

Engine and Driveline Repair

Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THIS PROJECT

Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.

Full Name:		
Signature:	Title:	Date:

CLIENT OR PRINCIPAL CONTRACTOR DETAILS

Client:	SCOPE OF WORKS
Project Name:	
Project Address:	
Project Manager:	
Contact Phone:	
Date Risk Assessment supplied to Project Manager:	



RISK MATRIX									
LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC	SCORE	ACTION	HIERARCHY OF CONTROLS	
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE			Elimination Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	Substitution Replace the hazard.	
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Review before work starts.	Isolation Isolate People from the hazard	
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	2M MODERATE	Ensure control measures in place.	Engineering Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	Administrative Change	
								PPE	

Risk Rating & Required Action:	
4A	Stop work. The risk is intolerable. Eliminate the hazard or redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or higher-level authorisation is required.
3H	Review and approve additional controls before the task starts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.
1L	Proceed, following standard operating procedures. Monitor and keep records.

Consequence Scale:			
Consequence	People (injury/illness)	Project / Assets	Compliance / Reputation
Catastrophic	Fatality or permanent total disability	project shutdown	Significant regulator intervention; criminal prosecution
Major	Serious injury/illness (hospital > 5 days)	critical delay	Improvement notice; major media coverage
Moderate	Medical-treatment injury; lost-time > 1 day	moderate delay	Minor breach; adverse client comment
Minor	First-aid only, no lost time	negligible delay	Isolated non-conformance
Insignificant	No injury	no schedule impact	Deviation caught and corrected on site

Notes on Hierarchy of Controls:
Remember to apply controls in the preferred order shown by the coloured pyramid:

1. **Eliminate**
2. **Substitute**
3. **Isolate**
4. **Engineering**
5. **Administrative**
6. **PPE**

Always document **why** a lower-order control is accepted if elimination or substitution is not reasonably practicable.

aligned with Safe Work Australia's Managing the risk of fatigue at work (2023) and ISO 45001:2018 clauses 6–8.

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
1. Workshop WHS Management, Governance and Legal Compliance	<ul style="list-style-type: none"> Absence of a documented WHS management system for engine and driveline repair activities Lack of clear allocation of WHS responsibilities and accountabilities under WHS Act 2011 (PCBU, Officers, Workers) Inadequate consultation and communication with workers and health and safety representatives about engine and driveline risks Failure to systematically identify, assess and review risks associated with engine, transmission and driveline repair operations Non-compliance with Australian WHS legislation, Codes of Practice and relevant Australian Standards Insufficient resourcing (time, budget, people) to implement and maintain risk controls Poor incident and near miss reporting culture leading to repeat failures and unaddressed hazards Lack of documented safe systems of work for complex engine, gearbox and driveline activities No structured WHS objectives, targets or performance indicators for workshop operations 	4A	<ul style="list-style-type: none"> Establish and maintain a documented WHS management system aligned with the WHS Act 2011, WHS Regulations and relevant Codes of Practice, specifically covering engine and driveline repair activities Define and document WHS roles, responsibilities and accountabilities for PCBUs, Officers, Supervisors and Workers, and communicate these through position descriptions and induction Implement regular consultation mechanisms (toolbox talks, WHS committee meetings, pre-job briefings) focused on engine, gearbox and driveline system risks and controls Introduce a formal risk management procedure requiring identification, assessment, control and periodic review of hazards related to engine and driveline repair tasks and equipment Maintain a legal register of WHS legislation, Codes of Practice and relevant Australian Standards (e.g. AS/NZS 3004 series for machinery safety) applicable to workshop operations, and review it at least annually Allocate sufficient budget and staffing for engineering controls, maintenance, training, supervision and safety equipment for engine and driveline work Implement a confidential incident and near miss reporting system, including mandatory reporting of loss-of-controls, equipment failures and high-potential near misses Develop and maintain documented safe operating procedures (SOPs) and safe systems of work for major categories such as engine overhauls, gearbox rebuilding, driveline disassembly, working on running engines and pressure testing Introduce WHS performance metrics (e.g. incident rates, completion of inspections, close-out of corrective actions) and review these at management meetings with documented actions Conduct periodic internal WHS audits and management reviews of engine and driveline repair operations, with corrective action plans and tracking to completion 	2M
2. Workshop Layout, Traffic Management and Segregation of High-Risk Work	<ul style="list-style-type: none"> Poor workshop layout causing interaction between pedestrians, forklifts, vehicles and suspended engine/transmission assemblies Inadequate segregation between engine test areas, driveline cutting/grinding zones, and general work bays Lack of designated exclusion zones for operating engines, rotating driveline 	4A	<ul style="list-style-type: none"> Develop a workshop layout plan that clearly defines zones for engine overhauls, transmission bench work, driveline disassembly, cutting operations and vehicle movement, and implement this with markings and signage Implement a traffic management plan including designated pedestrian walkways, speed limits, one-way vehicle routes and restricted access to high-risk areas Establish engineered barriers or physical separation (e.g. bollards, screens, chained zones) around engine start-up, running engine test areas and tailshaft balancing equipment Define exclusion zones for bench testing transmissions, operating diesel engines and working on running engines, including procedural controls for authorised access only 	2M

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	<p>components and bench-testing transmissions</p> <ul style="list-style-type: none"> • Uncontrolled movement of vehicles into and out of repair bays, increasing crush and impact risk • Insufficient space around hoists and stands leading to awkward access, overreaching and contact with hot or moving parts • Emergency exits obstructed by engines, driveline components, transmissions or cooling radiators awaiting repair • Inadequate signage and floor markings to warn of engine start-up zones and running machinery • Poor housekeeping leading to trip hazards in areas where heavy driveline components are manoeuvred 		<ul style="list-style-type: none"> • Ensure minimum clearance around vehicle hoists, engine stands and work benches is documented and enforced to allow safe access and egress • Implement housekeeping standards and scheduled inspections to keep floors clear of tools, driveline tubes, chains, radiators and waste materials • Provide clear directional signage, hazard warnings (e.g. Running Engines – Authorised Personnel Only) and floor markings to identify high-risk work zones • Ensure emergency exits and access to fire-fighting and spill equipment are kept clear through routine checks and supervisor sign-off • Integrate layout and traffic requirements into contractor and visitor induction so non-routine personnel respect engine and driveline work zones 	
3. Plant, Tools, Lifting Equipment and Engineering Controls	<ul style="list-style-type: none"> • Use of unsuitable or poorly maintained lifting equipment for engines, gearboxes and driveline components • Failure or overload of cranes, engine hoists, slings, tailshaft balancers and jacks during lifting and handling • Inadequate guarding of rotating machinery such as valve grinders, cylinder hones and cutting equipment used on driveline tubes • Lack of interlocks or safety devices for engine test stands and transmission bench-testing rigs • Uncalibrated or defective torque tools used to tighten drive chains, fan belts, high-pressure lines and gearbox components • Use of improvised fixtures when bench testing transmissions, operating diesel engines or running power take-offs • Inadequate isolation of power sources (electrical, hydraulic, pneumatic, fuel) for plant used in engine and driveline work 	4A	<ul style="list-style-type: none"> • Maintain a plant register for all lifting devices, engine stands, transmission benches, tailshaft balancers and specialised tools used for engine and driveline work • Ensure lifting equipment (hoists, cranes, jacks, chains, slings) is rated, inspected and tested in accordance with Australian Standards, with inspection tags and records • Specify and enforce the use of purpose-designed engine lifting points, gearbox jigs and driveline support fixtures rather than improvised arrangements • Install and maintain guarding and fixed barriers on rotating equipment such as valve grinders, cylinder hones and driveline cutting tools, consistent with AS/NZS 4024 principles • Ensure engine test stands and transmission bench-testing rigs are fitted with emergency stop devices, interlocks, speed controls and secure clamping systems • Implement a calibration and maintenance program for torque wrenches, pressure testing rigs and diagnostic equipment, including a recall schedule and calibration certificates • Introduce a formal plant pre-use inspection checklist for hoists, stands, balancers and power tools, with a process for tagging out defective equipment • Develop plant isolation and lockout procedures for electrical, hydraulic, pneumatic and fuel systems associated with engine and driveline repair plant • Prohibit home-made or modified lifting devices unless designed and certified by a competent engineer, and documented in the plant register • Provide competency-based training to workers on correct selection, inspection and use of lifting devices and specialised driveline repair equipment 	2M

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	<ul style="list-style-type: none"> Poor labelling and documentation for plant inspection, maintenance and defect reporting 			
4. Energy Isolation, Lockout and Verification Systems	<ul style="list-style-type: none"> Uncontrolled engine start-up during inspection, timing adjustment, spark plug replacement or throttle body adjustment Unexpected movement of driveline components during disconnection, removal or overhaul of drive shafts, tailshafts and differentials Residual pressure in transmission lines, high-pressure fuel systems and cooling systems during maintenance Inadequate isolation procedures for electrical systems, ignition systems and engine management systems during diagnostic work Failure to verify zero energy before working inside engine compartments or on running engines Shared workspace where multiple workers or contractors interfere with each other's isolation points 	4A	<p>[REDACTED]</p>	2M
5. Engine Operation, Testing and Commissioning Controls	<ul style="list-style-type: none"> Loss of control during engine start-up, engine tune-ups and system checks, leading to unexpected movement or component failure Exposure to rotating components (belts, pulleys, fans, drive chains) while engines and motors are operating Overheating engines during tuning, speed governor adjustments or timing work, causing burns and component failures Inadequate control of fumes and exhaust gases during test running, particularly in enclosed areas 	4A	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	2M

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	<ul style="list-style-type: none"> Lack of standard procedures for test-driving vehicles after engine, gearbox or driveline repair Inadequate communication and handover between mechanics and drivers regarding systems that have been repaired or left inoperative 		[REDACTED]	
6. Hazardous Chemicals, Fuels, Exhaust and Catalytic Converter Management	<ul style="list-style-type: none"> Exposure to fuel vapours, exhaust gases and combustion by-products during engine and exhaust system repairs Handling of catalytic converters containing hazardous substances without adequate controls Inhalation of metal particulates from cutting driveline tubes, grinding valves and honing cylinders Skin and eye contact with coolants, lubricants, cleaning solvents and transmission fluids Poor storage, labelling and segregation of flammable liquids, aerosols and degreasers Inadequate ventilation during work on running engines and power take-offs in enclosed areas Improper disposal of contaminated parts, used oils, coolants and catalytic converters 	4A	[REDACTED]	2M
7. Manual Handling, Ergonomics and	<ul style="list-style-type: none"> Improper lifting and handling of heavy engines, gearboxes, transfer cases and 	3H	[REDACTED]	1L

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Handling of Heavy Components	<p>differentials during installation and removal</p> <ul style="list-style-type: none"> • Awkward postures and repetitive movements while working inside engine compartments and under vehicles • Unplanned movement of suspended loads during attachment of coupling devices, drive plates, flywheels and power take-offs • Lack of mechanical aids or incorrect use of engine cranes, transmission jacks and stands for bench work • Manual handling of radiators, driveline tubes and steering components in constrained spaces • Inadequate planning for team lifts and coordination when removing and installing large driveline assemblies 		[REDACTED]	
8. Competency, Licensing, Training and Supervision	<ul style="list-style-type: none"> • Inadequate technical competency for diagnosing gearbox faults, rebuilding manual transmission and overhauling driveline components • Untrained personnel conducting technical adjustments such as timing, speed governor settings and clutch repairs • Lack of understanding of specific risks associated with working near or on running engines • Insufficient supervision of apprentices and new starters performing complex engine and driveline tasks • No verification of competency for use of specialised equipment such as tailshaft balancers, valve grinders and pressure testing rigs • Failure to keep training records current and aligned with changing plant, procedures and technology 	4A	[REDACTED]	2M

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			[REDACTED]	
9. Work Organisation, Fatigue, Workload and Scheduling	<ul style="list-style-type: none"> Extended working hours or overtime during major engine overhauls or urgent driveline repairs leading to fatigue Pressure to complete complex tasks such as transmission rebuilding or engine timing adjustments quickly, resulting in errors Insufficient staffing levels causing rushed inspections of drive belts, injectors and high-pressure lines Poor scheduling of test runs, bench work and heavy component changes, leading to conflicting activities in the workshop Inadequate breaks and rotation from physically or mentally demanding diagnostic work Lack of planning for parts availability causing last-minute rework or workarounds 	3H	[REDACTED]	1L
10. Safe Systems for Working Under, Around and Inside Vehicles	<ul style="list-style-type: none"> Collapse or failure of supports when working under vehicle inside engine compartments Inadequate control of vehicle roll away when drive shafts, transmissions or clutches are being removed or installed Poor access and egress when working inside engine bays or under chassis for driveline inspection and repair Inadequate lighting in under-vehicle areas leading to missed hazards or errors in assembly No system to verify reinstatement of safety-critical components after under-vehicle work 	4A	[REDACTED]	2M

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			[REDACTED]	
11. Electrical, High-Pressure Fluid and Thermal Hazards Management	<ul style="list-style-type: none"> Exposure to high-pressure fuel or hydraulic leaks when tightening bolts on high-pressure lines or pressure testing transmissions Contact with hot engine surfaces, exhaust components and radiators during repair and inspection Electrical hazards from diagnostic equipment, engine management systems and battery circuits Uncontrolled release of coolant or steam during radiator removal and maintenance Poor system design for identifying live circuits and pressurised lines during engine and driveline work 	4A	[REDACTED]	2M
12. Contractor, Supplier and Customer Vehicle Management	<ul style="list-style-type: none"> Contractors performing engine, transmission or exhaust repairs without alignment to the workshop safety systems Customer vehicles arriving with unknown faults, unsafe modifications or hazardous substances present Poor communication between the workshop and external specialists (e.g. tailshaft balancing, differential gear swapping) about risks and controls Lack of clear responsibilities for safety when vehicles are moved between sites or test-driven by third parties 	3H	[REDACTED]	1L

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			[REDACTED]	
13. Emergency Preparedness, Incident Response and First Aid	<ul style="list-style-type: none"> • Delayed or ineffective response to incidents involving crush injuries, burns, chemical exposure or high-pressure fluid injection • Lack of practice or familiarity with emergency procedures during engine fires, fuel spills or catastrophic driveline failures in the workshop • Insufficient first aid resources and trained personnel for the specific risks of engine, exhaust and driveline work • Poor post-incident investigation leading to recurrence of system-level failures 	3H	[REDACTED]	1L
14. Documentation, Records, Inspections and Continuous Improvement	<ul style="list-style-type: none"> • Outdated or inconsistent procedure for engine, transmission and driveline repair tasks • Missing or incomplete records of inspections, maintenance, training and incidents • Failure to track and close out corrective actions from audits, inspections or incident investigations • Inadequate monitoring of WHS performance indicators relating to workshop operations • Loss of corporate knowledge when experienced mechanics leave the organisation 	3H	[REDACTED]	1L

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			[REDACTED]	
			[REDACTED]	

SAMPLE

EMERGENCY RESPONSE – CALL 000 FOR EMERGENCIES

Ensure to have an Emergency Management Plan in place as well as adequate numbers of trained first aid staff with easy access to fully stocked first aid kits, rescue equipment, material safety data sheets, adequate access to emergency communication equipment and fire-fighting equipment suitable for all classes of fire and ignition sources.

LEGISLATIVE REFERENCES

RELEVANT LEGISLATION AND CODES OF PRACTICE. DELETE THE LEGISLATIVE REFERENCES FOR ANY STATE THAT ARE NOT APPLICABLE

Queensland & Australian Capital Territory

Work Health and Safety Act 2011
 Work Health and Safety Regulations 2011
 Legislation QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws>
 Codes of Practice QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice>
 Legislation ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/acts-and-regulations>
 Codes of Practice ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/codes-of-practice>

Victoria

Occupational Health and Safety Act 2004
 Occupational Health and Safety Regulations 2017
 Legislation VIC: <https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations>
 Codes of Practice VIC: <https://www.worksafe.vic.gov.au/compliance-codes-and-codes-practice>

New South Wales

Work Health and Safety Act 2011
 Work Health and Safety Regulations 2025
 Legislation NSW: <https://www.safework.nsw.gov.au/legal-obligations/legislation>
 Codes of Practice NSW: <https://www.safework.nsw.gov.au/resource-library/list-codes-of-practice>

Western Australia

Work Health and Safety Act 2020
 Work Health and Safety Regulations 2022
 Legislation Western Australia: <https://www.commerce.wa.gov.au/worksafe/legislation>
 Codes of Practice WA: <https://www.commerce.wa.gov.au/worksafe/codes-practice>

Northern Territory

Work Health and Safety (National Uniform Legislation) Act 2011
 Work Health and Safety (National Uniform Legislation) Regulation 2011
 Legislation NT: <https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws>
 Codes of Practice NT: <https://worksafe.nt.gov.au/laws-and-compliance/codes-of-practice>

Safe Work Australia Links

Law and Regulation (All States): <https://www.safeworkaustralia.gov.au/law-and-regulation>
 Model Codes of Practice: <https://www.safeworkaustralia.gov.au/resources-publications/model-codes-of-practice>

South Australia

Work Health and Safety Act 2012 (SA)
 Work Health and Safety Regulations 2012 (SA)
 Legislation for SA: <https://www.safework.sa.gov.au/resources/legislation>
 Codes of Practice for SA: <https://www.safework.sa.gov.au/workplaces/codes-of-practice#COPs>

Model Codes of Practice

- Managing noise and preventing hearing loss at work
- Confined spaces
- Labelling of workplace hazardous chemicals
- Managing risks of hazardous chemicals in the workplace
- Welding processes
- First aid in the workplace
- Managing the risk of falls at workplaces
- Hazardous manual tasks
- Managing the risk of falls in housing construction
- Managing electrical risks in the workplace
- Demolition work
- Excavation work
- Work health and safety consultation, cooperation and coordination
- Managing the work environment and facilities
- How to manage work health and safety risks
- Managing risks of plant in the workplace
- Construction work

Tasmania

Work Health and Safety Act 2012
 Work Health and Safety (Transitional and Consequential Provisions) Act 2012
 Work Health and Safety Regulations 2012
 Work Health and Safety (Transitional) Regulations 2012
 Legislation for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/acts-and-regulations>
 Codes of Practice for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/codes-of-practice>

Details of permits, licenses or access required by regulatory bodies (add or delete as required):

- Permits from local council
- Authorisation to commence work
- Any required documents.