2017

# Pedal Powered Water Pump / Purification System (PowerPoint)

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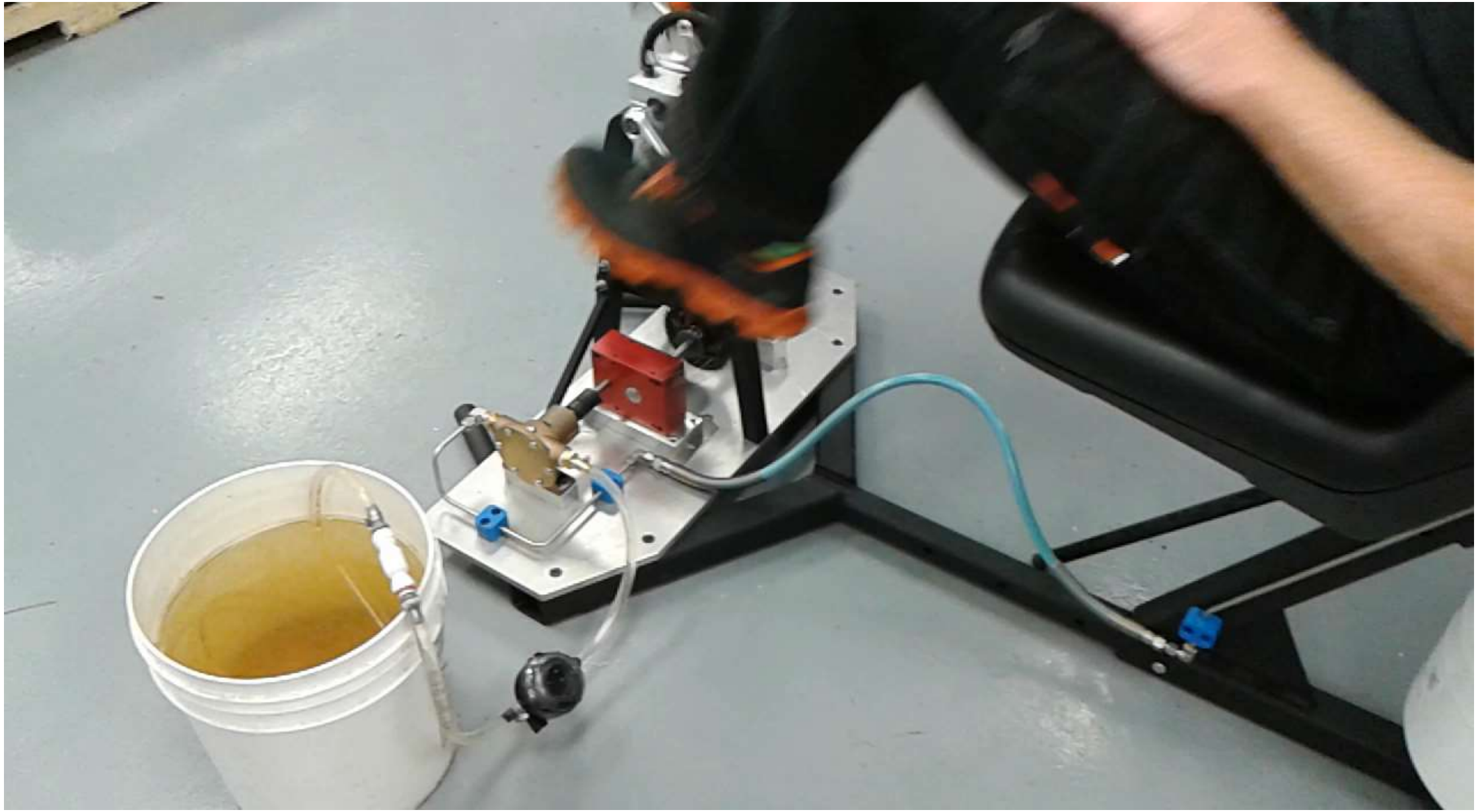
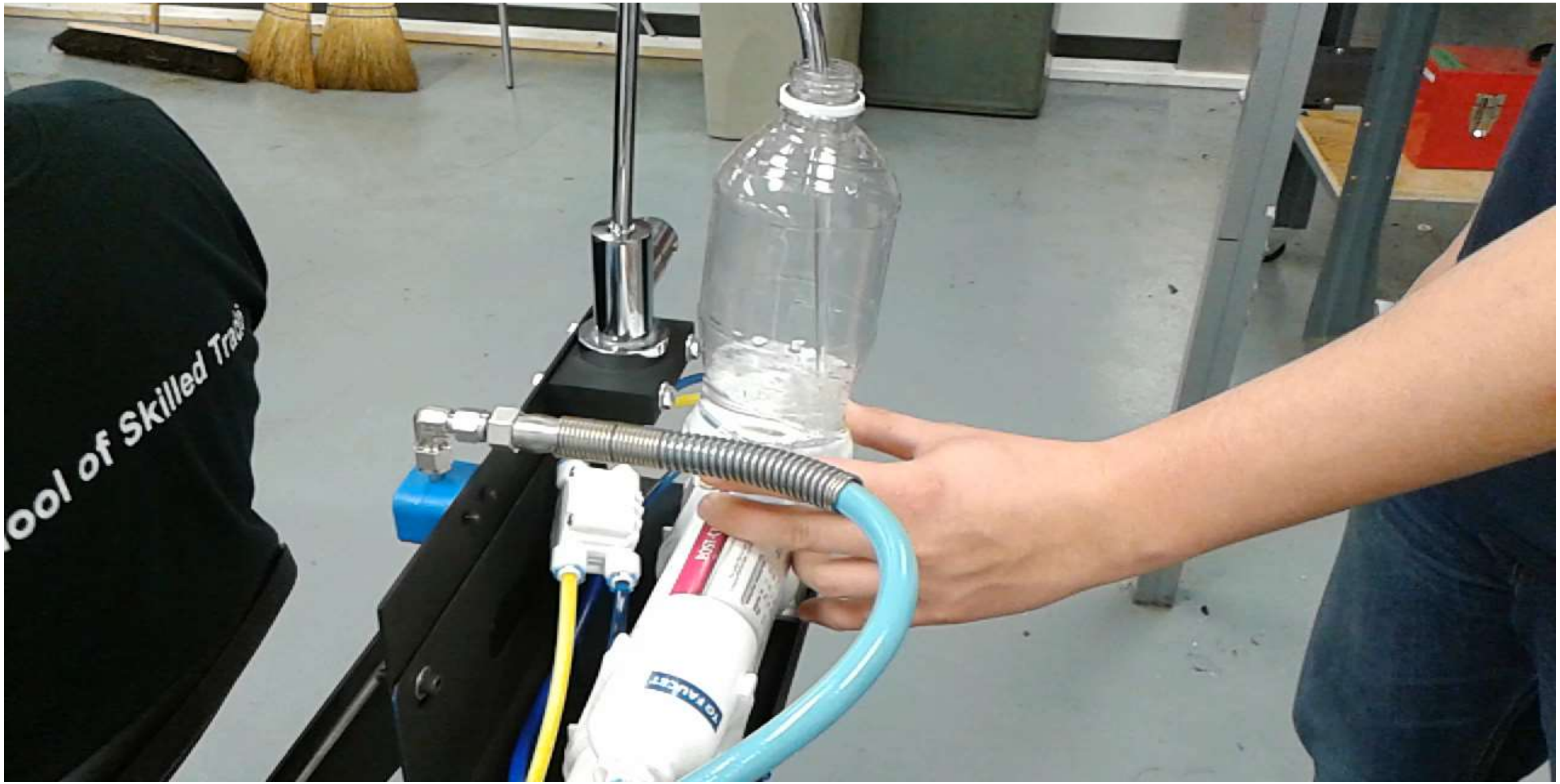
# Worldskills Industrial Mechanic Millwright Skill # 48

## Pedal Powered Water Pump / Purification System.

**At 30 to 40 rpm this unit will deliver ½ a litre of clean drinking water every 30 seconds through the overdrive gearbox, rubber vane positive displacement pump and 5 stage Reverse Osmosis Filtration System**

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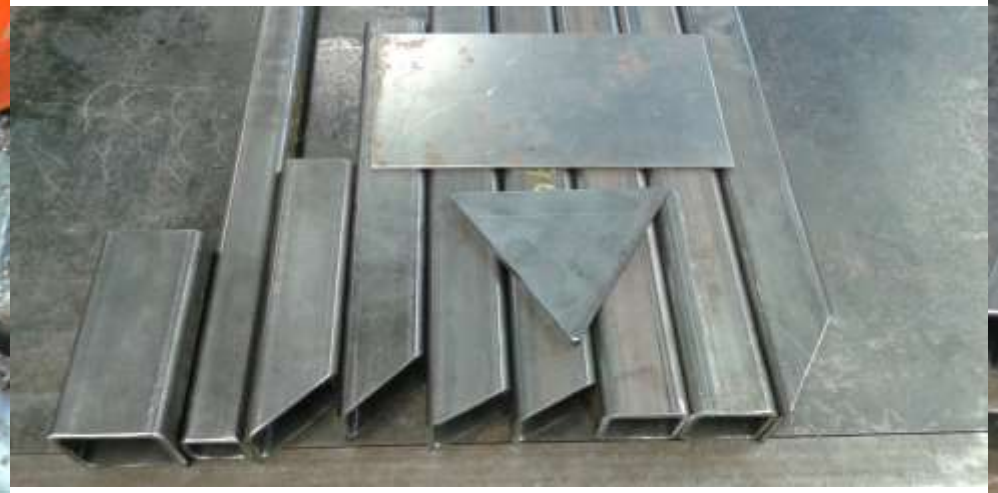
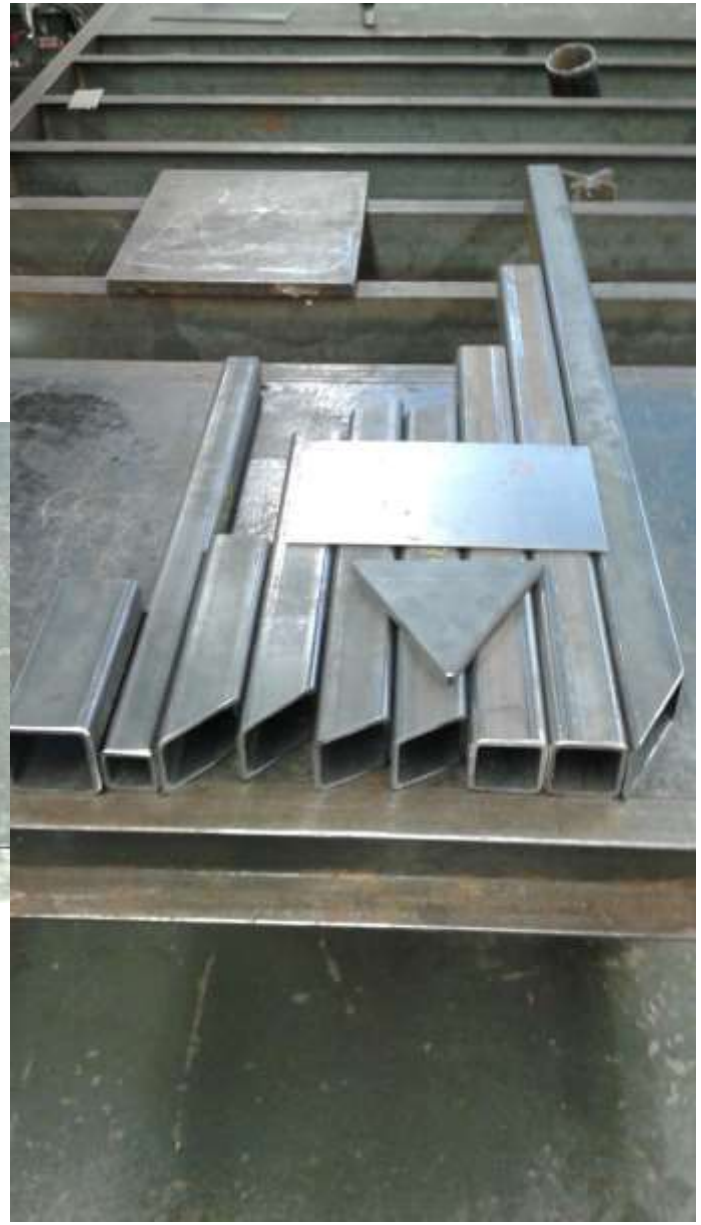
# Worldskills IMM Skill # 48

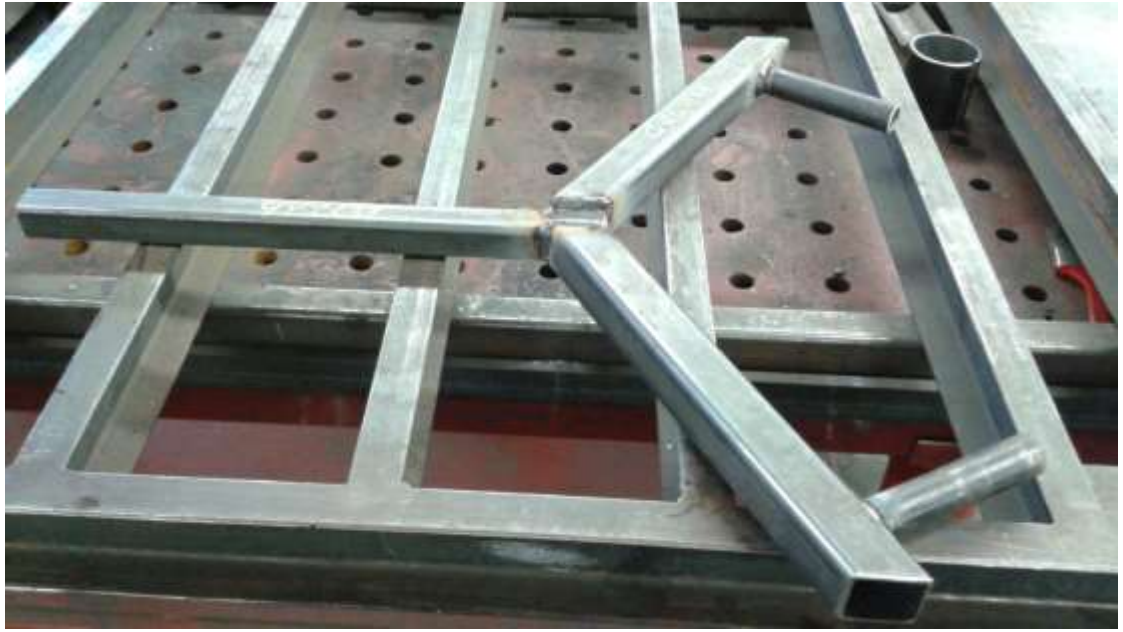
## Welding.

**Raw Material Stock for Welding Details 1-1 to 1-5, 2-1 to 2-3 & 3-1 to 3-3**

# Welding Details Angles Cut
# 1-3, 2-2 x 2 & 3-1







**Completed**

**Welding**

**Assembly**

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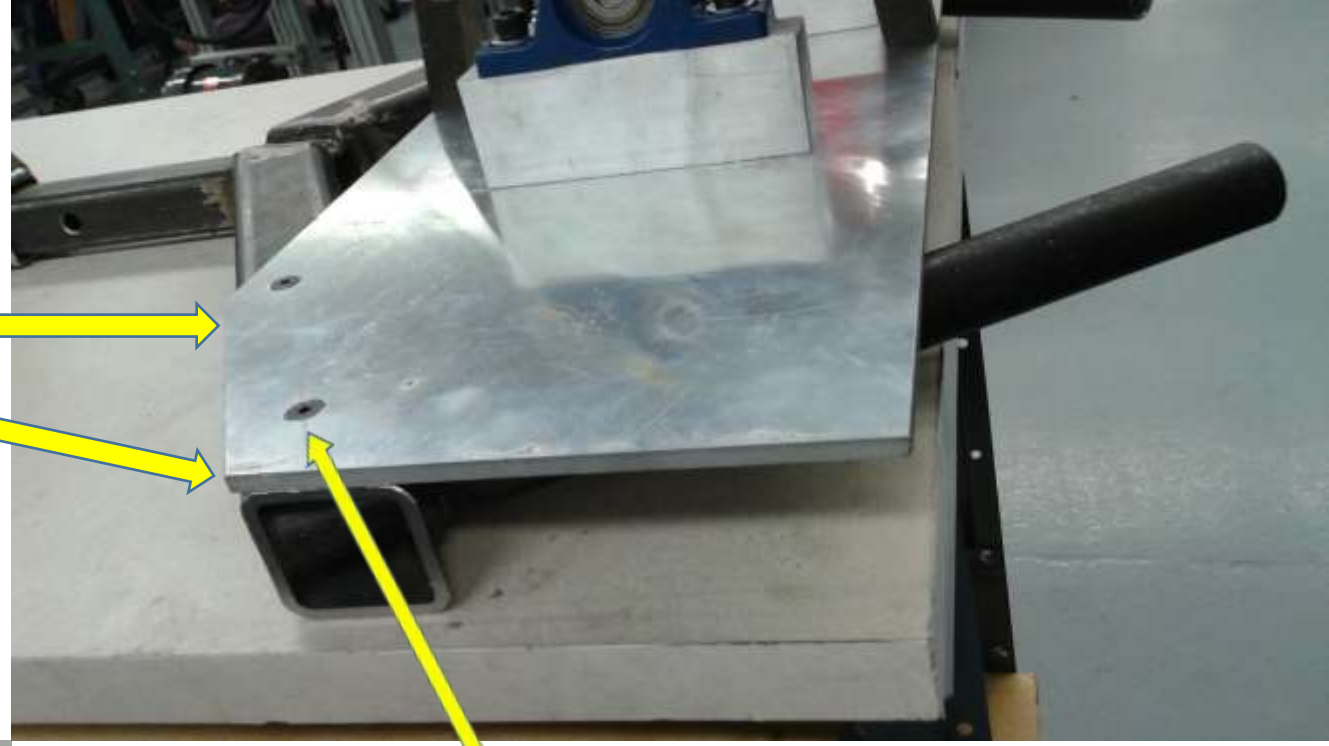
## Layout, Drilling & Tapping

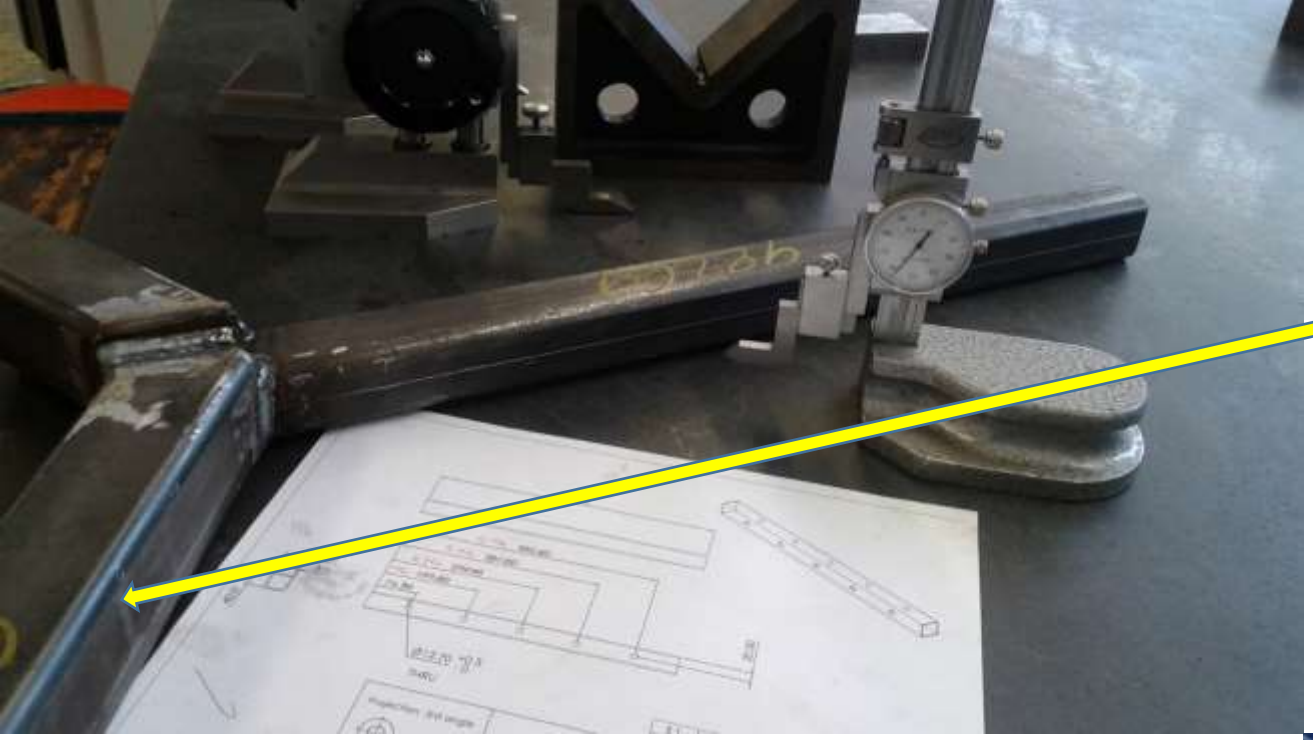
Layout, drill, tap and countersink as per supplied blueprint. Detail #4A

**Layout, drill, tap and countersink as per supplied blueprint. Detail #4A**

**Install Detail #4A level with the outside edge +/- 1.00mm of Detail #2-2 on both sides**



**Drill 9mm dia. & countersink to suit M8 x 25 FHCS, 4 reqd.**

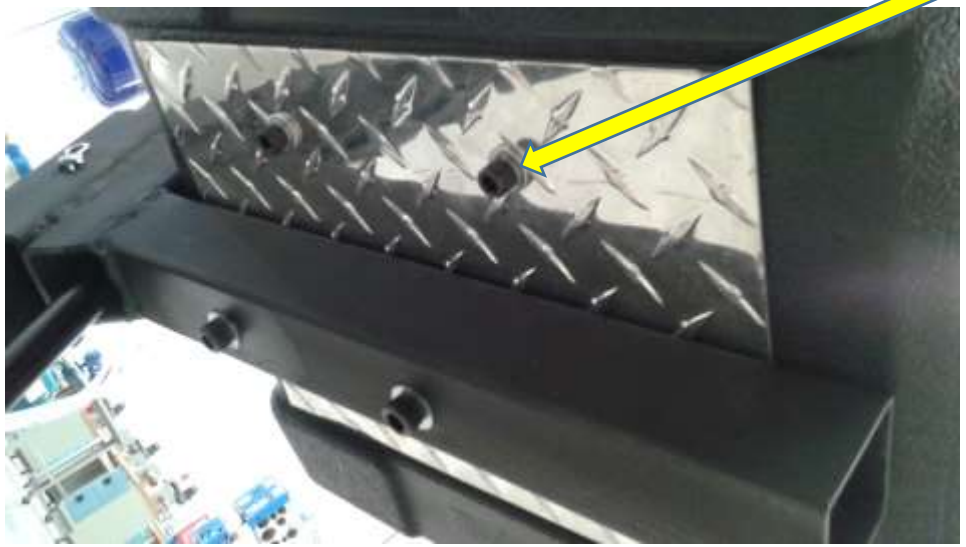


**Layout, drill and tap as per supplied blueprint on Detail #’s 2-1 & 2-2**

**As per supplied blueprint layout & drill detail #2-1.**

**As per supplied blueprint layout, drill & tap. Detail #2-2.**

Layout and drill detail #’s 3-1 & 17 as per tolerances on blueprint and install to detail #3-1 (2 M10 x 80 SHCS, 4 washers & 2 lock washers) & 47 (4 5/16” x 1 ¼ SHCS with 4 washers & lock washers)



Install detail #23 with cotter pin to detail #1-3 & 3-3.

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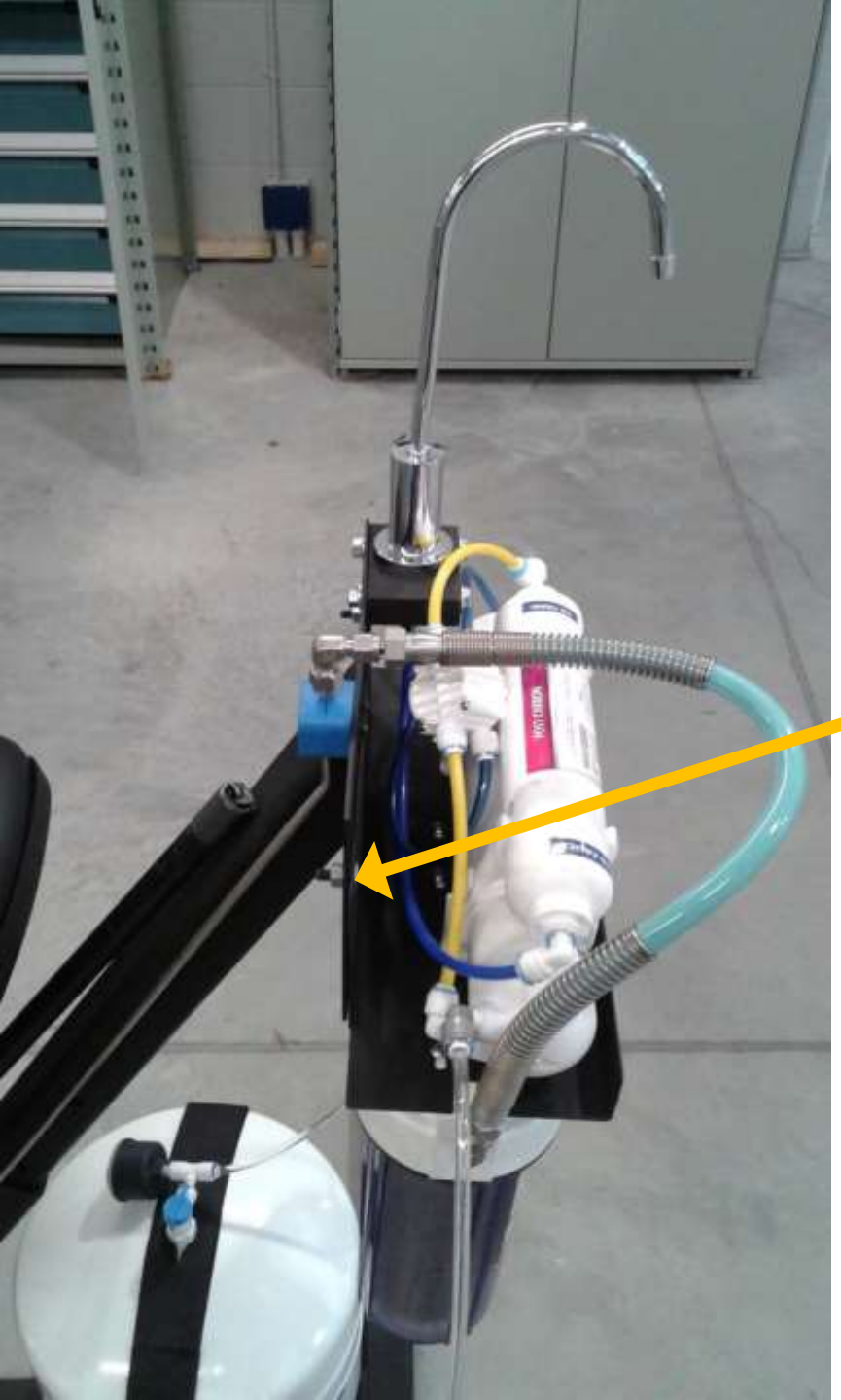
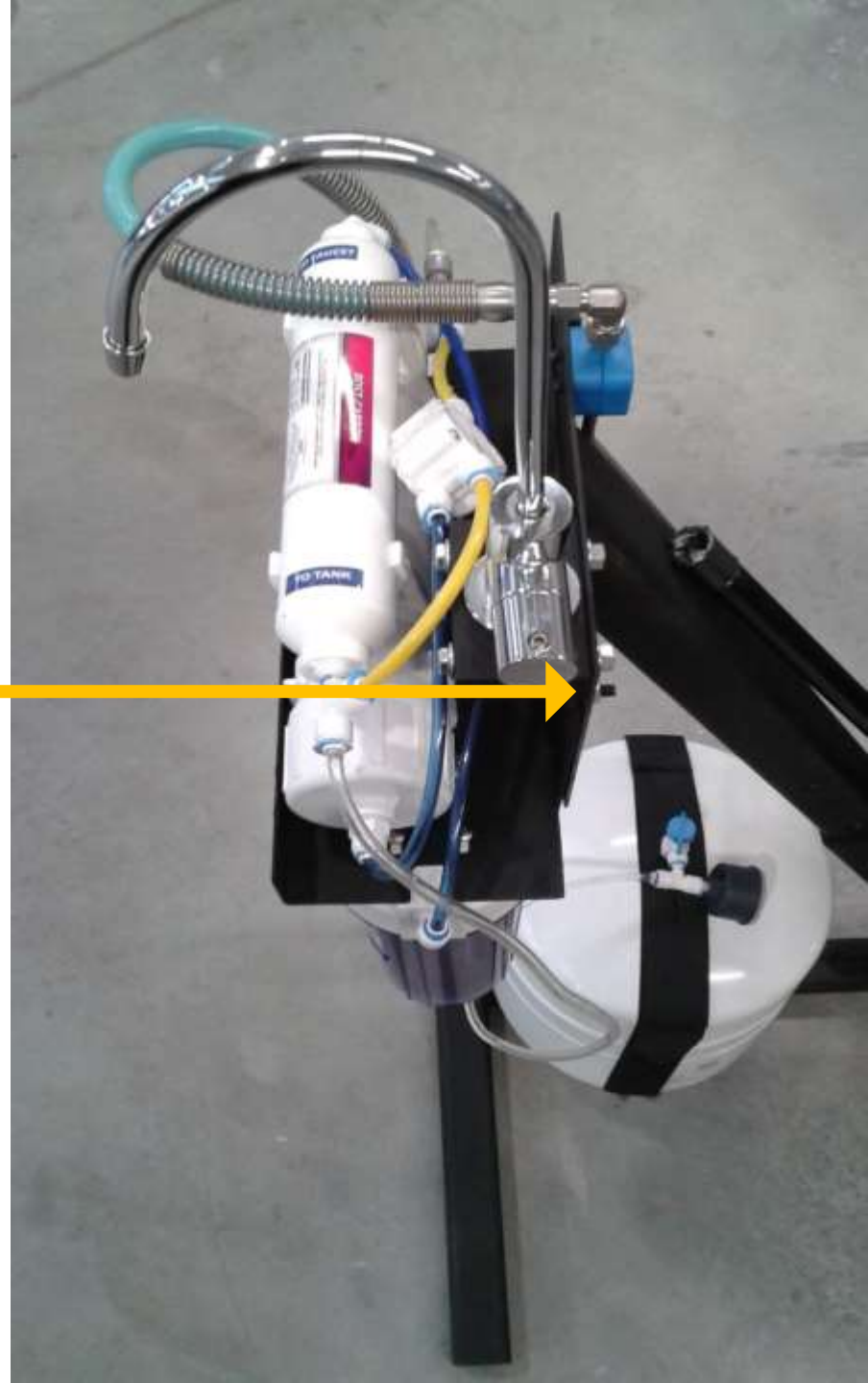
## Reverse Osmosis Filter Unit



**Layout & drill as per supplied blueprint & install Reverse Osmosis Filter Unit to Detail #1-5. (2 M6 x 15 SHCS, bolts, nuts and washers.)**



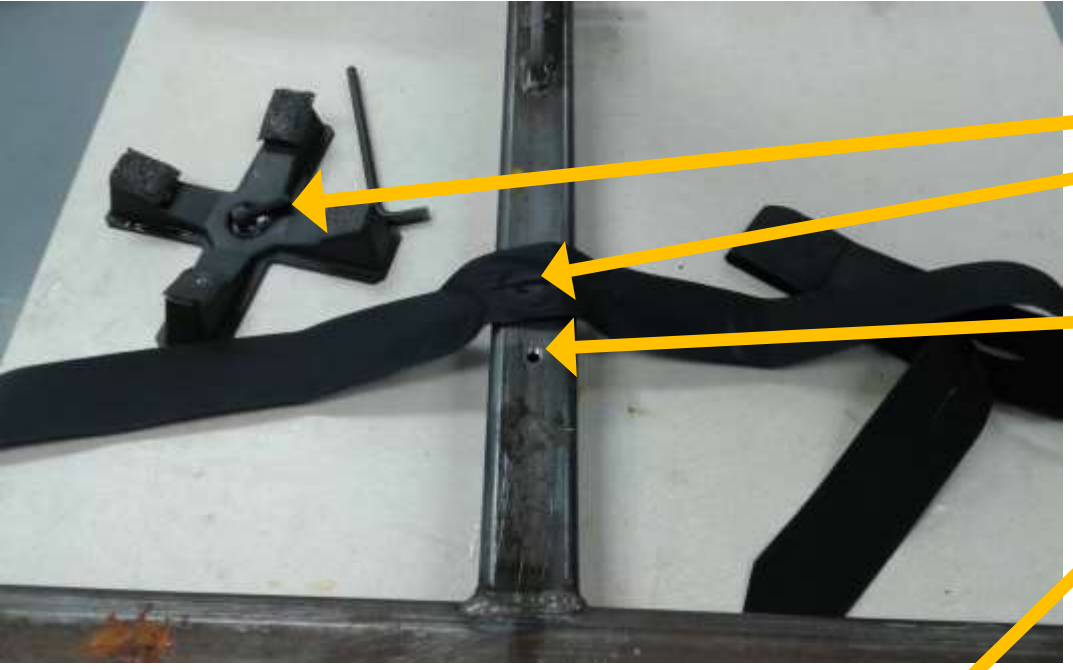
Layout, drill & tap as per blueprint install detail #40. (2 M6 x 25)

Install all supplied plastic tubing as per supplied tubing diagram

Detail #44

Detail #43

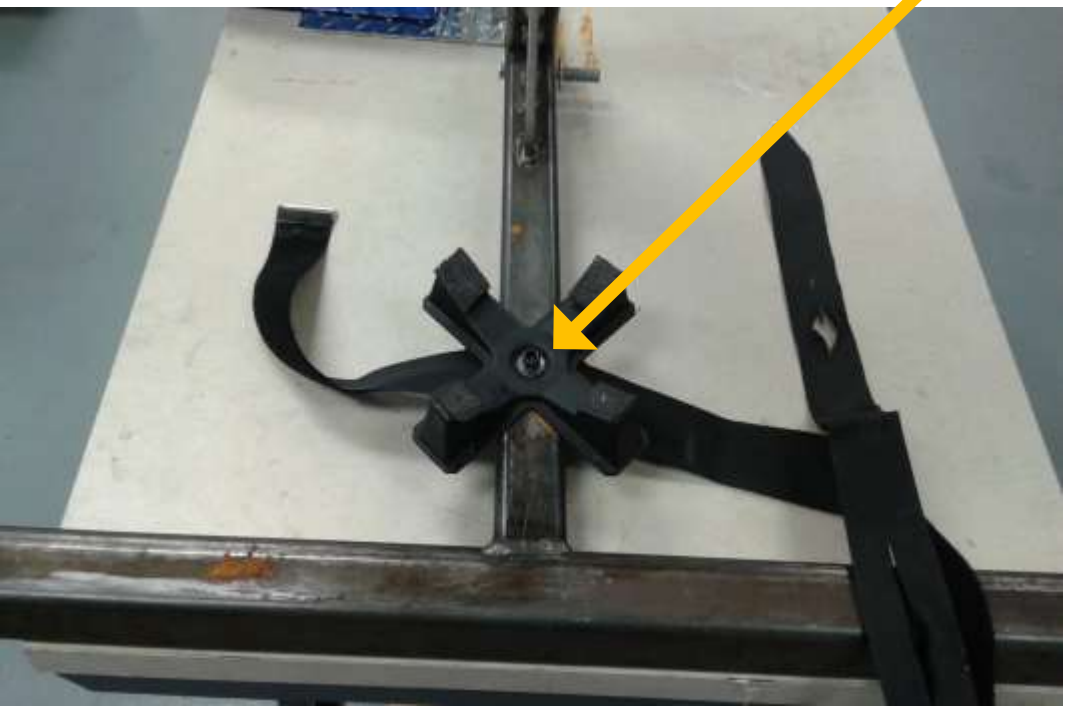
Detail #42



Tank Cradle Detail #21
Velcro Strap Detail #46

Detail# 1-2 Drilled & Tapped M6
as per blueprint.

Cradle Installed
(1 M6 x 30 SHCS & Washer)

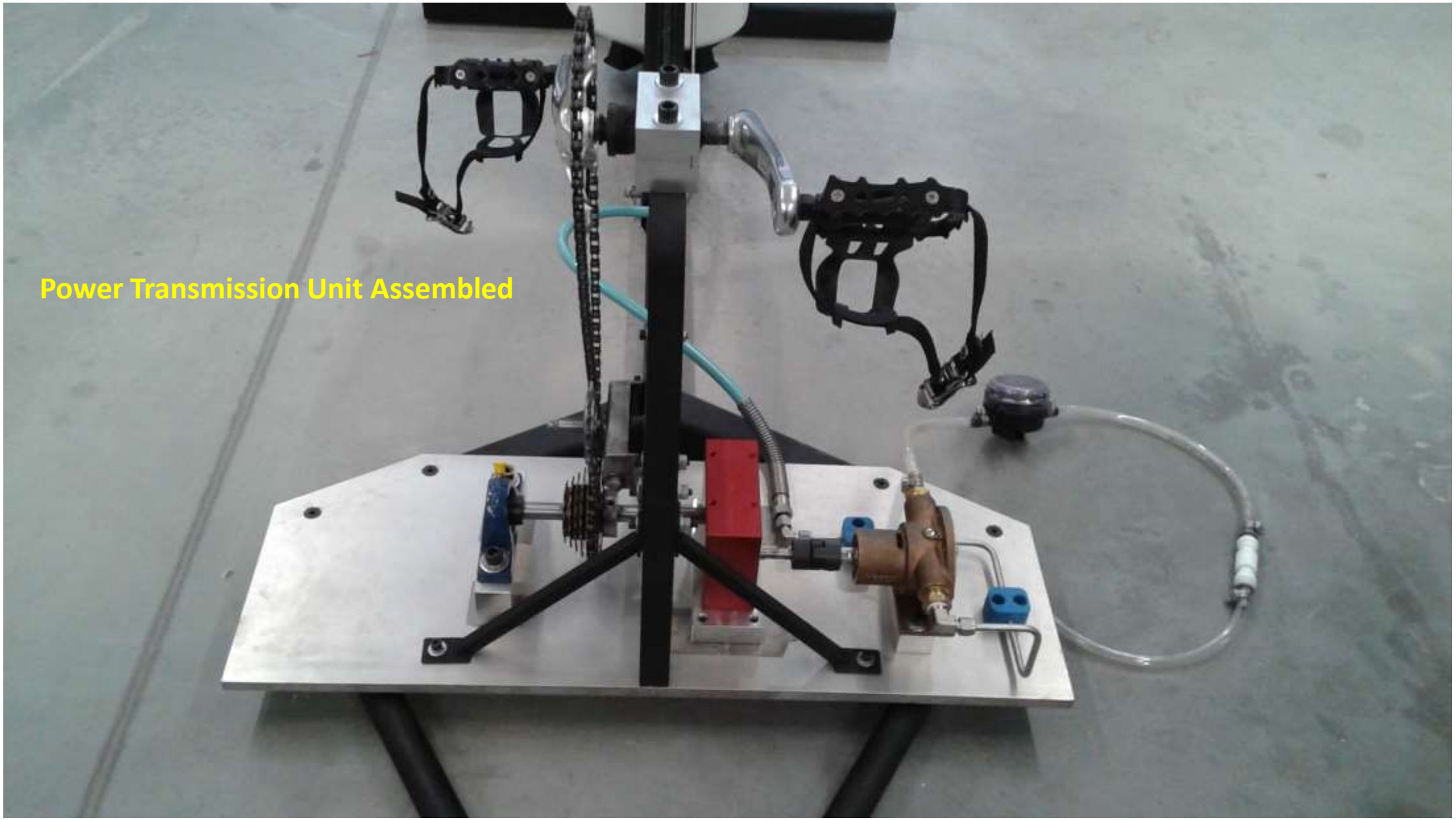


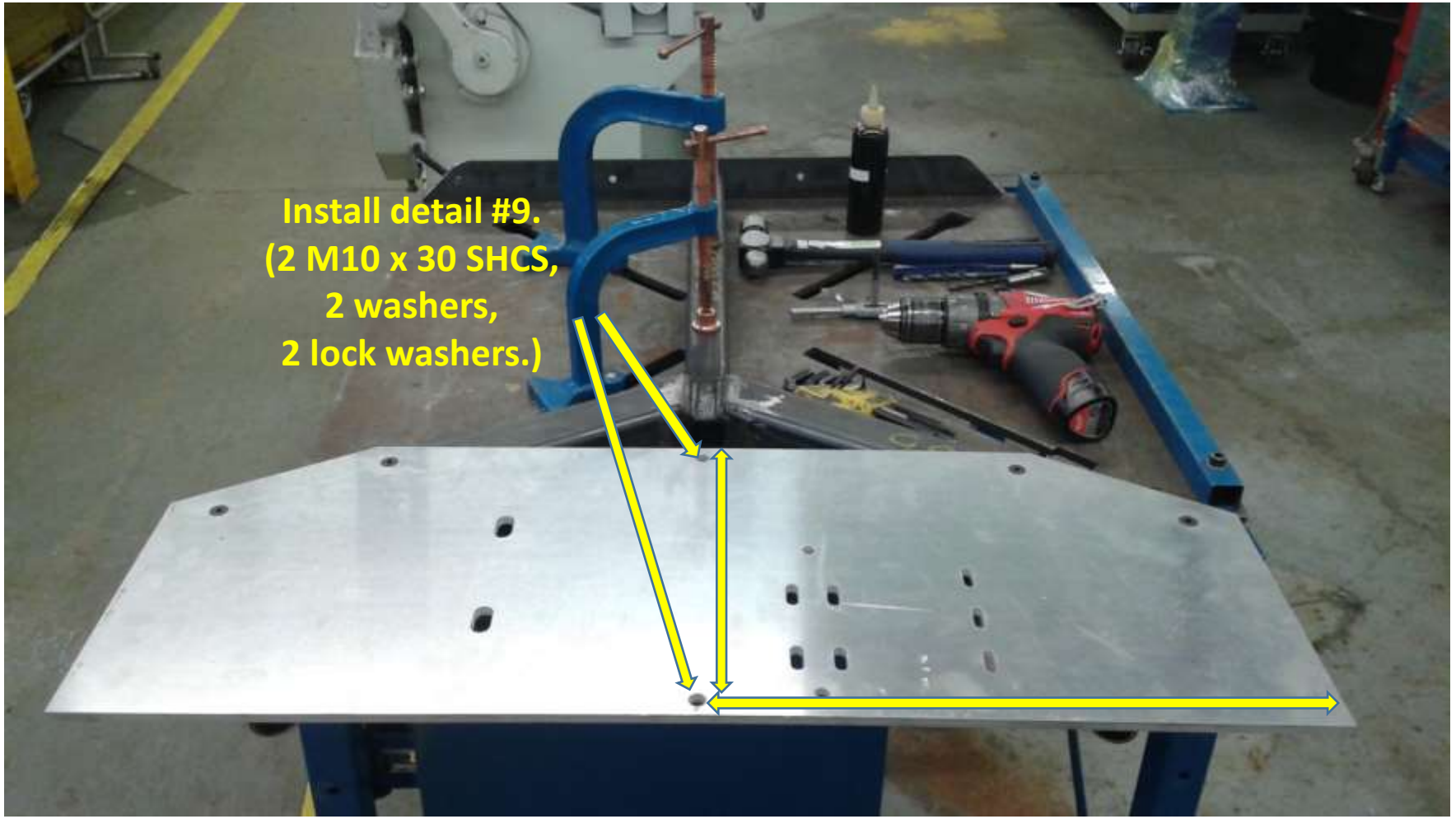
Cradle, Tank & Velcro Strap
Mounted & Installed

# Worldskills IMM Skill # 48

## Power Transmission System.

# Power Transmission Unit Parts & Details

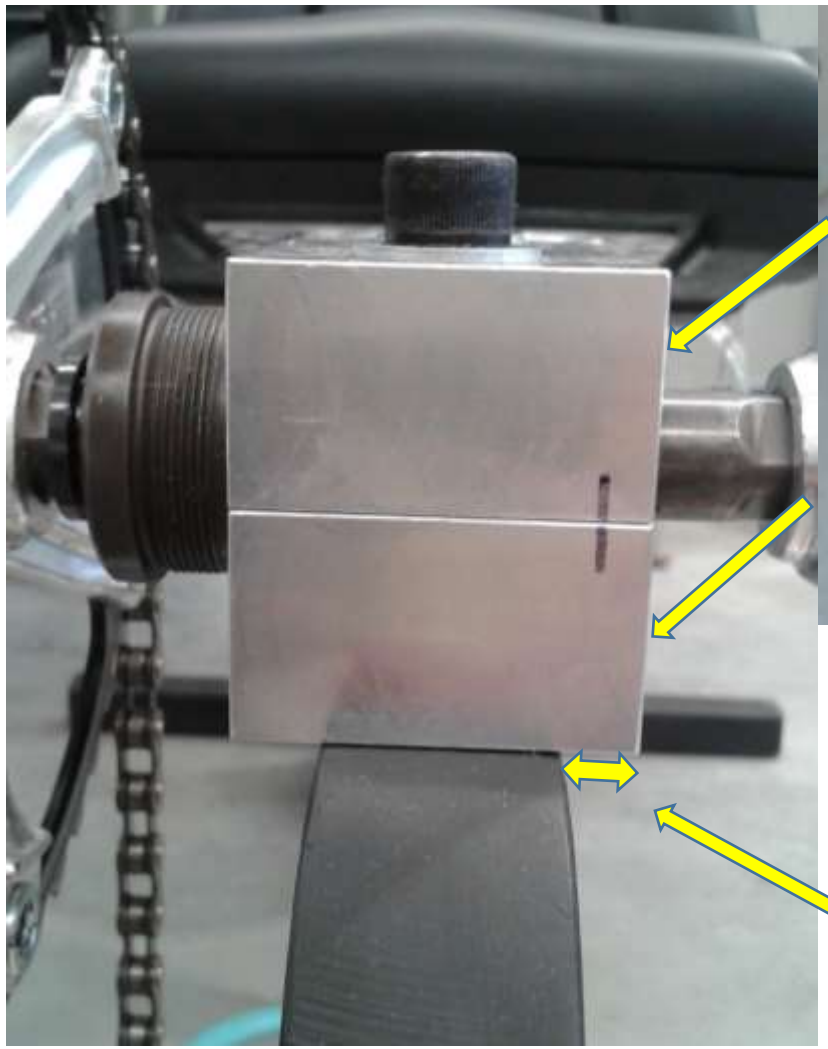

Power Transmission Unit Assembled

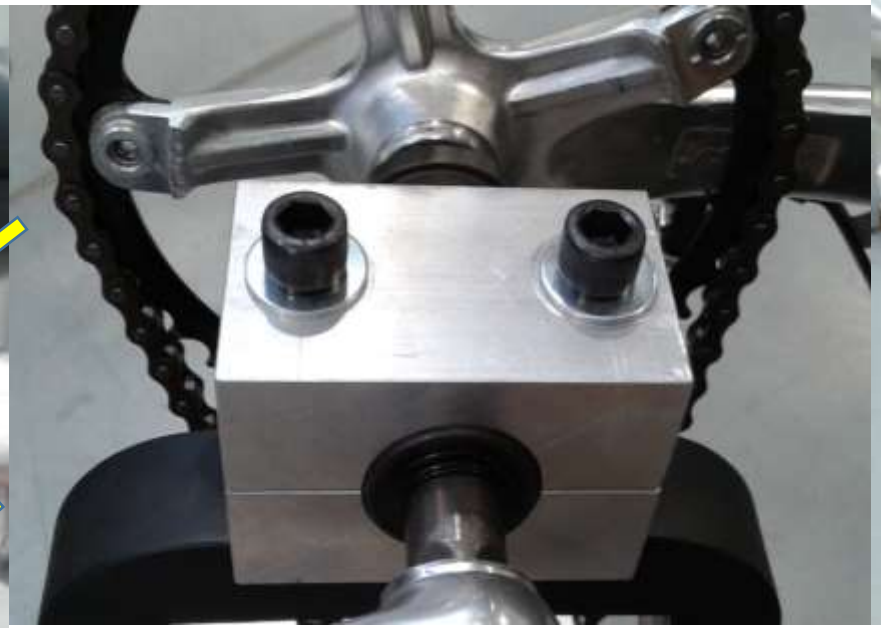


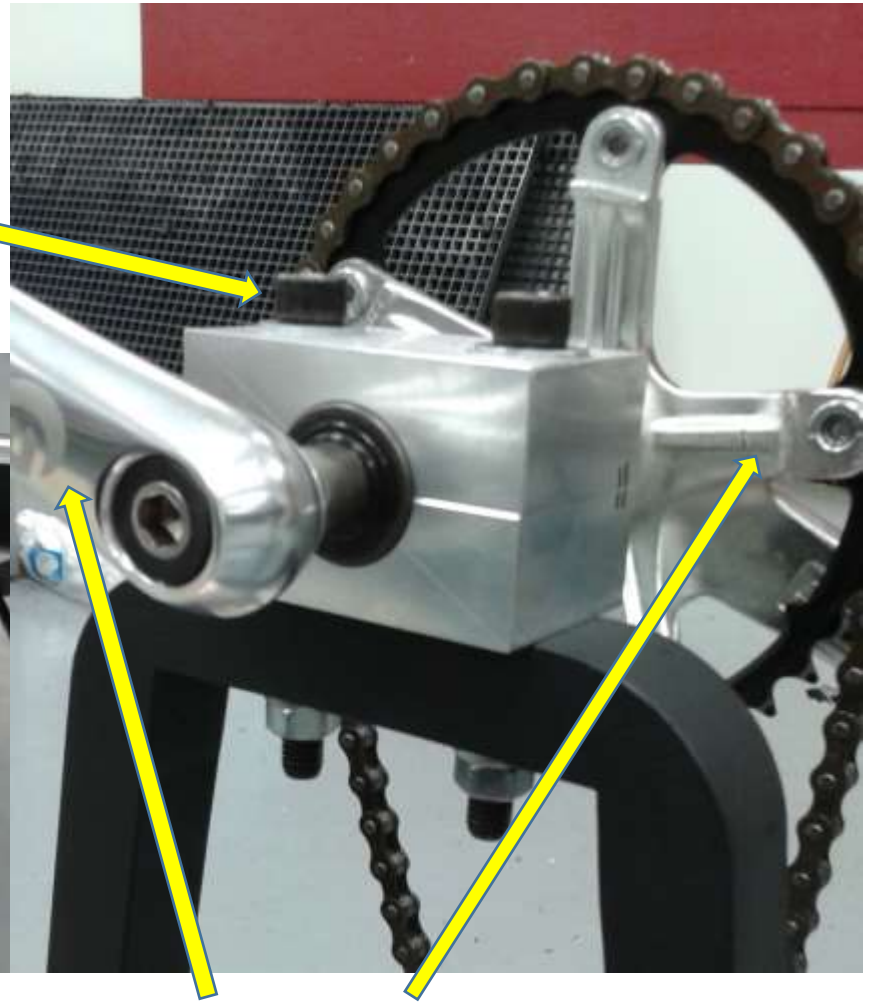

Detail #9.

**Square off datum edges +/- 1.00mm.**
**Competitor to decide datum edges to use.**

**Install detail #'s 7 & 8 as per photo on top of detail #9 with 2 M10 x 100 SHCS (2 nuts, 4 washers, 2 lock washers)**

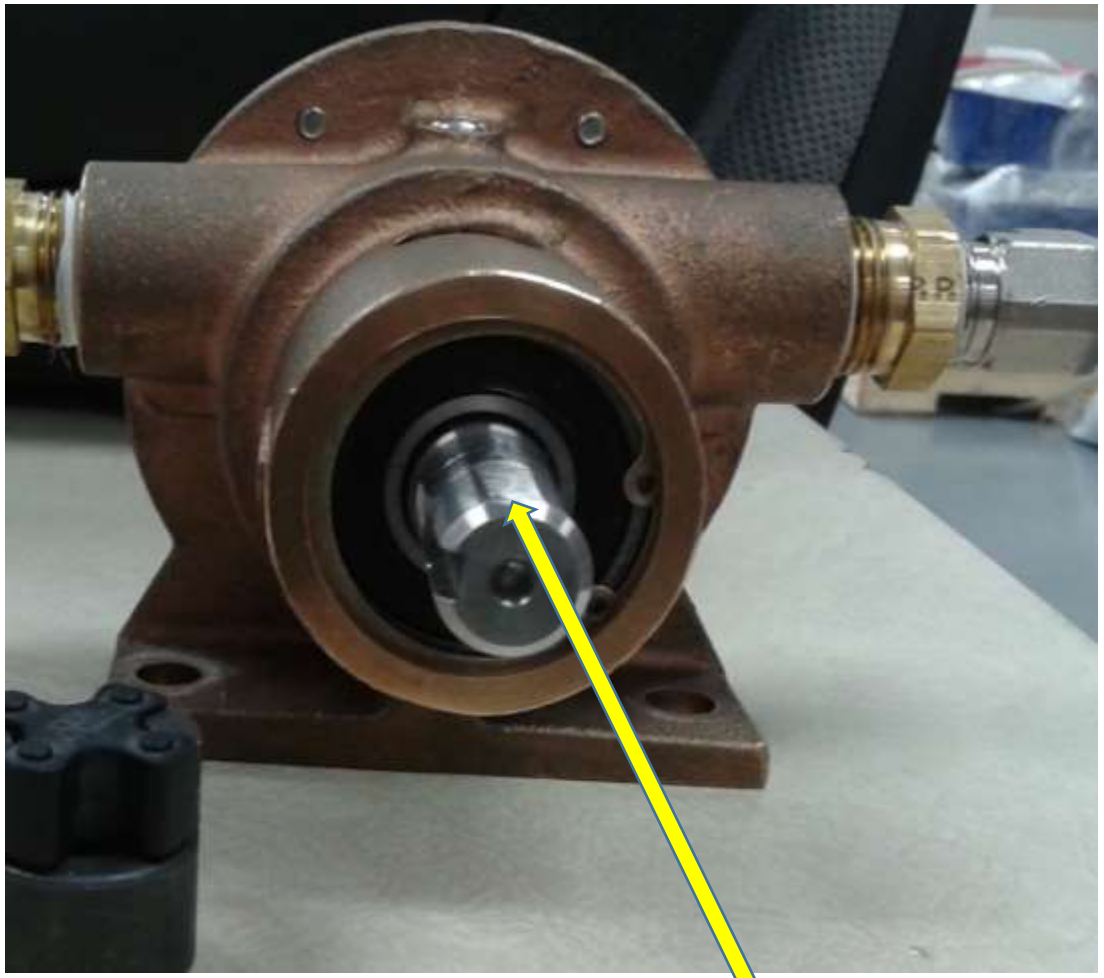


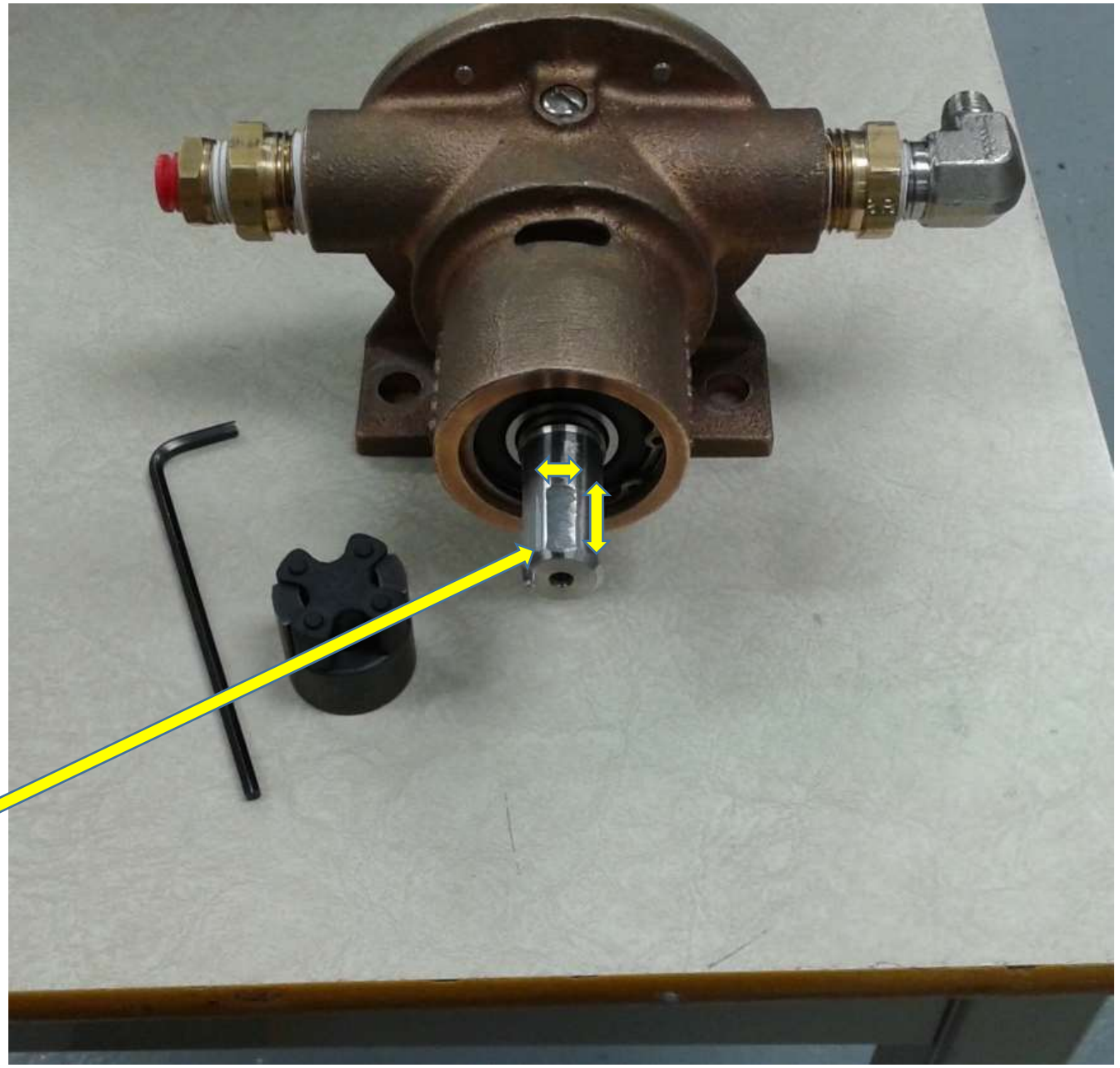




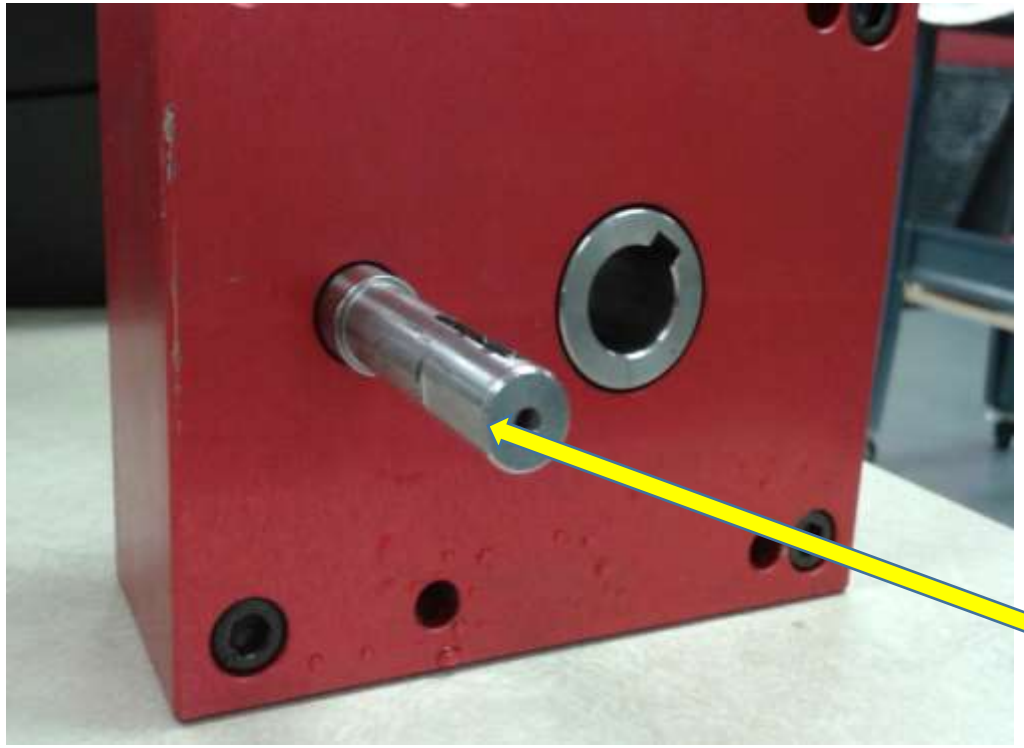
**Install detail #'s 49, 27 & 28 as per photo on top of detail #9.**

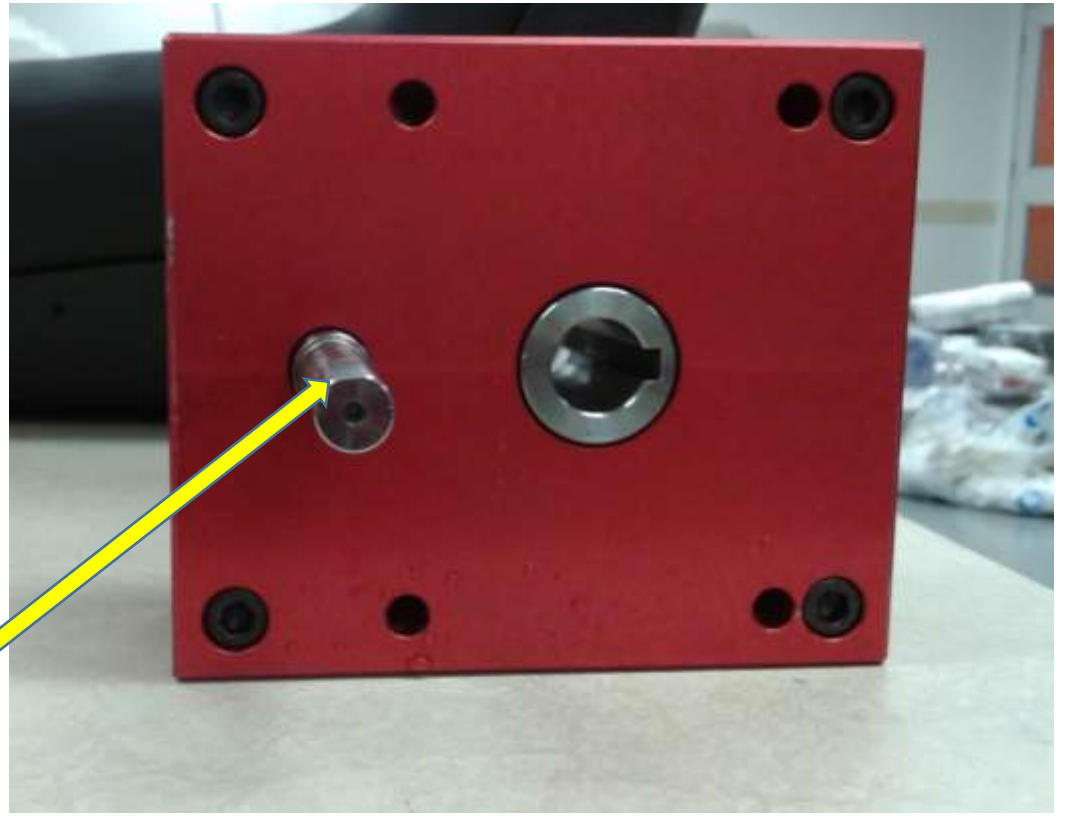
**Detail #7 to be installed within +/- 0.5mm along edge of detail #9 as per photo.**



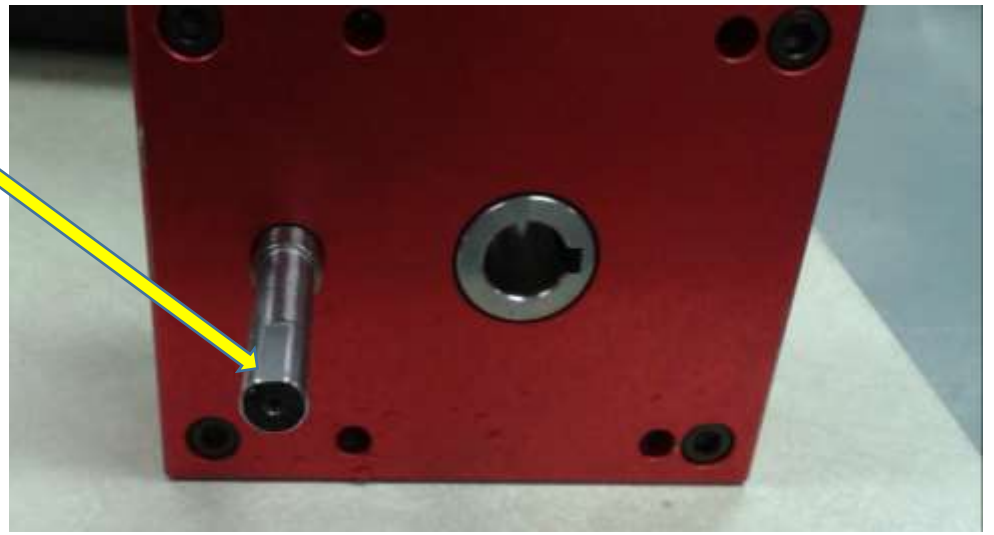


**File a flat 2mm deep x 12mm long on the positive displacement pump shaft of detail #30 @ 90° to the keyway**

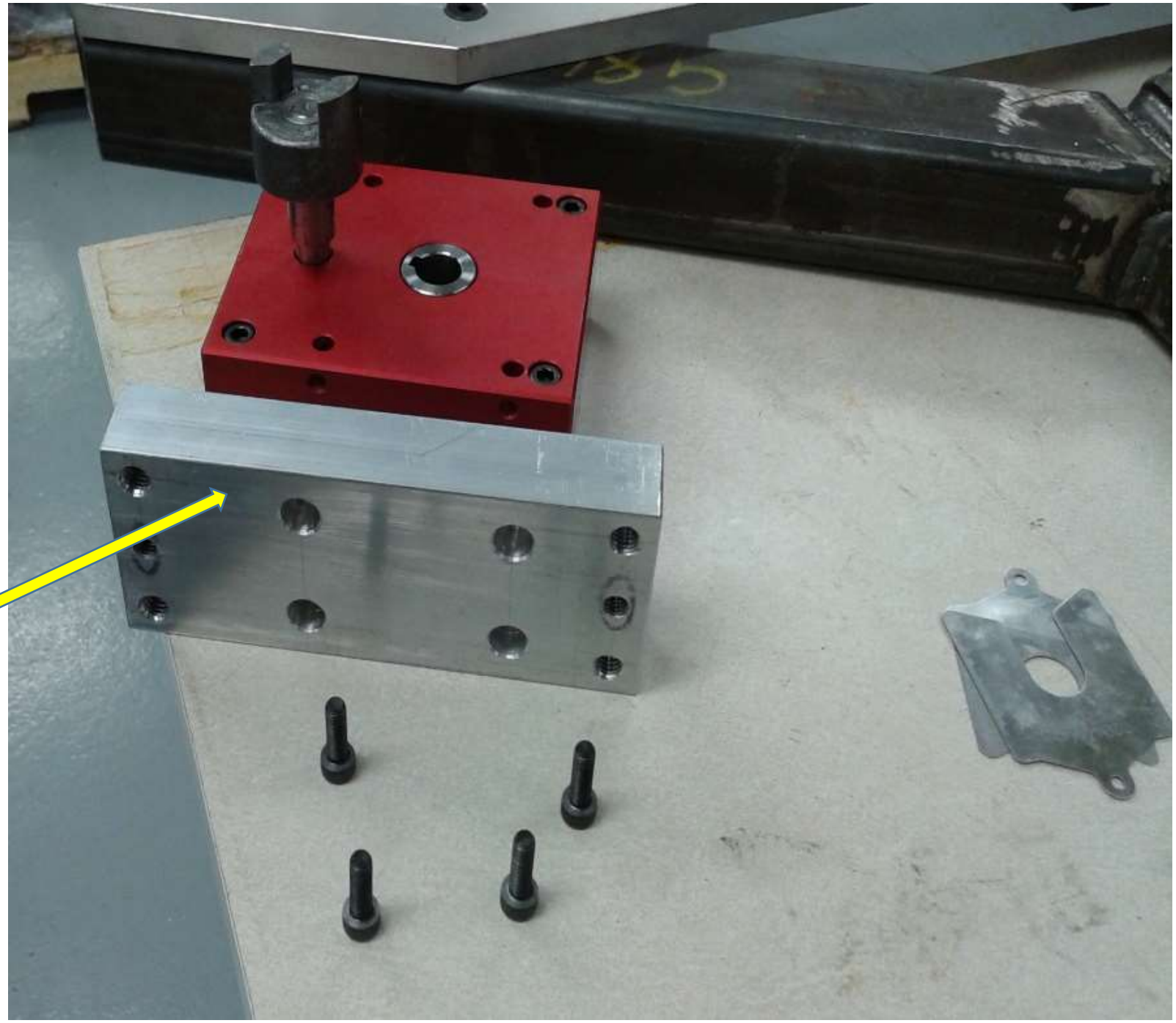


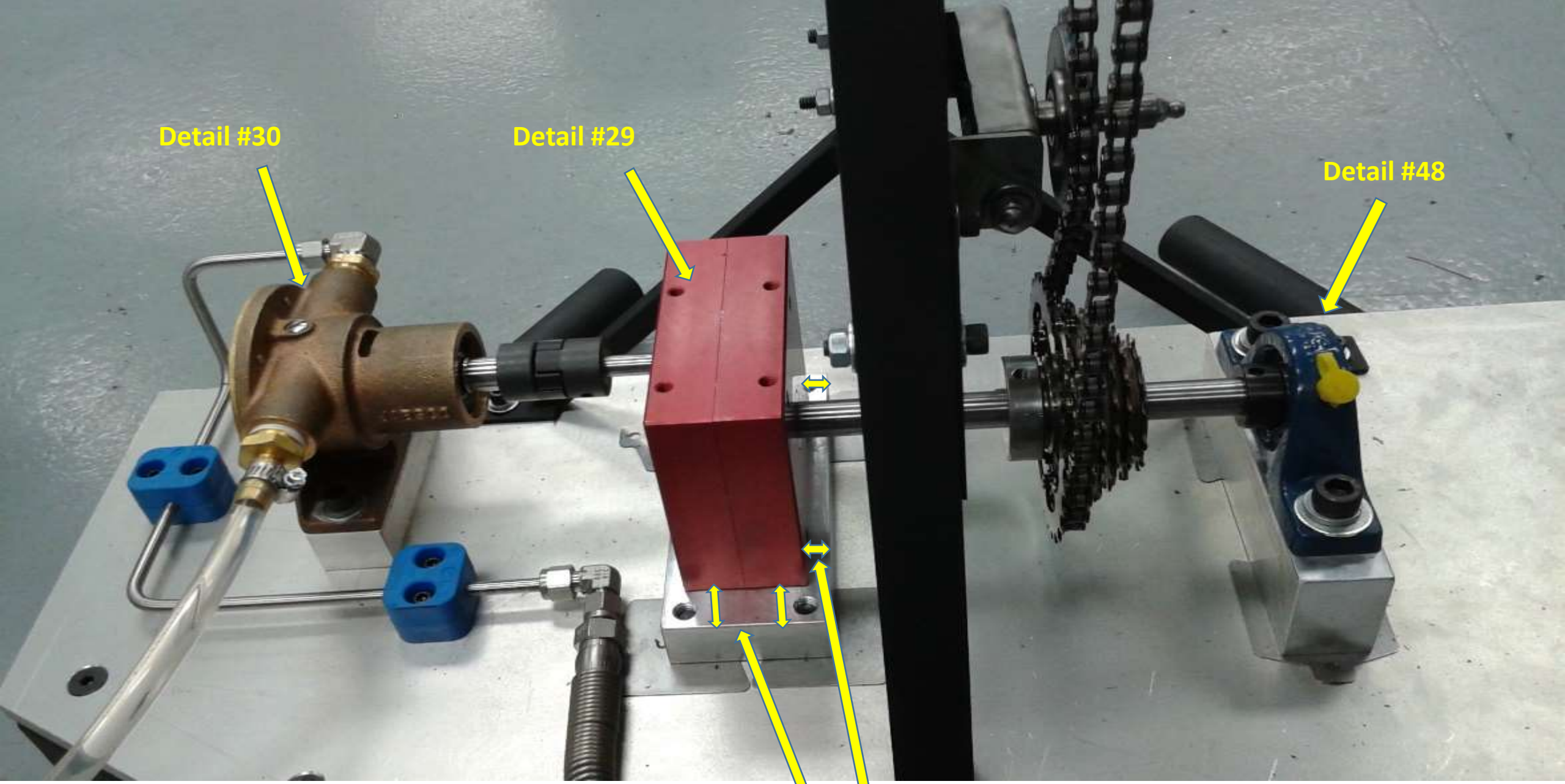


**File a flat 2mm deep x 12mm long on the pump shaft of detail #29 @ 90° to the keyway**



**Install detail #6 to detail #30**
**(4 M6 x 20 SHCS & 4 M8 x 40 SHCS**
**4 washers, 4 lock washers)**

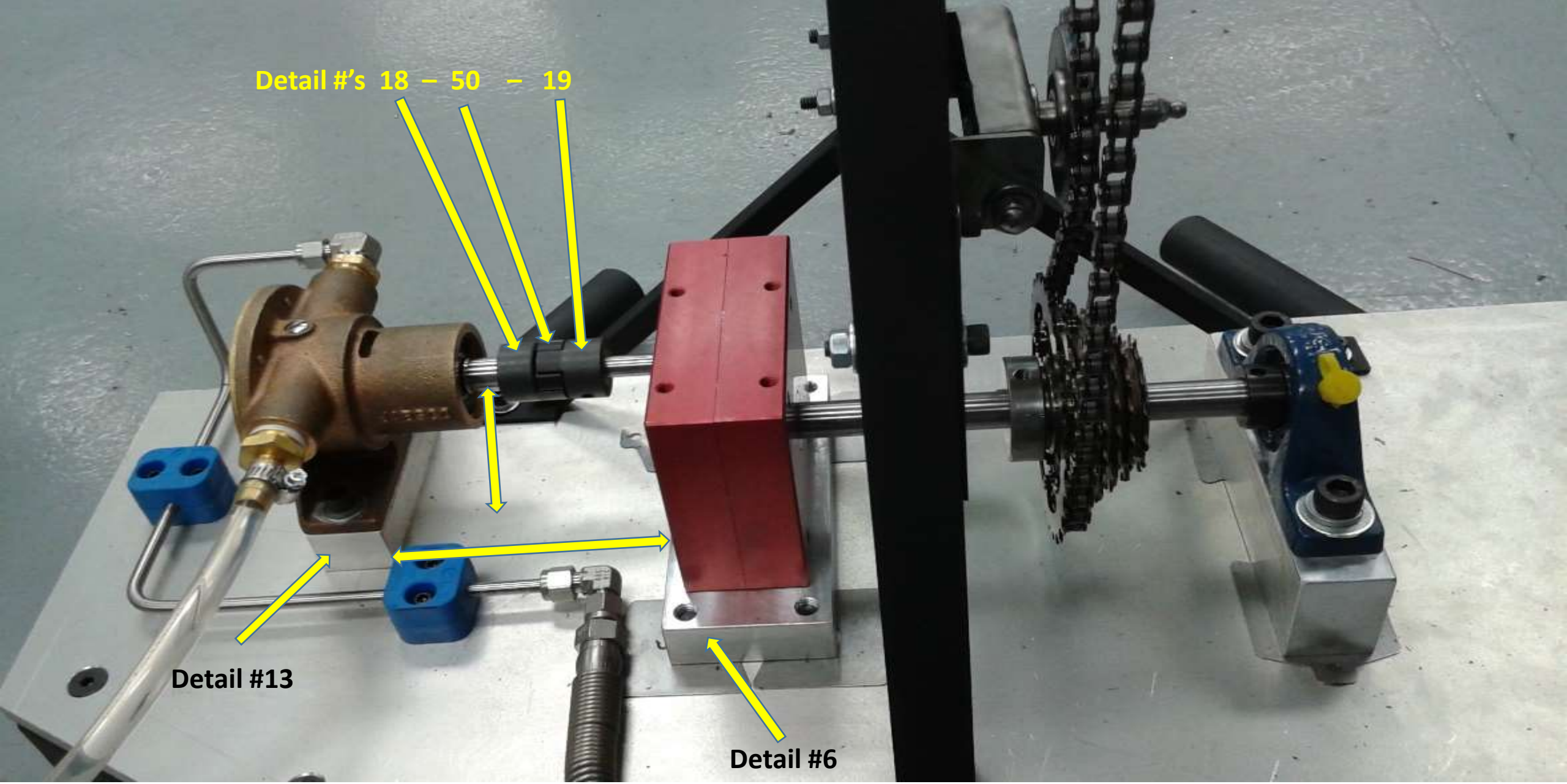





**Install detail #6 to detail #29 equally on one side and one end**

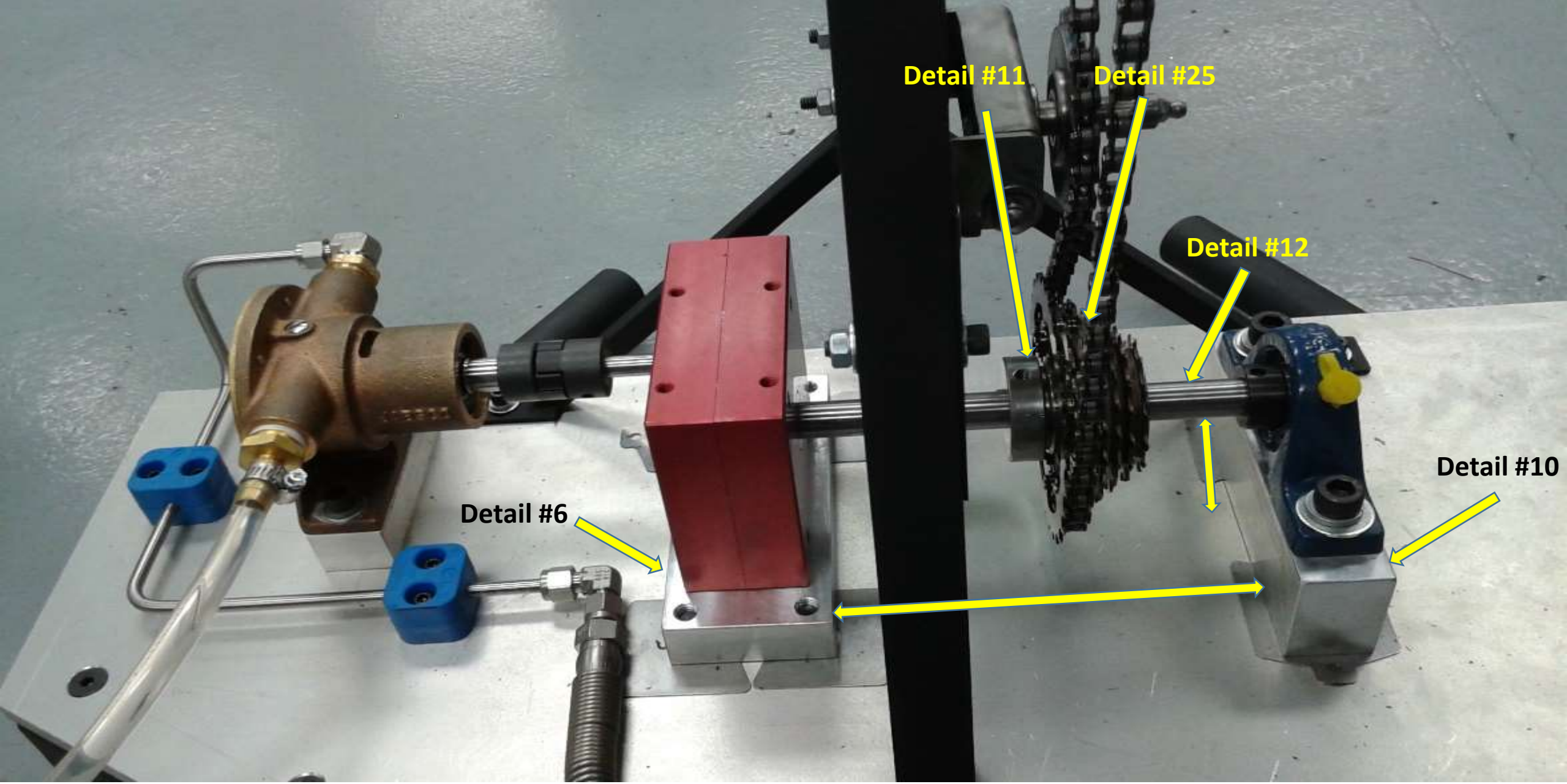
**Install detail #’s 30 & 13 set square off datum edges to +/- 0.12mm. This is the fixed machine. (2 M8 x 50 SHCS, 2 washers, 2 lock washers)**

**Install detail #’s 30 & 13 flush as per drawing**

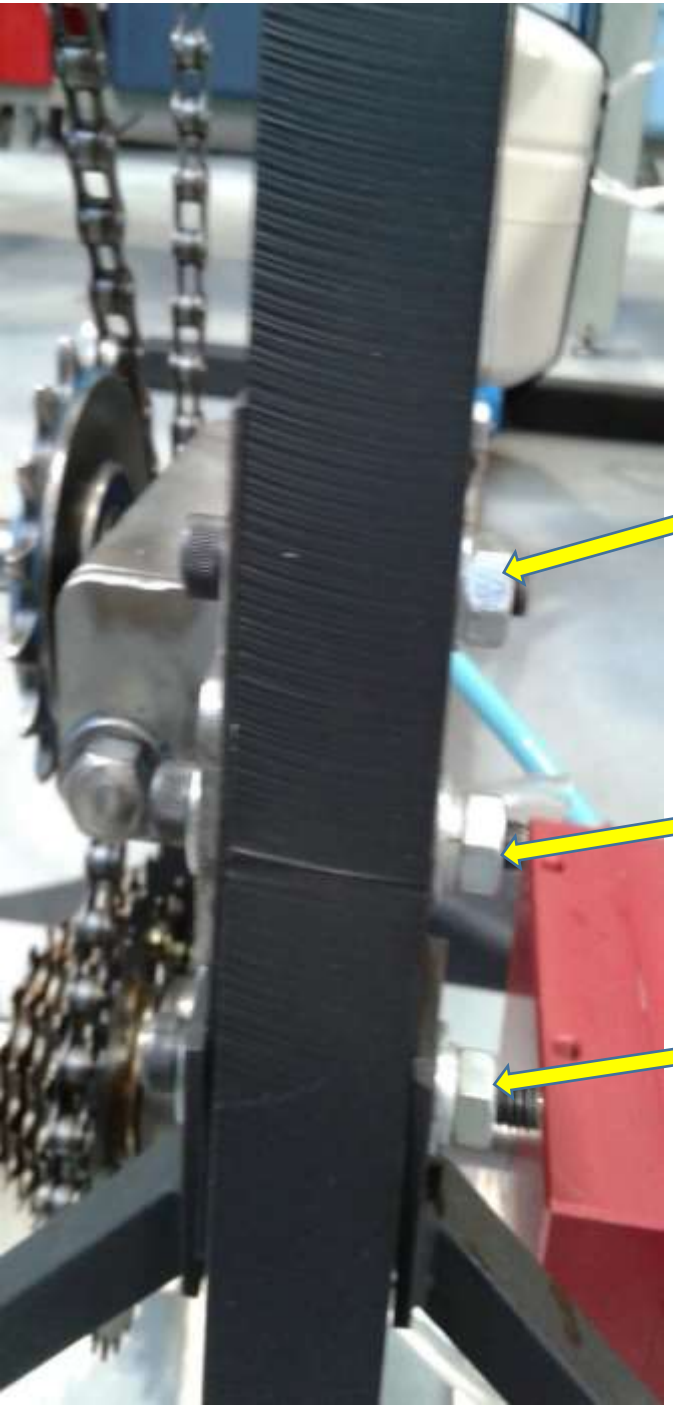



**Install details 18, 19. Install details 29 & 6. Align by hand detail #'s 6 & 13 in the horizontal and vertical to a tolerance of +/- 0.12mm, using supplied tooling.**

**Install detail #’s 10 & 48 flush as per drawing**
**(2 M10 x 25 SHCS, 2 washers, 2 lock washers, topside.**
**2 M10 X 25 SHCS, 2 washers, 2 lock washers underside)**




**Install detail #'s 11, 12, 25. Align by hand detail #'s 6 & 10 in the horizontal and vertical to a tolerance of +/- 0.12mm using supplied tooling.**



2 M6 x 40 SHCS, 2 nuts, 4 washers, 2 lock nuts

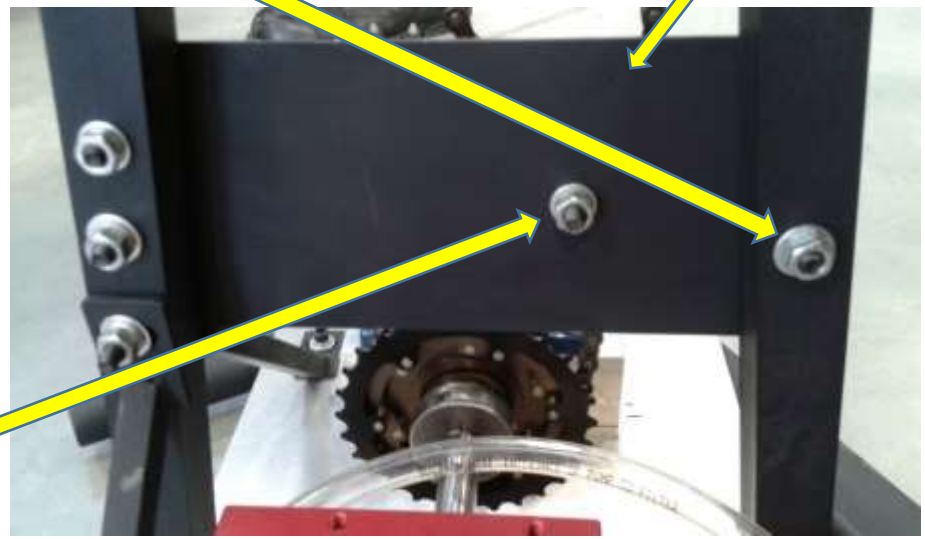
1 M6 x 45 SHCS,
1 nut, 2 washers, 1 lock nuts

1 M6 x 50 SHCS,
1 nut, 2 washers, 1 lock nut

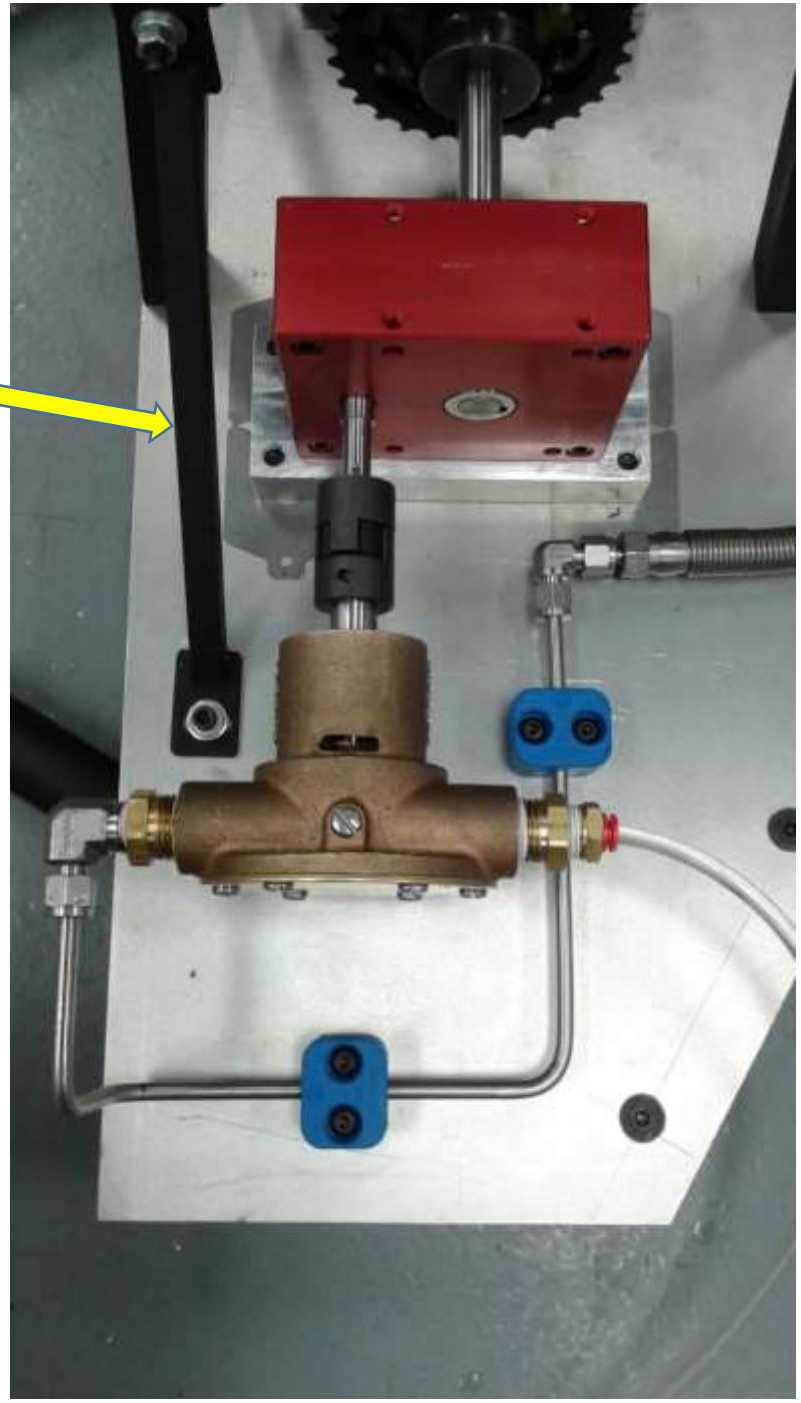
1 M6 x 20 SHCS, 1 nut, 2 washers, 1 lock nut

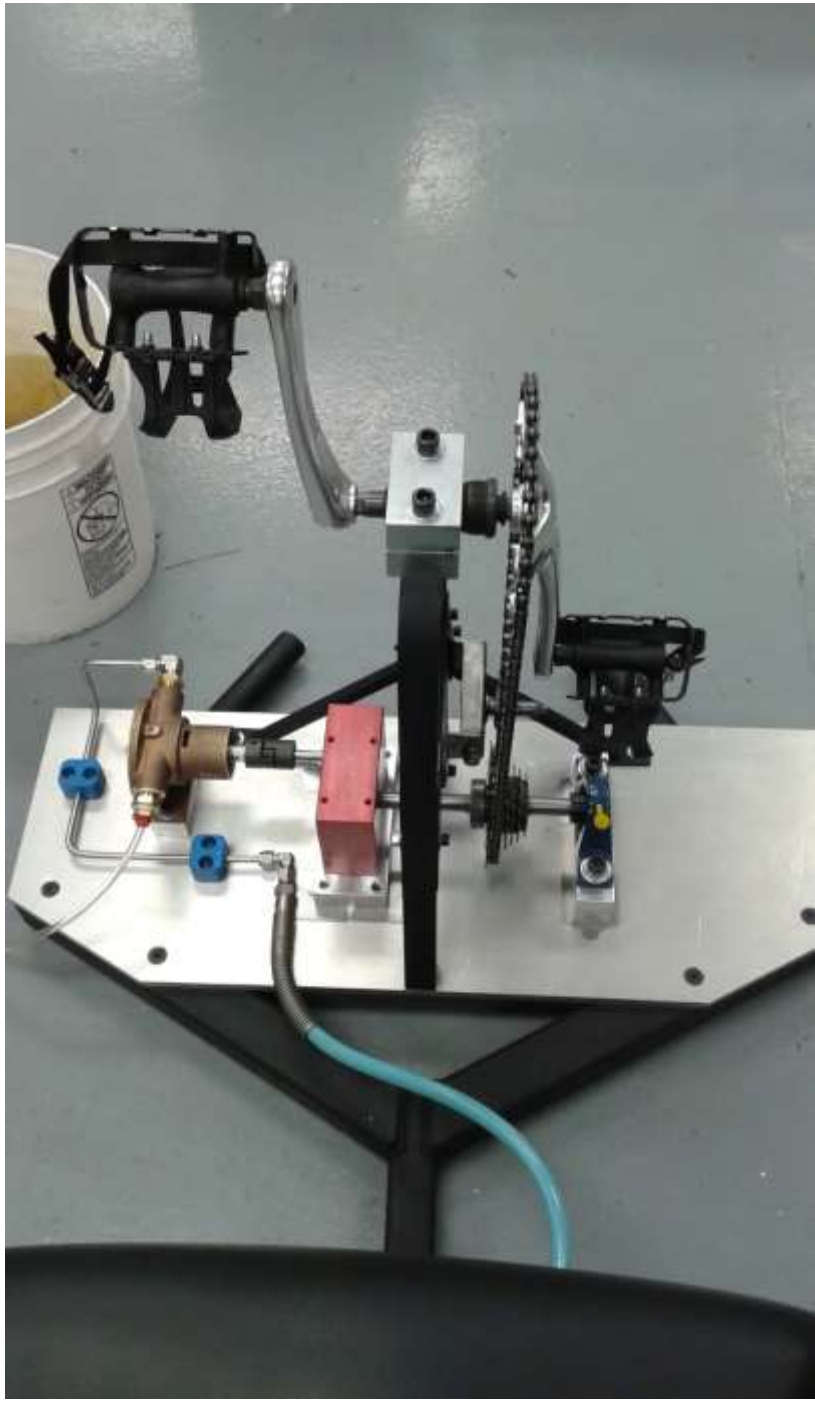
Detail #26

Detail #5



**Detail #14 x 2 reqd.**
**(2 M6 x 25, 2 washers)**
**Detail #14 x 2 is installed only after the Power Transmission Plate has been completely built.**





# Worldskills IMM Skill # 48

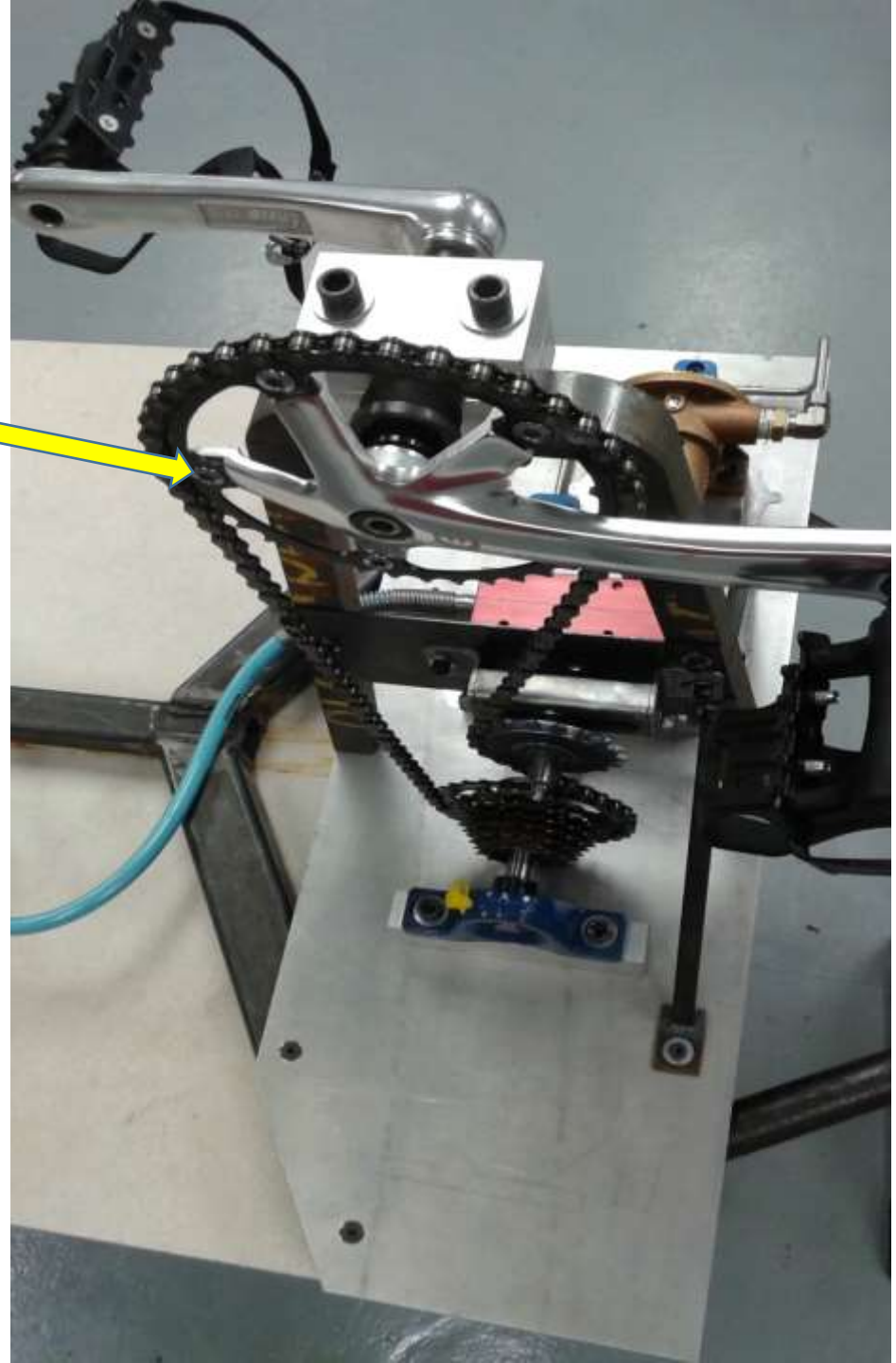
## Chain Drive Alignment

**The competitor must remove the lower Chain Set bolt to allow for the PAT holding fixture to sit “flat” for alignment**

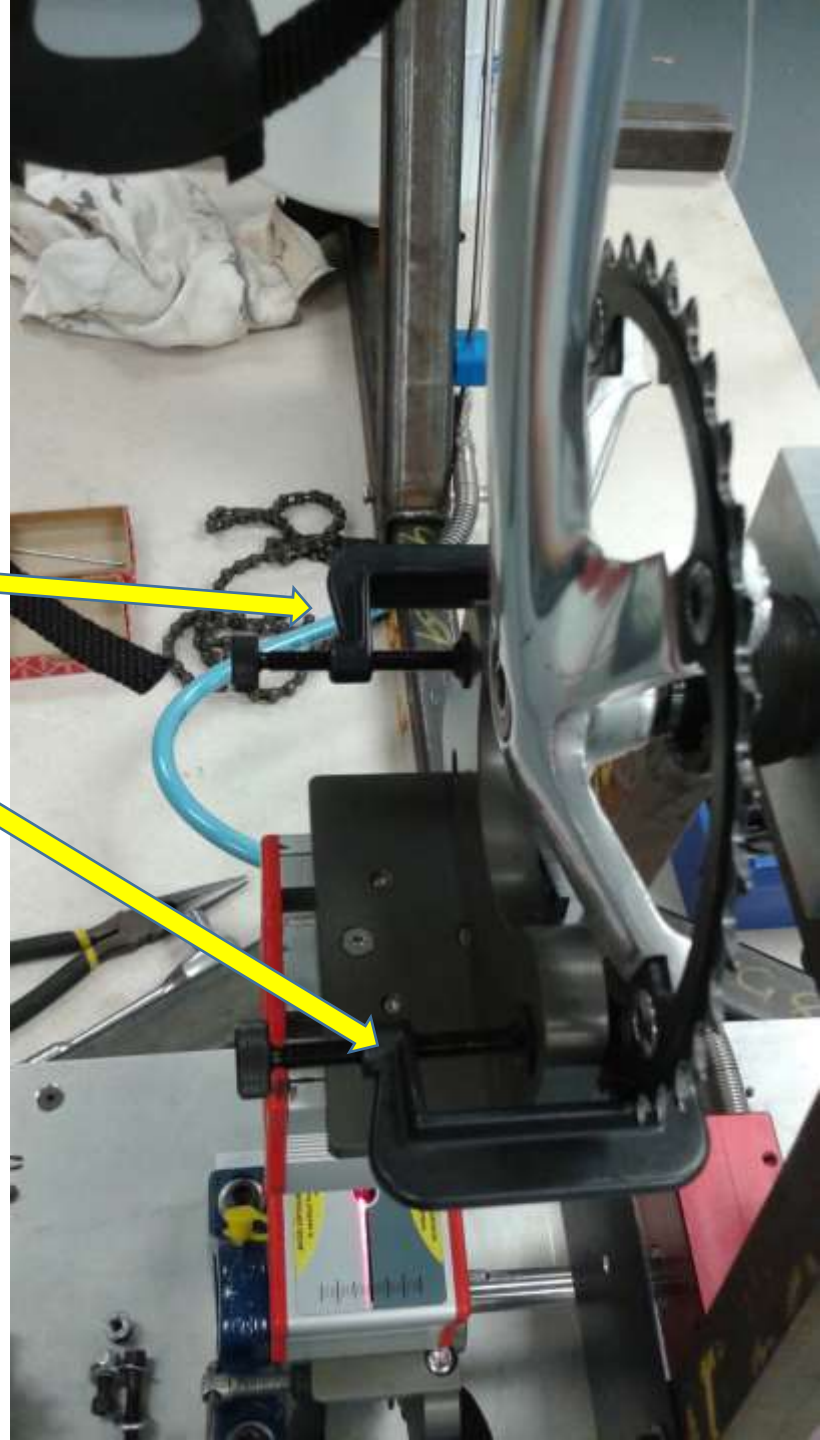
**The competitor must choose the correct sprocket to align on the driven gear block that will achieve a Driver/Driven 1:1.5 overdrive**

**After the PAT alignment is complete and signed off by the Experts.**

**The competitor requests the bicycle chain from the Workshop Manager. The competitor has to cut the chain to the required length and adjust to 4% chain slack for the chain drive.**

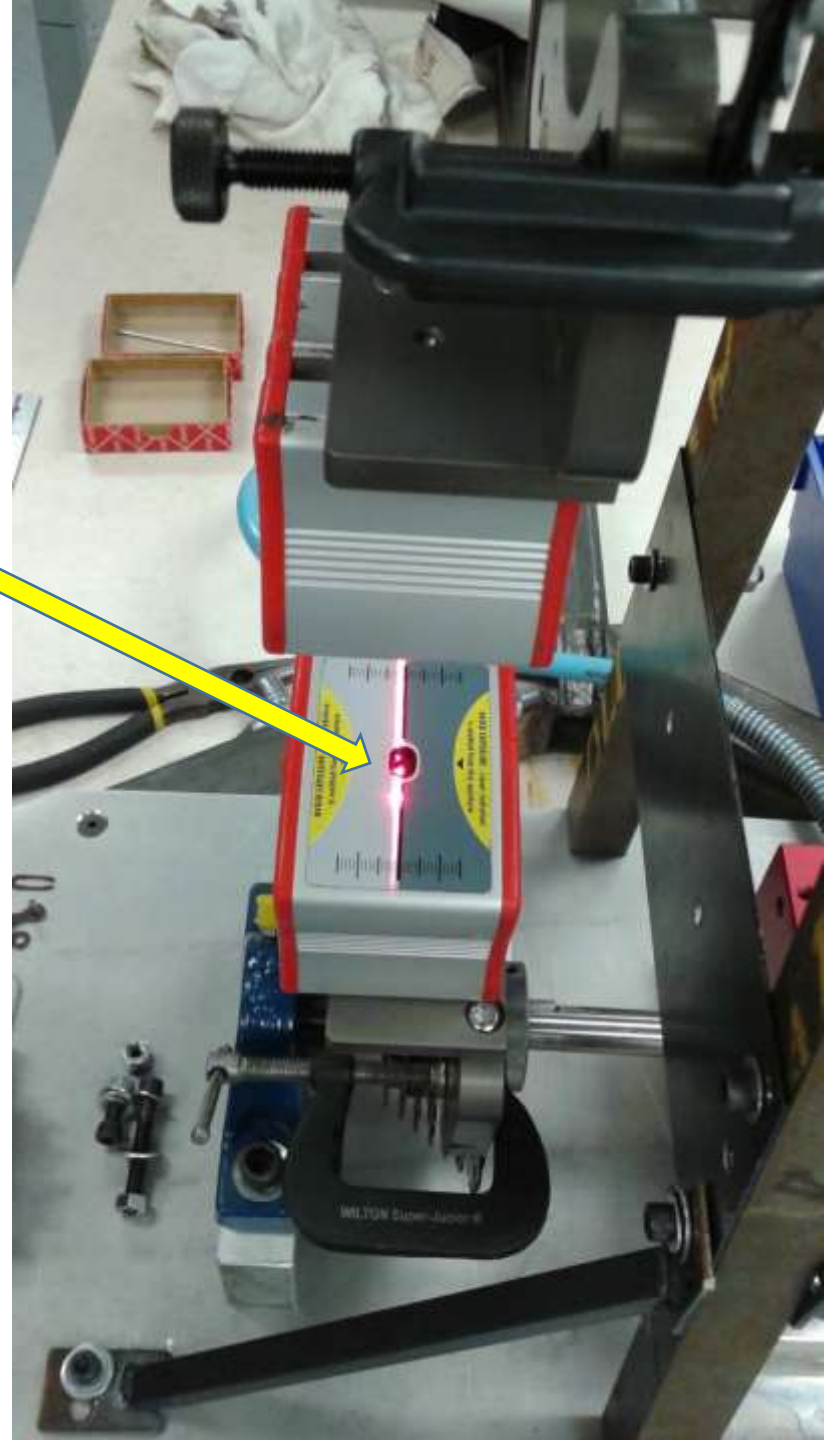



**Use the supplied “C” clamps (4) to attach the (2) top and (2) bottom PAT Laser Alignment Tool on Details #’s 25 & 27**



**When alignment is complete as per photo call Experts to verify**

**Tolerance +/- 1.00mm**

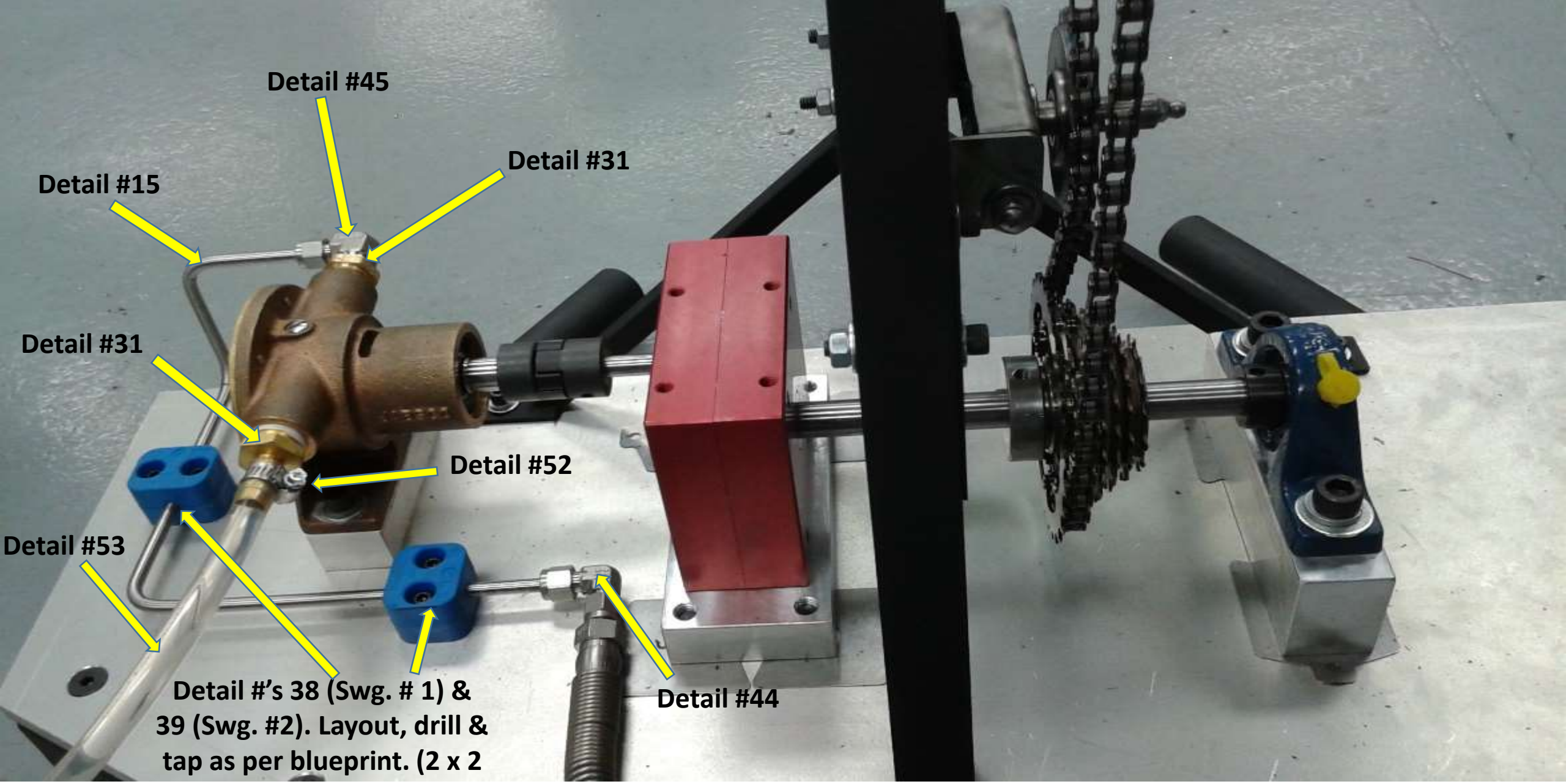



PAT


PAT
PAT

# Worldskills IMM Skill # 48

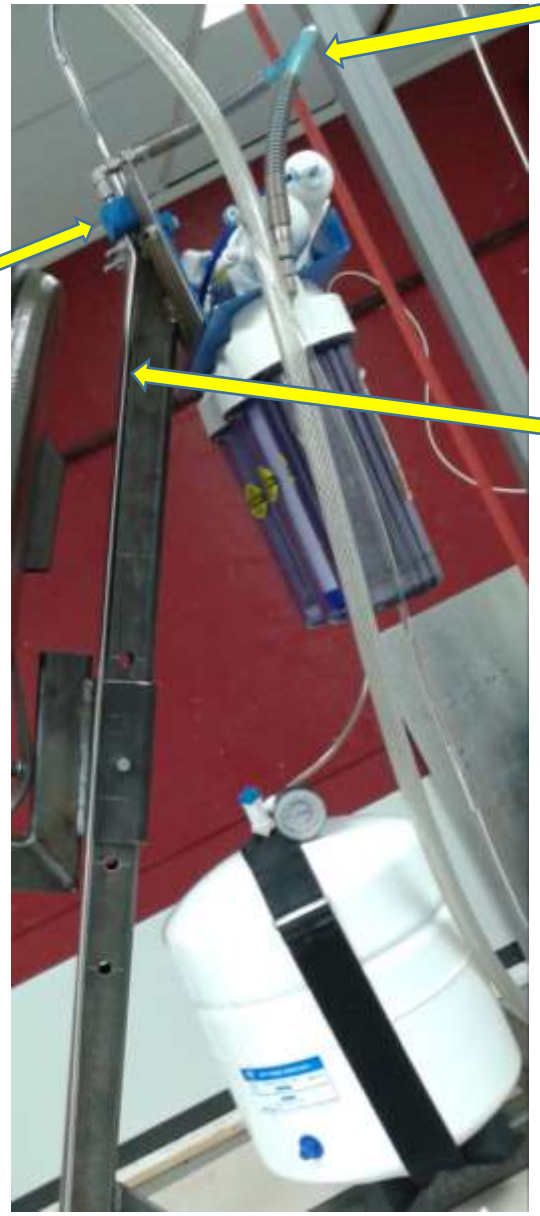
## Stainless Steel Tube Bending.




Tube bending tolerances for detail #’s 15 & 16 is ±2.00

Detail #42

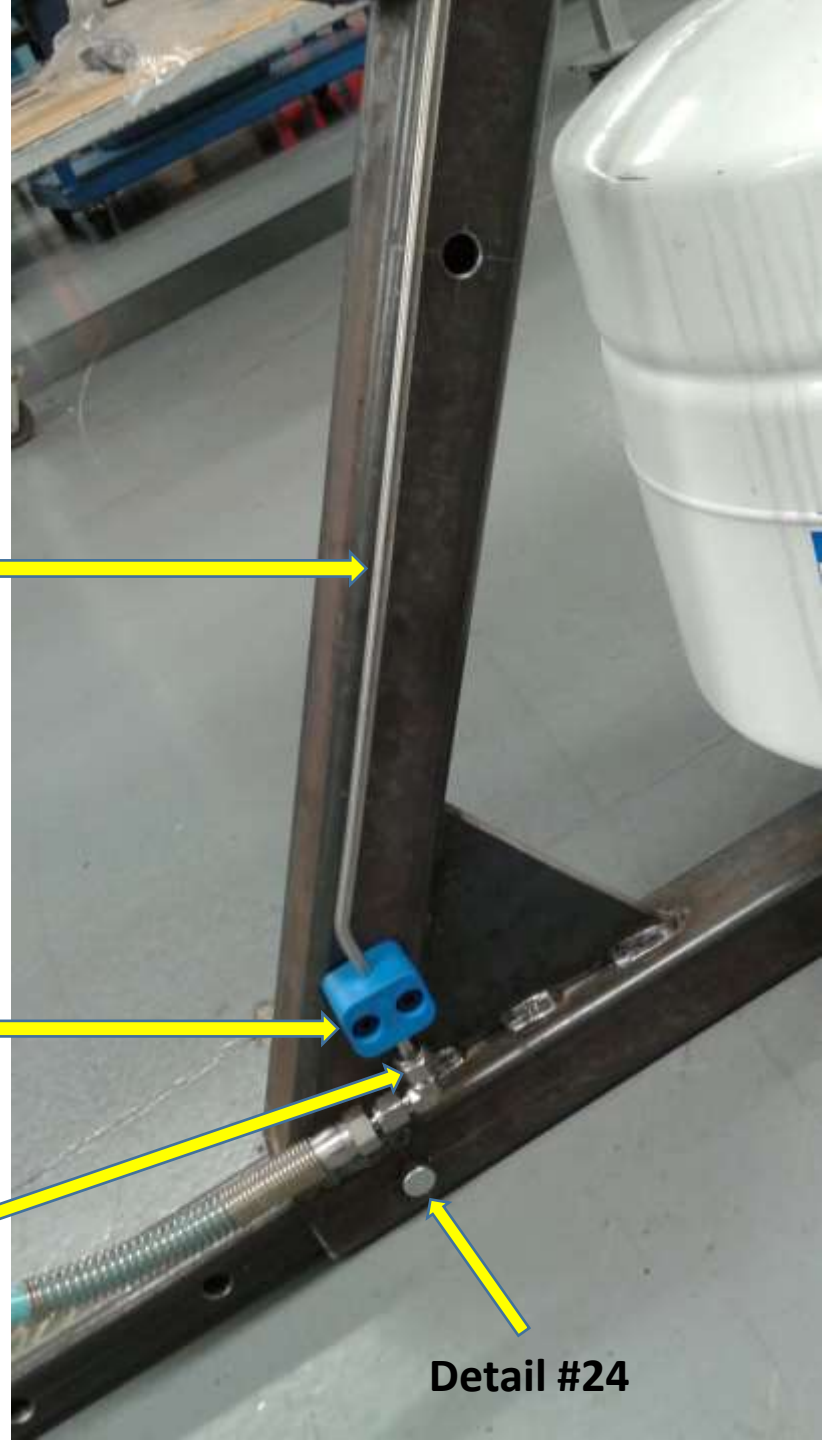
Layout, drill, tap & install Detail #40 (Swg. #4) 2 M6 X 25 SHCS



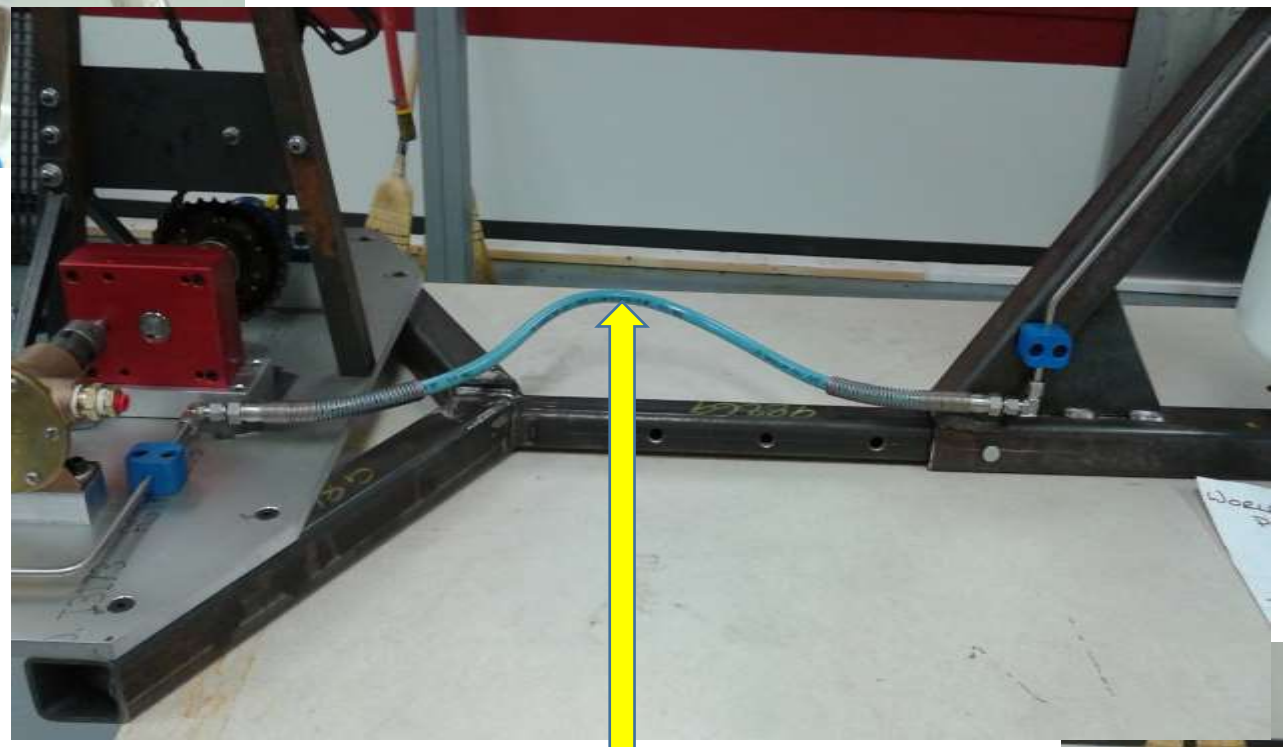
Detail #16

Layout, drill, tap & install Detail #39 (Swg. #3) 2 M6 x .75 X 25 SHCS

Detail #44



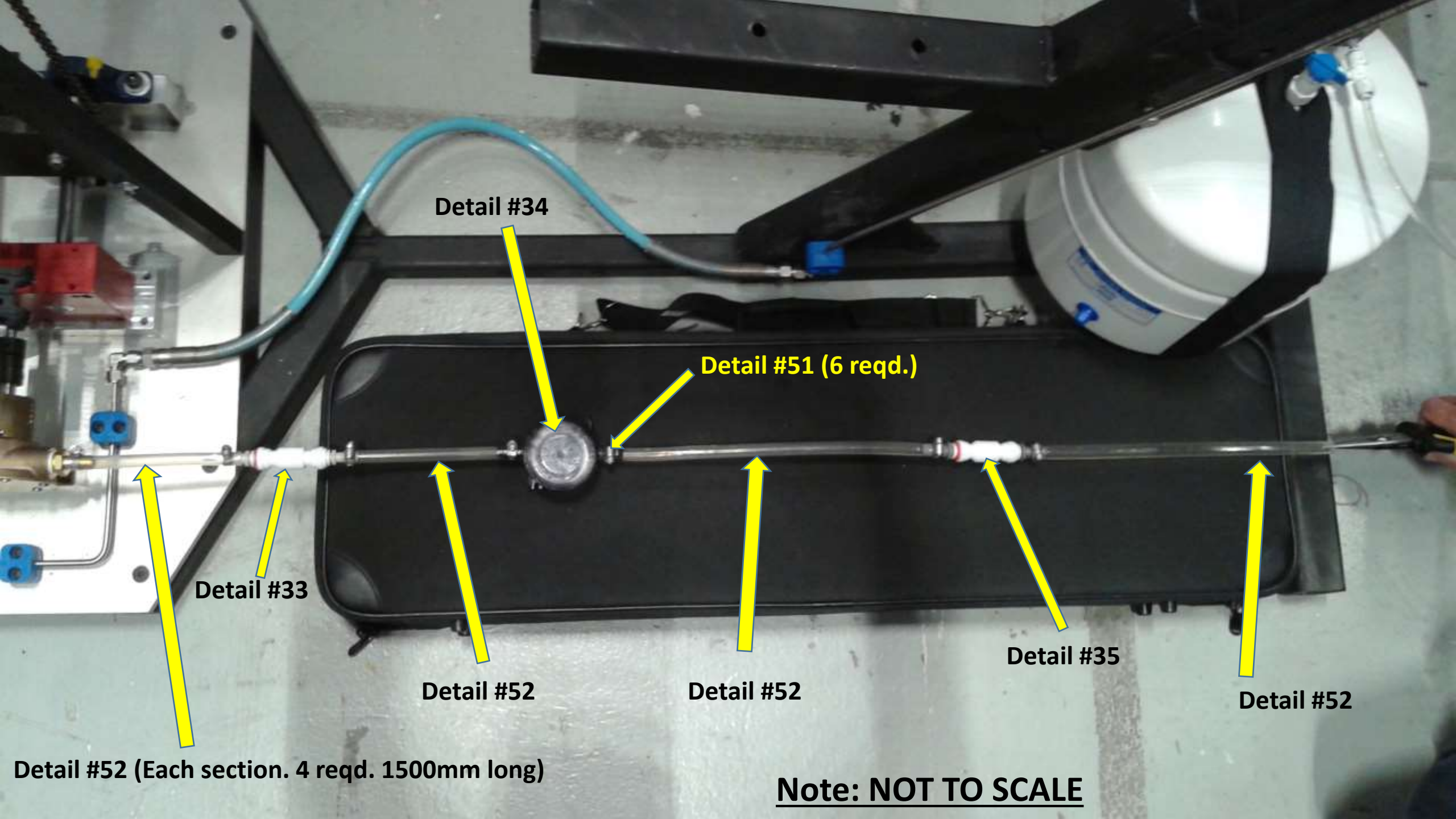
Detail #24



**Detail #41**

# Worldskills IMM Skill # 48

## Filtration:
## Tubing, Filter, Check Valve.




**Note: NOT TO SCALE**