



# Service Repair Manual

## **Models**

303 CR Mini Hydraulic  
Excavator

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Product: MINI HYD EXCAVATOR

Model: 303 MINI HYD EXCAVATOR DMA

Configuration: 303 CR Mini Hydraulic Excavator DMA00001-UP (MACHINE) POWERED BY S3L2 Engine

## **Disassembly and Assembly 303 CR Mini Hydraulic Excavator Machine Systems**

Media Number -REN5593-01

Publication Date -01/01/2004

Date Updated -13/01/2004

i01920827

# Main Control Valve - Assemble

SMCS - 5051-016

## Assembly Procedure

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### NOTICE

**Failure to properly assemble parts or failure to follow established procedures can lead to damage of the parts and assembly.**

**To avoid damage to parts, always identify and mark the parts so that they can be installed in the same location. Ensure that gear surfaces align. Never force parts during assembly.**



**Spring force can cause personal injury or death.**

**Do not repair until you have read the Operation and Maintenance Manual.**

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**Note:** Only a small number of components within the main control valve are serviced components. A large number of nonserviceable items must be disassembled in order to access the serviced components.

**Note:** Keep all of the internal parts of the main control valve clean and lubricated.

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

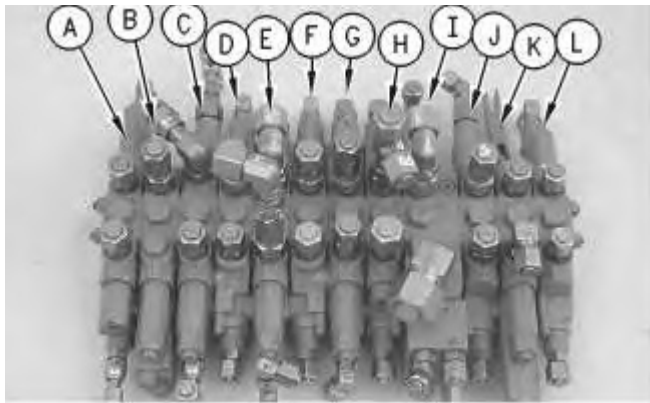


Illustration 1

g00999509

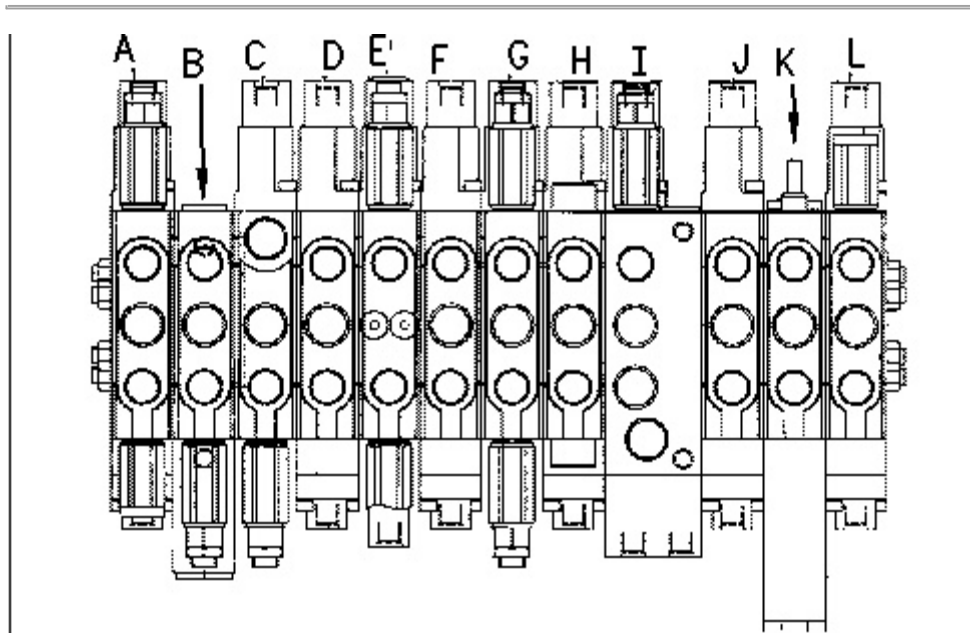


Illustration 2

g00995904

- (A) Bucket Block Assembly
- (B) Boom II Block Assembly
- (C) Boom Block Assembly
- (D) Left Travel Block Assembly
- (E) Straight Travel Block Assembly
- (F) Right Travel Block Assembly
- (G) Stick (Arm) Block Assembly

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(H) Auxiliary (PTO) Block Assembly

(I) Boom Up Block Assembly

(J) Swing Block Assembly

(K) Blade Assembly

(L) Boom Swing Block Assembly

2. The above photo displays the functional positions of the valves within the main control valve.

**Note:** Place identification marks on the valves. The valves **MUST** be assembled in the same configuration.

**Note:** The main control valve will be assembled in reverse order.

**Note:** Do not mix components from one valve to another valve. Valve components **MUST** be returned to the original valve.

3. Assemble Block Assembly (L), as follows:



**Personal injury can result from being struck by parts propelled by a released spring force.**

**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

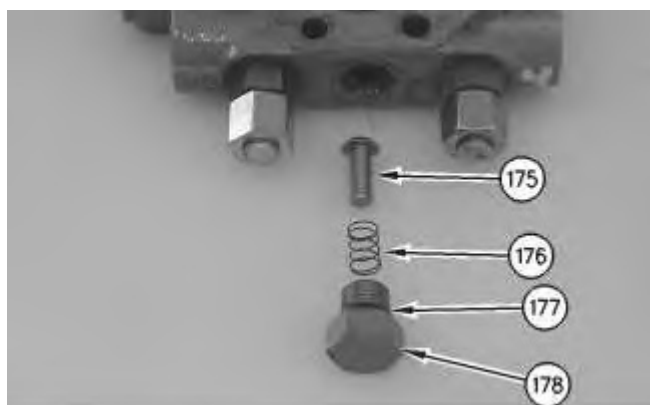


Illustration 3

g00999478

- a. Install spring (176) onto valve (175). Install O-ring seal (177) onto plug (178). Install plug (178) into spring (176). Install plug (178) and valve (175) into block assembly (L) .

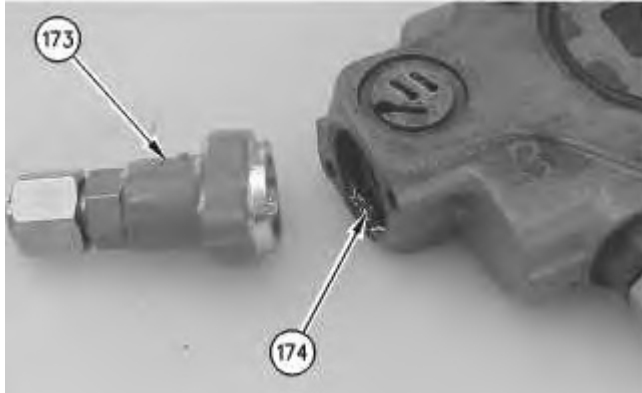


Illustration 4

g00999474

- b. Install O-ring seal (174) onto cover (173) .

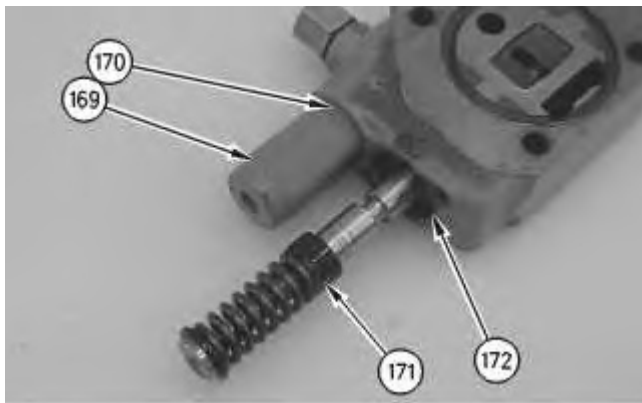


Illustration 5

g00999467

- c. Install O-ring seal (172) onto cover (167) .  
d. Install spool (171) into Block Assembly (L) .

**Note:** Lubricate the spool with a light coating of hydraulic oil at the time of installation.

**Note:** The spool must be oriented properly.

- e. Install O-ring seal (170) onto valve (169). Install valve (169) into Block Assembly (L). Tighten valve (169) to a torque of  $39 \pm 5 \text{ N}\cdot\text{m}$  ( $29 \pm 4 \text{ lb ft}$ ).
-

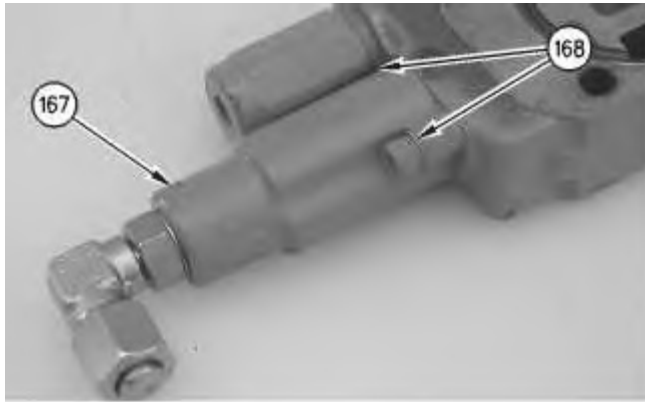


Illustration 6

g00999460

- f. Install cover (167) onto Block Assembly (L) .

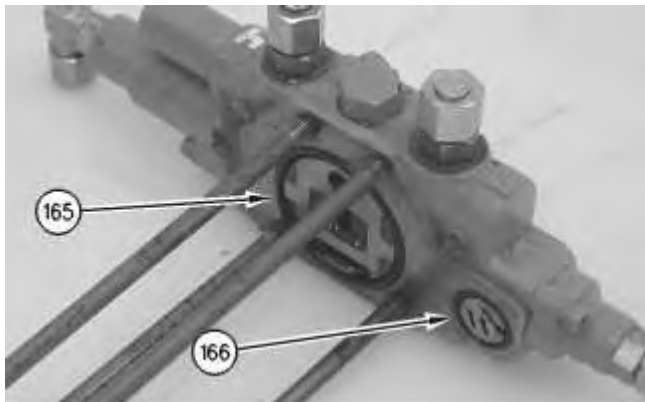


Illustration 7

g00999454

- g. Install O-ring seals (166) and (165) onto Block Assembly (L) .
- h. Install Block Assembly (L) onto the threaded rods.

4. Assemble Block Assembly (K), as follows:



**Personal injury can result from being struck by parts propelled by a released spring force.**

**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

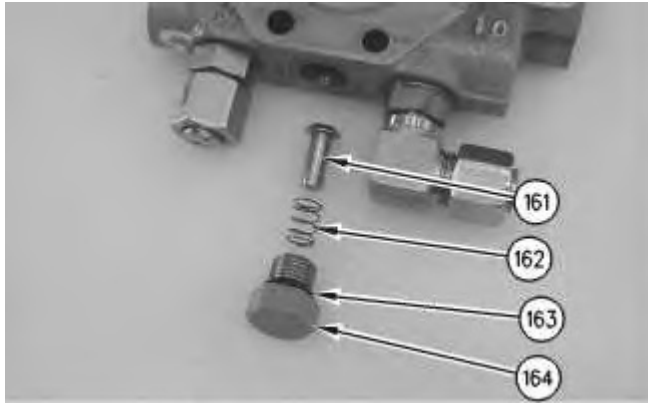


Illustration 8

g00999395

- a. Install spring (162) onto valve (161). Install O-ring seal (163) onto plug (164). Install plug (164) into spring (162). Install plug (164) and valve (161) into Block Assembly (K) .
- b. Install O-ring seal (160) onto valve (159). Install valve (159) into Block Assembly (K). Tighten valve (159) to a torque of  $39 \pm 5$  N·m ( $29 \pm 4$  lb ft).

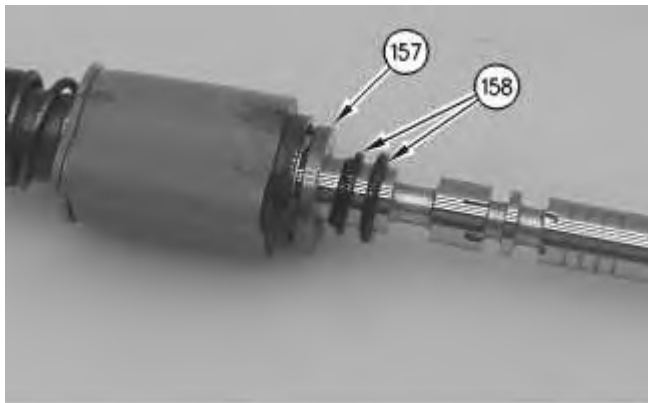
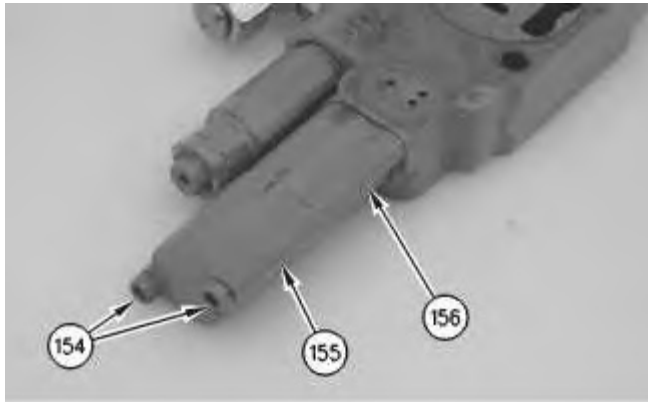


Illustration 9

g00999377

- c. Install washer (157) onto the spool.
- d. Install O-ring seals (158) onto the spool.

**Note:** The outer O-ring seal is tapered.



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Illustration 10

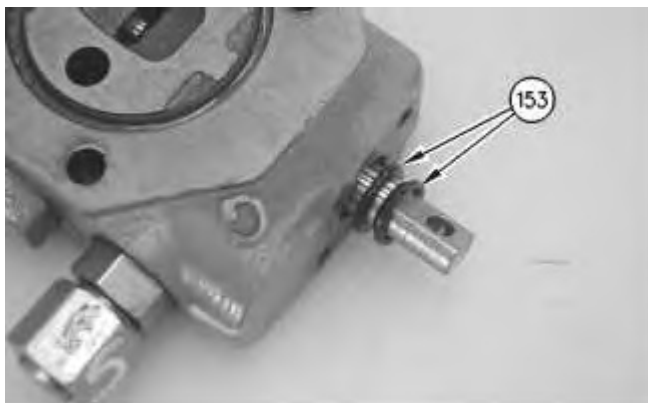
g00999354

- e. Install spool assembly (156) into Block Assembly (K) .

**Note:** Lubricate the spool with a light coating of hydraulic oil prior to assembly.

**Note:** The spool must be oriented properly.

- f. Install cover (155). Install allen head bolts (154) .



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Illustration 11

g00999246

- g. Install O-ring seals (153) onto the opposite end of the spool.

**Note:** The outer O-ring seal is tapered.

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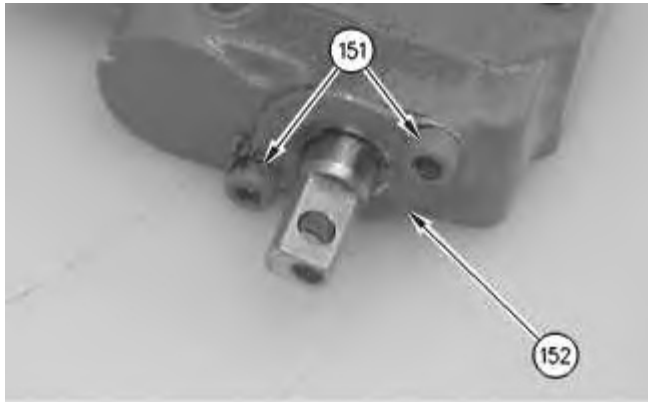


Illustration 12

g00999243

- h. Install cover (152). Install bolts (151) .

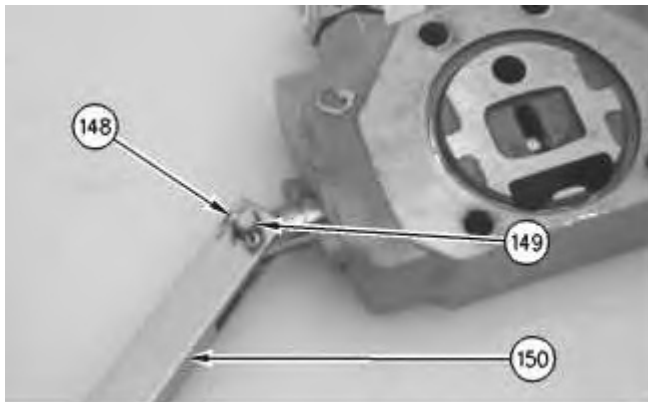


Illustration 13

g00999241

- i. Install linkage (150). Secure linkage (150) with pin (149) and cotter pin (148) .

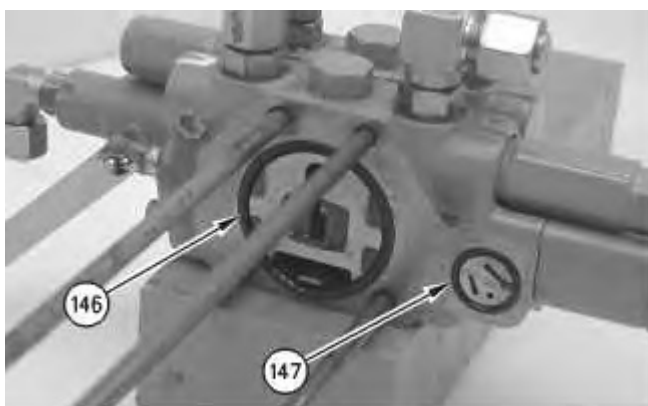


Illustration 14

g00999234

- j. Install O-ring seals (147) and (146) onto Block Assembly (L) .

k. Install Block Assembly (K) onto the threaded rods.

5. Assemble Block Assembly (J), as follows:

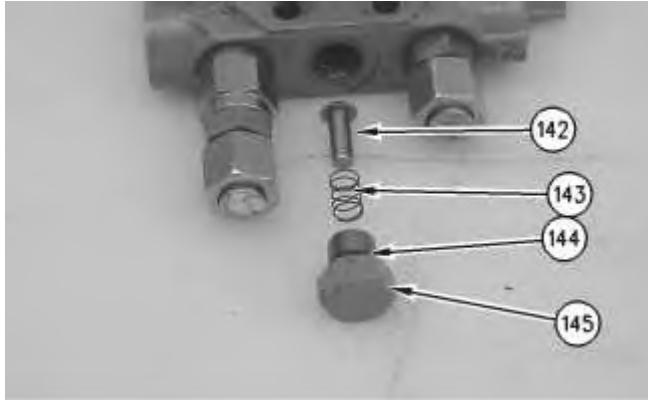


Illustration 15

g00999198



**Personal injury can result from being struck by parts propelled by a released spring force.**

**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

- a. Install spring (143) onto valve (142). Install O-ring seal (144) onto plug (145). Install plug (145) into spring (143). Install plug (145) and valve (142) into Block Assembly (J) .

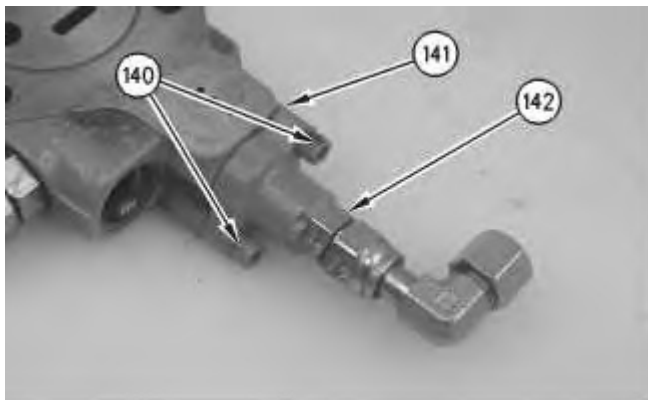


Illustration 16

g00999191

- b. Install O-ring seal (141) onto cover (142) .
- c. Install cover (142). Install allen head bolts (140) .



Illustration 17

g00999158

- d. Install spool (139) .

**Note:** Lubricate the spool with a light coating of hydraulic oil at the time of installation.

**Note:** The spool must be oriented properly.

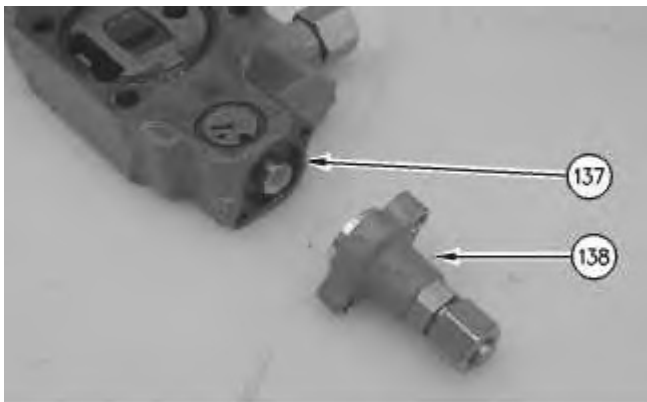


Illustration 18

g00998938

- e. Install O-ring seal (137) onto cover (138) .
  - f. Install cover (138) onto Block Assembly (J) .
-

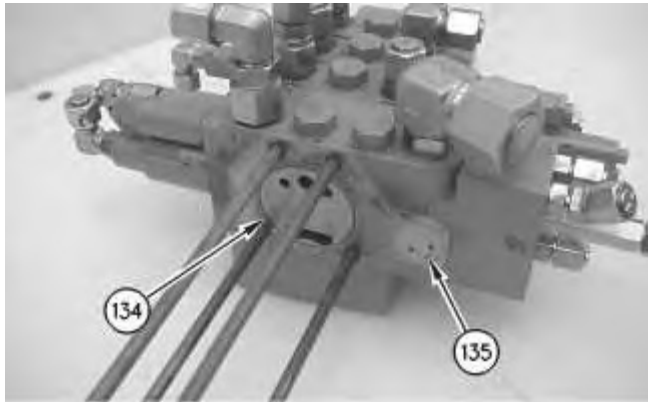


Illustration 19

g00998924

g. Install O-ring seals (135) and (134) onto Block Assembly (J) .

h. Install Block Assembly (J) onto the threaded rods.

6. Assemble Block Assembly (I), as follows:

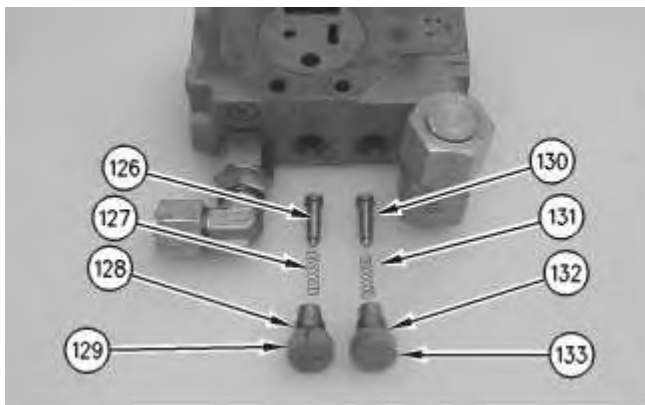


Illustration 20

g00999097



**Personal injury can result from being struck by parts propelled by a released spring force.**

**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

a. Install spring (131) onto valve (130). Install O-ring seal (132) onto plug (133). Install plug (133) into spring (131). Install plug (133) and valve (130) into Block Assembly (I) .

## **WARNING**

**Personal injury can result from being struck by parts propelled by a released spring force.**

**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

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- b. Install spring (127) onto valve (126). Install O-ring seal (128) onto plug (129). Install plug (129) into spring (127). Install plug (129) and valve (126) into block assembly (I) .

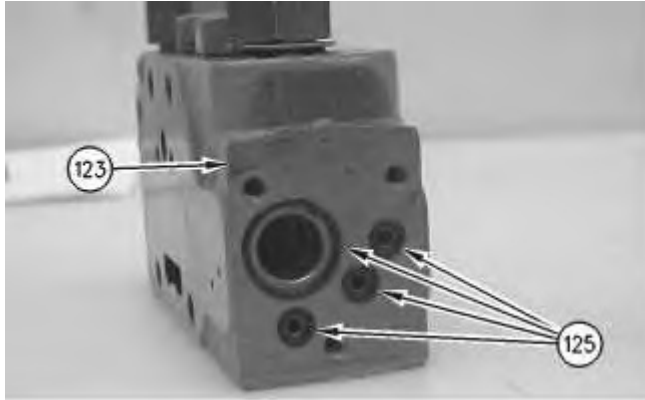


Illustration 21

g00999095

- c. Install O-ring seals (124) into block (123) .

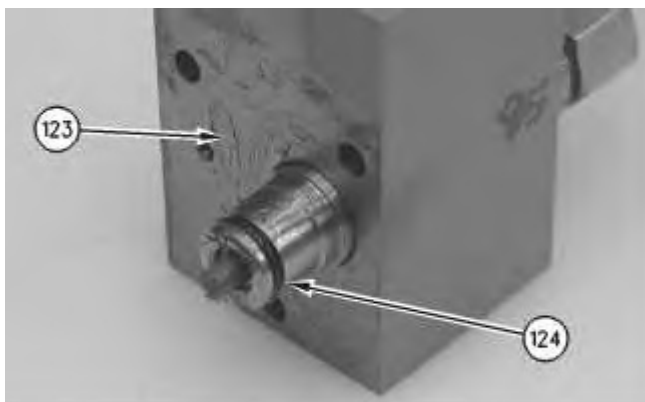


Illustration 22

g00999089

- d. Install O-ring seals (124) into block (123) .

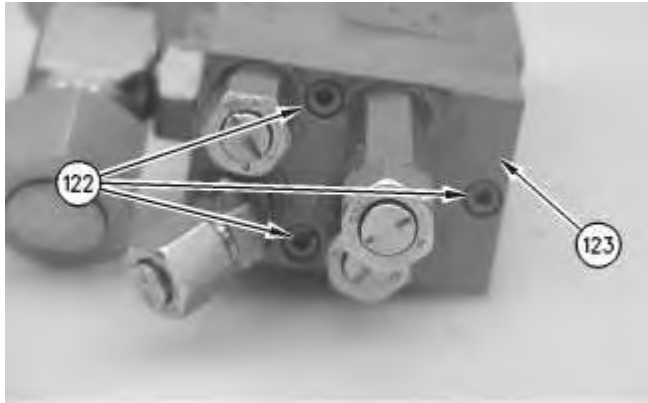


Illustration 23

g00999062

- e. Install manifold block (123) onto Block Assembly (I). Secure manifold block (123) with allen head bolts (122) .

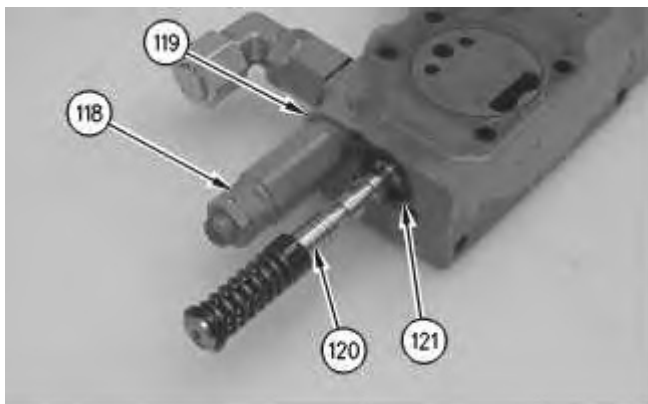


Illustration 24

g00999054

- f. Install O-ring seal (121) onto cover (116) .
- g. Install spool (120) into Block Assembly (I) .

**Note:** Lubricate the spool with a light coating of hydraulic oil at the time of installation.

**Note:** The spool must be oriented properly.

- h. Install O-ring seal (119) onto valve (118). Install valve (118) into block assembly (I). Tighten valve (118) to a torque of  $39 \pm 5 \text{ N}\cdot\text{m}$  ( $29 \pm 4 \text{ lb ft}$ ).
-

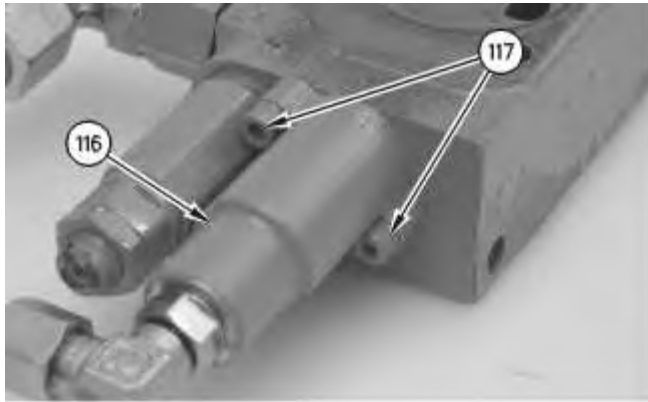


Illustration 25

g00999048

- i. Install cover (116) onto Block Assembly (J) .
- j. Secure cover (116) with bolts (117) .

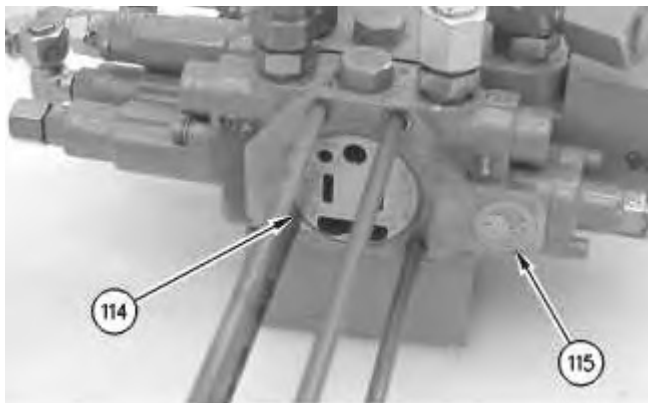
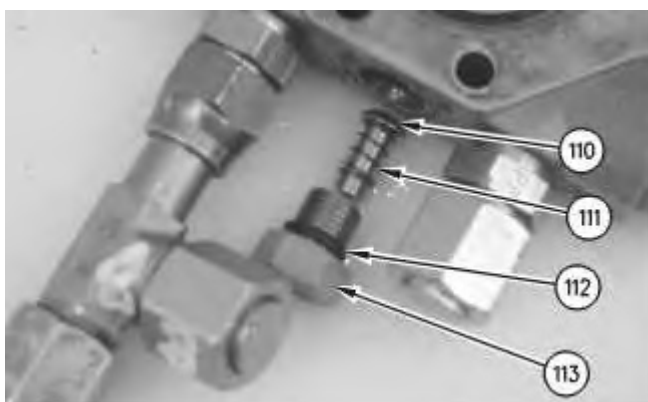


Illustration 26

g00998855

- k. Install O-ring seals (115) and (114) onto Block Assembly (I) .
- l. Install Block Assembly (I) onto the threaded rods.

7. Assemble Block Assembly (H), as follows:





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**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

- a. Install spring (111) onto valve (110). Install O-ring seal (112) onto plug (113). Install plug (113) into spring (111). Install plug (113) and valve (110) into Block Assembly (H) .

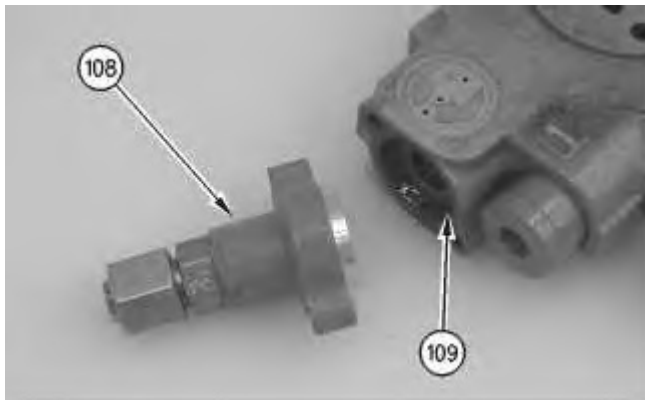
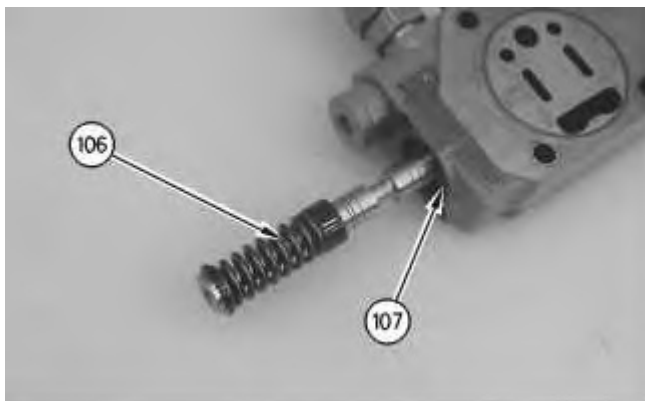


Illustration 28

- b. Install O-ring seal (109) onto cover (108). Install cover (108) into Block Assembly (H) .



- c. Install O-ring seal (107) onto cover (104) .
- d. Install spool (106) into Block Assembly (H) .

**Note:** Lubricate the spool with a light coating of hydraulic oil at the time of installation.

**Note:** The spool must be oriented properly.

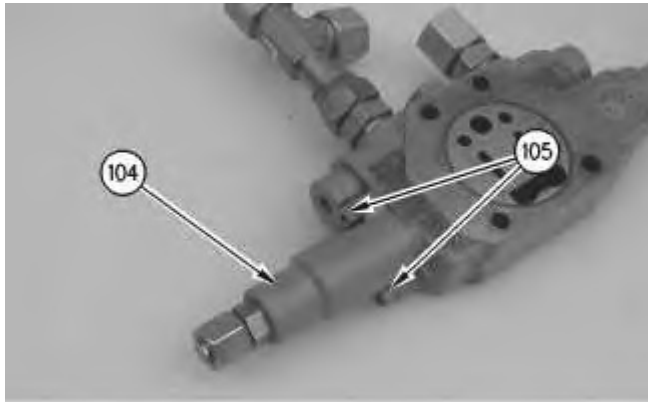


Illustration 30

g00998989

- e. Install cover (104) onto Block Assembly (H) .
- f. Secure cover (104) with bolts (105) .

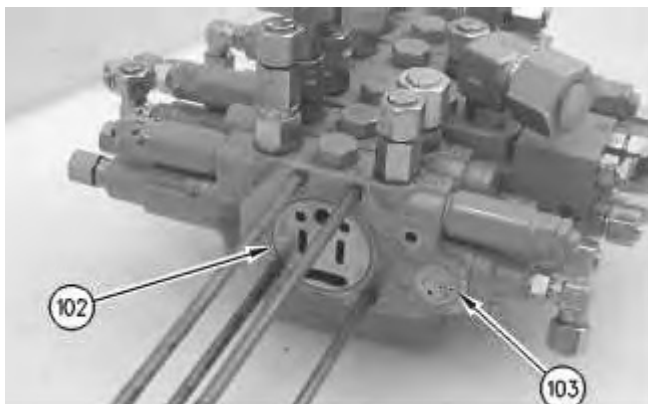


Illustration 31

g00998618

- g. Install O-ring seals (103) and (102) onto block assembly (H) .
- h. Install Block Assembly (H) onto the threaded rods.

8. Assemble Block Assembly (G), as follows:

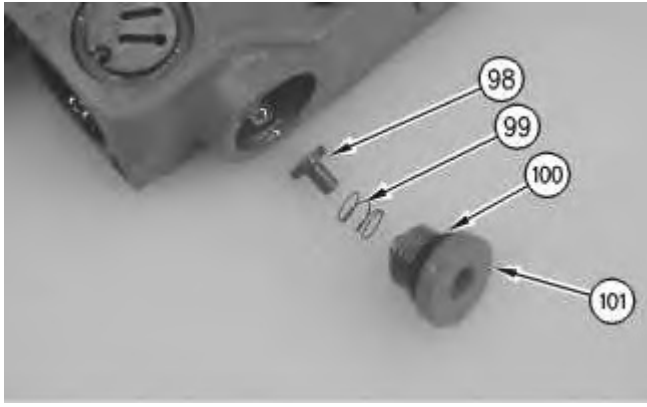


Illustration 32

g00998982

**! WARNING**

**Personal injury can result from being struck by parts propelled by a released spring force.**

**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

- a. Install spring (99) onto valve (98). Install O-ring seal (100) onto plug (101). Install plug (101) into spring (99). Install plug (101) and valve (98) into Block Assembly (G) .

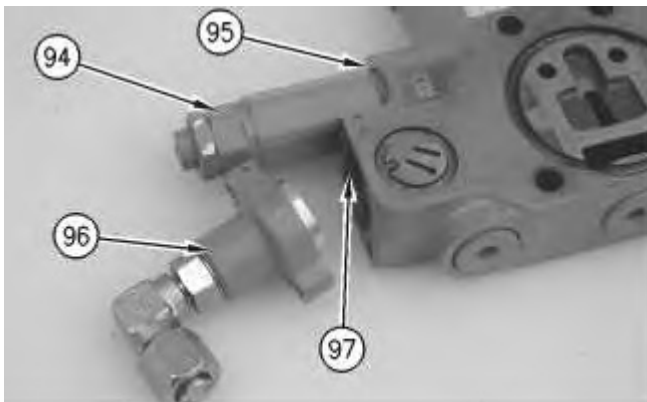


Illustration 33

g00998571

- b. Install O-ring seal (97) onto cover (96). Install cover (96) onto Block Assembly (G) .

- c. Install O-ring seal (95) onto valve (94). Install valve (94) into Block Assembly (G). Tighten valve (118) to a torque of  $39 \pm 5 \text{ N}\cdot\text{m}$  ( $29 \pm 4 \text{ lb ft}$ ).

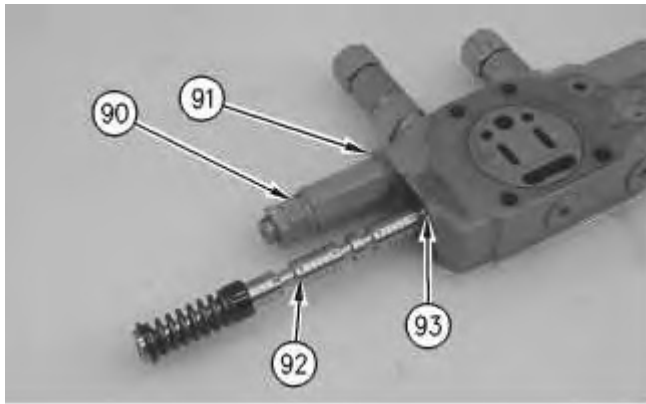


Illustration 34

g00998976

- d. Install O-ring seal (93) onto cover (88) .

- e. Install spool (92) into Block Assembly (G) .

**Note:** Lubricate the spool with a light coating of hydraulic oil at the time of installation.

**Note:** The spool must be oriented properly.

- f. Install O-ring seal (91) onto valve (90). Install valve (90) into Block Assembly (G). Tighten valve (90) to a torque of  $39 \pm 5 \text{ N}\cdot\text{m}$  ( $29 \pm 4 \text{ lb ft}$ ).

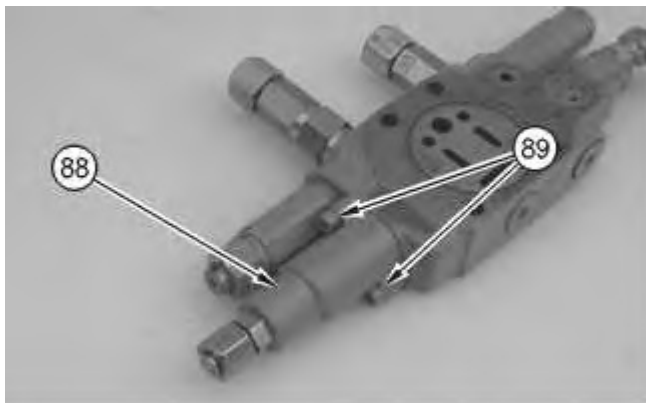


Illustration 35

g00998314

- g. Install cover (88) onto Block Assembly (G) .

- h. Secure cover (88) with two bolts (89) .
-



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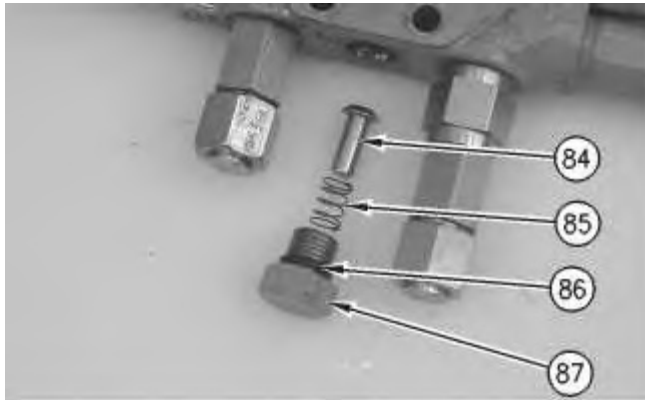


Illustration 36

g00998297



**Personal injury can result from being struck by parts propelled by a released spring force.**

**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

- i. Install spring (85) onto valve (84). Install O-ring seal (86) onto plug (87). Install plug (101) into spring (99). Install plug (87) and valve (84) into Block Assembly (G) .

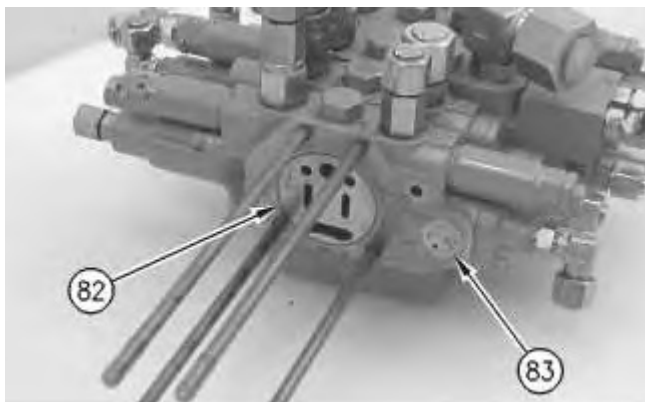


Illustration 37

g00998272

- j. Install O-ring seals (83) and (82) onto Block Assembly (G) .

- k. Install Block Assembly (G) onto the threaded rods.

9. Assemble Block Assembly (F), as follows:

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