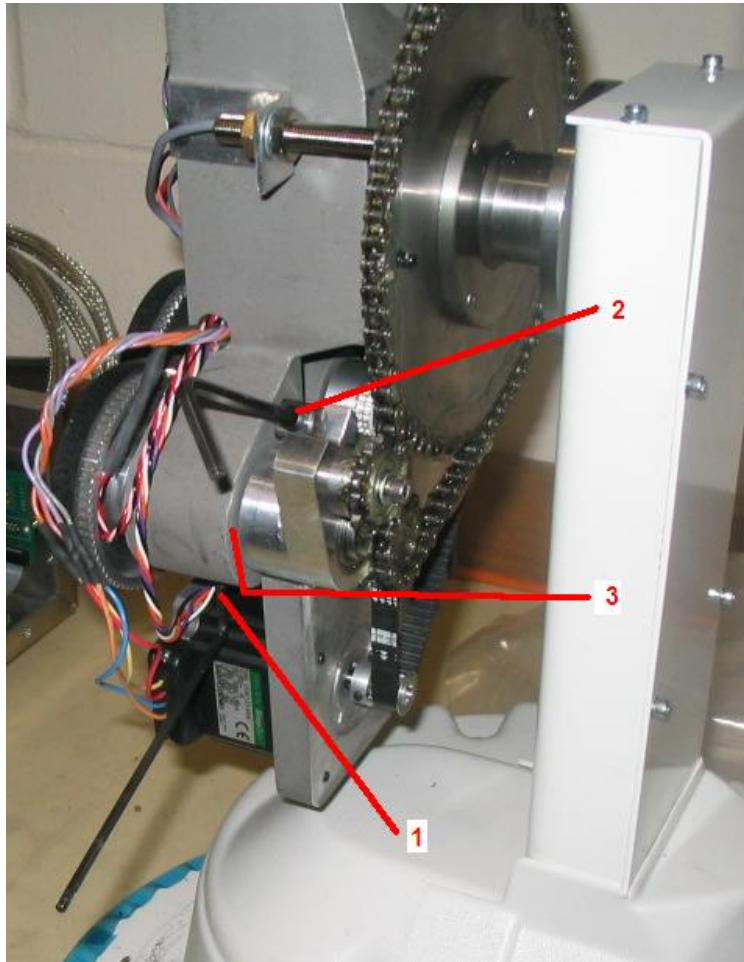


Chain adjustment of R17 robot arm

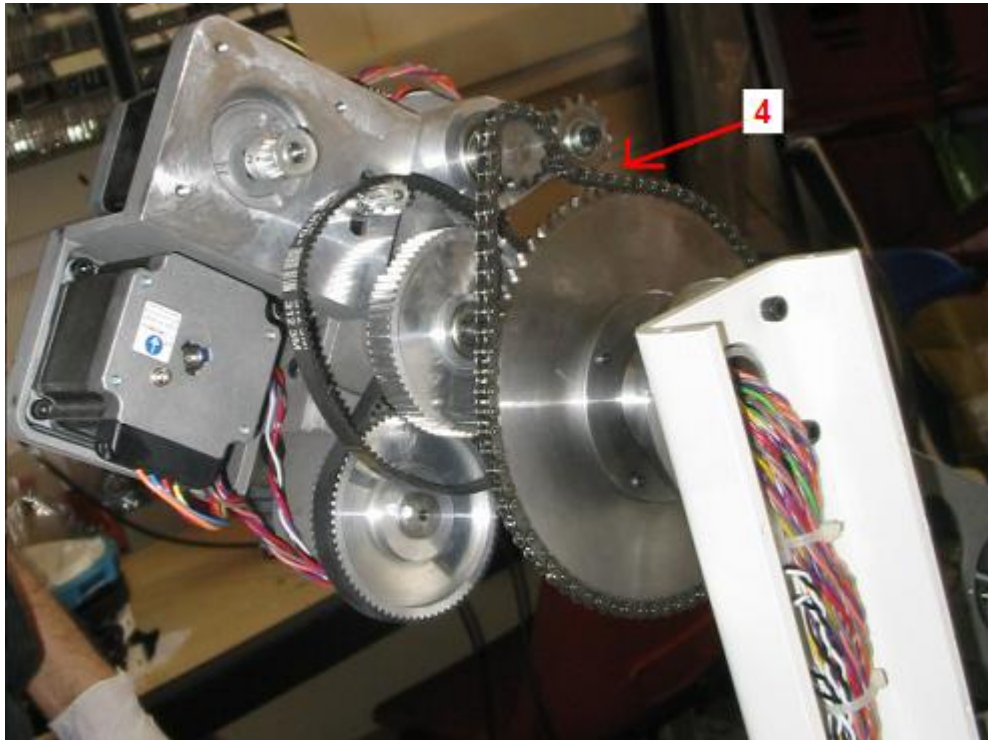
Shoulder drive:

With the arm energized rock the upper arm (that's the limb nearest the shoulder) back and forth to check for backlash. There will always be a little backlash because of the chain drive but if you think it might be excessive remove the covers and investigate. As you move the arm back and forth does the chain appear to relax and tighten just below the tensioner?



To adjust the tensioner proceed as follows:

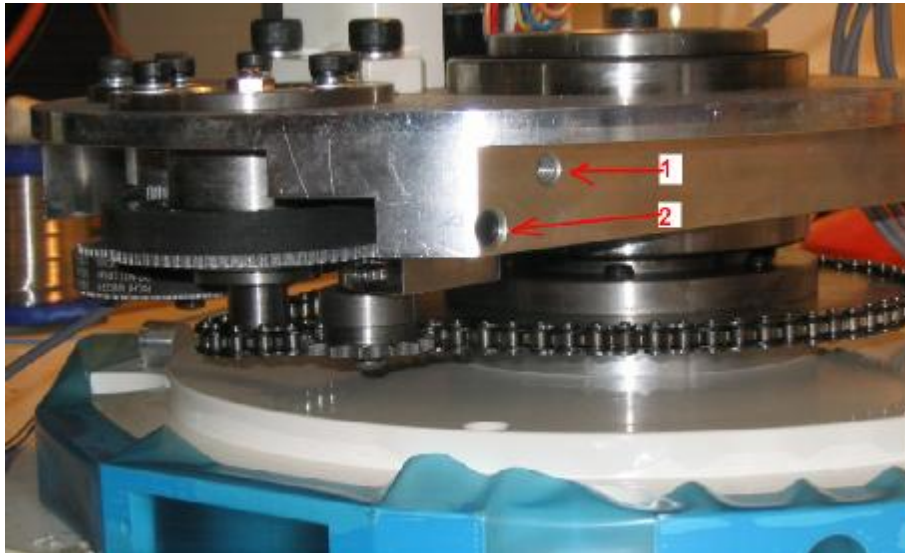
1. untighten the lock screw (1)
2. tighten the adjustment screw (2) while rocking the shoulder joint to check for backlash. If it is loose then as you rock the shoulder you will see the chain drop from being straight to hanging a little. The screw should be tightened until this is no longer the case but **NO FURTHER**. Over-tightening the chain can cause excessive drag on the motor, wear on the sprocket wheels or even break the chain.
3. make sure the chain adjuster is pushed fully in and the gap at (3) is minimum.



4. Make sure you do not allow the chain tensioner to run against the main sprocket wheel. There should be a small gap as in (4).
5. re-righten the lock screw (1)
6. While you have the covers off make sure there is grease on the inside of the chain, especially all round the small drive sprocket and the tensioner. There does not need to be much grease, just a small coating on the sprocket teeth will suffice.

Waist drive

With the arm energized rotate waist back and forth to check for backlash. There will always be a little backlash because of the chain drive but if you think it might be excessive remove the covers and investigate. Looking at the straight part of the chain between the small drive sprocket and the large sprocket wheel, as you move the waist back and forth does the chain appear to relax and tighten?



If so remove the covers and proceed as follows:

1. untighten the lock screw (1)
2. tighten the adjustment screw (2) while rocking the waist drive to check for backlash. If you make it too tight it will cause excessive drag on the motor, excessive wear on the sprocket wheels or even break the chain.
3. re-tighten the lock screw (1)

warning: the shaft that carries the tensioner can move up and down. Make sure by sight that the tensioner wheel is central on the chain before locking the shaft with the lock screw (1)

4. While you have the covers off make sure there is grease on the inside of the chain, especially all round the small drive sprocket and the tensioner.

Setting up from scratch

After adjusting the chain you may wish to check that calibration has not changed. Perform steps 1 to 9 to check. If the robot is not level then perform the steps 10 to 13 to correct the calibration.

1. Make sure you have a copy of the memory image on disk (see reloading ROBOFORTH).
2. Set the robot up to as near a HOME position as you can, visually. Robot must be bolted down to a level bench.
3. Enter TELL SHOULDER S-RATIO MOVE – shoulder moves so arm is horizontal.
4. Click the T (teach) button, select a low speed e.g. 2
5. Place a spirit level on the upper arm and use J2 to make it level.
6. Place the spirit level on the forearm and use J3 to make it level.
7. Place the spirit level on the hand flange and use J4 to make it vertical.
8. Place the spirit level on the gripper or tool and use J5 to make it level.
9. Use J1 to center the waist. The peg which stops the robot exceeding 360 degrees should be exactly opposite the stop toggle.
10. Enter TELL SHOULDER REVERSE S-RATIO MOVE – robot is now in HOME position.
11. Enter SETHOME
12. Enter CHECK – the robot seeks out the sensors.
13. Enter SETLIMITS which over-writes the old parameters

Now try the calibration by typing START CALIBRATE HOME (or click the 3 Robwin buttons). Does the HOME position look right? If so then save the calibration on disk and also into the flash ROM in the controller as follows:

14. Click file – save binary. Change parameters to start 9C00, length 100 (bank should be 0).
15. Save as serial number .SIG e.g. R17C123.SIG (actual filename will be R17C123.SIG.ram).
16. Enter PSAVE to save to the flash ROM.