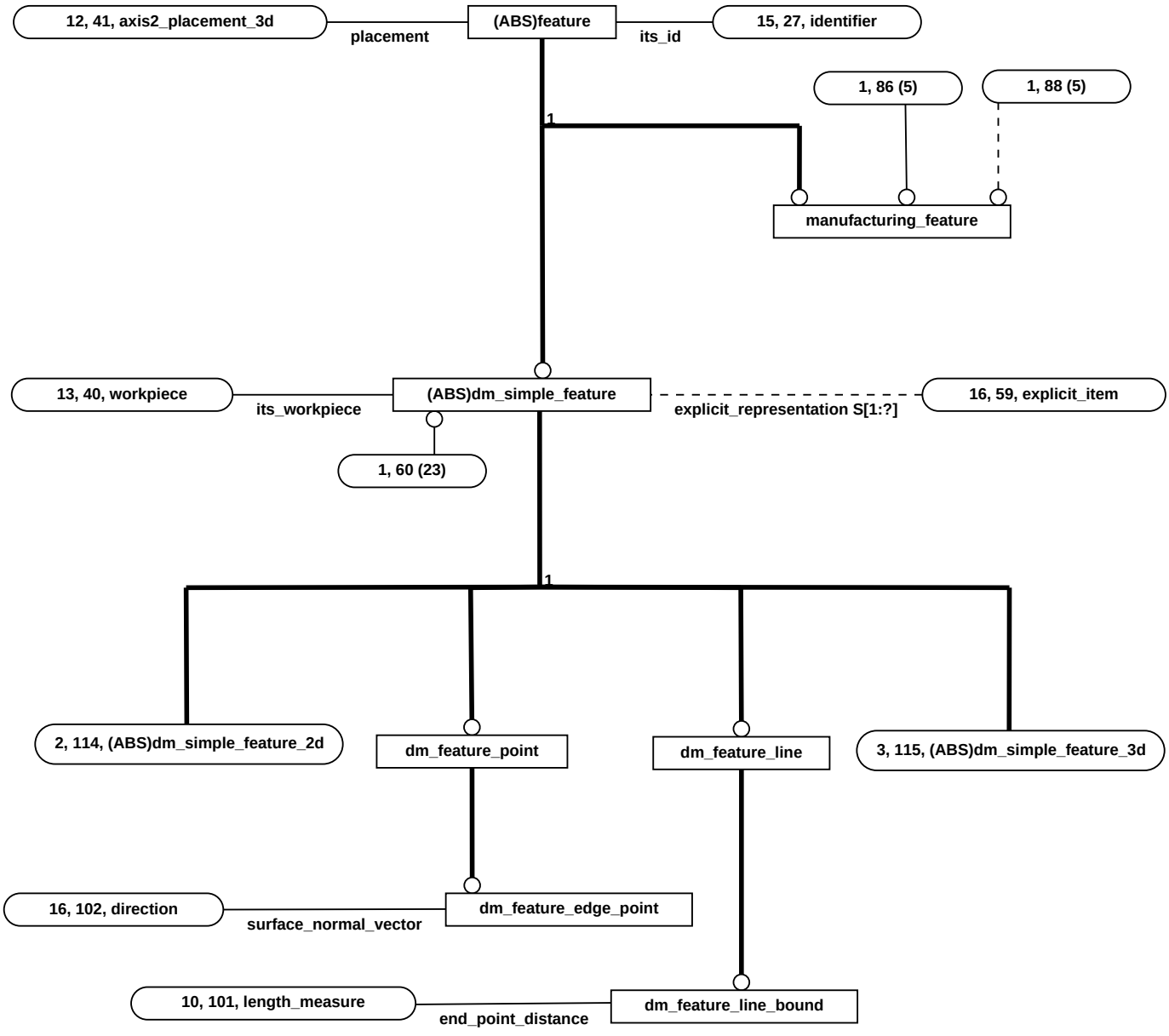
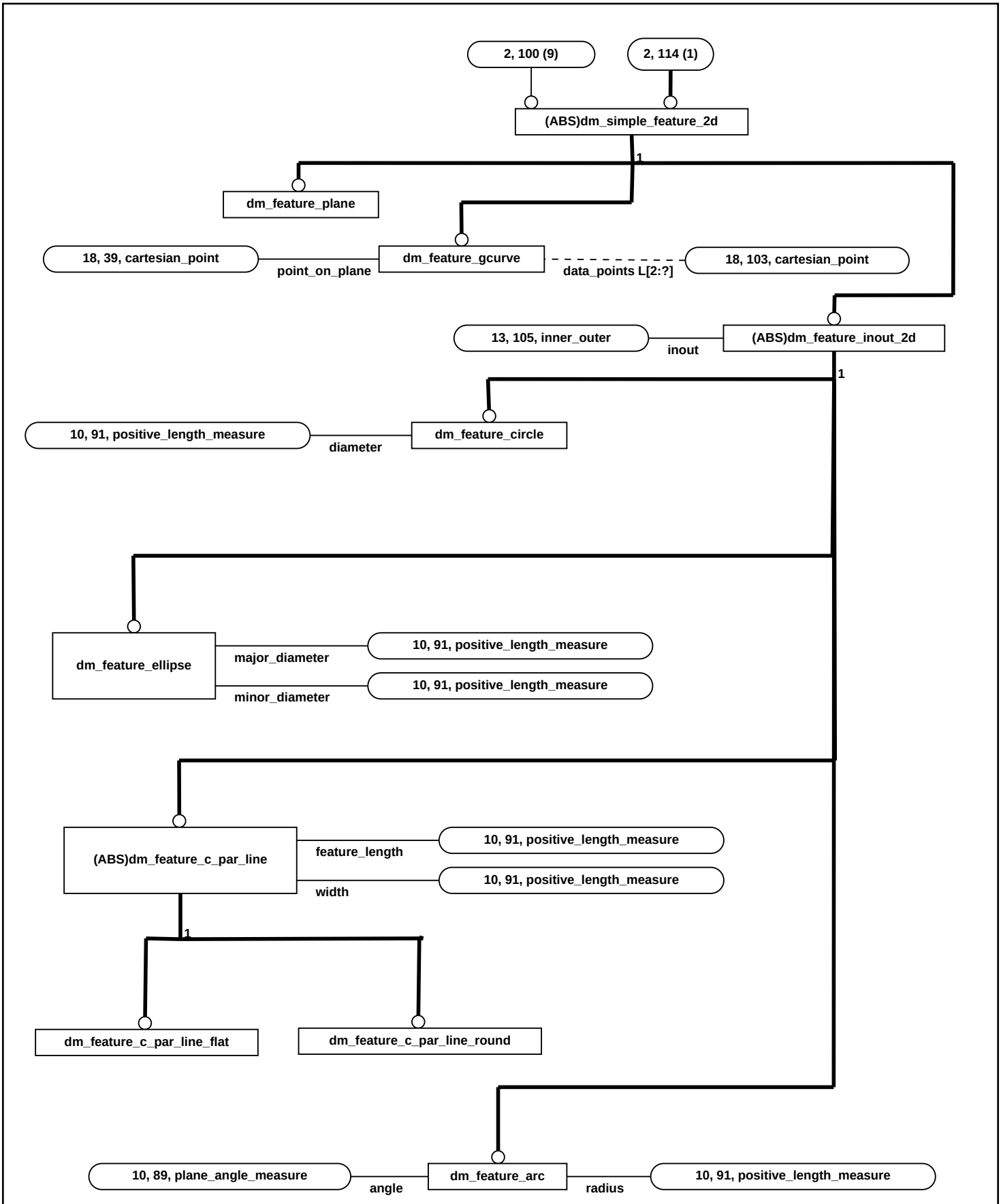
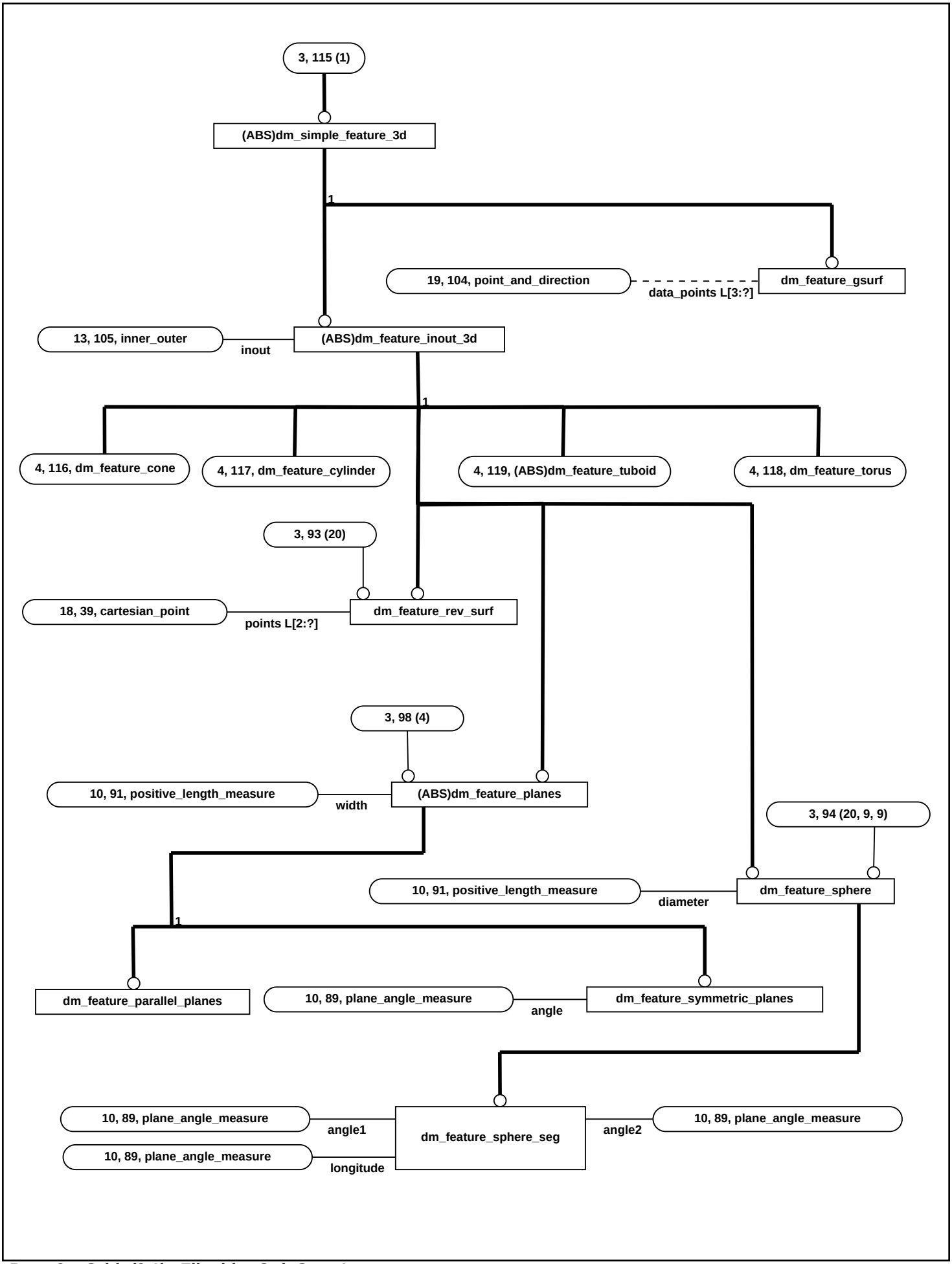
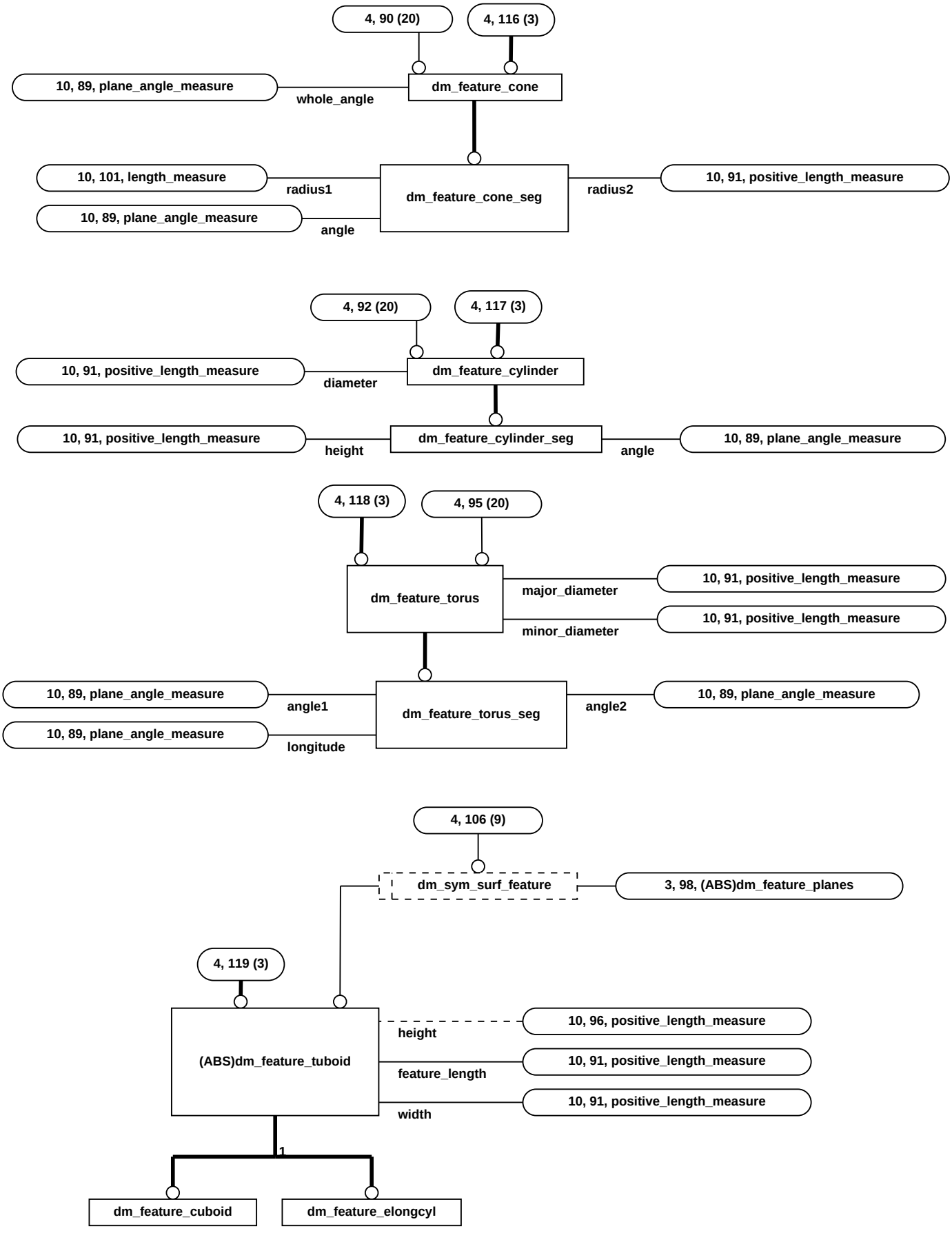
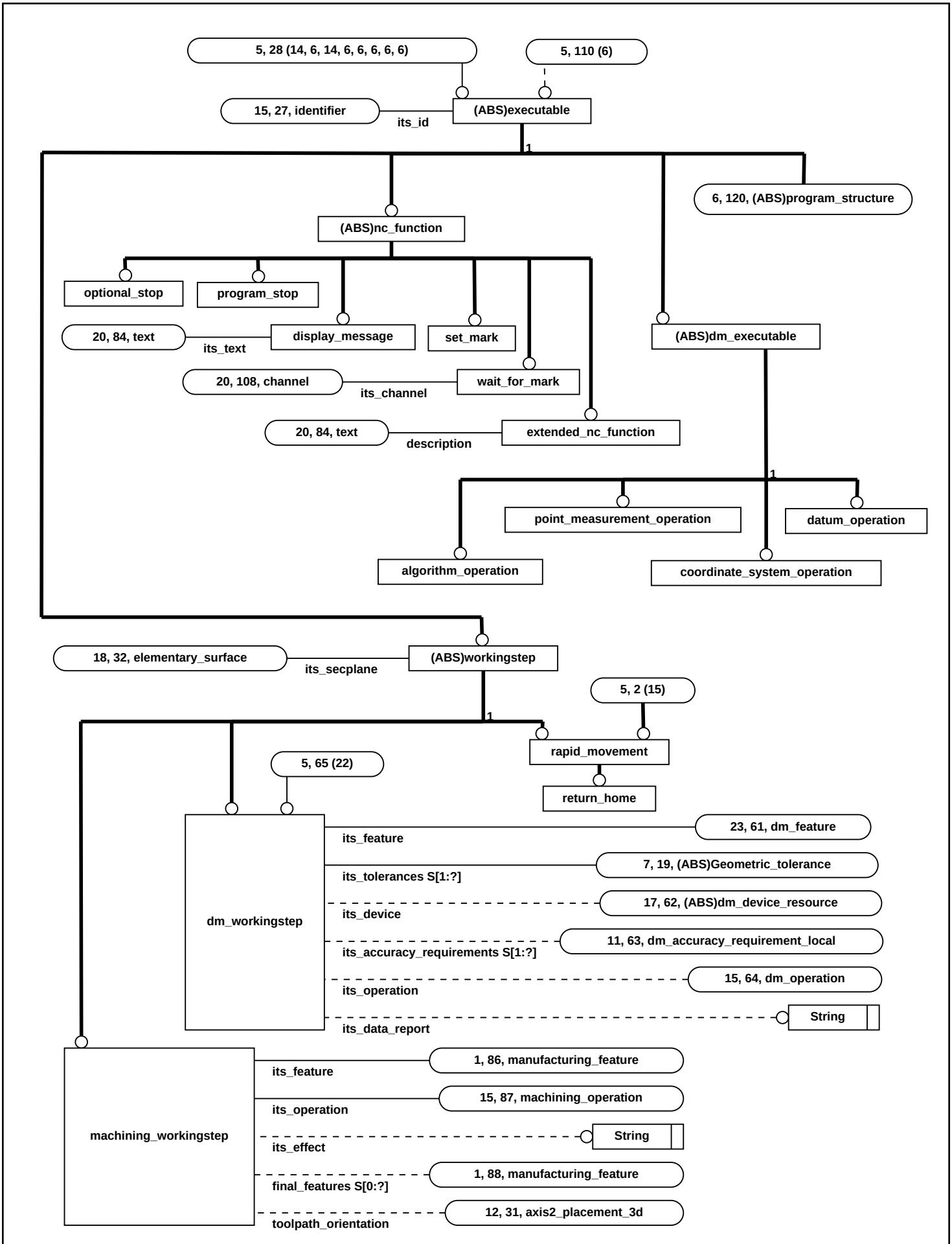
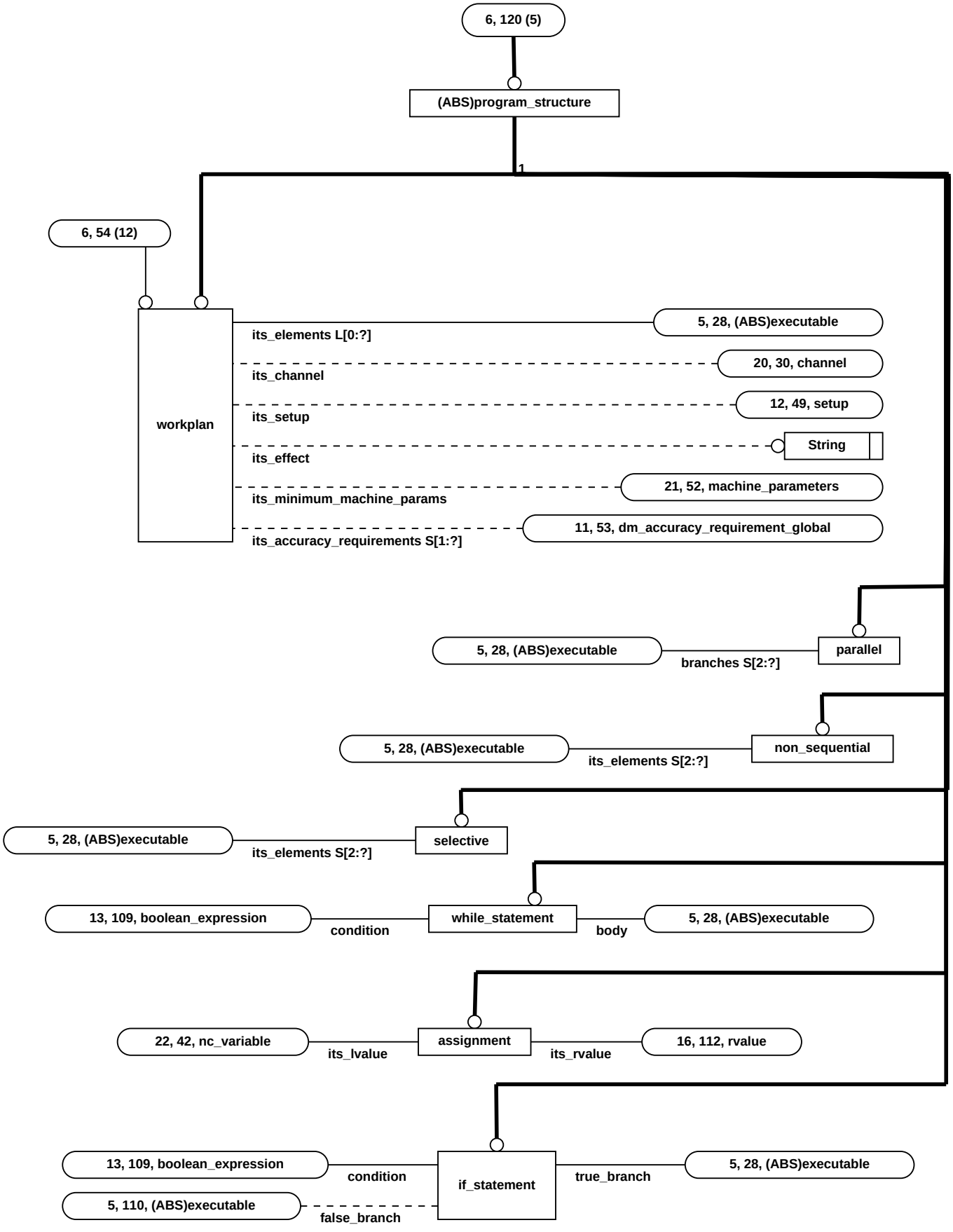

12, 41, axis2_placement_3d
placement
(ABS)feature
its_id
15, 27, identifier
1, 86 (5)
1, 88 (5)
1
manufacturing_feature
13, 40, workpiece
its_workpiece
(ABS)dm_simple_feature
explicit_representation S[1:?]
16, 59, explicit_item
1, 60 (23)
1
2, 114, (ABS)dm_simple_feature_2d
dm_feature_point
dm_feature_line
3, 115, (ABS)dm_simple_feature_3d
16, 102, direction
surface_normal_vector
dm_feature_edge_point
10, 101, length_measure
end_point_distance
dm_feature_line_bound

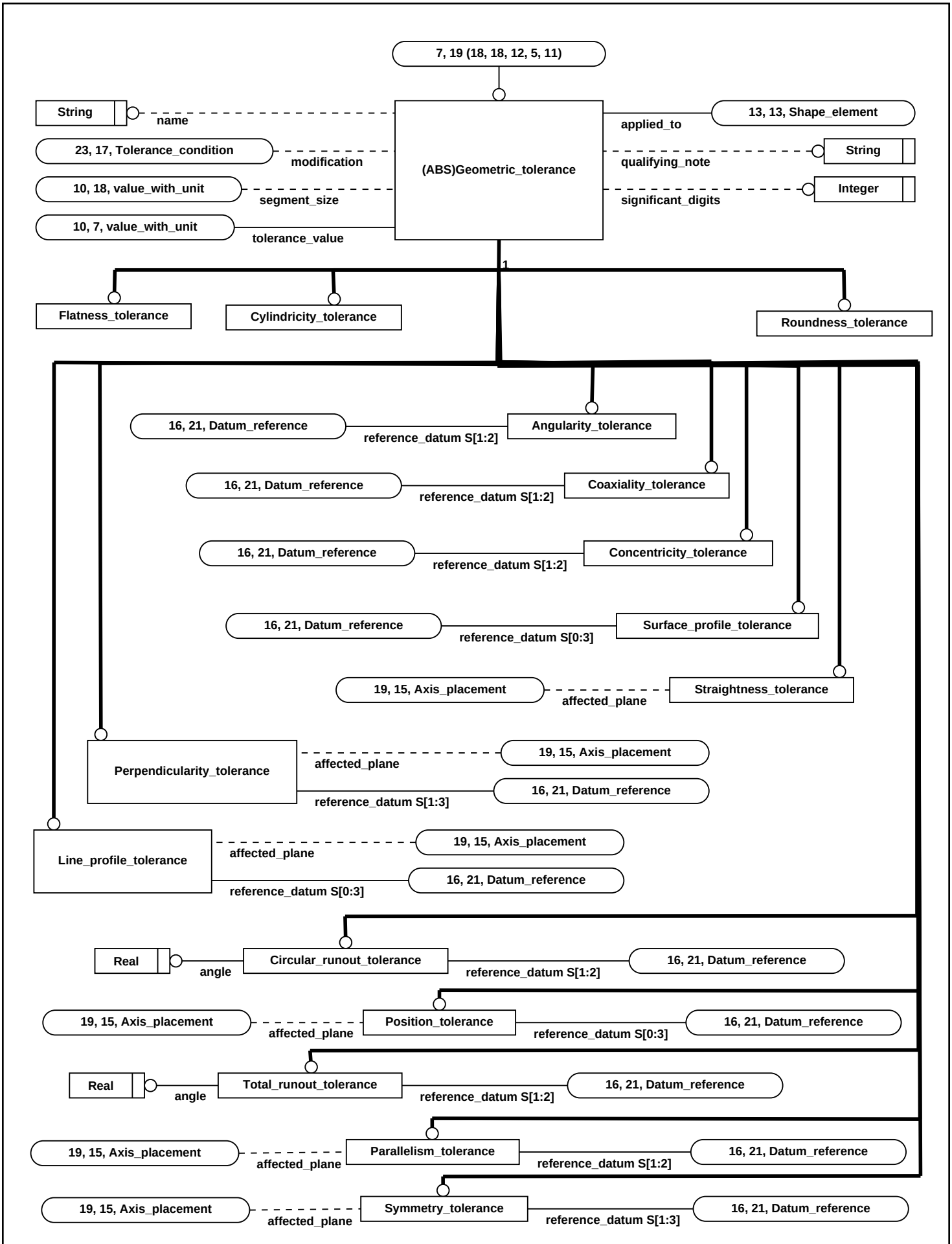

2, 100 (9)
2, 114 (1)
(ABS)dm_simple_feature_2d
1
dm_feature_plane
18, 39, cartesian_point
point_on_plane
dm_feature_gcurve
data_points L[2:?]
18, 103, cartesian_point
13, 105, inner_outer
inout
(ABS)dm_feature_inout_2d
1
10, 91, positive_length_measure
diameter
dm_feature_circle
dm_feature_ellipse
major_diameter
10, 91, positive_length_measure
minor_diameter
10, 91, positive_length_measure
(ABS)dm_feature_c_par_line
feature_length
10, 91, positive_length_measure
width
10, 91, positive_length_measure
1
dm_feature_c_par_line_flat
dm_feature_c_par_line_round
10, 89, plane_angle_measure
angle
dm_feature_arc
radius
10, 91, positive_length_measure

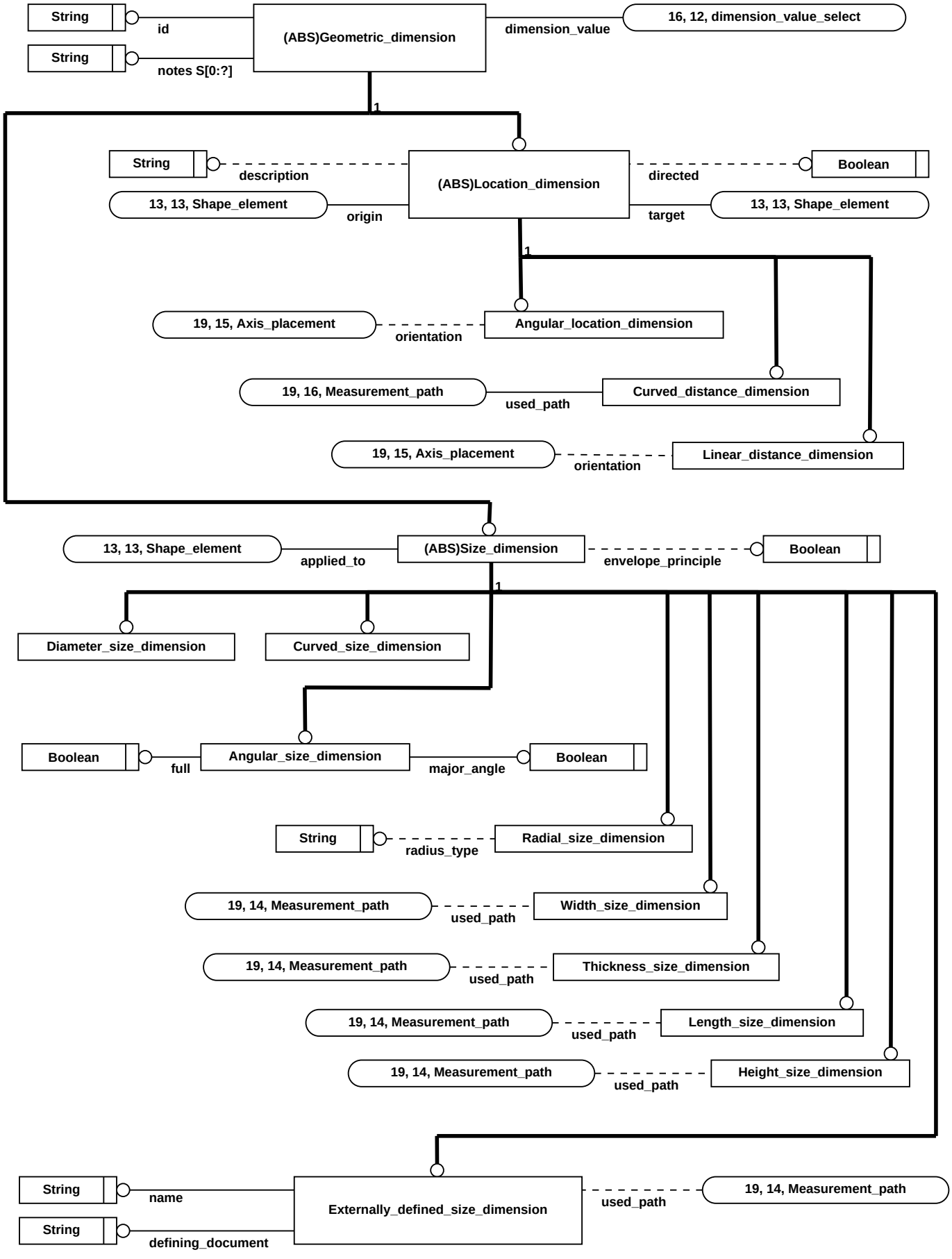

3, 115 (1)
(ABS)dm_simple_feature_3d
1
19, 104, point_and_direction
data_points L[3:?]
dm_feature_gsurf
13, 105, inner_outer
inout
(ABS)dm_feature_inout_3d
1
4, 116, dm_feature_cone
4, 117, dm_feature_cylinder
4, 119, (ABS)dm_feature_tuboid
4, 118, dm_feature_torus
3, 93 (20)
18, 39, cartesian_point
points L[2:?]
dm_feature_rev_surf
3, 98 (4)
10, 91, positive_length_measure
width
(ABS)dm_feature_planes
3, 94 (20, 9, 9)
10, 91, positive_length_measure
diameter
dm_feature_sphere
1
dm_feature_parallel_planes
10, 89, plane_angle_measure
angle
dm_feature_symmetric_planes
10, 89, plane_angle_measure
angle1
10, 89, plane_angle_measure
longitude
dm_feature_sphere_seg
angle2
10, 89, plane_angle_measure

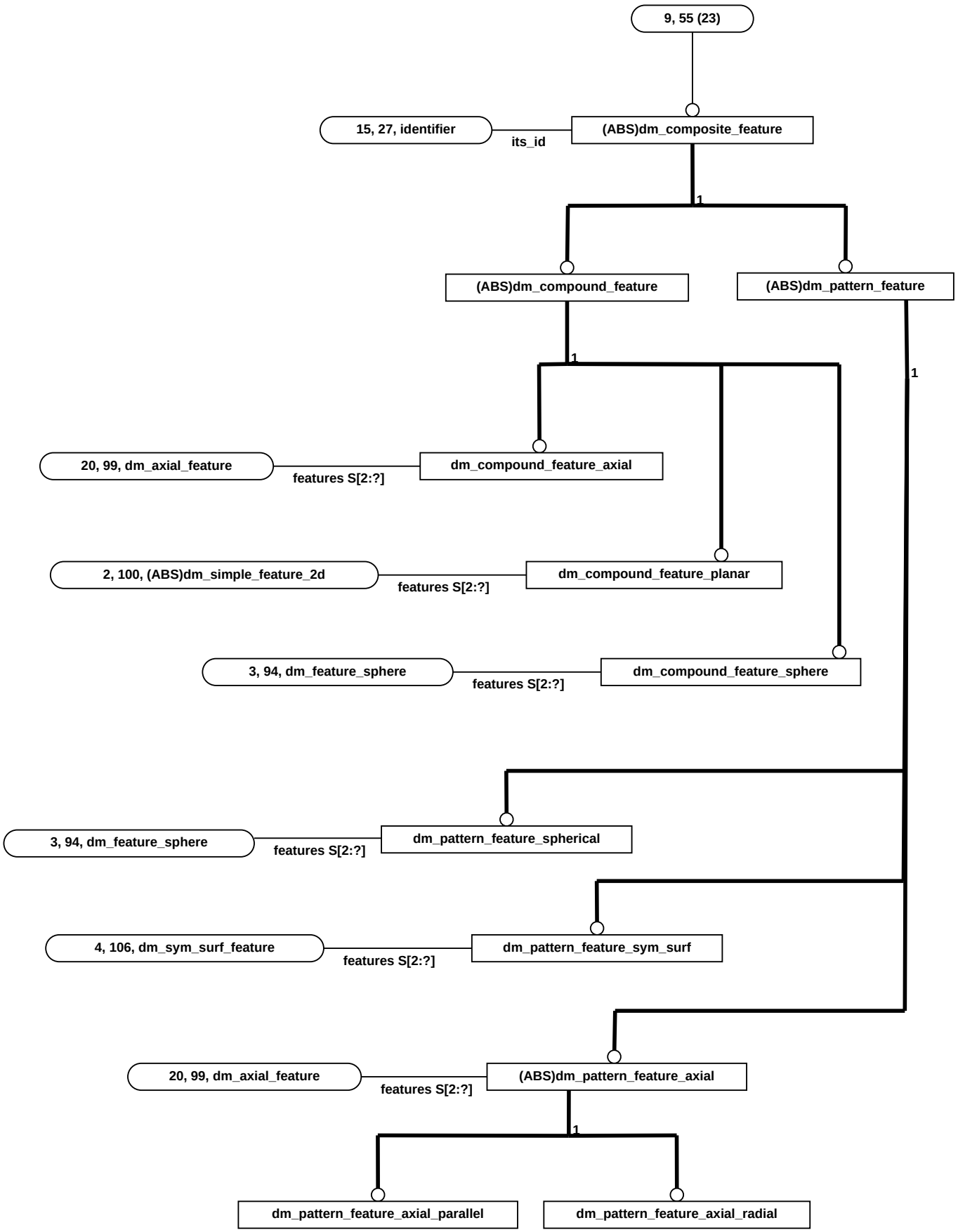

4, 90 (20)
4, 116 (3)
10, 89, plane_angle_measure
whole_angle
dm_feature_cone
10, 101, length_measure
radius1
dm_feature_cone_seg
radius2
10, 91, positive_length_measure
10, 89, plane_angle_measure
angle
4, 92 (20)
4, 117 (3)
10, 91, positive_length_measure
diameter
dm_feature_cylinder
10, 91, positive_length_measure
height
dm_feature_cylinder_seg
angle
10, 89, plane_angle_measure
4, 118 (3)
4, 95 (20)
dm_feature_torus
major_diameter
10, 91, positive_length_measure
minor_diameter
10, 91, positive_length_measure
10, 89, plane_angle_measure
angle1
dm_feature_torus_seg
angle2
10, 89, plane_angle_measure
10, 89, plane_angle_measure
longitude
4, 106 (9)
dm_sym_surf_feature
3, 98, (ABS)dm_feature_planes
4, 119 (3)
(ABS)dm_feature_tuboid
height
10, 96, positive_length_measure
feature_length
10, 91, positive_length_measure
width
10, 91, positive_length_measure
1
dm_feature_cuboid
dm_feature_elongcyl

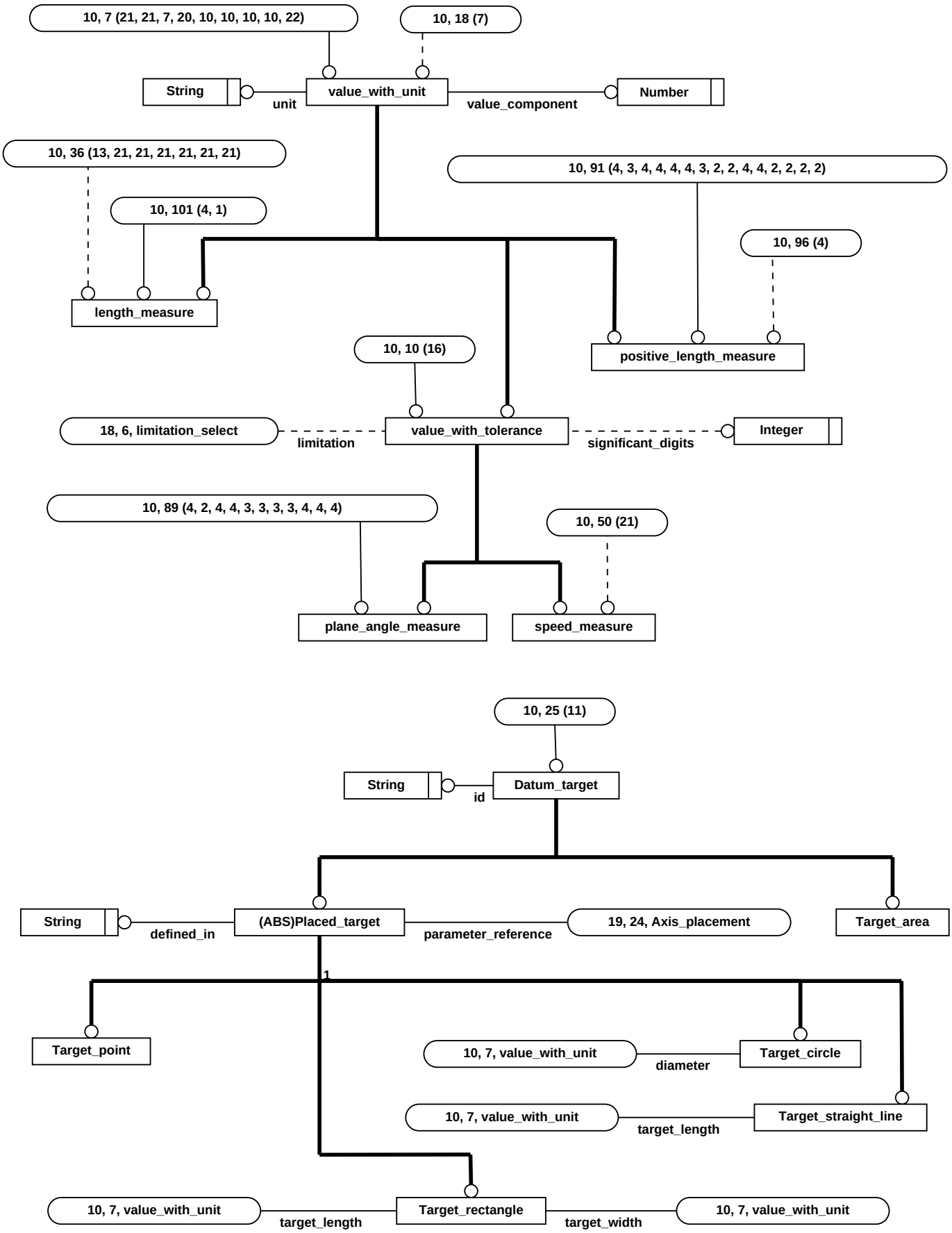

5, 28 (14, 6, 14, 6, 6, 6, 6, 6)
5, 110 (6)
15, 27, identifier
its_id
(ABS)executable
1
6, 120, (ABS)program_structure
(ABS)nc_function
optional_stop
program_stop
20, 84, text
its_text
display_message
set_mark
(ABS)dm_executable
20, 108, channel
its_channel
wait_for_mark
20, 84, text
description
extended_nc_function
1
point_measurement_operation
datum_operation
algorithm_operation
coordinate_system_operation
18, 32, elementary_surface
its_secplane
(ABS)workingstep
5, 2 (15)
1
rapid_movement
return_home
5, 65 (22)
dm_workingstep
its_feature
23, 61, dm_feature
its_tolerances S[1:?]
7, 19, (ABS)Geometric_tolerance
its_device
17, 62, (ABS)dm_device_resource
its_accuracy_requirements S[1:?]
11, 63, dm_accuracy_requirement_local
its_operation
15, 64, dm_operation
its_data_report
String
machining_workingstep
its_feature
1, 86, manufacturing_feature
its_operation
15, 87, machining_operation
its_effect
String
final_features S[0:?]
1, 88, manufacturing_feature
toolpath_orientation
12, 31, axis2_placement_3d

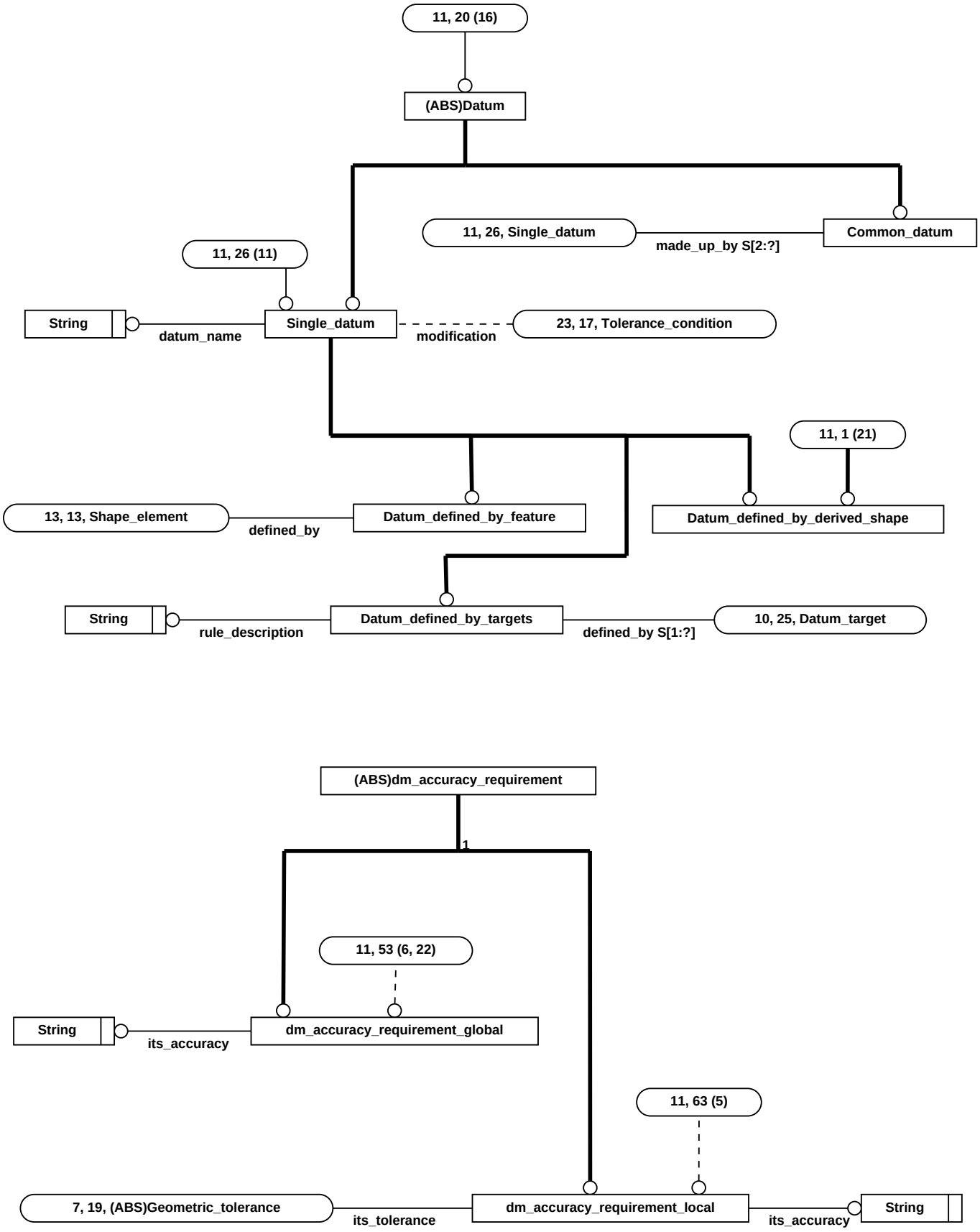

6, 120 (5)
(ABS)program_structure
1
6, 54 (12)
workplan
its_elements L[0:?]
5, 28, (ABS)executable
its_channel
20, 30, channel
its_setup
12, 49, setup
its_effect
String
its_minimum_machine_params
21, 52, machine_parameters
its_accuracy_requirements S[1:?]
11, 53, dm_accuracy_requirement_global
5, 28, (ABS)executable
branches S[2:?]
parallel
5, 28, (ABS)executable
its_elements S[2:?]
non_sequential
5, 28, (ABS)executable
its_elements S[2:?]
selective
13, 109, boolean_expression
condition
while_statement
body
5, 28, (ABS)executable
22, 42, nc_variable
its_lvalue
assignment
its_rvalue
16, 112, rvalue
13, 109, boolean_expression
condition
5, 110, (ABS)executable
false_branch
if_statement
true_branch
5, 28, (ABS)executable

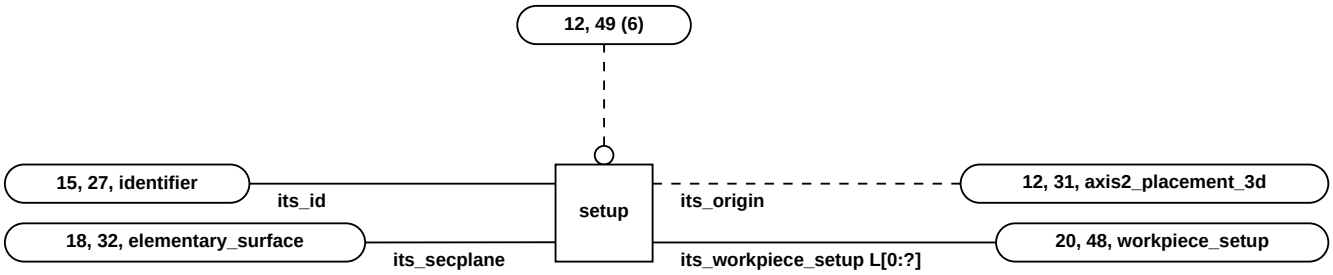

7, 19 (18, 18, 12, 5, 11)
String
name
(ABS)Geometric_tolerance
13, 13, Shape_element
applied_to
23, 17, Tolerance_condition
modification
qualifying_note
String
10, 18, value_with_unit
segment_size
significant_digits
Integer
10, 7, value_with_unit
tolerance_value
1
Flatness_tolerance
Cylindricity_tolerance
Roundness_tolerance
16, 21, Datum_reference
reference_datum S[1:2]
Angularity_tolerance
16, 21, Datum_reference
reference_datum S[1:2]
Coaxiality_tolerance
16, 21, Datum_reference
reference_datum S[1:2]
Concentricity_tolerance
16, 21, Datum_reference
reference_datum S[0:3]
Surface_profile_tolerance
19, 15, Axis_placement
affected_plane
Straightness_tolerance
Perpendicularity_tolerance
affected_plane
19, 15, Axis_placement
reference_datum S[1:3]
16, 21, Datum_reference
Line_profile_tolerance
affected_plane
19, 15, Axis_placement
reference_datum S[0:3]
16, 21, Datum_reference
Real
angle
Circular_runout_tolerance
reference_datum S[1:2]
16, 21, Datum_reference
19, 15, Axis_placement
affected_plane
Position_tolerance
reference_datum S[0:3]
16, 21, Datum_reference
Real
angle
Total_runout_tolerance
reference_datum S[1:2]
16, 21, Datum_reference
19, 15, Axis_placement
affected_plane
Parallelism_tolerance
reference_datum S[1:2]
16, 21, Datum_reference
19, 15, Axis_placement
affected_plane
Symmetry_tolerance
reference_datum S[1:3]
16, 21, Datum_reference

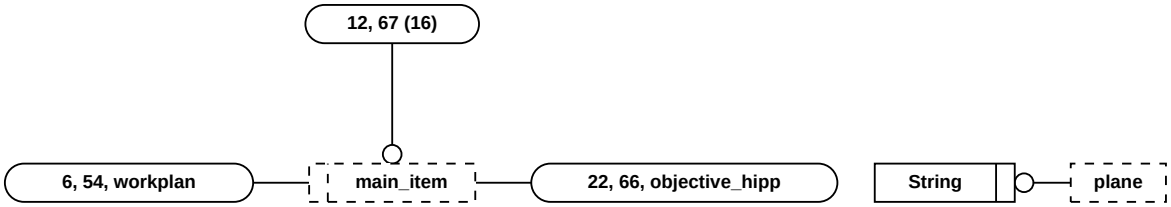

String
id
String
notes S[0:?]
(ABS)Geometric_dimension
dimension_value
16, 12, dimension_value_select
1
String
description
(ABS)Location_dimension
directed
Boolean
13, 13, Shape_element
origin
target
13, 13, Shape_element
1
19, 15, Axis_placement
orientation
Angular_location_dimension
19, 16, Measurement_path
used_path
Curved_distance_dimension
19, 15, Axis_placement
orientation
Linear_distance_dimension
13, 13, Shape_element
applied_to
(ABS)Size_dimension
envelope_principle
Boolean
1
Diameter_size_dimension
Curved_size_dimension
Boolean
full
Angular_size_dimension
major_angle
Boolean
String
radius_type
Radial_size_dimension
19, 14, Measurement_path
used_path
Width_size_dimension
19, 14, Measurement_path
used_path
Thickness_size_dimension
19, 14, Measurement_path
used_path
Length_size_dimension
19, 14, Measurement_path
used_path
Height_size_dimension
String
name
String
defining_document
Externally_defined_size_dimension
used_path
19, 14, Measurement_path

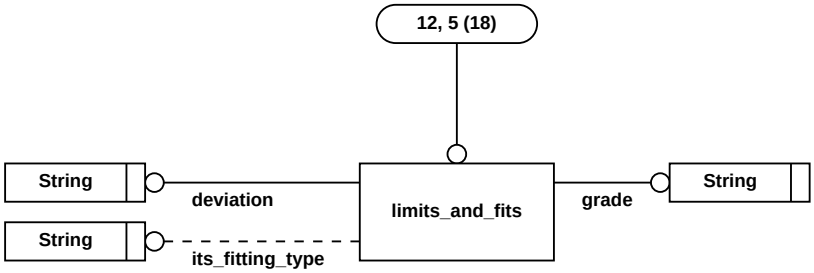

9, 55 (23)
15, 27, identifier
its_id
(ABS)dm_composite_feature
1
(ABS)dm_compound_feature
(ABS)dm_pattern_feature
1
1
20, 99, dm_axial_feature
features S[2:?]
dm_compound_feature_axial
2, 100, (ABS)dm_simple_feature_2d
features S[2:?]
dm_compound_feature_planar
3, 94, dm_feature_sphere
features S[2:?]
dm_compound_feature_sphere
3, 94, dm_feature_sphere
features S[2:?]
dm_pattern_feature_spherical
4, 106, dm_sym_surf_feature
features S[2:?]
dm_pattern_feature_sym_surf
20, 99, dm_axial_feature
features S[2:?]
(ABS)dm_pattern_feature_axial
1
dm_pattern_feature_axial_parallel
dm_pattern_feature_axial_radial

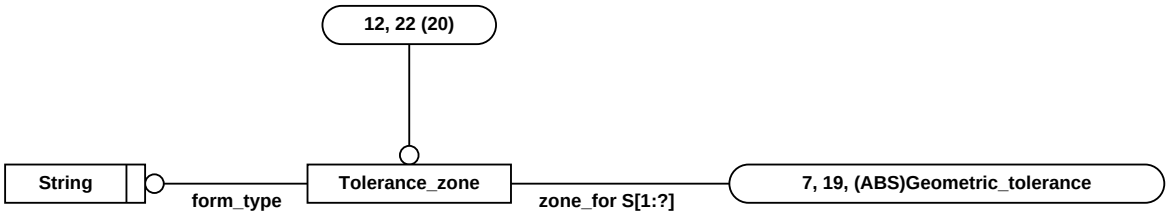

10, 7 (21, 21, 7, 20, 10, 10, 10, 10, 22)
10, 18 (7)
String
value_with_unit
Number
unit
value_component
10, 36 (13, 21, 21, 21, 21, 21, 21)
10, 91 (4, 3, 4, 4, 4, 4, 3, 2, 2, 4, 4, 2, 2, 2, 2)
10, 101 (4, 1)
10, 96 (4)
length_measure
positive_length_measure
10, 10 (16)
18, 6, limitation_select
value_with_tolerance
Integer
limitation
significant_digits
10, 89 (4, 2, 4, 4, 3, 3, 3, 3, 4, 4, 4)
10, 50 (21)
plane_angle_measure
speed_measure
10, 25 (11)
String
Datum_target
id
String
(ABS)Placed_target
19, 24, Axis_placement
Target_area
defined_in
parameter_reference
1
Target_point
10, 7, value_with_unit
Target_circle
diameter
10, 7, value_with_unit
Target_straight_line
target_length
10, 7, value_with_unit
Target_rectangle
10, 7, value_with_unit
target_length
target_width

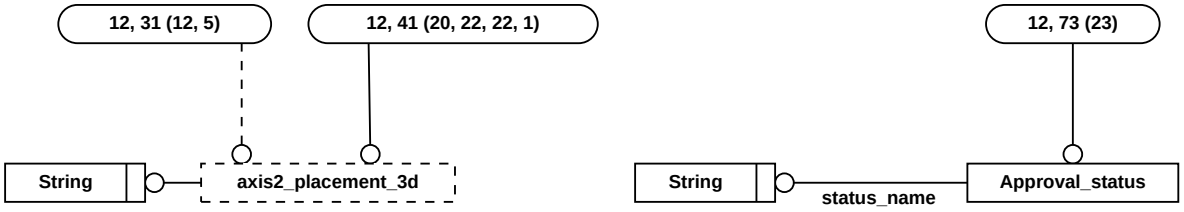

11, 20 (16)
(ABS)Datum
11, 26, Single_datum
made_up_by S[2:?]
Common_datum
11, 26 (11)
String
datum_name
Single_datum
modification
23, 17, Tolerance_condition
11, 1 (21)
13, 13, Shape_element
defined_by
Datum_defined_by_feature
Datum_defined_by_derived_shape
String
rule_description
Datum_defined_by_targets
defined_by S[1:?]
10, 25, Datum_target
(ABS)dm_accuracy_requirement
1
11, 53 (6, 22)
String
its_accuracy
dm_accuracy_requirement_global
11, 63 (5)
7, 19, (ABS)Geometric_tolerance
its_tolerance
dm_accuracy_requirement_local
its_accuracy
String

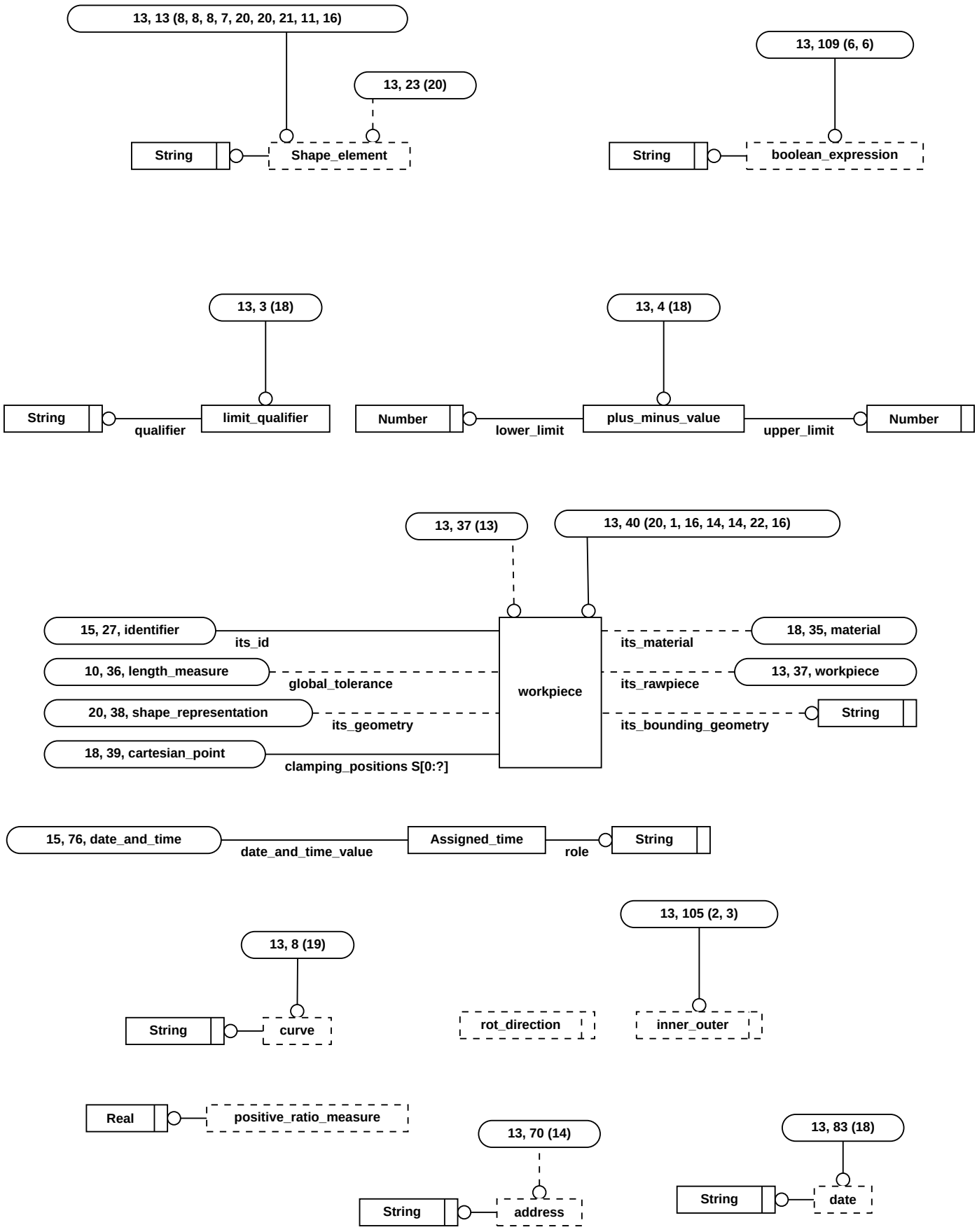

12, 49 (6)
15, 27, identifier
its_id
setup
its_origin
12, 31, axis2_placement_3d
18, 32, elementary_surface
its_secplane
its_workpiece_setup L[0:?]
20, 48, workpiece_setup

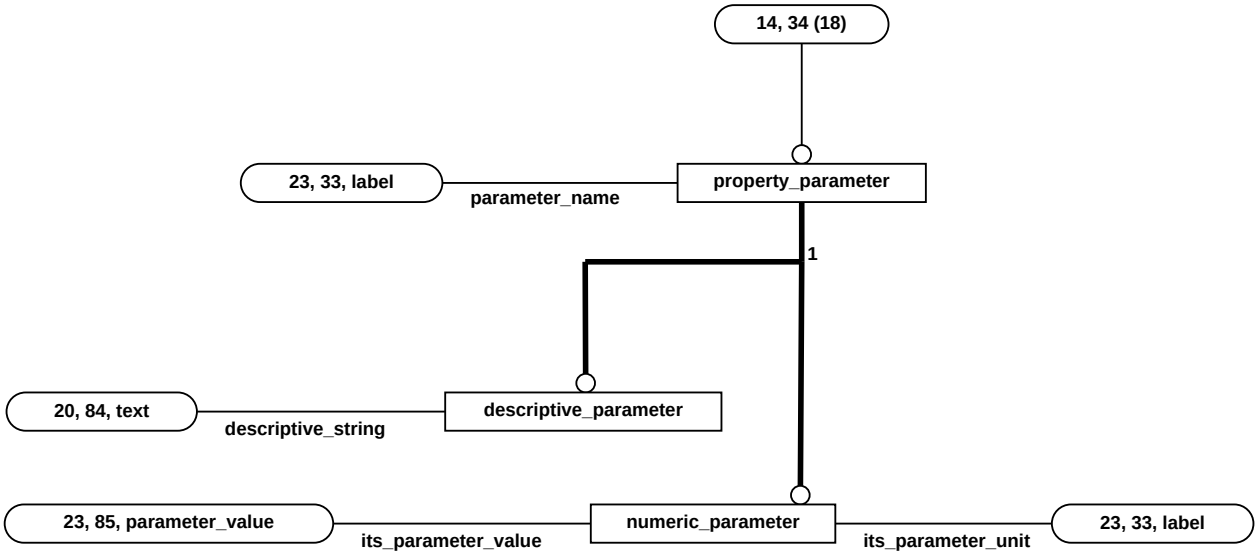

12, 67 (16)
6, 54, workplan
main_item
22, 66, objective_hipp
String
plane

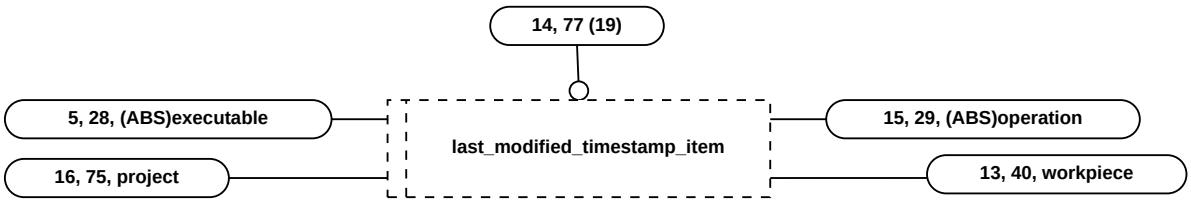

12, 5 (18)
String
deviation
limits_and_fits
grade
String
String
its_fitting_type

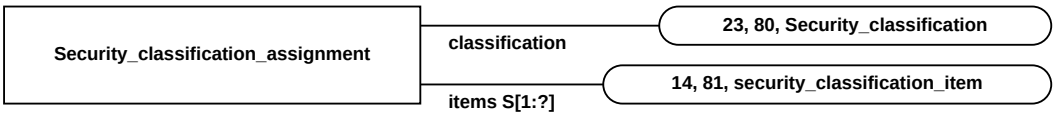

12, 22 (20)
String
form_type
Tolerance_zone
zone_for S[1:?]
7, 19, (ABS)Geometric_tolerance

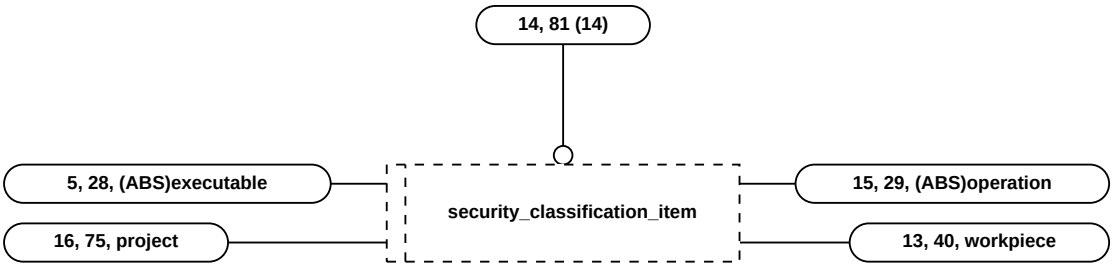

12, 31 (12, 5)
12, 41 (20, 22, 22, 1)
12, 73 (23)
String
axis2_placement_3d
String
status_name
Approval_status

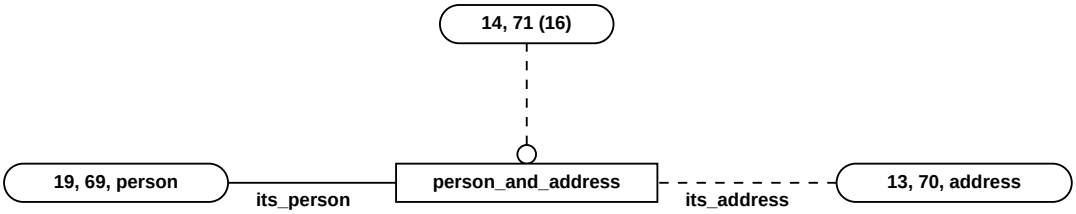

13, 13 (8, 8, 8, 7, 20, 20, 21, 11, 16)
13, 23 (20)
String
Shape_element
13, 109 (6, 6)
String
boolean_expression
13, 3 (18)
String
qualifier
limit_qualifier
13, 4 (18)
Number
lower_limit
plus_minus_value
upper_limit
Number
13, 37 (13)
13, 40 (20, 1, 16, 14, 14, 22, 16)
15, 27, identifier
its_id
10, 36, length_measure
global_tolerance
20, 38, shape_representation
its_geometry
18, 39, cartesian_point
clamping_positions S[0:?]
workpiece
its_material
18, 35, material
its_rawpiece
13, 37, workpiece
its_bounding_geometry
String
15, 76, date_and_time
date_and_time_value
Assigned_time
role
String
13, 105 (2, 3)
13, 8 (19)
String
curve
rot_direction
inner_outer
Real
positive_ratio_measure
13, 70 (14)
String
address
13, 83 (18)
String
date

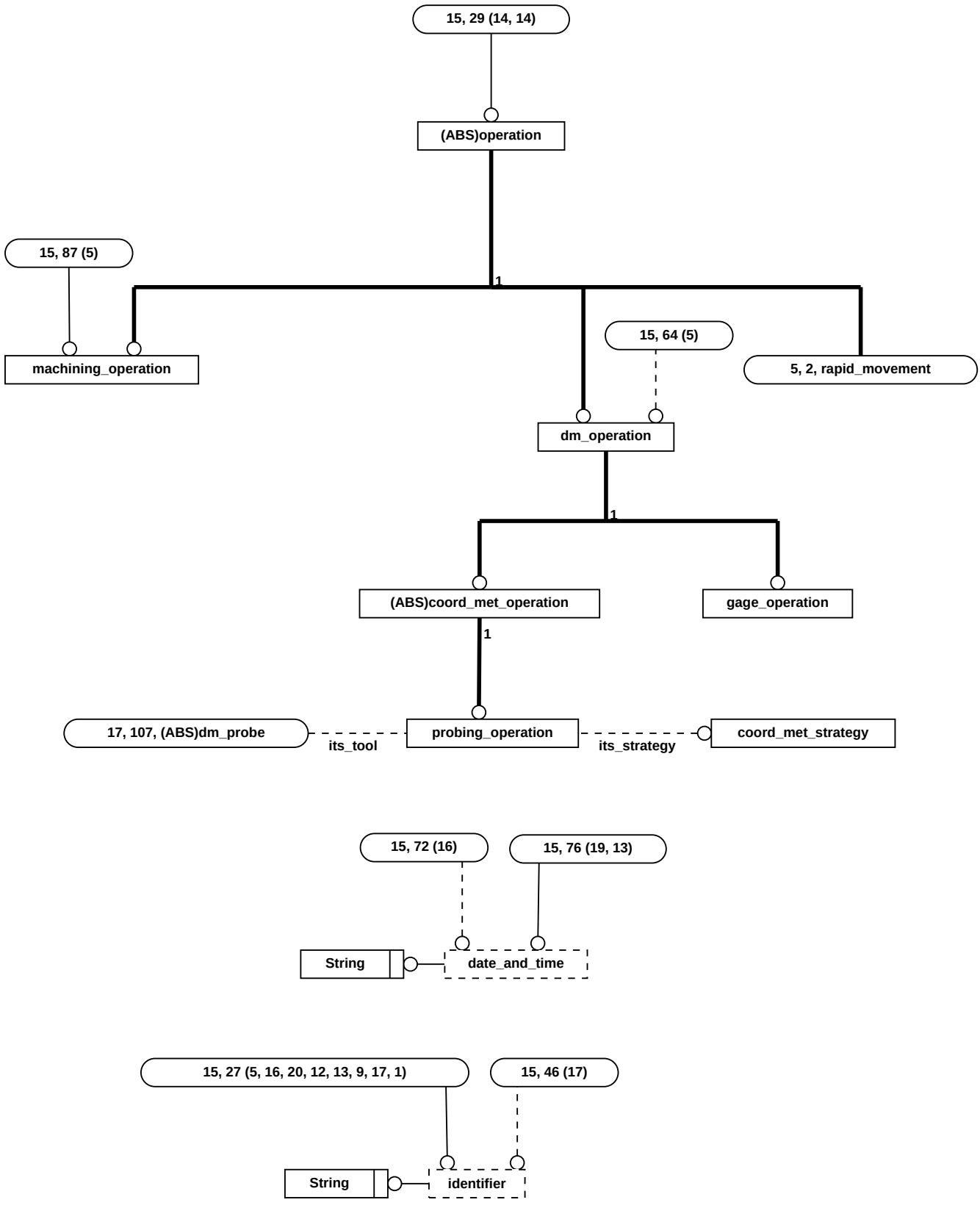

14, 34 (18)
23, 33, label
parameter_name
property_parameter
1
20, 84, text
descriptive_string
descriptive_parameter
23, 85, parameter_value
its_parameter_value
numeric_parameter
its_parameter_unit
23, 33, label

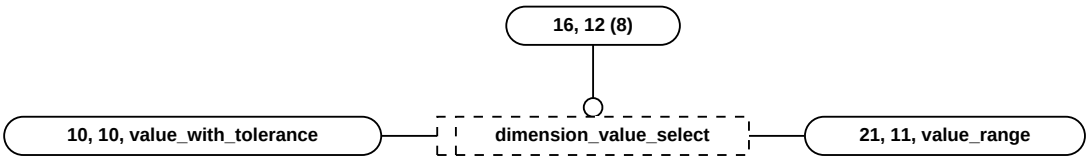

14, 77 (19)
5, 28, (ABS)executable
16, 75, project
last_modified_timestamp_item
15, 29, (ABS)operation
13, 40, workpiece

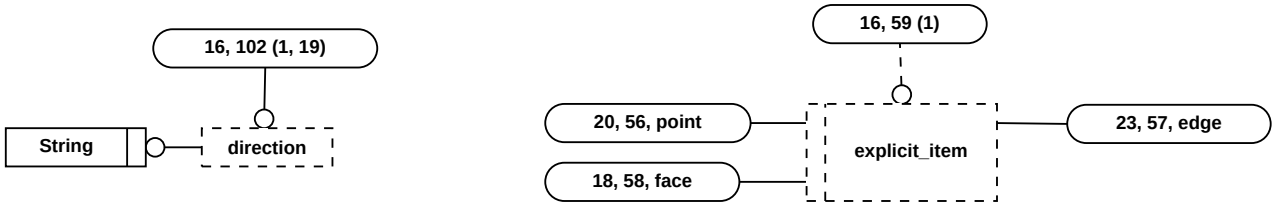

Security_classification_assignment
classification
23, 80, Security_classification
items S[1:?]
14, 81, security_classification_item

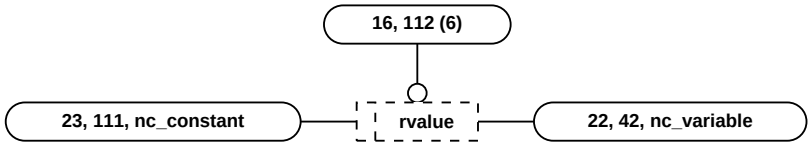

14, 81 (14)
5, 28, (ABS)executable
16, 75, project
security_classification_item
15, 29, (ABS)operation
13, 40, workpiece

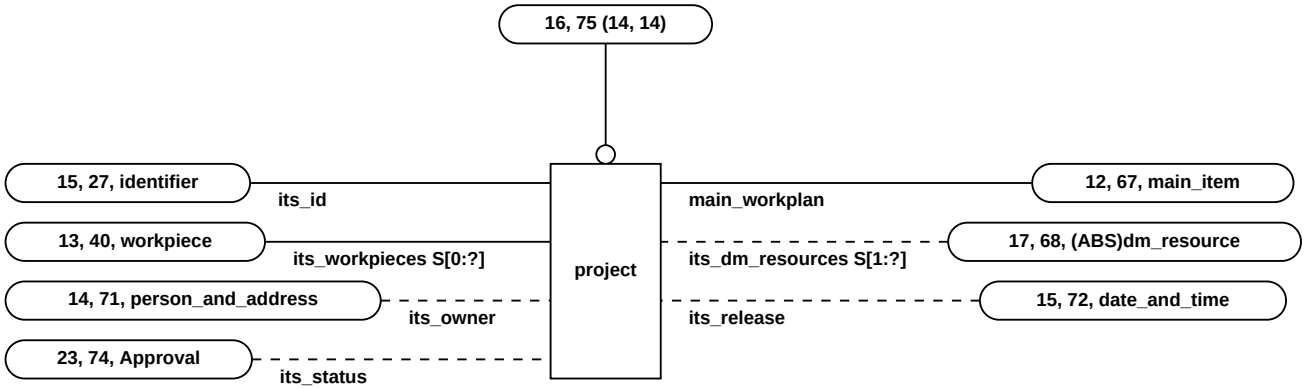

14, 71 (16)
19, 69, person
its_person
person_and_address
its_address
13, 70, address

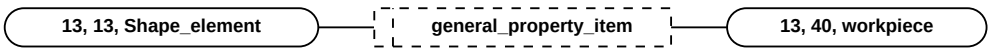

15, 29 (14, 14)
(ABS)operation
15, 87 (5)
1
machining_operation
15, 64 (5)
5, 2, rapid_movement
dm_operation
1
(ABS)coord_met_operation
gage_operation
1
17, 107, (ABS)dm_probe
its_tool
probing_operation
its_strategy
coord_met_strategy
15, 72 (16)
15, 76 (19, 13)
String
date_and_time
15, 27 (5, 16, 20, 12, 13, 9, 17, 1)
15, 46 (17)
String
identifier

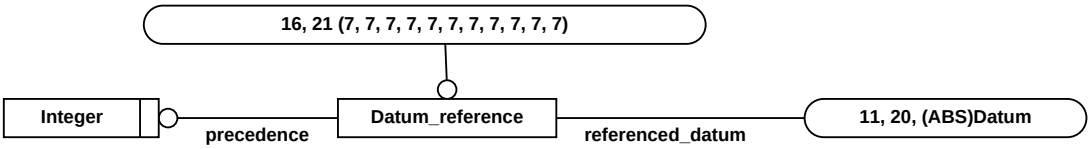

16, 12 (8)
10, 10, value_with_tolerance
dimension_value_select
21, 11, value_range

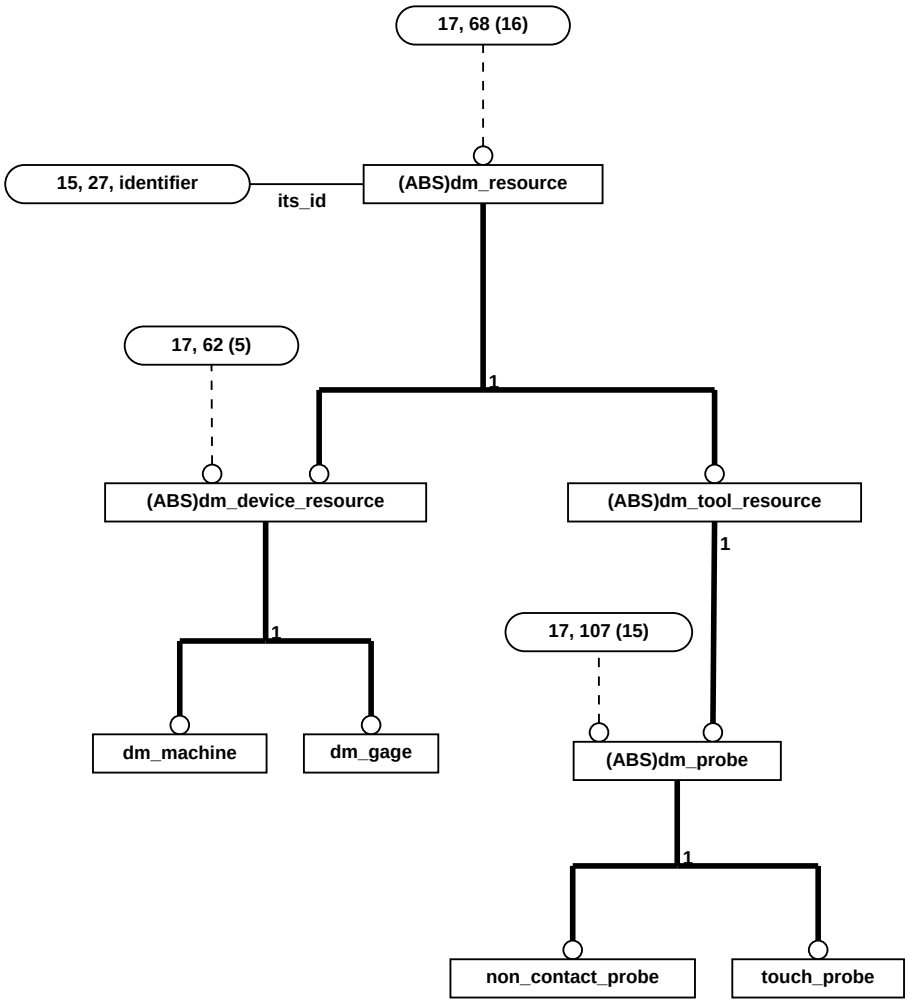

16, 102 (1, 19)
String
direction
16, 59 (1)
20, 56, point
18, 58, face
explicit_item
23, 57, edge

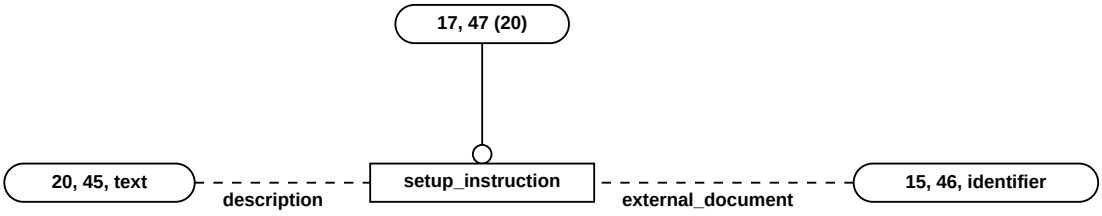

16, 112 (6)
23, 111, nc_constant
rvalue
22, 42, nc_variable

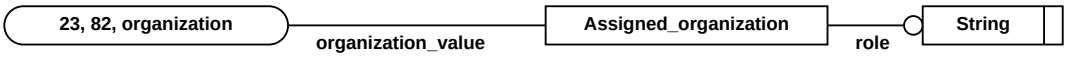

16, 75 (14, 14)
15, 27, identifier
its_id
13, 40, workpiece
its_workpieces S[0:?]
14, 71, person_and_address
its_owner
23, 74, Approval
its_status
project
main_workplan
its_dm_resources S[1:?]
its_release
12, 67, main_item
17, 68, (ABS)dm_resource
15, 72, date_and_time

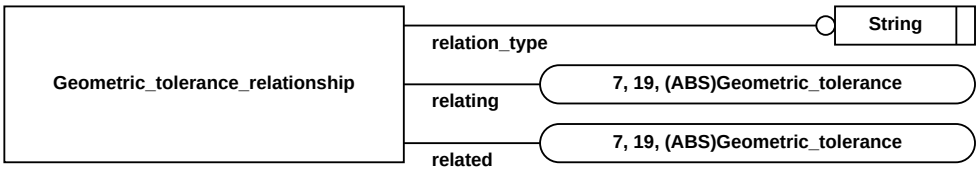

13, 13, Shape_element
general_property_item
13, 40, workpiece

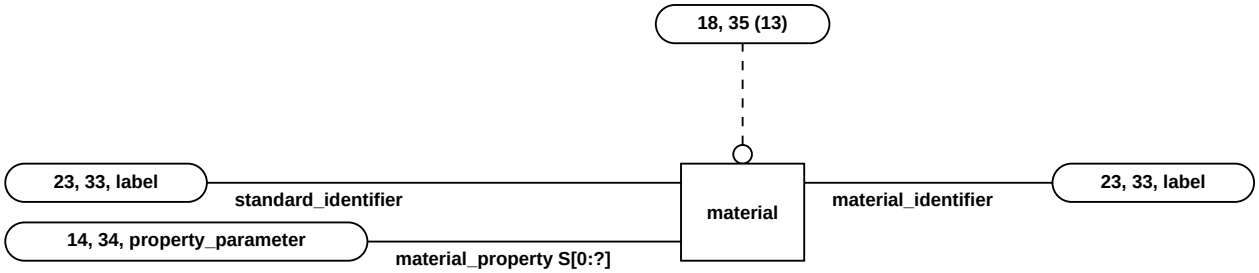

16, 21 (7, 7, 7, 7, 7, 7, 7, 7, 7, 7, 7)
Integer
precedence
Datum_reference
referenced_datum
11, 20, (ABS)Datum

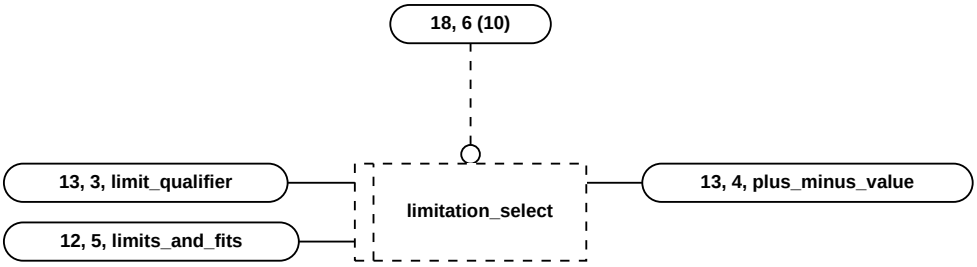

17, 68 (16)
15, 27, identifier
its_id
(ABS)dm_resource
17, 62 (5)
1
(ABS)dm_device_resource
(ABS)dm_tool_resource
1
1
17, 107 (15)
dm_machine
dm_gage
(ABS)dm_probe
1
non_contact_probe
touch_probe

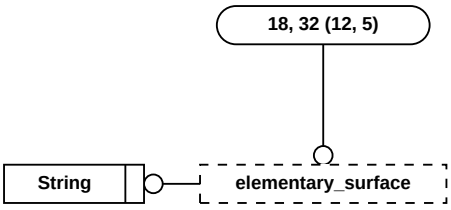

17, 47 (20)
20, 45, text
description
setup_instruction
external_document
15, 46, identifier

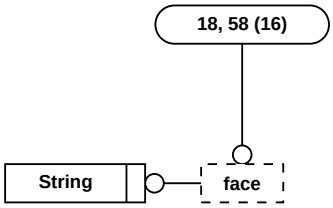

23, 82, organization
organization_value
Assigned_organization
role
String

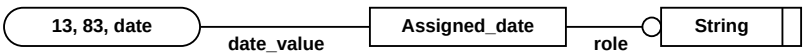

Geometric_tolerance_relationship
relation_type
String
relating
7, 19, (ABS)Geometric_tolerance
related
7, 19, (ABS)Geometric_tolerance

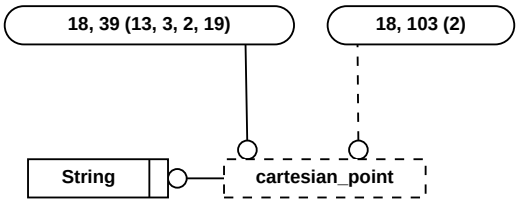

18, 35 (13)
23, 33, label
standard_identifier
material
material_identifier
23, 33, label
14, 34, property_parameter
material_property S[0:?]

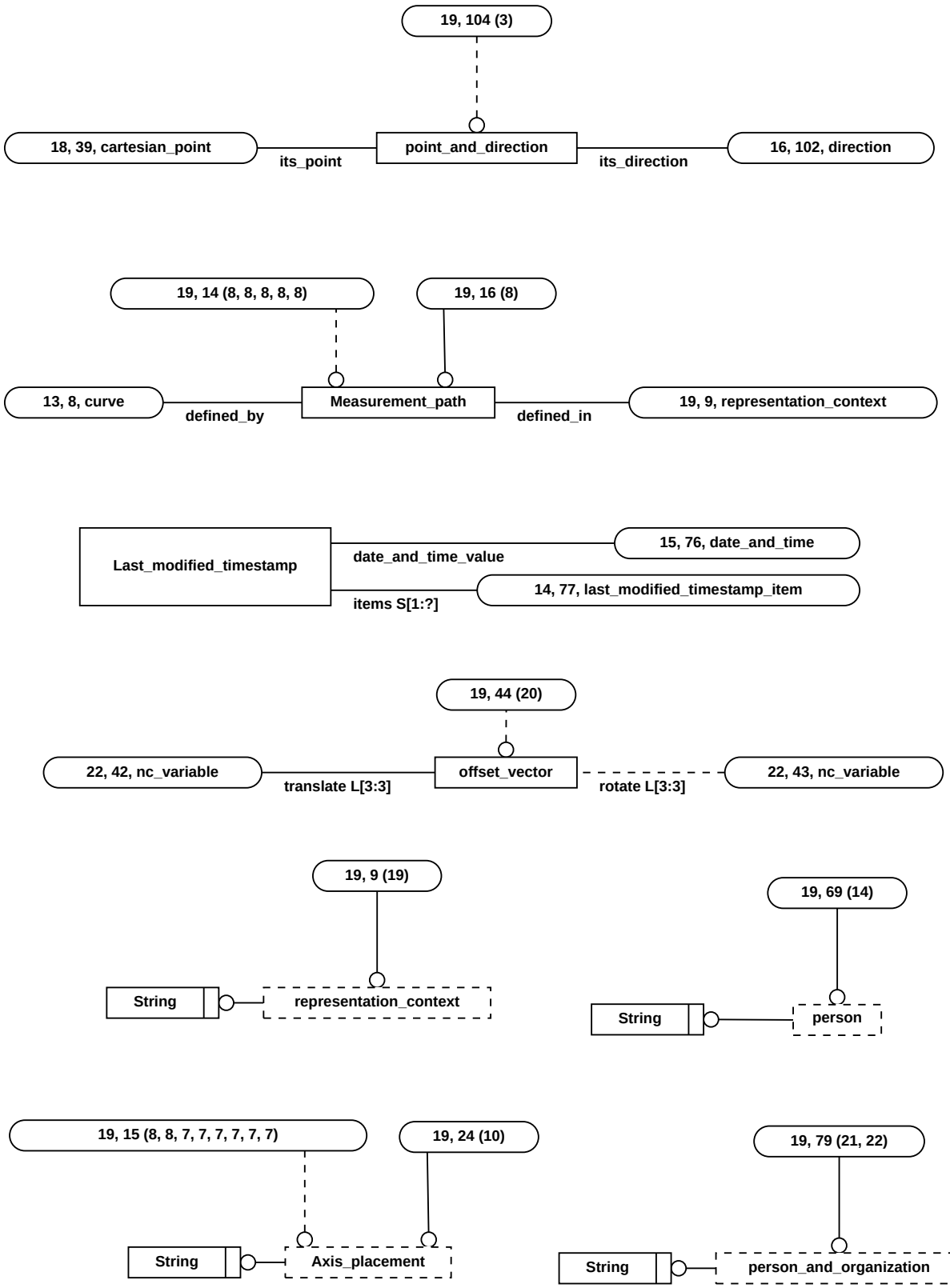

18, 6 (10)
13, 3, limit_qualifier
limitation_select
13, 4, plus_minus_value
12, 5, limits_and_fits

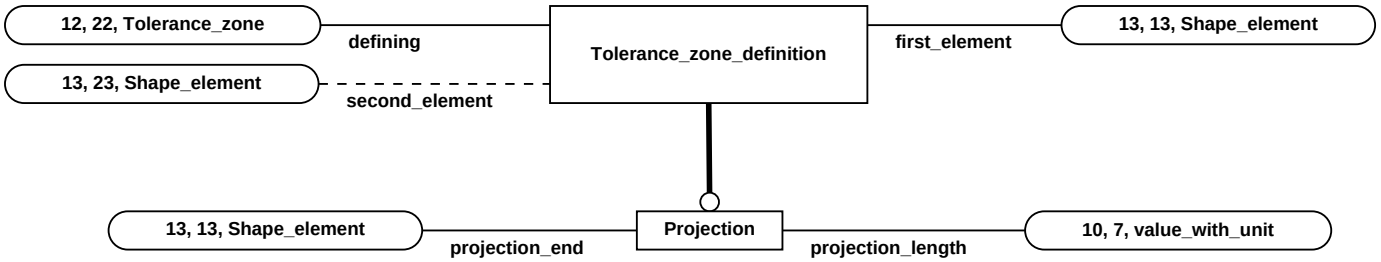

18, 32 (12, 5)
String
elementary_surface

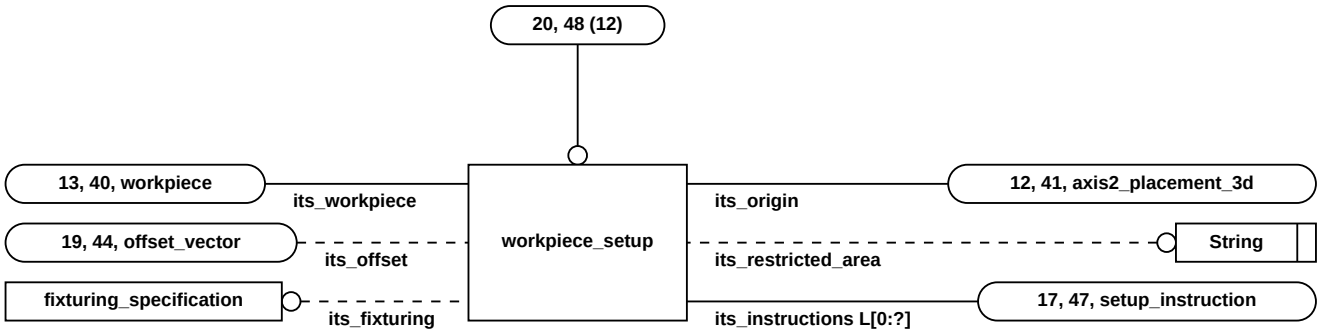

18, 58 (16)
String
face

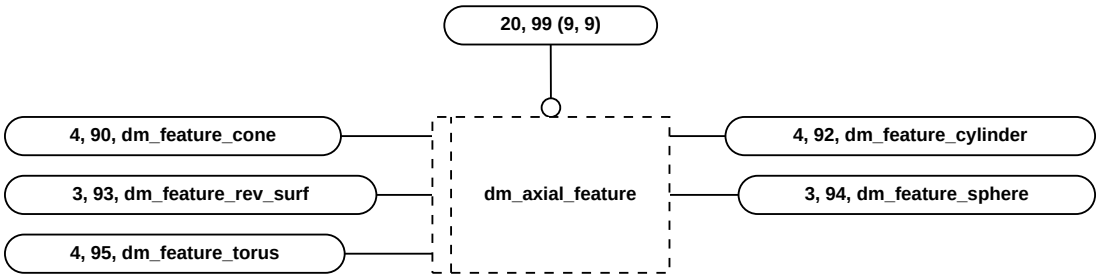

13, 83, date
date_value
Assigned_date
role
String

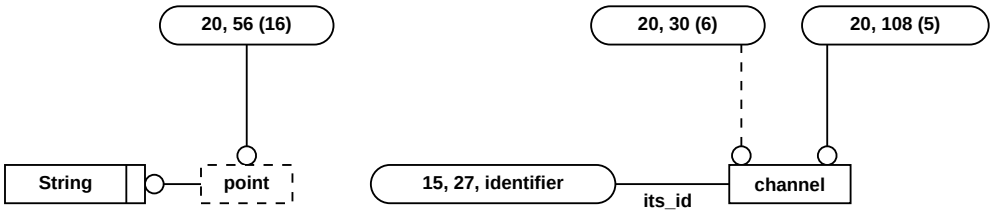

18, 39 (13, 3, 2, 19)
18, 103 (2)
String
cartesian_point

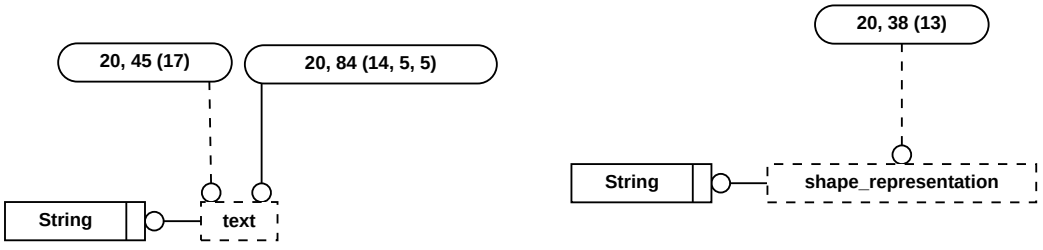

19, 104 (3)
18, 39, cartesian_point
its_point
point_and_direction
its_direction
16, 102, direction
19, 14 (8, 8, 8, 8, 8)
19, 16 (8)
13, 8, curve
defined_by
Measurement_path
defined_in
19, 9, representation_context
Last_modified_timestamp
date_and_time_value
15, 76, date_and_time
items S[1:?]
14, 77, last_modified_timestamp_item
19, 44 (20)
22, 42, nc_variable
translate L[3:3]
offset_vector
rotate L[3:3]
22, 43, nc_variable
19, 9 (19)
String
representation_context
19, 69 (14)
String
person
19, 15 (8, 8, 7, 7, 7, 7, 7, 7)
19, 24 (10)
String
Axis_placement
19, 79 (21, 22)
String
person_and_organization

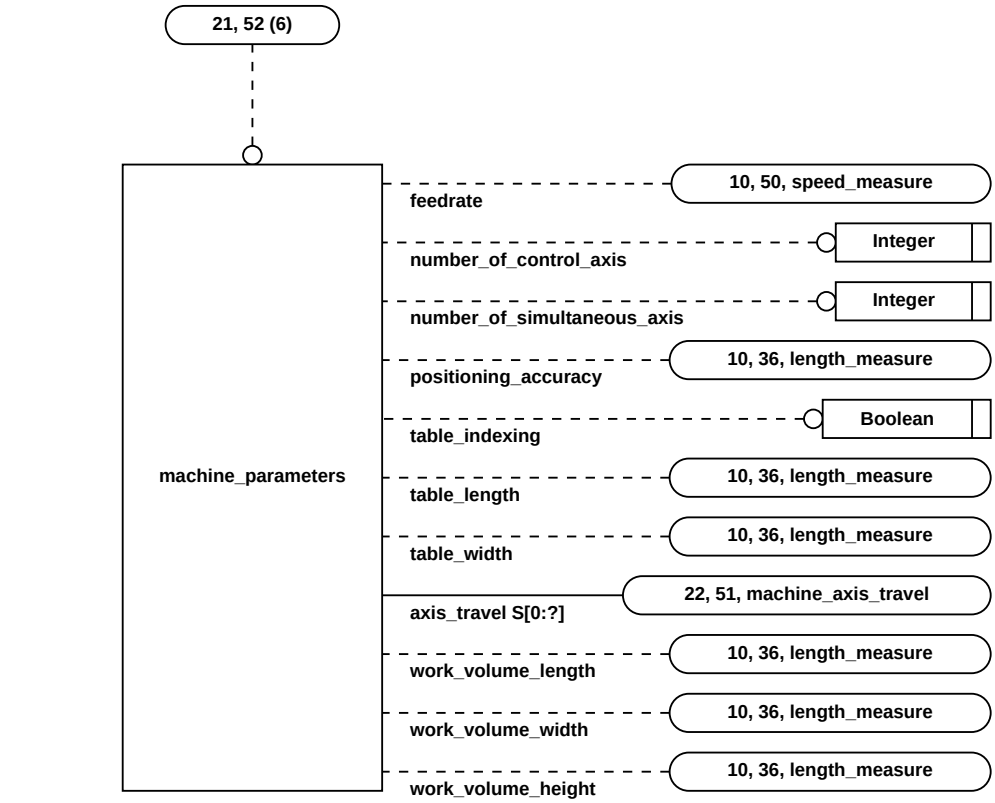

12, 22, Tolerance_zone
defining
13, 23, Shape_element
second_element
Tolerance_zone_definition
first_element
13, 13, Shape_element
13, 13, Shape_element
projection_end
Projection
projection_length
10, 7, value_with_unit

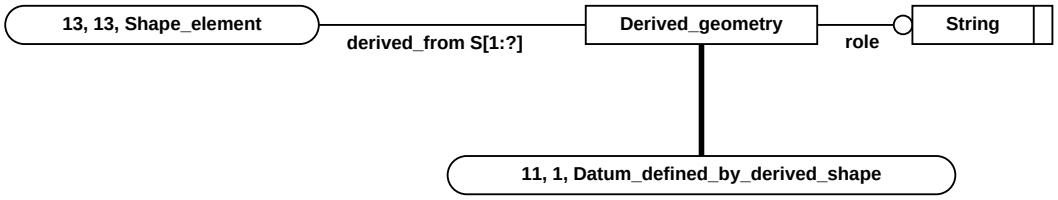

20, 48 (12)
13, 40, workpiece
its_workpiece
19, 44, offset_vector
its_offset
fixturing_specification
its_fixturing
workpiece_setup
its_origin
its_restricted_area
its_instructions L[0:?]
12, 41, axis2_placement_3d
String
17, 47, setup_instruction

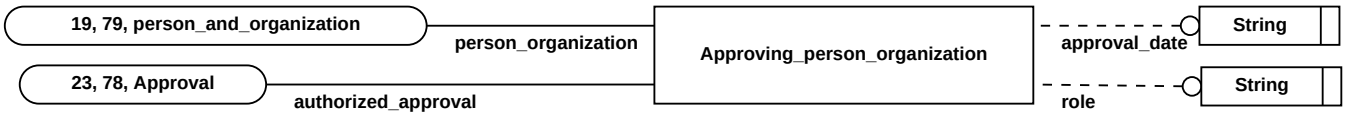

20, 99 (9, 9)
4, 90, dm_feature_cone
3, 93, dm_feature_rev_surf
4, 95, dm_feature_torus
dm_axial_feature
4, 92, dm_feature_cylinder
3, 94, dm_feature_sphere

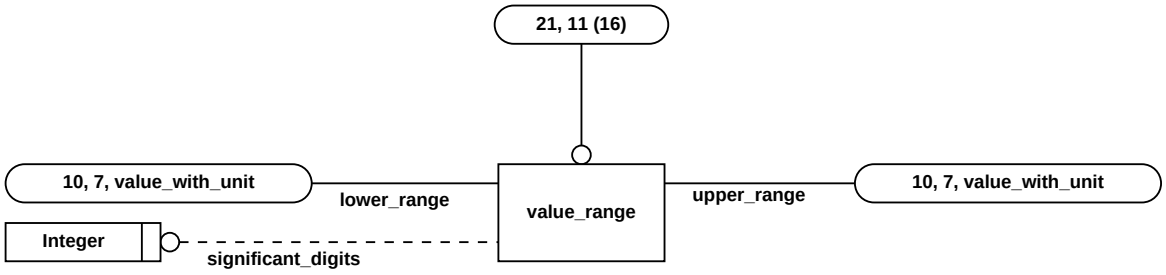

20, 56 (16)
String
point
20, 30 (6)
20, 108 (5)
15, 27, identifier
its_id
channel

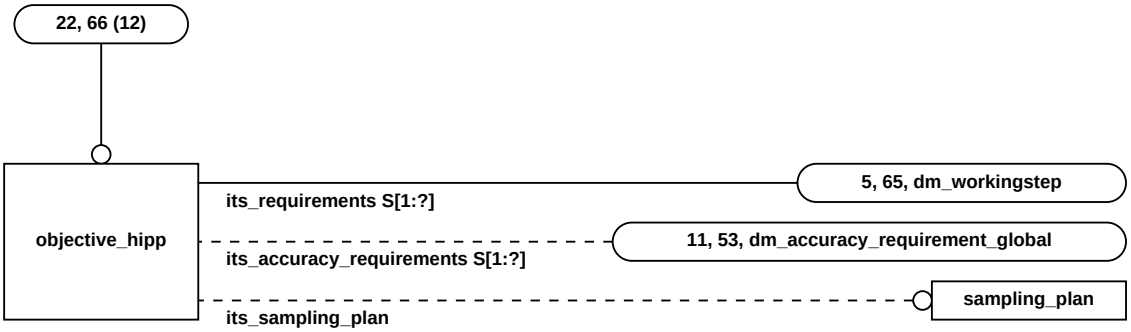

20, 45 (17)
20, 84 (14, 5, 5)
String
text
20, 38 (13)
String
shape_representation

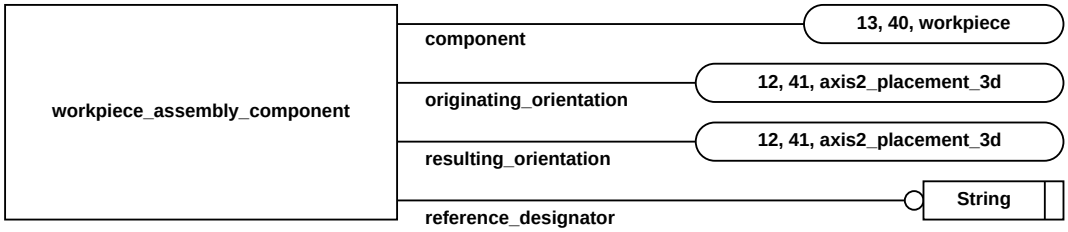

21, 52 (6)
machine_parameters
feedrate
10, 50, speed_measure
number_of_control_axis
Integer
number_of_simultaneous_axis
Integer
positioning_accuracy
10, 36, length_measure
table_indexing
Boolean
table_length
10, 36, length_measure
table_width
10, 36, length_measure
axis_travel S[0:?]
22, 51, machine_axis_travel
work_volume_length
10, 36, length_measure
work_volume_width
10, 36, length_measure
work_volume_height
10, 36, length_measure

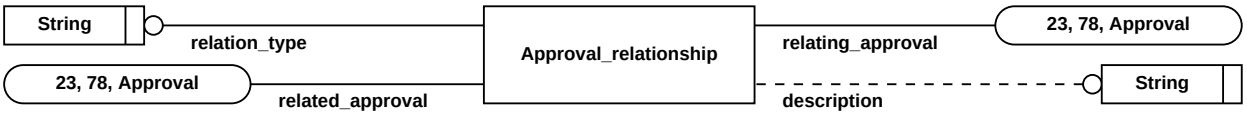

13, 13, Shape_element
derived_from S[1:?]
Derived_geometry
role
String
11, 1, Datum_defined_by_derived_shape


19, 79, person_and_organization
person_organization
Approving_person_organization
approval_date
String
23, 78, Approval
authorized_approval
role
String


21, 11 (16)
10, 7, value_with_unit
lower_range
value_range
upper_range
10, 7, value_with_unit
Integer
significant_digits


22, 66 (12)
objective_hipp
its_requirements S[1:?]
5, 65, dm_workingstep
its_accuracy_requirements S[1:?]
11, 53, dm_accuracy_requirement_global
its_sampling_plan
sampling_plan


workpiece_assembly_component
component
13, 40, workpiece
originating_orientation
12, 41, axis2_placement_3d
resulting_orientation
12, 41, axis2_placement_3d
reference_designator
String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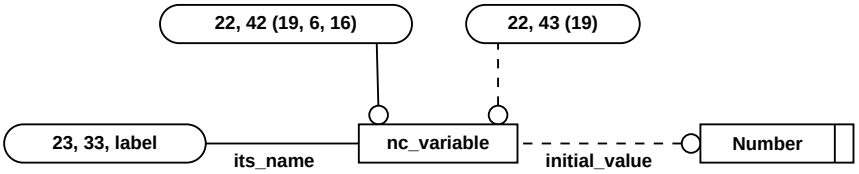
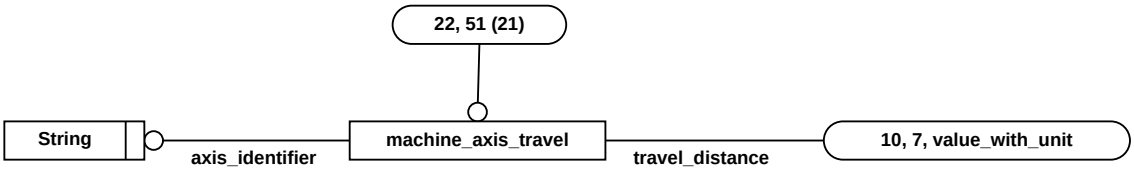
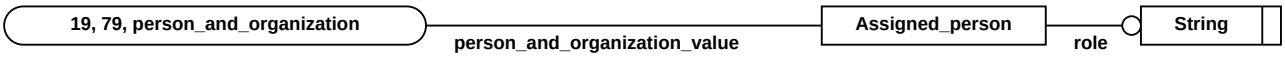
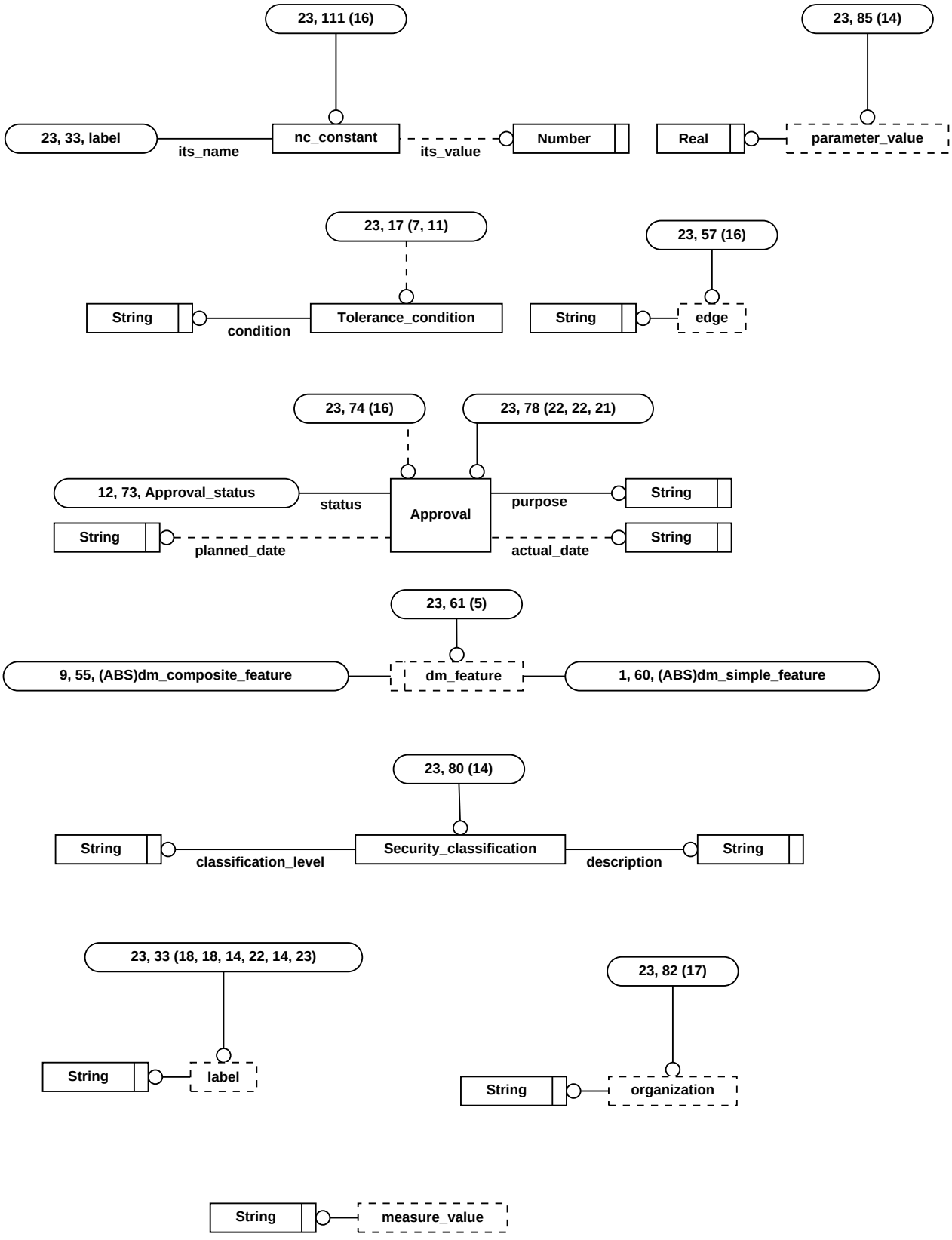
relation_type
Approval_relationship
relating_approval
23, 78, Approval
23, 78, Approval
related_approval
description
String


22, 42 (19, 6, 16)
22, 43 (19)
23, 33, label
its_name
nc_variable
initial_value
Number


22, 51 (21)
String
axis_identifier
machine_axis_travel
travel_distance
10, 7, value_with_unit


19, 79, person_and_organization
person_and_organization_value
Assigned_person
role
String


23, 111 (16)
23, 85 (14)
23, 33, label
its_name
nc_constant
its_value
Number
Real
parameter_value
23, 17 (7, 11)
23, 57 (16)
String
condition
Tolerance_condition
String
edge
23, 74 (16)
23, 78 (22, 22, 21)
12, 73, Approval_status
status
Approval
purpose
String
String
planned_date
actual_date
String
23, 61 (5)
9, 55, (ABS)dm_composite_feature
dm_feature
1, 60, (ABS)dm_simple_feature
23, 80 (14)
String
classification_level
Security_classification
description
String
23, 33 (18, 18, 14, 22, 14, 23)
23, 82 (17)
String
label
String
organization
String
measure_value