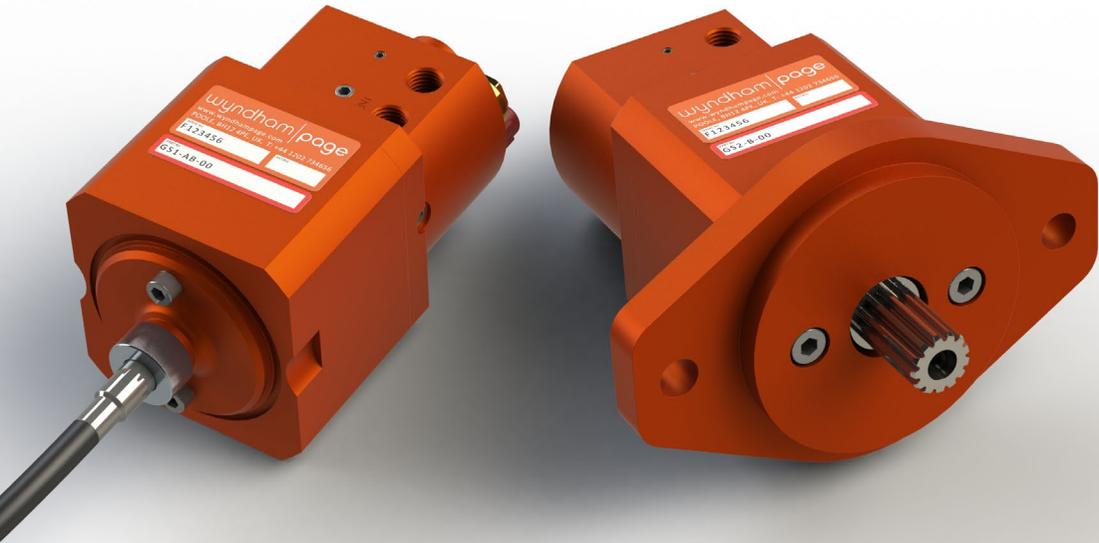


GS1 & GS2 Speed Valves

Mechanical Engine Speed Sensing Valves

*Part of the G Series of mechanical engine safety products
for diesel engine emergency shutdown.*



wyndham|page

About Wyndham Page Ltd

Based in the UK Wyndham Page specialise in the design and manufacture of safety equipment for diesel engines.

Our product range of Air Intake Shutdown Valves includes our E Series Automatic Valves and our F Series Butterfly Valves with solenoid, pneumatic or manual actuation options. We offer Speedswitch kits for the F Series valves, a range of G Series Mechanical Engine Safety Products and a range of Spark Arresters designed to prevent the emission of high energy sparks from diesel exhaust systems.

Wyndham Page is headed by Freddy Page-Roberts who brings over 20 years' experience in the diesel safety industry and was previously managing director of Chalwyn Ltd.

All members of the senior management team have considerable experience in organisations specialising in the design and manufacture of hazardous area equipment for diesel engines.

Quality Assurance

Wyndham Page Valves are manufactured and tested under our EN ISO 9001: 2015 quality management system.

Wyndham Page Ltd are certified to supply Ex equipment under Quality Assurance Notification CML ATEXQ11003 in the UK, CML ATEXQ13649 in the EU and IECEx Quality Assurance Report GB/CML/QAR17.0023/01.

- Equipment supplied with an UK Declaration/Assertion of Conformity is CA marked and meets the provision of the UK directive SI 2016No. 1107
- Equipment supplied with an EU Declaration/Assertion of Conformity is CE marked and meets the provision of the ATEX directive 2014/34/EU.

New G Series Mechanical Engine Safety Products Now Available

Wyndham Page also supplies an ASOV, a fuel control system and a range of temperature sensing valves for incorporation into the emergency shutdown control circuit of this type of application. Details can be found in our **“G Series Mechanical Engine Safety Products” Handbook** available for download on our website. Please contact Wyndham Page or your Wyndham Page supplier for additional details.

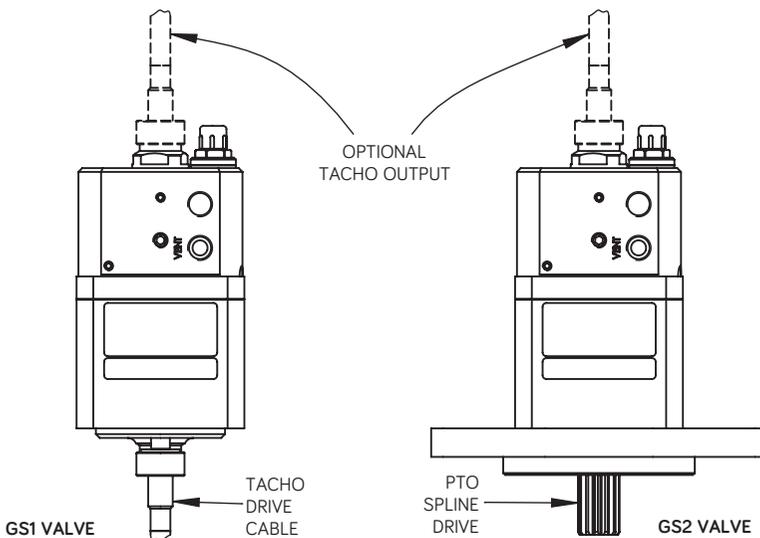
GS1 & GS2 Valves: Application

The GS series of mechanical engine speed sensing valves are designed for use in the safety control circuit of diesel engines required to operate without an electrical system. When used in combination with a suitable air intake shutdown valve (ASOV) such as the Wyndham Page FG3, they provide an emergency means for rapid shutdown of a diesel engine should the engine RPM exceed a preset limit.

The GS valve is mechanically driven by a rotating output from the engine such as the tachometer drive or PTO. The safety control circuit, usually pressurised oil from the engine lube system or an independent pneumatic supply, is vented to sump or atmosphere by the GS speed valve in the event of an engine overspeed. The resulting pressure drop in the control circuit results in closure of the ASOV and a rapid shutdown of the engine.

The GS valve will automatically reset as the engine RPM falls below the preset trip speed due to closure of the ASOV.

Corrosion resistant materials are used where applicable in the construction of the valve. This lightweight and compact valve design and range of mechanical drive options assists with easy installation.



Description and Main Dimensions

The GS speed valves use rotating forces acting on a system of flyweights to open the safety control circuit valve at a preset trip speed. The trip speed is adjustable via a setting screw acting on a compression spring.

The valve comes in 2 configurations

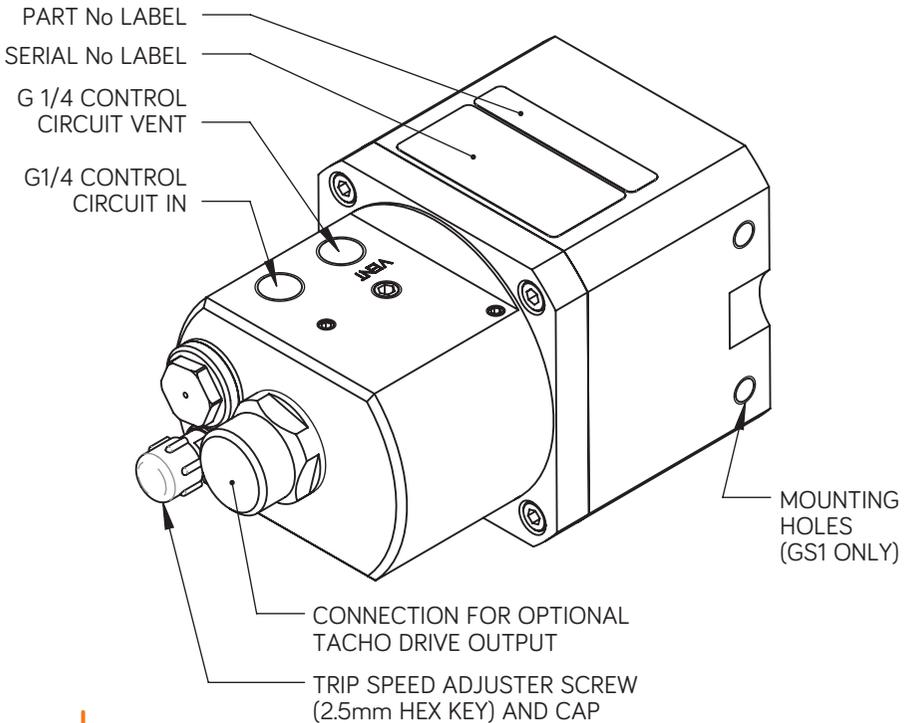
GS1 - driven by a tacho cable from the engine's tacho drive output

GS2 - driven by a spline drive at the engine's PTO output

Full details of these options are given below.

Both of the above configurations have an optional Tacho drive output on the back of the valve to enable a tachometer to be connected. This is a direct drive from the input shaft hence rpm and direction of rotation are unchanged.

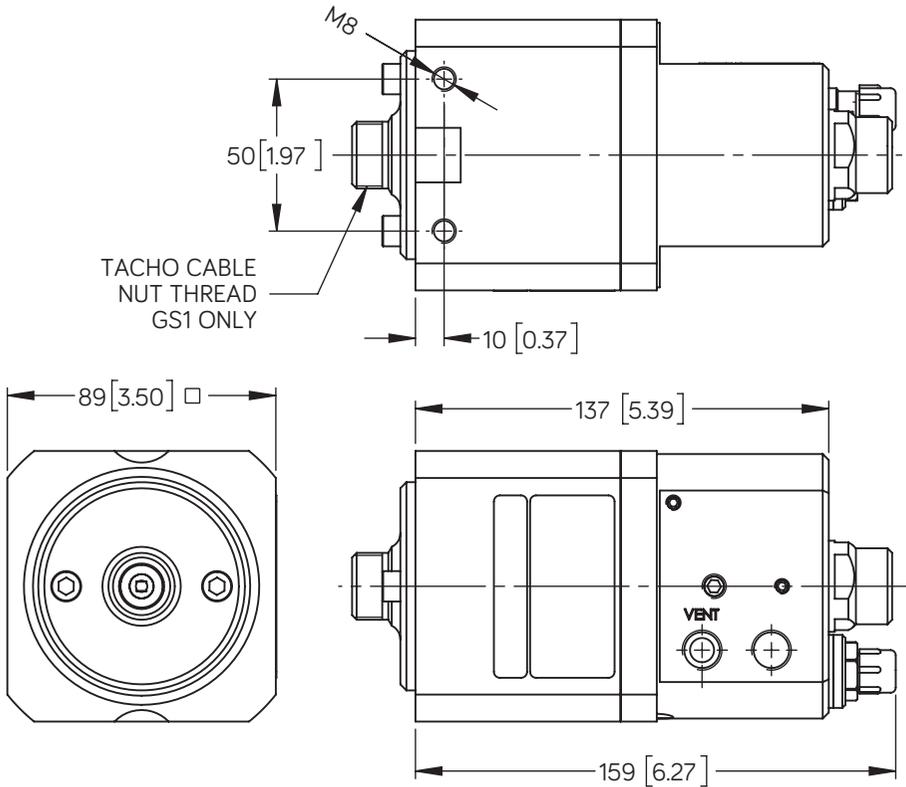
The diagram below and the diagrams and data on pages 5 to 7 cover the main features and basic dimensions of the GS valve range including selection of options and order coding.



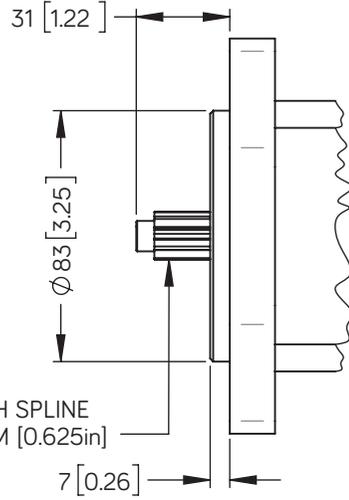
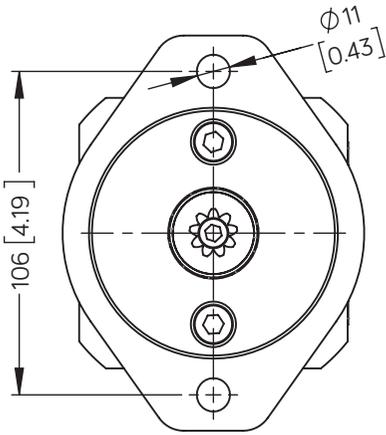
GS1 VALVE TRIP RPM'S		
TACHO DRIVE RATIO 0.5 x ENGINE RPM		
GS1	VALVE RPM	ENGINE RPM*
MIN TRIP	1080	2160
MAX TRIP	1500	3000

GS2 VALVE TRIP RPM'S		
PTO DRIVE RATIO 1.25 x ENGINE RPM		
GS2	VALVE RPM	ENGINE RPM*
MIN TRIP	2700	2160
MAX TRIP	3750	3000

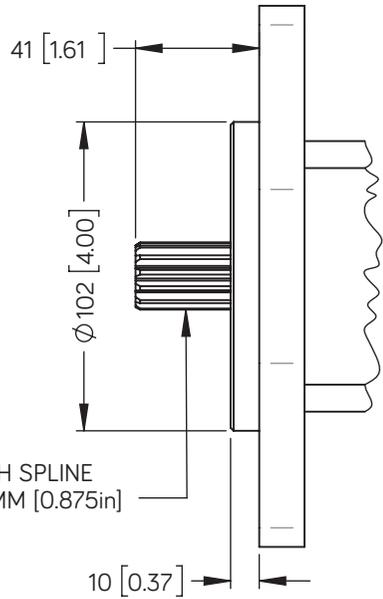
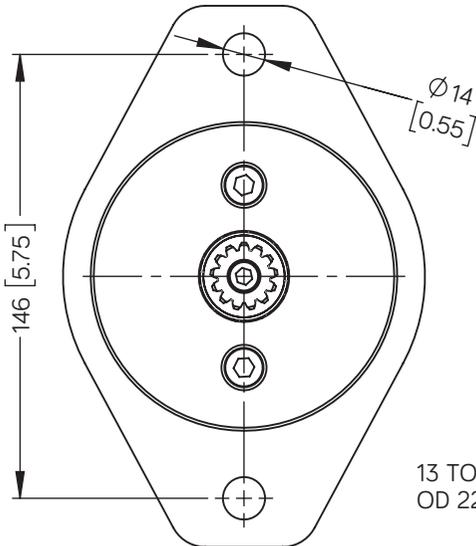
* Engine RPM calculated for drive ratio in table



GS VALVE: DIMENSIONS



GS2 VALVE: PTO DRIVE A - SAE MOUNTING TYPE A



GS2 VALVE: PTO DRIVE B - SAE MOUNTING TYPE B

Valve Selection

To enable Wyndham Page to select the most suitable version of the GS valve for the Customers application the following data is required:

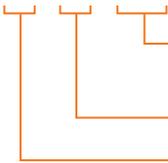
1. Drive type:
 - a. Tacho cable specification or
 - b. PTO type A or B
 - c. Engine operating RPM and required trip RPM
2. Optional Tacho output: Tacho cable specification

Order Coding

GS1 Valve

Example: GS1-AB-00

GS1 - XX - XX - S00



Special features code (refer to sales) only include in code if required

Rear Tacho Output option: Coding as Input. 00 = None

Drive Input: Drive Nut & Drive Tip (see order codes in table)

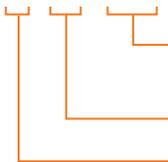
TACHO DRIVE NUT TABLE	
NUT	CODE
7/8 x 18	A
M22 x 1.5	B

TACHO DRIVE TIP TABLE	
TIP	CODE
2.7 (0.104) <input type="checkbox"/>	A
3.2 (0.124) <input type="checkbox"/>	B
3.9 (0.15) <input type="checkbox"/>	C

GS2 Valve

Example: GS2-A-BA

GS2 - X - XX - S00



Special features code (refer to sales) only include in code if required

Rear Tacho Output option: Coding as tables above. 00 = None

PTO Input: (see order codes in table)

PTO DRIVE TABLE	
PTO TYPE	CODE
PTO A	A
PTO B	B

Special Features:
By arrangement with Wyndham Page.

Valve Installation (mechanical)

GS1 Valve

Select a position for the valve which meets the requirements below. The valve may be fitted in any attitude from horizontal to vertical but not in a position where it is subjected to temperatures, internal or external, outside of the range -40°C to $+120^{\circ}\text{C}$. Mount the valve on a suitable bracket using the M8 mounting holes. When planning and checking installation always ensure that:

- a. There is a suitable route for the tacho drive cable and if selected the rear tacho output cable.
- b. There is safe access to the trip speed adjuster screw.
- c. There is a suitable route for the control circuit pipework.
 - i. In the case of a lube oil control circuit the orientation of the valve should be such that the vent port and associated pipework can drain back to the sump under gravity.
 - ii. In the case of a pneumatic control circuit the vent may be directly to atmosphere if allowed by applicable site regulations. In this case **always fit a suitable filter** to prevent contamination of the valve seat.

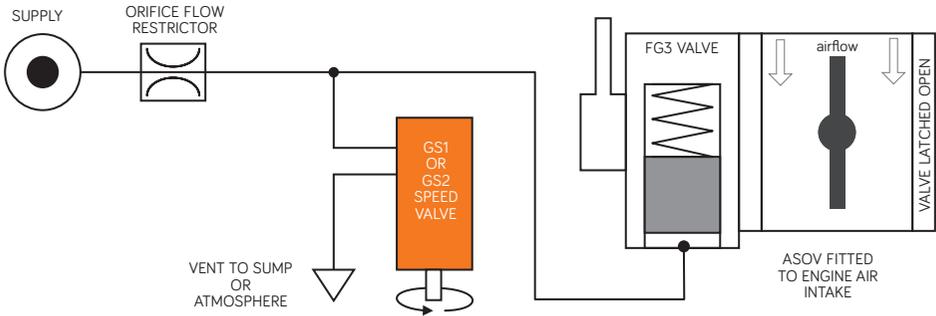
GS2 Valve

Mount the valve to the selected PTO output using the supplied mounting flange. The valve may be fitted in any attitude from horizontal to vertical but not in a position where it is subjected to temperatures, internal or external, outside of the range -40°C to $+120^{\circ}\text{C}$. Apply suitable grease to the spline gear before engaging into PTO. When planning and checking installation always ensure that:

- a. There is a suitable route for the optional rear tacho output cable if selected.
- b. There is safe access to the trip speed adjuster screw.
- c. There is a suitable route for the control circuit pipework.
 - i. In the case of a lube oil control circuit the orientation of the valve should be such that the vent port and associated pipework can drain back to the sump under gravity.
 - ii. In the case of a pneumatic control circuit the vent may be directly to atmosphere if allowed by applicable site regulations. In this case **always fit a suitable filter** to prevent contamination of the valve seat.

Valve Installation (control circuit connection)

Connect the control circuit feed to the valve via the G1/4 port using fittings appropriate to the control circuit type. The detailed design of the control circuit is not within the scope of this handbook however the simplified schematic below shows the basic operating principle. Note the requirement for a flow restrictor to ensure the control pressure drops sufficiently to trip the ASOV valve to the closed position when the GS1/2 safety valve opens.



Trip Speed Setting

The GS valve as supplied will normally be set to trip at the maximum speed for the valve type.

Note: Rotating the adjuster screw anticlockwise will decrease the trip speed.

The trip speed can be set in 2 ways:

1. With the valve installed with on the engine along with the ASOV.
 - a. Remove the adjuster protection cap.
 - b. Run the engine up to the required trip speed
 - c. Slowly rotate the adjuster screw anticlockwise until the ASOV closes and stops the engine.
 - d. Replace the adjuster protection cap.
- e. If it is not possible to raise the engine RPM above the normal maximum: first set the trip speed at this lower limit then, referring to the figures in the specification table, calculate the number of turns needed & rotate the adjuster screw clockwise to set the required higher trip speed.

2. The trip speed can be set on the bench with the valve mounted in a suitable drive rig and with a suitable supply (usually compressed air) connected to the control circuit inlet.
 - a. Remove the adjuster protection cap.
 - b. Run the valve up to the required trip speed (allowing for the drive ratio of the selected drive type)
 - c. Slowly rotate the adjuster screw anticlockwise until the valve starts to bleed air.
 - d. Note: the actual shutdown speed on the engine may vary slightly depending on how quickly the ASOV responds to the venting of control circuit pressure.

Operation

The GS valves require no intervention at start-up or in normal operation and will automatically reset after an overspeed trip.

Maintenance

The following maintenance schedule should be undertaken. Subject to experience of local operating conditions the frequency of the maintenance schedule may be varied. Carry out the proposed maintenance work when the equipment is in a safe area and record details of the work carried out. Rectify any problems identified before returning the diesel powered equipment back into service.

FOLLOWING INITIAL INSTALLATION AND THEREAFTER AT WEEKLY INTERVALS:

1. Check any support brackets are properly fitted and secure and that the tacho drive cable shows no sign of significant deterioration or damage.
2. Check the control circuit pipework is secure and leak free.
3. Start engine. Carry out a overspeed test and check that the ASOV closes and brings the engine to a stop within a few seconds.

SIX MONTHLY:

Remove the GS valve. Wipe clean as necessary and visually inspect for damage or excessive wear. Bench test valve function. Refit and complete the “Weekly” maintenance as listed above.

GS1 & GS2 Valves: General Specification

GENERAL DESCRIPTION:	
A mechanical valve designed to vent the safety control circuit pressure at a preset RPM.	
Temperature:	Ambient: -40°C to 120°C
Construction:	Body: Anodised aluminium
	Internal components: Stainless steel, steel, aluminium
	Seals: Viton
Weight:	Base Valve -2.6 Kg (5.7 lb)
OPERATING SPECIFICATION:	
Valve normally closed, opens when RPM exceeds preset trip speed	
Control circuit type:	Filtered Engine lubrication oil
	Filtered Air: ISO 8573 Class 4
Control circuit pressures:	Max: 5.5 Bar (80 PSI)
	Air control circuits recommended max: 4 Bar (58 PSI)
Max Valve RPM:	GS1 - 2000
	GS2 - 5000
Trip adjuster screw setting (at valve RPM):	GS1 - approx 20 RPM per turn
	GS2 - approx 70 RPM per turn

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