Ankle: Before you start - Tools, Hardware and Components

From HuboWiki

UNDER CONSTRUCTION!!!

Contents

- 1 Tools
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  - 2.1 Socket Head Cap Screws
  - 2.2 Set Screws
- 3 Components
  - 3.1 Harmonic Drive
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    - 3.1.2 Roll
  - 3.2 Bearings
  - 3.3 Belts
  - 3.4 Pulleys
  - 3.5 Motors
  - 3.6 Gears
  - 3.7 Other Components

Tools

- 2.0mm hex wrench
- 2.5mm hex wrench
- 3.0mm hex wrench
- 4.0mm hex wrench
- 5.0mm hex wrench

Screws

Socket Head Cap Screws

<table>
<thead>
<tr>
<th>Size</th>
<th>Length(mm)</th>
<th>Pitch(mm)</th>
<th>Quantity</th>
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M3  20  0.5  12
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M4  10  0.7  9
M4  6  0.7  3
M6  8  1.0  10
M6  10  1.0  6
M6  12  1.0  5

Set Screws

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Components

Harmonic Drive

Wave Generator (SHD-17-100-2SH)
HUBO-01-502G-01
1x

Shaft Ankle Pitch
HUBO-02-201C-01
1x
### Ankle: Before you start - Tools, Hardware and Components

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
<th>Model</th>
<th>Quantity</th>
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<tr>
<td>Pitch Harmonic Drive (SHD-17-100-2SH)</td>
<td>HUBO-01-502G-01</td>
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<td>Ankle Pitch Harmonic Cover</td>
<td>HUBO-02-108C-01</td>
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<td>1x</td>
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<tr>
<td>Ankle Cap</td>
<td>HUBO-02-107C-01</td>
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**Roll**
### Roll Harmonic Drive (SHD-17-100-2SH)

- 1x

### Ankle Foot Linker

- **HD R_1**
  - Ankle Roll Harmonic Mount
    - **HUBO-02-109C-01**
      - 1x

- **HD R_4**
  - Ankle Roll Motor Holder
    - **HUBO-02-112C-01**
      - 1x

- **HD R_5**
  - Harmonic Inner Gear Holder
    - **HUBO-01-102G-011**
      - 1x

### Bearings

- **12mm x 2.5mm Bearing 1260**
  - **HUBO-01-607G-01**
    - 1x

- **52 mm Bearing 6808ZZ**
  - **HUBO-01-601G-01**
    - 1x

- **7mm x 17mm Bearing**
  - 1x
### Belts

<table>
<thead>
<tr>
<th>Belt 80 XL</th>
<th>HUBO-01-304G-01</th>
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| 1x |

### Pulleys

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<thead>
<tr>
<th>Pulley 25 XL-8Φ</th>
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| 1x |

<table>
<thead>
<tr>
<th>Pulley 10 XL-5Φ</th>
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| 1x |

### Motors

**EXAMPLE MATERIAL**
Roll Motor (EC-PWERMAX30 200W 48V With Pinion)
HUBO-01-402G-01
1x

Pitch Motor (EC-PWERMAX30 200W 48V)
HUBO-01-401G-01
1x

Gears

Spur Gear Set
HUBO-01-702G-01
1x

Other Components

Foot Joint Plate Supporter (Front)
HUBO-02-104C-01
1x

Ankle Core (R)
HUBO-02-110R-01
1x

Ankle Pitch Motor Supporter

Core Line Exit Frame
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<th>Item Description</th>
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<td>Foot Joint Plate Supporter (Back)</td>
<td>HUBO-02-105C-01</td>
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<td>Bearing Cover</td>
<td>HUBO-01-101G-01</td>
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<td>Ankle Pitch Switch Trigger (R)</td>
<td>HUBO-03-107R-01</td>
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Ankle: Step-by-Step Disassembly

From HuboWiki

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- 2 Pitch Motor Strut
  - 2.1 Hardware
    - 2.1.1 Exploded Views
- 3 Roll Motor Housing
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- 4 Pitch harmonic drive and casing Disassembly
  - 4.1 Hardware
  - 4.2 Disassembly
    - 4.2.1 Exploded Views

Attach Top Cap and Foot Bearing Connection Assembly

Hardware

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<thead>
<tr>
<th>Size</th>
<th>Length(mm)</th>
<th>Pitch(mm)</th>
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Exploded Views
Assemble Pitch Motor, Motor Strut, and Pulley
Attach Foot Connection Flange
Attach Pitch Motor Assembly to Roll Motor Housing
Assemble Pitch Motor, Motor Strut, and Pulley
Pitch Motor Strut

Hardware

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Exploded Views

Attach Pitch Motor Assembly to Roll Motor Housing

Pitch Motor Belt Alignment
### Roll Motor Housing

#### Hardware

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Attach Roll Harmonic Drive Assembly to Flange
Attach Motor and Bearing to Harmonic Drive Flange

Attach Harmonic Drive to Motor Housing
Attach Harmonic Drive Flange to Motor Housing

Attach Bearing and Roll Harmonic Drive Casing

**Pitch harmonic drive and casing Disassembly**

**Hardware**

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hubo.ece.drexel.edu/index.php/Ankle:_Step-by-Step_Disassembly
Disassembly

Exploded Views

detach Harmonic Drive Pulley Belt and Casing

remove Pulley and Bearing to Harmonic Drive Shaft
detach Pitch Harmonic Drive Casing

Shaft locking technique

disassemble Pitch Harmonic Drive

Harmonic Drive: DON'T TOUCH

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