



Technical Service Bulletin

SUBJECT:			No: TSB-13-11-002
BALANCER AND OIL PUMP MODULE FOR 4B11 ENGINE – SERVICE MANUAL REVISION			DATE: February, 2013
			MODEL: 2013 Outlander Sport
CIRCULATE TO:	<input type="checkbox"/> GENERAL MANAGER	<input checked="" type="checkbox"/> PARTS MANAGER	<input checked="" type="checkbox"/> TECHNICIAN
<input checked="" type="checkbox"/> SERVICE ADVISOR	<input checked="" type="checkbox"/> SERVICE MANAGER	<input checked="" type="checkbox"/> WARRANTY PROCESSOR	<input type="checkbox"/> SALES MANAGER

PURPOSE

This TSB updates the affected service manual with engine service and repair instruction related to the addition of the balancer shaft and oil pump module.

AFFECTED VEHICLES

2013 Outlander Sport Limited Edition (U.S. And Puerto Rico) built from February, 2013

AFFECTED SERVICE MANUALS

2013 Outlander Sport Service Manual – Engine:

Group 11A – Engine Mechanical > Oil Pan > Removal and Installation

Group 11A – Engine Mechanical > Balancer Timing Chain, Balancer Shaft and Oil Pump Module > Removal and installation

Group 11A – Engine Mechanical > Balancer Shaft and Oil Pump Module > Removal and Installation

Group 11B – Engine Overhaul > Torque Specifications

Group 11B – Engine Overhaul > Balancer Chain > Removal and Installation

Continued

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(3967)

The information contained in this bulletin is subject to change. For the latest version of this document, go to the Mitsubishi Dealer Link, MEDIC, or the Mitsubishi Service Information website (www.mitsubishitechinfo.com).

Please add the following information to
 2013 Outlander Sport Service Manual – Engine: Group 11A – Engine Mechanical > Oil Pan > Removal
 and Installation

**ENGINE MECHANICAL
 GENERAL INFORMATION**

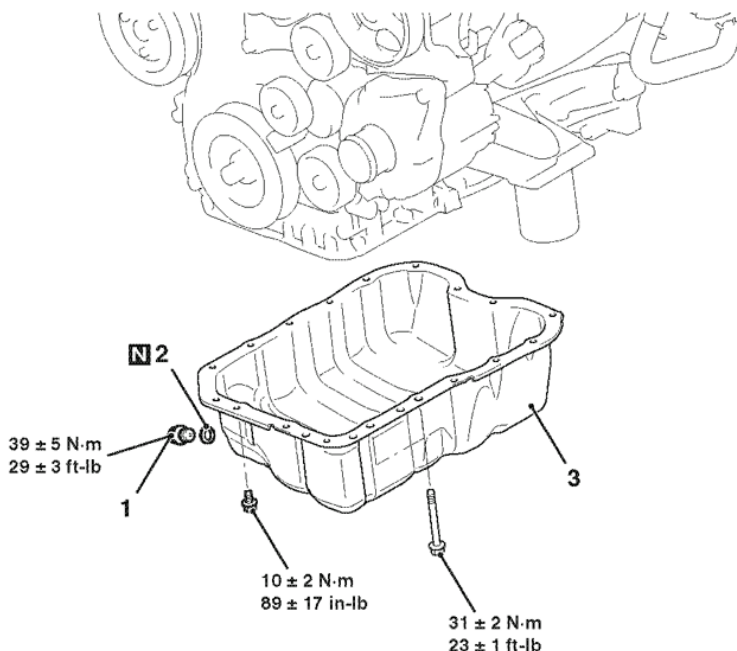
OIL PAN

REMOVAL AND INSTALLATION

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Due to the change below, the service procedure has been established. The other service procedures are the same as before.

Pre-removal Operation	Post-installation Operation
<ul style="list-style-type: none"> • Engine Room Under Cover Front A, B and Engine Room Side Cover (RH) Removal (Refer to GROUP 51 – Under Cover). • Engine Oil Draining (Refer to GROUP 12 – On-vehicle Service, Engine Oil Replacement). • Drive Belt Removal. 	<ul style="list-style-type: none"> • Drive Belt Installation. • Engine Oil Refilling (Refer to GROUP 12 – On-vehicle Service, Engine Oil Replacement). • Engine Room Under Cover Front A, B and Engine Room Side Cover (RH) Installation (Refer to GROUP 51 – Under Cover).



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<<A>>

- Removal steps**
- A/C compressor and clutch assembly (Refer to GROUP 55A – Compressor Assembly).
 - A/C compressor bracket (Refer to GROUP 55A – Compressor Assembly).

>>B<<
 <> >>A<<

Removal steps (Continued)

1. Engine oil pan drain plug
2. Engine oil pan drain plug gasket
3. Engine oil pan

Required Special Tool:

- MD998727: Oil Pan FIPG Cutter

Please add the following information to
 2013 Outlander Sport Service Manual – Engine: Group 11A – Engine Mechanical > Balancer Timing
 Chain, Balancer Shaft and oil Pump Module > Removal and Installation

ENGINE MECHANICAL
 BALANCER TIMING CHAIN, BALANCER SHAFT AND OIL PUMP MODULE

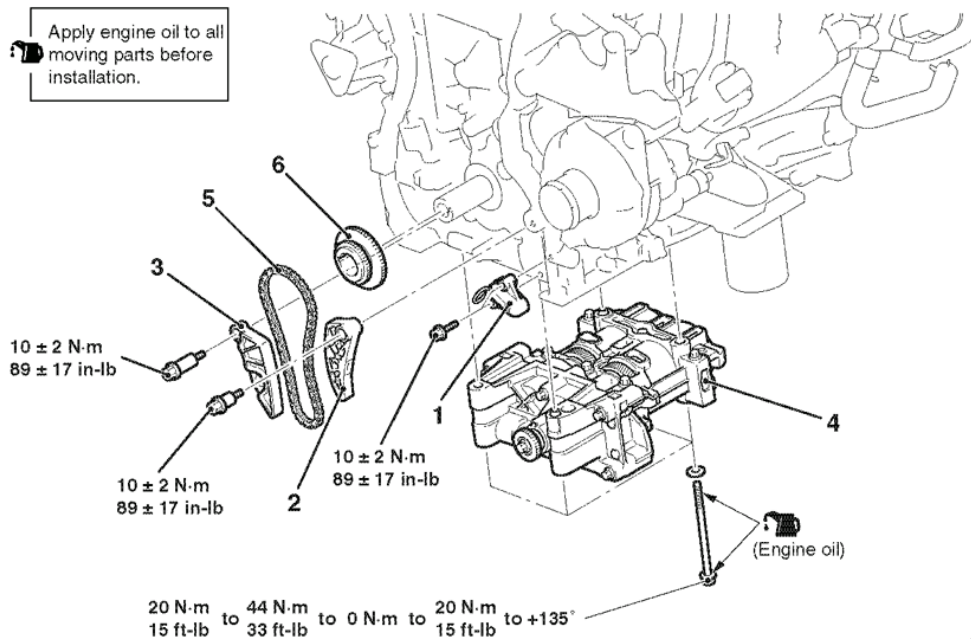
**BALANCER TIMING CHAIN, BALANCER SHAFT
 AND OIL PUMP MODULE**

REMOVAL AND INSTALLATION

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Pre-removal and Post-installation Operation
 • Timing Chain Removal and Installation.

Apply engine oil to all
 moving parts before
 installation.



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- <<A>> >>B<<
- Removal steps**
1. Timing chain tensioner
 2. Balancer timing chain guide
 3. Balancer timing chain guide

- >>A<<
- Removal steps (Continued)**
4. Balancer shaft and oil pump module
 5. Balancer timing chain
 6. Crankshaft sprocket

- Required Special Tool:**
- MB991614: Angle Gauge

ENGINE MECHANICAL
BALANCER TIMING CHAIN, BALANCER SHAFT AND OIL PUMP MODULE

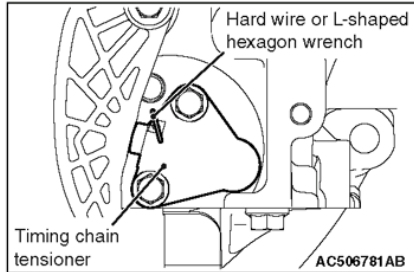
REMOVAL SERVICE POINT

<<A>> TIMING CHAIN TENSIONER REMOVAL

⚠ CAUTION

Securely install the plunger of the timing chain tensioner. Otherwise, it may pop out.

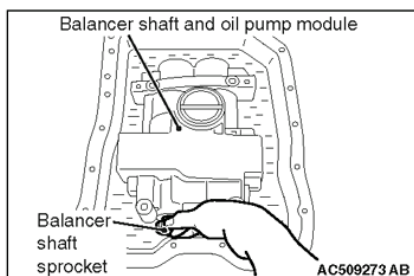
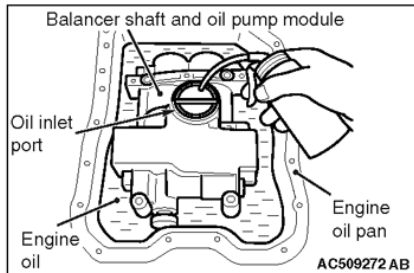
1. Press the balancer timing chain against the timing chain tensioner, compress the plunger of the timing chain tensioner and insert hard wire (piano wire, etc.) or L-shaped hexagon wrench (1.5 mm [0.05 inch]) to fix the plunger of the timing chain tensioner.
2. Remove the timing chain tensioner.



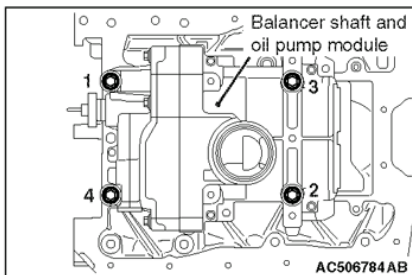
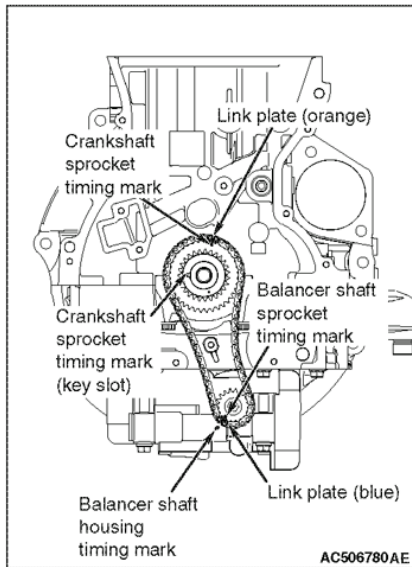
INSTALLATION SERVICE POINTS

>>A<< CRANKSHAFT SPROCKET/BALANCER TIMING CHAIN/BALANCER SHAFT AND OIL PUMP MODULE INSTALLATION

1. When installing the new balancer shaft and oil pump module, apply oil to the oil pump in the balancer shaft and oil pump module and the balancer shaft bearing as follows.
 - (1) Clean the inside of the removed engine oil pan, and put the balancer shaft and oil pump module into the engine oil pan with its oil inlet port facing up.
 - (2) Pour new engine oil until two-thirds of the balancer shaft and oil pump module is soaked.
 - (3) Fill the engine oil (approximately 50 cm³ [3.05 cu.in.]) into the balancer shaft and oil pump module from the oil inlet port.
- (4) Turn the balancer shaft sprocket of the balancer shaft and oil pump module clockwise four rotations or more to apply the engine oil to the entire area of the oil pump and the balancer shaft bearing.

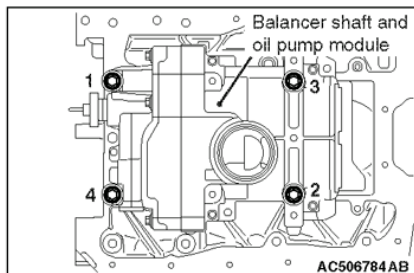


ENGINE MECHANICAL
BALANCER TIMING CHAIN, BALANCER SHAFT AND OIL PUMP MODULE

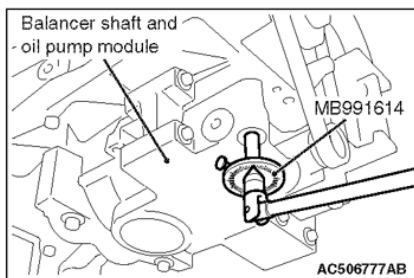


2. With the link marks (orange or blue) of balancer timing chain aligned with the timing marks of balancer sprocket and crankshaft sprocket, install the balancer shaft and oil pump module together with the balancer timing chain and crankshaft sprocket as one unit to the cylinder block. At this time, securely bring the balancer shaft and oil pump module into contact with the rudder frame mounting area.
3. Apply an adequate and minimum amount of engine oil to the threads and bearing surfaces of the balancer shaft and oil pump module bolts.
4. Tighten the balancer shaft and oil pump module bolts to the specified torque of 20 N·m (15 ft·lb) in the order of number shown in the figure.
5. Retighten the balancer shaft and oil pump module bolts to the specified torque of 44 N·m (33 ft·lb) in the order of number shown in the figure.
6. Loosen each balancer shaft and oil pump module bolt fully in the reverse sequence to that shown.
7. Tighten the balancer shaft and oil pump module bolts to the specified torque of 20 N·m (15 ft·lb) in the order of number shown in the figure.

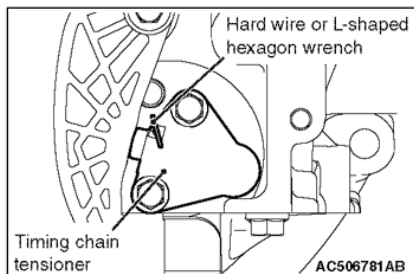
ENGINE MECHANICAL
BALANCER TIMING CHAIN, BALANCER SHAFT AND OIL PUMP MODULE



8. After tightening to the specified torque, tighten the balancer shaft and oil pump module bolts to 135 degrees, using special tool MB991614, in the order of number shown in the figure.



**>>B<< TIMING CHAIN TENSIONER
 INSTALLATION**



1. Install the timing chain tensioner to the cylinder block.
2. Remove the hard wire or L-shaped hexagon wrench fixing the plunger of the timing chain tensioner to apply tension to the balancer timing chain.

Please add the following information to
2013 Outlander Sport Service Manual – Engine: Group 11A – Engine Mechanical > Balancer Shaft
and Oil Pump Module > Removal and Installation

ENGINE MECHANICAL
BALANCER SHAFT AND OIL PUMP MODULE

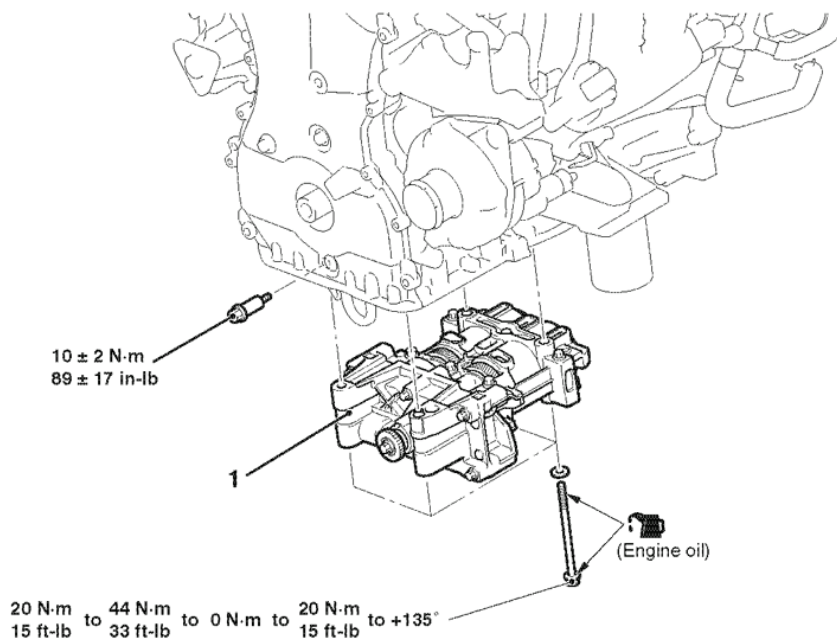
BALANCER SHAFT AND OIL PUMP MODULE

REMOVAL AND INSTALLATION

M1112008900315

Pre-removal and Post-installation Operation

- Engine Oil Pan Removal and Installation.



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Removal steps

- <<A>> >>A<< 1. Balancer shaft and oil pump module

Required Special Tool:

- MB991614: Angle Gauge

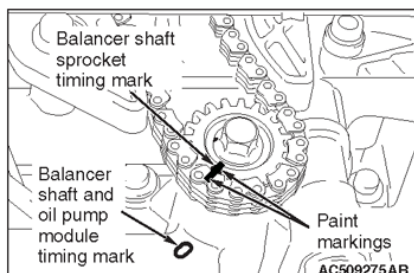
ENGINE MECHANICAL
BALANCER SHAFT AND OIL PUMP MODULE

REMOVAL SERVICE POINT

<<A>> BALANCER SHAFT AND OIL PUMP
MODULE REMOVAL

CAUTION

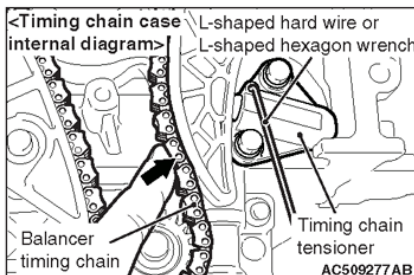
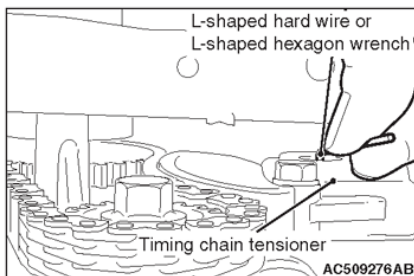
- Never turn the crankshaft counterclockwise.
 - Never turn the crankshaft after the cylinder No.1 or No.4 is set to the top dead center of compression.
1. Turn the crankshaft clockwise to align the timing mark of the balancer shaft sprocket with the timing mark of the balancer shaft and oil pump module, and set the cylinder No.1 or No.4 to the top dead center of compression.
 2. Put paint marks on the balancer shaft sprocket timing mark and balancer timing chain.



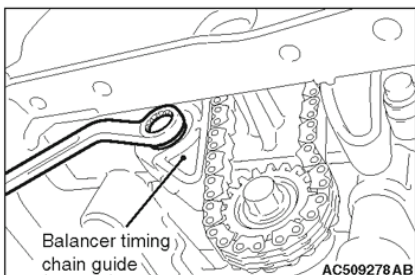
CAUTION

Securely install the plunger of the timing chain tensioner. Otherwise, it may pop out.

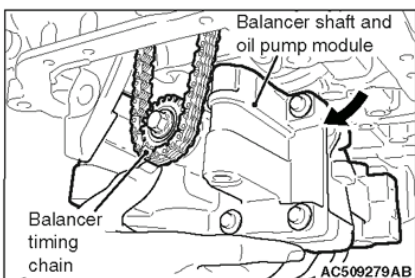
3. Press the balancer timing chain against the timing chain tensioner, compress the plunger of the timing chain tensioner and insert L-shaped hard wire (piano wire, etc.) or L-shaped hexagon wrench (1.5 mm [0.05 inch]) to the plunger fixing hole of the timing chain tensioner from under the timing chain case, and fix the plunger of the timing chain tensioner.



ENGINE MECHANICAL
BALANCER SHAFT AND OIL PUMP MODULE



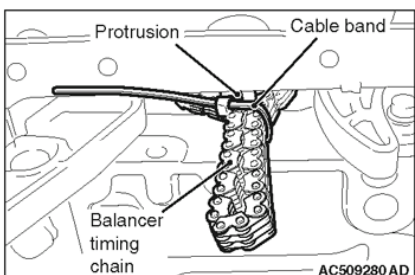
4. Use a wrench to remove the mounting bolt at the lower side of the balancer timing chain guide shown in the figure so that the balancer timing chain guide is unrestricted.
5. Support the balancer shaft and oil pump module with a hand, and remove the balancer shaft and oil pump module mounting bolt.



6. Remove the balancer shaft and oil pump module from the rudder frame with the balancer timing chain attached, and move it to the center of the engine.
7. Remove the balancer timing chain from the balancer shaft and oil pump module, and remove the balancer shaft and oil pump module.

CAUTION

When the tooth jump of the balancer timing chain from the crankshaft sprocket occurs, the timing between the balancer shaft and the oil pump module becomes off, resulting in the abnormal engine vibration. Be sure that the tooth jump will not occur.

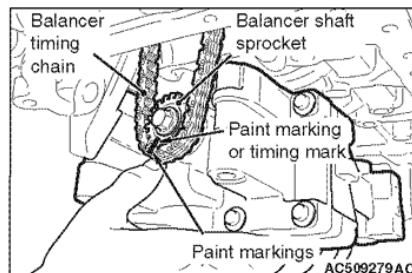
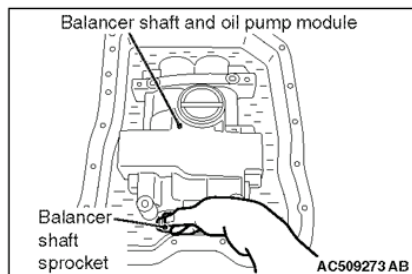
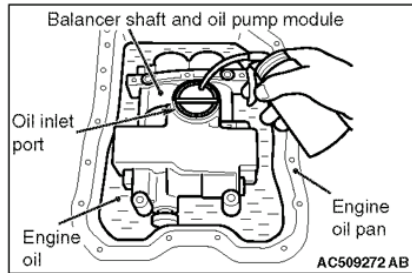


8. After the balancer shaft and oil pump module is removed, using a cable band, tie the balancer timing chain at the protrusion of the rudder frame to prevent the tooth jump of balancer timing chain from the crankshaft sprocket.

**ENGINE MECHANICAL
BALANCER SHAFT AND OIL PUMP MODULE**

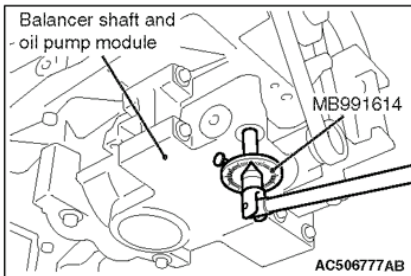
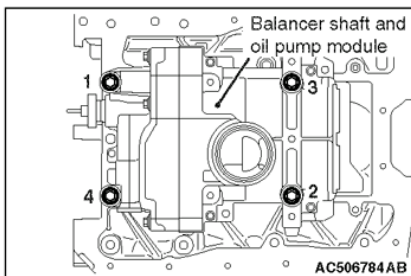
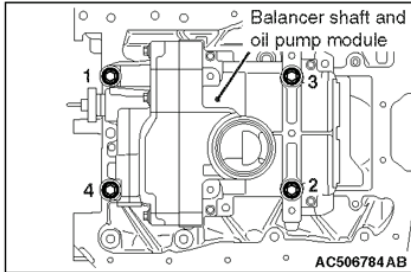
INSTALLATION SERVICE POINT

>>A<< BALANCER SHAFT AND OIL PUMP MODULE INSTALLATION



1. When installing the new balancer shaft and oil pump module, apply oil to the oil pump in the balancer shaft and oil pump module and the balancer shaft bearing as follows.
 - (1) Clean the inside of the removed engine oil pan, and put the balancer shaft and oil pump module into the engine oil pan with its oil inlet port facing up.
 - (2) Pour new engine oil until two-thirds of the balancer shaft and oil pump module is soaked.
 - (3) Fill the engine oil (approximately 50 cm³ [3.05 cu.in.]) into the balancer shaft and oil pump module from the oil inlet port.
 - (4) Turn the balancer shaft sprocket of the balancer shaft and oil pump module clockwise four rotations or more to apply the engine oil to the entire area of the oil pump and the balancer shaft bearing.
2. Remove the cable band installed to prevent the tooth jump of the balancer timing chain from the crankshaft sprocket from the balancer timing chain.
3. Regarding the prevention of the tooth jump of the balancer timing chain, install the balancer shaft sprocket to the balancer timing chain with aligning the paint marking of the balancer shaft sprocket (the timing mark of the new balancer shaft and oil pump module) with that of the balancer timing chain.
4. With the paint marking of the balancer timing chain aligned with that of the balancer sprocket (the timing mark of the new balancer shaft and oil pump module), install the balancer shaft and oil pump module to the rudder frame. Securely bring the balancer shaft and oil pump module into contact with the rudder frame mounting area.
5. Apply an adequate and minimum amount of engine oil to the threads and bearing surfaces of the balancer shaft and oil pump module bolts.

ENGINE MECHANICAL
BALANCER SHAFT AND OIL PUMP MODULE



6. Tighten the balancer shaft and oil pump module bolts to the specified torque 20 N·m (15 ft-lb) in the order of number shown in the figure.
7. Tighten the balancer shaft and oil pump module bolts again to the specified torque 44 N·m (33 ft-lb) in the order of number shown in the figure.
8. Loosen the balancer shaft and oil pump module bolts fully in the reverse sequence to that shown.
9. Tighten the balancer shaft and oil pump module bolts to the specified torque 20 N·m (15 ft-lb) in the order of number shown in the figure.
10. After tightening to the specified torque, tighten the balancer shaft and oil pump module bolts to 135 degrees, using special tool MB991614, in the order of number shown in the figure.
11. Tighten the mounting bolt of the balancer timing chain guide lower with the standard torque.
Tightening torque: 10 ± 2 N·m (89 ± 17 in-lb)
12. Remove the plunger of the timing chain tensioner using the L-shaped hard wire (piano wire, etc.) or L-shaped hexagon wrench (1.5 mm [0.05 inch]).

Please add the following information to
2013 Outlander Sport Service Manual – Engine: Group 11B – Engine Overhaul > Torque Specifications

**ENGINE OVERHAUL
GENERAL INFORMATION**

TORQUE SPECIFICATIONS

M1113023405713

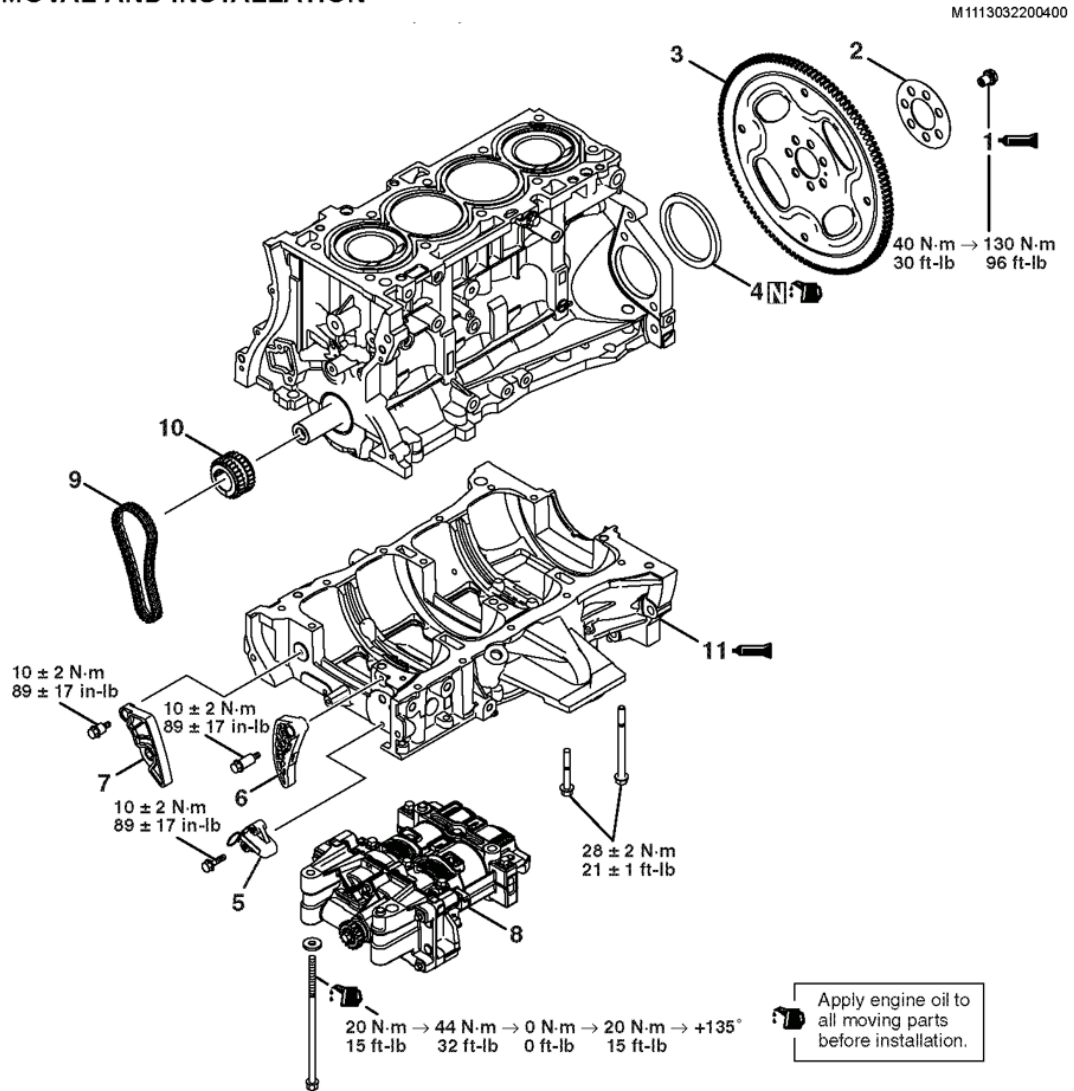
Item	Specification
Balancer chain	
Balancer shaft module bolt	20 N·m (15 ft-lb) → 44 N·m (32 ft-lb) → 0 N·m (0 ft-lb) → 20 N·m (15 ft-lb) → +135°
Balancer shaft chain tensioner bolt	10 ± 2 N·m (89 ± 17 in-lb)
Lever tensioner bolt	10 ± 2 N·m (89 ± 17 in-lb)
Balancer shaft chain guide bolt	10 ± 2 N·m (89 ± 17 in-lb)

2013 Outlander Sport Service Manual – Engine: Group 11B – Engine Overhaul > Balancer Chain Removal and Installation

ENGINE OVERHAUL
BALANCER CHAIN

BALANCER CHAIN

REMOVAL AND INSTALLATION



AK603009AH

- Removal steps**
- <<A>> >>E<< 1. Drive plate bolt
 - >>D<< 2. Adapter plate
 - <> >>C<< 3. Drive plate
 - >>D<< 4. Rear oil seal
 - <> >>C<< 5. Balancer shaft chain tensioner
 - >>C<< 6. Balancer shaft tensioner lever

- Removal steps (Continued)**
- <> >>B<< 7. Balancer shaft chain guide
 - <> >>B<< 8. Balancer shaft module
 - <> >>B<< 9. Balancer chain
 - <> >>B<< 10. Crankshaft sprocket
 - <<C>> >>A<< 11. Ladder frame

Required Special Tool:

- MB991883: Flywheel stopper
- MB991614: Angle gauge
- MD998718: Rear oil seal installer

ENGINE OVERHAUL
BALANCER CHAIN

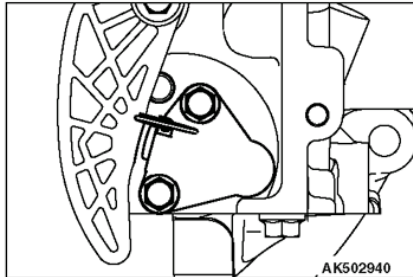
REMOVAL SERVICE POINT

<> BALANCER SHAFT CHAIN TENSIONER /
CRANKSHAFT SPROCKET / BALANCER CHAIN /
BALANCER SHAFT MODULE REMOVAL

CAUTION

Reliably secure the plunger of the chain tensioner with hard wire to prevent it from jumping out of the main body.

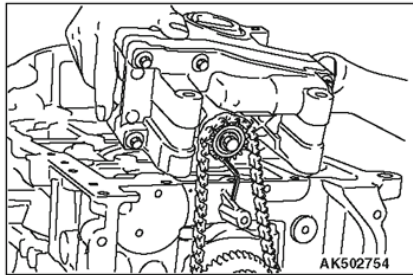
1. Push in the balancer shaft tensioner lever by hand and push in the plunger of the chain tensioner until it contacts the bottom. Then, insert hard wire (piano wire, etc.) of $\phi 1.5$ or hexagonal bar wrench (1.5 mm [0.06 inch]) into the plunger fixing hole to secure.
2. Remove the balancer shaft chain tensioner.



CAUTION

The balancer shaft module must not be disassembled because of assembly warranty.

3. Remove the crankshaft sprocket, balancer chain and balancer shaft module as a unit.

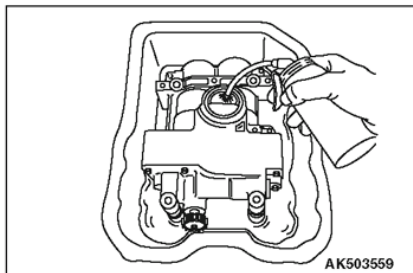


INSTALLATION SERVICE POINT

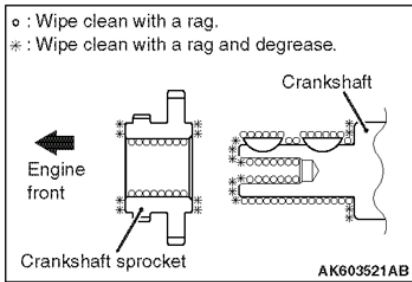
>>B<< CRANKSHAFT SPROCKET / BALANCER
CHAIN / BALANCER SHAFT MODULE INSTALLA-
TION

When the new balancer shaft module is installed, supply oil to the oil pump and the balancer shaft bearing in the balancer shaft module using the following procedures.

- i. Clean the inside of the removed oil pan. Put the balancer shaft module carefully into the oil pan so that the oil inlet can be upward.
- ii. Pour the engine oil so that the two-third of the balancer module can be immersed.
- iii. Also, pour approximate 50 cm^3 (3.1 cu in) of engine oil from the oil inlet.
- iv. By giving four clockwise rotations or more to the balancer shaft sprocket, the oil is supplied to the oil pump and the balancer shaft bearing.

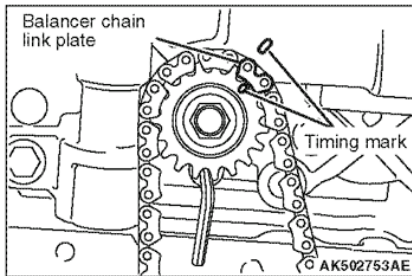


ENGINE OVERHAUL BALANCER CHAIN



1. Wipe the dirt on the crankshaft sprocket and the crankshaft using a rag, and then remove the grease from the portion shown in the illustration.

NOTE: Remove grease to prevent a drop in the coefficient of friction of the pressing portion caused by adhesion of oil.



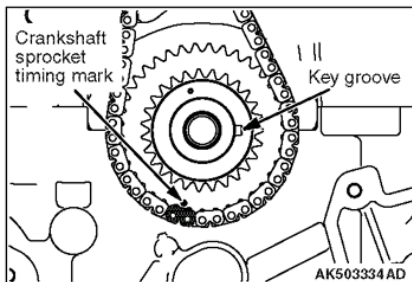
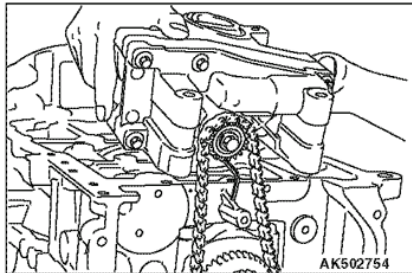
2. Align the timing mark of the balancer shaft module sprocket with that of the balancer shaft module.
3. Insert a hexagonal bar wrench (3 mm [0.12 inch]) as illustrated to prevent the balancer shaft module sprocket from moving.
4. Loop the balancer chain, aligning its link plate with the timing mark.
5. Install the crankshaft sprocket on the crankshaft.

NOTE: Do not push in the crankshaft sprocket to the normal position. Push it in only up to the tip of the crankshaft.

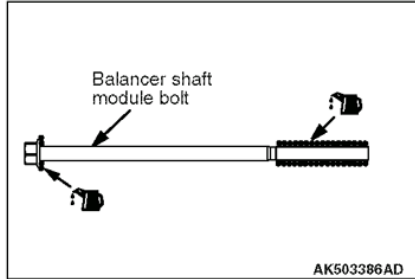
6. While slanting the balancer shaft module, align the link plate of another balancer chain with the timing mark of the crankshaft sprocket to loop. Gradually push in the crankshaft sprocket and fit it into the key groove of the crankshaft. Then, install the balancer shaft module on the ladder frame.

NOTE: Make sure that the balancer shaft module is completely intimate contact with the ladder frame.

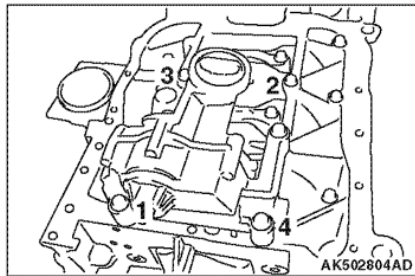
NOTE: Make sure that the key groove of the crankshaft is aligned with the contact surface of the cylinder block and ladder frame as shown in the illustration.



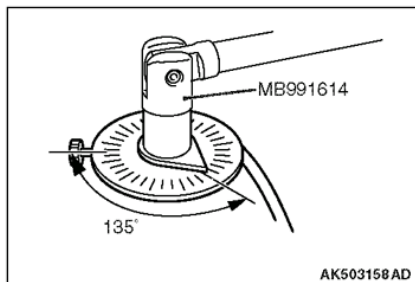
**ENGINE OVERHAUL
BALANCER CHAIN**



7. Apply an appropriate and minimum amount of engine oil to the screw thread of the balancer shaft module bolt.



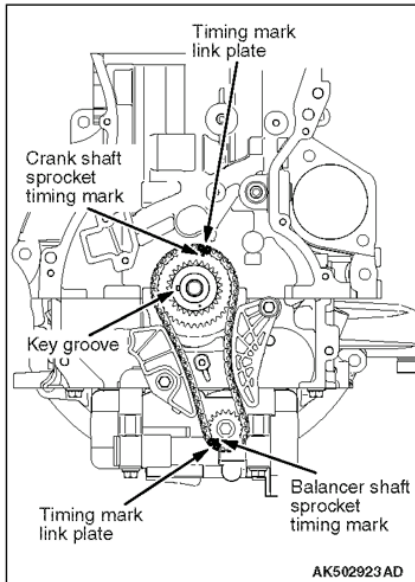
8. Tighten bolts to the specified tightening torque of 20 N·m (14 ft·lb) according to the assembly order in the illustration, retighten them to 44 N·m (32 ft·lb), and then completely loosen them.



9. After tightening them to the specified tightening torque of 20 N·m again, use special tool MB991614 to tighten them to 135°.

10. Pull out the hexagonal bar wrench from the balancer module sprocket.

ENGINE OVERHAUL
BALANCER CHAIN



11. Make sure that the respective timing mark is aligned with each other as illustrated.
12. Install the balancer chain tensioner lever and balancer chain guide.