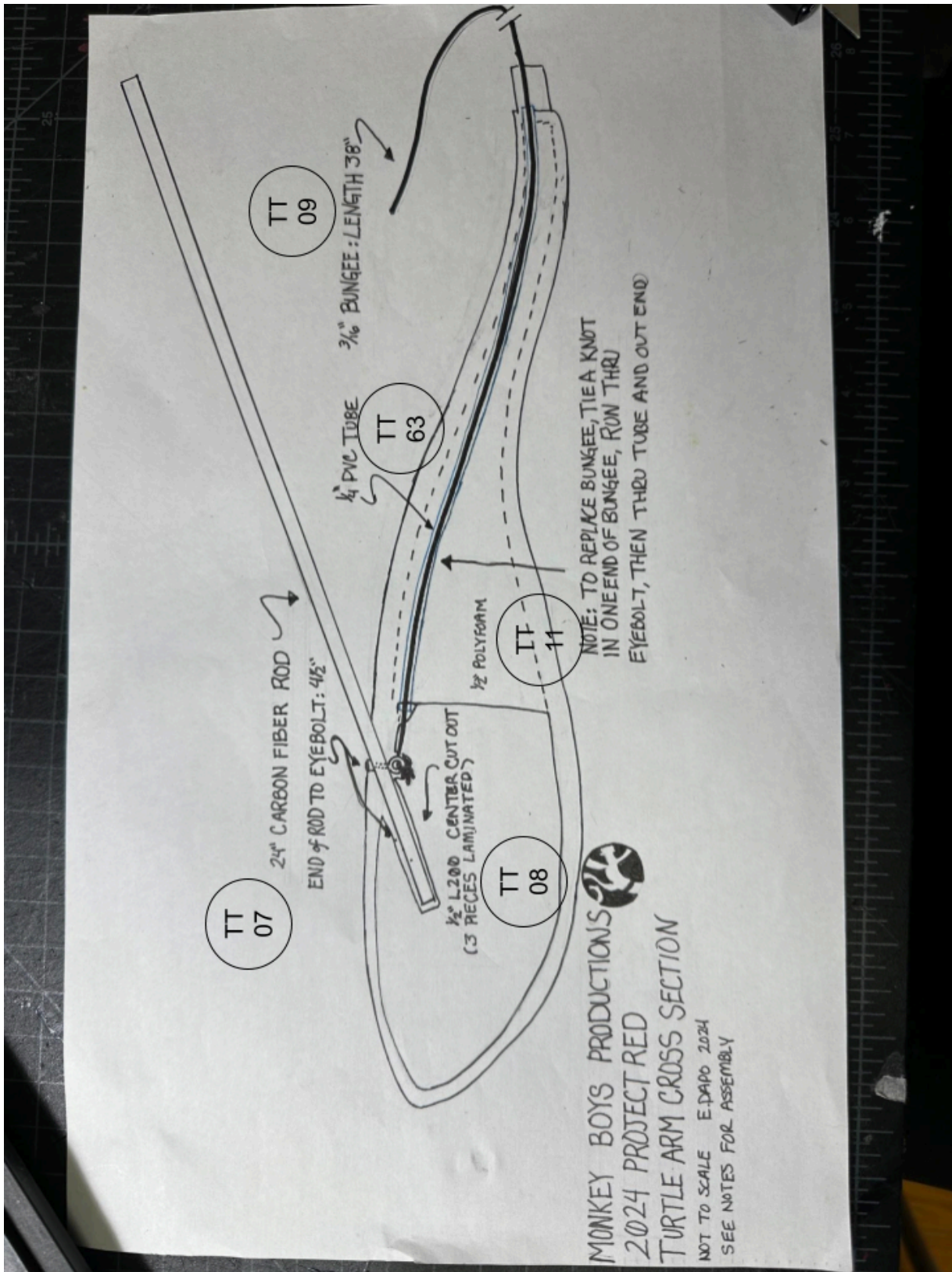
3.2.5 Storage

To store the puppet ensure that the puppet is stable on the stand and lower the cover over the top. Draw the string around the bottom of the puppet and pull the cord lock to secure it in place. The cover does not need to be cinched completely closed around the stand.

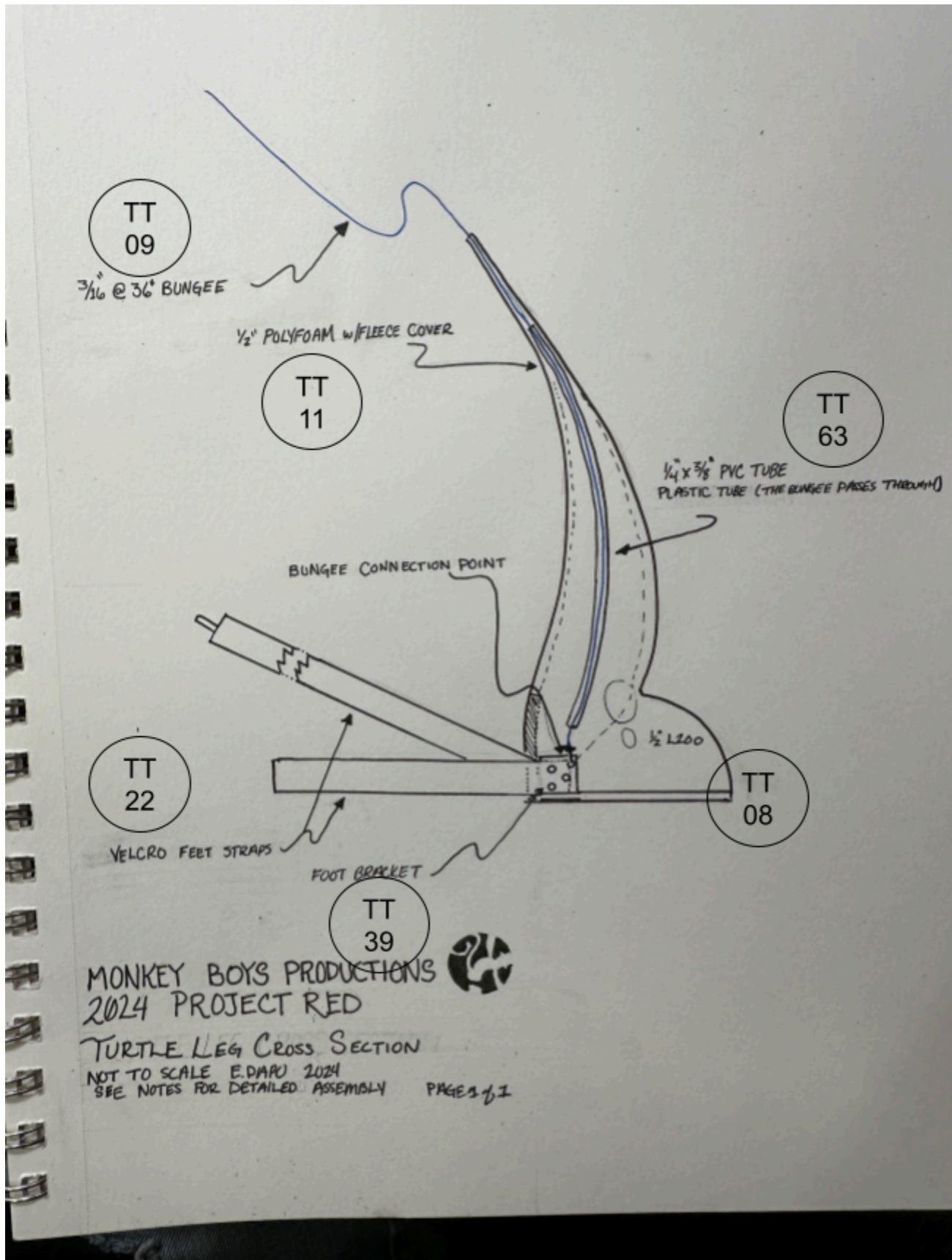


4 Detailed Diagrams of Mechanisms and Hardware

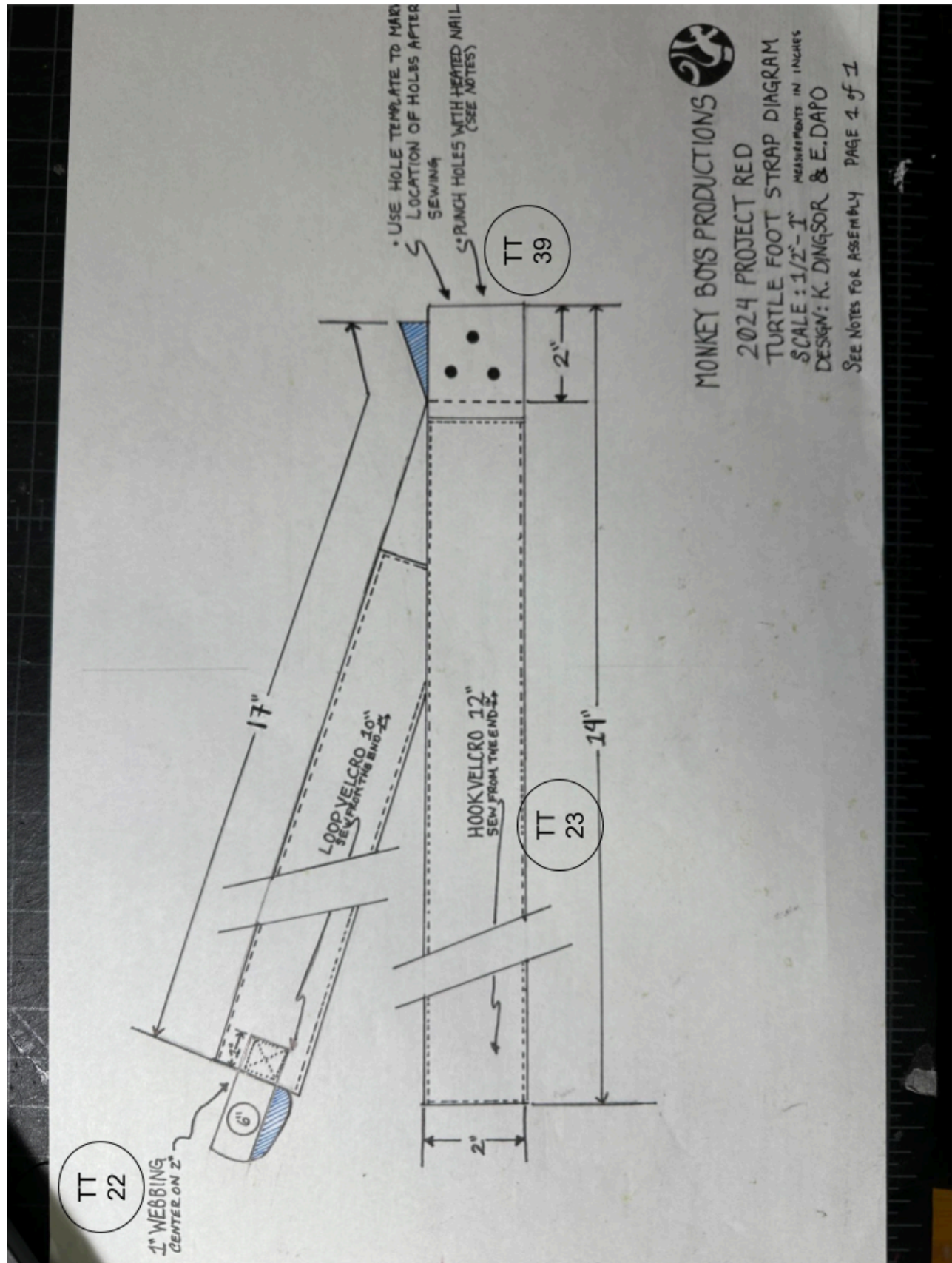
4.1 Arm Connection Points



4.2 Leg Connection Points



4.3 Leg Strap



5 Safety and Hazards

5.1 Safety Precautions and Hazard Identification

As is the case with any puppet, care must be taken when handling this item to make sure that the item does not become damaged beyond normal expectations.

- Care should be taken that the puppet and its accessories do not crash against walls, doorframes, other props, or other items. This could cause the puppet to become damaged or soiled.
- If the hardware on the puppet becomes loosened, pieces of the puppet will be likely to behave erratically. Care should be taken to ensure that all hardware is present and properly tightened at all times.
- All electrical systems should be regularly checked and maintained to the utmost safety standards.

5.2 Hazard Mitigation Strategy

There is always a chance of breakage and small injury when handling puppets and props, but Monkey Boys Productions has done their best to keep these chances low and keep both performers and technicians safe. All items have been built to be safe to handle with little chance of injury when handled correctly.

- All carbon fiber parts have been sanded to a smooth surface and sealed or covered.
- All wires and other such electrical parts have been assembled in the most safe and logical way to avoid injury and avoid becoming a hazard to performers or technicians.
- Weights and distribution of weight have been thought through to make the carrying and handling of the props easier on the performers to avoid muscular injury or strain.

These puppets are not a hazard to the environment or the performance location.

6 Repair & Service

6.1 Daily Checks and Inspections

The following list is provided as a basis for daily inspection of the puppet. Items may be added to or removed from this list as the on-site technical director sees fit.

Check Point	How to Inspect
Arm and leg bungees	Visually and physically check the outside of the puppet to see that the arms and legs are securely attached.

6.2 Periodic Testing

The following list is provided as a basis for periodic testing of the puppet. Items may be added to or removed from this list as the on-site technical director sees fit.

Check Point	How to Inspect	When to Inspect
Harness clip	Visually and physically inspect clip on puppet to ensure that it is secure and safe	Weekly
Neck	Visually and physically check that the head and neck are securely in place	Weekly
Foot attachments	Visually and physically check that the foot attachments are not cracked or broken, and that the elastic and Velcro are not frayed or torn.	Weekly

6.3 Routine Corrective Maintenance

The following list is provided as a basis for routine maintenance of items that will commonly need replacement or adjustment. Items may be added to or removed from this list as the on-site technical director sees fit.

Check Point	Corrective Action	When to Address
Bungees	Replace	As needed

6.4 Puppet-specific Service Items

A basic service kit has been supplied for use with this specific prop. Refills of the items in this kit can be handled by direct purchase from the source or by emailing contact@monkeyboysproductions.com. A full manifest of these items is supplied inside the kit and is included on the final page of this manual.

6.5 Cleaning Fabrics

*****Please note that using liquids or detergents on UV treated fabrics may cause the UV reactivity to fade*****

6.5.1 Spot Cleaning

- Spot clean as soon as dirt and grime are noticed.

- Gently wipe with Shout or Tide wipe.
- Dab product into deeper stains.
- Blot and gently wipe with a clean, white towel.
- Make sure that the area dries well.

6.5.2 Deep Cleaning Option 1 for widespread stains

- Dilute a drop of Woolite detergent in room temperature water.
- Dab on with a white cloth.
- Gently wipe & dab with clean white towel.

6.5.3 Deep Cleaning Option 2 for deep stains

- Spray Bissell Pro Carpet Cleaner on worst of spot.
- Allow it to rest for 1 minute.
- Carefully dab and wipe with a clean towel, being mindful that fabric doesn't pull away from the material beneath.

6.5.4 In all cases

- DO NOT rub, twist, or pull when cleaning
- DO NOT use heat, steam, or pressure
- DO NOT use bleach or other harsh chemicals
- DO NOT immerse in or saturate with water

6.6 Cleaning Hard Surfaces

*****Please note that using liquids or detergents on UV treated surfaces may cause the UV reactivity to fade*****

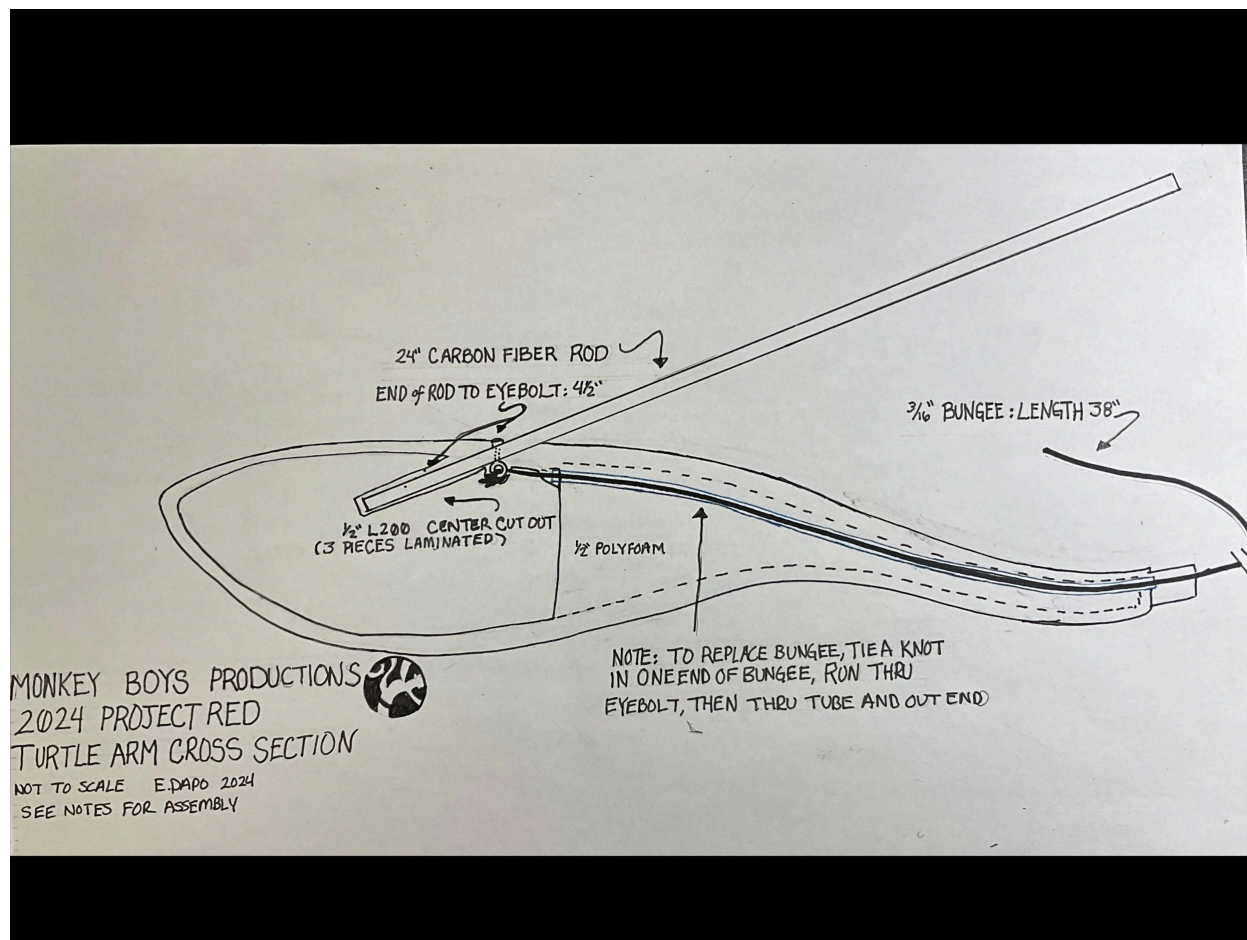
- Hard surfaces (Carbon fiber, plastic, aluminum, grip tapes, etc.) can be wiped clean with water or a mild cleanser such as Dawn dish detergent diluted in water.
- Always use a soft cloth and work carefully to avoid scratching or damaging any coatings or paints.
- Always wipe all surfaces dry immediately after cleaning to avoid leaving water spots or otherwise damaging finishes.

7 Detailed Maintenance Procedures

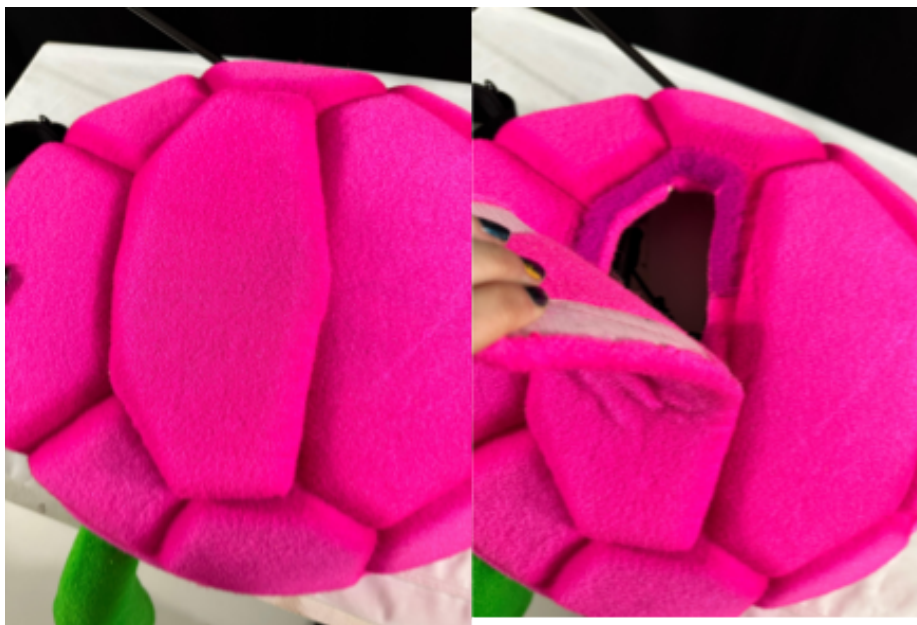
7.1 Specialty information about replacing arm bungees

Materials needed:

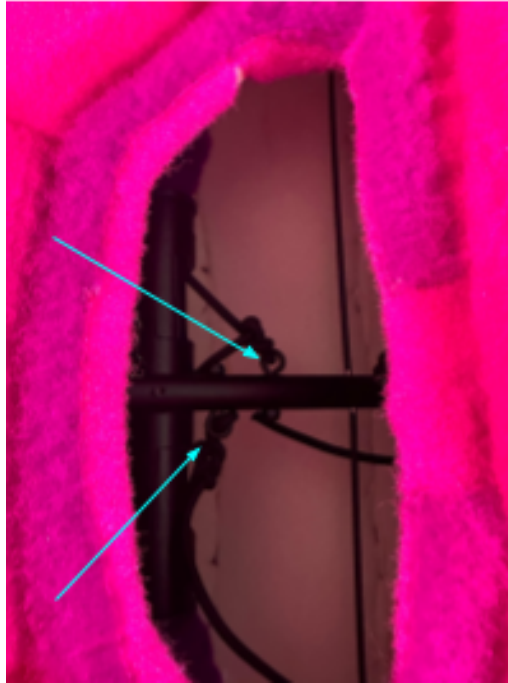
3/16" bungee cord at 38" (one per arm)



1. Open the back panel on the shell.



2. Inside you will see the four points where the bungee connects to the skeleton of the turtle. The top two are the arms, the bottom two are the legs.



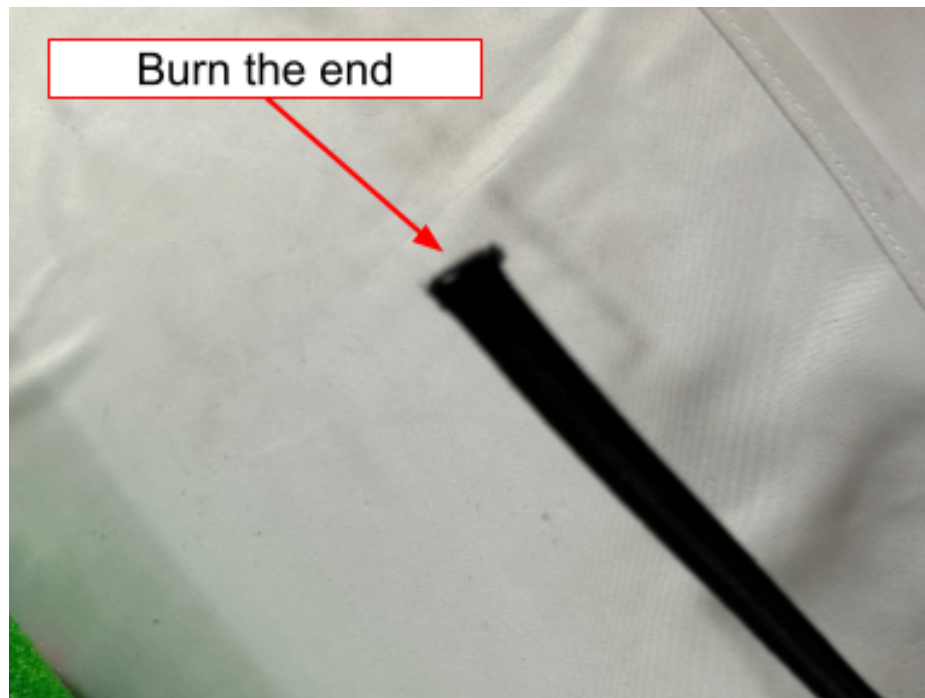
3. Untie the arm bungee and remove it from the turtle.
4. With the arm free, open the velcro around where the control rod enters the arm.



5. Inside you will see an eyebolt. The bungee is knotted and pulled through the eyebolt. Remove the damaged bungee and replace with a fresh one by tying a knot in the bungee and pulling it through



6. Push the bungee through the tube that runs through the arm and out the other end. Remember to burn the end of the bungee to keep it from fraying.



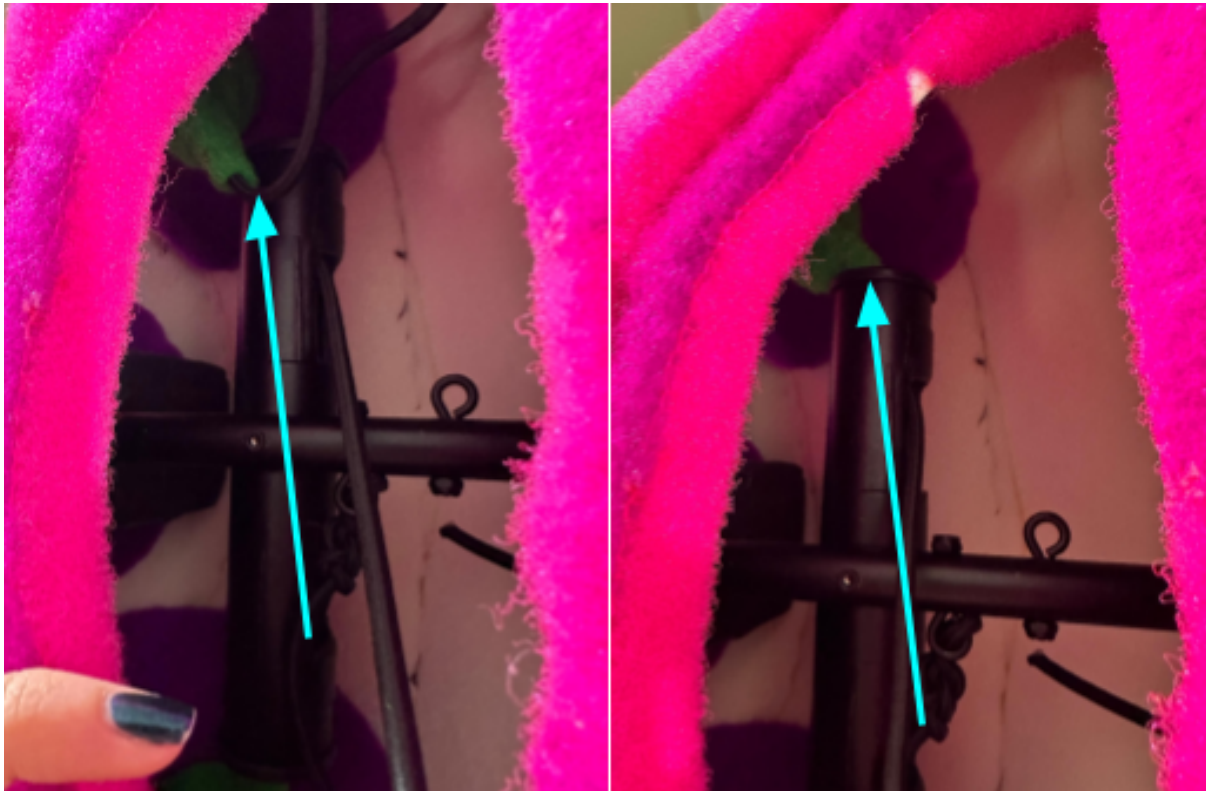
7. Re attach the velcro. Start at the top, so that it squeezes together well and then pressure down. Try to make the top seam as clean as possible. This might take a little pulling on the fabric to make it lay down well.



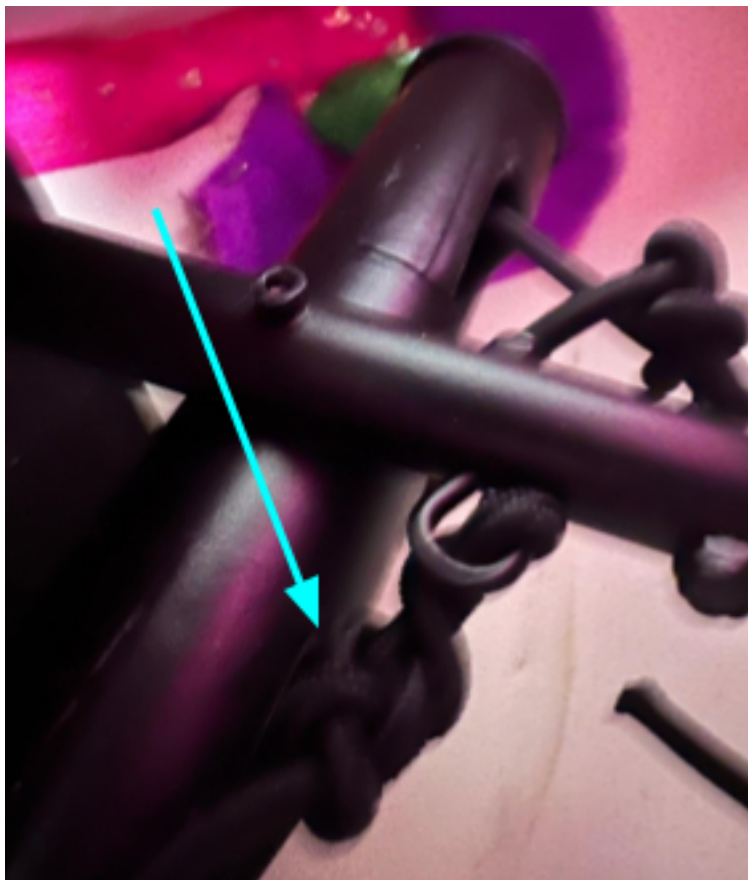
8. Insert the end of the arm and the bungee back into the shell/belly.



9. Insert the end of the bungee into the skeleton at the end and through the hole. Pull the arm until it is just slightly in the skeleton. See photos for reference.



10. Tie bungee snugly on the eyebolt in the skeleton.



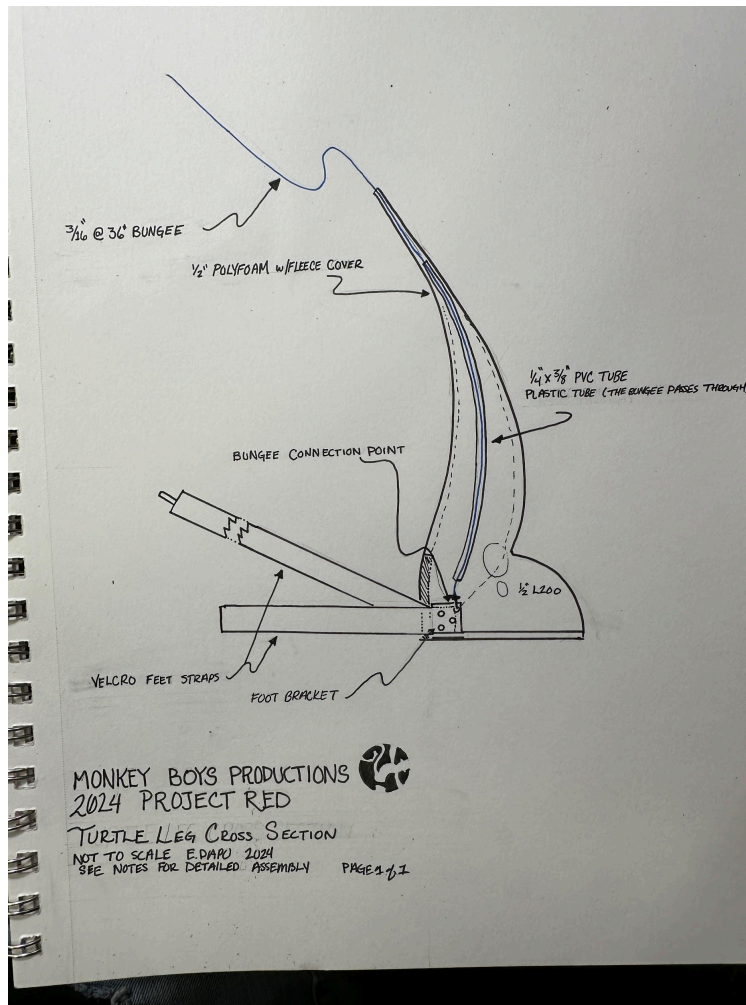
11. Replace the back panel



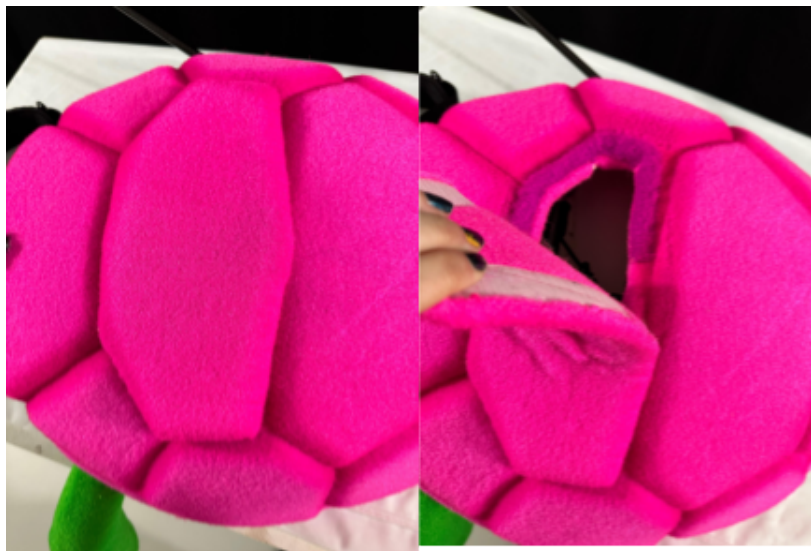
7.2 Specialty information about replacing leg bungees

Materials needed:

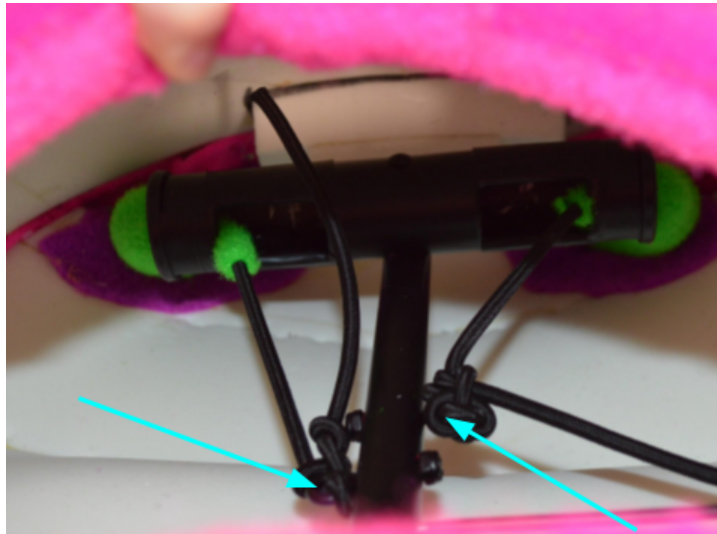
3/16" bungee cord at 36" (one per leg)



1. Open the back panel on the shell.



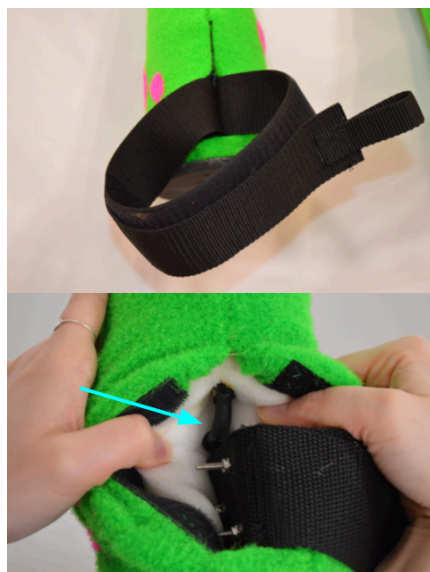
2. Inside you will see the four points where the bungee connects to the skeleton of the turtle. The top two are the arms, the bottom two are the legs.



3. Untie the leg bungee and remove it from the turtle.



4. Once the legs are untied, remove them from the shell. At the point where the foot strap connects is a row of velcro. Undo the velcro and inside is a bracket.



5. The bungee is tied to the bracket towards the front of the foot. Untie/cut the damaged bungee and pull to remove from the leg.



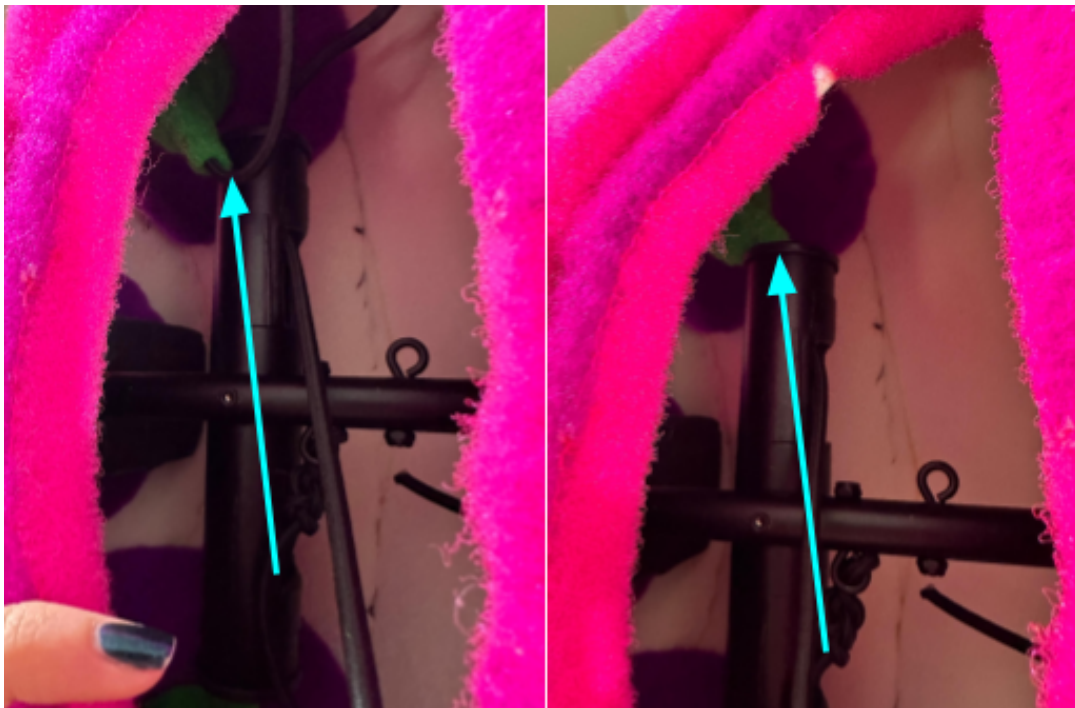
6. Tie the new bungee on the foot bracket. (Optional to ensure it stays put, use a small piece of gaff tape around the bungee) Push the bungee through the inner tubing and out the top of the leg.
7. Reattach the velcro around the foot strap



8. Insert the end of the leg and the bungee back into the shell/belly.



9. Insert the end of the bungee into the skeleton at the end and through the hole. Pull the leg until it is just slightly in the skeleton. See photos for reference.



10. Tie bungee snugly on the eyebolt in the skeleton. After tying, use gaff tape to make sure the bungee stays in place.



11. Replace the back panel



7.3 Specialty information about repairing the leg attachment

Scenario 1: 3D printed bracket break

Materials:

- Printed bracket
- Lock nuts
- Bolts
- Hex key
- Wrench or socket

- 1) Open the velcro on the back of the turtle leg
- 2) Using the hex key and wrench, remove the three lock nuts and bolts holding the strap to the printed bracket.



- 3) Untie the bungee from the bracket. Pull the bungee in and tie a small knot in the end so it doesn't slip into the tube.
- 4) Using the hex key and wrench or socket wrench, undo the bolts and nuts holding the bracket to the foot plate. Once the bolts are free, remove the old bracket.



- 5) Place the new bracket, lock into place replacing the nuts, bolts, and washers.
- 6) Reattach the bungee to the new bracket, tie a strong knot, reinforce with a tab of gaff tape.



- 7) Reattach the foot strap by replacing the three bolts, nuts, and washers using the hex key and wrench/socket. Bolts go through one side of webbing, through the bracket, and through the other side of the webbing. See the attached diagram.
- 8) Once all nuts are secure, close the velcro back up on the fleece cover.

Scenario 2: Foot strap replacement

Materials needed:

Strap/bungee plate to carbon foot:

- (4) ½" socket cap 4-40
- (8) thin 4/40 washer
- (4) 4-40 locknut

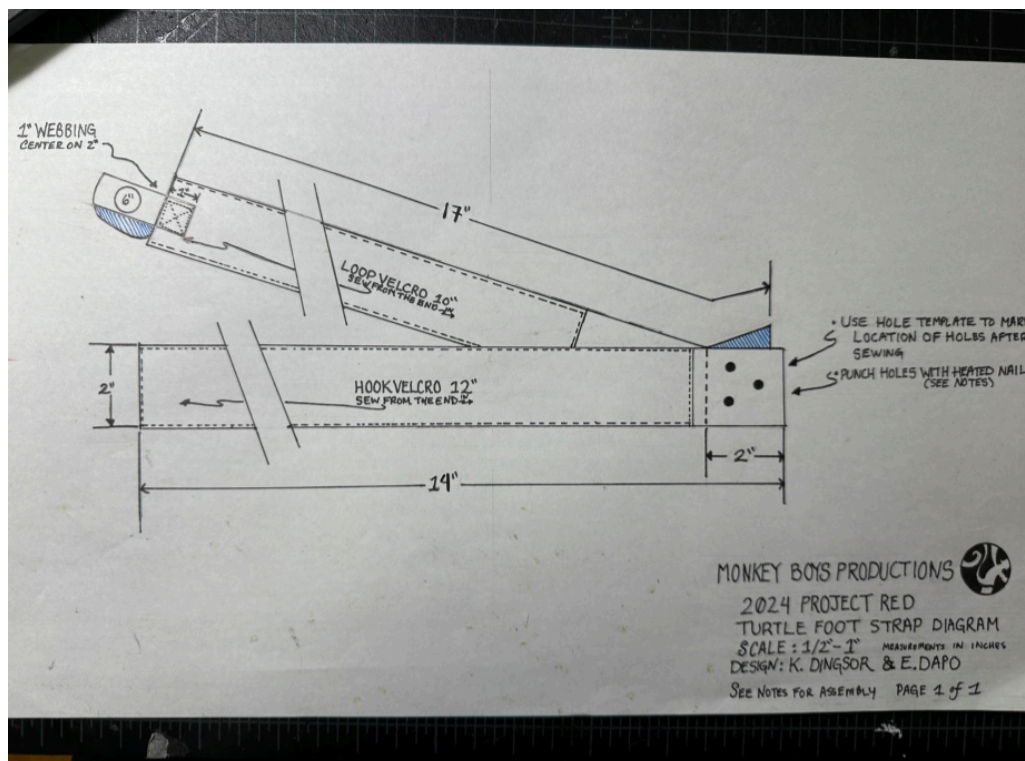
Strap:

- 2" webbing (total length 17" for the longer side, 14" for the shorter side)
- 2" hook and loop velcro (total length is 12" for the hook, 10" for the loop side)
- 1" webbing at 6" length

Webbing attachment (per foot):

- (3) ⅝" socket cap 4-40
- (6) thin washer 4-40
- (3) 4-40 locknut

See the diagram below for reference



- 1) Replacing the strap is easiest if the foot is detached from the body. See **Section 7.2** for instructions.
- 2) To disconnect the current foot strap from the mounting plate, use an appropriate sized socket wrench and hex wrench. Remove by taking off the locking nut and holding the bolt in place.
 - a) There are 3 bolts to each strap, two in the front and one in the back.
 - b) The space is tight but moving the foam around will help you access the furthest connection point.



- 3) Once the bolts are removed, a new strap can be installed. Be mindful of which direction the velcro needs to pull off and on. See the photos below for left and right leg directions.
- 4) Reinstall the bolts. It's advisable to replace the lock nuts, which can lose their effectiveness if removed more than once.
- 5) Once the bolts, washers, and nuts are replaced and the new strap is on, close up the velcro on the back of the leg.



- 6) Reinstall the leg into the turtle.

- a) Insert the end of the leg bungee back into the shell belly
- b) Insert the end of the bungee into the skeleton at the end and through the hole. Pull the leg until it is just slightly in the skeleton. See photo for reference
- c) Tie the bungee snugly on the eyebolt in the skeleton



- d) Replace the back panel on the shell

8 Comprehensive Parts List

8.1 Understructure and Base

Part #	Part	Usage	Vendor	Vendor Part ID
TT1	nylon rod	inside frame tube ends	mcmaster	8541K18
TT2	PVC 1" internal	Frame bungee guides	home depot	Internet #202300506
TT3	rubber gaskets	pvc end caps	mcmaster	63595k34
TT4	5/8" aluminum tube	Spine	mcmaster	9056k67
TT5	1-1/4" aluminum square tubing	head mount	mcmaster	88875k17
TT6	1/8" Stainless Rod	Body to shell attachment	mcmaster	89535k16
TT7	14mm carbon tubes for arm rods	arm rods	amazon	B07Q5HN9DG
TT8	L200 foam	head		XPE2
TT9	Elastic Cord Abrasion-Resistant, 3/16" Diameter	arm and leg attachment	mcmaster	8858T21
TT10	1/2" bra foam	neck and stomach	coastpad.com	CPIT100010
TT11	1/2" polyfoam	leg and arm external structure	foambyemail.com	PE17-_1
TT12	3" polyfoam	leg, neck, and arm internal structure	foambyemail.com	P
TT13	1/8" bra foam	tongue	coastpad.com	CPIT100021
TT14	1" L400	mounting block for the head to internal skeleton	foambyemail.com	XPE4
TT63	PVC Tubing 1/4"ID X 3/8"OD Flexible Clear Vinyl Hose	arms and legs core to protect bungee	amazon/DERNORD	1/4"ID X 3/8"OD

8.2 Hardware

Part #	Part	Quantity	Usage	Vendor	Vendor Part ID
TT15	5/8" Shackle	1	lanyard attachment	Diver Supply inc.	NF1017

CP3	4-40 1/2" socket cap	4	bungee/strap foot plate	mcmaster	92196A110
CP14	4-40 5/8" socket cap	3	leg webbing to foot plate	mcmaster	91771A112
CP19	4-40 SS nylon lock nut	7	carbon foot plate and webbing connections	mcmaster	91831A005
CP126	1/8" washers (thin)	24	carbon foot plate and webbing connections	mcmaster	92141A006
TT16	6-32 x 5/8" SS binding barrel	2	PVC to spine connection	mcmaster	99637A530
TT17	6-32 1-1/2", 1/2" unthreaded	3	PVC to spine connection, neck mount to spine	mcmaster	92185A158
TT18	3/4" eye bolt	6	bungee attachment points, on spine and arms	mcmaster	9489T52
CP34	6-32 SS nylon locknut	7	eye bolts and neck mount attachment	mcmaster	91841A007
TT19	Slide	1	lanyard	mcmaster	3361T69
TT20	Strap adjuster	1	lanyard	amazon	B09FYFF9QL
TT21	Swivel snap hook	1	lanyard	Rockywoods	2-SSH-Black

8.3 Fabric and Fibers

Part #	Part	Usage	Vendor	Vendor Part ID
TT22	2" Black Nylon webbing	leg straps	Amazon	B01KTVCGJ2
TT23	2" black velcro	leg straps	Velcro	# VO54BK
TT24	Rainbow Pearl Siser Iron on vinyl	Sparkle dots on fabric	cricut	Item # holographic-iron-on
TT25	F3 fleece	all of body and shell covering	Dharma Trading	F3F
TT26	Shoulder strap pad sandwich mesh	lanyard	amazon	B0C2GXZN8Y
TT27	White nylon thread	body stitching	wawak	ATDP1000
TT28	Pink nylon thread	Shell stitching	wawak	ATDP2434
TT29	green nylon thread	head hand stitching	wawak	ATDP2754

TT30	black nylon thread	stomach stitching	wawak	ATDP4000
TT31	polyester thread white	machine stitching	wawak	GTDA1
TT32	polyester thread black	machine stitching	wawak	GTDA000
TT33	polyester thread pink	machine stitching	wawak	GTDA16
TT34	polyester thread green	machine stitching	wawak	GTDA833
TT35	1" black velcro	arm closures	Amazon	B07PVDPV9Z
TT36	1" white velcro	shell plate closure	Amazon	B07PXJT25K
TT37	Twill tape	on mouth plate to sew mouth palate	wawak	TPE124NA

8.4 Custom Made Parts

Part #	Part	Quantity	Usage	Vendor	Filename
TT38	eyes- HIPS 1/16" plastic	2	eyes	vacuform	W01-01726
TT39	Leg Velcro brace	2	for foot attachment to performer	Lo	RED Turtle Velcro Brace_final_02-02-2024_VS C_LM.stl

8.5 Paints and Dyes

SDS sheets are available in the separate SDS Project Packet.

Part #	Part	Usage	Vendor	Vendor Part ID
TT40	Wildfire optical white	eyes and belly swirl detail	worldpaintsupply.com	WF 19132
TT41	Wicked fluorescent blue	belly swirl detail	createxcolors.com	5403
TT42	0007 Wicked Colors Wicked Blue	Belly swirl detail	createxcolors.com	7
TT43	W210 Wicked Colors Wicked UV Glow Base	Belly swirl detail	createxcolors.com	W210
TT44	5408 Createx Airbrush Colors Fluorescent Red	Turtle mouth plate cover color	createxcolors.com	5408
TT45	5407 Createx Airbrush Colors Fluorescent Hot Pink	Shell shadow	createxcolors.com	5407

TT46	5402 Createx Airbrush Colors Fluorescent Raspberry	Shell shadow	createxcolors.com	5402
TT47	5404 Createx Airbrush Colors Fluorescent Green	Shadow on head	createxcolors.com	5404
TT48	5401 Createx Airbrush Colors Fluorescent Violet	Stomach shadow color	createxcolors.com	5401
TT49	4011 Createx Colors Reducer	all airbrushed parts	createxcolors.com	4011
TT50	0001 Wicked Colors Wicked White	Undercoat to belly swirl detail	createxcolors.com	1
TT51	645 Blacklight Blue (Neon)	Dye - Body	Dharma Trading Co.	645
TT52	647 Aqua Tropic	Dye - Body	Dharma Trading Co.	647
TT53	479 Radioactive (fluor.)	Dye - Body	Dharma Trading Co.	479
TT54	640 Flo. Yellow (Neon)	Dye - Body	Dharma Trading Co.	640
TT55	406 Fluorescent Fuchsia (Primary)	Dye - Shell (Inner & Outer)	Dharma Trading Co.	406
TT56	478 Purple Pop (fluor.)	Dye - Shell (Outer)	Dharma Trading Co.	478
TT57	623 Brilliant Blue (Primary)	Dye - Shell (Inner)	Dharma Trading Co.	623
TT62	W00 Wicked Colors Fluorescent Purple	Shell Shadow (Darkest tone)	createxcolors.com	W020

8.6 Glues, Treatments, Coatings, and Chemicals

SDS sheets are available in the separate SDS Project Packet.

Part #	Part	Usage	Vendor	Vendor Part ID
TT58	barge	gluing all foam understructure	Frankford Leather	BAPCPAR
TT59	Fabric Tac	Gluing fabric to fabric	Amazon	B00A459606
TT60	gaffers tape	mounting the head to the understructure	Amazon	B07ZK518HP
TT61	Insta-Shield Flame Retardant	Fire treatment	Northeast FireShield	N/A

