Hello

I would like to see bolt force changes with regard to temperature and service load.

First, bolt is tightened.

Second, temperature is assigned.

Finally, service load is applied.

In order to run these simulations, I think I have two methods.

1) multiple studies

2) multiple steps.

\*\*(1) multiple studies\*\*

Study 1: Bolt pretension

Study 2: Heat transfer in solid-Thermal expansion

Study 3: Service load

\*\*Study 1 setting\*\*

\*1) Model configuration for study step\*

 Bolt pretension : Enable

 Heat transfer-thermal expansion : Disable

 Service load : Disable

\*2)Values of dependent variables\*

 Initial values of variables solved for : Physics controlled

 Values of variables not solved for : Physics controlled

\*\*Study 2 setting\*\*

\*1) Model configuration for study step\*

 Bolt pretension : Enable

 Heat transfer in solid-Thermal expansion : Enable

 Service load : Diable

\*2)Values of dependent variables\*

 Initail values of variables solved for : User controlled/Solution/Study 1

 Values of variables not solved for : User controlled/Solution/Study 1

\*\*Study 3 setting\*\*

\*1) Model configuration for study step\*

 Bolt pretension : Enable

 Heat transfer in solid-Thermal expansion : Enable

 Service load : Enable

\*2)Values of dependent variables\*

 Initial values of variables solved for : User controlled/Solution/Study 2

 Values of variables not solved for : User controlled/Solution/Study 2

\*\*Multiple steps\*\*

\*\*Step 1\*\*

 \*1) Model configuration for study step\*

 Bolt pretension : Enable

 Heat transfer-thermal expansion : Disable

 Service load : Disable

\*2)Values of dependent variables\*

 Initial values of variables solved for : Physics controlled

 Values of variables not solved for : Physics controlled

\*\*Step 2\*\*

 \*1) Model configuration for study step\*

 Bolt pretension : Enable

 Heat transfer-thermal expansion : Enable

 Service load : Disable

\*2)Values of dependent variables\*

 Initial values of variables solved for : Physics controlled

 Values of variables not solved for : Physics controlled

\*\*Step 3\*\*

 \*1) Model configuration for study step\*

 Bolt pretension : Enable

 Heat transfer-thermal expansion : Enable

 Service load : Disable

\*2)Values of dependent variables\*

 Initial values of variables solved for : Physics controlled

 Values of variables not solved for : Physics controlled

 \*\*Question\*\*

 1) Are the settings for multiple studies and multiple steps proper?

 2) Would you please explain initial values of variables solved for/values of variables not solved for? using my simulation cases?

 3) For steps, I can use stored values for values of dependent variables. when should I use them? if I just select physics controlled for both solved for and not solved for, does it run the simulation as I intended? ( For example, heat transfer simulation will be done, based on the values calculated from bolt pretension)