

DF2.5 “K9” (2009) MODEL

FOREWORD

This supplementary service manual describes the outline, technical data and servicing procedures for the “K9” (2009) model outboard motor.
Please read and thoroughly familiarize yourself with this information before using it for your service activities.

NOTE:

- Use this supplement with the following service manual:
DF2.5 Service Manual (P/no, 99500-97J0 • -01E)
DF2.5 Supplementary Service Manual for '08 model. (P/no, 99501-97J00-01E)
- This Supplementary Service Manual describes the modification for 2009 Model.

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GENERAL INFORMATION

* SPECIFICATIONS

* These specifications are subject to change without notice.

| Item | Unit | Data |
|---------|------|--------|
| | | DF2.5 |
| PRE-FIX | | 00251F |

DIMENSIONS & WEIGHT

| | | | |
|-----------------------------------|---|-------------------|---------------------------------------|
| Overall length (front to back) | | mm (in) | 437 (17.2): with tiller handle raised |
| Overall width (side to side) | | mm (in) | 262 (10.3) |
| Overall height | S | mm (in) | 963 (37.9) |
| Weight (without engine oil) | S | kg (lbs) | 13 (29) |
| Transom height | S | mm (inch type) | 435 (15) |

PERFORMANCE

| | | | |
|-----------------------------|--|---------|--------------------------------------|
| Maximum output | | kW (PS) | 1.8 (2.5) |
| Recommended operating range | | r/min | 5 250 – 5 750 |
| Idle speed | | r/min | 1 900 ± 100 (in-gear: approx. 1 500) |

POWER HEAD

| | | |
|---------------------|--------------------------|---------------------------|
| Engine type | | 4-stroke OHV |
| Number of cylinders | | 1 |
| Bore | mm (in) | 48.0 (1.89) |
| Stroke | mm (in) | 38.0 (1.50) |
| Total displacement | cm ³ (cu. in) | 68 (4.1) |
| Compression ratio | : 1 | 9.0 |
| Spark plug | NGK | CR6HSA |
| Ignition system | | Transistorized ignition |
| Fuel supply system | | Carburetor |
| Exhaust system | | Above prop exhaust |
| Cooling system | | Water cooled |
| Lubrication system | | Wet sump by trochoid pump |
| Starting system | | Manual |
| Choke system | | Manual |
| Throttle control | | Twist grip |

| Item | Unit | Data |
|------|------|-------|
| | | DF2.5 |

FUEL & OIL

| | | |
|---------------------------------------|--------------------|---|
| Fuel | | Suzuki highly recommends that you use alcohol-free unleaded gasoline with a minimum pump octane rating of 87 (R/2 + M/2 method) or 91 (Research method). However, blends of unleaded gasoline and alcohol with equivalent octane content may be used. |
| Fuel tank capacity (Built-in tank) | L (US/Imp. gal) | 1.0 (0.26/0.22) |
| Engine oil | | <ul style="list-style-type: none"> API classification : SG, SH, SJ, SL, SM or NMMA FC-W classification : SG, SH, SJ, SL, SM Viscosity rating : SAE 10W-40 or NMMA FC-W 10W-40 |
| Engine oil amounts | L (US/Imp. qt) | 0.38 (0.40/0.33) |
| Gear oil | | SUZUKI Outboard Motor Gear Oil (Hypoid gear oil SAE90, API classification GL-5) |
| Gearcase oil amounts | ml (US/Imp. oz) | 60 (2.0/2.1) |

BRACKET

| | | |
|-----------------------------|---------|------------------------------------|
| Trim angle | Degrees | 6 – 20 |
| Number of tilt pin position | | 4 |
| Maximum tilt angle | Degrees | 74 (from lowest tilt pin position) |

LOWER UNIT

| | | | |
|------------------------------|-----------------|---------------------|----------------------------|
| Reversing system | Gear | | |
| Transmission | Forward-Neutral | | |
| Reduction system | Bevel gear | | |
| Gear ratio | 13 : 28 (2.154) | | |
| Drive line impact protection | Shear pin | | |
| Propeller | Blade | × Dia. | × Pitch (ID No.) |
| | 3 | × 188 mm (7-3/8 in) | × 135 mm (5-3/8 in) (A510) |

*** SERVICE DATA**

* These service data are subject to change without notice.

| Item | Unit | Data |
|------|------|-------|
| | | DF2.5 |

POWER HEAD

| | | |
|----------------------------------|-----------------------------------|--|
| Recommended operating range | r/min | 5 250 – 5 750 |
| Idle speed | r/min | 1 900 ± 100 (in-gear: approx. 1 500) |
| * Cylinder compression | kPa (kg/cm ² , psi) | 960 – 1 400 (9.6 – 14.0, 137 – 199) |
| Engine oil | | <ul style="list-style-type: none"> • API classification : SG, SH, SJ, SL, SM or NMMA FC-W classification : SG, SH, SJ, SL, SM • Viscosity rating : SAE 10W-40 or NMMA FC-W 10W-40 |
| Engine oil amounts | L (US/Imp. qt) | 0.38 (0.40/0.33) |
| Thermostat operating temperature | °C (°F) | 48 – 52 (118 – 126) |

* Figures shown are guidelines only, not absolute service limit.

CARBURETOR

| | | |
|---------------|------------|-------------------|
| Type | Walbro | LMJ-26A |
| I.D mark | | LMJ-26A |
| Main jet | # | 64 |
| Main air jet | # | 170 |
| Pilot jet | # | 32 |
| Pilot air jet | # | 145 |
| Pilot screw | Turns open | Pre-set (2 ± 1/2) |
| Float height | mm | 10 ± 2 |

CYLINDER HEAD/CAMSHAFT

| | | | |
|-----------------------------------|-----------|---------|-----------------------------------|
| Cylinder head distortion | Limit | mm (in) | 0.05 (0.002) |
| Cam height | IN, STD | mm (in) | 28.480 – 28.680 (1.1213 – 1.1291) |
| | EX, Limit | mm (in) | 28.180 (1.1094) |
| Rocker arm shaft hole diameter | IN, STD | mm (in) | 4.015 – 4.027 (0.1581 – 0.1585) |
| | EX | | |
| Rocker arm shaft outside diameter | IN, STD | mm (in) | 3.990 – 4.005 (0.1571 – 0.1577) |
| | EX | | |

| Item | Unit | Data | |
|------|------|-------|--|
| | | DF2.5 | |

VALVE/VALVE GUIDE

| | | | | |
|--|--------|-------|-------------|--|
| Valve diameter | | IN | mm (in) | 20.0 (0.79) |
| | | EX | mm (in) | 18.0 (0.71) |
| Valve clearance (Cold engine condition) | IN | STD | mm (in) | 0.13 – 0.17 (0.005 – 0.007) |
| | EX | STD | mm (in) | 0.13 – 0.17 (0.005 – 0.007) |
| Valve seat angle | | IN | — | 45° |
| | | EX | — | 45° |
| Valve guide to valve stem clearance | IN | STD | mm (in) | 0.010 – 0.037 (0.0004 – 0.0015) |
| | | Limit | mm (in) | 0.075 (0.0030) |
| | EX | STD | mm (in) | 0.025 – 0.052 (0.0010 – 0.0020) |
| | | Limit | mm (in) | 0.090 (0.0035) |
| Valve guide inside diameter | IN, EX | STD | mm (in) | 4.000 – 4.012 (0.1575 – 0.1580) |
| Valve stem outside diameter | IN | STD | mm (in) | 3.975 – 3.990 (0.1565 – 0.1571) |
| | EX | STD | mm (in) | 3.960 – 3.975 (0.1559 – 0.1565) |
| Valve stem deflection | IN, EX | Limit | mm (in) | 0.35 (0.014) |
| Valve stem runout | IN, EX | Limit | mm (in) | 0.05 (0.002) |
| Valve head radial runout | IN, EX | Limit | mm (in) | 0.08 (0.003) |
| Valve head thickness | IN, EX | Limit | mm (in) | 0.5 (0.02) |
| Valve seat contact width | IN, EX | STD | mm (in) | 0.8 – 1.0 (0.03 – 0.04) |
| Valve spring free length | | STD | mm (in) | 22.8 (0.90) |
| | | Limit | mm (in) | 21.9 (0.86) |
| Valve spring tension | | STD | N (kg, lbs) | 36.05 – 42.85 (3.61 – 4.29, 8.0 – 9.5) for 16.9 mm (0.67 in) |
| | | Limit | N (kg, lbs) | 33.53 (3.35, 7.39) for 16.9 mm (0.67 in) |

| Item | Unit | Data | |
|------|------|-------|--|
| | | DF2.5 | |

CYLINDER/PISTON/PISTON RING

| | | | |
|-----------------------------------|------------|---------|------------------------------------|
| Cylinder distortion | Limit | mm (in) | 0.05 (0.002) |
| Piston to cylinder clearance | STD | mm (in) | 0.018 – 0.033 (0.0007 – 0.0013) |
| | Limit | mm (in) | 0.100 (0.0039) |
| Cylinder bore | STD | mm (in) | 48.000 – 48.015 (1.8898 – 1.8904) |
| Cylinder measuring position | | mm (in) | 20 (0.8) from cylinder top surface |
| Piston skirt diameter | STD | mm (in) | 47.975 – 47.990 (1.8888 – 1.8894) |
| Piston measuring position | | mm (in) | 5 (0.2) from piston skirt end |
| Cylinder bore wear | Limit | mm (in) | 0.100 (0.0039) |
| Piston ring end gap | 1st, STD | mm (in) | 0.15 – 0.35 (0.006 – 0.014) |
| | 2nd, Limit | mm (in) | 0.50 (0.020) |
| Piston ring free end gap | 1st, STD | mm (in) | Approx. 6.1 (0.24) |
| | 1st, Limit | mm (in) | 4.9 (0.19) |
| | 2nd, STD | mm (in) | Approx. 5.7 (0.22) |
| | 2nd, Limit | mm (in) | 4.6 (0.18) |
| Piston ring to groove clearance | 1st, STD | mm (in) | 0.020 – 0.060 (0.0008 – 0.0024) |
| | 2nd, Limit | mm (in) | 0.120 (0.0047) |
| Piston ring groove width | 1st, STD | mm (in) | 1.21 – 1.23 (0.048 – 0.049) |
| | Oil, STD | mm (in) | 1.51 – 1.53 (0.059 – 0.060) |
| Piston ring thickness | 1st, STD | mm (in) | 1.17 – 1.19 (0.046 – 0.047) |
| Pin clearance in piston pin hole | STD | mm (in) | 0.002 – 0.013 (0.0001 – 0.0005) |
| | Limit | mm (in) | 0.040 (0.0016) |
| Piston pin outside diameter | STD | mm (in) | 11.995 – 12.000 (0.4722 – 0.4724) |
| | Limit | mm (in) | 11.980 (0.4717) |
| Piston pin hole diameter | STD | mm (in) | 12.002 – 12.008 (0.4725 – 0.4728) |
| | Limit | mm (in) | 12.030 (0.4736) |
| Pin clearance in conrod small end | STD | mm (in) | 0.006 – 0.019 (0.0002 – 0.0007) |
| | Limit | mm (in) | 0.050 (0.0020) |

| Item | Unit | Data | |
|------|------|-------|--|
| | | DF2.5 | |

CRANKSHAFT/CONROD

| | | | |
|---|-------|---------|-----------------------------------|
| Conrod small end inside diameter | STD | mm (in) | 12.006 – 12.014 (0.4727 – 0.4730) |
| | Limit | mm (in) | 12.040 (0.4740) |
| Conrod big end oil clearance | STD | mm (in) | 0.015 – 0.035 (0.0006 – 0.0014) |
| | Limit | mm (in) | 0.080 (0.0031) |
| Conrod big end inside diameter | STD | mm (in) | 19.015 – 19.025 (0.7486 – 0.7490) |
| Crank pin out-side diameter | STD | mm (in) | 18.990 – 19.000 (0.7476 – 0.7480) |
| Crank pin out-side diameter difference (out-of-round and taper) | Limit | mm (in) | 0.010 (0.0004) |
| Conrod big end side clearance | STD | mm (in) | 0.20 – 0.70 (0.008 – 0.028) |
| | Limit | mm (in) | 1.00 (0.039) |
| Conrod big end width | STD | mm (in) | 17.50 – 17.80 (0.689 – 0.701) |
| Crank pin width | STD | mm (in) | 18.00 – 18.20 (0.709 – 0.717) |
| Crankshaft runout | Limit | mm (in) | 0.05 (0.002) |

ELECTRICAL

| | | | |
|---------------------------|-----------|-------------|---------------------------|
| Ignition timing | | Degrees | BTDC 30 |
| Ignition coil resistance | Primary | Ω at 20 °C | 0.5 – 0.9 |
| | Secondary | kΩ at 20 °C | 10 – 16 |
| Spark plug cap resistance | | kΩ at 20 °C | 4 – 6 |
| Standard spark plug | Type | NGK | CR6HSA |
| | Gap | mm (in) | 0.6 – 0.7 (0.024 – 0.028) |

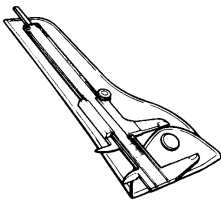
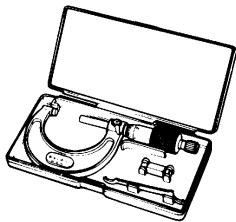
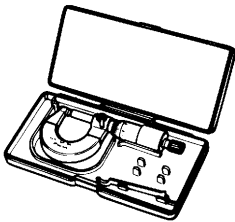
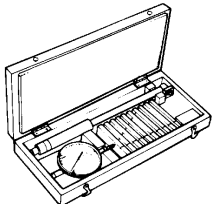
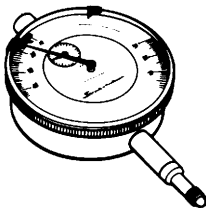
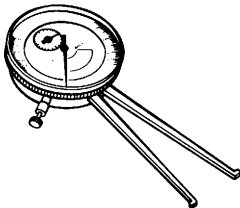
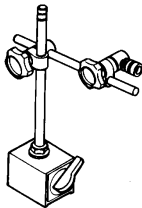
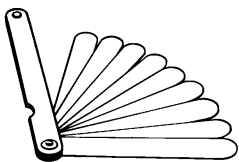
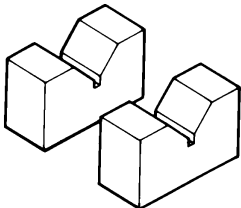
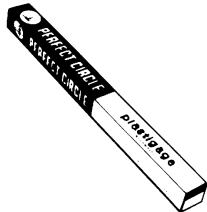
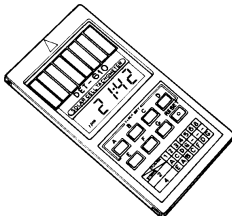
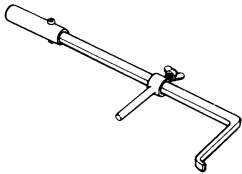
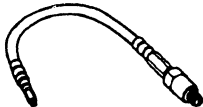
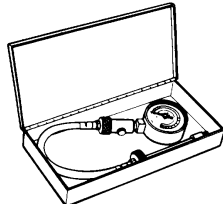
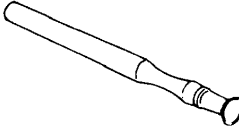
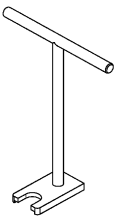
LOWER UNIT

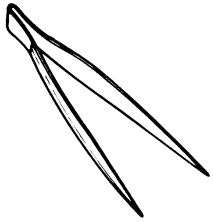
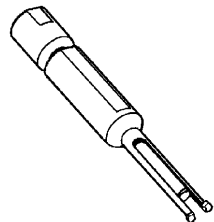
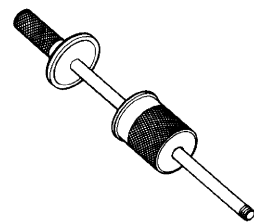
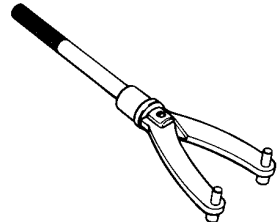
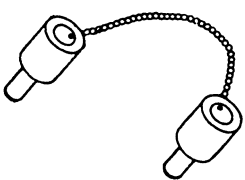
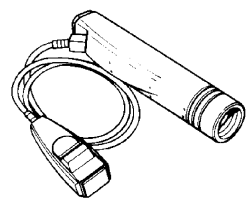
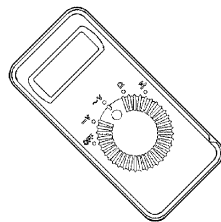
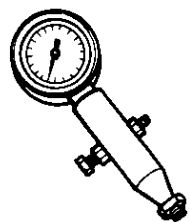

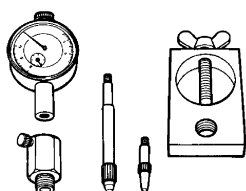
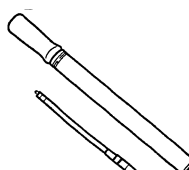
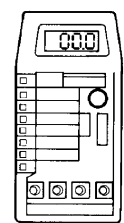
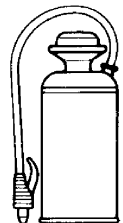
Preliminary gear shim & thrust washer

| | | |
|---------------------------------------|---------|------------|
| Pinion gear backup shim | mm (in) | 2.0 (0.08) |
| Forward gear backup shim | mm (in) | 0.5 (0.02) |
| Propeller shaft reverse thrust washer | mm (in) | 1.8 (0.07) |

Initial selection-shim adjustment may be required.

SPECIAL TOOLS

| | | | |
|---|--|--|---|
| <p>1.</p>  <p>09900-20101 (150 mm) Vernier calipers</p> | <p>2.</p>  <p>09900-20202 Micrometer (25 – 50 mm)</p> | <p>3.</p>  <p>09900-20205 Micrometer (0 – 25 mm)</p> | <p>4.</p>  <p>09900-20530 Cylinder gauge set (40 – 100 mm)</p> |
| <p>5.</p>  <p>09900-20602 Dial gauge</p> | <p>6.</p>  <p>09900-20605 Dial calipers (10 – 34 mm)</p> | <p>7.</p>  <p>09900-20701 Magnetic stand</p> | <p>8.</p>  <p>09900-20803 Thickness gauge</p> |
| <p>9.</p>  <p>09900-21304 Steel "V" block set</p> | <p>10.</p>  <p>09900-22301 Plastigauge (0.025 – 0.076 mm)</p> | <p>11.</p>  <p>09900-26006 Engine tachometer</p> | <p>12.</p>  <p>09913-50121 Oil seal remover</p> |
| <p>13.</p>  <p>09915-63311 Compression gauge adaptor</p> | <p>14.</p>  <p>09915-64512 Compression gauge</p> | <p>15.</p>  <p>09916-10911 Valve lapper</p> | <p>16.</p>  <p>09916-19910 Valve spring compressor</p> |

| | | | |
|--|--|--|---|
| <p>17.</p>  <p>09916-84511 Tweezers</p> | <p>18.</p>  <p>09921-20210 Bearing remover</p> | <p>19.</p>  <p>09930-30104 Sliding hammer</p> | <p>20.</p>  <p>09930-40113 Flywheel holder</p> |
| <p>21.</p>  <p>09930-40120 Rotor holder attachment</p> | <p>22.</p>  <p>09930-76420 Timing light</p> | <p>23.</p>  <p>09930-99320 Digital tester</p> | <p>24.</p>  <p>09950-69512 Gearcase oil leakage tester</p> |
| <p>25.</p>  <p>09950-69710 Gear oil leakage tester attachment</p> | <p>26.</p>  <p>09951-09530 Gear adjusting gauge</p> | <p>27.</p>  <p>09952-99310 Air pump assy</p> | <p>28.</p>  <p>99954-53008-820* Digital voltmeter</p> |
| <p>29.</p>  <p>99954-53883* Gear oil filler</p> | | | |

NOTE:

* Marked part No. is in U.S. market only.

ENGINE SERIAL NUMBER

The engine serial number starts from the following six-figure number located after the model pre-fix.

MODEL PRE-FIX — **980001** ~

Serial number

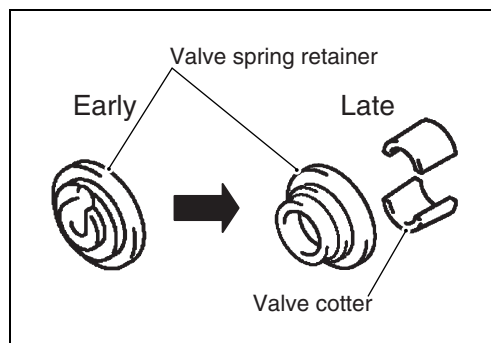
POWER UNIT

VALVE AND ROCKER ARM

The following components of the valve and valve train have been changed.

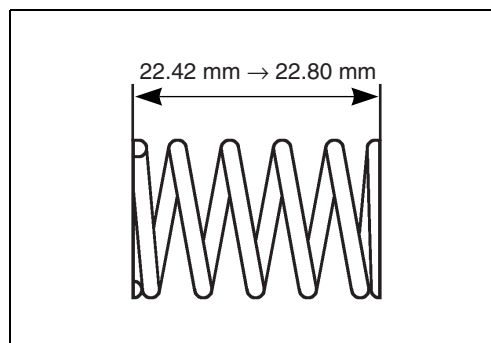
VALVE SPRING RETAINER

The fastening method of valve spring retainer to valve stem has been changed from slide set type to valve cotter set type with the retainer shape modified.



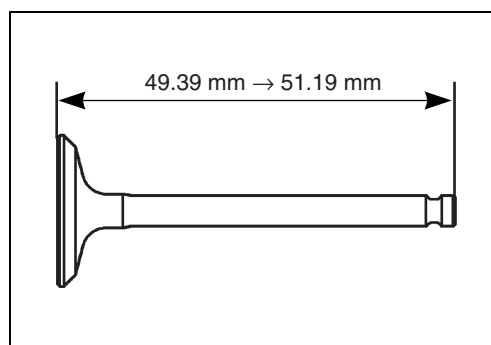
VALVE SPRING

The free length of valve spring has been changed.



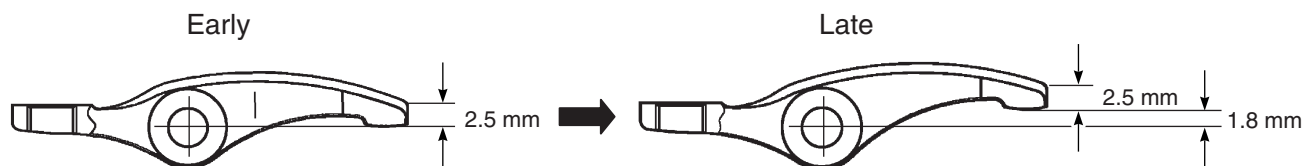
INTAKE/EXHAUST VALVE

Due to modification of retainer, the shape of valve stem end has been also changed.



ROCKER ARM

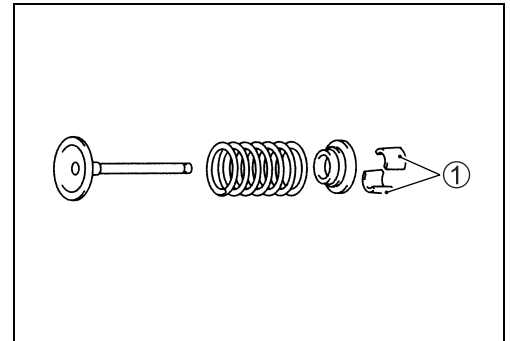
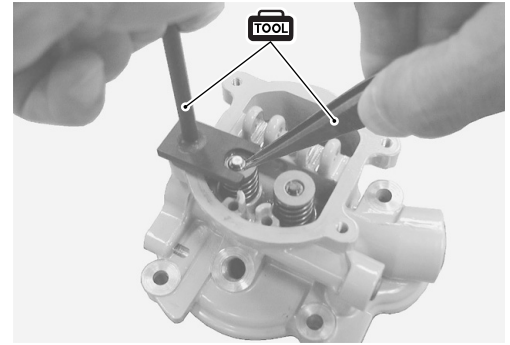
The rocker arm has been changed in shape.



CYLINDER HEAD DISASSEMBLY

1. Put a wood block under the valve head, so that the valve should not move. Using the special tools, remove the valve cotters ① while compressing the valve spring.

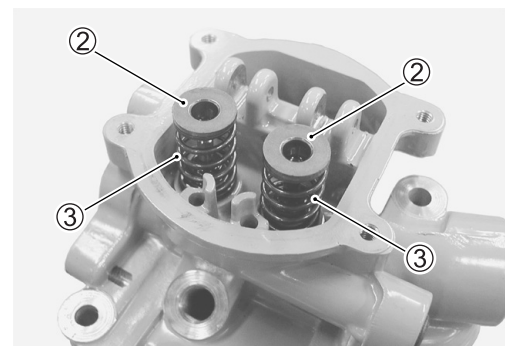
TOOL 09916-19910: Valve spring compressor
09916-84511: Tweezers



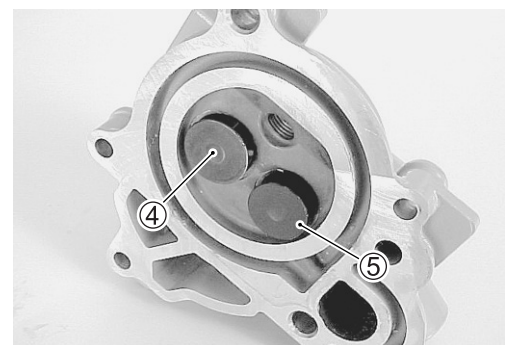
2. Remove the valve spring retainer ②, the valve spring ③.

NOTE:

Reassemble each valve spring to their original position.



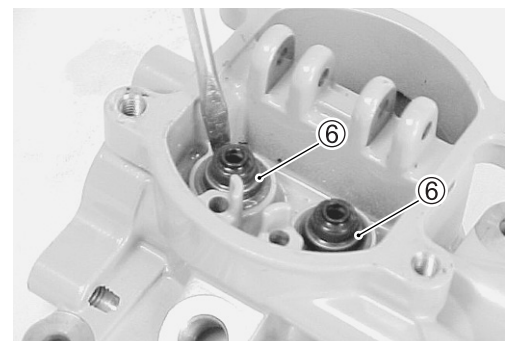
3. Remove the intake valve ④ and exhaust valve ⑤.



4. Remove the valve stem seals ⑥.

CAUTION

Do not re-use the valve stem seal once removed.




CYLINDER HEAD COMPONENTS INSPECTION

VALVE SPRING

Valve spring free length

Measure the valve spring free length.

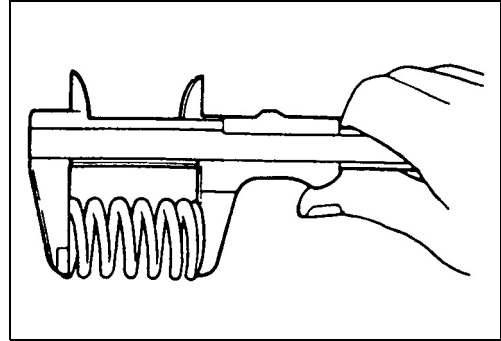
 **09900-20101: Vernier calipers**

Valve spring free length:

Standard: IN. & EX. 22.8 mm (0.90 in)


Service limit: IN. & EX. 21.9 mm (0.86 in)

If the measurement exceeds the service limit, replace the valve spring.



Valve spring preload

Measure the valve spring preload.

 **09900-20101: Vernier calipers**

Valve spring preload:

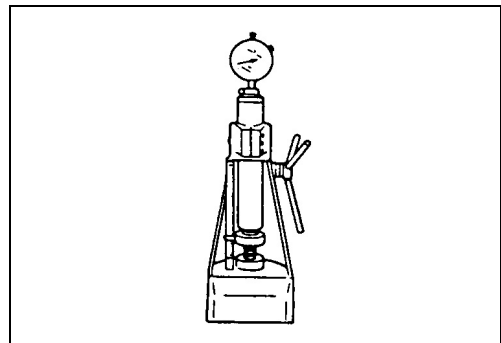
Standard:

**IN. & EX. 30.05 – 42.85 N (3.61 – 4.29 kg, 8.0 – 9.5 lbs)
for 15 mm (0.6 in)**

Service limit:

**IN. & EX. 33.53 N (3.35 kg, 7.39 lbs)
for 16.9 mm (0.67 in)**

If the measurement exceeds the service limit, replace the valve spring.



CYLINDER HEAD REASSEMBLY

Reassembly is reverse order of disassembly with the special attention to the following steps.

1. Apply engine oil to the valve stem seals ①.
2. Install the valve stem seals to the valve guide.

CAUTION

**Do not re-use the valve stem seal once removed.
Always use a new stem seal.**

3. Apply engine oil to the valve guide bore and valve stem.
4. Install the valve ② to the valve guide.

5. Install the valve spring ③ and the retainer ④.

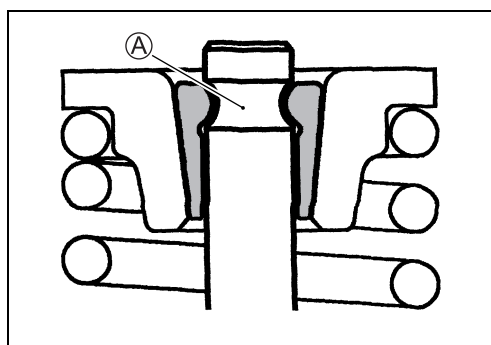
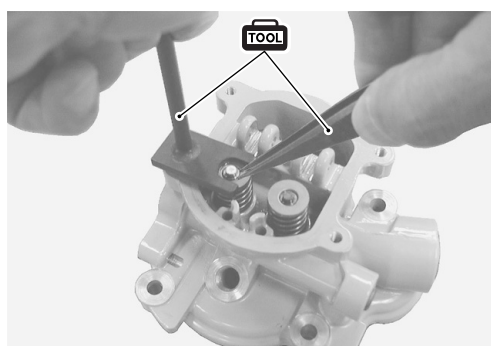
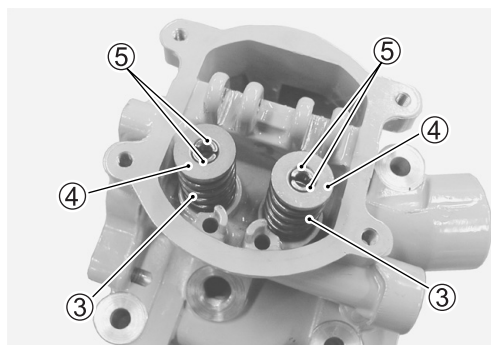
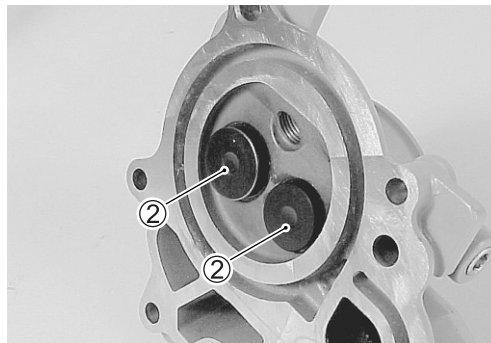
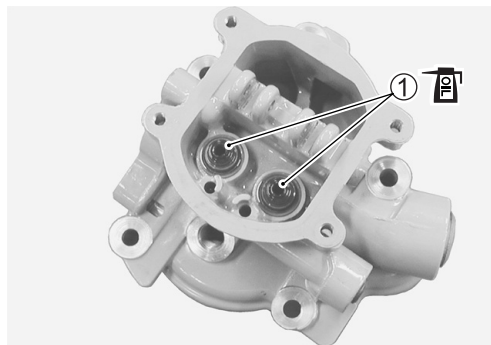
NOTE:

Reassemble each valve spring to their original position.

6. Put a wood block under the valve head, so that the valve should not move.
Install the valve cotters ⑤ while compressing the valve spring using the special tools.

TOOL 09916-19910: Valve spring compressor
09916-84511: Tweezers

7. Make sure the valve cotters are properly seated in the groove ①.



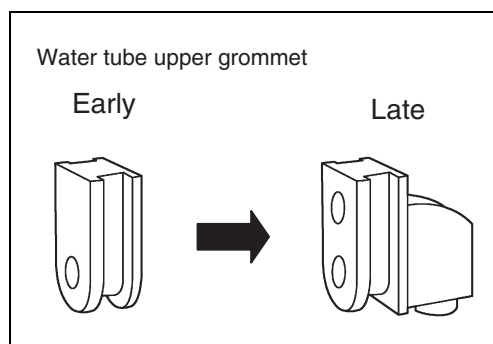
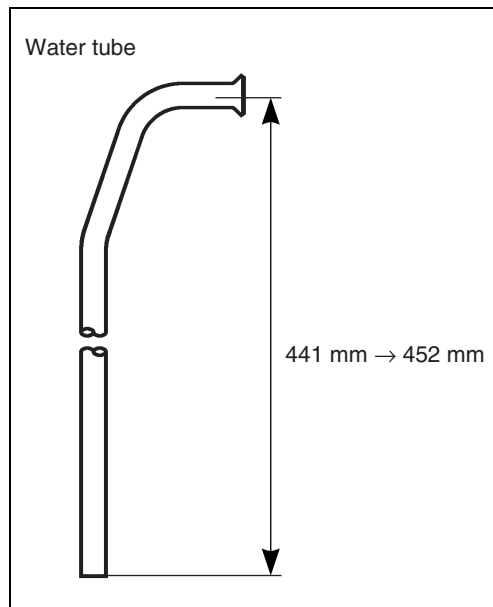
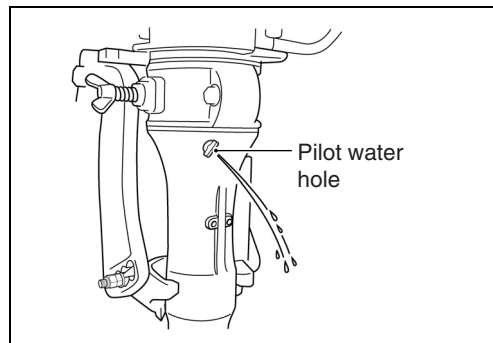
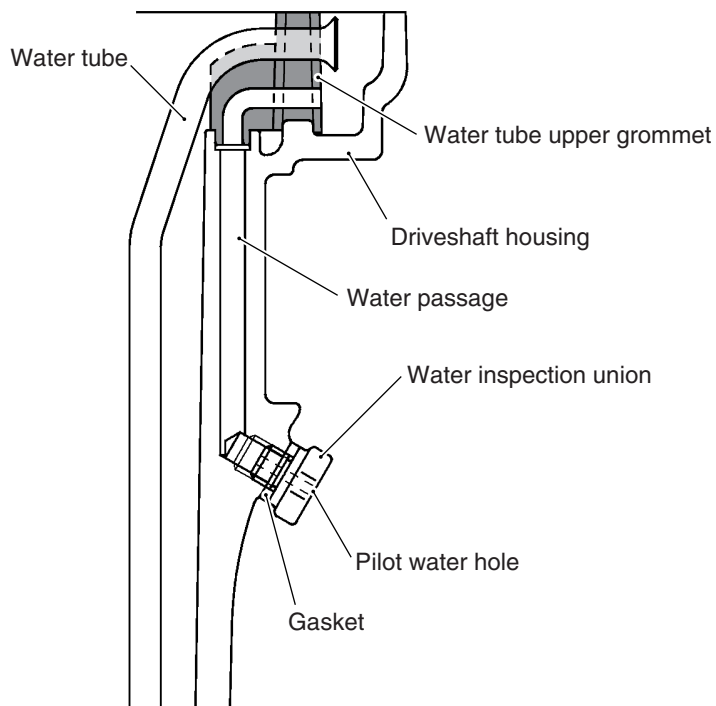
MID UNIT

DRIVESHAFT HOUSING AND WATER TUBE

The pilot water hole has been added to the driveshaft housing. In accordance with this addition, the water inspection union and gasket have been added.

The length of water tube has been changed from 441 mm to 452 mm.

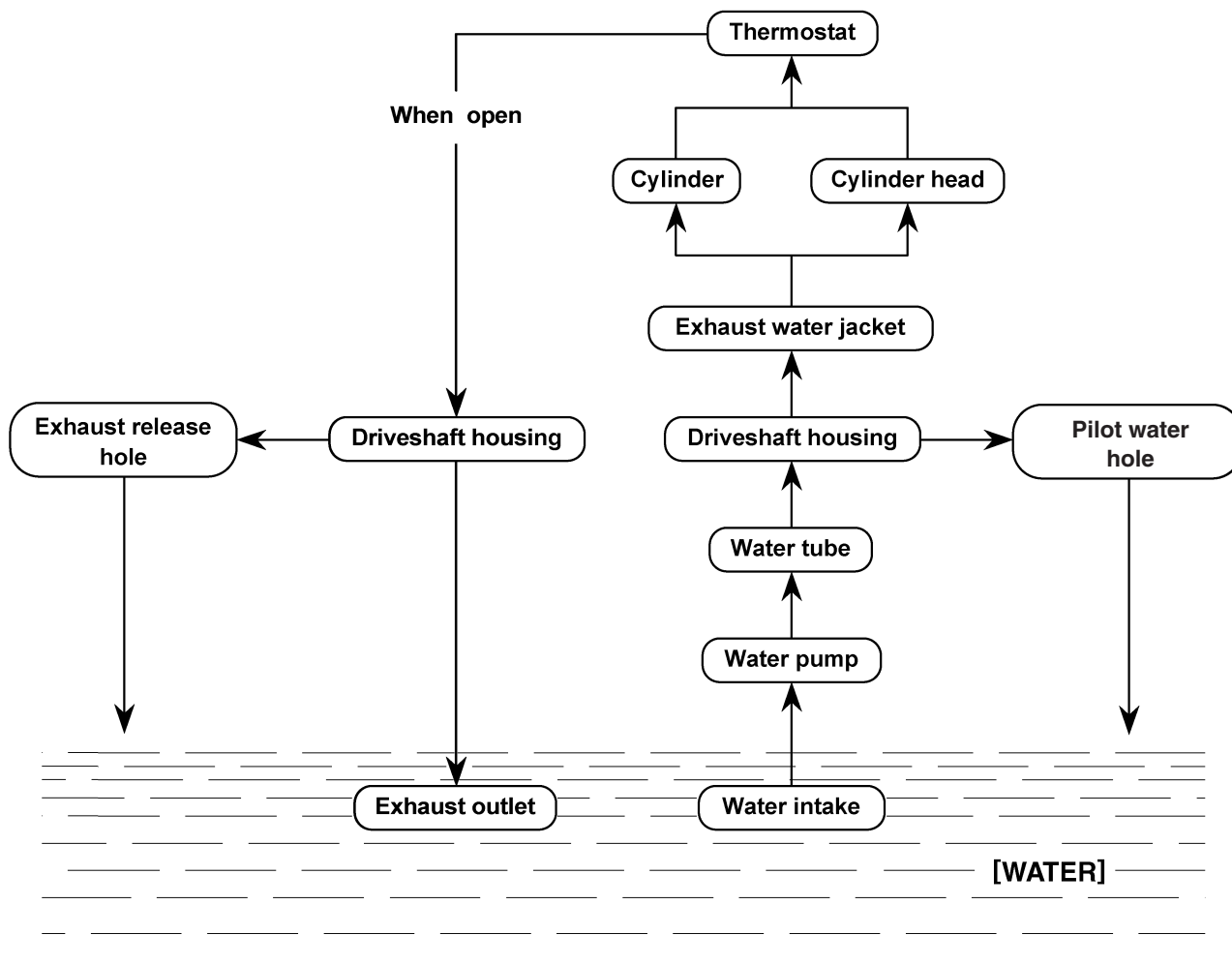
The water tube upper grommet has been changed in shape.



WATER COOLING SYSTEM

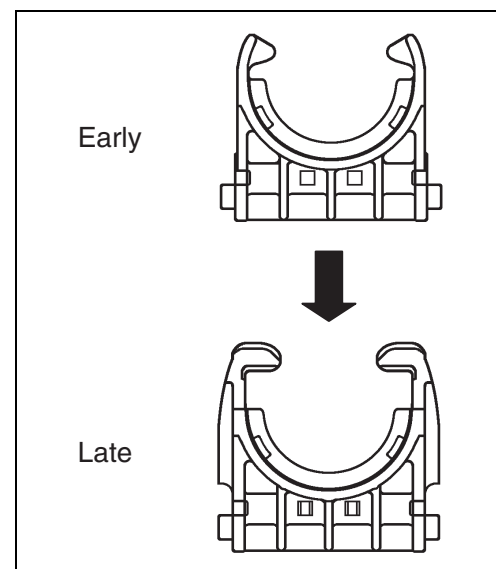
Flow of cooling water is changed as shown in schematic.

COOLING SYSTEM SCHEMATIC



THRUST BLOCK

The thrust block has been changed in shape.

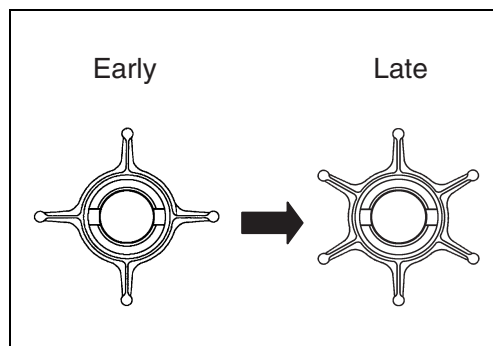


LOWER UNIT

WATER PUMP IMPELLER

The number of water pump impeller blades has been changed from 4 to 6.

The purpose of this modification is to secure sufficient pumping capacity that is required due to addition of pilot water hole.

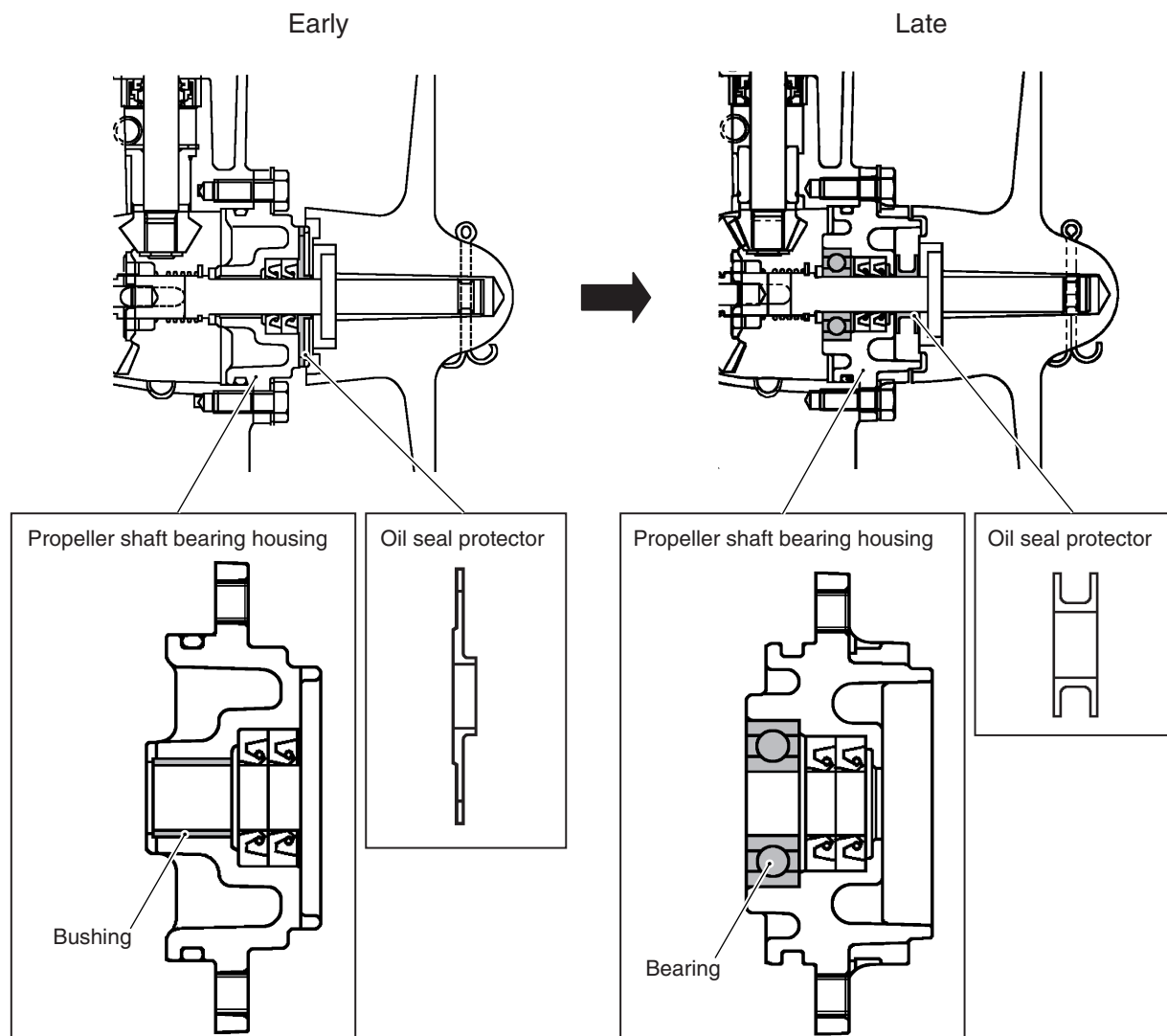


PROPELLER SHAFT BEARING HOUSING

The type of propeller shaft bearing has been changed from plane bearing to ball bearing.

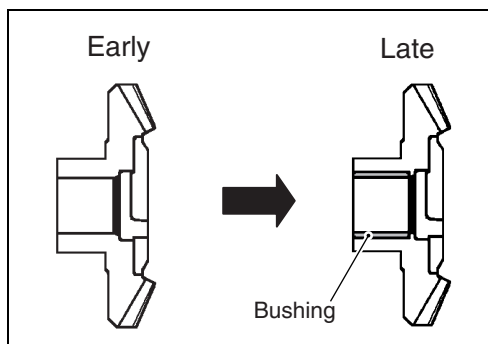
Due to this modification, the shape of propeller shaft bearing housing has been also changed.

In accordance with this change, the oil seal protector has been changed in shape.



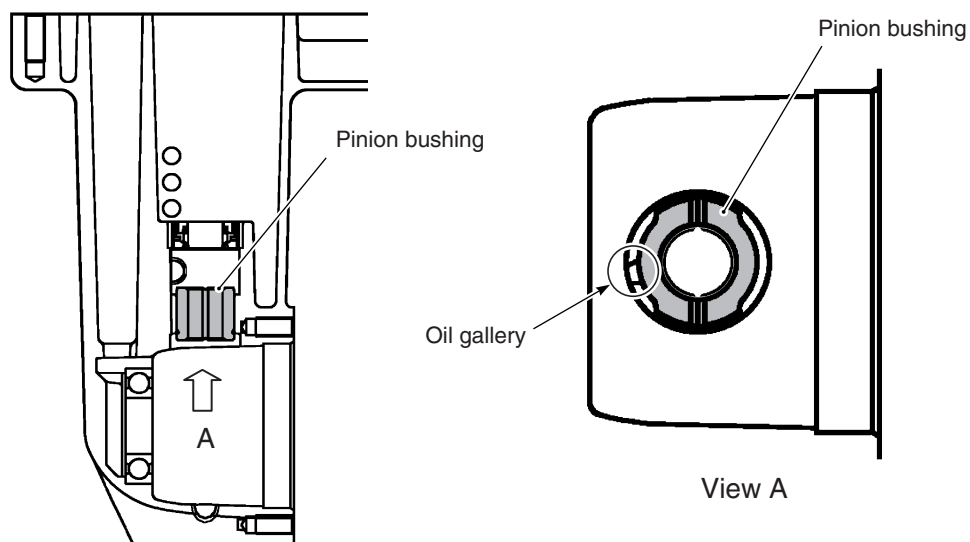
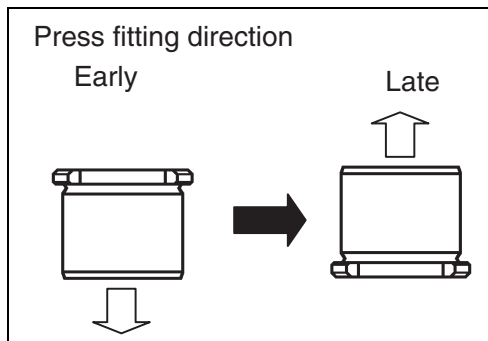
FORWARD GEAR

The metal bushing has been added on forward gear.



PINION BUSHING

The press fitting direction of pinion bushing into gearcase is changed.



NOTE:

When pinion bushing is installed, the flange of bushing must not obstruct the oil gallery.

