

CYBEX 350A Home Arc Trainer

Resistance Motor replacement and setup

The 350A uses a Eddy Current Brake type resistance system that employs a pair of permanent magnets mounted opposite each other on a steel pivot bracket (see Fig. 1) that are controlled by a 12VDC servo motor (see Fig .2) which positions the magnets into a rotating wheel, which passes between the 2 permanent magnets from the 0 resistance position (magnets retracted from resistance disc) to full resistance (magnets positioned on either side of the disc) the following procedures cover replacement of the motor, and also for troubleshooting a malfunctioning motor.



Fig. 1



Fig.2

Removal of Resistance motor

The resistance motor is attached to the frame by a single pivot bolt, and to the resistance motor by a single M6 x 40 Socket head cap screw. To remove the motor first unplug the cable from the 5-pin connector on the motor assembly, then remove the M8 nylon locknut on the upper motor pivot, then remove the M6 cap screw connecting the resistance motor to the magnet bracket assembly. (note: if the motor failed in the “full resistance” position you will not be able to remove the M6 cap screw from the tube nut on the resistance motor due to interference of the main drive wheel. You will need to remove the pivot pin from the magnet and remove motor, Then disassemble them outside the unit.) see reference picture (fig. 3) below:

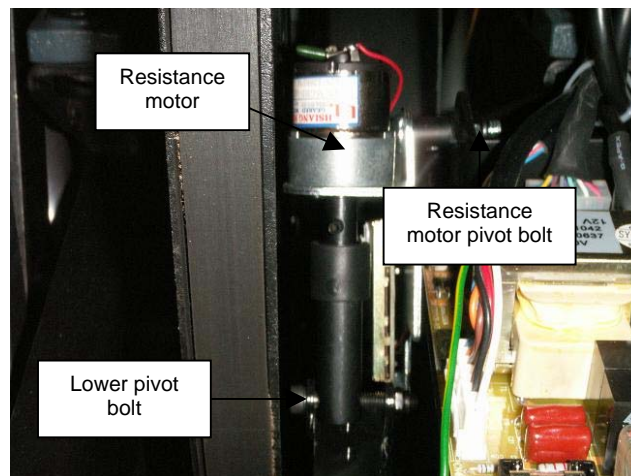


Fig. 3

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Initial setup of replacement motor

The replacement motor setup should be checked before reinstallation regardless of if it is a new motor or reinstalling a motor after it has been disassembled. The first step is to verify that the length of the tube nut at the “0” position is correct. The length, measured from the base of the motor bracket to the end of the tube nut should be $3 - 3/16"$ (82mm) at this time the through hole on the bottom of the motor tube nut (for mounting the magnet bracket) should be perpendicular to the motor plate. At this time loosen the screw on the resistance sensor actuator and disengage it from the sensor slide. (be careful not to disturb the setting of the tube nut while adjusting the slide) You will need an ohm meter at this time to verify the “0” position of the sensor by measuring across pins 4 and 5 of the connector plug, slide the actuator lever of the sensor until the ohm reading of the sensor is between 380-400 ohms. At this time, carefully rotate the actuator to engage it with the sensor lever (you may need to slide the actuator up or down to align it properly. Tighten the screw on the actuator and re-check the reading of the sensor and the length of the tube nut from the motor bracket. See Fig. 4 below:

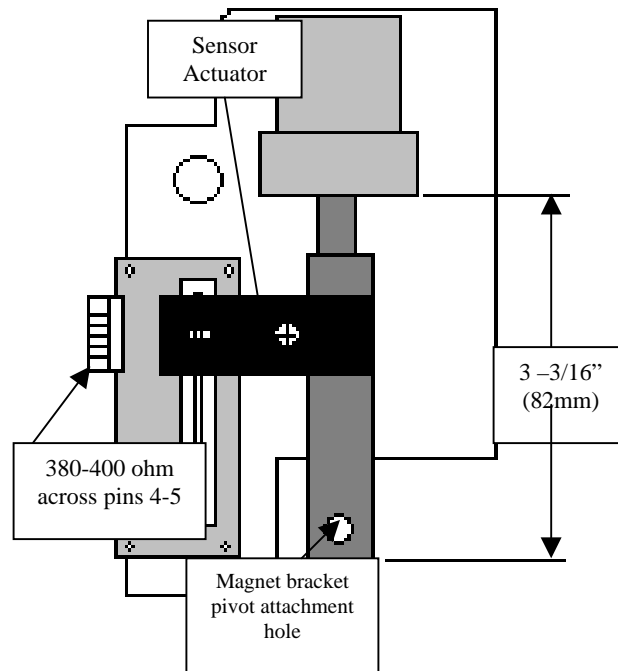


Fig. 4 - Resistance motor assembly

Reinstallation of motor and magnet

To reinstall the motor, you will need to rotate the large drive wheel to a position where the spokes of the wheel do not interfere with the positioning of the motor pivot into the mount on the frame. Using the M8 locknut to attach the pivot, tighten until snug, but allowing the motor to pivot at this point. If you needed to remove the magnet bracket, it will need to be reinstalled now. The magnet pivot needs to be assembled as below. Making sure that the 20mm washer is on the

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threaded side of the pivot shaft and the 25mm washer is on the opposite side of the bracket with the spring. To set the proper 2.5mm gap on the magnet use the 6mm allen socket in the end of the pivot shaft to adjust the magnet bracket side to side and achieve the proper 2.5 mm gap between the wheel and the magnets. (see fig. 5 below) when the proper setting is achieved, use the 6mm Allen wrench to hold the pivot pin while tightening the locknut to maintain the shaft position. After the gap is set and tight, attach the magnet bracket to the motor tube nut with the M6 x 40 socket cap screw and the M6 locknut, tightening until the bolt is snug, but allowing the magnet bracket to pivot on the end of the tube nut, first attach the upper pivot to the frame.

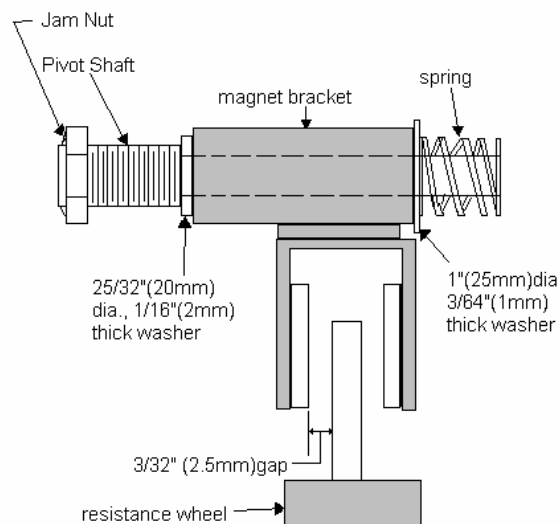


Fig. 5 - Magnet bracket (view from front of unit)

Problem Diagnosis

- **Motor runs away upon pressing “quick start” key. Machine makes a scraping noise and locks up** - sensor voltage not registering at display board, or failed resistance sensor. Check for voltage at pin # 3 (teal wire) at display board. Should read around 0.3 VDC at “0” resistance, and increase to around 4.0 VDC at full resistance. If this voltage is present at display, upper board has a fault. If no voltage present, check continuity of the teal wire from the display to lower controller. If wire is open, repair or replace data cable. If wire is good, check for voltage at pins 4-5 of the resistance motor connector. there should be .3VDC (0 resistance) to 4.0VDC (full resistance) if no signal sensor (which is part of the resistance motor assembly SK-20068) will need to be replaced.
- **Error 4 – No Feedback from Brake System** No signal coming back from resistance motor sensor when operating. This error will occur if the motor or sensor fails or the signal does not reach display board. Error will not show up on display until entering test mode and pressing “Strides/Min” key to display error log. See flowchart for Error 4 for further diagnosis.

