



MAZDA

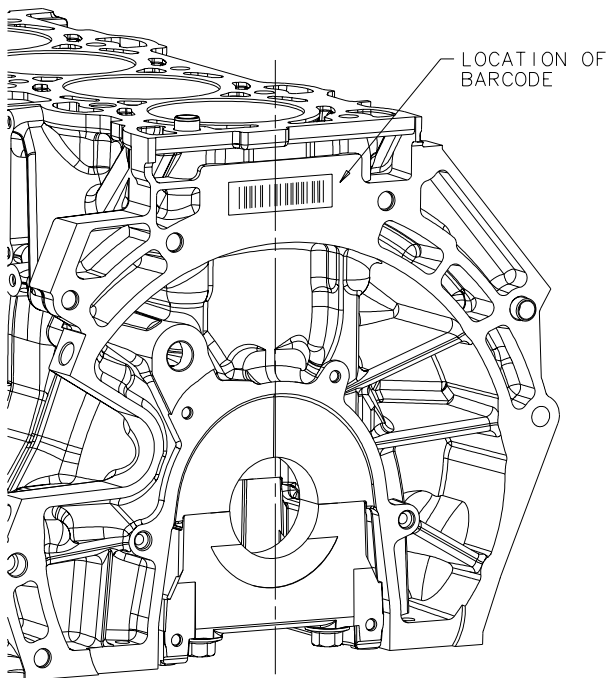
Engine Assembly 543 Chart
C1S7G-543-AC

Revision BP

EN00 E 11290169 002 020110

Issue Date: 10 January, 2002

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS				PART NAME/TITLE			
				BARCODE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AA	EN00 E 11087761 000	00-11-17	2001 2.0L-4V NON DI CD132	5	6	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

INFORMATION

UNIT : mm

	MARK	CYLINDER BORE DIA.	BARE PISTON STANDARD DIA.	CLEARANCE
2.0L / 2.3L	1	$\phi 87.5$ +0.01 MAX. 0 MIN	$\phi 87.465$ +0.01 MAX. 0 MIN	0.025 ~ 0.045
	2	$\phi 87.5$ +0.02 MAX. +0.01 MORE THAN	$\phi 87.475$ +0.01 MAX. 0 MORE THAN	0.025 ~ 0.045
	3	$\phi 87.5$ +0.03 MAX. +0.02 MORE THAN	$\phi 87.485$ +0.01 MAX. 0 MORE THAN	0.025 ~ 0.045

1.8L	1	$\phi 83$ +0.01 MAX. 0 MIN	$\phi 82.965$ +0.01 MAX. 0 MIN	0.025 ~ 0.045
	2	$\phi 83$ +0.02 MAX. +0.01 MORE THAN	$\phi 82.975$ +0.01 MAX. 0 MIN	0.025 ~ 0.045
	3	$\phi 83$ +0.03 MAX. +0.02 MORE THAN	$\phi 82.985$ +0.01 MAX. 0 MIN	0.025 ~ 0.045

PISTON ADD SKIRT COATING

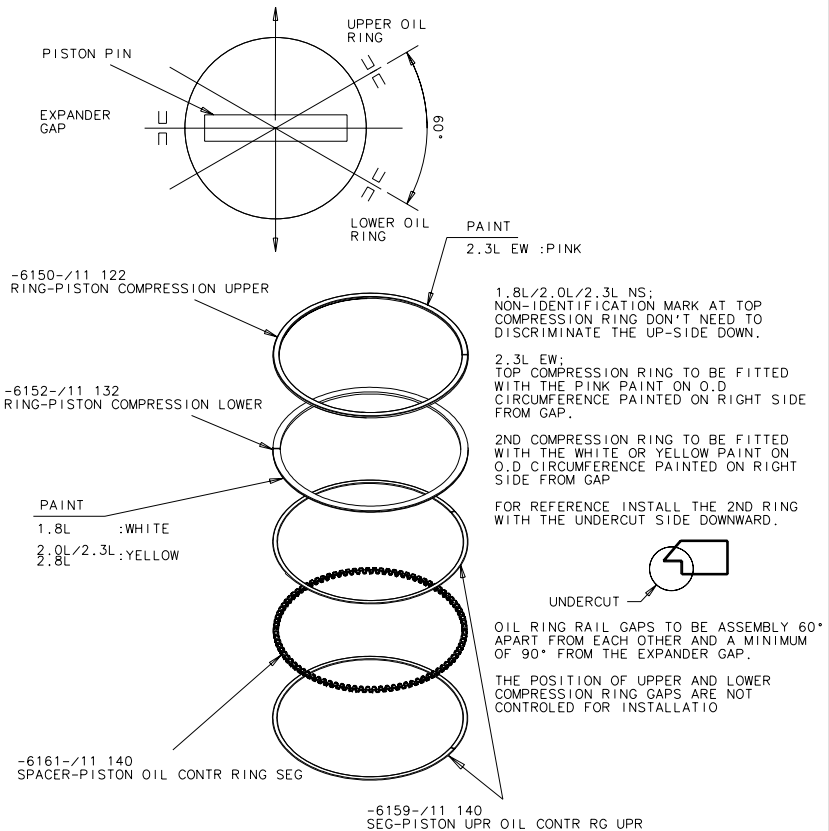
(THICKNESS 0.008 - 0.016 1.8L/2.0L/2.3L EW)
 0.008 - 0.020 2.3L NS

RESTRICTIONS				PART NAME/TITLE PISTON GRADE CHART			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	BA	EN00 E 11255548 001	01-10-17	2001 2.0L-4V NON DI CD132	6	7	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

INFORMATION

NOTE: PISTON ARE RECEIVED WITH PISTON RINGS PRE-ASSEMBLED.



RESTRICTIONS

PART NAME/TITLE

PISTON RING

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BA	EN00 E 11255548 001	01-10-17	2001 2.0L-4V NON DI CD132	7	8

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

	WEIGHT TOLERANCE OF ONE SET
SMALL END	2.0g MAX
BIG END	1.5g MAX

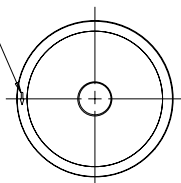
CONNECTING RODS TO BE FITTED TO PISTONS IN SETS OF ONE WEIGHT GRADE.

RESTRICTIONS				PART NAME/TITLE CONROD WEIGHT TOLERANCE				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.		
C1S7G-543-AC	BA	EN00 E 11255548 001	01-10-17	2001 2.0L-4V NON DI CD132	8	9		

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

SKETCH SHOWS ONLY ORIENTATION
OF ASSEMBLED PARTS.

PISTON TO BE ASSEMBLED
WITH ARROW POINTING TO
FRONT OF ENGINE.

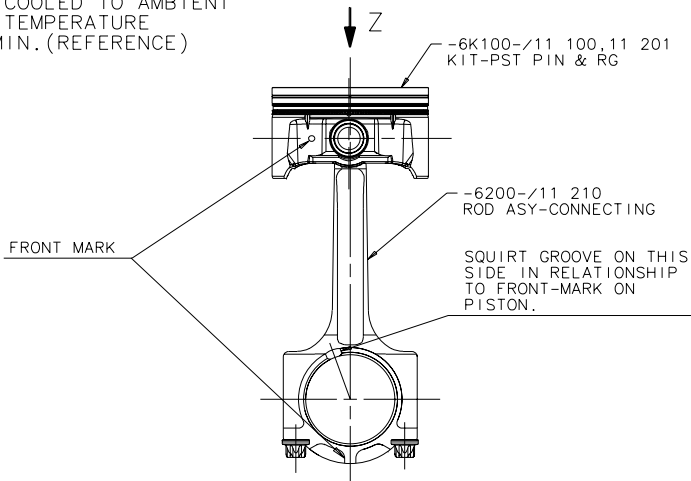
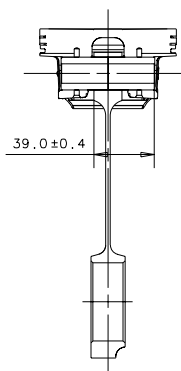


DETAIL Z

HEAT PISTON PIN END OF
CONROD TO 250-300°C MAX
IMMEDIATELY THEREAFTER
ASSEMBLE PIN TO ROD AND
PISTON AS SHOWN.

LOAD TO MOVE PIN AFTER
ASY HAS COOLED TO AMBIENT
(PLANT) TEMPERATURE
3600 N MIN. (REFERENCE)

← FRONT

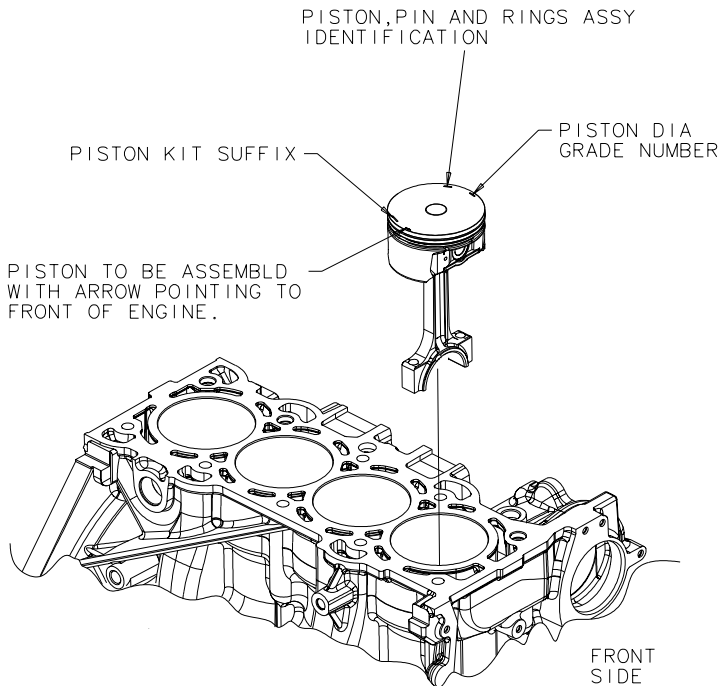


RESTRICTIONS

PART NAME/TITLE
PISTON AND CONROD ASY

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	R	EN00 E 11069681 001	00-04-20	2001 2.0L-4V NON DI CD132	9	10

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



CYLINDER BORE TO BE
LUBRICATED USING
FACTORY FILL ENGINE
OIL PRIOR TO ASSEMBLING
PISTON TO CYLINDER.

RESTRICTIONS

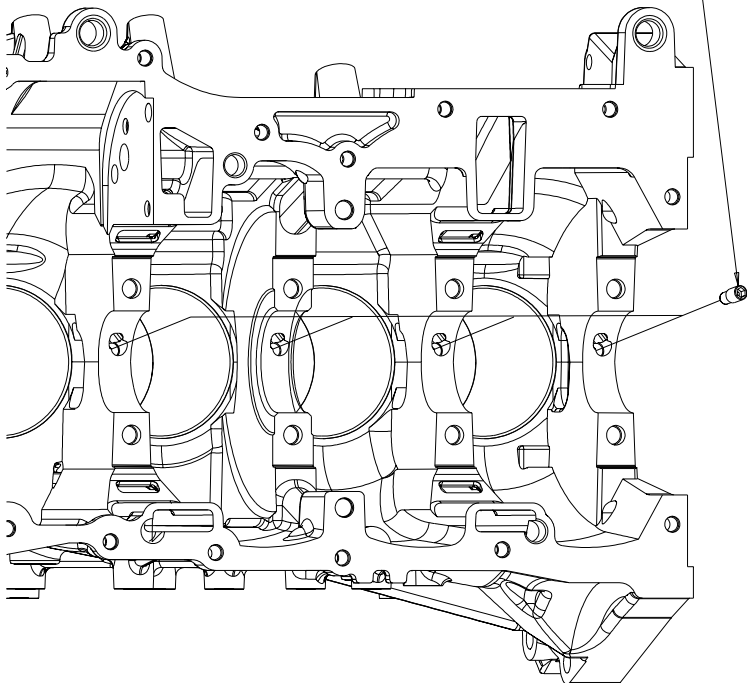
PART NAME/TITLE

PISTON & CONROD ASSEMBLY

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BA	EN00 E 11255548 001	01-10-17	2001 2.0L-4V NON DI CD132	10	11

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

-6K868- / 10 590
VALVE ASY-ENG PISTON OIL COOL
TORQUE 3.95±0.95 N·m
4 PLACES



RESTRICTIONS

PART NAME/TITLE

VALVE ASY-ENG PISTON OIL COOL

SPECIFICATION NO.
C1S7G-543-AC

REV
H

RELEASE NO.
EN00 E 11007392 000

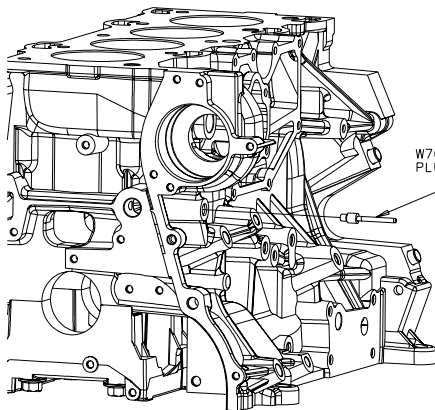
DATE
99-09-06

MODEL
2001 2.0L-4V NON DI CD132

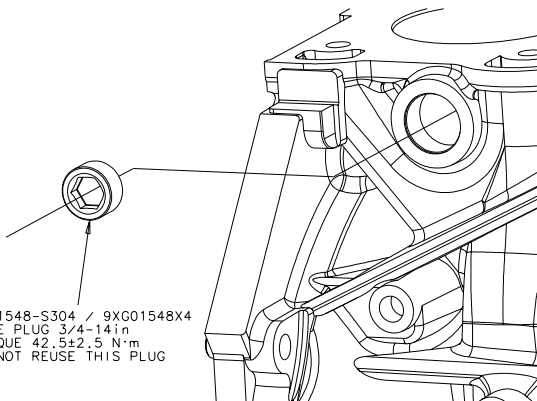
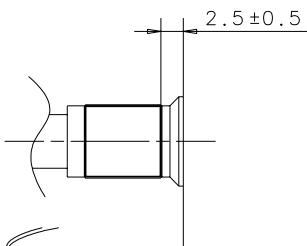
SHEET
11

CONTD.
11-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



W702287-S300 / 9XG02287X0
PLUG AVDEL



W701548-S304 / 9XG01548X4
PIPE PLUG 3/4-14in
TORQUE 42.5±2.5 N·m
DO NOT REUSE THIS PLUG

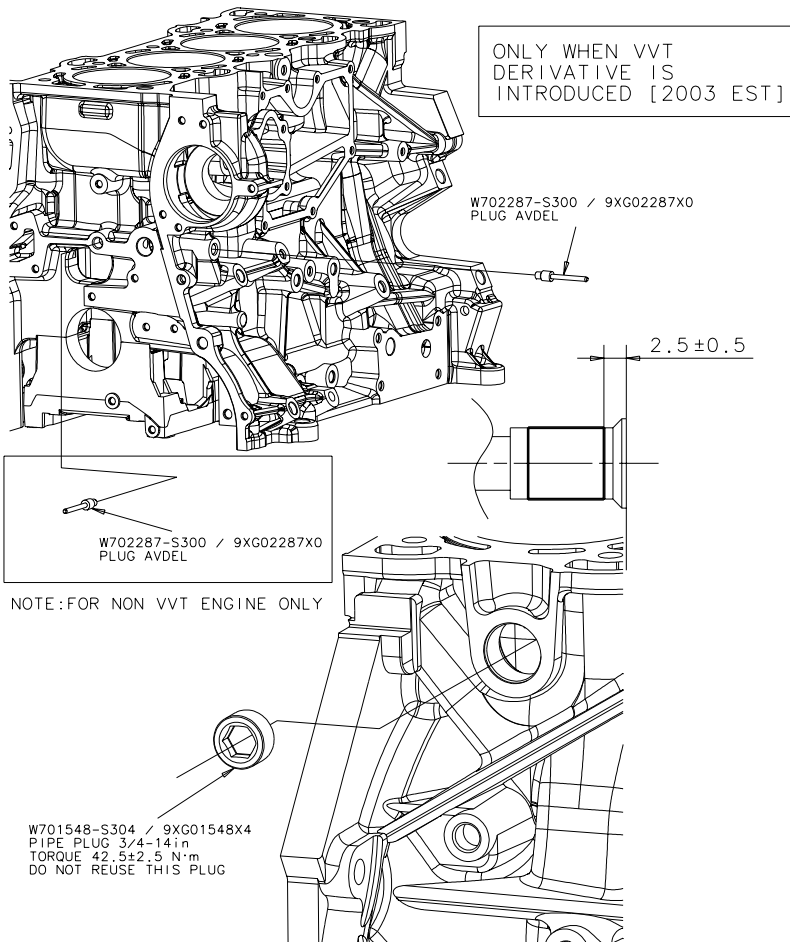
RESTRICTIONS

PART NAME/TITLE

PLUG-OIL GALLERY

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BD	EN00 E 11271059 000	01-11-02	2001 2.0L-4V NON DI CD132	12	12-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



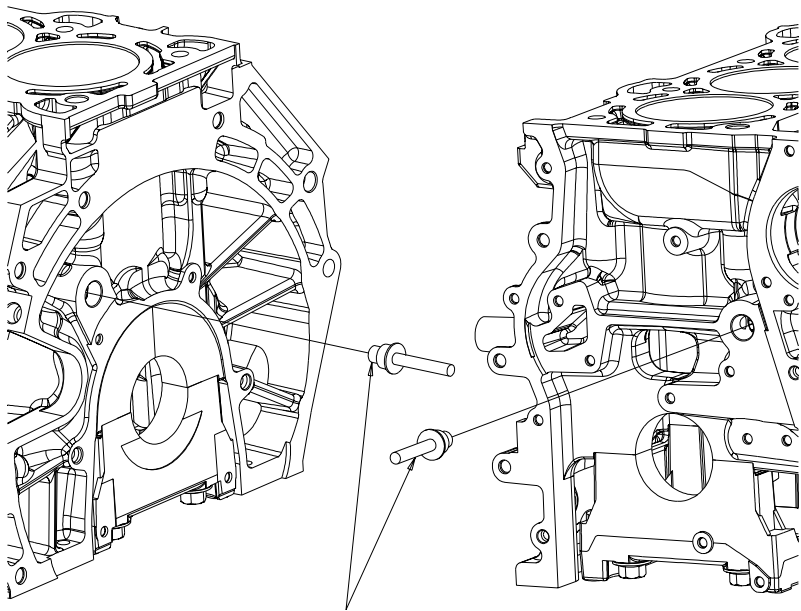
RESTRICTIONS

PART NAME/TITLE

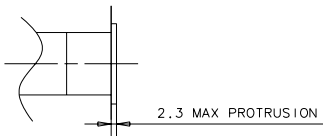
PLUG-OIL GALLERY

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BD	EN00 E 11271059 000	01-11-02	2001 2.0L-4V NON DI CD132	12-A	13

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



W704456-S1300 / 9XG04456X0
PLUG AVDEL
2 PLACES



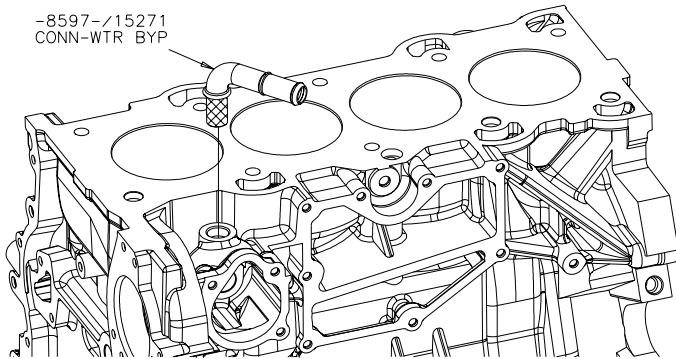
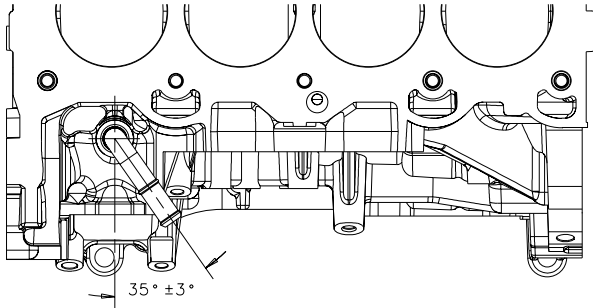
RESTRICTIONS

PART NAME/TITLE

PLUGS-OIL GALLERY

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AS	EN00 E 11200123 000	01-07-02	2001 2.0L-4V NON DI CD132	13	14

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

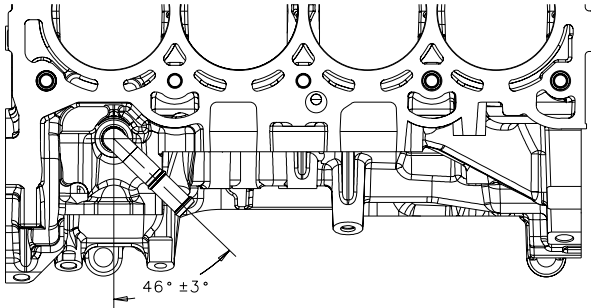


NOTES

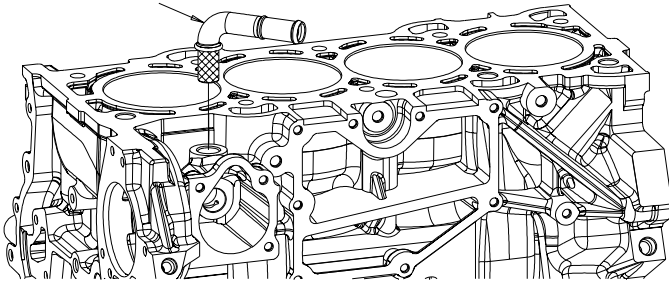
1. PRESS IN PIPE TO BLOCK FULLY UNTIL IT MEETS THE PIPE COLLAR.
2. USE THE COLLAR TO PRESS IN THE PIPE. NOT THE PIPE ITSELF.
3. SEALANT [WSK-M2G349-A7 (LOCTITE 243) OR WSS-M2G349-A13 (LOCTITE 962T) OR *THREE BOND 1386D*] TO BE APPLIED TO THE PIPE IN THE AREA HATCHD.
4. PARTS THAT HAVE BEEN DAMAGED OR HAVE SCRATCHES ON SEALING AREAS MUST NO BE ASSEMBLED.
- ~~5. (REF) BREAKAWAY TORQUE AFTER ASSEMBLY SHOULD BE GREATER THAN 2 N·m AT ROOM TEMPERATURE.~~

RESTRICTIONS					PART NAME/TITLE PIPE CONNECTOR-BYPASS		
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET		
C1S7G-543-AC	AY	EN00 E 11255546 001	01-09-29	2001 2.0L-4V NON DI CD132	14	14-A	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



-8597-/15271
CONN-WTR BYP



NOTES

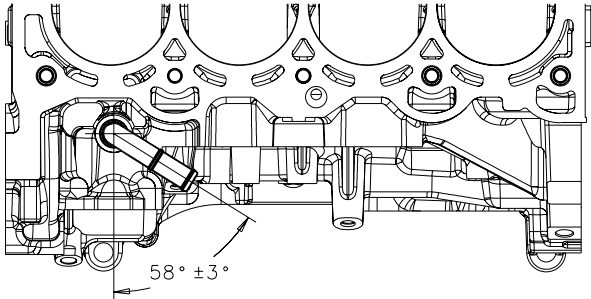
1. PRESS IN PIPE TO BLOCK FULLY UNTIL IT MEETS THE PIPE COLLAR.
2. USE THE COLLAR TO PRESS IN THE PIPE. NOT THE PIPE ITSELF.
3. SEALANT [WSK-M2G349-A7 (LOCTITE 243) OR WSS-M2G349-A13 (LOCTITE 962T) OR *THREE BOND 1386D*] TO BE APPLIED TO THE PIPE IN THE AREA HATCHD.
4. PARTS THAT HAVE BEEN DAMAGED OR HAVE SCRATCHES ON SEALING AREAS MUST NO BE ASSEMBLED.
- ~~5. (REF) BREAKAWAY TORQUE AFTER ASSEMBLY SHOULD BE GREATER THAN 2 N·m AT ROOM TEMPERATURE.~~

RESTRICTIONS

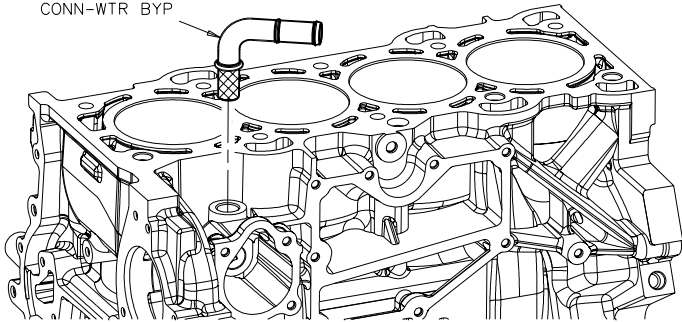
PART NAME/TITLE PIPE CONNECTOR-BYPASS

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	
C1S7G-543-AC	AY	EN00 E 11255546 001	01-09-29	2003 1.8/2.0L C1, 2004 RANGER	14-A	14-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



-8597-15271
CONN-WTR BYP



NOTES

1. PRESS IN PIPE TO BLOCK FULLY UNTIL IT MEETS THE PIPE COLLAR.
2. USE THE COLLAR TO PRESS IN THE PIPE. NOT THE PIPE ITSELF.
3. SEALANT [WSK-M2G349-A7 (LOCTITE 243) OR WSS-M2G349-A13 (LOCTITE 962T) OR *THREE BOND 1386D*] TO BE APPLIED TO THE PIPE IN THE AREA HATCHD.
4. PARTS THAT HAVE BEEN DAMAGED OR HAVE SCRATCHES ON SEALING AREAS MUST NO BE ASSEMBLED.
- ~~5. (REF) BREAKAWAY TORQUE AFTER ASSEMBLY SHOULD BE GREATER THAN 2 N·m AT ROOM TEMPERATURE.~~

RESTRICTIONS

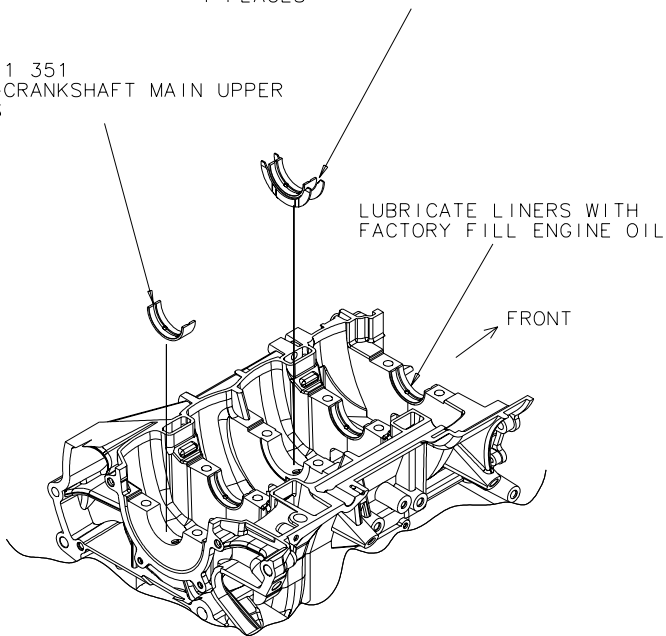
PART NAME/TITLE
PIPE CONNECTOR-BYPASS

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET
C1S7G-543-AC	AU	EN00E11212646000	01-08-07	2003 2.3L-4V NON-DI	14-D 15-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

-6337-/11 361
BEARING-CRANKSHAFT MAIN THRUST UPPER
1 PLACES

-6333-/11 351
BEARING-CRANKSHAFT MAIN UPPER
4 PLACES



NOTE: FOR MAIN BEARING SELECTION AND ASSEMBLY PROCEDURE
SEE SHEET: 16 & 17

RESTRICTIONS				PART NAME/TITLE				
				MAIN BEARING & THRUST LINERS				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.		
C1S7G-543-AC	W	EN00 E 11140144 000	00-10-01	2001 2.0L-4V NON DI CD132	15-A	15-D		

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

SELECT UPPER LINERS FOR MAIN BEARING HOUSINGS AND ASSEMBLE, PRESSING LINERS TO DEPTH, POSITIONING LINERS IN RESPECTIVE CYLINDER BLOCK REAR MACHINING FACE. (SEE SHEET 23-B)

SELECT LOWER LINERS FOR MAIN BEARING BEAM AND ASSEMBLE TO BEAM, PRESSING LINERS TO DEPTH, POSITIONING LINERS IN RESPECTIVE BEARING BEAM REAR MACHINING FACE. (SEE SHEET 23-C)

PUT ON THRUST BEARING FOR MAIN BEARING HOUSING.

LUBRICATE BEARINGS IN CYLINDER BLOCK WITH RELEASED FACTORY FILL ENGINE OIL.

INSTALL CRANKSHAFT INTO CYLINDER BLOCK.

LUBRICATE JOURNALS ON CRANKSHAFT WITH RELEASED FACTORY FILL ENGINE OIL.

REFIT MAIN BEARING BEAM TO CYLINDER BLOCK ENSURING THAT THE BEARING BEAM IS IN THE CORRECT ORIENTATION.

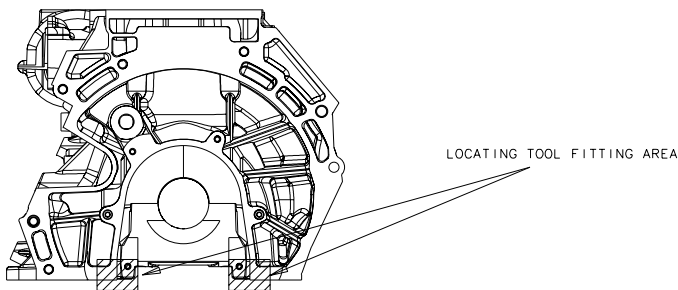
OIL "MOBIL 1409" TO BE APPLIED ON SIDE FIT SURFACE OF THE MAIN BEARING BEAM WHEN THE MAIN BEARING BEAM IS ASSEMBLED.

RUN DOWN TO TORQUE THE 10 MAIN BEARING BOLTS WHILE MAINTAINING AN AXIAL FORCE OF 500N MAX ON BEARING BEAM TOWARDS THE REAR OF THE ENGINE WITH BEARING BEAM LOCATING TOOL. (SEE SHEET 23-A)

QC CHECK : (ONCE PER WEEK).

AXIAL CLEARANCE OF CRANKSHAFT TO BE 0.335 ± 0.115 mm. (INFORMATION)

IN CASE OF REUSE THE BEARINGS, BEARING POSITION AND DIRECTION MUST BE SAME AS BEFORE REMOVAL. PART NUMBER MARKING SHOWS BEARING DIRECTION.



RESTRICTIONS				PART NAME/TITLE			
				PROCEDURE-MAIN BEARING LINER			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AJ	EN00 E 11131462 001	01-04-17	2001 2.0L-4V NON DI CD132	16	17	

**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS**

MAIN BEARING LINERS ARE GRADED AND ARE TO BE SELECTED TO GIVE A TOTAL CLEARANCE OF 0.019mm TO 0.035mm.

CLEARANCE IS CALCULATED AS :

(MAIN BEARING BORE DIA + HOUSING SWELL)

- (UPPER LINER THICKNESS + LOWER LINER THICKNESS + JOURNAL DIAMETER)

BEARING SHELL THICKNESS) - (JOURNAL DIAMETER).

HOUSING SWELL IS DETERMINED TO BE : (INFORMATION)

HOUSING DIAMETER (mm)	SWELL (μm)
X =< 57.018	21 - 28
57.019 >=< 57.021	20 - 27
57.022 >=< 57.025	19 - 26
57.026 >=< 57.028	18 - 25
57.029 >=< 57.032	17 - 25
57.033 >=< 57.036	16 - 23
57.037 >=< 57.039	15 - 22
57.040 <	14 - 21

EACH BEARING BORE IN THE CYLINDER BLOCK TO BE MEASURED IN THE MIDDLE OF THE BEARING BORE ON AXIS PARALLEL TO THE TOP DEAD CENTRE POSITION.

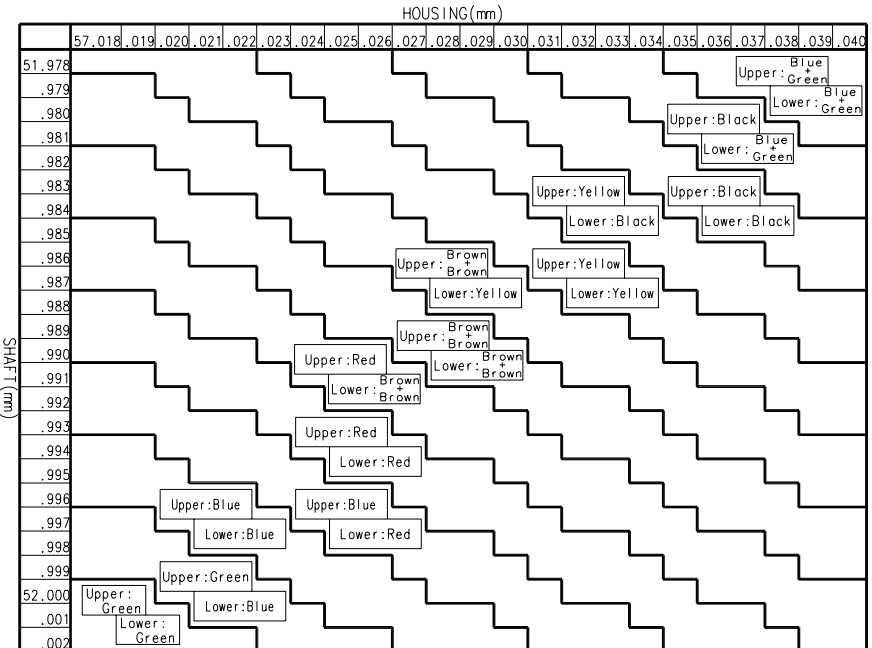
EACH CRANKSHAFT MAIN BEARING JOURNAL TO BE MEASURED IN THE CENTRE OF THE JOURNAL ON AN AXIS PARALLEL TO THE TOP DEAD CENTRE POSITION.

LINER THICKNESS TO BE SELECTED FROM THE GRADING TABLE.

RESTRICTIONS				PART NAME/TITLE			
				MAIN BEARING CLEARANCES			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AU	EN00 E 11212646 000	01-08-07	2001 2.0L-4V NON DI CD132	17	18	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

SELECTION OF MAIN BEARING LINERS (NORMALIZED AT 20 deg C)
FOR STANDARD CRANKSHAFTS



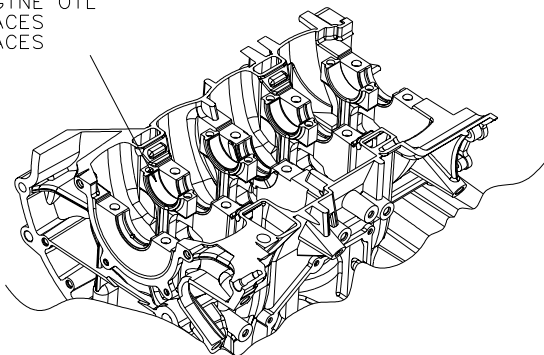
RESTRICTIONS		PART NAME/TITLE	
SPECIFICATION NO.	REV	RELEASE NO.	DATE
C1S7G-543-AC	H	EN00 E 11007392 000	99-09-06
MAIN BEARING COLOUR CODING		MODEL	MODEL
		2001 2.0L-4V M0N D1	00132
		SHEET	18
		CONTD.	19

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

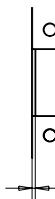
-6211-/11 225
BEARING-CONNECTING ROD
14:4 PLACES
15:5 PLACES



LUBRICATE WITH FACTORY
FILL ENGINE OIL
14:4 PLACES
15:5 PLACES



TOLERANCE OF POSITION
BETWEEN LINER AND ROD.
(ALIGNMENT)



2.5 ± 0.2 (REF)
FROM THE SAME FACE
OF ROD AND CAP.

RESTRICTIONS				PART NAME/TITLE			
				CONROD BEARING LINERS			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	H	EN00 E 11007392 000	99-09-06	2001 2.0L-4V NON DI CD132	19	20	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

BEARING CLEARANCES

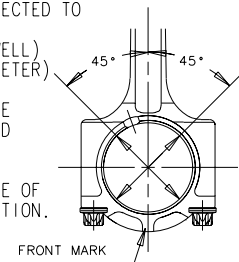
CONNECTING ROD/CRANKPIN LINERS ARE GRADED AND ARE TO BE SELECTED TO GIVE A TOTAL CLEARANCE OF 0.026mm TO 0.052mm.

CLEARANCE IS CALCULATED AS: (CONROD BIG END DIA + HOUSING SWELL)
- (UPPER LINER THICKNESS + LOWER LINER THICKNESS + PIN DIAMETER)

EACH CONROD BIG END BORE TO BE MEASURED IN THE CENTRE OF THE JOURNAL ON 45° CLOCKWISE OR ANTI-CLOCKWISE FROM THE TOP DEAD CENTRE POSITION. (SEE SKETCH)

EACH CRANKSHAFT PIN BEARING JOURNAL TO BE MEASURED IN CENTRE OF THE JOURNAL ON AN AXIS PARALLEL TO THE TOP DEAD CENTRE POSITION.

LINER THICKNESS TO BE SELECTED FROM THE GRADING TABLE.



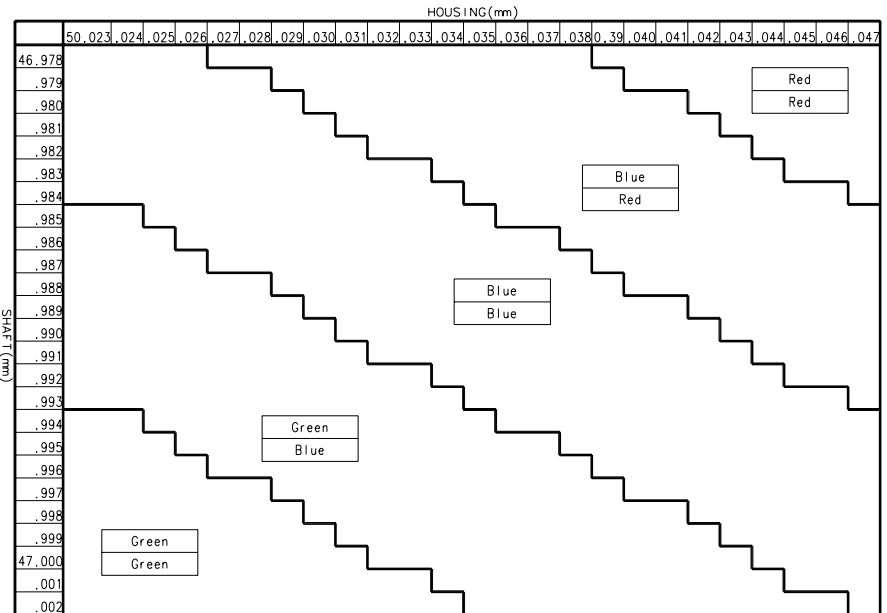
ASSEMBLY PROCEDURE PRODUCTION PROCESS

1. REMOVE CAPS FROM CONNECTING RODS
2. SELECT LINERS AND ASSEMBLE, PRESSING LINERS TO DEPTH, SEE NOTE ON SHEET 19 LINERS IN RESPECTIVE HOUSINGS.
3. LUBRICATE UPPER BEARINGS IN CONNECTING RODS WITH RELEASED FACTORY FILL ENGINE OIL.
4. LUBRICATE JOURNALS ON CRANKSHAFT WITH RELEASED FACTORY FILL ENGINE OIL.
5. FIT CAPS TO CONNECTING RODS ENSURING THAT THE CAPS ARE FITTED TO CORRECTLY MATCH THE ROD JOINT.
6. ENGAGE 8(14), 10(15) BOLTS IN THREAD.
7. OIL UNDERNEATH BOLT HEAD. (FACTORY FILL ENGINE OIL)
8. TIGHTEN BOLTS TO A SNUG TORQUE $29 \pm 3 \text{ N}\cdot\text{m}$.
9. TIGHTEN BOLTS BY $90^\circ \pm 10^\circ$.
10. DURING THE ABOVE TIGHTENING PROCEDURE, THE TWO BOLTS IN EACH CONNECTING ROD ARE TO BE RUN DOWN SIMULTANEOUSLY.
11. CONROD AXIAL CLEARANCE OF 0.14mm TO 0.36mm. (INFORMATION)
12. IN CASE OF REUSE THE BEARINGS AT SERVICE, BEARING POSITION AND DIRECTION MUST BE SAME AS BEFORE REMOVAL. PART NUMBER MARKING SHOWS BEARING DIRECTION.

RESTRICTIONS				PART NAME/TITLE			
				PROCEDURE—CONROD BEARIG LINER			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AU	EN00 E 11212646 000	01-08-07	2001 2.0L-4V NON DI CD132	20	21-A	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

SELECTION OF CONROD BEARING LINERS (NORMALIZED AT 20 deg C)
FOR STANDARD CRANKSHAFTS (1.8L & 2.0L)

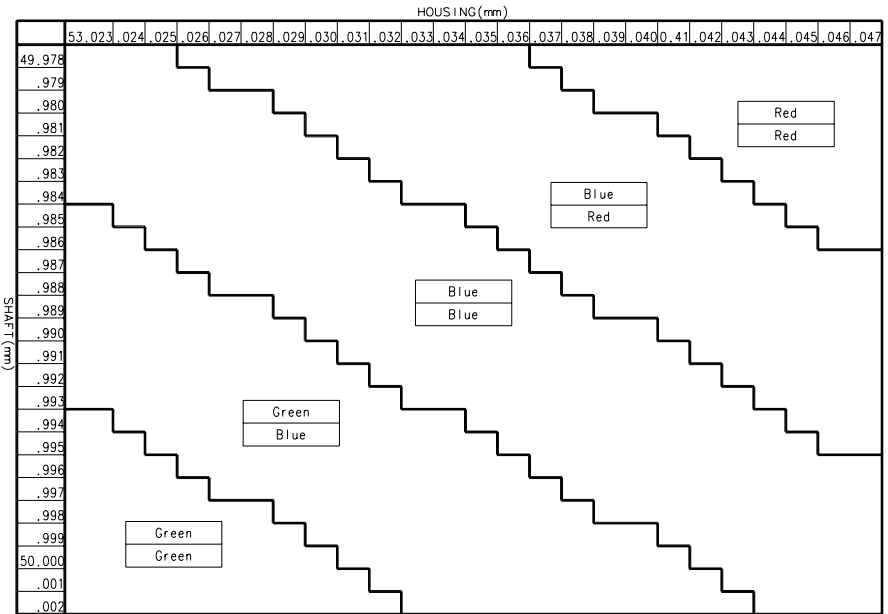


THE POSITION (UPPER OR LOWER) OF CONROD BEARINGS DO NOT CONTROL FOR INSTALLATION.

RESTRICTIONS		PART NAME/TITLE	
SPECIFICATION NO.	REV	CONROD BEARING COLOUR CODING	
C1STG-543-AC	H		
RELEASE NO.	DATE	MODEL	SHEET
EN00 E 11007392 000	99-09-06	2001 2.0L-4V M0N D1 00132	21-A
			CONTD.
			21-B

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

SELECTION OF CONROD BEARING LINERS (NORMALIZED AT 20 deg C)
FOR STANDARD CRANKSHAFTS (2.3L)



THE POSITION (UPPER OR LOWER) OF CONROD BEARINGS DO NOT CONTROL FOR INSTALLATION.

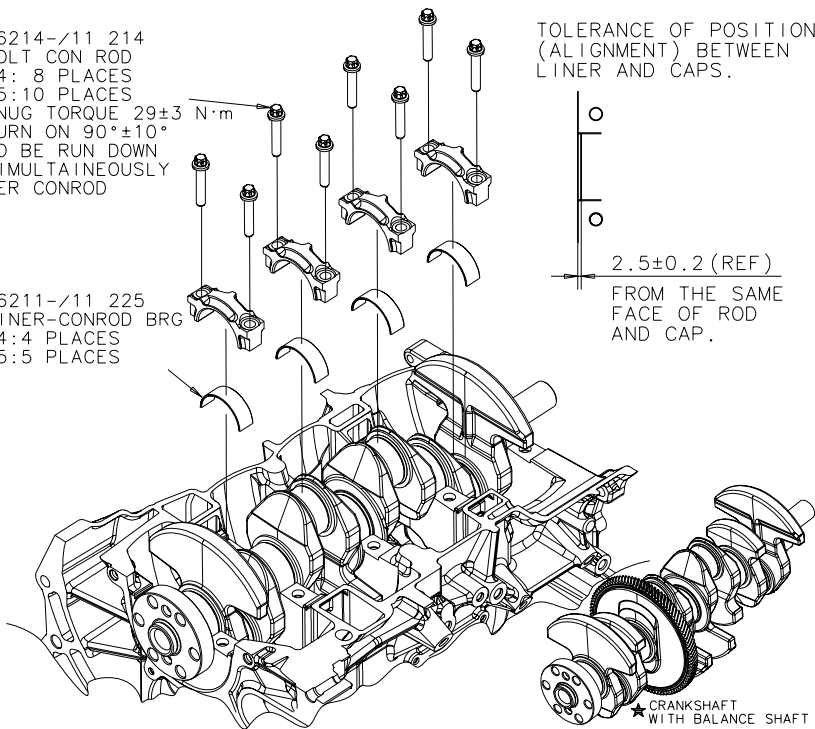
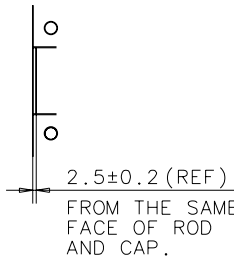
RESTRICTIONS		PART NAME/TITLE	
SPECIFICATION NO.	REV	RELEASE NO.	DATE
C1STG-543-AC	H	END0 E 11007392 000	99-09-06
CONROD BEARING COLOUR CODING		MODEL	MODEL
		21-B	22
		SHEET	CONTR.
		21-B	22

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

-6214-/11 214
BOLT CON ROD
14: 8 PLACES
15: 10 PLACES
SNUG TORQUE 29 ± 3 N·m
TURN ON $90^\circ \pm 10^\circ$
TO BE RUN DOWN
SIMULTAINEOUSLY
PER CONROD

-6211-/11 225
LINER-CONROD BRG
14: 4 PLACES
15: 5 PLACES

TOLERANCE OF POSITION
(ALIGNMENT) BETWEEN
LINER AND CAPS.



LUBRICATE ALL JOURNALS BEFORE FITTING BIG END LOWER BEARINGS WITH FACTORY FILL ENGINE OIL AND BEFORE FITTING MAIN LADDER. FOR BEARING SELECTION AND ASSEMBLY PROCEDURE SEE SHEET 21

Q.C,CHECK:
DO NOT REUSE CONROD BOLT, IN CASE BOLT LENGTH IS OVER 46 mm.(REF)

★ NO HAMMERED MARKS/FLAWS ON GEAR TEETH OF CRANKSHAFT WHICH END UP WITH UNEXPECTED NOISE. (GEAR ACCURACY SPECIFIED ON THE DRAWING TO BE SATISFIED BUT THE GEAR ACCURACY IS NOT REQUIRED TO BE MEASURED IN THE ENGINE PLANT)

★ -IT ONLY APPLYS TO BALANCE SHAFT ENGINE.

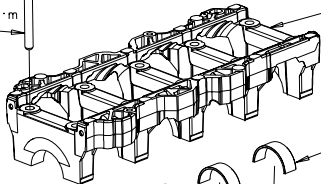
RESTRICTIONS				PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	Y	EN00 E 11145063 001	00-11-03	2001 2.0L-4V NON DI CD132	22	23-A	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

-6345-/10 352
10 PLACES
SIMULTANEOUSLY
SNUG TORQUE 45 ± 2 N·m
TURN ON $180^\circ \pm 5^\circ$

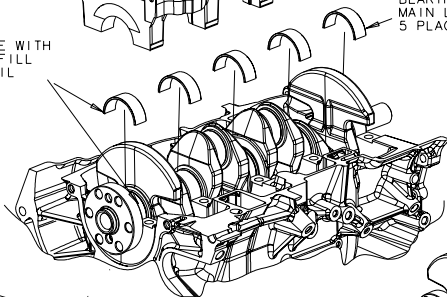


-6F098-/10 351
SUPT-ENG BLKHD BRG

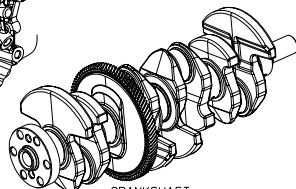
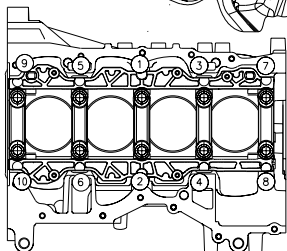


-6A338-/11 851
BEARING-CRANKSHAFT
MAIN LOWER
5 PLACES

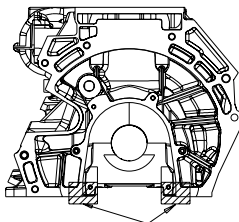
LUBRICATE WITH
FACTORY FILL
ENGINE OIL



FOR MAIN BEARING SELECTION
AND ASSEMBLY PROCEDURE SEE
SHEET 16 & 17



★ CRANKSHAFT
WITH BALANCE SHAFT



LOCATING TOOL FITTING AREA

OIL "MOBIL 1409" TO BE
APPLIED ON SIDE FIT SURFACE
OF THE MAIN BEARING BEAM
WHEN THE MAIN BEARING CAP
IS ASSEMBLED.
BEARING BEAM AND CYLINDER
BLOCK TO BE ALIGNED
AGAINST PLANE JIG FOR
MATCHING RETAINER MATCHING
SURFACE.
POSITIONAL TOLERANCE
 ± 0.1

BEARING CAP BOLTS MAY BE
REUSED A MAXIMUM OF 3
TIMES ONLY.

WHEN THE MAIN BEARING CAP IS ASSEMBLED MANUALLY,
TO BE TIGHTEN FOLLOWING PROCEDURE.

- (1) ALL BOLT-CRANK SHAFT TO BE TIGHTENED ONLY "SNUG" TORQUE (45 ± 2 N·m) ACCORDING TO THE ORDER WHICH IS SHOWN ABOVE DRAWING.
- (2) ALL BOLT-CRANK SHAFT TO BE TIGHTENED WITH TIGHTENING ANGLE ($90 \pm 2.5 \text{ deg} \times 2 \text{ times} = 180 \pm 5 \text{ deg}$) ACCORDING TO ORDER WHICH IS SHOWN ABOVE DRAWING.

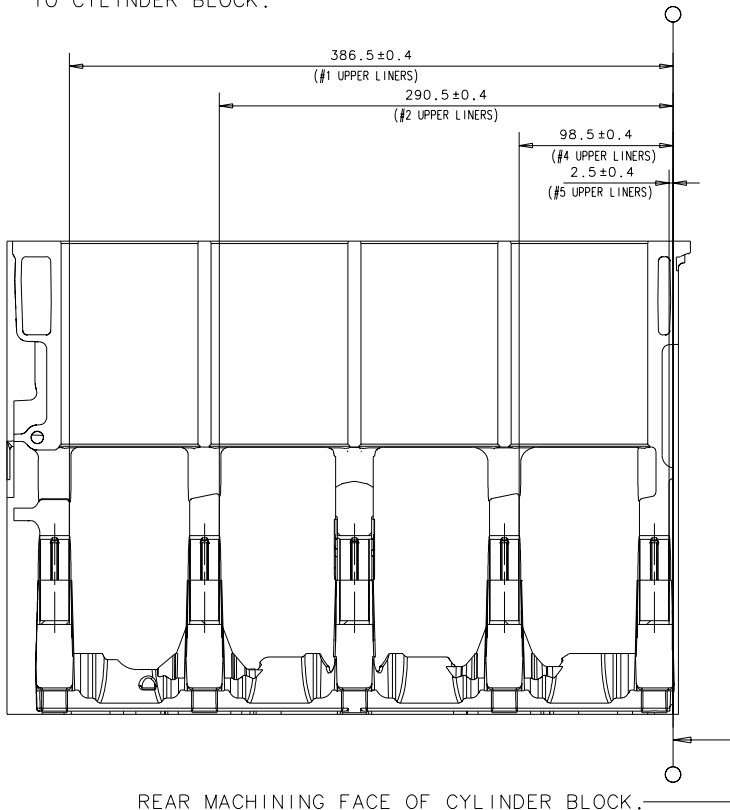
★ NO HAMMERED MARKS/FLAWS ON GEAR TEETH OF CRANKSHAFT WHICH END UP WITH UNEXPECTED NOISE. (GEAR ACCURACY SPECIFIED ON THE DRAWING TO BE SATISFIED BUT THE GEAR ACCURACY IS NOT REQUIRED TO BE MEASURED IN THE ENGINE PLANT)

★ -IT ONLY APPLYS TO BALANCE SHAFT ENGINE.

RESTRICTIONS				PART NAME/TITLE				
				MAIN BEARING LADDER BEAM & BOLTS				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CNTD.		
C1S7G-543-AC	BE	EN00 E 11218821 000	01-11-05	2001 2.0L-4V NON DI CD132	23-A	23-B		

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
 CLEARANCE LIMITS AND SPECIFICATIONS

UPPER LINERS FOR MAIN BEARING EXCEPT #3 UPPER LINERS IS POSITIONED SO THAT THE DISTANCES OF LINERS REAR EDGE FROM REAR MACHINING FACE MUST BE KEPT FOLLOWING AFTER BEARING BEAM IS ASSEMBLED TO CYLINDER BLOCK.



RESTRICTIONS

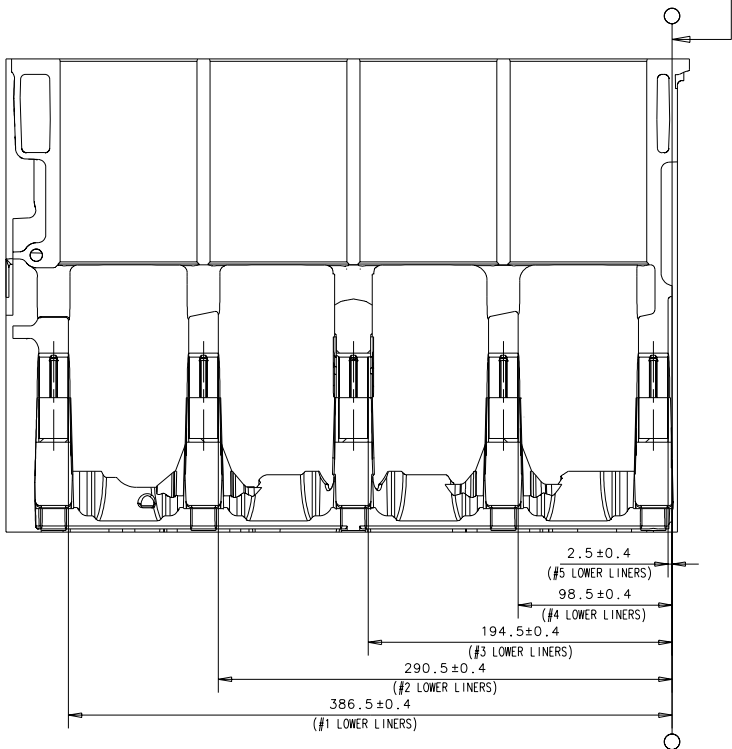
PART NAME/TITLE
 MAIN BEARING UPPER

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AB	EN00 E 11136863 000	00-12-04	2001 2.0L-4V NON DI CD132	23-B	23-C

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

LOWER LINERS FOR MAIN BEARING IS POSITIONED SO THAT THE DISTANCES OF LINERS REAR EDGE FROM REAR MACHINING FACE MUST BE KEPT FOLLOWING AFTER BEARING BEAM IS ASSEMBLED TO CYLINDER BLOCK.

REAR MACHINING FACE OF BEARING BEAM. 



RESTRICTIONS

PART NAME/TITLE

MAIN BEARING LOWER

SPECIFICATION NO.
C1S7G-543-AC

REV
AB

RELEASE NO.
EN00 E 11136863 000

DATE
00-12-04

MODEL
2001 2.0L-4V NON DI CD132

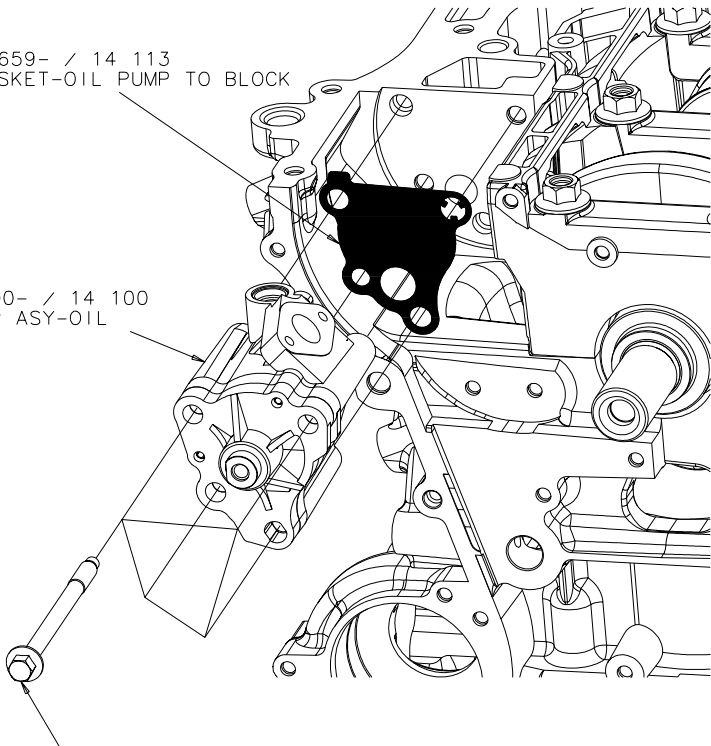
SHEET
23-C

CONTD.
23-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

-6659- / 14 113
GASKET-OIL PUMP TO BLOCK

-6600- / 14 100
PUMP ASY-OIL



W703647-S309 / 9XG03647X9
FASTNER M8 X 103
4PLACES

BOLT TIGHTENING PROCEDURE :

- ① TIGHTEN THE BOLTS AT SIMULTANEOUSLY OR CROSSWISE WITH THE PRE-TORQUE OF 10 ± 2 N·m
- ② TIGHTEN THE BOLTS AT SIMULTANEOUSLY OR CROSSWISE WITH THE TORQUE OF 22.5 ± 2.5 N·m

RESTRICTIONS

PART NAME/TITLE

PUMP ASY-OIL & GASKET-OIL PUMP TO BLOCK

SPECIFICATION NO.
C1S7G-543-AC

REV
K

RELEASE NO.
EN00 E 11026968 000

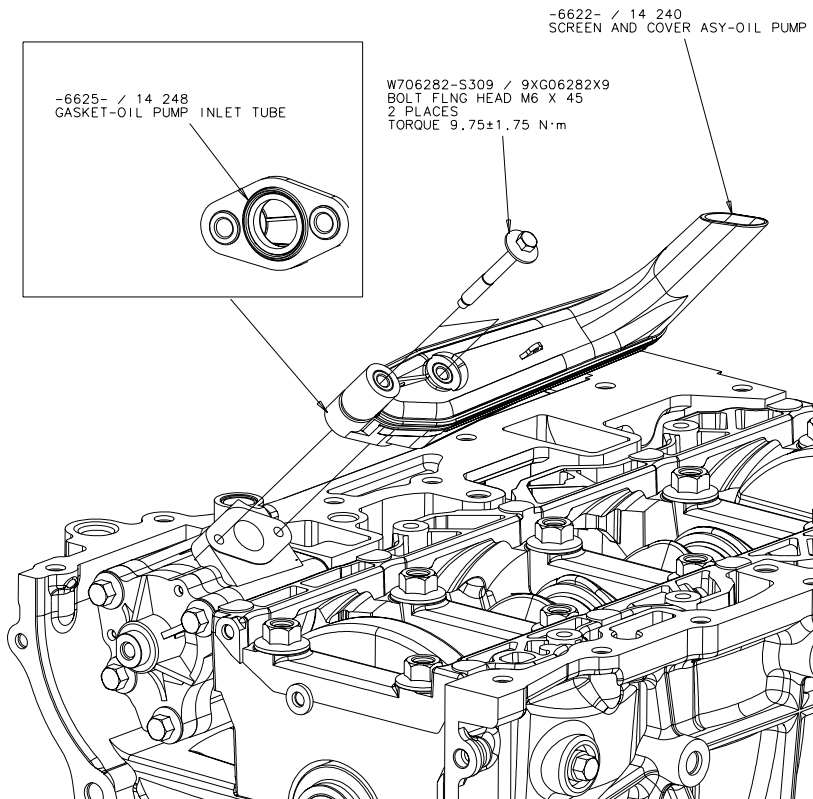
DATE
99-12-13

MODEL
2001 2.0L-4V NON DI CD132

SHEET
24

CONTD.
25-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



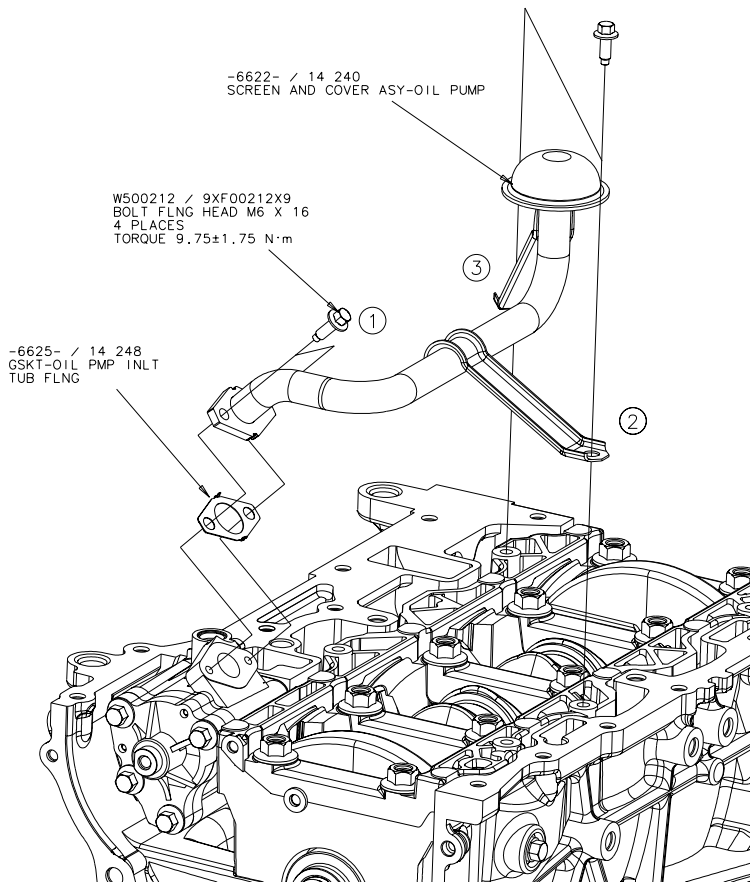
RESTRICTIONS

PART NAME/TITLE

SCREEN AND COVER ASY-OIL PUMP

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD
C1S7G-543-AC	H	EN00 E 11007392 000	99-09-06	2001 2.0L-4V NON DI CD132	25-A	25-B

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



TIGHTENING ORDER: ① - ③ .

RESTRICTIONS

PART NAME/TITLE

SCREEN AND COVER ASY-OIL PUMP

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD
C1S7G-543-AC	H	EN00 E 11007392 000	99-09-06	2001 2.0L-4V NON DI RANGER	25-B	25-E

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

BALANCER ASSY ASSEMBLY TO BLOCK

**NOTE) MANUAL PROTOTYPE PROCESS ONLY-
MASS PRODUCTION MAY DIFFER,
BUT WILL FOLLOW EQUIVALENT STEPS.**

(4) BOLT(M10) 4PLACES

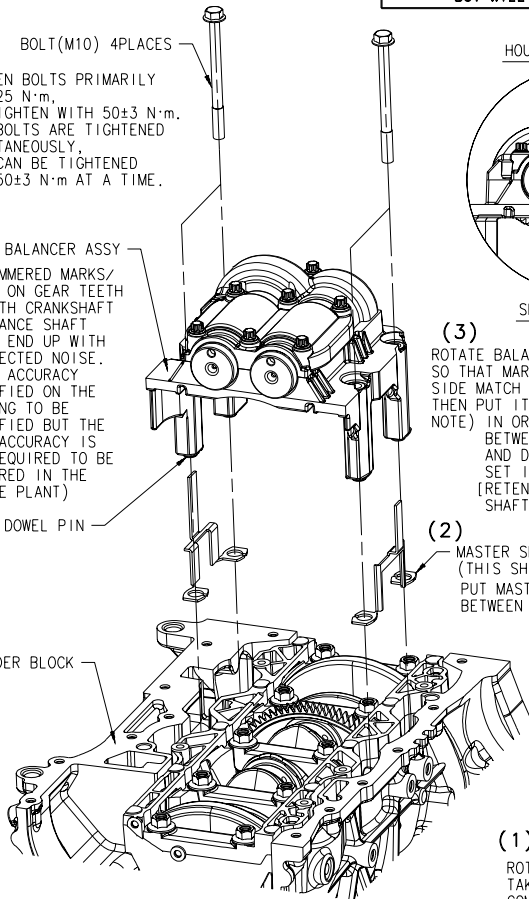
TIGHTEN BOLTS PRIMARILY WITH 25 N·m, AND TIGHTEN WITH 50±3 N·m. WHEN BOLTS ARE TIGHTENED SIMULTANEOUSLY, THEY CAN BE TIGHTENED WITH 50±3 N·m AT A TIME.

BALANCER ASSY

NO HAMMERED MARKS/FLAWS ON GEAR TEETH OF BOTH CRANKSHAFT & BALANCE SHAFT WHICH END UP WITH UNEXPECTED NOISE. (GEAR ACCURACY SPECIFIED ON THE DRAWING TO BE SATISFIED BUT THE GEAR ACCURACY IS NOT REQUIRED TO BE MEASURED IN THE ENGINE PLANT)

DOWEL PIN

CYLINDER BLOCK



HOUSING SIDE MARK

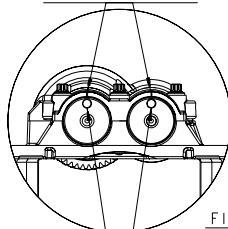


FIG. 1

SHAFT SIDE MARK

(3)

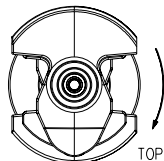
ROTATE BALANCE SHAFT OF BALANCER ASSY, SO THAT MARKS ON BOTH HOUSING & SHAFT SIDE MATCH AS SHOWN ON FIG.1, THEN PUT IT ON BLOCK SET IT.

NOTE) IN ORDER TO AVOID INTERFERENCE BETWEEN DRIVE GEAR AT CRANK SIDE AND DRIVEN GEAR AT BALANCER SIDE, SET IT SLOWLY. [RETENTION FEATURE FOR SETTING SHAFT POSITION UNDER STUDY.]

(2)

MASTER SHIM
(THIS SHEET SHOWS A CONCEPT SAMPLE.)
PUT MASTER SHIM (THICKNESS 1.42mm) BETWEEN BLOCK AND BALANCER ASSY.

(1)



ROTATE CRANKSHAFT CLOCKWISE, TAKE 1ST CYLINDER TO COMPRESSION TOP DEAD CENTER.

RESTRICTIONS

PART NAME/TITLE
BALANCER AND SHIM TO BLOCK

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	Y	EN00 E 11145063 001	00-11-03	2003 2.3L-4V NON-D1 J71	25-E	25-F

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

NOTE) MANUAL PROTOTYPE PROCESS ONLY-
MASS PRODUCTION MAY DIFFER,
BUT WILL FOLLOW EQUIVALENT STEPS.

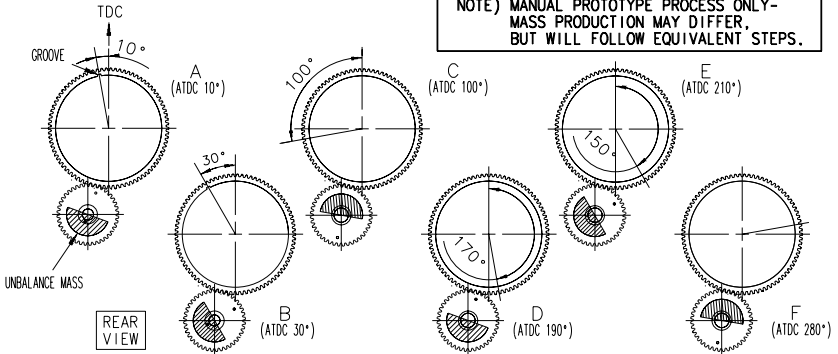


FIG. 2 BACKLASH MEASUREMENT LOCATION

NO HAMMERED MARKS/FLAWS ON GEAR TEETH OF BOTH CRANKSHAFT & BALANCER SHAFT WHICH END UP WITH UNEXPECTED NOISE. (GEAR ACCURACY SPECIFIED ON THE DRAWING TO BE SATISFIED BUT THE GEAR ACCURACY IS NOT REQUIRED TO BE MEASURED IN THE ENGINE PLANT)

BACKLASH MEASUREMENT

1. ROTATE CRANKSHAFT FEW TIMES IN ORDER TO ADJUST GEAR.
2. ROTATE CRANKSHAFT AND TAKE IT TO THE POINT 10° AFTER TDC (FIG. 2 A). THEN FIX CRANKSHAFT.
3. AS SHOWN ON FIG. 3, SET A MEASURING NEEDLE OF DIAL GAUGE ON THE CERTAIN LOCATION OF MEASURING LEVER PERPENDICULARLY (RADIUS OF DRIVEN GEAR PITCH CIRCLE IS 41.4).
4. PUSH THE FLANGE OF BALANCER NO.1 SHAFT IN THE AXIAL DIRECTION WITH APPROXIMATELY 49N.
5. a) ROTATE BALANCER NO.1 SHAFT CLOCKWISE WITH 0.5 N·m AND READ DIAL GAUGE VALUE.
b) ROTATE BALANCER NO.1 SHAFT COUNTERCLOCKWISE WITH 0.5 N·m AND READ DIAL GAUGE VALUE.
c) THE AMPLITUDE OF READINGS SHALL BE A BACKLASH.
6. REPEAT THE PROCEDURES 1. THROUGH 5. FOR B-F.
7. SELECT A SHIM IN ORDER THAT THE MINIMUM VALUE OF BACKLASH BECOMES $15 \mu\text{m}$ AS TO MEASURING VALUES OF A-F IN ACCORDANCE WITH *SHIM SELECTION CHART* ON NEXT PAGE.

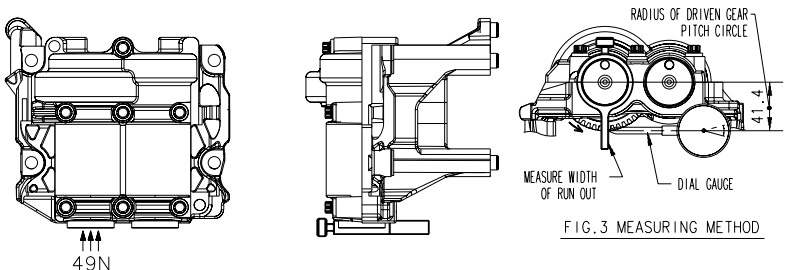


FIG. 3 MEASURING METHOD

RESTRICTIONS

PART NAME/TITLE
BACKLASH MEASURING METHOD

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AN	EN00 E 11208966 001	01-06-08	2003 2.3L-4V NON-DI J71	25-F	25-G

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

CLEARANCE LIMITS AND SPECIFICATIONS

**(NOTE) MANUAL PROTOTYPE PROCESS ONLY-
MASS PRODUCTION MAY DIFFER,
BUT WILL FOLLOW EQUIVALENT STEPS.**

NO HAMMERED MARKS/FLAWS ON GEAR TEETH OF BOTH CRANKSHAFT & BALANCE SHAFT WHICH END UP WITH UNEXPECTED NOISE. (GEAR ACCURACY SPECIFIED ON THE DRAWING TO BE SATISFIED BUT THE GEAR ACCURACY IS NOT REQUIRED TO BE MEASURED IN THE ENGINE PLANT)

REPLACEMENT OF SELECTED SHIM

- (1) LOOSEN 4 BOLTS BETWEEN BALANCER ASSY AND BLOCK, AND TAKE OFF MASTER SHIM.
- (2) SET SHIM, SELECTED BY THE PRECEDING PAGE (*BACKLASH MEASUREMENT*), ONTO THE BOTTOM OF BALANCER ASSY SECURELY (RIGHT AND LEFT SHIMS SHOULD BE SAME THICKNESS.). SET BALANCER ASSY WITH SHIMS. SEE NEXT PAGE.
- (3) RE-TIGHTEN 4 BOLTS. SEE NEXT PAGE.

RE-MEASUREMENT OF BACKLASH AFTER REPLACEMENT

- (1) RE-MEASURE BACKLASH BY MEANS OF THE PRECEDING PAGE (*BACKLASH MEASUREMENT*), AND CHECK IF IT IS WITHIN RANGE OF TOLERANCE.
[BACKLASH TOLERANCE AFTER REPLACEMENT]
TARGET (MINIMUM) POINT; 5-42 μm
OTHER POINTS; 5-101 μm
- (2) WHEN BACKLASH IS UNDER LOWER LIMIT (LESS THAN 5 μm), REPLACE SHIM TO BIGGER ONE (THICK ONE) AND RE-MEASURE BACKLASH.
- (3) WHEN BACKLASH IS OVER UPPER LIMIT (MORE THAN 101 μm), REPLACE SHIM TO SMALLER ONE (THIN ONE) AND RE-MEASURE BACKLASH.
[REF.] REGARDING SHIM SELECTION, REFER THAT BACKLASH CHANGES APPROX. 7 μm IF SPACER CHANGES 1 RANK.
- (4) IF IT IS NOT WITHIN RANGE OF TOLERANCE AFTER RE-MEASUREMENT, CHANGE BALANCER ASSY.

THIS CHART APPLIES TO SHIM SELECTION WHEN THE ENGINE IS INVERTED.

SHIM SELECTION CHART

(MASTER SHIM THICKNESS 1.42 mm)

BACKLASH AT STANDARD SHIM	SHIM NO.	SHIM THICKNESS	BACKLASH AT STANDARD SHIM	SHIM NO.	SHIM THICKNESS	BACKLASH AT STANDARD SHIM	SHIM NO.	SHIM THICKNESS
270-276 μm	05	1.05 mm	165-171 μm	20	1.20 mm	61-67 μm	35	1.35 mm
263-269	06	1.06	158-164	21	1.21	54-60	36	1.36
256-262	07	1.07	151-157	22	1.22	47-53	37	1.37
249-255	08	1.08	144-150	23	1.23	40-46	38	1.38
242-248	09	1.09	137-143	24	1.24	33-39	39	1.39
235-241	10	1.10	130-136	25	1.25	26-32	40	1.40
228-234	11	1.11	123-129	26	1.26	19-25	41	1.41
221-227	12	1.12	116-122	27	1.27	12-18	42	1.42
214-220	13	1.13	109-115	28	1.28	5-11	43	1.43
207-213	14	1.14	102-108	29	1.29	0-4	44	1.44
200-206	15	1.15	96-101	30	1.30	—	—	—
193-199	16	1.16	89-95	31	1.31	—	—	—
186-192	17	1.17	82-88	32	1.32	—	—	—
179-185	18	1.18	75-81	33	1.33	—	—	—
172-178	19	1.19	68-74	34	1.34	—	—	—

AS SHIM CHANGES 1 RANK, BACKLASH CHANGES APPROXIMATELY 7 μm .

RESTRICTIONS

PART NAME/TITLE

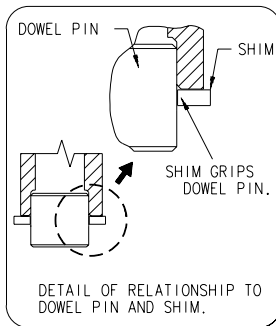
REPLACEMENT OF SHIM SELECTION

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	Y	EN00 E 11145063 001	00-11-03	2003 2.3L-4V NON-D1 J71	25-G	25-H

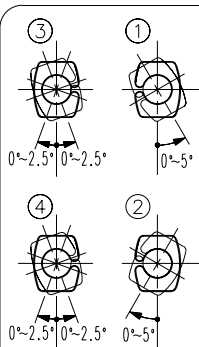
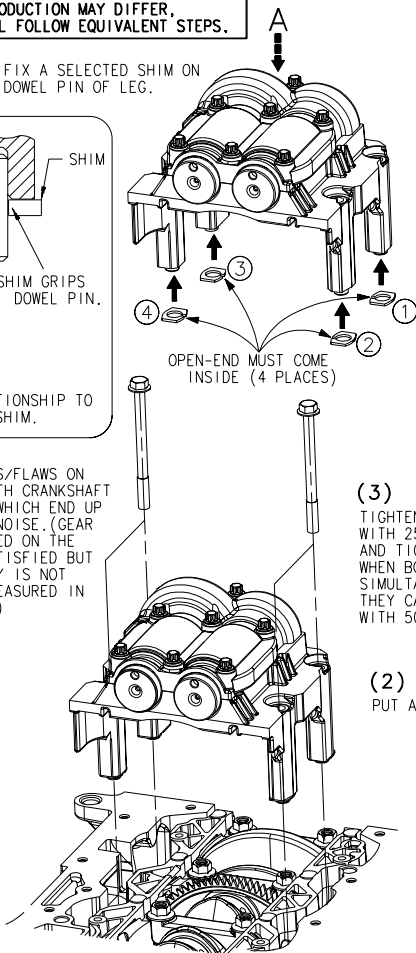
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

**NOTE) MANUAL PROTOTYPE PROCESS ONLY-
MASS PRODUCTION MAY DIFFER,
BUT WILL FOLLOW EQUIVALENT STEPS.**

- (1) FIX A SELECTED SHIM ON
DOWEL PIN OF LEG.



NO HAMMERED MARKS/FLAWS ON
GEAR TEETH OF BOTH CRANKSHAFT
& BALANCE SHAFT WHICH END UP
WITH UNEXPECTED NOISE. (GEAR
ACCURACY SPECIFIED ON THE
DRAWING TO BE SATISFIED BUT
THE GEAR ACCURACY IS NOT
REQUIRED TO BE MEASURED IN
THE ENGINE PLANT)



VIEW A

ANGLE TOLERANCE FOR
SHIM FIXING.

- (3)
TIGHTEN BOLTS PRIMARILY
WITH 25 N·m,
AND TIGHTEN WITH 50±3 N·m.
WHEN BOLTS ARE TIGHTENED
SIMULTANEOUSLY,
THEY CAN BE TIGHTENED
WITH 50±3 N·m AT A TIME.

- (2)
PUT A BALANCER ON BLOCK.

RESTRICTIONS

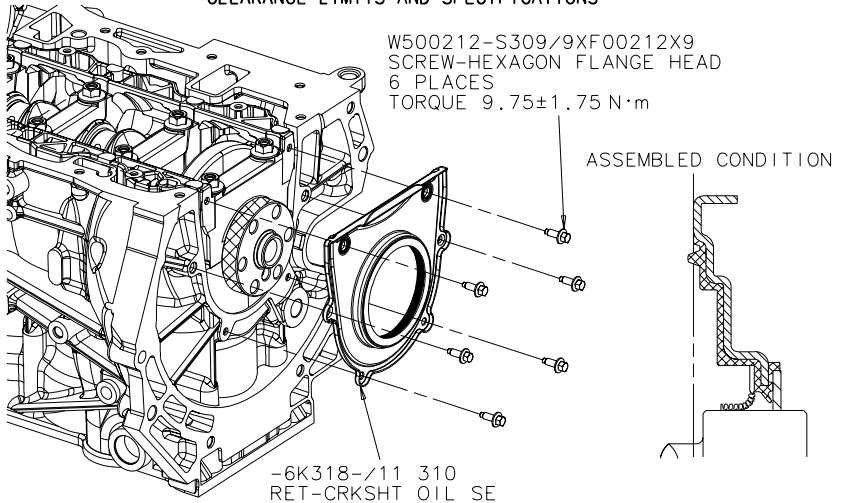
PART NAME/TITLE

BALANCER AND SELECTED SHIM TO BLOCK

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	Y	EN00 E 11145063 001	00-11-03	2003 2.3L-4V NON-DI J71	25-H	26

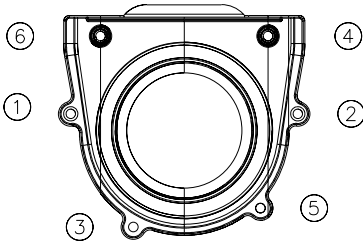
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

W500212-S309/9XF00212X9
SCREW-HEXAGON FLANGE HEAD
6 PLACES
TORQUE $9.75 \pm 1.75 \text{ N}\cdot\text{m}$



FASTENING PROCEDURE

(AUTOMATIC MACHINE)



1. Snag torque: $3 \frac{3}{8} \text{ Nm}$, then
Final torque: $9.75 \pm 1.75 \text{ Nm}$
2. Tightening speed: 10rpm
3. Tightening order: Begin to tighten
① & ② then wait 0.5-1.0 second and
start to tighten ③, ④, ⑤ & ⑥.

(SINGLE SPINDLE)

ALL BOLT TO BE TIGHTENED ACCORDING
TO THE ORDER WHICH IS SHOWN IN
LEFT HAND DRAWING.
TIGHTENING ORDER ; ① - ⑥

NOTES

1. No sticking of stain, dust, etc is allowed on oil seal sliding surface (hatched area) of crank shaft.
2. Attach oil seal exactly perpendicular to crankshaft to prevent oil seal lip from peeling and cutting.
3. Oil seal lip with flaw, deformation or dent that harm its sealability shall be replaced.
4. Oil seal shall be assembled in specified direction drawing.

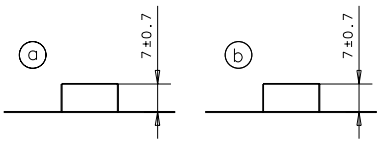
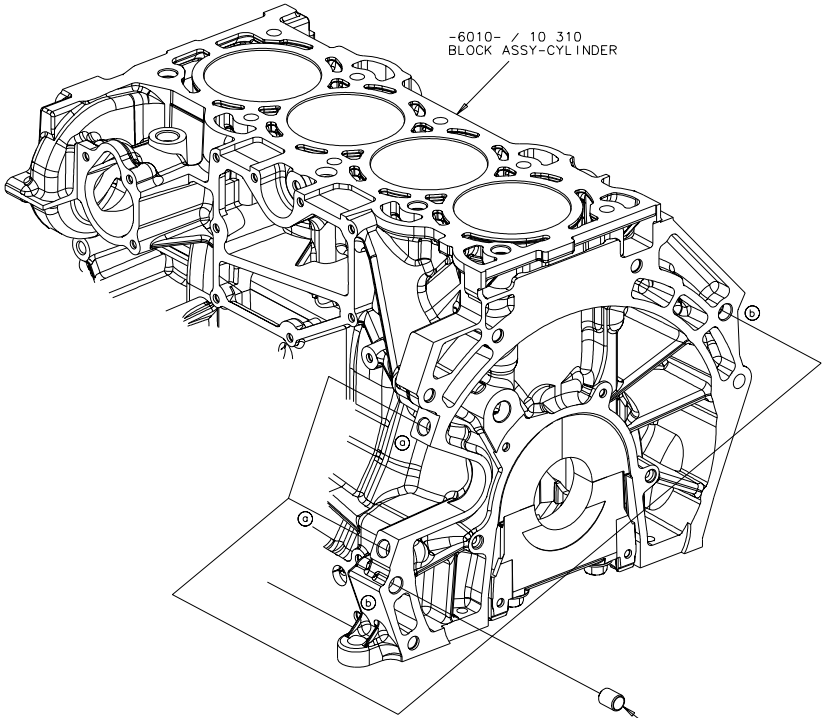
RESTRICTIONS

PART NAME/TITLE

REAR OIL SEAL - CRANKSHAFT

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	V	EN00E11124480001	00-09-08	2001 2.0L-4V NON DI CD132	26	27

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



-6397- / 10 306
DOWEL
4 PLACES
DOWEL TO BE PUSHED TO
BOTTOM OF DOWEL HOLE.

RESTRICTIONS

PART NAME/TITLE

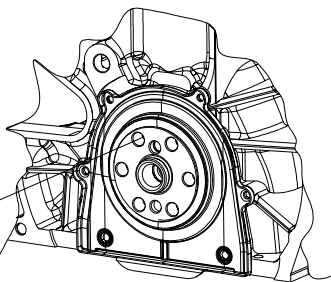
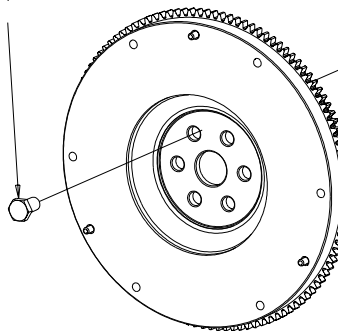
DOWEL ASY-CYLINDER BLOCK

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BD	EN00 E 11271059 000	01-11-02	2001 2.0L-4V NON DI CD132	27	28

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

-6379-/11 511
BOLT FLYWHEEL
6 PLACES
SIMULTANEOUSLY

▽ TORQUE 112±4 N·m



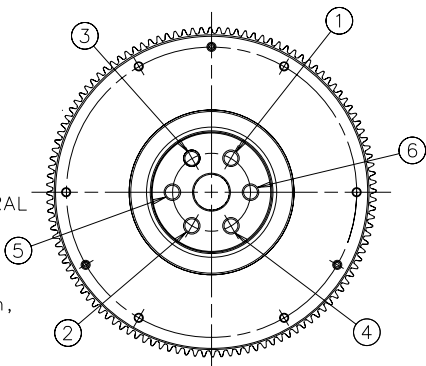
-6K390-/11 500
FLYWHEEL ASY

SINGLE SPINDLE METHOD
INSTALL AND UNIFORMLY
TIGHTEN 6 BOLTS, IN SEVERAL
PASSES, IN THE SEQUENCE
SHOWN.

TORQUE STEPS

1ST 50±4 N·m, 2ND 80±4 N·m,

▽ TORQUE 3RD 112±4 N·m



RESTRICTIONS

PART NAME/TITLE
FLYWHEEL ASY

SPECIFICATION NO.
C1S7G-543-AC

REV
P

RELEASE NO.
EN00 E 11045491 000

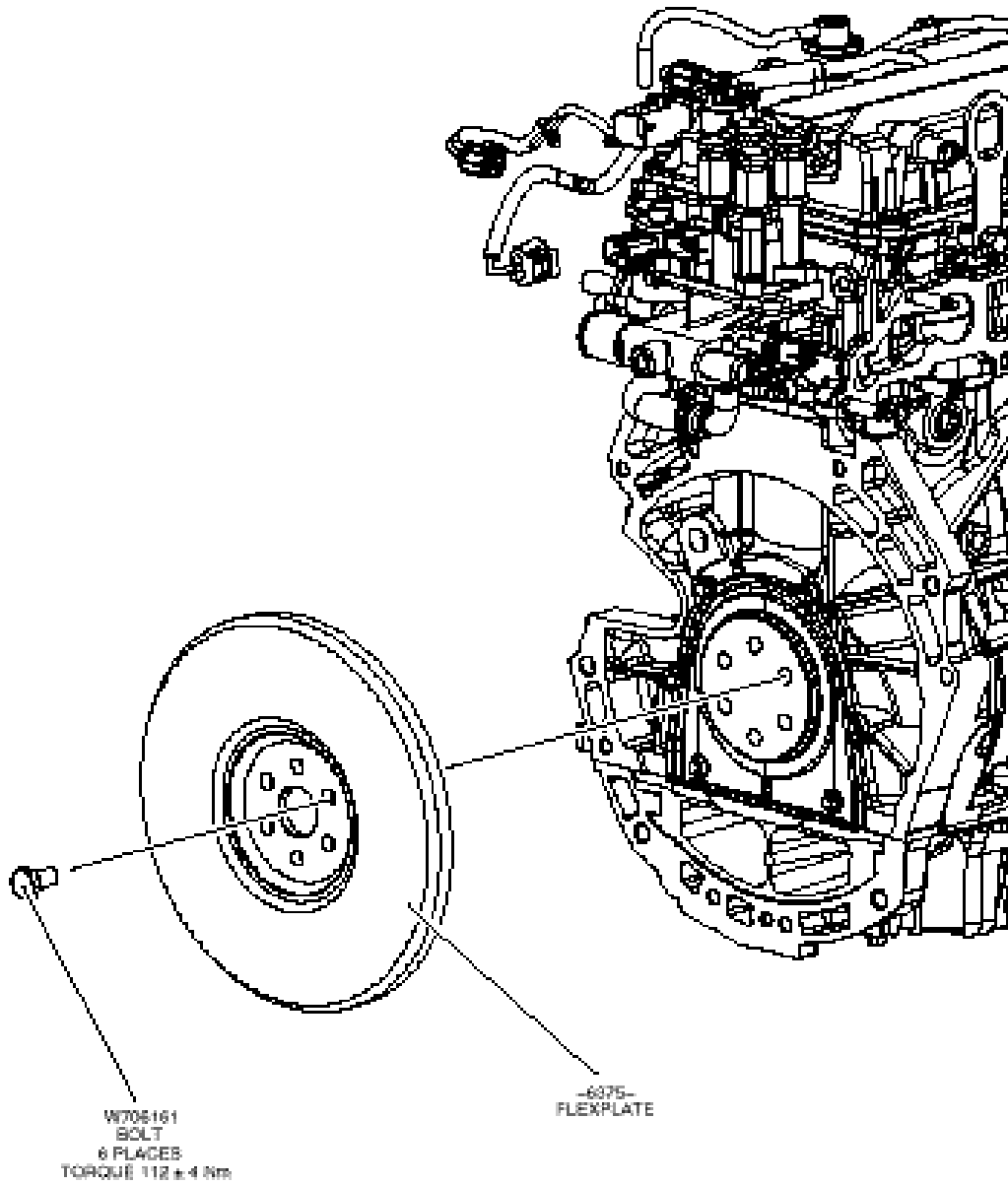
DATE
00-03-31

MODEL
2001 2.3L-4V NON DI RANGER

SHEET
28

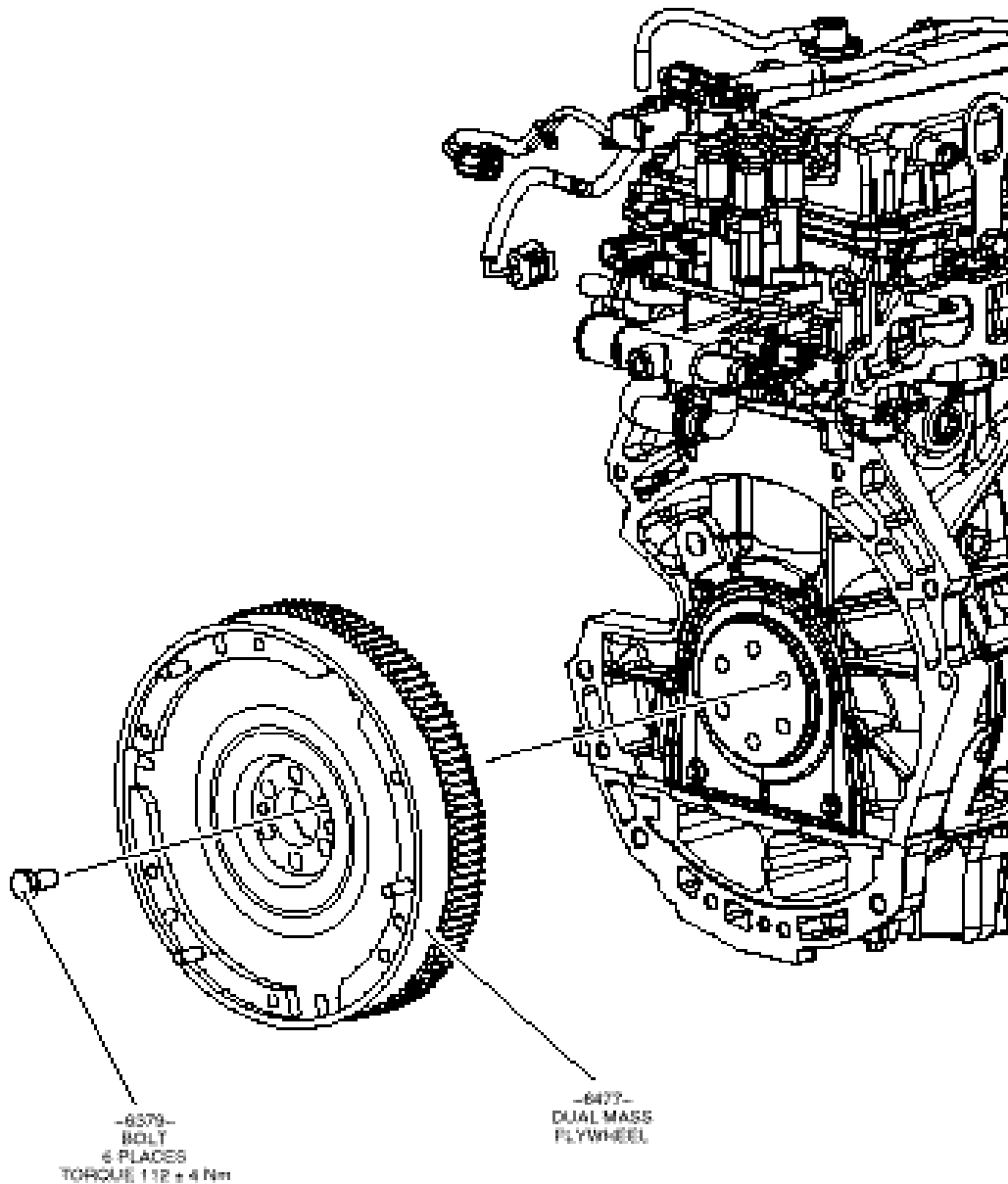
CONTD.
28-A

**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS**



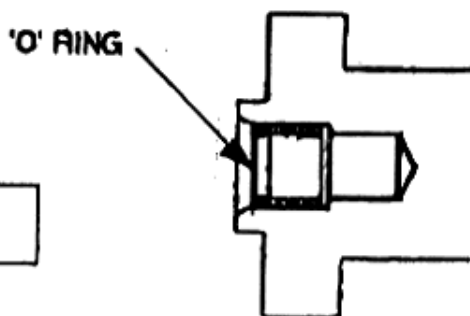
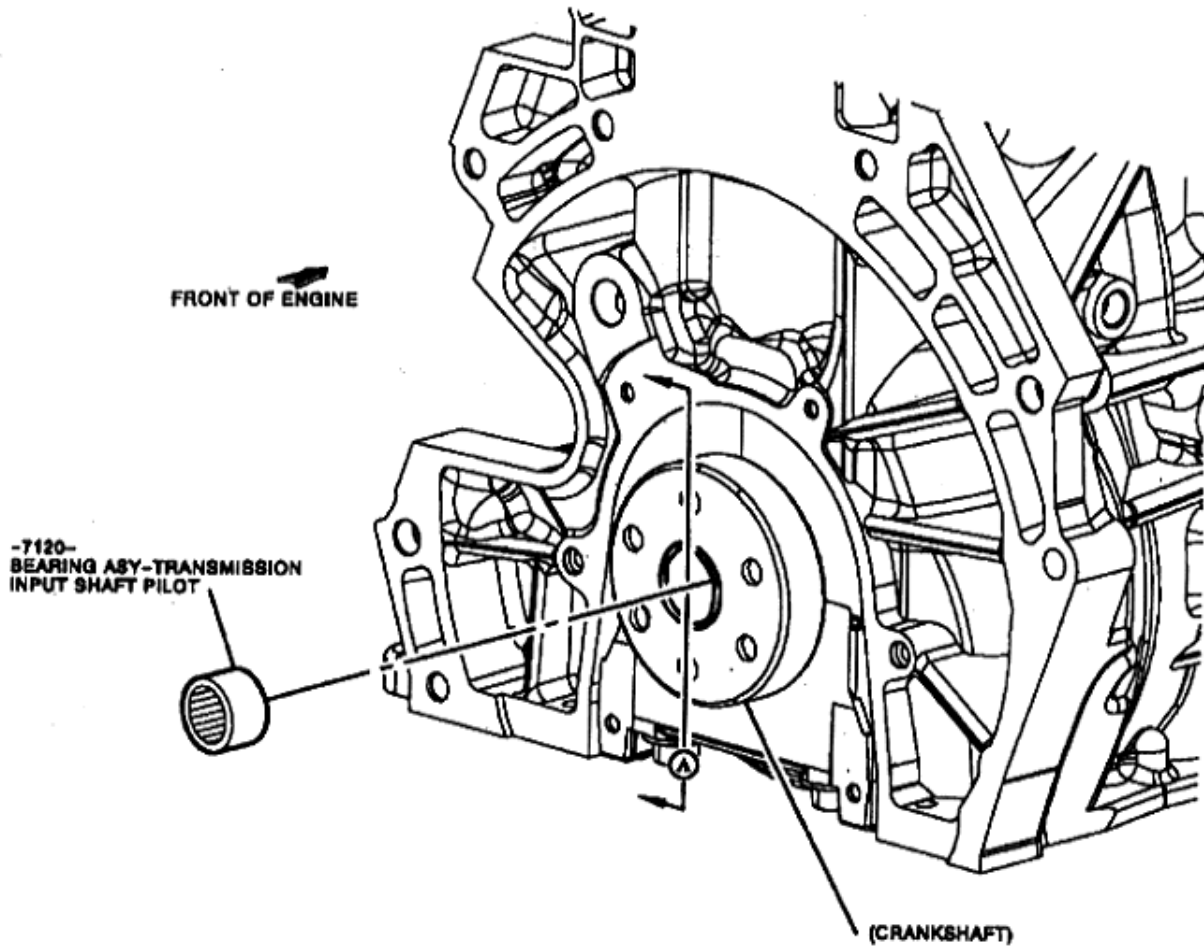
RESTRICTI				PART NAME/TITLE			
SPECIFICATION NO. C1S7G-543-AC	REV N	RELEASE NO. EN00 E 11030674 000	DATE 00-02-10	MODEL 2001 2.0L-4V NON DI	SHEET 28-A	CONTD. 28-B	

**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS**



RESTRICTI				PART NAME/TITLE			
SPECIFICATION NO. C1S7G-543-AC	REV X	RELEASE NO. EN00E11099311 000	DATE 00-10-13	MODEL 2001 2.0L-4V NON DI CD132	SHEET 28-B	CONTD. 28-C	

PILOT BEARING (MANUAL TRANSMISSION)



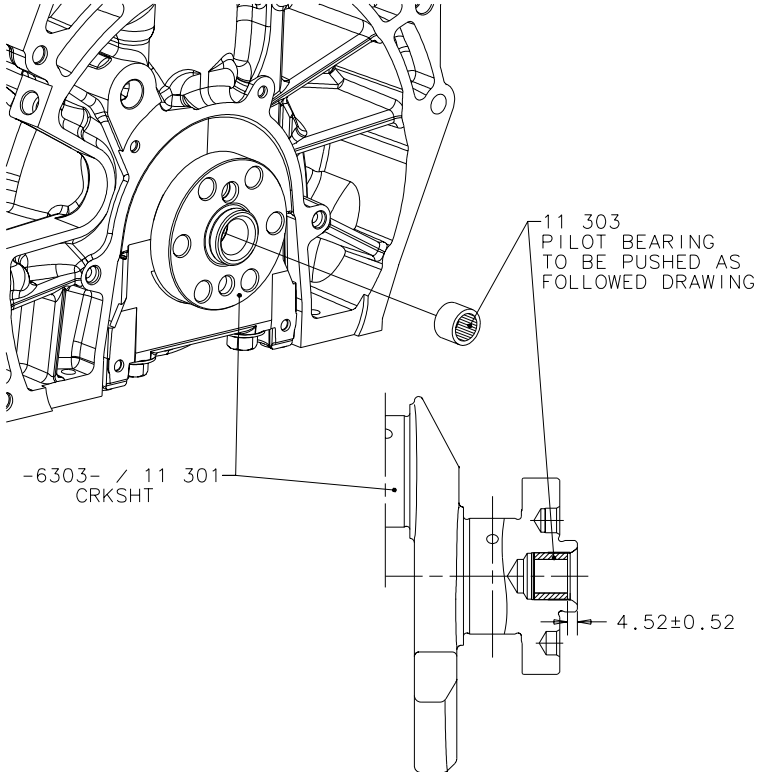
NOTE:
INSTALL BEARING WITH SEAL END TOWARD
TRANSMISSION.

SECTION A

031101

RESTRICTIONS				PART NAME/TITLE PILOT BEARING			
SPECIFICATION NO. C1S7G-543-AC	REV AN	RELEASE NO. EN00 E11208966 001	DATE 01-06-08	MODEL 2001 2.3L-4V NON DI RANGER	SHEET 28-C	CONTD. 28-D	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS

PART NAME/TITLE

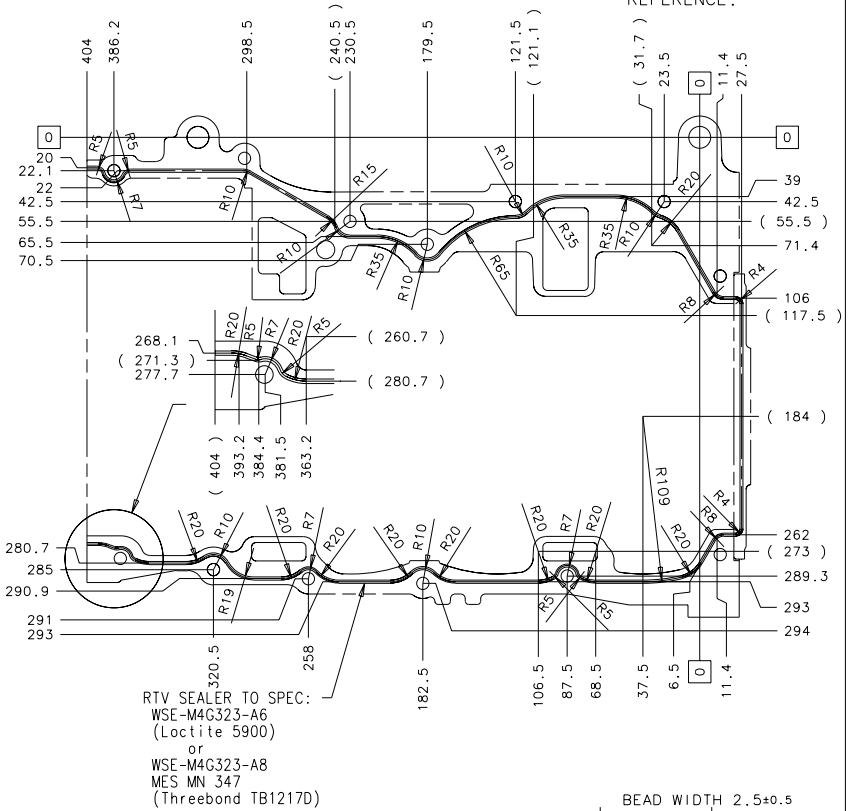
PILOT BEARING

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AN	EN00 E 11208966 001	01-06-08	2003 2.3L-4V NON DI J56A/F/J	28-D	29

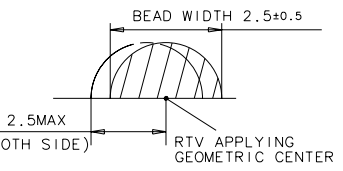
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

CLEARANCE LIMITS AND SPECIFICATIONS

ALL DIMENSION ARE REFERENCE.



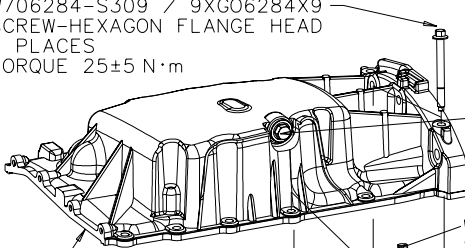
- NOTES**
- 1.No sticking of stain, dust, etc is allowed on RTV apply surface of cylinder block.
 - 2.After applying RTV, complete assembling oil pan within 10 min, and then complete tightening all bolts within further 5 min.(within 15 min in total.)



RESTRICTIONS				PART NAME/TITLE			
				RTV SEALER - OIL PAN			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	N	EN00E11030674000	00-02-10	2001 2.0L-4V NON DI CD132	29	29-D	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

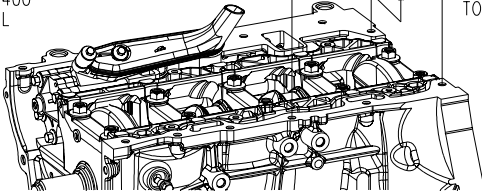
W706284-S309 / 9XG06284X9
SCREW-HEXAGON FLANGE HEAD
2 PLACES
TORQUE 25±5 N·m



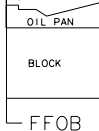
REF: ONLY
-6730- / 10 404
PLG-OIL PAN DRN
TORQUE 27.5±2.5 N·m

W500224-S309 / 9XF00224X9
SCREW-HEXAGON FLANGE HEAD
11 PLACES
TORQUE 25±5 N·m

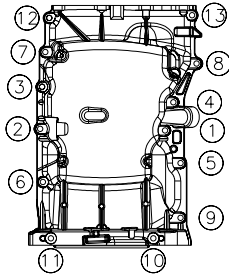
-6675-/10 400
PAN ASY-OIL



OIL PAN TO FLUSH ±0.05mm



FASTENING PROCEDURE (SINGLE SPINDLE METHOD).



OIL FILL QUANTITIES

TOTAL FACTORY OIL FILL (DRY ENGINE) = 4.6 ± 0.05 L
(WITHOUT OIL COOLER)
SERVICE FILL (INCLUDING FILTER CHANGE) = 4.3L (4.5qt)
SERVICE FILL (EXCLUDING FILTER CHANGE) = 3.9L (4.1qt)

NOTE: DIFFERENCE BETWEEN 'MIN' & 'MAX' MARKS ON OIL
LEVEL INDICATOR IS EQUIVALENT TO 0.75L (0.8qt)

NOTES

- 1.No sticking of stain, dust, etc is allowed on oil pan sealing surface of cylinder block and oil pan.
- 2.If parts have scratch on seal face of oil pan assembly, which might give negative effect on sealability, those have to be replaced with good part.

RESTRICTIONS

PART NAME/TITLE

OIL PAN & OIL FILL QUANTITIES

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON DI CD 132	30-A	30-B

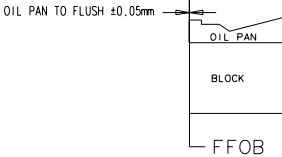
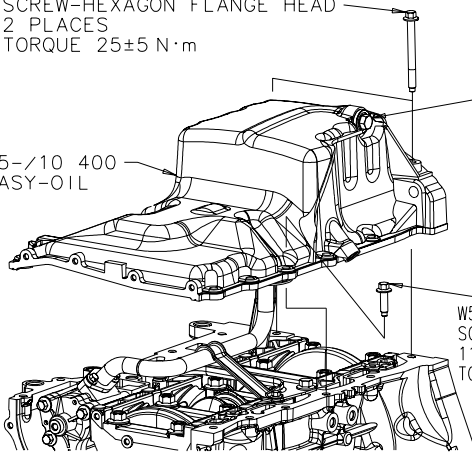
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

W706284-S309 / 9XG06284X9
SCREW-HEXAGON FLANGE HEAD
2 PLACES
TORQUE 25±5 N·m

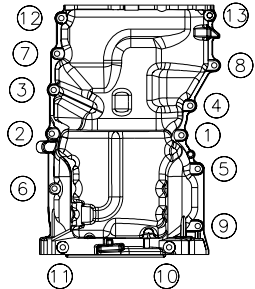
-6675-/10 400
PAN ASY-OIL

REF: ONLY
-6730- / 10 404
PLG-OIL PAN DRN
TORQUE 27.5±2.5 N·m

W500224-S309 / 9XF00224X9
SCREW-HEXAGON FLANGE HEAD
11 PLACES
TORQUE 25±5 N·m



FASTENING PROCEDURE (SINGLE SPINDLE METHOD).



OIL FILL QUANTITIES

TOTAL FACTORY OIL FILL (DRY ENGINE) = 4.1 ± 0.05 L
(WITHOUT OIL COOLER)
SERVICE FILL (INCLUDING FILTER CHANGE) = 3.8L (4qt)
SERVICE FILL (EXCLUDING FILTER CHANGE) = 3.3L (3.5qt)

NOTE: DIFFERENCE BETWEEN 'MIN' & 'MAX' MARKS ON OIL LEVEL INDICATOR IS EQUIVALENT TO 1.4L (1.5qt)

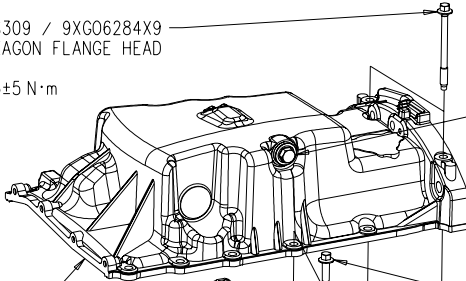
NOTES

- 1.No sticking of stain, dust, etc is allowed on oil pan sealing surface of cylinder block and oil pan.
- 2.If parts have scratch on seal face of oil pan assembly, which might give negative effect on sealability, those have to be replaced with good part.

RESTRICTIONS					PART NAME/TITLE			
					OIL PAN & OIL FILL QUANTITIES			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.		
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.3L-4V NON DI RANGER	30-B	30-D		

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

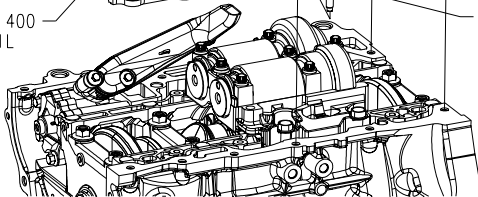
W706284-S309 / 9XG06284X9
SCREW-HEXAGON FLANGE HEAD
2 PLACES
TORQUE 25±5 N·m



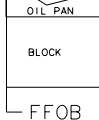
REF: ONLY
-6730- / 10 404
PLG-OIL PAN DRN
TORQUE 27.5±2.5 N·m

-6675-/10 400
PAN ASY-OIL

W500224-S309 / 9XF00224X9
SCREW-HEXAGON FLANGE HEAD
11 PLACES
TORQUE 25±5 N·m



OIL PAN TO FLUSH ±0.05mm



FASTENING PROCEDURE (SINGLE SPINDLE METHOD).

OIL FILL QUANTITIES

TOTAL FACTORY OIL FILL (DRY ENGINE) = 4.6 ± 0.05 L
(WITHOUT OIL COOLER)

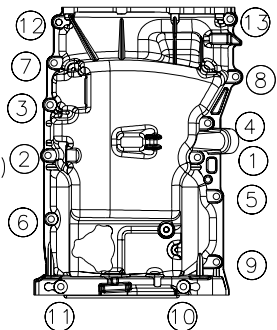
SERVICE FILL (INCLUDING FILTER CHANGE) = 4.3L (4.5qt)

SERVICE FILL (EXCLUDING FILTER CHANGE) = 3.9L (4.1qt)

NOTE: DIFFERENCE BETWEEN 'MIN' & 'MAX' MARKS ON OIL LEVEL INDICATOR IS EQUIVALENT TO 0.75L (0.8qt)

NOTES

- 1.No sticking of stain, dust, etc is allowed on oil pan sealing surface of cylinder block and oil pan.
- 2.If parts have scratch on seal face of oil pan assembly, which might give negative effect on sealability, those have to be replaced with good part.



RESTRICTIONS


PART NAME/TITLE




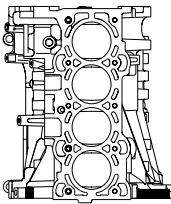
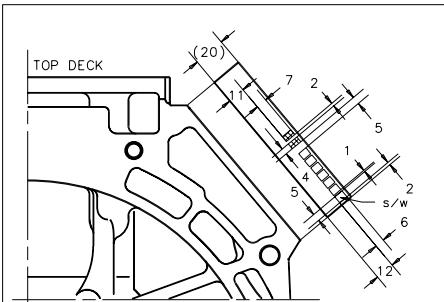



OIL PAN & OIL FILL QUANTITIES

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AA	EN00E11087761000	00-11-17	2003 2.3L-4V NON DI U204	30-D	30-E

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

ENGINE NUMBER STAMPING POSITION

 REGARDING THE STAMPING PROCEDURE, PLEASE REFER TO THE *STAMP CONTROL MANUAL
 : MBSMB-M750050* AND THE *NUMBERING OPERATION MANUAL
 : MBSMB-M750030*

	ENGINE TYPE MARKING	L8 TYPE (0.0018 m3) LF TYPE (0.002 m3) L3 TYPE (0.0023 m3)
	SPEC OF ENGRAVING	CONFORM TO MES W7102-1003.
	LOCATION OF MARKING	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>FRONT</p>  <p>REAR</p> </div> <div style="text-align: center;"> <p>DETAIL</p>  </div> </div> <p style="text-align: center; margin-top: 10px;">  ENGINE TYPE & NUMBER STAMPING POSITION </p> <div style="margin-top: 10px;"> <p>  ENGINE TYPE  ENGINE NUMBER </p> </div>
UNIQUE TO MAZDA ONLY. ENGINE SHALL BE MARKED ENGINE TYPE & NUMBER BEFORE SHIPPING. (ONE EXAMPLE.)		

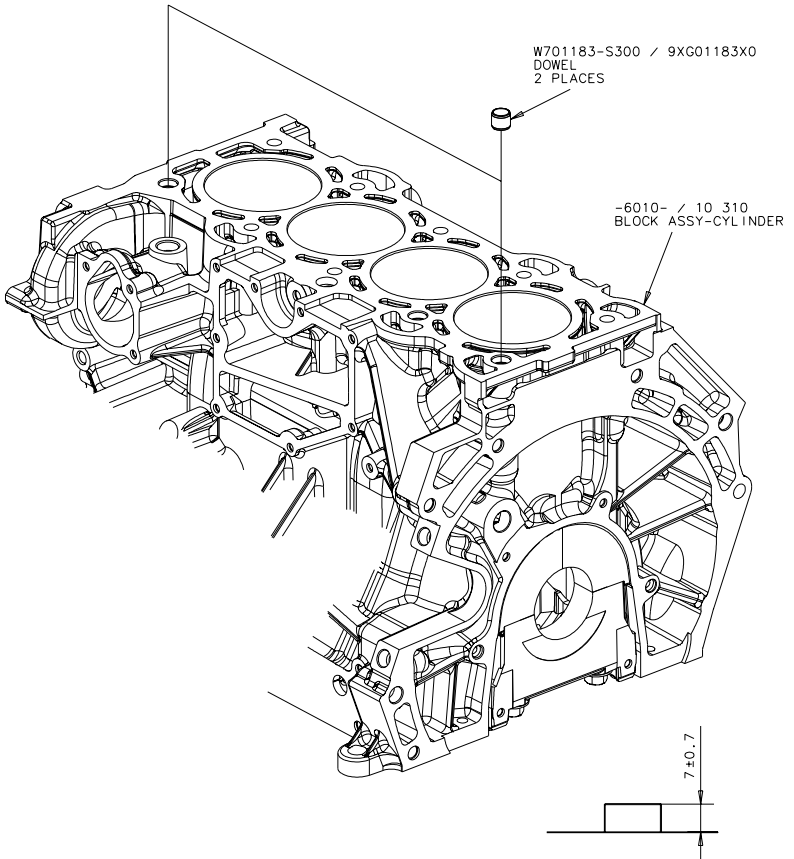


RESTRICTIONS

 PART NAME/TITLE
ENGINE NUMBER STAMPING POSITION

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AL	EN00 E 11204632 000	01-05-08	2001 2.0L-4V NON DI CD132	30-E	31

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS

PART NAME/TITLE

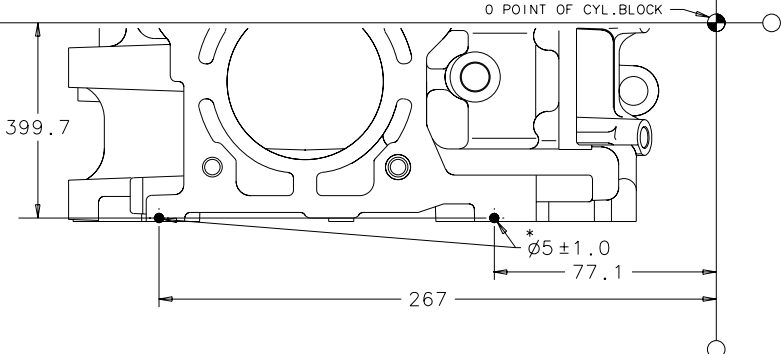
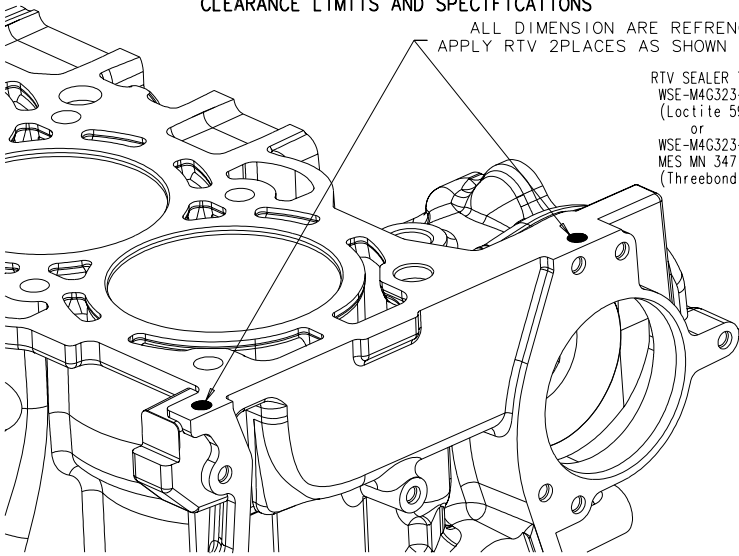
DOWEL ASY-CYLINDER BLOCK

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BD	EN00 E 11271059 000	01-11-02	2001 2.0L-4V NON DI CD132	32	32-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
 CLEARANCE LIMITS AND SPECIFICATIONS

ALL DIMENSION ARE REFERENCE.
 APPLY RTV 2PLACES AS SHOWN BELOW.

RTV SEALER TO SPEC:
 WSE-M4G323-A6
 (Loctite 5900)
 or
 WSE-M4G323-A8
 MES MN 347
 (Threebond TB1217D)



NOTES

1. After applying RTV, complete assembling front cover and cylinder head within 10 min and then complete tightening all bolts within further 5 min. (within 15 min in total.)

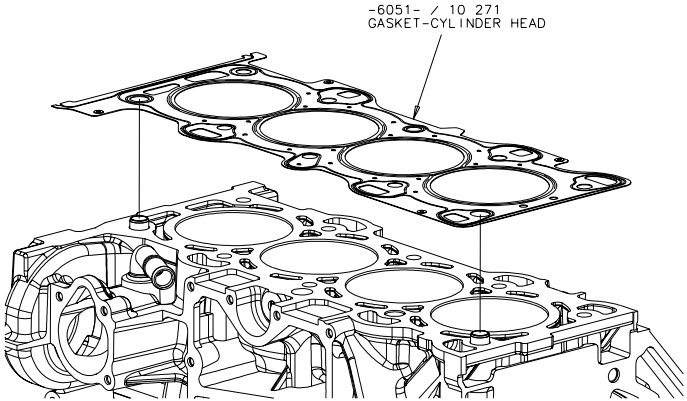
RESTRICTIONS

PART NAME/TITLE

RTV SEALER - CYL HEAD GASKET

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BG	EN00E11282537000	01-11-09	2001 2.0L-4V NON D1 CD132	33	34

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



1.8L Non-DI			○
1.8L DI		○	○
2.0L+2.3L		○	
2.4L	○	○	
2.8L	○		

CAUTION: DO NOT RE-USE GASKET

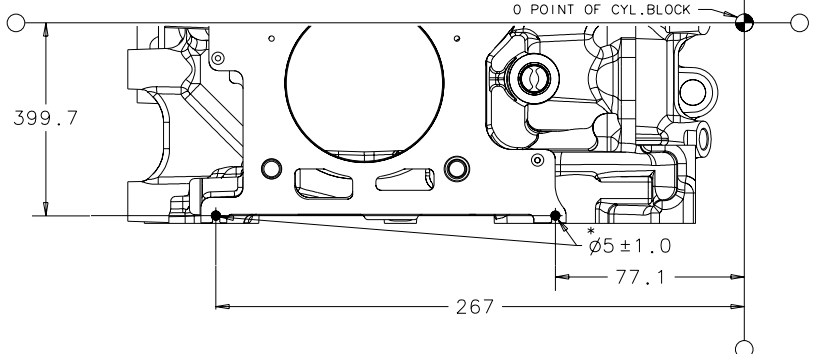
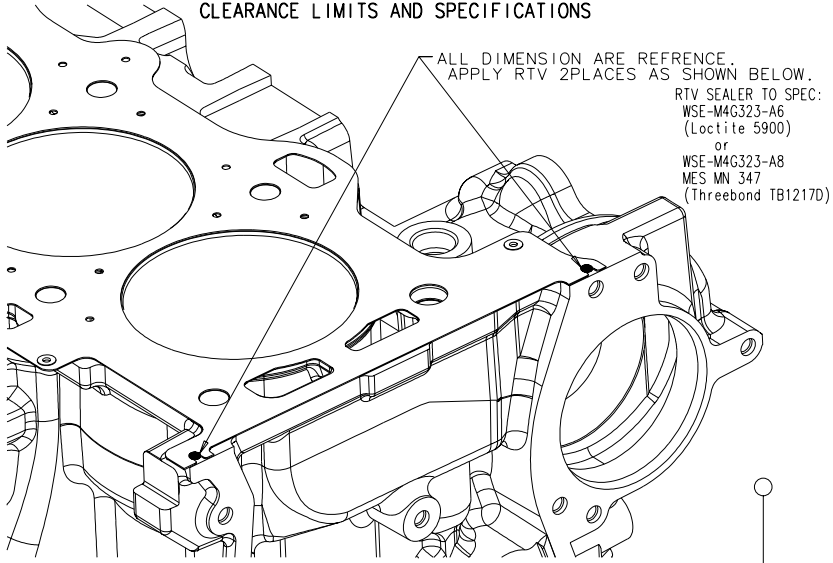
RESTRICTIONS

PART NAME/TITLE

GASKET-CYLINDER HEAD

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BG	EN0011282537000	01-11-09	2001 2.0L-4V NON DI CD132	34	34-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



NOTES

1. After applying RTV, complete assembling front cover and cylinder head within 10 min and then complete tightening all bolts within further 5 min. (within 15 min in total.)

RESTRICTIONS

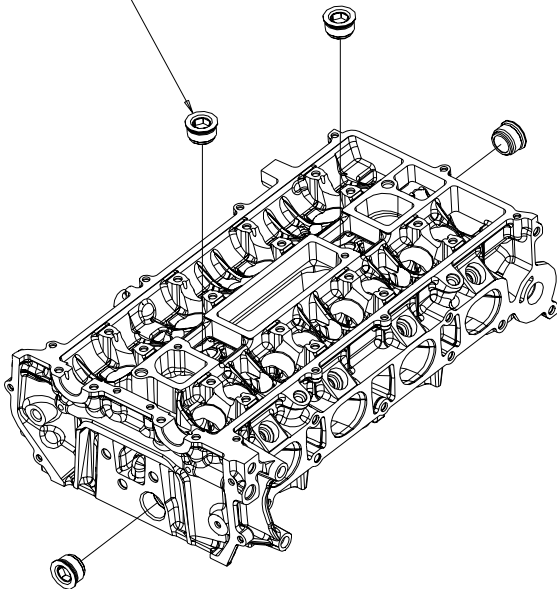
PART NAME/TITLE

RTV SEALER - CYL HEAD GASKET

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BG	EN00E11282537000	01-11-09	2001 2.0L-4V NON D1 CD132	34-A	35

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

-W701441- / 9XG01441X0
 PLUG INT HEX
 4 PLACES FOR ALL 14
 5 PLACES FOR 15
 TORQUE 75±5 Nm
 USING WSK-M2G349-A7
 SEALER(LOCTITE 243 OR 962T)



RESTRICTIONS

 PART NAME/TITLE
PLUG-CYLINDER HEAD

 SPECIFICATION NO.
C157G-543-AC

 REV
AP

 RELEASE NO.
EN00E11189361000

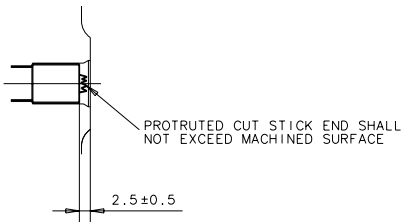
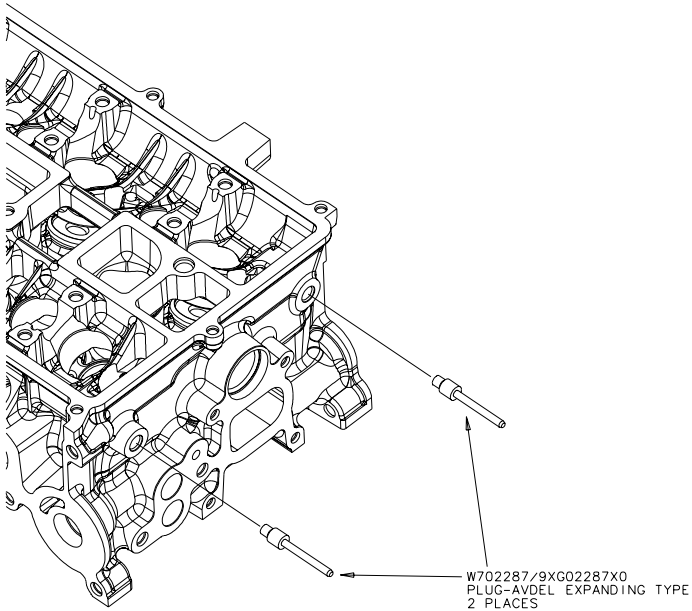
 DATE
01-06-22

 MODEL
2001 2.0L-4V NON D1 CD132

 SHEET
35

 CONTD.
36

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS

PART NAME/TITLE
PLUG-AVDEL

SPECIFICATION NO.
C157G-543-AC

REV
C

RELEASE NO.
EN00110819645017

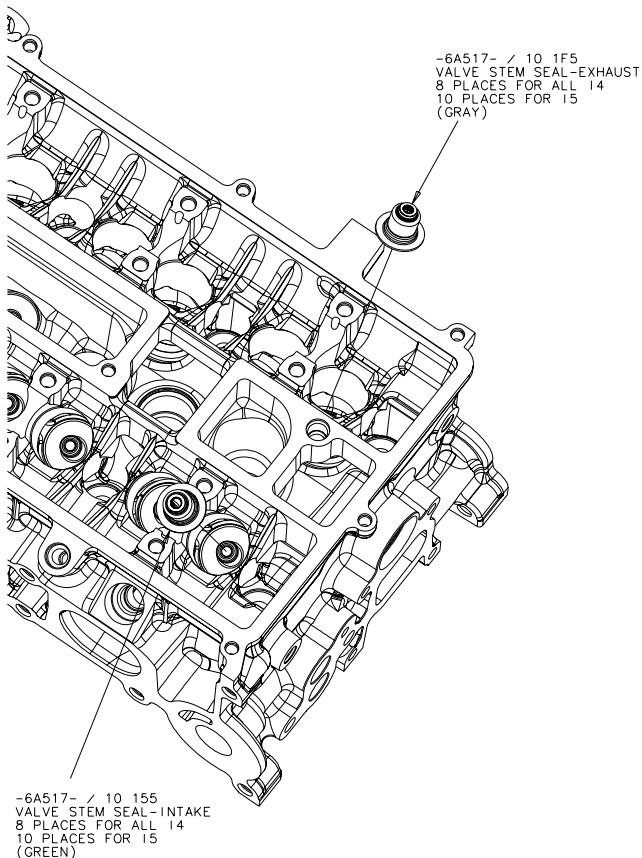
DATE
99-02-25

MODEL
2001 2.0L-4V NON DI CD132

SHEET
36

CONTD.
37

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



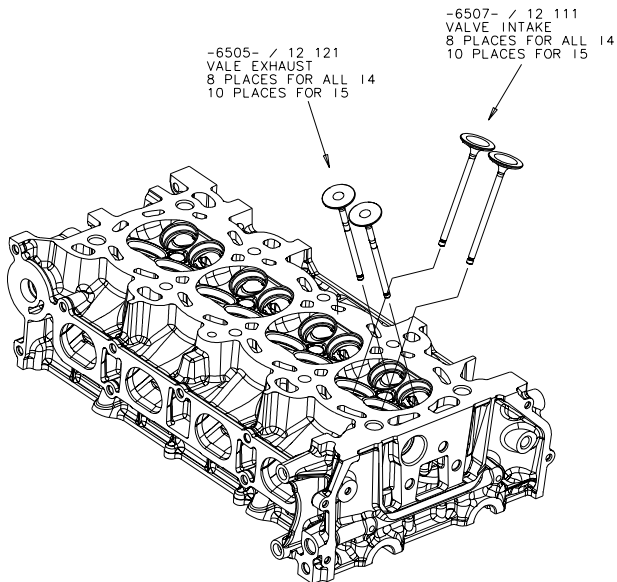
RESTRICTIONS

PART NAME/TITLE

VALVE STEM OIL SEALS

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C157G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON DI CD 132	37	38

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



BEFORE ATTACHING VALVE, APPLY EQUIVALENT OF FACTORY FILL ENGINE OIL TO THE STEM 40mm MAX FROM THE STEM-END. OIL MUST BE APPLIED ON KEY GROOVE.

RESTRICTIONS				PART NAME/TITLE				
				INTAKE & EXHAUST VALVES				
SPECIFICATION NO. C1S7G-543-AC	REV H	RELEASE NO. EN00E11007392000	DATE 99-09-06	MODEL 2001 2.0L-4V NON DI CD132	SHEET 38	CONTD. 39		

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

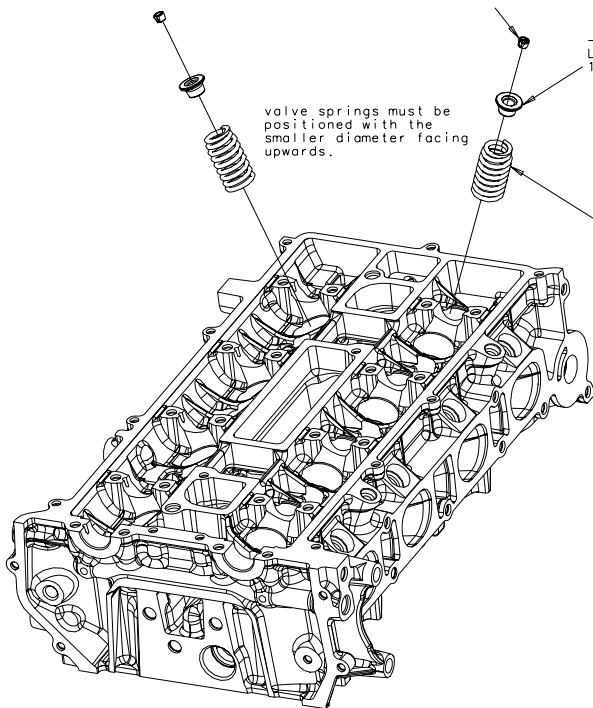
CLEARANCE LIMITS AND SPECIFICATIONS

-6518- / 12 114
LOCK VALVE SPRING RETAINER
32 PLACES

-6514- / 12 113
LOCK VALVE SPRING
16 PLACES

valve springs must be
positioned with the
smaller diameter facing
upwards.

-6513- / 12 125
VALVE SPRING
16 PLACES



AIR LEAKAGE TEST(DRY CONDITION)

AIR PRESSURE TO BE LOADED ON INTAKE AND EXHAUST PORT IN AIR-TIGHT TEST:14.7 KPa

TOLERABLE LEAKAGE FOR THE ENGINE OF CD132 AND RANGER

INTAKE PORT : WITHIN 50 cm³ [normal]/min (PER ONE PORT)

EXHAUST PORT : WITHIN 100 cm³ [normal]/min (PER ONE PORT)

TOLERABLE LEAKAGE FOR THE OTHER ENGINE

INTAKE & EXHAUST PORT : WITHIN 15 cm³ [normal]/min (PER ONE PORT)

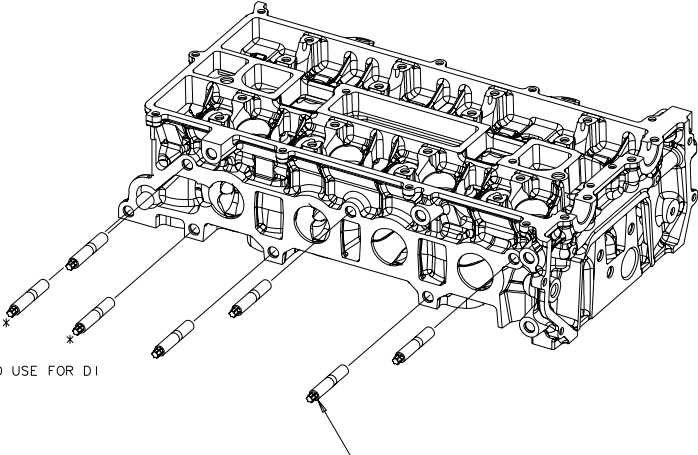
RESTRICTIONS

PART NAME/TITLE

VALVE SPRINGS & RETAINERS

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BC	EN00E11185527000	01-10-30	2001 2.0L-4V NON DI CD132	39	40

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



* NO USE FOR DI

-W704474- / 9XG044474
STUD M10
5 PLACES FOR DI
7 PLACES FOR OTHER I4
TORQUE 17±2 Nm

NOTE :

STUDS MAY BE ASSEMBLED ON MAIN ENGINE LINE

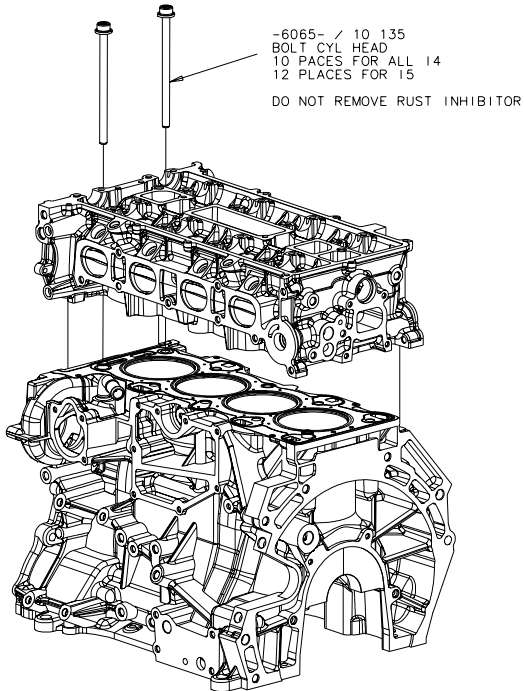
RESTRICTIONS

PART NAME/TITLE

STUDS-EXHAUST MANIFOLD

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AU	EN00E11212646000	01-08-07	2001 2.0L-4V NON DI CD132	40	41

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



FOR CYLINDER HEAD
BOLT ASSEMBLY PROCEDURE
SEE PROCEDURE - CYLINDER HEAD BOLTS

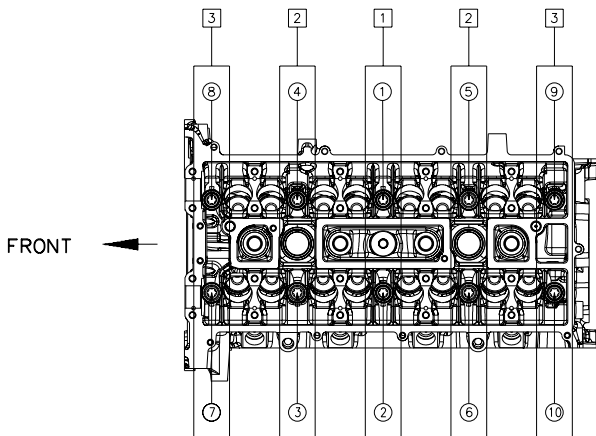
RESTRICTIONS

PART NAME/TITLE

CYLINDER HEAD & BOLTS

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	D	EN00E10967761000	'99-04-28	2001 2.0L-4V NON D1 CD132	41	42

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



MULTI-SPINDLE METHOD.

1. RUNDOWN ALL BOLTS SIMULTANEOUSLY TO 5 Nm.
 2. RUNDOWN ALL BOLTS SIMULTANEOUSLY 15 ± 2 Nm.
 3. RUNDOWN ALL BOLTS TO 45 ± 1 Nm.
- TIGHTNING SEQUENCE AS SHOWN IN THE SKETCH ABOVE. 1 ~ 3
4. TURN ALL BOLTS SIMULTANEOUSLY $180^\circ \pm 4^\circ$.

SINGLE WRENCH METHOD.

1. RUNDOWN ALL BOLTS TO 5 Nm.
 2. RUNDOWN ALL BOLTS TO 15 ± 2 Nm.
 3. RUNDOWN ALL BOLTS TO 45 ± 1 Nm.
 4. TURN ALL BOLTS $90^\circ \pm 2^\circ$.
 5. TURN ALL BOLTS $90^\circ \pm 2^\circ$.
- TIGHTNING SEQUENCE AS SHOWN IN THE SKETCH ABOVE. 1 ~ 10

RESTRICTIONS

PART NAME/TITLE

PROSEDURE - CYLINDER HEAD BOLTS

 SPECIFICATION NO.
C1S7G-543-AC

 REV
E

 RELEASE NO.
EN00E10986253000

 DATE
***99-06-30**

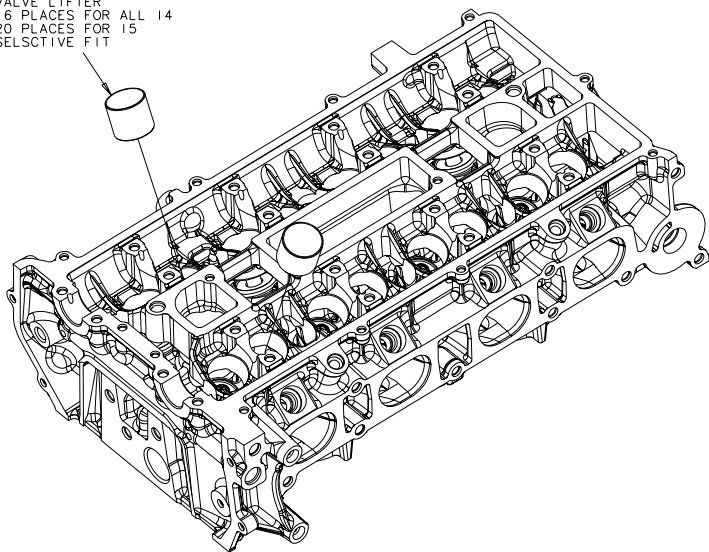
 MODEL
2001 2.0L-4V NON DI CD132

 SHEET
42

 CONTD.
42-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

-6500- / 12 551
VALVE LIFTER
16 PLACES FOR ALL 14
20 PLACES FOR 15
SELECTIVE FIT



NOTE: LUBRICATE VALVE LIFTER BORE WITH FACTORY FILL ENGINE OIL
BEFORE ASSEMBLY OF VALVE LIFTER

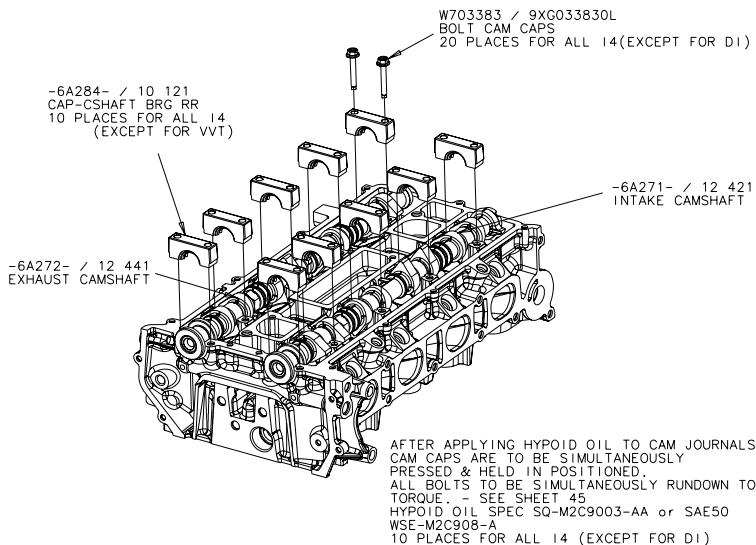
VALVE LIFTERS ARE SELECTED TO GIVE VALVE CLEARANCE OF
0.25±0.03 INTAKE
0.30±0.03 EXHAUST
(AFTER TIGHTENING HEAD BOLT)

RESTRICTIONS

 PART NAME/TITLE
VALVE LIFTERS

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	D	EN00E10967761000	'99-04-28	2001 2.0L-4V NON D1 CD132	43	44

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



ASSEMBLE THE "INTAKE CAMSHAFT" AND
"EXHAUST CAMSHAFT" WITH #1 CYLINDER COMPRESSION TOP DEAD CENTER.

CAMSHAFT THRUST CLEARANCE 0.09-0.24 (INFORMATION ONLY)

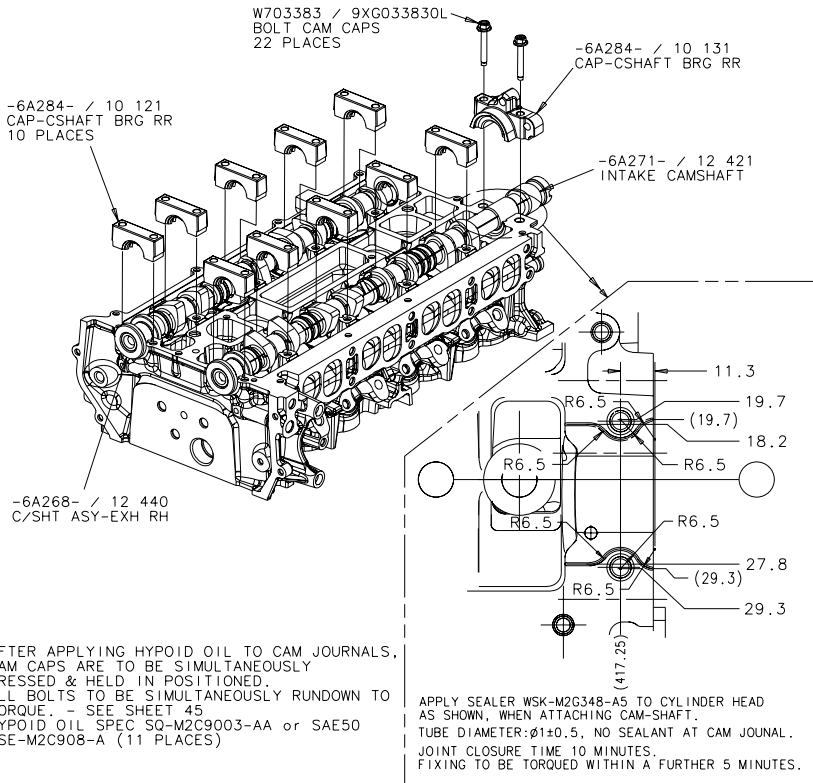
CAUTION:

SET PISTON ON #1 CYLINDER COMPRESSION TOP DEAD CENTER
TO AVOID ANY POSSIBILITY OF PISTON INTERFERING WITH VALVES.

RESTRICTIONS				PART NAME/TITLE			
				CAM SHAFT & CAM CAP			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AU	EN00E11212646000	01-08-07	2001 2.0L-4V NON D1 CD132	44	44-C	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

CLEARANCE LIMITS AND SPECIFICATIONS



ASSEMBLE THE *INTAKE CAMSHAFT* AND *EXHAUST CAMSHAFT* WITH #1 CYLINDER COMPRESSION TOP DEAD CENTER.

CAMSHAFT THRUST CLEARANCE 0.09-0.24 (INFORMATION ONLY)

CAUTION:

SET PISTON ON #1 CYLINDER COMPRESSION TOP DEAD CENTER TO AVOID ANY POSSIBILITY OF PISTON INTERFERING WITH VALVES.

RESTRICTIONS

PART NAME/TITLE

CAM SHAFT & CAM CAP

 SPECIFICATION NO.
C157G-543-AC

 REV
AU

 RELEASE NO.
EN00E11212646000

 DATE
01-08-07

 MODEL
2003,5 1.8L-4V DI CD132

 SHEET
44-C

 CONTD.
44-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

W703383 / 9XG033830L
BOLT CAM CAPS
20 PLACES

-6A267- / 12 420
C/SHT ASY-INTK LH

(1S7G)
-6A284- / 10 121
CAP-CSHAFT BRG RR
9 PLACES FOR INTAKE VVT

(3M4G)
-6A284- / 10 140
CAP-CSHAFT BRG RR

-6A272- / 12 441
EXHAUST CAMSHAFT

AFTER APPLYING HYPOID OIL TO CAM JOURNALS,
CAM CAPS ARE TO BE SIMULTANEOUSLY
PRESSED & HELD IN POSITIONED.
ALL BOLTS TO BE SIMULTANEOUSLY RUNDOWN TO
TORQUE. - SEE SHEET 45
HYPOID OIL SPEC SQ-M2C9003-AA or SAE50
WSE-M2C908-A (10 PLACES)

ASSEMBLE THE *INTAKE CAMSHAFT* AND
EXHAUST CAMSHAFT WITH #1 CYLINDER COMPRESSION TOP DEAD CENTER.

CAMSHAFT THRUST CLEARANCE 0.09-0.24 (INFORMATION ONLY)

CAUTION:

SET PISTON ON #1 CYLINDER COMPRESSION TOP DEAD CENTER
TO AVOID ANY POSSIBILITY OF PISTON INTERFERING WITH VALVES.

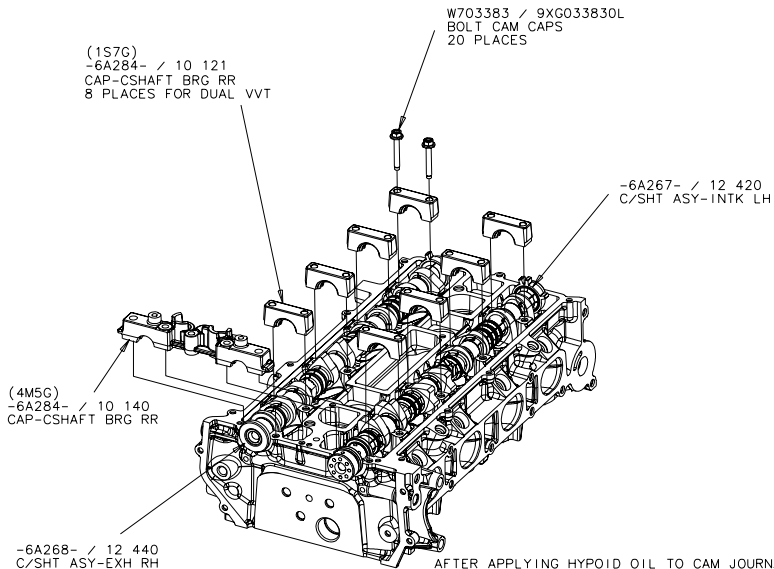
RESTRICTIONS

PART NAME/TITLE

CAM SHAFT & CAM CAP

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AU	EN00E11212646000	01-08-07	2003 2.3L 4V NON DI S-VVT	44-D	44-E

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



AFTER APPLYING HYPOID OIL TO CAM JOURNALS, CAM CAPS ARE TO BE SIMULTANEOUSLY PRESSED & HELD IN POSITIONED. ALL BOLTS TO BE SIMULTANEOUSLY RUNDOWN TO TORQUE. - SEE SHEET 45
HYPOID OIL SPEC SQ-M2C9003-AA or SAE50 WSE-M2C908-A (10 PLACES)

ASSEMBLE THE *INTAKE CAMSHAFT* AND *EXHAUST CAMSHAFT* WITH #1 CYLINDER COMPRESSION TOP DEAD CENTER.

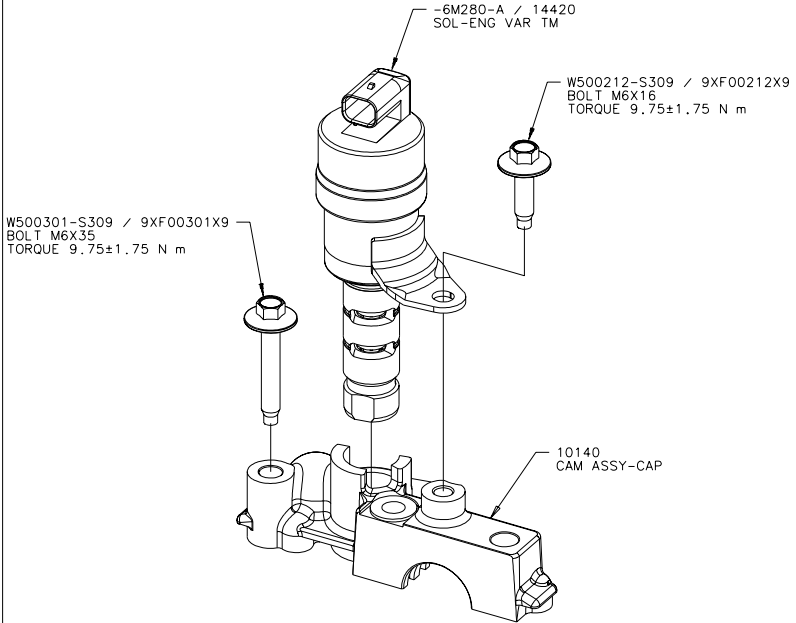
CAMSHAFT THRUST CLEARANCE 0.09-0.24 (INFORMATION ONLY)

CAUTION:

SET PISTON ON #1 CYLINDER COMPRESSION TOP DEAD CENTER TO AVOID ANY POSSIBILITY OF PISTON INTERFERING WITH VALVES.

RESTRICTIONS				PART NAME/TITLE			
				CAM SHAFT & CAM CAP			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AU	EN00E11212646000	01-08-07	2003 2.3L-4V NON DI D-VVT	44-E	44-F	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



1. TIGHTEN THE "BOLT M6X35".
2. ASSEMBLE THE "SOL-ENG VAR TM".
3. TIGHTEN THE "BOLT M6X14".

RESTRICTIONS

 PART NAME/TITLE
SOL-ENG VAR TM

 SPECIFICATION NO.
C1S7G-543-AC

 REV
AH

 RELEASE NO.
EN00E11190272000

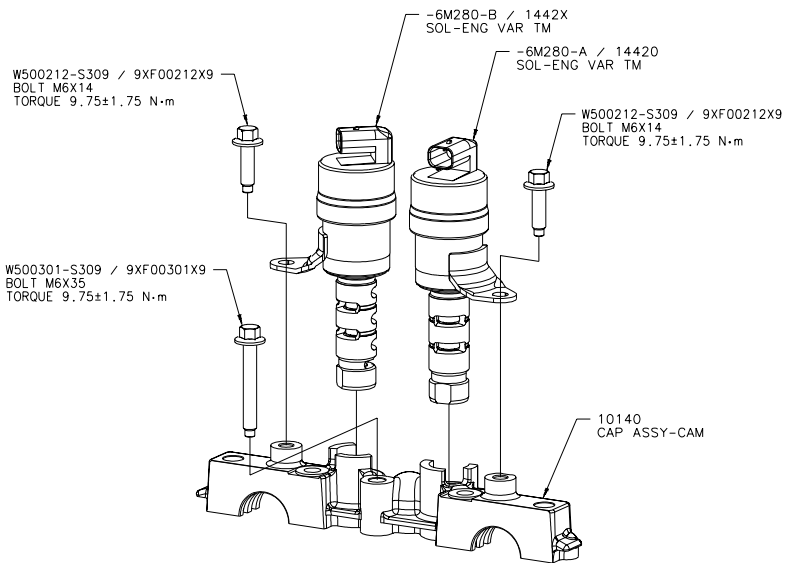
 DATE
01-03-28

 MODEL
2003 2.3L-4V NON DI

 SHEET
44-G

 CONTD.
44-H

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



1. TIGHTEN THE "BOLT M6X35".
2. ASSEMBLE THE "SOL-ENG VAR TM".
3. TIGHTEN THE "BOLT M6X14".

RESTRICTIONS

PART NAME/TITLE

SOL-ENG VAR TM

SPECIFICATION NO.
C1S7G-543-AC

REV
AH

RELEASE NO.
EN00E11190272000

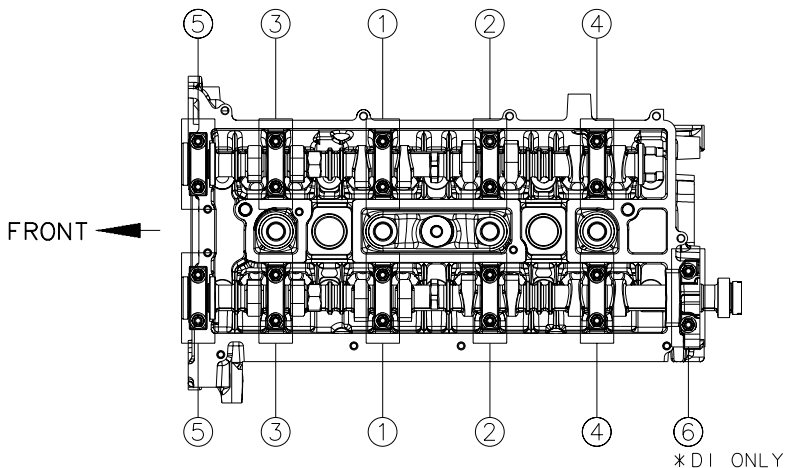
DATE
01-03-28

MODEL
2003 2.3L-4V NON DI

SHEET
44-H

CONTD.
45

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



MULTI-SPINDLE METHOD.

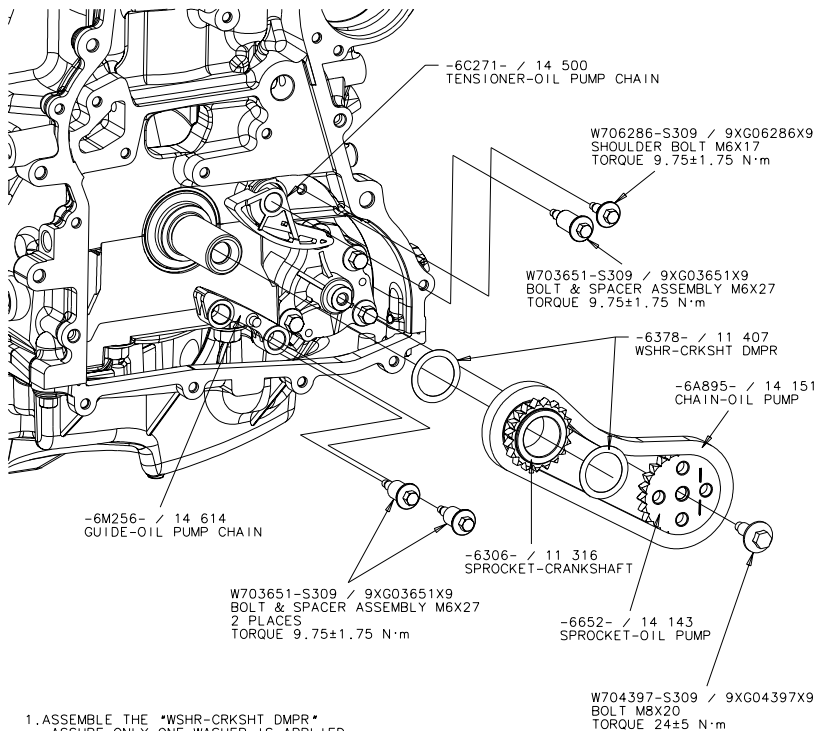
1. RUNDOWN ALL BOLTS SIMULTANEOUSLY TO 7 ± 2 Nm.
2. RUNDOWN ALL BOLTS SIMULTANEOUSLY TO 15.5 ± 1.5 Nm.

SINGLE WRENCH METHOD.

FOLLOW THE SAME RUNDOWN STEPS AS MULTI-SPINDLE METHOD,
BUT FOLLOW THE CAP SEQUENCE INDICATED IN THE SKETCH ABOVE.

RESTRICTIONS				PART NAME/TITLE			
				PROCEDURE - CAMCAP BOLT			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON DI CD132	45	45-D	

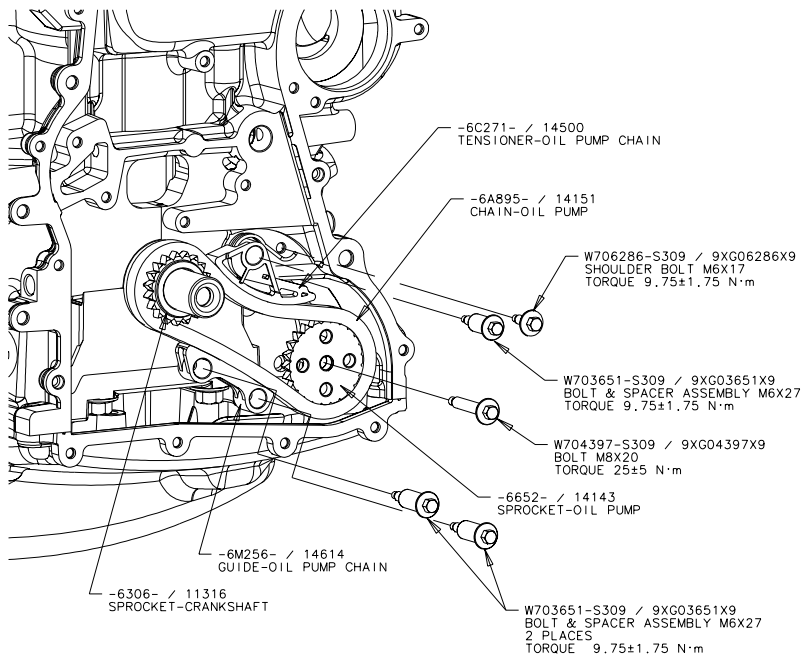
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



1. ASSEMBLE THE *WSHR-CRKSHT DMPR*
-ASSURE ONLY ONE WASHER IS APPLIED.
-DO NOT USE BENDED WASHER.
-DO NOT REUSE WASHER.
-WASHER CAN BE USED IN BOTH SIDES.
2. ASSEMBLE THE *CHAIN-OIL PUMP*, *SPROCKET-CRANKSHAFT* AND *SPROCKET-OIL PUMP* AT THE SAME TIME.
3. TIGHTEN THE BOLT-OIL PUMP SPROCKET(W704397-S309)
4. ASSEMBLE THE *GUIDE-OIL PUMP CHAIN* AND TIGHTEN THE BOLT
5. TIGHTEN THE *SHOULDER BOLT M6X17*.
6. ASSEMBLE THE *TENSIONER-OIL PUMP CHAIN* AND TIGHTEN THE BOLT.
7. ASSEMBLE THE *WSHR-CRKSHT DMPR*
-ASSURE ONLY ONE WASHER IS APPLIED.
-DO NOT USE BENDED WASHER.
-DO NOT REUSE WASHER.
-WASHER CAN BE USED IN BOTH SIDES.

RESTRICTIONS				PART NAME/TITLE			
				CHAIN-AUX OIL PUMP / SPROCKET-AUX OIL PUMP DRV			
SPECIFICATION NO. C1S7G-543-AC	REV AX	RELEASE NO. EN00 E 11183682 001	DATE 01-09-27	MODEL 2001 2.0L-4V NON DI CD132	SHEET 46	CONTD. 46-A	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



1. ASSEMBLE THE "CHAIN-OIL PUMP", "SPROCKET-CRANKSHAFT" AND "SPROCKET-OIL PUMP" AT THE SAME TIME.
2. TIGHTEN THE BOLT-OIL PUMP SPROCKET(W704397-S309)
3. ASSEMBLE THE "GUIDE-OIL PUMP CHAIN" AND TIGHTEN THE BOLT
4. TIGHTEN THE "SHOULDER BOLT M6X17".
5. ASSEMBLE THE "TENSIONER-OIL PUMP CHAIN" AND TIGHTEN THE BOLT.

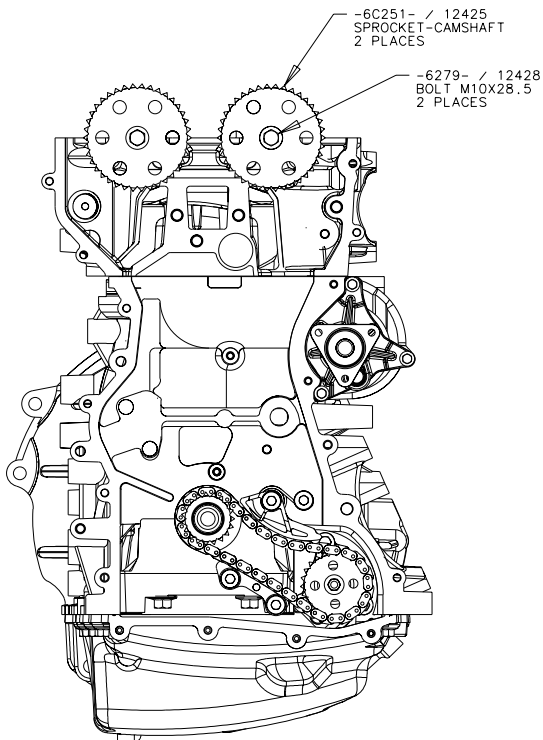
RESTRICTIONS

PART NAME/TITLE

CHAIN-AUX OIL PUMP / SPROCKET-AUX OIL PUMP DRV

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AX	EN00 E11183682 001	01-09-27	2003 2.3L-4V NON DI J56A/F	46-A	47

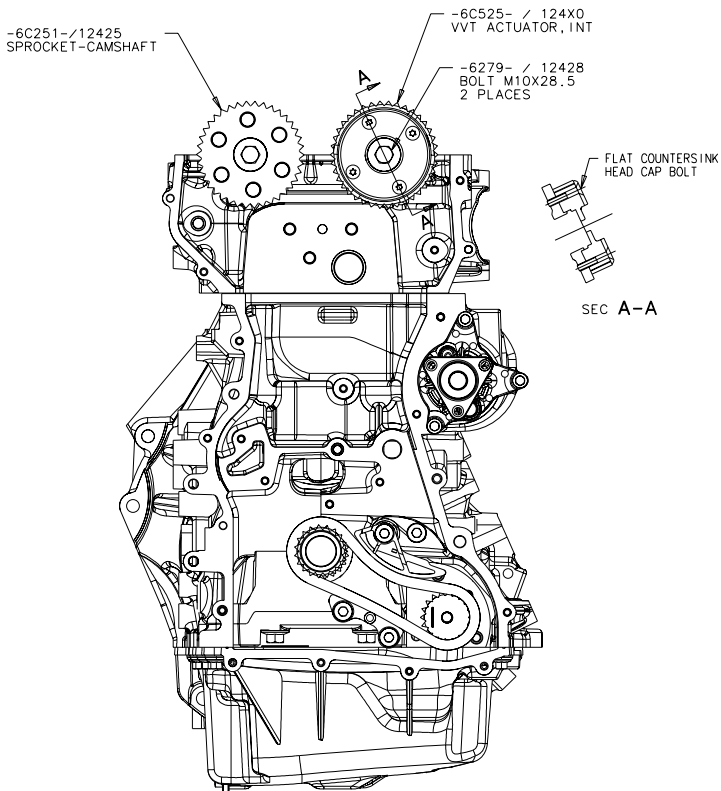
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



PUT *SPROCKET-CAMSHAFT* ON THE CAMSHAFTS.
ASSEMBLE CAMSHAFT BOLT.

RESTRICTIONS				PART NAME/TITLE			
				SPROCKET-CAMSHAFT			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AW	EN00E11114191001	01-09-11	2001 2.0L-4V NON DI CD132	47	47-E	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



PUT *SPROCKET-CAMSHAFT* AND *VVT ACTUATOR* ON THE CAMSHAFTS.
ASSEMBLE CAMSHAFT BOLT AND VVT BOLT.

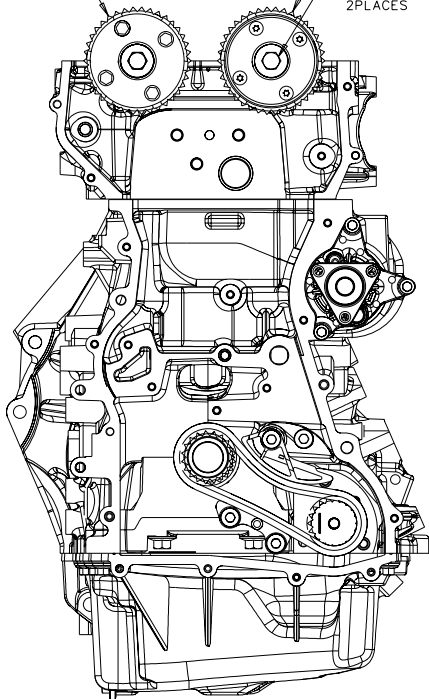
RESTRICTIONS				PART NAME/TITLE SPROCKET-CAMSHAFT			
SPECIFICATION NO. C1S7G-543-AC	REV AW	RELEASE NO. EN00E11114191001	DATE 01-09-11	MODEL 2003 2.3L-4V NON D1	SHEET 47-E	CONTD. 47-F	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

-6C524- / 12350
VVT ACTUATOR, EXH

-6C525- / 124X0
VVT ACTUATOR, INT

-6279- / 12428
BOLT M10X28.5
2PLACES



PUT *SPROCKET-CAMSHAFT* AND *VVT ACTUATOR* ON THE CAMSHAFTS.
ASSEMBLE CAMSHAFT BOLT.

RESTRICTIONS

PART NAME/TITLE

SPROCKET-CAMSHAFT

SPECIFICATION NO.
C1S7G-543-AC

REV
AW

RELEASE NO.
EN00E11114191001

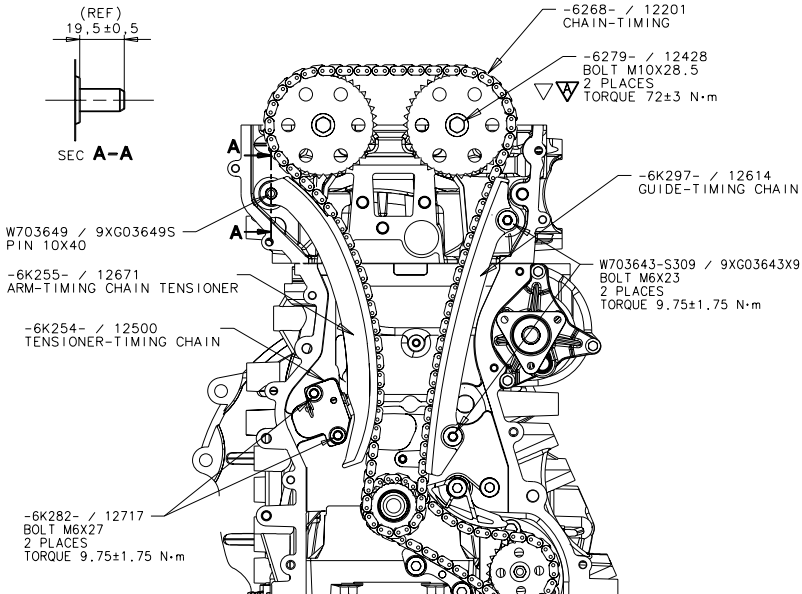
DATE
01-09-11

MODEL
2003 2.3L-4V NON DI

SHEET
47-F

CONTD.
48

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



1. ASSEMBLE THE CHAIN OVER *SPROCKET-CAMSHAFT* AND *SPROCKET-CRANKSHAFT* (NO TIMING MARK SPECIFIED).
2. ASSEMBLE THE *GUIDE-TIMING CHAIN* AND FASTEN TIGHTLY.
3. ASSEMBLE THE *ARM-TIMING CHAIN TENSIONER* IN THE PIVOT.
ASSEMBLE *TENSIONER-TIMING CHAIN* AND TIGHTEN THE BOLTS.
4. PULL THE PIN OF *TENSIONER-TIMING CHAIN*. THE CHAIN IS NOW IN TENSION.
5. ROTATE THE CAMSHAFTS BY HOLDING AT THE FLATS BETWEEN THE LOBES OF CYLINDER #1 AND CYLINDER #2 SO THAT THE SLOTS ON THE BACK END OF THE TWO CAM SHAFTS LINE UP.
6. INSERT SPECIAL TOOL IN THE BACK END SLOTS OF CAMSHAFTS TO SET THEM IN THE RIGHT POSITION.
7. HOLD THE *SPROCKET-CAMSHAFT* AND TIGHTEN THE CAM SPROCKET BOLTS.
CAUTION; DO NOT GIVE ROTATIONAL TORQUE TO THE SPECIAL TOOL THROUGH THE BACK END SLOTS OF CAMSHAFT.

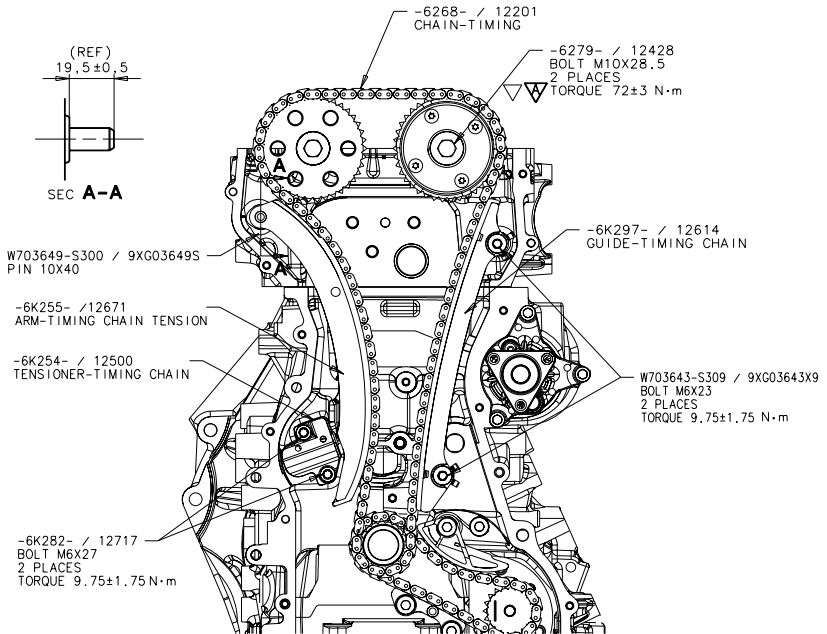
RESTRICTIONS

PART NAME/TITLE

CHAIN-TIMING / GUIDE-TIMING CHAIN

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AX	EN00E11183682001	01-09-27	2001 2.0L-4V NON DI CD132	48	48-E

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



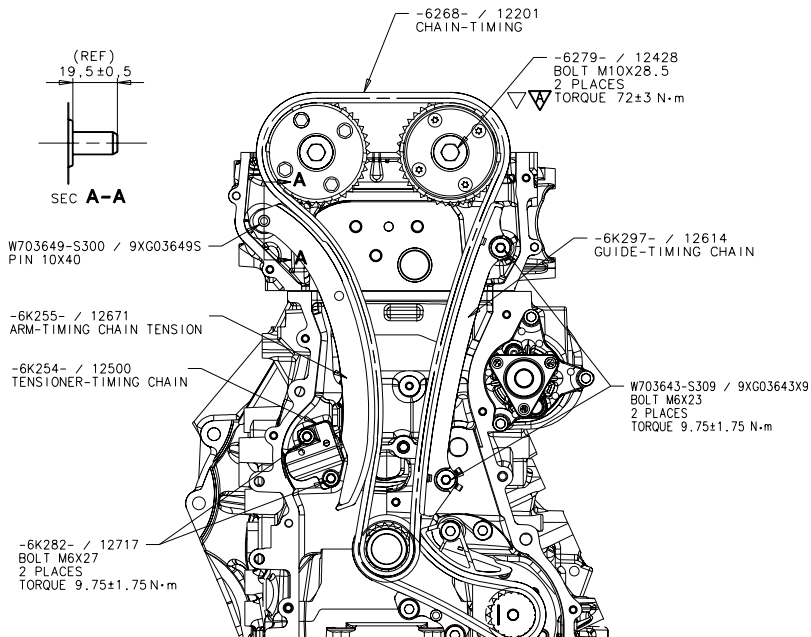
1. ASSEMBLE THE CHAIN OVER *SPROCKET-CAMSHAFT*, *VVT ACTUATOR* AND *SPROCKET-CRANKSHAFT* (NO TIMING MARK SPECIFIED).
2. ASSEMBLE THE *GUIDE-TIMING CHAIN* AND FASTEN TIGHTLY.
3. ASSEMBLE THE *ARM-TIMING CHAIN TENSIONER* IN THE PIVOT.
ASSEMBLE *TENSIONER-TIMING CHAIN* AND TIGHTEN THE BOLTS.
4. PULL THE PIN OF *TENSIONER-TIMING CHAIN*. THE CHAIN IS NOW IN TENSION.
5. ROTATE THE CAMSHAFTS BY HOLDING AT THE FLATS BETWEEN THE LOBES OF CYLINDER #1 AND CYLINDER #2 SO THAT THE SLOTS ON THE BACK END OF THE TWO CAM SHAFTS LINE UP.
6. INSERT SPECIAL TOOL IN THE BACK END SLOTS OF CAMSHAFTS TO SET THEM IN THE RIGHT POSITION.
7. HOLD THE *SPROCKET-CAMSHAFT* AND TIGHTEN THE CAM SPROCKET BOLTS.
CAUTION; DO NOT GIVE ROTATIONAL TORQUE TO THE SPECIAL TOOL THROUGH THE BACK END SLOTS OF CAMSHAFT.

RESTRICTIONS

PART NAME/TITLE
CHAIN-TIMING / GUIDE-TIMING CHAIN

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AX	EN00E11183682001	01-09-27	2003 2.3L-4V NON DI	48-E	48-F

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



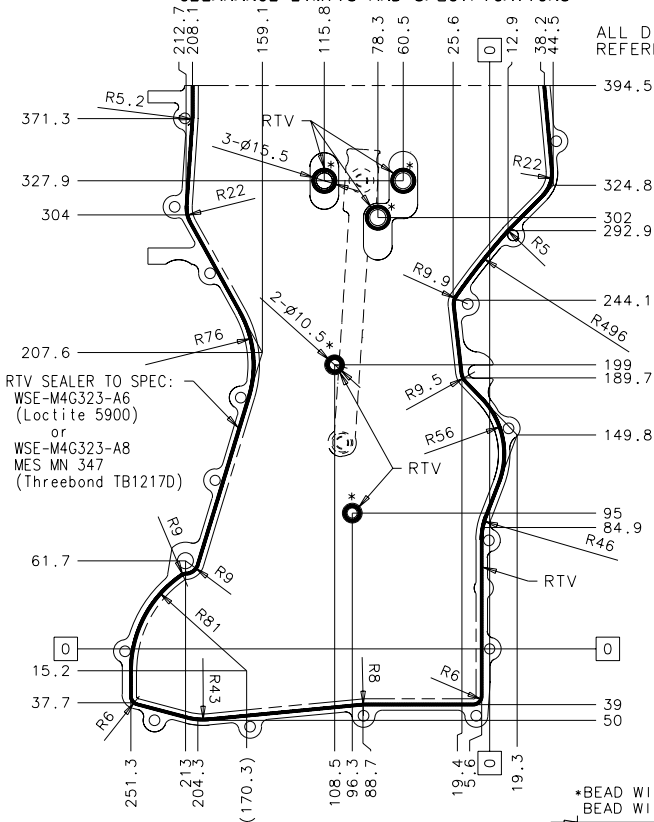
1. ASSEMBLE THE CHAIN OVER *VVT ACTUATOR INT*, *VVT ACTUATOR EXH* AND *SPROCKET-CRANKSHAFT* (NO TIMING MARK SPECIFIED).
2. ASSEMBLE THE *GUIDE-TIMING CHAIN* AND FASTEN TIGHTLY.
3. ASSEMBLE THE *ARM-TIMING CHAIN TENSIONER* IN THE PIVOT.
ASSEMBLE *TENSIONER-TIMING CHAIN* AND TIGHTEN THE BOLTS.
4. PULL THE PIN OF *TENSIONER-TIMING CHAIN*. THE CHAIN IS NOW IN TENSION.
5. ROTATE THE CAMSHAFTS BY HOLDING AT THE FLATS BETWEEN THE LOBES OF CYLINDER #1 AND CYLINDER #2 SO THAT THE SLOTS ON THE BACK END OF THE TWO CAM SHAFTS LINE UP.
6. INSERT SPECIAL TOOL IN THE BACK END SLOTS OF CAMSHAFTS TO SET THEM IN THE RIGHT POSITION.
7. HOLD THE *VVT ACTUATOR* AND TIGHTEN THE VVT SPROCKET BOLTS.
CAUTION; DO NOT GIVE ROTATIONAL TORQUE TO THE SPECIAL TOOL THROUGH THE BACK END SLOTS OF CAMSHAFT.

RESTRICTIONS				PART NAME/TITLE			
				CHAIN-TIMING / GUIDE-TIMING CHAIN			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AX	EN00E11183682001	01-09-27	2003 2.3L-4V VVT / BS	48-F	49-A	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

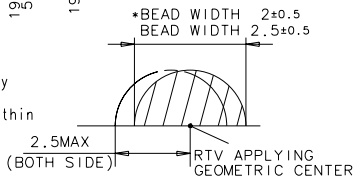
CLEARANCE LIMITS AND SPECIFICATIONS

ALL DIMENSION ARE REFERENCE.



NOTES

- 1.No sticking of stain, dust, etc is allowed on RTV apply surface of cylinder block.
- 2.After applying RTV, complete assembling Front cover within 10 min, and then complete tightening all bolts within further 5 min.(within 15 min in total.)



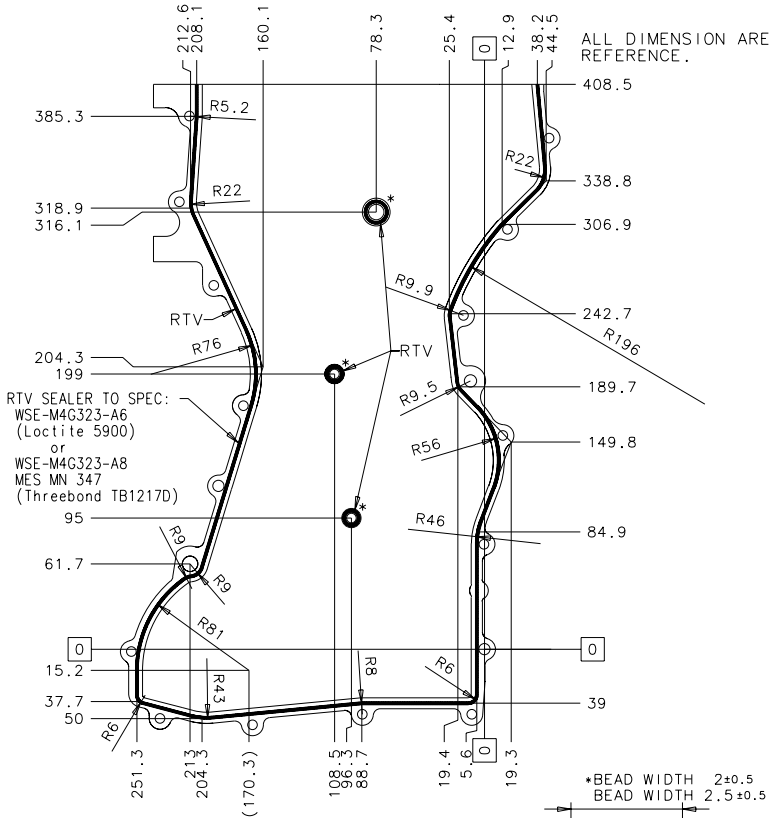
RESTRICTIONS

PART NAME/TITLE

RTV SEALER-FRONT COVER

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BG	EN00E11282537000	01-11-09	2001 2.0L-4V NON D1 CD132	49-A	49-B

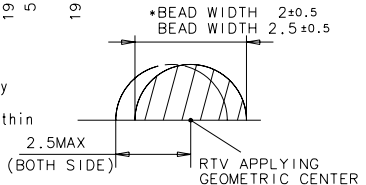
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



RTV SEALER TO SPEC:
WSE-M4G323-A6
(Loctite 5900)
or
WSE-M4G323-A8
MES MN 347
(Threebond TB1217D)

NOTES

- 1.No sticking of stain, dust, etc is allowed on RTV apply surface of cylinder block.
- 2.After applying RTV, complete assembling Front cover within 10 min, and then complete tightening all bolts within further 5 min.(within 15 min in total.)



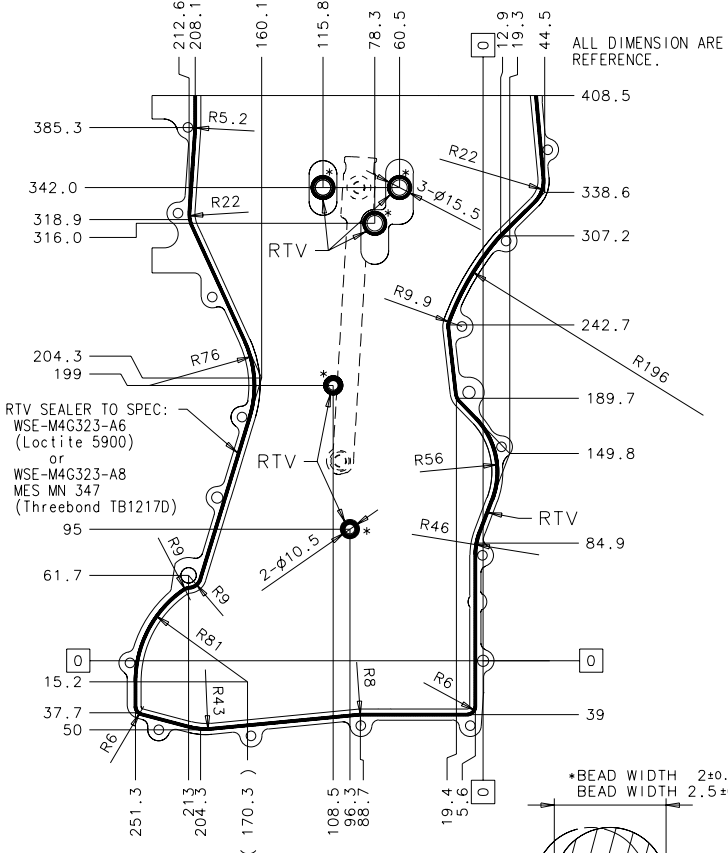
RESTRICTIONS

PART NAME/TITLE

RTV SEALER-FRONT COVER

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BG	EN00E11282537000	01-11-09	2001 2.3L-4V NON DI RANGER	49-B	49-E

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

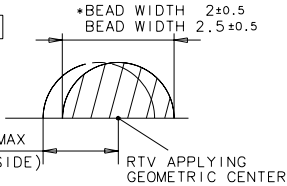


ALL DIMENSION ARE REFERENCE.

RTV SEALER TO SPEC:
WSE-M4G323-A6
(Loctite 5900)
or
WSE-M4G323-A8
MES MN 347
(Threebond TB1217D)

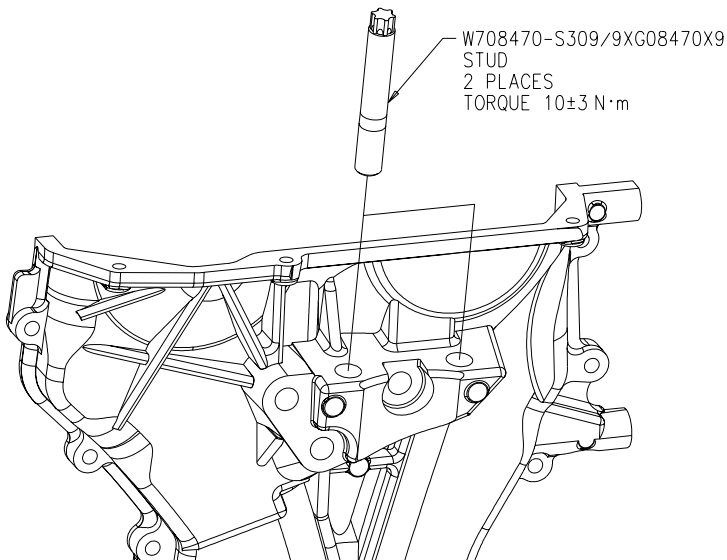
NOTES

- 1.No sticking of stain, dust, etc is allowed on RTV apply surface of cylinder block.
- 2.After applying RTV, complete assembling Front cover within 2.5MAX 10 min, and then complete tightening all bolts within further 5 min.(within 15 min in total.)



RESTRICTIONS				PART NAME/TITLE RTV SEALER-FRONT COVER			
SPECIFICATION NO. C1S7G-543-AC	REV BG	RELEASE NO. EN00E11282537000	DATE 01-11-09	MODEL 2002 2.3L-4V NON DI J56J	SHEET 49-E	CONTD. 50	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



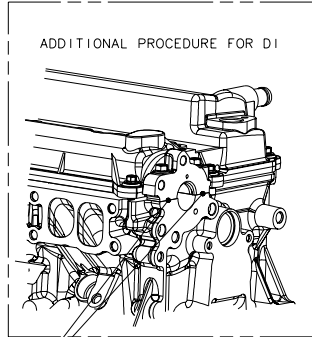
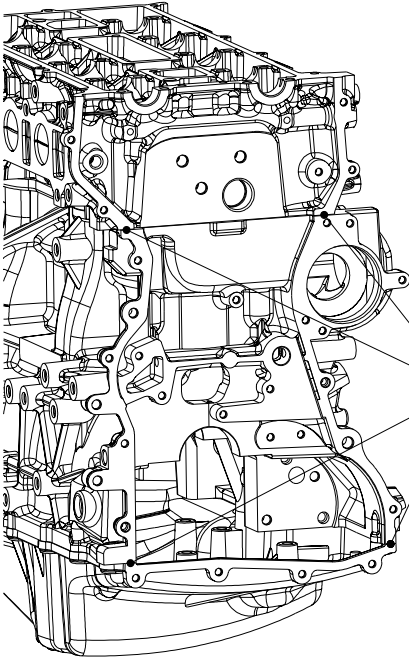
RESTRICTIONS

PART NAME/TITLE

STUD-ENGINE MOUNT

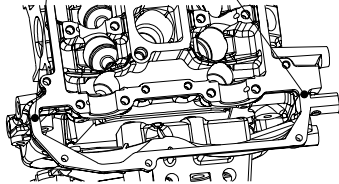
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BG	EN00E11282537000	01-11-09	2001 2.0L-4V NON DI CD132	50	50-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



ADDITIONAL PROCEDURE FOR D1

EXPOSED SURFACE :
ENSURE THAT EXCESS RTV MATERIAL
IS REMOVED FROM "T-JOINT"
PRIOR TO SEALING THE JOINT LATER
IN THE PROCESS.

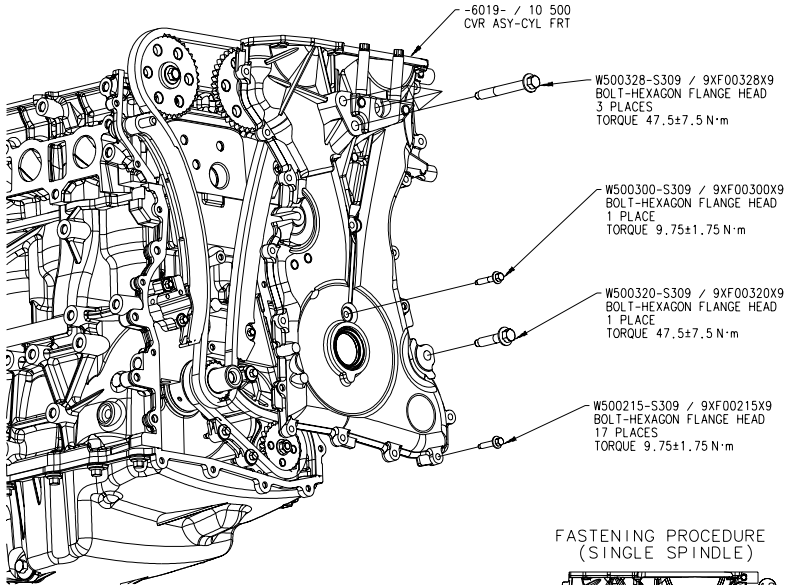


RESTRICTIONS

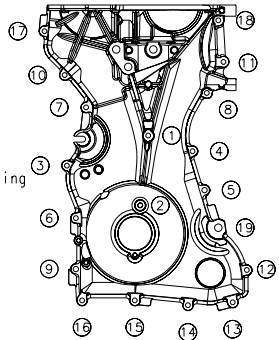
PART NAME/TITLE
EXCESS RTV REMOVING

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON D1 CD132	51	52-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



FASTENING PROCEDURE (SINGLE SPINDLE)



NOTES

1. No sticking of stain, dust, etc is allowed on front cover sealing surface of cylinder block, cylinder head, front cover.
2. If parts have scratch on seal face of front cover assembly, which might give negative effect on sealability, those have to be replaced with good part.

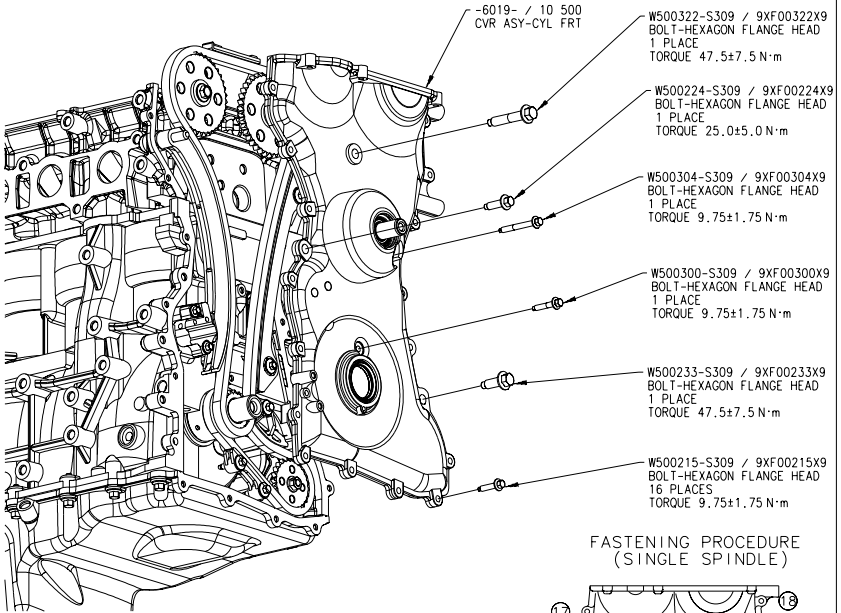
RESTRICTIONS

PART NAME/TITLE

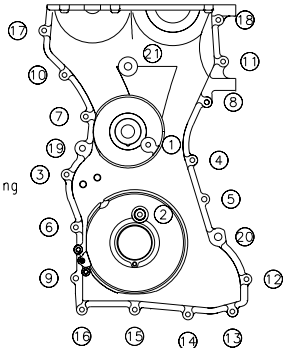
COVER ASY-CYL FRONT

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	R	EN00E11069681001	00-04-20	2001 2.0L-4V NON DI CD132	52-A	52-B

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



FASTENING PROCEDURE (SINGLE SPINDLE)



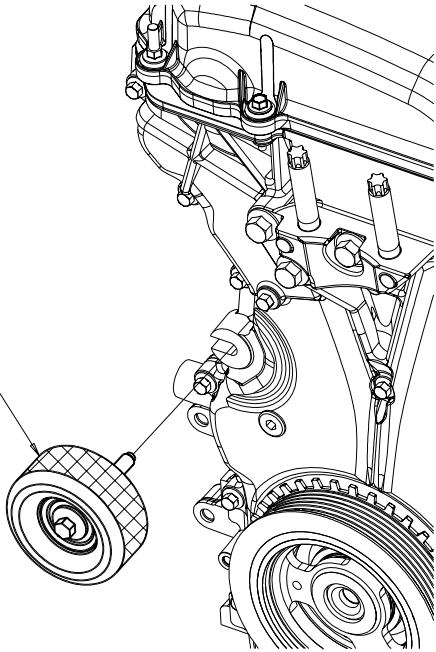
NOTES

1. No sticking of stain, dust, etc is allowed on front cover sealing surface of cylinder block, cylinder head, front cover.
2. If parts have scratch on seal face of front cover assembly, which might give negative effect on sealability, those have to be replaced with good part.

RESTRICTIONS				PART NAME/TITLE COVER ASY-CYL FRONT			
SPECIFICATION NO. C1S7G-543-AC	REV R	RELEASE NO. EN00E11069681001	DATE 00-04-20	MODEL 2001 2.3L-4V NON DI RANGER	SHEET 52-B	CONTD. 52-E	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

-19A216- / 15 940
IDL ASY-ACC DRV BEL
TORQUE 25±5 N·m



NOTES

1. ENSURE THERE IS NOT ANY GREASE, OIL OR FOREIGN MATTER ON THE HATCHED AREA BEFORE SHIPMENT.
2. DAMAGED PULLEY MUST NOT BE ASSEMBLED.
3. THE PULLEY MUST NOT CONTACT ANY OTHER PARTS OF THE ENGINE DURING ROTATION.

RESTRICTIONS

PART NAME/TITLE

IDLER ASY-ACC DR BELT

SPECIFICATION NO.
C1S7G-543-AC

REV
H

RELEASE NO.
EN00E11007392000

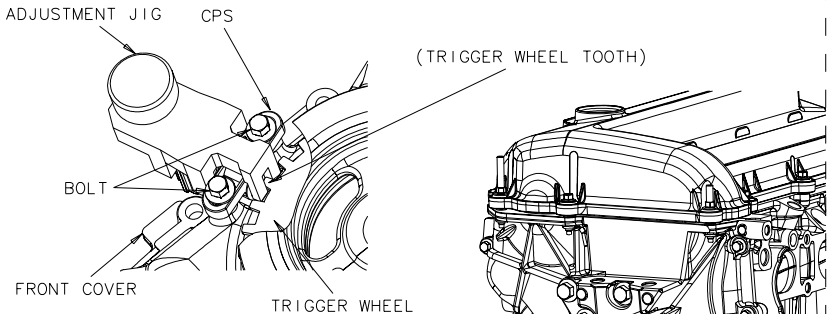
DATE
'99-09-06

MODEL
2001 2.0L-4V NON DI CD132

SHEET
52-E

CONTD.
53-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



CPS ASSEMBLY PROCEDURE

1. SET THE CRANK ANGLE SO THAT CYL. #1 IS SET TO THE 'TDC' POSITION.
2. ASSEMBLE CPS INTO ADJUSTMENT JIG.
3. LOCATE JIG WITH CPS TOGETHER OVER TRIGGER WHEEL TOOTH. (AS IN PICTURE)
4. ASSEMBLE 2 BOLTS. (HAND START)
- KEEPING THE JIG LOCATED ON THE TOOTH.
5. RUN DOWN 2 BOLTS TO FINAL TORQUE
- KEEPING THE JIG LOCATED ON TOOTH.
6. REMOVE JIG.

W701219-S309 / 9XG01219X9
BOLT FLNG HEAD M6X16
2 PLACES
TORQUE 6.5±1 N·m

-6C315- / 18 221
SENSOR-CRANKSHAFT POSITION(CPS)

NOTE:

INSTALLATION OF CPS : ORIENTATE THE SENSOR SO THAT THE ELECTRICAL TERMINALS ARE POINTING AT THE REAR.

RESTRICTIONS

PART NAME/TITLE

SENSOR-CRANKSHAFT POSITION

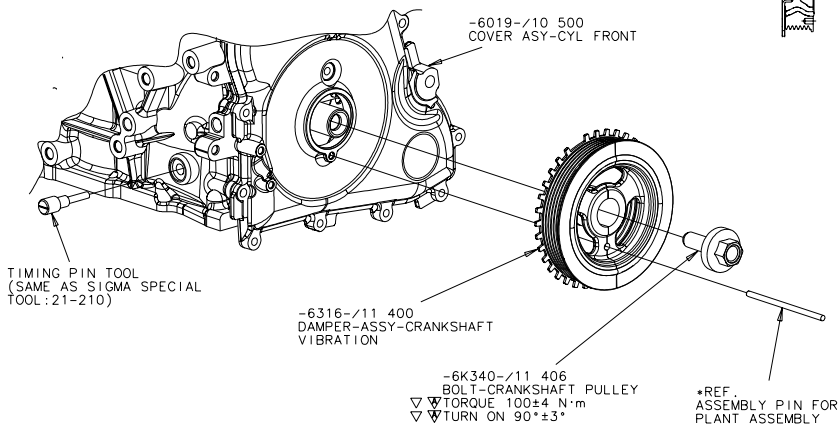
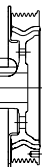
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON DI CD132	54	55

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

PROCEDURE

- INSERT T.D.C. PIN INTO BLOCK(TIMING PIN DETAIL;56)
- TURN CRANKSHAFT TO T.D.C:UNTIL THE CRANKSHAFT LOCATION PAD TOUCHES THE PIN.
- TURN CRANK DAMPER PULLEY UNTIL ALIGN THE TIMING HOLE BETWEEN DAMPER PULLEY AND FRONT COVER.
- INSERT ASSEMBLY PIN INTO DAMPER PULLEY LOCATION HOLE.
- INSERT SPECIAL TOOL IN THE BACK END SLOTS OF CAMSHAFTS TO SET THEN IN THE RIGHT POSITION.
- THEN CLAMP THE DAMPER PULLEY AND RUNDOWN PULLEY LOCK BOLT TO SPECIFIED TORQUE.
- REMOVE TIMING PEG AND UN-LOCK CAMSHAFTS,CRANKSHAFT.

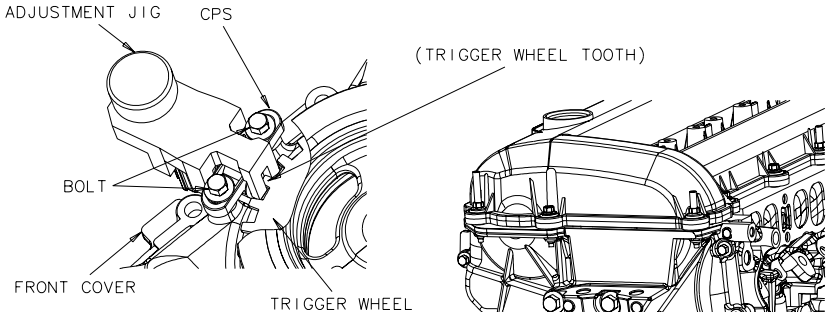
ADD FACTORY FILL
ENGINE OIL ON PULLEY
SEALING SURFACE,
PRIOR TO INSTALL
ON TO CRANKSHAFT.



NOTE :- DO NOT REUSE DAMPER BOLT.

RESTRICTIONS				PART NAME/TITLE			
				PULLEY/DAMPER-CRANKSHAFT			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AN	EN00 E 11208966 001	01-06-08	2001 2.0L-4V NON DI CD132	55	56-C	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



CPS ASSEMBLY PROCEDURE

1. SET THE CRANK ANGLE SO THAT CYL.#1 IS SET TO THE 'TDC' POSITION.
2. ASSEMBLE CPS INTO ADJUSTMENT JIG.
3. LOCATE JIG WITH CPS TOGETHER OVER TRIGGER WHEEL TOOTH. (AS IN PICTURE)
4. ASSEMBLE 2 BOLTS. (HAND START)
- KEEPING THE JIG LOCATED ON THE TOOTH.
5. RUN DOWN 2 BOLTS TO FINAL TORQUE
- KEEPING THE JIG LOCATED ON TOOTH.
6. REMOVE JIG.

W701219-S309 / 9XG01219X9
BOLT FLNG HEAD M6X16
2 PLACES
TORQUE 6.5±1 N·m

-6C315- / 18 221
SENSOR-CRANKSHAFT POSITION(CPS)

NOTE :

INSTALLATION OF CPS : ORIENTATE THE SENSOR SO THAT THE ELECTRICAL TERMINALS ARE POINTING AT THE REAR.

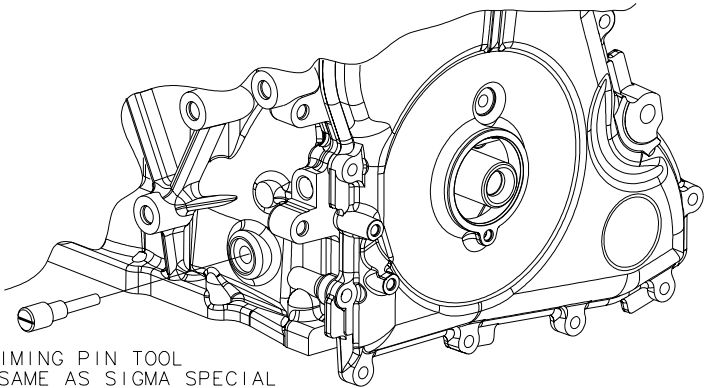
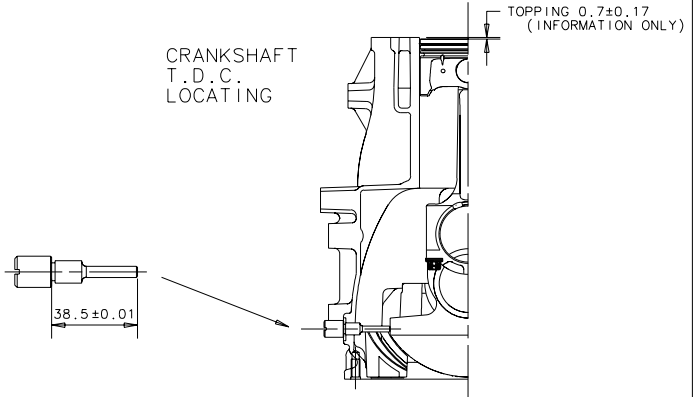
RESTRICTIONS

PART NAME/TITLE

SENSOR-CRANKSHAFT POSITION

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	R	EN00E11069681001	00-04-20	2002 1.8L-4V DI C0132	56-C	57

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



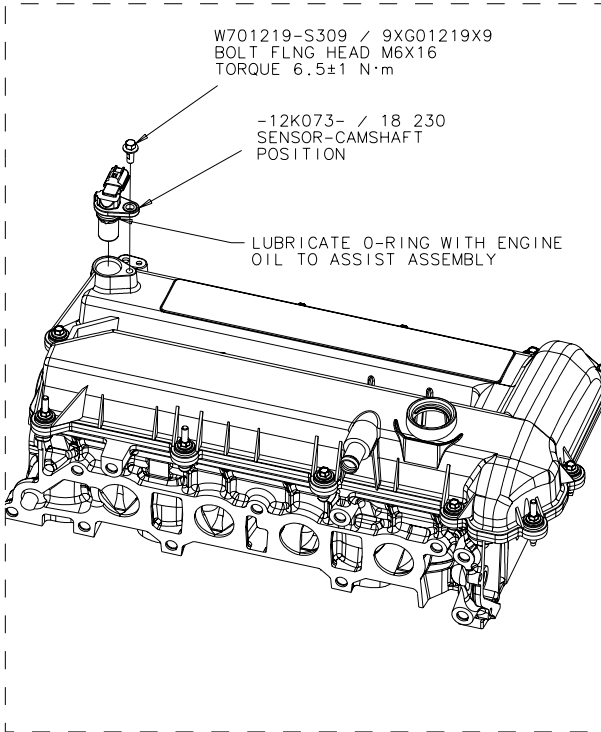
TIMING PIN TOOL
(SAME AS SIGMA SPECIAL
TOOL : 21-210)

RESTRICTIONS

PART NAME/TITLE
SPROCKET-CRANKSHAFT & TIMING PLATE

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AE	EN00 E 11157486 001	01-01-31	2001 2.0L-4V NON D1 CD132	57	58

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



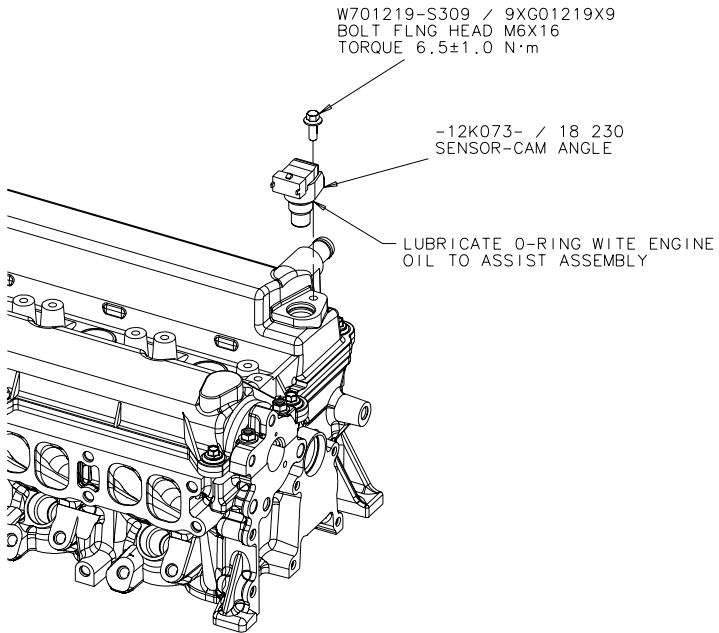
RESTRICTIONS

PART NAME/TITLE

SENSOR-CAMSHAFT POSITION

SPECIFICATION NO.
C1S7G-543-ACREV
HRELEASE NO.
EN00E11007392000DATE
99-09-06MODEL
2001 2.0L-4V NON DI CD132SHEET
58CONTD.
58-C

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS

PART NAME/TITLE

SENSOR-CAM ANGLE

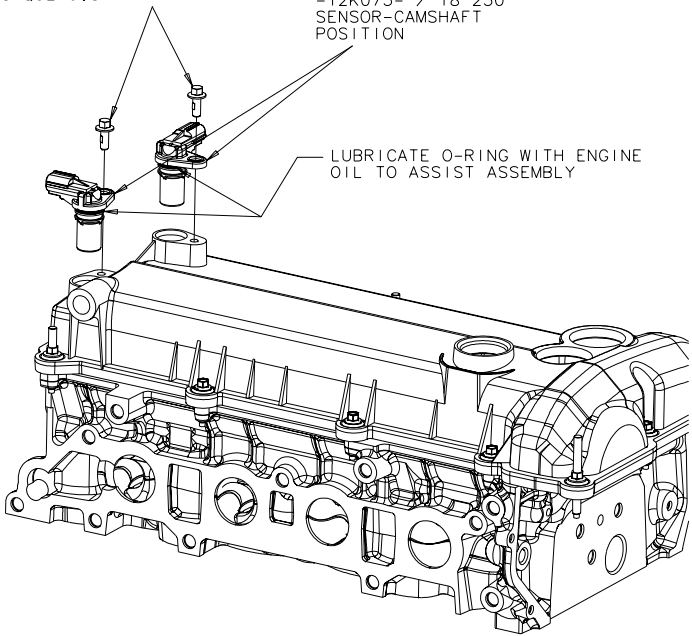
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2002 1.8L-4V DI CD132	58-C	58-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

W701219-S309 / 9XG01219X9
BOLT FLNG HEAD M6X16
TORQUE 6.5 ± 1 N·m

-12K073- / 18 230
SENSOR-CAMSHAFT
POSITION

LUBRICATE O-RING WITH ENGINE
OIL TO ASSIST ASSEMBLY



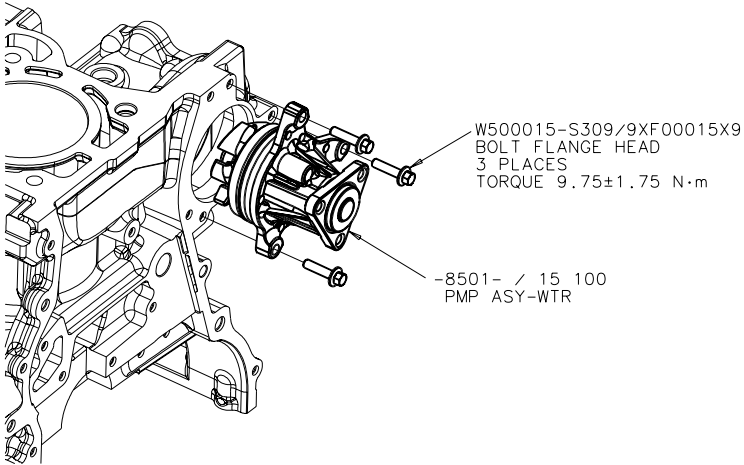
RESTRICTIONS

PART NAME/TITLE

SENSOR-CAMSHAFT POSITION

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AH	EN00E11190272000	01-03-28	2003 2.3L-4V NON DI & DI	58-E	59

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



NOTES

1. COMPATIBLE WITH "SEALUB S-4"-NOK OR "ESE-M99B144-A" "ESE-M99B144-B" -Merpol TO BE APPLIED TO O_RING BEFORE PUMP ASSEMBLY. MINERAL LUBE(ENGINE OIL,A/T FLUID,GASOLINE etc.)MUST NOT BE USED.
2. STAINS,OILS,FOREIGN MATTER etc.MUST NOT BE VISUALLY PRESENT ON SEAL AREAS OF BLOCK AND PUMP.
3. ASSEMBLE THE PUMP TO BLOCK SQUARELY TO AVOID O_RING DISTORTION.
4. THE PUMP O_RING MUST BE FITTED TO PUMP GROOVE BEFORE ASSEMBLY.
5. DO NOT ASSEMBLE PARTS THAT HAVE DAMAGE.

RESTRICTIONS

PART NAME/TITLE

WATER PUMP & GASKET

SPECIFICATION NO.
C1S7G-543-AC

REV
T

RELEASE NO.
EN00E11095813000

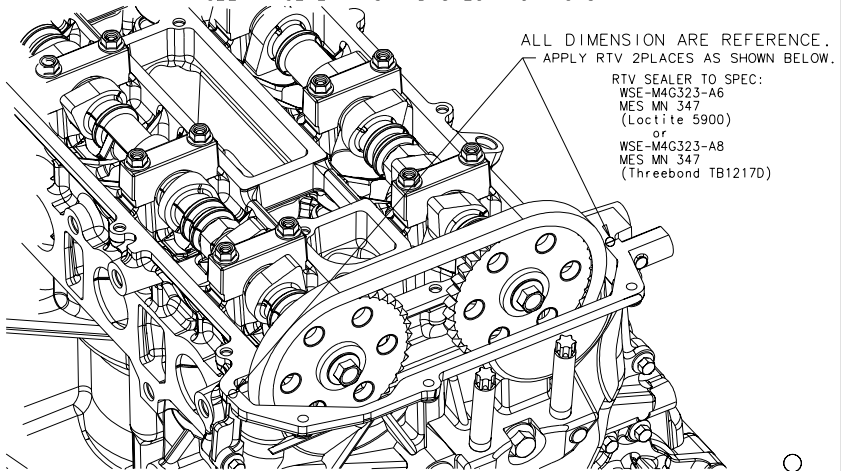
DATE
'00-06-30

MODEL
2001 2.0L-4V NON DI CD132
2001 2.3L-4V NON DI RANGER

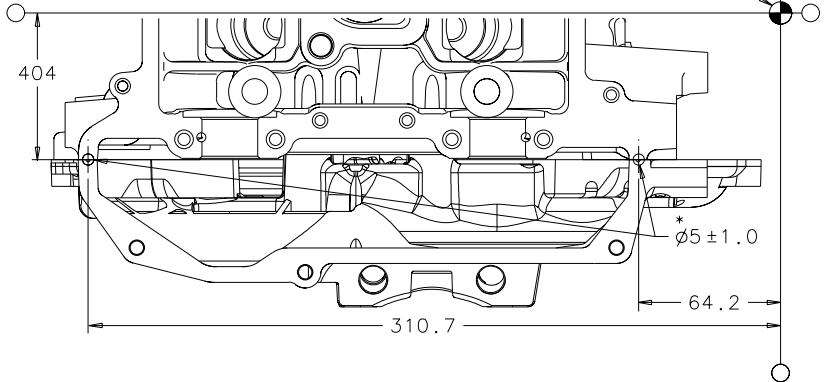
SHEET
59

CONTD.
60

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



0 POINT OF CYL. BLOCK



NOTES

1. After applying RTV, complete assembling camshaft cover and cylinder head within 10 min and then complete tightening all bolts within further 5 min. (within 15 min in total.)

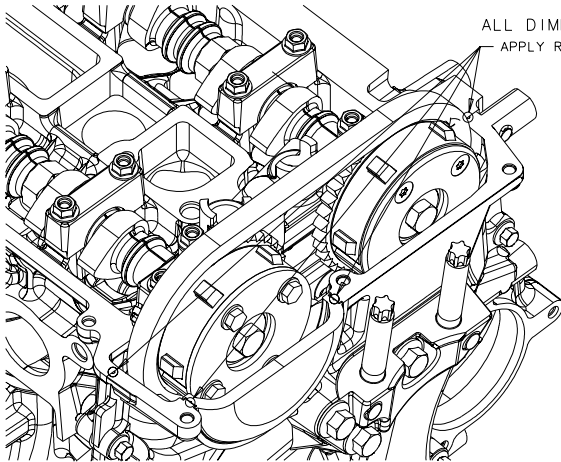
RESTRICTIONS

PART NAME/TITLE

RTV SEALER - CAM COVER

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AA	EN00E11087761000	00-11-17	2001 2.0L-4V NON D1 CD132	60	60-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



ALL DIMENSION ARE REFERENCE.

APPLY RTV 4PLACES AS SHOWN BELOW.

RTV SEALER TO SPEC:

WSE-M4G323-A6

MES MN 347

(Loctite 5900)

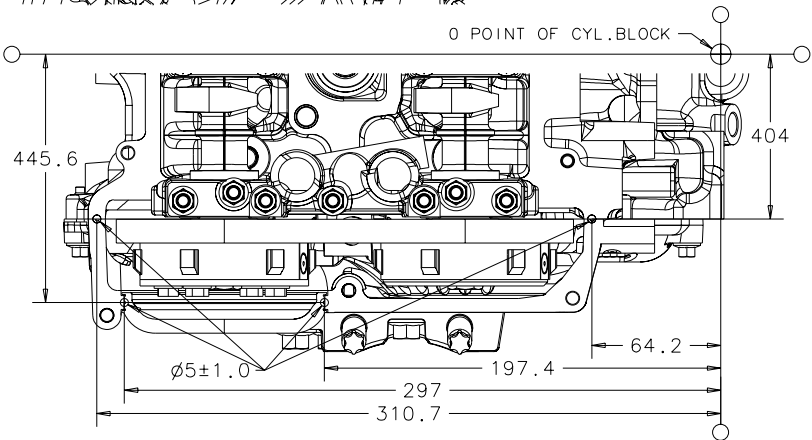
or

WSE-M4G323-A8

MES MN 347

(Threebond TB1217D)

0 POINT OF CYL.BLOCK

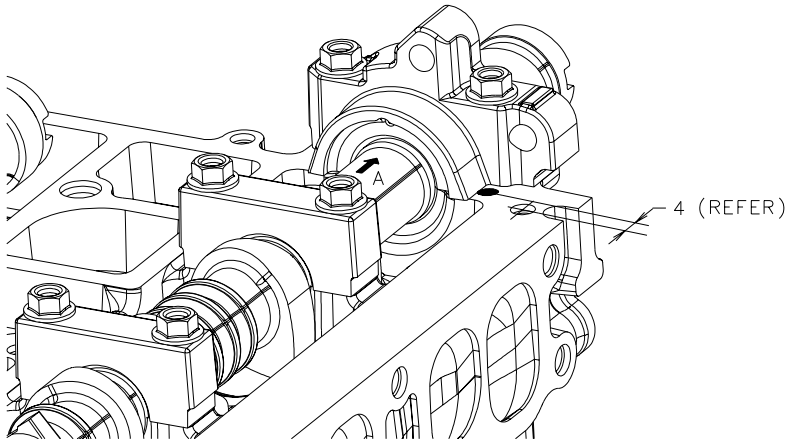


NOTES

- After applying RTV, complete assembling camshaft cover and cylinder head within 10 min and then complete tightening all bolts within further 5 min. (within 15 min in total.)

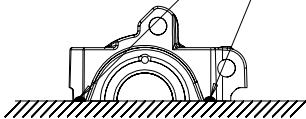
RESTRICTIONS				PART NAME/TITLE			
				RTV SEALER - CAM COVER			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	AA	EN00E11087761000	00-11-17	2003 2.3L-4V DUAL-WT U204	60-A	60-C	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



RTV SEALER TO SPEC:
WSE-M4G323-A6/MES MN 347
(LOCTITE 5900) OR
WSE-M4G323-A8/MES MN 347
(THREEBOND TB1217D)
2 PLACES AS SHOWN BELOW

ø5 (REFER)



HEAD

VIEW A

JOINT CLOSURE TIME 10 MINUTES.
FIXING TO BE TORQUED WITHIN A FURTHER
5 MINUTES (within 15 min in total).

RESTRICTIONS

SPECIFICATION NO.
C1S7G-543-AC

REV
U

RELEASE NO.
EN00E11085584000

DATE
00-07-11

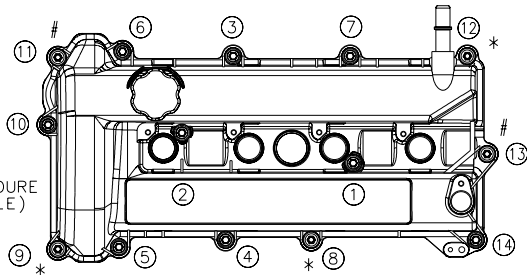
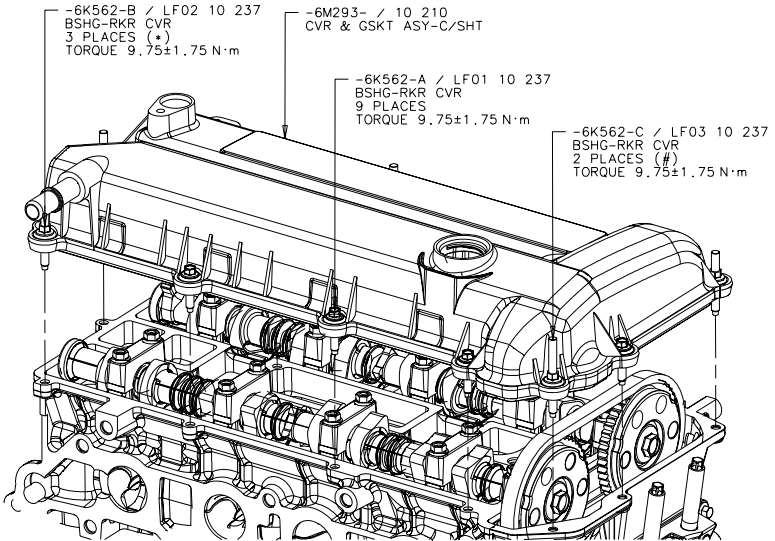
MODEL
2002 2.0L-4V DI CD132

SHEET
60-C

CONTD.
61-A

PART NAME/TITLE
CAM COVER & GASKET ASSEMBLY

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



FASTENING PROCEDURE
(SINGLE SPINDLE)

NOTES

- 1.No sticking of stain, dust, etc is allowed on camshaft cover sealing surface of cylinder head and camshaft cover.
- 2.If parts have scratch on seal face of camshaft cover assembly, which might give negative effect on sealability, those have to be replaced with good part.

RESTRICTIONS

PART NAME/TITLE

CAM COVER & GASKET ASSEMBLY

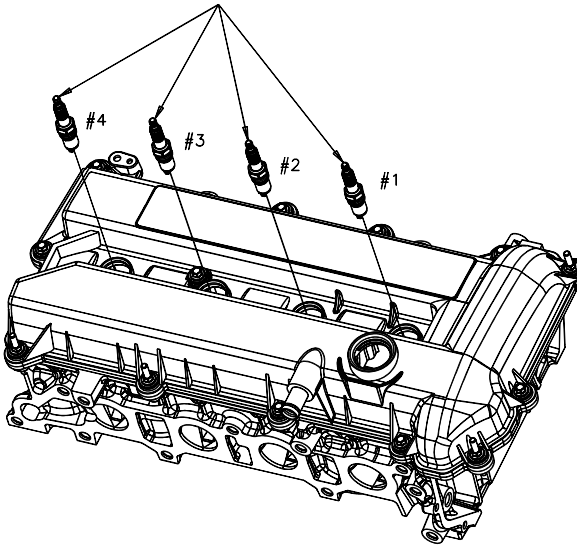
SPECIFICATION NO. C1S7G-543-AC	REV BM	RELEASE NO. EN00E11247483004	DATE 01-12-07	MODEL 2003 2.3L-4V NON DI C170	SHEET 61-F	CONTD. 61-G
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ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

(*) EXCEPT J56A/F/J, J16L, C1

ENG.	PLUG TYPE	ID. COLOR	QUANTITY
1.8/2.0L EW (*)	PTR6F-13	GREEN	4
2.3L NS	PTR5F-11	WHITE	4
2.3L EW (*)	PTR6F-11	YELLOW	4
1.8L DI EW	HGR 7 HQPE0	BLUE	4
PZEV, J56A/F/J, J16L, C1	ITR 6F-13	PINK	4

-12405- / 18 110
SPARK PLUG
TORQUE 12±2 N·m



RESTRICTIONS

 PART NAME/TITLE
 SPARK PLUG

 SPECIFICATION NO.
 C1S7G-543-AC

 REV
 BL

 RELEASE NO.
 EN00E11271652000

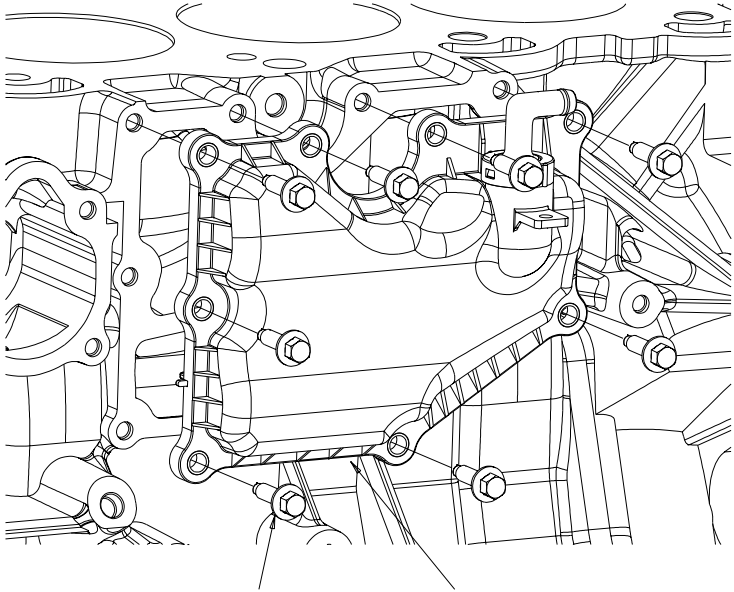
 DATE
 01-11-15

 MODEL
 2001 2.0L-4V NON DI

 SHEET
 62-A

 CONTD.
 62-B

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



W500214/9XF00214

BOLT M6

8 PLACES

TORQUE $9.75 \pm 1.75 \text{ N}\cdot\text{m}$

-6A785-/13 570

CRANKCASE VENTILATION COVER ASY

NOTES

1. DO NOT ASSEMBLE PARTS WHERE THERE ARE SCRATCHES OR FOREIGN MATTER WHICH WILL AFFECT SEALABILITY. (INCLUDING CYLINDER BLOCK)
2. THE GASKET MUST BE FITTED TO SEAL GROOVE BEFORE ASSEMBLY.
3. DO NOT ASSEMBLE PARTS THAT HAVE DAMAGE.

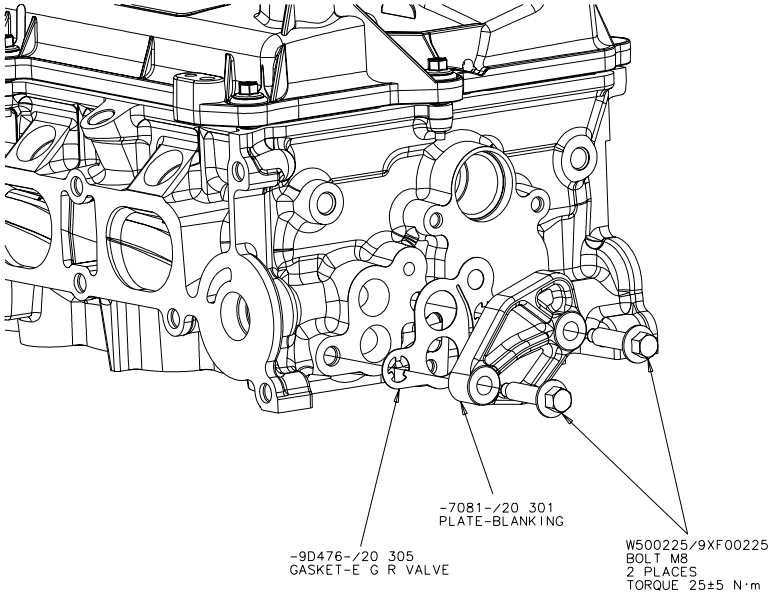
RESTRICTIONS

PART NAME/TITLE

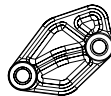
CRANKCASE VENTILATION COVER

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
CIS7G-543-AC	BL	EN00E11271652000	01-11-15	2001 2.0L-4V NON DI CD132	64	65-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



DIRECTION UPWARD



FOR GASHOL/LEADED, ONLY

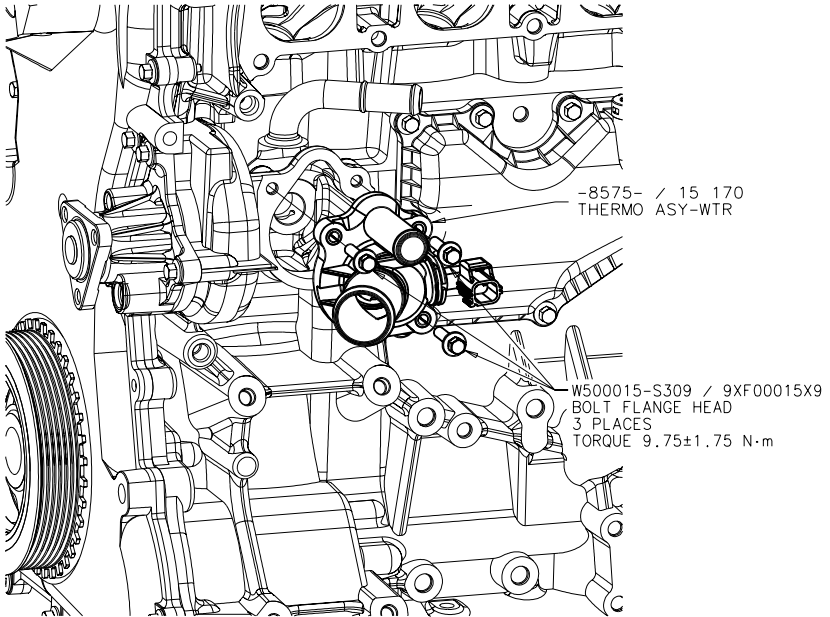
RESTRICTIONS

PART NAME/TITLE

EGR BLANKING PLATE

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	N	EN00E11030674000	00-02-10	2001 2.0L-4V NON DI CD132	67-B	67-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS



NOTES

1. DO NOT ASSEMBLE PARTS WHERE THERE IS GREASE/OIL/FOREIGN MATTER ON THE SEAL SURFACES OF THERMOSTAT OR BLOCK.
2. A THERMOSTAT THAT HAS BEEN DROPPED OR MIS HANDLED MUST NOT BE ASSEMBLED IRRESPECTIVE OF ITS VISUAL APPEARANCE.
3. THE O-RING MUST BE CORRECTLY SEALED IN THE THERMOSTAT BEFORE ASSEMBLY.

RESTRICTIONS

PART NAME/TITLE
THERMOSTAT

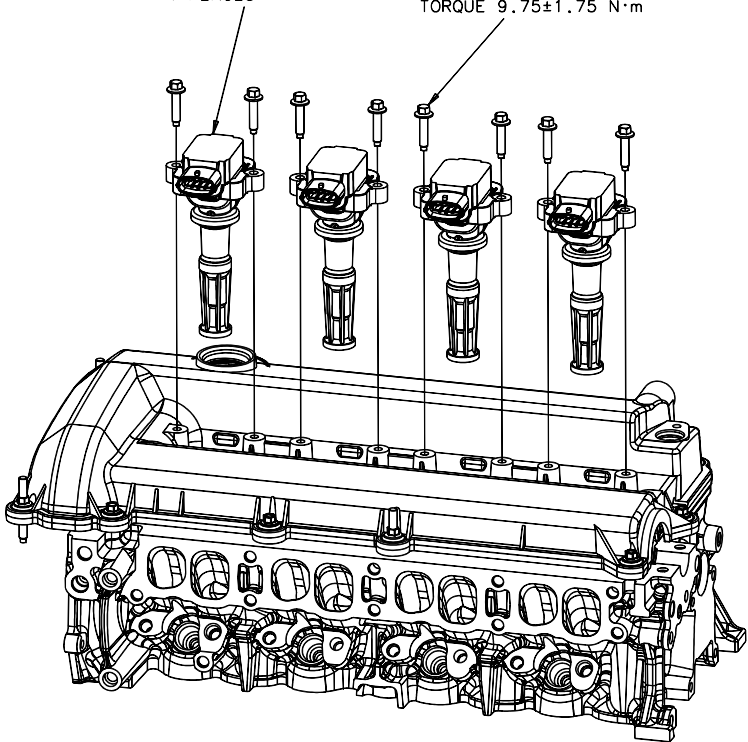
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	H	EN00E11007392000	'99-09-06	2001 2.0L-4V NON D1 CD132 2001 2.3L-4V NON D1 RANGER	68	69-C

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

CLEARANCE LIMITS AND SPECIFICATIONS

-12029- / 18 100
IGNITION COIL
4 PLACES

W500215-S309 / 9XF00215X9
BOLT FLNG HEAD M6X25
8 PLACES
TORQUE 9.75 ± 1.75 N·m



RESTRICTIONS

PART NAME/TITLE

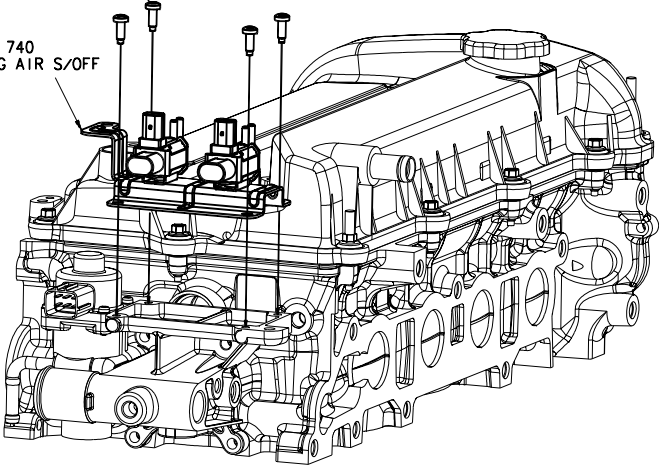
IGNITION COIL

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BL	EN00E11271652000	01-11-15	2002 1.8L-4V DI CD132	73-C	73-D

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS
CLEARANCE LIMITS AND SPECIFICATIONS

W505572-S303 / 9XF05572X3
BOLT M5X12
4 PLACES
TORQUE 6 ± 1 N·m

-9J559- / 18 740
CONTR ASY-ENG AIR S/OFF



RESTRICTIONS

PART NAME/TITLE

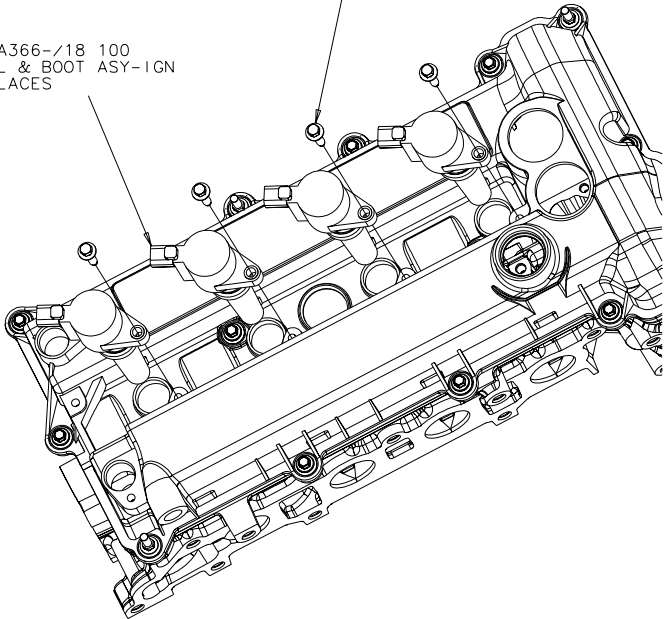
SOLENOID VALVE

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	BL	EN00E11271652000	01-11-15	2004 2.0L-4V NON-DI J48C	73-D	73-E

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

W500215-S309/9XF00215X9
BOLT M6X25
4 PLACES
TORQUE 9.75±1.75 N·m

-12A366-/18 100
COIL & BOOT ASY-IGN
4 PLACES



RESTRICTIONS

PART NAME/TITLE

IGNITION COIL

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.
C1S7G-543-AC	AH	EN00E11190272000	01-03-28	2003 2.3L-4V NON DI	73-E	74-C