GROUP 11 – ENGINE

BULLETIN No.	SUBJECT	MODEL
11/2003/001	“O” Ring material change	6G7
11/2003/002	Special tool change	4M41
11/2003/003	Crankshaft Pulley bolt	6G7
11/2002/001	Glow plug tightening procedure	4D5 Engine
11/2002/002	4D5 head gasket change	4D5 Engine
11/2002/003	Timing Chain replacement	4M40 Engine
11/2002/004	Valve clearance specification (hot)	4M41 Engine
11/2002/005	Change to Crankshaft bolt torque	4G1 Engine
11/2002/006	Correction to fuel pump timing procedures	4M40 Engine

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SERVICE BULLETIN

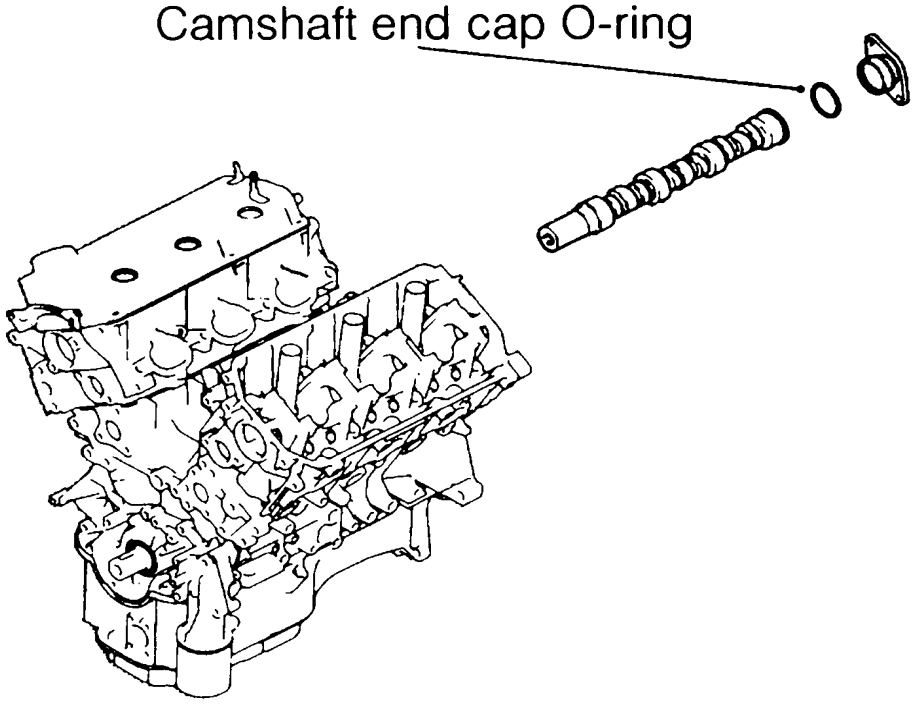
GROUP: 11 – Engine	**DATE:** October 2003	**NO.** 11/2003/001
MODEL: All 6G7 V6 Engine	**SUBJECT:** Change of camshaft end cap O–ring material	
COUNTRIES: Australia	R.I.WYATT MANAGER - AFTERSALES TECHNICAL SUPPORT	.....
	Bulletin Consists of 1 Pages	

The purpose of this bulletin is to advise of the introduction ot a revised specification material used in the manufacture of the O–ring fitted to the camshaft end caps of the 6G7 range of vehicles

To improve durability and reduce the effects of thermal degradation, the O–ring material has been changed fron Nitrile rubber to Acrylic rubber.

NOTE:
It is highly recommended that the new O–rings be used in all circumstances where replacement is required.

6G7 Engine
Camshaft end cap O-ring



Parts Availability
Parts are available through your normal spare parts channel

Engine	Old Part no	**New Part no**
6D7 V6	MF520031	**MN176208**

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SERVICE BULLETIN

GROUP: 11 – Engine	**DATE:** July 2003	**NO.** 11/2003/002
MODEL: All 4M41 Engine	**SUBJECT:** Correction to special tool part number	
COUNTRIES: Australia	R.I.WYATT MANAGER - AFTERSALES TECHNICAL SUPPORT	.....
	Bulletin Consists of 2 Pages	

The purpose of this bulletin is to advise of the correction to the part number listed for the special tool required for injection timing of the 4M41 Direct Injected Diesel engine.

Would you please ensure the corrections and additions are added to the appropriate publication listed below in accordance with this bulletin.

These changes will be applied to the next issue of updated information for this model.

Publication	Part. No.	Page
PAJERO 2002 Service Manual	PWJE0005 (1/2)	11D–9

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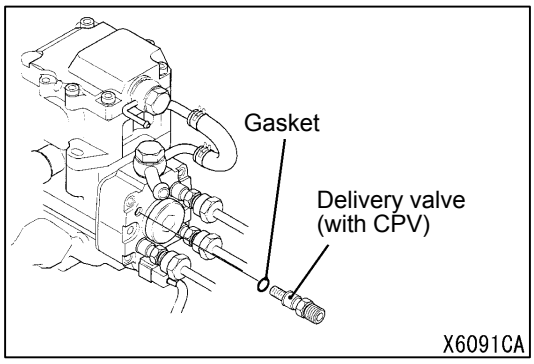
(2) After adjustment, tighten the lock nut to the specified torque while preventing the adjusting screw from turning with a screwdriver.

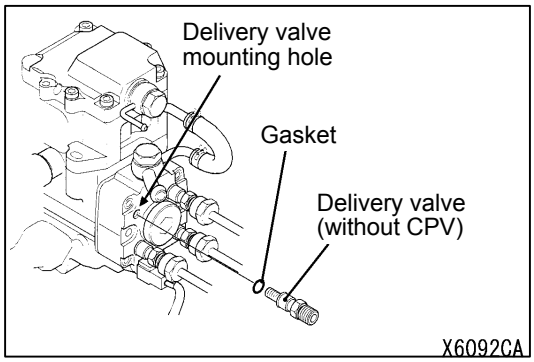
Tightening torque: 9.5 ± 0.5 N·m

(3) Measure the valve clearance again, and check that it is at the standard value.



INJECTION TIMING CHECK AND ADJUSTMENT

1. Warm up the engine.
2. Remove all the glow plugs.
3. Remove the No.1 cylinder delivery valve (with CPV) and gasket of the injection pump.



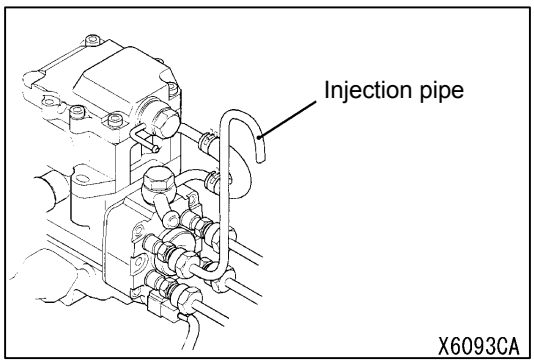
< INCORRECT >

~~4. Install the gasket (ME741133) and delivery valve (without CPV) (Special tool Pt.No. MH063483) to the injection pump delivery valve mounting hole, and tighten them to the specified torque.~~

< CORRECT >

4. Install the gasket (ME741133) and delivery valve without CPV (Special tool Pt.No. EMH063483) to the injection pump delivery valve mounting hole, and tighten them to the specified torque.

Tightening torque: 49 ± 5 N·m



5. Install an old auxiliary injection pipe to the delivery valve. Cut out the open end of the injection pipe, and bend it down so as to observe the fuel flow.

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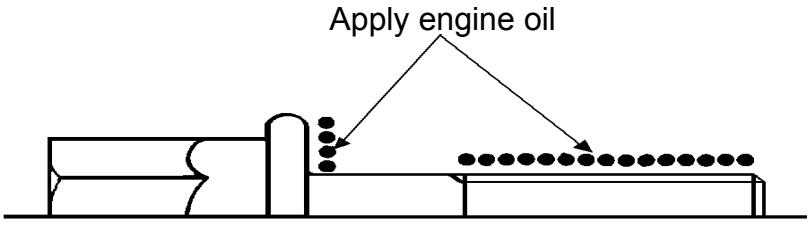
SERVICE BULLETIN

GROUP: 11 – Engine	**DATE:** November 2003	**NO.** 11/2003/003
MODEL: Magna/Verada	**SUBJECT:** Crankshaft pulley bolt torque	
COUNTRIES: Australia	R.I.WYATT MANAGER - AFTERSALES TECHNICAL SUPPORT	.....
	Bulletin Consists of 1 Pages	

The purpose of this bulletin is to advise of a correction to the procedures and specified torque required to tension the crankshaft pulley bolt on the **6G7 series V6** petrol engines fitted to Magna/Verada vehicles.

Procedure

1) Apply engine oil onto the crankshaft bolt thread and seating face prior to tightening crankshaft bolt to crankshaft assembly.



2) Tension crankshaft bolt to 185Nm.

Component	Tightening specifications	
	<OLD>	<NEW>
Crankshaft pulley bolt	180Nm – 190 Nm	185Nm

Affected vehicles

TE/KE, TF/KF, TH/KH, TJ/KJ, TL/KL.

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SERVICE BULLETIN

GROUP: 11–Engine	**DATE:** January 2002	**NO.** 11/2002/001
MODEL: 4D5 Engine	**SUBJECT:** Glow plug tightening procedure	
COUNTRIES: Australia	R.I.WYATT MANAGER - WARRANTY & TECHNICAL PUBLICATIONS	.....
	Bulletin Consists of 3 Pages	

The purpose of this bulletin is to advise that a change has been made to the tightening procedure of the glow plug fitted to the 4D5 Engine.

Applicable Manual:

Manual	Publication	Page
ENGINE 4D5 Workshop Manual	PWEE9067	11B–3–1, 3–1a

The attached page should be used to ensure that your workshop manuals are updated to reflect the correct information.

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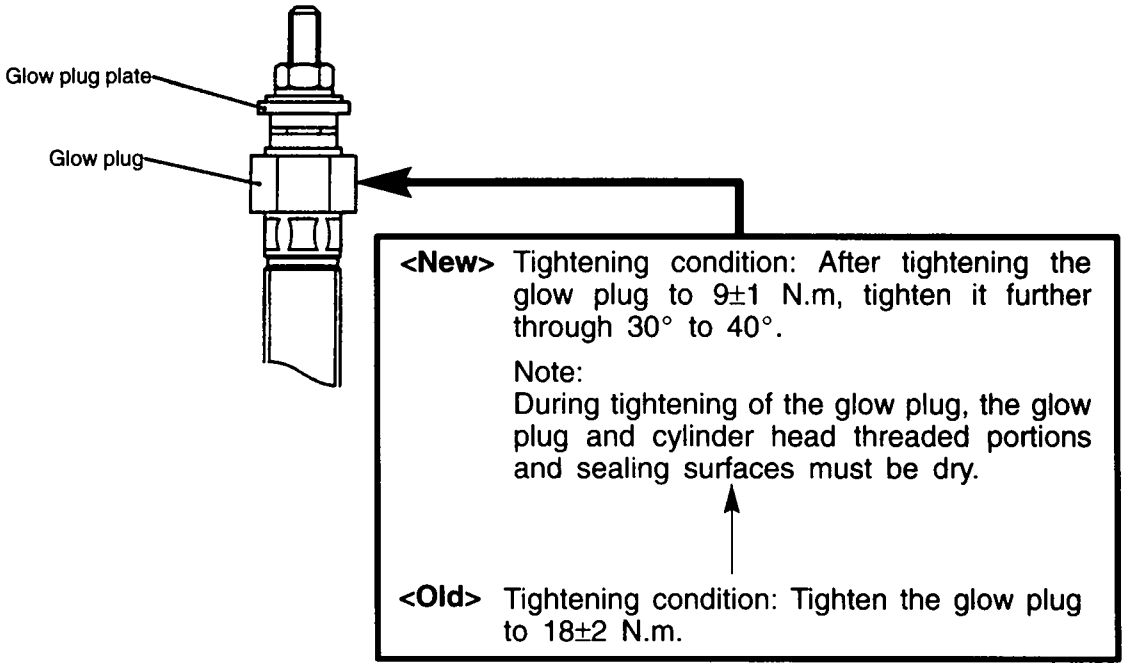
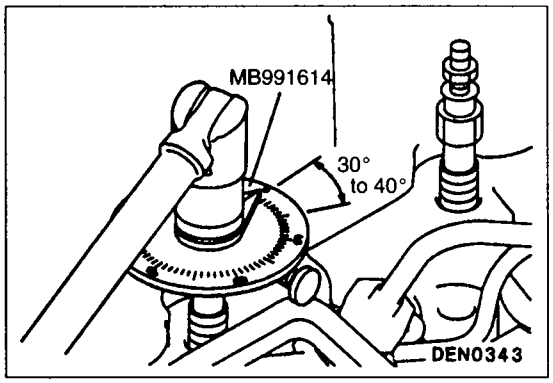
3. Details:

In order to improve reliability, the glow plug tightening condition has been changed as follows.



For angular tightening method of the glow plug, see the illustration and text given below.



After tightening the glow plug to 9±1 N.m, tighten it further through 30° to 40°.

Note:
During tightening of the glow plug, the glow plug and cylinder head threaded portions and sealing surfaces must be dry.

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SERVICE BULLETIN

GROUP: 11–Engine	**DATE:** January 2002	**NO.** 11/2002/002
MODEL: 4D5 Engine	**SUBJECT:** 4D5 head gasket change	
COUNTRIES: Australia	R.I.WYATT MANAGER - WARRANTY & TECHNICAL PUBLICATIONS	.....
	Bulletin Consists of 4 Pages	

With the change to the 4D5 engine cylinder head gasket, the thickness identification mark has been changed in position and an identification hole has been added.

Applicable Manual:

Manual	Publication	Affected Pages
ENGINE 4D5 Workshop Manual	PWEE9067	11B–11–6, 7

The attached pages should be used to ensure that your workshop manuals are updated to reflect the correct information.

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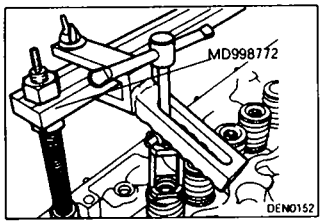
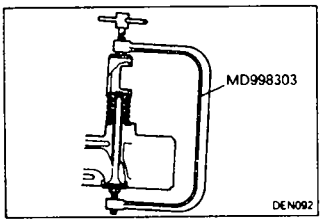
4. Details:

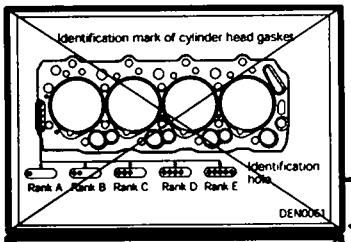




▶C◀ RETAINER LOCK INSTALLATION

Caution

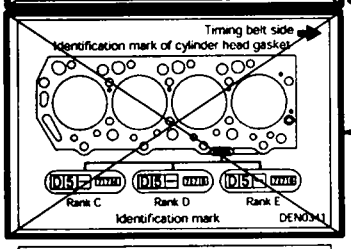
- **The valve spring, if excessively compressed, causes the bottom end of the retainer to be in contact with, and damage, the stem seal.**



▶D◀ CYLINDER HEAD GASKET INSTALLATION

(1) In case any of the cylinder block, piston, connecting rod and crankshaft has not been replaced, install the gasket of the same rank as before which can be identified by the mark shown in the illustration at left.

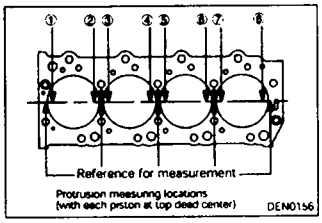
<Incorrect>



<Incorrect>

(2) In case any of the cylinder block, piston, connecting rod and crankshaft have been replaced, reselect and install the gasket in accordance with the following procedure.

1) With each piston held at the top dead center, measure its protrusion from the upper block surface at the locations shown in the illustration at left (total of eight locations). Be sure to take measurements on the crankshaft center line.
2) Using the average of the eight measurements, select the gasket rank (A, B, C, D or E) in accordance with the table given below. If, however, the maximum protrusion at any one location exceeds the protrusion tolerance shown for any rank in the following table, use the gasket one rank higher that rank.



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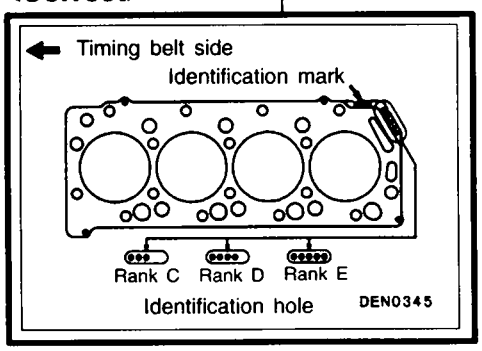
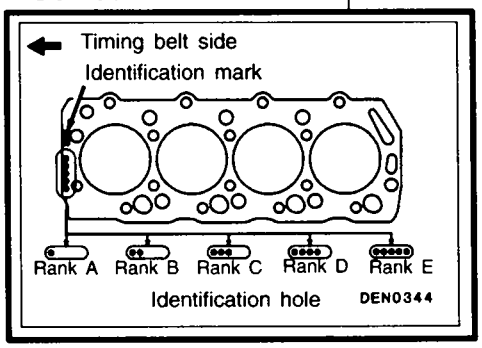
PWEE9067-G

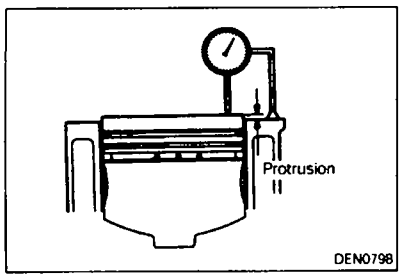
Revised

<Correct>



<Correct>





<Deleted>

Engines without turbocharger mm (in.)

Rank	Average value of piston protrusions	Protrusion tolerance for each rank	Thickness of selected gasket (when tightened)
A	0.562 - 0.620 (0.0221 - 0.0244)	0.670 (0.0264)	1.35 ± 0.05 (0.0531 ± 0.0020)
B	0.620 - 0.680 (0.0244 - 0.0268)	0.730 (0.0287)	1.40 ± 0.05 (0.0551 ±0.0020)
C	0.680 - 0.744 (0.0268 - 0.0293)	0.794 (0.0313)	1.45 ± 0.05 (0.0571 ±0.0020)

<Incorrect>

Engines with turbocharger mm (in.)

Rank	Average value of piston protrusions	Protrusion tolerance for each rank	Thickness of selected gasket (when tightened)
C	0.562 - 0.620 (0.0221 - 0.0244)	0.670 (0.0264)	1.45 ± 0.05 (0.0571 ± 0.0020)
D	0.620 - 0.680 (0.0244 - 0.0268)	0.730 (0.0287)	1.50 ± 0.05 (0.0590 ±0.0020)
E	0.680 - 0.744 (0.0268 - 0.0293)	0.794 (0.0313)	1.55 ± 0.05 (0.0610 ±0.0020)

NOTE
If the piston projection exceeds the tolerance, replace the piston, connecting rod, crankshaft or cylinder block and check again.

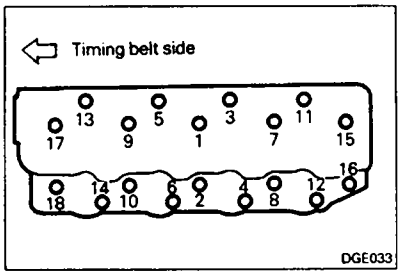
<Correct>

See the following page.

▶E◀ CYLINDER HEAD BOLT INSTALLATION

<Without throttle body>

(1) Set the cylinder head bolt washer with its shear droop toward the bolt head.
(2) Apply engine oil to the bolt threads and washer.



(3) Using the special tool and torque wrench, tighten bolts in the shown sequence.

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<Correct>

Engines without turbocharger

mm (in.)

Rank	Average value of piston protrusions	Protrusion tolerance for each rank	Thickness of selected gasket (when tightened)	Identification mark
A	0.562 – less than 0.620 (0.0221 – less than 0.0244)	0.670 (0.0264)	1.35 ± 0.05 (0.0531 ± 0.0020)	135
B	0.620 – less than 0.680 (0.0244 – less than 0.0268)	0.730 (0.0287)	1.40 ± 0.05 (0.0551 ± 0.0020)	140
C	0.680 – less than 0.774 (0.0268 – less than 0.0293)	0.794 (0.0313)	1.45 ± 0.05 (0.0571 ± 0.0020)	145

Engines with turbocharger

mm (in.)

Rank	Average value of piston protrusions	Protrusion tolerance for each rank	Thickness of selected gasket (when tightened)	Identification mark
C	0.562 – less than 0.620 (0.0221 – less than 0.0244)	0.670 (0.0264)	1.45 ± 0.05 (0.0571 ± 0.0020)	145
D	0.620 – less than 0.680 (0.0244 – less than 0.0268)	0.730 (0.0287)	1.50 ± 0.05 (0.0590 ± 0.0020)	150
E	0.680 – less than 0.774 (0.0268 – less than 0.0293)	0.794 (0.0313)	1.55 ± 0.05 (0.0610 ± 0.0020)	155

NOTE
If the position projection exceeds the tolerance, replace the piston, connecting rod, crankshaft or cylinder block and check again.

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SERVICE BULLETIN

GROUP: 11–Engine	**DATE:** July 2002	**NO.** 11/2002/003
MODEL: 4M40 Engine	**SUBJECT:** Timing Chain replacement	
COUNTRIES: Australia	R.I.WYATT MANAGER - WARRANTY & TECHNICAL PUBLICATIONS	.....
	Bulletin Consists of 2 Pages	

Purpose

The purpose of this bulletin is to advise that the Timing Chain of the 4M40 engine has been changed from a double roller to a single roller type.

It is recommended that in the event that a replacement chain is required due to wear or damage then the upgraded single roller chain and associated parts be used to effect the repair.

NOTE:
Excessive wear is denoted by the chain tensioner projection exceeding 26mm.

Components

All of the following components must be changed when upgrading to the single roller chain

PART NAME	**NEW PART NUMBER**	OLD PART NUMBER
CHAIN, TIMING	**ME190012**	ME200244
GEAR ASSEMBLY, IDLE	**ME190019**	ME202194
GUIDE, CHAIN	**ME190013**	ME200476
LEVER, TENSION (GUIDE, TENSION SIDE)	**ME190016**	ME200423
SPROCKET, CAM	**ME203099**	ME200748

Effective Date

Single roller chain introduced into 4M40 production as of Engine # **DC9067**

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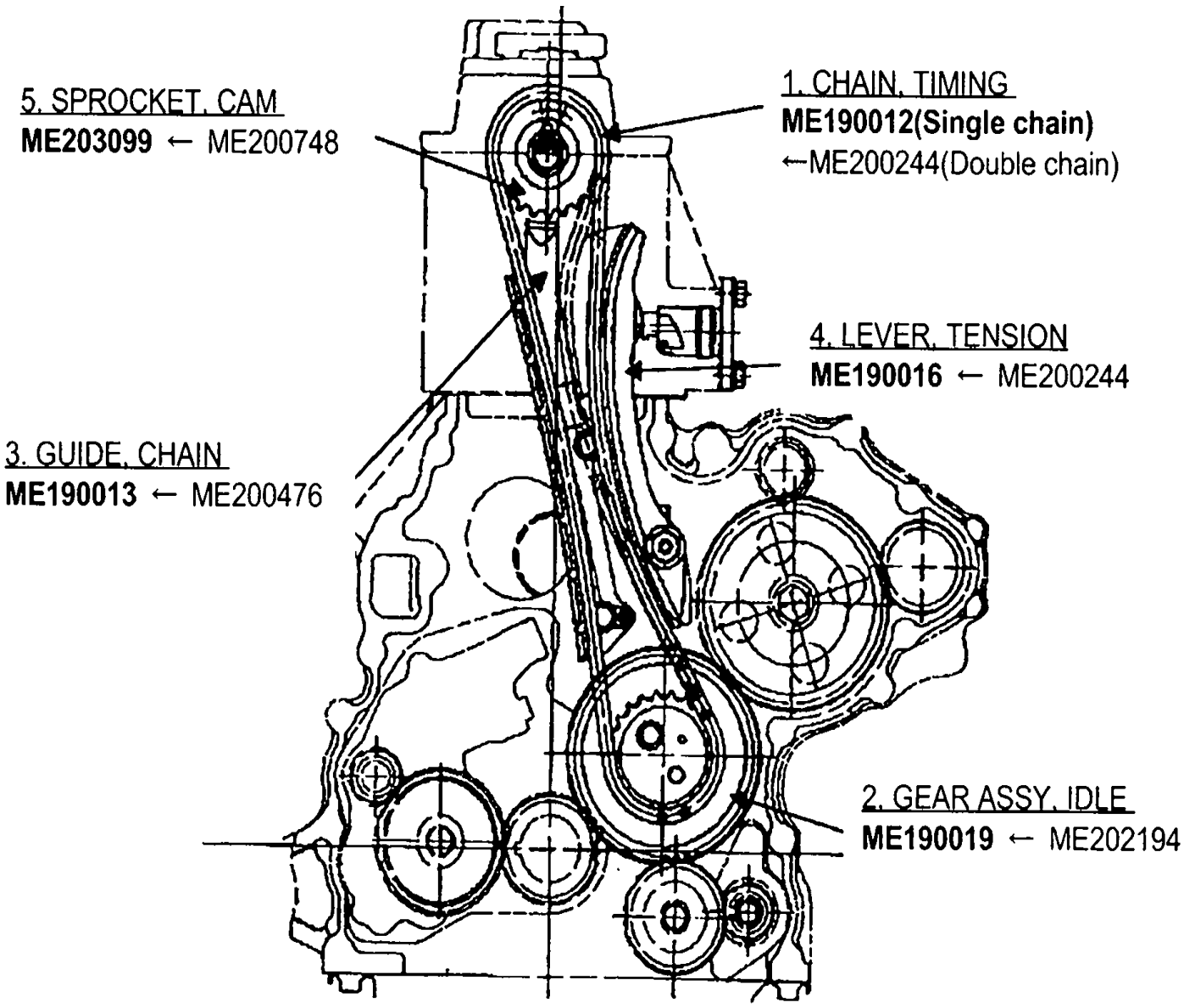
4M40 ENGINE COMPONENTS (ROLLER CHAIN UPGRADE)



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SERVICE BULLETIN

GROUP: 11–Engine	**DATE:** October 2002	**NO.** 11/2002/004
MODEL: 4M41 Engine	**SUBJECT:** Valve clearance specification (hot)	
COUNTRIES: Australia	R.I.WYATT MANAGER - AFTERSALES TECHNICAL SUPPORT	
	Bulletin Consists of 1 Pages	

Purpose

The purpose of this bulletin is to advise that a standard value of valve clearance has been established for the 4M41 Diesel engine when hot.

Valve Clearance (Coolant temperature between 80 to 95 degrees centigrade)

Intake Valve : 0.15 mm

Exhaust Valve : 0.20 mm

Applicable Manual

Manual	Publication No.	Page No.
2001 PAJERO Workshop Manual Chassis Vol. 1	PWJE0005	11D–8

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SERVICE BULLETIN

GROUP: 11–Engine	**DATE:** October 2002	**NO.** 11/2002/005
MODEL: 4G1 Engine	**SUBJECT:** Change to Crankshaft bolt torque	
COUNTRIES: Australia	R.I.WYATT MANAGER - AFTERSALES TECHNICAL SUPPORT	.....
	Bulletin Consists of 3 Pages	

Purpose:

The purpose of this bulletin is to advise that a change has been made to the tightening torque for the 4G1 engine's M12 crankshaft bolt. The tightening procedure for the larger M14 crankshaft bolt is also specified in addition to the new tightening torque and procedure for the existing M12 crankshaft bolt.

Tightening torque:

Current torque M12 crankshaft bolt	**New torque M12 crankshaft bolt**	**Pulley style**
125 Nm	132 Nm	Cast pulley
	132 Nm + (35 to 55 degrees) Caution: Stop tightening and never tighten the bolt any more if a torque of 206 Nm is reached during additional tightening to an angle within the specified range.	Steel plate pulley
Current torque M14 crankshaft bolt	181 Nm	

Applicable manual:

Manual	Publication No.	Page
ENGINE 4G1 (E–W) Workshop Manual	PWEE9520–F	11A–1–4 11A–3–1, 1a, 1b, 3,4

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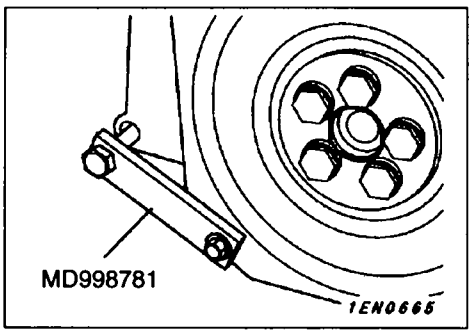
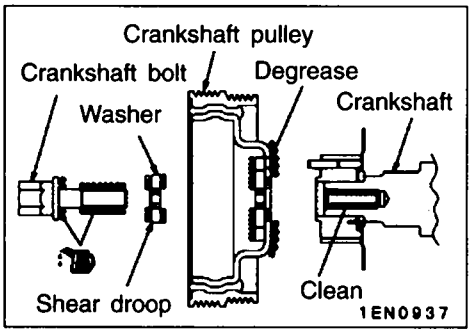
M12 CRANKSHAFT BOLT

<Tightening procedure>



1. Prevent the flywheel or drive plate from rotating using the special tool.



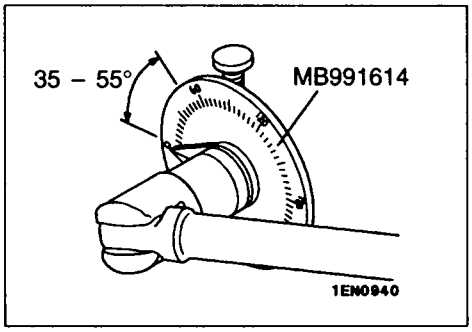
2. Clean the crankshaft bolt hole.
3. Clean and degrease the crankshaft pulley.

   NOTE
   Degreasing is necessary to prevent lack of frictional coefficient on the mating surfaces due to presence of oil or grease.
4. Install the crankshaft pulley.
5. Apply necessary minimum amount of engine oil to the threads and bearing surface of the crankshaft bolt flange.
6. Clean the washer.
7. Install the washer with the shear droop side toward the bolt head.
8. Tighten the crankshaft bolt in the following procedure.

   <Crankshaft with steel plate pulley>
   1. Tighten the crankshaft bolt to 132 N·m.

      Caution
      Never exceed a torque of 206 N·m during additional tightening to an angle within the specified range.
   2. Using the special tool, Angle gauge (MB991614), turn the bolt in the tightening direction to an angle within the 35 – 55° range.

   <Crankshaft with casting pulley>
   Tighten the crankshaft bolt to 132 N·m.

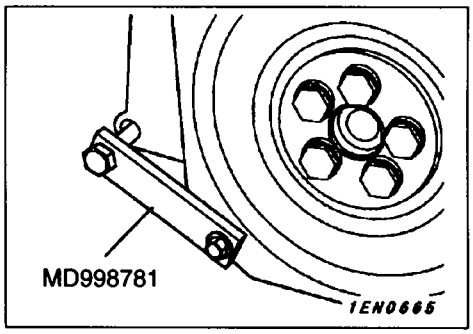


M14 CRANKSHAFT BOLT

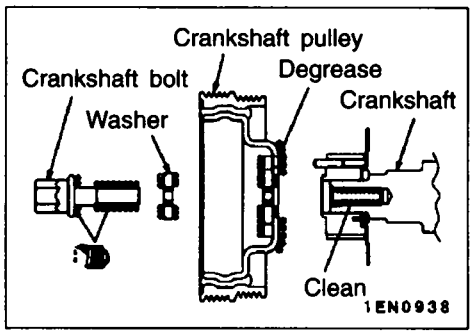
<Tightening torque>

The specified tightening torque for the crankshaft bolt is 181 N·m.

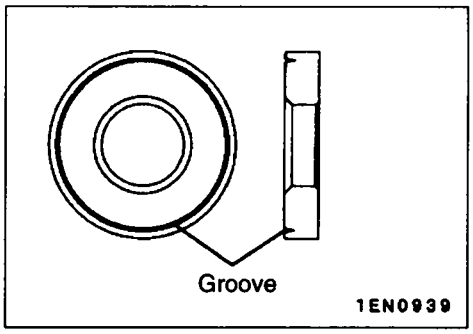
<Tightening procedure>



1. Prevent the flywheel or drive plate from rotating using the special tool.



2. Clean the crankshaft bolt hole.
3. Clean and degrease the crankshaft pulley.
   NOTE
   Degreasing is necessary to prevent lack of frictional coefficient on the mating surfaces due to presence of oil or grease.
4. Install the crankshaft pulley.
5. Apply necessary minimum amount of engine oil to the threads and bearing surface of the crankshaft bolt flange.
6. Clean the washer.



7. Install the washer with the grooved side toward the bolt head.
8. Tighten the crankshaft bolt to 181 N·m.

MITSUBISHI MOTORS

SERVICE BULLETIN

GROUP: 11–Engine	**DATE:** October 2002	**NO.** 11/2002/006
MODEL: 4M40 Engine	**SUBJECT:** Correction to fuel pump timing procedures	
COUNTRIES: Australia	R.I.WYATT MANAGER - AFTERSALES TECHNICAL SUPPORT	.....
	Bulletin Consists of 3 Pages	

Purpose:

The purpose of this bulletin is to advise of a change to the timing adjustment procedures for the 4M40 engine's fuel injection pump.

Applicable manual

Manual	Publication number	Page
ENGINE 4M4 Workshop manual	PWEE9409	11A–22–3

NOTE: THIS BULLETIN SHOULD BE FORWARDED DIRECT TO THE SERVICE MANAGER FOR ACTION/DISTRIBUTION.

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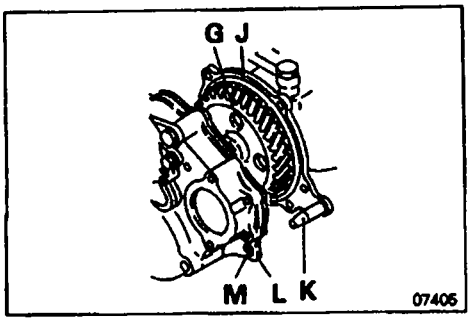
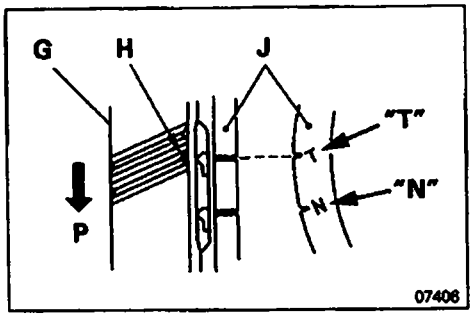
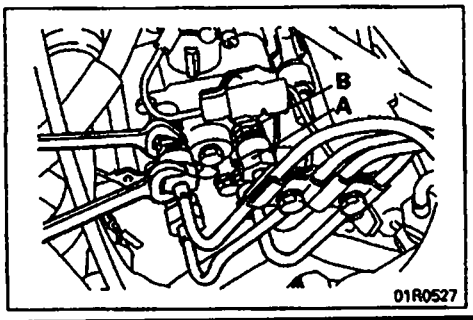


(3) Align the guide bar **K** of the flange plate **J** with the guide hole **M** of the front plate **L** and insert the front plate just before the injection pump gear **G** meshes with the idler gear.

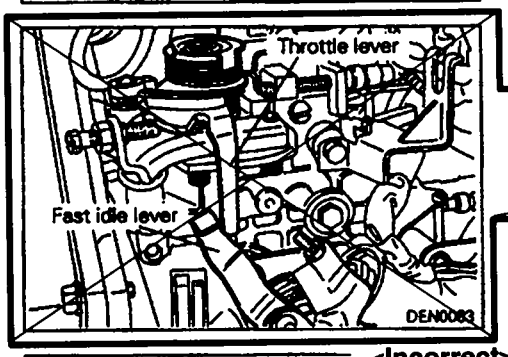


(4) Confirm that the notch **H** on the injection pump gear **G** is aligned with the mating mark "**N**" <Non-turbo> or "**T**" <Turbo> on the flange plate **J**. Then install the front plate on the injection pump assembly.
While meshing the gears, the notch **H** on the gear should move in the direction **P**.



◆C◆ FUEL INJECTION PIPE INSTALLATION

(1) Tighten the union nut **A** of the fuel injection pipe while locking the delivery valve holder **B** to prevent it from rotating together.



FUEL INJECTION TIMING CHECK AND ADJUSTMENT

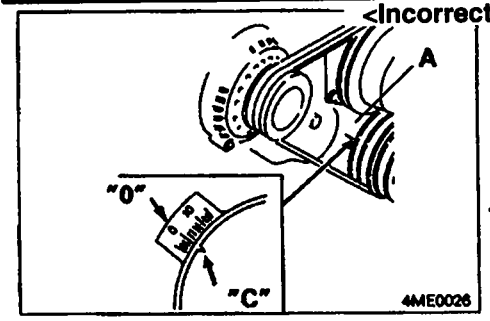
~~CHECKING~~

~~(1) Warm up the engine and then check that the fast idle lever is separated from the throttle lever.~~

~~(2) Remove all the glow plugs.~~

<Incorrect> → See the following page.

CHECKING <Added>



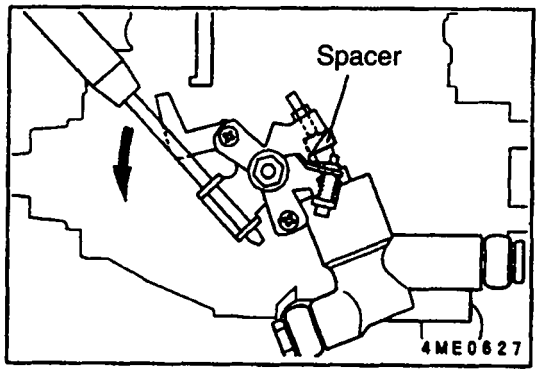
<Incorrect>

(3) Crank up the engine to place No.1 piston at the TDC on the compression stroke. Align the notch **C** in the crankshaft with the timing mark "**0**" on the timing gear case **A**.

(1)

<Correct>

<Correct>



Before check and adjustment, deactivate the advancer as follows:

(1) Insert a screwdriver (with a shank of 8mm in diameter) in the hole for deactivating the advancer, and turn the screwdriver in the direction indicated by the arrow.

(2) Insert an approximately 10mm thick spacer between the lever and the thermowax to deactivate the advancer.

CAUTION

Return the lever slowly not to give the lever a strong impact.

(3) Pull out the screwdriver.