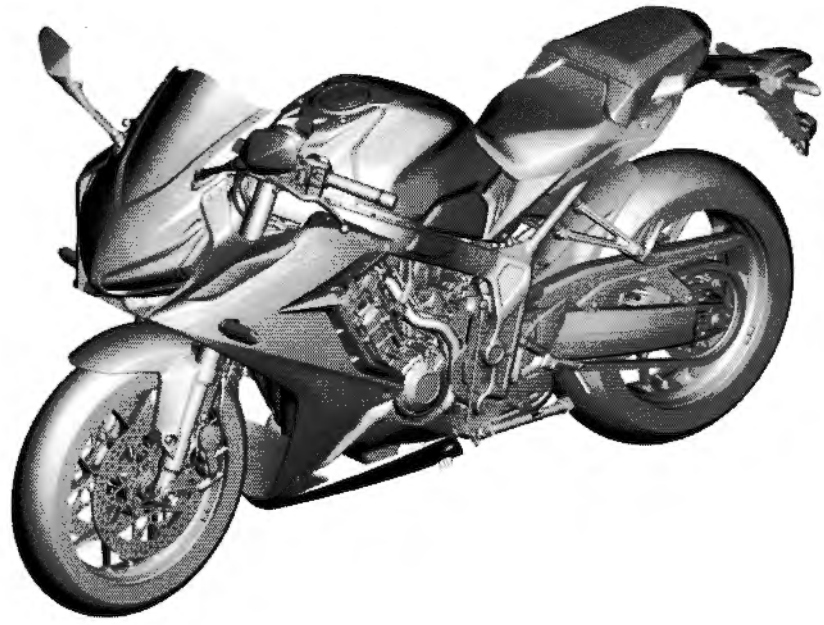
CONTENTS

MODEL IDENTIFICATION

CBR650R/RA:

CBR650RA shown:



CB650R/RA:

CB650RA shown:

This manual covers following models:

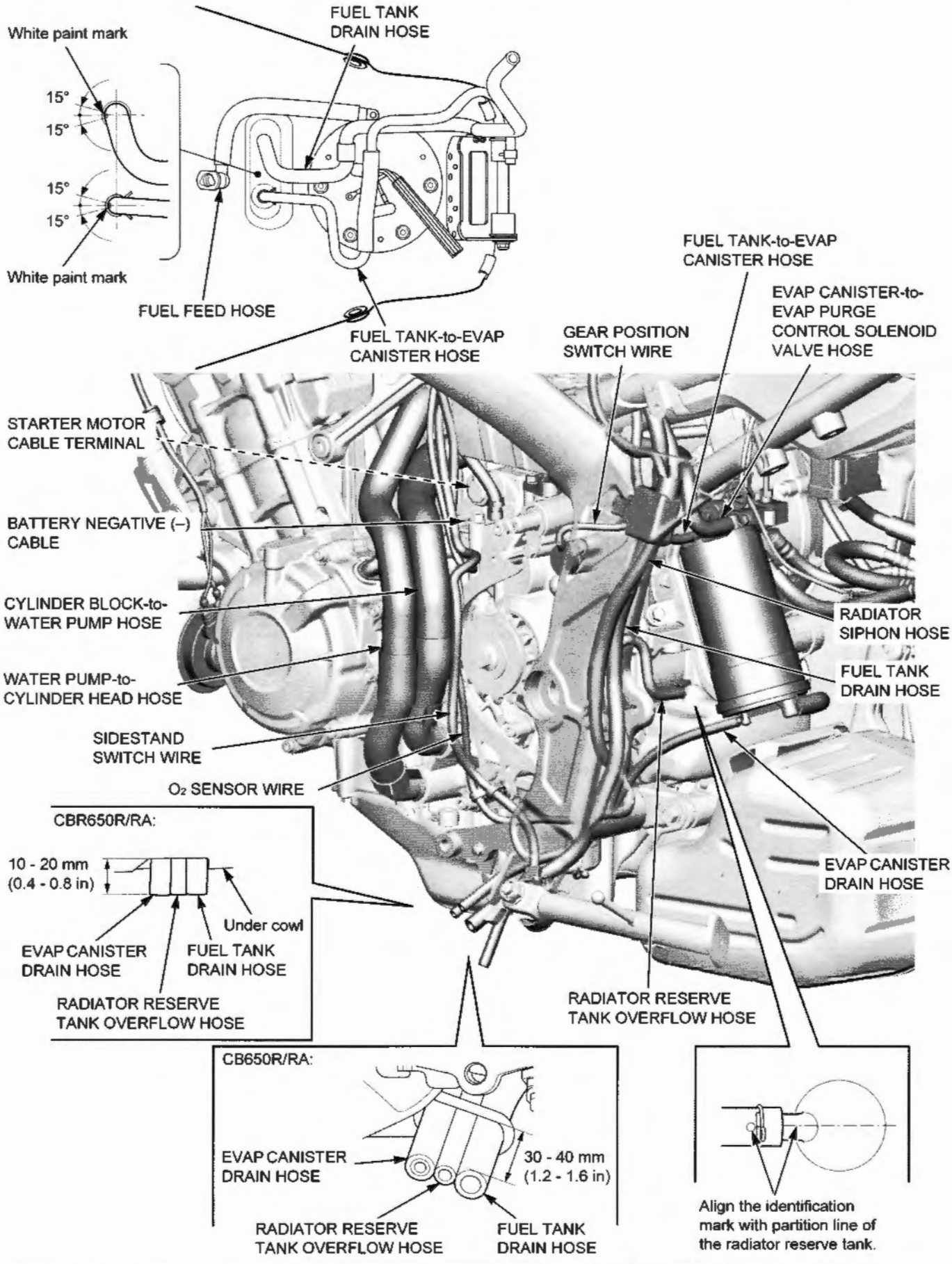
TYPE	DESTINATION CODE	EVAP CONTROL SYSTEM	ABS
CBR650R	AC	O	–
CBR650RA	AC	O	O
	CM	–	
CB650R	AC	O	–
CB650RA	AC	O	O
	CM	–	

Be sure to refer to the procedure for the appropriate model.

SPECIAL TOOL LIST

TITLE	TOOL No	TOOL NAME
MAINTENANCE	07HAA-PJ70101 or 07AAA-PLCA100 (U.S.A. only)	Oil filter wrench
	07HMH-MR10103 or 07HMH-MR1010C (U.S.A. only)	Drive chain tool set
PGM-FI SYSTEM	070MZ-K530100	OBD adaptor harness
	070PZ-ZY30100	SCS service connector
	07ZAJ-RDJA110	Test probe, 2 pack
IGNITION SYSTEM	MTP07-0286 (U.S.A. only)	IgnitionMate peak voltage tester
	07HGJ-0020100 (Not available in U.S.A.)	Peak voltage adaptor
	07ZAJ-RDJA110	Test probe, 2 pack
FUEL SYSTEM	07406-0040004 or 07406-004000B or 07406-004000C (U.S.A. only)	Fuel pressure gauge
	070MJ-K260100	Pressure gauge attachment set
	07ZAJ-S5A0130	Hose attachment, 6 mm/9 mm
	07ZAJ-S7C0100	Hose attachment, 8 mm/9 mm
	07ZAJ-S7C0200	Attachment joint, 8 mm/9 mm
	07ZAJ-S5A0150	Attachment joint, 6 mm/9 mm
	07AMJ-HW3A100 (U.S.A. only)	Pressure manifold hose
	07AAJ-S6MA300 (U.S.A. only)	Adaptor C, male
	07AAJ-S6MA500 (U.S.A. only)	Adaptor C, female
LUBRICATION SYSTEM	07506-3000001 or MT37A (Snap-On) or equivalent commercially available in U.S.A.	Oil pressure gauge set
	07406-0030000 or equivalent commercially available in U.S.A.	Oil pressure gauge attachment
CYLINDER HEAD/VALVES	070MG-0010100 or 07AMG-001A100 (U.S.A. only)	Tensioner stopper
	07HMG-MR70002 (Not available in U.S.A.)	Tappet hole protector
	07757-0010000	Valve spring compressor
	07959-KM30101	Valve spring compressor attachment
	07HMD-ML00101	Valve guide driver, 4.5 mm
	07743-0020000 (Not available in U.S.A.)	Valve guide adjusting driver
	07HMH-ML00101 or 07HMH-ML0010B (U.S.A. only)	Valve guide reamer, 4.5 mm
	07781-0010600 or equivalent commercially available in U.S.A.	Cutter holder, 4.5 mm
	07780-0010200 or equivalent commercially available in U.S.A.	Seat cutter, 27.5 mm (IN, 45°)
	07780-0010600 or equivalent commercially available in U.S.A.	Seat cutter, 24 mm (EX, 45°)
	07780-0012100 or equivalent commercially available in U.S.A.	Flat cutter, 28 mm (IN, 32°)
	07780-0012500 or equivalent commercially available in U.S.A.	Flat cutter, 24 mm (EX, 32°)
	07780-0014500 or equivalent commercially available in U.S.A.	Interior cutter, 26 mm (IN, 60°)
	07780-0014202 or equivalent commercially available in U.S.A.	Interior cutter, 22 mm (EX, 60°)
CLUTCH/GEARSHIFT LINKAGE/STARTER CLUTCH	07724-0050002 or equivalent commercially available in U.S.A.	Clutch center holder
	07724-0010100 or 07724-001A100 (U.S.A. only)	Gear holder, M2.5
ALTERNATOR	07725-0040001	Flywheel holder
	07733-0020001 or 07933-3950000 (U.S.A. only)	Rotor puller
CRANKCASE/TRANSMISSION	07936-3710600	Bearing remover set, 20 mm
	07741-0010201 or 07936-371020A (U.S.A. only)	Remover weight
	07936-3710100	Remover handle
	07949-3710001	Driver, 15 x 280L
	07746-0010300	Attachment, 42 x 47 mm
	07746-0040500	Pilot, 20 mm

AC type:


White paint mark
15°
15°
15°
15°
White paint mark
FUEL TANK DRAIN HOSE
FUEL FEED HOSE
FUEL TANK-to-EVAP CANISTER HOSE
FUEL TANK-to-EVAP CANISTER HOSE
GEAR POSITION SWITCH WIRE
EVAP CANISTER-to-EVAP PURGE CONTROL SOLENOID VALVE HOSE
STARTER MOTOR CABLE TERMINAL
BATTERY NEGATIVE (–) CABLE
CYLINDER BLOCK-to-WATER PUMP HOSE
WATER PUMP-to-CYLINDER HEAD HOSE
SIDESTAND SWITCH WIRE
O2 SENSOR WIRE
RADIATOR SIPHON HOSE
FUEL TANK DRAIN HOSE
EVAP CANISTER DRAIN HOSE
RADIATOR RESERVE TANK OVERFLOW HOSE
CBR650R/RA:
10 - 20 mm (0.4 - 0.8 in)
Under cowl
EVAP CANISTER DRAIN HOSE
FUEL TANK DRAIN HOSE
RADIATOR RESERVE TANK OVERFLOW HOSE
CB650R/RA:
EVAP CANISTER DRAIN HOSE
30 - 40 mm (1.2 - 1.6 in)
RADIATOR RESERVE TANK OVERFLOW HOSE
FUEL TANK DRAIN HOSE
Align the identification mark with partition line of the radiator reserve tank.

INTAKE AIR DUCT (CBR650R/RA)

REMOVAL/INSTALLATION

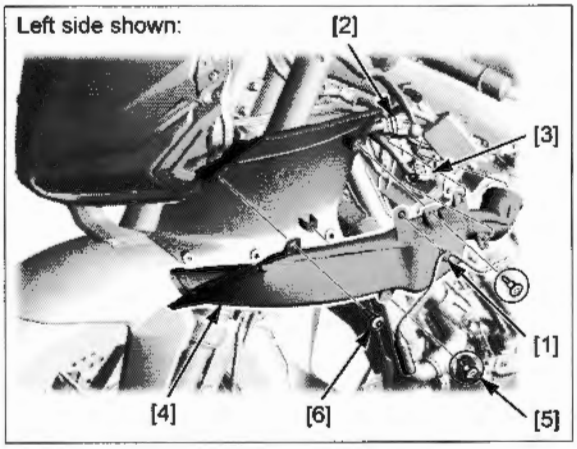
Remove the middle cowl (page 2-7).

Left side: Release the harness clip [1] and front sub harness 12P (Black) [2] and 12P (Gray) [3] connectors from the intake air duct [4].

Right side: Release the harness clip and front wheel speed sensor 2P (Black) connector from the intake air duct.

Remove the two trim clips [5], socket bolt [6] and intake air duct.

Installation is in the reverse order of removal.



UPPER INNER PANEL (CBR650R/RA)

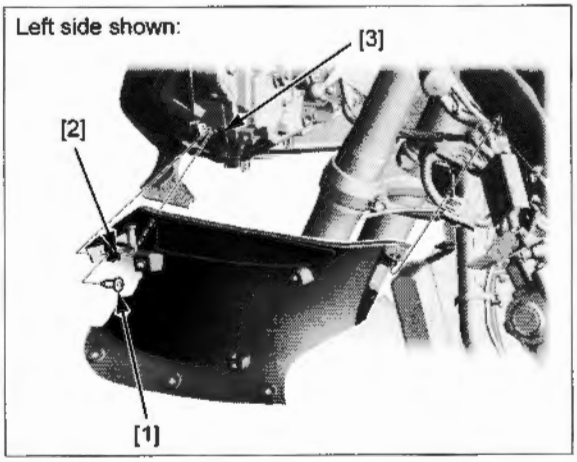
REMOVAL/INSTALLATION

Remove the intake air duct (page 2-8).

Remove the trim clip [1].

Release the tab [2] from the slot [3] of headlight and remove the upper inner panel.

Installation is in the reverse order of removal.



METER PANEL (CBR650R/RA)

REMOVAL/INSTALLATION

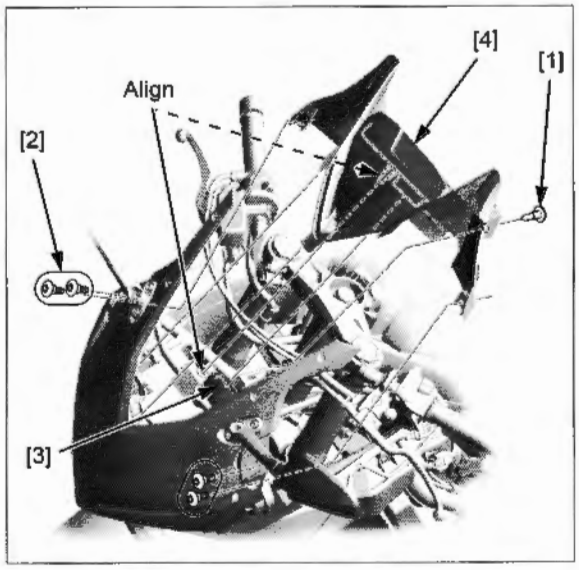
Remove the following:

- Windscreen (page 2-6)
- Middle cowls (page 2-7)
- Trim clip [1]
- Four socket bolts [2]

Disconnect the combination meter 20P (Gray) connector [3], then remove the meter panel [4].

Installation is in the reverse order of removal.

- Align the boss with the hole of the headlight stay.



VALVE CLEARANCE

INSPECTION

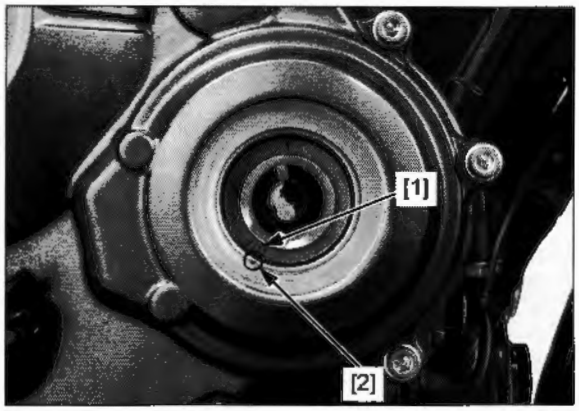
NOTE:

- Inspect and adjust the valve clearance while the engine is cold (below 35°C/95°F).

Remove the following:

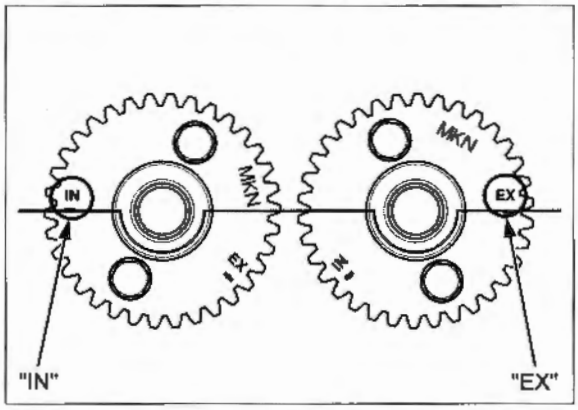
– Cylinder head cover (page 10-6)
– Timing hole cap and O-ring

Rotate the crankshaft clockwise slowly and align the "T" mark [1] with the index notch [2] in the crankcase cover.



Make sure the timing marks ("IN" and "EX") on the sprockets are flush with the cylinder head surface and facing outward as shown.

If the marks are not this position, turn the crankshaft clockwise one full turn (360°) and realign the "T" mark with the index notch.

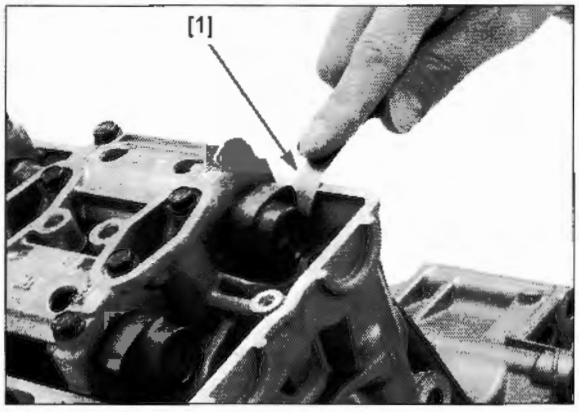


Insert the feeler gauge [1] between the valve lifter and the cam lobe.

Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.1 and No.3 cylinder intake valves using a feeler gauge.

VALVE CLEARANCE:
IN: 0.20 ± 0.03 mm (0.008 ± 0.001 in)

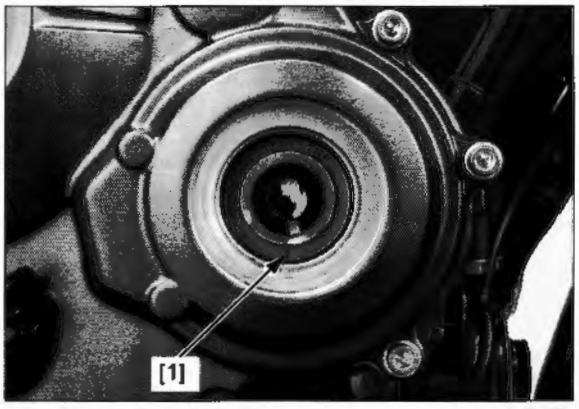


Turn the crankshaft clockwise 1/2 turn (180°), align the index line [1] on the CKP sensor rotor so that it is facing down as shown.

Record the clearance for each valve for reference in shim selection if adjustment is required.

Check the valve clearance for the No.2 and No.4 cylinder exhaust valves using a feeler gauge.

VALVE CLEARANCE:
EX: 0.28 ± 0.03 mm (0.011 ± 0.001 in)



DTC 7-1
(ECT SENSOR LOW VOLTAGE)

1. **ECT Sensor System Inspection**

   Check the ECT sensor with the MCS.

   Is about 0 V indicated?

   YES – GO TO STEP 2.

   NO – Intermittent failure

2. **ECT Sensor System Inspection with Connector Disconnected**

   Turn the ignition switch OFF.
   Disconnect the ECT sensor 2P (Blue) connector (page 4-44).
   Check the ECT sensor with the MCS.

   Is about 0 V indicated?

   YES – GO TO STEP 3.

   NO – Faulty ECT sensor

3. **ECT Sensor Output Line Short Circuit Inspection**

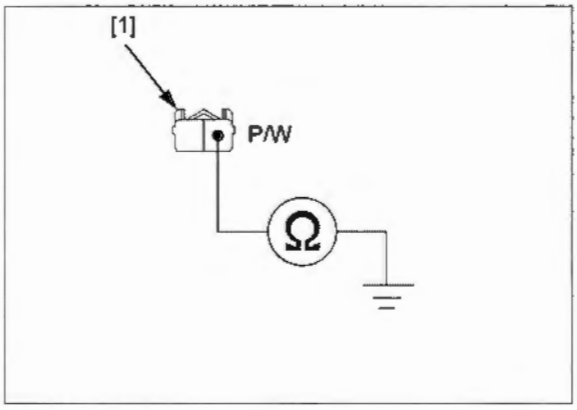
   Turn the ignition switch OFF.
   Disconnect the ECM 33P (Gray) connector (page 4-42).
   Check for continuity between the wire harness side ECT sensor 2P (Blue) connector [1] terminal and ground.

   CONNECTION: Pink/white – Ground

   Is there continuity?

   YES – Short circuit in Pink/white wire

   NO – Replace the ECM with a known good one, and recheck.



DTC 7-2
(ECT SENSOR HIGH VOLTAGE)

- Before starting the inspection, check for loose or poor contact on the ECT sensor 2P (Blue), ECM 33P (Black) and 33P (Gray) connectors, and recheck the DTC.

1. **ECT Sensor System Inspection**

   Check the ECT sensor with the MCS.

   Is about 5 V indicated?

   YES – GO TO STEP 2.

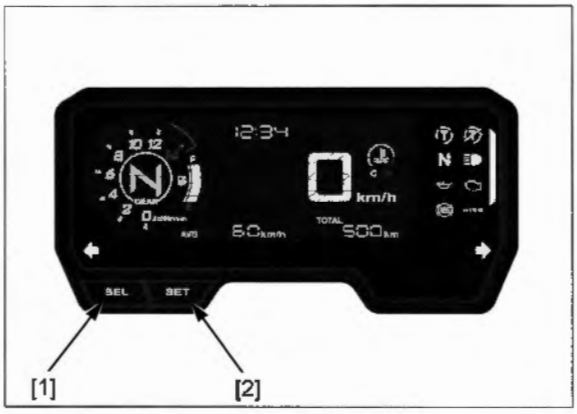
   NO – Intermittent failure

2. Combination Meter Serial Line Output Voltage Inspection

Turn the ignition switch OFF.

Disconnect the ECM 33P (Gray) connector (page 4-42).

Turn the ignition switch ON while pushing and holding combination meter SEL button [1] and SET button [2] over 10 seconds.

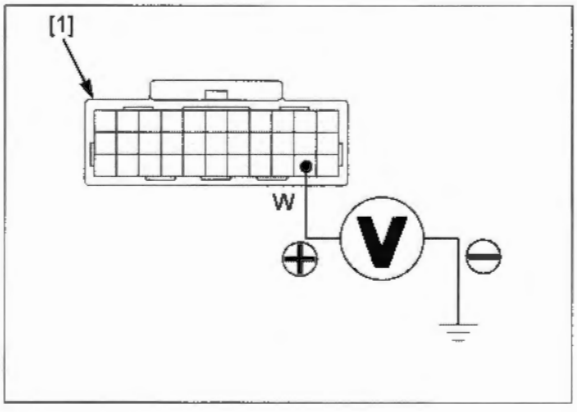


NOTE:

The combination meter enters the communication diagnostic mode.

Measure the voltage at the ECM 33P (Gray) connector [1] of the wire harness side and ground.

CONNECTION: White (+) – Ground (–)
STANDARD: 8 V or more (Every 5 seconds)



TOOL:
Test probe, 2 pack 07ZAJ-RDJA110

Does the standard voltage exist?

YES – GO TO STEP 3.

NO – Inspect the combination meter (page 21-7).

DIODE

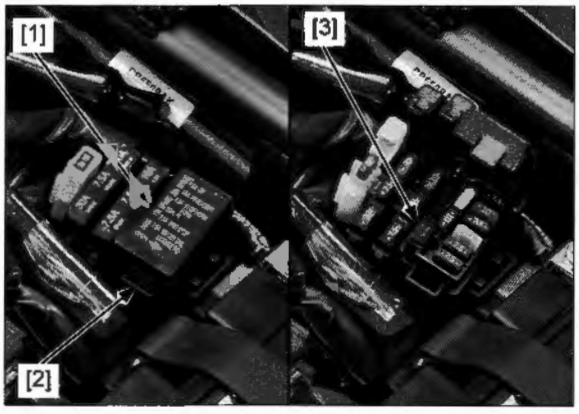
REMOVAL/INSTALLATION

NEUTRAL DIODE

Remove the main seat (page 2-11).

Open the cover [1] on the fuse box 1 by releasing the tab [2].

Remove the neutral diode [3].



CLUTCH DIODE

Remove the air cleaner housing (page 7-13).

Remove the rubber cap [1] and clutch diode [2].

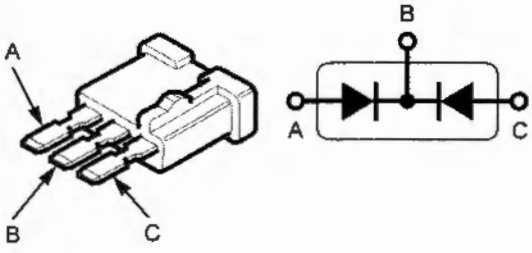
Installation is in the reverse order of removal.

INSPECTION

Check for continuity between the diode terminals. When there is continuity, a small resistance value will register.

If there is continuity in direction shown by the arrow, the diode is normal.

Neutral diode shown:

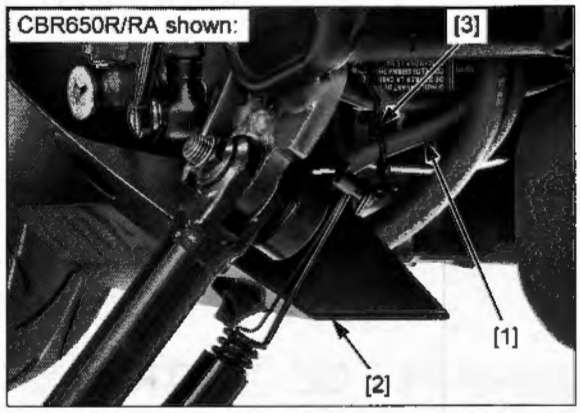


EVAP CANISTER (AC type)

REMOVAL/INSTALLATION

CBR650R/RA: Release the EVAP canister drain hose [1] from under cowl [2] and harness clip [3].

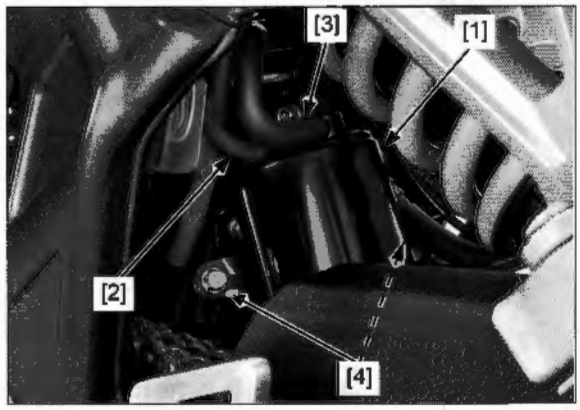
CB650R/RA: Release the EVAP canister drain hose from hose clamp and harness clip.



Disconnect the following from the EVAP canister [1]:

- Fuel tank-to-EVAP canister hose [2]
- Canister-to-EVAP purge control solenoid valve hose [3]

Remove the two mounting bolts [4] and EVAP canister.



Remove the heat guard [1] by releasing the tabs [2] from the grooves of the rubber mount [3].

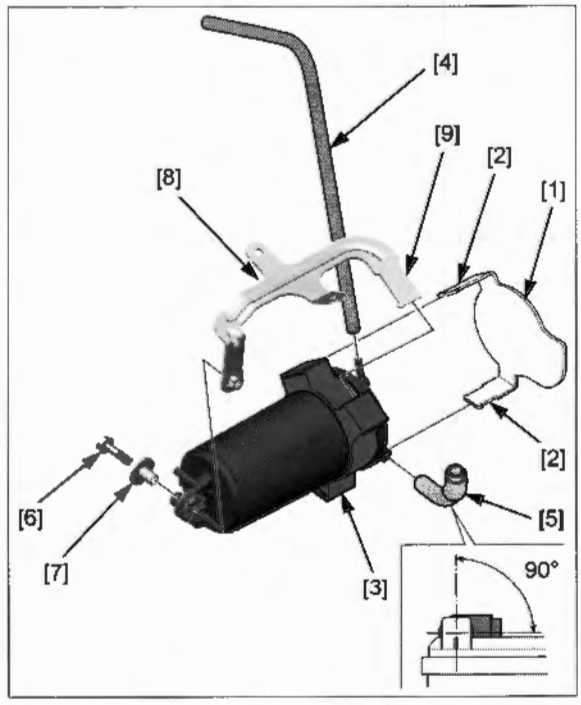
Disconnect the following:

- EVAP canister drain hose [4]
- EVAP canister breather hose [5]

Remove the bolt [6] and collar [7].

Remove the EVAP canister stay [8] by releasing the tab [9] from the groove of the rubber mount.

Installation is in the reverse order of removal.

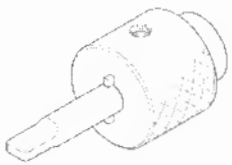
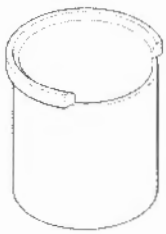
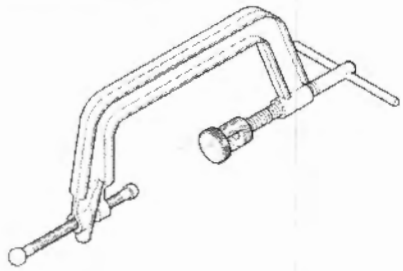
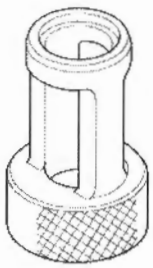
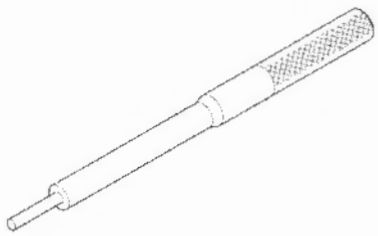
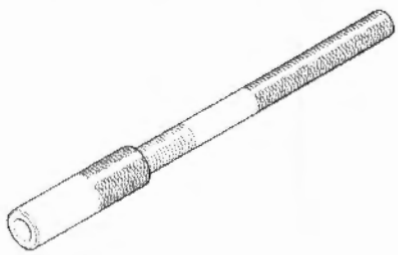
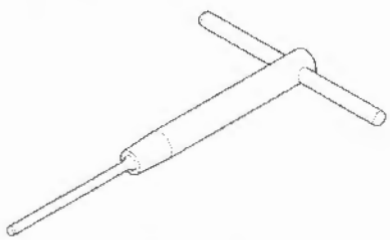


SERVICE INFORMATION

GENERAL

- This section covers service of the cylinder head, valves and camshafts.
- All the services covered in this section can be done with the engine installed in the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshafts lubricating oil is fed through oil passages in the cylinder head and camshaft holder. Clean the oil passages before assembling them.
- Be careful not to damage the mating surfaces when removing the cylinder head cover and cylinder head.

TOOLS

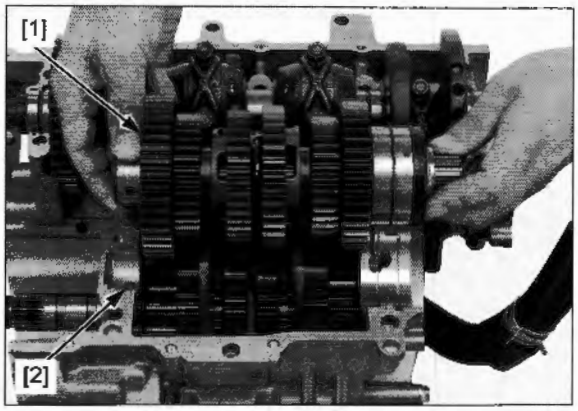
Tensioner stopper 070MG-0010100  or 07AMG-001A100 (U.S.A. only)	Tappet hole Protector 07HMG-MR70002  (Not available in U.S.A.)	Valve spring compressor 07757-0010000 
Valve spring compressor attachment 07959-KM30101 	Valve guide driver, 4.5 mm 07HMD-ML00101 	Valve guide adjusting driver 07743-0020000  (Not available in U.S.A.)
Valve guide reamer, 4.5 mm 07HMH-ML00101  or 07HMH-ML0010B (U.S.A. only)	Cutter holder, 4.5 mm 07781-0010600  or equivalent commercially available in U.S.A.	Seat cutter, 27.5 mm (IN, 45°) 07780-0010200  or equivalent commercially available in U.S.A.

TRANSMISSION

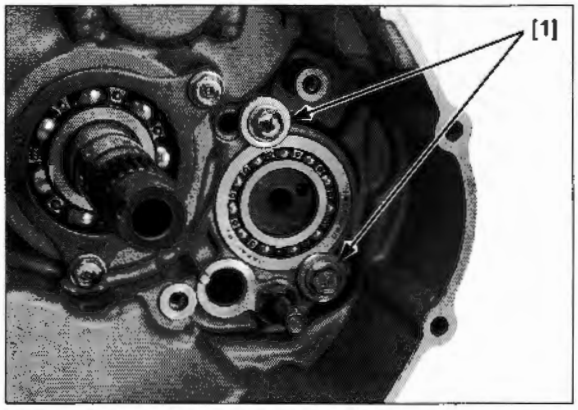
REMOVAL

Separate the crankcase halves (page 13-5).

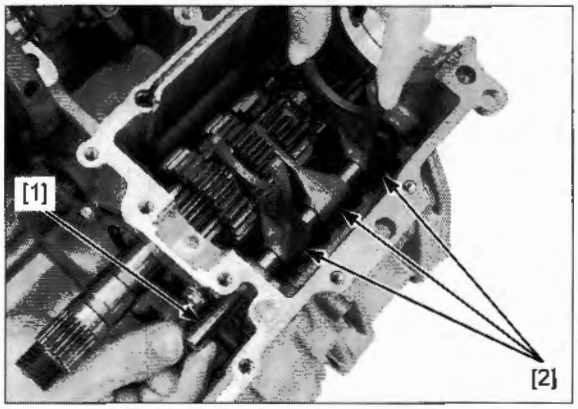
Remove the countershaft assembly [1] and dowel pin [2].



Remove the shift drum bearing setting washer-bolts [1].

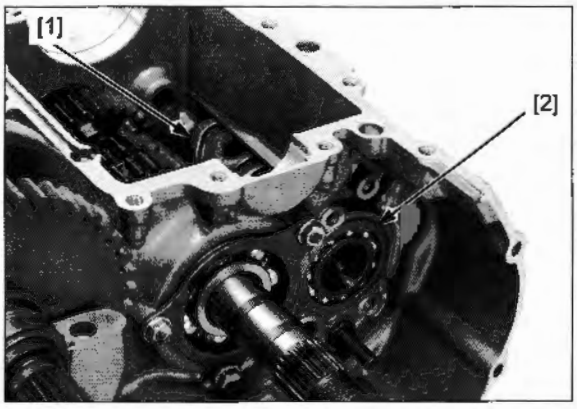


Remove the shift fork shaft [1] and shift forks [2].

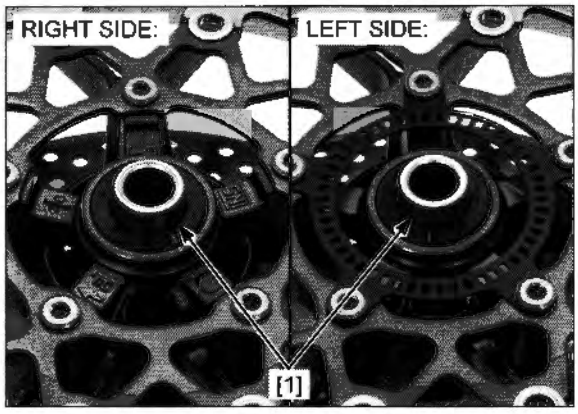


Remove the shift drum [1]/bearing [2] assembly.

Remove the shift drum bearing from the shift drum.



Remove the right and left side collars [1].



INSPECTION

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Replace the bearings if they do not turn smoothly, quietly, or if they fit loosely in the hub.

Inspect the following parts for damage, abnormal wear, deformation or bend.

- Front axle
- Front wheel

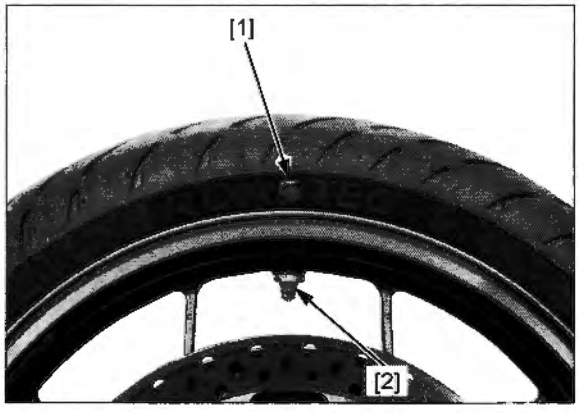
Measure each part according to FRONT WHEEL/ SUSPENSION/STEERING SPECIFICATIONS (page 1-8).

Replace any part if it is out of service limit.

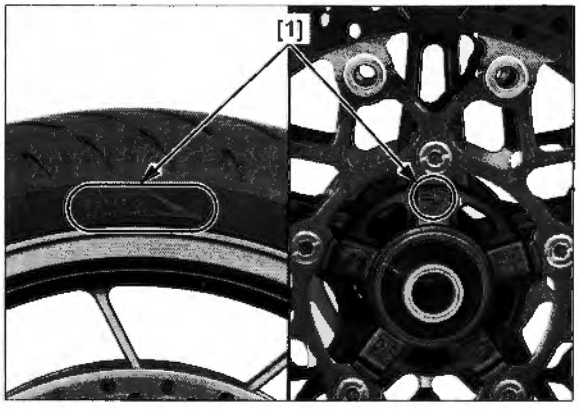
WHEEL BALANCE

NOTE:

- Wheel balance directly affects the stability, handling and overall safety of the motorcycle. Always check balance whenever the tire has been removed from the rim.
- For optimum balance, the tire balance mark [1] (a paint dot on the side wall) must be located next to the valve stem [2]. Remount the tire if necessary.



Note the rotating direction (arrow) marks [1] on the tire and wheel upon tire mounting. Always mount the tire onto the wheel with the marks facing in the same direction.



If it is necessary to disassemble the fork leg, perform the following procedure:

Keep the master cylinder reserve tank upright to prevent air from entering the hydraulic system.

– Remove the handlebar (page 16-11)
– Loosen the pinch bolt of the top bridge (page 16-25)

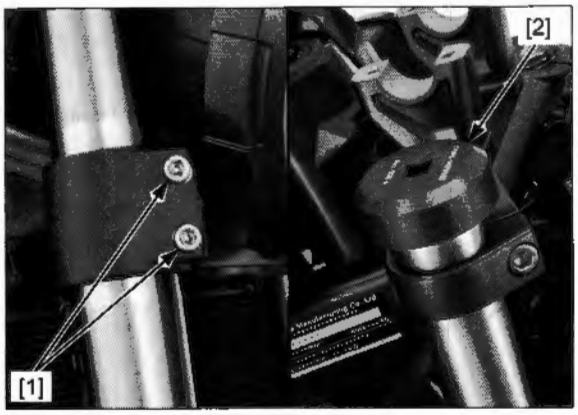
While holding the fork leg, loosen the bottom bridge pinch bolts [1]. Lift up the fork leg and tighten the pinch bolts.

Take care not to scratch the cap head.

Loosen the fork cap, but do not remove it yet.

TOOL:

[2] Fork cap wrench	**070MA-MGP0100 or 07AMA-MGPA100 (U.S.A. only)**



INSTALLATION (CB650R/RA)

When the fork is disassembled:

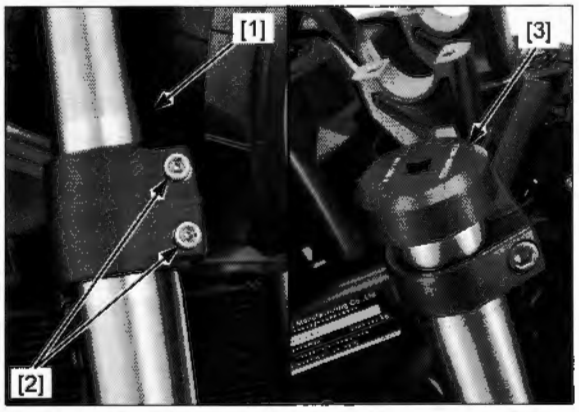
Insert the fork leg [1] into the bottom bridge, top bridge and temporarily tighten the pinch bolt [2].

Tighten the fork cap to the specified torque using the special tools.

TOOL:

[3] Fork cap wrench	**070MA-MGP0100 or 07AMA-MGPA100 (U.S.A. only)**

TORQUE: 35 N·m (3.6 kgf·m, 26 lbf·ft)



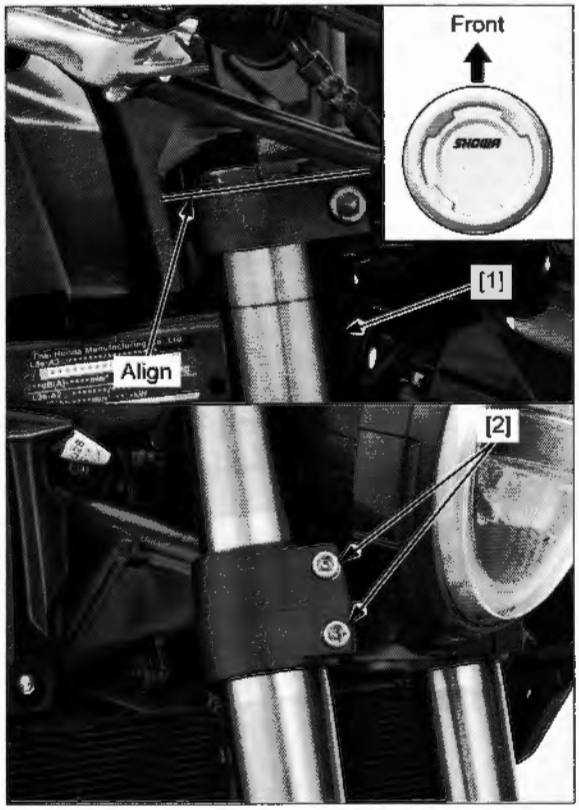
Route the wires, cables and hose properly (page 1-22).

Install the fork leg into the bottom bridge and top bridge.

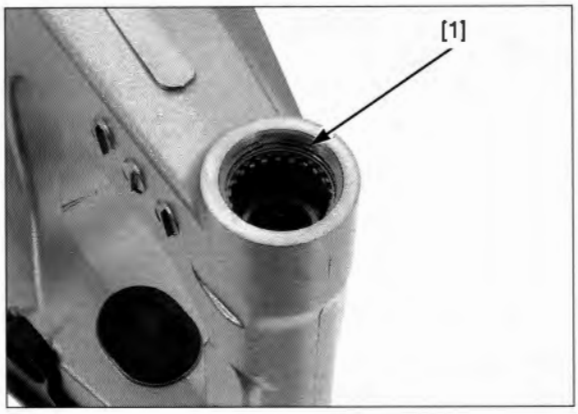
Align the top end of the fork pipe [1] with the upper surface of the top bridge as shown.

Tighten the bottom bridge pinch bolts [2] to the specified torque.

TORQUE: 27 N·m (2.8 kgf·m, 20 lbf·ft)



Install the snap ring [1] into the right pivot groove securely.



NOTE:

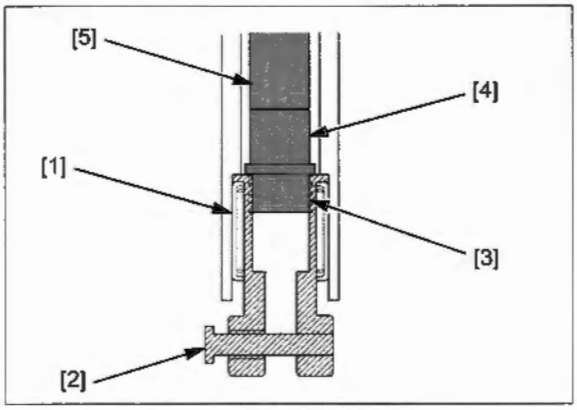
- Do not reuse worm snap ring which could easily spin in the groove.
- Make sure that the snap ring is firmly seated in the groove.

LEFT SIDE

Press the needle bearing [1] out of the swingarm using the special tools.

TOOLS:

[2] Remover attachment, 28 mm	**07HMC-MR70100**
[3] Pilot 17 mm	**07746-0040400**
[4] Attachment, 22 x 24 mm	**07746-0010800**
[5] Driver, 15 x 280L	**07949-3710001**



Apply molybdenum disulfide grease to the rotating area of a new needle bearing [1].

Carefully press the bearing in the left pivot with the marked side facing up until the depth from the pivot end surface is 4.5 – 5.0 mm (0.18 – 0.20 in), using the special tools.

TOOLS:

[2] Driver	**07749-0010000**
[3] Attachment, 37 mm	**07ZMD-MBW0200**
[4] Pilot, 28 mm	**07746-0041100 or 07JAD-PH80400**