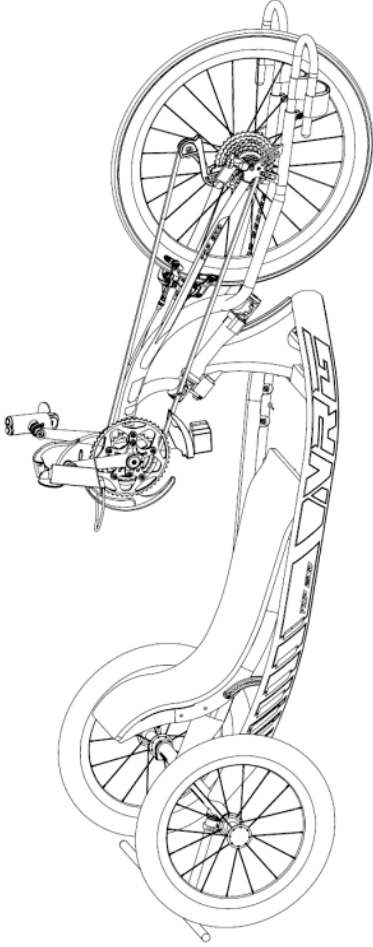


Invacare® Top End®

Force™ NRG Racing Handcycle

en

User Manual



This manual MUST be given to the user of the product.
BEFORE using this product, read this manual and save for future reference

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Yes, you can.®



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1 General

1.1 Symbols

Signal words are used in this manual and apply to hazards or unsafe practices which could result in personal injury or property damage.

See the information below for definitions of the signal words.



DANGER!

- Danger indicates an immediately hazardous situation which, if not avoided, could result in death or serious injury.



WARNING!

- Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION!

- Caution indicates a potentially hazardous situation which, if not avoided, may result in property damage or minor injury or both.



IMPORTANT

- Important indicates a hazardous situation that could result in damage to property if it is not avoided.



Gives useful tips, recommendations and information for efficient, trouble-free use.

1.2 Intended Use

Invacare Top End Racing Handcycles are designed and built solely for transportation of a single rider for use in recreational, road racing, time trial and paved course enjoyment. They are intended to be used for longer, faster rides in recreational areas including paved, crushed gravel, and riding paths. They are not intended to be used as a daily wheelchair or the treatment of any medical condition but only for recreational purposes. Any other use is prohibited.

Max. user weight: 250lbs (100 kg).

1.3 Indications For Use

The device is intended to provide mobility to persons playing sports activities only on courts or designated playing surfaces. The device is not intended for a daily use wheelchair or treatment of any medical condition but for recreational purposes only. Any other use is prohibited.

1.4 Service Life

The expected service life is five years, presuming that the product is used daily and in accordance with safety instructions, maintenance instructions and intended use, stated in this manual.

1.5 Wear and Tear Information

Normal wear and tear items and components include but are not limited to: all upholstery items including seat and back upholstery, cushions, wheels, tires and strapping.

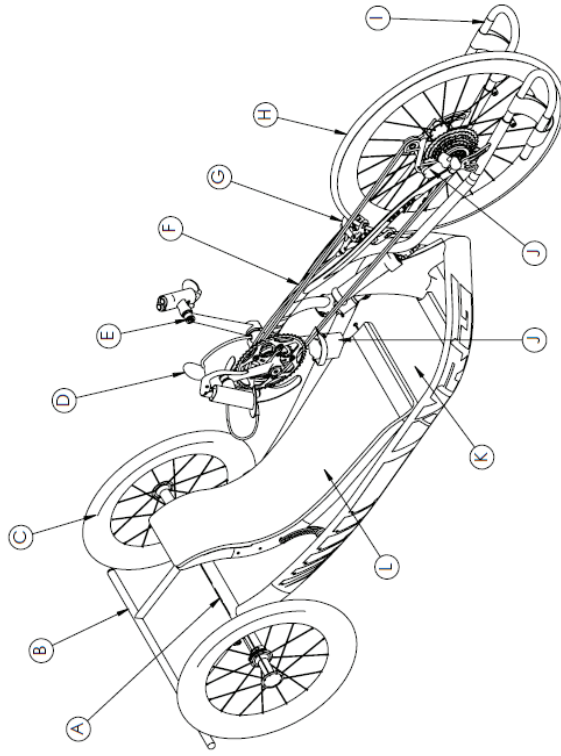
Invacare reserves the right to ask for any item back that has an alleged defect in workmanship. See Warranty policy shipped with the product for specific warranty information.


Refer to the Maintenance chapter in this user manual for the proper preventative maintenance schedule and use of the product.

This is only a general guideline and does not include items damaged due to abuse and misuse.

2 Overview

2.1 Label Locations and Component Identification



ITEM	DESCRIPTION
A	Weight Capacity Label 
B	Bumper
C	Rear Wheels
D	Accessories
E	Crank Sets
F	Fork
G	Braking
H	Front Wheel
I	Footrests
J	Shifting
K	Seat
L	Backrest

2.2 Typical Product Parameters

Seat Width:	13", 14", 15"
Seat Cushion to Bottom Bracket Height	15", 16", 17", 18"
Fork Length:	27", 28", or 29"
Crank Lengths:	160mm, 165mm, 170mm
Crank Width:	12", 13", 14"
Hand Pedal Angles:	15, 25, 45 Degrees
Wheelbase (Axle to Axle)	60"
Camber	3 Degrees
Rear Wheel Size (diameter):	20" (406)
Rear Axle (diameter):	½" threaded
Front Wheel Size (diameter):	26" (650C)
Brake:	Rim Brake, hand Operated Brake Lever
Weight:	NA: Dependent on options and accessories
Shipping Weight:	NA: Dependent on options and accessories
Standard Equipment:	Race Foam Seat Cushion, Race Foam Back Cushion, Hook and loop Waist Strap, Carbon Fiber Chain Guard, Safety Flag, Race Mirror, and Drafting Bumper
Options: *see order form	NA: See order form

2.3 Tire Pressure Conversion



PSI rating is printed on the side of the tire.

Conversion formula: 1 psi = 6.895 kPa (approx. 7 kPa).

PSI	KILOPASCALS
50	345
55	379
60	414
65	448
70	483
75	517
80	552
85	586
90	621
95	655
100	690
105	724
110	758
115	793
130	827

3 Safety

3.1 General Guidelines

The safety section contains important information for the safe operation and use of this product.

The Top End Force NRG handcycle is custom built to make the most of each athlete's potential by matching up the athlete's ability with the optimum position. It is recommended for users position themselves by:

1. Saddle the front of the frame
 - a. If the user has loss of feeling, ensure a safe gap between the body and frame is present before each ride to avoid injury.
2. Position the feet in footrests
 - a. Adjust the footrests and straps according to the needs for the User's leg length and size.
 - b. Ensure the footrests are secured and that the footrest straps are fully engaged before riding.
3. Position shoulder height
 - a. Locate the shoulders in a position that provides a minimum of 2" elbow clearance from the ground while performing a complete revolution with the cranks.
 - b. Shoulder position may be adjusted to suite needs of the rider after test rides are complete.



WARNING! **Risk of Death, Injury or Damage**

Improper use of this product may cause injury or damage.

- If you are unable to understand the warnings, cautions or instructions, contact a healthcare professional, or provider before attempting to use this equipment.
- DO NOT use this product or any available optional equipment without first completely reading and understanding these instructions and any additional instructional material such as user manuals, service manuals or instruction sheets supplied with this product or optional equipment.

Continued use of the products with damaged parts could lead to the product malfunctioning, causing injury to the user and/or caregiver.

- Check all product components and carton for damage and test components before use. In case of damage or if the product is not working properly, stop using the product and contact a qualified technician or Invacare for repair.



WARNING!

Risk of Serious Injury or Damage

- Use of unapproved accessories may result in serious injury or damage.
- Invacare products are specifically designed and manufactured for use in conjunction with Invacare accessories. Unapproved accessories have not been tested by Invacare for use with Invacare products.
 - DO NOT use unapproved accessories.
 - To obtain approved Invacare accessories, contact Invacare by phone or at www.invacare.com.



DANGER!

Risk of Death, Serious Injury or Damage

- Lighted cigarettes dropped onto an upholstered seating system can cause a fire resulting in death, serious injury, or damage.
- Handcycle occupants are at particular risk of death or serious injury from these fires and resulting fumes because they may not have the ability to move away from the handcycle.
- DO NOT smoke while using this handcycle.



DANGER!

Risk of Death, Serious Injury or Damage

- Use of incorrect or improper replacement (service) parts may cause death, serious injury or damage.
- Replacement parts MUST match original Invacare parts.
 - ALWAYS provide the handcycle serial number to assist in ordering the correct replacement parts.



WARNING!

Risk of Injury, Damage or Death

- Improper monitoring or maintenance may cause injury, damage or death due to ingestion or choking on parts or materials.
- Closely supervise children, pets, or people with physical/mental disabilities.



WARNING!

Risk of Serious Injury

- Sharp edges can cause serious injury
- Be mindful that some parts may have sharp edges. Use caution when encountering these sharp edges.



WARNING!

Risk of Serious Injury or Damage

- Hardware that is loosely secured could cause loss of stability resulting in serious injury or damage.
- After ANY adjustments, repair or service and before use, make sure that all attaching hardware is tightened securely.

this information only as a basic guide. The techniques that are discussed on the following pages have been used successfully by many. Individual users often develop skills to deal with daily living activities that may differ from those described in this manual. Invacare recognizes and encourages each individual to try what works best for him/her in overcoming obstacles that they may encounter. Techniques in this manual are a starting point for the handcycle user and assistant with safety as the most important consideration for all.

3.2 Safety and Handling

Safety and Handling of the handcycle requires close attention of the user as well as the assistant. This user manual points out the most common procedures and techniques involved in the safe operation and maintenance of the handcycle. It is important to practice and master these safe techniques until you are comfortable in maneuvering the handcycle.

Care, consideration and practice **MUST** be taken and observed in the following safety points.



DANGER!

Risk of Death, Serious Injury or Damage

Missing attaching hardware could cause instability resulting in death, serious injury or damage.
 – Ensure all attaching hardware is present and tightened securely.

Repair and Service Information



DANGER!

Risk of Injury, Damage or Death

Improper setup, service or adjustment may cause injury, damage or death.
 – Qualified technician **MUST** setup and service the handcycle.
 – **DO NOT** allow non-qualified individuals to perform any work or adjustments on the handcycle.
 – Ensure all hardware is securely tightened after setup, service or adjustments.
 – Warranty is void if non-qualified individuals perform any work on this product.



IMPORTANT

– **THE INFORMATION CONTAINED IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE.**

As a manufacturer of Handcycles, Invacare endeavors to supply Handcycles to meet many needs of the end user. However, final selection of a Handcycle to be used by an individual rests solely with the user and his/her health care professional capable of making such a selection. Use



WARNING!

Risk of Injury or Damage

- The user is responsible for normal upkeep and maintenance of the handcycle to keep it in proper operating condition.
- The manufacturer is not responsible for failure, damage or injury caused by improper operation or maintenance by the end-user.
- A helmet **MUST ALWAYS** be worn when operating the handcycle.
- Operation of the handcycle is subject to all traffic rules and regulations. (This may include the use of a safety lights and reflectors for dusk/night riding.) Give pedestrians the right of way.
- Use proper hand signals when turning.
- Slow down when turning or cornering, at all street intersections and observe in both directions at least twice before proceeding.
- **DO NOT** attempt to move up or down an incline with an ice or oil film. Avoid all surface hazards.
- **DO NOT** attempt to ride over curbs or obstacles or speed bumps. Doing so may cause your handcycle to "bottom out" and/or turn over and cause bodily harm or damage to the handcycle.



WARNING!

Risk of Injury or Damage

- **DO NOT** attempt to lift the handcycle by any removable (detachable) parts. Lifting by means of any removable (detachable) parts of an handcycle may result in injury to the user or damage to the handcycle.
- **DO NOT** stand on the seat or frame of the handcycle.



WARNING!

Risk of Injury or Damage

- **DO NOT** carry any items that may obstruct your view or prohibit you from operating the handcycle properly.
- Invacare strongly recommends that the handcycle be boxed or otherwise protected before transporting by an airline carrier.



WARNING!

Risk of Injury or Damage or Death

- Improper use of the handcycle may cause instability and may result in injury, damage or death. The stability of the handcycle is adversely affected by additional weight that shifts the center of gravity.
- This handcycle has been designed to accommodate one individual. **DO NOT** operate with additional persons.
 - **DO NOT** carry heavy objects on your lap while operating the handcycle.



WARNING!

Risk of Injury, Damage or Death

Use of the handcycle while judgement or ability is impaired may result in injury, damage or death.

- DO NOT operate the handcycle under the influence of alcohol, medications or other substances that impair judgement or function.
- Changing medications may affect your ability to operate the handcycle. Discuss the impact on your ability to operate the handcycle with a health care professional when changing medications.
- DO NOT operate the handcycle under conditions where judgement or function may be impaired. This may include but is not limited to lack of sleep or poor sight.
- Always be aware of your surroundings.



WARNING!

Risk of Injury or Damage

To avoid injury or damage from moving parts:
 – ALWAYS keep hands and fingers clear of moving parts.



WARNING!

Risk of Injury or Damage

Improper operation may change the normal balance, center of gravity or weight distribution of the handcycle causing injury or damage.

- Determine and establish your particular safety limits. Practice bending, reaching and transferring activities in several combinations in the presence of a qualified healthcare professional before attempting active use of the handcycle.
- ALWAYS shift your weight in the direction you are turning. Shifting your weight in the opposite direction of the turn may cause the wheels to lose traction.



WARNING!

Risk of Serious Injury

Impacting objects in the surrounding environment can cause serious injury.

- When maneuvering the handcycles ALWAYS have assured cleared distance with all objects in environment.



WARNING!

Risk of Injury, Damage or Death

- Damaged parts due to collision or impact may result in injury, damage or death.
- Seek immediate attention and service if handcycle is involved in a collision or impact event. This includes, but is not limited to, vehicle accidents, mishandling and impact events where the handcycle strikes something or is struck by something that may cause damage.
 - Ensure your handcycle is working properly and is inspected by a qualified Invacare technician if the handcycle is involved in a collision or impact event.

3.3 Operating Information



WARNING!

Risk of Injury or Damage

- Invacare DOES NOT recommend the use of its handcycle as a weight training apparatus. Invacare handcycles have NOT been designed or tested as a seat for any kind of weight training. Using said handcycles for weight training could result in serious bodily injury to the user, damage to the handcycles and surrounding property. Also, if occupant uses said handcycle as a weight training apparatus, Invacare shall NOT be liable for bodily injury and the warranty is void.
- DO NOT use the handcycles as a weight training apparatus.

As of this date, the Department of Transportation has not approved any tie-down systems for transportation of a user while in a handcycle, in a moving vehicle of any type. It is Invacare's position that users who are racing should be transferred into appropriate seating in vehicles for transportation and use be made of the restraints made available by the auto industry. Invacare cannot and does not recommend any racing transportation system.



WARNING!

Risk of Injury or Damage

- Care, consideration and practice MUST be taken and observed in the following safety points.
- Safe use requires the close attention of the user as well as the assistant. This user manual points out the most common procedures and techniques involved in the safe operation and maintenance of the handcycle. It is important to practice and master these safe techniques until you are comfortable in maneuvering the handcycles.
- Shoes MUST ALWAYS be worn when operating the racing handcycle.



WARNING!
Risk of Injury or Damage
Stability and Balance

- For stability and proper operation of your handcycle you **MUST** at all times maintain proper balance. Turning and cornering affects the stability and balance of the handcycle and user. Your handcycle should remain upright and stable during turns and cornering when operated correctly.
- Invacare recommends using seat positioning strap for additional safety.

Note for Assistants

- When learning assistance techniques for the handcycle, have an experienced assistant help you before attempting it alone.
- When you are assisting with a transfer to/from the handcycle, remember to use good body mechanics. Keep your back straight and bend your knees when lifting or positioning the handcycle for the end-user.
- Also, be aware of detachable parts. These must **NEVER** be used for lifting supports or to move the handcycle, as they may be inadvertently released, resulting in possible injury to the user and/or assistant.



DANGER!
Risk of Death or Serious Injury

- Not wearing your seat positioning strap could result in death or serious injury.
- **ALWAYS** wear your seat positioning strap. Your seat positioning strap helps reduce the possibility of a fall from the handcycle. The seat positioning strap is a positioning belt only. It is not designed for use as a safety device withstanding high stress loads such as auto or aircraft safety belts. If signs of wear appear, seat positioning strap **MUST** be replaced **IMMEDIATELY**.



WARNING!
Percentage of Weight Distribution

- Transferring in and out of the handcycle, turning and cornering will cause a change to the normal balance, the center of gravity, and the weight distribution of the handcycle. To determine and establish your particular safety limits, practice transferring activities in several combinations in the presence of a qualified health care professional before attempting a transfer alone.
- Proper positioning is essential for your safety.

3.4 Weight Capacity



WARNING!

Risk of Death or Serious Injury

Exceeding the weight capacity of the handcycle could cause instability resulting in death or serious injury.

- DO NOT exceed the weight capacity.

The Invacare Force NRG has a weight capacity of 250 lbs (100 kg).

3.5 Tire Pressure



DANGER!

Risk of Injury, Damage or Death

Over inflation of tires may cause tires to explode.

- Inflate tire to the proper tire pressure (P.S.I./kilopascals) listed on the side wall of the tire.
- Only use handcycle with tires at proper tire pressure.
- The wheels and tires should be checked periodically for cracks and wear and should be replaced if necessary.



WARNING!

Risk of Injury or Damage

Riding on flat or under inflated tires can cause injury, as well as, damage to the tire, tube and handcycle wheels.

- DO NOT ride on a flat or under inflated tires.
- CARBON FIBER WHEELS ONLY - Carbon Fiber Wheels MUST NOT be used when tires are bare or flat. If a flat wheel occurs, STOP USING IMMEDIATELY.

3.6 Transferring Into/Out of the Handcycle



WARNING!

Risk of Injury or Damage

- Before attempting to transfer in or out of the handcycle, every precaution should be taken to reduce the gap distance. Position the handcycle on level ground and as close as possible to the object you are transferring into or out of.
- The tautness of the back upholstery, knee and/or foot position, as well as the user condition directly relate to the stability of the handcycle. Any change to one or any combination of the three may cause the handcycle to decrease in stability.
- The object you are transferring into or out of **MUST** also be secured before attempting any transfer.

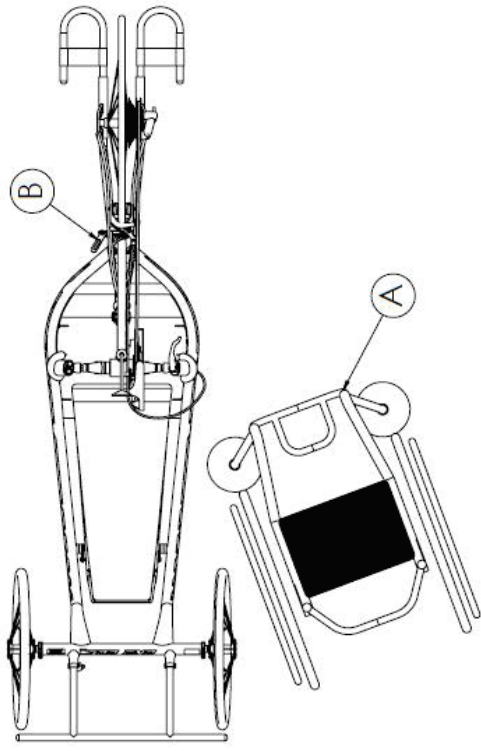


Fig. 3-1

- ! – Invacare strongly recommends an experienced assistant help in the transferring to and from the handcycle. The assistant should hold down the front of the handcycle to avoid any instability that may occur.

1. Perform the following:

- a. Ensure the parking brake is engaged.
- b. Position the chair as close as possible alongside the seat to which you are transferring.
- c. If possible, have assistant nearby in case additional help is needed

4 Safety Inspection Troubleshooting

4.1 Safety Inspection Checklist



Every six months or as necessary, take your Top End handcycle to a qualified technician for a thorough inspection and servicing. Regular cleaning will reveal loose or worn parts and enhance the smooth operation of your handcycle. For safe and proper operation, your handcycle MUST be cared for just like any other vehicle. Routine maintenance will extend the life and efficiency of your handcycle.

Initial adjustments should be made to suit your personal body structure and preference. Thereafter, follow these maintenance procedures:

Inspect/Adjust Initially and Weekly

- Make sure that the handcycle rolls straight (no excessive drag or pull to one side).
- Inspect seat and back upholstery for rips or sagging.
- Inspect that rear wheel axles are securely tightened.
- Inspect that there is no excessive side movement or binding when rear wheel is lifted and spun.
- Inspect front wheel axle is secure
- Inspect spokes for bent or broken spokes.
- Inspect that all spokes are uniformly tight.
- Inspect that the wheel bearings are clean and free of moisture.
- Inspect chain and drivetrain components for wear.

- Inspect that the brake cable is not frayed or damaged
- Inspect that the brake does not interfere with front wheel when rolling.
- Inspect that the brake is easy to engage.
- Inspect that there is no excessive wear of brake pads.



CAUTION!

– As with any vehicle, the wheels and tires should be checked periodically for cracks, flat spots and wear, and should be replaced.

- Inspect tires for flat spots and wear.
- Check pneumatic tires for proper inflation.
- Check carbon fiber seat for cracks or damage.
- Clean upholstery with light detergent and water.
- Inspect for bent or broken frame.
- Inspect footrests and ensure there's no bending or cracks
- Inspect footrest straps for wetness and/or damage.
- Inspect seat positioning straps for any signs of wear. Replace if necessary.

Inspect/Adjust Monthly

- Inspect that rear wheel axles are securely tightened.
- Inspect front wheel axle is secure.
- Inspect that headset cap screws are tight.
- Inspect footrests aren't damaged.
- Inspect brake cables are not damaged or frayed.
- Inspect flip lever parking brake assembly.
- Inspect that the wheel bearings are clean and free of moisture.

- Inspect that the brake does not interfere with front wheel when rolling.
- Inspect that there is no excessive wear of brake pads.
- Inspect chain for lubrication and wear.

Inspect/Adjust Periodically

- Make sure that the handcycle rolls straight (no excessive drag or pull to one side).
- Inspect upholstery for rips or sagging.
- Inspect that rear wheel axles are securely tightened.
- Inspect front wheel axle is secure.
- Inspect that there is no excessive side movement or binding when rear wheel is lifted and spun.
- Inspect that the wheel bearings are clean and free of moisture.
- Inspect that the brake is easy to engage.
- Clean upholstery with light detergent and water.

4.2 Troubleshooting

Veers Right	Veers Left	Sluggish Turn or Performance	Squeaks and Rattles	Looseness in Handcycle	Solutions
X	X	X			Check tires for correct and equal pressure.
X	X				Check steering dampener wear and position
			X	X	Check rear wheel alignment, bottom bracket, chain, and front wheel alignment.
X	X	X	X	X	Check all of the above. Ensure seating, fork, and wheels are properly assembled.
		X		X	Check fork and frame connection.

5 Initial Setup

5.1 Assembly instructions are provided under part number 60121508.

6 General Operation

6.1 Positioning

Transfer into handcycle and ensure positioning is comfortable and efficient. We encourage consulting your dealer to ensure the best fit for your needs. Before going on a ride or racing, the user must ensure they are secure and are not bringing bodily harm by misuse of the handcycle. With a fixed crank height and minimal adjustment in seating, there is possibility of crank arm, hand pedal, and/or derailleur interference with the user. Pedaling while cornering may also cause interference. To prevent injury, each user must be aware of personal needs and fitment requirements before operating the handcycle.



CAUTION!

- User must take caution when positioning themselves in the bike to prevent skin irritation or other injury.

6.2 Braking

Before each ride, inspect the braking system. Actuate the brake lever and ensure there's smooth actuation and that the lever doesn't touch the handpedal. Inspect the brake cable and ensure there's no damage, wear, or fraying. Inspect the brake caliper and brake pads. Ensure the pads are aligned and have proper engagement according to bicycle standards.

6.3 Shifting

Your Force NRG comes with electronic shifting as standard. Batteries require recharging depending on hours ridden. We suggest charging the batteries regularly to prevent shifting issues when riding.

6.4 Drive Control

The Force NRG is a high-performance handcycle that is intended for use in competition. Because of this, there are many attributes about the handcycles drive control components that require expertise in fitment and operation. To provide the best user experience when using the handcycle, consult your dealer for advice regarding cranks, handpedals, and other drive control components.

6.5 Post Ride Maintenance

After each ride, we suggest taking time clean your handcycle. Using a wet and soapy soft sponge to wipe down the handcycle is acceptable. Ensure to be careful when wiping down the bike to prevent damage. After the handcycle has been wiped down, gently rinse off excess dirt and grime. Using a dry towel, gently dry off the handcycle and make sure to oil drive train components as recommended by the manufacturer.

7 Upholstery

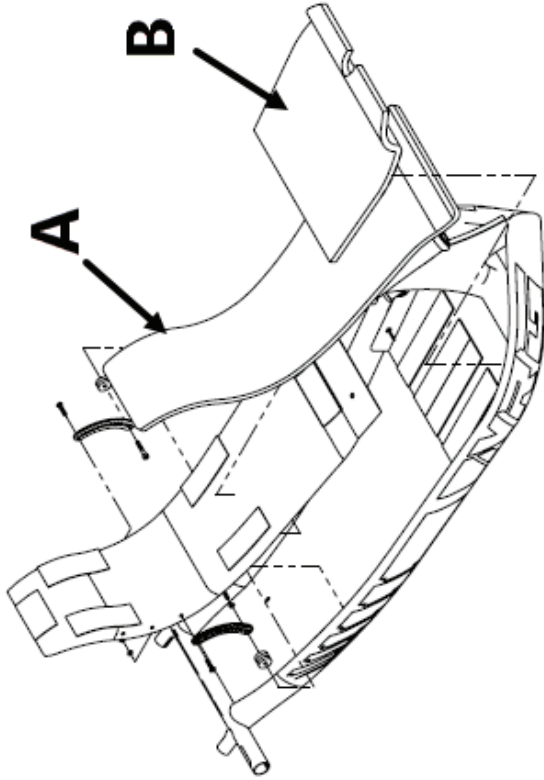
7.1 Upholstery Components

Your Force NRG comes with a 1/2" foam backrest (A) and a 1" thick seat cushion (B). Both foams are moisture resistant to prevent soaking. Additional foam can be used to improve the riders fit.



CAUTION!

– User must take caution to ensure cushions provide enough protection to prevent skin damage or other injury.



7.2 Upholstery Maintenance

It's recommended to regularly wipe down and clean your upholstery. Over time, upholstery may need replaced due to wear or tearing.

To help reduce weight, Velcro is used to connect the foam to the Carbon Fiber backrest. If the Velcro tears from the foam, it is recommended to replace the cushion.

8 Brakes

8.1 Adjusting Brake Sensitivity

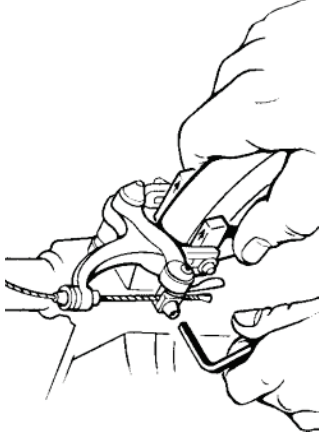


Fig. 9-1



WARNING!

Risk of Injury or Damage

Brake and/or Brake pads not operating properly may result in injury or damage.

- Inspect the brake and brake pads for proper operation and wear. Replace if worn or not operating properly.

1. Loosen the hex screw that maintains the tautness of the brake cable.
2. Squeeze both brake pads with your hand to adjust the brake cable.

3. Loosely tighten the hex screw to ensure that the brake is adjusted properly.

I When the brake is engaged, the brake pads should rest solely on the rim of the wheel. If not, adjust the brake pads.

4. Repeat this procedure until the brake is adjusted properly.
5. Securely tighten the hex screw that maintains the tautness of the brake cable.

8.2 Adjusting Brake Pads

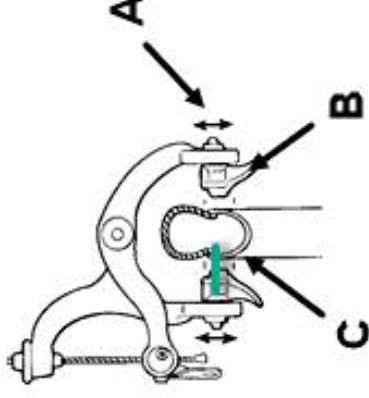
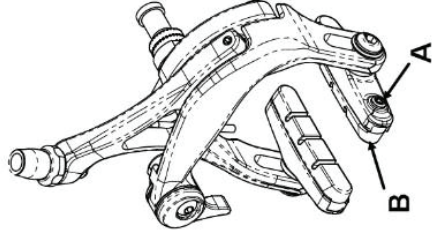


Fig. 9-2

1. Loosen the hex screw **A** that secures the brake pad **B** to the brake.
2. Position the brake pad until it is in-line with the rim **C** of the front wheel.
3. While squeezing the brake lever, tighten the hex screw to between 8 and 9 Newton-meters to secure the brake pad to the brake.

4. Repeat this procedure for the opposite side.
5. Adjust the brake sensitivity, if necessary.

8.3 Replacing Brake Pads



 Use a 2.5 mm hex key for this procedure.

1. Loosen set screw **A** until the brake pad **B** can slide out.
2. Slide out the existing brake pad
3. Install new brake pad.
4. Tighten set screw.
5. Repeat for remaining brake pad.

9 Alignment

9.1 Determining Toe in and Out

Front of Wheelchair

Toe-out

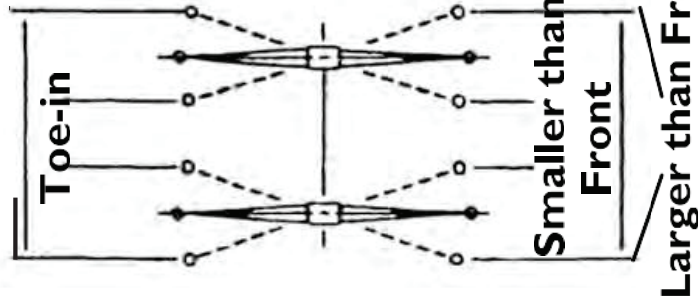


Fig. 8-1

1. Inflate all pneumatic tires to recommended tire pressures (listed on the sidewall of the tire).
2. Measure the distance between the center lines at the rear and front of the rear wheels at approximately 9-1/4 inches from the ground/floor
 - For optimum accuracy, perform STEP 2 with the handcycle occupied.
 - STEP 2 may be performed by using alignment gauge (available as an option for the handcycle).
3. Determine the difference between the two measurements. If the difference between the two measurements is greater than 1/4-inch ($0 \pm 1/8$ inch for maximum rollability), one of two conditions exists:
 - If the rear centerline measurement of the rear wheels is **SMALLER** than the front centerline measurement of the rear wheels, a toe-out condition exists.
 - If the rear centerline measurement of the rear wheels is **LARGER** than the front centerline measurement of the rear wheels, a toe-in condition exists.
4. If the difference between the measurements is greater than 1/8-inch, correct the toe-in/toe-out condition.
5. See page 32 for additional alignment gauge information.

9.2 Adjusting Toe in and Out

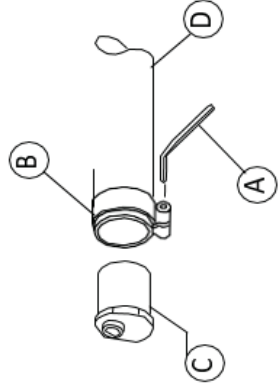


Fig. 8-2

1. Loosen, but do not remove the socket screws **A** and clamps **B** that secure camber inserts **C** to the camber bar **D**.
2. Slowly rotate each camber insert equally until the rear wheels are approximately in a straight line.
3. Securely tighten the socket screws and clamps that secure the camber inserts to the camber bar.
4. Measure the distance between the center lines at the rear and front of the rear wheels at approximately 9-1/4 inches from the ground/floor.
5. Repeat STEPS 1-4 until the toe in/toe out measurement is less than 1/8-inch (for maximum rollability).

9.3 Replacing Camber Inserts

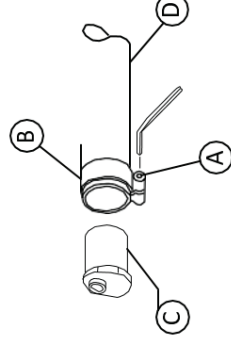


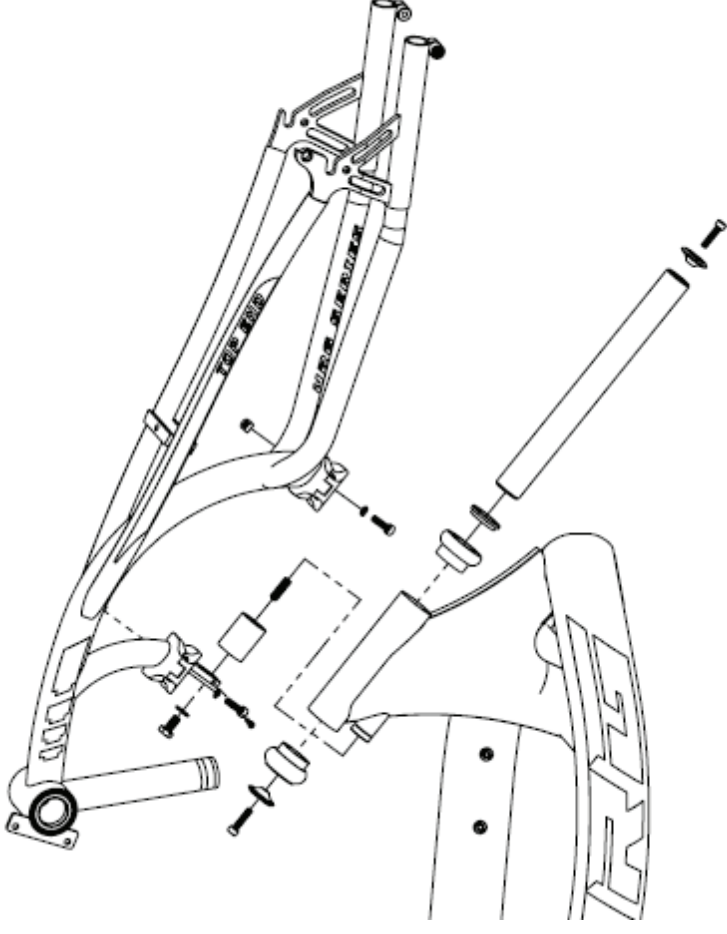
Fig. 8-3

1. Loosen, but do not remove the socket screws **A** and clamps **B** that secure camber inserts **C** to the camber bar **D**.
2. Remove the existing camber insert from the camber bar.
3. Install the new camber insert into the camber bar.
4. Adjust the toe in/toe out of the handcycle.

10 Fork and Drivetrain

10.1 Fork to Frame

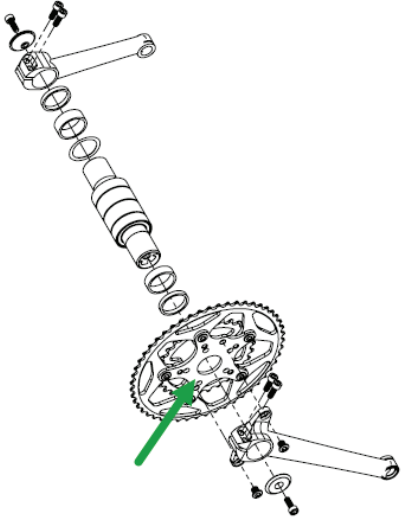
1. Your Force NRG fork and Frame can be easily assembled. We suggest assembling the fork and frame following the steps below:
 - a. Insert the steer tube into the frame
 - b. Confirm Headset assembly and spacers are in the correct order as received.
 - c. Install the fork onto the steer tube and tighten the clamps only enough for the clamps to touch the steertube.
 - d. Tighten the steertube end caps according to torque specifications.
 - e. Tighten both fork clamps according to torque specifications.
 - f. Install the dampener to hold the fork upright. Adjustment to the dampener can be made after riding the handcycle using the two small adjustment screws.
 - g. Complete a final review of the assembly to ensure all hardware is secure.



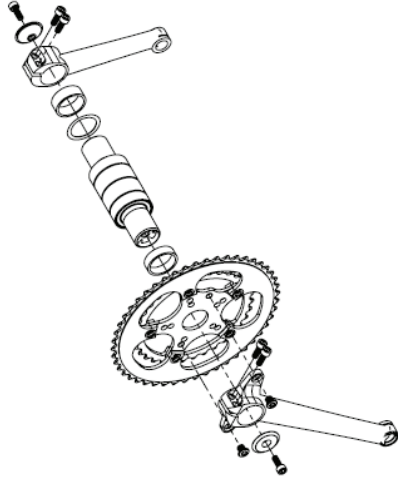
10.2 Crank Assembly

1. Your Force NRG comes with 3 unique chainring assemblies. The configurations below can be used as a guideline for assembling your crank assembly.

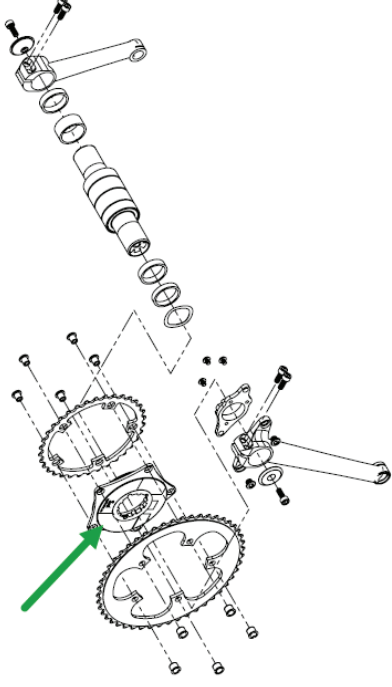
- Spider located on the outside of chainrings.



- Spider located between chainrings as standard



- Power Meter is used as spider located between chainrings as standard.



10.3 Gear selection

Your Force NRG comes with 2 chainrings. The small chainring is intended to be used with the larger half of the cassette, while the large chainring is intended for use with the smaller side.

If these conventions aren't used, the drivetrain will not function properly, and premature wear is likely. Below is a reference diagram to help better understand appropriate gearing.



10.4 Repairing/Replacing Wheel and Tire/Tube

Tubular tires are tires with tubes sewn into the tires. They are high pressure and MUST be glued to the rim. Once they have a hole in them, they MUST be replaced. Tubular tires will lose air overnight, but they are not faulty. This is a characteristic of tubular tires. Tubular tires DO NOT fit on a clincher rim.

Clincher tires are like conventional bicycle tires. There is an inner tube separate from the actual tire. They are more durable for longer periods of time and if punctured, the tube can be replaced (by a qualified technician). Clincher tires use 100+ lbs. psi. Clincher tires DO NOT fit on a tubular rim.

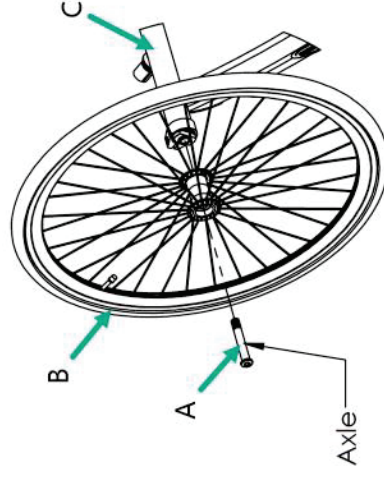


WARNING!

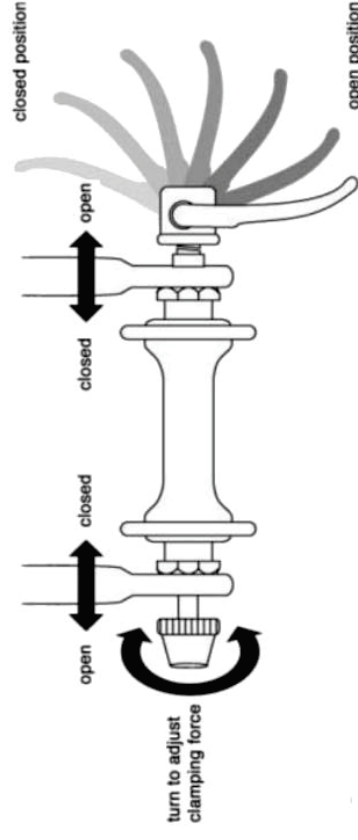
Risk of Injury or Damage

– Replacement of a clincher tire or tube MUST be performed by a qualified technician.

1. Loosen the axle A and remove the rear wheel B from the axle tube C. Use 6mm hex key for Corima wheels, 10mm for C7 wheels, and 1/4" hex key for standard high-performance wheels.
2. Use standard tire removal tools and methods to repair your tire and or tube.
3. Install rear wheel. Refer to initial setup.



1. To remove the front wheel, first shift into the smallest cassette gear.
2. Position the quick release lever in the open position.
3. Rotate the wheel derailleur to rearward of handcycle.
4. Begin removing the wheel from the dropout while holding the derailleur in the rearward position (see next page)
5. While removing the wheel guide the chain around the axle to completely remove the wheel.

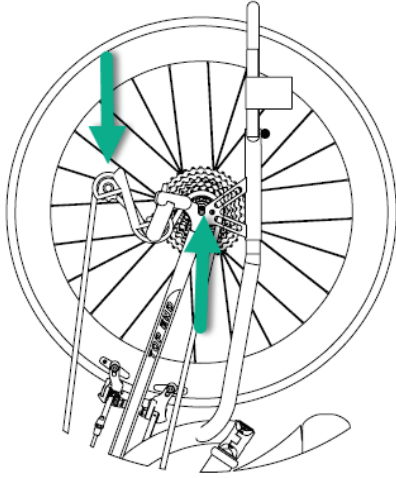


See next page



WARNING!
Risk of Serious Injury or Damage

-If the seat pan cracks or tears during operation, immediately stop operating the handcycle to prevent injury or damage.

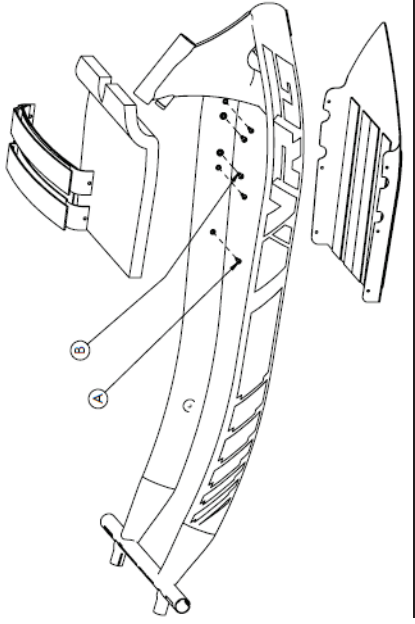


6. Once the repair is complete, the wheel can be reinstalled by reversing the wheel removal steps.

11 Seat and Backrest Positioning

11.1 Connecting the Seat

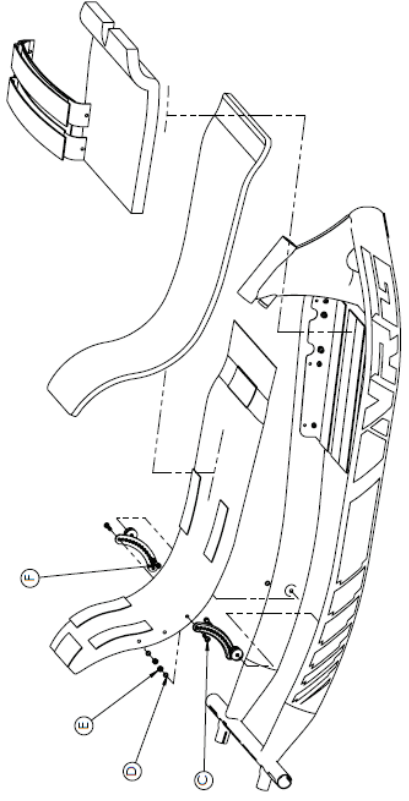
The seat is connected by six (6) M5 screws (A). These fasteners are installed through the seat and secured in each side of the frame. Hardware is included in the accessory package.



11.2 Connecting Backrest

The backrest is connected by 4 screws and Velcro. To make for an easier installation, it's helpful to remove the seat upholstery. The position of the backrest is unique to each user. Additional adjustments may be needed. General guidelines are listed below to find optimum positioning.

1. Eyes must have clear line of site above the bottom bracket
2. Shoulder position from cranks should be such that when the user is pedaling, the arms are not fully extended.
3. Shoulder position from the ground should provide the elbows enough ground clearance throughout an entire pedal stroke. It's recommended to keep at least 2" of ground clearance.



12 Maintenance

12.1 Suggested General Maintenance



WARNING!

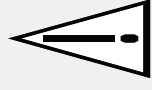
Risk of Serious Injury or Damage

Hardware that is loosely secured could cause loss of stability resulting in serious injury or damage.

- After ANY adjustments, repair or service and before use, make sure that all attaching hardware is tightened securely.

4. Before using your Force NRG, check all parts for damage or wear and replace, if necessary. Check all parts for proper adjustment.
5. Keep axles free of dirt and lint to ensure proper fit in axle receivers on the Force NRG.
6. Check tires for proper pressure and if not inflated properly, inflate to recommended tie pressure listed on the side wall of the tire
7. The wheels and tires should be checked periodically for cracks and wear, and should be replaced by a qualified technician.
8. Regularly check for loose spokes in the rear and front wheels. If loose, have them adjusted by a qualified technician.
9. Periodically check handpedals to ensure they are secure to the cranks.
10. Periodically adjust brake in correlation to brake pad wear.
11. If your Force NRG is equipped with electronic shifting, regularly check your battery life!

12. For more specific Maintenance contact your dealer.



**WARNING!
Maintenance**

Technological improvements are continuously being made in the bicycle market. Because of this, components used on Handcycles are affected. In order to help minimize the chances of an accident and possible injury, it is critical that you have any repair or maintenance which is not specifically described in this manual performed by your dealer. Additionally, the maintenance required on your handcycle will largely be determined by what how you ride, where you ride, and how you store your handcycle. For additional concerns, contact your dealer.



WARNING!

Repair Techniques and Tooling

Often handcycle service and repair requires special knowledge and tools. Before working on your handcycle, consult your dealer for guidance on how to properly maintain and or repair your handcycle. Any work performed on the handcycle without proper technique or tooling may result in damage to the handcycle, an accident which can cause serious injury or death, and void warranty.

13 Options

13.1 Installing Safety Lights



WARNING!

– Operation of the handcycle is subject to all traffic rules and regulations (this may include the use of a safety lights and reflectors for dusk/night riding).

Batteries

1. Remove the lens cover.
2. Insert the AAA batteries with correct polarity (+ or -).
3. Reinstall lens cover.

Mounting the Safety Light

1. Remove the set screw from the clamp on the safety light.
2. Install the safety light.
 - a. Rear safety light: Position the clamp onto the rear of the frame. Install the set screw into the clamp and tighten securely.
 - b. Front safety light: Position the clamp onto the fork. Install the set screw into the clamp and tighten securely.

Operating the Safety Light

1. Press button to turn safety light on/off.
2. Remove lens cover and slide switch back and forth for pulse or constant mode.

13.2 Using Safety Helmet

Helmet



1. Secure helmet using the chin strap.
2. Ensure proper fit.

13.3 Using the Alignment Gauge

1. Inflate the tires to recommended tire pressures (listed on the sidewall of the tire).
2. Place the handcycle and alignment gauge A on a flat surface.
3. Position the alignment gauge A near the rear of the rear tires B.
4. Loosen the alignment screw on each side.
5. Position the alignment gauge A between the rear of the rear tires B.
6. Adjust the alignment inserts so the alignment gauge A fits snugly between the rear of the rear tires B.
7. Tighten the alignment screws to secure the alignment bar position.

8. Position the alignment gauge A at the front of the rear tires B.
9. Examine the gauge A. Perform one of the following:
 - a. If the alignment gauge A fits snugly between the front of the rear tires, the wheels are aligned. No toe in/toe out adjustment is required.
 - b. If there is extra space between the alignment gauge A and rear tires, the tires have a toe out condition. Refer to Adjusting Toe in Toe Out.
 - c. If the alignment gauge A does not fit between rear tires, the tires have a toe in condition. Refer to Refer to Adjusting Toe in Toe Out.

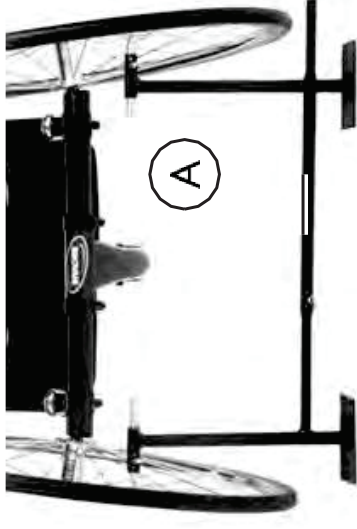


Fig. 12-2

Front of Handcycle

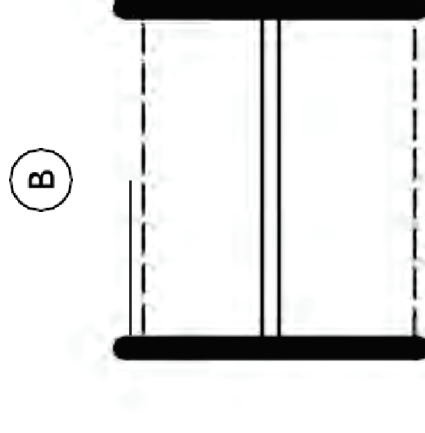


Fig. 12-3

Rear of Racing Handcycle

charges incurred in replacement part installation or repair of any such product. Product repairs shall not extend this warranty. - coverage for repaired product shall end when this limited warranty terminates. Invacare's sole obligation and your exclusive remedy under this warranty shall be limited to such repair and/or replacement.

LIMITATIONS AND EXCLUSIONS: THE FOREGOING WARRANTY SHALL NOT APPLY TO SERIAL NUMBERED PRODUCTS IF THE SERIAL NUMBER HAS BEEN REMOVED OR DEFACTED, PRODUCTS SUBJECTED TO NEGLIGENCE, ACCIDENT, IMPROPER OPERATION, MAINTENANCE OR STORAGE, COMMERCIAL OR INSTITUTIONAL USE, PRODUCTS MODIFIED WITHOUT INVACARE'S EXPRESS WRITTEN CONSENT, INCLUDING, BUT NOT LIMITED TO, MODIFICATION THROUGH THE USE OF UNAUTHORIZED PARTS OR ATTACHMENTS; PRODUCTS DAMAGED BY REASON OF REPAIRS MADE TO ANY COMPONENT WITHOUT THE SPECIFIC CONSENT OF INVACARE, OR TO A PRODUCT DAMAGED BY CIRCUMSTANCES BEYOND INVACARE'S CONTROL, AND SUCH EVALUATION WILL BE SOLELY DETERMINED BY INVACARE. THE WARRANTY SHALL NOT APPLY TO PROBLEMS ARISING FROM NORMAL WEAR OR FAILURE TO ADHERE TO THESE INSTRUCTIONS.

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14 Warranty

14.1 Warranty

United States Limited Warranty

PLEASE NOTE: THE WARRANTY BELOW HAS BEEN DRAFTED TO COMPLY WITH FEDERAL LAW APPLICABLE TO PRODUCTS MANUFACTURED AFTER JULY 4, 1975.

This warranty is extended only to the original purchaser/user of our products.

This warranty gives you specific legal rights and you may also have other legal rights which vary from state to state.

Invacare warrants the frames when purchased new and unused to be free from defects in materials and workmanship for a period of three (3) years from the date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty. Invacare warrants the upholstered materials (seat and back) and remaining components of this product when purchased new and unused to be free from defects in materials and workmanship for a period of thirteen (13) months from date of purchase from Invacare or a dealer, with a copy of the seller's invoice required for coverage under this warranty.

All component parts including, but not limited to forks, and upholstery are warranted against defects in materials and workmanship for a period of one year from the date of purchase except bushings, bearings, and tires/tubes. If within such warranty period any such product shall be proven to be defective, such product shall be repaired or replaced, at Invacare's option, with refurbished or new parts. This warranty does not include any labor or shipping

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PROVIDED HEREIN. the manufacturer SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES WHATSOEVER.

THIS WARRANTY SHALL BE EXTENDED TO COMPLY WITH STATE/PROVINCIAL LAWS AND REQUIREMENTS.

14.2 Limited Warranty—Europe, Australia and New Zealand

Terms and conditions of the warranty are part of the general terms and conditions particular to the individual countries in which this product is sold.

Contact information for your local Invacare office is located inside the back cover of this manual.

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