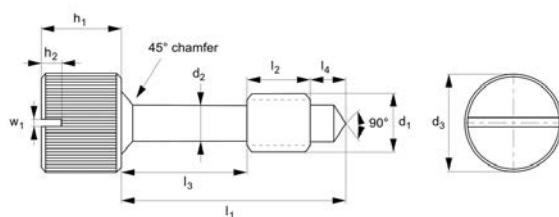




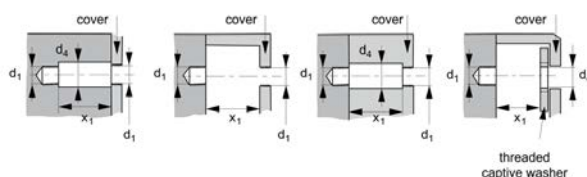
# Captive Panel Thumb Screws

slot drive - 303 stainless

## Captive Screws



application examples :-  
counterbore length 'x<sub>1</sub>' should be > l<sub>2</sub>



## P0159.A2

CAPTIVE SCREWS

### Material

Stainless steel (AISI 303, 1.4305). Tensile strength 550 N/mm<sup>2</sup>. Proof stress min. 190 N/mm<sup>2</sup>, austenitic stainless steel. Also available on request in steel (anodised, black oxide or zinc plated),

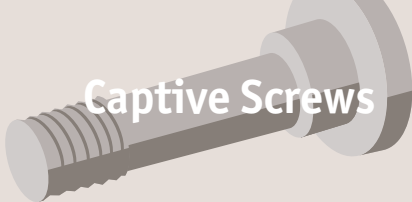
stainless steel (AISI 316, 1.440), brass, aluminium etc.

### Technical Notes

Used to comply with the Machinery Directive 2006/42/EC. Often used with our

captive washers (P0168) or retaining flanges (P0169.A2 - for sheet metal applications). The use of our captive washers should be considered when fitted in panels with unthreaded holes.

Order No.	d <sub>1</sub>	l <sub>1</sub> ±0.25	d <sub>2</sub> ±0.12	d <sub>3</sub>	d <sub>4</sub> min.	h <sub>1</sub>	h <sub>2</sub>	l <sub>2</sub> ±0.25	l <sub>3</sub>	l <sub>4</sub>	w <sub>1</sub>
P0159.030-010-A2	M 3	10	2.0	6.5	3.5	6.5	2.0	3.2	4.8	2.0	1.2
P0159.030-014-A2	M 3	14	2.0	6.5	3.5	6.5	2.0	3.2	8.8	2.0	1.2
P0159.030-016-A2	M 3	16	2.0	6.5	3.5	6.5	2.0	3.2	10.8	2.0	1.2
P0159.030-020-A2	M 3	20	2.0	6.5	3.5	6.5	2.0	3.2	14.8	2.0	1.2
P0159.030-022-A2	M 3	22	2.0	6.5	3.5	6.5	2.0	3.2	16.8	2.0	1.2
P0159.030-024-A2	M 3	24	2.0	6.5	3.5	6.5	2.0	3.2	18.8	2.0	1.2
P0159.030-026-A2	M 3	26	2.0	6.5	3.5	6.5	2.0	3.2	20.8	2.0	1.2
P0159.031-010-A2	M 3	10	2.0	8.0	3.5	8.0	2.0	3.2	4.8	2.0	1.2
P0159.031-014-A2	M 3	14	2.0	8.0	3.5	8.0	2.0	3.2	8.8	2.0	1.2
P0159.031-016-A2	M 3	16	2.0	8.0	3.5	8.0	2.0	3.2	10.8	2.0	1.2
P0159.031-020-A2	M 3	20	2.0	8.0	3.5	8.0	2.0	3.2	14.8	2.0	1.2
P0159.031-022-A2	M 3	22	2.0	8.0	3.5	8.0	2.0	3.2	16.8	2.0	1.2
P0159.031-024-A2	M 3	24	2.0	8.0	3.5	8.0	2.0	3.2	18.8	2.0	1.2
P0159.040-014-A2	M 4	10	3.0	8.0	4.5	8.0	2.0	5.5	2.0	2.5	1.2
P0159.040-016-A2	M 4	14	3.0	8.0	4.5	8.0	2.0	5.5	6.0	2.5	1.2
P0159.040-016-A2	M 4	16	3.0	8.0	4.5	8.0	2.0	5.5	8.0	2.5	1.2
P0159.040-020-A2	M 4	20	3.0	8.0	4.5	8.0	2.0	5.5	12.0	2.5	1.2
P0159.040-022-A2	M 4	22	3.0	8.0	4.5	8.0	2.0	5.5	14.0	2.5	1.2
P0159.040-024-A2	M 4	24	3.0	8.0	4.5	8.0	2.0	5.5	16.0	2.5	1.2
P0159.040-027-A2	M 4	27	3.0	8.0	4.5	8.0	2.0	5.5	19.0	2.5	1.2
P0159.040-032-A2	M 4	32	3.0	8.0	4.5	8.0	2.0	5.5	24.0	2.5	1.2
P0159.050-014-A2	M 5	14	3.5	10.0	5.5	10.0	2.5	6.5	3.5	4.0	1.5
P0159.050-016-A2	M 5	16	3.5	10.0	5.5	10.0	2.5	6.5	5.5	4.0	1.5
P0159.050-020-A2	M 5	20	3.5	10.0	5.5	10.0	2.5	6.5	9.5	4.0	1.5
P0159.050-022-A2	M 5	22	3.5	10.0	5.5	10.0	2.5	6.5	11.5	4.0	1.5
P0159.050-024-A2	M 5	24	3.5	10.0	5.5	10.0	2.5	6.5	13.5	4.0	1.5
P0159.050-027-A2	M 5	27	3.5	10.0	5.5	10.0	2.5	6.5	16.5	4.0	1.5
P0159.050-032-A2	M 5	32	3.5	10.0	5.5	10.0	2.5	6.5	21.5	4.0	1.5
P0159.050-035-A2	M 5	35	3.5	10.0	5.5	10.0	2.5	6.5	24.5	4.0	1.5
P0159.050-040-A2	M 5	40	3.5	10.0	5.5	10.0	2.5	6.5	29.5	4.0	1.5
P0159.060-016-A2	M 6	16	4.5	12.0	6.5	15.0	2.5	8.0	3.0	5.0	2.0
P0159.060-020-A2	M 6	20	4.5	12.0	6.5	15.0	2.5	8.0	7.0	5.0	2.0



# Captive Screws

## Captive Panel Thumb Screws

slot drive - 303 stainless



Order No.	d <sub>1</sub>	l <sub>1</sub> ±0.25	d <sub>2</sub> ±0.12	d <sub>3</sub>	d <sub>4</sub> min.	h <sub>1</sub>	h <sub>2</sub>	l <sub>2</sub> ±0.25	l <sub>3</sub>	l <sub>4</sub>	w <sub>1</sub>
P0159.060-022-A2	M 6	22	4.5	12.0	6.5	15.0	2.5	8.0	9.0	5.0	2.0
P0159.060-024-A2	M 6	24	4.5	12.0	6.5	15.0	2.5	8.0	11.0	5.0	2.0
P0159.060-027-A2	M 6	27	4.5	12.0	6.5	15.0	2.5	8.0	14.0	5.0	2.0
P0159.060-032-A2	M 6	32	4.5	12.0	6.5	15.0	2.5	8.0	19.0	5.0	2.0
P0159.060-035-A2	M 6	35	4.5	12.0	6.5	15.0	2.5	8.0	22.0	5.0	2.0
P0159.060-040-A2	M 6	40	4.5	12.0	6.5	15.0	2.5	8.0	27.0	8.5	2.0
P0159.060-045-A2	M 6	45	4.5	12.0	6.5	15.0	2.5	8.0	32.0	8.5	2.0
P0159.060-050-A2	M 6	50	4.5	12.0	6.5	15.0	2.5	8.0	37.0	8.5	2.0

CAPTIVE SCREWS

Automotion produce a wide range of fasteners designed for application where it is important that fasteners are not separated from equipment (e.g. cover panels etc). This is now important to ensure that equipment complies with Machinery Directive 200642/EC - requiring that fasteners remain attached to fixed guards or equipment when guards are removed.






Our captive panel screws are manufactured mainly from stainless steel (A2, AISI 303 grade), but they can also be produced in stainless steel (A4, AISI 316), aluminium, brass or zinc-plated steel.

Many finishes can be applied - black-oxide finish, anodizing etc.

The main options are as follows:

Finish	Notes
<b>Black Chrome</b> (MIL-C-1458B)	Black chrome is a hard, non-reflective coating which is resistant to abrasion, heat and corrosion. The black chrome surface is a dull, dark grey and may be waxed or oiled to darken surface.
<b>Black Oxide Coating</b> (MIL-C-13924B)	Black oxide is a uniform black coating for ferrous metals. Generally it is considered a decorative coating and provides only very limited corrosion protection under mild corrosion conditions.
<b>Cadmium</b>	Cadmium is a bright, silvery white plating. Supplementary treatments for Type II can be golden, iridescent, amber, black or olive drab.
<b>Passivate</b> (QQ-P-35/MIL S-500SC)	Passivation is a process designed to remove foreign metals from the surface of stainless and corrosion resistant steels.
<b>Phosphate Coating Light</b> (TT-C-00490B)	Phosphate coating is a light coating for use as a base paint.
<b>Gold</b> (MIL-G-45204B)	Yellow to orange colour depending on proprietary process used. Will range from matt to bright finish depending on base metal. Good corrosion resistance and high tarnish resistance.
<b>Nickel</b> (QQ-N-290A)	Nickel is a corrosion protective plating for steel, zinc and zinc alloys as well as copper and copper alloys.
<b>Zinc</b> (QQ-Z-325C)	The primary use of chromate finishes on zinc is to retard or prevent formation of white corrosion products on zinc surfaces.

The available head sockets include:

Schematic	Drive Types	Uses
	Hexagonal Recess	Ideal for precision assembly. Most recommended where less surface area is available.
	Crosshead (Phillips®)	Provides good control in driving. Always use a driver bit of the proper size which is in good condition.
	Star Head (Torx®)	Positive-engaging, fast-locating method which transmits drive torque with less required downward pressure. Good fastening appearance.
	Slotted	Accepts standard blade screwdriver. Requires less downward pressure to drive parts than those with recessed openings. Use a proper fitting blade to minimize slippage.
	Security	These screws are impossible to remove without the special matching screw driver.



Automotion provides a wide range of captive screws to aid customers to comply with the Machinery Directive 2006/42/EC.

In general there is a requirement that fixings for fixed guards shall remain attached to the guard or machinery when the guard is removed. This was implemented mainly to ensure that as far as possible fasteners are not lost when the guard is removed and the guard is therefore re-installed with all required fixings.

A wide range of captive screws and thumb screws are provided...



**P0151**  
Button Head - Hex  
Security and Torx Options



**P0154**  
Socket Head - Cap Screw  
Security and Torx Options



**P0158**  
Hexagon Head Bolt



**P0159**  
Captive Panel Screw



**P0160**  
Thin Head Thumb Screws



**P0161**  
Thumb Screws

### Installation

To work effectively the captive screw when installed needs to have a space or counterbore between the thread and cover at least equal to the length of the thread.

