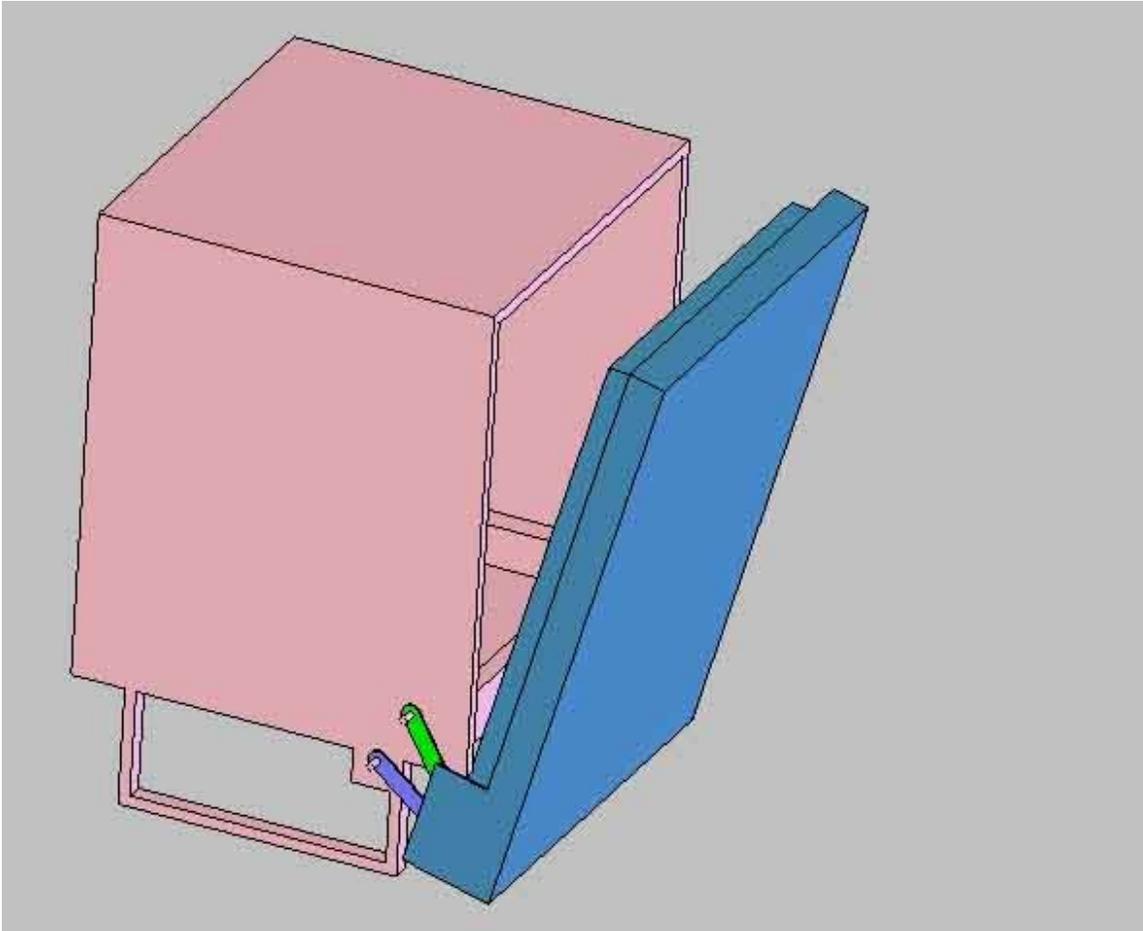


Hinge Design Target Feature Improvements (from 1-11-2005 ideation):

(Results of Prototype 4Bar Concept Sample Built 7-2007 shown in Red)



1. Pop Open position – Door should have a set position at 4-6in. of door opening to allow steam to be vented from the unit following the dry cycle. (Possible elimination of the door vent and console went with this added feature resulting in a cost reduction and cleaner console appearance)

4Bar Hinge Concept allows for door to open and remain fixed at any position

2. Full Open position – Door should remain in the full down position, 90deg. From closed. (This feature will help with the rolling action of the lower rack and give a more professional “feel” to the door spring)

4Bar Hinge Concept allows for door to open and remain down.

No Springs or frictional pulleys that cause variances in forces on door

3. Torsion bar – The 4 bar hinge design should give a “stiffer” door that would not “flex” as easily as our current door. (possible elimination of the aluminum support rod resulting in a cost savings)

4Bar Hinge Concept allows for a very stiff door with support at structurally supportive points on the door.

4. Door Catch – the hinge should help with the closing action of the door catch. Possibly a counter weight design or spring retention design where the hinge applies improved forces against the seal/catch to give a better seal of the door resulting in less leaks and fewer service calls.

4Bar Hinge Concept causes sealing surface on entire seal to compresses parallel to the door all at the same time. No uneven seal compression.

5. Top Load Door – A future design may incorporate a door that hinges from the top instead of from the front allowing easier access to the dishes on the top rack. Prototypes are now being made of this unit and sample hinges should be looked at. Cutting board top or other “heavy” materials could give a wide range of forces required to make this a counterbalanced door. This should therefore be adjustable out in the field on each unit.

Working prototype has been completed and functions well.

6. 8-wheel Gap – Currently there is a large gap between the door and the tub guide rails when the dishwasher door is opened. The lower rack must currently have 8 wheels on each side to help clear this gap and to maintain that 6 wheels are always in contact with the tub or door guides when clearing this gap. A new hinge design should still maintain the correct seal but additionally close up this gap when the door rotates to the full down position.

4Bar Hinge Concept allows for the elimination of 4 of the 8 rack wheels, and has a smoother rolling rack.

7. Full Door Design – The new hinge design should be capable of keeping a close tolerance between the bottom of the door and still maintaining the correct rotation for the height position for the pull out of the lower rack. Aesthetically this full door design gives a very marketable look that is clean without the break lines of the toe and kick plate. Also there is a potential cost reduction with the elimination of the toe and kick plate and the cost of assembly and improved serviceability.

4Bar Hinge Concept allows for door length to be any size.

8. Complete Assembly Design – The hinge, locating points, pivot pins, counterweight mechanism and springs should all be incorporated in one easy to mount housing. Preferably these would be interchangeable from side to side to eliminate all the left and right versions of our current hinges.

4Bar Hinge Concept eliminates springs, pulleys, and all left and right version components.

The 4 bar linkage components are simple stamped forms, and would require 1 new part replacing 12 current components.

9. Adjustable Mechanism – The hinge should have a factory setting for each variation of our door weights. The hinge should be adjustable throughout this range as one common hinge.

4Bar Hinge Concept uses door weight as counterbalance, no need for added counterbalance or biasing springs.

10. Self adjusting Hinge- A “wish List” item where the weight of the door is translated to the mechanism of the hinge to offset the weight of the door without any manual adjustment by assemblers or service.

4Bar Hinge Concept eliminates the need for service or manufacturing to make door adjustments.

Due to Troy Dalsing’s Management error and lack of communication with Electrolux Industrial Design Department that created a shorter door than the rest of the Elctrolux Pro Series Due to launch in Jan 2008. A launch delay of more than 3 months due to retooling of a new door, left and right Hinge components, springs, pulleys, kick plate, adjustment plate, insulation backing, etc. (Minnimum of 14 component changes and tooling) Saving \$700K in tooling of new door to match new Electrolux Pro Line. Launch delay avoidance can be averted by 3 months with the implementation of this 4bar hinge concept.