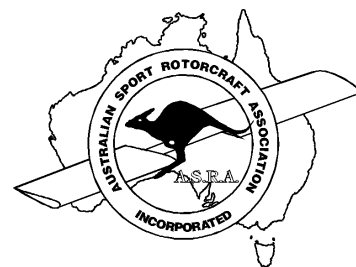


GYROPLANE INSPECTION CHECKLIST



This checklist is designed to provide guidance for ASRA Technical Advisers and gyroplane owners to ensure that a gyroplane complies with the applicable ASRA standard prior to its first flight.

Registration No: **Airframe S/N:** **Manufacturer:**

Owners Name:

Owners Address:

Phone No: **Mobile:** **Email:**

ROTOR SYSTEM		Pass	Fail
Head Serial No:	Visible and recorded		
Hardware:	AN or fit for purpose Lock nuts correctly fitted. Castellated nuts safety pinned.		
Head Movement:	Lateral and Fore/aft within limits. Lateral stops present and secure. Adjustable fore/aft stops lockwired or otherwise secured to preclude unwanted movement in-flight.		
Pre-rotator:	Secure and safetied. Electrical connections secure, cable insulation intact and secured against vibration. Sufficient slack in the cables to allow full and free head movement.		
Control Rods:	Rod ends suitably sized with nuts suitably locked. No possibility of binding through full head movement in any direction. Articulated control arms securely mounted and have full and free movement, and must not move more than 45° from mean position		
Rotor Tachometer:	Secure. Electrical connections secure. Electrical wiring secured against vibration with provision to allow full and free head movement in any direction.		
Trim System:	Springs secure with safety cord or cable in place. In-flight variable trim systems on Approved gyros fitted with a trim position indicator system.		
Rotor Brake:	Correctly fitted such that it does not interfere with head movement. Precluded from unintentional application in-flight.		
Rotor Blades:	Manufacturer, serial numbers and diameter recorded. Correctly fitted. Teeter movement within limits. "Breather" holes in blades roots and tips. Adequate clearance from the ground and airframe components in the worst-case scenario.		

Comments:

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MAST		Pass	Fail
Material:	6061-T6 Aluminium or other material fit for purpose.		
Bolts and Holes:	AN or other suitable grade, suitably sized. No holes drilled through the mast except at the extremities to mount cheek plates. Holes drilled and reamed close to but not penetrating sidewall. Locknuts correctly fitted and castellated nuts safetied		
Attached Plates: (Upper, Lower cheek plates, Mounting Brackets)	Suitable material with holes located correctly relative to edges. Sufficient bolts used. Clamped fittings correctly tensioned and precluded from vertical movement. Locknuts correctly fitted and castellated nuts safetied.		
Placards:	Airframe S/N and Registration placards in place.		

Comments:

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KEEL		Pass	Fail
Material:	6061 T6 Aluminium or other suitable material		
Bolts:	AN or fit for purpose.		
Attached Mounting Brackets/Fittings:	Suitable material fit for purpose Holes located correctly relative to edges. Sufficient bolts used. Clamped fittings correctly tensioned. Locknuts correctly fitted and castellated nuts safetied or pinned.		

Comments:

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FUEL TANK		Pass	Fail
Type:	Suitable material fit for purpose. Filler cap secured so as to preclude loss in-flight. Vent lines fitted and secure with discharge clear of cabin enclosure and airframe. Fuel gauge fitted and calibrated; fuel gauge calibration chart fitted. Fuel tank drain fitted and serviceable. Minimum fuel grade placarded. Maximum useable fuel placarded.		
Fuel and Vent Lines:	Suitable material fit for purpose. Fuel filters/strainers fitted with water drain fitted to lowest point in the system. Hose clamps secure. Fuel and vent lines secured against vibration and chafing. No kinks or unnecessarily tight radius turns in fuel and vent lines. No electrical wiring attached to fuel or vent lines. Fuel pump secure with electrical terminals insulated.		
Mount:	Suitable material and design. Attached to frame using AN or other suitable grade hardware.		

Harness:	Minimum 4 point system that is approved for aviation use or has CAMS approval for automotive sport. Lap belt attached to keel or cluster plates with AN or other suitable hardware fit for purpose. Shoulder harnesses fitted in accordance with the guidelines in Appendix 1.		
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Comments:

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ENGINE		Pass	Fail
Serial No:	Recorded		
General:	Free from Oil and Fluid leaks. Ignition and Engine Management System components secure. Wiring insulated and isolated from vibration and chafing. Oil Filler cap and Dipstick secured. Oil Filter correctly tensioned or safetied. Carburettor and associate control linkages secure. Air Cleaner secured and lockwired where appropriate. Crankcase breathers secured and lockwired. Alternator and mount secure with drive belt aligned and correctly tensioned. Turbo Charger and fittings correctly fitted and secure.		
Mount:	Suitable material and design. Correct thrust line alignment both horizontally and vertically.		
Hardware:	AN or other suitable grade fit for purpose. Lock nuts or metal lock nuts in place where applicable. Mounting bolts lock wired where necessary.		
Control Cables:	Throttle cable free, correct sense and properly secured. Carburettor alternate air system functional and secure.		
Exhaust System:	Secure and isolated from vibration. Safety cables in place where appropriate. Exhaust gasses routed away from heat sensitive components. Heat shields fitted where appropriate.		
Cooling System:	Radiator correctly mounted. Hoses securely clamped and lockwired. Radiator caps serviceable and lockwired. Overflow tank of suitable material, properly secured. Radiator overflow pipe outlet located away from sensitive components. Cooling system components that could cause scalding of the occupants if burst must be suitably lagged.		

Comments:

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REDUCTION DRIVE		Pass	Fail
Serial No:	Recorded.		
Reduction Ratio:	Recorded.		
General:	Free from Oil Leaks. Filler Cap, Level Screws and Drain Plug safetied. Mounting bolts thread locked or lockwired.		

Comments:

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PROPELLER		Pass	Fail
Serial No:	Recorded.		
Specifications:	Diameter and Pitch recorded.		
Manufacturer:	Recorded.		
General:	Fitted in accordance with the manufacturers instructions. All bolts correctly tensioned. Main Mounting bolts lockwired or fitted with locknuts.		
Clearances:	Adequate clearance from the keel and from the plane of the rotor blades in the worst case scenario. Adequate clearance from other airframe/engine components. Rudder Cables prevented from penetrating the propeller arc in the event of cable failure.		

Comments:

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UNDERCARRIAGE		Pass	Fail
Material:	Suitable for the application.		
Hardware:	AN or other suitable grade fit for purpose. Locknuts or castellated nuts correctly fitted.		
Nosegear:	Wheel and tyre suitably sized; tyre sound and correctly inflated. Wheel rotates freely. Spring suspension moves freely. Nose wheel assembly moves freely with rudder pedal movement and in the correct sense. Nosewheel steering linkage fit for purpose Axle retention system pinned or otherwise locked.		
Main Gear:	Suitable for application (drop test for Approved Gyroplanes). Wheel and tyre suitably sized; tyres sound and correctly inflated. Wheels rotate freely. Locknuts or castellated nuts correctly fitted. Main wheel nuts pinned or otherwise locked. Brakes checked for functionality and ease of use. Drag and lateral struts correctly fitted and free to move.		

Comments:

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FLIGHT CONTROLS		Pass	Fail
Material:	Suitable for application.		
Hardware:	AN or other suitable grade. Castellated nuts to be fitted to all bolts subject to rotation in operation and correctly pinned or safetied. Locknuts correctly fitted.		
Pitch; Lateral:	Able to move freely throughout whole range without binding or fouling other components. Fore and aft, and lateral stick movement checked.		
Rudder:	Moves freely without binding. Cable diameter at or above minimum. Pulleys used where a significant change of cable direction is necessary. Guards fitted to prevent cables from jumping off pulleys. A pulley must lie in the plane of the cable it guides.		
Articulation:	Complies with ASRA AD 06/2007 and AD 07/2007.		
Trim System:	Suitably sized cabling and springs. Springs fitted with safety device to prevent total loss in the event of a breakage in-flight. Trim controls correctly labelled. Trim position indicators fitted. Confirm ease of operation.		

Comments:

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TAIL SECTION		Pass	Fail
Material:	Suitable for the purpose.		
Hardware:	AN or other suitable grade with nuts correctly locked.		
Fin/Rudder:	Correct offset direction applied. Suitably attached to mainframe. Free from excessive movement. Rudder displacement stops fitted. Rudder moves freely in the correct sense with rudder pedal movement. Trim/Servo/Anti-servo tabs securely fitted. Surface areas and moment arm from C of G noted.		
Horizontal Stab:	Correctly fitted with (usually) zero or negative angle of attack. Surface area and moment arm from C of G noted.		

Comments:

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INSTRUMENTS		Pass	Fail
Flight:	ASI calibrated in knots Altimeter, preferably sensitive, with the subscale calibrated in millibars. Correctly fitted. Pitot/static system lines free from kinks with the pressure sources suitably located. Airspeed limitations marked on ASI or placarded. Yaw Indicator fitted.		
Engine:	Minimum for type. Correctly fitted. Maximum and minimum limits marked on the gauges or placarded.		

Comments:

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ELECTRICAL		Pass	Fail
Cabling:	Correctly sized for maximum current draw. Circuit protection fitted. Terminals correctly sized and properly crimped. Note: Soldering as a primary method of terminal attachment is not recommended. Terminals suitably insulated. Cables adequately supported and protected from chafing against airframe. Sufficient slack in the cabling to preclude breakage from movement due to airflow and vibration.		
Switches:	Suitable for the application. Toggle switches preferred in all situations. Fitted such that when the switch is in the up or forward direction, a circuit is energised. Switch positions and function clearly marked. Master and Ignition switches within easy reach of pilot when he is seated and secured in the normal in-flight position.		
Battery:	Suitably located and secured using a system capable of withstanding a 9 G acceleration. Breather system outlet suitably located so as preclude acid or fumes contacting any part of the gyroplane.		

Comments:

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Inspection Date:

Appendix 1.

Installation of Shoulder Harness

Figures 1, 2 and 3 show the recommended installation geometry for this type of restraint.

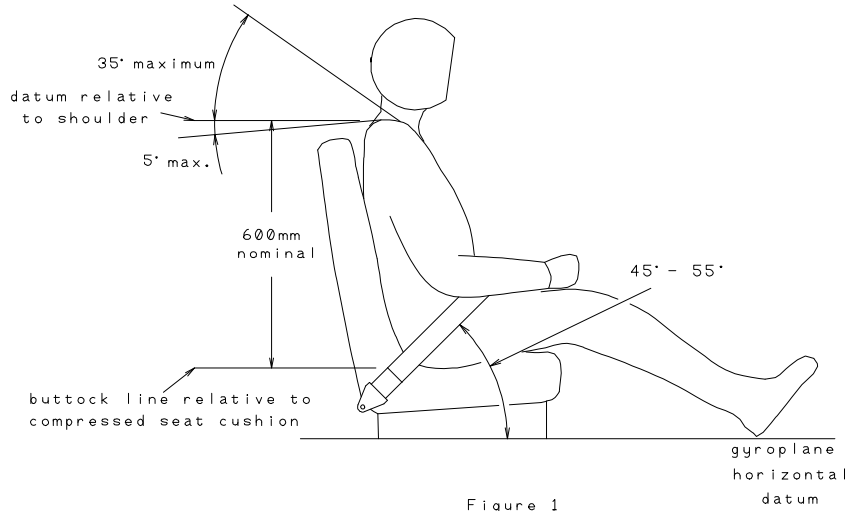


Figure 1

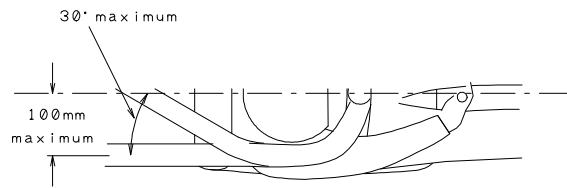


Figure 2

Range of Angles of Sholder Straps

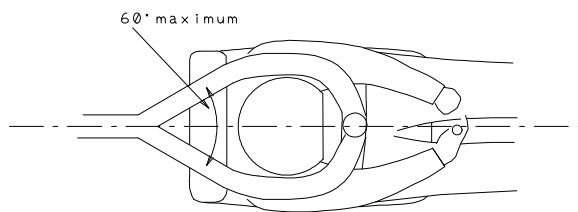


Figure 3

Appendix 2.

This Appendix contains the recommended limits applicable to the various components of gyroplanes.

This Appendix will be removed from this document when the information it contains is published in the ASRA Technical Manual.

Bolts and Nuts.

All tightened bolts must have at least 2 threads showing.

A maximum of 3 washers is permitted in any bolt installation.

A washer should always be present under nuts.

Where practical, bolts should all be installed facing the same direction.

Unless specified by the manufacturer, bolts should be torqued in accordance with the following table:

Fine Thread Series	
Bolt Size	Standard Type Nuts
3/16 – 32	20 – 25 inch/pounds
1/4 - 28	50 – 70 inch/pounds
5/16 – 24	100 – 140 inch/pounds
3/8 – 24	160 – 190 inch/pounds
7/16 - 20	450 – 500 inch/pounds
1/2 – 20	480 – 690 inch/pounds
9/16 - 18	800 – 1000 inch/pounds
5/8 – 18	1100 - 1300inch/pounds
3/4 – 16	1300 – 1500 inch/pounds

Castellated nuts may be over tightened only until the locking pin hole aligns with the castellations in the nut.

Hole Locations.

Holes drilled in square or rectangular tubular material should be positioned as close as possible to the edge of the material without scoring the internal surface. Alternatively, anti-crush spacers must be used to prevent material deformation due to crushing as bolts are torqued.

Holes drilled in plates must be located such that the centre of the hole is at least 2 hole diameters from the edges of the plates and 3 hole diameters apart.

Head Movement.

Fore/Aft: Zero or slightly negative forward to at least 18 degrees aft.

Lateral: Between 9 and 11 degrees left and right.

Teeter Limits.

Recommended minimum +/- 9 degrees or that specified by the manufacturer of the rotor blades.

Cyclic Stick Movement.

At least 300 mm fore and aft measured at the top centre of the stick for Approved (normally 2 seat) Gyros, and 250 mm for Basic Gyros.

At least 250 mm left and right measured at the top of the stick for Approved (normally 2 seat) Gyros, and 200mm for Basic Gyros

Control Cables.

Minimum thickness of any cable is 2.4 mm, 7 X 19 strand stainless.

Where significant changes of direction (more than 3 degrees) in the same plane are necessary, suitable pulleys should be used.

Where pulleys are used, the cable must run in the same plane as that of the pulley.

Cable retainers should be used in all pulley installations.

Rudder cables prevented from entering the propeller arc in the event of a breakage.

Clearances.

A minimum of 75 mm clearance between the plane of the rotor disc and the plane of the propeller in the worst-case scenario. Recommended 150 mm.

A minimum of 25 mm between the propeller and any part of the airframe.

Adequate clearance between the rotor disc and the top of the tails or fins with the cyclic held fully aft and the blades at rest (not pulled down). Minimum 250 mm recommended.