

Annex E: Illustration of PackageInterfaces and PackageBindings Usage with Assurance Cases

(informative)

This annex ~~includes a series of illustrations and Venn diagrams that show how PackageInterfaces and PackageBindings~~ ^{shows how} ~~can be used to combine elements of separate AssuranceCasePackages.~~ ^{BindingPackages} ~~The example uses a trivial number of elements from an assurance case for an engine and from an assurance case for controls for that engine that are combined (presumably along with many other elements) into an assurance case for a complete automobile (along with many other elements not identified).~~

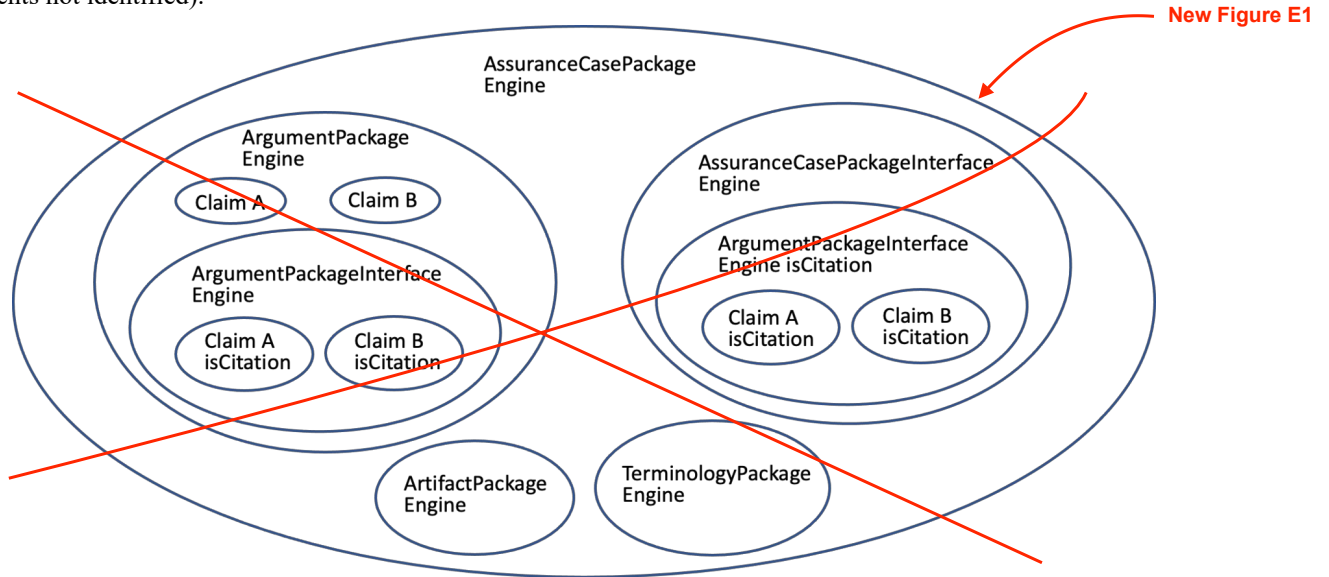
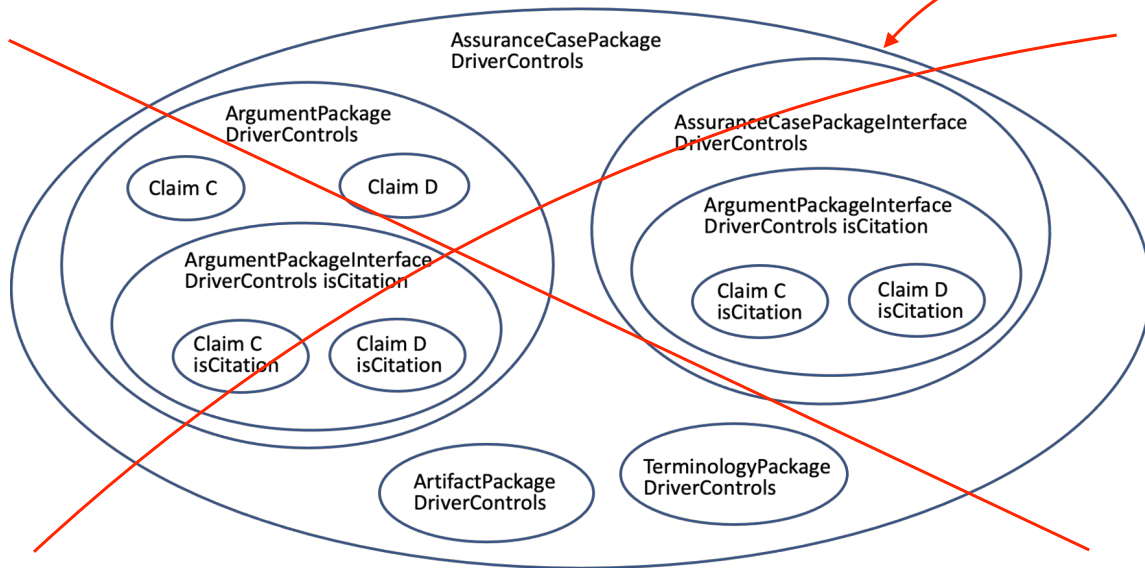


Figure E1 – ~~Engine~~ ^{Automobile} Assurance Case Illustration

In Figure E1, ~~ArgumentPackageInterface for Engine is shown as contained within the ArgumentPackage for Engine which itself is contained within AssuranceCasePackage for Engine. The ArgumentPackageInterface for Engine is also cited within the AssuranceCasePackageInterface for Engine. Claim A and Claim B are defined within the ArgumentPackage and cited within both the actual and cited ArgumentPackageInterface.~~

~~the various top level packages that could be filled to define the complete AssuranceCase for Automotive including Engine and DriverControls are shown.~~



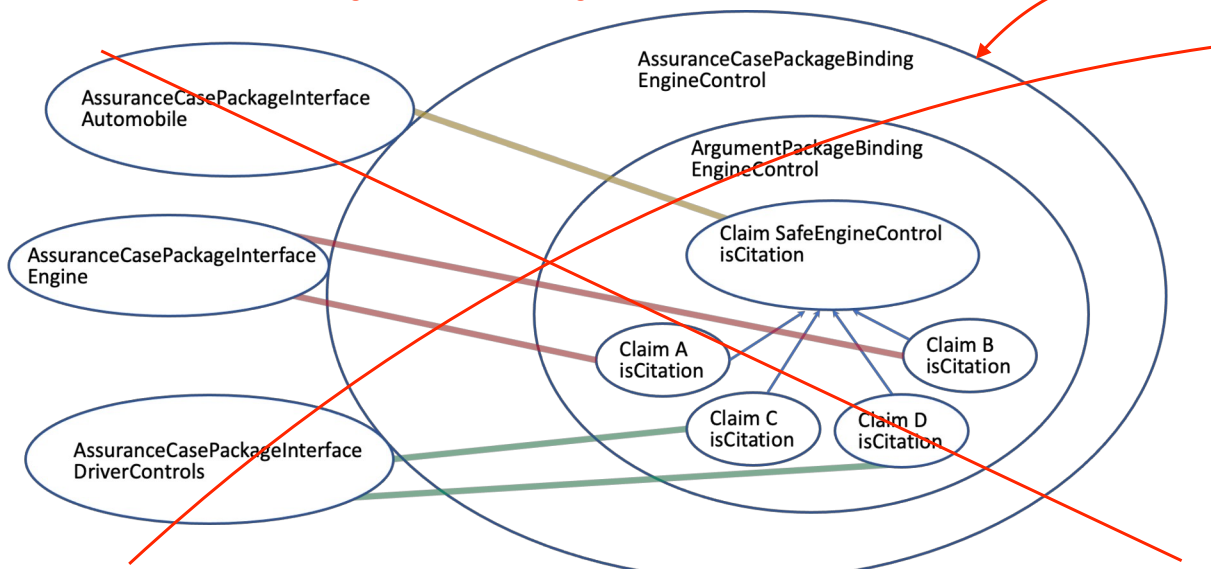
Automobile
Figure E2 – Driver Controls Assurance Case Illustration

the overall assurance picture for Automobile.

Figure E2 shows how the ArgumentPackageInterface for DriverControls is contained within the ArgumentPackage for DriverControls which itself is contained within AssuranceCasePackage for DriverControls.

The ArgumentPackageInterface for DriverControls is also cited within the AssuranceCasePackageInterface for DriverControls. Claim C and Claim D are defined within the ArgumentPackage and cited within both the actual and cited ArgumentPackageInterface.

Automobile shows local claims, Y, Z, and Q, as well as Claim SafeEngineControl for which needsDevelopment=true. This Claim is cited in the Automobile's ArgumentInterfacePackage for use.



In Figure E3, each of the ArgumentInterfacePackage for Engine and DriverControls is shown as contained within each of the ArgumentPackage for Engine and DriverControls which are contained within AssuranceCasePackage for Automobile.

Figure E3 – Assurance Case Bindings Illustration

Figure E3 shows how the AssuranceCasePackageBinding for EngineControl externally references its participant packages, specifically, the AssuranceCasePackageInterface for Automobile, Engine, and DriverControls. It contains the ArgumentPackageBinding for EngineControl. This binding shows Claims A and B from Engine and Claims C and D

from DriverControls, in support of Claim SafeEngineControl from Automobile. The colored lines show how each claim in the ArgumentPackageBinding refers to the appropriate participant package through an AssuranceCasePackageInterface.

New Figure E4

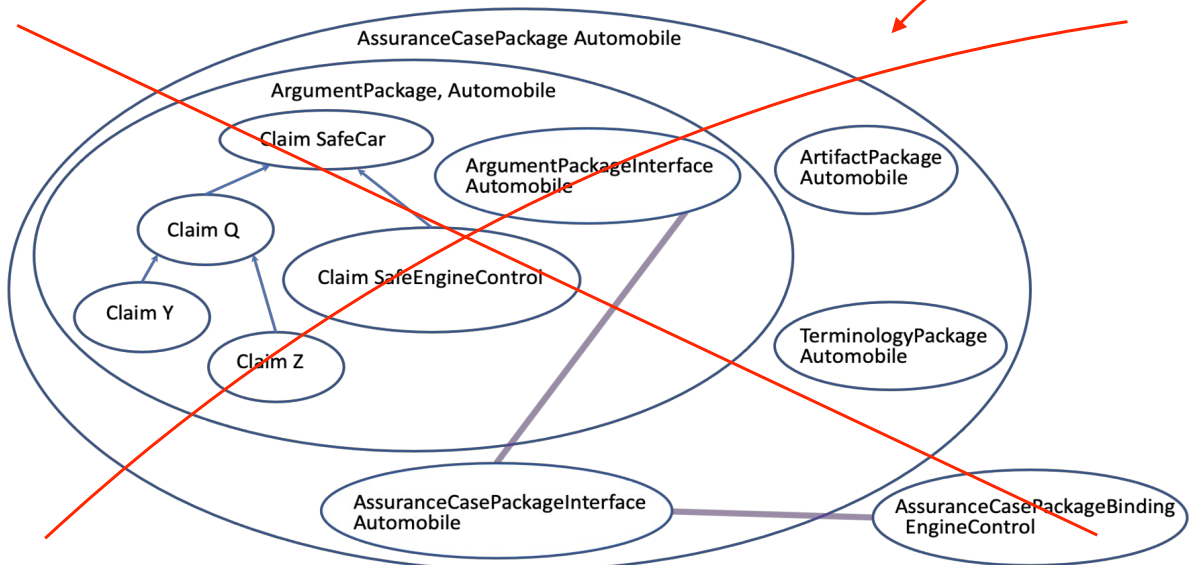


Figure E4 shows how the BindingPackage for EngineControl. This binding shows Claims A and B from Engine and Claims C and D from DriverControls, in support of Claim SafeEngineControl from Automobile.

Figure E4 – Automobile Assurance Case Illustration

Figure E4 shows the overall assurance picture for Automobile. AssuranceCasePackage for Engine and for DriverControls, as well as AssuranceCasePackageBinding for EngineControl are expanded from those in the previous figures above. The ArgumentPackage for Automobile shows local claims, Y, Z, and Q, as well as Claim SafeEngineControl, which is supported by claims A, B, C, and D in the Binding. The colored lines show how elements in the ArgumentPackageBinding for EngineControl refer to the AssuranceCasePackageInterface for Automobile, and in turn to the ArgumentPackageInterface for Automobile. Similar relationships might also be needed for ArtifactPackage and/or TerminologyPackage.

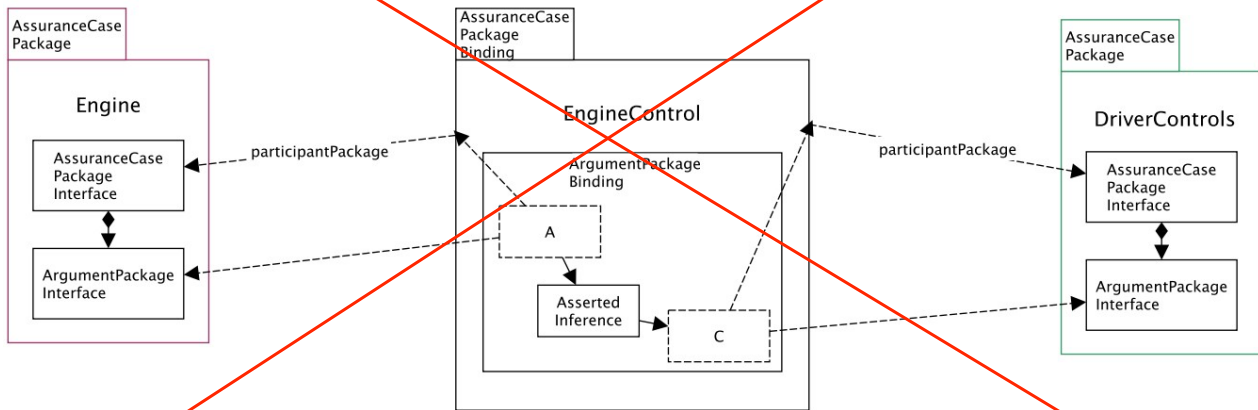


Figure E5 – Logical Relationships between DriverControls, EngineControl, and Engine Assurance Cases Illustration

In Figure E5, above, the logical relationships between DriverControls, EngineControl, and Engine Assurance Cases are shown, where some claims are omitted to improve readability.

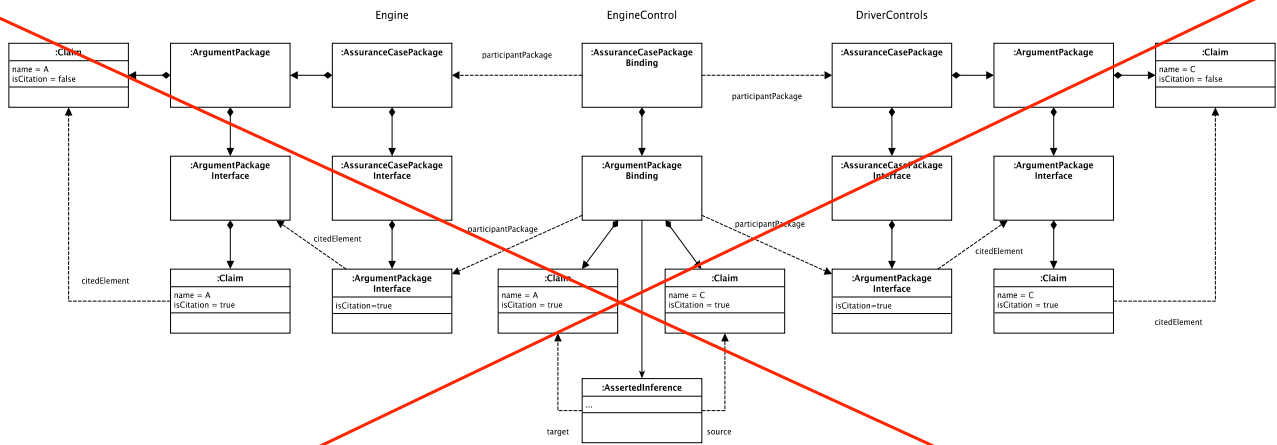


Figure E6 – Specific Relationships between DriverControls, EngineControl, and Engine Assurance Cases Illustration

Finally, in Figure E6 the specific (model element wise) relationships between DriverControls, EngineControl, and Engine Assurance Cases are shown, where some claims are omitted to improve readability.

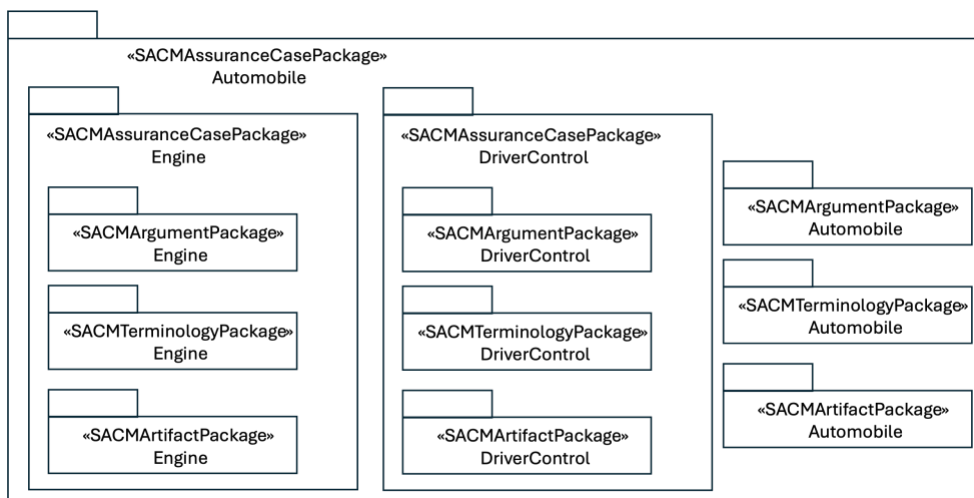


Figure E.1 – Automobile Assurance Case Diagram

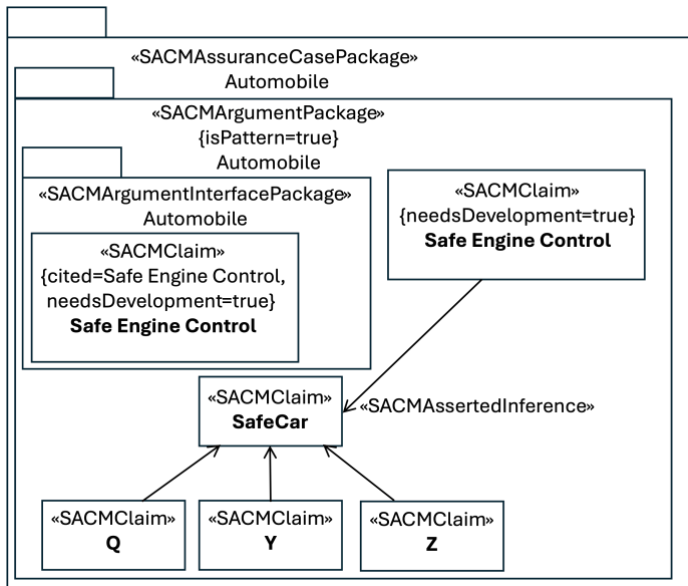


Figure E.2 – Automobile Assurance Case Diagram

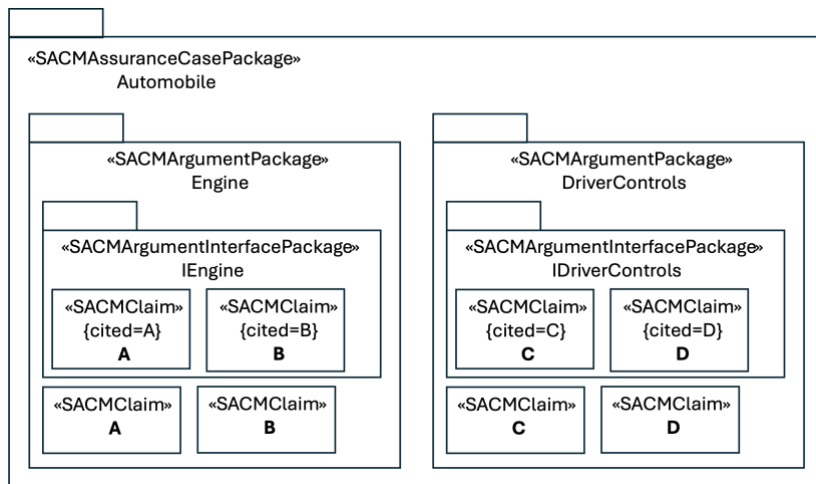


Figure E.3 – Engine and DriverControls Assurance Case Diagram

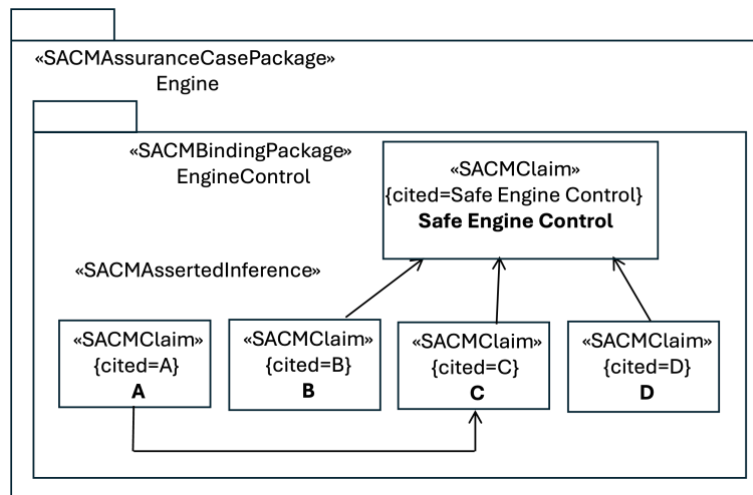


Figure E.4 – Assurance Case Bindings Diagram