



# Service Repair Manual

## **Model**

320C, 320C L, 320C LN,  
320C S Excavator

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Product: EXCAVATOR

Model: 320C EXCAVATOR BEA

Configuration: 320C, 320C L, 320C LN, 320C S Excavators BEA00001-UP (MACHINE) POWERED BY 3066 Engine

## Disassembly and Assembly 320C Excavator Machine Systems

Media Number -REN3826-16

Publication Date -01/11/2014

Date Updated -30/03/2016

i02544012

# Bucket Cylinder - Remove and Install

SMCS - 5457-010

## Removal Procedure



**Cylinders equipped with lock valves can remain pressurized for very long periods of time, even with the hoses removed.**

**Failure to relieve pressure before removing a lock valve or disassembling a cylinder can result in personal injury or death.**

**Ensure all pressure is relieved before removing a lock valve or disassembling a cylinder.**

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**Note:** Cleanliness is an important factor. Before the disassembly procedure, the exterior of the component should be thoroughly cleaned. This will help to prevent dirt from entering the internal mechanism.

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### NOTICE

**Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.**

**Refer to Special Publication, NENG2500, "Caterpillar Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.**

**Dispose of all fluids according to local regulations and mandates.**

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## **WARNING**

**At operating temperature, the hydraulic oil is hot and under pressure. Hot oils can cause burns.**

**To prevent possible personal injury, release the pressure in the work tool hydraulic circuit (boom, stick, bucket, and swing), travel circuits, and the hydraulic oil tank at the filler cap before any hydraulic lines or components are disconnected or removed.**

**Remove the filler cap only when the engine is stopped and the filler cap is cool enough to touch.**

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**Note:** Put identification marks on all lines, on all hoses, on all wires, and on all tubes for installation purposes. Plug all lines, hoses, and tubes. This helps to prevent fluid loss and this helps to keep contaminants from entering the system.

1. Release the hydraulic system pressure. Refer to Disassembly and Assembly, "System Pressure - Release".

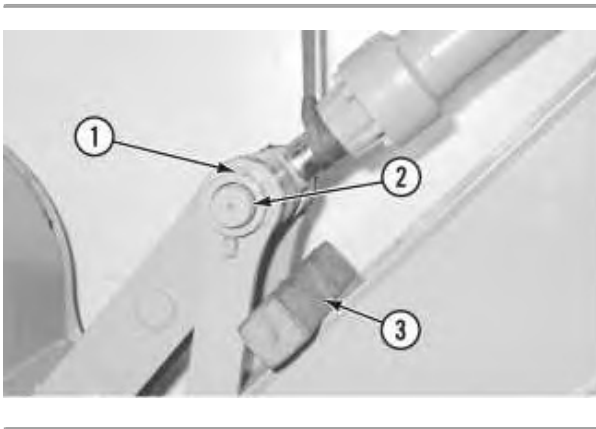


Illustration 1

g00555749

2. Fasten a suitable lifting device to the rod end of the bucket cylinder, as shown. Put suitable blocking (3) under the link assemblies as a support.
  3. Remove the nuts and retaining bolt (1) . Remove pin (2) .
  4. Note the location and the quantity of the shims between the power link and the idler link. Remove the shims.
-

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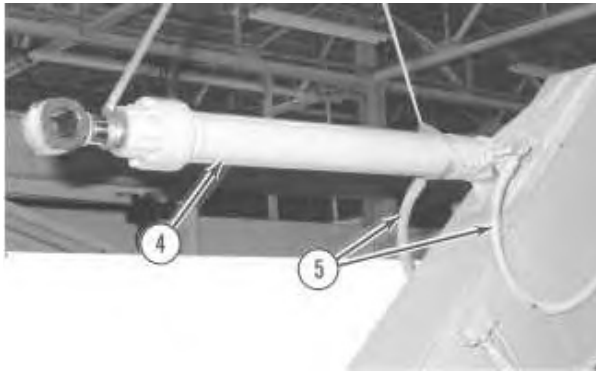


Illustration 2

g00477372

5. Raise bucket cylinder (4) until bucket cylinder (4) is level. Fasten a suitable lifting device to the head end of bucket cylinder (4) , as shown. Disconnect hose assemblies (5) .

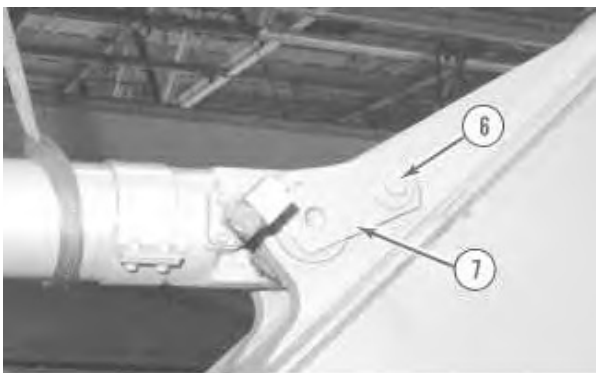


Illustration 3

g00477379

6. Remove retaining bolt (6) , pin assembly (7) , and the spacer. Remove the bucket cylinder. The weight of the bucket cylinder is approximately 150 kg (330 lb).
7. Note the location and the quantity of shims on both sides of the bucket cylinder at the stick pin. Remove the shims.

## Disassembly and Assembly Information

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
	127-4904	Hydraulic Cylinder Repair Stand Gp	1
	1P-0520	Driver Gp	1
A	9U-7868	Spanner Wrench	1
	127-8064	Adapter Plate Gp	1
	195-4609	Seal Pick	1
B	4C-4032	Bearing Mount Compound	1

 **WARNING**

Cylinders equipped with lock valves can remain pressurized for very long periods of time, even with the hoses removed.

Failure to relieve pressure before removing a lock valve or disassembling a cylinder can result in personal injury or death.

Ensure all pressure is relieved before removing a lock valve or disassembling a cylinder.

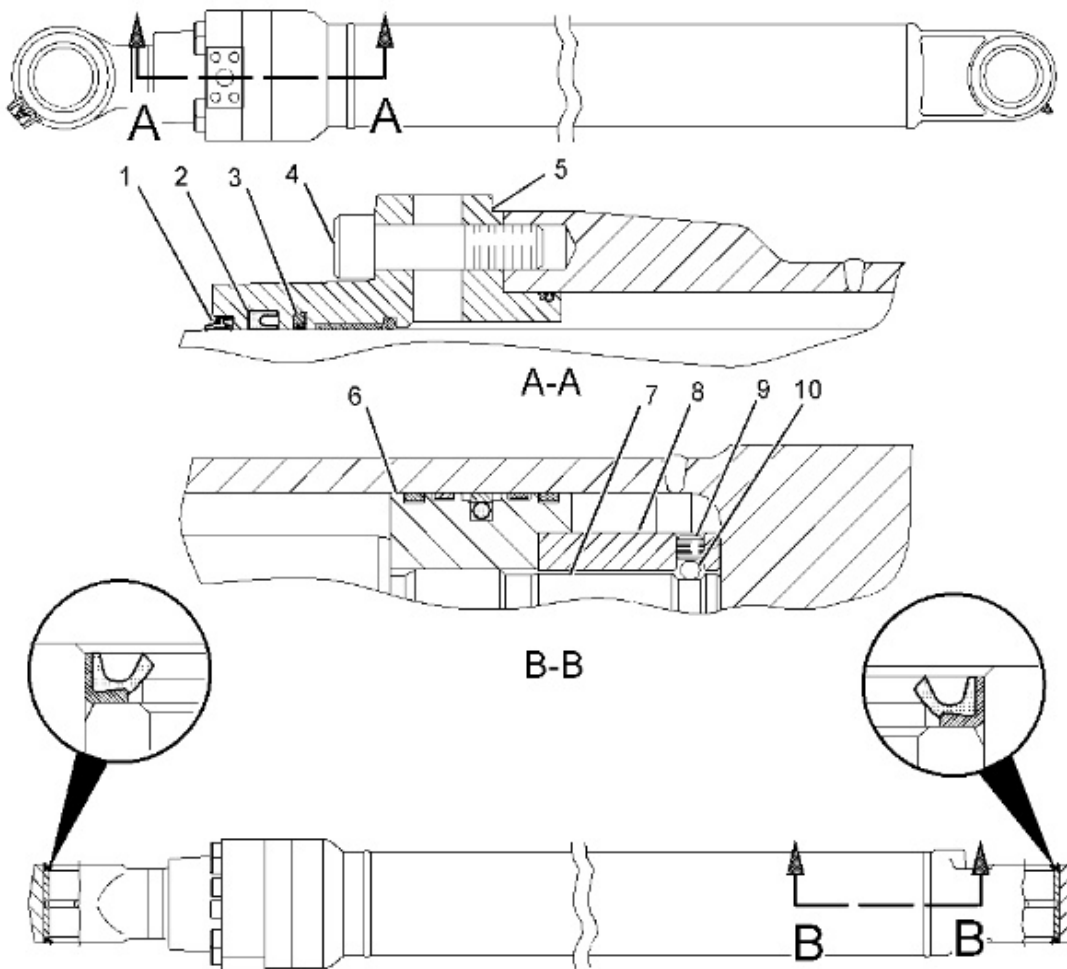


Illustration 4

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**Note:** Apply a light film of hydraulic oil to all components before assembly.

1. Apply Tooling (B) to seal (1) prior to assembly.

2. Apply clean hydraulic oil on the lip of seal (1) , seal (2) , and seal (3) .
3. Apply Tooling (C) to the threads of head (5) .
4. Lubricate the threads of rod assembly (7) with Tooling (C) .
5. Tighten locknut (8) to a torque of  $7600 \pm 380 \text{ N}\cdot\text{m}$  ( $5605 \pm 280 \text{ lb ft}$ ).
6. Install ball (10) and setscrew (9) in locknut (8) . Tighten setscrew (9) to a torque of  $57 \pm 10 \text{ N}\cdot\text{m}$  ( $42 \pm 7 \text{ lb ft}$ ).
7. Lubricate the outside of piston (6) with Tooling (C) .
8. Tighten bolts (4) to a torque of  $267 \pm 40 \text{ N}\cdot\text{m}$  ( $197 \pm 30 \text{ lb ft}$ ).

## Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
D	5P-0960	Grease Cartridge	1

**Note:** Cleanliness is an important factor. Before assembly, all parts should be thoroughly cleaned in cleaning fluid. Allow the parts to air dry. Wiping cloths or rags should not be used to dry parts. Lint may be deposited on the parts which may cause later trouble. Inspect all parts. If any parts are worn or damaged, use new parts for replacement.

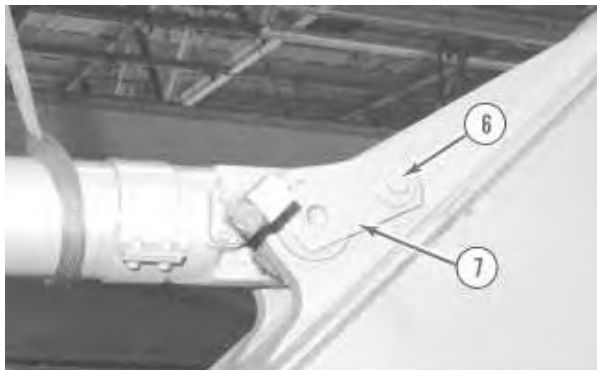


Illustration 5

g00477379

1. Fasten a suitable lifting device to bucket cylinder (4) . The weight of bucket cylinder (4) is approximately 150 kg (330 lb). Place bucket cylinder (4) in position in the stick. Lower the head end of bucket cylinder (4) into the brackets on top of the stick. Make sure that the pin bores in the stick are in alignment with the pin bores in the bucket cylinder. Make sure that the grease fittings in the head end and in the rod end of bucket cylinder (4) are facing away from the stick.
2. Install the shims on both sides of the bucket cylinder at the bore for pin assembly (7) .
3. Install pin assembly (7) .
4. Install retaining bolt (6) . Tighten retaining bolt (6) to a torque of  $460 \pm 60 \text{ N}\cdot\text{m}$  ( $340 \pm 44 \text{ lb ft}$ ).

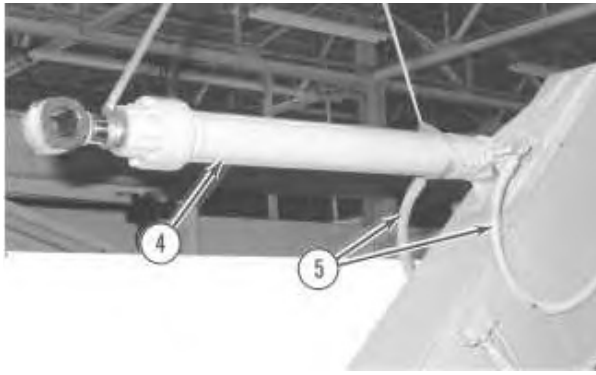


Illustration 6

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5. Install O-ring seals in the ends of hose assemblies (5) . Connect hose assemblies (5) to bucket cylinder (4) .

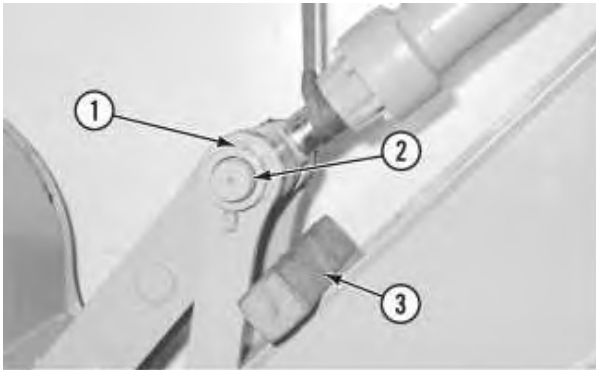
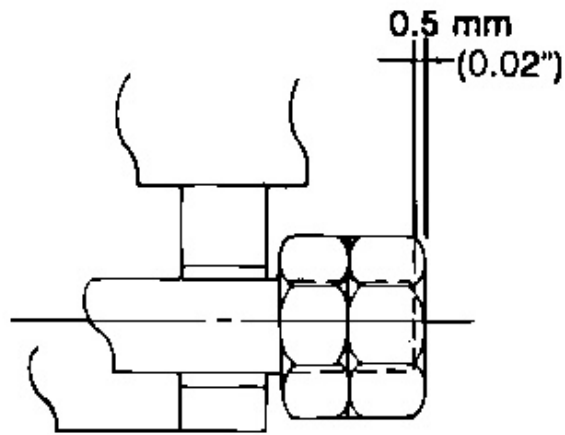


Illustration 7

g00555749

6. Lower the bucket cylinder between the link assemblies. Install the shims on both sides of the power link between the power link and the idler links.
  7. Apply a thin coat of Tooling (D) on pin (2) . Make sure that the bore in the bucket cylinder rod is in alignment with the bores in the link assemblies. Install pin (2) . Install retaining bolt (1) and the two nuts.
-



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Illustration 8

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8. Tighten the nuts on retaining bolt (1) . Tighten the outside nut until the nut is 0.5 mm (0.02 inch) beyond the end of the retaining bolt, as shown. Tighten the inside nut against the outside nut to a torque of  $460 \pm 60 \text{ N}\cdot\text{m}$  ( $340 \pm 44 \text{ lb ft}$ ).
9. Fill the hydraulic oil tank with oil to the correct level. Refer to Operation and Maintenance Manual, "Refill Capacities".
10. Start the engine, and run the engine at a low idle speed. Raise the bucket from the ground. Extend and retract the bucket cylinder approximately ten times in order to remove the air from the hydraulic system.
11. Recheck the oil level in the hydraulic oil tank. If necessary, refill the hydraulic oil tank to the correct level.

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Configuration: 320C, 320C L, 320C LN, 320C S Excavators BEA00001-UP (MACHINE) POWERED BY 3066 Engine

**Disassembly and Assembly  
320C Excavator Machine Systems**

Media Number -REN3826-16

Publication Date -01/11/2014

Date Updated -30/03/2016

i01862522

## Drift Reduction Valve (Stick) - Remove

SMCS - 5143-011-JJ

### Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	FT-2674	Vacuum Cap	1

**Start By:**

- a. Release the hydraulic system pressure. Refer to Disassembly and Assembly, "Hydraulic System Pressure - Release" .

---

**NOTICE**

**Keep all parts clean from contaminants.**

**Contamination of the hydraulic system with foreign material will reduce the service life of the hydraulic system components.**

**To prevent contaminants from entering the hydraulic system, always plug or cap the lines, fittings, or hoses as they are disconnected. Cover any disassembled components and clean them properly before assembly.**

**Clean the hydraulic system properly after any major component exchange or especially after a component failure, to remove any contamination.**

---

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## NOTICE

**Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting, and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.**

**Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat<sup>®</sup> products.**

**Dispose of all fluids according to local regulations and mandates.**

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**Note:** A hydraulic oil sample should be obtained before any maintenance is performed in order to establish the system contaminant level. Refer to Fluid Analysis Laboratory Guide, SEBF3116, "Obtaining an Oil Sample for S·O·S Analysis". Refer to Operation and Maintenance Manual, "Sampling Interval and Location of Sampling Valve" for the correct location.



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Illustration 1

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1. Remove the cap from the hydraulic tank. Attach Tooling (A) to the hydraulic tank.

**Note:** Hook up the air to Tooling (A) in order to create a vacuum in the hydraulic system. This will minimize the leakage from the hose assemblies.

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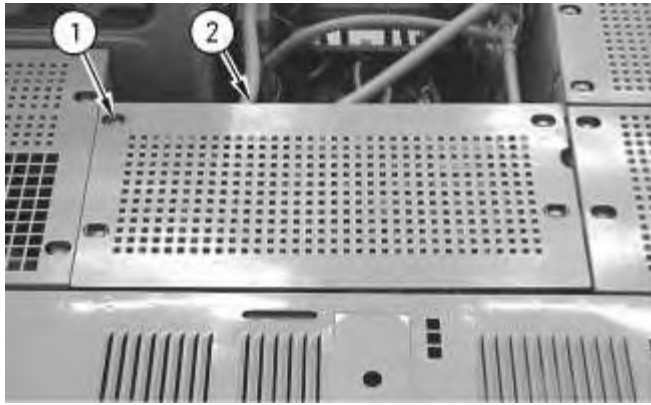


Illustration 2

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2. Remove bolts (1) and the washers in order to remove cover (2).

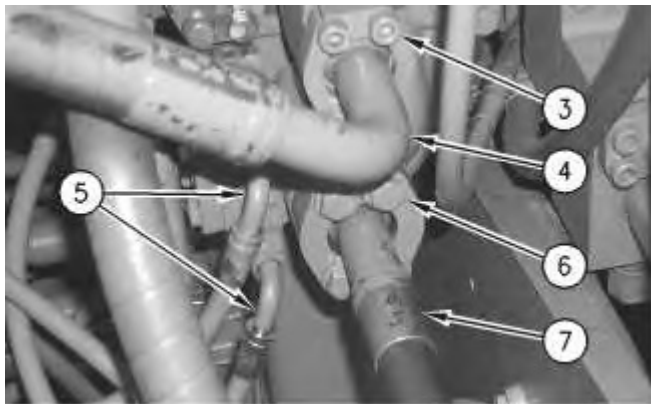


Illustration 3

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3. Remove socket head bolts (3) and the split flanges in order to disconnect hose assembly (4) from the stick drift reduction valve.
4. Remove bolts (6), the washers, and the split flanges in order to disconnect hose assembly (7) from the stick drift reduction valve.
5. Disconnect hose assemblies (5).

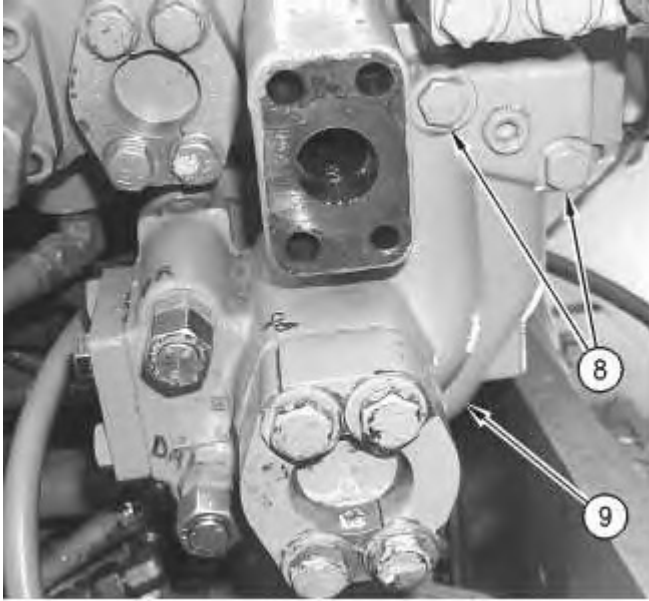


Illustration 4

g00706051

6. Remove bolts (8).
7. Remove stick drift reduction valve (9).

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## Disassembly and Assembly 320C Excavator Machine Systems

Media Number -REN3826-16

Publication Date -01/11/2014

Date Updated -30/03/2016

i02696617

# Drift Reduction Valve (Stick) - Disassemble

SMCS - 5143-015-JJ

## Disassembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	6V-7981	Bolt (M10-1.5 by 70mm)	2

### Start By:

- a. Remove the stick drift reduction valve. Refer to Disassembly and Assembly, "Drift Reduction Valve (Stick) - Remove".

---

### NOTICE

**Keep all parts clean from contaminants.**

**Contamination of the hydraulic system with foreign material will reduce the service life of the hydraulic system components.**

**To prevent contaminants from entering the hydraulic system, always plug or cap the lines, fittings, or hoses as they are disconnected. Cover any disassembled components and clean them properly before assembly.**

**Clean the hydraulic system properly after any major component exchange or especially after a component failure, to remove any contamination.**

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**Note:** Cleanliness is an important factor. Before the disassembly procedure, the exterior of the component should be thoroughly cleaned. This will prevent dirt from entering the internal mechanism.

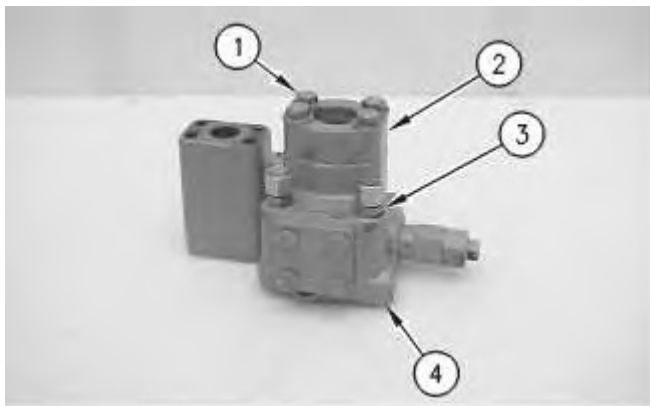


Illustration 1

g00703710

1. Remove bolts (1) and the washers. Remove half flanges (2) and the cover. Remove fittings (3) from valve body (4).



Illustration 2

g00703711

2. Remove O-ring seal (5) from the fittings.



**WARNING**

**Personal injury can result from parts and/or covers under spring pressure.**

**Spring force will be released when covers are removed.**

**Be prepared to hold spring loaded covers as the bolts are loosened.**

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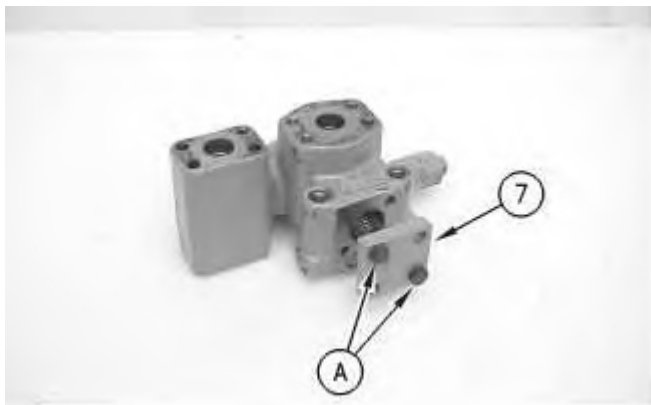


Illustration 4

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3. Remove two bolts (6). Install Tooling (A). Remove the remaining two bolts. Remove Tooling (A). Remove cover (7) from the valve body.
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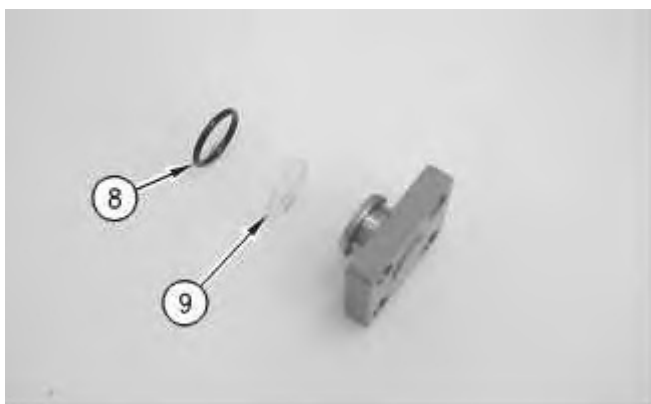


Illustration 5

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4. Remove O-ring seal (8) and ring (9) from the cover.
-

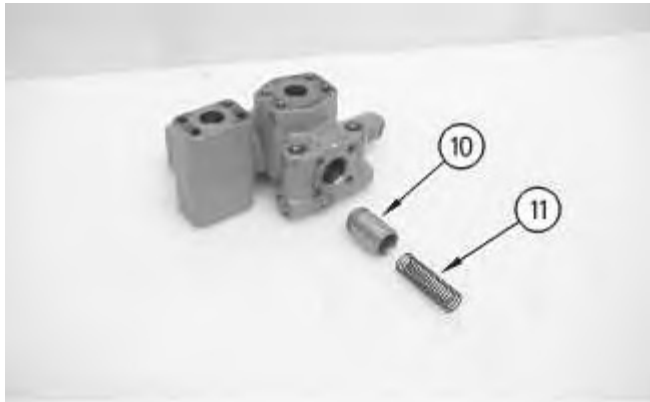


Illustration 6

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 **WARNING**

**Personal injury can result from parts and/or covers under spring pressure.**

**Spring force will be released when covers are removed.**

**Be prepared to hold spring loaded covers as the bolts are loosened.**

5. Remove spring (11) and spool valve (10) from the valve body.



Illustration 7

g00703716

6. Remove plug (12) and the O-ring seal from the valve body.

 **WARNING**

**Personal injury can result from parts and/or covers under spring pressure.**

**Spring force will be released when covers are removed.**

**Be prepared to hold spring loaded covers as the bolts are loosened.**

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Illustration 8

g00703718

7. Remove O-ring seal (13) from the plug.



Illustration 9

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8. Remove plug (14) and the O-ring seal from the valve body.



9. Remove O-ring seal (15) from the plug.

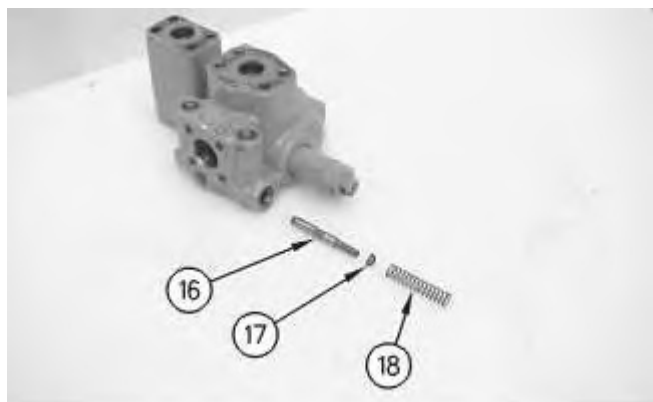


Illustration 11

10. Remove spring (18), guide (17), and spool (16) from the valve body.



Illustration 12

11. Remove plug (19) and the O-ring seal from the valve body.



Illustration 13

12. Remove O-ring seal (20) from the plug.



Illustration 14

g00703724

13. Remove relief valve (21) from the valve body.

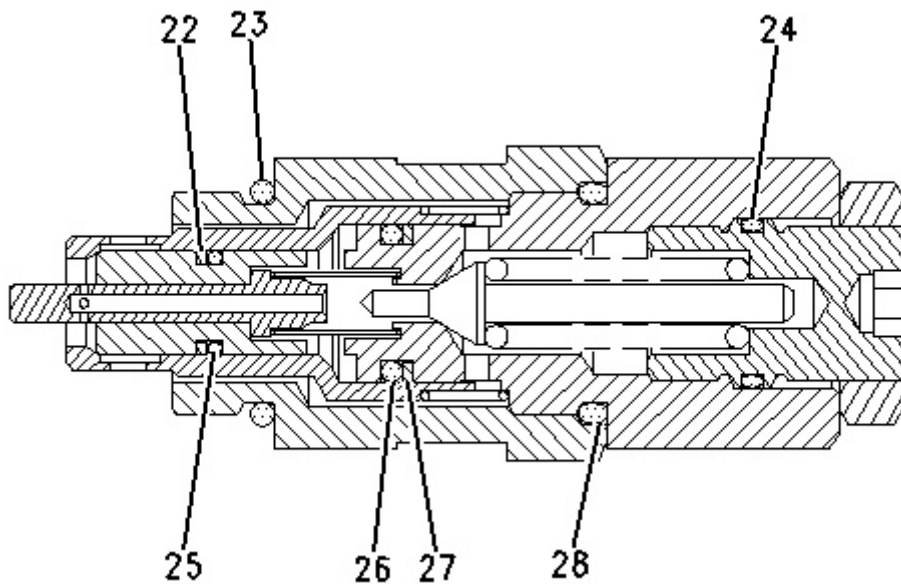


Illustration 15

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14. Remove O-ring seals (23), (24), (25), (26), and (28). Remove rings (22) and (27).



15. Remove pipe plug (29) from the valve body.



Illustration 17

16. Remove O-ring seal (30) and O-ring seal (31) from the valve body. Remove plug (32) and the O-ring seal from the valve body.



Illustration 18

17. Remove O-ring seal (33) from the plug.



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Product: EXCAVATOR

Model: 320C EXCAVATOR BEA

Configuration: 320C, 320C L, 320C LN, 320C S Excavators BEA00001-UP (MACHINE) POWERED BY 3066 Engine

## Disassembly and Assembly 320C Excavator Machine Systems

Media Number -REN3826-16

Publication Date -01/11/2014

Date Updated -30/03/2016

i02696641

# Drift Reduction Valve (Stick) - Assemble

SMCS - 5143-016-JJ

## Assembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	6V-7981	Bolt M10-1.5 by 70mm	2
B	1U-6396	O-Ring Assembly Compound	1

**Note:** Cleanliness is an important factor. Before assembly, all parts should be thoroughly cleaned in cleaning fluid. Allow the parts to air dry. Wiping cloths or rags should not be used to dry parts. Lint may be deposited on the parts which may cause later trouble. Inspect all parts. If any parts are worn or damaged, use new parts for replacement. All disassembly and all assembly procedures must be performed on a clean work surface and in a clean hydraulic area. Keep cleaned parts covered and protected at all times.

**Note:** O-rings, gaskets, and seals should always be replaced. A used O-ring seal may not have the same sealing properties as a new O-ring seal. Use Tooling (A) during the assembly procedure.

**Note:** Apply a light film of hydraulic oil to all components before assembly.

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