CJ650B

ENGINE SERVICE AND ASSEMBLY MANUAL

(MT283-F)

14.1 14.1 Engine Special Tool

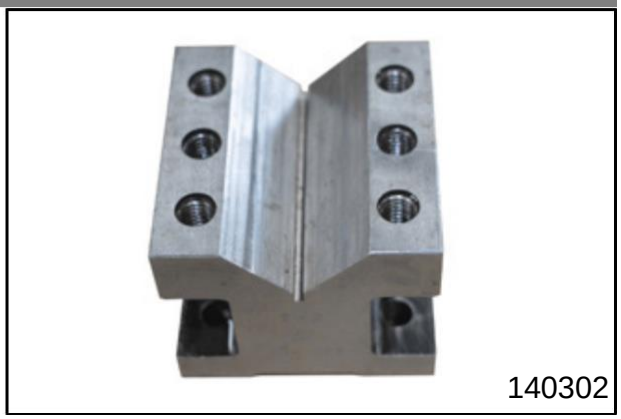
Magneto rotor removing tool (to remove magneto rotor)

0700-031000-922-00


140301

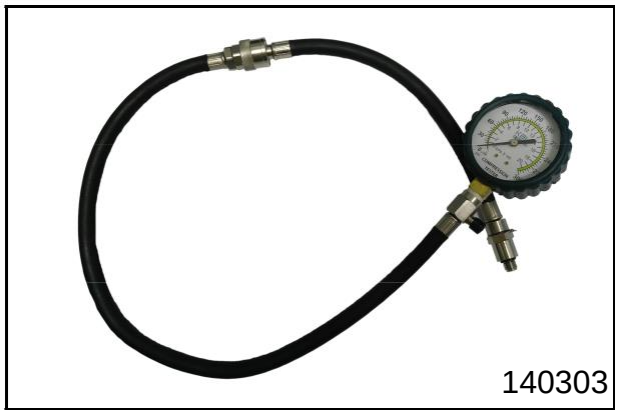
V-block

0800-060000-923-001


140302

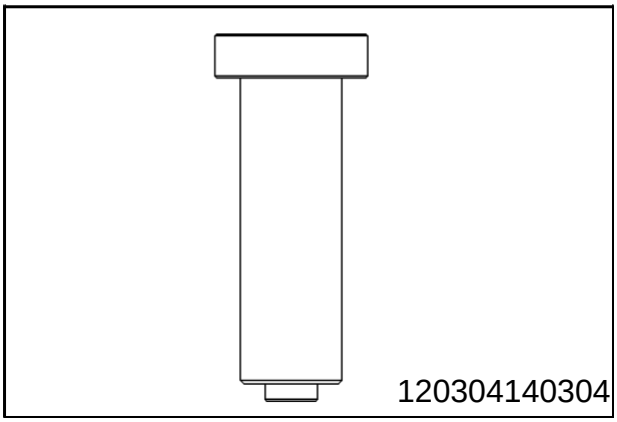
Cylinder pressure gauge and connecting seat

Cylinder pressure standard: 0-2MPa


140303

Water seal ring installing tool (puncher pin)

0700-080000-923-002


120304140304

Piston pin circlip installing tool (to install piston pin circlip)

0800-040005-922-001


140401

Feeler gauge (to measure the valve clearance)


140402

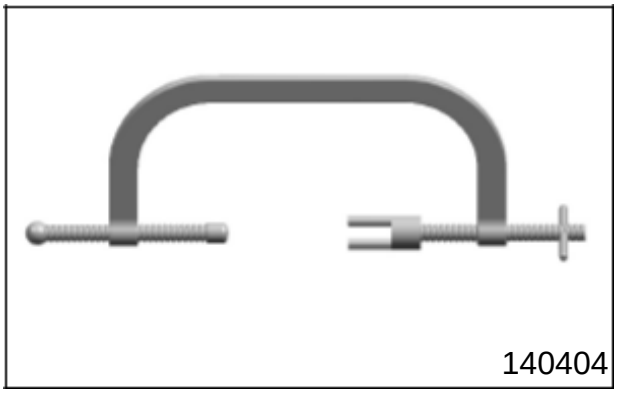
Spark plug sleeve

0700-170200-923-001


140403

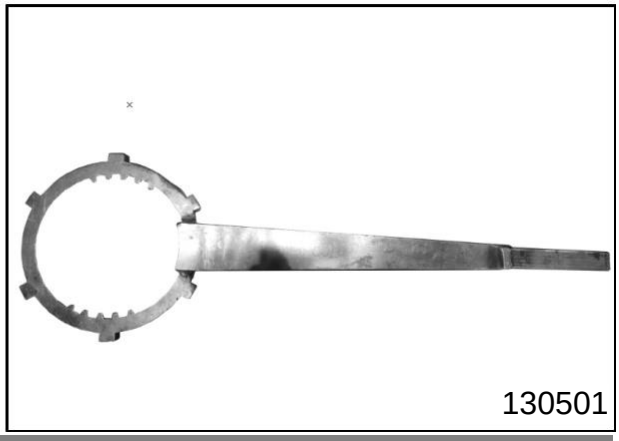
Valve spring compressing tool

CF188-022006-922-001


140404

Clutch stopping wrench (to remove/install clutch nuts, crankshaft RH nuts)

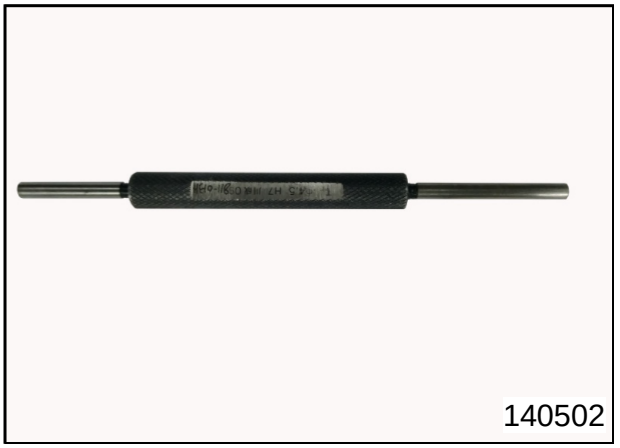
0700-051000-922-001



130501

Valve pipe guide shaft

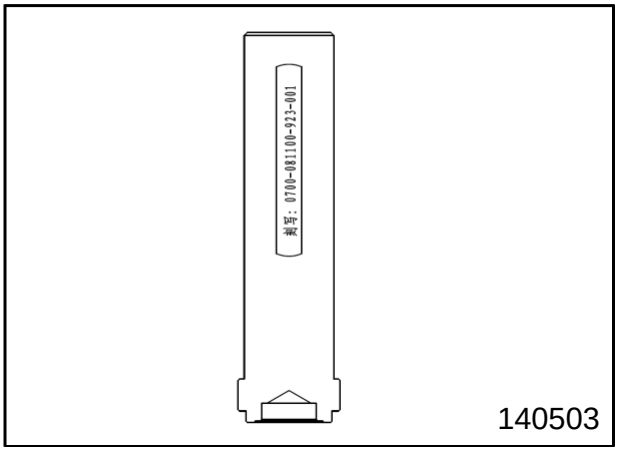
φ4.5



140502

Water pump oil seal puncher

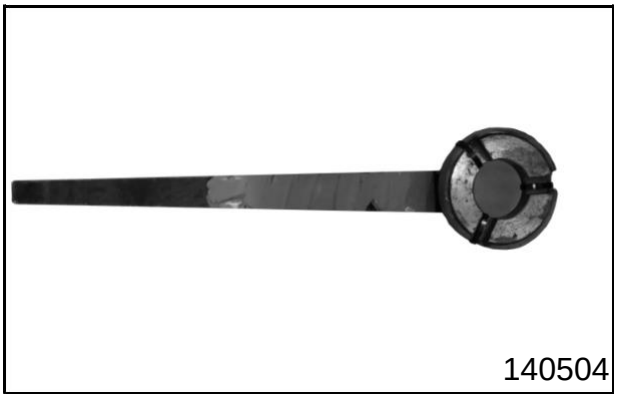
0700-081100-923-001



140503

Magneto rotor stopping wrench

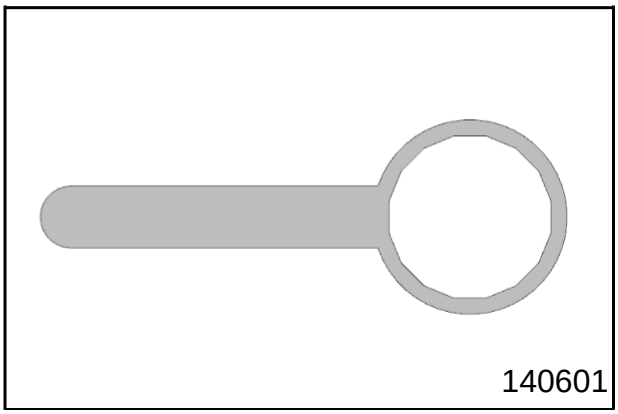
0700-031000-922-001



140504

Oil filter wrench

0700-070200-922-001



140601

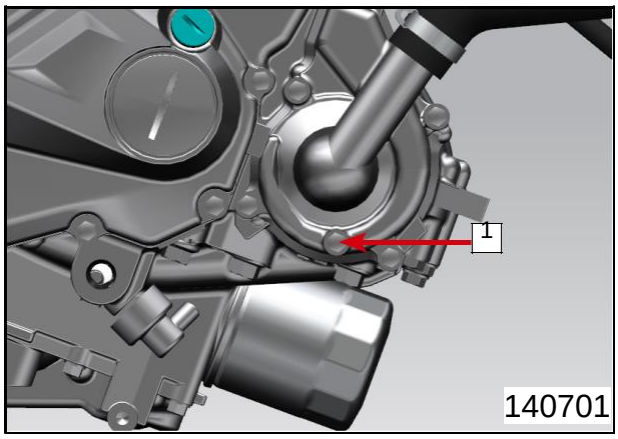
14.2 Engine Removal

Remove muffler.
Remove electrical connectors on engine.
Remove reservoir LH&RH outer protection plates.
Remove reservoir LH&RH inner protection plates.
Remove LH&RH panels.
Remove engine guards assy.
Remove frame LH&RH protection plates.

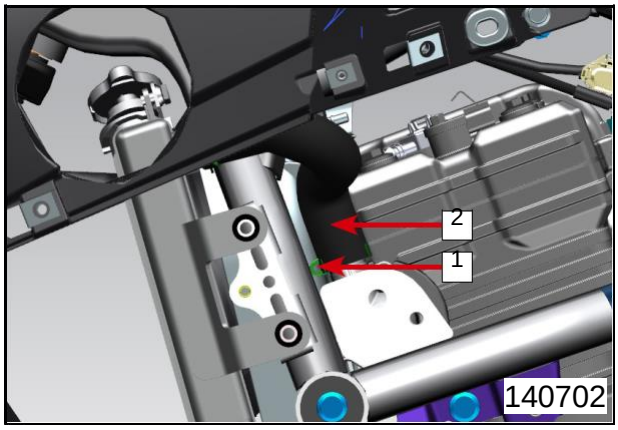
⚠ Note: Remove the engine until it cools down or wear protection clothes to avoid burnt injury.

14.2.1 Engine Inlet&Outlet Water Pipe Removal

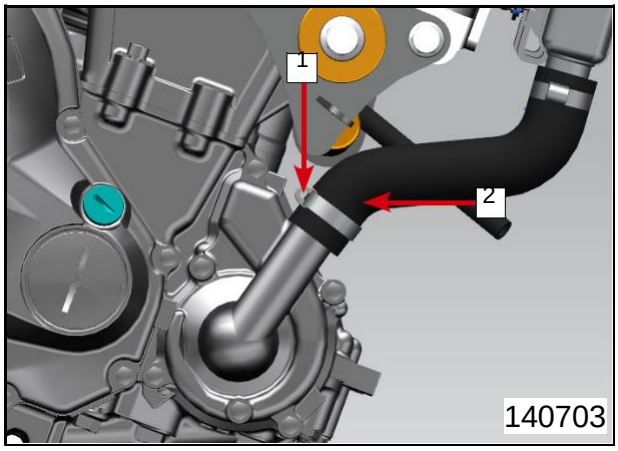
Open reservoir cap.
Straighten the vehicle. Place a pan under the engine to store the drained coolant.
Remove M6 bolt [1] and washer to drain the coolant.



Loose clamp [1].
Pull out inlet pipe [2] from the engine with caliper.

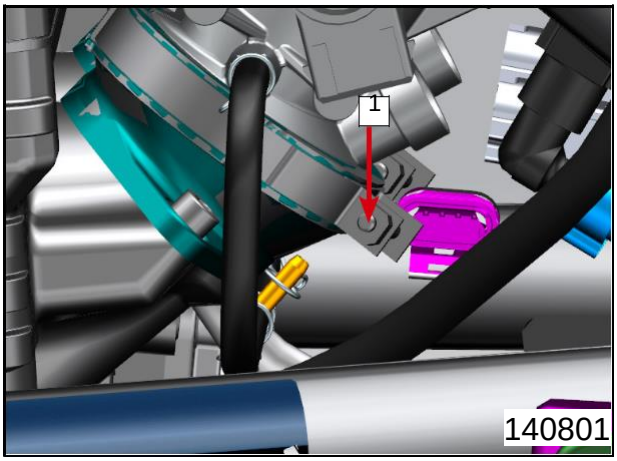


Loose clamp [1].
Pull out outlet pipe [2] from the engine with caliper.

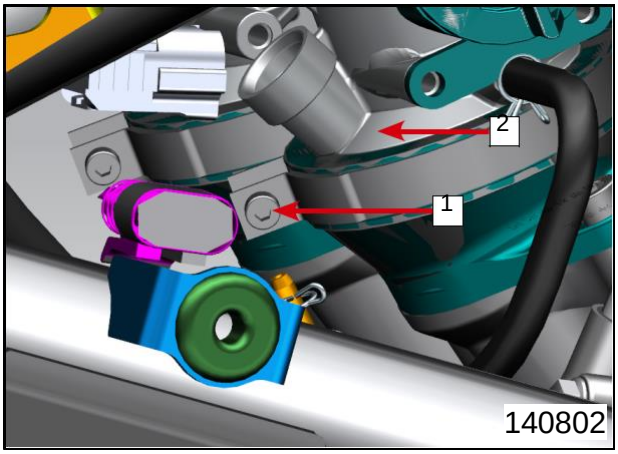


14.2.2 Air Filter Loose

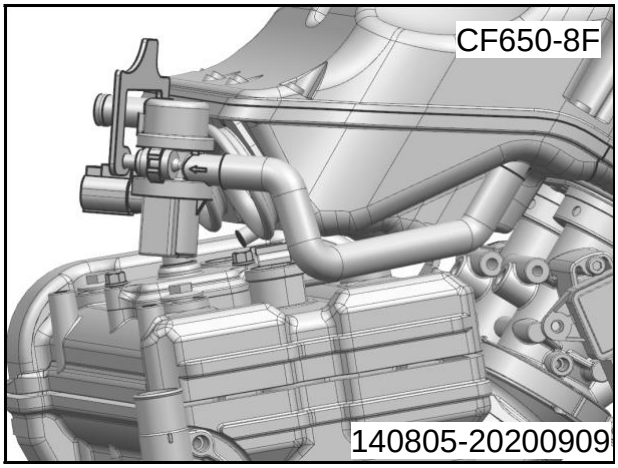
Loose clamp [1].



Loose clamp [1].
Shake throttle valve body [2] until it looses.
Remove air filter.



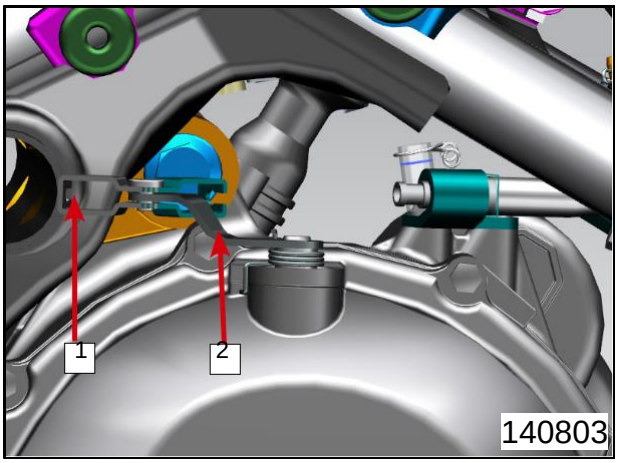
Remove AIS valve and air inlet and outlet pipes;
Remove air filter.



14.2.3 Clutch Cable Removal

Use tool to rotate clutch rod [2].

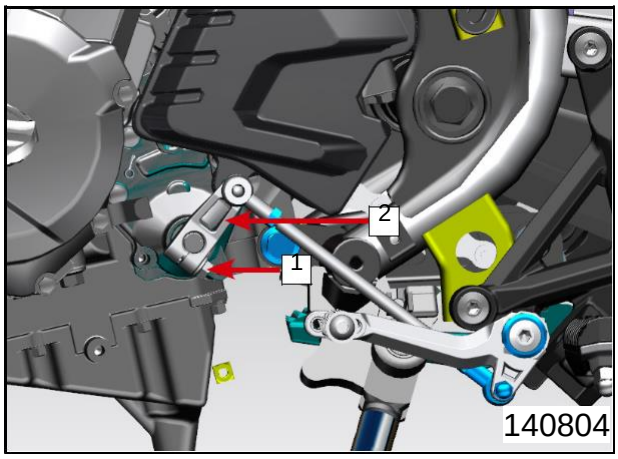
Remove clutch cable [1].



14.2.4 Gearshift Lever Assy

Removal Remove M6 bolt [1].

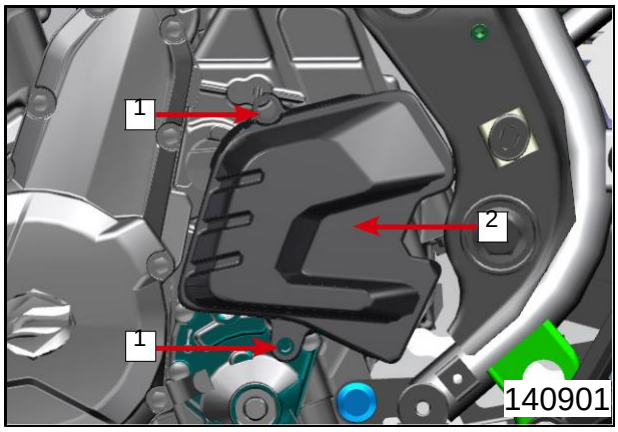
Remove gearshift lever assy [2].



14.2.5 Sprocket Removal

Remove M6 bolt [1].

Remove engine LH rear cover [2].

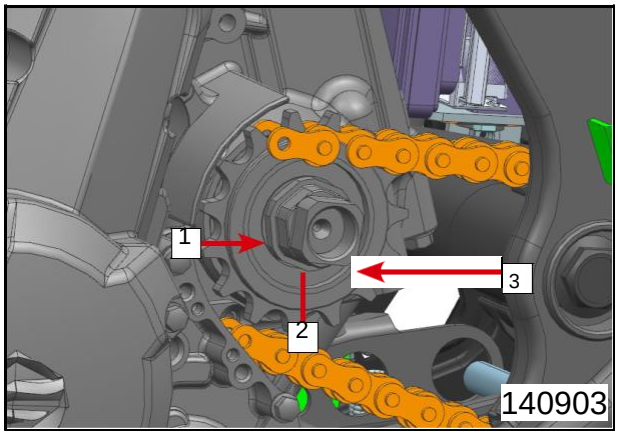


Knock and straighten the flanging of retainer [1].

Remove counter pulse M20 nut [2].

Remove retainer [1].

Remove output sprocket [3].



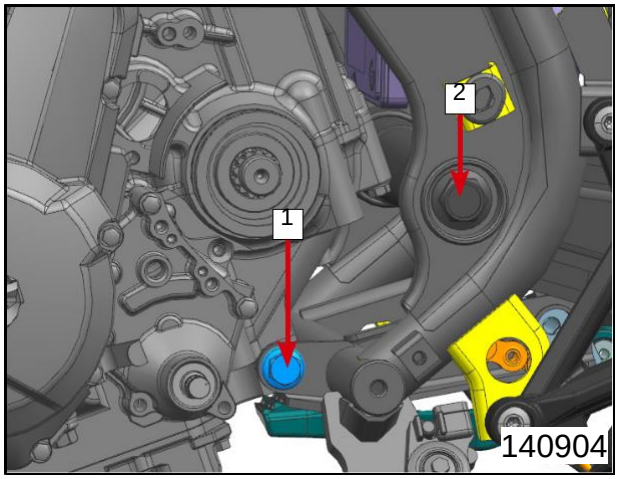
14.2.6 Engine Assy Removal

Place the jack with soft cushion under the engine to support it.

Remove M10 nut [1] and bolt.

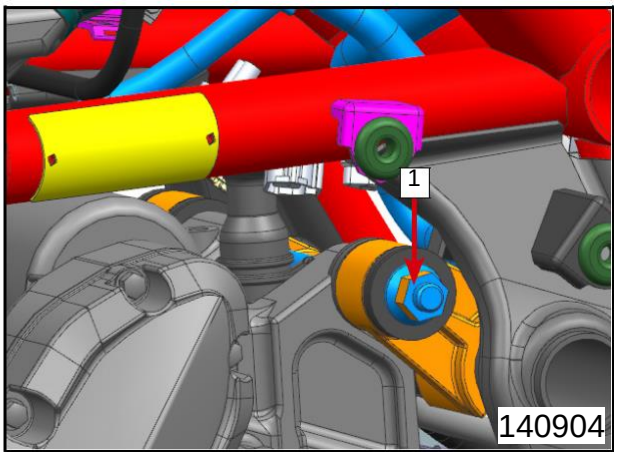
Remove M20 nut [2] and bolt.

Note: Fix the other side with wrench during removal.



Remove M10 nut [1] and bolt.

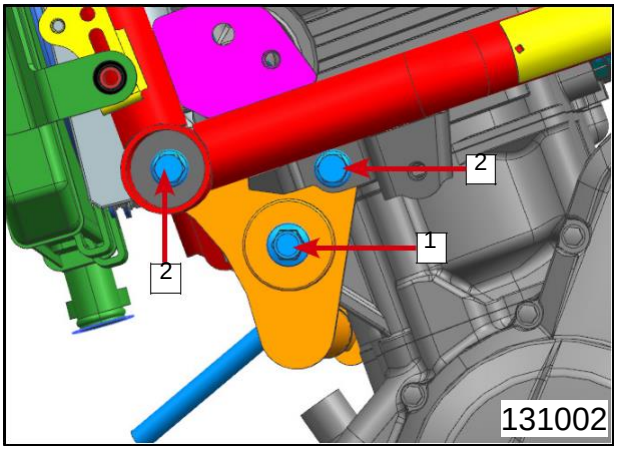
Note: Fix the other side with wrench during removal.



Remove M10 bolt [1] and nut.

Remove M8 bolts [2].

Note: Fix the other side with wrench during removal.



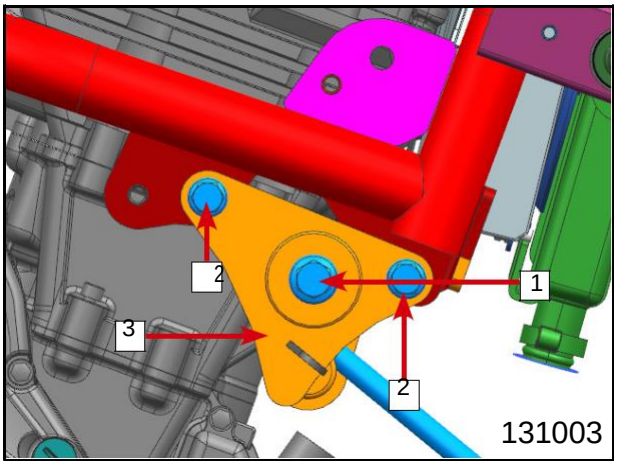
Remove M10 bolt [1] and nut.

Remove M8 bolts [2].

Remove engine front mounting bracket assy [3].

Shake the engine and decline the jack slowly to remove the engine.

Note: Fix the other side with wrench during removal.

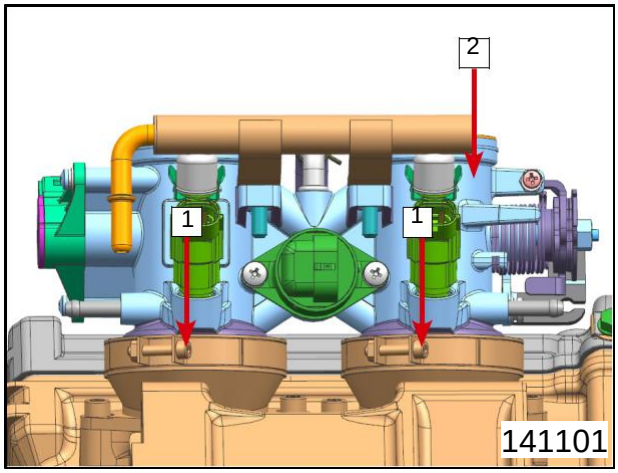


14.3 Engine Air Intake System

14.3.1 Throttle Valve Assy Disassembly Air Filter Assy Removal (refer to Air Filter chapter)

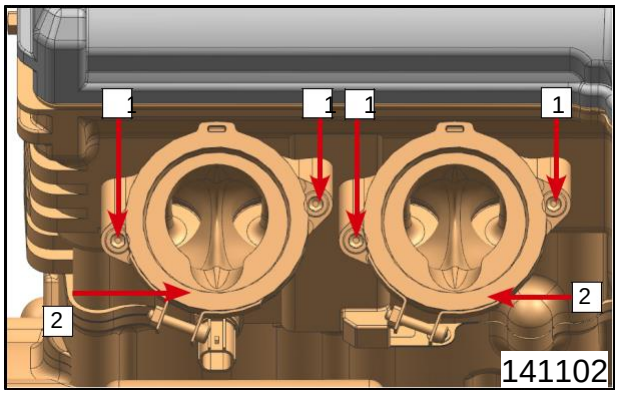
Loose clamps [1].

Remove throttle valve assy [2].



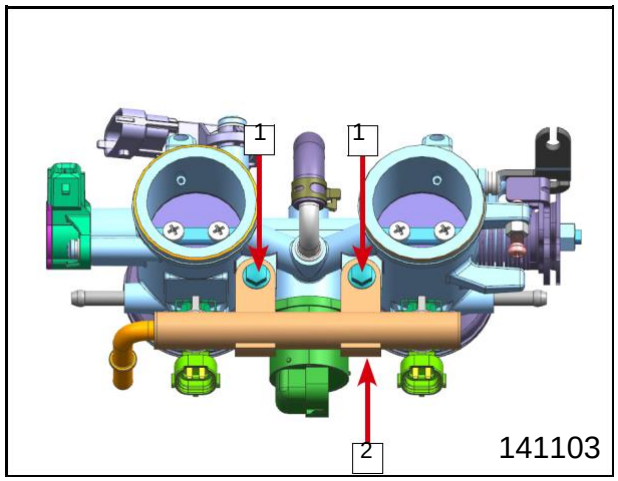
Remove M6 inner hex screws [1].

Remove air intake pipes [2].



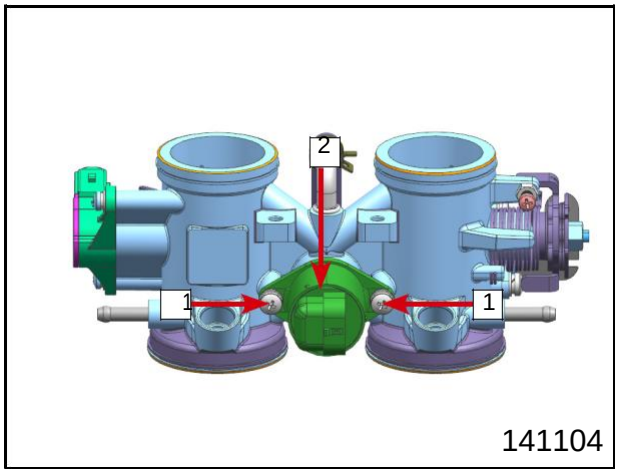
Remove M6 bolts [1].

Remove fuel rail assy [2].



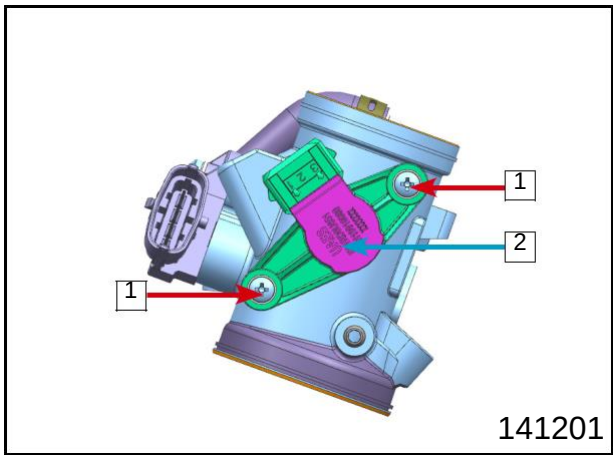
Remove screws [1].

Remove idle stepping motor [2].



Remove screws [1].

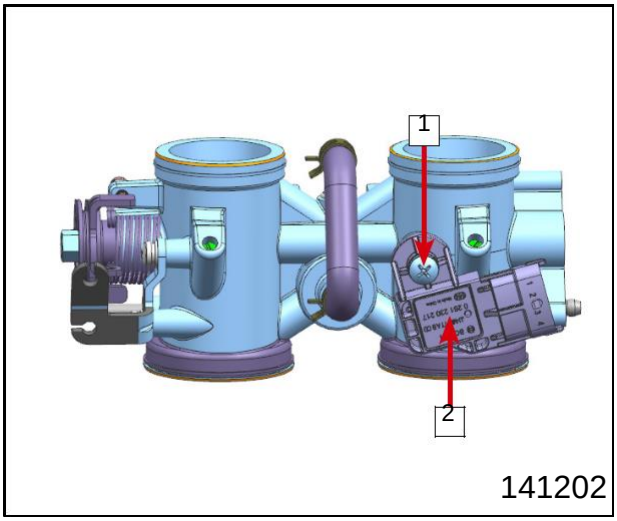
Remove TPS [2].



141201

Remove screw [1].

Remove T-MAP [2].



141202

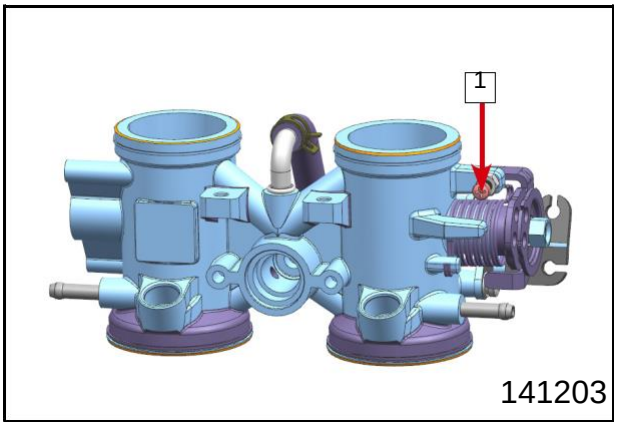
14.3.2 Throttle Valve Assy Inspection

14.3.2.1 Throttle Valve Body

Inspect throttle valve body for crack or damage. Replace if it does.

Inspect electrical parts (refer to the Inspection section of Electrical System chapter).

Note: It is not allowed to remove the idle position screw [1].



141203

14.3.2.2 Fuel Rail

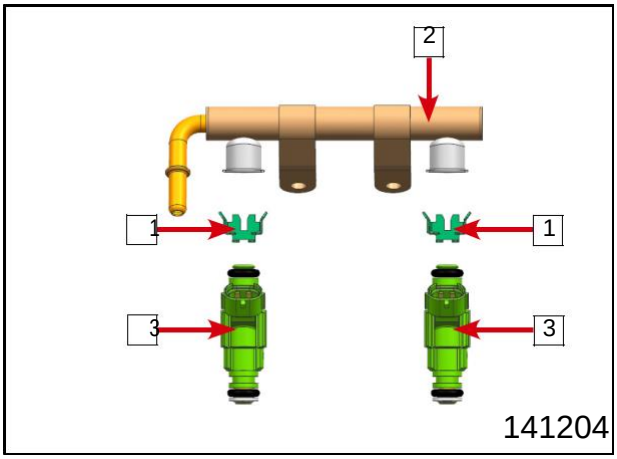
Assy Disassembly

Push both sides of injector spring [1] with thumbs to remove the spring [1]. Remove fuel injector caps [2].

Details refer to Electrical System.

Assembly

Install injector [3] on injector caps [2]. Then install injector cap spring [1]. Make sure the edge of the injector cap [2] clip into the groove of the spring [1].



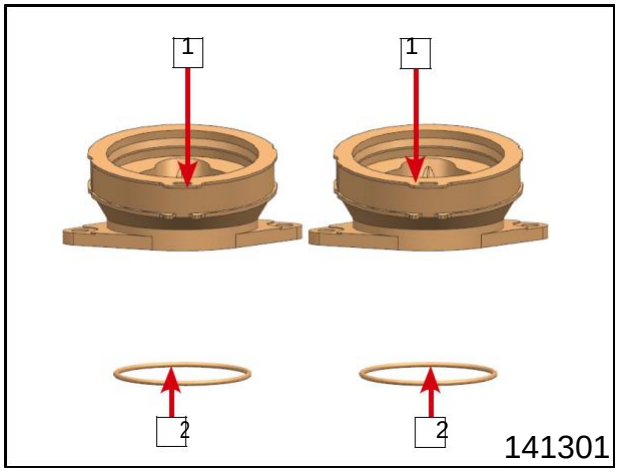
141204

Idle stepping motor, TPS and T-MAP inspection refer to Electrical System chapter.

14.3.2.3 Air Intake Pipe Inspection

Inspect air intake pipes [1] for cracks or damage. Replace if they do.

Inspect rubber seal rings [2] for cracks, hardening or damage. Replace if they do.

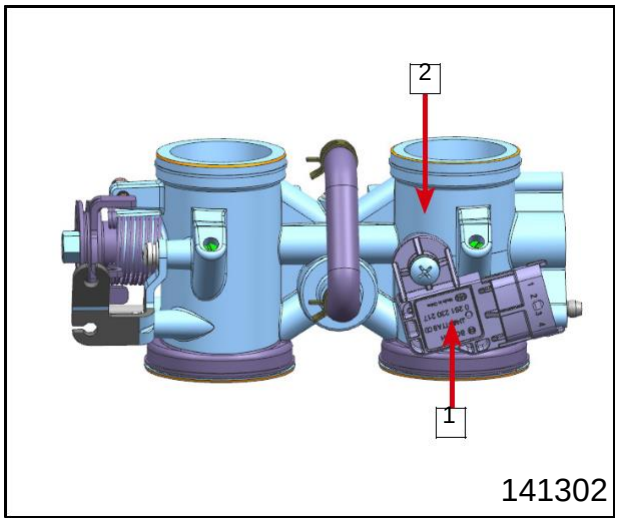


141301

14.3.3 Throttle Valve Assy Assembly

Install T-MAP [1].

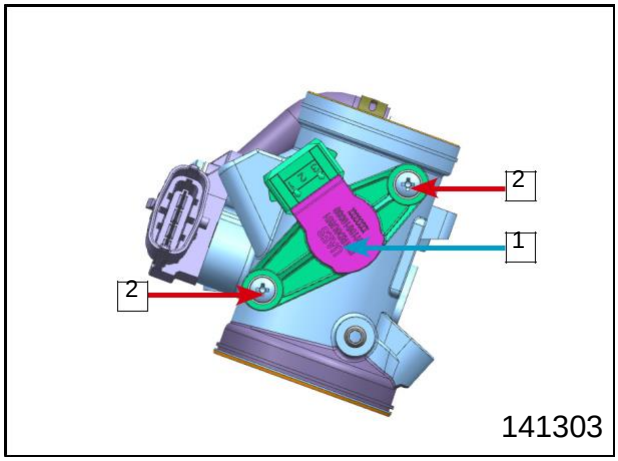
Install screw [2].



141302

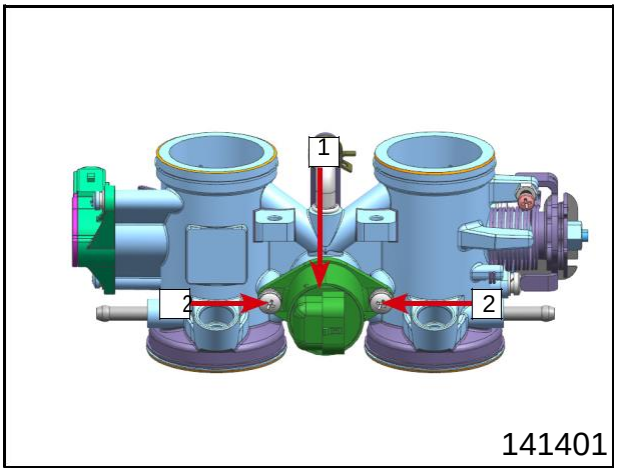
Install TPS [1].

Install screws [2].



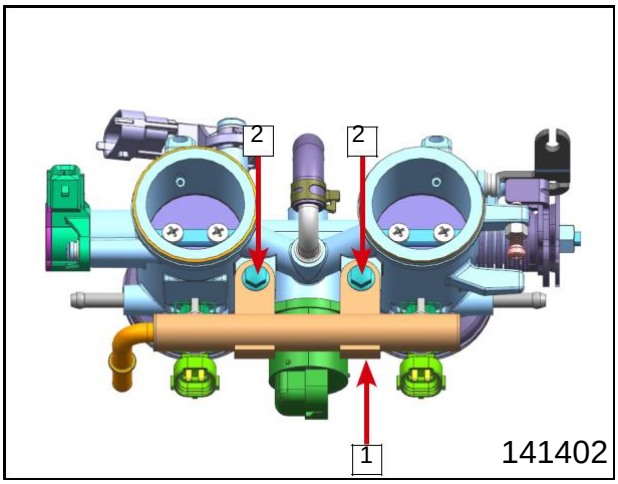
141303

Install idle stepping motor [1].
Install screws [2].



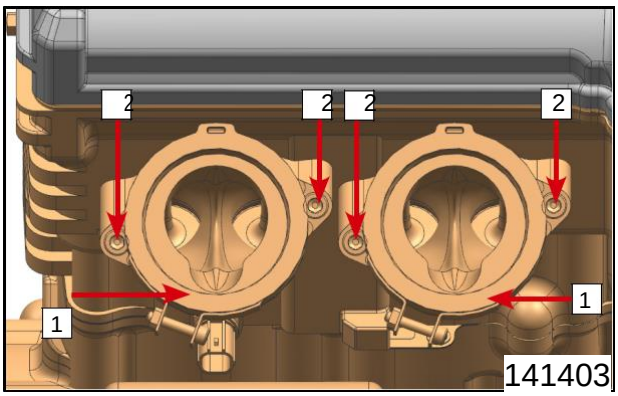
141401

Install fuel rail assy [1].
Install M6 bolts [2].



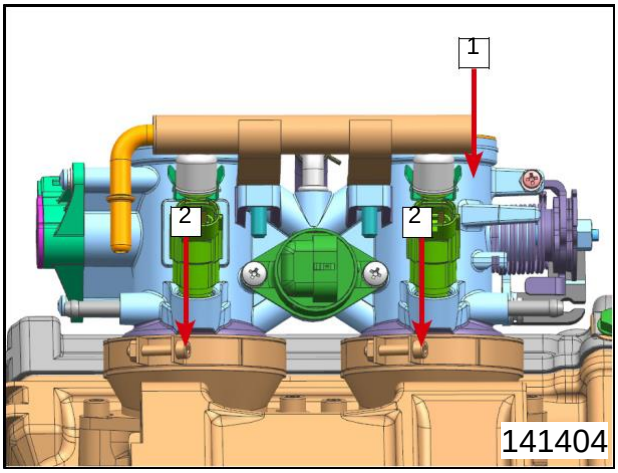
141402

Install air intake pipes assy [1].
Install M6 inner hex screws [2].



141403

Install throttle valve assy [1].
Tighten clamps [2].



141404

14.4 Engine Disassembly

Put the engine on operating bench and fix it.

⚠Warning: Fix the engine firmly on the bench, in case it falls down to cause injury or engine damage.

⚠ Warning: Disassemble the engine when the engine is cool. Otherwise, wear protective clothes in case of getting burnt.

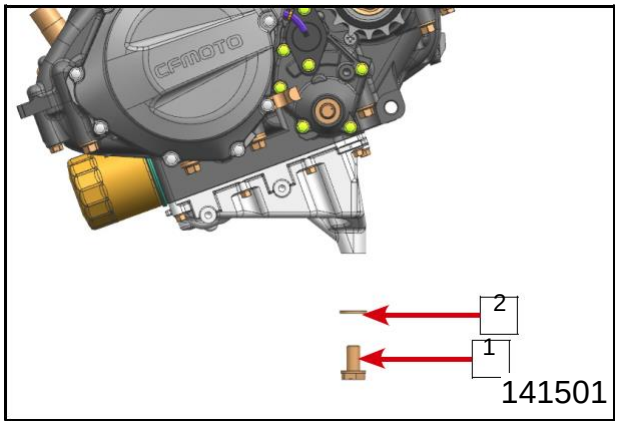
14.4.1 Engine Oil Drain

Place a pan under the engine to store the engine oil from the engine.

Remove M12×22 drain bolt [1].

Remove washer 12 [2].

Drain the engine oil.

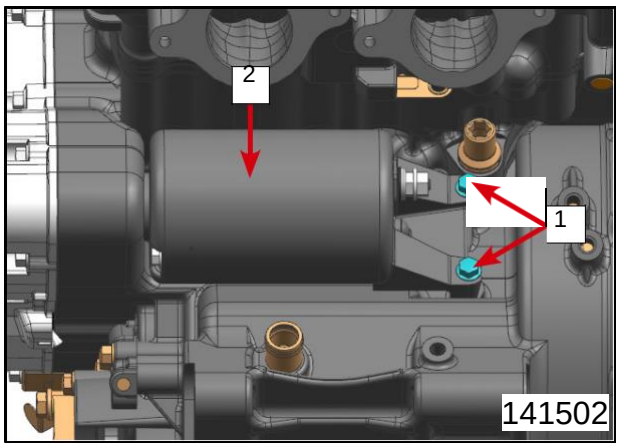


14.4.2 Starter Motor Removal

Remove M6 bolts [1].

Shake the starter motor [2] to remove it.

If it is too tight, knock the motor gently with hammer to loose. Do not knock it very hard.

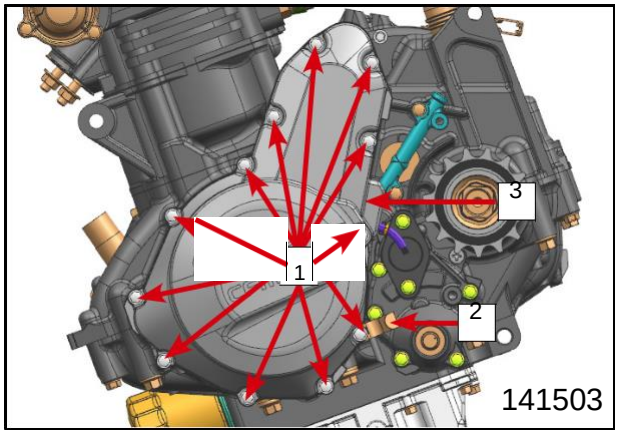


14.4.3 Magneto Rotor Removal

Remove M6 bolts [1].

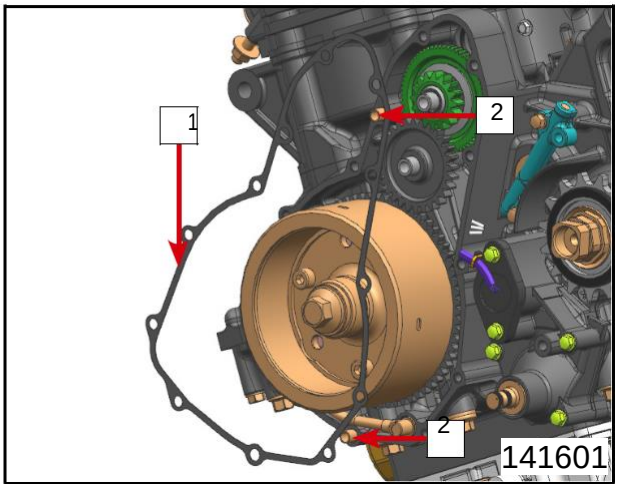
Remove cable clip [2].

Remove LH front cover [3].

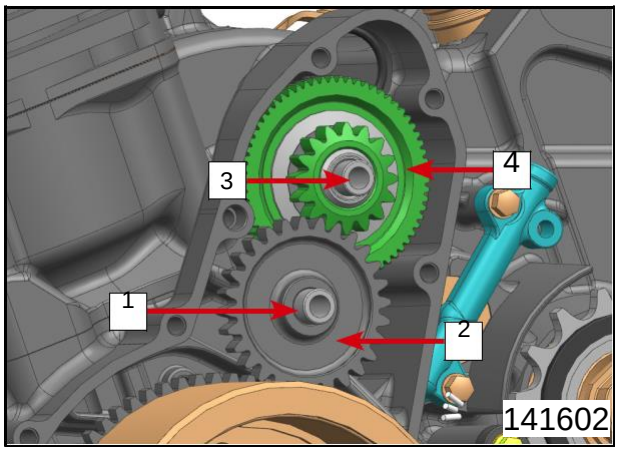


Remove seal gasket [1].
Remove dowel pins [2].

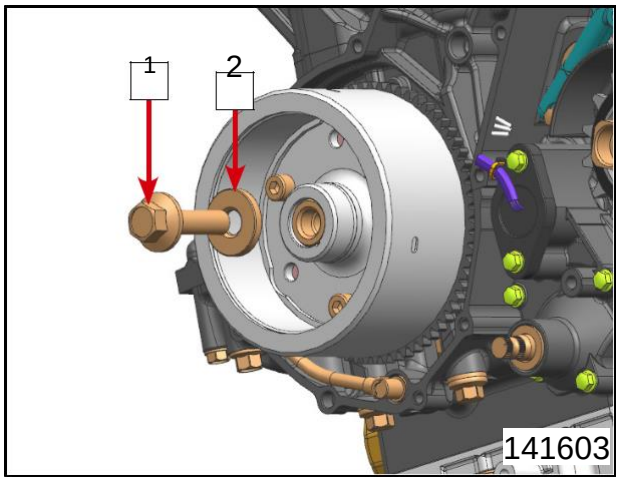
⚠ Note: Pay attention there are dowel pins [2] in case of getting lost. Dowel pins [2] may be on the LH front cover when removing it.



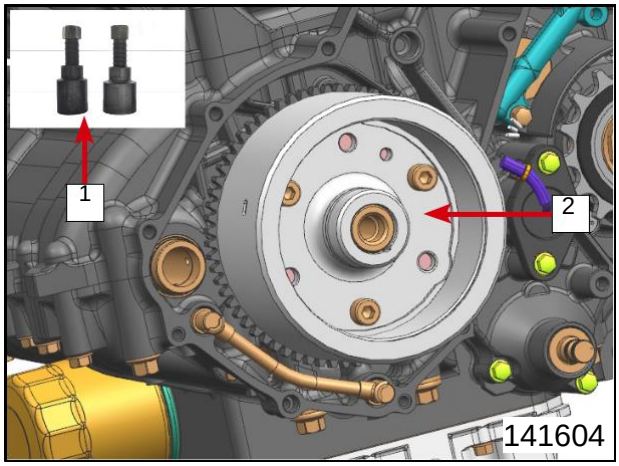
Remove middle gear shaft [1].
Remove starter middle gear [2].
Remove middle gear shaft [3].
Remove dual gear assy [4].



Remove M12 bolt [1].
Remove washer [2].



Use special tool: magneto rotator removing tool [1] to remove the magneto rotor [2].

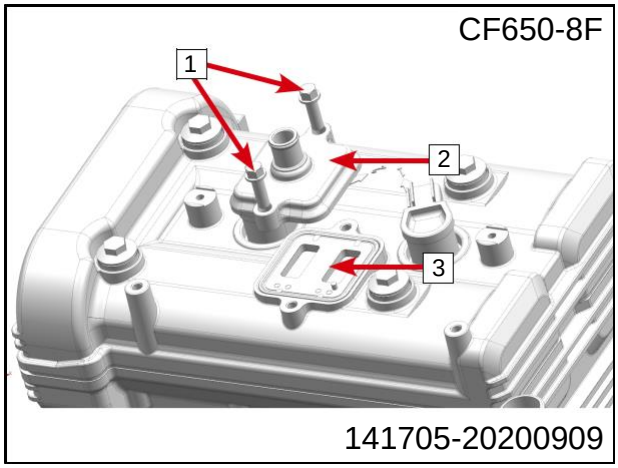


14.4.4 Ignition Coil and Spark Plug Removal

Remove bolts 1

Remove spring valve cover 2;

Remove spring valve assy 3.

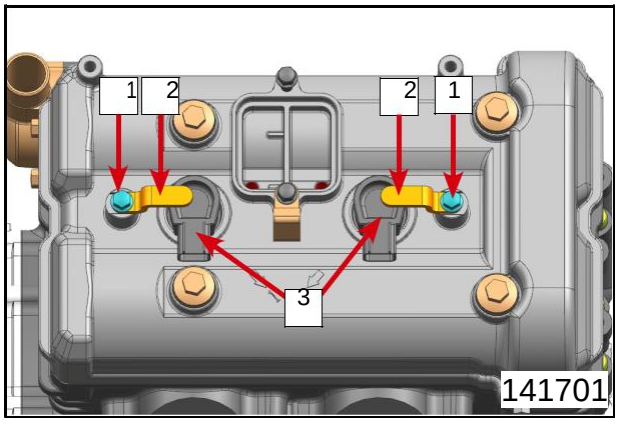


Remove M6 bolts 1.

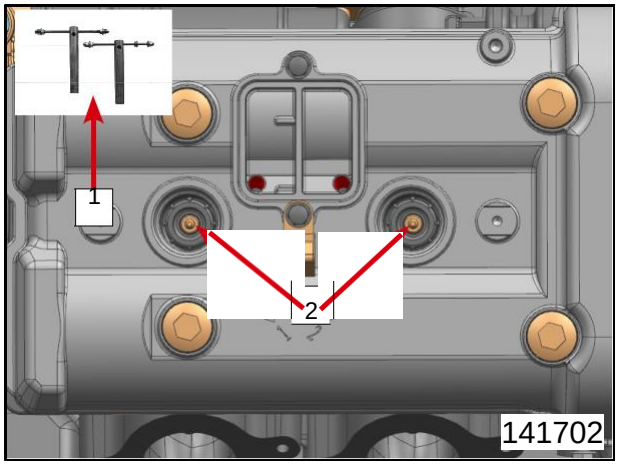
Remove press plate 2.

Rotate the ignition coil 1 counter clockwise until it gets loose.

Pull out ignition coil 1.

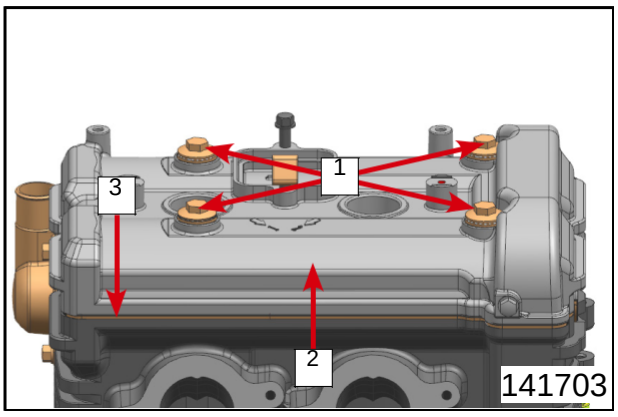


Use special tool: spark plug sleeve 1 to remove spark plug 2.



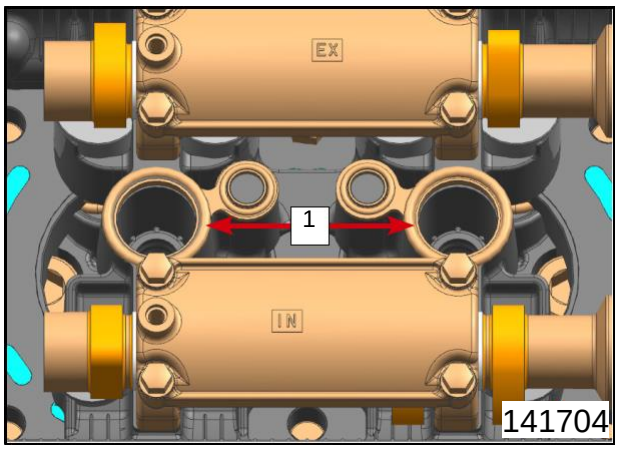
14.4.5 Cylinder Head Cover Removal

Remove cylinder head cover M6 bolts and seal rings [1].
Remove cylinder head cover [2].
Remove cylinder head cover seal gasket [3].

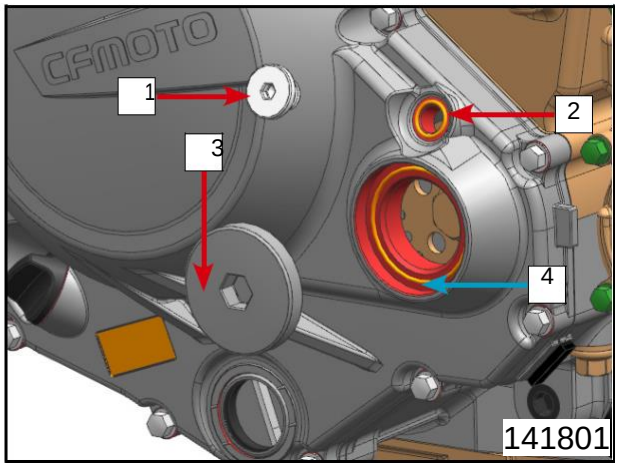


Note: After cylinder head cover removal, the seal gasket may remain on the cover. If the gasket is not broken, it is not necessary to remove it.

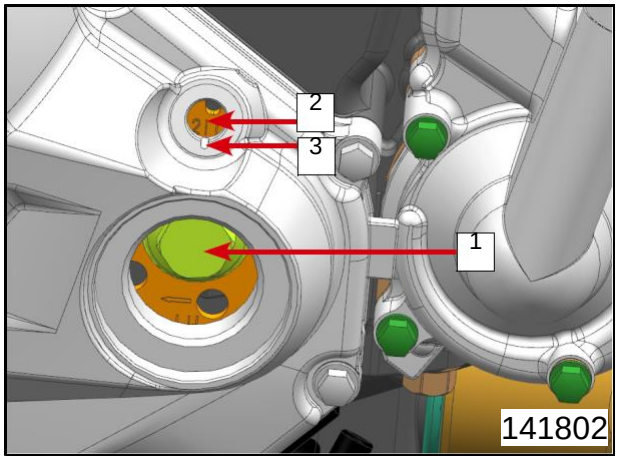
Remove spark plug hole seal ring [1].



Remove timing inspection hole cap [1].
Remove o-ring [2].
Remove oil filter cover [3].
Remove o-ring [4].

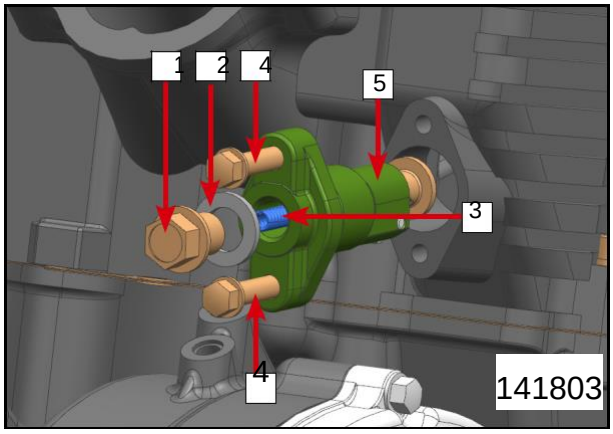


Find a proper sleeve to install on M8 bolt [1]. Rotate it clockwise until X/T mark [2] is aligned with the timing inspection mark [3] on RH side cover.



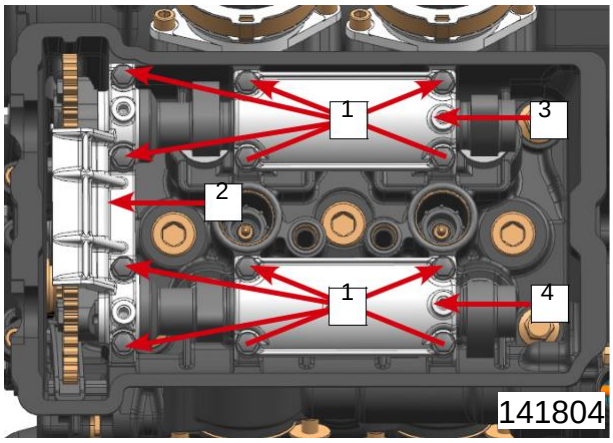
14.4.6 Tensioner Removal

Remove M11 spring seat bolt [1].
Remove washer [2].
Remove tensioner spring [3].
Remove M6X14 bolt [4].
Remove tensioner [5].



14.4.7 Camshaft Removal

Remove M6 bolt [1].
Remove camshaft plate [2].
Remove air inlet camshaft seat [3].
Remove air exhaust camshaft seat [4].

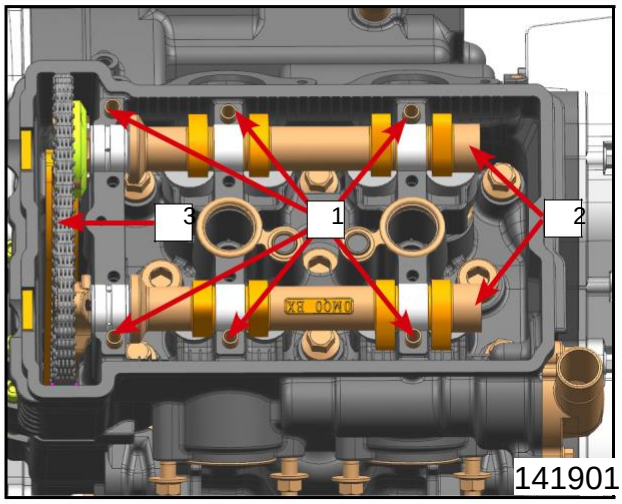


Note: Pay attention to dowel pins in case of getting lost when removing camshaft plate, air inlet&exhaust camshaft seat. Do not knock parts hard during removal, in case of damaging dowel pins and parts.

Remove dowel pins 1.

Remove camshaft assy 2.

⚠Note: During camshaft assy removal, hook timing chain 3 in case it falls down into the engine.



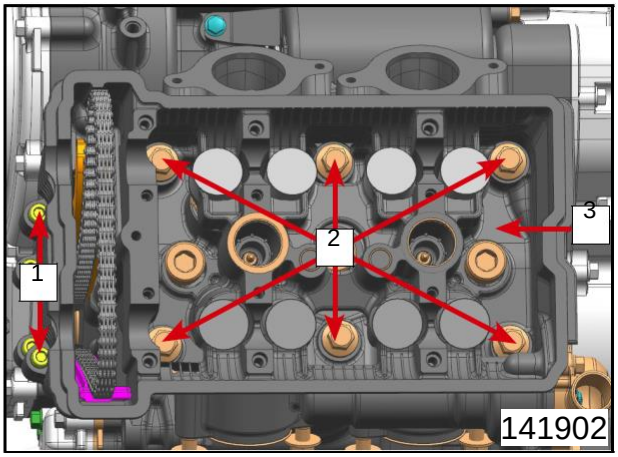
14.4.8 Cylinder Head Removal

Remove M6 inner hex bolts 1 and washers.

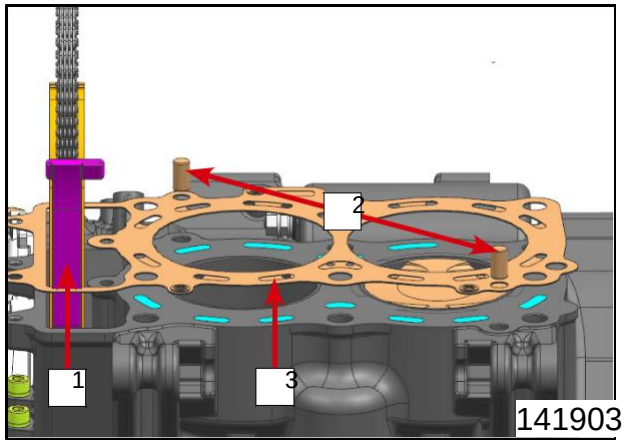
Remove cylinder head M10 bolts 2 and washers.

Remove cylinder head 3.

⚠Note: Pay attention to the washers in case of getting lost or falling into the engine body when removing bolts. Cylinder head M10 bolts 2 can be removed with magnet.



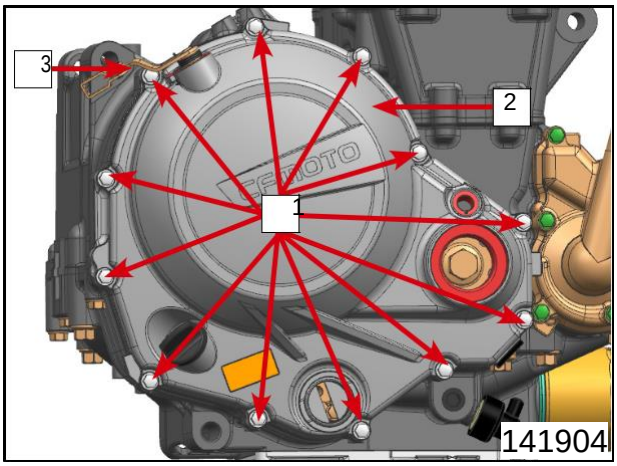
⚠Note: Cylinder head can be removed by shaking it. Pay attention to dowel pins in case of getting lost. Hook timing chain 3 in case it falls down into the engine.



Remove chain guide 1.

Remove dowel pins 2.

Remove cylinder head gasket 3.



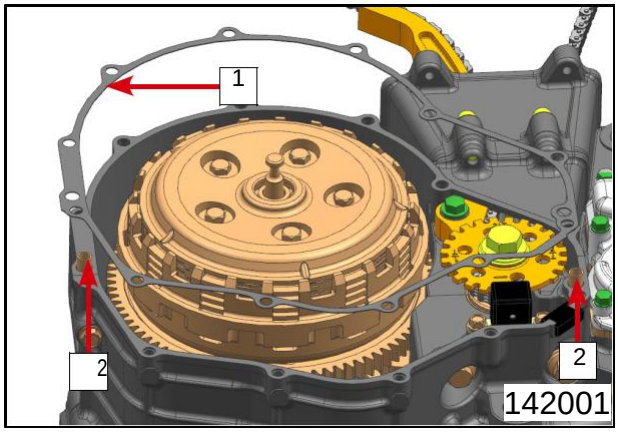
14.4.9 RH Side Cover Removal

Remove M6 bolts 1.

Remove RH side cover 2. (Rotate the clutch rod 3 to the proper position to remove the RH side cover.)

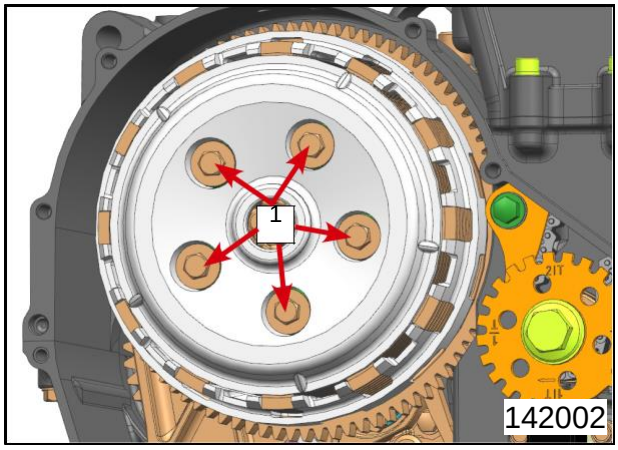
Remove seal gasket 1.

Remove dowel pins 2.

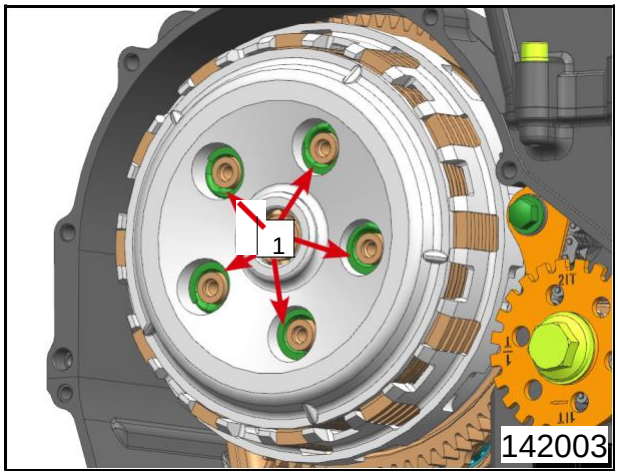


14.4.10 Clutch Removal

Remove M6 bolts assy 1.

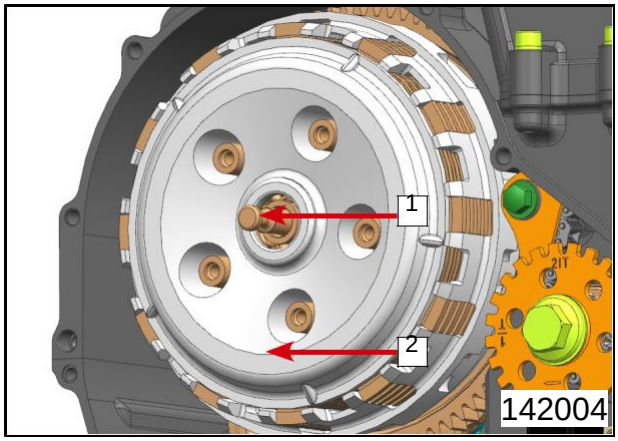


Remove clutch springs 1.

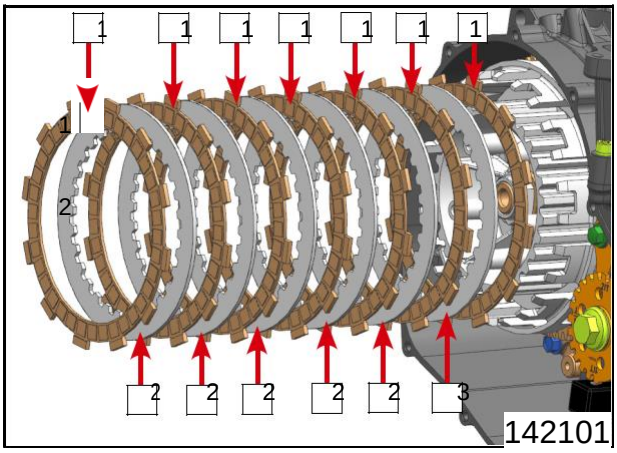


Pull the tie-rod 1 to remove clutch press plate 2 along with tie-rod 1.

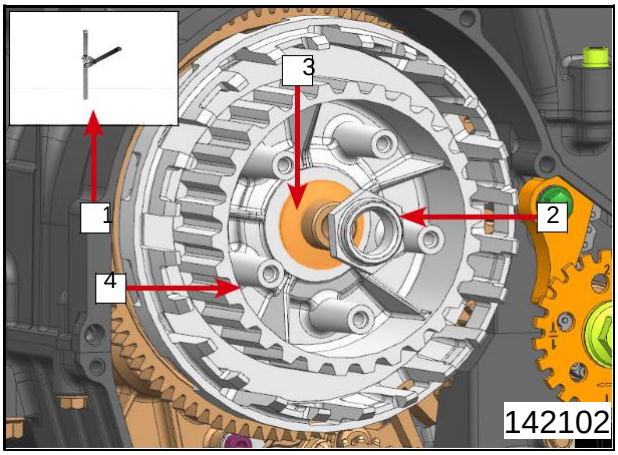
Remove the tie-rod 1 from the press plate 2.



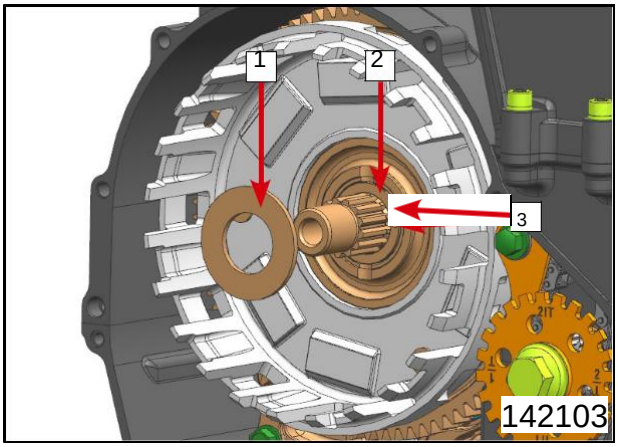
Remove frication disc assy [1].
Remove steel plate B [2].
Remove steel plate A [3].



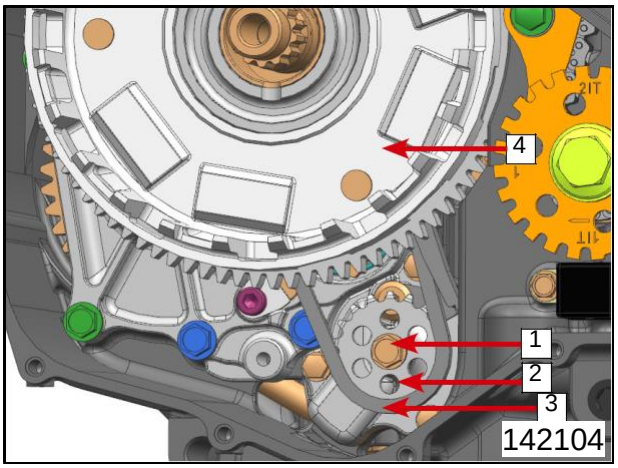
Use special tool: clutch stopping wrench [1] to fix the clutch hub and remove M20 nut [2].
Remove washer [3].
Remove central sleeve assy [4].



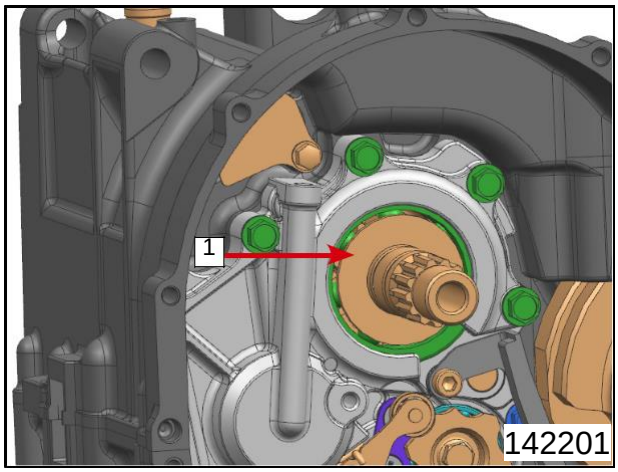
Remove washer [1].
Insert into the holes [3] with needle-nose pliers and pull out the clutch shaft sleeve [2].



Remove M6 bolt [1] and washer. (Left-hand thread)
Pull out oil pump sprocket [2] with needle-nose pilers. (Oil pump sprocket is still on the oil pump chain assy.)
Remove housing assy [4], oil pump chain [3] and oil pump sprocket together.



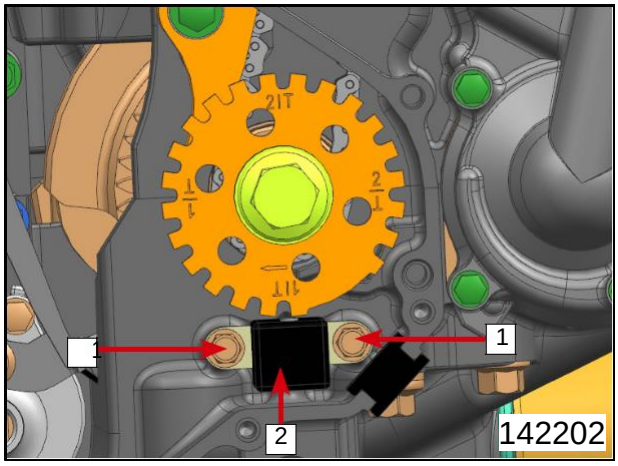
Remove washer [1].



14.4.11 Crankshaft Pulsing Rotor Removal

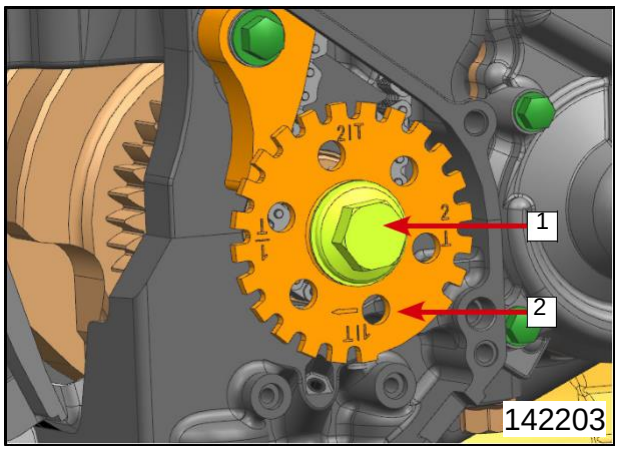
Remove M5 bolt [1].

Remove trigger assy [2].



Remove M8 bolt [1] and washer.

Remove crankshaft pulsing rotor [2].

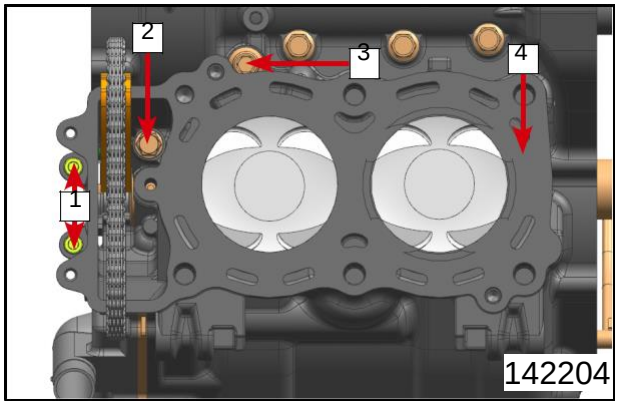


14.4.12 Cylinder Body Removal

Remove M6 inner hex bolts [1] and washers.

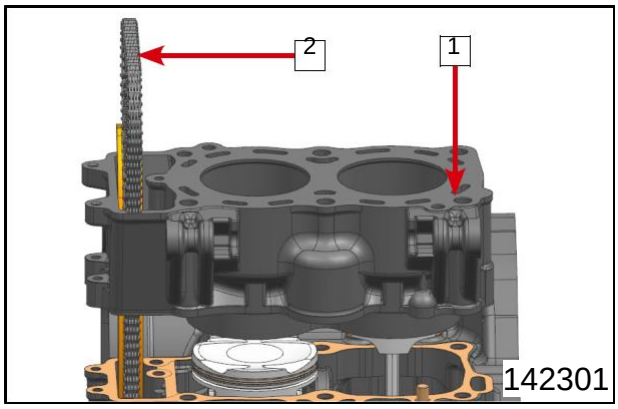
Remove M8 bolt [2].

Loose M10 nut [3]. Loose the cylinder body [4] by slightly shaking it. Remove M10 nut [3] and washer.



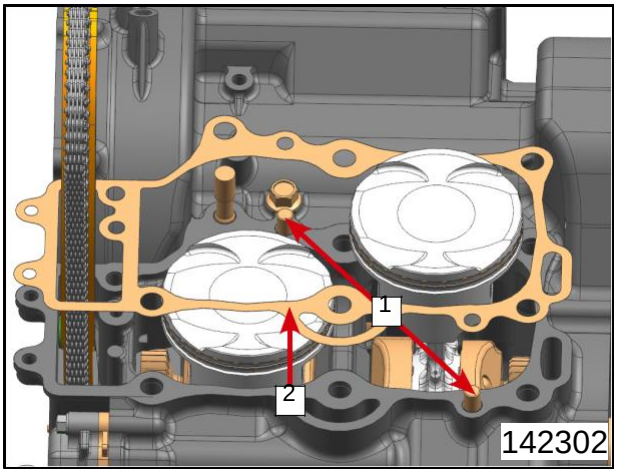
Lift and pull out cylinder body [1].

Note: Hook timing chain [2] in case it falls down into the engine.



Remove dowel pins [1].

Remove cylinder body gasket [2].



14.4.13 Piston Removal

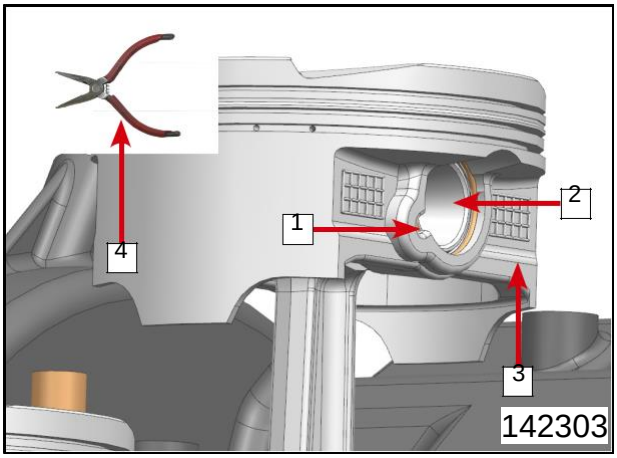
Rotate the crankshaft to the proper situation.

Use special tool: piston pin installing tool [4] to remove the circlip [1] from the gap.

Remove the piston pin [2].

Remove piston [3].

Note: When removing piston pin, it is not necessary to remove the circlip on both sides. One is enough. The removed circlip can not be used again. Replace with a new one when installing.

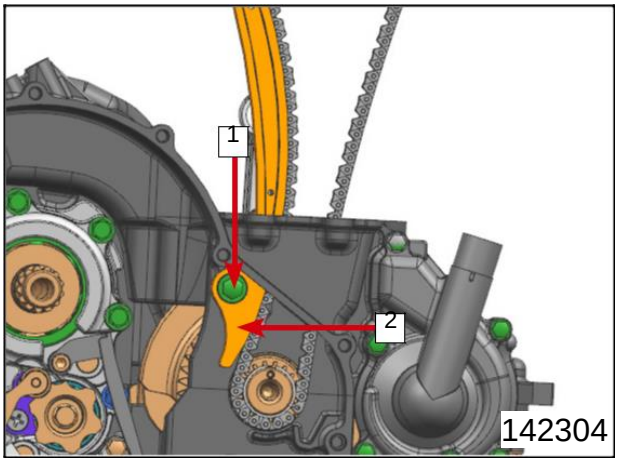


Rotate the crankshaft to proper position to remove the other piston following the same procedures.

14.4.14 Tensioner Plate Removal

Remove pin shaft [1].

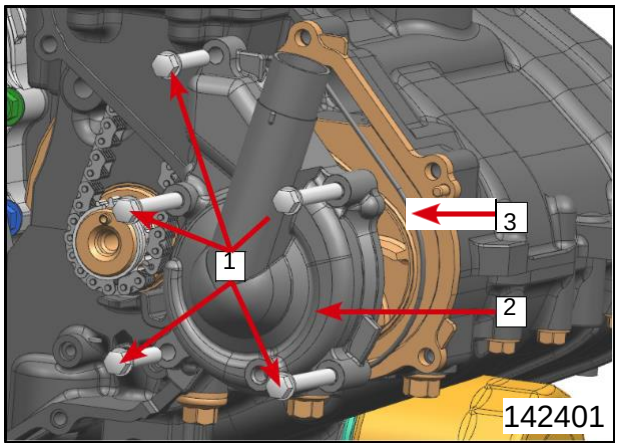
Remove tensioner plate [2].



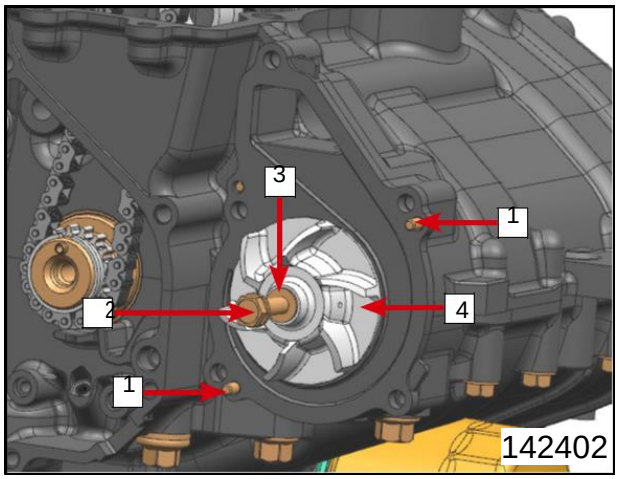
14.4.15 Water Pump

Removal Remove M6 bolts [1].

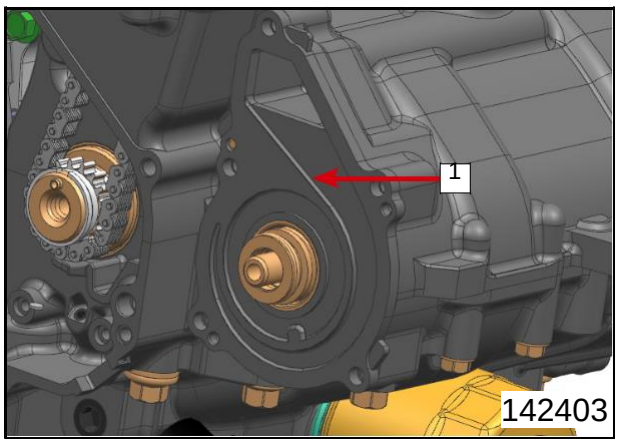
Remove water pump cover [2]. The seal gasket [3] may remain on the cover. Remove it along with the water pump cover.



Remove dowel pins [1].
Remove M6 bolt [2].
Remove washer [3].
Remove water pump impeller [4].



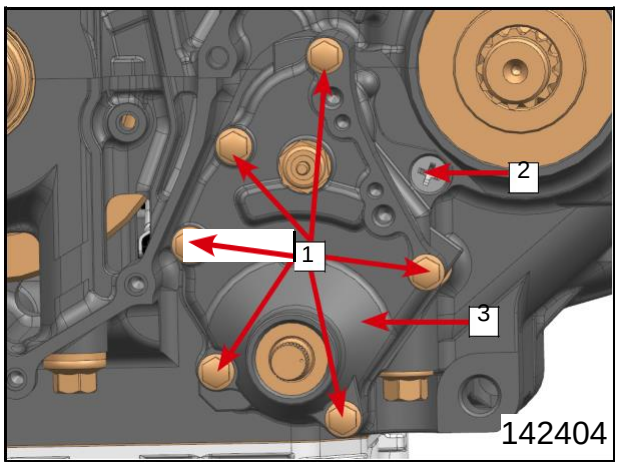
Remove water pump [1].



14.4.16 Gearshift Assy

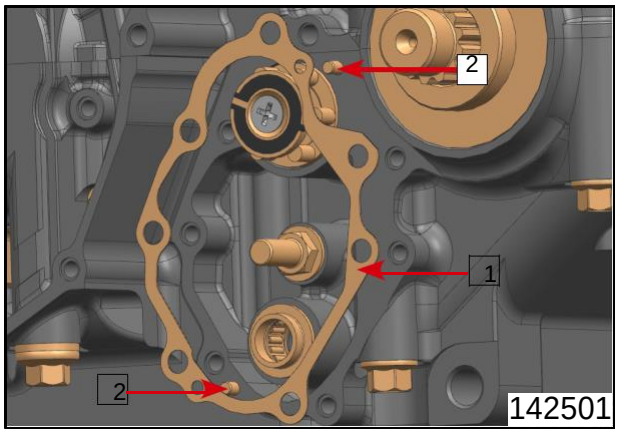
Removal Status 1

Remove M6 bolts [1].
Remove screw [2].
Remove gearshift cover [3].



Remove gearshift cover gasket [1].

Remove dowel pins [2].

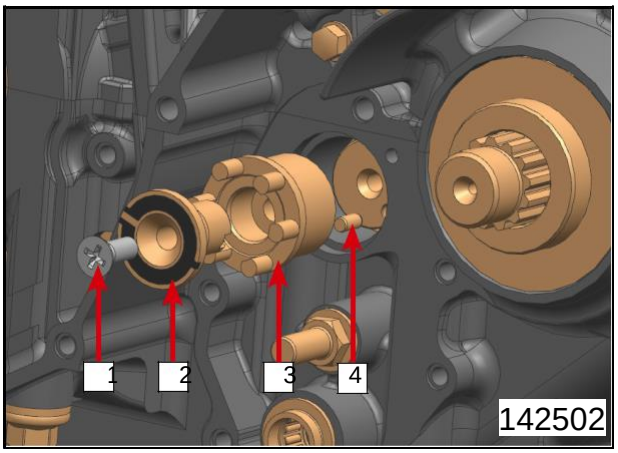


Remove screw [1].

Remove gear sensor [2].

Remove shift location drum [3].

Remove roller needle [4].



Status 2

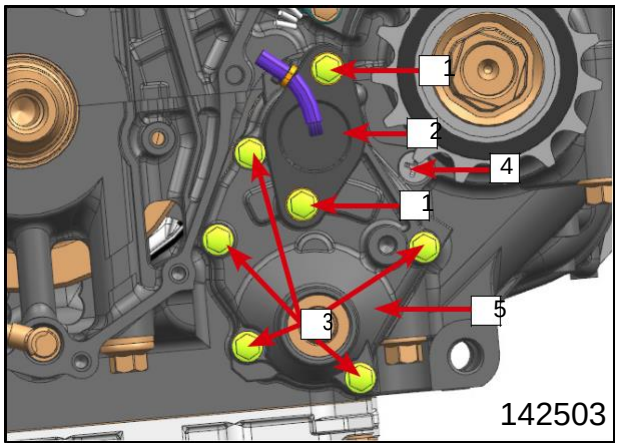
Remove M6 bolts [1].

Remove gear position sensor [2].

Remove M6 bolts [3].

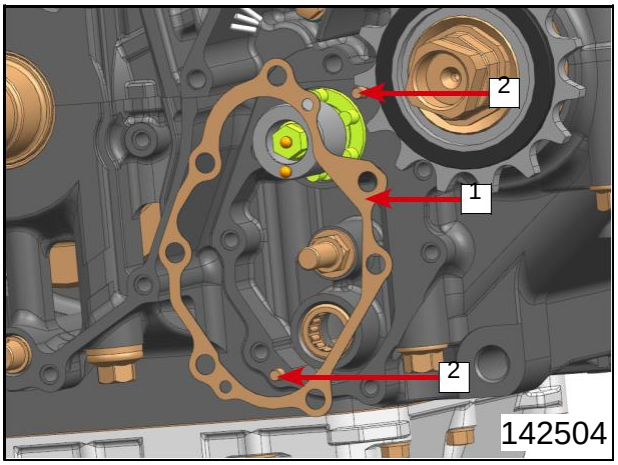
Remove screw [4].

Remove gearshift cover [5].

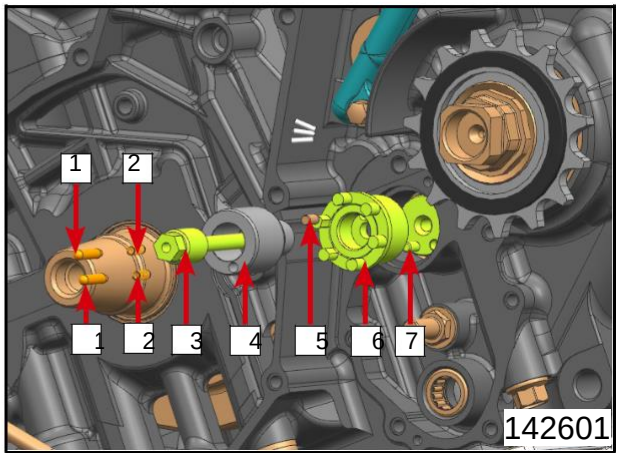


Remove gearshift cover gasket [1].

Remove dowel pins [2].

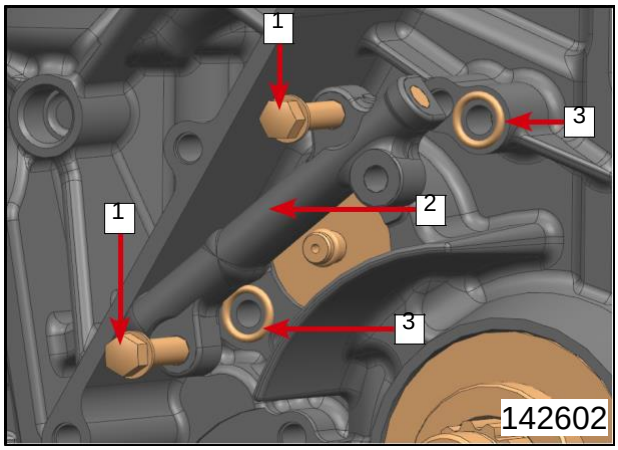


Remove ball contactors [1].
Remove contactor springs [2].
Remove contactor bolt [3].
Remove gear rotor [4].
Remove dowel pin [5].
Remove shift location drum [6].
Remove roller needle [7].



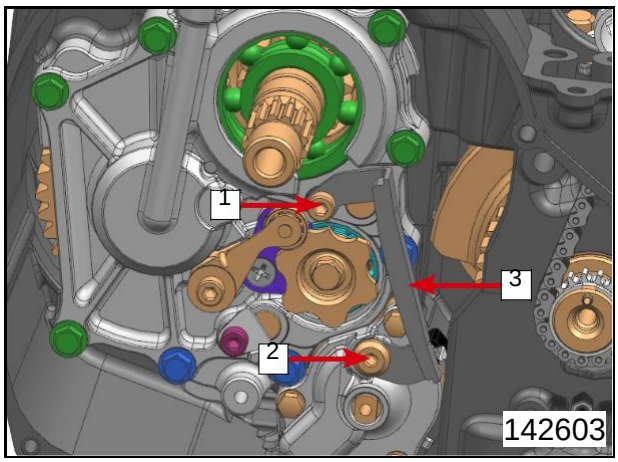
14.4.17 Oil Pipe IV Removal

Remove M6 bolts [1]. Remove oil pipe IV assy [2].
O-ring [3] remains on oil pipe IV assy [2].
Remove o-ring [3].

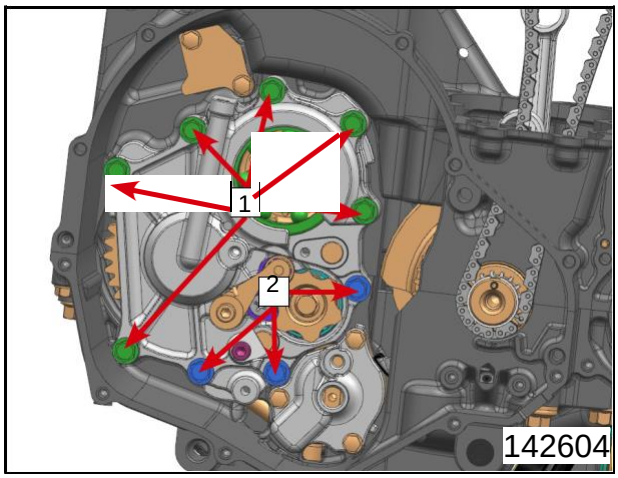


14.4.18 Transmission Assy Removal

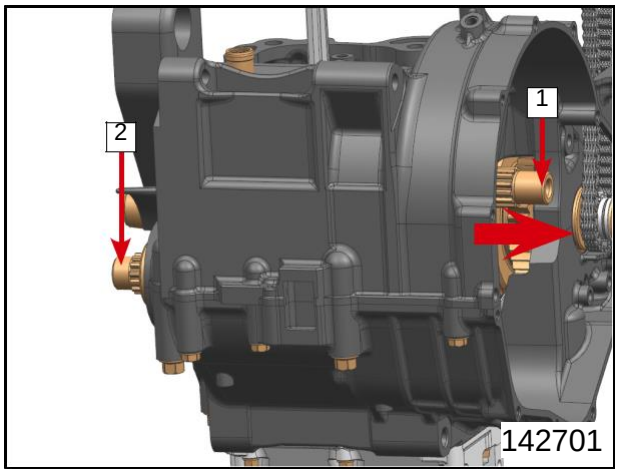
Remove M6 screw [1].
Remove M6 screw [2].
Remove oil pump chain guide [3].



Remove M7 bolts [1].
Remove M7 bolts [2].

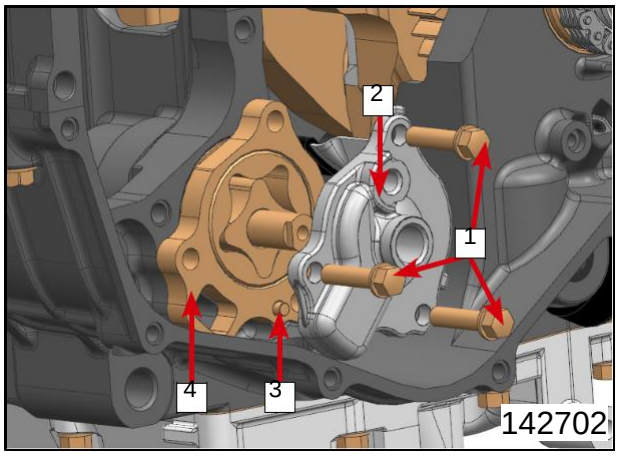


Pull the main shaft [1] in the arrow direction (by slightly shaking).
If shaking doesn't work, slightly knock the countershaft [2] with rubber hammer in the arrow direction, then pull out the whole transmission assy.

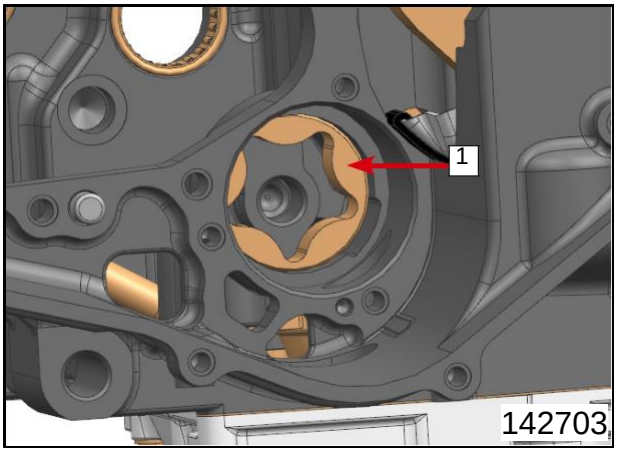


14.4.19 Oil Pump Assy Removal

Remove M6 bolts [1].
Remove oil pump cover [2].
Remove roller needle [3].
Remove oil pump assy [4] with needle-nose pliers.



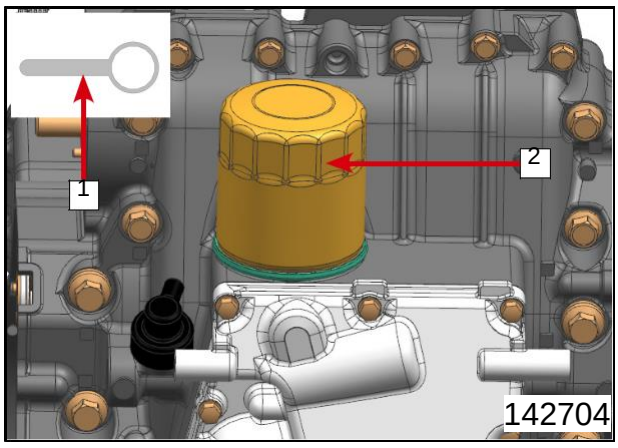
Remove oil pump outer rotor [1].



14.4.20 Oil Filter Removal

Use special tool: oil filter wrench [1] to remove the oil filter [2].

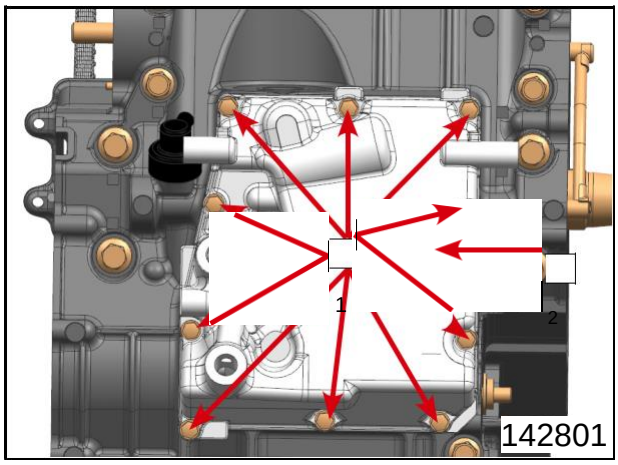
Note: Cover a cloth or rubber cushion when removing the oil filter, in case the special tool damages the oil filter.



14.4.21 Oil Pan Assy Removal

Remove M6 bolts [1].

Remove oil pan [2].

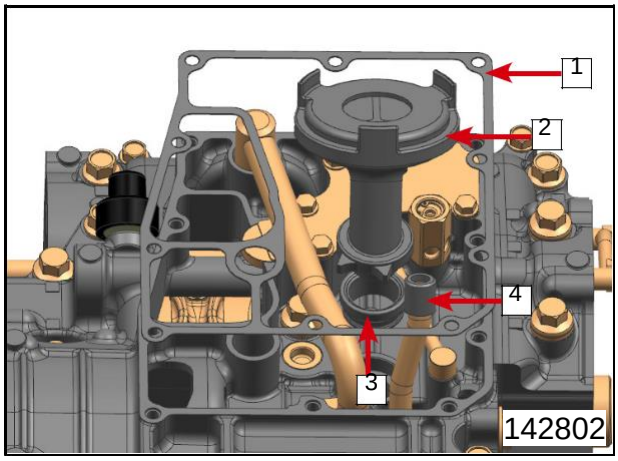


Remove seal gasket [1].

Remove oil suction pan assy [2].

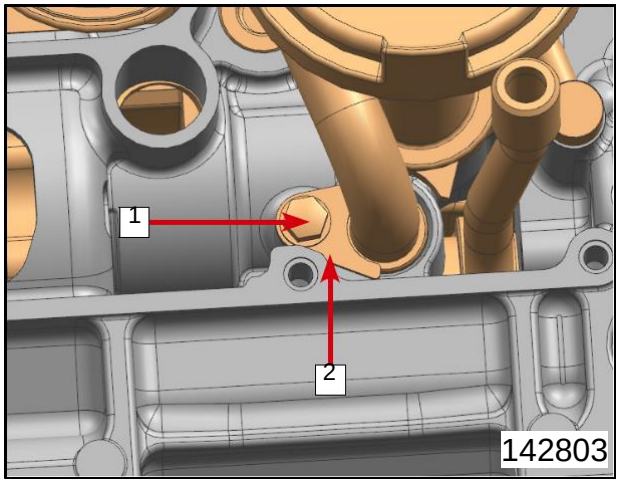
Remove seal gasket [3].

Remove oil return pipe rubber sleeve [4].



Remove M6 bolt [1].

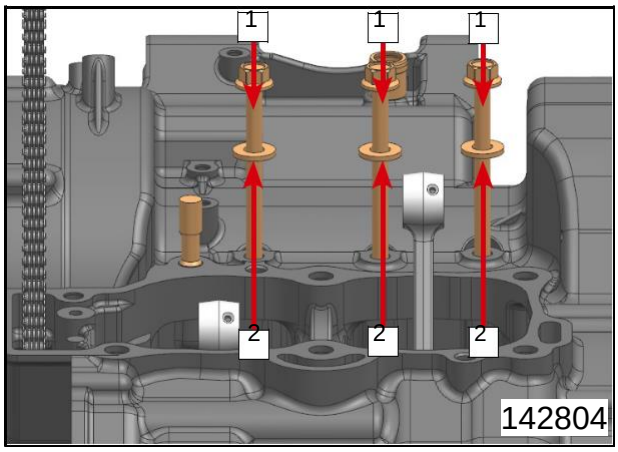
Remove oil pipe I press plate [2].



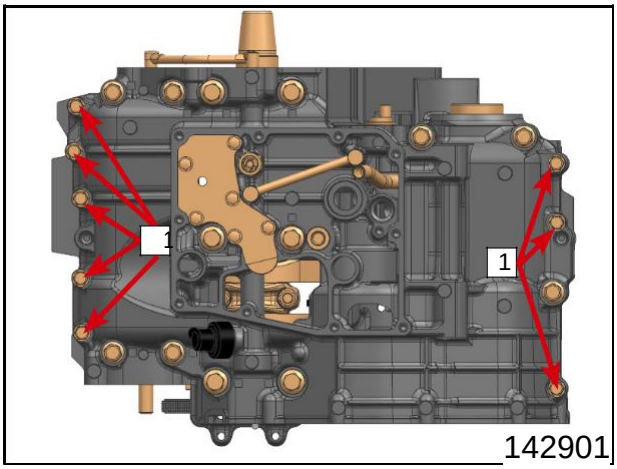
14.4.22 Engine Case

Removal Remove M8 bolts [1].

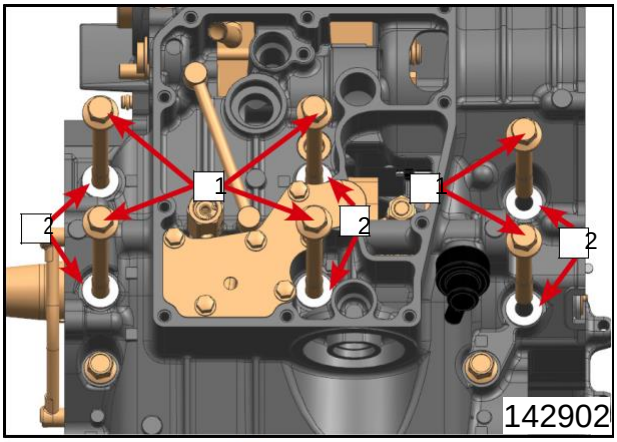
Remove washers [2].



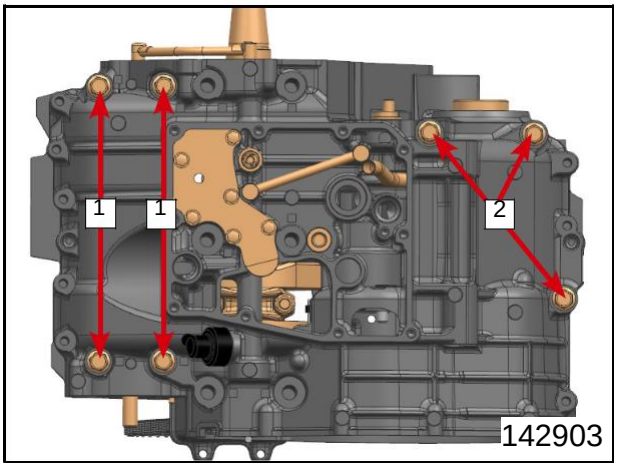
Remove M7 bolts [1].



Remove M9 bolts [1].
Remove washers [2].

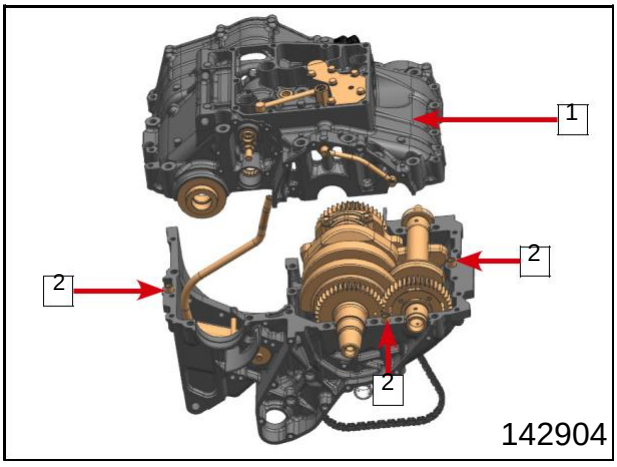


Remove M8 bolts [1].
Remove M8 bolts [2].



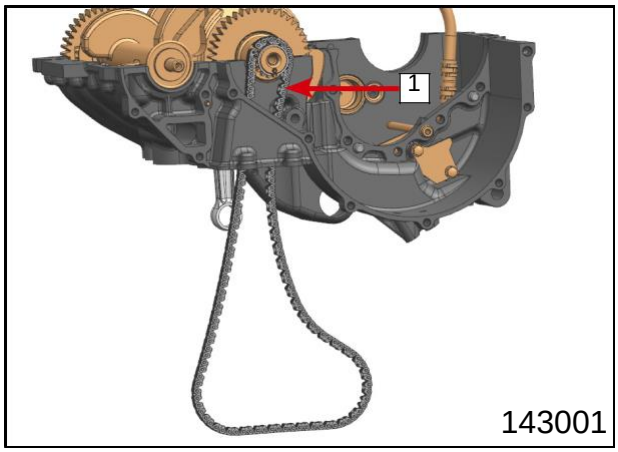
Remove engine case [1].
Remove dowel pins [2].

⚠Remove: Pay attention to dowel pins [2] during removal in case of getting lost.



14.4.23 Timing Chain Removal

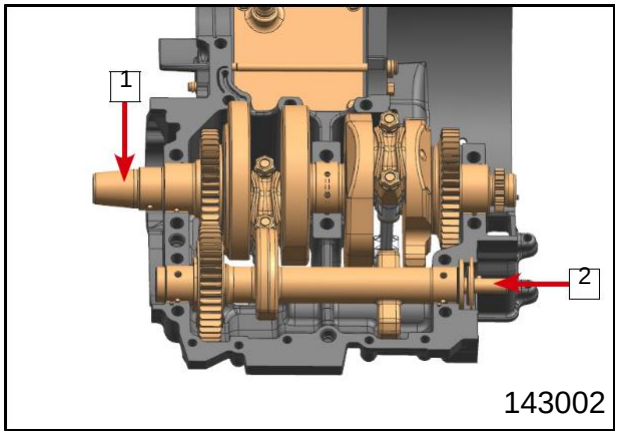
Remove timing chain [1].



14.4.24 Crankshaft and Balance Shaft Removal

Remove crankshaft [1] and balance shaft [2] together.

Note: Pay attention during crankshaft and balance shaft removal in case of parts impact and damage.



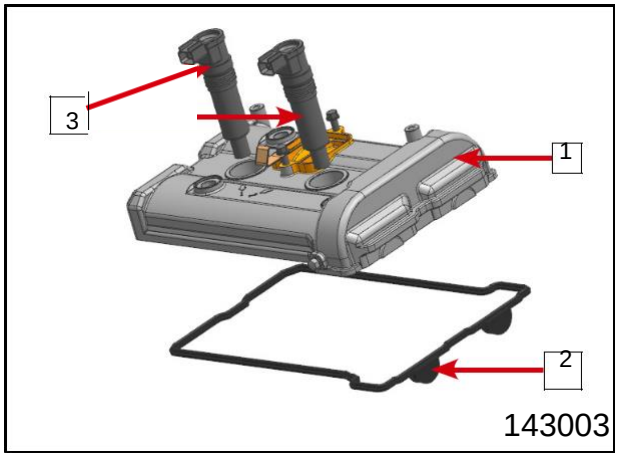
14.5 Engine Parts Inspection

14.5.1 Cylinder Head Cover Inspection

Inspect cylinder head cover [1] for crack or damage. Replace or repair if any defect occurs.

Inspect seal gasket [2] for crack, hardening or damage. Replace if any defect occurs.

Inspect ignition coil [3] for damage. Replace if any defect occurs.



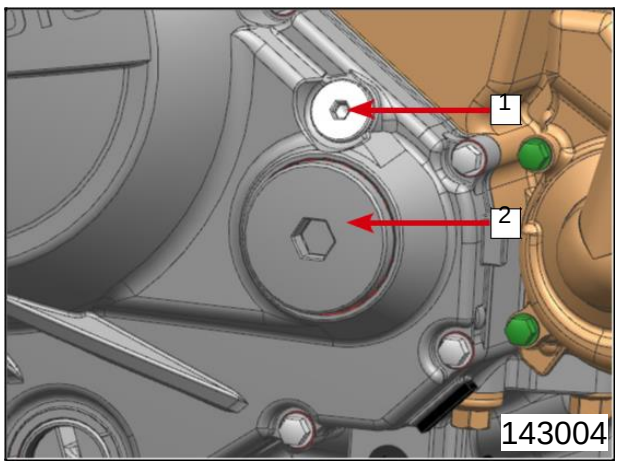
14.5.2 Cylinder Head Inspection Valve Clearance Inspection and Adjustment

Note: Inspect and adjust when engine is cool.

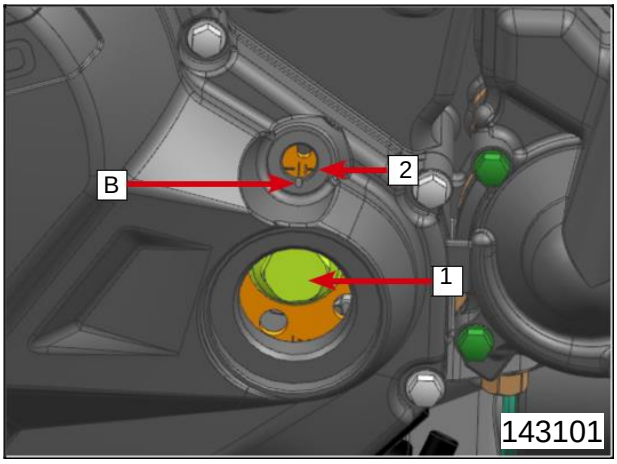
Adjust first cylinder timing.

Remove cylinder head cover. (Refer to Engine Disassembly section) Remove timing inspection hold cap [1].

Remove oil strainer cover [2].



Rotate M8 bolt 1 with sleeve and watch its movement through timing inspection hole 2 . Stop rotating when mark “1/T” on pulsing rotor is aligned with mark B. This is the TDC of first cylinder.

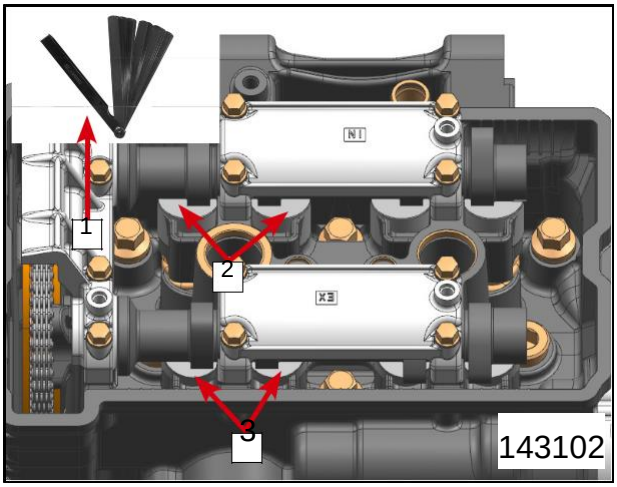


Measurement

Use feeler gauge 1 to measure the clearance of air inlet valve 2 and air exhaust valve 3 . Record measurement result.Transfer it to tappet thickness according to data. If the valve is out of standard, removetensioner, intake & exhaust camshafts and replace the tappets of proper thickness. Inspect again after installation.

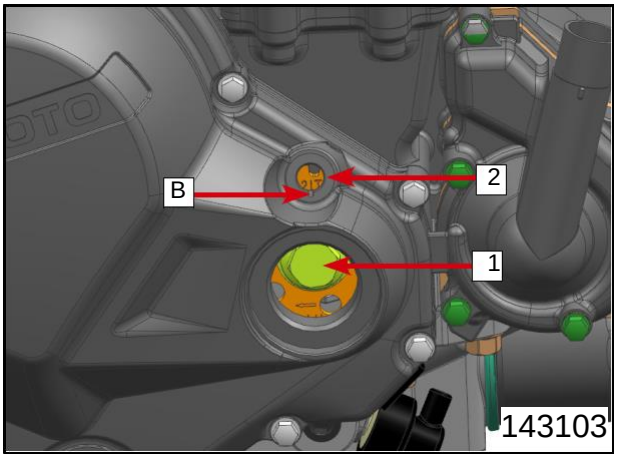
Valve Clearance Standard Exhaust: 0.22
mm~0.28 mm Intake: 0.08 mm~0.13 mm

Installation procedures refer to Installation section.



Adjust second cylinder timing.

Rotate M8 bolt 1 with sleeve and watch its movement through timing inspection hole 2 . Stop rotating when mark “2/T” on pulsing rotor is aligned with mark B. This is the TDC of second cylinder.

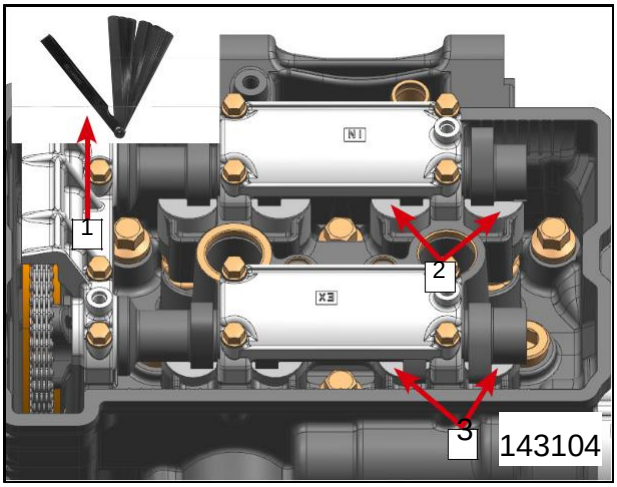


Measurement

Use feeler gauge 1 to measure the clearance of air inlet valve 2 and air exhaust valve 3 . Record measurement result. Transfer it to tappet thickness according to data. If the valve is out of standard, removetensioner, intake&exhaust camshafts and replace the tappets of proper thickness. Inspect again after installation.

Valve clearance standard
Exhaust: 0.22 mm~0.28 mm
Intake: 0.08 mm~0.13 mm

Installation procedures refer to Installation section.



14.5.3 Camshaft Cover Inspection

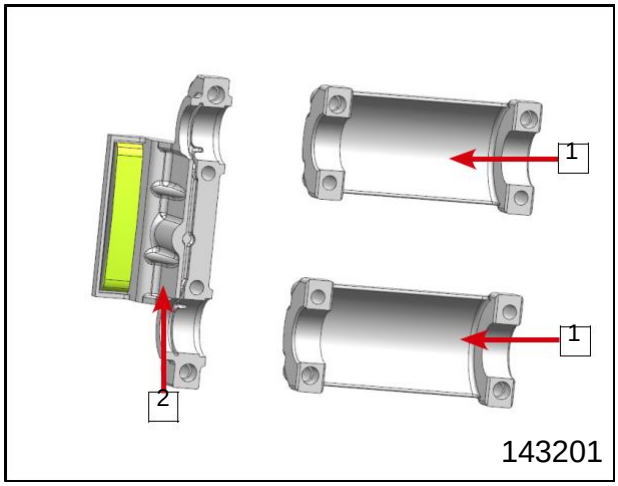
Removal/installation procedures refer to engine disassembly/assembly sections.

Inspect camshaft covers [1] for wear, cracks or damage. Replace camshaft and cover together if any defect occurs.

Inspect camshaft holding strip [2] for wear, cracks or damage. Replace if any defect occurs.

Camshaft cover hole diameter
Standard: 24.00 mm~24.021 mm
Service limit: 24.05 mm

Note: Replace with new cylinder head assy if the camshaft cover hole diameter is beyond service limit.



143201

14.5.4 Camshaft Assy Inspection

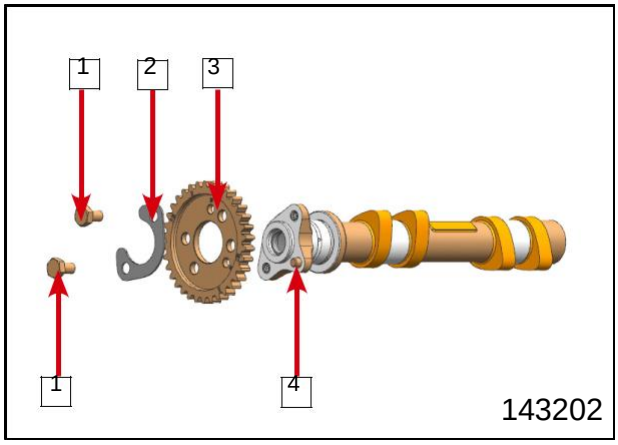
Camshaft Disassembly

Remove M6 bolts [1].

Remove retainer [2].

Remove timing sprocket [3].

Remove roller needle [4].



143202

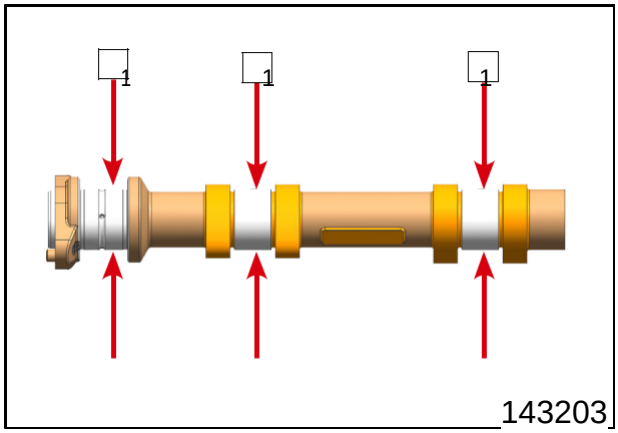
Camshaft Neck Diameter Measurement

Measure camshaft neck 1 diameter.

Camshaft neck diameter
Standard: 23.950 mm~23.972 mm
Service limit: 23.920 mm

Note: Replace with new camshafts if the diameter is beyond service limit.

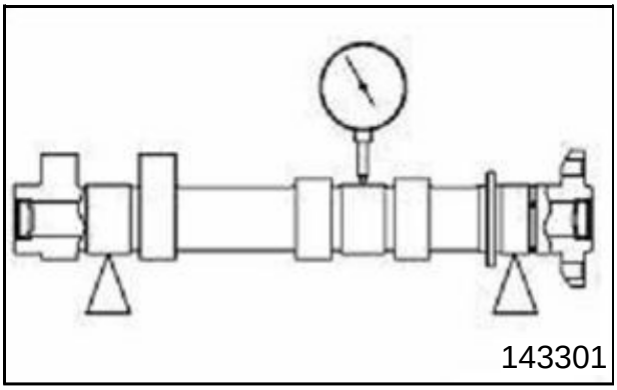
Clearance between camshaft neck and camshaft cover
Standard: 0.028 mm~0.071 mm
Service limit: 0.13mm



143203

Camshaft Deformation

Remove camshafts (refer to Camshaft Removal section).
Replace with new camshafts if the difference is beyond service limit.
Place camshafts on camshaft fixing tool or V-block.
Measure camshaft deformation value with dial gauge as picture shows.

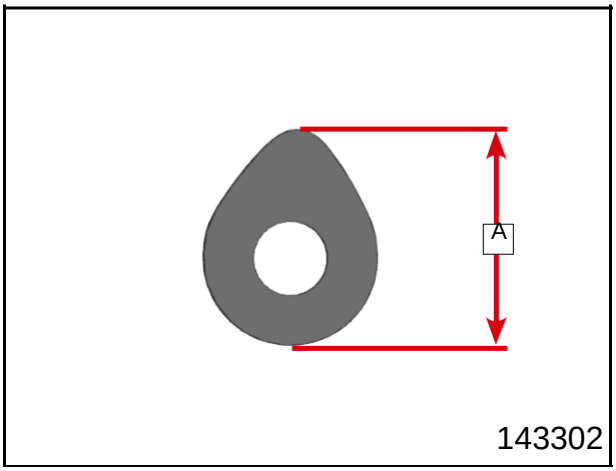

143301

Cam Wear

Remove camshafts (refer to Camshaft Removal section).
Measure each cam height [A] with dial gauge.
Replace if cam wear is beyond service limit.

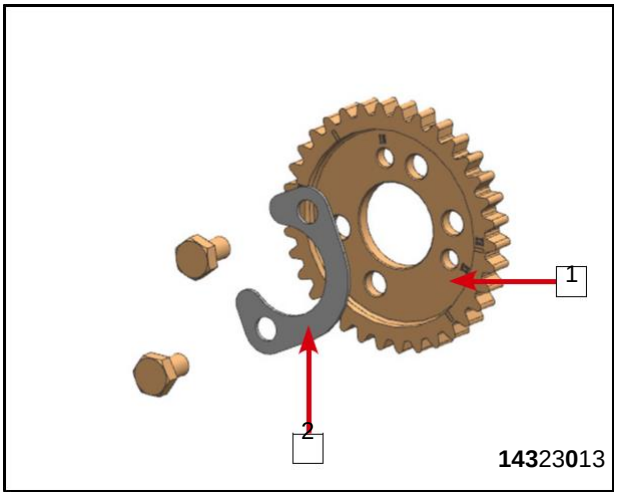
Cam height standard
Exhaust: 35.843 mm~35.957 mm
Intake: 36.543 mm~36.657 mm

Service limit
Exhaust: 35.74 mm
Intake: 36.44 mm



143302

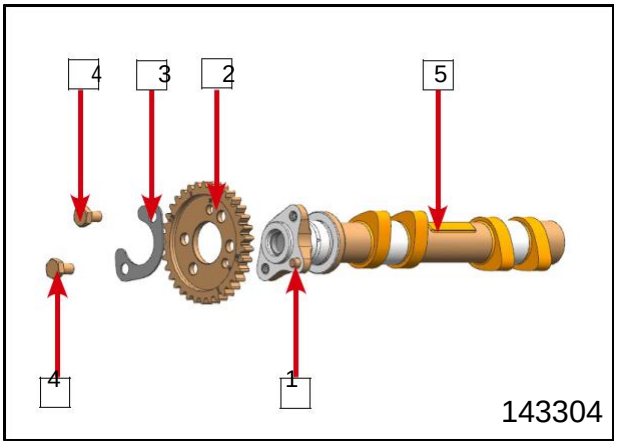
Inspect timing sprocket [1] for teeth break, damage or wear. Replace if any defect occurs.
Inspect retainer [2] for damage. Replace if it does.



14323013

Camshaft Assy Assembly

Put roller needle [1] on camshaft [5].
Install timing sprocket [2].
Install retainer [3].
Install M6 bolts [4].



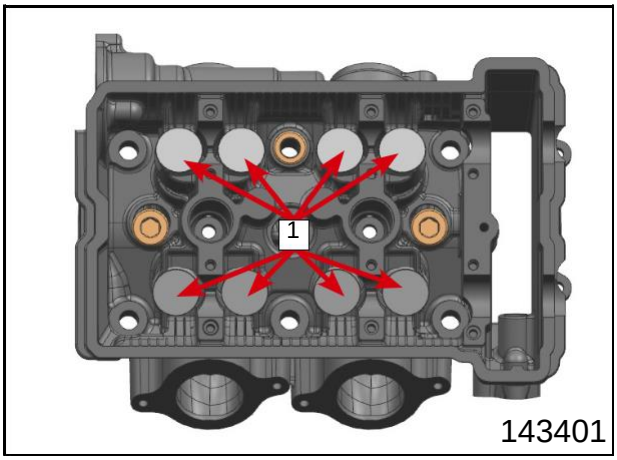
143304

14.5.5 Cylinder Head Assy Inspection

Cylinder Head Assy Disassembly

Remove tappets [1].

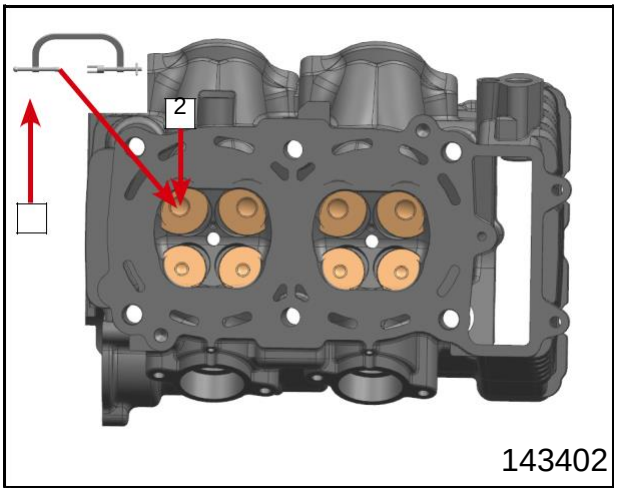
Note: Record every tappet place so that it can be installed into the original position.



143401

Put special tool: valve spring compressing tool [1] in the center [2] of valves as picture shows.

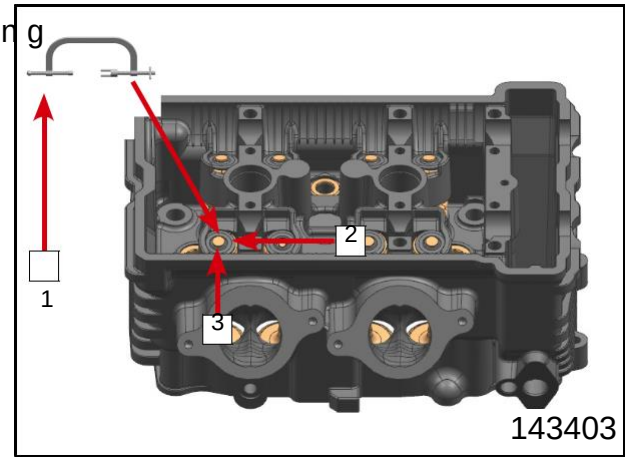
Warning: Wear goggles all the 1 way during valve spring removal.
Be caution because the spring may pop out due to high pressure when removing it.



143402

Install special tool: valve spring compressing tool [1] on valve spring upper seat [3] as picture shows. Tighten it to compress the spring.
Remove valve clip [2] with tweezers.
Loose valve spring compressing tool [1].
Remove valve spring upper seat [3].

Note: The removed valve and related parts should be marked and put together in case of getting mixed.

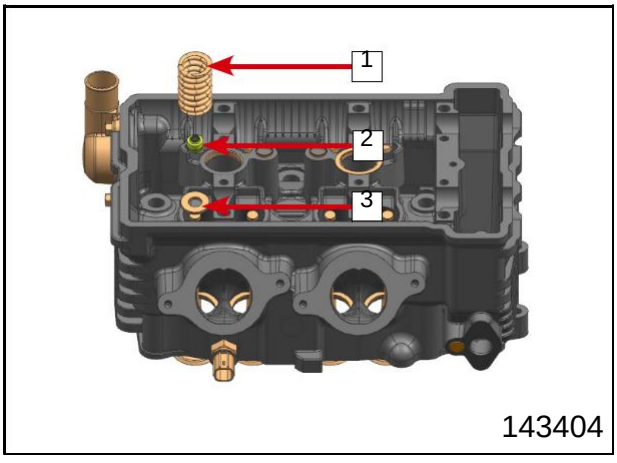


143403

Remove spring [1].
Remove valve stem seal ring assy [2].
Remove valve spring lower seat [3].

Note: Replace with new seal rings after every removal. The removed seal rings are sorted into waste.

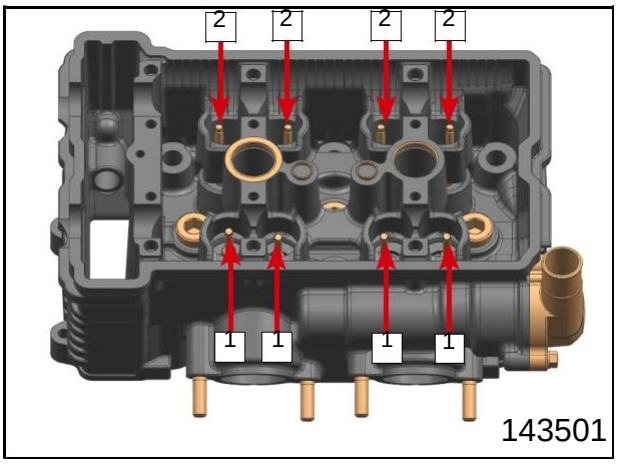
Note: The removed valve and related parts should be marked and put together in case of getting mixed.



143404

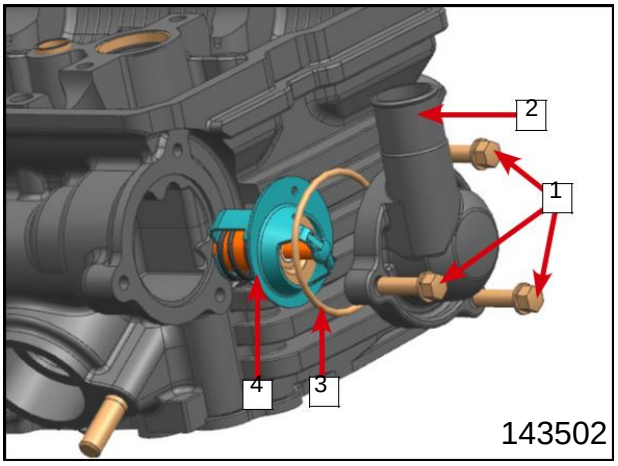
Compress exhaust valves [1]. Remove exhaust valves [1] from other side.
Compress intake valves [2]. Remove intake valves [2] from other side.

Note: The removed valve and related parts should be marked and put together in case of getting mixed.



143501

Remove M6 bolts [1].
Remove thermostat cover [2].
Remove o-seal ring [3].
Remove thermostat [4].



143502

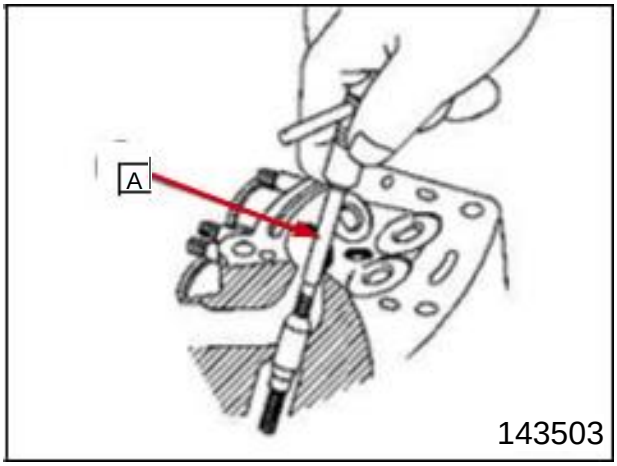
14.5.6 Valve Guide Pipe
Removal Removal

Remove valve (refer to Valve Removal section).
Remove soil seal and spring seat.

Heat valve guide pipe nearby area to 120°C~150°C, slightly knock the valve guide shaft head [A] to remove the valve guide pipe.

Warning: Do not heat the cylinder head directly. Otherwise, it will cause deformation. Soak the cylinder into the oil and heat the oil, in order to heat the cylinder head indirectly.

Special tool: valve pipe guide shaft φ4.5



143503

14.5.7 Cylinder Head Wear

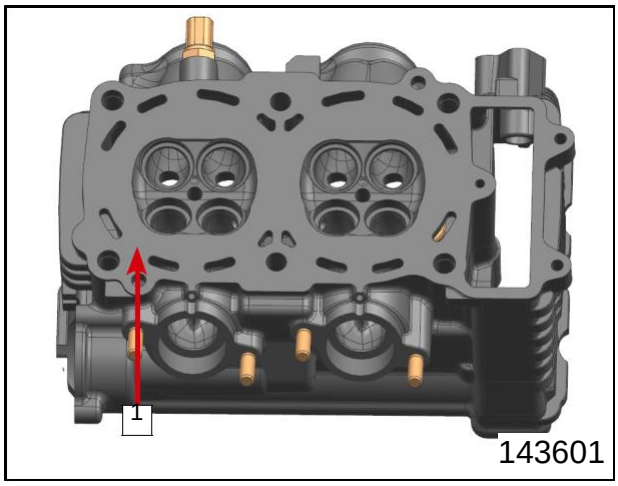
Cylinder Head Inspection

Put a parallel rule under the different positions under cylinder head lower surface [1]. Measure the clearance between parallel rule and cylinder head with feeler gauge.

Cylinder head flatness service limit: 0.05 mm

Replace a new cylinder head if beyond service limit.

If the flatness is less than service limit, wipe cylinder head lower surface [1] for service with sandpaper that is fixed on a tablet (first use #200 sandpaper, then #400).



143601

Valve Clean

Rotate the reamer clockwise until it can rotate freely in valve guide pipe. Never rotate counter clockwise, or the reamer may be dull.

Clean the valve guide pipe.

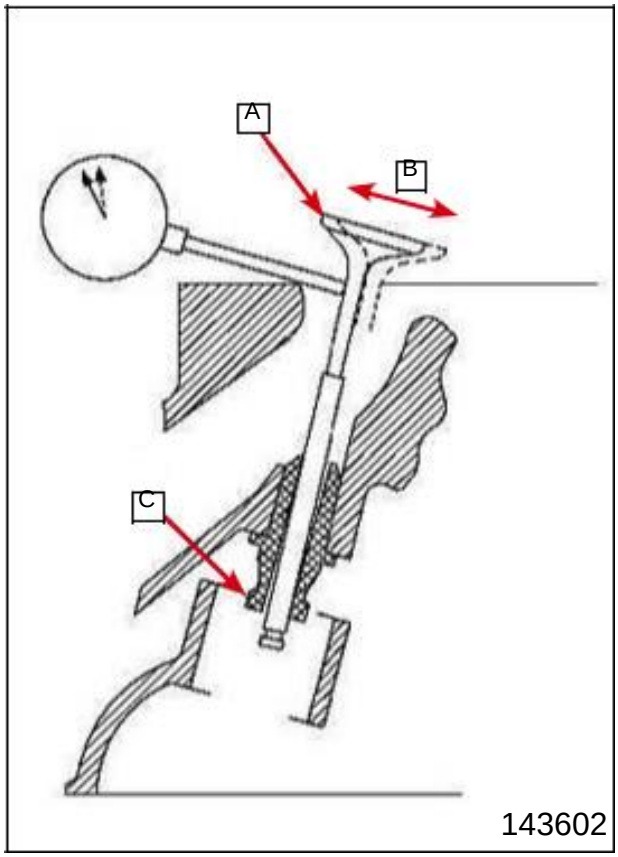
Tool: Valve guide pipe reamer φ4.5

Valve/Valve Guide Pipe Clearance Measurement (Swing Method)

Insert a new valve [A] into guide pipe [B]. Place the dial gauge perpendicular to valve stem and close to cylinder head connecting surface as much as possible.

Swing the valve forward and backward [C] to measure the clearance between valve and valve guide pipe.

Repeat several times to measure. Replace valve guide pipes if beyond service limit.



143602

Note: The measurement valve is not the exact clearance, because the measuring point is on the valve stem.

Valve/valve guide pipe clearance standard
Exhaust: 0.07 mm~0.14 mm
Intake: 0.02 mm~0.08 mm

Service limit
Exhaust: 0.27 mm
Intake: 0.22 mm

Valve Seat Ring Inspection

Remove valve (refer to Valve Removal section).

Inspect valve B and the seal surface A of valve seat ring C.

Measure the outer diameter of valve seat ring D.

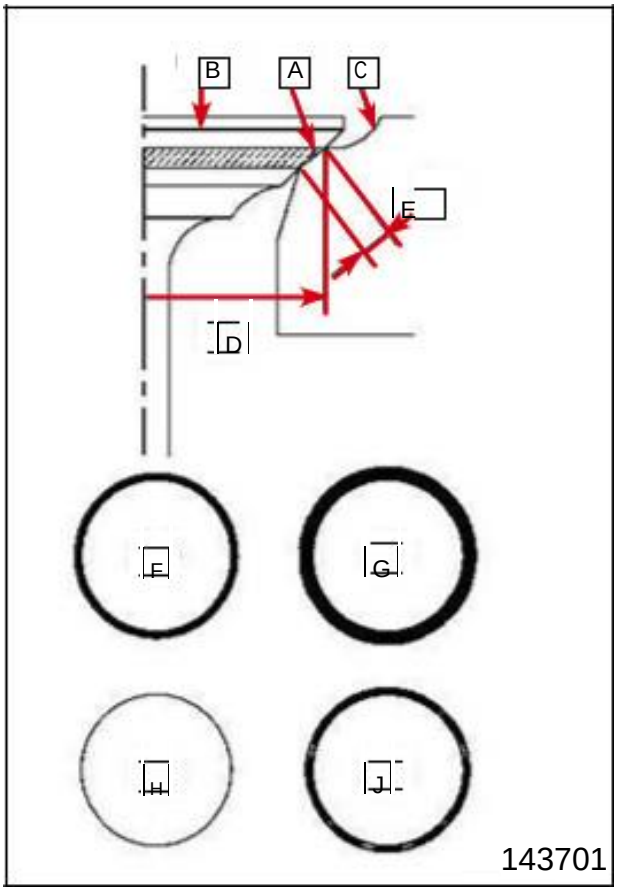
Service valve seat ring if outer diameter is too large or small.

Valve seat ring outer diameter standard
Exhaust: 26.6 mm~26.7 mm
Intake: 32.6 mm~32.7 mm

Measure the valve seat seal surface width E of no carbon deposition with slide caliper.

F is proper. If it is too wide G, too narrow H or uneven J, service valve seat ring.

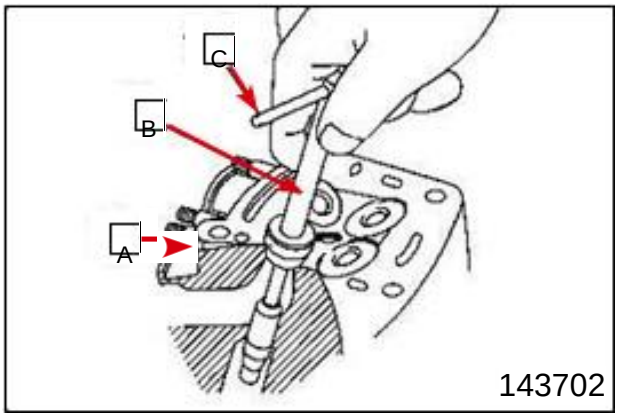
Valve seat ring outer diameter standard
Exhaust: 0.9 mm~1.1 mm
Intake: 0.9 mm~1.1 mm



143701

Valve Seat Ring Service

Tool: valve seat ring knife A, Holding shaft B and lever C



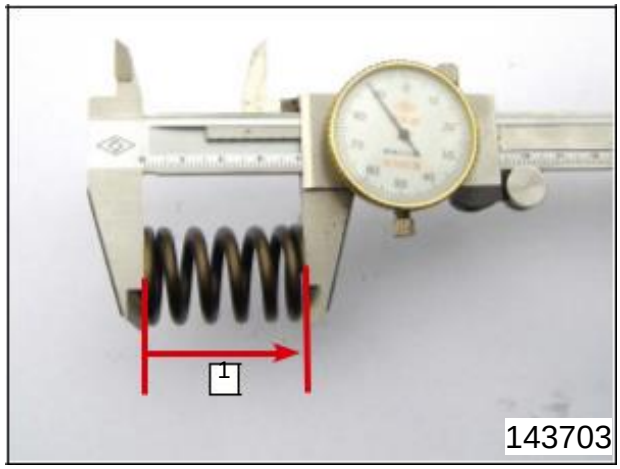
143702

Valve Spring

Valve spring is used to strengthen the seal effect between valve and valve seat. Spring elasticity reduce will cause the engine output power reduce and valve noise.

Measure spring free length. Replace if less than service limit.

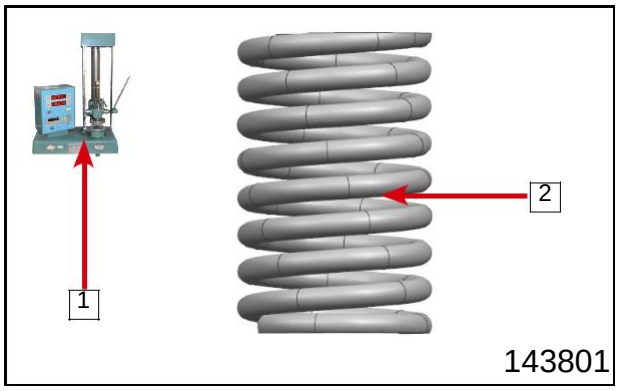
Valve spring free length standard: 41.6 mm



143703

Use spring scales [1] to measure the spring [2] elastic force when compressed to specific length . Replace if beyond standard.

When compressed to 38.4 mm, exhaust valve closed, the spring force is 103 N~121 N
When compressed to 30.5 mm, exhaust valve open, the spring force is 422 N~466 N
When compressed to 29.8 mm,exhaust valve open, the spring force is 455 N~503 N



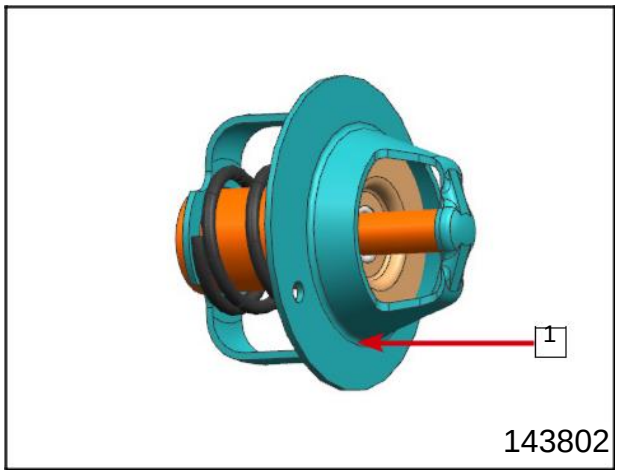
143801

Measure spring lean value. Replace if beyond service limit.

Spring lean service limit: 2°

Thermostat Inspection

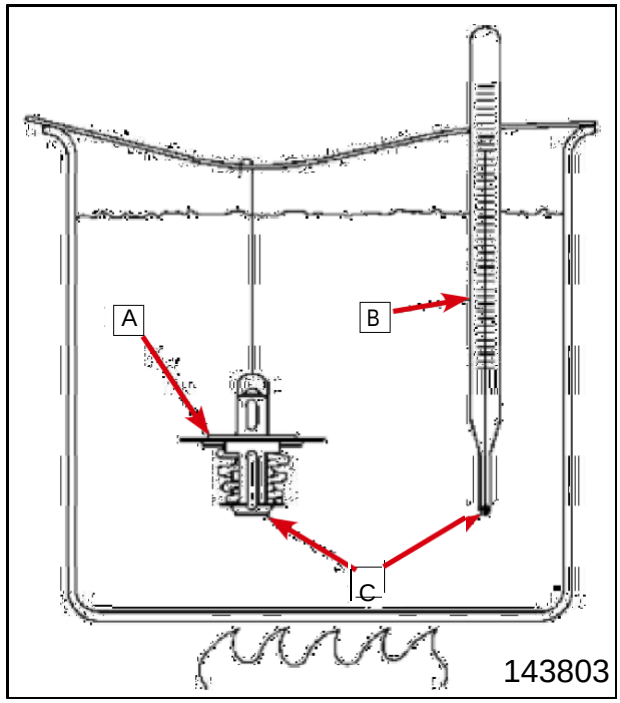
Remove thermostat [1] and inspect it at room temperature.
Replace with a new thermostat if the valve opens.



143802

To inspect the valve open temperature, soak the thermostat [A] into the container full of water, and gradually heat the water. The thermostat has to be immersed into the water, but do not touch container wall or bottom. Place a standard temperature gauge [B] into the water at the same level [C] with the thermostat. The gauge can not touch the container neither.

Replace if the value is beyond the standard.

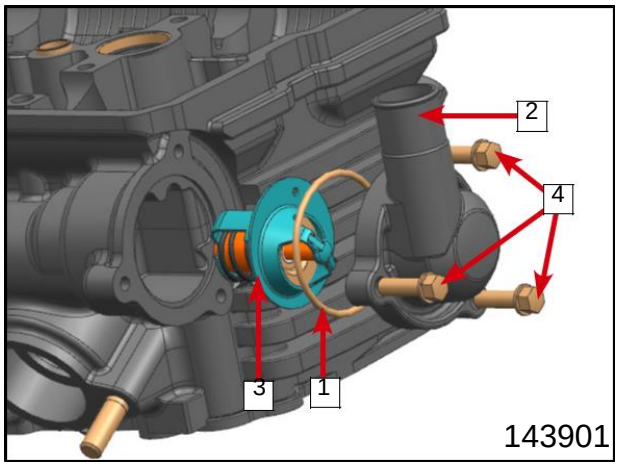


143803

Thermostat valve open temperature
Initial open: 70°C~74°C
Full open: 83°C~87°C

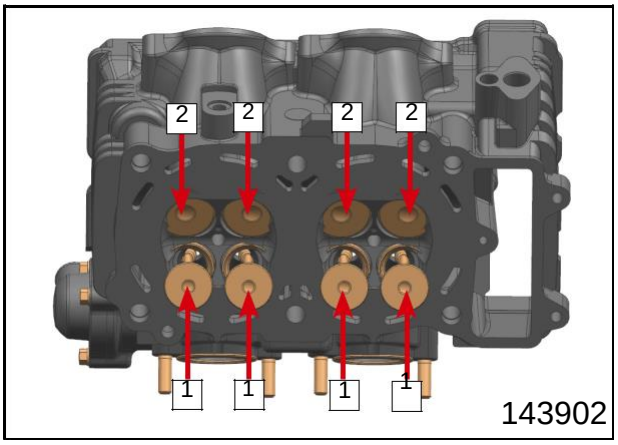
Cylinder Head Assy Assembly

Install o-seal ring [1] on thermostat cover [2].
Install thermostat [3].
Install M6 bolts [4].



143901

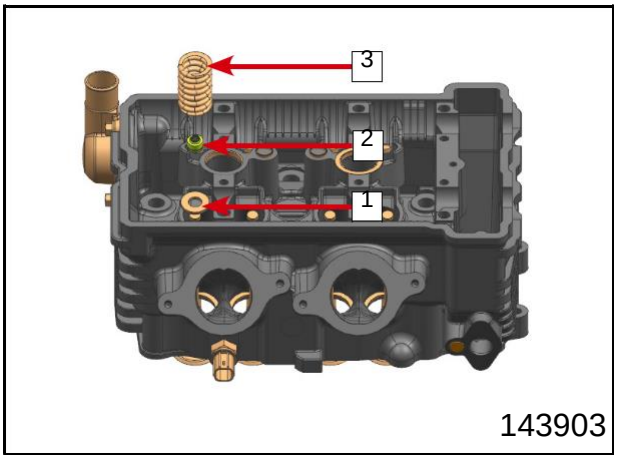
Install air exhaust valves [1] according to the records.
Install air intake valves [2] according to the records.



143902

According to records, install valve spring lower seat [1].
Install valve stem seal ring assy [2].
Install valve spring [3].

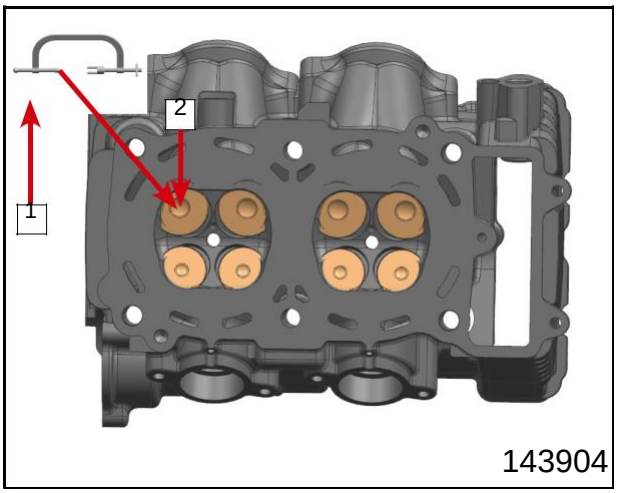
Note: Replace with new seal rings after every removal. The removed seal rings are sorted into waste.



143903

Put special tool: valve spring compressing tool [1] in the center [2] of valves as picture shows.

Warning: Wear goggles all the way during valve spring removal. Be caution because the spring may pop out due to high pressure when removing it.



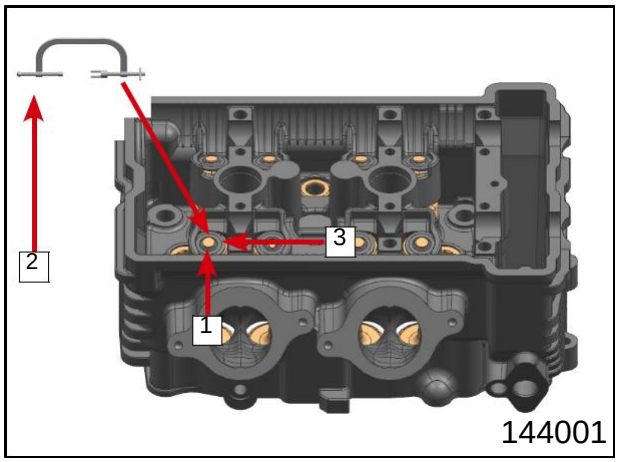
143904

According to records, install valve spring upper seat [1].

Install special tool: valve spring compressing tool [2] on valve spring upper seat [1] as picture shows. Tighten it to compress the spring.

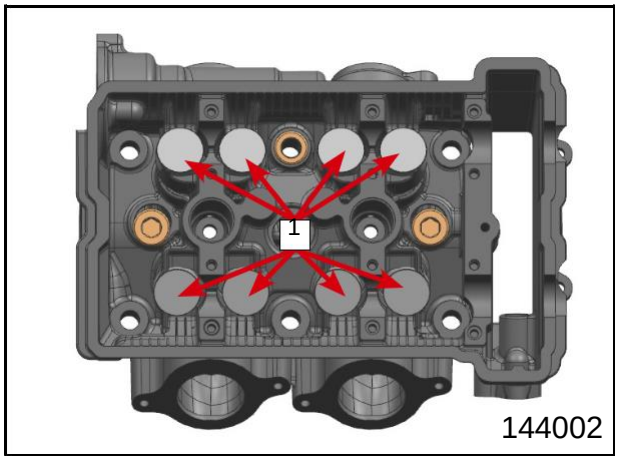
Install valve clip [3] with tweezers.

Loose valve spring compressing tool [2] after the clip is installed.



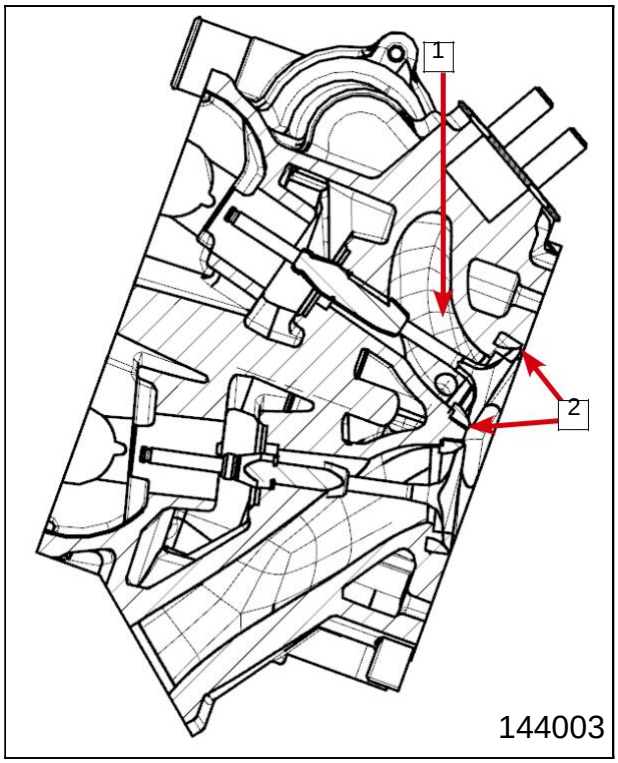
144001

Install tappets [1] into the original positions according to records.



144002

Cylinder head sealing inspection: Inject cleaning agent into air intake/exhaust passage [1]. Wait for a while to check whether there is leaking from valve seat [2].



144003

14.5.8 Timing Tensioner Inspection

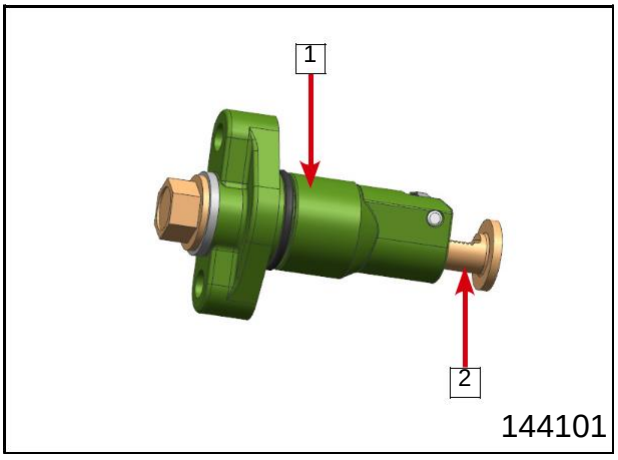
Removal procedures refer to Engine Disassembly section.

Inspect tensioner 1 for damage and smooth performance. Replace if defects below occur.

Method:

1. Compress the tensioner arm 2 to the end with hand.
2. Loose the arm, inspect whether the tensioner arm 2 can return gently and smoothly. Replace if the return is rough.

Inspect whether chain tensioner arm can return smoothly or have scratches or not. Replace if necessary.



144101

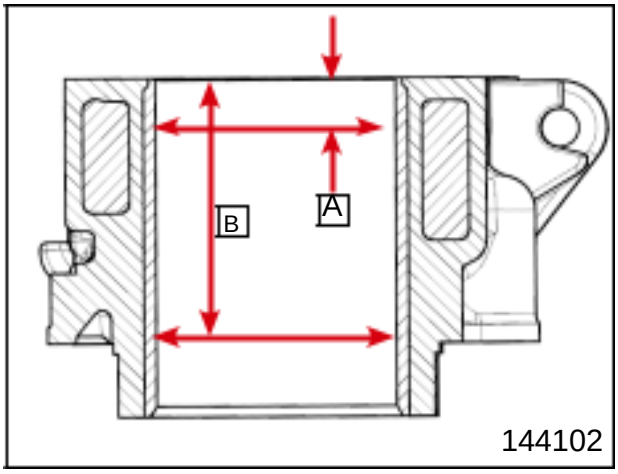
14.5.9 Cylinder Body Inspection

Cylinder body removal/installation procedures refer to Engine Disassembly/ Assembly sections.

Cylinder head has different wear degree in different directions. Measure at four points as picture show. Replace cylinder body if any measuring point is beyond service limit.

10 mm A

60 mm B



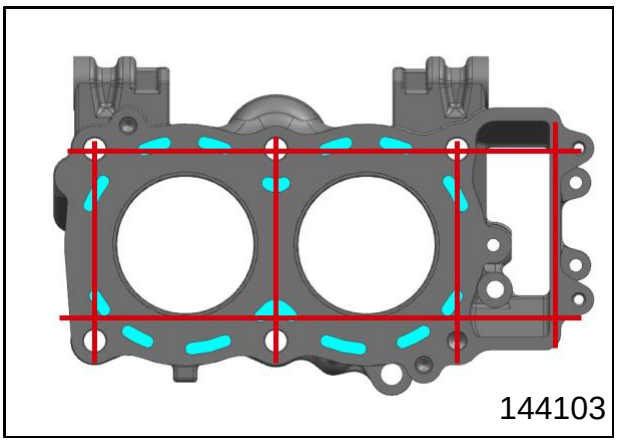
144102

Cylinder body inner diameter
Standard: 83.008 mm~83.026 mm
Service limit: 83.1 mm

Cylinder Body Deformation

Measure the flatness of cylinder sealing surface with straight edge knife and feeler gauge at different measuring points. Replace the cylinder body if any value is beyond the service limit.

Cylinder body flatness service limit: 0.03 mm


144103

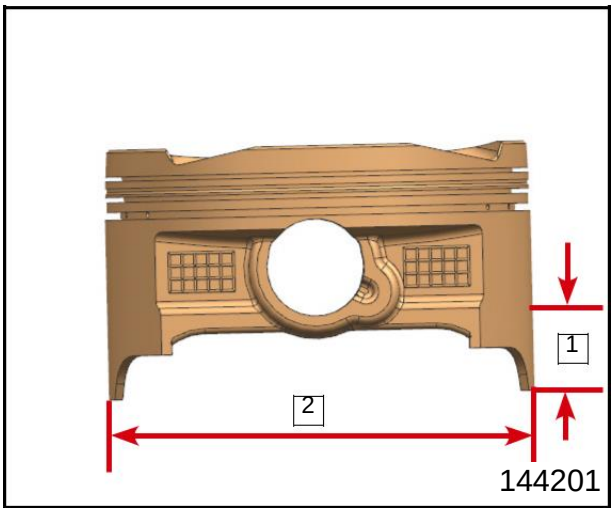
Note: Replace with new piston rings when replacing cylinder body.

14.5.10 Piston Assy Inspection

Removal/Installation procedures refer to Engine Disassembly/Assembly sections.

Measure piston outer diameter [2] at [ ] different positions which are perpendicular to piston pin and 10 mm [1] from the bottom. Replace if the measuring value is less than service limit.

Piston diameter
Standard: 82.970 mm~82.988 mm
Service limit: 82.83 mm



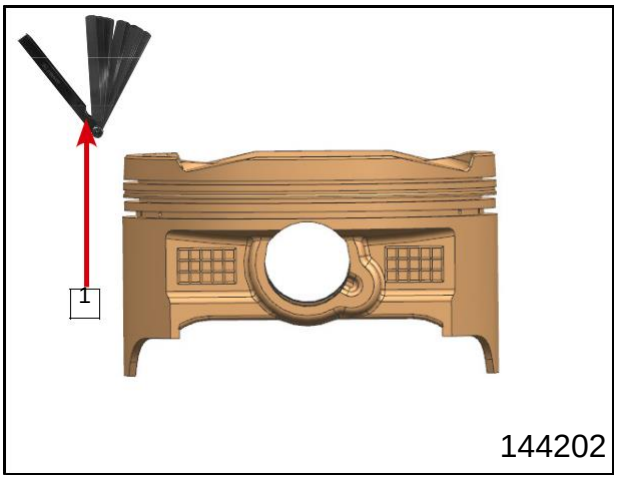
According to the above measurement, figure out the fit clearance between piston and cylinder body. If the clearance is larger than 0.10 mm, replace cylinder body and/ or piston.

Piston Ring/Groove Clearance

Piston rings have to be parallel to piston ring groove. Replace piston and all piston rings if not parallel.

Use feeler gauge [1] to measure the clearance between piston ring and groove for several times.

Clearance between first ring and groove
Standard: 0.03 mm~0.06 mm
Service limit: 0.16 mm
Clearance between second ring and groove
Standard: 0.02 mm~0.06 mm
Service limit: 0.16 mm

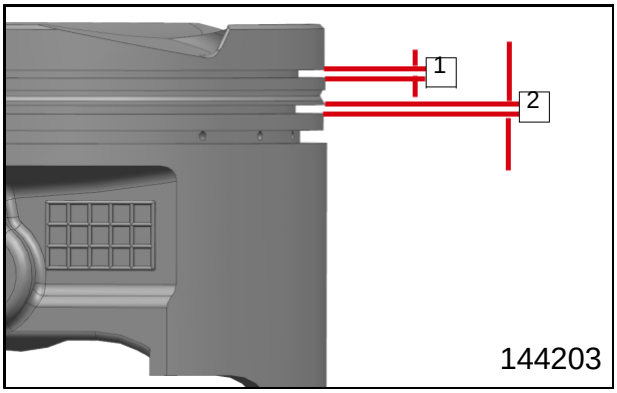


Piston Ring Groove Width

Measure piston ring groove width with slide caliper at different points.

First piston ring groove width [1]
Standard: 0.92 mm~0.94 mm
Service limit: 1.02 mm

Second piston ring groove width [2]
Standard: 1.01 mm~1.03 mm
Service limit: 1.11 mm



Replace piston if the width of any ring is beyond service limit.

Piston Ring Thickness

Measure piston ring thickness with dial gauge at different points.

First piston ring thickness [1]
Standard: 0.87 mm~089 mm
Service limit: 0.80 mm

Second piston ring thickness [2]
Standard: 0.97 mm~0.99 mm
Service limit: 0.90 mm

Replace piston if the thickness of any ring is beyond service limit.

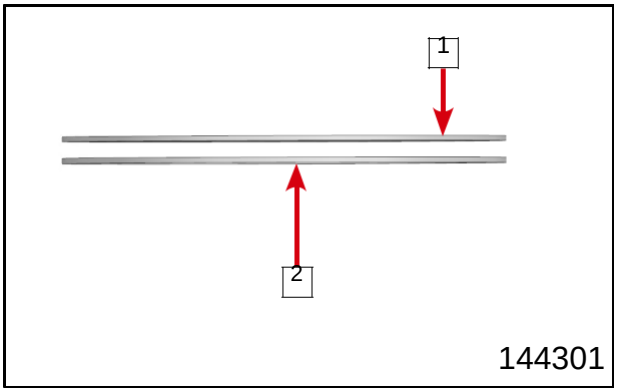
Note: If new rings are used on old piston, inspect the ring groove for wear condition. If the groove surface is not parallel, replace piston.

Piston Ring Cut Clearance

Put piston ring [1] into cylinder body and fix it to the end, at which cylinder has minimum wear.

Measure piston ring cut clearance [2] with feeler gauge.

Replace all rings if clearance of any ring is beyond service limit.



144301

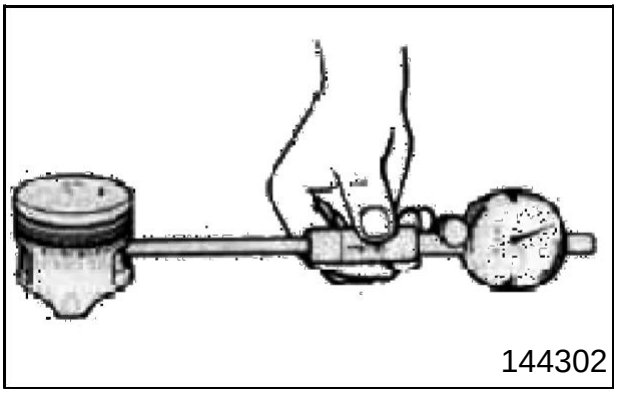
First piston ring cut clearance
Standard: 0.25 mm~0.40 mm
Service limit: 0.70 mm

Second piston ring cut clearance
Standard: 0.40 mm~0.55 mm
Service limit: 0.80 mm

Piston Pin and Pin Hole

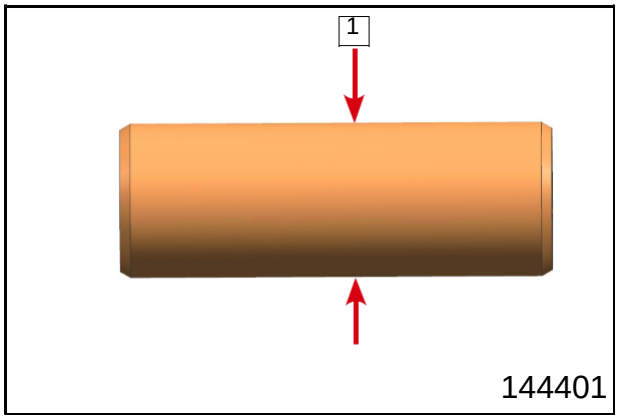
Measure piston pin hole inner diameter and outer diameter with dial gauge. Replace piston and piston pin together if beyond standard.

Piston pin hole inner diameter standard: 19.004 mm~19.010 mm


144302

Measure piston pin outer diameter 1 at three points.

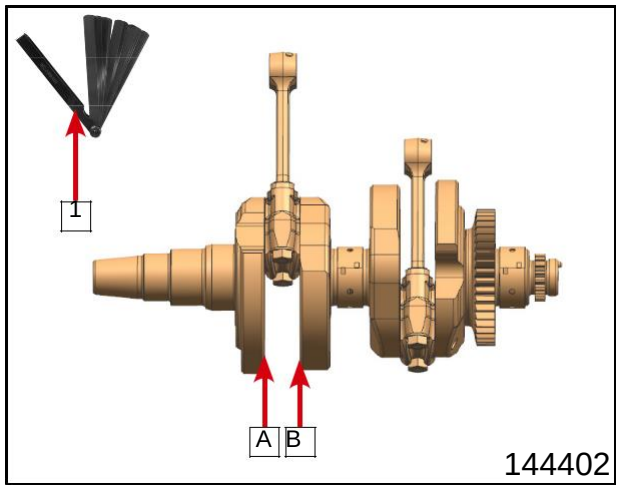
Piston pin outer diameter standard:
18.996 mm~19 mm



14.5.11 Camshaft Connecting Rod Assy Inspection
(Status 1)
Connecting Rod Big Side Clearance
Measurement: Push the big end closely to the shaft neck surface A. Insert the feeler gauge 1 between surface B and rod to measure the clearance.
Connecting Rod Bid Side Clearance Standard:

Standard	0.15 mm~0.30 mm
Service limit	0.50 mm

Note: Replace with a new connecting rod and measure the clearance if beyond service limit. If the clearance is still out of standard, replace crankshaft.



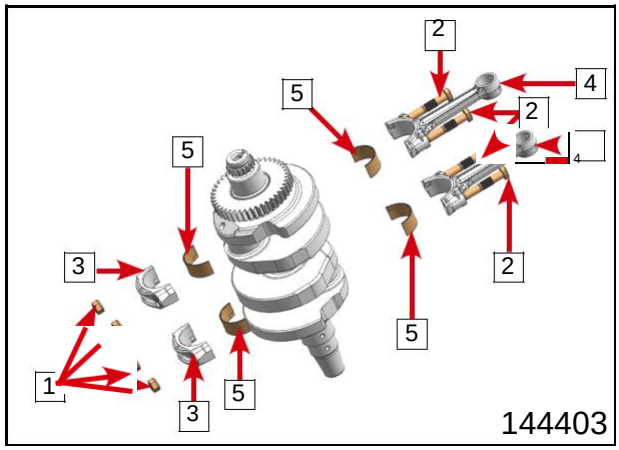
Disassembly
Remove connecting rod M9 nut 1.
Remove connecting rod bolts 2.
Remove connecting rod cap 3.
Remove connecting rod body 4.
Remove the plain bearing 5 from connecting rod cap 3 and body 4.

Waring: Pay attention during connecting rod removal, in case it breaks the shaft neck.

Note: Mark connecting rod cap and body after removal.

Note: If not worn or damaged, plain bearings 3 are not necessary to remove.

Note: Connecting rod bolt tighten method: 29 N·m+90°. Final torque: 65 N·m~90 N·m.



Connecting Rod Parallelism

Remove plain bearings and install connecting rod cap.

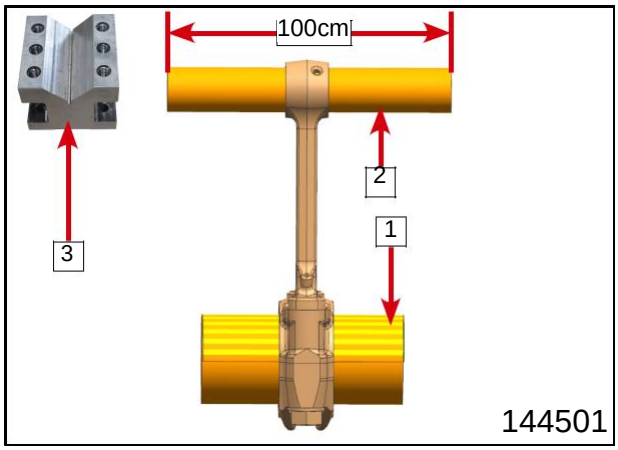
Insert mandrel 1 into big end hole.

Insert mandrel 2 (100 mm long) into small end hole.

Put connecting rod big end mandrel on V-block 3. Plumb it and measure mandrel 2 height on both sides, the height difference is the parallelism.

Note: Replace if parallelism is beyond service limit.

Parallelism service limit: 0.2 mm



144501

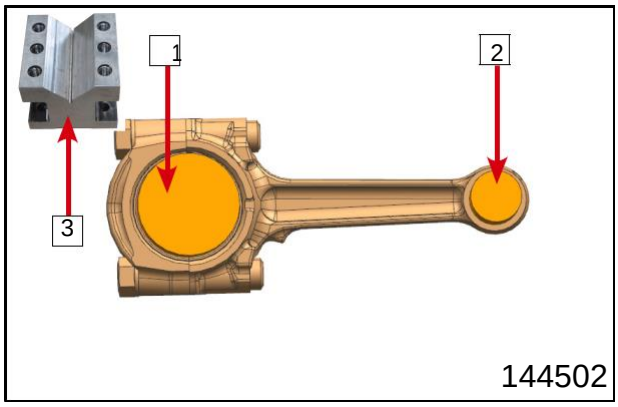
Connecting Rod Bend

Put connecting rod big end mandrel 1 on V-block 3.

Measure the mandrel 2 height difference, which is the bend value.

Bend service limit: 0.2 mm

Note: Replace if bend value is beyond service limit.



144502

Crankshaft Rod Journal/Bearing Shell Wear

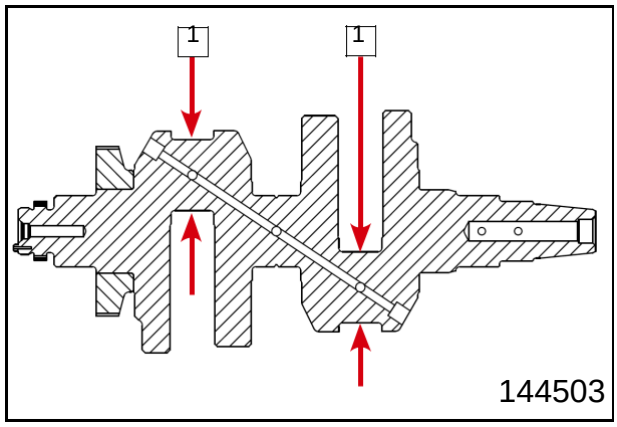
Measure crankshaft rod journal diameter 1 with micrometer.

Specification:

Standard	37.985 mm~38.00 mm
Service limit	37.97 mm

Note: Replace if diameter is beyond service limit.

Note: If measured diameter is not less than service limit but coincide the marks, re-mark signs.



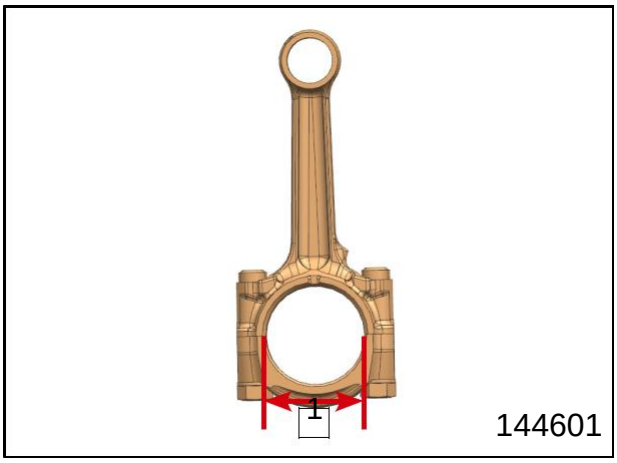
144503

Connecting rod journal	
Journal size	Mark
ø37.985~ø37.990	3
ø37.991~ø37.995	2
ø37.996~ø38.000	1
Install on second crankshaft outer circle	

Measure connecting rod big end hole diameter 1. It should coincide the mark. Otherwise, re-mark.

Connecting rod big end hole diameter mark	
1	41.00 mm~41.008 mm
2	41.009 mm~41.016 mm

After connecting rod plain bearing installation, measure connecting rod big end hole diameter and record the value.
Clearance between connecting rod and crankshaft journal plain bearing:
0.032 mm~0.042 mm

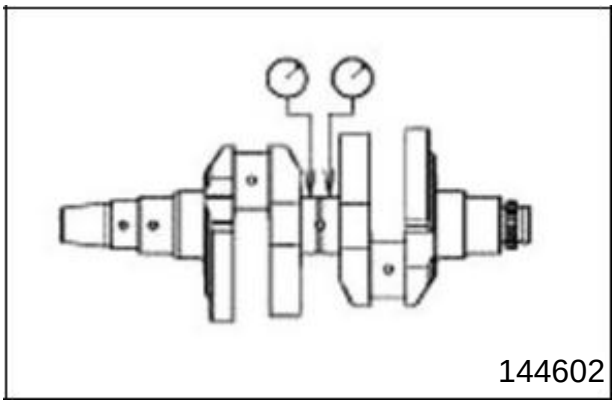


144601

Note: The weight difference between two chosen connecting rods should be ≤2g.

Crankshaft Runout Inspection
Measure crankshaft runout value.

Crankshaft runout standard	
Standard	0.02mm
Service limit	0.05 mm

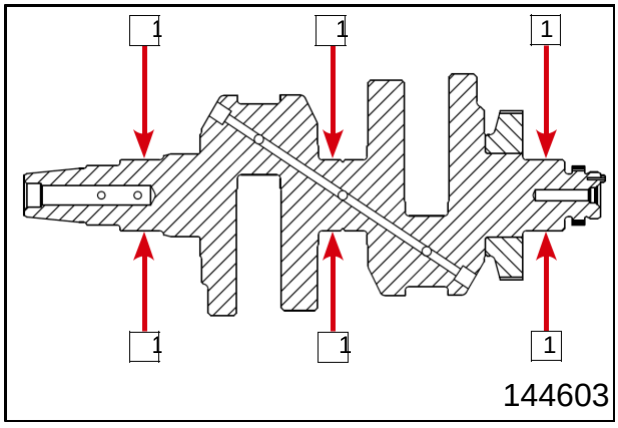

144602

Note: Replace with a new crankshaft if beyond service limit.

Crankshaft Main Journal

Measure crankshaft main journal 1 diameter with micrometer.

Crankshaft main journal diameter	
Standard	37.984 mm~38.00 mm
Service limit	37.97 mm



144603

Note: Replace with a new crankshaft if beyond service limit.

Note: If measured diameter is not less than service limit but coincide the marks, re-mark signs.

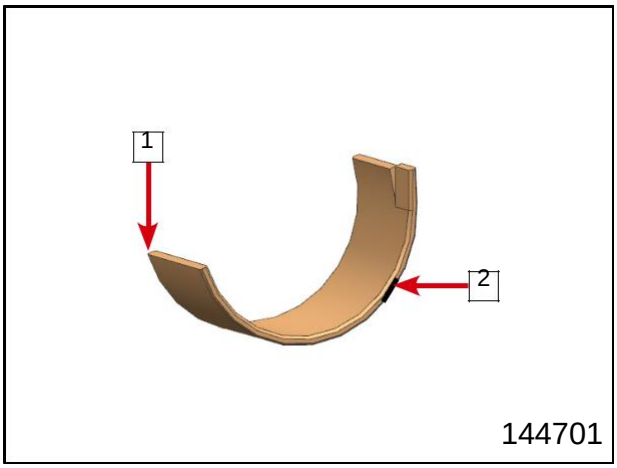
Crankshaft main journal diameter mark	
2	37.984 mm~37.992 mm
1	37.993 mm~38.000 mm

Assemble the upper and lower crankcase according to 14.3.6 Crankcase Assembly section (without installing other parts). Measure the crankcase hole diameter vertically. It should coincide the mark. Otherwise, re-mark.

Crankcase main shaft hole diameter mark	
Yellow	41.000 mm~41.008 mm
Green	41.008 mm~41.016 mm

According to the crankshaft main journal mark and crankcase main shaft hole, choose main plain bearing [1]. Color mark [2].

Crankcase main shaft hole/main journal/ main plain bearing		
Crankcase main shaft hole mark	Crankshaft main journal diameter mark	Main plain bearing color
Yellow	1	Brown
Yellow	2	Black
Green	1	
Green	2	Blue

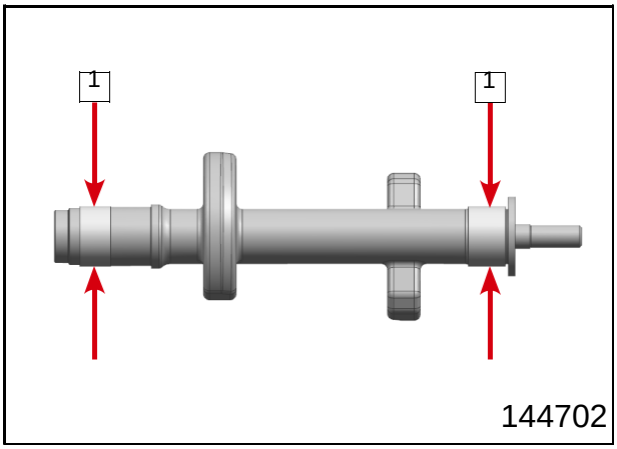


144701

14.5.12 Balance Shaft/Plain Bearing Wear

Measure balance shaft journal [1] diameter with micrometer.

Balance shaft journal diameter	
Standard	27.987 mm~28.000 mm
Service limit	27.96 mm



144702

Note: Replace with a new balance shaft if beyond service limit.

Note: If measured diameter is not less than service limit but coincide the marks, re-mark signs.

Balance shaft journal diameter mark	
1	27.987 mm~27.993 mm
2	27.993 mm~28.000 mm

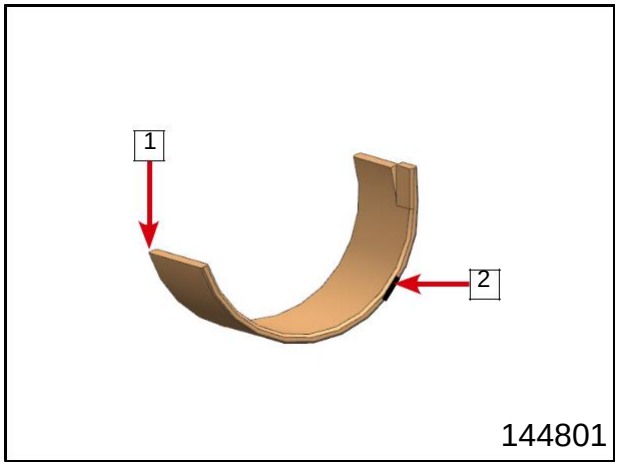
Balance Shaft

Measure balance shaft hole diameter. It should coincide the mark. Otherwise, re-mark.

Balance shaft hole diameter mark	
Yellow	31.000 mm~31.008 mm
Green	31.008 mm~31.016 mm

According to the balance shaft journal mark and balance shaft hole, choose main plain bearing 1. Color mark 2.

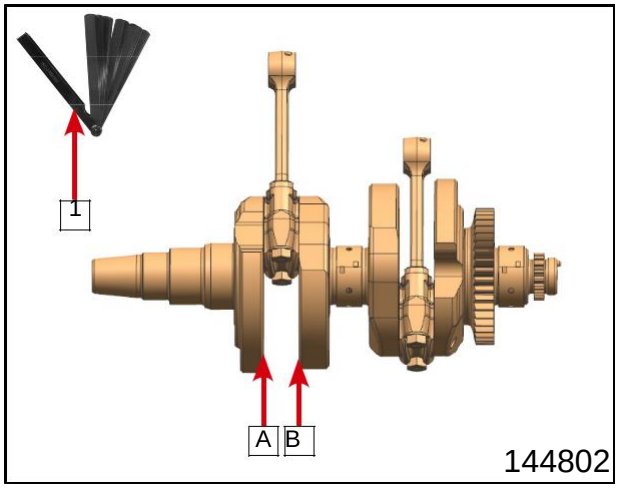
Balance shaft hole/balance shaft journal/ balance shaft plain bearing		
Balance shaft hole mark	Balance shaft journal diameter mark	Balance shaft plain bearing color
Yellow	2	Brown
Yellow	1	Black
Green	2	
Green	1	Blue



(Status 2)

Connecting Rod Big Side Clearance

Measurement: Push the big end closely to the shaft neck surface A. Insert the feeler gauge 1 between surface B and rod to measure the clearance.



Connecting Rod Bid Side Clearance

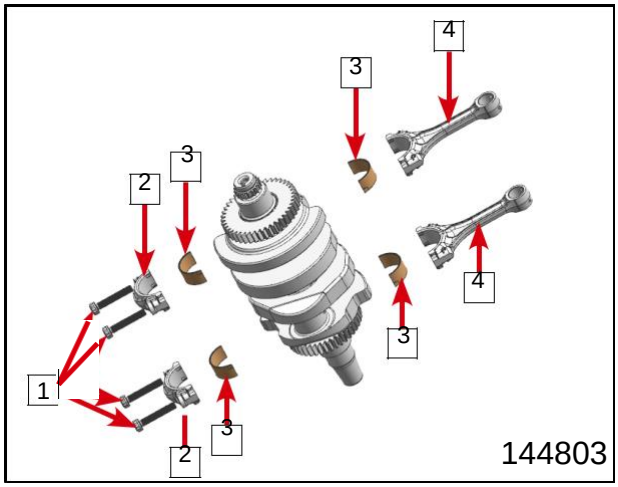
Standard:

Standard	0.15 mm~0.30 mm
Service limit	0.55 mm

Note: Replace with a new connecting rod and measure the clearance if beyond service limit. If the clearance is still out of standard, replace crankshaft.

Disassembly

Remove connecting rod M9 nut 1. Remove connecting rod bolts 2. Remove connecting rod cap 3. Remove connecting rod body 4. Remove the plain bearing 5 from connecting rod cap 3 and body 4.



Waring: Pay attention during connecting rod removal, in case it breaks the shaft neck.

Note: Mark connecting rod cap and body after removal.

Note: If not worn or damaged, plain bearings 3 are not necessary to remove.

Note: Connecting rod bolt tighten method:20N·m+180°±5° for new bolt, 18N·m+180°±5° for old bolt. Connecting rod bolts can not be used more than three times.

Note: Loosen and tighten the connecting rod bolt, the diameter difference at 10° surface should be less than 0.01mm.

Connecting Rod Parallelism

Remove plain bearings and install connecting rod cap.

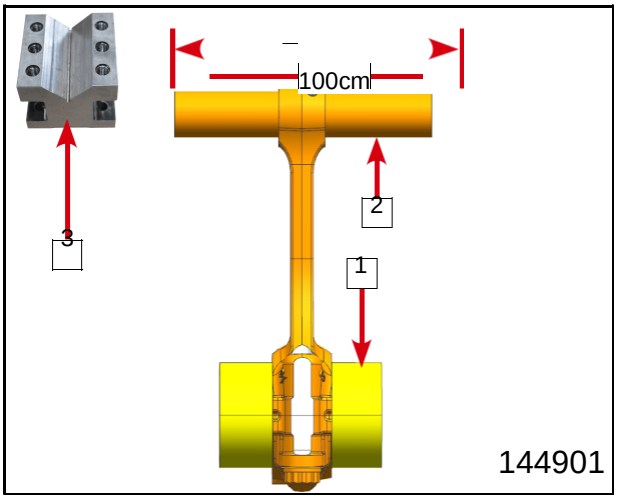
Insert mandrel [1] into big end hole.

Insert mandrel [2] (100 mm long) into small end hole.

Put connecting rod big end mandrel on V-block [3]. Plumb it and measure mandrel [2] height on both sides, the height difference is the parallelism.

Note: Replace if parallelism is beyond service limit.

Parallelism service limit: 0.2 mm



144901

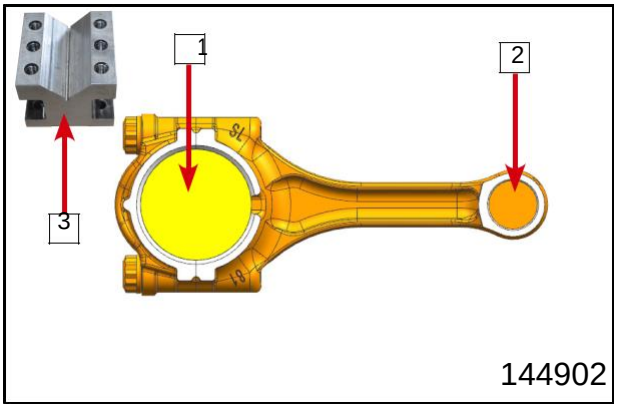
Connecting Rod Bend

Put connecting rod big end mandrel [1] on V-block [3].

Measure the mandrel [2] height difference, which is the bend value.

Bend service limit: 0.2 mm

Note: Replace if bend value is beyond service limit.



144902

Crankshaft Rod Journal/Bearing Shell Wear

Measure crankshaft rod journal diameter [1] with micrometer.

Specification:

Standard	37.984 mm~38.00 mm
Service limit	37.97 mm

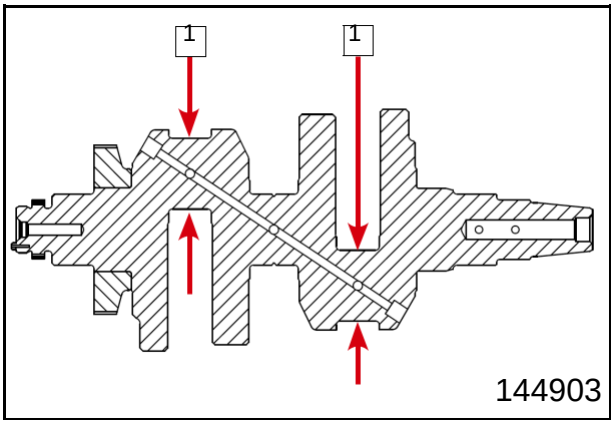
Note: Replace if diameter is beyond service limit.

Note: If measured diameter is not less than service limit but coincide the marks, re-mark signs.

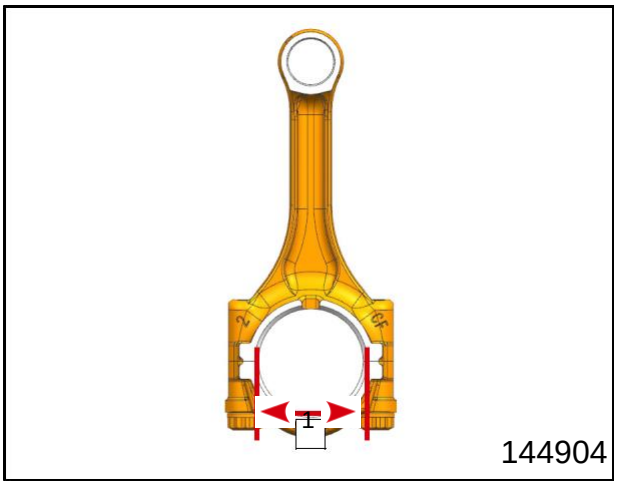
Crankshaft rod journal diameter mark	
3	37.985 mm~37.990 mm
2	37.991 mm~37.995 mm
1	37.996 mm~38.000 mm

Measure connecting rod big end hole diameter [1]. It should coincide the mark. Otherwise, re-mark.

Connecting rod big end hole diameter mark	
1	41.000 mm~41.005 mm
2	41.005 mm~41.010 mm
3	41.010 mm~41.015 mm



144903



144904

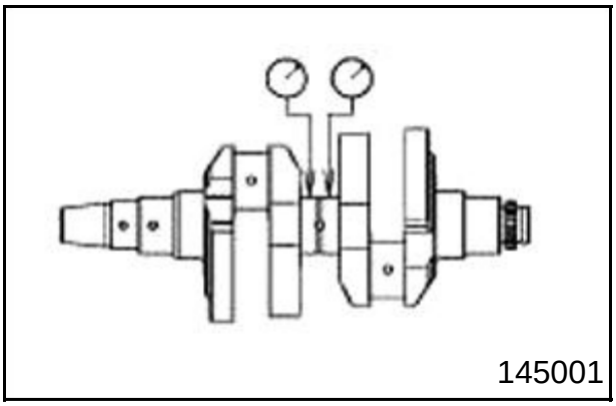
After connecting rod plain bearing installation, measure connecting rod big end hole diameter and record the value.
Clearance between connecting rod and crankshaft journal plain bearing:
0.032 mm~0.042 mm

Note: The weight difference between two chosen connecting rods should be ≤2g.

Crankshaft Runout Inspection

Measure crankshaft runout value.

Crankshaft runout standard	
Standard	0.02mm
Service limit	0.05 mm

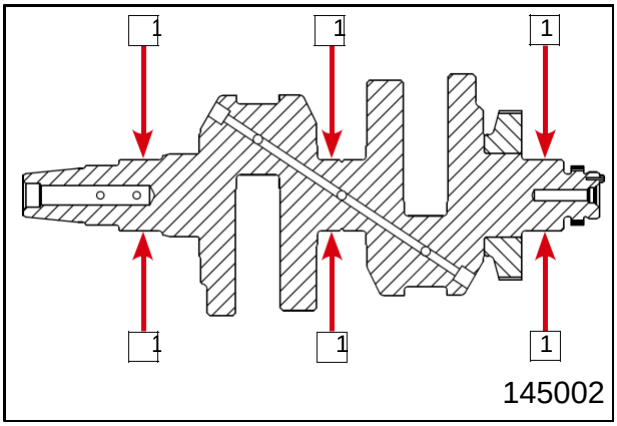

145001

Note: Replace with a new crankshaft if beyond service limit.

Crankshaft Main Journal

Measure crankshaft main journal 1 diameter with micrometer.

Crankshaft main journal diameter	
Standard	37.984 mm~38.00 mm
Service limit	37.97 mm



145002

Note: Replace with a new crankshaft if beyond service limit.

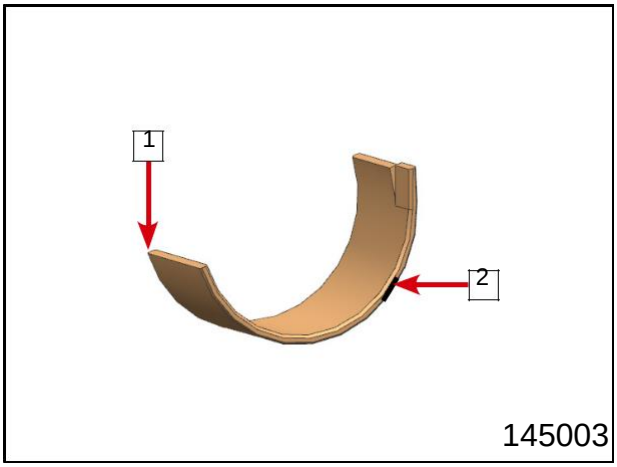
Note: If measured diameter is not less than service limit but coincide the marks, re-mark signs.

Crankshaft main journal diameter mark	
2	37.984 mm~37.992 mm
1	37.993 mm~38.000 mm

Measure crankcase main shaft hole diameter. It should coincide the mark. Otherwise, re-mark.

Crankcase main shaft hole diameter mark	
1	41.00 mm~41.008 mm
2	41.009 mm~41.016 mm

According to the crankshaft main journal mark and crankcase main shaft hole, choose main plain bearing 1. Color mark 2.



145003

Crankcase main shaft hole/main journal/ main plain bearing		
Crankcase main shaft hole mark	Crankshaft main journal diameter mark	Main plain bearing color
Yellow	1	Brown
Yellow	2	Black
Green	1	
Green	2	Blue

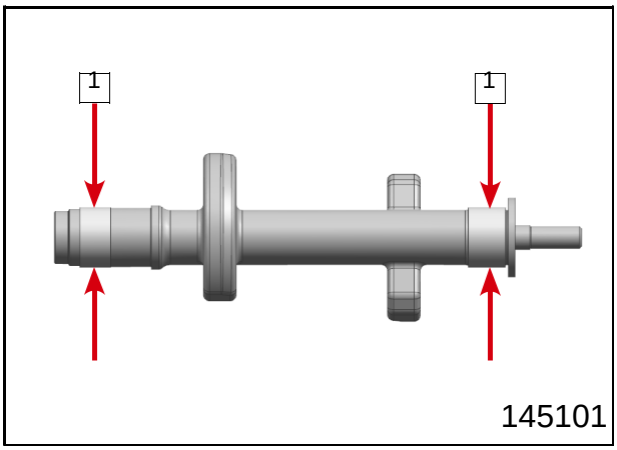
14.5.13 Balance Shaft/Plain Bearing Wear

Measure balance shaft journal [1] diameter with micrometer.

Balance shaft journal diameter	
Standard	27.987 mm~28.000 mm
Service limit	27.96 mm

Note: Replace with a new balance shaft if beyond service limit.

Note: If measured diameter is not less than service limit but coincide the marks, re-mark signs.



145101

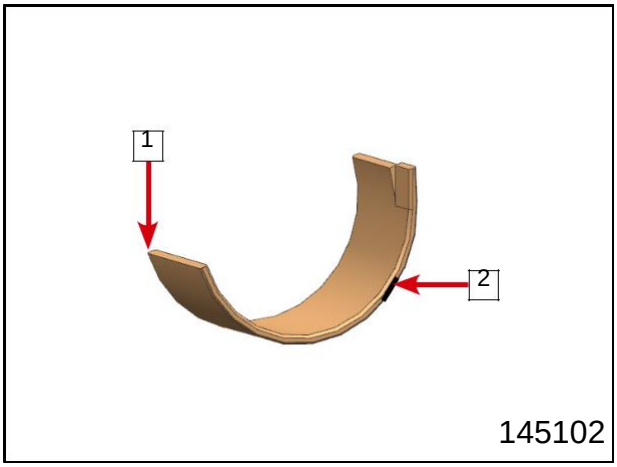
Balance shaft journal diameter mark	
1	27.987 mm~27.993 mm
2	27.994 mm~28.000 mm

Balance Shaft

Measure balance shaft hole diameter. It should coincide the mark. Otherwise, re-mark.

Balance shaft hole diameter mark	
1	31.000 mm~31.008 mm
2	31.009 mm~31.016 mm

According to the balance shaft journal mark and balance shaft hole, choose main plain bearing [1]. Color mark [2].



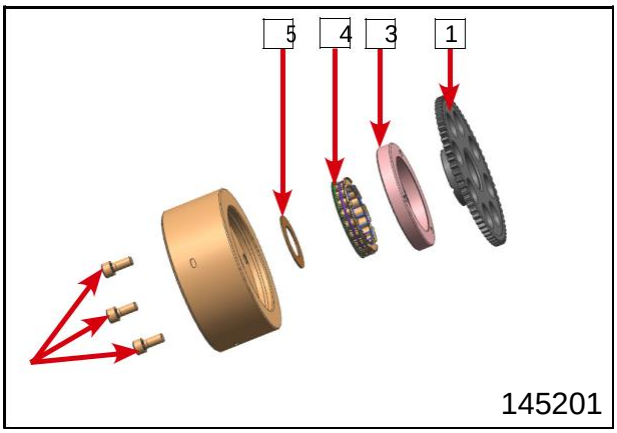
145102

Balance shaft hole/balance shaft journal/ balance shaft plain bearing		
Balance shaft hole mark	Balance shaft journal diameter mark	Balance shaft plain bearing color
Yellow	2	Brown
Yellow	1	Black
Green	2	
Green	1	Blue

14.5.14 Overriding Clutch Inspection Disassembly

Remove starter big gear assy [1].
Remove M8 inner hex screws [2].
Remove one-way clutch seat [3].
Remove one-way clutch assy [4].
Remove washer [5].

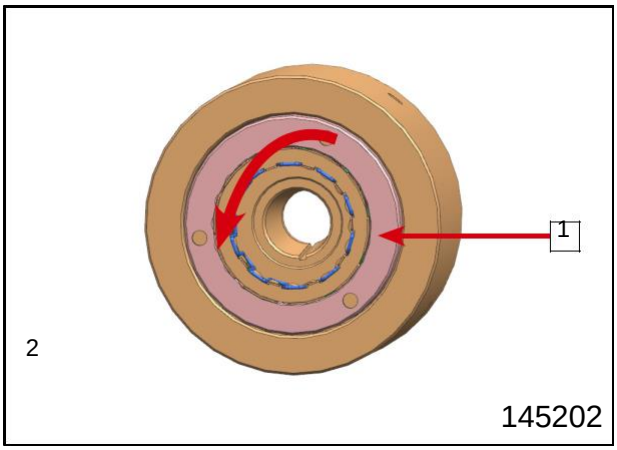
Note: Never try to knock the AC generator rotor. Otherwise, magnet will lose its magnetism.



Inspection

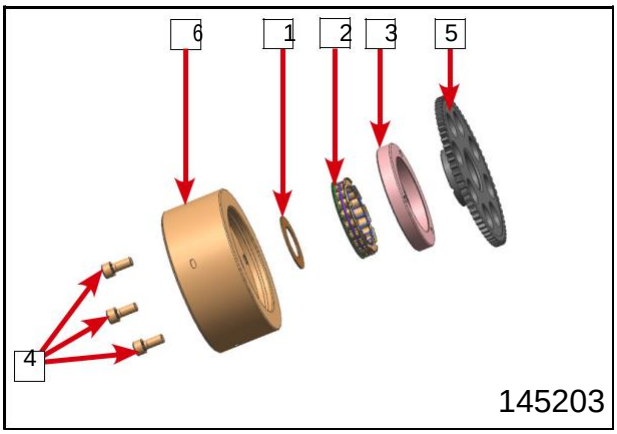
Turn overriding clutch assy gear [1] with hand. It should rotate counterclockwise freely, but not clockwise.

If overriding clutch assy can not work or makes noise, disassemble and inspect overriding clutch parts for damage. Replace if necessary.



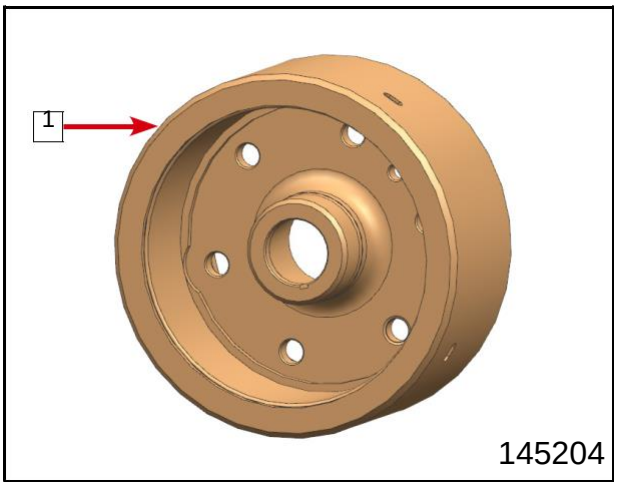
Assembly

Install one-way clutch assy [2] on seat [3]. Make sure the counter-clockwise direction.
Put the washer [1] under magneto rotor lower surface. Install one-way clutch assy [2] on rotor [6]. Install M8 inner hex screws [4] (with 243 thread locker).
Tighten torque: 34 N·m
Apply some grease on one-way clutch assy [2] inner side and install starter big gear [5].



14.5.15 Magneto Rotor Inspection

Inspect rotor [1] inside for scratch or other damage.
Inspect rotor [1] key groove for skewness or other damage.
Inspect rotor [1] outer ring teeth for lean or other damage.
Inspect woodruff key and key groove on crankshaft for wear or other damage.
Replace the parts above if severely damaged.



14.5.16 Starter Driven Gear, Dual Gear and Shaft Inspection

Inspection

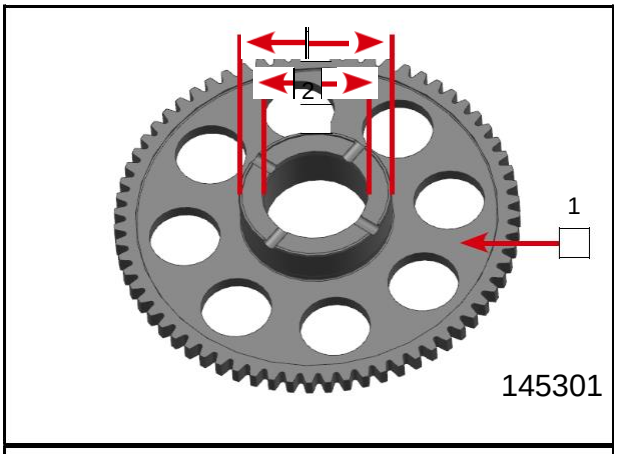
Inspect starter driven gear [1] for wear and damage.

-Measure starter driven gear [1] inner diameter and outer diameter.

Service limit:

Outer diameter [3]	51.705 mm~51.718 mm
Inner diameter [2]	32.025 mm~32.05 mm

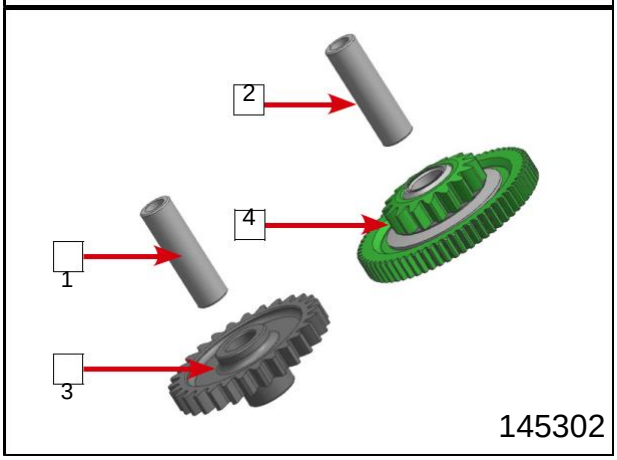
Replace starter driven gear [1] if beyond service limit.



145301

Inspect starter middle gear [3] and dual gear assy [4] for wear and damage. Replace if necessary.

Inspect middle gear shaft [1] and [2] for wear and damage. Replace if necessary.



145302

14.5.17 Magneto

Stater Disassembly

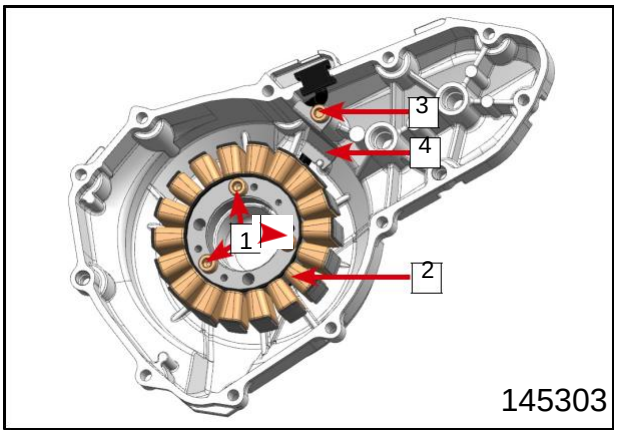
Remove M6 inner hex bolt [1].

Remove stater assy [2].

Remove M6 screws [3].

Remove wire-press plate [4].

Remove magneto stater [2].

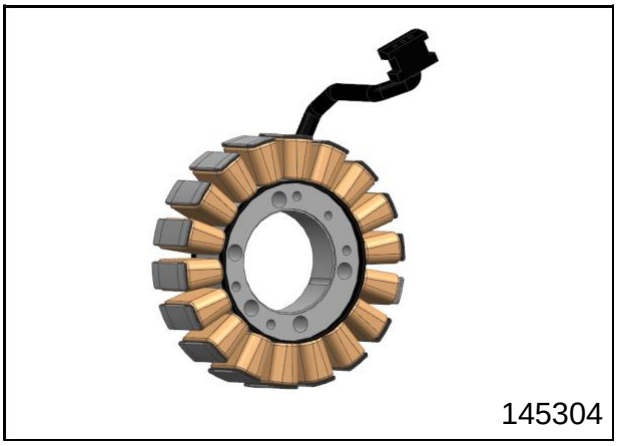


145303

Inspection

Inspect stater condition. Replace if broken.

Inspect coil for break, age or other damage. Replace if necessary.

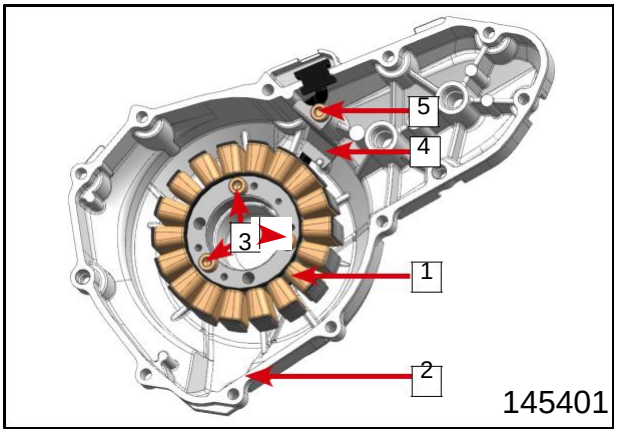

145304

Assembly

Install magneto stater [1] side [ ] on engine LH cover [2]. [ ]

Install M6 inner hex bolt [3]. Install wire-press plate .

Install M6 screw [5].



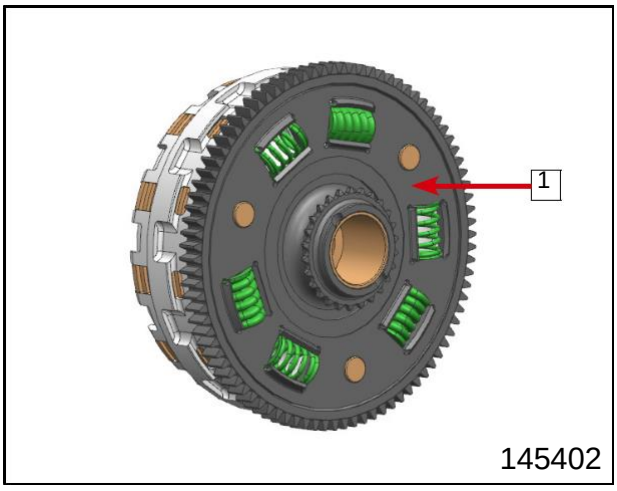
14.5.18 Clutch Assy

Inspection Housing Assy

-If inner damping springs get worn, it will cause waggle between gear and clutch housing, which makes noise. Replace primary driven gear assy [1] if the waggle is severe.

-Replace two gears if worn or damaged.

-Replace two gears if the noise is too loud.



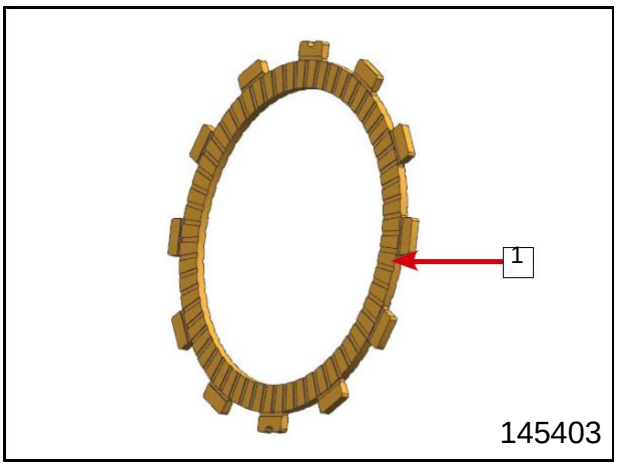
Friction Disc Assy

Inspect friction discs and steel plates for blocking, overheating (color changed) and other defects.

Measure friction disc [1] thickness at different positions.

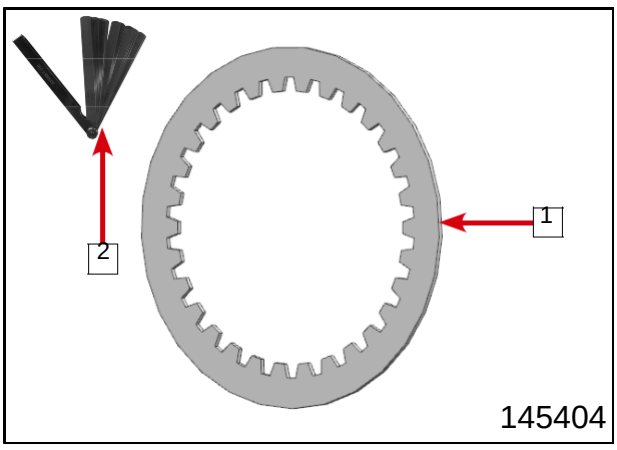
Replace if any disc gets broken or the thickness is beyond service limit.

Friction disc thickness	
Standard	2.95 mm~3.05 mm
Service limit	2.8 mm



Put every friction disc or steel plate on flatbed. Use feeler gauge [2] to measure the clearance [1] between flatbed and friction disc or steel plate. Such clearance is the friction disc or steel plate deformation value. Replace with new discs or plates if beyond service limit.

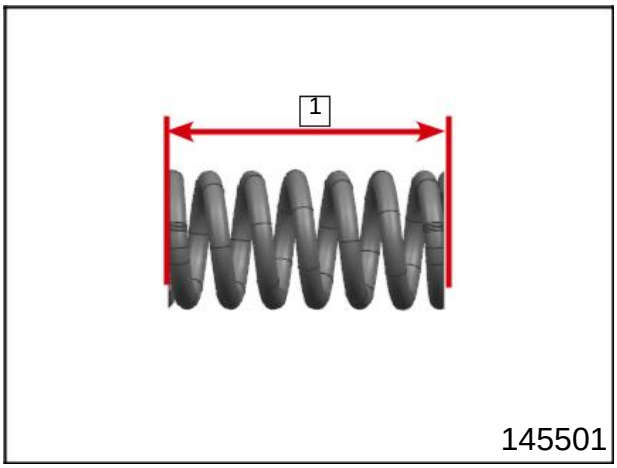
Friction disc and steel plate deformation	
Standard	0.15 mm or less
Service limit	0.3 mm



Clutch Press Spring

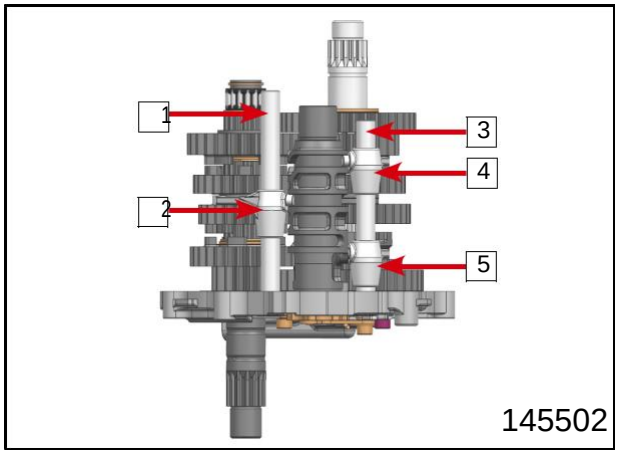
Measure clutch press spring [1] free length.
Replace if less than service limit.

Clutch press spring free length	
Standard	33.6 mm±0.5 mm
Service limit	32.6 mm

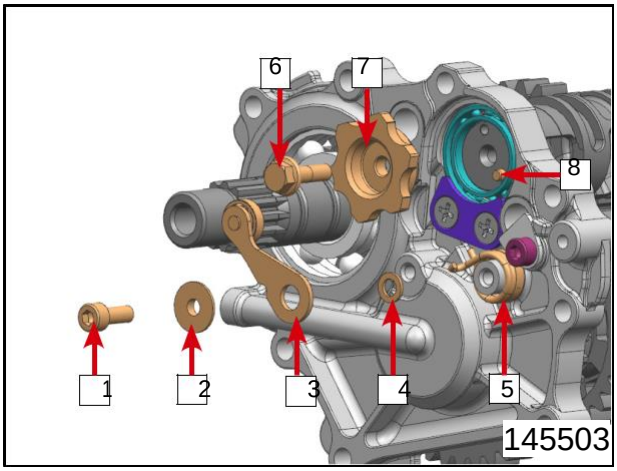


14.5.19 Transmission Case Inspection Disassembly

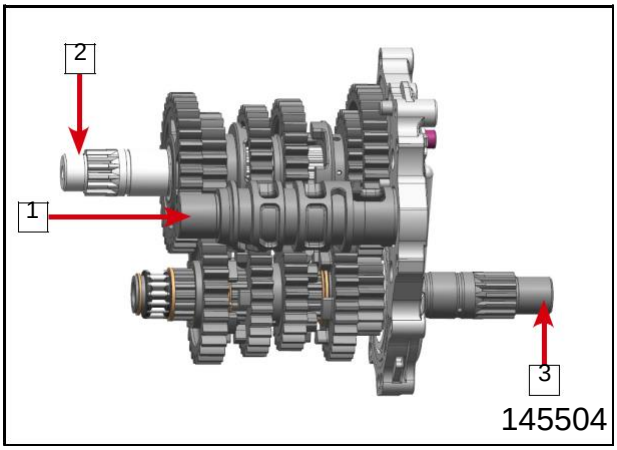
Remove main shaft fork shaft [1].
Remove main shift fork [2].
Remove countershaft fork shaft [3].
Remove countershaft shift fork [3] and [5].



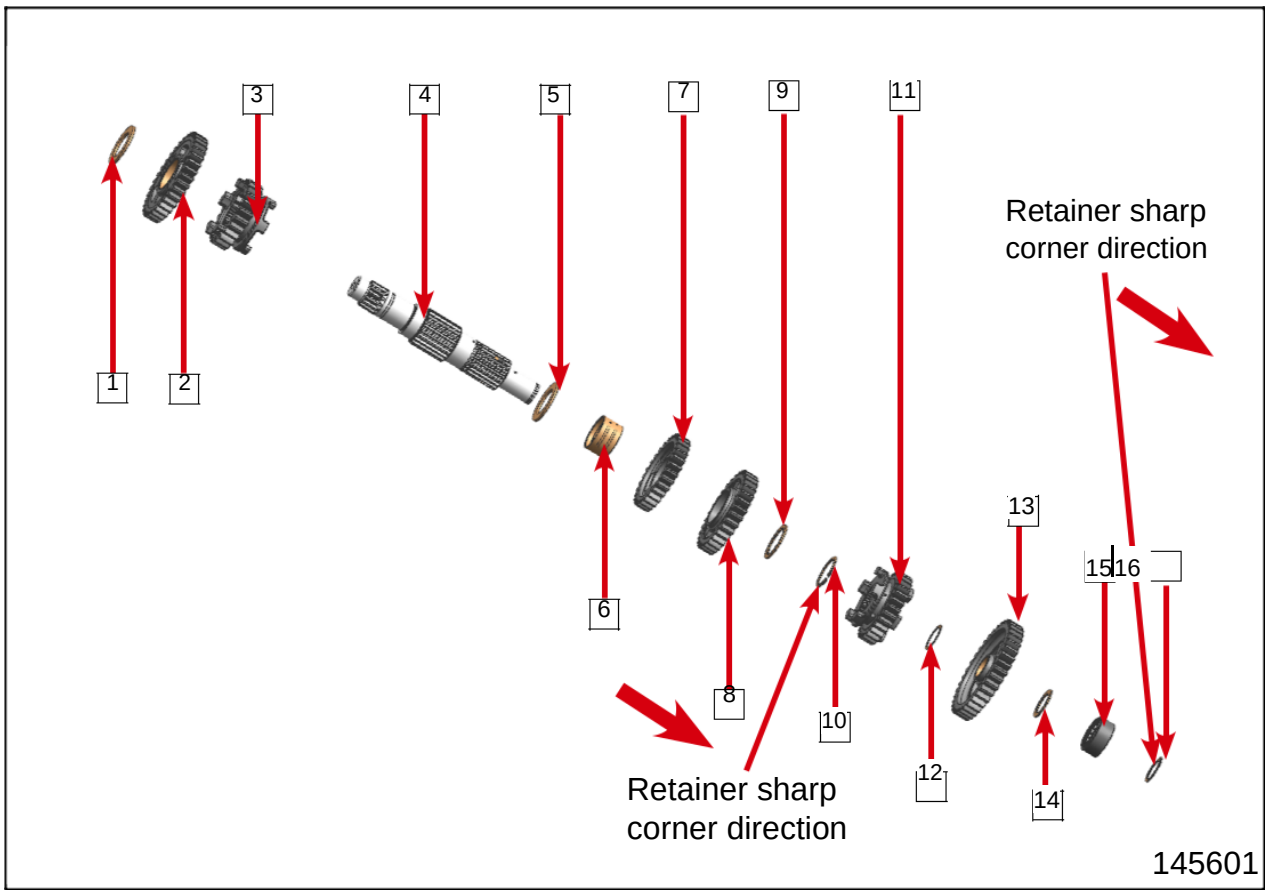
Remove M6 inner hex screw [1].
Remove gearshift swing arm bushing [2].
Remove gearshift swing arm assy [3].
Remove washer [4].
Remove gearshift swing arm spring [5].
Remove M6 bolt [6].
Remove gearshift cam [7].
Remove roller needle [8].



Remove shift drum hub [1].
Remove countershaft assy [2].
Remove main shaft assy [3].

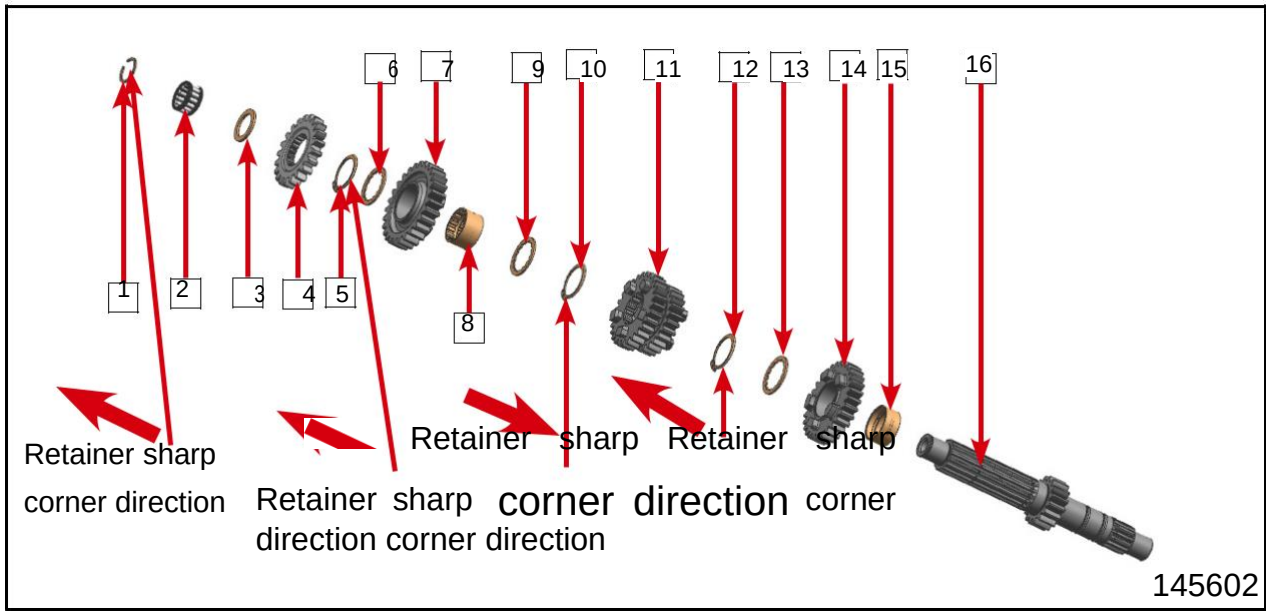


Countershaft Assy



1	25×39×2 washer	7	Driven gear (4th gear)	13	Driven gear (1st gear)
2	Driven gear (2nd gear)	8	Driven gear (3rd gear)	14	20.4×28×1.2 washer
3	Driven gear (6th gear)	9	Washer, spline	15	20×26×13.8 needle bearing
4	Countershaft	10	30 retainer	16	20 retainer
5	30 washer	11	Driven gear (5th gear)		
6	Bearing bushing	12	20.4×25×0.5 washer		

Main Shaft Assy



1	20 retainer	7	Drive gear (6th gear)	13	Washer, spline
2	Needle bearing	8	28×14.7 bearing bushing	14	Drive gear (5th gear)
3	20.5×30×1.5 washer	9	Washer, spline	15	28×14 bearing bushing
4	Drive gear (2nd gear)	10	28 retainer	16	Main shaft
5	28 retainer	11	Drive gear (3rd and 4th gear)		
6	Washer, spline	12	28 retainer		

Note: The removed retainers are sorted into waste. Replace with new re-tainers during installation.

Gear Inspection

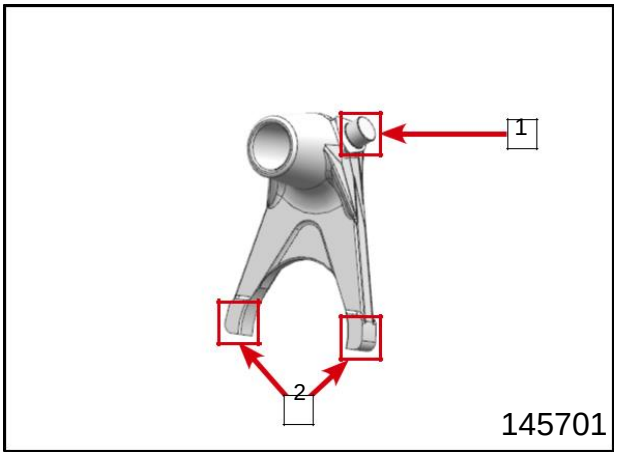
Inspect every gear to see whether it becomes blue, rusty or worn. Replace if it does.

Inspect gear teeth if they become rounded, misplace or have cracks. Replace if they do.

Note: Replace gears in pairs. Use new retainer during installation.

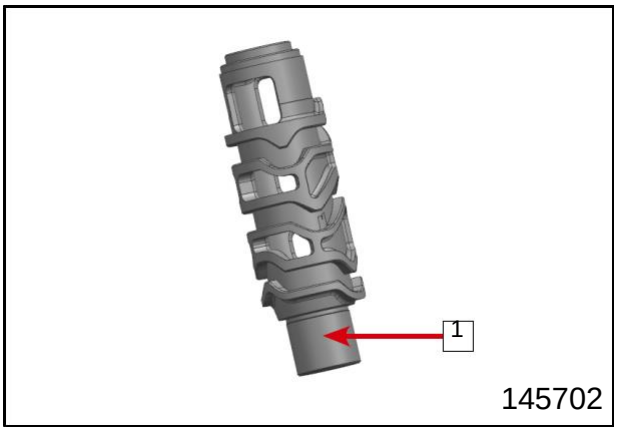
Shift Fork Inspection

Inspect shift fork bulge [1] and paw [2] for scratches, bend or damage. Replace if yes.



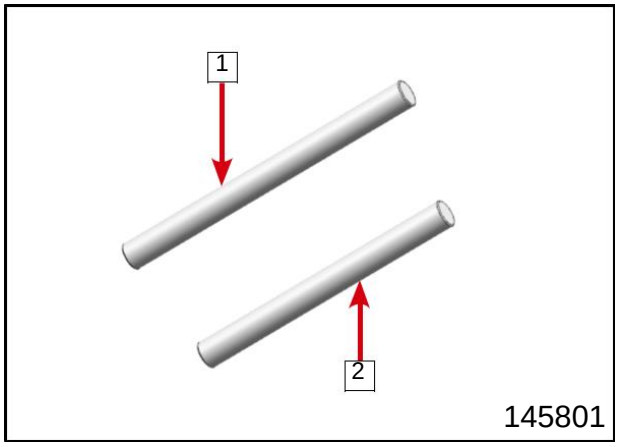
Shift Drum

Inspect shift drum groove and surface A for wear or damage. Replace if necessary.

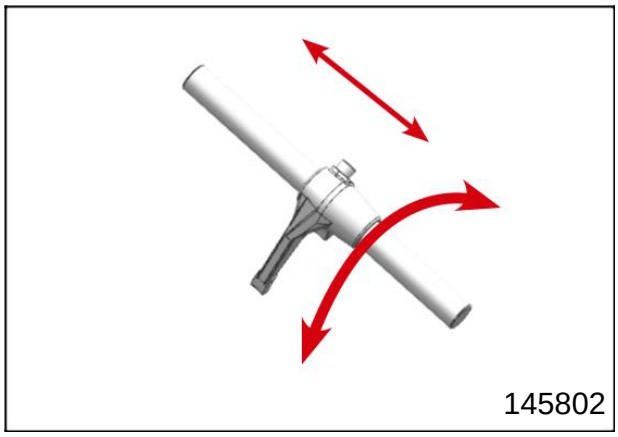


Shift Fork Shaft Inspection

Inspect shift fork shaft [1] and [2] for deformation, scratches, wear or damage. Replace if necessary.

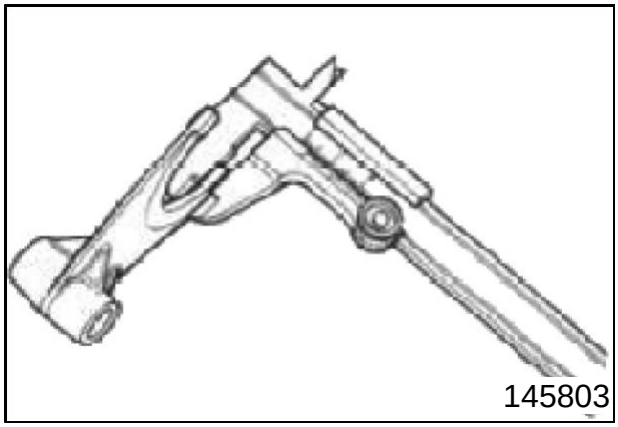


According to the picture, slide/rotate shift fork to check its action. Replace shift fork or fork shaft if the action isn't smooth.



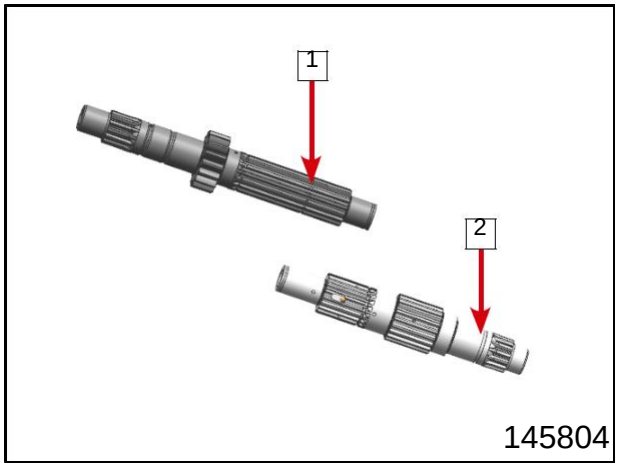
Measure shift fork joint thickness with vernier caliper.

Shift fork thickness: 4.8 mm~5.0 mm



Main Shaft and Countershaft

Inspect main shaft [1] and countershaft [2] for bending, wear or damage. Replace if they do.

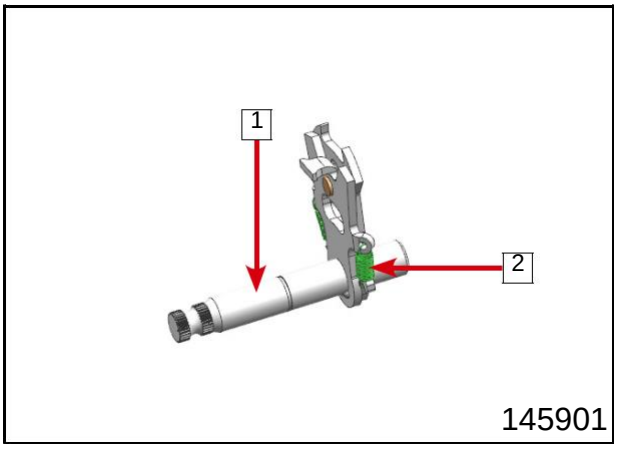


14.5.20 Gearshift Assy Inspection

Gearshift Rod Inspection

Inspect gearshift rod [1] for bending, wear or damage. Replace if it does.

Inspect gearshift spring [2] for damage or severe deformation. Replace if it does.

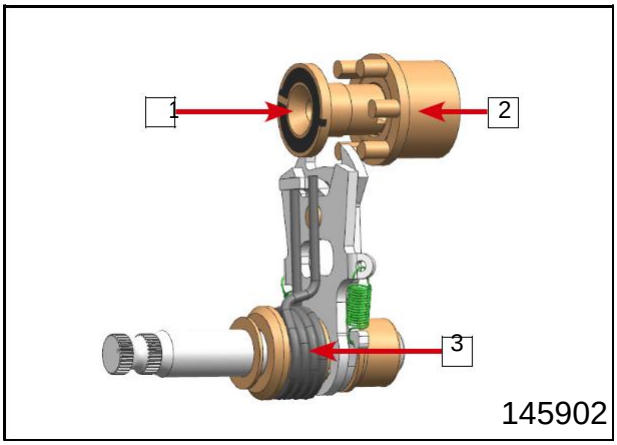


145901

Gear sensor [1] inspection refers to Electrical System chapter.

Inspect shift location drum [2] for damage or deformation. Replace if it does.

Inspect gearshift swing arm return spring [3] for damage or deformation. Replace if it does.



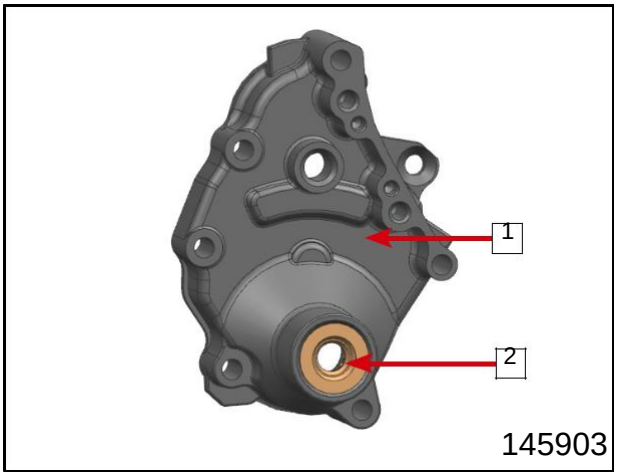
145902

14.5.21 Gearshift Cover Inspection

Inspect gearshift cover [1] for cracks, damage or severe deformation. Replace if it does.

Rotate needle bearing [2] to inspect for block or damage. Replace if it does.

Inspect oil seal for damage. Replace if it does.

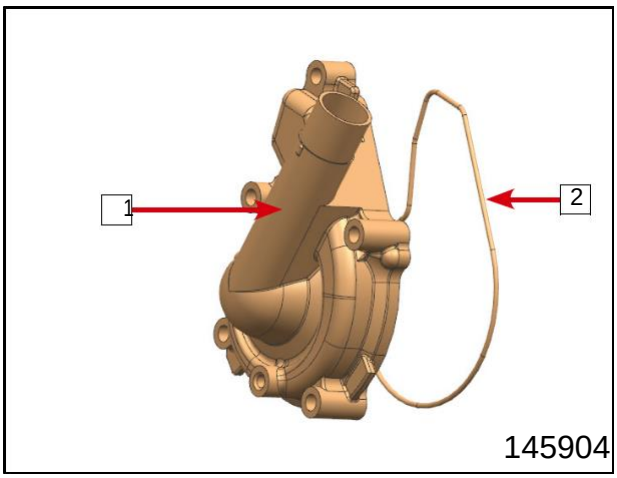


145903

14.5.22 Water Pump Assy Inspection

Inspect water pump cover [1] for cracks, damage or severe deformation. Replace if it does.

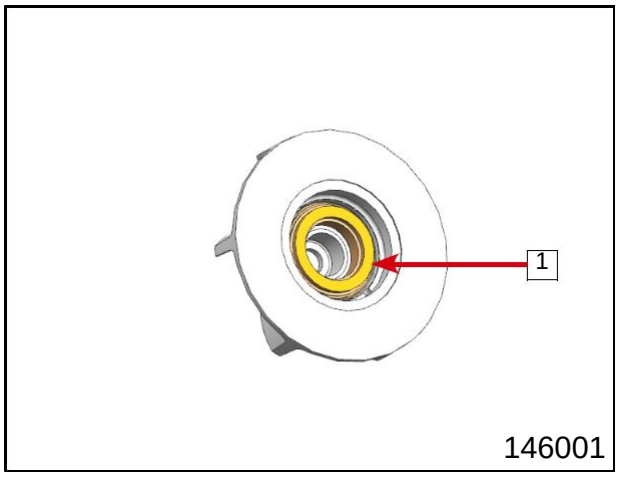
Inspect water pump cover seal ring [2] for cracks, aging or damage. Replace if necessary.



145904

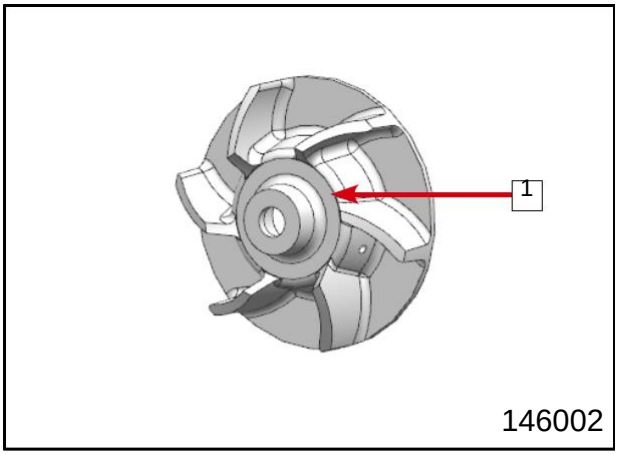
Water Pump Impeller
Disassembly

Remove water seal moving ring [1].



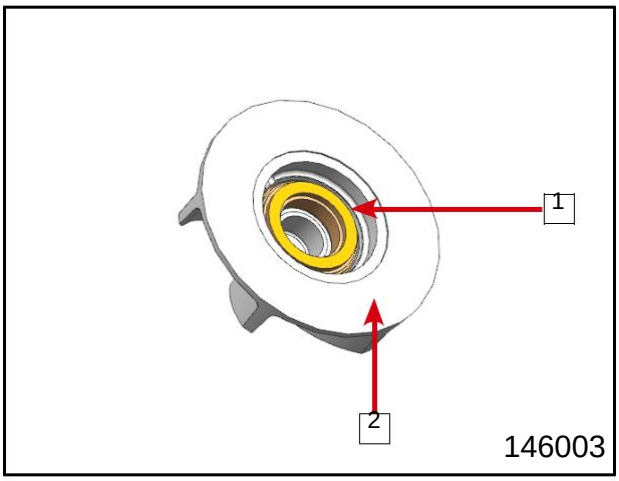
Inspection

Inspect water pump impeller [1] for damage. Replace if it does.



Assembly

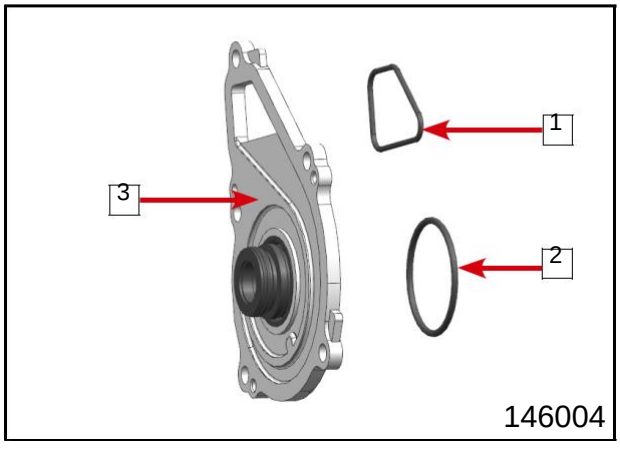
Dip some ethyl alcohol with clean cloth to clean water moving ring. Install the ring into the mounting hole on water impeller.



Water Pump Inspection

Inspect 34×2.5 o -seal ring [1] and water pump seal ring [2] for cracks, hardening or damage. Replace if necessary.

Inspect water pump [3] for cracks, damage or severe deformation. Replace if it does.



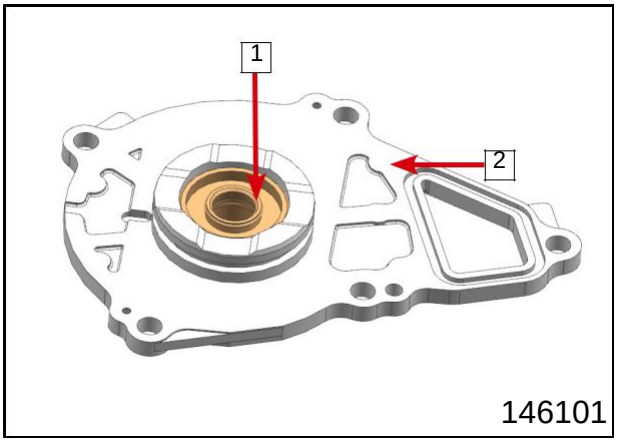
Water Seal Inspection

Watch the water seal to inspect. If any part breaks, replace the whole water pump assy. If the seal is good, it is not necessary to remove it.

Removal

Remove oil seal [1] from water pump [2].

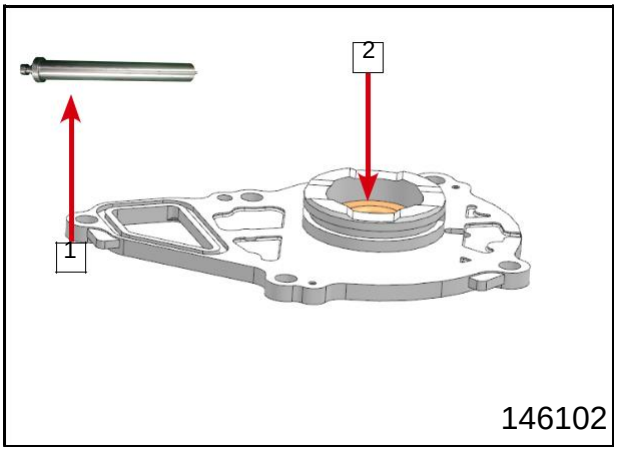
Note: The removed oil seals are sorted into waste. Use new oil seals during installation.



146101

Use special tool: water seal puncher pin [1] to press out the static ring [2] from water pump.

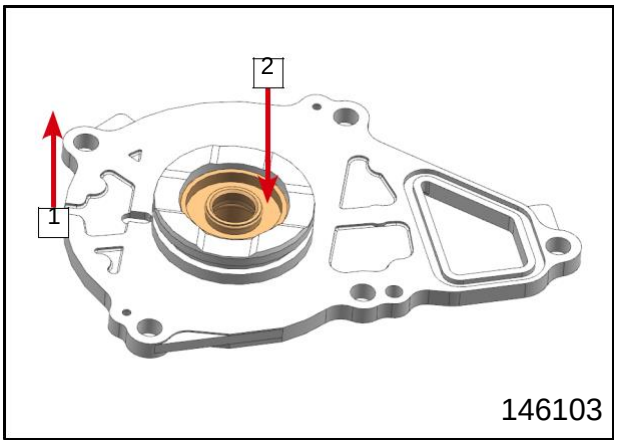
Note: The removed water seals are sorted into waste. Use new water seals during installation.



146102

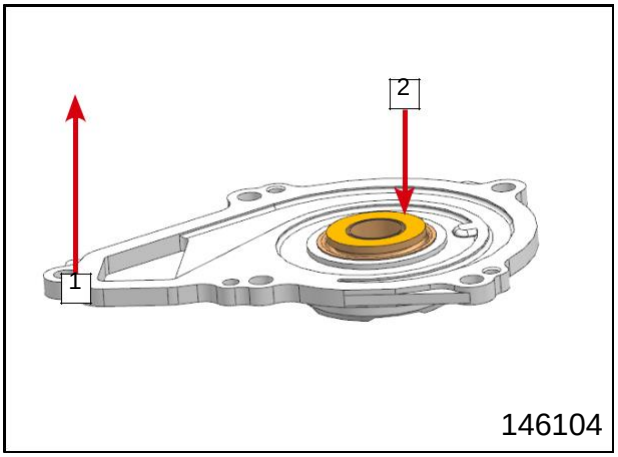
Assembly

Put the water pump on work bench as picture shows. Apply some surface sealing glue on 12×32×5.5 oil seal [2], put the seal on special tool: water pump oil seal puncher pin. Align the seal with water pump mounting hole. Knock puncher pin [1] with hammer to install the oil seal [2].



146103

Apply 5699 sealing glue on water seal static ring assy [2]. Install it into the water pump mounting hole with special tool: water seal puncher pin [1].

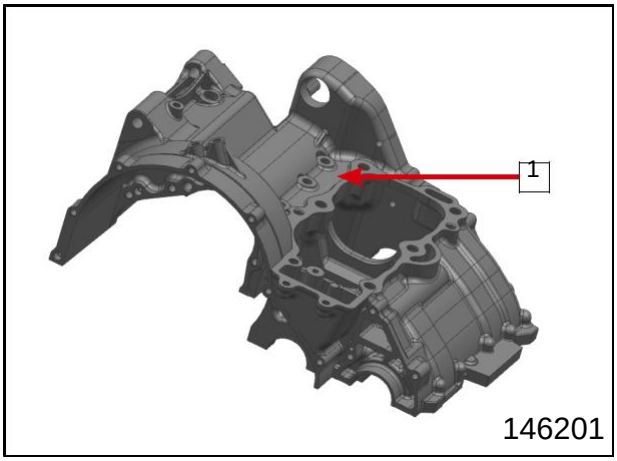


146104

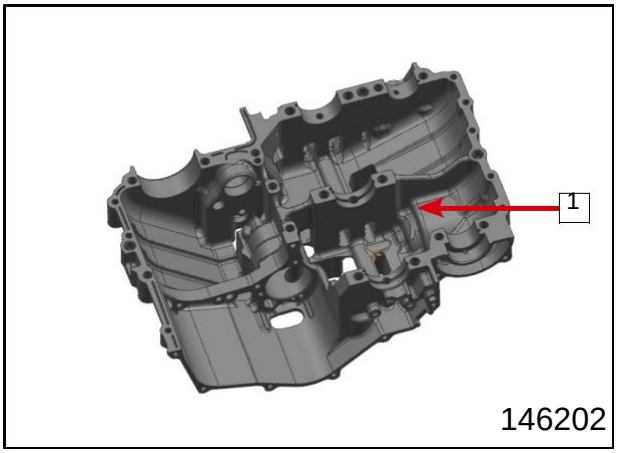
14.5.23 Crankcase Inspection

Inspect plain bearings on crankcase. Replace if severely worn.

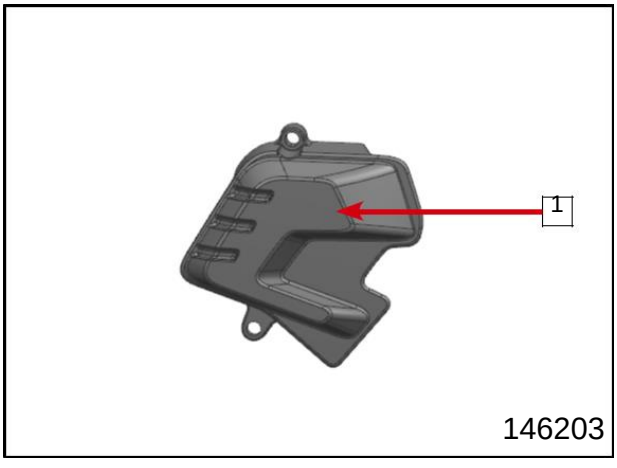
Inspect upper crankcase [1] for cracks or damage. Replace in pairs if necessary.



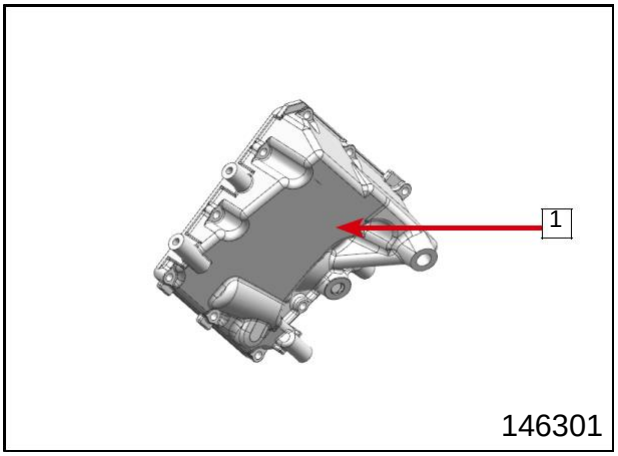
Inspect lower crankcase [1] for cracks or damage. Replace in pairs if necessary.



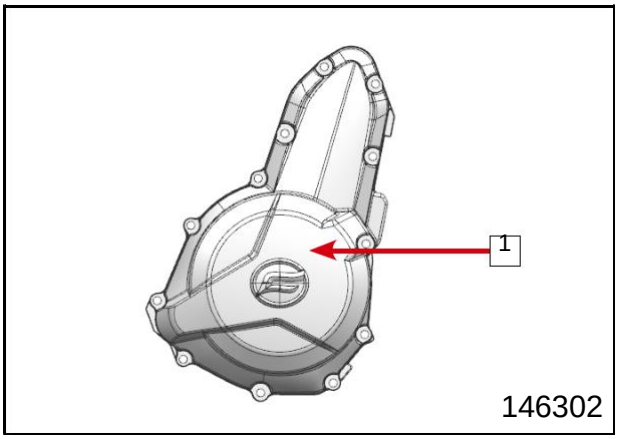
Inspect LH rear cover [1] for cracks or damage. Replace if necessary.



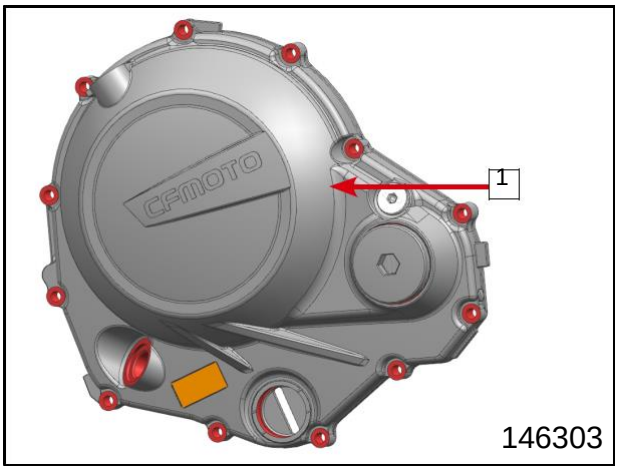
Inspect oil pan [1] for cracks or damage. Replace if necessary.



Inspect LH side cover [1] for cracks or damage. Replace in pairs if necessary.



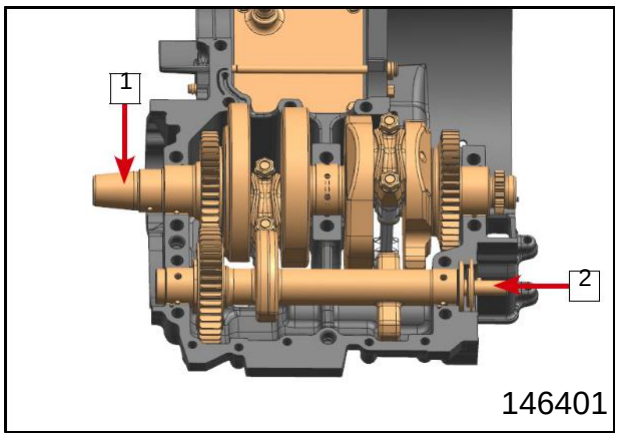
Inspect RH crankcase cover [1] for cracks or damage. Replace in pairs if necessary.



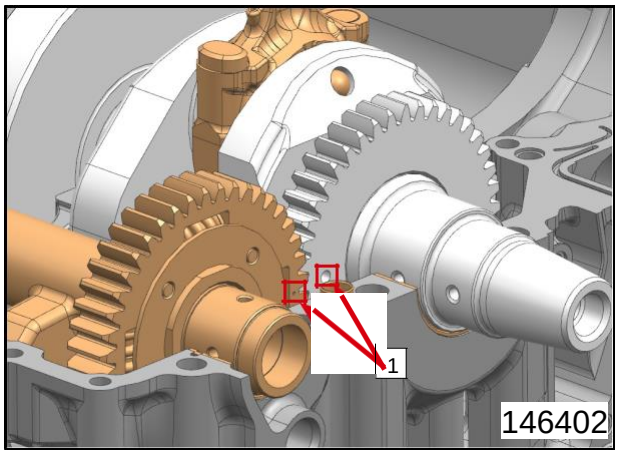
14.6 Engine Assembly

14.6.1 Crankshaft and Balance Shaft Installation

Apply MoS2 on crankshaft [1] and balance shaft [2] journal, then install them.

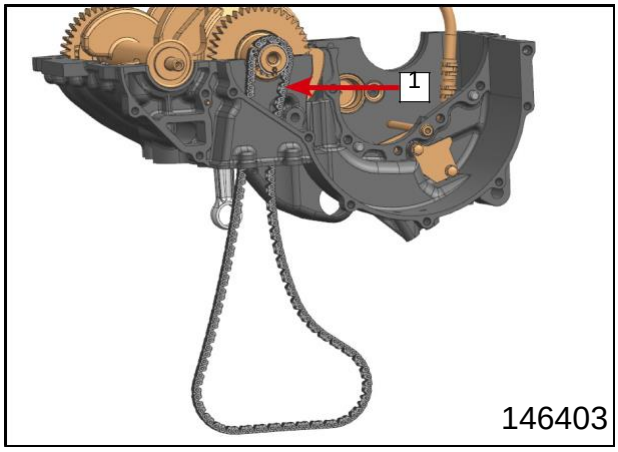


Note: Align teeth marks 1 during installation.



14.6.2 Timing Chain Installation

Install timing chain [1].

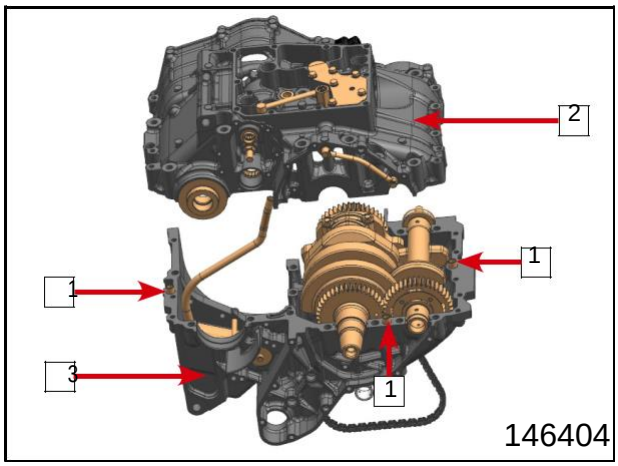


14.6.3 Crankcase Installation

Install dowel pins [1].

Apply sealing glue on joint surface evenly and uninterruptedly.

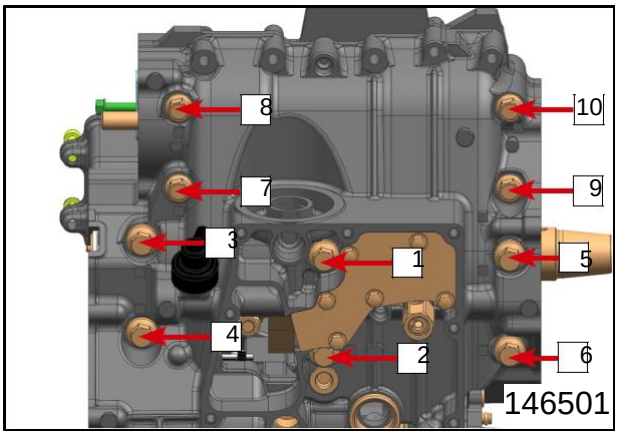
Combine lower crankcase [2] with upper crankcase [3].



According to the number sequence, pre-tighten the bolts 1~10 with 20 N·m torque wrench. (Bolts 1~6 are M9, bolts 7~10 are M8.)
According to the number sequence, tighten the bolts 1~10 with 35 N·m torque wrench. (Bolts 1~6 are M9, bolts 7~10 are M8.)
According to the number sequence, tighten the bolts 1~6 with 44 N·m torque wrench. (Bolts 1~6 are M9, bolts 7~10 are M8.)

Note: Insert the bolts into holes before installation. The exposed height should be the same. Adjust the bolt if not. Tighten the bolts in criss-cross way.

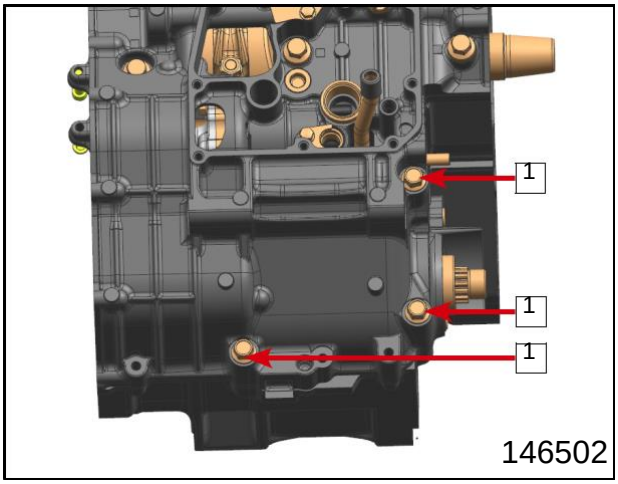
Note: Apply engine oil on thread of bolts 1~10 and both sides of washers.



146501

Install M8 bolts 1. Tighten torque: 27.5 N·m.

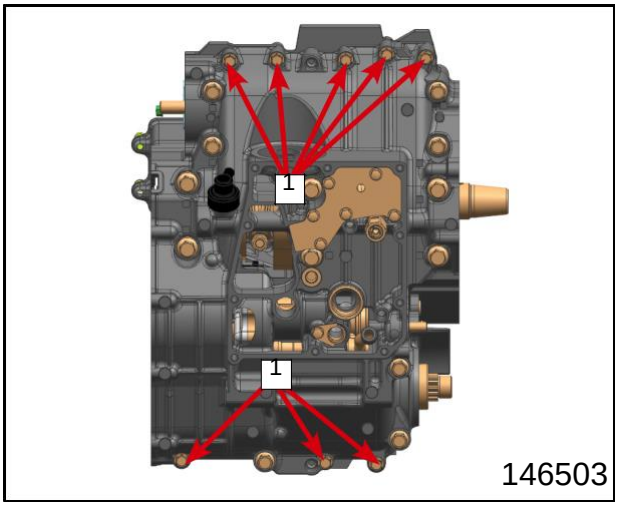
Note: Insert the bolts into holes before installation. The exposed height should be the same. Adjust the bolt if not. Tighten the bolts in criss-cross way.



146502

Install M7 bolts 1. Tighten torque: 20 N·m.

Note: Insert the bolts into holes before installation. The exposed height should be the same. Adjust the bolt if not. Tighten the bolts in criss-cross way.

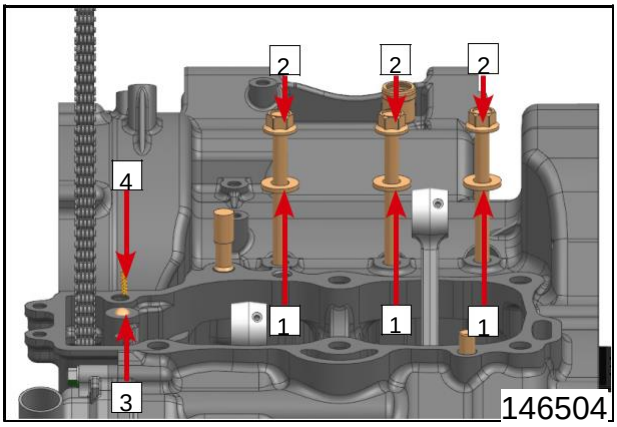


146503

Put washers 1 on M8 bolts 2 and install the them on crankcase. Tighten torque: 27.5 N·m.

Note: Apply engine oil on thread of bolts and both sides of washers.

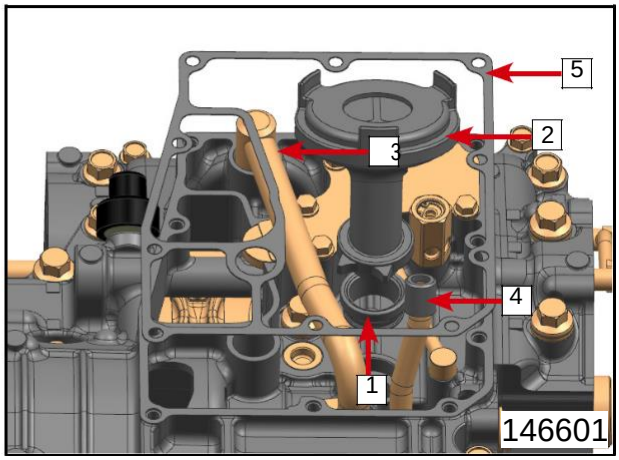
Note: When tightening bolts 2, tighten 2~3 times in criss-cross way, from inside to outside.



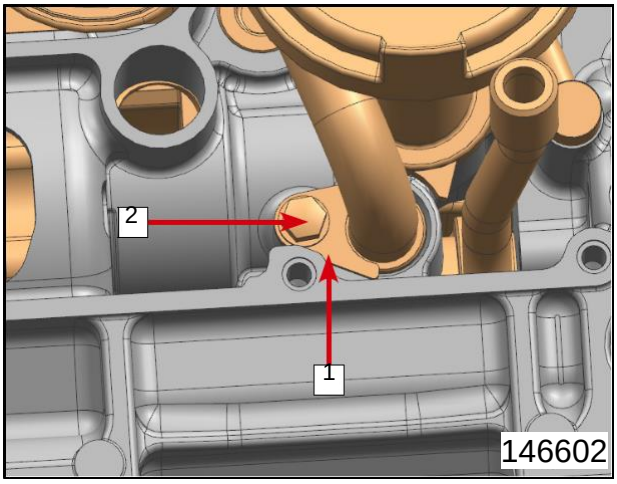
146504

14.6.4 Oil Pan Assy Installation

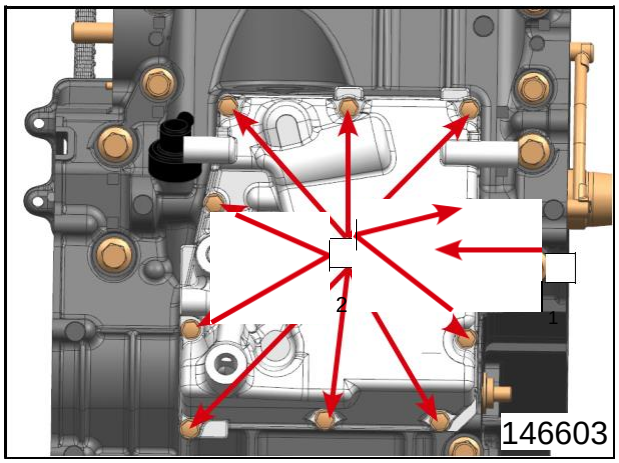
Install oil suction pan seal ring [1].
Install oil suction pan assy [2].
Put two 14x2.5 o-rings on oil pipe I [3]. Apply some engine oil to the mounting hose and install the pipe.
Install oil return hose damping rubber sleeve [4].
Install seal gasket [1].



Install oil pipe I press plate [1].
Install M6 bolt [2] with 243 thread locker.
Tighten torque: 8 N·m



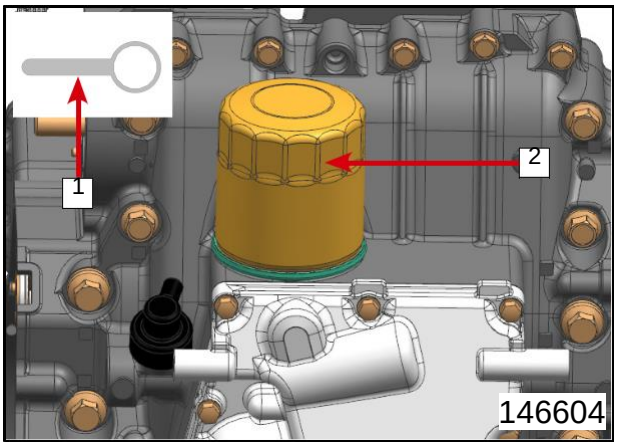
Adjust oil return hose to make it fix into the mounting groove. Then install oil pan assy [1].
Install M6×25 bolts [2].
Tighten torque: 11~13 N·m



14.6.5 Oil Filter Installation

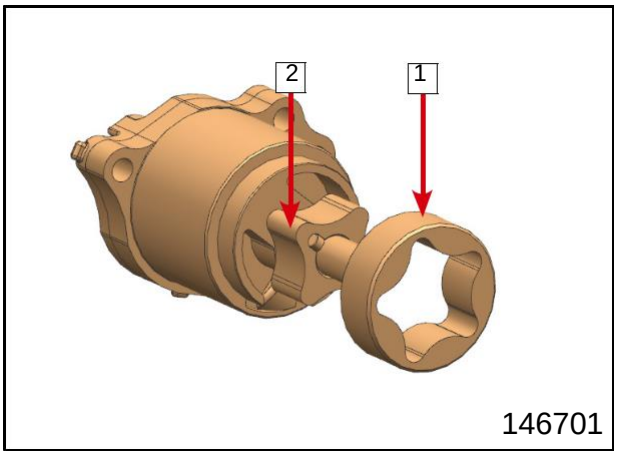
Use special tool: oil filter wrench [1] to install the oil filter [2]. Tighten torque: 16~18 N·m

⚠Note: Wrap oil filter with a cloth or rubber mat, in case the wrench breaks the filter.

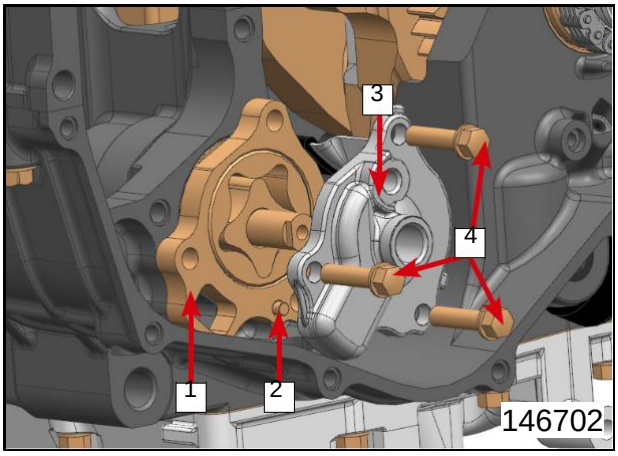


14.6.6 Oil Pump Installation

Install oil pump outer rotor [1] into the inner rotor [2].

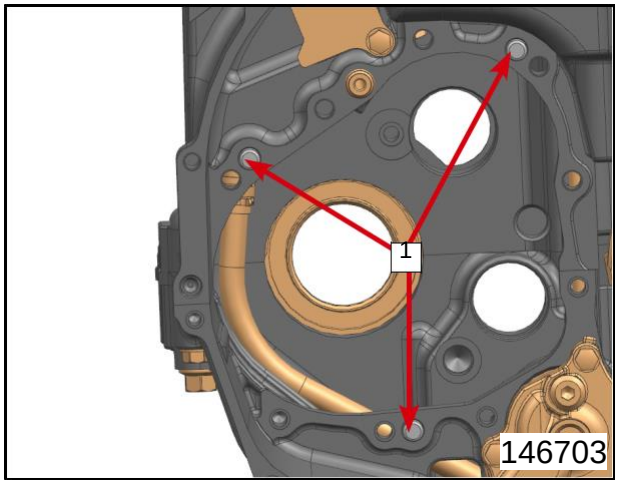


Install oil pump [1].
Install roller pin [2].
Install oil pump cover [3].
Install M6 bolts [4].

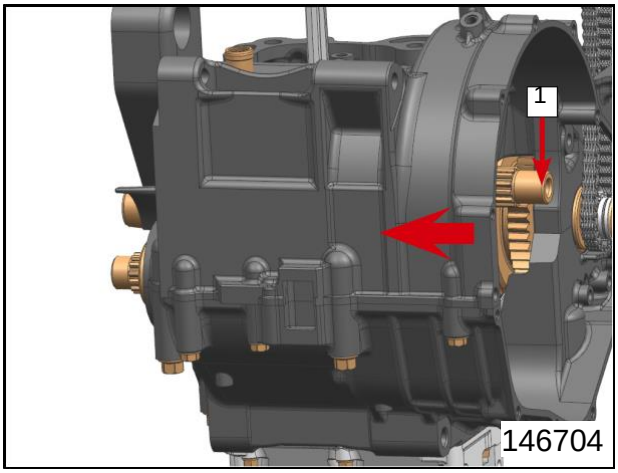


14.6.7 Transmission Case Installation

Install pins [1].

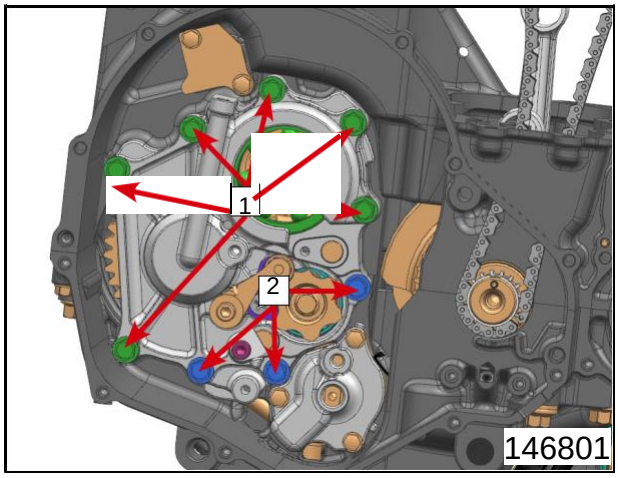


Install the gearshift cover sub assy [1] to the proper position in the direction of the arrow.

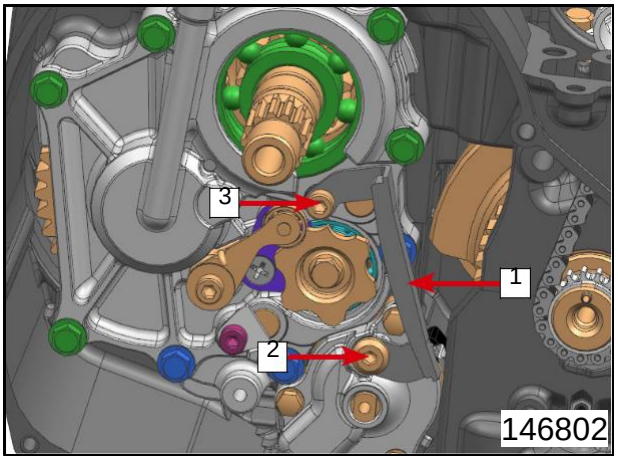


Install M7×30 bolts [1] with 243 thread locker.
Tighten torque: 19~21 N·m
Install M7×26 bolts [2] with 243 thread locker.
Tighten torque: 20 N·m

Note: Tighten the bolts in criss-cross way.



Install oil pump chain guide [1].
Install M6×12 screw [3] with 243 thread locker.
Tighten torque: 10 N·m
Install M6×9 screw [2] with 243 thread locker.
Tighten torque: 10 N·m

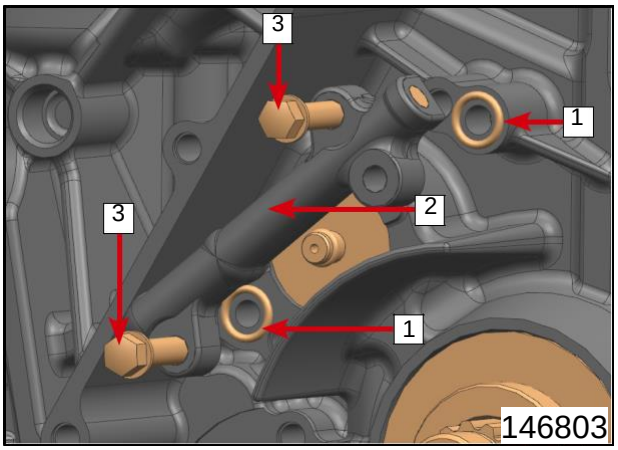


14.6.8 Oil Pipe IV Assy Installation

Apply engine oil on o-seal ring [1]. Install the ring on oil pipe IV assy [2].

Insert the oil pipe IV assy [2] into the hole on upper crankcase. After installing position confirmed, knock with rubber hammer to install the pipe.

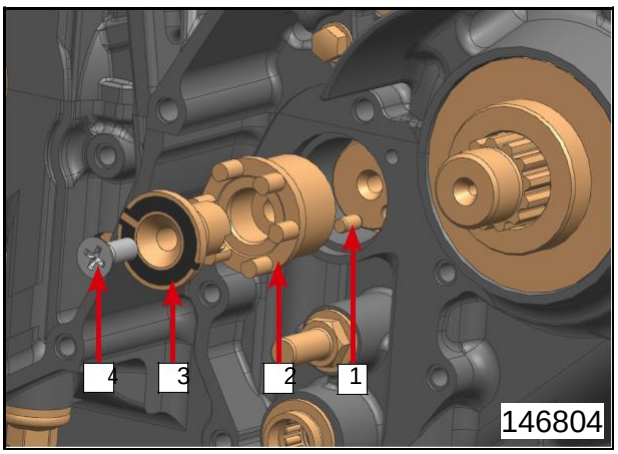
Install M6 bolts [3]. (Along with a wire clip for each bolt)



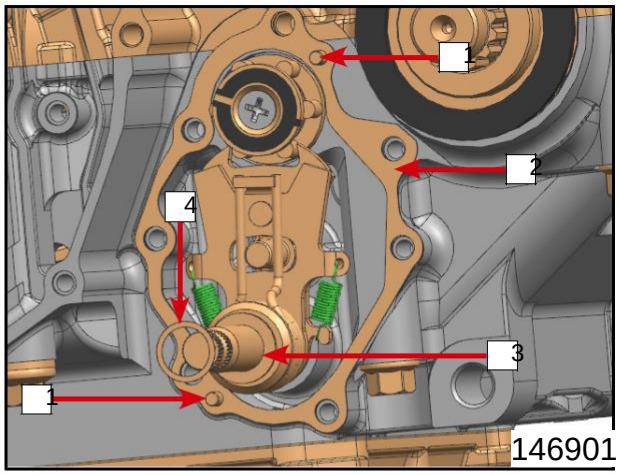
14.6.9 Gearshift Assy

Installation Status 1

Install roller needle [1].
Install shift location drum [2].
Install gear sensor [3].
Install screw [4] with 243 thread locker.

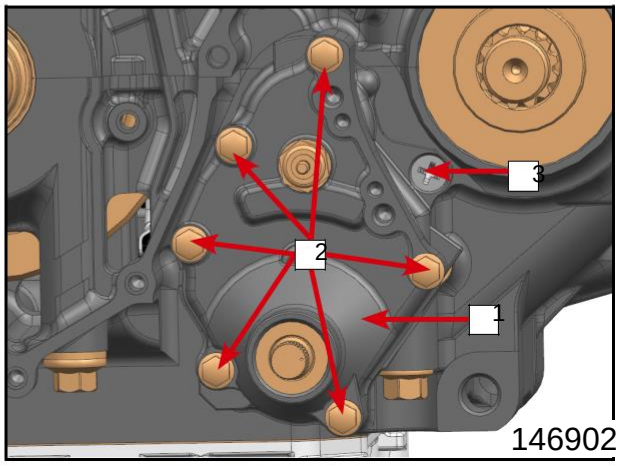


Install dowel pins [1] .
Install seal gasket [2] .
Install shift shaft sub assy [3] .
Install washer [4].



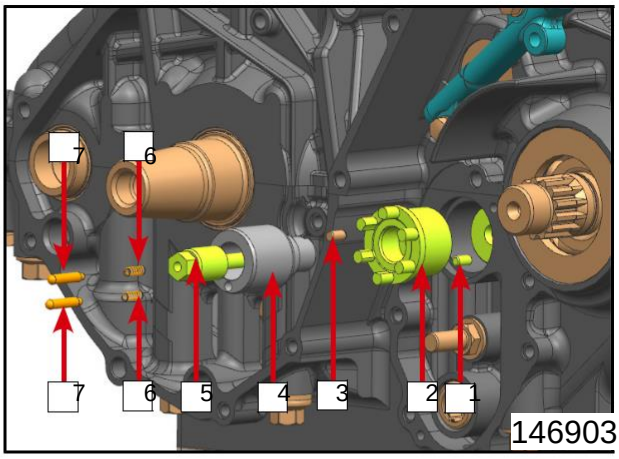
Install gearshift cover [1].
Install M6 bolts [2]. Tighten torque: 12 N·m
Install screw [3].

⚠Note: Insert the bolts into holes before installation. The exposed height should be the same. Adjust the bolt if not. Tighten the bolts in criss-cross way.

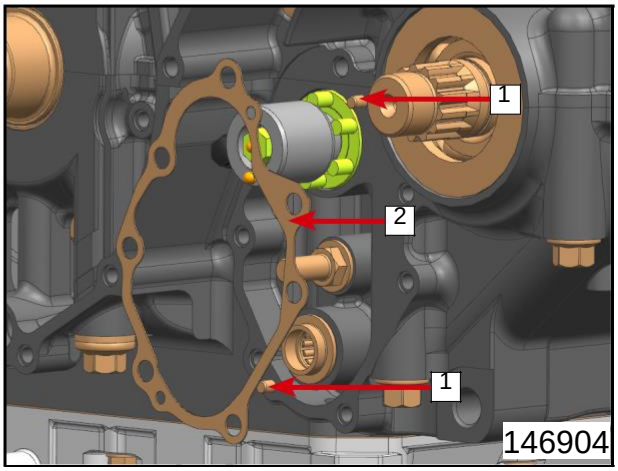


Status 2

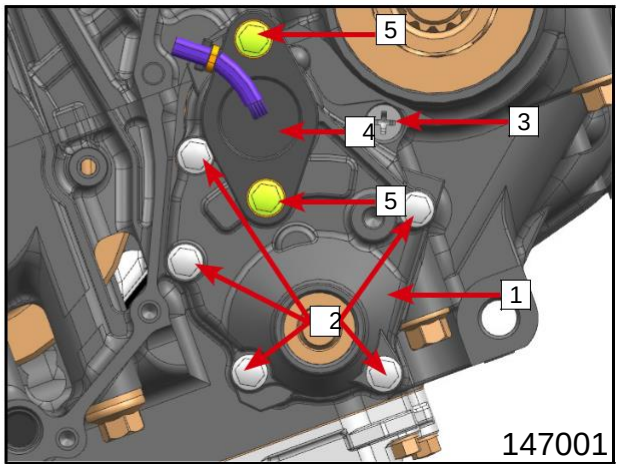
Install roller needle [1].
Install shift location drum [2].
Install dowel pins [3] .
Install gear rotor [4]
Install contactor bolt [5].
Install contactor springs [6].
Install ball contactors [7].



Instatll dowel pins [1]. [2] .
Install gearshift cover gasket [ ]

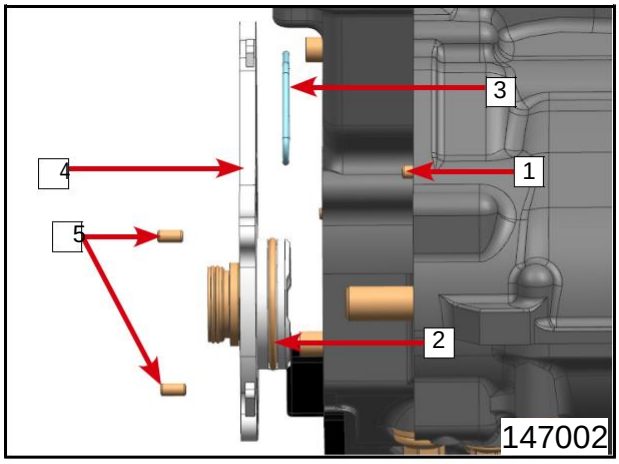


Install gearshift cover [1].
Install M6 bolts [2].
Install screw [3].
Install gear position sensor [4].
Install M6 bolts [5].



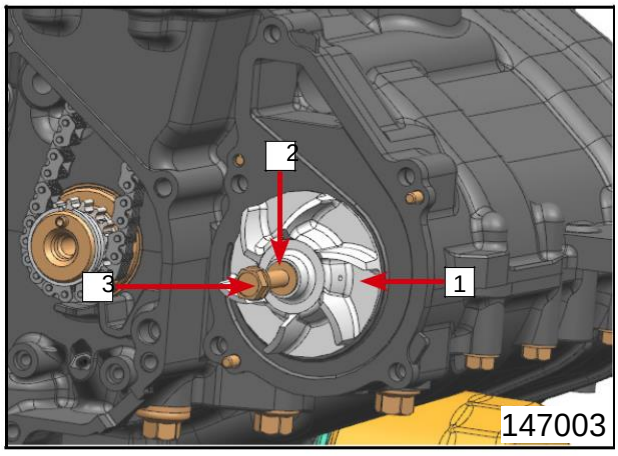
14.6.10 Water Pump Installation

Install roller needle [1].
Apply engine oil on o-ring [2].
Install seal ring [3] on water pump [4]. Do not drop the seal ring. Install water pump [4].
Install roller needle [5].

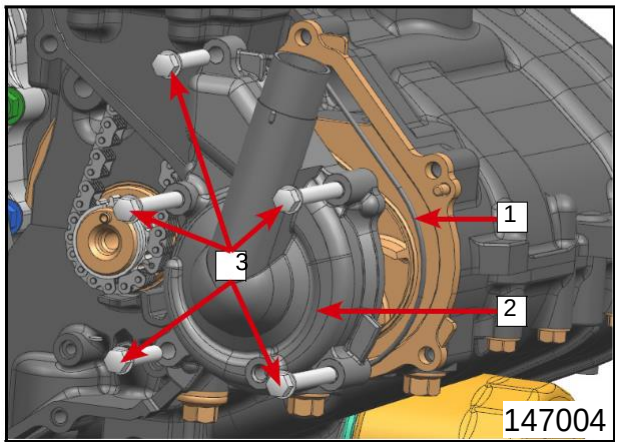


Install water pump impeller [1].
Put washer [2] on M6 bolt [3].
Install M6 bolt [3].

Note: Measure the clearance between water pump and impeller during installation. The clearance should be 0.2~0.7.



Put seal ring [1] on water pump cover [2].
Install water pump cover [2].
Install M6 bolts [3].

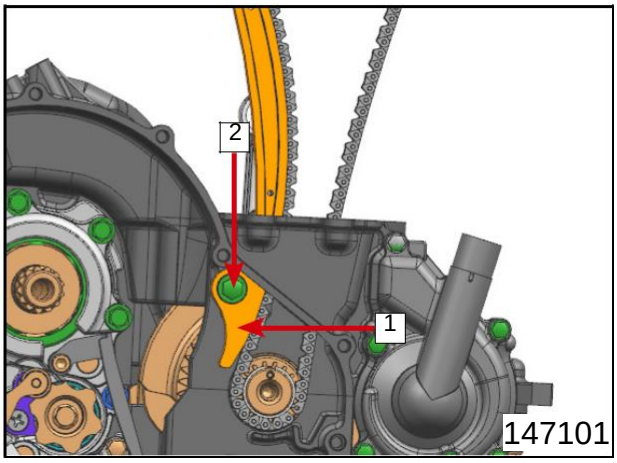


14.6.11 Tensioner Plate Installation

Install tensioner plate assy [1].

Install thread pin shaft [2] with 243 thread locker.

Tighten torque: 20 N·m



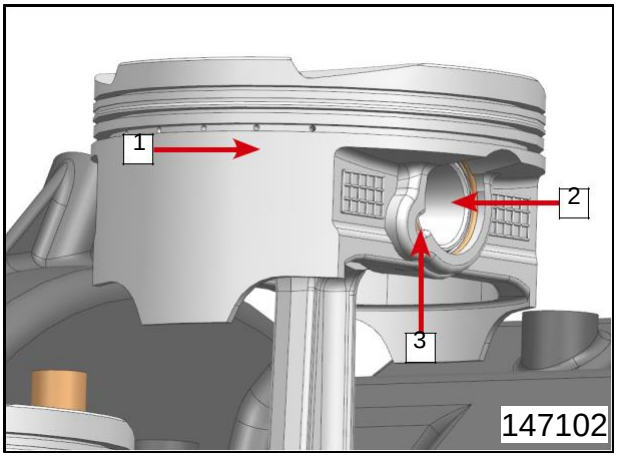
14.6.12 Piston Installation

Install piston circlip on one side in advance.

Install piston [1].

Install piston pin [2].

Install piston circlip [3] on the other side. Adjust the circlip position to make the angle between circlip cut and piston cut approximately 30°.

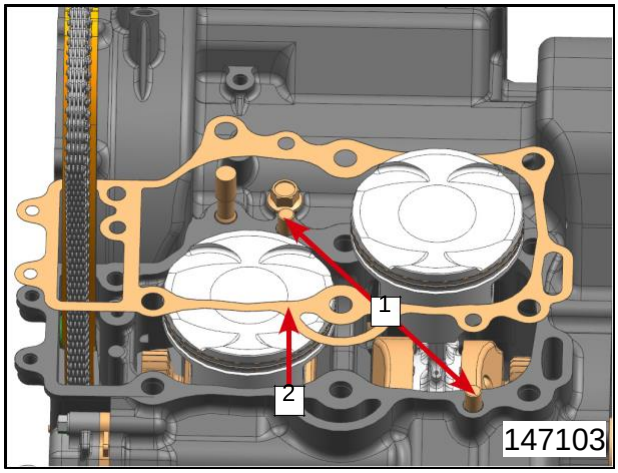


Note: Use new piston circlips after removal. Replace with new ones if deformed.

Turn crankshaft to adjust the proper position of the piston. Apply the same procedures to install the other piston.

Install dowel pins [1].

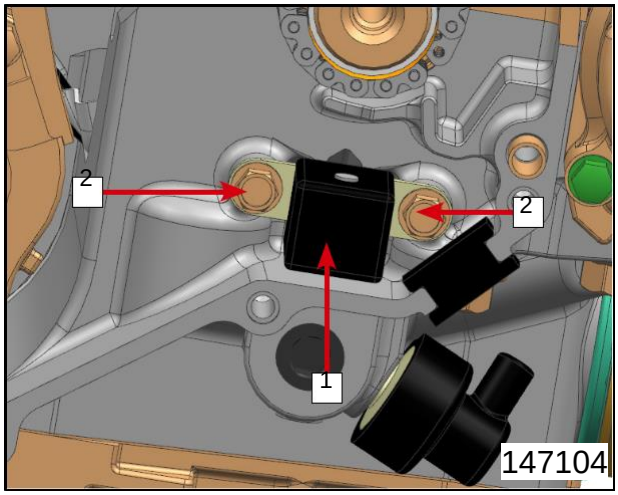
Install cylinder gasket [2].



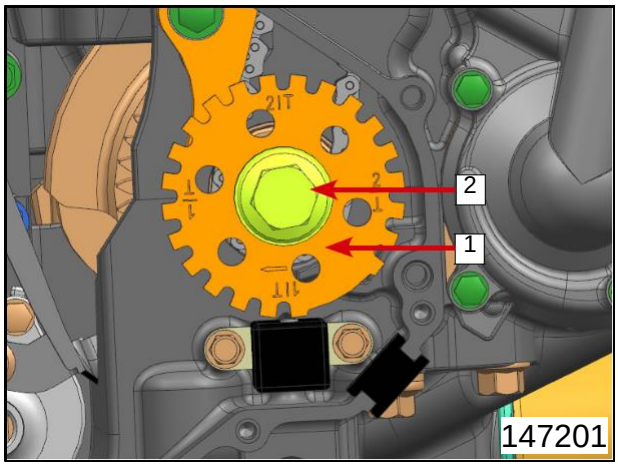
14.6.13 Crankshaft Pulsing Rotor Installation

Install trigger assy [1].

Install M5 bolts [2].



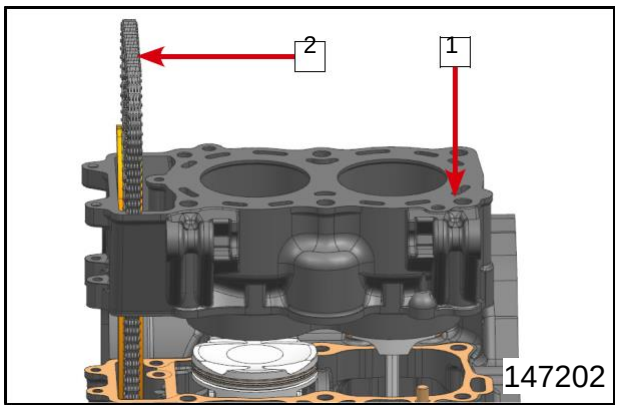
Install crankshaft pulsing rotor 1.
Install M8 bolt 2 with 243 thread locker.
Tighten torque: 40 N·m



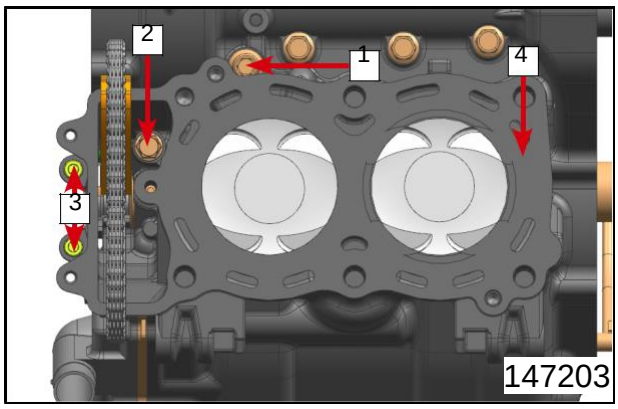
14.6.14 Cylinder Body Installation

Rotate the crankshaft until first cylinder and second cylinder are on the same level. Apply engine oil inside the cylinder body. Install cylinder body 1.

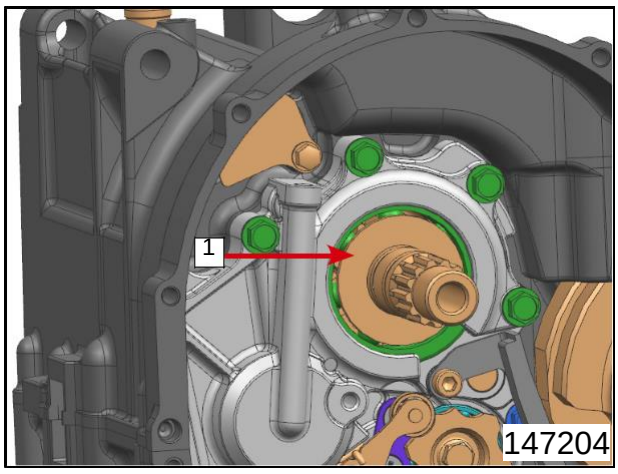
Note: Hook the timing chain 2 in case it falls into the engine.



Note: There three rings 2 3 4 on piston. Make sure the top ring 3 cut align with the mark "0" on piston. Make 180° angle between second ring 2 cut and the mark. Oil ring 4 upper and lower rail cuts align with the top ring and second ring respectively. Make 60° angle between spacer and rails. Compress the each ring into the groove before installing into the cylinder. Install the piston rings one by one.



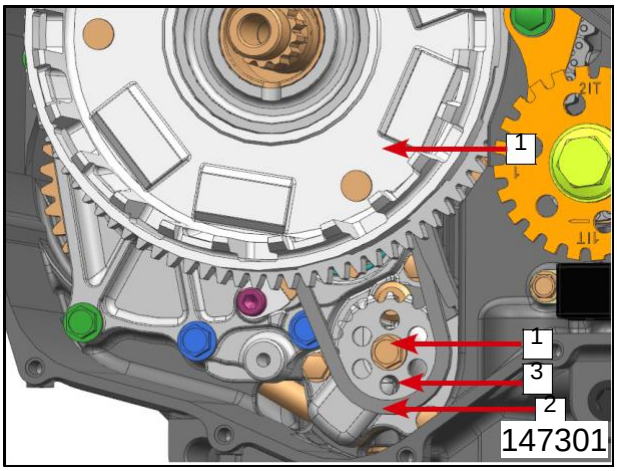
Install M10 nut 1.
Install M8 bolt 2 and washer.
Install M6 bolts 3 and washer.
Install cylinder gasket 4.



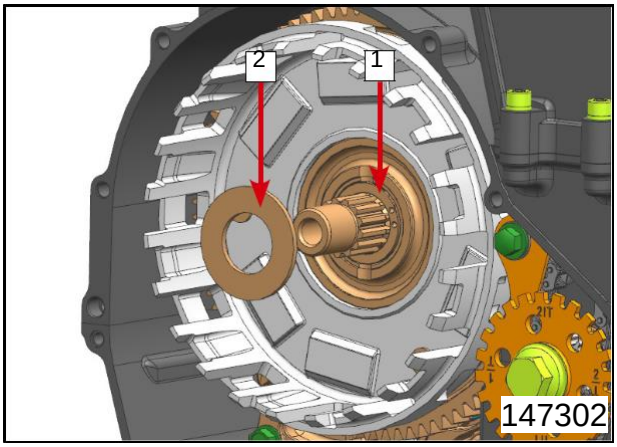
14.6.15 Clutch Assy Installation

Install washer 1.

Put oil pump chain [2] on clutch housing sprocket [1], then put the oil pump sprocket [3] on chain [2].
Adjust oil pump shaft position, Install oil pump sprocket, chain and drive hub assy.
Apply 243 thread locker on M6×20 bolt [4] (left-hand thread). Install the bolt with 6.3×16.3×1.2 washer to fix the oil pump sprocket.
Tighten torque: 12 N·m

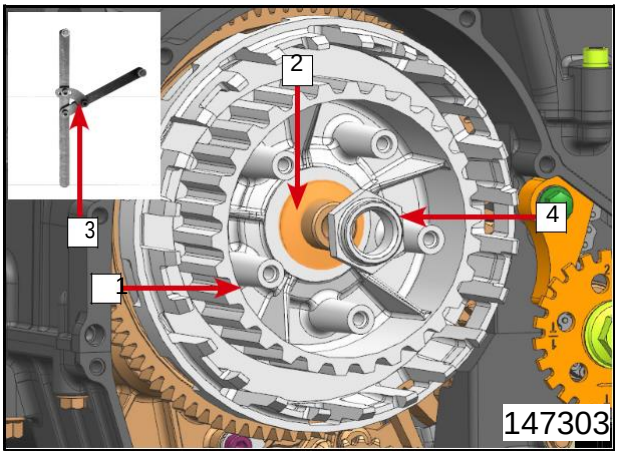


Note: Align the sprocket and gear during installation.



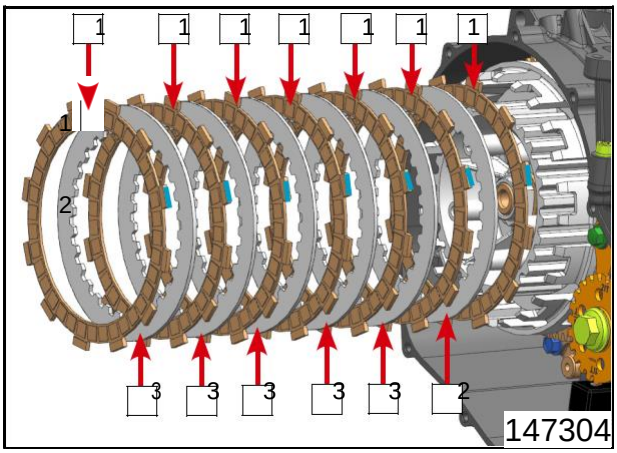
Apply engine oil on clutch sleeve [1]. Insert it (the end with holes faces outside) between main shaft and clutch housing.
Install washer [2].

Install central sleeve [1].
Install washer [2].
Use special tool: clutch stopping wrench [3] to fix the clutch housing.
Install M20 nut [4] with 243 thread locker.
Tighten torque: 132 N·m



Note: After tightening the nut, rotate the housing. The movement should be smooth, not blocked.

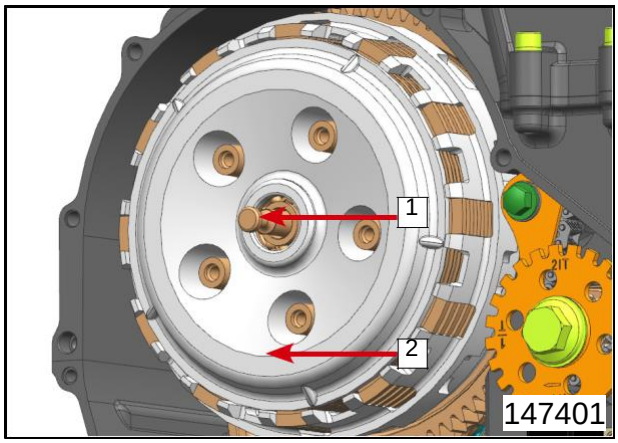
Install friction discs [1].
Install steel plates A [2].
Install steel plates B [3].



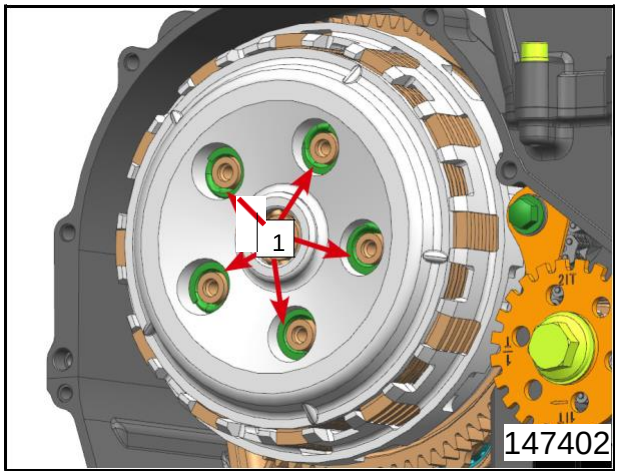
Note: During installation, align first 6 friction discs opening cut. The outermost friction disc is dislocated.

Install tie-rod [1].

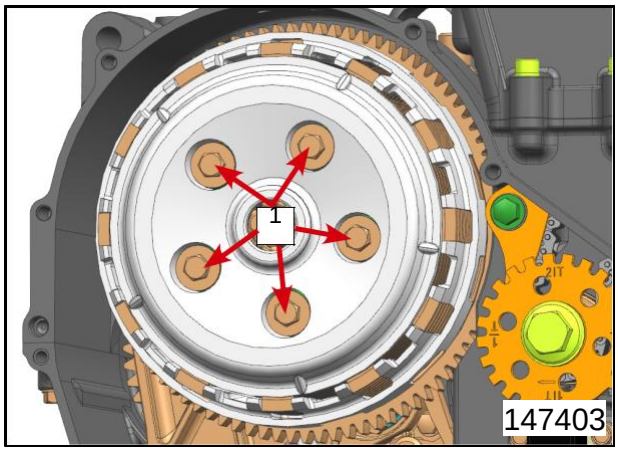
Install operating pad [2].



Install springs [1].



Install M6 bolts assy [1].

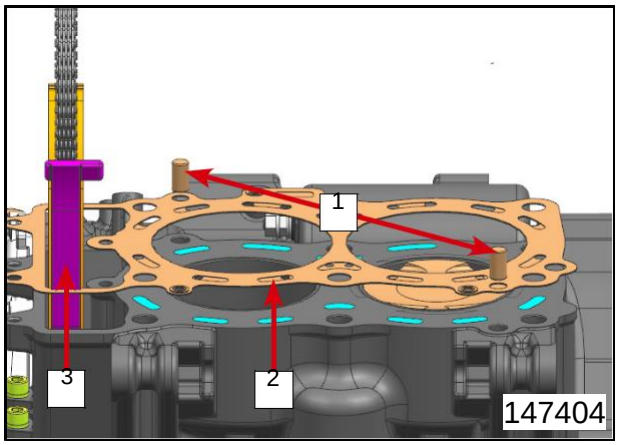


14.6.16 Cylinder Head

Installation Install dowel pins [1].

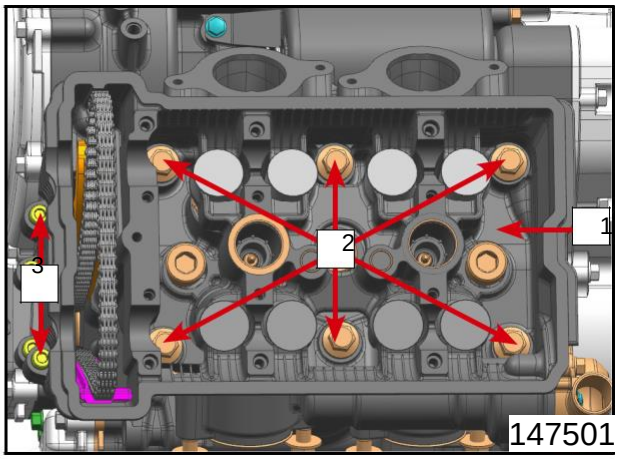
Install cylinder head gasket [2].

Install chain guide [3].



Install cylinder head [1].
Install M10 bolts [2].
Tighten torque: 54 N·m (if the bolts are old ones, tighten torque: 49 N·m)
Install M6 inner hex bolts [3] and washers.

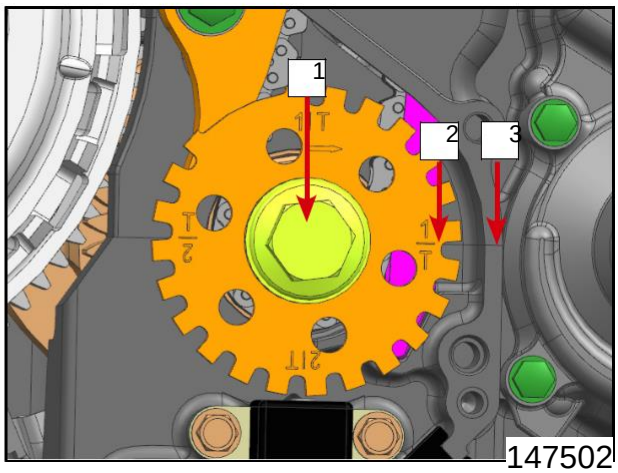
⚠Note: Hook the timing chain in case it falls into the engine.



147501

14.6.17 Camshaft Installation

Install M8 bolt [1] with sleeve. Tighten until the mark [2] on pulsing rotor aligns the mark [3] on crankcase.

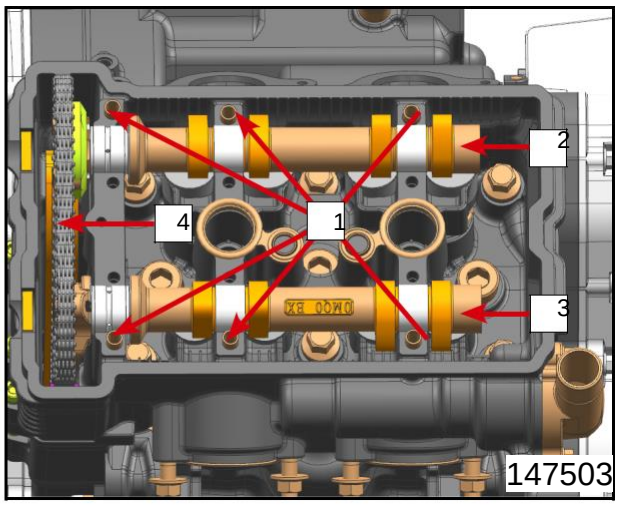


147502

Install dowel pins [1].
Install intake camshaft assy [2]. (There is “IN” mark on the intake camshaft.)
Install exhaust camshaft assy [3]. (There is “EX” mark on the exhaust camshaft.)
Put the timing chain [4] on timing sprocket.

⚠ Note: During intake camshaft installation, the “IN” mark line [2] on timing sprocket should be parallel with the cylinder edge [3]. During exhaust camshaft installation, the “EX” mark line [1] on timing sprocket should be parallel with the cylinder edge [3].

⚠ Note: The timing chain can not move during installation, the pulsing rotor should be at the right position. After timing chain installation, check if all the marks are qualified or not. Reinstall if not qualified.



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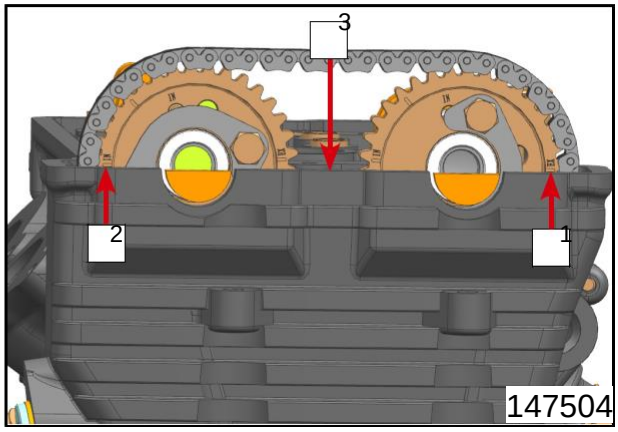
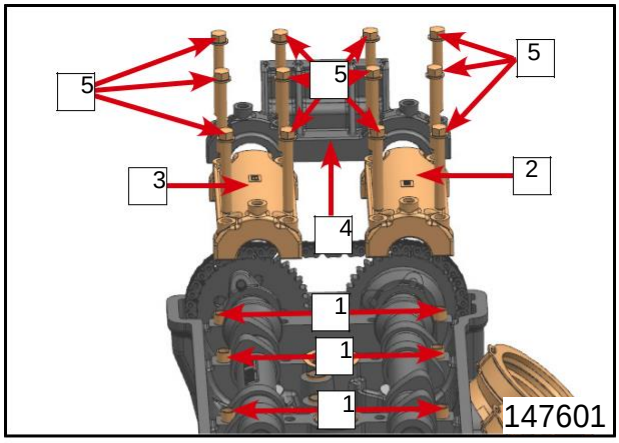


147504

Install dowel pins [1].
Install intake camshaft seat [2].
Install exhaust camshaft seat [3].
Install camshaft position plate [4].
Install M6 bolts [5].

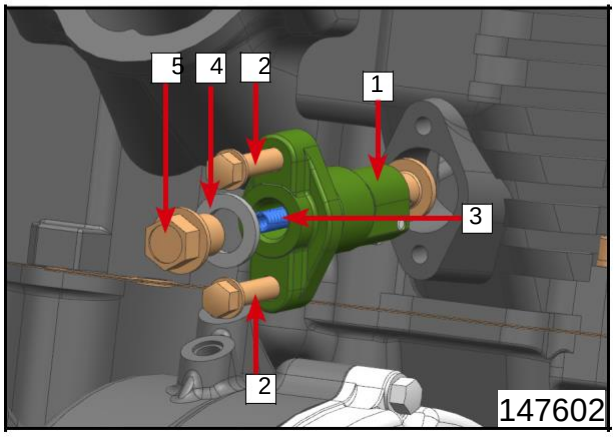
Note: Tighten the bolts [5] for three times. The tighten torque is 5 N·m, 8 N·m and 12 N·m respectively. Tighten the bolts in criss-cross way.

Note: The exhaust camshaft cover has "EX" mark on it while intake camshaft cover has "IN" mark.



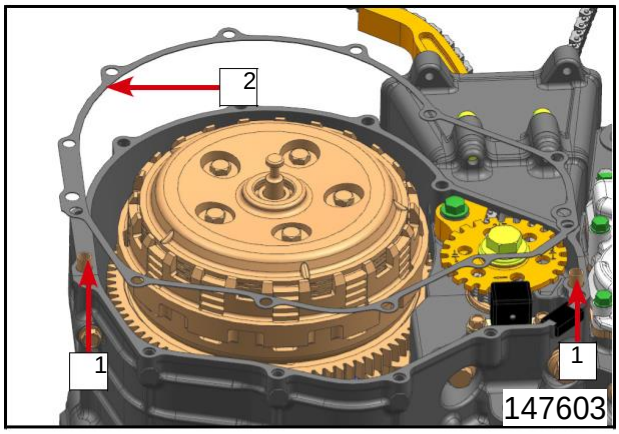
14.6.18 Tensioner Installation

Install tensioner [1].
Install M6 bolts [2] (with thread locker).
Install tensioner spring [3].
Put washer [4] on spring seat bolt [5].
Install M11 spring seat bolt M11 [5].

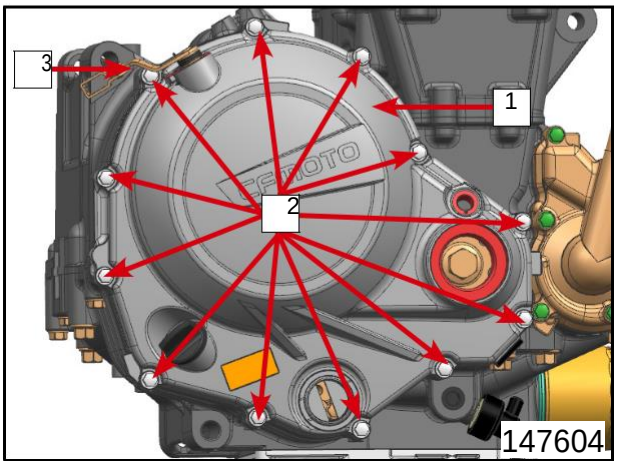


14.6.19 RH Side Cover

Installation Install dowel pins [1].
Install seal gasket [2].

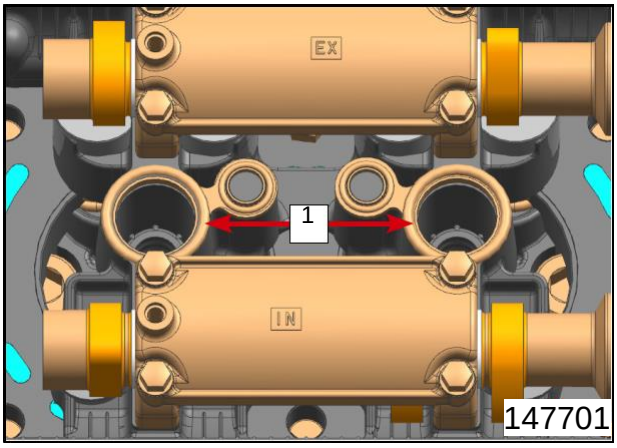


Install RH side cover [2]. (During installation, rotate the clutch tie-rod [3] to proper position.)
Install M6 bolts [2].

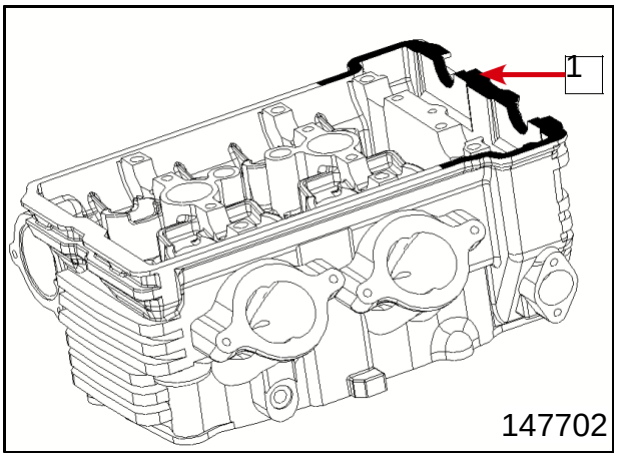


14.6.20 Cylinder Head Cover Installation 14.6.21

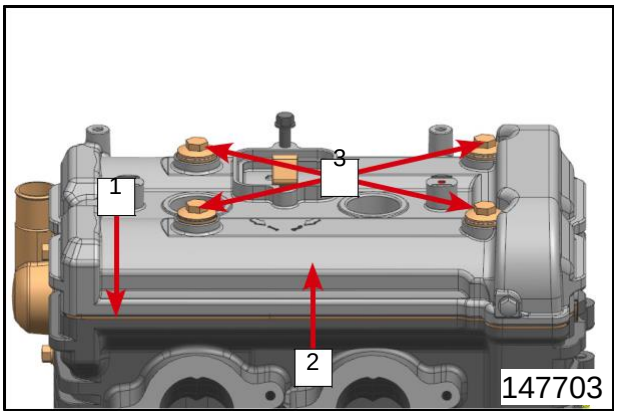
Install spark plug seal rings [1].



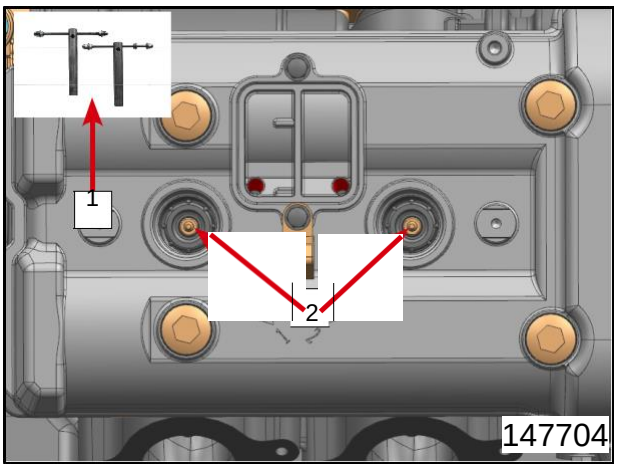
Apply 5699 surface sealing glue on cylinder head [1].



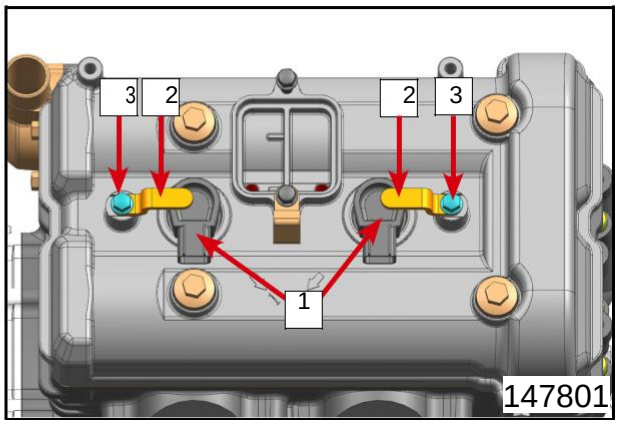
Put cylinder head seal ring [1] on cylinder head cover [2].
Install cylinder head cover [2].
Install M6 cylinder head cover bolts and washers [3].
Tighten torque: 11~13 N·m



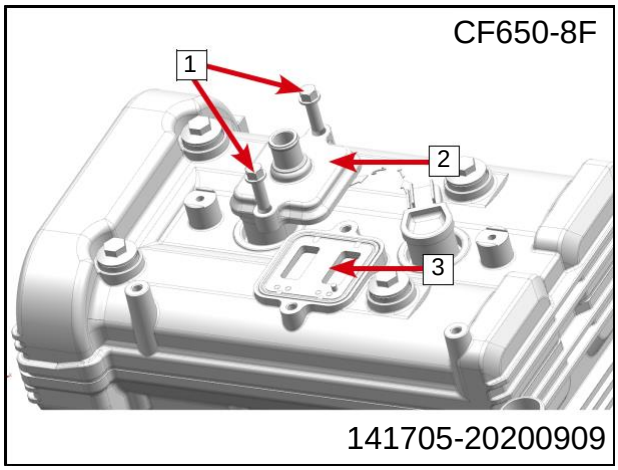
Use special tool: spark plug sleeve [1] to install spark plugs [2].
Tighten torque: 15 N·m



Install ignition coils [1].
Install press plates [2].
Install M6 bolts [3].



Install spring valve assy [3];
Install spring valve cover [2];
Install bolts [1].

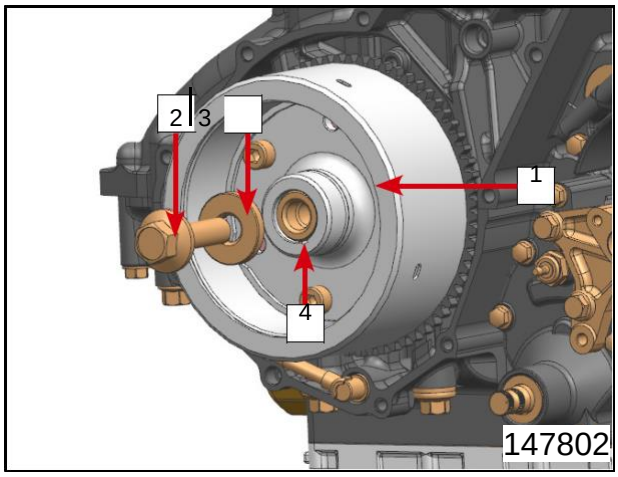


14.6.22 Magneto Rotor Installation

Apply engine oil on crankshaft and magneto rotor inner hole. Install magneto rotor [1].

Put washer [3] on M12 bolt [2]. Install M12 bolt [2] with 243 thread locker.

Tighten torque: 155 N·m



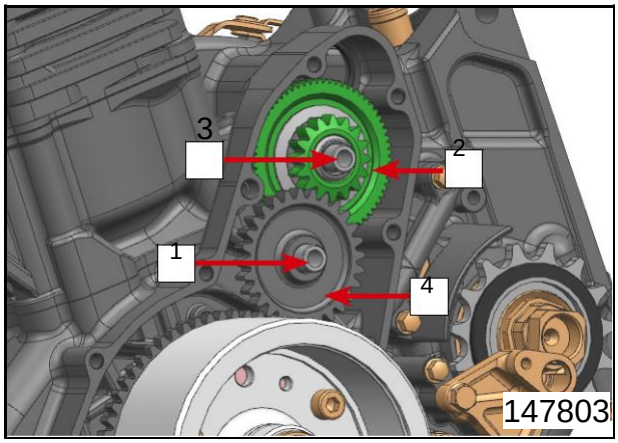
Note: Before tightening the bolt, pull magneto with hand to make sure it doesn't move. Turn the starter big gear with hand, it can rotate in one direction.

Install middle gear shaft [3].

Install dual gear assy [2].

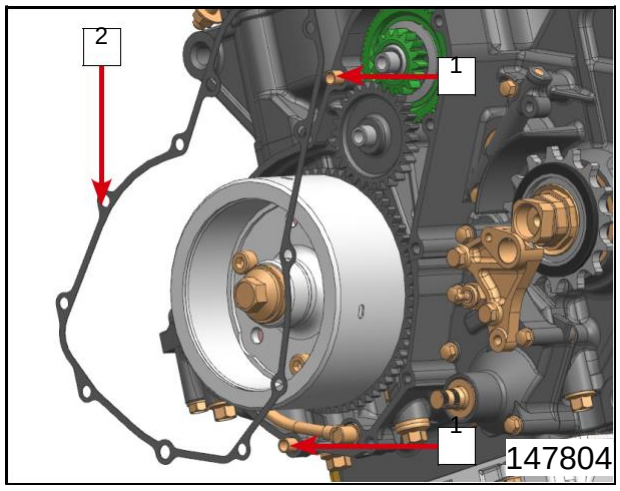
Install middle gear shaft [1].

Install starter middle gear [4].



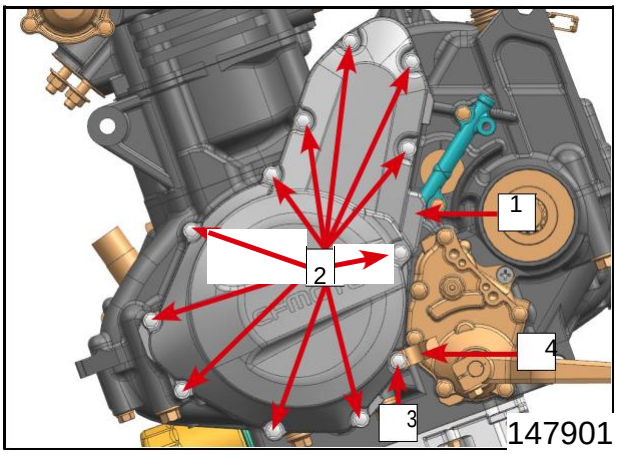
Install dowel pins [1].

Install seal gasket [2].



Install front LH cover [1].

Install M6 bolts [2] and M6 bolt [3]. Before installation, put wire clip [4] on M6 bolt, then install it.

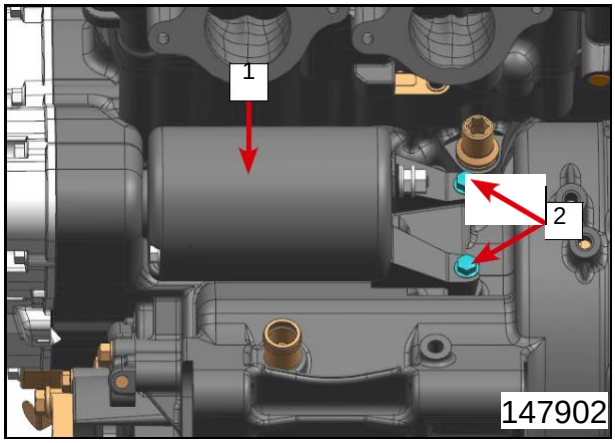


Note: Insert the bolts into holes before installation. The exposed height should be the same. Adjust the bolt if not. Tighten the bolts in criss-cross way.

14.6.23 Starter Motor Installation

Install starter motor [1]. Use rubber hammer to knock the motor slightly for installation.

Install M6 bolts [2].



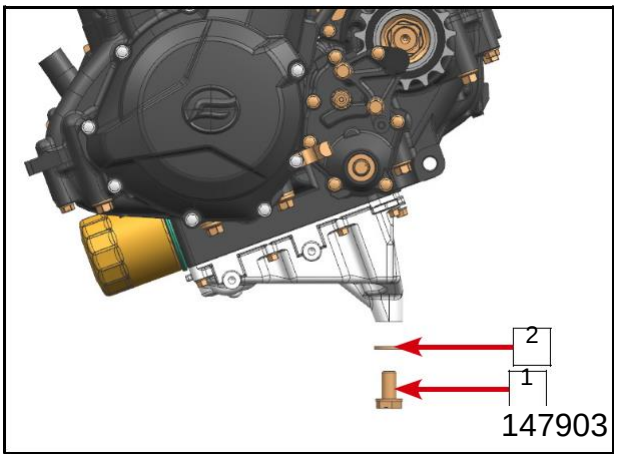
Note: Apply engine oil on starter motor o-ring before installation. The o-ring can not be deformed.

14.6.24 Drain Bolt

Installation Install washer [1].

Install M12 magnetic drain bolt [2].

Tighten torque: 28~32 N·m



14.7 Lubrication System

14.7.1 Engine Oil Inspection

Warning: Motorcycle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure, accident, and injury.

Oil Level Inspection

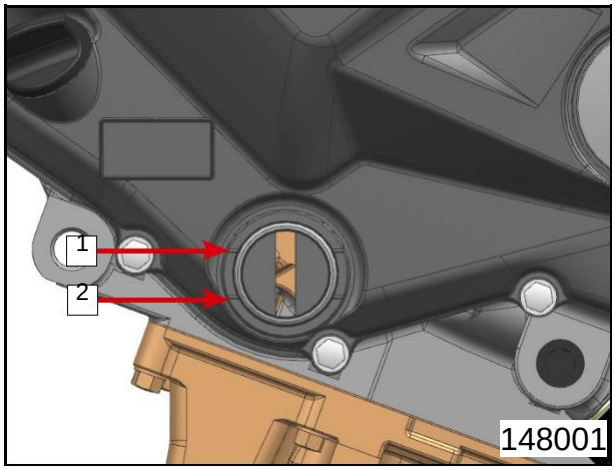
● Check that the engine oil level is between the upper 1 and lower 2 level in the viewer.

Note:
Situate the motorcycle so that it is perpendicular to the ground.
If the motorcycle has just been used, wait several minutes for all the oil to drain down.
If the oil has just been changed, start the engine and run it for several minutes at idle speed. This fills the oil filter with oil. Stop the engine, then wait several minutes until the oil settles.

Warning: Racing the engine before the oil reaches every part can cause engine seizure. If the engine oil gets extremely low or if the oil pump or oil passages clog up or otherwise do not function properly, the oil pressure warning light will light. If this light stays on when the engine is running above idle speed, stop the engine immediately and find the cause.

If the oil level is too high, remove the excess oil, using a syringe or some other suitable device.

If the oil level is too low, add the correct amount of oil through the oil filter opening. Use the same type and make of oil that is already in the engine.



Note: If the engine oil type and make are unknown, use any brand of the specified oil to top off the level in preference to running the engine with the oil level low. Then at your earliest convenience, change the oil completely.

14.7.2 Engine Oil Change

Make sure the engine is on the horizontal position before changing.

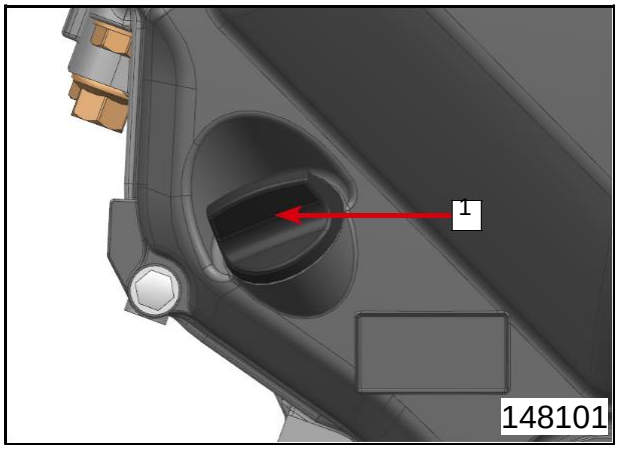
Change the engine oil and oil filter at the same time. Change when the engine is warm.

Note: The engine temperature may be very hot when changing. Wait until the temperature is suitable.

Note: Engine oil filter removal/ installation and engine oil drain refer to Engine Disassembly/Assembly section.

Note: The drain oil can reflect some conditions of the engine. Inspect whether there is some metal debris in the drain oil. The debris reflects the engine internal problems. Inspect the engine for trouble shooting.

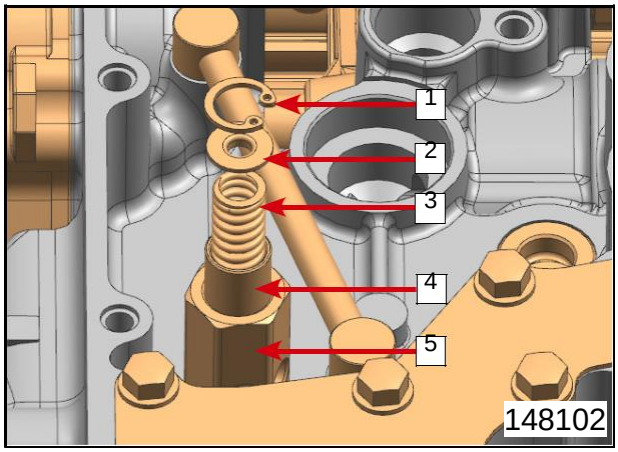
Remove filler screw plug 1. Add engine oil.



14.7.3 Relief Valve

Disassembly

Remove circlip 1 with plier.
Remove relief valve spring seat 2.
Remove relief valve spring 3.
Remove relief valve element 4.
Remove relief valve 5.



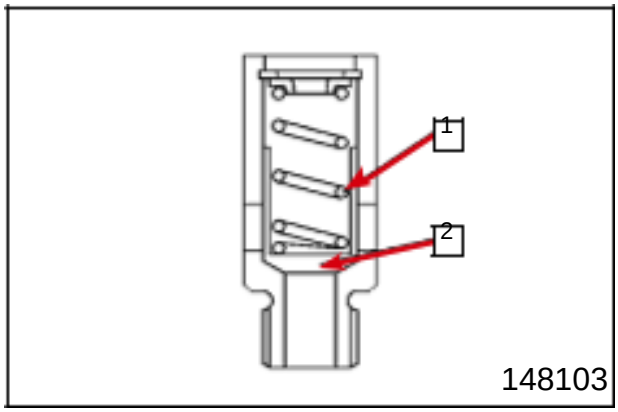
Oil Relief Valve Inspection

Inspect to see if the valve 1 slides smoothly when pushing it in with a wooden or other soft rod, and see if it comes back to its seat by spring 2 pressure.

Note: Inspect the valve in its assembled state. Disassembly and assembly may change the valve performance. Usually, the relief valve isn't disassembled.

If any rough spots are found during above inspection, wash the valve clean with a high-flash point solvent and blow out any foreign particles that may be in the valve with compressed air.

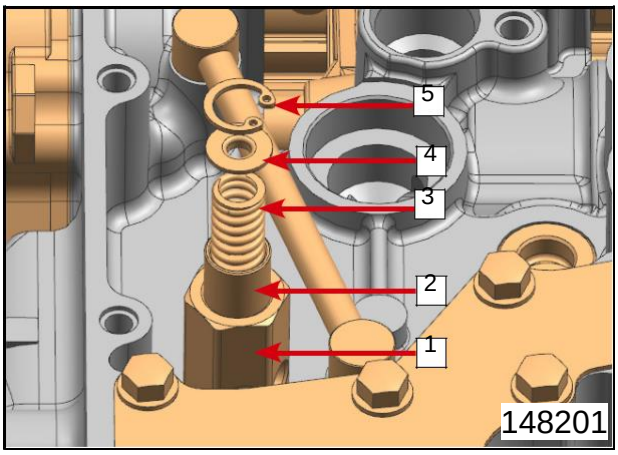
Warning: Clean the oil pressure relief valve in a well ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low flash point solvent.



Note: If cleaning does no solve the problem, replace the oil pressure relief valve as an accessory. The oil pressure relief valve is precision made with no allowance for replacement of individual parts.

Assembly

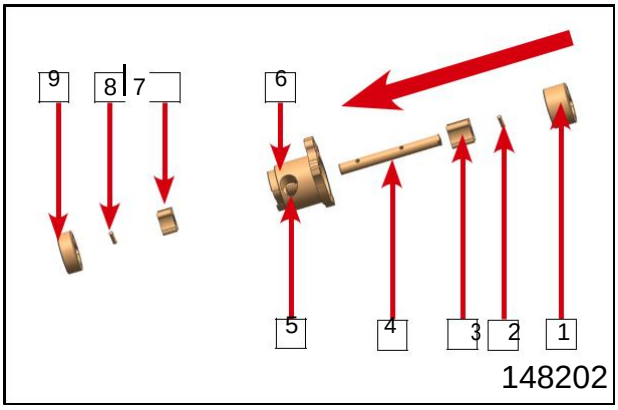
Install relief valve [1] with wrench.
Tighten torque: 15 N·m
Install relief valve element [2].
Install relief valve spring [3].
Remove relief valve spring seat [4].
Clamp circlip [5] with plier. Compress the valve spring seat to install the circlip [5].



14.7.4 Engine Oil Pump

Disassembly

Remove auxiliary oil pump outer rotor [1].
Remove auxiliary oil pump inner rotor [3].
Remove roller needle [2] through hole [5].
Remove main oil pump outer rotor [9].
Push oil pump shaft [4] towards arrow direction. Push the main oil pump inner rotor [7] towards arrow negative direction to remove roller needle [8].
Remove main oil pump inner rotor [7] from pump shaft [4].
Remove oil pump shaft [4] from the oil pump [6].



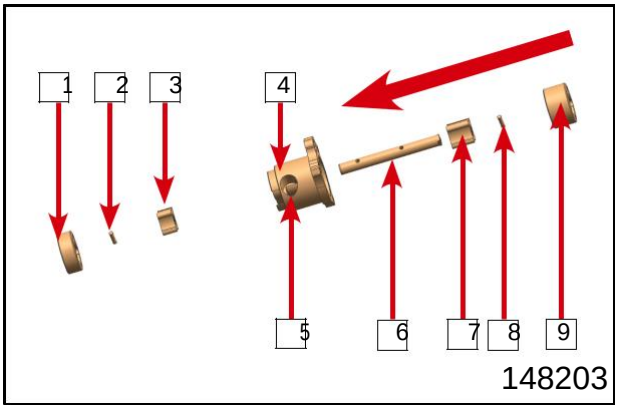
Inspection

Inspect oil pump each part for severe wear and damage. Replace with new oil pump assy.

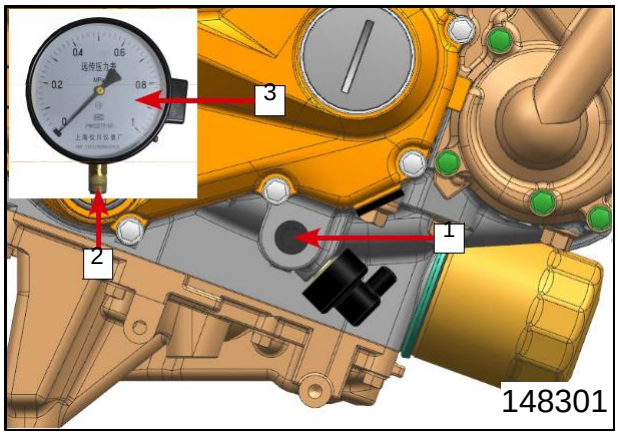
Assembly

Install pump shaft [6] on oil pump [4].
Install main oil pump inner rotor [3].
Install roller needle [2].
Install main oil pump outer rotor [1].
Install roller needle [8] through hole [5].
Install auxiliary oil pump inner rotor [7].
Install auxiliary oil pump outer rotor [9].

Note: The auxiliary oil pump rotors are wider than main oil pump ones.



14.7.5 14.7.5 Remove engine guard.
Remove main oil passage plug [1] and install the adapter [2] and dashboard [3] into the plug hole.



Tool: Oil pressure gauge 10kgf/cm2
Oil pressure gauge adapter PT3/8

Start and warm up the engine.
Run the engine at the specified speed, and read the oil pressure gauge

If the oil pressure is much lower than the standard, check the oil pump, relief valve, and/ or crankshaft bearing wear immediately.

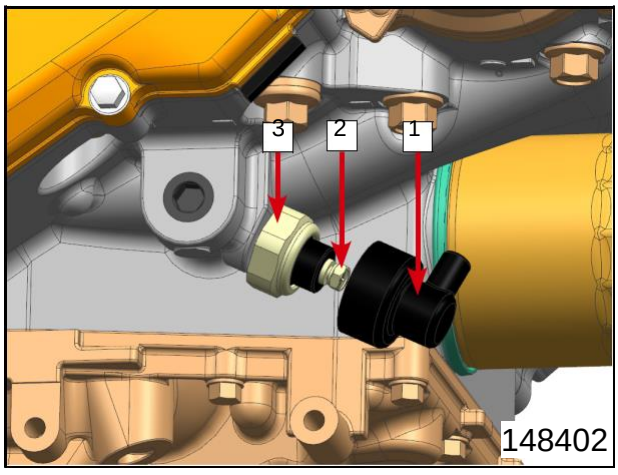
If the reading is much higher than the standard, check the oil passages for clogging.

Oil Pressure
Standard: At 4000r/min (rpm), the temperature is 90°C (194°F) 216~294 kPa (2.2~3.0 kgf/cm2 ,31~43 psi)

Stop engine.
Remove oil pressure gauge and adapter.

⚠ Warning: Take care against burns form hot engine oil that will drain through the oil passage when the gauge adapter is removed.

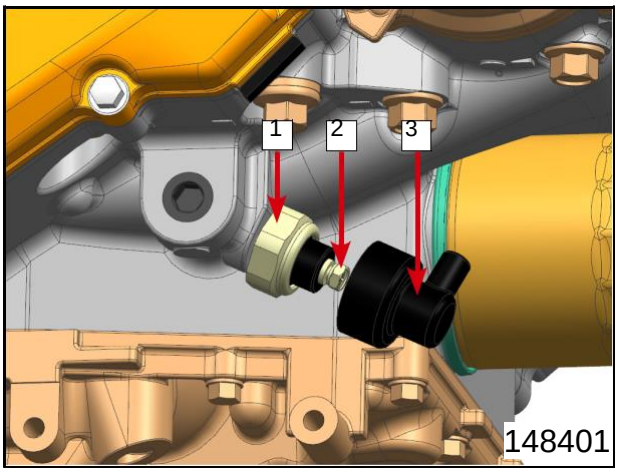
Apply thread locker on main oil passage plug. Install and tighten the oil passage plug.
Tighten torque: 20 N·m



14.7.6 Oil Pressure Warning Switch Removal
Drain engine oil (refer to Engine Disassembly section).
Remove protection cover [1].
Remove screw [2].
Remove oil pressure warning switch [3].

Inspection
Refer to Electrical System chapter.

Assembly
Apply silicone sealant to the threads of the oil pressure switch [1] and tighten it.
Tighten torque: 15 N·m
Put the wire on screw [2] and then install the screw [2].
Install protection cover [3] on warning switch [1].



14.8 Engine Installation

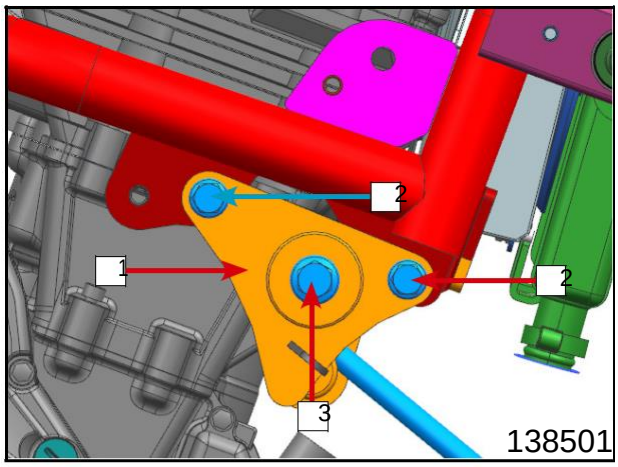
14.8.1 Engine Installation

Put the engine on jack and lift up the engine. Adjust it to the proper position.

Install engine mounting bracket assy [1].

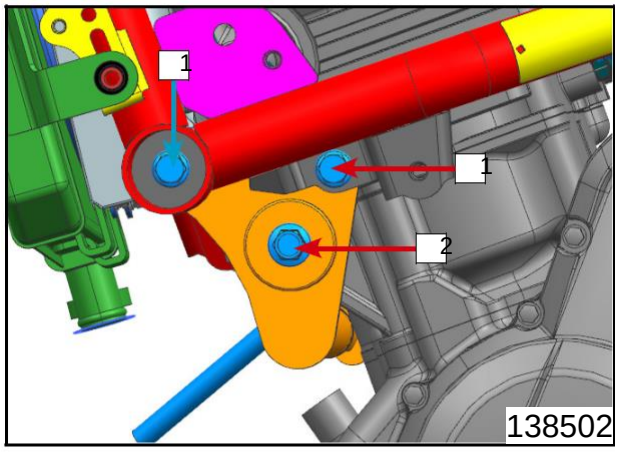
Install M8 bolts [2].

Put the M10 bolt [3] through the hole and install the nut. Fix the bolt with wrench and then tighten the nut.

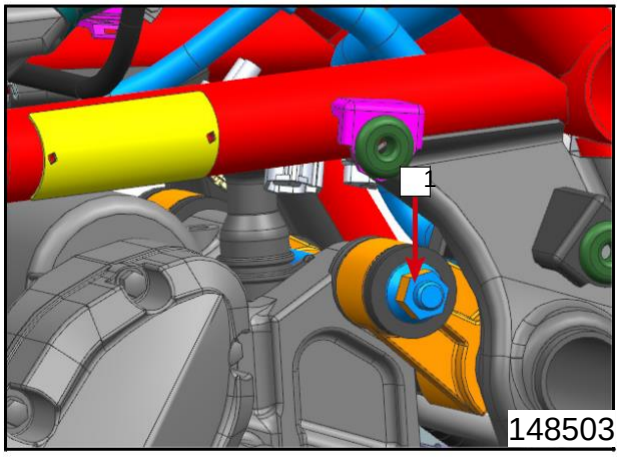


Install M8 bolts [1].

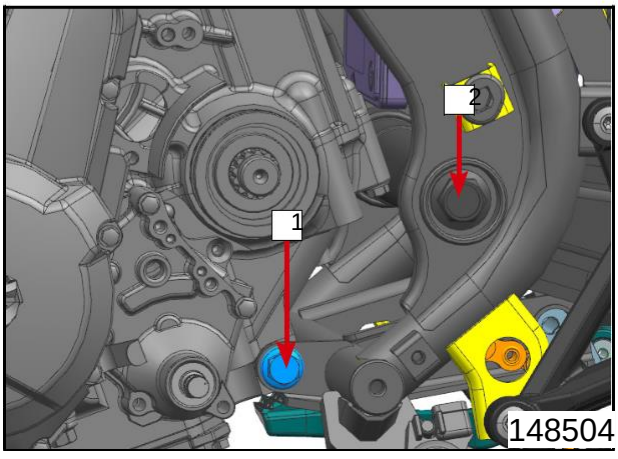
Put the M10 bolt [2] through the hole and install the nut. Fix the bolt with wrench and then tighten the nut.



Put the bolt [1] through the hole and install the M10 nut. Fix the bolt with wrench and tighten the nut.



Put the M10 bolt [1] and M20 bolt [2] through the holes and install the nuts. Fix the bolts with wrench and tighten the nuts.

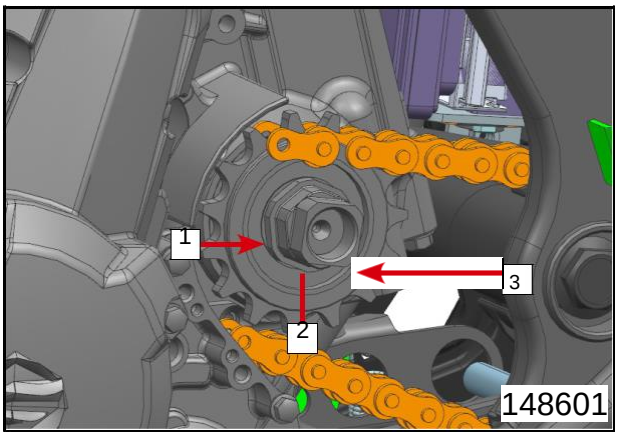


14.8.2 Output Sprocket Installation

Install output sprocket [1]. Install washer [2]. [ ]

Install M20 pulsing nut [3] with 243 thread locker.

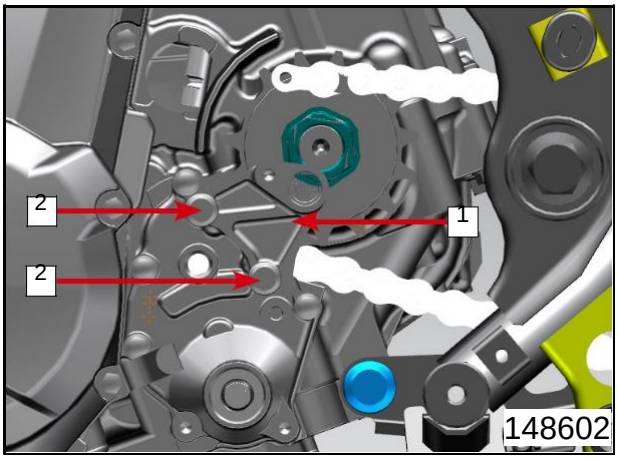
Tighten torque: 125 N·m



Install bracket [1].

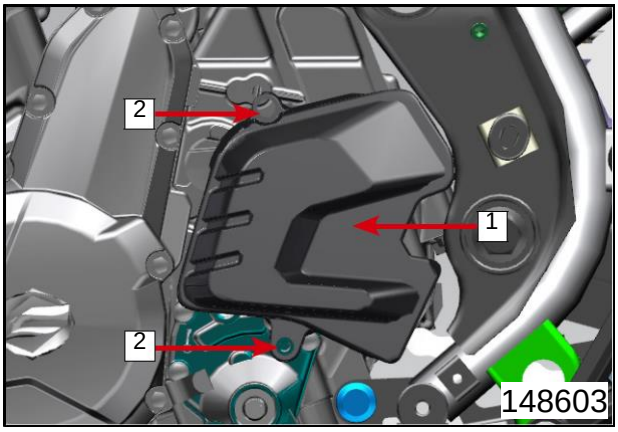
Install M6 bolts [2].

Note: There are two dowel pins [2] under the bracket. Do not lose them during installation.



Install engine rear LH cover assy [1].

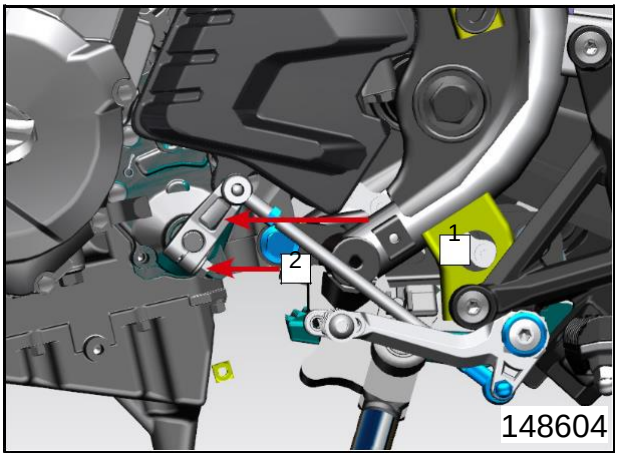
Install bolts [2].



14.8.3 Gearshift Lever Assy Installation

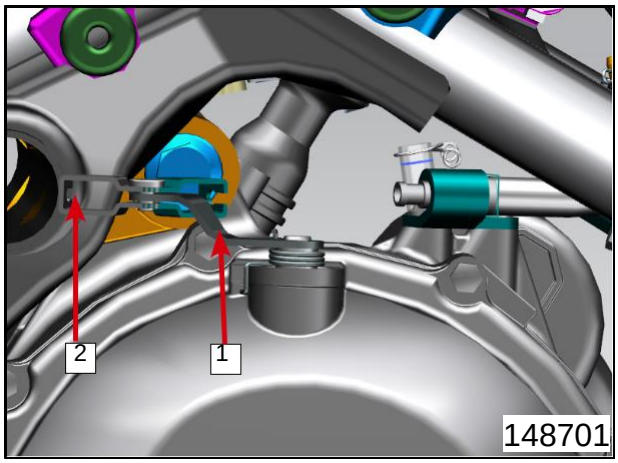
Install gearshift lever assy [1].

Install M6 bolt [2].



14.8.4 Clutch Cable Installation

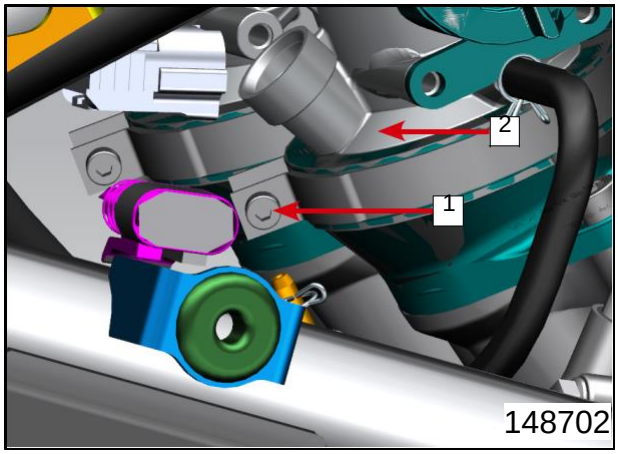
Rotate the clutch tie-rod [1] and install the clutch cable [2].



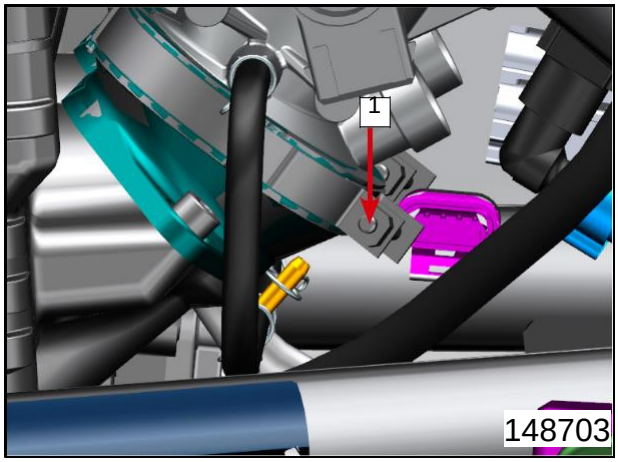
14.8.5 Air Filter Connection

Install throttle valve body [2] properly.

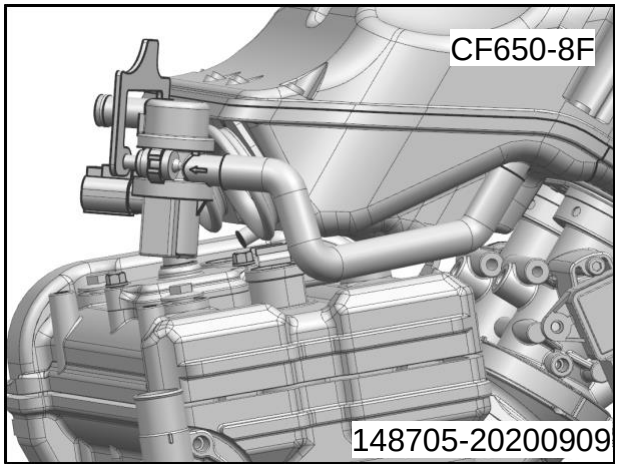
Tighten clamp [1].



Tighten clamp [1].



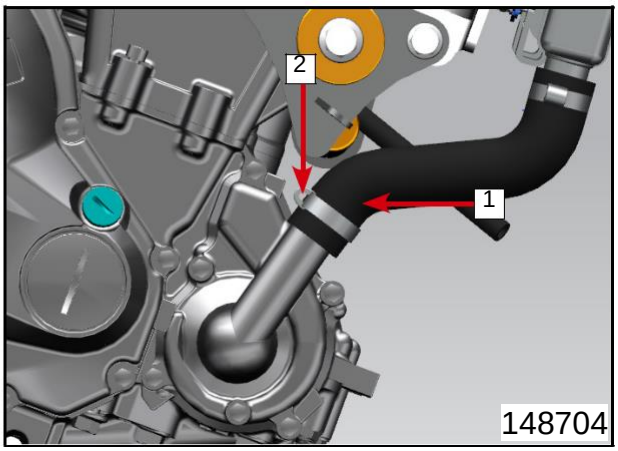
Install AIS valve and air inlet and outlet pipes.



14.8.6 Inlet/Outlet Pipe Installation

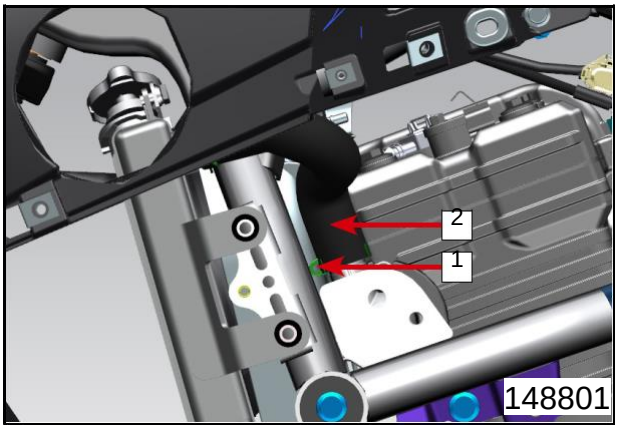
Install the outlet pipe [2] on engine.

Tighten clamp [1].

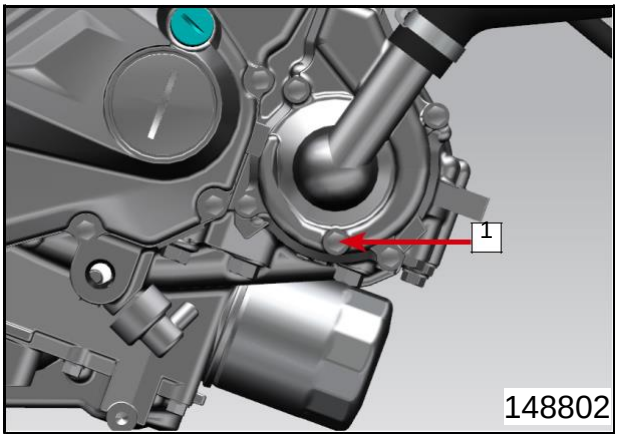


Install the inlet pipe [2] on engine.

Tighten clamp [1].



Install M6 drain bolt [1] and washer.



14.9 External gear display

Vehicles will be equipped with external gear display after moder year 2022.