TSC Category	Precision Manufacturing Process					
TSC	Jigs and Fixture Design					
TSC Description	Facilitate implementation of production operations through the design of jigs and fixtures required for manufacturing activities					
TSC Proficiency Description	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
			PRE-DES-3038-1.1	**PRE-DES-4038-1.1**		
			Draw mechanical design fixture assemblies for manufacturing	Design tooling, jigs and fixtures to support workplace manufacturing operations		
Knowledge			• Fundamentals of jigs and fixture design • Principles and design of locators • Principles, design and positioning of clamps • Jig design, rules, considerations and functions of jig bushes • Design of fixture, rules, considerations and fixture design processes • Modular construction of jigs and fixtures • Types, elements and applications of modular fixture design • Specialised work-holdings • Manufacturing design assemblies for component drawings	• Interpretation of blueprints • Geometric dimensioning and tolerancing (GD&T) and cumulative effect of tolerances • Tool design in manufacturing • Objectives of supporting and locating elements, and rules for location • Types of clamps and rules of clamping • Power work-holding systems and objectives of work-holding • Operations of setting blocks • Types of fastening devices • Requirements of different types of fixtures • Modular fixturing systems and applications • Time and motion studies relevant to tools, jigs and fixtures		
Abilities			• Identify datum or reference surfaces to be used as location features for jigs and fixture design • Design locators by drawing 6-degrees or 12-	• Review jig and fixture requirements for design considerations • Analyse existing, prototype and sample designs of tooling, jigs		

			degrees movements of a free body • Generate '3-2-1' and/or '4-2-1' principle of locations to constraint free body movements • Sketch the application of locating pins and buttons • Select appropriate clamping methods for work-holdings • Design mechanical fixture designs in accordance with workplace instructions • Produce mechanical fixture design assembly drawings to assist in design processes • Specify requirements for locking elements	and fixtures to facilitate design process • Design planning for jigs and fixtures relevant to the workplace • Plan for production processes and record check points for relevant measurements and tests • Design tooling, jigs and fixtures constructions to design specifications, in accordance with workplace instructions • Verify completed jigs and fixtures against design plan specifications for dimensions, structural strength and operations • Repair faults and provide solutions, in accordance with workplace procedures through practical knowledge		