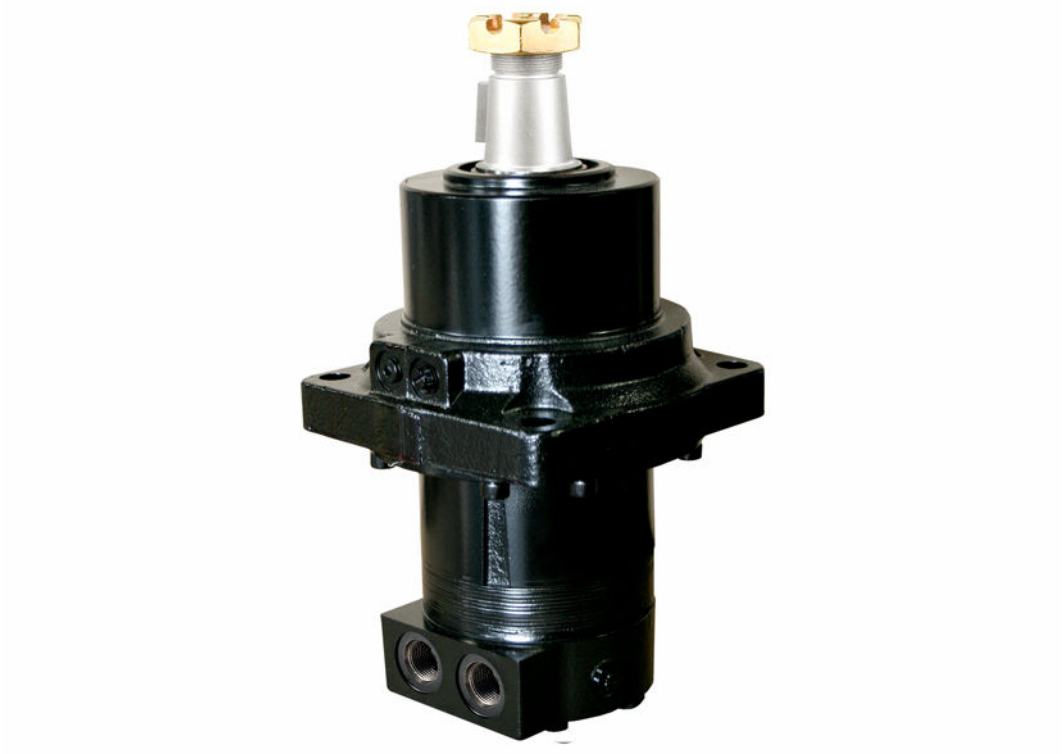
ENGINEERING
TOMORROW

Service Manual

Hydraulic Motor Brakes
Type DR 610 & DT 710



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Revision history

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Date	Changed	Rev
December 2017	First edition	0101

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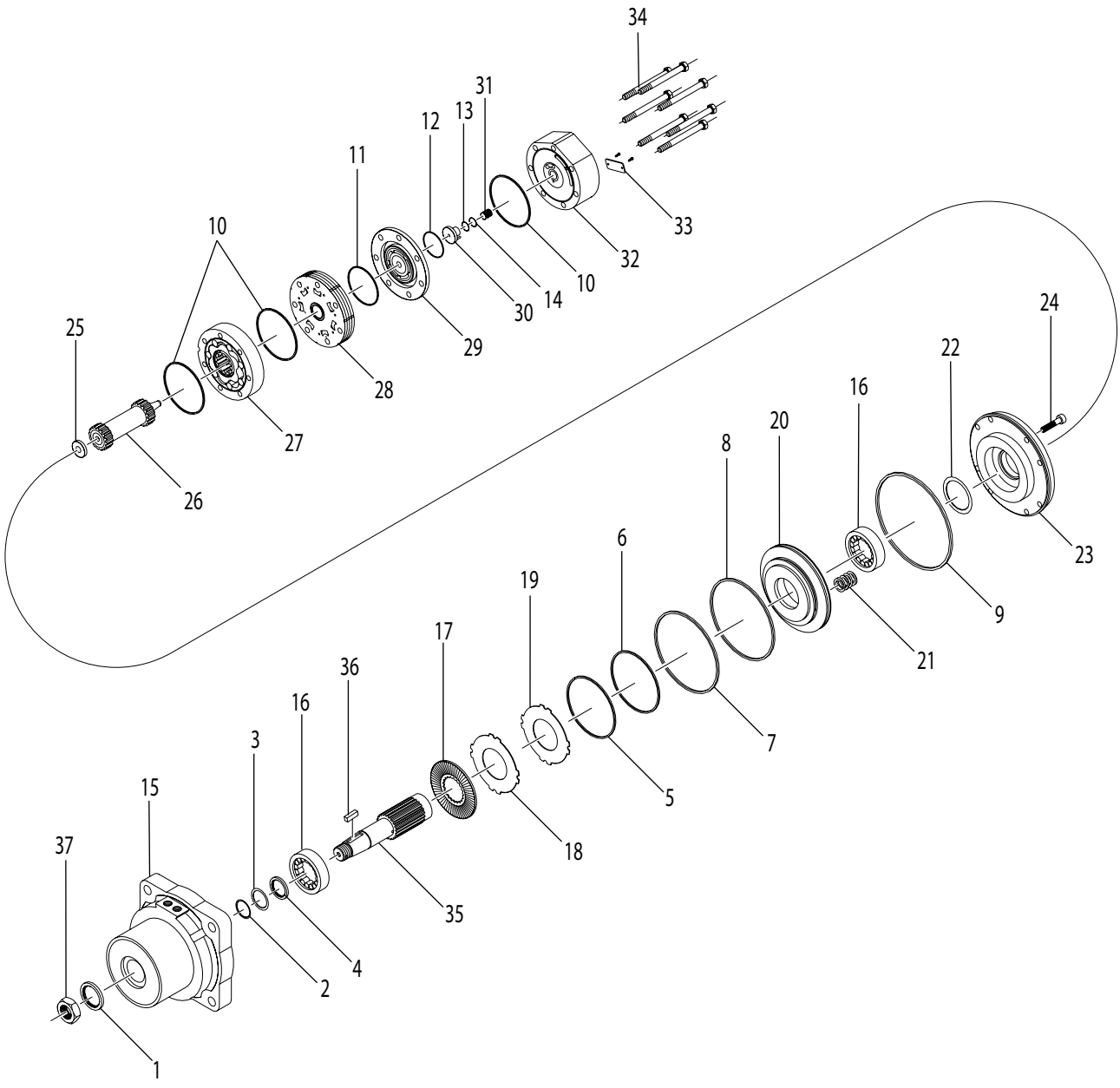
Exploded View



Components List

Description	Item Number	Description	Item Number
Dust seal	1	Piston	20
Metal backup shim	2	Spring	21

DR 610 & DT 710 Series Diagram

Description	Item Number	Description	Item Number
Backup seal	3	Spacer shims	22
Shaft seal	4	Rear housing	23
Small piston o-ring seal	5	Capscrew	24
Small piston seal	6	Drive link spacer	25
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O-ring seal	9	Manifold	28
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DR 610 & DT 710 Series Service Instructions

DR 610 & DT 710 Seal Kit Installation

dimensions: mm [in]

Because of the difficulties involved in servicing the 610 & 710 series', it is strongly recommended to return the units to the factory for service. To obtain return authorization, contact your nearest distributor.

Housing and body seals on products manufactured after July 1, 2016 are o-ring seals. Prior to this date the these seals were square cut seals. It is recommended that if the product being serviced has square seals to replace with the square seals in this kit, likewise if the product has o-ring seals, replace with the o-ring seals in this kit.

1. To aid in reassembly of the motor, make a "V" shaped set of lines from the endcover to the housing using either paint or a marker. With shaft facing down, secure motor in vise by clamping on to housing (15).
2. Loosen and remove seven bolts (34) holding motor assembly together.
   a) Remove endcover (32) carefully as piston (30) and spring (31) may fall out.
   b) If piston does not come out, carefully pry piston (30) out of endcover (32) and lay aside.
   c) Remove O-Ring seal (13) and backup seal (14) from endcover and discard seals.
   d) Remove spring (31) and lay aside.
3. Lift commutator container and commutator (29) from motor and lay aside.
   a) Place commutator on a flat, clean surface with the seal (12) facing up.
   b) Place the tip of a small screwdriver on the seal (12) and gently tap until opposite side of seal lifts from groove.
   c) Remove seal (12) and discard.
4. Remove manifold (28) and rotor set (27).
   a) Remove all seals (10 & 11) from components and discard.

      Caution

      Do not allow rolls to drop form rotor assembly (27) when removing rotor assembly from motor.

   b) Remove drive link (26) from motor and lay aside.
5. Put the housing assembly into an arbor press with the shaft facing down.
   a) Lower the press to apply downward pressure on the rear housing (23) and lock the press in place.
   b) Loosen and remove the eight capscrews (24) holding the rear housing (23) to the front housing (15).
   c) Slowly release the press to allow spring pressure to push the rear housing (23) from the front housing (15).
   d) Remove the rear housing (23) and lay aside.

      Bearing (16) and spacer shim(s) (22) may fall out of rear housing (23).
6. Remove springs (21) from front housing (15) and lay aside.
   a) Remove housing (15) from arbor press and place on a clean, flat surface with output end of shaft (35) facing up.
   b) To remove piston (20), friction disks (17) and disk stampings (18 & 19), firmly grasp output end of shaft with a rag.
   c) Raise housing assembly a few inches above work surface and firmly strike housing assembly on work surface until piston and disks drop from housing assembly.
   d) Lay piston (20) and disks (17, 18 &19) aside.
   e) Remove shaft (35) from housing (15) and lay aside.

      If possible, maintain disk stackup to aid it reassembly.

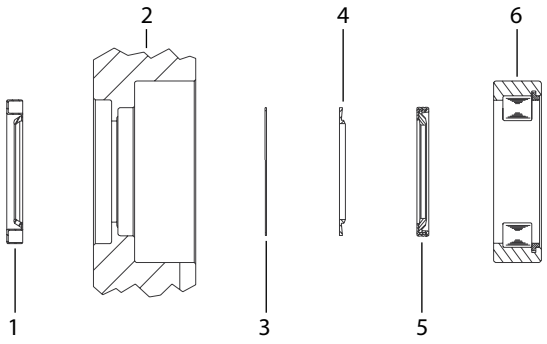
DR 610 & DT 710 Series Service Instructions

7. Remove front housing bearing (16) from housing and lay aside.
- a) Pry shaft seal (4) and backup seal (3) from front housing (15) and discard.
- b) Remove metal backup shim (2) from front housing (15) and discard.
- c) Remove dust seal (1) from housing and discard.

At this point, all parts should be cleaned in an oil-based solvent and dried using compressed air (For safety, observe all OSHA safety guidelines). All new seals should be lightly coated in clean oil prior to installation.

8. Place housing (15) on a flat surface with pilot of housing facing up.
- a) Install dust seal (1) making sure that lip on seal faces up.
- b) Place front housing (15) in vise with pilot on housing facing down.
- c) Install metal backup shim (2) into housing bore.
- d) Install backup seal (3) into housing bore making sure that lip on seal faces up.
- e) Install shaft seal (4) into housing bore making sure that lip on seal faces up. For correct seal orientation, see *Figure 1* on page 7.

Figure 1



1	Dust seal
2	Housing (bearing container)
3	Metal backup shim
4	Backup seal
5	Shaft seal
6	Front housing bearing

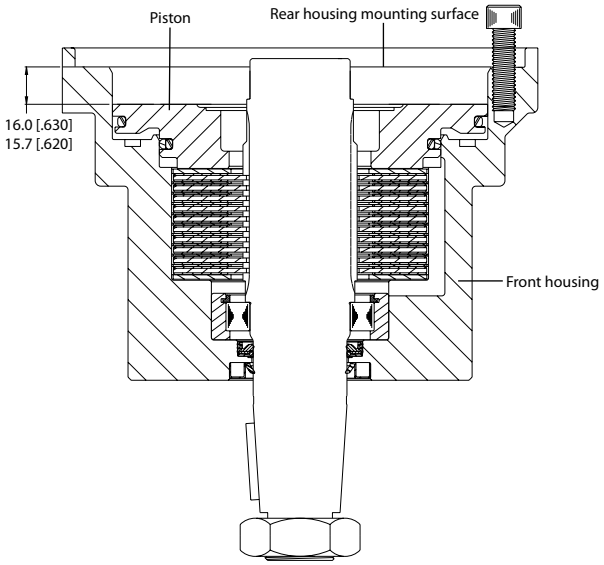
9. If servicing a 710 Series, install bearing shims (not shown in exploded view) in housing followed by front housing bearing (16). If servicing a DR motor, install front housing bearing (16) into housing making sure that the snap ring that retains bearing rolls faces up. Making sure not to cut seal lip with shaft keyway, install shaft (35) into housing (15).

10. Install one disk stamping (18) into housing making sure that lugs or splines engage those in housing (15).
- a) Install one friction disk (17) engaging splines on disk with those on shaft.
- b) Alternate disk stampings and friction disks until all disks except thick disk stamping (19) are installed.
- c) Install thick disk stamping (19) lastly on top of disk assembly.

11. Install small O-Ring seal (5) and large O-Ring seal (7) into corresponding grooves in piston (20).
- a) Install small seal (6) and large seal (8) in corresponding grooves over O-Ring seals.
- b) Thoroughly coat seals and sealing surfaces of housing (15) with clean oil.
- c) With large O.D. side of piston (20) facing up, install piston (20) into housing (15) and evenly press piston down making sure not to pinch seals. (If the disks and disk stampings are going to be replaced, the stack up on the new disks must be between 15.7 - 16.0 [.620 - .630]. Use *Figure 2* on page 8 for measuring reference.)

DR 610 & DT 710 Series Service Instructions

Figure 2



12. Install springs (21) on top of piston.
- a) Install O-Ring Seal (9) in groove in rear surface of housing (15).
- b) If servicing a 710 series, install rear bearing (16) in rear housing (23).
- c) If servicing a 610 series, and rear shaft bearing (16) and spacer shim(s) (22) came out of rear housing (23), reinstall at this time by placing spacer shim(s) (22) into rear housing (23).
- d) Install rear shaft bearing (16) making sure that snap ring that retains bearing rolls faces out.
- e) Place rear housing (23) onto front of housing (15) lining up bolt holes.
- f) While holding motor assembly together, remove motor assembly from vise and place in arbor press.
- g) Press down on rear housing (23) until it contacts front housing (15) and lock press.
- h) Install eight capscrews (24) and torque to 61.0 Nm [45 ft. lbs.].

13. If servicing a 610, install drive link spacer (25) in shaft if motor originally came with one.

710 Motors do not use spacer.

- a) Install drive link (26) into end of shaft with tapered end facing up.
- b) Place body seals (10) in grooves in both sides of rotor (27).
- c) Place rotor (27) onto housing (15) with side of rotor with chamfer in splines facing housing (15).
- d) Place manifold (28) over rotor (27) with seal groove side up.
- e) Install manifold seal (11).

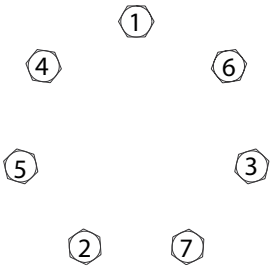
14. Install the commutator seal (12) into the commutator (29) with the metal side facing out.
- a) Use finger pressure to press the seal down flush with the surface of the commutator.
- b) Place the commutator container onto the manifold (28) and then place the commutator onto the protruding end of the drive link (26) making sure that the seal side faces up.

15. Install the remaining body seal (10) in the groove in the face of the endcover (32).
- a) Install piston spring (31) into endcover (32), then the white backup seal (14) followed by the O-Ring seal (13).
- b) Lining up the alignment pin with the hole in the endcover, press piston (30) into the endcover (32).
- c) While holding the piston (30) in the endcover, lower the endcover assembly onto the motor.
- d) Check to make sure that the endcover ports are in their original position.

DR 610 & DT 710 Series Service Instructions

16. Install the seven assembly bolts (34) and pre-torque to 13.6 Nm [10 ft. lb.]. Using the bolt torque pattern in *Figure 3* on page 9, final torque all bolts to 69.8 ± 7.5 Nm [51.5 ± 5.5 ft. lb.].

Figure 3



DR 610 & DT 710 Series Parts Listing

DR 610 Replacement Kits

Available Kits

Refer to the *Exploded View* on page 4 for item numbers

Seal kit

Description	Exploded View Item Number	Qty. In Kit	Order Number
Dust seal	1	1	700666750(Includes item numbers 1-14)
Metal backup seal	2	1	
Backup seal	3	1	
Shaft seal	4	1	
Small o-ring seal	5	1	
Small seal	6	1	
Large o-ring seal	7	1	
Large seal	8	1	
O-ring seal	9	1	
Body seal	10	3	
Manifold seal	11	1	
Commutator seal	12	1	
Piston o-ring seal	13	1	
Piston seal	14	1	

Miscellaneous kits

Description	Exploded View Item Number	Order Number
Shaft bearing (1 per kit)	16	910018011
Friction disks & stampings (22)	17-19	600018232
Piston	20	700018088
Springs (25 per kit)	21	910018014
Spacer shims (3 per kit)	22	300018068
Capscrews (8 per kit)	24	200018074
Drive link spacer	25	500018075
Manifold	28	700668002
Commutator assembly	29	700668003
Endcover piston	30	700668004
Piston spring	31	700018046
1000 psi relief valve	Not shown	500018228
2000 psi relief valve	Not shown	500018231
3000 psi relief valve	Not shown	500018221
1.125-18 UNEF slotted hex nut	37	700018038
1.125-18 UNEF solid hex nut	37	700018054

Rotors, drive links, and bolts

When changing motor displacements, a matching rotor, drive link, and bolt set kit must be ordered.

DR 610 & DT 710 Series Parts Listing

Exploded View Item Number	27	27	26	34
Displacement	**Standard Rotor Kit**	**Freeturn Rotor Kit**	**Drive Link Kit**	**Bolt Set Kit**
200	500167004	500167011	600140012	700664012
260	500227000	500227004	600140016	700664019
300	500247005	500247011	600140019	700664025
350	500207000	500207004	600140027	700665028
375	500307005	500307011	600140025	700664028
470	500357003	500357005	600140027	700665028
540	500407005	500407011	600140033	700665033
750	500607005	500607011	600140046	700665046

Housing kits

Description	Exploded View Item Number	Order Number
#W2& W8-DR Setback brake	15	300130054
Rear housing	23	500013067

Shafts and related components kits

Shaft kits come with related shaft components (i.e. keys, nuts, etc.). To order individual shaft components (i.e. keys, nuts, bolts, washers, or wire rings) use the kit number for each individual part.

Exploded View item Number	35	36	37
Description	**Shaft Kit**	**Key Kit**	**Nut kit**
#30-1-1/2" Straight	600011215	300339105	See *Miscellaneous kits* on page 10
#31-1-1/2" Tapered	600011308	500449102	

Endcover kits

Exploded view item #32

Endcover kits come assembled with exploded view item numbers 13, 14, 30, & 31. To order a relief valve for the valve cavity endcovers, see the *Miscellaneous kits* on page 10 listing for relief valve kit numbers.

Description	Standard Endcover Kit	Valve Cavity Endcover Kit
#1-7/8" O-ring rear ports	700160000	700160000R
#5- 1-1/16" O-ring radial ports	700160005	700160005R
#2-3/4" BSP.F Radial ports	700160007	700160007R
#6- 1-1/16" O-ring parallel ports	700160008	700160008R
#7-3/4" BSP.F Parallel ports	700160009	-

DT 710 Replacement Kits

Available Kits

Refer to the *Exploded View* on page 4 for item numbers

DR 610 & DT 710 Series Parts Listing

Seal kit

Description	Exploded View Item Number	Qty. In Kit	Order Number
Dust seal	1	1	700666750(Includes item numbers 1-14)
Metal backup seal	2	1	
Backup seal	3	1	
Shaft seal	4	1	
Small o-ring seal	5	1	
Small seal	6	1	
Large o-ring seal	7	1	
Large seal	8	1	
O-ring seal	9	1	
Body seal	10	3	
Manifold seal	11	1	
Commutator seal	12	1	
Piston o-ring seal	13	1	
Piston seal	14	1	

Miscellaneous kits

Description	Exploded View Item Number	Order Number
Spacer shim	16	700018096
Front shaft bearing	17	700018090
Friction disks & stampings (22)	18-20	700018078
Piston	21	700018088
Springs (25 per kit)	22	910018014
Rear shaft bearing	23	700018089
Capscrew (8 per kit)	25	200018074
Manifold	28	700668002
Commutator assembly	29	700668003
Endcover piston	30	700668004
Piston spring	31	700018046
1000 psi relief valve	Not shown	500018228
2000 psi relief valve	Not shown	500018231
3000 psi relief valve	Not shown	500018221
M42 X 3 castle nut	37	700669303

Rotors, drive links, and bolts

When changing motor displacements, a matching rotor, drive link, and bolt set kit must be ordered.

Exploded view Item Number	27	27	26	34
Displacement	**Standard Rotor Kit**	**Freeturn Rotor Kit**	**Drive Link Kit**	**Bolt Set Kit**
300	700662019	700662019F	700140019	700664019
375	700662025	700662025F	700140025	700664025
470	700662028	700662028F	700140028	700664028
540	700662033	700662033F	700140033	700664033
750	700662046	700662046F	700140046	700664046

DR 610 & DT 710 Series Parts Listing

Exploded view Item Number	27	27	26	34
Displacement	**Standard Rotor Kit**	**Freeturn Rotor Kit**	**Drive Link Kit**	**Bolt Set Kit**
930	700662056	-	700140056	700664056
1K1	700662066	700662066F	700140066	700664066
1K5	700662091	-	700140091	700664091
2K1	700662099	-	700140099	700664099

Housing kits

Description	Exploded View Item Number	Order Number
#W2 & W8-DT Setback brake	15	700130033
Rear housing	24	700013011

Shafts and related components kits

Shaft kits come with related shaft components (i.e. keys, nuts, etc.). To order individual shaft components (i.e. keys, nuts, bolts, washers, or wire rings) use the kit numbers for each individual part.

Exploded View Item Number	35	36	37	Not Shown
Description	**Shaft Kit**	**Key Kit**	**Nut Kit**	**Washer Kit**
#50-2" Straight	700110029	700669105	-	700669306
#51-55mm Tapered	700110030	700669107	700669303	700669307

Endcover kits

Exploded view item #32

Endcover kits come assembled with exploded view item numbers 13, 14, 30, & 31. To order a relief valve for the valve cavity endcovers, see the *Miscellaneous kits* on page 12 listing for relief valve kit numbers.

Description	Standard Endcover Kit	Valve Cavity Endcover Kit
#1-7/8" O-ring rear ports	700160000	700160000R
#5- 1-1/16" O-ring radial ports	700160005	700160005R
#2-3/4" BSP.F Radial ports	700160007	700160007R
#6- 1-1/16" O-ring parallel ports	700160008	700160008R
#7-3/4" BSP.F Parallel ports	700160009	-

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