

NORMACLAMP® – Hose Clamps

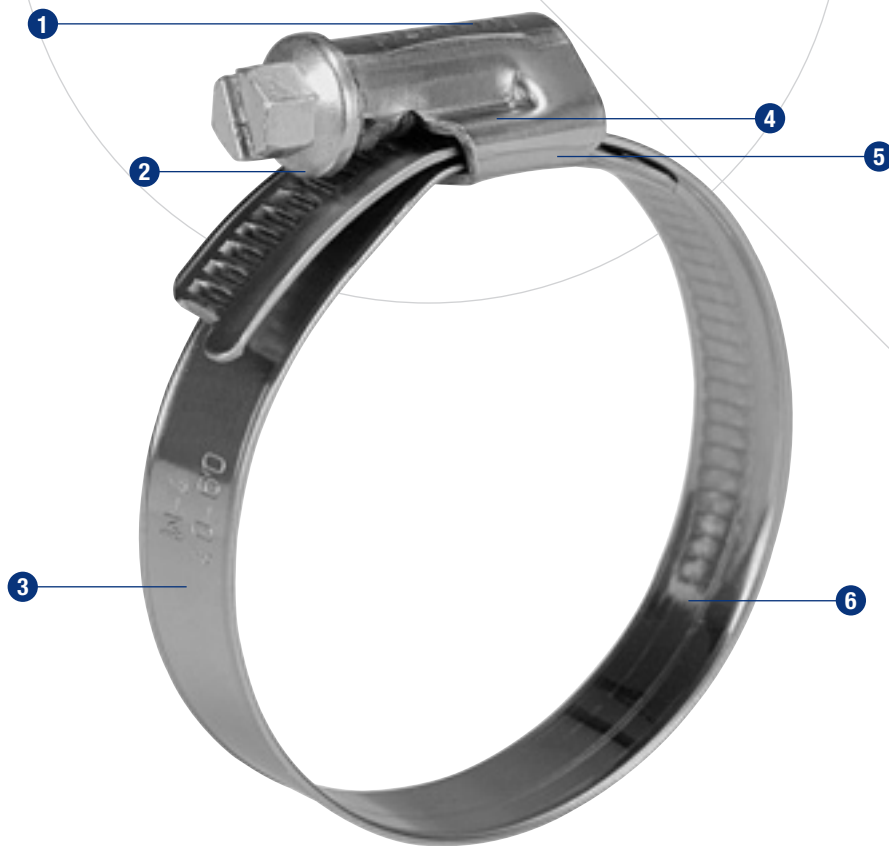
NORMACLAMP® TORRO® – Worm Drive Hose Clips to DIN 3017

NORMACLAMP® TORRO® hose clips are specially suitable for applications under high mechanical loads. Since we are contin-

uously working to improve its features this clip is still setting standards for modern hose clip design.

The distinguishing feature of the NORMACLAMP® TORRO® is the asymmetrical construction which tells you at first sight whether it is a genuine TORRO® or not.

Short description of technical features



- 1** Improved asymmetric housing = even distribution of forces and safe assembly
- 2** Screw support = Ease of assembly due to the safe guidance of the emerging band end
- 3** Material and clamping range stamped on the band = prevention of errors
- 4** Asymmetric extension = prevents the housing from tilting over when the clamp is tightened
- 5** Short housing saddle = even contact pressure = improved efficiency
- 6** Smooth or stamped inside of band = optimal hose protection

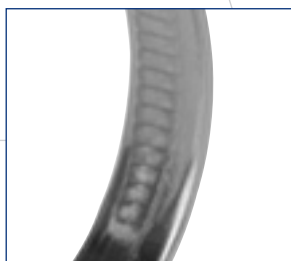
Materials

W1*	W2*	W3	W4	W5
X	X	X	X	X

* No chromium VI used for the coating of the closure components

NORMACLAMP® – Hose Clamps

Types of clamp band



- Band width 9 mm
- W1 with smooth inside
 - W2, W3, W4, W5 with stamped inside

- Band width 12 mm
- W1, W2, W3 with smooth inside
 - W4, W5 with stamped inside

Screw



		W1	W2	W3	W4	W5
Phillips head	SW 7*	•	•			
Slotted head	SW 7**			•	•	•

* Band width 7.5 mm = SW 6 ** Band width 16 mm = SW 8

The advantages at a glance

- Multi-range hose clamp
- Material: W1, W2, W3, W4, W5
- Chromium VI free: compliant with ROHS, WEEE and ELV Environmental Directives
- Clamping ranges to DIN 3017: 8 – 16 mm up to 140 – 160 mm
- Larger diameters on demand

NORMACLAMP® – Hose Clamps

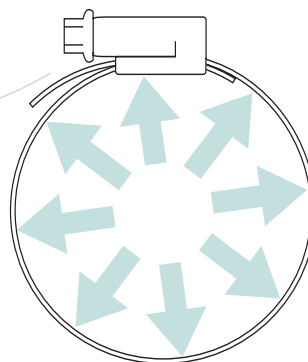
Technical features

High band tensile force and high fracture torque

As always, the new NORMACLAMP® TORRO® features high tensile forces. However, when compared with competitor's products and the previous model, we now achieve significantly higher fracture torques. This provides for an increased assembly reliability.

Even clamping force distribution

Thanks to its enhanced technical design, the new NORMACLAMP® TORRO® range delivers an even distribution of clamping force. The clamp sits perfectly on the hose and ensures the optimal sealing of the connection.



Corrosion resistance

Material	Corrosion resistance in salt spray testing
W1	Min. 144 h
W2	Min. 72 h
W3	Min. 200 h*
W4	Min. 240 h
W5	Min. 400 h

* Max 10% corrosion of the base material allowed

Applications

- Cooling water lines
- Depressurized as well as pressurized fuel lines and vent lines
- Oil lines
- Connections in sanitary installations
- Connections in engine construction
- Connections in the white goods industry
- Hose connections in commercial vehicles industries

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Table with torques

TORRO 9 W1										
Diameter (mm)	8–12	10–16	12–18	12–22	16–27	20–32	25–40	30–45	35–50	40–60
AD	2.5 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5
LD max	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
PD	3.3	4	4	4	4	4	4	4	4	4
BD min	4	4.5	4.5	4.5	4.5	4.5	6	6	6	6
TORRO 9 W2										
Diameter (mm)		8–16		12–22	16–27	20–32	25–40	30–45	35–50	40–60
AD		2 +0.5		3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5
LD max		0.7		0.7	0.7	0.7	0.7	0.7	0.7	0.7
PD		2.6		4	4	4	4	4	4	4
BD min		4		4.5	4.5	4.5	4.5	4.5	4.5	4.5
TORRO 9 W3–W5										
Diameter (mm)		8–16		12–22	16–27	20–32	25–40	30–45	35–50	40–60
AD		2 +0.5		3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5
LD max		0.7		0.7	0.7	0.7	0.7	0.7	0.7	0.7
PD		2.6		4	4	4	4	4	4	4
BD min		4		4.5	4.5	4.5	4.5	4.5	4.5	4.5
TORRO 12 W1										
Diameter (mm)					16–27	20–32	25–40	30–45	35–50	40–60
AD					5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5
LD max					1.2	1.2	1.2	1.2	1.2	1.2
PD					6.5	6.5	6.5	6.5	6.5	6.5
BD min					10	10	10	10	10	10
TORRO 12 W2/W3										
Diameter (mm)					16–27	20–32	25–40	30–45	35–50	40–60
AD					5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5
LD max					1	1	1	1	1	1
PD					6.5	6.5	6.5	6.5	6.5	6.5
BD min					8.0	8.0	8.5	8.5	8.5	8.5
TORRO 12 W4/W5										
Diameter (mm)					16–27	20–32	25–40	30–45	35–50	40–60
AD					5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5
LD max					1	1	1	1	1	1
PD					6.5	6.5	6.5	6.5	6.5	6.5
BD min					8	8	8.5	8.5	8.5	8.5

Legend:

AD = recommended tightening torque in Nm;

LD = no-load torque in Nm;

PD = test torque in Nm;

BD = fracture torque in Nm

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TORRO 9 W1

50–70	60–80	70–90	80–100	90–110	100–120	110–130	120–140	130–150	140–160	Diameter (mm)
3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	AD
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	LD max
4	4	4	4	4	4	4	4	4	4	PD
6	6	6	6	6	6	6	6	6	6	BD min

TORRO 9 W2

50–70	60–80	70–90	80–100	90–110	100–120	110–130	120–140	130–150	140–160	Diameter (mm)
3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	AD
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	LD max
4	4	4	4	4	4	4	4	4	4	PD
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	BD min

TORRO 9 W3–W5

50–70	60–80	70–90	80–100	90–110	100–120	110–130	120–140	130–150	140–160	Diameter (mm)
3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	3 +0.5	AD
0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	LD max
4	4	4	4	4	4	4	4	4	4	PD
4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	BD min

TORRO 12 W1

50–70	60–80	70–90	80–100	90–110	100–120	110–130	120–140	130–150	140–160	Diameter (mm)
5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	AD
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	LD max
6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	PD
10	10	10	10	10	10	10	10	10	10	BD min

TORRO 12 W2/W3

50–70	60–80	70–90	80–100	90–110	100–120	110–130	120–140	130–150	140–160	Diameter (mm)
5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	AD
1	1	1	1	1	1	1	1	1	1	LD max
6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	PD
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	BD min

TORRO 12 W4/W5

50–70	60–80	70–90	80–100	90–110	100–120	110–130	120–140	130–150	140–160	Diameter (mm)
5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	5 +0.5	AD
1	1	1	1	1	1	1	1	1	1	LD max
6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	PD
8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	BD min

NORMACLAMP® – Hose Clamps

Survey of sizes, band widths & materials NORMACLAMP® TORRO®

Band width (mm)	Description	Clamping Range		Packaging		B	h	L	s	s (only W1)	W1	W2	W3	W4	W5
		in mm	in Inches	PU	IC										
5	SGL 7-11/5			100								X			
5	SGL 11-19/5			100								X			
7.5	TORRO 8-12/7.5	8-12	5/16-1/2	100	1000	11.5	9.2	17.6	0.6			X	X		
7.5	TORRO 10-16/7.5	10-16	3/8-5/8	100	1000	11.5	9.2	17.6	0.6			X	X		
7.5	TORRO 12-18/7.5	12-18	1/2-3/4	100	1000	11.5	9.2	17.6	0.6			X	X		
9	TORRO 8-12/9	8-12	5/16-1/2	100	1000	13.0	11.0	21.0	0.7	0.8	X				
9	TORRO 8-16/9	8-16	5/16-5/8	100	1000	13.0	11.0	21.0	0.7			X	X	X	X
9	TORRO 10-16/9	10-16	3/8-5/8	100	1000	13.0	11.0	21.0	0.7	0.8	X				
9	TORRO 12-18/9	12-18	1/2-3/4	100	1000	13.0	11.0	21.0	0.7	0.8	X				
9	TORRO 12-22/9	12-22	1/2-7/8	100	1000	13.0	11.0	24.0	0.7			X	X	X	X
9	TORRO 16-27/9	16-27	5/8-11/16	100	1000	13.0	11.0	24.0	0.7	0.8	X	X	X	X	X
9	TORRO 20-32/9	20-32	3/4-11/4	100	1000	13.0	11.0	24.0	0.7	0.8	X	X	X	X	X
9	TORRO 25-40/9	25-40	1-15/8	100	1000	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 30-45/9	30-45	13/16-13/4	100	500	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 35-50/9	35-50	13/8-2	50	500	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 40-60/9	40-60	15/8-23/8	50	250	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 50-70/9	50-70	2-23/4	50	250	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 60-80/9	60-80	23/8-31/8	25	250	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 70-90/9	70-90	23/4-31/2	25	250	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 80-100/9	80-100	31/8-4	25	200	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 90-110/9	90-110	31/2-43/8	25	200	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 100-120/9	100-120	4-43/4	-	250	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 110-130/9	110-130	43/8-51/8	-	200	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 120-140/9	120-140	43/4-51/2	-	200	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 130-150/9	130-150	51/8-57/8	-	200	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X
9	TORRO 140-160/9	140-160	51/2-61/4	-	200	13.0	11.0	26.0	0.7	0.8	X	X	X	X	X

NORMACLAMP® – Hose Clamps

Band width (mm)	Description	Clamping Range		Packaging		B	h	L	s	s (only W1)	W1	W2	W3	W4	W5
		in mm	in Inches	PU	IC										
12	TORRO 16-27/12	16-27	5/8-11/16	50	500	14.6	12.5	30.0	0.8	0.8	X	X	X	X	X
12	TORRO 20-32/12	20-32	3/4-11/4	50	500	14.6	12.5	30.0	0.8	0.8	X	X	X	X	X
12	TORRO 25-40/12	25-40	1-15/8	50	500	14.6	12.5	30.0	0.8	1.0	X	X	X	X	X
12	TORRO 30-45/12	30-45	13/16-13/4	50	500	14.6	12.5	30.0	0.8	1.0	X	X	X	X	X
12	TORRO 35-50/12	35-50	13/8-2	50	500	14.6	12.5	30.0	0.8	1.0	X	X	X	X	X
12	TORRO 40-60/12	40-60	15/8-23/8	25	250	14.6	12.5	30.0	0.8	1.0	X	X	X	X	X
12	TORRO 50-70/12	50-70	2-23/4	25	250	14.6	12.5	30.0	0.8	1.0	X	X	X	X	X
12	TORRO 60-80/12	60-80	23/8-31/8	25	250	14.6	12.5	30.0	0.8	1.0	X	X	X	X	X
12	TORRO 70-90/12	70-90	23/4-31/2	25	250	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X
12	TORRO 80-100/12	80-100	31/8-4	25	100	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X
12	TORRO 90-110/12	90-110	31/2-43/8	25	100	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X
12	TORRO 100-120/12	100-120	4-43/4	-	100	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X
12	TORRO 110-130/12	110-130	43/8-51/8	-	100	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X
12	TORRO 120-140/12	120-140	43/4-51/2	-	100	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X
12	TORRO 130-150/12	130-150	51/8-57/8	-	100	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X
12	TORRO 140-160/12	140-160	51/2-61/4	-	100	14.6	12.5	36.0	0.8	1.0	X	X	X	X	X

Further sizes on request

- B = total width in mm (housing)
- h = total height in mm (screw and housing)
- IC = industrial carton
- L = total length in mm (screw and housing)
- PU = packaging unit
- s = band thickness in mm (clamp band)

NORMACLAMP® – Hose Clamps

Survey of sizes, band widths & materials NORMACLAMP® TORRO® WF

Band width (mm)	Description	Clamping Range		Packaging		B	h	L	s	W2	W3	W4
		in mm	in inches	PU	IC							
9	TORRO 8-16/9 WF	8-16	5/16-5/8	100	1000	13.0	11.0	21.0	0.7	X	X	X
9	TORRO 12-22/9 WF	12-22	1/2-7/8	100	1000	13.0	11.0	24.0	0.7	X	X	X
9	TORRO 16-27/9 WF	16-27	5/8-11/16	100	1000	13.0	11.0	24.0	0.7	X	X	X
9	TORRO 20-32/9 WF	20-32	3/4-11/4	100	1000	13.0	11.0	24.0	0.7	X	X	X
9	TORRO 25-40/9 WF	25-40	1-15/8	100	1000	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 30-45/9 WF	30-45	13/16-2	100	500	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 35-50/9 WF	35-50	13/8-2	50	500	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 40-60/9 WF	40-60	15/8-23/8	50	250	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 50-70/9 WF	50-70	2-23/4	50	250	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 60-80/9 WF	60-80	23/8 - 31/8	25	250	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 70-90/9 WF	70-90	23/4-31/2	25	250	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 80-100/9 WF	80-100	31/8-4	25	200	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 90-110/9 WF	90-110	31/2-43/8	25	200	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 100-120/9 WF	100-120	4-43/4	-	200	13.0	11.0	26.0	0.7	X	X	X
9	TORRO 110-130/9 WF	110-130	43/8-51/8	-	200	13.0	11.0	26.0	0.7	X	X	X

NORMACLAMP® – Hose Clamps

Band width (mm)	Description	Clamping Range		Packaging		B	h	L	s	W2	W3	W4
		in mm	in inches	PU	IC							
12	TORRO 16-27/12 WF	16-27	5/8-11/16	-	500	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 20-32/12 WF	20-32	3/4-11/4	-	500	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 25-40/12 WF	25-40	1-15/8	-	500	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 30-45/12 WF	30-45	13/16-13/4	50	500	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 35-50/12 WF	35-50	13/8-2	50	500	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 40-60/12 WF	40-60	15/8-23/8	25	250	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 50-70/12 WF	50-70	2-23/4	25	250	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 60-80/12 WF	60-80	23/8-31/8	25	250	14.6	12.5	30.0	0.8	X	X	X
12	TORRO 70-90/12 WF	70-90	23/4-31/2	25	250	14.6	12.5	36.0	0.8	X	X	X
12	TORRO 80-100/12 WF	80-100	31/8-4	25	100	14.6	12.5	36.0	0.8	X	X	X
12	TORRO 90-110/12 WF	90-110	31/2-43/8	25	100	14.6	12.5	36.0	0.8	X	X	X
12	TORRO 100-120/12 WF	100-120	4-43/4	-	100	14.6	12.5	36.0	0.8	X	X	X
12	TORRO 110-130/12 WF	110-130	43/8-51/8	-	100	14.6	12.5	36.0	0.8	X	X	X
12	TORRO 120-140/12 WF	120-140	43/4-51/2	-	100	14.6	12.5	36.0	0.8	X	X	X

Further sizes on request

B = total width in mm (housing)
h = total height in mm (screw and housing)
IC = industrial carton
L = total length in mm (screw and housing)
PU = packaging unit
s = band thickness in mm (clamp band)

NORMACLAMP® – Hose Clamps

NORMACLAMP® TORRO® Modular System

The TORRO® modular system offers several accessories that can be added to the clip, in order to modify its technical characteristics. You are free to combine two or more of these accessories according to your requirements.

The Notch



The notch is a clever means for pre-positioning the TORRO® hose clip on the hose. In this case the oval hole in the clamp band finds its exact counter part on the hose surface. Thus the TORRO® is safely and accurately kept in place prior to the final assembly.

Advantage:

- Safe pre-assembly on the hose.

The Clip



With this accessory the TORRO® can also be pre-positioned on the hose. The two 'teeth' of this device keep the TORRO® hose clip safely in place if it needs to be stocked or transported prior to its final assembly.

Advantage:

- Safe pre-assembly on the hose

NORMACLAMP® – Hose Clamps

The Spring insert



For this version of the NORMACLAMP® TORRO® the standard hose clip is equipped with a spring insert on the inside of the clip band. When tightening the screw the spring is loaded and stores sufficient clamping force to ensure a long-lasting automatic re-tensioning effect. Thus the radial clamping force achieved will be sufficient even under extremely low temperatures. Therefore, the TORRO® is an optimal solution for applications under extreme temperature changes.

Advantages:

- Automatic re-tensioning effect in the event of hose relaxation
- Increased sealing reliability across a wide temperature range

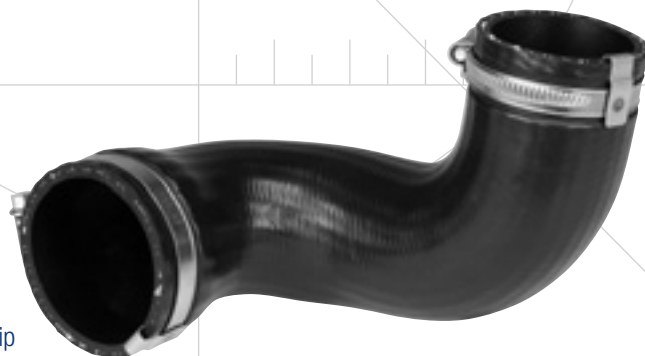
The Torque Cap



The torque cap cuts off when the permissible torque is reached and thus saves the need for a torque wrench. Even without the cap the hose clip still remains adjustable and can be disassembled and/or retightened if necessary.

Advantages:

- Defined tightening torque without special tool
- Visual assembly control



TORRO® pre-positioned using the clip

The Safety Collar



The safety collar is an assembly aid consisting of a plastic collar that is easily fixed on the screw head. It prevents the screwdriver from slipping off the screw head thus making the assembly much easier. The safety collar matches our standard screw head size 7.

Advantage:

- The screwdriver is kept from slipping off the screw head during assembly

The Thumbscrew



The NORMACLAMP® TORRO® thumbscrew is easily tightened by hand.

Advantage:

- The TORRO® hose clip can be manually tightened and opened

The Safety-Cap



The NORMACLAMP® TORRO® safety cap is used to prevent injuries during assembly work. The small plastic cap covering the end of the clamp band is one of our contributions to prevent accidents.

Advantage:

- The NORMACLAMP® TORRO® safety cap is available to fit the band width 9 mm and 12 mm

Please make sure that the NORMACLAMP® TORRO® accessory you wish to order is suitable for your application.