SECTION AND GROUP CONTENTS

WORKSHOP MANUAL

Floating Seal Precautions

1. In general, replace the floating seal with a new one after disassembling.
   If the floating seal is to be reused, follow these procedures:

   (1) Keep seal rings together as a matched set with seal ring faces together. Insert a piece of cardboard to protect surfaces. Apply oil to the sliding surface (C) on seal ring (A).

   (2) Check the slide surface (C) on seal ring (A) for scuffing, scoring, corrosion, deformation or uneven wear.

   (3) Check O-ring (B) for tears, breaks, deformation or hardening.

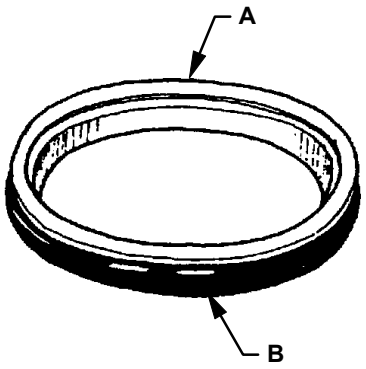
2. If incorrectly assembled, oil leakage or damage will occur. Be sure to do the following, to prevent trouble.

   (1) Clean the floating seal and seal mounting bores with cleaning solvent.
   Use a wire brush to remove mud, rust or dirt.
   After cleaning, thoroughly dry parts with compressed air.

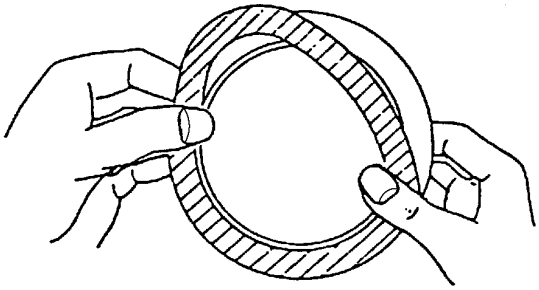
   (2) Clean the floating seal and seal mounting bores. Check the bore surface for scuffing or scoring by touching the surface.

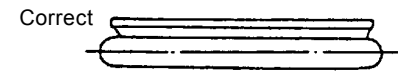
   (3) Check that the O-ring is not twisted, and that it is installed correctly on the seal ring.

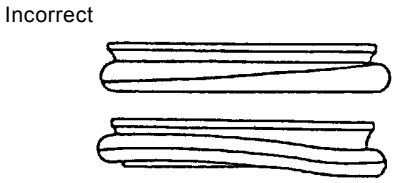
   (4) After installing the floating seal, check that seal ring surface (C) is parallel with seal mating face (D) by measuring the distances (C) and (D) at point (a) and (b), as illustrated. If these distances differ, correct the O-ring seating.



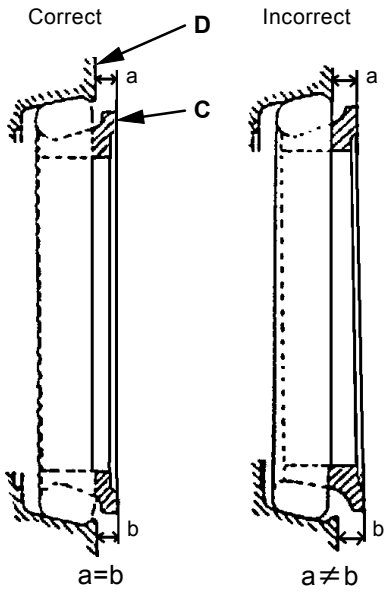
W105-03-05-019





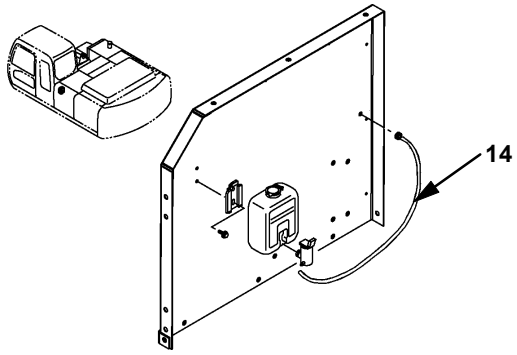


W105-03-05-020



W110-03-05-004

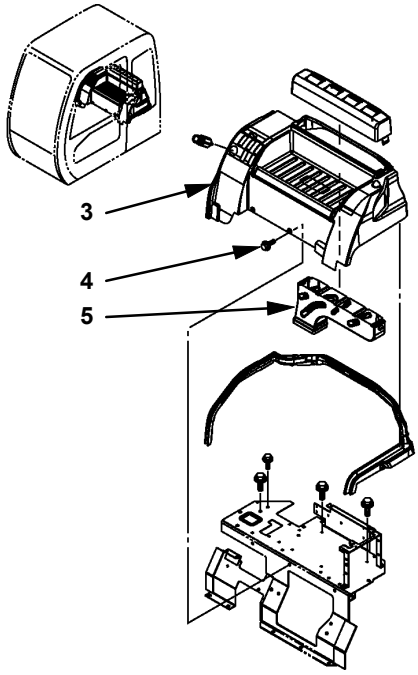
5. Connect washer vinyl hose (14) at the rear of the cab inside.



W178-02-01-015

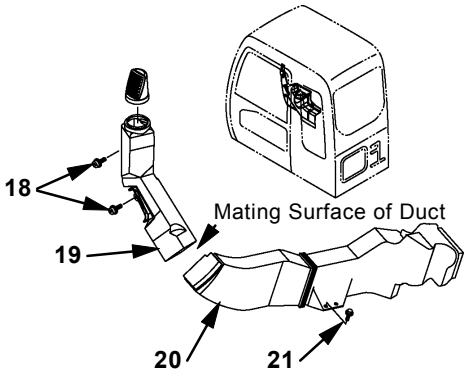
6. Aligning the mounting hole for duct (5). While pressing duct downward, install it.

7. Install rear box (3) with bolts (4).
   : 17 mm
   : 50 N·m (5.1 kgf·m, 37 lbf·ft)



W178-02-01-012

8. Install duct (20) with bolts (21). Install duct (19) into duct (20) and fix them with bolt (18).
   : 17 mm
   : 50 N·m (5.1 kgf·m, 37 lbf·ft)



W178-02-01-017

MAINTENANCE STANDARD

Pump Device

Unit : mm (in)

	Standard	Allowable Limit	Remedy
Gear backlash	0.48 (0.019)	1.5 (0.059)	Replace

Main Pump

1. Drive disc: Spline tooth thickness

Unit : mm (in)

Standard	Allowable Limit
4.9 (0.193)	3.5 (0.138)

2. Drive disc: Oil seal outer diameter

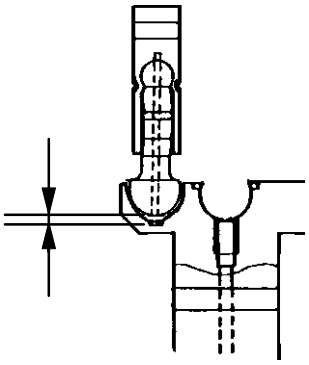
Unit : mm (in)

Standard	Allowable Limit
60.0 (2.362)	59.8 (2.354)

3. Spherical joint: The clearance between plunger and drive disc

Unit : mm (in)

Standard	Allowable Limit
0.060 (0.0024)	0.4 (0.0016)

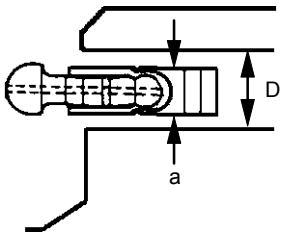


W157-02-04-016

4. Cylinder block: Clearance between plunger outer diameter and cylinder block bore

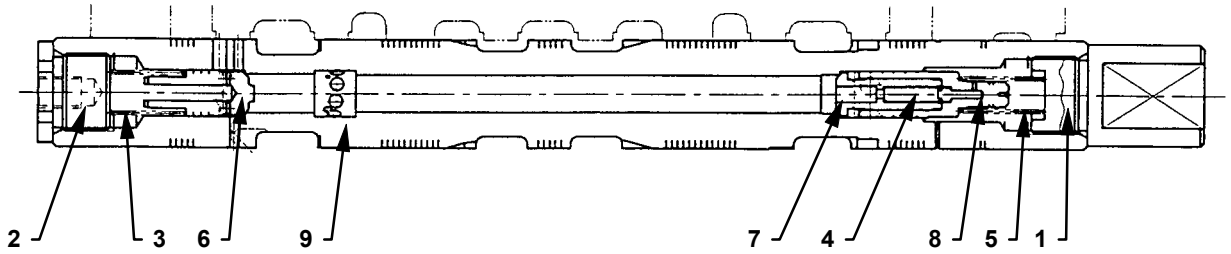
D-a Unit : mm (in)

Standard	Allowable Limit
0.044 (0.0017)	0.08 (0.0031)



W157-02-04-017

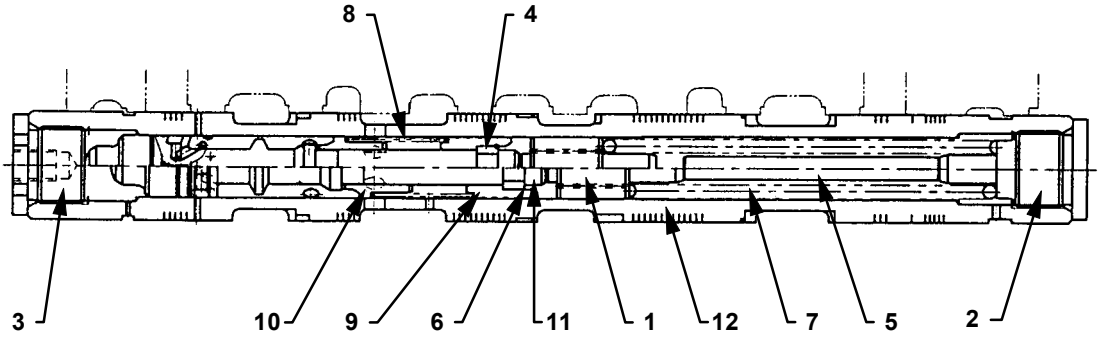
Boom 1 Spool Assembly



W173-02-05-015

ITEM	PART NAME	QTY
1	Plug 2	1
2	Plug 1	1
3	Spring B3	1
4	Spring B2	1
5	Spring B1	1
6	Plunger 3	1
7	Plunger 2	1
8	Plunger 1	1
9	Spool	1

Arm 2 Spool Assembly



W173-02-05-016

ITEM	PART NAME	QTY
1	Spring Seat (1)	1
2	Plug	1
3	Plug	1
4	Stopper (2)	1
5	Stopper (1)	1
6	C-Ring	1
7	Spring A2	1
8	Spring A1	1
9	Sleeve (1)	1
10	Sleeve (2)	1
11	Sub Spool	1
12	Spool	1

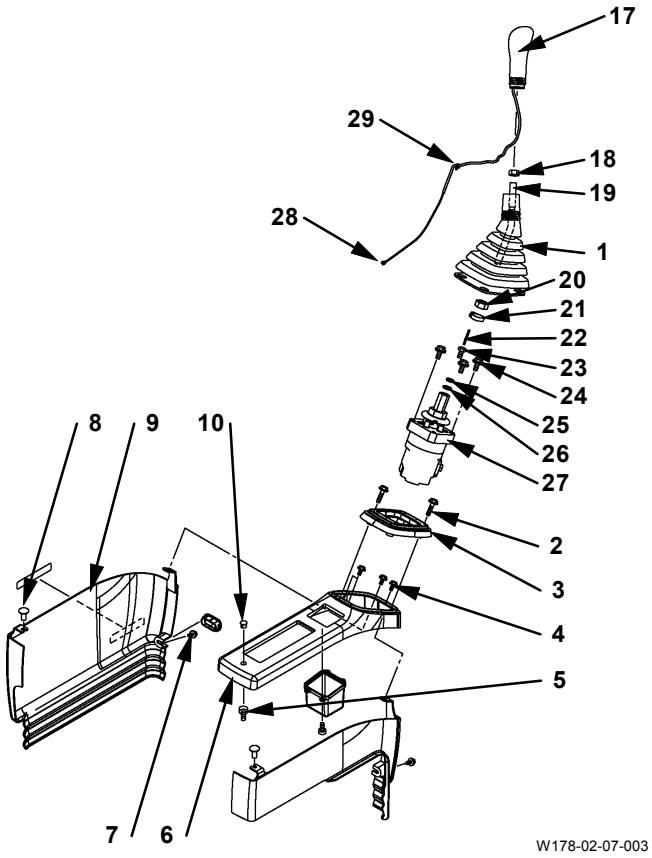
IMPORTANT: If the harness is arranged to the inside of spring pin (21), it may make contact with the moving part of the pilot valve which may damage the harness. Be sure to arrange harness to the outside of spring pin (21).

3. Temporarily tighten nut (20) to lever (19), then install washers (25) and (26). Install lever (19) onto pilot valve (27) with nut (20). Install boot (1).
   Temporarily tighten nut (18) to lever (19), then secure grip (17) with nut (18).
   Pass the harness of grip (17) through the upper hole of boot (1), then connect it to lever (19) via grips (29). Arrange the harness to the outside of spring pin (22) over bolt (23) head. Connect connector (28).
   : 13 mm
   : 10 N·m (1.0 kgf·m, 7.2 lbf·ft)
   : 22 mm
   : 26 N·m (2.0 kgf·m, 14 lbf·ft)
   : 19 mm
   : 26 N·m (2.0 kgf·m, 14 lbf·ft)

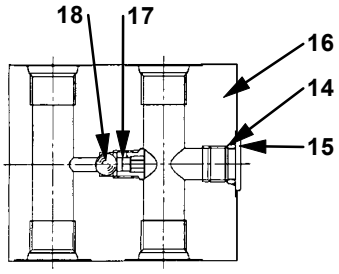
4. Connect the connector of the radio and install cover (6) with screws (4) (4 used) and (5), install cap (10).
   Install cover (9) with screws (7), (8).

5. Install boot (1) and cover (3) with screw (2) (4 used).

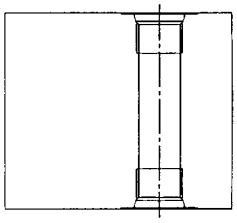
IMPORTANT: After installation, check the oil level. Start the engine and check for oil leaks.



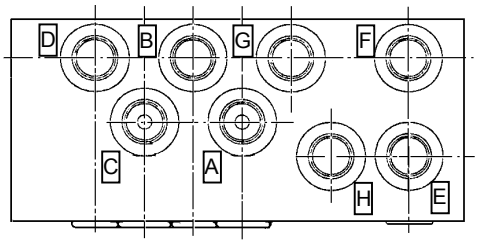
DISASSEMBLE AND ASSEMBLE SHOCKLESS VALVE

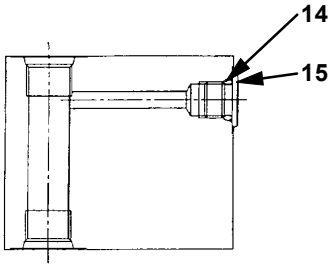


Section S

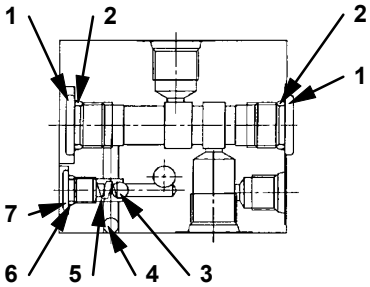


Section T

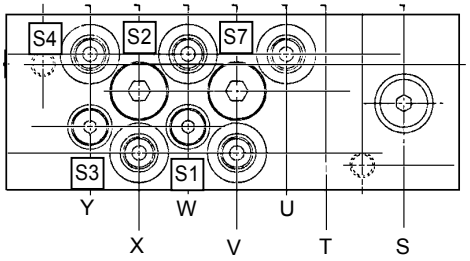


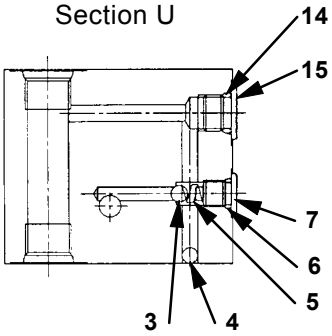


Section U

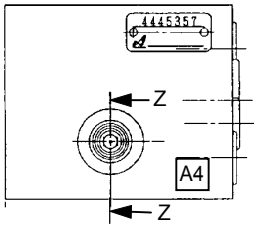


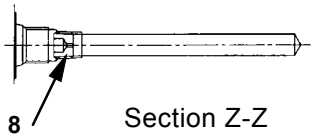
Section V



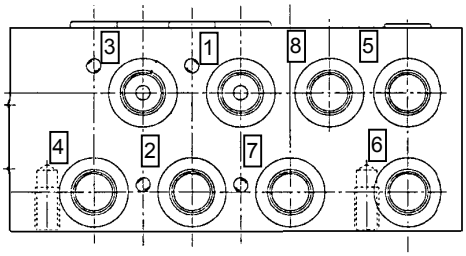


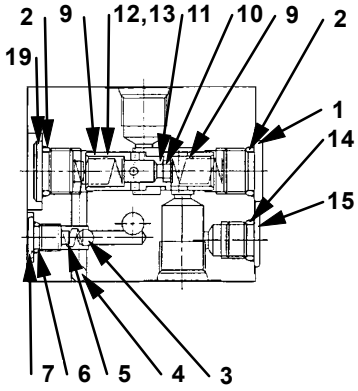
Section W



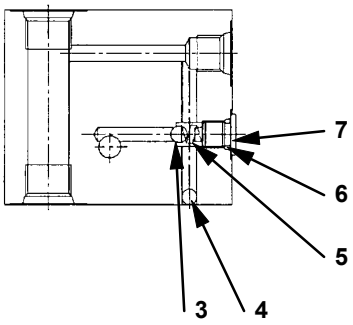


Section Z-Z



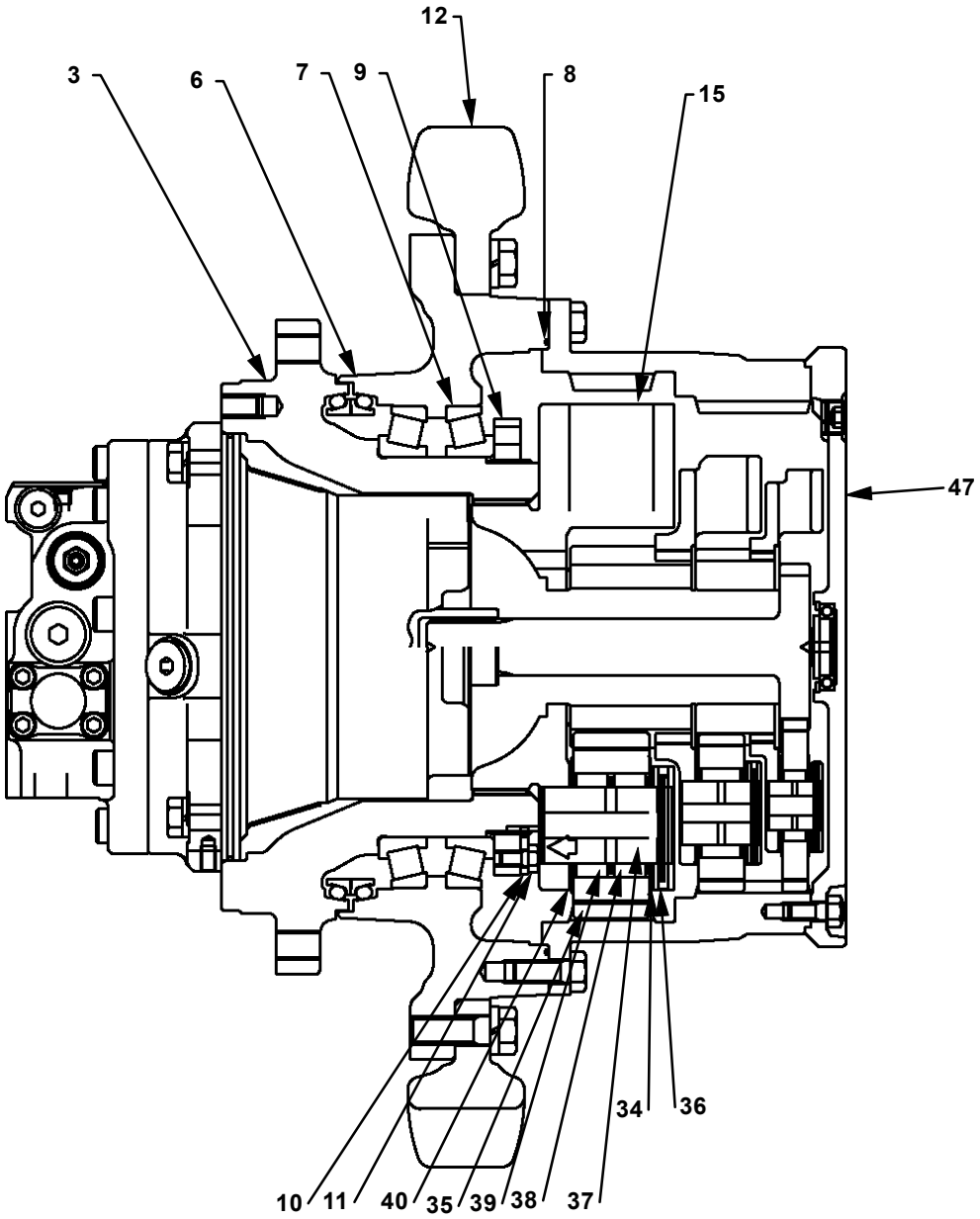


Section X



Section Y

WIHH-02-09-001


12
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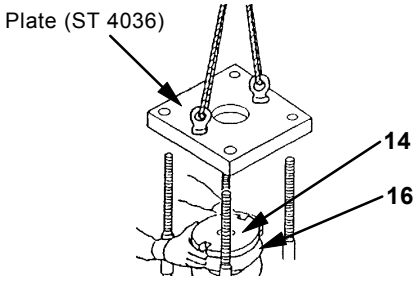
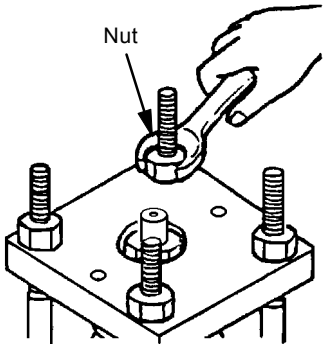
T16J-03-05-001

11. Install washer (14) on spring (16) after removing the eye bolt.
    Install the plate (ST 4036).



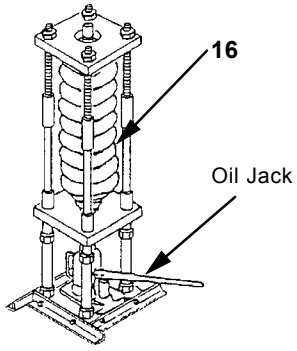
W105-03-04-016

12. Tighten the nuts to secure the spring assembly.
    : 46 mm



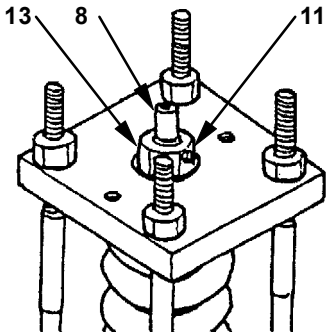
W105-03-04-012

13. Operate the oil jack to compress spring (16) to specification.
    Compressed Length: 557 mm (1 ft 9.9 in)



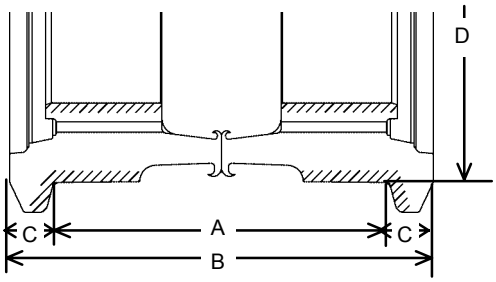
W105-03-04-026

14. Install nut (13) and plug (11) to rod (8).
    : 85 mm
    : 5 mm
    : 14.5 N·m (1.5 kgf·m, 11 lbf·ft)



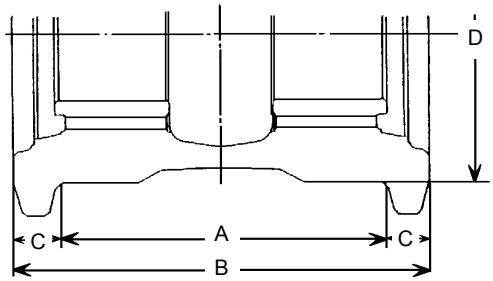
W105-03-04-014

Lower Roller



ZAXIS330, 330LC, 350H, 350LCH

W1HH-03-06-002



ZAXIS370MTH

W157-03-06-003

Unit: mm (in)

	ZAXIS330, 330LC, 350H, 350LCH		ZAXIS 370MTH		Remedy
	Standard	Allowable Limit	Standard	Allowable Limit	
A	203(7.99)	[229.5 (9.06)]	214 (8.43)	[249 (9.80)]	Cladding by welding and finish or replace
B	256 (10.08)	–	284 (11.18)	–	
C	26.5 (1.04)	[13.25 (0.52)]	35 (1.38)	[17.5 (0.69)]	
D	175 (6.89)	[157 (6.18)]	200 (7.87)	182 (7.17)	

Axle and Bushing

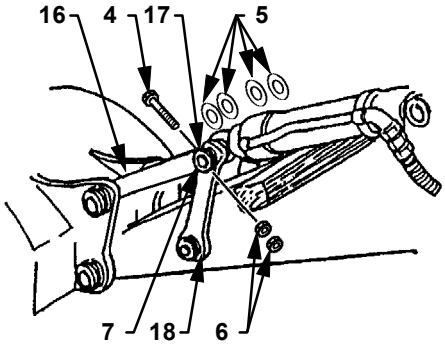
Unit: mm (in)

		ZAXIS330, 330LC, 350H, 350LCH		ZAXIS 370MTH		Remedy
		Standard	Allowable Limit	Standard	Allowable Limit	
Axle	Outside Dia.	75 (2.95)	[74.2 (2.92)]	85 (3.35)	[84.2 (3.31)]	Replace
Bushing	Inside Dia.	75 (2.95)	[76 (2.99)]	85 (3.35)	[86.0 (3.39)]	
	Flange Thickness	2 (0.079)	[1.2 (0.047)]	6 (0.24)	[5.2 (0.20)]	

NOTE: Values in [ ] are just for reference.

CAUTION: Prevent personal injury. Metal fragments may fly off when a hammer is used. Be sure to wear necessary protection, such as goggles, hard hats, etc.

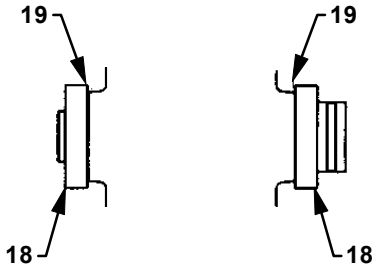
5. Start the engine and operate the bucket lever to align the cylinder rod side pin hole with those of links (16), (18). Insert thrust plate (5) and pin (7).



W158-04-02-006

6. Insert stopper pin (4) into stopper (17) and pin (7), to install nuts (6) (2 used).
   : 32 mm
   : 550 N·m (56.0 kgf·m, 405 lbf·ft)

IMPORTANT: In case link (18) has been removed from the arm, never forget to reinsert thrust plate (19).

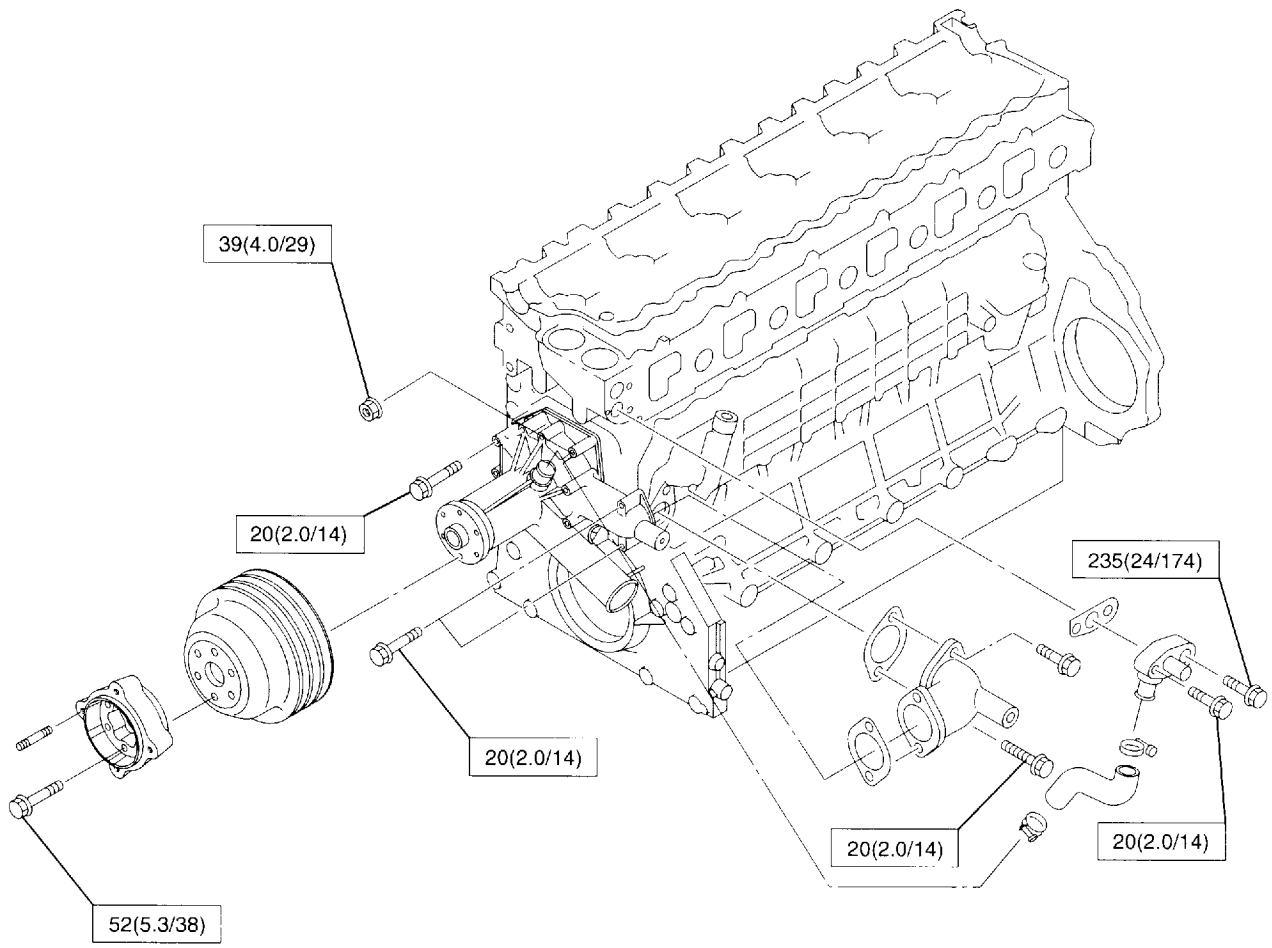


W157-04-01-015

IMPORTANT: After all work is completed, run bucket cylinder for several times to stroke end to bleed air from the circuit.

Water Pump

N·m (kgf·m/lb ft)



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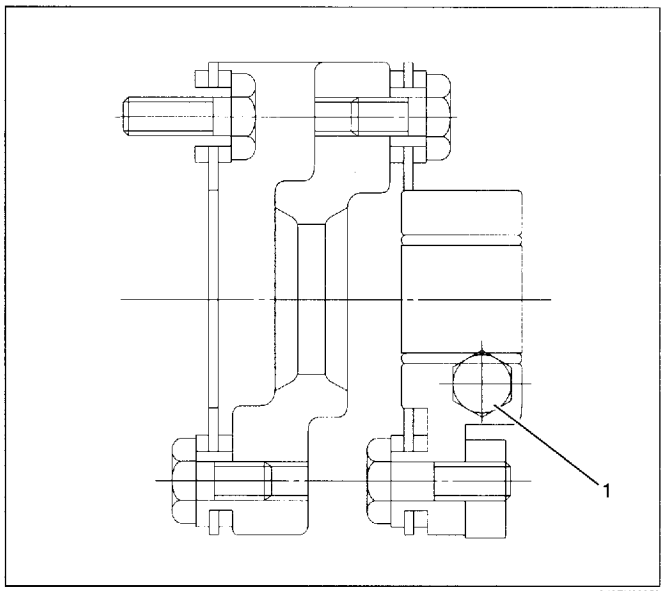
Bearing Case

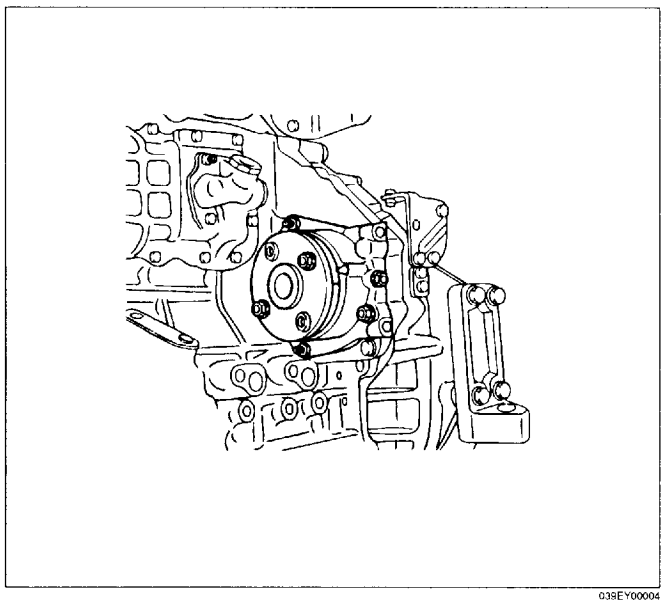
Removal

1. Remove the injection pump .
   Refer to "Injection Pump Removal" in this manual.
2. Remove the coupling.
   - Loosen the bolt (1).



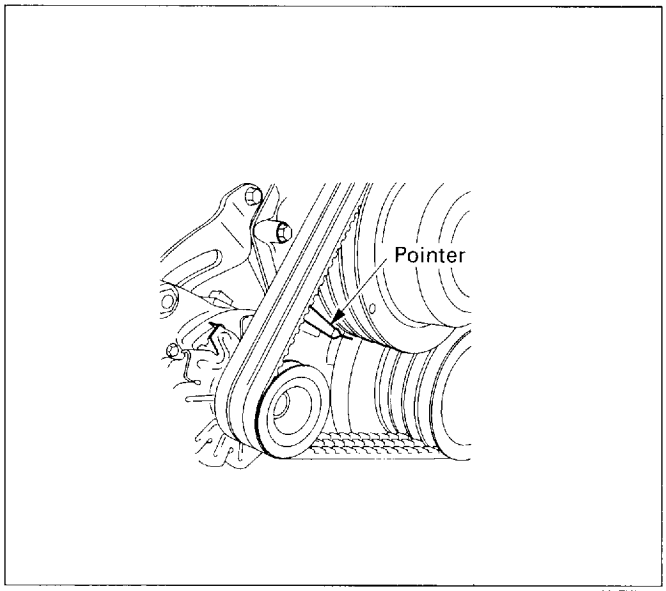
040EY00059

3. Remove the oil feed pipe from the bearing case.
4. Remove the bearing case.


039EY00004

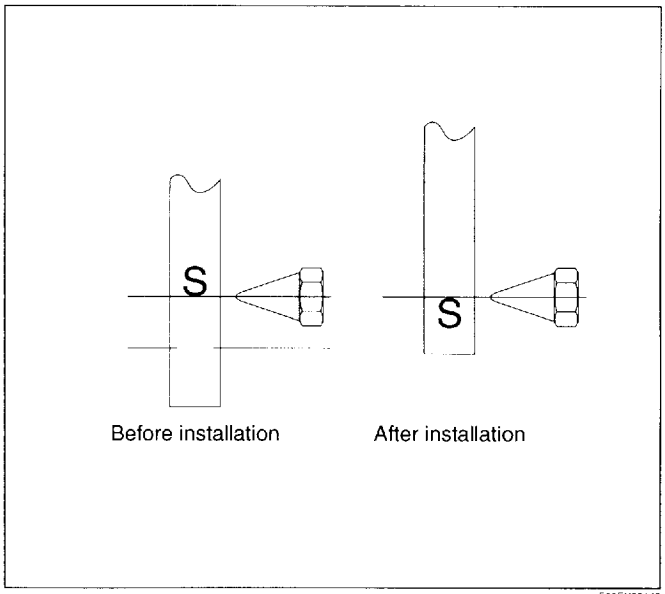
Installation

1. Bring No. 1 piston to top dead center on the compression stroke.



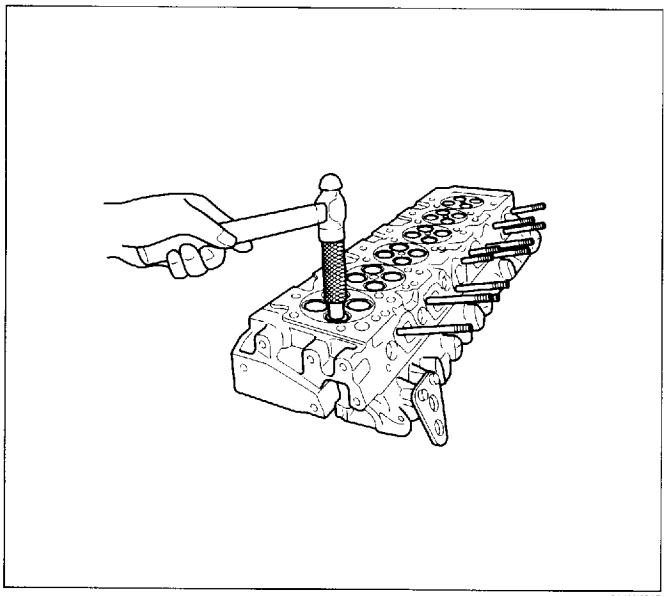
020EY00005

2. Install the bearing case with new gasket to the cylinder block.
   - Apply Three Bond No. 1208 or equivalent to the gasket.
     This will hold the gasket in place during installation.
   - Install the gasket to the bearing case groove.
   - Install the coupling to the bearing case shaft.
   - Align the S mark on the coupling with the pointer as shown in the illustration.
   - Install the bearing case to the cylinder block.
   - Confirm S mark position after installation.

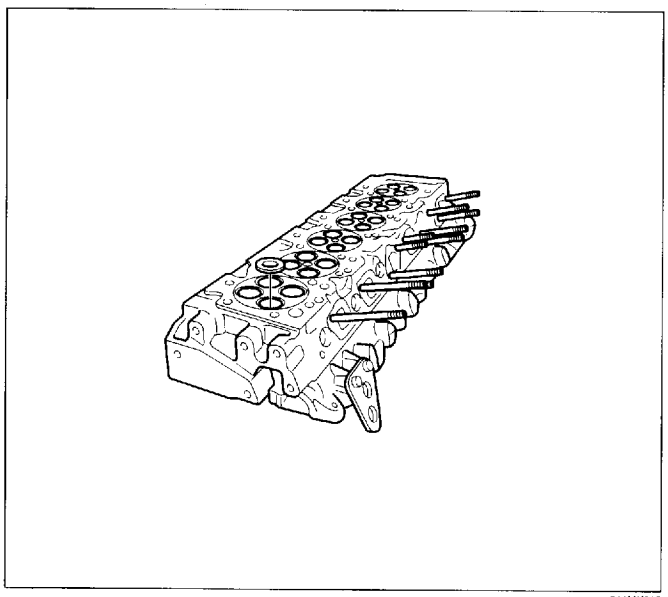


F06EY00146

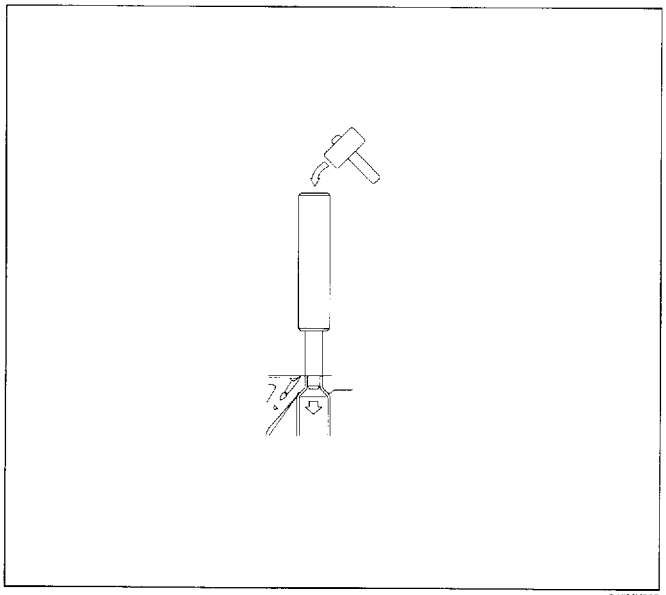
11. Remove the valve guide.
    - Use the valve guide remover 5-8840-2628-0 to remove the valve guide.



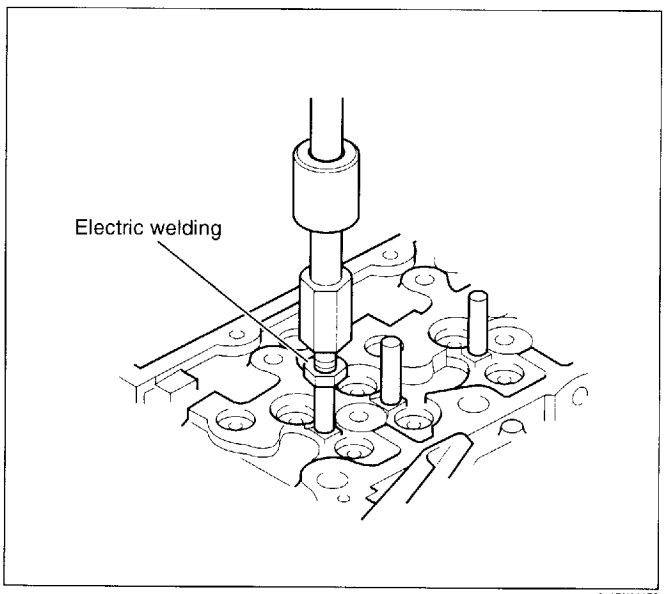
12. Remove the valve seat insert.
    1. Heat (about 600 – 700°C) two points on the valve seat insert with a gas torch and then allow the valve seat insert to cool for a few minutes.
    2. This will invite contraction and make removal of the valve seat insert easier.
    3. Use a screwdriver to pry the valve seat insert free. Take care not to damage the cylinder head.
    4. Carefully remove carbon built-up and other foreign materials from the cylinder head insert bore.

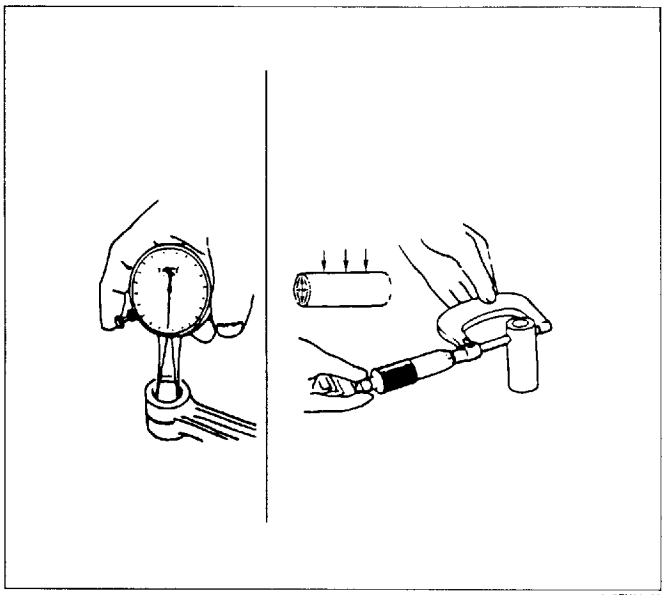


13. Remove the injection nozzle sleeve.
    Use the nozzle sleeve remover 5-8840-2623-0 to drive the nozzle sleeve from the lower side cylinder head.



14. Remove the bridge guide.
    The bolt is electrically welded to the bridge guide. Use a sliding hammer to remove it.





Connecting Rod Alignment

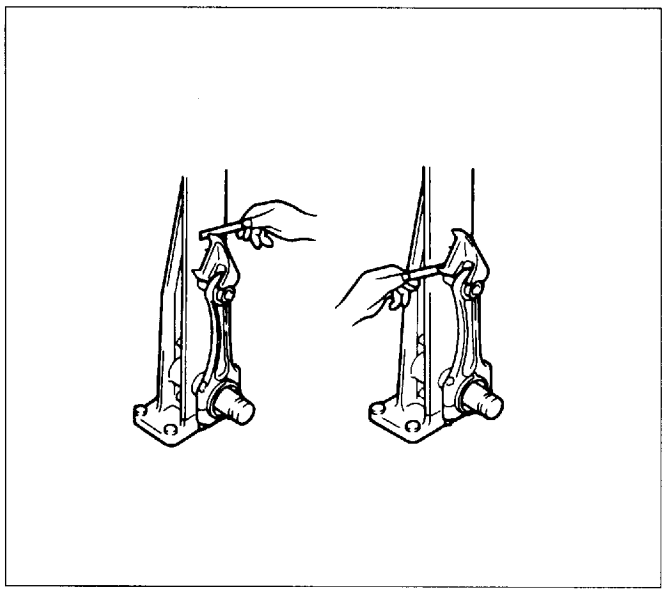
Use a connecting rod aligner to measure the distortion and the parallelism between the connecting rod big end hole and the connecting rod small end hole.
If either the measured distortion or parallelism exceeds the specified limit, the connecting rod must be replaced.

Connecting rod alignment

Per length of 100 mm (3.94 in.)

Standard: 0.05 mm (0.002 in.) or less

Limit: 0.20 mm (0.008 in.)



Crankshaft and Connecting Rod Bearing Clearance

1. Clean the crankshaft, connecting rod, bearing cap, and bearings.
2. Install the bearing to the connecting rod and bearing cap.
3. Apply a coat of molybdenum disulfide grease to the bearing cap bolt threads and setting faces.
4. Prevent the connecting rod from moving.
5. Tighten the bearing cap to the specified torque.

   Connecting rod bearing cap bolt torque

   1st step: 39 N·m (4.0 kgm)

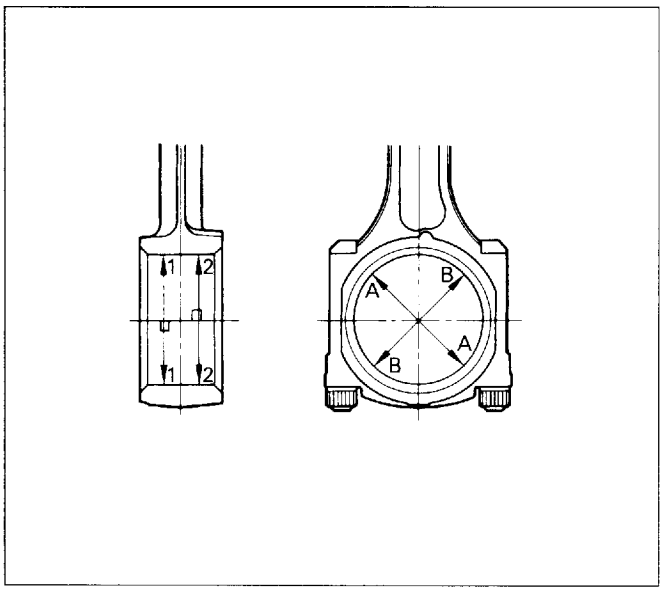
   2nd step: 60 deg.

   3rd step: 30 – 60 deg.
6. Use a dial indicator to measure the connecting rod bearing inside diameter.

   Crankpin and connecting rod bearing clearance

   Standard: 0.037 – 0.070 mm (0.0015 – 0.0030 in.)

   Limit: 0.1 mm (0.0034 in.)



7. If the clearance between the measured bearing inside diameter and the crankpin exceeds the specified limit, the bearing and/or crankshaft must be replaced.