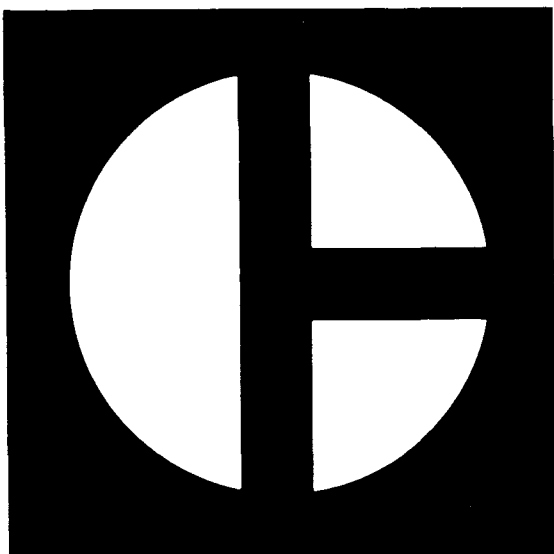




LOADER HYDRAULIC SYSTEM SPECIFICATIONS

FOR

950 WHEEL LOADER

SERIAL NUMBERS

31K

43J

73J

81J

INTRODUCTION

The specifications in this book are given on the basis of information that was current at the time the book was written. These specifications give the torques, operating pressures, measurements of new parts and other items. When the word "permissible" is used in the description, the specification value given is the "maximum or minimum" normally permitted before adjustment, repair and/or new parts are needed. Make a comparison of the measurements of a worn part with the specifications of a new part to find the amount of wear. The wear factor is not the only basis for the replacement of parts. The expected service life of the worn part is a factor. A part that is worn can be safe to use if an estimate of the remainder of its service life is good. When a disassembly is made for the purpose of reconditioning, the recommendation is the replacement of parts not completely worn out if a short service life is expected.

77200

NOTE: For Systems Operation and Testing and Adjusting, make reference to 950 LOADER HYDRAULIC SYSTEM, Form No. REG00565.

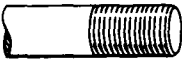
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GENERAL TIGHTENING TORQUE FOR BOLTS, NUTS AND TAPERLOCK STUDS

The following charts give the standard torque values for bolts, nuts and taperlock studs of SAE Grade 5 or better quality. Exceptions are given in the Specifications.



THREAD DIAMETER		STANDARD TORQUE	
inches	millimeters	lb. ft.	mkg
Standard thread 		Use these torques for bolts and nuts with standard threads.	
1/4	6.35	9 ± 3	1.24 ± 0.4
5/16	7.94	18 ± 5	2.5 ± 0.7
3/8	9.53	32 ± 5	4.4 ± 0.7
7/16	11.11	50 ± 10	6.9 ± 1.4
1/2	12.70	75 ± 10	10.4 ± 1.4
9/16	14.29	110 ± 15	15.2 ± 2.0
5/8	15.88	150 ± 20	20.7 ± 2.8
3/4	19.05	265 ± 35	36.6 ± 4.8
7/8	22.23	420 ± 60	58.1 ± 8.3
1	25.40	640 ± 80	88.5 ± 11.1
1 1/8	28.58	800 ± 100	110.6 ± 13.8
1 1/4	31.75	1000 ± 120	138 ± 16.6
1 3/8	34.93	1200 ± 150	166 ± 20.7
1 1/2	38.10	1500 ± 200	207 ± 27.7
		Use these torques for bolts and nuts on hydraulic valve bodies.	
5/16	7.94	13 ± 2	1.8 ± 0.3
3/8	9.53	24 ± 2	3.3 ± 0.3
7/16	11.11	39 ± 2	5.4 ± 0.3
1/2	12.70	60 ± 3	8.3 ± 0.4
5/8	15.88	118 ± 4	16.3 ± 0.5
Taperlock stud 		Use these torques for studs with Taperlock threads.	
1/4	6.35	5 ± 2	0.69 ± 0.3
5/16	7.94	10 ± 3	1.4 ± 0.4
3/8	9.53	20 ± 3	2.8 ± 0.4
7/16	11.11	30 ± 5	4.1 ± 0.7
1/2	12.70	40 ± 5	5.5 ± 0.7
9/16	14.29	60 ± 10	8.3 ± 1.4
5/8	15.88	75 ± 10	10.4 ± 1.4
3/4	19.05	110 ± 15	15.2 ± 2.0
7/8	22.23	170 ± 20	23.5 ± 2.8
1	25.40	260 ± 30	35.9 ± 4.1
1 1/8	28.58	320 ± 30	44.2 ± 4.1
1 1/4	31.75	400 ± 40	55 ± 5.5
1 3/8	34.93	480 ± 40	66 ± 5.5
1 1/2	38.10	550 ± 50	76 ± 7

T95416-5

HYDRAULIC PUMP (7J740 and 8J151)

Rotation is counterclockwise when seen from drive end.

Type of pump: Vane

For test use SAE 10W oil at 150° F (65° C)

LARGE SECTION OF PUMP (Drive end) (Implement)

Test at Full Speed:

Output	62.3 U.S. gpm (235.8 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	1870 rpm
with engine at	2000 rpm
Output	59.2 U.S. gpm (224.1 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	1870 rpm
with engine at	2000 rpm

Test at Half Speed:

Output	30.9 U.S. gpm (117.0 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	935 rpm
with engine at	1000 rpm
Output	27.8 U.S. gpm (105.2 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	935 rpm
with engine at	1000 rpm

SMALL SECTION OF PUMP (Cover end) (Steering)

Test at Full Speed:

Output	34.4 U.S. gpm (130.2 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	1870 rpm
with engine at	2000 rpm
Output	33.0 U.S. gpm (125.0 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	1870 rpm
with engine at	2000 rpm

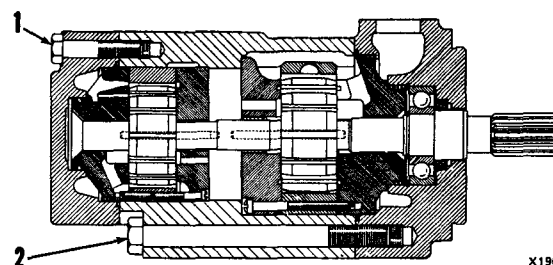
Test at Half Speed:

Output	17.1 U.S. gpm (64.7 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	935 rpm
with engine at	1000 rpm
Output	15.7 U.S. gpm (59.4 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	935 rpm
with engine at	1000 rpm

(1) Torque for bolts 70 ± 5 lb. ft. (9.7 ± 0.7 mkg)

(2) Torque for bolts 150 ± 10 lb. ft. (20.7 ± 1.4 mkg)

NOTE: See subject, PUMP TESTS (Chart B) in FLOW METER TEE TEST PROCEDURE II, FORM NO. REG00880.



NOTE: FOR TORQUE VALUES NOT GIVEN, SEE THE FIRST PAGE OF SPECIFICATIONS FOR GENERAL TIGHTENING TORQUES

HYDRAULIC PUMP (6J8880)

Rotation is counterclockwise when seen from drive end.

Type of pump: Vane

For test use SAE 10W oil at 150° F (65° C)

LARGE SECTION OF PUMP (Drive end) (Implement)

Test at Full Speed:

Output 62.5 U.S. gpm (236.6 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 2010 rpm
 with engine at 2000 rpm

Output 59.5 U.S. gpm (225.2 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 2010 rpm
 with engine at 2000 rpm

Test at Half Speed:

Output 31.1 U.S. gpm (117.7 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 1005 rpm
 with engine at 1000 rpm

Output 26.9 U.S. gpm (101.8 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 1005 rpm
 with engine at 1000 rpm

SMALL SECTION OF PUMP (Cover end) (Steering)

Test at Full Speed:

Output 34.4 U.S. gpm (130.2 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 2010 rpm
 with engine at 2000 rpm

Output 32.7 U.S. gpm (123.8 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 2010 rpm
 with engine at 2000 rpm

Test at Half Speed:

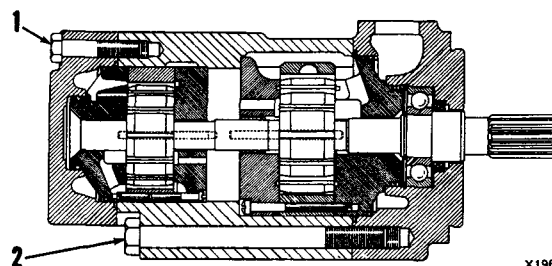
Output 17.1 U.S. gpm (64.7 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 1005 rpm
 with engine at 1000 rpm

Output 15.7 U.S. gpm (59.4 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 1005 rpm
 with engine at 1000 rpm

(1) Torque for bolts 70 ± 5 lb. ft. (9.7 ± 0.7 mkg)

(2) Torque for bolts 150 ± 10 lb. ft. (20.7 ± 1.4 mkg)

NOTE: See subject, PUMP TESTS (Chart B) in FLOW METER TEE TEST PROCEDURE II, FORM NO. REG00880.



HYDRAULIC PUMP (5J1405)

Rotation is counterclockwise when seen from drive end.

Type of pump: Vane

For test use SAE 10W oil at 150° F (65° C)

LARGE SECTION OF PUMP (Drive end) (Implement)

Test at Full Speed:

Output	59.0 U.S. gpm (223.3 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	2055 rpm
Output	56.6 U.S. gpm (214.2 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	2055 rpm
with engine at	2000 rpm

Test at Half Speed:

Output	29.2 U.S. gpm (110.5 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	1027 rpm
with engine at	1000 rpm
Output	27.0 U.S. gpm (102.2 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	1027 rpm
with engine at	1000 rpm

SMALL SECTION OF PUMP (Cover end) (Steering)

Test at Full Speed:

Output	35.3 U.S. gpm (133.6 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	2055 rpm
with engine at	2000 rpm
Output	33.7 U.S. gpm (127.6 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	2055 rpm
with engine at	2000 rpm

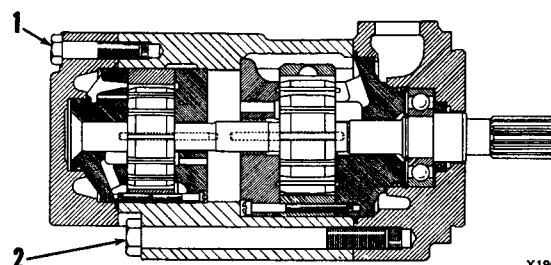
Test at Half Speed:

Output	17.6 U.S. gpm (66.6 lit/min)
at a pressure of	100 psi (7.0 kg/cm ²)
with pump at	1027 rpm
with engine at	1000 rpm
Output	16.2 U.S. gpm (61.3 lit/min)
at a pressure of	1000 psi (70.3 kg/cm ²)
with pump at	1027 rpm
with engine at	1000 rpm

(1) Torque for bolts 70 ± 5 lb. ft. (9.7 ± 0.7 mkg)

(2) Torque for bolts 150 ± 10 lb. ft. (20.7 ± 1.4 mkg)

NOTE: See subject, PUMP TESTS (Chart B) in FLOW METER TEE TEST PROCEDURE II, FORM NO. REG00880.



HYDRAULIC PUMP**(7J604)**

Rotation is counterclockwise when seen from drive end.

Type of pump: Vane

For test use SAE 10W oil at 150° F (65° C)

LARGE SECTION OF PUMP (Drive end) (Implement)**Test at Full Speed:**

Output 52.6 U.S. gpm (199.1 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 1826 rpm
 with engine at 2000 rpm

Output 50.4 U.S. gpm (190.8 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 1826 rpm
 with engine at 2000 rpm

Test at Half Speed:

Output 26.0 U.S. gpm (98.4 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 913 rpm
 with engine at 1000 rpm

Output 24.2 U.S. gpm (91.6 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 913 rpm
 with engine at 1000 rpm

SMALL SECTION OF PUMP (Cover end) (Steering)**Test at Full Speed:**

Output 31.4 U.S. gpm (118.8 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 1826 rpm
 with engine at 2000 rpm

Output 30.1 U.S. gpm (113.9 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 1826 rpm
 with engine at 2000 rpm

Test at Half Speed:

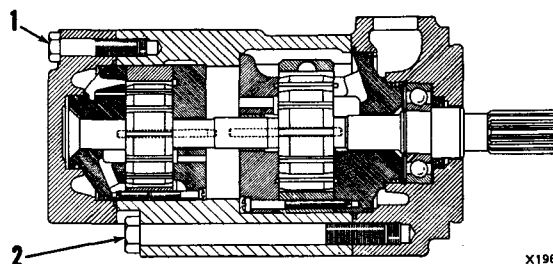
Output 15.6 U.S. gpm (59.0 lit/min)
 at a pressure of 100 psi (7.0 kg/cm²)
 with pump at 913 rpm
 with engine at 1000 rpm

Output 14.5 U.S. gpm (54.9 lit/min)
 at a pressure of 1000 psi (70.3 kg/cm²)
 with pump at 913 rpm
 with engine at 1000 rpm

(1) Torque for bolts 70 ± 5 lb. ft. (9.7 ± 0.7 mkg)

(2) Torque for bolts 150 ± 10 lb. ft. (20.7 ± 1.4 mkg)

NOTE: See subject, PUMP TESTS (Chart B) in FLOW METER TEE TEST PROCEDURE II, FORM NO. REG00880.



CONTROL VALVE FOR LIFT AND TILT (7J3974)

(1) 4J7066 Spring for make-up valves of tilt circuit:

Length under test force 2.03 in. (51.6 mm)
 Test force 3.9 ± .3 lb. (1.8 ± 0.1 kg)
 Free length after test 3.00 in. (76.2 mm)
 Outside diameter 1.12 in. (28.4 mm)

(1) 1J8960 Spring for make-up valves of tilt circuit
 (early machines):

Length under test force 2.66 in. (67.6 mm)
 Test force 2.78 ± .22 lb. (1.26 ± 0.10 kg)
 Free length after test 3.25 in. (82.6 mm)
 Outside diameter 1.12 in. (28.4 mm)

(2) 4J3555 Spring for tilt valve spool:

Length under test force 2.00 in. (50.8 mm)
 Test force 29.8 ± 1.5 lb. (13.5 ± 0.7 kg)
 Free length after test 4.71 in. (119.6 mm)
 Outside diameter 2.13 in. (54.1 mm)

(3) Torque for bolts to install valve body of tilt make-up
 valves to control valve body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)

(4) 2J5845 Spring for check valves of lift and tilt circuits:

Length under test force 2.50 in. (63.5 mm)
 Test force 6.75 ± .54 lb. (3.06 ± 0.24 kg)
 Free length after test 4.19 in. (106.4 mm)
 Outside diameter 1.12 in. (28.4 mm)

(5) 4J8149 Spring for lift valve spool (outer):

Length under test force 2.16 in. (54.9 mm)
 Test force 16 ± 1 lb. (7.2 ± 0.4 kg)
 Free length after test 3.45 in. (87.6 mm)
 Outside diameter 2.38 in. (60.5 mm)

(6) 8F1560 Spring for lift valve spool (inner):

Length under test force 2.38 in. (60.5 mm)
 Test force 30.4 ± 2.4 lb. (13.8 ± 0.9 kg)
 Free length after test 3.88 in. (98.5 mm)
 Outside diameter 1.81 in. (46.0 mm)

(7) Torque for plug in valve

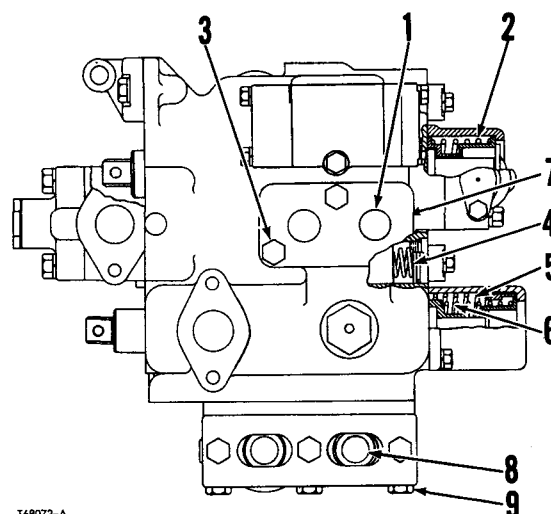
body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)

(8) 4J7066 Spring for make-up valves of lift circuit:

Length under test force 2.03 in. (51.6 mm)
 Test force 3.9 ± .3 lb. (1.8 ± 0.1 kg)
 Free length after test 3.00 in. (76.2 mm)
 Outside diameter 1.12 in. (28.4 mm)

(8) 1J8960 Spring for make-up valves of lift
 circuit (early machines):

Length under test force 2.66 in. (67.6 mm)
 Test force 2.78 ± .22 lb. (1.26 ± 0.10 kg)
 Free length after test 3.25 in. (82.6 mm)
 Outside diameter 1.12 in. (28.4 mm)



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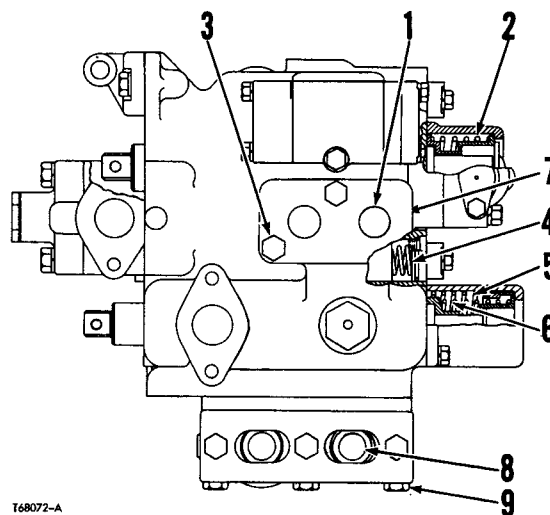
**NOTE: FOR TORQUE VALUES NOT GIVEN, SEE THE FIRST
PAGE OF SPECIFICATIONS FOR GENERAL TIGHTENING TORQUES**

Control Valve For Lift And Tilt (Cont.)

- (9) Torque for bolts to install valve body of lift make-up valves to control valve body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- Torque for lines and cover bolts to control valve 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- Torque for bolts to install control valve to tank 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)

CONTROL VALVE FOR LIFT AND TILT (EARLY MACHINES) (4J8125)

- (1) 9F1993 Spring for make-up valves of tilt circuit:
 Length under test force 1.44 in. (36.6 mm)
 Test force 1.24 to 1.46 lb. (0.56 to 0.66 kg)
 Free length after test 1.88 in. (47.7 mm)
 Outside diameter97 in. (24.6 mm)
- (2) 4J3555 Spring for tilt valve spool:
 Length under test force 2.00 in. (50.8 mm)
 Test force 29.8 ± 1.5 lb. (13.5 ± 0.7 kg)
 Free length after test 4.71 in. (119.6 mm)
 Outside diameter 2.13 in. (54.1 mm)
- (3) Torque for bolts to install valve body of tilt make-up valves to control valve body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (4) 2J5845 Spring for check valves of lift and tilt circuits:
 Length under test force 2.50 in. (63.5 mm)
 Test force $6.75 \pm .54$ lb. (3.06 ± 0.24 kg)
 Free length after test 4.19 in. (106.4 mm)
 Outside diameter 1.12 in. (28.4 mm)
- (5) 4J8149 Spring for lift valve spool (outer):
 Length under test force 2.16 in. (54.9 mm)
 Test force 16 ± 1 lb. (7.2 ± 0.4 kg)
 Free length after test 3.45 in. (87.6 mm)
 Outside diameter 2.38 in. (60.5 mm)
- (6) 8F1560 Spring for lift valve spool (inner):
 Length under test force 2.38 in. (60.5 mm)
 Test force 30.4 ± 2.4 lb. (13.8 ± 0.9 kg)
 Free length after test 3.88 in. (98.5 mm)
 Outside diameter 1.81 in. (46.0 mm)
- (7) Torque for plug in valve body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (8) 1J8960 Spring for make-up valves of lift circuit:
 Length under test force 2.66 in. (67.6 mm)
 Test force $2.78 \pm .22$ lb. (1.26 ± 0.10 kg)
 Free length after test 3.25 in. (82.6 mm)
 Outside diameter 1.12 in. (28.4 mm)

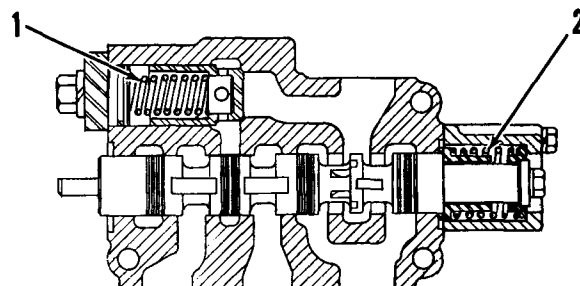


Control Valve For Lift And Tilt (Cont.)

- (9) Torque for bolts to install valve body of lift make-up valves to control body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- Torque for lines and cover bolts to control valve 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- Torque for bolts to install control valve to tank 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)

AUXILIARY CONTROL VALVE

(4J8126 and 6J4692)

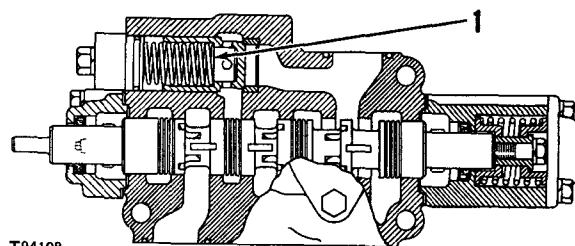


X1281-A

- (1) 2J5845 Spring for check valve:
- Length under test force 2.50 in. (63.5 mm)
- Test force $6.75 \pm .54$ lb. (3.06 ± 0.24 kg)
- Free length after test 4.19 in. (106.4 mm)
- Outside diameter 1.12 in. (28.4 mm)
- (2) 4J3840 Spring for auxiliary valve spool:
- Length under test force 1.73 in. (43.9 mm)
- Test force 28.5 to 31.5 lb. (12.9 to 14.3 kg)
- Free length after test 3.21 in. (81.5 mm)
- Outside diameter 1.81 in. (46.0 mm)

AUXILIARY CONTROL VALVE

(4J487)



T94108

- (1) 2J5845 Spring for check valve:
- Length under test force 2.50 in. (63.5 mm)
- Test force $6.75 \pm .54$ lb. (3.06 ± 0.24 kg)
- Free length after test 4.19 in. (106.4 mm)
- Outside diameter 1.12 in. (28.4 mm)

NOTE: FOR TORQUE VALUES NOT GIVEN, SEE THE FIRST PAGE OF SPECIFICATIONS FOR GENERAL TIGHTENING TORQUES

RELIEF VALVE FOR MAIN PRESSURE**(7J3975)**Pressure to open relief valve 2200 ± 25 psi (154.7 ± 1.8 kg/cm²)

(1) Thickness of 2J2866 Shim005 in. (0.13 mm)

One shim will change pressure 35 psi (2.5 kg/cm²)

(2) 2J6089 Spring for pilot valve:

Length under test force 1.43 in. (36.3 mm)

Test force 64.2 to 71.0 lb. (29.1 to 32.2 kg)

Free length after test 1.74 in. (44.2 mm)

Outside diameter49 in. (12.4 mm)

(3) 5J4664 Spring for dump valve:

Length under test force 1.14 in. (29.0 mm)

Test force 8.6 ± .9 lb. (3.9 ± 0.4 kg)

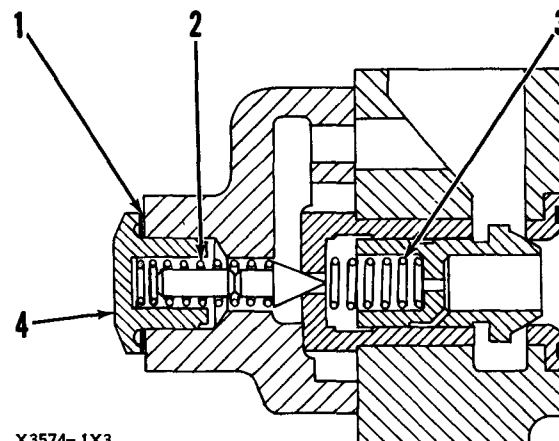
Free length after test 1.43 in. (36.3 mm)

Outside diameter50 in. (12.7 mm)

(4) Torque for plug 80 ± 5 lb. ft. (11.1 ± 0.7 mkg)

Torque for bolts to install relief valve on control valve

body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)



X3574-1X3

RELIEF VALVE FOR MAIN PRESSURE**(EARLY MACHINES)****(4J8131)**Pressure to open relief valve 2000 ± 25 psi (140.6 ± 1.8 kg/cm²)

(1) Thickness of 2J2866 Shim005 in. (0.13 mm)

One shim will change pressure 40 psi (2.8 kg/cm²)

(2) 4J7115 Spring for pilot valve:

Length under test force 1.34 in. (34.0 mm)

Test force 50.1 to 58.8 lb. (22.7 to 26.7 kg)

Free length after test 1.69 in. (42.9 mm)

Outside diameter47 in. (11.9 mm)

(3) 2J6088 Spring for dump valve:

Length under test force 1.53 in. (38.9 mm)

Test force 20.95 to 23.15 lb. (9.5 to 10.5 kg)

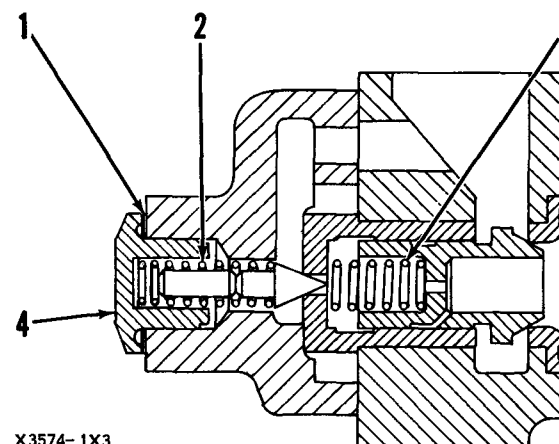
Free length after test 2.34 in. (59.4 mm)

Outside diameter81 in. (20.6 mm)

(4) Torque for plug 80 ± 5 lb. ft. (11.1 ± 0.7 mkg)

Torque for bolts to install relief valve on control

valve body 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)



X3574-1X3

RELIEF VALVE FOR AUXILIARY CONTROL VALVE (6J8272)

Pressure to open relief valve 1800 ± 25 psi (126.5 ± 1.8 kg/cm²)

(1) Thickness of 3H2549 Shim010 in. (0.25 mm)

One shim will change pressure 51 psi (3.6 kg/cm²)

(2) 4F7115 Spring for pilot valve:

Length under test force 1.34 in. (34.0 mm)

Test force 50.1 to 58.8 lb. (22.7 to 26.7 kg)

Free length after test 1.69 in. (42.9 mm)

Outside diameter47 in. (11.9 mm)

(3) 5J4664 Spring for dump valve:

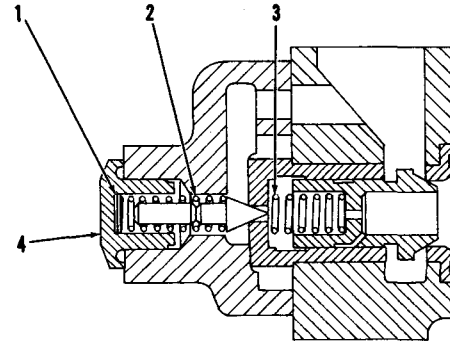
Length under test force 1.14 in. (29.0 mm)

Test force 8.6 ± .9 lb. (3.9 ± 0.4 kg)

Free length after test 1.43 in. (36.3 mm)

Outside diameter50 in. (12.7 mm)

(4) Torque for plug 80 ± 5 lb. ft. (11.1 ± 0.7 mkg)



X3574-A

RELIEF VALVES FOR TILT CIRCUIT (7J4878 and 7J3972)

Pressure to open relief valve 2500 ± 25 psi (175.8 ± 1.8 kg/cm²)

(1) Torque for bolts 27 ± 2 lb. ft. (3.7 ± 0.3 mkg)

(2) Torque for bolts 27 ± 2 lb. ft. (3.7 ± 0.3 mkg)

(3) 3J8880 Spring (outer):

Length under test force 2.42 in. (61.5 mm)

Test force 70.2 ± 3.5 lb. (31.6 ± 1.6 kg)

Free length after test 2.98 in. (75.7 mm)

Outside diameter66 in. (16.8 mm)

(4) 3J8879 Spring (inner):

Length under test force 2.61 in. (66.3 mm)

Test force 31.7 ± 1.6 lb. (14.4 ± 0.7 kg)

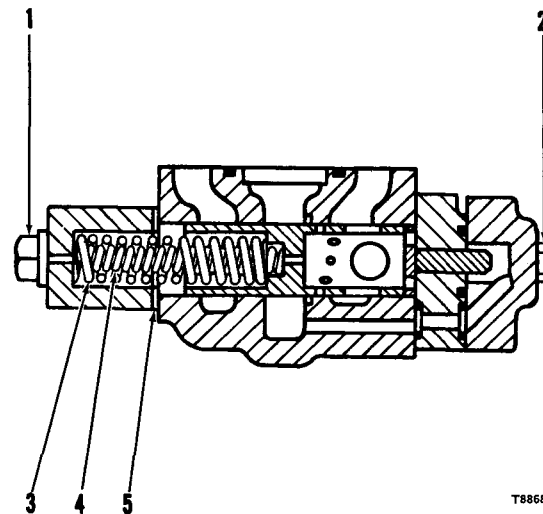
Free length after test 3.02 in. (76.7 mm)

Outside diameter38 in. (9.6 mm)

(5) Thickness of 2J8200 Shim010 in. (0.25 mm)

One shim will change pressure 42 psi (2.9 kg/cm²)

Torque for bolts to install relief valve on control
valve body 39 ± 2 lb. ft. (5.4 ± 0.3 mkg)



T88687

**NOTE: FOR TORQUE VALUES NOT GIVEN, SEE THE FIRST
PAGE OF SPECIFICATIONS FOR GENERAL TIGHTENING TORQUES**

RELIEF VALVE FOR TILT CIRCUIT (EARLY MACHINES) (4J8675)

Pressure to open relief valve 2200 ± 25 psi (154.7 ± 1.8 kg/cm²)

(1) Torque for bolts 27 ± 2 lb. ft. (3.7 ± 0.3 mkg)

(2) Torque for bolts 27 ± 2 lb. ft. (3.7 ± 0.3 mkg)

(3) 3J8880 Spring (outer):

Length under test force 2.42 in. (61.5 mm)

Test force 70.2 ± 3.5 lb. (31.6 ± 1.6 kg)

Free length after test 2.98 in. (75.7 mm)

Outside diameter66 in. (16.8 mm)

(4) 3J8879 Spring (inner):

Length under test force 2.61 in. (66.3 mm)

Test force 31.7 ± 1.6 lb. (14.4 ± 0.7 kg)

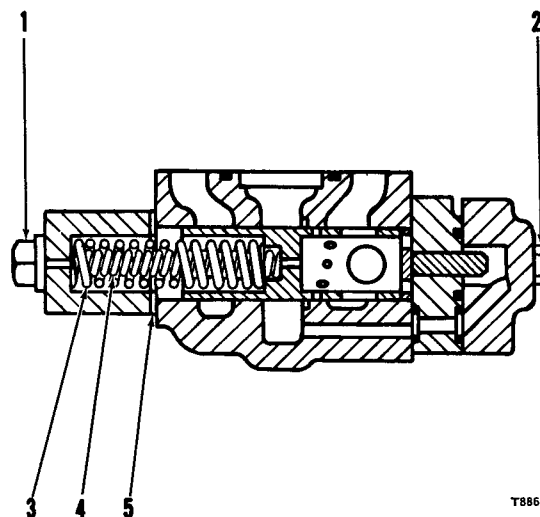
Free length after test 3.02 in. (76.7 mm)

Outside diameter38 in. (9.6 mm)

(5) Thickness of 2J8200 Shim010 in. (0.25 mm)

One shim will change pressure 35 psi (2.5 kg/cm²)

Torque for bolts to install relief valve on control valve body 39 ± 2 lb. ft. (5.4 ± 0.3 mkg)



T88687

HYDRAULIC TANK

(1) Torque for plugs for slave cylinders 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)

(2) Torque for bolts in cover (5J892 Tank and Valve Group only) 21 ± 2 lb. ft. (2.9 ± 0.3 mkg)

(3) Torque for bolts in cover 47 ± 2 lb. ft. (6.5 ± 0.3 mkg)

(4) Torque for nuts on roller 15 ± 2 lb. ft. (2.0 ± 0.3 mkg)

(5) Distance from cam surface to top of roller in TILT BACK position24 in. (6.1 mm)

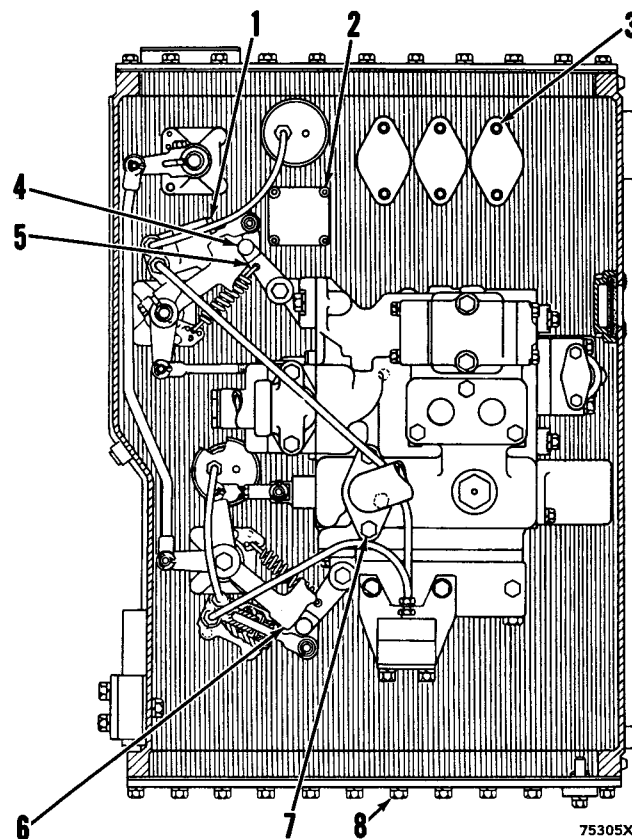
(6) Distance from cam surface to top of roller in RAISE position29 in. (7.3 mm)

(7) Torque for bolts (two) 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)

(8) Torque for bolts in top and bottom cover 43 ± 5 lb. ft. (5.9 ± 0.7 mkg)

Torque for fittings of lines from slave cylinders to make-up valves and tank bosses (eight places) 25 ± 2 lb. ft. (3.5 ± 0.3 mkg)

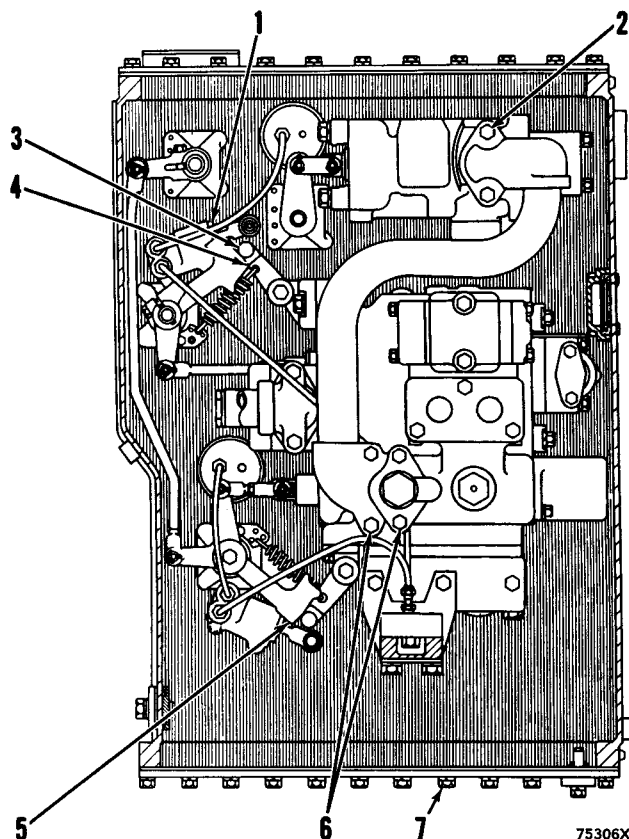
Push tubes to bottom of fittings and tighten nut 2 2/3 turns beyond finger tight.



75305X1

HYDRAULIC TANK WITH AUXILIARY VALVE

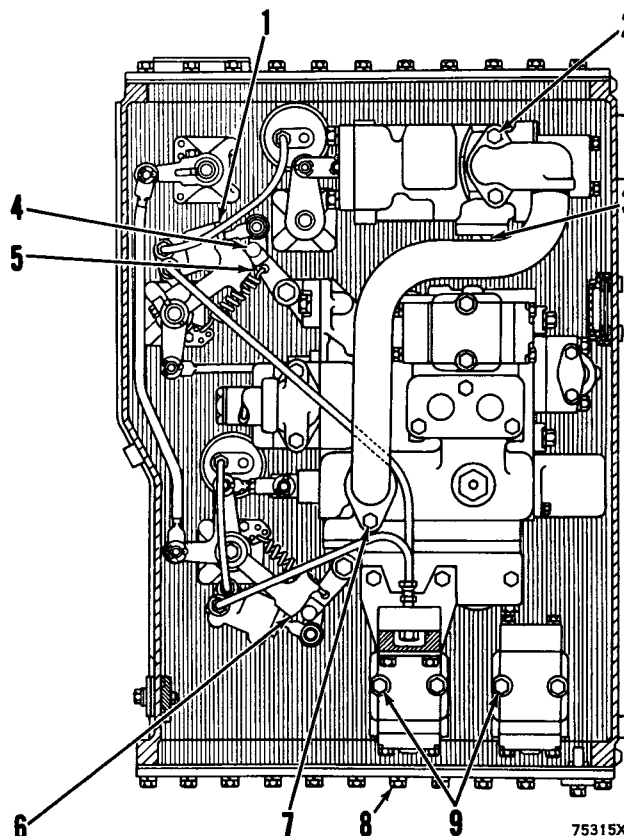
- (1) Torque for plugs for slave cylinders 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (2) Torque for bolts (two) 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- Torque for bolts (two) in elbow to filter 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (3) Torque for nuts on roller 15 ± 2 lb. ft. (2.0 ± 0.3 mkg)
- (4) Distance from cam surface to top of roller in TILT BACK position24 in. (6.1 mm)
- (5) Distance from cam surface to top of roller in RAISE position29 in. (7.3 mm)
- (6) Torque for bolts (four) 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (7) Torque for bolts in top and bottom cover 43 ± 5 lb. ft. (5.9 ± 0.7 mkg)
- Torque for fittings of lines from slave cylinders to make-up valves and tank bosses (eight places) 25 ± 2 lb. ft. (3.5 ± 0.3 mkg)
- Push tubes to bottom of fittings and tighten nut $2 \frac{2}{3}$ turns beyond finger tight.



75306X1

HYDRAULIC TANK WITH AUXILIARY VALVE AND AUXILIARY CYLINDER RELIEF VALVES

- (1) Torque for plugs for slave cylinders 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (2) Torque for bolts (two) 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (3) Torque for bolts (two) 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (4) Torque for nuts on roller 15 ± 2 lb. ft. (2.0 ± 0.3 mkg)
- (5) Distance from cam surface to top of roller in TILT BACK position24 in. (6.1 mm)
- (6) Distance from cam surface to top of roller in RAISE position29 in. (7.3 mm)
- (7) Torque for bolts (two) 60 ± 2 lb. ft. (8.3 ± 0.3 mkg)
- (8) Torque for bolts in top and bottom cover 43 ± 5 lb. ft. (5.9 ± 0.7 mkg)
- (9) Torque for bolts (four) 39 ± 2 lb. ft. (5.4 ± 0.3 mkg)
- Torque for fittings of lines from slave cylinders to make-up valves and tank bosses (eight places) 25 ± 2 lb. ft. (3.5 ± 0.3 mkg)
- Push tubes to bottom of fittings and tighten nut $2 \frac{2}{3}$ turns beyond finger tight.



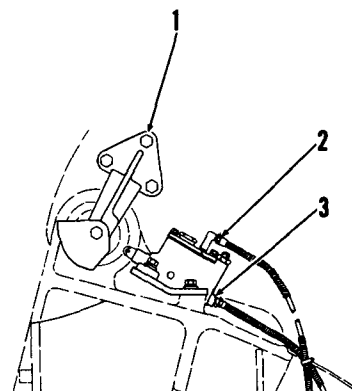
75315X1

NOTE: FOR TORQUE VALUES NOT GIVEN, SEE THE FIRST PAGE OF SPECIFICATIONS FOR GENERAL TIGHTENING TORQUES

LIFT KICKOUT

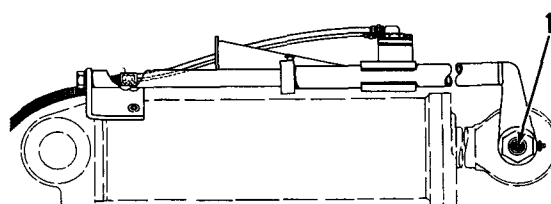
- (1) Torque for bolts 40 ± 5 lb. ft. (5.5 ± 0.7 mkg)
- (2) Push tubes to bottom of fittings and tighten nuts 3/4 turn beyond finger tight.
- (3) Torque for fitting to side of master cylinder for lift kickout 30 ± 5 lb. ft. (4.1 ± 0.7 mkg)

T99489

**BUCKET POSITIONER**

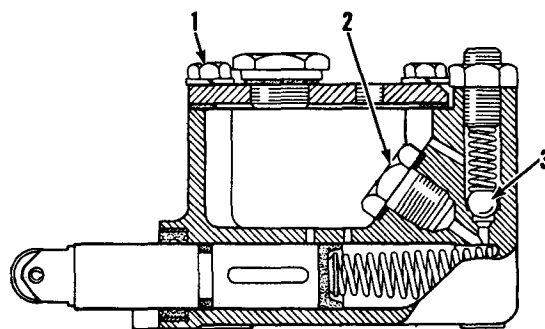
- (1) Torque for bolt 240 ± 30 lb. ft. (33.2 ± 4.1 mkg)
- Torque for fitting on tank 25 ± 3 lb. ft. (3.5 ± 0.4 mkg)
- Torque for fitting to side of master cylinder for bucket positioner 70 lb. in. (80.7 cm.kg)
- Push tubes to bottom of fittings and tighten nuts 3/4 turn beyond finger tight.

T99490

**MASTER CYLINDERS
(5K2783 and 5K2446)**

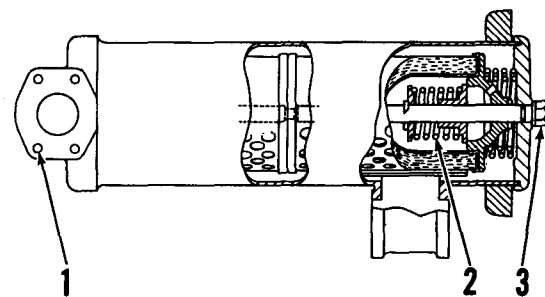
- Maximum stroke72 in. (18.3 mm)
- (1) Torque for bolts in cover 10 ± 2 lb. ft. (1.4 ± 0.3 mkg)
- (2) Opening pressure of check valve $.6 \pm .5$ psi (0.04 ± 0.03 kg/cm²)
- (3) Opening pressure of relief valve 225 ± 25 psi (15.8 ± 1.8 kg/cm²)

T99652

**FILTER
(6J1443)**

- (1) Torque for bolts 43 ± 5 lb. ft. (5.9 ± 0.7 mkg)
- (2) 5J2926 Spring for bypass valve.
Length under test force 2.98 in. (75.7 mm)
Test force 60.6 ± 4.3 lb. (27.5 ± 1.9 kg)
Free length after test 3.52 in. (89.4 mm)
Outside diameter 1.42 in. (36.0 mm)
- (3) Torque for bolt 43 ± 4 lb. ft. (5.9 ± 0.6 mkg)

T67869-A



CYLINDERS

5J1468 Lift Cylinder

- (1) Torque for nut with lubricant on threads 2000 ± 200 lb. ft. (276.6 ± 27.7 mkg)
- (2) Bore in new head $2.503 \pm .001$ in. (63.58 ± 0.02 mm)
Diameter of new rod $2.4980 \pm .0015$ in. (63.45 ± 0.38 mm)
- (3) Bore in new cylinder ... $5.4995 \pm .0015$ in. (139.69 ± 0.38 mm)

8K6135 Lift Cylinder

- (1) Torque for nut with lubricant on threads 2000 ± 200 lb. ft. (276.6 ± 27.7 mkg)
- (2) Bore in new head $2.503 \pm .001$ in. (63.58 ± 0.02 mm)
Diameter of new rod $2.4980 \pm .0015$ in. (63.45 ± 0.38 mm)
- (3) Bore in new cylinder $5.500; +.005$ to $-.002$ in.
($139.70; +0.13$ to -0.05 mm)

5J1314 and 6J1430 Tilt Cylinders

- (1) Torque for nut with lubricant on threads 2000 ± 200 lb. ft. (276.6 ± 27.7 mkg)
- (2) Bore in new head $2.503 \pm .001$ in. (63.58 ± 0.02 mm)
Diameter of new rod $2.4980 \pm .0015$ in. (63.45 ± 0.38 mm)
- (3) Bore in new cylinder ... $5.4995 \pm .0015$ in. (139.69 ± 0.38 mm)

7K9435 and 7K9436 Tilt Cylinders

- (1) Torque for nut with lubricant on threads 2000 ± 200 lb. ft. (276.6 ± 27.7 mkg)
- (2) Bore in new head $2.503 \pm .001$ in. (63.58 ± 0.02 mm)
Diameter of new rod $2.4980 \pm .0015$ in. (63.45 ± 0.38 mm)
- (3) Bore in new cylinder $5.500; +.005$ to $-.002$ in.
($139.70; +0.13$ to 0.05 mm)

3K6553, 3K6554 and 9K3161 Multi-Purpose Bucket Cylinders

- (1) Torque for nut with lubricant on threads 1200 ± 120 lb. ft. (166.0 ± 16.6 mkg)
- (2) Bore in new head $2.003 \pm .001$ in. (50.88 ± 0.02 mm)
Diameter of new rod $1.9980 \pm .0015$ in. (50.75 ± 0.38 mm)
- (3) Bore in new cylinder $5.000; +.005$ to $-.002$ in.
($127.00; +0.13$ to -0.05 mm)

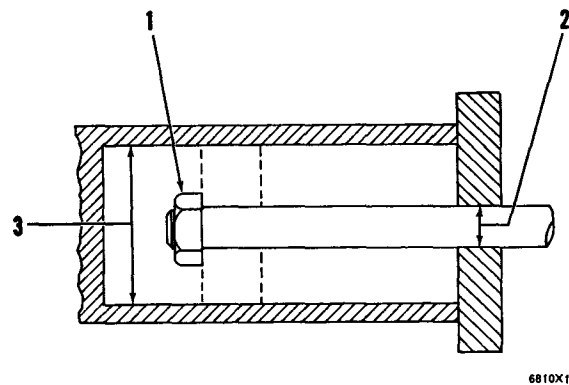
2K6841 Lumber Fork Cylinder

- (1) Torque for nut with lubricant on threads 1200 ± 120 lb. ft. (166.0 ± 16.6 mkg)
- (2) Bore in new head $2.003 \pm .001$ in. (50.88 ± 0.02 mm)
Diameter of new rod ... $1.9985 \pm .0005$ in. (50.76 ± 0.012 mm)
- (3) Bore in new cylinder $4.000; +.005$ to $-.002$ in.
($101.6; +0.13$ to -0.05 mm)

4K501, 4K502, 9K3159 and 9K3160 Log Fork Cylinders

- (1) Torque for nut with lubricant on threads 1200 ± 120 lb. ft. (166.0 ± 16.6 mkg)
- (2) Bore in new head $2.003 \pm .001$ in. (50.88 ± 0.02 mm)
Diameter of new rod $1.9980 \pm .0015$ in. (50.75 ± 0.38 mm)
- (3) Bore in new cylinder (4K501 and 4K502) $4.500; +.005$ to $-.002$ in.
($114.30; +0.13$ to -0.05 mm)

Bore in new cylinder (9K3159 and 9K3160) $5.500; +.005$ to $-.002$ in.
($139.70; +0.13$ to -0.05 mm)



6810X1

NOTE: FOR TORQUE VALUES NOT GIVEN, SEE THE FIRST PAGE OF SPECIFICATIONS FOR GENERAL TIGHTENING TORQUES

Cylinders (Cont.)**5J156 Ripper-Scarifier Cylinder**

- (1) Torque for nut with lubricant on
threads 2000 ± 200 lb. ft. (276.6 ± 27.7 mkg)
 - (2) Bore in new head $2.498 \pm .001$ in. (63.45 ± 0.02 mm)
Diameter of new rod $2.4915 \pm .0015$ in. (63.28 ± 0.38 mm)
 - (3) Bore in new cylinder $5.500; +.005$ in. to $-.002$ in.
($139.70; +0.13$ to -0.05 mm)
-



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