

TORO

TS90 Series Sprinkler Installation & Adjustment Guide



Specifications

- Threaded inlet: 1" NPT or 25mm BSP
- Pop-up height: 4" (12,7cm)
- Pop-up height to spray: 3.5" (8,89cm)
- Overall height: 12.5" (31,75cm)
- Retracted height: 8.5" (21,59cm)
- Ratcheting riser
- Spray arc: 360° and adjustable 40°–330°
- Main nozzle trajectory: adjustable 7°–30°
- Nozzle options: 9 Main, 3 Intermediate, 1 Inner
- Radius: 53'–95' (16,15m–28,97m) @ 25° trajectory
- Flow rate: 13.9–61.6 GPM (52,6–233,2 LPM)
- Precipitation rate: 0.56–0.60"/hr (14,2–15,2mm/hr)
- Minimum pressure: 40 psi (2,7 bar)
- Maximum pressure: 100 psi (6,9 bar)
- Recommended pressure: 50–100 psi (3,4–6,9 bar)
- Check valve elevation rating: 6' (1,8m)
- Stator/Drive: Constant velocity
- Rubber cover (nozzle turret)

Performance Data - U.S.

Sprinkler Model Configuration	Nozzle Set Main / Intermediate		Stator Type	@ 50 psi		@ 60 psi		@ 70 psi		@ 80 psi		@ 90 psi		@ 100 psi	
				Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM
	#1 - Yellow	Blue	Low	53	13.9	54	15.2	55	16.4	55	17.4	54	18.5	56	19.4
	#2 - Blue	Red	Low	55	18.7	59	20.5	61	22.1	59	23.6	59	25.0	62	26.3
(S) TS90TP-02-14	#3 - Brown	Orange	Low	54	20.7	57	22.7	60	24.5	61	26.1	63	27.6	68	29.1
(‡) TS90TP-52	#4 - Orange	Orange	Low	69	27.7	72	30.2	74	32.7	80	35.1	81	36.9	82	38.9
	#5 - Green	Blue	Medium	69	29.7	73	32.6	78	35.2	79	37.7	82	39.9	84	41.8
	#6 - Gray	Blue	Medium	72	31.1	76	34.3	81	36.9	82	39.6	86	41.9	87	44.1
(f) TS90TP-02-58	#7 - Black	Orange	Medium	71	34.8	78	38.1	79	41.1	80	43.6	87	46.2	84	48.6
	#8 - Red	Blue	Medium	73	38.4	78	42.0	83	45.3	86	48.5	88	51.4	88	54.1
	#9 - Beige	Blue	High	75	43.5	81	47.6	83	51.4	85	55.1	91	58.3	95	61.6

(S) NPT inlet, includes nozzle/stator set 1–4

(‡) BSP inlet, includes nozzle/stator set 1–9

(f) NPT inlet, includes nozzle/stator set 5–8

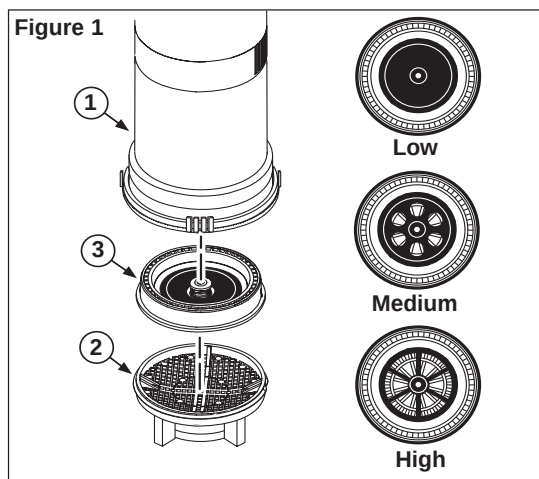
Performance Data - Metric

Sprinkler Model Configuration	Nozzle Set Main / Intermediate		Stator Type	@ 3,4 bar		@ 4,1 bar		@ 4,8 bar		@ 5,5 bar		@ 6,2 bar		@ 6,9 bar	
				Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM
	#1 - Yellow	Blue	Low	16,2	53	16,5	58	16,8	62	16,8	66	16,5	70	17,1	74
	#2 - Blue	Red	Low	16,8	71	18,0	77	18,6	84	18,0	89	18,0	95	18,9	99
(S) TS90TP-02-14	#3 - Brown	Orange	Low	16,5	78	17,4	86	18,3	93	18,6	99	19,2	105	20,7	110
(‡) TS90TP-52	#4 - Orange	Orange	Low	21,0	105	21,9	114	22,6	124	24,4	133	24,7	140	25,0	147
	#5 - Green	Blue	Medium	21,0	112	22,3	123	23,8	133	24,1	143	25,0	151	25,6	158
	#6 - Gray	Blue	Medium	21,9	118	23,2	130	24,7	140	25,0	150	26,2	159	26,5	167
(f) TS90TP-02-58	#7 - Black	Orange	Medium	21,6	132	23,8	144	24,1	156	24,4	165	26,5	175	25,6	184
	#8 - Red	Blue	Medium	22,3	145	23,8	159	25,3	171	26,2	184	26,8	195	26,8	205
	#9 - Beige	Blue	High	22,9	165	24,7	180	25,3	195	25,9	208	27,7	221	29,0	233

Note: Toro service tool model 995-99 (or 5/8" nut driver) is required for main nozzle exchange. For Intermediate nozzle exchange and main nozzle trajectory adjustment, Toro service tool model 995-105 (or 5/16" nut driver) is required.

Stator Replacement

1. Remove cap set screw with a small slotted or phillips screwdriver.
2. Unscrew and remove cap. Remove seal assembly, spring, and riser assembly (1).
3. Unscrew debris screen/check valve assembly (2) and remove from riser assembly.
4. Slide stator assembly (3) out of riser assembly and replace with alternate stator.
5. Reassemble sprinkler components in reverse order.



Sprinkler Installation

1. Construct or install manufactured triple swing joints for each sprinkler. See **Figure 2**.
2. Flush lines thoroughly prior to installing sprinkler.
3. Apply PTFE pipe thread tape to the sprinkler nipple threads. Install the sprinkler to the nipple, tightening by hand to a snug fit.

▲ CAUTION: Use only PTFE tape on plastic thread connections. Applying pipe dope or other thread-sealing compounds can cause deterioration of plastic threads.

Arc Adjustment

The TS90 series sprinkler features both an adjustable arc from 40° to 330°, in 5° increments, and full-circle 360° operation. All TS90 series sprinklers are preset to half-circle (180°) arc when shipped from the factory.

The left side of the adjustable arc is fixed, and is aligned to the left watering border by turning the ratcheting riser assembly in the sprinkler body. The right side of the arc is aligned to the right watering border by turning the nozzle turret while compressing and holding the adjustment band in a stationary position.

1. Arc adjustment can be made wet or dry. For dry adjustment, insert the blade of the sprinkler tool (included in carton) through the slitted opening in the top of the nozzle turret. Twist the tool 1/2 turn to catch the inside of the nozzle turret, then pull the riser assembly out of the body until fully extended. Grasp the riser below the gray adjustment band and hold firmly to prevent retraction. See **Figure 3**.

Note: Specific arc settings of 90°, 180°, 270° and 360° are provided on the adjustment band to preset the sprinkler arc if desired. To use this adjustment option, simply compress the serrated portion of the adjustment band and turn it to align the preferred arc indicator with the nozzle turret arrow indicator. See **Figure 4**.

2. Find the sprinkler left and right arc limits by rotating the nozzle turret back and forth (**in the direction of free travel only**). The left stop indicates the fixed (non-adjustable) side of the arc. See **Figure 5**.

▲ CAUTION: Do not force the nozzle turret past the arc travel limits. Permanent damage to the drive assembly can result.

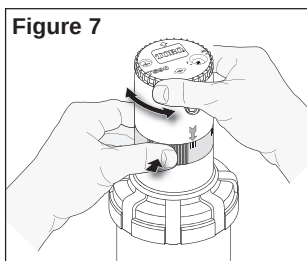
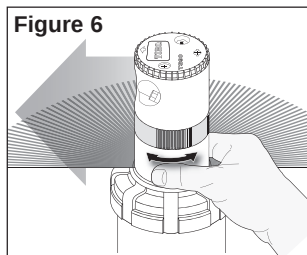
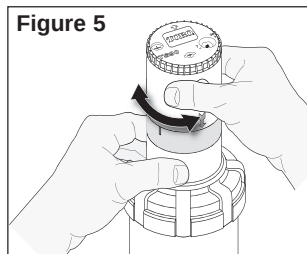
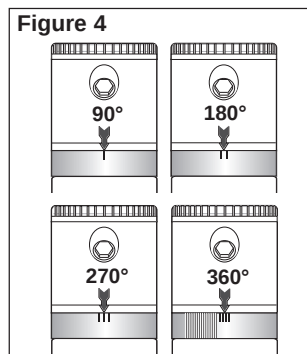
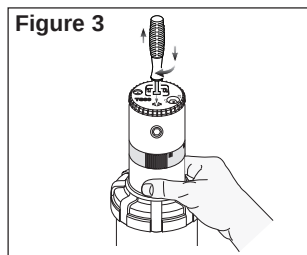
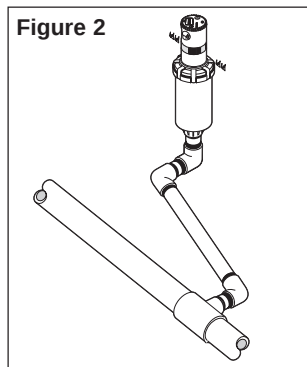
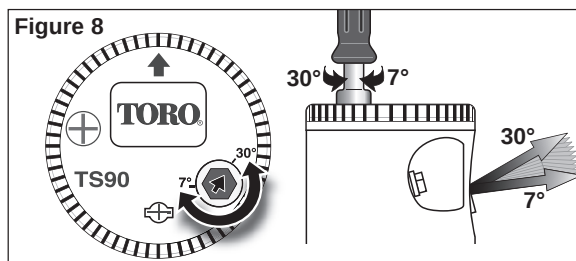
3. With the nozzle turret rotated to the left stop, align the nozzles to the left watering border by ratcheting the riser assembly in either direction. See **Figure 6**.
4. Find the sprinkler right stop by rotating the turret clockwise until it stops.
5. To adjust the arc, compress the ribbed area of the adjustment band, then rotate the nozzle turret to align the nozzles with the right watering border. For full-circle operation, rotate the nozzle turret to the right until it stops. See **Figure 7**.
6. With the sprinkler on, check arc setting again and fine tune arc setting as needed.

Main Nozzle Trajectory Adjustment

The main nozzle trajectory angle is factory-set at 25°, and is adjusted between 7°–30° by turning the trajectory adjustment nut, accessible through the top of the nozzle turret. Typical uses of this feature are to increase trajectory to compensate for high-mounded turf, or to decrease trajectory to clear low-hanging tree branches.

Note: Prior to changing the nozzle trajectory, it is important to consider that increasing the trajectory increases the spray radius, and decreasing trajectory decreases the spray radius.

1. Using Toro service tool 995-105 or a 5/16" nut driver, turn the adjustment nut clockwise to decrease trajectory or counterclockwise to increase trajectory, as indicated by the bidirectional arrow. See **Figure 8**.



TORO

TS90 Series Sprinkler with TurfCup™ Installation & Adjustment Guide



Specifications

- Threaded inlet: 1" NPT or 25mm BSP
- Overall height: 14.5" (36,8 cm)
- Retracted height: 10.75" (27,3 cm)
- Ratcheting riser
- Spray arc: 360° and adjustable 40°–330°
- Main nozzle trajectory: adjustable 7°–30°
- Nozzle options: 4 Main, 2 Intermediate, 1 Inner
- Radius: 71'–90' (21,64m–27,43 m) @ 25° trajectory
- Flow rate: 28.1-50.3 GPM (106–190 LPM)
- Precipitation rate: 0.56–0.60"/hr (14,2–15,2mm/hr)
- Minimum pressure: 40 psi (2,7 bar)
- Maximum pressure: 100 psi (6,9 bar)
- Recommended pressure: 50–100 psi (3,4–6,9 bar)
- Check valve elevation rating: 6' (1,8m)
- Stator/Drive: Constant velocity

Performance Data - U.S.

Sprinkler Model Configuration	Nozzle Set Main / Intermediate		Stator Type	@ 50 psi		@ 60 psi		@ 70 psi		@ 80 psi		@ 90 psi		@ 100 psi	
				Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM	Radius (ft)	GPM
	#5 - Green	Blue	Medium	71	28.1	75	30.7	79	33.2	81	35.4	83	37.5	86	39.5
	#6 - Gray	Blue	Medium	72	29.8	76	32.6	79	35.1	80	37.7	81	40.0	83	42.1
	#7 - Black	Orange	Medium	71	32.2	77	35.3	80	38.1	84	40.7	85	43.1	90	45.4
TS90TP-02TC	#8 - Red	Blue	Medium	74	35.7	78	39.2	82	42.2	85	45.1	88	47.8	90	50.3

Performance Data - Metric

Sprinkler Model Configuration	Nozzle Set Main / Intermediate		Stator Type	@ 3,4 bar		@ 4,1 bar		@ 4,8 bar		@ 5,5 bar		@ 6,2 bar		@ 6,9 bar	
				Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM	Radius (m)	LPM
	#5 - Green	Blue	Medium	21,64	106	22,86	116	24,08	126	24,69	134	25,3	142	26,21	150
	#6 - Gray	Blue	Medium	21,95	113	23,16	123	24,08	133	24,38	143	24,69	151	25,3	159
	#7 - Black	Orange	Medium	21,64	122	23,47	134	24,38	144	25,60	154	25,91	163	27,43	172
TS90TP-52TC	#8 - Red	Blue	Medium	22,56	135	23,77	148	24,99	160	25,91	171	26,82	181	27,43	190

Note: Toro service tool 995-99 (or 5/8" nut driver) is required for main nozzle exchange. For Intermediate nozzle exchange and main nozzle trajectory adjustment, Toro service tool 995-105 (or 5/16" nut driver) is required.

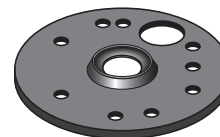
Main Nozzle Trajectory Adjustment

The main nozzle trajectory angle is factory-set at 25°, and is adjusted between 7°–30° by turning the **Trajectory Nut** through the top of the nozzle base **Turret Cover** (Figure 1). Typical uses of this feature are to increase the spray radius. Decreasing trajectory decreases the spray radius.

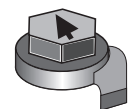
NOTE: Nozzle trajectory adjustment must be made prior to installing Turf disk.

1. Locate the small, black arrow on top of the sprinkler head.
2. Install the Trajectory Nut over black arrow so that it rests flush.
3. Place the nozzle base Turret Cover over the sprinkler head. Align into place.
4. Using a 5/16" (995-105) nut driver, turn the Trajectory Nut clockwise to decrease trajectory or counterclockwise to increase trajectory. (Figure 2)

Figure 1

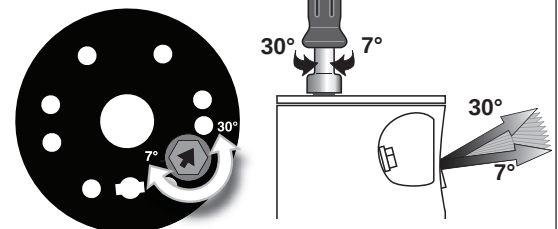


Turret cover



Trajectory Nut

Figure 2



Arc Adjustment

The TS90 series sprinkler features an adjustable arc from 40° to 330°, in 5° increments, or full-circle 360° operation. All TS90 series sprinklers are preset to half-circle (180°) arc when shipped from the factory.

The left side of the adjustable arc is fixed, and is aligned to the left watering border by turning the ratcheting riser assembly in the sprinkler body. The right side of the arc is aligned to the right watering border by turning the nozzle turret while compressing and holding the adjustment band in a stationary position.

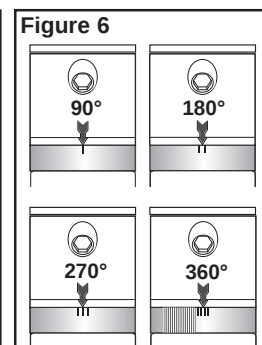
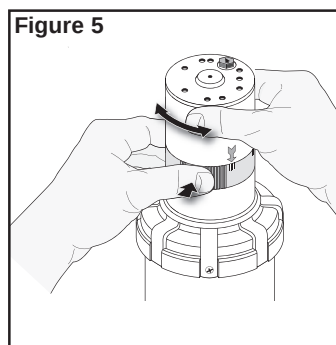
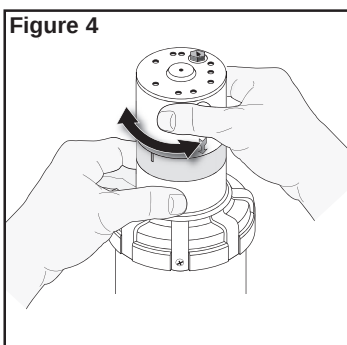
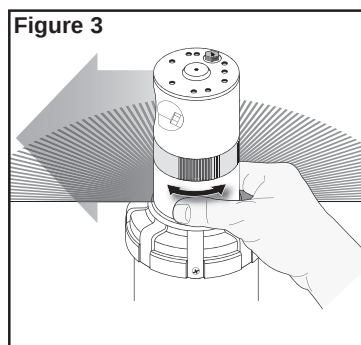
NOTE: Arc adjustment must be done *before* sprinkler and TurfCup assembly is installed.

1. Using your thumb, push up the spring-loaded sprinkler head from the bottom of the TS90. Grasp the exposed sprinkler head firmly and pull the riser assembly out of the body until fully extended. Hold firmly to prevent retraction.
2. Find the sprinkler left and right arc limits by rotating the riser back and forth (**in the direction of free travel only**) (Figure 3).

⚠ CAUTION: Do not force the nozzle turret past the arc travel limits. Permanent damage to the drive assembly can result.

3. With the nozzle base turret rotated to the left stop, align the nozzles to the left watering border by ratcheting the riser assembly in either direction (Figure 4). You will hear a clicking noise as you turn the riser assembly.
4. Find the sprinkler right stop by rotating the nozzle base turret counter-clockwise until it stops.
5. Compress the ribbed area of the adjustment band, then rotate the nozzle base turret to align the nozzles with the right watering border. For full-circle operation, rotate the nozzle turret to the right until it stops (Figure 5).

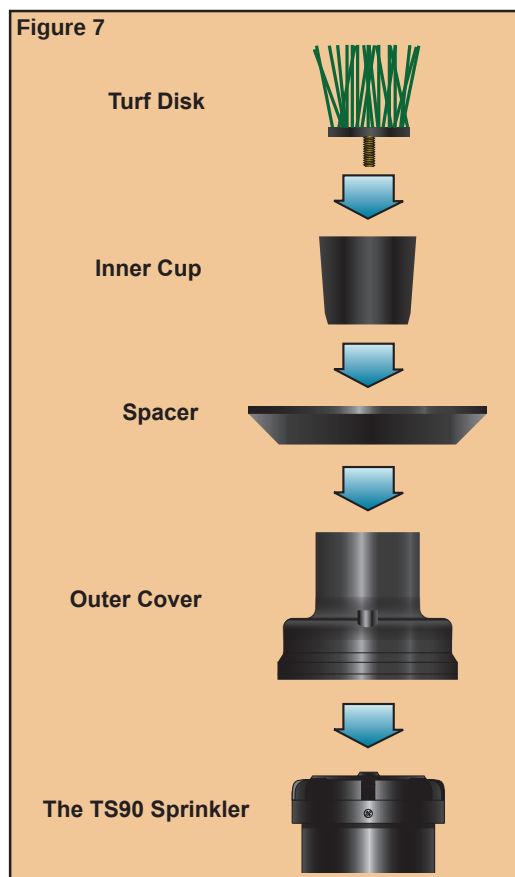
Specific arc settings of 90°, 180°, 270° and 360° are indicated on the adjustment band to preset the sprinkler arc if desired. To use this adjustment option, simply compress the ribbed portion of the adjustment band and turn it to align the preferred arc indicator with the nozzle turret arrow indicator. (Figure 6)



Building the TurfCup™

NOTE: Arc and trajectory adjustments *must be* complete prior to installing the TurfCup.

1. Push the **Outer Cover** (Figure 7) down over the top of the TS90. Align the hole in the outer cover with the caplock screw (Figure 7). Ensure a snug fit.
2. Install the **Spacer** down onto the Outer Cover, aligning the holes in the spacer and the Outer Cover. Ensure a snug fit.
3. Install the Trajectory Nut over black arrow so that it rests flush.
4. Place the nozzle base Turret Cover over the sprinkler head. Align into place (Figure 1).
5. Place the **Inner Cup** on the nozzle base Turret Cover, aligning it properly.
6. Position the artificial **Turf Disk** in the cup and secure it to the TS90 with the center screw. Hand tighten using a Philips screwdriver.
7. Fill the cup with the filler material to the desired level, using the material to position the turf to stand up straight.



TurfCup Field Installation

1. Construct or install manufactured triple swing joints for each sprinkler (Figure 8). This allows the TS90 to move vertically to level the spacer with the field surface. The spacer allows continuity between the TurfCup and playing field. This aids in the laying of artificial turf and increases the stability of the sprinkler.
2. Flush lines thoroughly prior to installing sprinkler.
3. Apply PTFE pipe thread tape to the pipe threads. Install the sprinkler to the threads, tightening by hand to a snug fit.

⚠ CAUTION: Use only PTFE tape on plastic thread connections. Applying pipe dope or other thread-sealing compounds can cause deterioration of plastic threads.

4. Adjust height of sprinkler to approximately field surface as noted in Step 1 above.
5. With sprinkler installed and watering, it is possible to fine tune arc location by ratcheting the riser. See Arc Adjustment, note 3.
6. Install artificial turf over the top of the Spacer, around the TurfDisk (Figure 9).

Figure 9

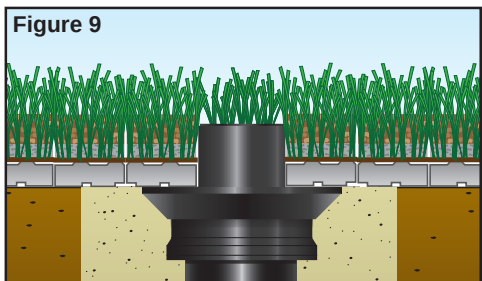


Figure 8: TurfCup Field Installation Diagram

