$$(t=t)\ ((t_1t_2)v=t_1(t_2v))\vdash B(u)\ (klv+kl=klv+kl))$$

$$\dfrac{\forall x(x=x)\ ((t_1t_2)v=t_1(t_2v))\vdash B(u)\ (klv+kl=klv+kl)) \qquad \forall x\forall y\forall z(x(y+z)=xy+xz)\vdash\forall x(x=x)}{\forall x\forall y\forall z(x(y+z)=xy+xz)\ ((t_1t_2)v=t_1(t_2v))\vdash B(u)\ (klv+kl=klv+kl))}\ \text{cut}$$

$$\forall x\forall y\forall z(x(y+z)=xy+xz)\ ((t_1t_2)v=t_1(t_2v))\vdash B(u)\ (klv+kl=k(lv+l))$$

$$\dfrac{\forall x\forall y\forall z(x(y+z)=xy+xz)\ ((t_1t_2)v=t_1(t_2v))\vdash B(u)\ ((kl)(v+1)=k(l(v+1))) \qquad \vdash\forall x\forall y\forall z(x(y+z)=xy+xz)}{(t_1t_2)v=t_1(t_2v)\vdash B(u)\ ((kl)(v+1)=k(l(v+1)))}\ \text{cut}$$

$$\dfrac{(t_1t_2)v=t_1(t_2v)\vdash B(u)\ ((kl)(v+1)=k(l(v+1)))}{\forall x\forall y((xy)v=x(yv))\vdash B(u)\ ((kl)(v+1)=k(l(v+1)))}\ (\forall\vdash)$$

$$\dfrac{\forall x\forall y((xy)v=x(yv))\vdash B(u)\ ((kl)(v+1)=k(l(v+1)))}{\forall x\forall y((xy)v=x(yv))\vdash B(u)\ \forall x\forall y((xy)(v+1)=x(y(v+1)))}\ (\vdash\forall)$$

$$\dfrac{\forall x\forall y((xy)v=x(yv))\vdash B(u)\ \forall x\forall y((xy)(v+1)=x(y(v+1)))}{B(v)\vdash B(v+1)\ B(u)}\ \text{def}$$

$$\dfrac{B(v)\vdash B(v+1)\ B(u)}{\vdash (B(v)\to B(v+1))\ B(u)}\ (\vdash\to)$$

$$\dfrac{\vdash (B(v)\to B(v+1))\ B(u)}{\vdash \forall z(B(z)\to B(z+1))\ B(u)}\ (\vdash\forall)$$

$$t=t\vdash B(u)\ (0=0)$$

$$\dfrac{\forall x(x=x)\vdash B(u)\ (0=0) \qquad \forall x(x=x)\vdash\forall x(x\cdot 0=0)}{\forall x(x\cdot 0=0)\vdash B(u)\ (0=0)}\ \text{cut}$$

$$\forall x(x\cdot 0=0)\vdash B(u)\ (0=v\cdot 0)$$

$$\dfrac{\forall x(x\cdot 0=0)\vdash B(u)\ ((vw)\cdot 0=v(w\cdot 0)) \qquad \vdash\forall x(x\cdot 0=0)}{\vdash B(u)\ ((vw)\cdot 0=v(w\cdot 0))}\ \text{cut}$$

$$\dfrac{\vdash B(u)\ ((vw)\cdot 0=v(w\cdot 0))}{\vdash B(u)\ \forall x\forall y((xy)\cdot 0=x(y\cdot 0))}\ (\vdash\forall)$$

$$\dfrac{\vdash B(u)\ \forall x\forall y((xy)\cdot 0=x(y\cdot 0))}{\vdash B(0)\ B(u)}\ \text{def}$$

$$\dfrac{\vdash \forall z(B(z)\to B(z+1))\ B(u) \qquad \vdash B(0)\ B(u)}{\vdash (B(0)\ \&\ \forall z(B(z)\to B(z+1)))\ B(u)}\ (\vdash\&)$$

$$\dfrac{B(t)\vdash B(u)}{\forall zB(z)\vdash B(u)}\ (\forall\vdash)$$

$$\dfrac{\vdash (B(0)\ \&\ \forall z(B(z)\to B(z+1)))\ B(u) \qquad \forall zB(z)\vdash B(u)}{B(0)\ \&\ \forall z(B(z)\to B(z+1))\to\forall zB(z)\vdash B(u)}\ (\to\vdash)$$

$$\dfrac{B(0)\ \&\ \forall z(B(z)\to B(z+1))\to\forall zB(z)\vdash B(u)}{B(0)\ \&\ \forall z(B(z)\to B(z+1))\to\forall zB(z)\vdash\forall zB(z)}\ (\vdash\forall)$$