# Custom trailers in Snowrunner:

## Part 1: Mod File Structure

Within your mod file you will need the following in bold for your saddles. If you are using custom models and not just editing the XML, you will also need to follow part 4 of my guides for how to export custom models.

**- mod_name**
- **- classes**
  - customization_presets
  - engines
  - gearboxes
  - suspensions
  - **- trucks**
    - addons
    - cargo
    - **- trailers**
    - vehicle_name_tuning
  - winches
- **- meshes**
  - **- trucks**
    - addons
    - cargo
    - **- trailers**
    - vehicle_name_tuning
- **- textures**
  - **- trucks**
- ui
  - textures

## Part 2: Truck XML File

This file will be saved within the **classes/trucks** folder. Within the truck's xml file you will need the following to make the trailers attachable. Also note that (0.000; 0.000; 0.000) represents the origin and will need adjusting to fit your mod.

```
<!--trailer addons-->
    <AddonSockets>
      <Socket
        Names="ScautTrailer"
        Offset="(0.000; 0.000; 0.000)"
        ParentFrame="BoneChassis_cdt"
      />
      <Socket
        Names="Trailer"
        Offset="(0.000; 0.000; 0.000)"
        ParentFrame="BoneChassis_cdt"
      />
      <Socket
        Names="Semitrailer, SemitrailerOiltank"
        Offset="(0.000; 0.000; 0.000)"
        CablesName="env/trailer_cable"
        TruckCablesPos="(0.000; 0.000; 0.000)"
        ParentFrame="BoneChassis_cdt"
      />
```

```
      <Socket
        Names="LargeSemitrailer, LargeSemitrailerOiltank"
        Offset="(0.000; 0.000; 0.000)"
        CablesName="env/trailer_cable"
        TruckCablesPos="(0.000; 0.000; 0.000)"
        ParentFrame="BoneChassis_cdt"
      />
      <Socket
        Names="SemitrailerCat770g"
        Offset="(0.000; 0.000; 0.000)"
        ParentFrame="BoneChassis_cdt"
      />
      <Socket
        Names="Goosenecktrailer"
        Offset="(0.000; 0.000; 0.000)"
        ParentFrame="BoneChassis_cdt"
      />
    </AddonSockets>
```

You will also need to add a saddle addon tag for any trailer that also requires a saddle to be equipped:

```
      <Socket
        Names="SaddleLow"
        NamesBlock=""
        Offset="(0.000; 0.000; 0.000)"
        ParentFrame="BoneChassis_cdt"
      />
```

This will need to match the corresponding trailer's install sockets. For example, SaddleLow, SaddleHigh etc.

## Part 3: Trailer Install Sockets

The trailer XML file will be saved within the **classes/trucks/trailers** folder. Within the file, you will need the following to make your trailer compatible with each saddle type:

Scout Trailers:

```
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      Type="ScautTrailer"
      ParentFrame="BoneChassis_cdt"
    />
```

Bumper-Pull Trailers:

```
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      Type="Trailer"
      ParentFrame="BoneChassis_cdt"
    />
```

Low Saddle Semitrailers:

```
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      CablesPos="(0.000; 0.000; 0.000)"
      Type="Semitrailer"
      ParentFrame="BoneChassis_cdt"
    />
    <RequiredAddon _template="SaddleLow" />
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      CablesPos="(0.000; 0.000; 0.000)"
      Type="SemitrailerOiltank"
      ParentFrame="BoneChassis_cdt"
    />
    <RequiredAddon _template="SaddleLow" />
```

High Saddle Semitrailers:

```
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      CablesPos="(0.000; 0.000; 0.000)"
      Type="LargeSemitrailer"
      ParentFrame="BoneChassis_cdt"
    />
    <RequiredAddon _template="SaddleHigh" />
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      CablesPos="(0.000; 0.000; 0.000)"
      Type="LargeSemitrailerOiltank"
      ParentFrame="BoneChassis_cdt"
    />
    <RequiredAddon _template="SaddleHigh" />
```

Special Mining Trailers:

```
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      Type="SemitrailerCat770g"
      ParentFrame="BoneChassis_cdt"
    />
    <RequiredAddon _template="SaddleLow" />
```

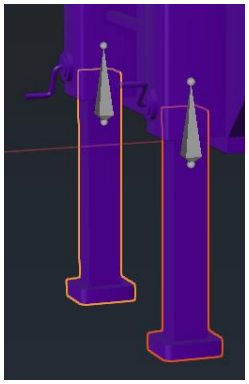
Gooseneck Trailers:

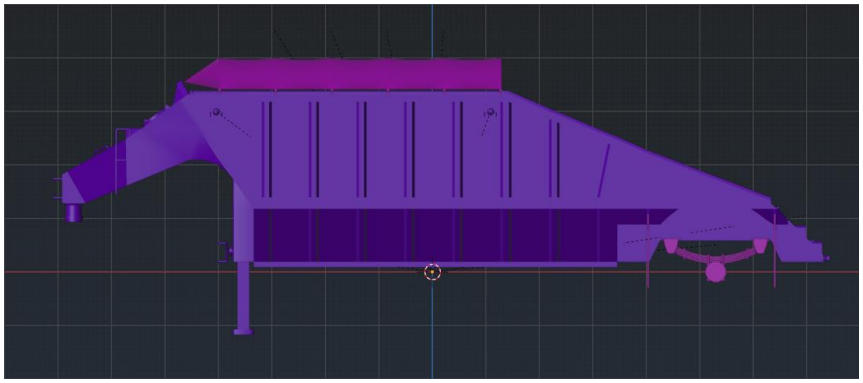
```
<!--hitch position-->
    <InstallSocket
      Offset="(0.000; 0.000; 0.000)"
      Type="Goosenecktrailer"
      ParentFrame="BoneChassis_cdt"
    />
```

Again, note that (0.000; 0.000; 0.000) represents the origin and will need adjusting to fit your mod. Additionally, if you do not want the trailer to use the vanilla trailer wires and breakline pipes, then you should remove lines 658, 666, 674 and 682 respectively.

## Part 4: Trailer Legs

Within the Trailer 3D file, you will need to separate the legs into their own objects and parent them to either a single bone between the two, or a bone each You should also note the location of the base of the feet. For example, the feet are at the positions: 3.5X, -1.2Y, 0.8Z and 3.5X, -1.2Y, -0.8Z





Within the TruckData tags, you should then add a foot origin tag using the feet positions:

```
<Foot Origin="(3.500;-1.200; 0.800)" />
<Foot Origin="(3.500;-1.200;-0.800)" />
```

This allows the trailer to spawn into the game with the feet above the ground.

The next step is to define the trailer leg bones, and their powered constraints in order to get them to auto-retract and extend when a trailer is connected to a truck. For example, the below are what the GGMS Heavy Gooseneck Trailer uses:

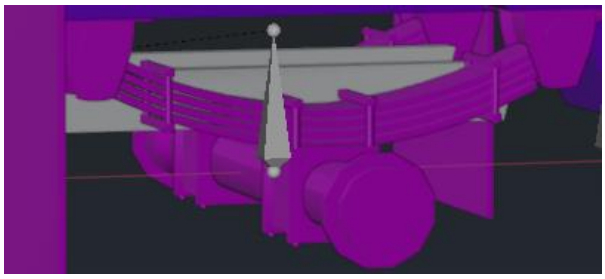
```
<!--trailer collisions data-->
  <PhysicsModel Mesh="trucks/trailers/ggms_heavy_gooseneck_4">
    <Body
      CenterOfMassOffset="(0; 0; 0)"
      ImpactType="Truck"
      Mass="100"
    >
      <Body
        CenterOfMassOffset="(0;-1; 0)"
        ImpactType="Truck"
        Mass="10000"
        ModelFrame="BoneChassis_cdt"
      >
        <Constraint Type="Fixed" />
        <!--legs-->
        <Body
          Mass="500"
          ModelFrame="BoneHeavyLegLeft_cdt"
          NoFoliageCollisions="true"
        >
          <Constraint
            AxisLocal="(0; 1; 0)"
            Name="Leg"
            Type="Prismatic"
            MinLimit="0"
            MaxLimit="1.200"
          >
            <Motor Force="50000" Type="Position" />
          </Constraint>
        </Body> <!-- BoneLegLeft_cdt end -->
```

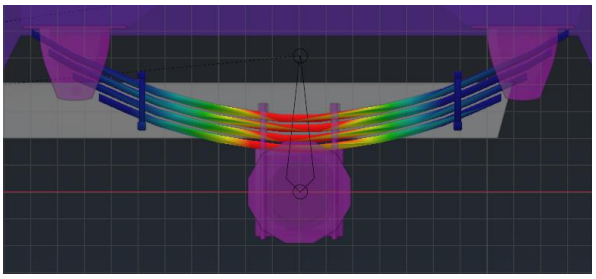
```
<!--feet activation-->
  <PoweredConstraints>
    <Group
      Id="_trailer_foot"
      ParentBodies="BoneHeavyLegLeft_cdt, BoneHeavyLegRight_cdt"
    >
      <Constraint
        InitialFix="true"
        Name="Leg"
        Tau="0.04"
        TerminalFix="true"
        SpeedMult="1.000"
        Position="1.200"
      />
    </Group>
  </PoweredConstraints>
```

**Note: The ID must be exactly as above for the feet to auto activate.*

## Part 4: Trailer Axles, Suspension & Wheels

In order to get axles to be animated, and have the suspension 'flex', you will need an axle bone for each axle. The bone should be positioned in the centre of the axle, with the suspension weighted between the chassis and the axle bone as follows:





Then in the trailer XML file, within the TruckData tags, you will need to define the axle bone:

```
<Axles>
  <Axle Frame="BoneAxle" ParentFrame="BoneChassis_cdt" />
</Axles>
```

You will also want to define the axle suspension info, wheel location and wheel types. Here I make use of templates at the start of the XML to increase the readability of the code:

```
<_templates Include="trucks">
  <Wheel>
    <TrailerWheel
      Location="rear"
      SuspensionHeight="0.05"
      SuspensionMin="-0.25"
      SuspensionStrength="0.02"
      Damping="0.4"
      ConnectedToHandbrake="true"
      Torque="default"
      ParentFrame="BoneAxle"
    />
  </Wheel>
```

The wheel info should be within the TruckData tags:

```
    <Wheels
      DefaultRim="rim_1"
      DefaultTire="mudtires_1"
      DefaultWheelType="wheels_superheavy_cat770g_double"
    >
      <Wheel _template="TrailerWheel" Pos="(-5.300; 0.000; 1.360)" />
      <Wheel _template="TrailerWheel" Pos="(-5.300; 0.000; 1.360)" RightSide="true" />
    </Wheels>
    <CompatibleWheels Scale="0.94" Type="wheels_superheavy_cat770g_double" />
```