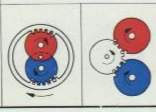
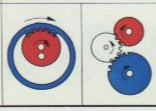
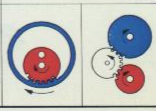
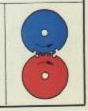
Significance of the colour code

- Piston-runner or rotor (output component)
- Sealing-rotor (sealing component)
- Alternating or simultaneous piston or rotor and sealing component
- Stationary chamber wall
- Crank
- Sealing element

Illustrations of engagement methods

Internal-axis SIM

Similar arrangement to the axes of an external-tooth gear meshing with internal tooth ring gear

Principle of Engagement	I. Reciprocating engagement (R)	II. Arctuate engagement (A)	III. Cam engagement (Ce) or (Ci)	IV. Slip engagement (S)	V. Counter engagement (Coi) or (Coe)
Example of models	Inpossible as SIM machines				
Diagrammatic sketch, arrows indicate direction of rotation					
Distinguishing mark		At point of contact the rotating parts move in same direction. Engaging parts pursue parallel circular paths. They revolve at equal r. p. m.	At point of contact motion is in same direction. Engaging component with smaller diameter and higher speed has fewer teeth. Larger diameter part running at lower speed has more teeth.	At contact point rotation in same direction. Larger diameter part with higher speed has fewer teeth. Smaller diameter part with lower speed has more teeth.	Direction of rotation at contact point in opposite direction. Speed ratio may be anything provided it is a whole number.
Gear connections between axes					

3 External-axis SIM

Similar to the axes of a pair of meshing spur gears

Principle of Engagement	I. Reciprocating engagement (R)	II. Arctuate engagement (A)	III. Cam engagement (Ci) or (Ce)	IV. Slip engagement (S)	V. Counter engagement (Coi) or (Coe)
Example of models	Impossible as SIM machines	Impossible with external-axis SIM machines		Cam engagement cannot form chambers on external-axis machines.	
Diagrammatic sketch, arrows indicate direction of rotation					
Distinguishing mark			At contact point rotation in same direction. Component with equal or unequal diameter and higher speed has fewer teeth. Component with equal or unequal diameter and lower speed has more teeth. Component with equal or unequal diameter and equal speed has equal number of teeth.		Direction of rotation at contact point in opposite direction. Speed ratio may be anything provided it is a whole number.
Gear connections between axes					

4 Internal-axis PLM with inner piston-rotor similar to the arrangement of axes of pinion and internal-tooth ring gear, the piston-rotor revolving about its own centre of gravity

Principle of Engagement	I. Reciprocating engagement (R)	II. Arctuate engagement (A)	III. Cam engagement (Ci) or (Ce)	IV. Slip engagement (S)	V. Counter engagement (Coi) or (Coe)
Example of models					 Sealing component if present = crank
Diagrammatic sketch, arrows indicate direction of rotation					
Distinguishing mark	Linear motion between the engaging components. Piston-rotor rotates in opposite direction to crank at half crank speed relative to housing. Sealing component also rotates in same direction at half crank speed relative to casing.	Circular parallel motion of the engaging components. Piston-rotor revolves in opposite direction to crank but at the same speed as the crank relative to the casing.	Rolling motion at engagement point. Piston-rotor revolves in opposite direction to crank but at higher speed than the crank relative to casing. Engaging component with smaller diameter and higher speed has smaller number of teeth. Engaging component with larger diameter has more teeth.	Rolling motion at engaging point. Piston-rotor revolves in opposite direction to crank but at lower speed relative to casing. Engaging component with larger diameter has fewer teeth. Engaging component with smaller diameter and lower speed has more teeth.	Counter movement at point of contact. Piston-rotor revolves at equal speed round crank pin at any speed ratio to crank relative to casing provided it is a whole number.
Gear connections between axes					

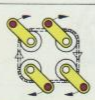
Internal-axis PLM with outer piston-rotor similar to the arrangement of axes of pinion and internal tooth ring gear, piston-rotor rotating about its own centre of gravity

5

Principle of Engagement	I. Reciprocating engagement (R)	II. Arctuate engagement (A)	III. Cam engagement (Ci) or (Ce)	IV. Slip engagement (S)	V. Counter engagement (Coi) or (Coe)
Example of models					
Diagrammatic sketch, arrows indicate direction of rotation					
Distinguishing mark	Linear motion between the engaging components. Piston-rotor rotates in opposite direction to crank at half crank speed relative to housing. Sealing component also rotates in same direction at half crank speed relative to casing.	Circular parallel motion of the engaging components. Piston-rotor revolves in opposite direction to crank but at the same speed as the crank relative to the casing.	Rolling motion at engagement point. Piston-rotor revolves in opposite direction to crank at lower speed than the crank relative to casing. Engaging component with smaller diameter has fewer teeth. Larger diameter part with lower speed has more teeth.	Rolling motion at engagement point. Piston-rotor revolves in opposite direction to crank at higher speed relative to casing. Engaging component with larger diameter and higher speed has fewer teeth. Larger diameter part has more teeth.	Counter movement at point of contact. Piston-rotor revolves at equal speed round crank pin at any speed ratio to crank relative to casing provided it is a whole number.
Gear connections between axes					

External-axis PLM have axes similarly arranged to meshing spur gears and the rotating piston-rotor revolves round its c.g. which itself follows a circular path

6

Principle of Engagement	I. Reciprocating engagement (R)	II. Arctuate engagement (A)	III. Cam engagement (Ci) or (Ce)	IV. Slip engagement (S)	V. Counter engagement (Coi) or (Coe)
Example of models			 Sealing component if present = crank	Cam engagement cannot form chambers on external-axis machines.	 Sealing component if present = crank
Diagrammatic sketch, arrows indicate direction of rotation					
Distinguishing mark	Linear motion of engaging components. Piston-rotor revolves in opposite direction to crank and at the same speed relative to the casing. Crankshafts rotate in opposite directions.	Circular parallel motion of the engaging components. Piston-rotor revolves in opposite direction to crank and at the same speed relative to casing. Crankshafts rotate in the same direction.	Rolling motion at engaging point. Piston-rotor revolves in the same direction relative to housing. Engaging component with equal or unequal diameters and higher speeds have fewer teeth. Engaging component with equal or unequal diameters and lower speeds have more teeth. Engaging component with equal or unequal diameters have equal number of teeth.		Counter rolling movement at contact point. Piston-rotor revolves in opposite direction to crank pin at any speed ratio relative to crank, provided it is a whole number.
Gear connections between axes					

Classification of single-rotation machines (SIM)