

## 9.9.4.1 Physics - Rigid Body - Rigid Body Constraints - introduction

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### Rigid Body Constraints

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  - Hinge
  - Slider
  - Piston
  - Generic
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### Introduction

Constraints (also known as joints) for rigid bodies connect two rigid bodies.

The physics constraints available in the non-game modes are meant to be attached to an *Empty* object. The constraint then has fields which can be pointed at the two physics-enabled object which will be bound by the constraint. The *Empty* object provides a location and axis for the constraint distinct from the two constrained objects. The location of the entity hosting the physics constraint marks a location and set of axes on each of the two constrained objects. These two anchor points are calculated at the beginning of the animation and their position and orientation remain fixed *in the local coordinate system of the object* for the duration of the animation. The objects can move far from the constraint object, but the constraint anchor moves with the object. If this feature seems limiting, consider using multiple objects with a non-physics *Child-of* constraint and animate the relative location of the child.

The quickest way to constrain two objects is to select both and click the *Connect* button in the *Physics* tab of the *Tool Shelf*. This creates a new *Empty* object (named “Constraint”) with a physics constraint already attached and pointing at the two selected objects.

Also you can create *Rigid Body Constraint* on of the two constrained objects with *Rigid Body Constraint* button of the *Physics* context in the *Properties* window. This constraint be depend on the object location and rotation which on it created. Thereafterat, there are no *Empty* object created for the constraint. The role of the *Empty* object is put on this object. The constrained object can be then set as *Passive* type for better driving the constrain.

Additional parameters appear in the *Rigid Body Constraint* panel of the *Physics* context in the *Properties* window for the selected *Empty* object or the one of the two constrained objects with the created constraint.

## Common Options

Rigid Body Constraint panel.

### **Enabled**

Specifies whether the constraint is active during the simulation.

### **Disable Collisions**

Allows constrained objects to pass through one another.

### **Object 1**

First object to be constrained.

### **Object 2**

Second object to be constrained.

### **Breakable**

Allows constraint to break during simulation. Disabled for the *Motor* constraint.

### **Threshold**

Impulse strength that needs to be reached before constraint breaks.

### **Override Iterations**

Allows to make constraints stronger (more iterations) or weaker (less iterations) than specified in the rigid body world.

### **Iterations**

Number of constraint solver iterations made per simulation step for this constraint.

### **Limits**

By using limits you can constrain objects even more by specifying a translation/rotation range on/around respectively axis (see below for each one individually). To lock one axis, set both limits to 0.