

Source Four[®]



CE Assembly Guide

Production Dates: September 2004 - Present

ATTENTION: The part numbers listed in this guide may differ from the parts required for your particular Source Four luminaire. Part numbers for luminaires change occasionally as parts are replaced or upgraded.

To ensure that you are ordering the proper part for your specific luminaire, please contact your ETC dealer, or ETC Customer Service for assistance.

Table of Contents

Declaration of Conformity	1
Basic Luminaire	2
Assembling basic luminaire	3
Lamp Socket Assembly	4
Assembling lamp socket	5
Reflector Housing Assembly	8
Removing reflector.	8
Installing reflector.	9
Cleaning reflector.	9
Front Barrel Assembly	10
Assembling front barrel	11
Lens Tubes - 19°, 26°, 36° and 50°	13
Assembling lens tube - 19°, 26°, 36° and 50°	14
Cleaning glass lens - 19°, 26°, 36°, 50° and all EDLT lenses	17
Lens Tube - 10°	18
Lens Tube - 5°	19
Assembling lens tubes - 5° and 10°	20
Cleaning polymer lenses - 5° and 10°	20
Lens Tube - 14°	21
Assembling lens tube - 14°	22
Cleaning glass lenses - 14°	22
Lens Tube - 70°	23
Lenses - 70°	24
Assembling lens tube - 70°	25
Cleaning glass lens - 70°	25
Lens Tube - 90°	26
Lenses - 90°	27
Assembling lens tube - 90°	28
Cleaning glass lens - 90°	28

ETC®, Emphasis®, Expression®, Insight™, Imagine™, Focus™, Express™, Unison®, Obsession® II, ETCNet2™, EDMX™, Source Four®, Revolution®, Sensor®, and WYSILink™ are either registered trademarks or trademarks of Electronic Theatre Controls, Inc. in the United States and other countries.

All other trademarks, both marked and not marked, are the property of their respective owners.

Declaration of Conformity



We, Electronic Theatre Controls, Europe Ltd., declare under sole responsibility that the product:

Product name: Source Four CE
 Product type/model: Source Four CE series (405, 410, 414, 419, 426, 436, 450, 470, 490)
 Lot: n/a
 Batch/Serial number: n/a
 Item numbers: one of each model

to which this declaration relates in conformity with the following standards:

EN60598-1:2000 Luminaires, General requirements and tests
 EN60598-2-17:1990 Specification for luminaires for stage lighting, television, film, and photographic studios (outside and indoor) - equiv. BS 4533-102.17:1990

following the provisions of EU LV Directive(s) 73/23/EEC

London, United Kingdom

(Place of issue)

22nd Jan 1997

(Date of issue)

Mr. Adam Bennette

(Name of authorised person)

Adam Bennette

(signature of authorised person)

Electronic Theatre Controls, Ltd.
 Unit 26-28, Victoria Industrial Estate,
 Victoria Road, London W3 6UU U.K.
 Telephone (+44) (0)20 8896 1000
 Fax (+44) (0)20 8896 2000

Registered office:
 Grant Thornton House
 Melton St., London NW1 28W, England
 Registered in England No. 3057796
 VAT No. 6629487 90

Basic Luminaire

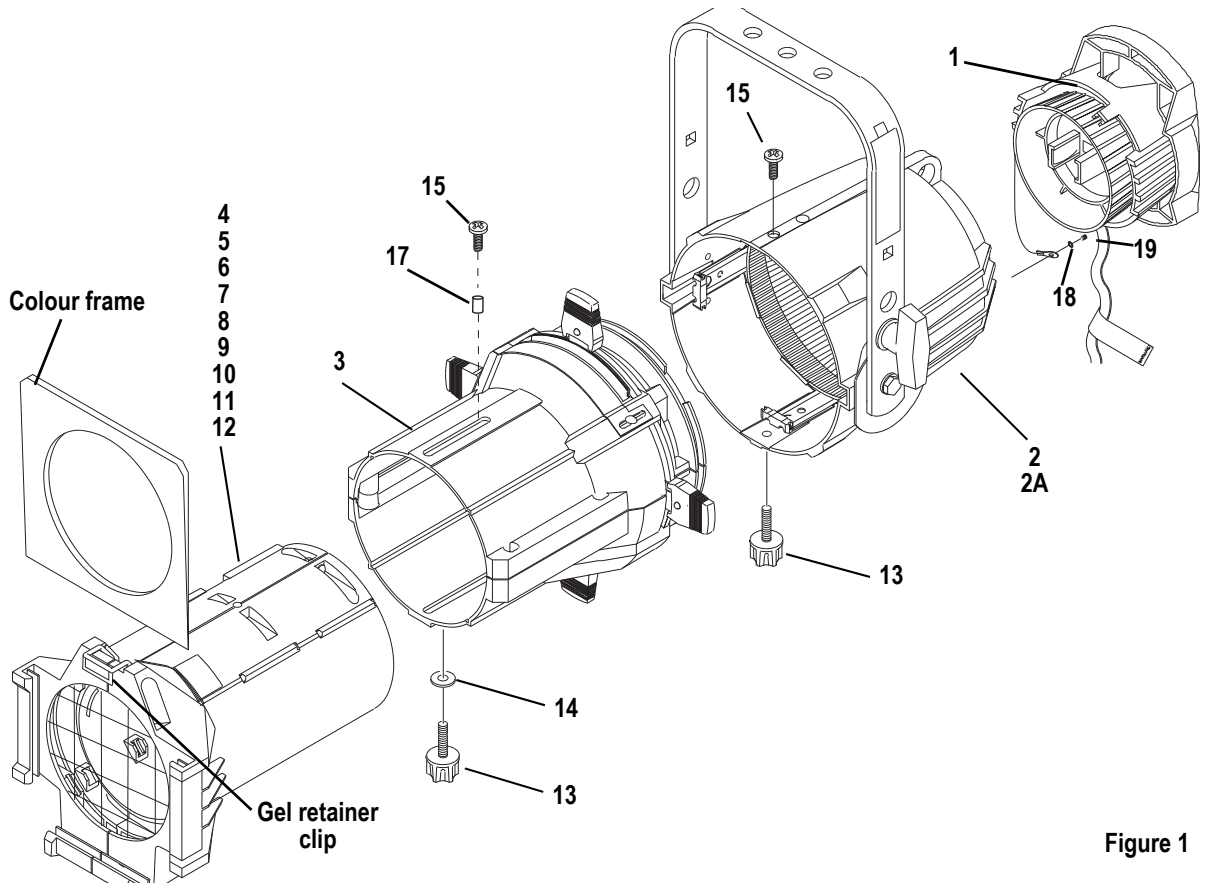


Figure 1

Reference Number	Part Number	Description	Quantity Required
1	7060A2208	Lamp socket assembly (See page 5)	1
2	7060A2211	Reflector housing assembly, single clutch	1
2A	7060A2220	Reflector housing assembly, double clutch	1
3	7060A2012	Front barrel assembly	1
4	7060A2000-K	5° lens tube, with knob (See page 19)	1
5	7060A2001-K	10° lens tube, with knob (See page 18)	1
6	7060A2050-K	14° lens tube, with knob (See page 21)	1
7	7060A2202-K	19° lens tube (6 x 16), with knob (See page 13)	1
8	7060A2203-K	26° lens tube (6 x 12), with knob (See page 13)	1
9	7060A2204-K	36° lens tube (6 x 9), with knob (See page 13)	1
10	7060A2205-K	50° lens tube (4.5 x 6), with knob (See page 13)	1
11	7060A2051-K	70° lens tube, with knob (See page 23)	1
12	7060A2052-K	90° lens tube, with knob (See page 26)	1
13	7060A4008-01	Knob set with male insert	2
14	HW5143	Washer, flat fiber	1
15	HW5197	Screw, 1/4-20 x 5/8, black zinc	2
17	HW5200	Washer, spacer, .253 x .281 x .438	1
18	HW349	Washer, Ext #8, .170 x .381 x .023, zinc	1
19	HW3117	Screw, 8-32 x 3/8, Taptite	1

Assembling basic luminaire

- Step 1: Follow instructions under [Assembling lamp socket, page 5](#).
- Step 2: Follow instructions under [Reflector Housing Assembly, page 8](#).
- Step 3: Follow instructions under [Front Barrel Assembly, page 10](#).
- Step 4: Assemble Lens Tubes following the instructions for your applicable lens degree application.
- Step 5: Insert lens tube assembly (4-12) fully into the front barrel assembly (3). Align the mounting hole with the slot and secure with knob (13). Install screw (15) and spacer (16) on top of front barrel. See [Figure 1](#).
- Step 6: Install reflector housing (2) onto front barrel assembly (3) and align the two mounting holes. Secure with screw (15) top of reflector housing and knob (13) on bottom. Tighten both securely. See [Figure 1](#).
- Step 7: Install the lamp socket assembly (1) to the reflector housing (2) and secure with brass knurled screw on rear of lamp socket assembly.
- Step 8: Secure the earth bond wire to the luminaire body using screw (19) and washer (18).
- Step 9: Release the gel retaining clip by pushing it sideways while gently pulling backwards.
- Step 10: Insert the colour frame.
- Step 11: Lock the clip by pushing sideways while gently pushing it forward.

Lamp Socket Assembly

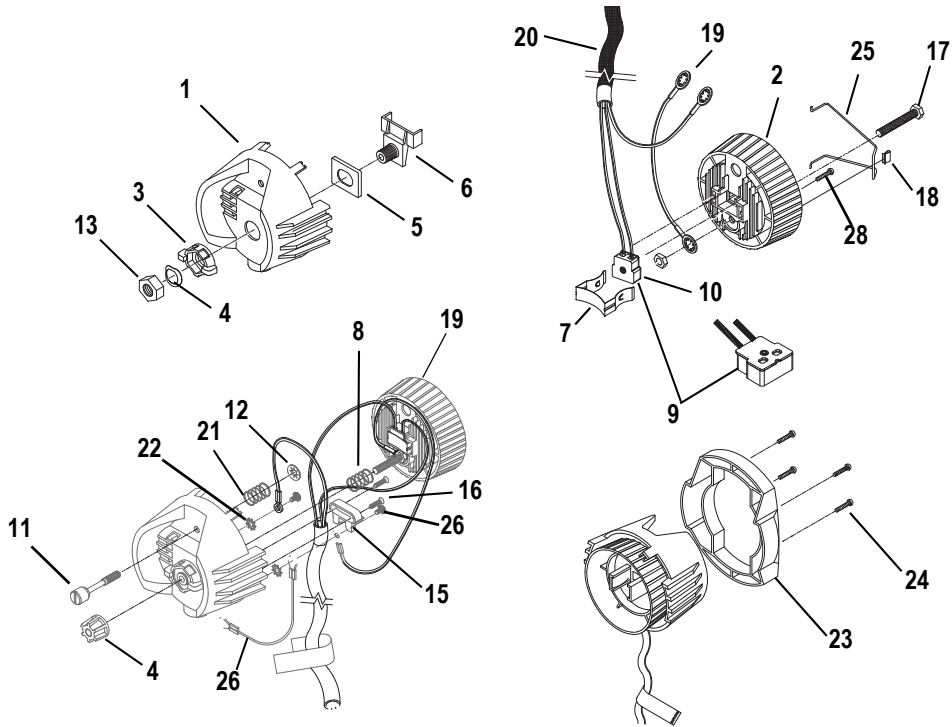


Figure 2

Reference Number	Part Number	Description	Quantity Required
1	7060A3055	Housing, socket, casting, painted	1
2	7060A3007	Socket, light baffle casting, raw	1
3	7060A4007	Knob, X-Y, lamp set	1
4	7060A4008-02	Knob, Z, lamp set w/female insert	1
5	7060A4011	Bushing, cup	1
6	7060A3011	Hub, index, casting	1
7	7060A3012	Spring, lamp retainer	1
8	HW748	Spring, compression	1
9	7060B7013	Complete CE socket assembly	1
10	HW534	Nut, hex, 1/4-20, black zinc	1
11	7060A3025	Screw, 1/4-20 knurled head	1
12	HW746	Retaining ring, flat, Southco	1
13	HW5123	Nut, hex, 9/16-18, black zinc	1
14	HW747	Washer, wave	1
15	7060A3056	Clamp, strain relief, painted	1
16	HW3103	Screw, 8-32 x 5/8 PhFHMS, black zinc	2
17	HW5122	Bolt, 1/4-20 x 1.75, full thread, black zinc	1
18	HW8209	Clip Tinnerman	1
19	7060B7014	Source Four CE ground wire	1
20	7060B7013	Source Four CE cable assembly	1
21	HW749	Spring, ground	1
22	HW349	Washer, ext. #8	1
23	7060A4037	Handle, insulated rear, black	1
24	HW2181	Screw, 6-32 x 3/4, Taptite	4
25	7060A3085	Source Four lamp retainer wire	1
26	7060A7017	Source Four retainer wire	1
27	HW385	Screw, 8-32 x 3/8, PhPHMS, SEMS	2
28	HW2125	Screw, 6-32 x 3/8, PhFHTC, Typ 1, zinc	1

Assembling lamp socket

Tools Required:

- Open-end adjustable spanner or a 7/16" socket
- Needle-nose pliers
- #2 Phillips screwdriver

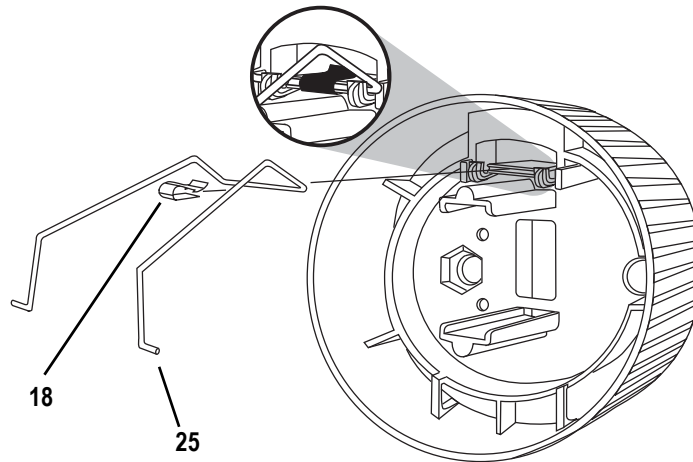


Figure 3

- Step 1: Set the crossbar of the retainer clip (25) under the two hooks on the clip bracket as shown in [Figure 3](#).
- Step 2: Place the Tinnerman clip (18) over the retainer clip crossbar between the two hooks and press it down firmly until it snaps into place.

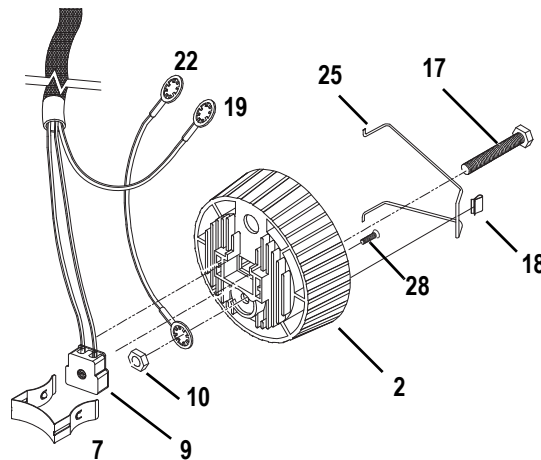


Figure 4

- Step 3: Insert the bolt (17) through the light baffle socket casting (2). See [Figure 4](#).
- Step 4: Install the green and yellow ground wire assemblies (19 and 22) on the bolt (17) with the prongs on the crimped connectors toward the casting. Run both wires through the indent in the lip around the bolt hole. Secure with nut (10) and tighten securely (6.7 Newton meters).
- Step 5: Place the socket assembly (9) into the light baffle socket casting (2). Be sure it is well seated.

Step 6: Install the lamp retainer spring (7). The lamp retainer spring secures the socket. Insert the spring one end at a time, making sure the rectangular slot in each side of the spring seats on the corresponding tab in the casting. See [Figure 4](#).



Note: *If the spring does not seat correctly, coax it into place with a screwdriver or needle-nose pliers.*

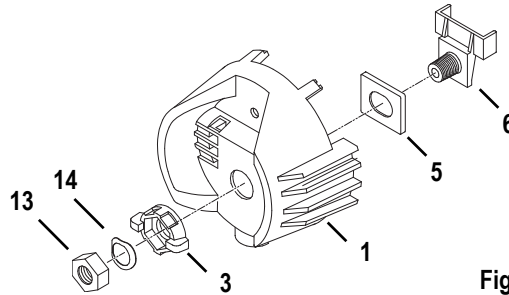


Figure 5

- Step 7: Install the bushing cup (5) into the housing socket casting (1) as shown in [Figure 5](#). The cup should slide smoothly up and down, but not side to side.
- Step 8: Insert the threaded end of the index hub (6) through the holes in the bushing cup and the back of the housing socket casting (1).
- Step 9: Slide the X-Y knob (3) over the exposed index hub bolt (6), then insert the wave washer (14) on the bolt and secure with the 9/16 hex nut (13). Hand tighten the X-Y knob (3).



Note: *Install the wave washer with the upward curve toward the hex nut.*

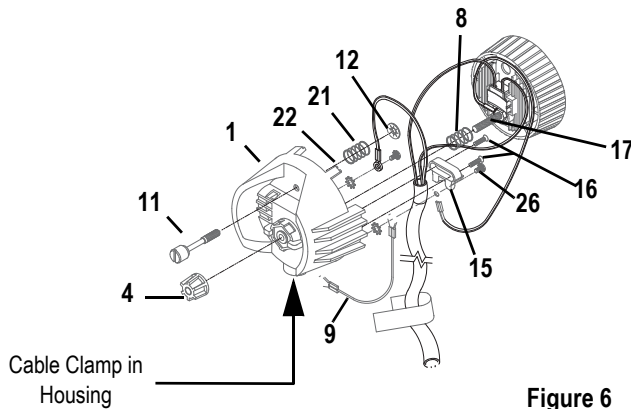


Figure 6

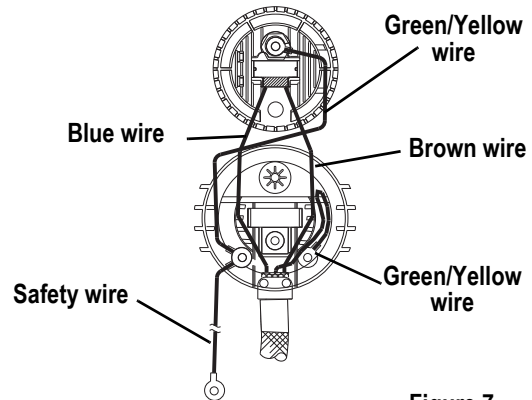


Figure 7

- Step 10: Insert the knurled head screw (11) through the housing socket casting (1) as shown in [Figure 6](#).
- Step 11: Install the ground spring (21) onto the screw and secure it with the Southco flat retaining ring (12). Install the Southco ring with its prongs away from the casting.



Note: *Use pliers to straighten the Southco retaining ring (12) if it bends when you install it on the bolt.*

Step 12: Lay the leads in the bottom half of the cable clamp (located in the housing socket casting [1]), making sure that the cable insulation jacket extends slightly past the screw holes in the housing socket casting. Then, route the wires as shown in [Figure 7](#).



CAUTION: *You must follow the wire routing diagram to ensure that the socket leads do not interfere with the lamp focus mechanism.*

Step 13: Install the top half of the cable clamp (15) and secure it with the two screws (16). Tighten the screws alternately to ensure a solid connection.



Note: *Make sure the top edge of the cable clamp is even with the edge of the socket to prevent interference with lamp focus movement. Make sure insulation jacket is not pinched.*

Step 14: Using the four screws (24), attach the handle (23) to the lamp socket assembly. See [Figure 2](#).

Step 15: Place the compression spring (8) on the protrusion on the inside of the index hub. See [Figure 6](#).

Step 16: Insert bolt (17) through spring (8) and through the index hub (6) of the housing socket (1), joining the two castings as shown in [Figure 6](#). Make sure wires are not pinched between the two pieces.

Step 17: Before proceeding, check again to make sure the wires are still positioned as indicated in [Figure 7](#). Adjust if necessary.

Step 18: Press the two castings together firmly so the bottom of the light baffle (2) sits on top of the cable clamp (15), then install Z lamp knob (4). Hand tighten the knob all the way to the right. See [Figure 6](#).



CAUTION: *You must install Z knob as described above to ensure proper lamp focus travel.*

Reflector Housing Assembly

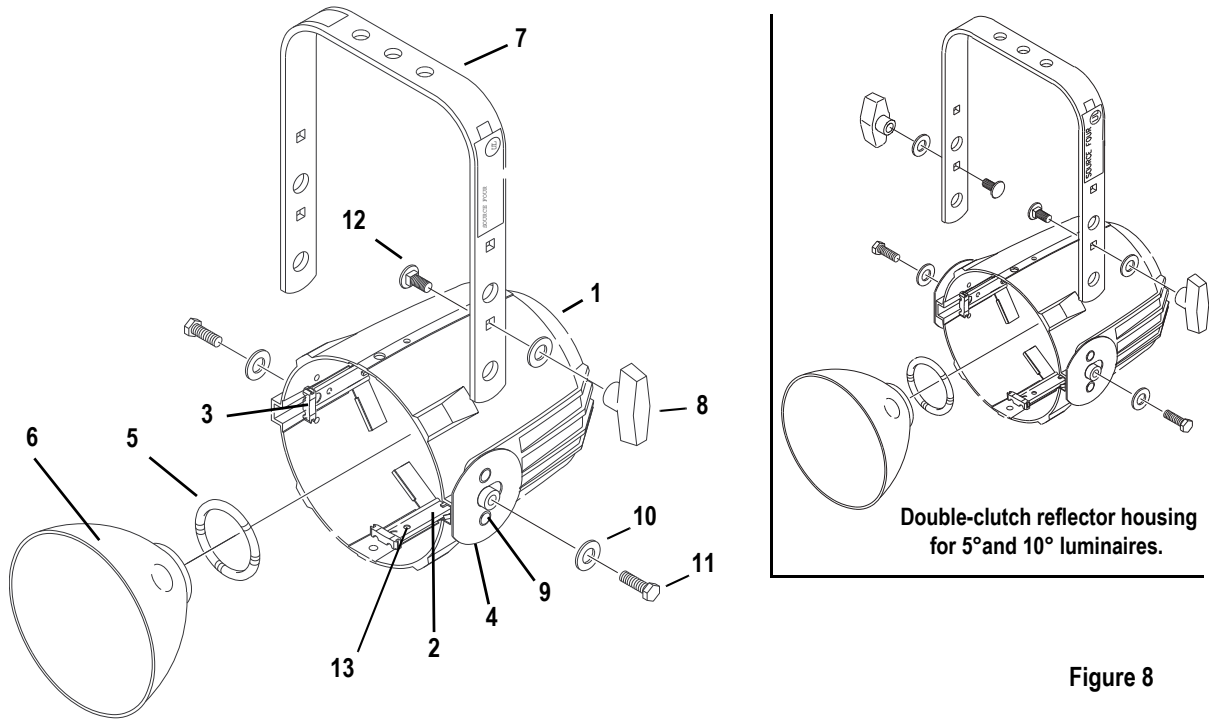


Figure 8

Reference Number	Part Number	Description	Quantity Required
1	7060A2013	Housing, reflector casting, single clutch	1
	7060A2019	Housing, reflector casting, double clutch	1
2	7060A3006	Clip, reflector retainer	4
3	7060A4010	Bushing, gate	4
4	7060A3016	Plate, clutch	1
5	7060A3019	Spring, reflector support	1
6	7060A4015	Reflector, molded glass, coated	1
7	7060A3058	Bracket, yoke, painted	1
8	HW8144	Handle, yoke knob, 5/16 - 18	2
9	HW753	Rivet, machine, 3/16 x .720, flat head, black zinc	2
10	HW5126	Washer, flat, 5/16, black zinc	4
11	HW5193	Bolt 5/16-18 x 3/4, black zinc	2
12	HW5125	Bolt, carriage, 5/16-18 x.75, black zinc	2
13	HW752	Rivet machine, 3/16 x 5/16, black zinc	4

Removing reflector

Tools Required:

- Minimally padded work surface (cardboard, carpet, or rubber mat recommended)



WARNING: *This procedure may crack or break the reflector. Always wear gloves, safety glasses, and a dust mask when performing this procedure.*

- Step 1: Place the reflector housing face down on your work surface so that the concave reflector surface points downward.

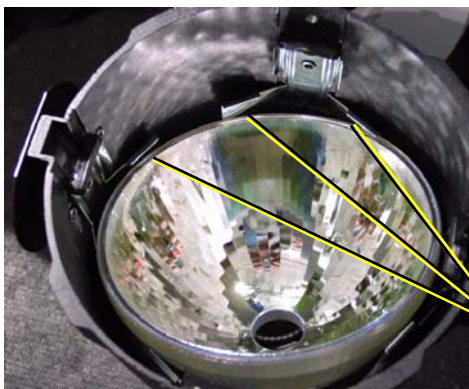
- Step 2: Loosen the clutch and rotate the yoke so that it is perpendicular to the housing at roughly a 90° angle. Tighten the clutch.
- Step 3: Using the yoke as your handle, raise the housing assembly off of the work surface a few inches and then firmly tap the housing on the work surface. This should force the reflector out of its clips.
- Step 4: Carefully lift the housing to see if the reflector is released. If it is not, repeat step 3 with slightly more force.

Installing reflector



Note: *The following assumes all four reflector retainer clips (2) have already been riveted to the reflector housing casting (1) and the gate bushings (3) installed on the retainer clips. See [Figure 8](#).*

- Step 1: Place the reflector housing casting (1) on a flat work surface with the large opening facing up.
- Step 2: Install the reflector support spring (5) in the circular opening at the base of the casting.
- Step 3: Insert the reflector (6) at an angle, under any three adjacent legs of the reflector's clips.
- Step 4: Gently press down on the opposite side of the reflector until it snaps into place under the remaining clips.



Step 3

Under three adjacent clips.



Step 4



Note: *If the reflector does not snap in, turn the casting over. Gently pull on the side of the reflector that has not snapped in until the rest of the reflector slides into place.*

Cleaning reflector



WARNING: *Do not use ammonia-based or other harsh commercial cleaners. Clean reflector only as directed.*

Commercially available glass cleaning agents should be avoided as they may contain ammonia, other harsh chemical detergents or abrasive agents. These cleaners may damage the glass surface and the Anti-Reflective coatings. Do not immerse or soak the glass in any cleaning solution.

Remove dust with a blast of oil-free air or wipe with a clean, lint-free cloth. Isopropyl alcohol, distilled water or a 50%-50% mixture of each can be used to clean the glass surface.

Front Barrel Assembly

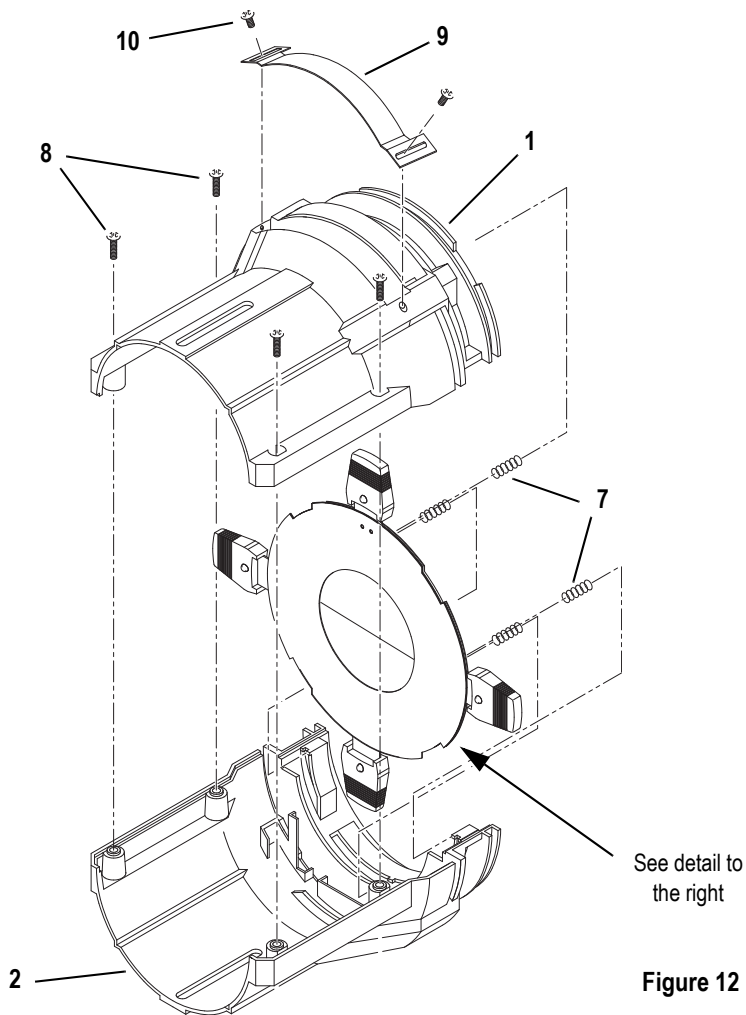


Figure 12

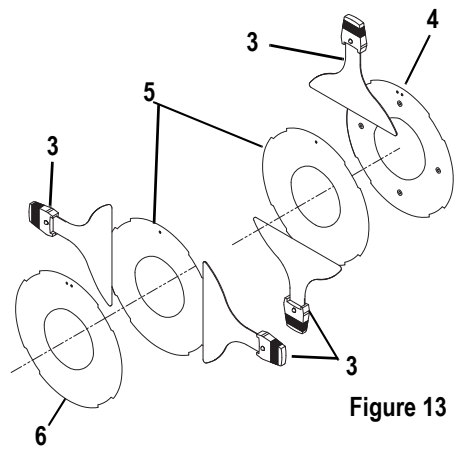


Figure 13

Shutter Assembly: The bottom divider plate (4) has four dimples punched into the surface; the top plate (6) has none. The middle divider plates (5) are noticeably thinner metal than the other two.

Reference Number	Part Number	Description	Quantity Required
1	7060A3052	Front barrel, top casting, black	1
2	7060A3053	Front barrel, bottom casting, black	1
3	7060A2025	Shutter blade assembly, 0.65 mm	4
4	7060A3001-01	Plate, divider with dimples (bottom)	1
5	7060A3003	Plate, gate (middle)	2
6	7060A3001-02	Plate, divider (top)	1
7	HW754	Shutter spring	4
8	HW3165	Screw, 8/32 x 1/2, Taptite	4
9	7060A3045	Cover, iris slot	1
10	HW372	Screw, 8-32 x 1/4, black zinc	2

Assembling front barrel

Tools Required:

- #2 Phillips head screwdriver



WARNING: *During assembly, the shutter springs can pop out of place. Always wear protective eyewear during this procedure.*

Step 1: Stand the top and bottom front barrel castings (1 and 2) upright with the shutter end of the castings toward the bottom.



Note: *The top front barrel casting contains the iris slot.*

Step 2: Slide the bottom divider plate (4), into its place in the bottom casting (2). The dimples on the divider plate must point down.



Note: *The bottom divider plate (4) has four dimples punched into the surface; the top plate (6) has none. The middle divider plates (5) are noticeably thinner-gauge metal than the other two.*

The notches on the divider plates must fit against the flanges in the casting so the plates do not move.



WARNING: *Divider plate edges are sharp. Handle with caution.*

Step 3: With the bottom barrel casting (2) to your left, place two shutter blades (3) on top of dimple plate (4) and opposite each other so together they form a barrier. The handles should extend past the barrel casting, rivets pointed down. These will be the side shutters (See [Figure 13](#)).

Step 4: Place a divider plate (5) on top of the two shutter blades.

Step 5: Place another shutter blade on top of the middle divider plates and perpendicular to the previously installed shutter blades. This will be the top shutter, so align the handle away from the bottom casting (2). Then place the other divider plate on top.

Step 6: Place the fourth shutter blade on top of the divider and through the bottom casting in the final shutter position. Pull the blade and plate assembly slightly forward to allow the handle to slip through the slot in the bottom casting. Then fully seat the blader assembly into the casting again.

Step 7: Place the top divider plate (6) on top of the fourth shutter blade.



Note: *Make sure no shutter assembly components are under the gobo holder guides.*

Step 8: With both front barrel castings still standing upright, join the two halves, sliding the handle of the top shutter blade through the slot in the top front barrel casting (1).

Step 9: Starting at the bottom of the castings (closest to the shutters), use four PHMS screws (9) to fasten the front barrel casting halves together, as shown. Hand tighten only (2.8 Newton meters).



Note:

The ends of the two front barrel castings must be even. Adjust as necessary before completely tightening the nuts and screws. Failure to do this could interfere with the barrel rotation.

Step 10: Turn the front barrel assembly over so that the narrower end is on your work surface.

Step 11: Install the four shutter springs (7) between the four dimples in the shutter plate and the tabs in the lip of the casting.



Note:

Install the springs at the joints in the castings on either of the tabs at the joint. Once they are installed, the springs at the joints will sit at a slight angle.

Step 12: Place iris slot cover (9) over the iris slot. Use two screws (10) to secure the cover.

Lens Tubes - 19°, 26°, 36° and 50°

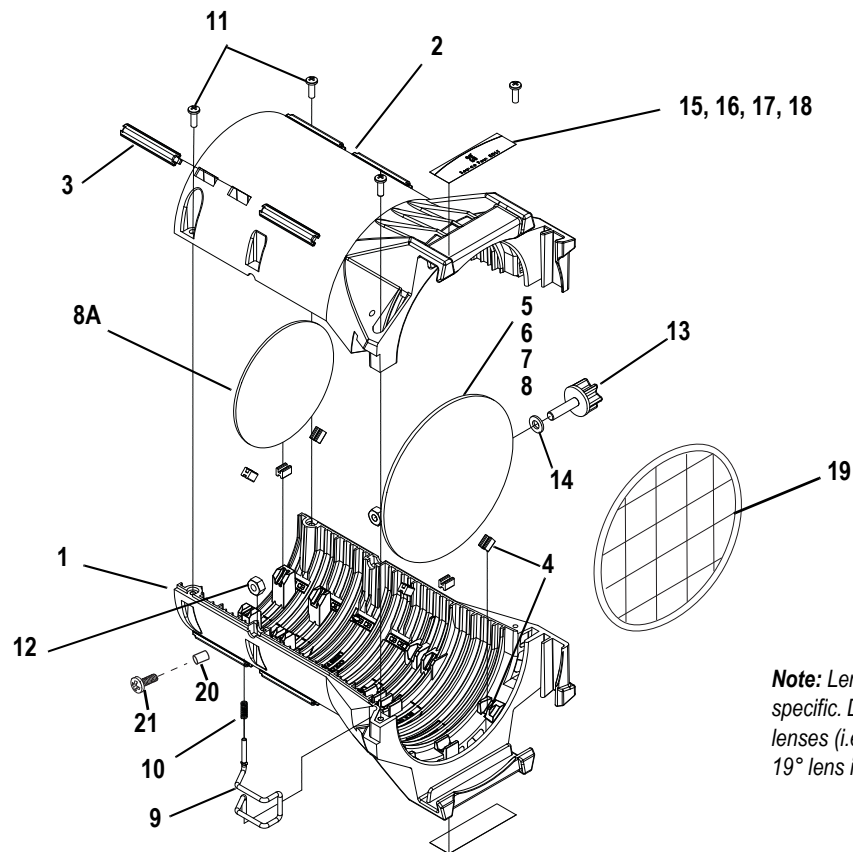


Figure 14

Reference	Part Number	Description	Quantity
1	7060A3169	Lens tube, left, black	1
2	7060A3171	Lens tube, right, black	1
3	7060A4009	Bushing, guide	8
4	7060A4012	Pad lens support - asphere	5
		Pad lens support - meniscus set	10
5	7060A4077	Aspheric lens, 19°	1
6	7060A4001	Aspheric lens, 26°	1
7	7060A4004	Aspheric lens, 50°	1
8	7060A4020	Meniscus lens, 36° set, front	1
8A	7060A4023	Bi-convex lens, 36° set, coated, rear (36° Only)	1
9	7060A3079	Clip, gel retainer, 90° bend	1
10	HW750	Spring, retainer	1
11	HW369	Screw, Phillips, 8-32 x 5/8, Taptite	4
12	HW534	Nut, hex, 1/4-20, black zinc	2
13	7060A4008-01	Knob set with male insert	1
14	HW5143	Washer, flat, 1/4	1
15	7060A4033	19° lens tube label	1
16	7060A4034	26° lens tube label	1
17	7060A4035	36° lens tube label	1
18	7060A4036	50° lens tube label	1
19	7060A1047	Safety Screen, S4 Enhanced	1
20	HW5200	Washer, .251 x .281 x .438, brass	1
21	HW5197	Screw, 1/4-20 x 5/8, PHRMS, black zinc	1

Assembling lens tube - 19°, 26°, 36° and 50°

Lens Positions

The lens tube casting can accept either original or Enhanced Definition (ED) lenses. The lens positions are colour-coded within the lens casting to match the coloured dots on the lenses (see [Figure 15](#)). Only lenses bearing at least one dot of the indicated colour should be placed in that position.

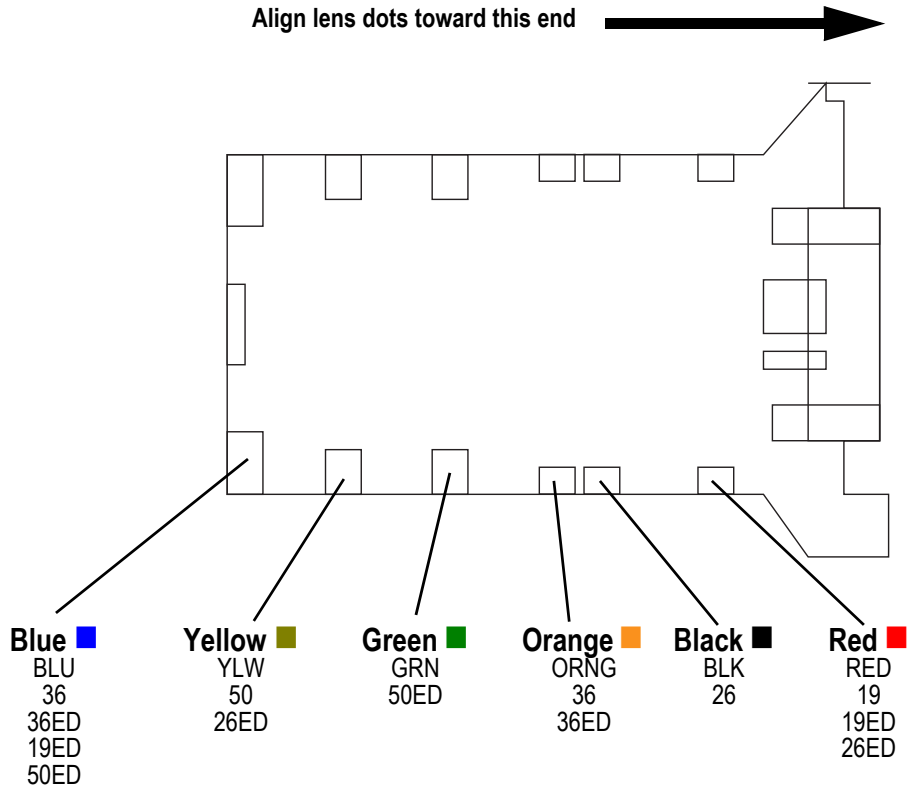
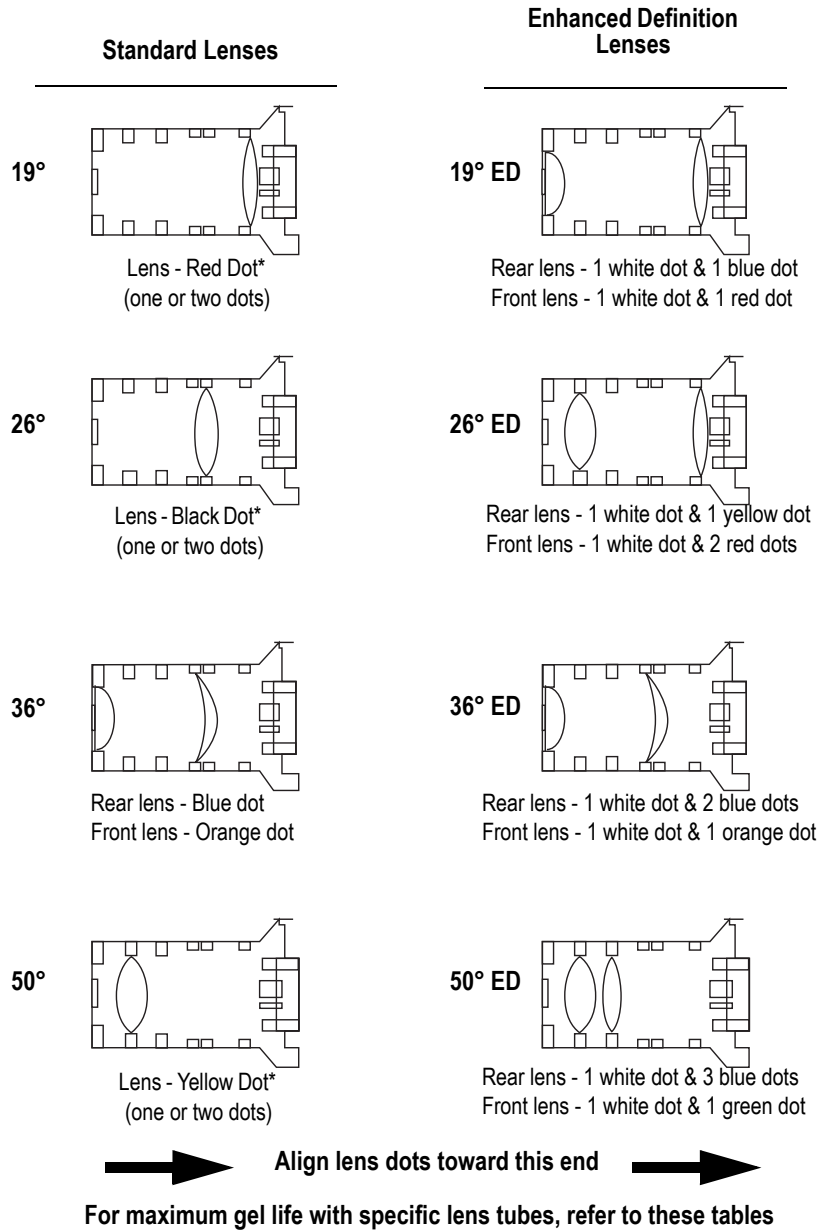


Figure 15

Lens Markings

The lenses are colour-coded for identification. Normal lenses have a single dot of colour while Enhanced Definition lenses have a combination of white dots and colour dots. See [Figure 16](#) for lens colour coding.



* Some pre-2006 fixtures have lenses with two color code dots. There is no difference between lenses with one dot or two dots.

Figure 16

For maximum gel life with specific lens tubes, refer to the tables below.

Lens Tube	Soft Focus Back (Lamp "flat")	Sharp Focus (Lamp "cosine")	Soft Focus Forward (Lamp "peak")	Soft Focus Forward (Lamp "cosine")
19°	worse	better	better	not applicable
26°	worse	better	better	not applicable
36°	better	better	worse	not applicable
50°	worse	better	better	not applicable

ED Lens Tube	Soft Focus Back (Lamp "flat")	Sharp Focus (Lamp "cosine")	Soft Focus Forward (Lamp "peak")	Soft Focus Forward (Lamp "cosine")
19°	worse	better	better	not applicable
26°	better	better	worse	not applicable
36°	better	better	worse	not applicable
50°	better	better	worse	not applicable

Assembling the lens tube

Tools Required:

- #2 Phillips head screwdriver

Step 1: Place the left and right lens tubes (1 & 2) face up on your work surface. Align the tubes so the colourframe grooves are to your left.

Step 2: Install lens support pads (4) as required inside both lens tubes. Four pads are required per lens. Insert pads short-side down, as shown in [Figure 19](#).

Step 3: Install the 1/4-20 hex nut (13) in the left lens tube as shown.

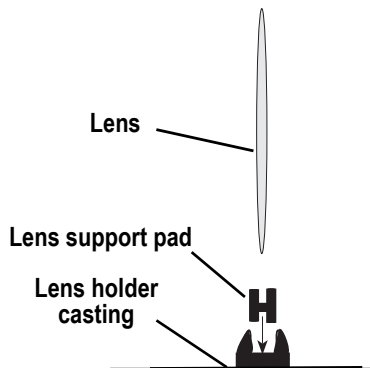


Figure 17

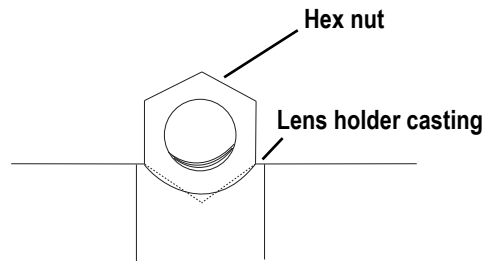


Figure 18

Step 4: Install the short end of the gel retainer clip (9) in the left lens tube (1).

Step 5: Position the clip in the forward, locked position, then install the retainer spring (10) on the clip.

Step 6: Install the required lens (or lenses) (5, 6, 7, or 8 & 8A) in the correct position as shown on [Figure 15](#).



Note:

Install the lens with the painted dot facing the front of the tube. Seat the lens in the support pads so the dot remains visible.

Step 7: See [Figure 14](#). Invert the right lens tube (2) and hold it above the left lens tube (1). Fit the clip (9) and spring (10) into the right lens tube. Gently place the right lens tube onto the left lens tube, making sure that the 1/4-20 hex nut and

retaining clip assembly stay properly seated. Make sure the lens stays straight by looking into the lens holder. The top edge of the lens should seat properly in the support pads.

- Step 8: Install the PHMS screws (11) in four locations with Ny-lok nuts (12). The PHMS screw location on the bottom of the colourframe holder is threaded and does not require a Ny-lok nut. Hold the nuts tight against the casting and torque the screws to 2.8 Newton meters (25 inch pounds).
- Step 9: Install the eight bushing guides (3). Point the narrow tab on the bottom toward the back of the tube; point the square tab toward the front. Squeeze the guides slightly so they bend in the middle then snap into place. Make sure the rounded side of the guide faces outward from the tube.

Cleaning glass lens - 19°, 26°, 36°, 50° and all EDLT lenses



WARNING: *Do not use ammonia-based or other harsh commercial cleaners. Clean lens only as directed.*

Commercially available glass cleaning agents should be avoided as they may contain ammonia, other harsh chemical detergents or abrasive agents. These cleaners may damage the glass surface and the Anti-Reflective coatings. Do not immerse or soak the glass in any cleaning solution.

Remove dust with a blast of oil-free air or wipe with a clean, lint-free cloth. Isopropyl alcohol, distilled water or a 50%-50% mixture of each can be used to clean the glass surface.

Lens Tube - 10°

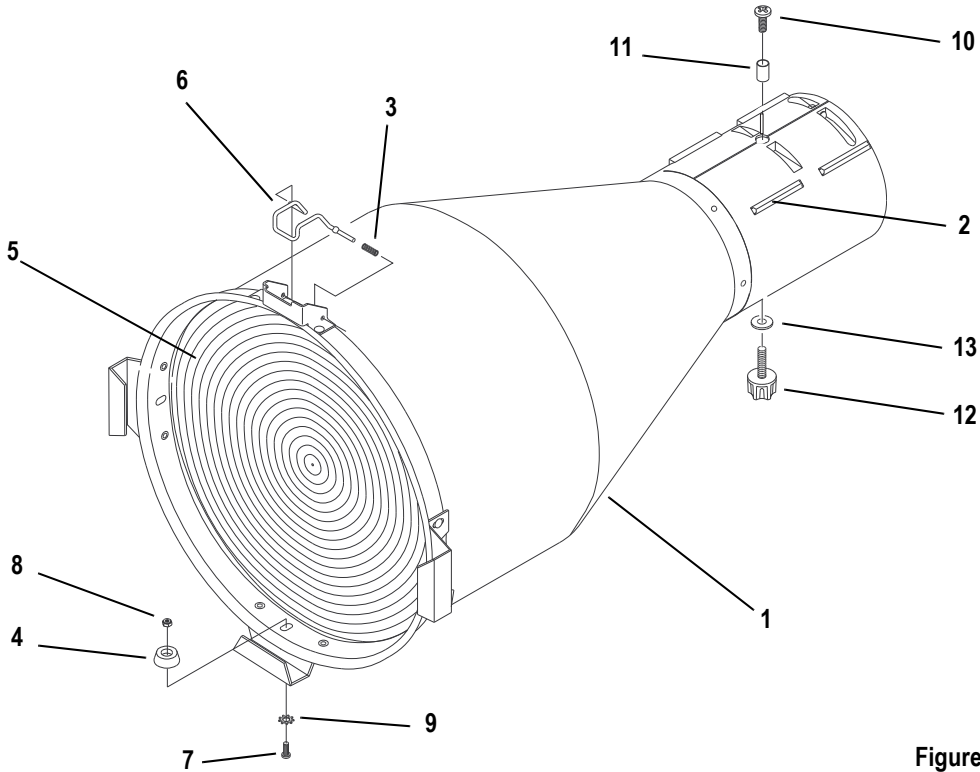


Figure 19

Reference Number	Part Number	Description	Quantity Required
1	7060A3096	10° lens tube assembly, painted	1
2	7060A4009	Bushing, guide	8
3	HW750	Spring, retainer	1
4	HW6122	Bumper, recess rubber	4
5	7060A4025	Lens, 10°, 10"	1
6	7060A3079	Clip, gel retainer	1
7	HW307	Screw, 8-32 x.38 lg, SPHMS, black zinc	4
8	HW370	Nut, 8-32, 3/8, 1/4, black zinc	4
9	HW3104	Washer, .170 x.381 x.023, black zinc	4
10	HW5197	Screw, 1/4, 20x58 PHRMS, black zinc	1
11	HW5200	Washer, SH, .253 x.281 x.438, black zinc	1
12	7060A4008	Knob, Z lamp, with male insert	1
13	HW5143	Washer, Fit. 1/4, .252 x.500 x.060, FL	1

Lens Tube - 5°

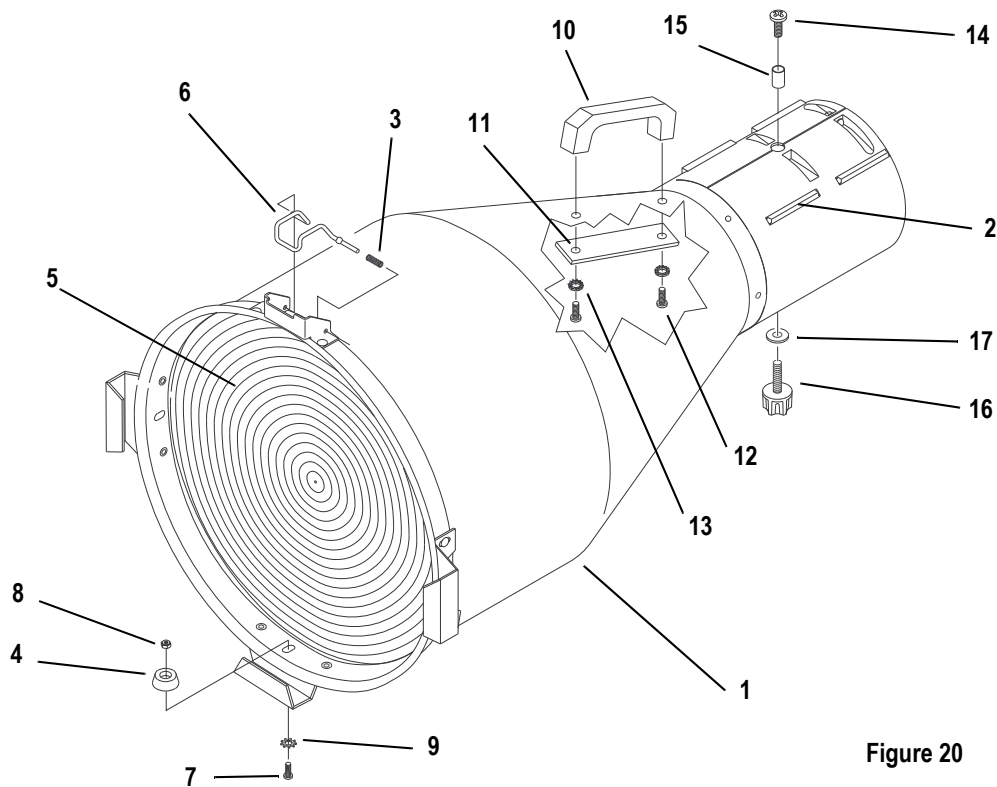


Figure 20

Reference Number	Part Number	Description	Quantity Required
1	7060A3095	5° lens tube assembly, painted	1
2	7060A4009	Bushing, guide	8
3	HW750	Spring, retainer	1
4	HW6122	Bumper, recess rubber	4
5	7060A4024	Lens, 5°, 10"	1
6	7060A3079	Clip, gel retainer	1
7	HW307	Screw, 8-32 x.38 lg, SPHMS, black zinc	4
8	HW370	Nut, 8-32, 3/8, 1/4, black zinc	4
9	HW3104	Washer,.170 x.381 x.023, black zinc	4
10	HW8170	Handle, 10-32 inserts	1
11	7060A3073	Handle backing plate	1
12	HW467	Screw, 10-32 x 1/2 PHTRMS	2
13	HW443	Washer,.195 x.410 x.025 black zinc	2
14	HW5197	Screw, 1/4, 20x58 PHRMS, black zinc	1
15	HW5200	Washer, SH,.253 x.281 x.438, black zinc	1
16	7060A4008	Knob, Z lamp, with male insert	1
17	HW5143	Washer, Flt. 1/4,.252 x.500 x.060, FL	1

Assembling lens tubes - 5° and 10°

Tools Required:

- #2 Phillips head screwdriver

- Step 1: Place the lens tube assembly (1) on your work surface. Align the assembly so that the colourframe grooves are to your left.
- Step 2: If you are assembling a 5° tube, attach the handle (10) as shown in [Figure 20](#), using the screws (12), washers (13) and backing plate (11).
- Step 3: Install the required lens as shown in [Figure 19](#) or [Figure 20](#) in the tube using required bumpers (4), screws (7), nuts (8), and washers (9). The side of the lens with the fresnel grooves should face the front of the tube. The smooth side should face the rear.

Cleaning polymer lenses - 5° and 10°



WARNING: *Handle polymer lenses by their edges only. Never rub anything dry on a polymer lens. Do not use glass and window cleaners on the lens. This will damage the lens.*

Remove dust with a blast of oil-free air. If this is not sufficient, follow the instructions below.

- Step 1: Dip the lens in a clean isopropyl alcohol/water mixture (9 parts water to 1 part isopropyl alcohol).
- Step 2: Use a soft moistened nylon bristle brush to wash the lens' smooth side in a linear (non-circular) motion.
- Step 3: Use the same brush to lightly wash the lens' ridged side by following its ridges.
- Step 4: Dip the lens in a clean isopropyl alcohol/water mixture (9 parts water to 1 part isopropyl alcohol).
- Step 5: Use air gun to dry the smooth surface. Use air gun to dry the ridged surface. Use air stream to move the liquid away from you. Using this method, remove as much liquid as possible. Inspect the lens for dirt. If necessary, repeat the entire process.

Lens Tube - 14°

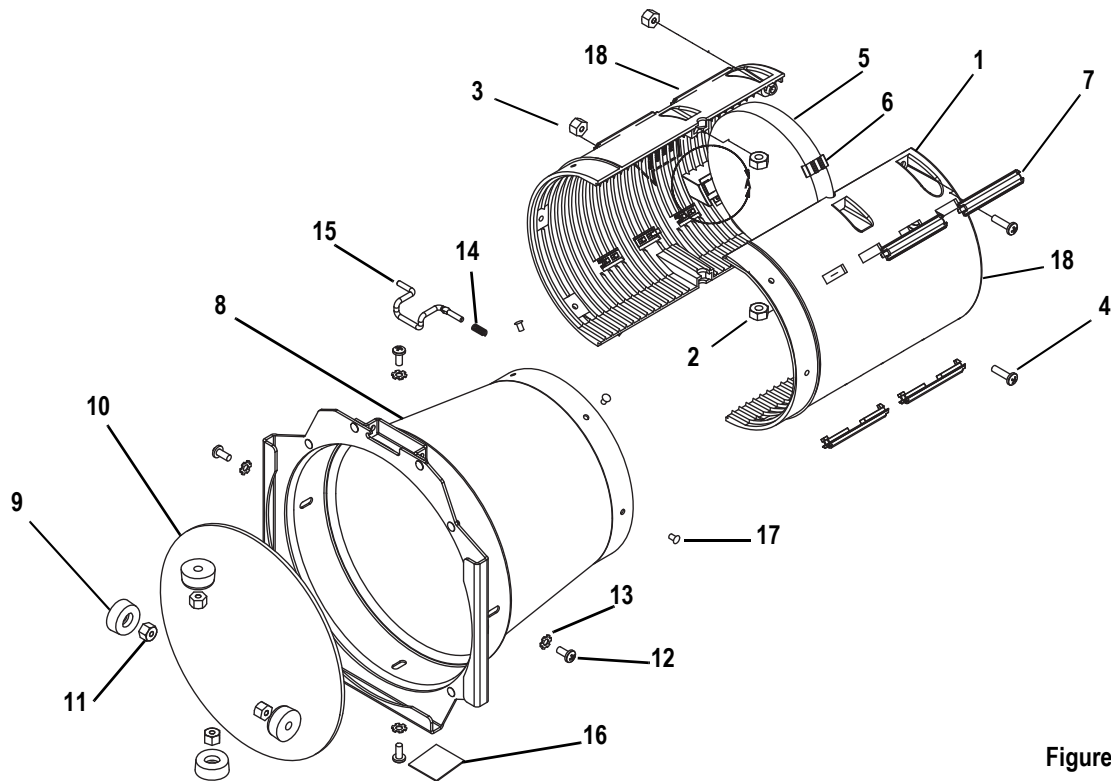


Figure 21

Reference Number	Part Number	Description	Quantity Required
1	7060A3152	14° Lens tube, painted	2
2	HW534	Nut, 1/4-20, hex, 7/16 7/32 BZ	2
3	HW370	Nut, 8-32	2
4	HW369	Screw, Phillips, 8-32, PhFHMS	2
5	7060A4124	14° Lens, rear	1
6	7060A4142	Lens pad	4
7	7060A4009	Bushing guide	8
8	7060A2055	14° Lens tube spin assembly	1
9	HW6122	Bumper, rubber	4
10	7060A4125	14° Lens, front	1
11	HW370	Nut, 8-32	4
12	HW307	Screw, Phillips, 8-32 x 3/8, PHMS	4
13	HW3104	Washer, #8	4
14	HW750	Spring retainer	1
15	7060A3180	Gel clip, lens tube	1
16	7060A4143	Label	1
17	HW7289	Rivet	6
18	7060A3152	Lens tube casting, painted	2

For maximum gel life with specific lens tubes, refer to the table below

Lens Tube	Soft Focus Back (Lamp "flat")	Sharp Focus (Lamp "cosine")	Soft Focus Forward (Lamp "peak")	Soft Focus Forward (Lamp "cosine")
14°	worse	good	best	good

Assembling lens tube - 14°

Lens Markings and Positions

The lenses are colour-coded for identification. The rear lens has two brown dots and the front lens has one brown dot. The lens positions are colour-coded within the lens casting to match the coloured dots on the lenses (see [Figure 22](#)).

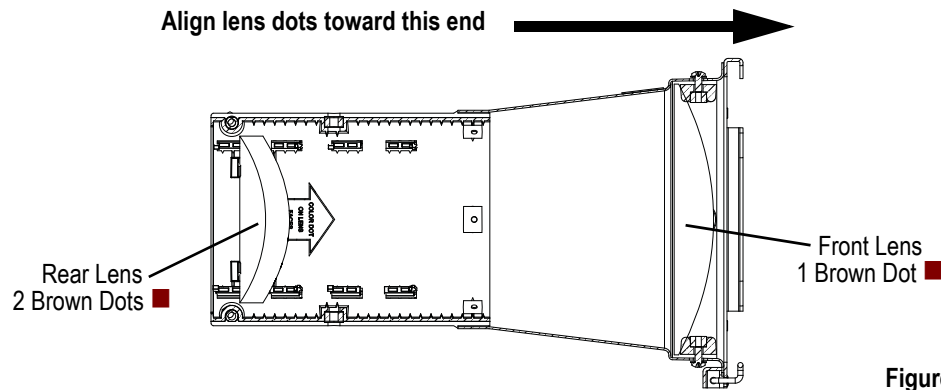


Figure 22

Assembling the lens tube

Tools Required:

- #2 Phillips head screwdriver

- Step 1: Place lens tube assembly face up on your work surface.
- Step 2: Install the eight bushing guides (7). Point the narrow tab on the bottom toward the back of housing; point the square tab toward the front. Squeeze the guides slightly so they end in the middle, then snap into place. Make sure the rounded side of the guide faces outward from the tube.
- Step 3: Install the front lens (10) in the tube using required bumpers (9), screws (12), nuts (11), and washers (13) as shown in [Figure 21](#). Colored dot on lens should face towards the front.

Cleaning glass lenses - 14°



WARNING: *Do not use ammonia-based or other harsh commercial cleaners. Clean lens only as directed.*

Commercially available glass cleaning agents should be avoided as they may contain ammonia, other harsh chemical detergents or abrasive agents. These cleaners may damage the glass surface and the Anti-Reflective coatings. Do not immerse or soak the glass in any cleaning solution.

- Step 1: Remove dust with a blast of oil-free air or wipe with a clean, lint-free cloth. Isopropyl alcohol, distilled water or a 50%-50% mixture of each can be used to clean the glass surface.
- Step 2: If necessary, remove the front lens to access the front surface of the rear lens for cleaning. Remove the four screws (12), nuts (11), washers (13) and bumpers (9) and gently lift out front lens as shown in [Figure 21](#). Reassemble in reverse order.

Lens Tube - 70°

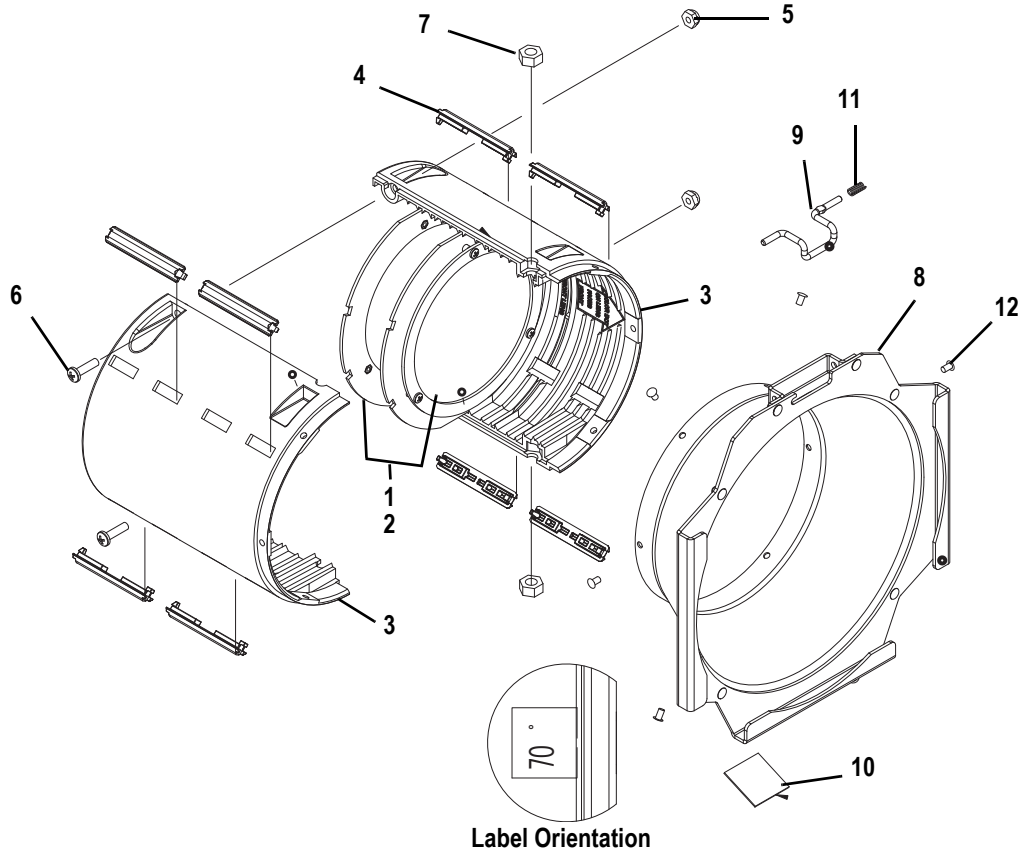


Figure 23

Reference Number	Part Number	Description	Quantity Required
1	See Figure 24	70° rear lens assembly	1
2	See Figure 24	70° front lens assembly	1
3	7060A3179	Lens tube casting, painted	2
4	7060A4009	Bushing, guide	8
5	HW370	Nut, 8-32	2
6	HW369	Screw, Phillips, 8-32 x.62, LG, PHMS	2
7	HW534	Nut, Hex, 1/4-20	2
8	7060A2057	Spin Assembly, lens tube	1
9	7060A3180	Gel clip	1
10	7060A4144	Label, 70° lens	1
11	HW750	Spring, latch return	1
12	HW7289	Rivet	6

For maximum gel life with specific lens tubes, refer to the table below

Lens Tube	Soft Focus Back (Lamp "flat")	Sharp Focus (Lamp "cosine")	Soft Focus Forward (Lamp "peak")	Soft Focus Forward (Lamp "cosine")
70°	best	good	worse	good

Lenses - 70°

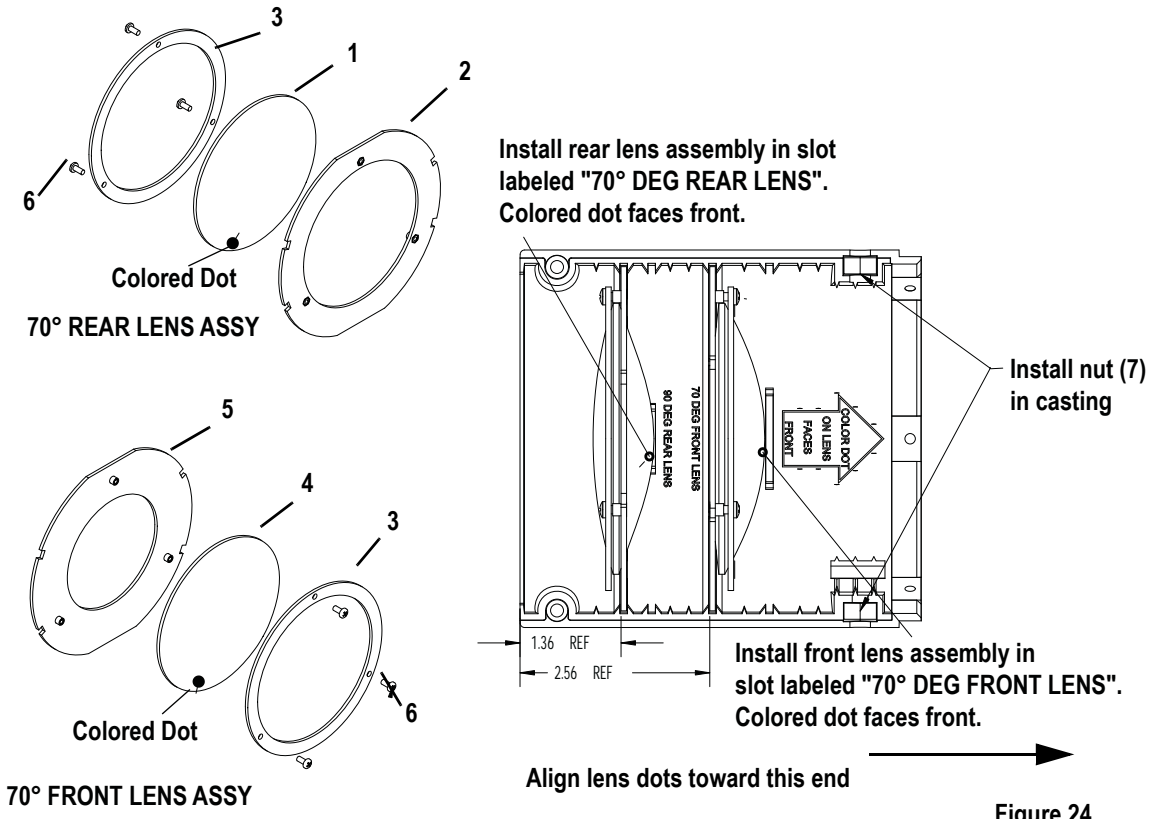


Figure 24

Reference Number	Part Number	Description	Quantity Required
1	7060A4134	Rear lens, 70°	1
2	7060A3185	Mounting Plate, 70° rear lens	1
3	7060A3186	Retaining ring	2
4	7060A4135	Front lens, 70°	1
5	7060A3187	Mounting Plate, 70°, front lens	1
6	HW1119	Screw, Phillips, 4-40 x 1/4, SEMS, PHMS	6

Assembling lens tube - 70°

Lens Markings and Positions

The lenses are colour-coded for identification. The rear lens has two green dots and the front lens has one green dot. The lens positions are colour-coded within the lens tube casting to match the coloured dots on the lenses (see [Figure 25](#)).

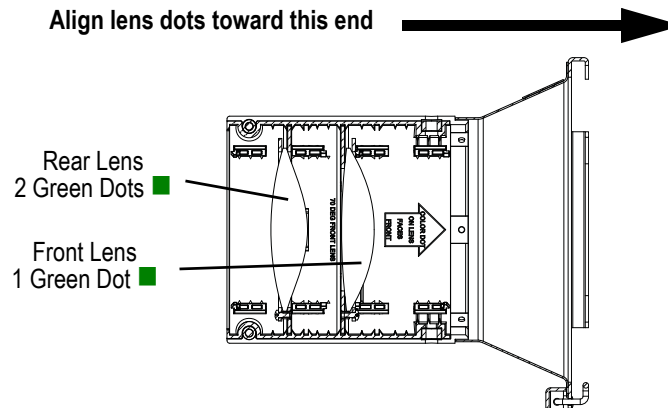


Figure 25

Assembling the lens tube

Tools Required:

- #2 Phillips head screwdriver

Step 1: See [Figure 24](#). Place rear lens (1) into mounting plate (2) with paint dots facing forward. Center the lens in the mounting plate and secure with the retaining ring (3) and screws (6). Lightly tighten all three screws while maintaining lens position, then tighten screws securely.

Step 2: See [Figure 24](#). Place front lens (4) into mounting plate (5) with paint dots facing forward. Center the lens in the mounting plate and secure with the retaining ring (3) and screws (6). Lightly tighten all three screws while maintaining lens position, then tighten screws securely.

Cleaning glass lens - 70°



WARNING: *Do not use ammonia-based or other harsh commercial cleaners. Clean lens only as directed.*

Commercially available glass cleaning agents should be avoided as they may contain ammonia, other harsh chemical detergents or abrasive agents. These cleaners may damage the glass surface and the Anti-Reflective coatings. Do not immerse or soak the glass in any cleaning solution.

Remove dust with a blast of oil-free air or wipe with a clean, lint-free cloth. Isopropyl alcohol, distilled water or a 50%-50% mixture of each can be used to clean the glass surface.

Lens Tube - 90°

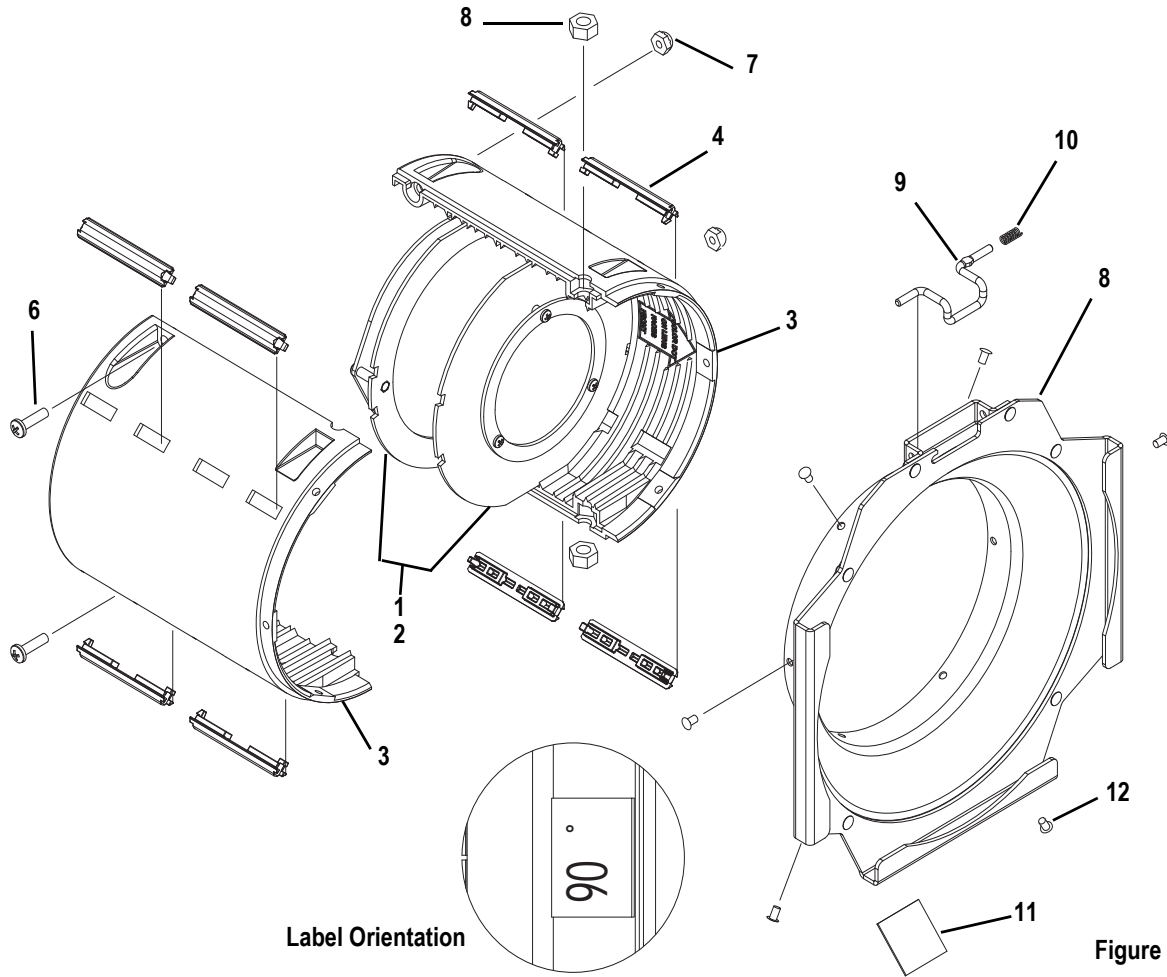


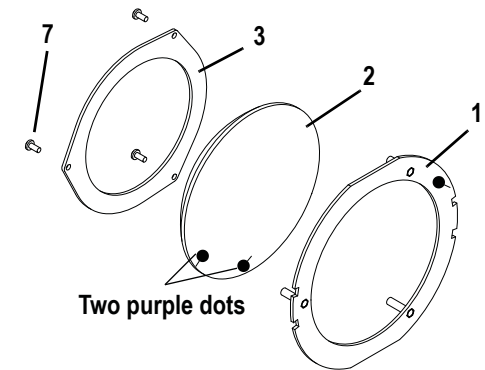
Figure 26

Reference Number	Part Number	Description	Quantity Required
1	See Figure 27	90° rear lens assembly	1
2	See Figure 27	90° front lens assembly	1
3	7060A3179	Lens tube casting, painted	2
4	7060A4009	Bushing, guide	8
5	HW370	Nut, 8-32	2
6	HW369	Screw, Phillips, 8-32 x.62, LG, PHMS	2
7	HW534	Nut, Hex, 1/4-20	2
8	7060A2059	Spin Assembly, lens tube	1
9	7060A3180	Gel clip	1
10	HW750	Spring, latch return	1
11	7060A4145	Label, 90° lens	1
12	HW7289	Rivet	6

For maximum gel life with specific lens tubes, refer to the table below

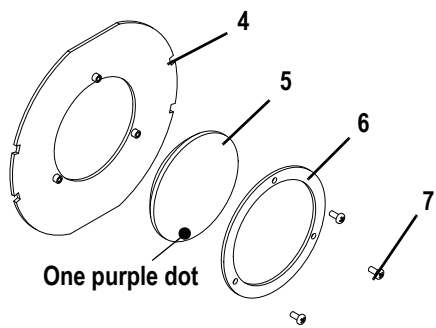
Lens Tube	Soft Focus Back (Lamp "flat")	Sharp Focus (Lamp "cosine")	Soft Focus Forward (Lamp "peak")	Soft Focus Forward (Lamp "cosine")
90°	best	good	good	worse

Lenses - 90°



Two purple dots

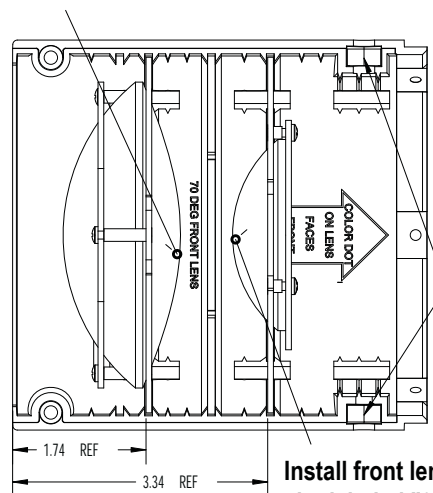
REAR LENS ASSY



One purple dot

FRONT LENS ASSY

Install rear lens assembly in slot labeled "90° DEG REAR LENS". Colored dots faces front.



Install nut (7) in casting

Install front lens assembly in slot labeled "90° DEG FRONT LENS". Colored dot faces front.

Align lens dots toward this end

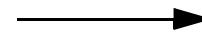



Figure 27

Reference Number	Part Number	Description	Quantity Required
1	7060A3181	Mounting plate, 90° rear lens	1
2	7060A4136	Rear lens, 90°	1
3	7060A3182	Retaining ring, 90°, rear lens	1
4	7060A3183	Mounting plate, 90°, front lens	1
5	7060A4137	Front lens, 90°	1
6	7060A3184	Retaining ring, 90°, front lens	1
7	HW1119	Screw, Phillips, 4-40 x 1/4, SEMS, PHMS	6

Assembling lens tube - 90°

Lens Markings and Positions

The 90° lenses are colour-coded for identification. The rear lens has two purple dots and the front lens has one purple dot. The lens positions are colour-coded within the lens casting to match the coloured dots on the lenses (see [Figure 28](#)).

Align lens dots toward this end 

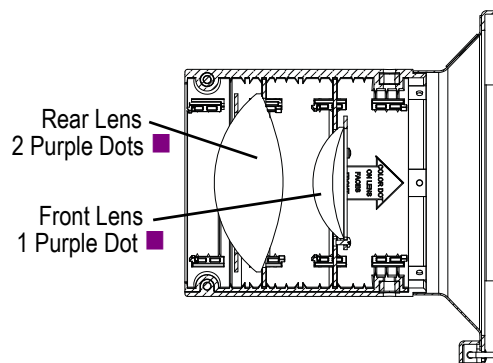


Figure 28

Assembling the lens tube

Tools Required:

- #2 Phillips head screwdriver

- Step 1: See [Figure 27](#). Place rear lens (2) into mounting plate (1) with paint dots facing forward. Center the lens in the mounting plate and secure with the retaining ring (3) and screws (7). Lightly tighten all three screws while maintaining lens position, then tighten screws securely.
- Step 2: See [Figure 27](#). Place front lens (5) into mounting plate (4) with paint dots facing forward. Center the lens in the mounting plate and secure with the retaining ring (6) and screws (7). Lightly tighten all three screws while maintaining lens position, then tighten screws securely.

Cleaning glass lens - 90°



WARNING: *Do not use ammonia-based or other harsh commercial cleaners. Clean lens only as directed.*

Commercially available glass cleaning agents should be avoided as they may contain ammonia, other harsh chemical detergents or abrasive agents. These cleaners may damage the glass surface and the Anti-Reflective coatings. Do not immerse or soak the glass in any cleaning solution.

Remove dust with a blast of oil-free air or wipe with a clean, lint-free cloth. Isopropyl alcohol, distilled water or a 50%-50% mixture of each can be used to clean the glass surface.

This page intentionally left blank.



Corporate Headquarters ■ 3031 Pleasant View Road, P.O. Box 620979, Middleton, Wisconsin 53562-0979 USA ■ Tel +608 831 4116 ■ Fax +608 836 1736
London, UK ■ Unit 26-28, Victoria Industrial Estate, Victoria Road, London W3 6UU, UK ■ Tel +44 (0)20 8896 1000 ■ Fax +44 (0)20 8896 2000
Rome, IT ■ Via Ennio Quirino Visconti, 11, 00193 Rome, Italy ■ Tel +39 (06) 32 111 683 ■ Fax +39 (06) 32 656 990
Holzkirchen, DE ■ Ohmstrasse 3, 83607 Holzkirchen, Germany ■ Tel +49 (80 24) 47 00-0 ■ Fax +49 (80 24) 47 00-3 00
Hong Kong ■ Rm 1801, 18/F, Tower 1 Phase 1, Enterprise Square, 9 Sheung Yuet Road, Kowloon Bay, Kowloon, Hong Kong ■ Tel +852 2799 1220 ■ Fax +852 2799 9325
Service: (Americas) service@etcconnect.com ■ (UK) service@etc europe.com ■ (DE) techserv-hoki@etcconnect.com ■ (Asia) service@etcasia.com
Web: www.etcconnect.com ■ Copyright © 2007 ETC. All Rights Reserved. ■ Product information and specifications subject to change.
7060M2510-06.01 ■ Rev A ■ Released 08/2007