WHAT IS CLAIMED IS:

1. An axial retention assembly for combustor components of a gas turbine engine, the axial retention assembly comprising:

a combustor (14) defining an axial centerline (28) extending between a forward end (27) of the combustor (14) and an aft end (29) of the combustor (14), the combustor (14) further defining a radial direction (30) extending orthogonally outward from the axial centerline (28), the combustor (14) including a liner (38) and a casing (58), the liner (38) defines a combustor chamber (46) and the casing (58) defines a head-end volume (64) being positioned upstream of the combustor chamber (46), the casing (58) including a flange (70) spaced apart from the liner (38) ~~along~~in the direction of the axial centerline (28);

a mounting plate (106) including a first end (114) removably coupled to the flange (70) and a second end (116) positioned inward from the casing (58) in the radial direction (30);

characterized in that the assembly also includes:

a clamp (108) removably coupled to the liner (38); and

a tie rod (110) coupled to the second end (116) of the mounting plate (106) and the clamp (108) to reduce relative movement between the liner (38) and the casing (58) within the combustor (14) along the axial centerline (28), wherein the tie rod (110) is positioned between the liner (38) and the casing (58) in the radial direction (30).

~~2. The axial retention assembly of claim 1, wherein the tie rod is positioned between the liner and the casing in the radial direction.~~

~~3~~2. The axial retention assembly (100) of claim 1, wherein the tie rod (110) is adjustably coupled to the second end (116) of the mounting plate (106).

~~4~~3. The axial retention assembly (100) of claim ~~3~~2, further comprising:

a first fastener (128) threadingly engaging the tie rod (110) on one of a first side (118) or a second side (120) of the mounting plate (106);

a second fastener (130) threadingly engaging the tie rod (110) on the other of the first side (118) or the second side (120) of the mounting plate (106),

wherein movement of the first fastener (128) and the second faster (130) relative to the tie rod (110) adjusts a distance (112) between the mounting plate (106) and the clamp (108) along the axial centerline (28).

~~5~~4. The axial retention assembly (100) of claim 1, wherein the second end (116) of the mounting plate (106) defines an elongated slot (126), the tie rod (110) extending through the elongated slot (126).

~~6~~5. The axial retention assembly (100) of claim 1, wherein the clamp (108) comprises:

a clamp frame (132) including a first wall (138) and a second wall (140) spaced apart from the first wall (138) in the radial direction (30);

a clamp plate (134) positioned between the first wall (138) and the second wall (140); and

a clamp rod (136) threadingly engaging the first wall (138) and the clamp plate (134) ~~and the clamp plate~~,

wherein rotation of the clamp rod (136) relative to the first wall (138) moves the clamp plate (134) between the first wall (138) and the second wall (140) in the radial direction (30).

~~7~~6. The axial retention assembly (100) of claim ~~6~~5, wherein:

the combustor(14) further comprises a sleeve (50) coupled to the casing (58) and at least partially circumferentially positioned around the liner (38), the liner (38) and the sleeve (50) defining a flow passage (56) therebetween;

the liner (38) defines an aperture therethrough and a combustion chamber (46) therein;

the first wall (138) of the clamp frame (132) is positioned within the combustion chamber (46);

the second wall (140) of the clamp frame (132) is positioned within the flow passage (56); and

the clamp rod (136) extends through the aperture defined by the liner (38).

~~8~~7. The axial retention assembly (100) of claim ~~6~~5, wherein the tie rod (110) is coupled to the clamp plate (134).

~~9~~8. The axial retention assembly (100) of claim ~~8~~7, wherein the clamp frame (132) further includes a third wall (142) extending from the first wall (138) to the second wall (140) in the radial direction (30), the third wall (142) defining an elongated slot (144) through which the tie rod (110) extends.

~~10~~9. The axial retention assembly (100) of claim ~~6~~5, wherein the clamp rod (136) comprises a first portion (150) and a second portion (152), the first portion (150) having a different diameter than a second portion (152).

~~11~~10. A gas turbine engine (10), comprising the axial retention assembly according to claim 1 and a plurality of axial retention tools (102), wherein each of the plurality of axial retention tools (102) comprises the mounting plate (106), the clamp (108) and the tie rod (110). ~~:~~

~~a combustor defining an axial centerline extending between a forward end of the combustor and an aft end of the combustor, the combustor further defining a radial direction extending orthogonally outward from the axial centerline, the combustor comprising:~~

~~a liner defining an aperture therethrough and a combustion chamber therein;~~

~~a sleeve at least partially circumferentially positioned around the liner, the sleeve and the liner defining a flow passage therebetween; and~~

~~a casing coupled to the sleeve, the casing including a flange spaced apart from the liner along the axial centerline; and~~

~~a plurality of axial retention tools, each axial retention tool comprising:~~

~~a mounting plate including a first end removably coupled to the flange and a second end positioned inward from the casing in the radial direction;~~

~~a clamp removably coupled to the liner; and~~

~~a tie rod positioned between the liner and the casing in the radial direction, the tie rod coupled to the second end of the mounting plate and the clamp to reduce relative movement between the liner and the casing along the axial centerline.~~

~~12~~11. The gas turbine engine (10) of claim ~~11~~10, wherein each of the plurality of axial retention tools (102) are circumferentially spaced apart from each other around the combustor (14).

~~13. The gas turbine engine of claim 11, wherein the tie rod is positioned between the liner and the casing in the radial direction.~~

~~14~~12. The gas turbine engine (10) of claim ~~11~~10, wherein the tie rod (110) is adjustably coupled to the second end (116) of the mounting plate (106).

~~15~~13. The gas turbine engine (10) of claim ~~14~~12, wherein each axial retention tool (102) further comprises:

a first fastener (128) threadingly engaging the tie rod (110) on one of a first side (118) or a second side (120) of the mounting plate (106);

a second fastener (130) threadingly ~~engaging the tie rod the other of the first side~~ or the second side (120) of the mounting plate (106),

wherein movement of the first fastener (128) and the second ~~faster~~fastner (130) relative to the tie rod (110) adjusts a distance (112) between the mounting plate (106) and the clamp (108) along the axial centerline (28).

~~16~~14. The gas turbine engine (10) of claim ~~11~~10, wherein the second end (116) of the mounting plate (106) defines an elongated slot (126), the tie rod (110) extending through the elongated slot (126).

~~17~~15. The gas turbine engine (10) of claim 10, wherein each clamp (108) comprises:

a clamp frame (132) including a first wall (138) and a second wall (140) spaced apart from the first wall (138) in the radial direction (30);

a clamp plate (134) positioned between the first wall (138) and the second wall (140); and

a clamp rod (136) threadingly engaging the first wall (138) and the clamp plate (134),

wherein rotation of the clamp rod (136) relative to the first wall (138) moves the clamp plate (134) between the first wall (138) and the second wall (140) in the radial direction (30).

~~18~~16. The gas turbine engine (10) of claim ~~17~~15, wherein:

the first wall (138) of the clamp frame (132) is positioned within the combustion chamber (46);

the second wall (140) of the clamp frame (132) is positioned within the flow passage (56); and

the clamp rod (136) extends through the aperture defined by the liner (38).

~~19~~17. The axial retention assembly (10) of claim ~~17~~15, wherein the tie rod (110) is coupled to the clamp plate (134).

~~20~~18. The gas turbine engine (10) of claim ~~19~~17, wherein the clamp frame (132) further includes a third wall (142) extending from the first wall (138) to the second wall (140) in the radial direction (30), the third wall (142) defining an elongated slot (144) through which the tie rod (110)extends.