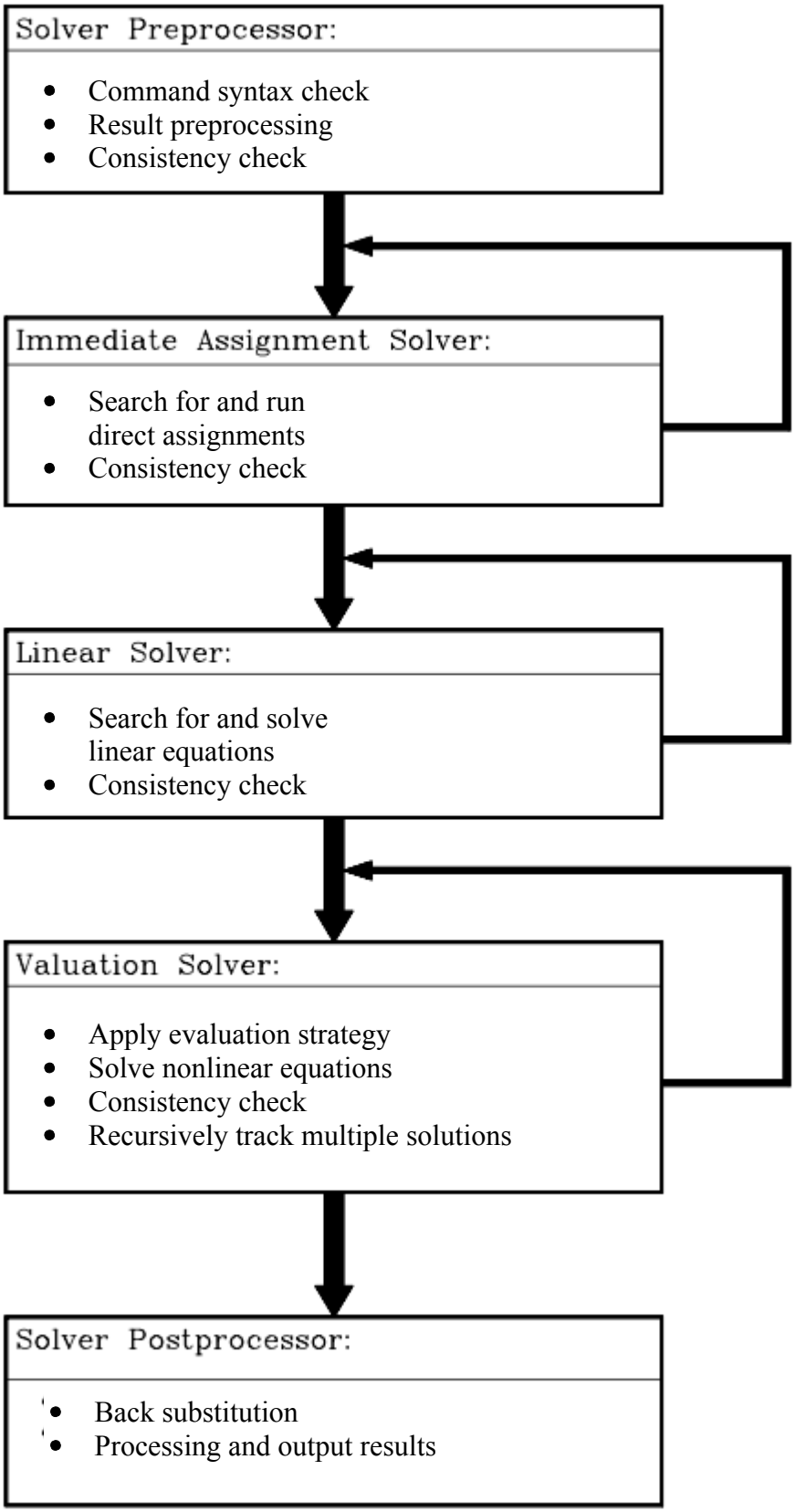
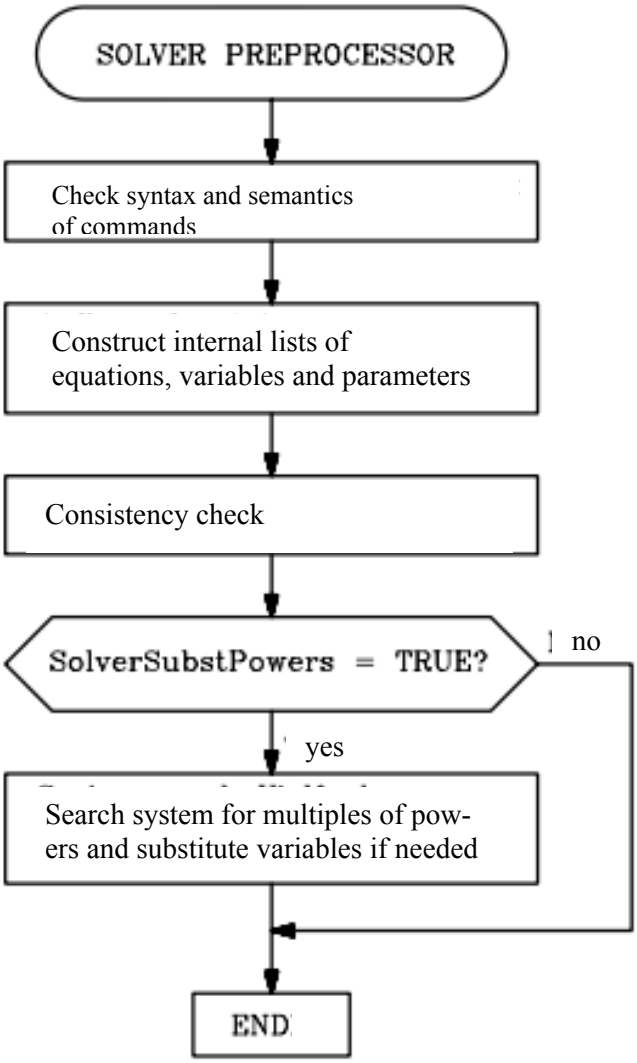
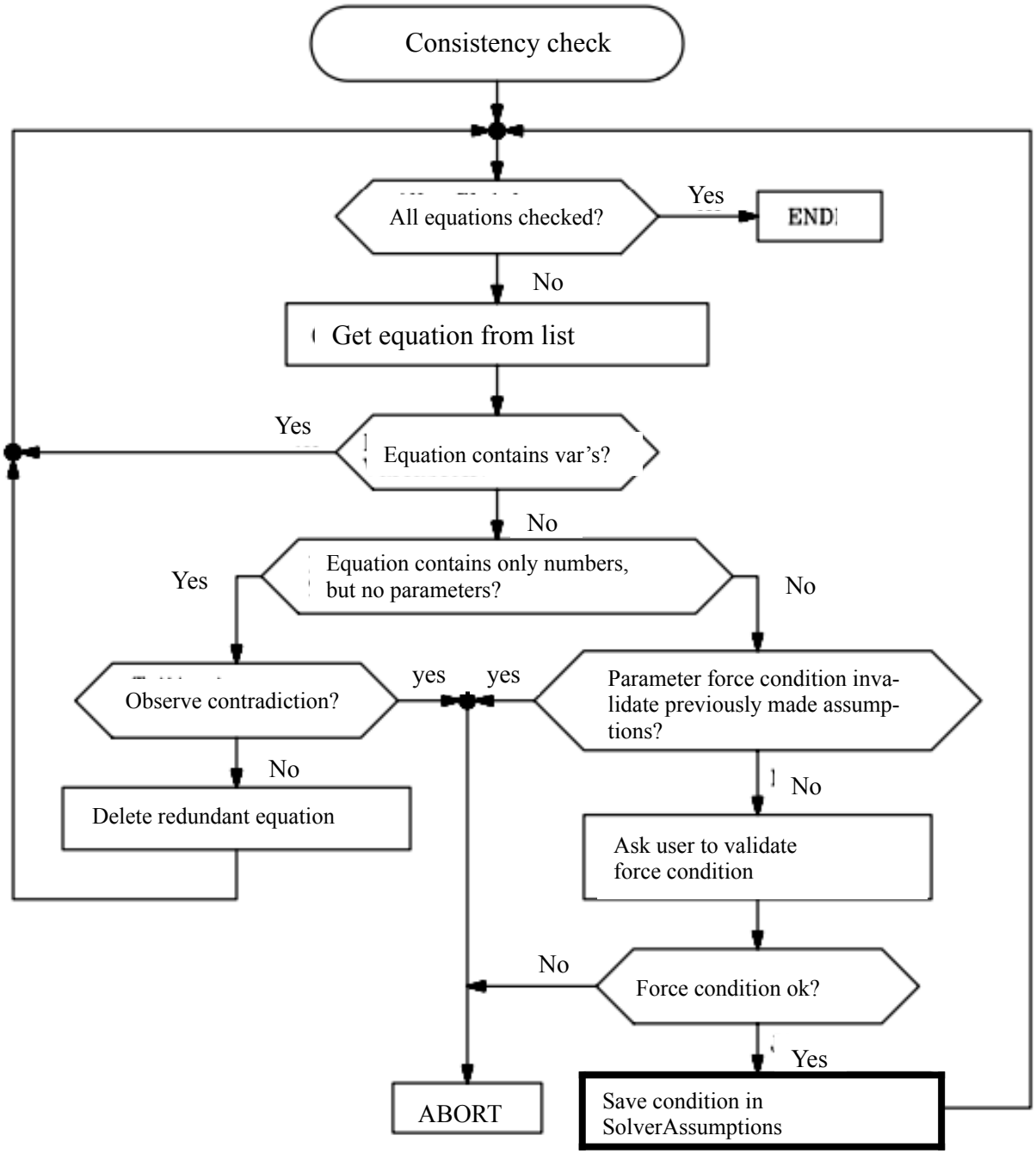
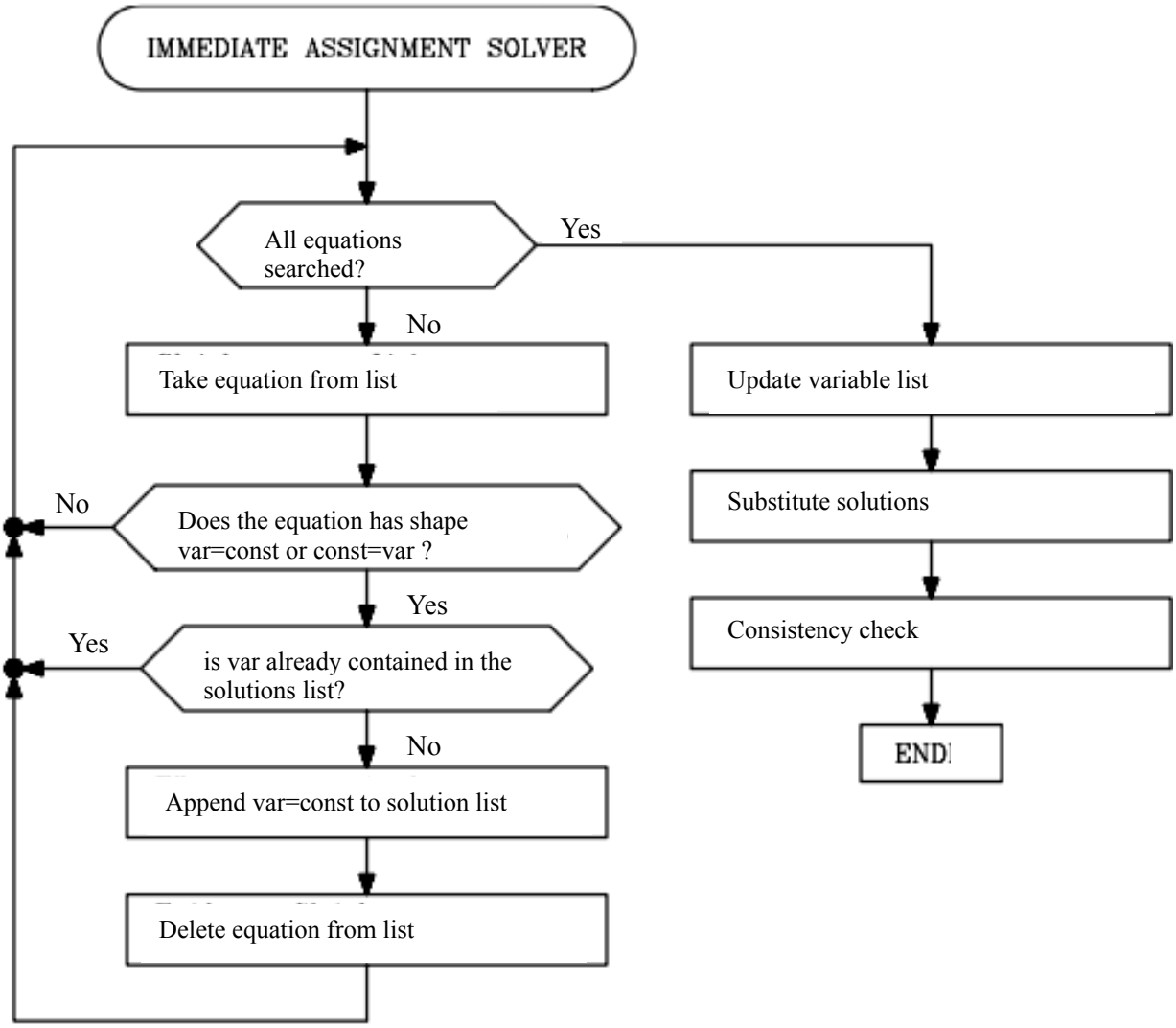
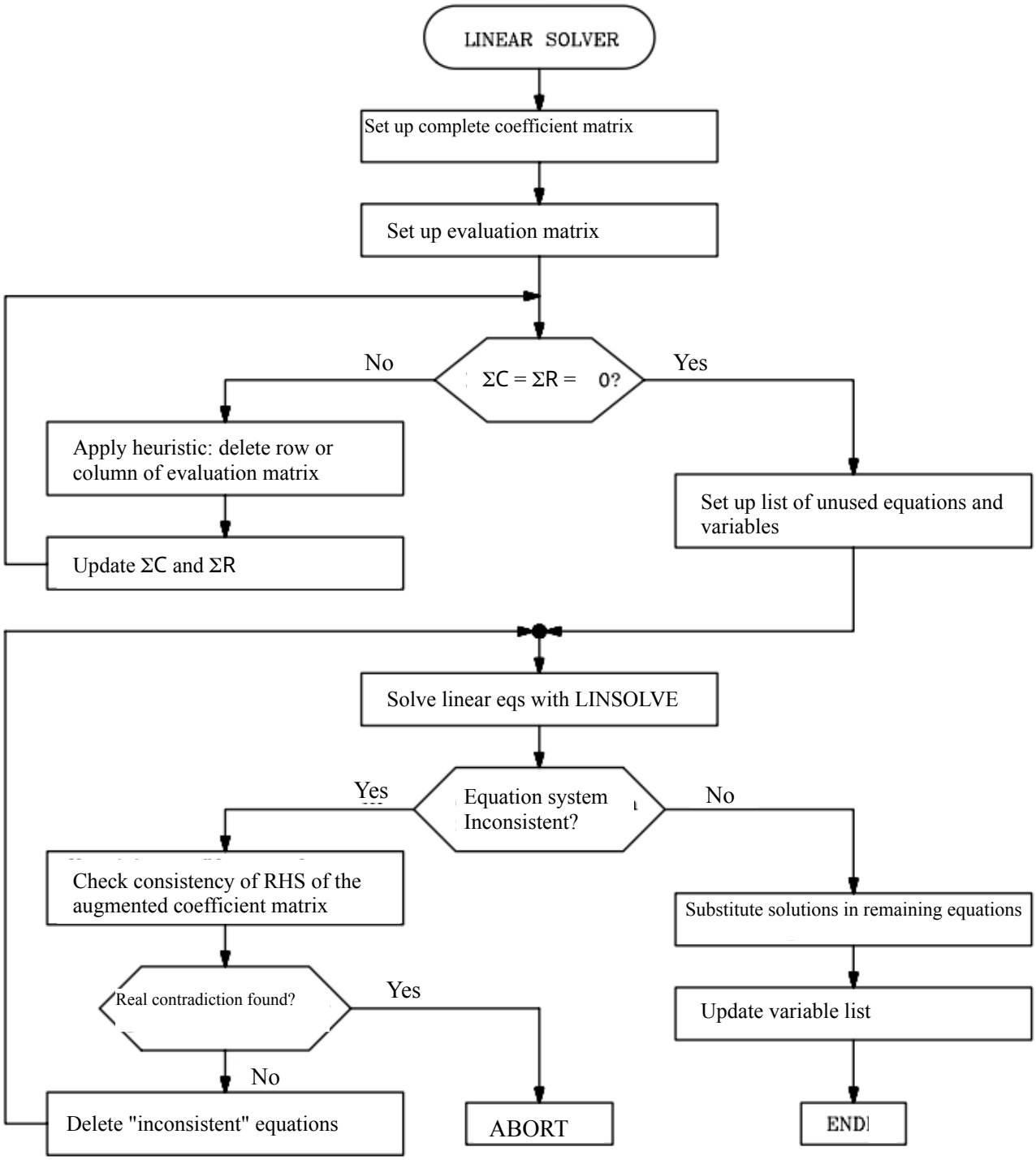
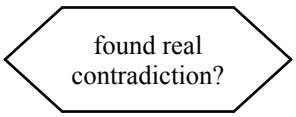

Solver Preprocessor:
Command syntax check
Result preprocessing
Consistency check
Immediate Assignment Solver:
Search for and run direct assignments
Consistency check
Linear Solver:
Search for and solve linear equations
Consistency check
Valuation Solver:
Apply evaluation strategy
Solve nonlinear equations
Consistency check
Recursively track multiple solutions
Solver Postprocessor:
Back substitution
Processing and output results

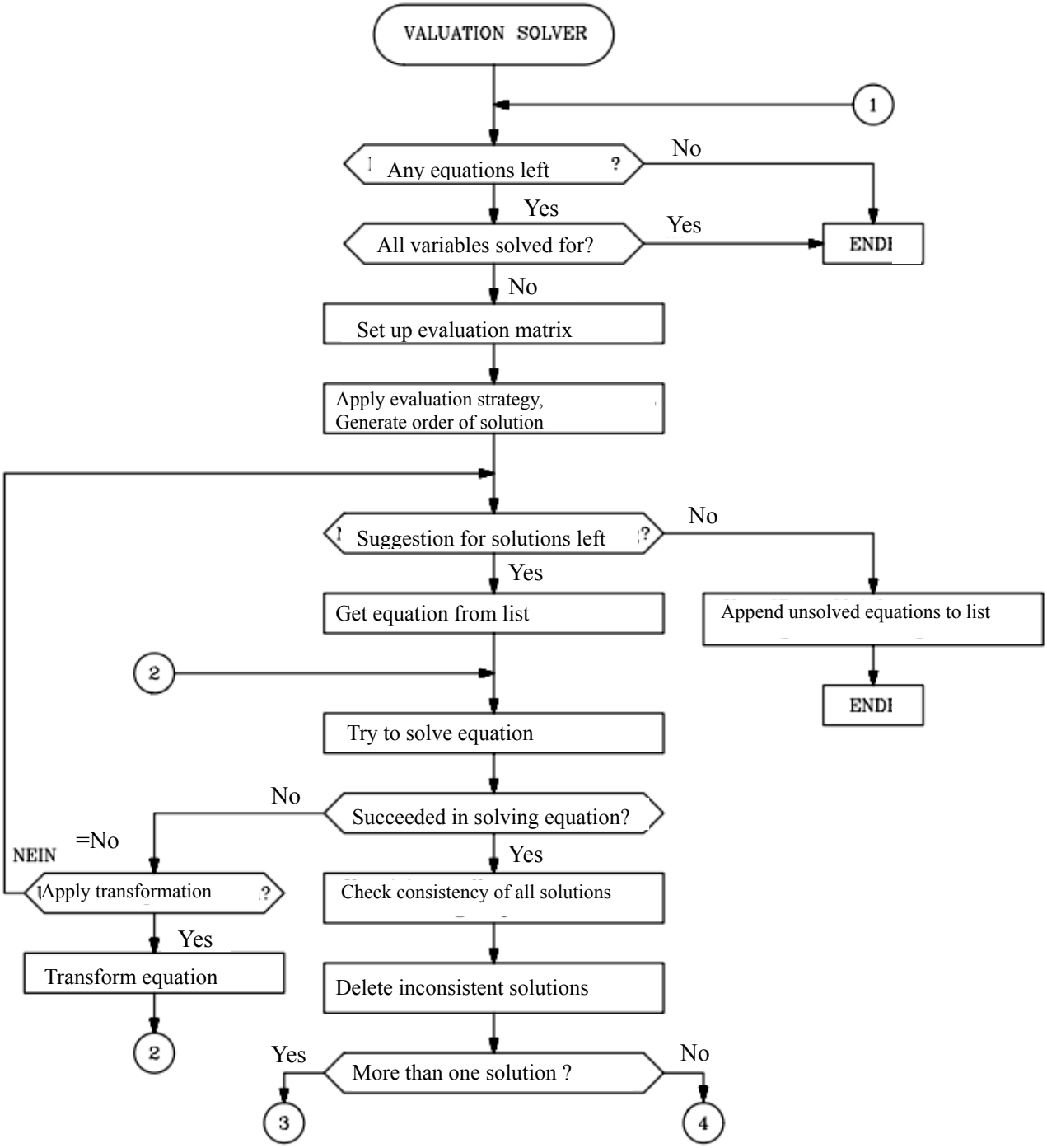

SOLVER PREPROCESSOR
Check syntax and semantics of commands
Construct internal lists of equations, variables and parameters
Consistency check
SolverSubstPowers = TRUE?
no
yes
Search system for multiples of pow-ers and substitute variables if needed
END

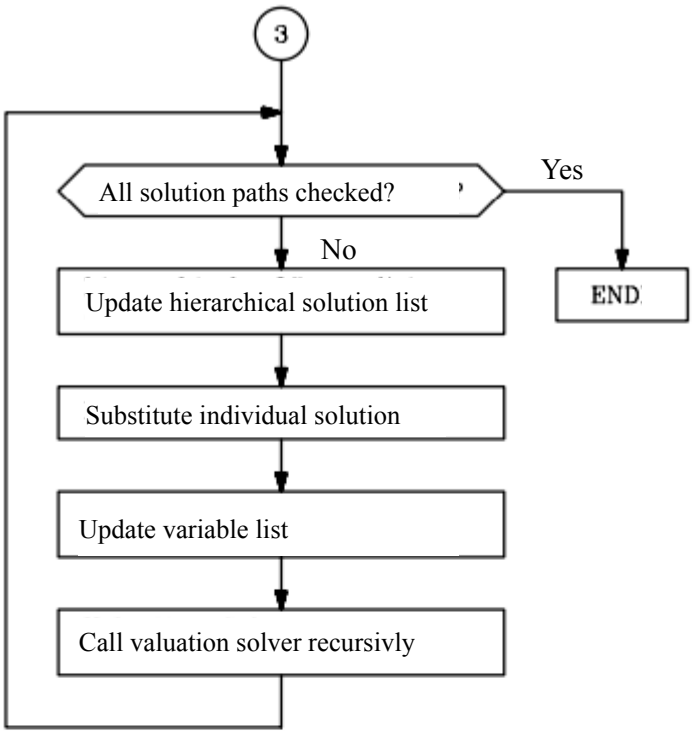

Consistency check
All equations checked?
Yes
END
No
Get equation from list
Yes
Equation contains var's?
No
Yes
Equation contains only numbers, but no parameters?
No
Observe contradiction?
yes
yes
Parameter force condition invalidate previously made assumptions?
No
Delete redundant equation
No
Ask user to validate force condition
No
Force condition ok?
Yes
ABORT
Save condition in SolverAssumptions

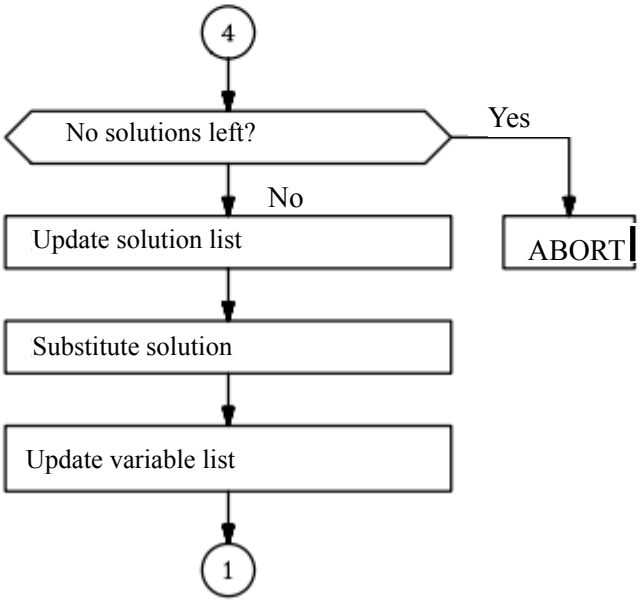

IMMEDIATE ASSIGNMENT SOLVER
All equations searched?
Yes
No
Take equation from list
Update variable list
Substitute solutions
Consistency check
END
No
Does the equation has shape var=const or const=var ?
Yes
Yes
is var already contained in the solutions list?
No
Append var=const to solution list
Delete equation from list

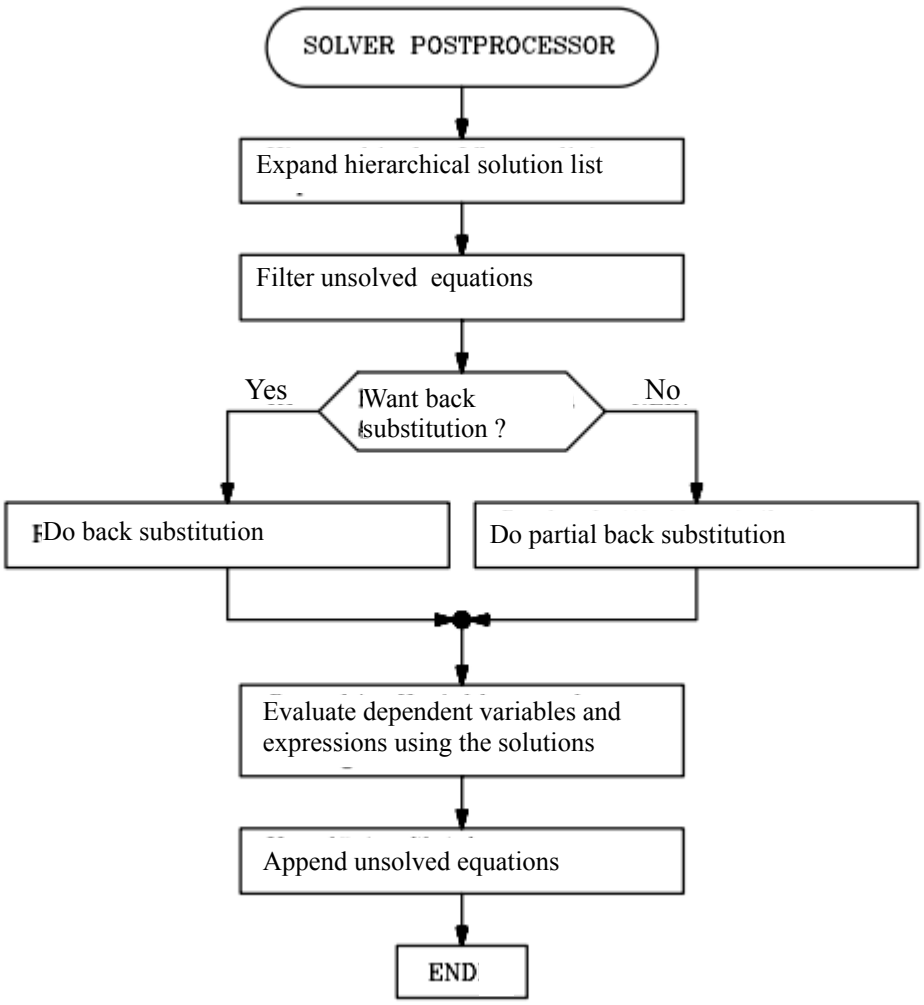

LINEAR SOLVER
Set up complete coefficient matrix
Set up evaluation matrix
ΣC = ΣR = 0?
No
Yes
Apply heuristic: delete row or column of evaluation matrix
Update ΣC and ΣR
Set up list of unused equations and variables
Solve linear eqs with LINSOLVE
Equation system Inconsistent?
Yes
No
Check consistency of RHS of the augmented coefficient matrix
Substitute solutions in remaining equations
Real contradiction found?
Yes
Update variable list
No
Delete "inconsistent" equations
ABORT
END


found real contradiction?


VALUATION SOLVER
1
Any equations left ?
No
Yes
All variables solved for?
Yes
ENDI
No
Set up evaluation matrix
Apply evaluation strategy,
Generate order of solution
Suggestion for solutions left ?
No
Yes
Get equation from list
Append unsolved equations to list
2
ENDI
Try to solve equation
No
Succeeded in solving equation?
=No
NEIN
Yes
Apply transformation ?
Check consistency of all solutions
Yes
Transform equation
Delete inconsistent solutions
2
Yes
More than one solution ?
No
3
4


3
All solution paths checked?
Yes
No
END
Update hierarchical solution list
Substitute individual solution
Update variable list
Call valuation solver recursivly


4
No solutions left?
Yes
No
ABORT
Update solution list
Substitute solution
Update variable list
1


SOLVER POSTPROCESSOR
Expand hierarchical solution list
Filter unsolved equations
Yes
Want back substitution ?
No
Do back substitution
Do partial back substitution
Evaluate dependent variables and expressions using the solutions
Append unsolved equations
END