



**mazda**

**Engine Assembly 543 Chart  
C1S7G-543-AC**

**Revision BP**

**EN00 E 11290169 002 020110**

**Issue Date: 10 January, 2002**

PART NAME/TITLE		SHEET NUMBER				
A	ABSOLUTE PRESS SENSOR AIR BYPASS VALVE AIR BYPASS VALVE & SOLENOID VALVE AUDIO GROUND STRAP	90A-C 89B / 89H 89A / 89E 87F				
B	BACKLASH MEASURING METHOD BALANCER AND SELECTED SHIM TO BLOCK BALANCER AND SHIM TO BLOCK BARCODE	25F 25H 25E 5 / 111				
C	CAM SHAFT & CAM CAP CAM COVER & GASKET ASSEMBLY CAP-BLIND PLUG CHAIN-AUX OIL PUMP/SPROCKET-AUX OIL PUMP DRV CHAIN-TIMING/GUIDE-TIMING CHAIN CHT SENSOR CONROD BEARING COLOUR CODING CONROD BEARING LINERS CONROD BEARING,CAPS & BOLTS CONROD WEIGHT TOLERANCE COOLER ASY-OIL & FASTENER COVER ASY-CYL FRONT CRANKCASE VENTILATION CRANKCASE VENTILATION COVER CYLINDER HEAD & BOLTS	44 / 44C-F 60C / 61A-E / 61J 90D 46 / 46A 48 / 48E-F 63-B 21A-B 19 22 8 94 52A-B 88A-C 64 41				
D	DIPSTICK & DIPSTICK TUBE DIS COIL DIS COIL & SENSOR-WATER TEMP DOWEL ASY-CYLINDER BLOCK	97A / 97B 73A 73B 27 / 32				
E	EGR BLANKING PLATE EGR OUTLET EGR TUBE EGR VALVE ENGINE NUMBER STAMPING POSITION ENGINE WIRE HARNESS EXCESS RTV REMOVING EXHAUST MANIFOLD	67B / 87E 87C 77 / 87B 67A / 67D / 72C 31 80C / 81C / 99 / 100C / 101C / 102C-D 51 96B				
F	FLYWHEEL ASY FILTER ASY-OIL/ADAPTER/OIL PRESSURE SWITCH FUEL PUMP ASSEMBLY FUEL PUMP COVER ASSEMBLY FUEL RAIL ASSEMBLY FUEL RAIL COVER FUEL RETURN HOSE	28 93A-B 70C 69C 78A-D / 78F 84D 79C				
G	GENERAL INFOMAIION GASKET-CYLINDER HEAD	4 / 4A 34				
H	HIGH PRESSURE FUEL PIPE HIGH PRESSURE FUEL PIPE/MARKET SERVISE HOSE ASSY E/G/R COOL OUTLET HOSE&CLAMP ASSY-WATER BYPASS HOSE-EVAP HOSES-VACUUM	82C 83C 103C-E 76A-D 108 95A-B / 95D-H				
I	IABV BLANKING PLATE AND SOLENOID VALVE IDLER ASY-ACC DR BELT IGNITION COIL INSTALLATION DUAL MASS FLYWHEEL INSTALLATION FLEXPLATE(AUTO) INTAKE & EXHAUST VALVES INTAKE MANIFOLD	89-D 52E 73C / 73E 28B / 110 28A 38 85A-D				
L	LIFTING EYE FRONT & REAR	66A-B				
RESTRICTIONS		PART NAME/TITLE INDEX				
SPECIFICATION NO. C1S7G-543-AC	REV BL	RELEASE NO. EN00E11271652 000	DATE 01-11-15	MODEL 2001 2.0L-4V NON DI CD132	SHEET 3	CONT'D. 3A

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

PART NAME/TITLE		SHEET NUMBER
M	MAIN BEARING & THRUST LINERS MAIN BEARING CLEARANCES MAIN BEARING COLOUR CODING MAIN BEARING LADDER BEAM & BOLTS MAIN BEARING UPPER MAIN BEARING LOWER	15A 17 18 23A 23B 23C
O	OIL FILLER CAP OIL PAN & OIL FILL QUANTITIES	104A-B 30A-D / 30E
P	PILOT BEARING PIPE CONNECTOR-BYPASS PISTON & CONROD ASSEMBLY PISTON AND CONROD ASY PISTON GRADE CHART PISTON RING PLUG-AVDEL PLUG-CYLINDER HEAD PLATE END PLUG-OIL GALLERY PLUG-TIMING PIN HOLE PROCEDURE-CAMCAP BOLT PROCEDURE-CONROD BEARING LINER PROCEDURE-CYLINDER HEAD BOLTS PROCEDURE-MAIN BEARING LINER PULLEY / DAMPER-CRANKSHAFT PUMP ASY-OIL & GASKET-OIL PUMP TO BLOCK	28C / 28D 14 / 14A / 14D 10 9 6 7 36 35 110A 12 / 12A / 13 / 105 75 45 20 42 16 55 24
R	REPLACEMENT OF SHIM SELECTION REAR OIL SEAL-CRANKSHAFT RTV SEALER-CAM COVER RTV SEALER-CYL HEAD GASKET RTV SEALER-FRONT COVER RTV SEALER-OIL PAN	25G 26 60 / 60A 33 / 34A 49A / 49B / 49E 29
S	SCREEN AND COVER ASY-OIL PUMP SENSOR ECT SENSOR-CAM ANGLE SENSOR-CAMSHAFT POSITION SENSOR-CRANKSHAFT POSITION SENSOR-KNOCK SOL-ENG VAR TM SOLENOID VALVE SPARK PLUG SPARK PLUG LEADS SPROCKET-CAMSHAFT SPROCKET-CRANKSHAFT & TIMING PLATE STUD-ENGINE MOUNT STUDS-EXHAUST MANIFOLD SUPT-INTK MANF	25A / 25B 74C-D 58C 58 / 58E 54 / 56C 65A-C / 92A-E 44-G / 44-H 73D / 89F / 89G 62-A 98A / 98B 47 / 47E / 47F 57 50 40 84C
T	THERMOSTAT THROTTLE BODY	68 91A-C
V	VACUUM HARNESS VALVE ASY-ENG PISTON OIL COOL VALVE LIFTERS VALVE SPRINGS & RETAINERS VALVE STEM OIL SEALS	109 11 43 39 37
W	WATER PUMP & GASKET WATER OUTLET CONNECTOR & GASKET WATER PUMP PULLEY WATER PUMP PULLEY & FAN PULLEY WIRING ASY	59 71A-C 107A 107B 99B / 100D-H / 100J-N

RESTRICTIONS			PART NAME/TITLE INDEX		
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET CONTD.
C1S7G-543-AC	BL	EN00E11271652 000	01-11-15	2001 2.0L-4V NON DI CD132	3A 4

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

HOT TEST SPECIFICATION	ALL ENGINES TO BE HOT TESTED TO SPECIFICATION S88WF-6L084-AA
OIL LEAK TEST	THERE SHALL BE NO VISIBLE OIL LEAKS UNDER STATIC AND OPERATING CONDITIONS.
TORQUE DEFINITION	<p>ASSEMBLY TORQUE - THE TORQUE IMPARTED BY A TOOL DURING ASSEMBLY AND MEASURED AT TOOL STALL POINT.</p> <p>STABILIZED TORQUE - WILL BE CHECKED AFTER HOT TEST AT THE FIRST ROTARY MOVEMENT OF THE FASTENER IN THE DIRECTION TO INCREASE ITS CLAMPING LOAD.</p>
TORQUE CHECK	THE SPECIFIED STABILIZED TORQUE MUST BE ACHIEVED AT THE BUY-OFF STAGE AND MAINTAINED WITHIN THE RANGE SPECIFIED ON ENGINE TEARDOWN
QUALITY CONTROL	A PERCENTAGE OF ENGINE MUST BE CHECKED AFTER HOT TEST FOR LEAKAGE AND ASSEMBLY TORQUE.
TORQUE TO TURN CRANKSHAFT	<p>AT-6011-(CYLINDER ASSEMBLY) STAGE OF ASSEMBLY, TORQUE MUST NOT EXCEED TBE...Nm. REF ONLY.</p> <p>AT-6011-(CYLINDER ASSEMBLY) STAGE OF ASSEMBLY, BUT WITH CYLINDER HEAD FITTED LESS SPARK PLUGS AND CYLINDER HEAD BOLTS TIGHTENED TO SPECIFICATION, TORQUE TO ROTATE CRANKSHAFT MUST NOT EXCEED TBE...Nm. REF ONLY</p> <p>CRANKSHAFT TO BE ROTATED AT LEAST ONE COMPLETE REVOLUTION TO OBTAIN MAXIMUM READING.</p>
RE-USE OF FASTENERS	<p>FASTENERS WHICH CAN BE RE-USED MUST BE BROUGHT BACK TO ORIGINAL FINISH SPECIFICATION BEFORE RE-ASSEMBLY OR REPLACED BY UNUSED FASTENERS. i.e. LUBRICATED FINISHES MUST BE RE-LUBRICATED AND DRY FINISHES DEGREASED.</p> <p>FASTENERS WHICH HAVE STABILIZED AT A HIGHER TORQUE THAN THE MAXIMUM SPECIFIED MUST BE REPLACED,</p> <p>ASSOCIATED COMPONENTS MUST BE CHECKED FOR POSSIBLE DAMAGE AND IF NECESSARY BE REPAIRED OR REPLACED BEFORE RE-ASSEMBLY.</p> <p>BOLTS WHICH WERE PREPARED AND USED FOR THE CHECK OF ELONGATION, (CENTERING MARKS ON TOP AND BOTTOM SIDE) CAN BE REUSED, IF RE-USAGE OF THE BOLT IS GENERALLY PERMITTED.</p>
FOREIGN MATTER SPECIFICATION	FOR THE ACCEPTABLE MAXIMUM AMOUNT OF FOREIGN MATTER REFER TO ENGINEERING SPECIFICATION S72HM-6B616-AA.
FACTORY FILL OIL SPEC	WSS-M2C914-A
HYPOID OIL SPEC	SQ-M2C9003-AA
(REF) Dimension	MANUFACTURING DEPT. SHALL DETERMINE INSPECTION PERIOD AFTER CHECKING PROCESS CAPABILITY.

RESTRICTI			PART NAME/TITLE GENERAL INFORMATION				
SPECIFICATION NO. <b>C1S7G-543-AC</b>	REV <b>H</b>	RELEASE NO. <b>EN00E11007392000</b>	DATE <b>99-09-06</b>	MODEL <b>2001 2.0L-4V NON DI CD132</b>	SHEET <b>4</b>	CONTD. <b>4-A</b>	

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

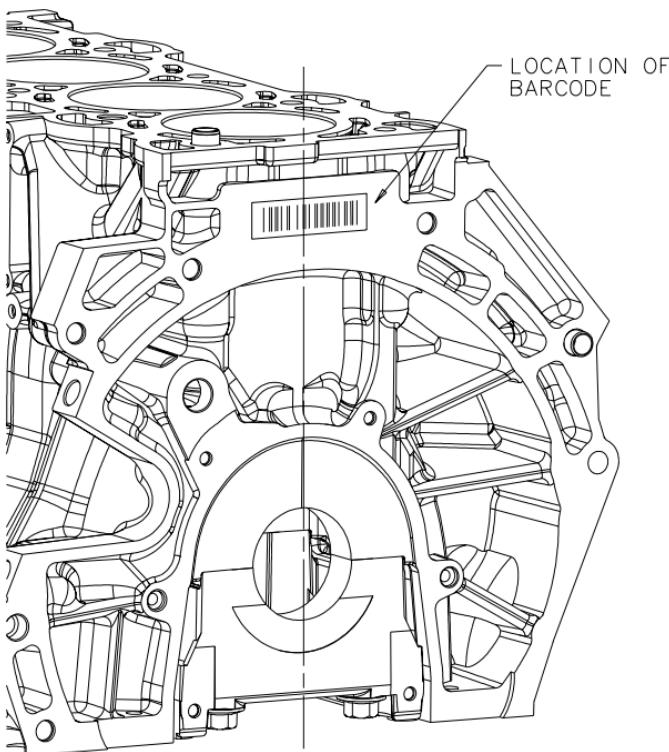
**ELECTRICAL CONNECTION** ALL ELECTRICAL CONNECTIONS MUST BE POSITIVELY SECURED,

**[TO ENSURE GOOD CONTACT] BEFORE ENGINE SHIPMENT.**

Characteristic	 Critical Characteristics (CC) rank is defined in Ford FAO Product Engineering Procedure FAP03-111.  : A rank is defined in the azda EngineeringStandards in MES-K01-002  : AR rank is defined in the Mazda Engineering Standards in MES-K01-002  To meet to one of them in the case of   parallel marking.
Assistant material	If another material, which is not shown in each sheet, is used, negotiation with Mazda design engineering and approval from them is required.

RESTRICTIONS				PART NAME/TITLE GENERAL INFORMATION			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	X	EN00E11099311000	00-10-13	2001 2.0L-4V NON DI CD132	4-A	5	

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS				PART NAME/TITLE BARCODE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
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
	1	+0.01 MAX. 0 MIN	Ø87.465	+0.01 MAX. 0 MIN 0.025 ~ 0.045
2.0L <del>2.3L</del>	2	+0.02 MAX. +0.01 MORE THAN	Ø87.475	+0.01 MAX. 0 MORE THAN 0.025 ~ 0.045
	3	+0.03 MAX. +0.02 MORE THAN	Ø87.485	+0.01 MAX. 0 MORE THAN 0.025 ~ 0.045

1.8L	1	+0.01 MAX. 0 MIN	Ø82.965	+0.01 MAX. 0 MIN 0.025 ~ 0.045
	2	+0.02 MAX. +0.01 MORE THAN	Ø82.975	+0.01 MAX. 0 MIN 0.025 ~ 0.045
	3	+0.03 MAX. +0.02 MORE THAN	Ø82.985	+0.01 MAX. 0 MIN 0.025 ~ 0.045

**PISTON ADD SKIRT COATING**

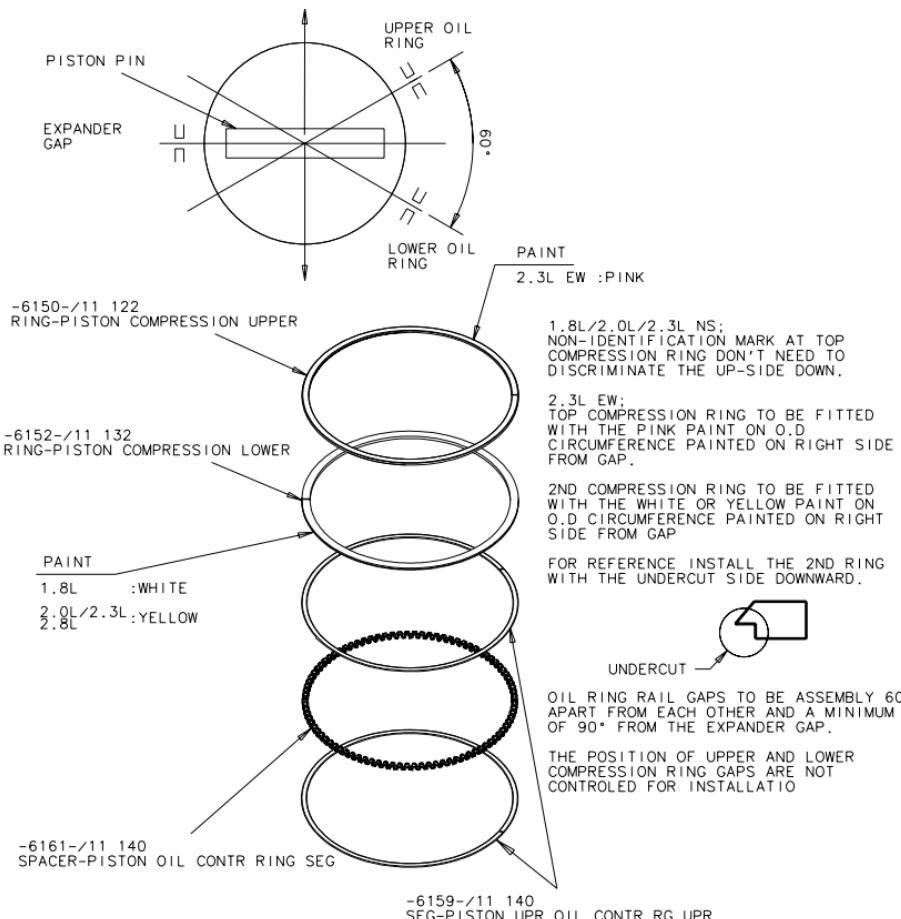
( THICKNESS    0.008 - 0.016    1.8L/2.0L/2.3L EW  
                 0.008 - 0.020    2.3L NS )

RESTRICTIONS		PART NAME/TITLE PISTON GRADE CHART				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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 <b>PISTON RING</b>			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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	CONT'D.	
C1S7G-543-AC	BA	EN00 E 11255548 001	01-10-17	2001 2.0L-4V NON DI CD132	8	9	

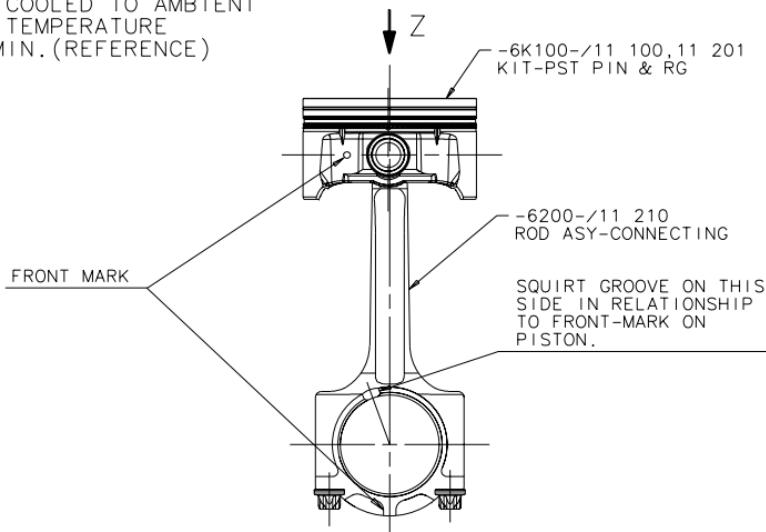
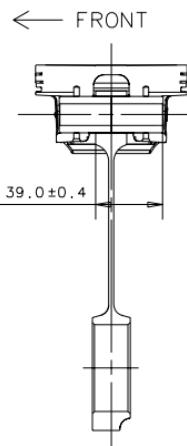
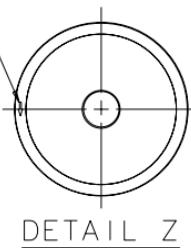
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**

SKETCH SHOWS ONLY ORIENTATION OF ASSEMBLED PARTS.

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

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)



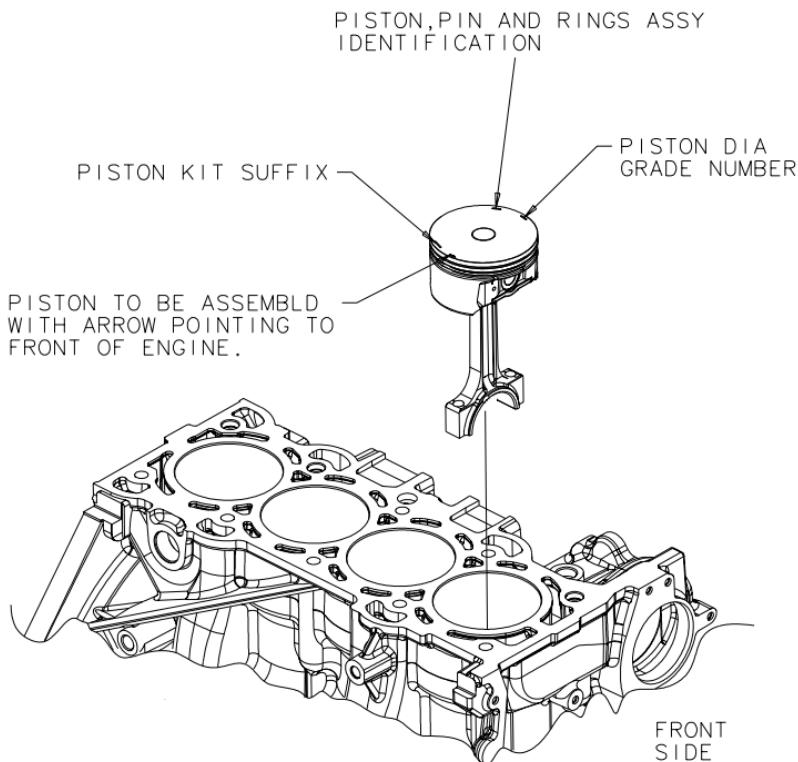
**RESTRICTIONS**

**PART NAME/TITLE**

PISTON AND CONROD ASY

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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**

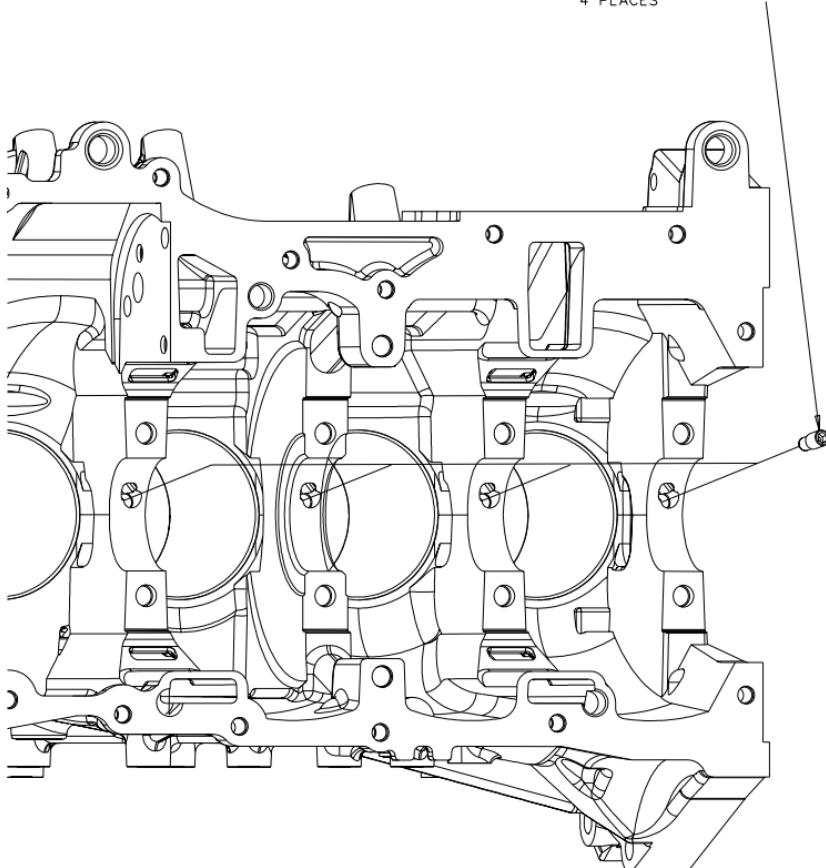


CYLINDER BORE TO BE  
LUBRICATED USING  
FACTORY FILL ENGINE  
OIL PRIOR TO ASSEMBLING  
PISTON TO CYLINDER.

RESTRICTIONS			PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	BA	EN00 E 11255548 001	01-10-17	2001 2.0L-4V NON DI CD132	10	11

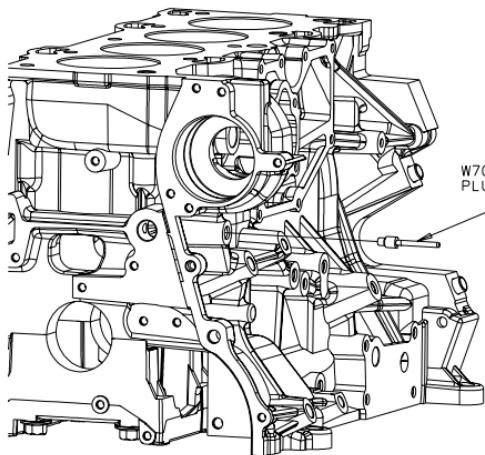
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

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



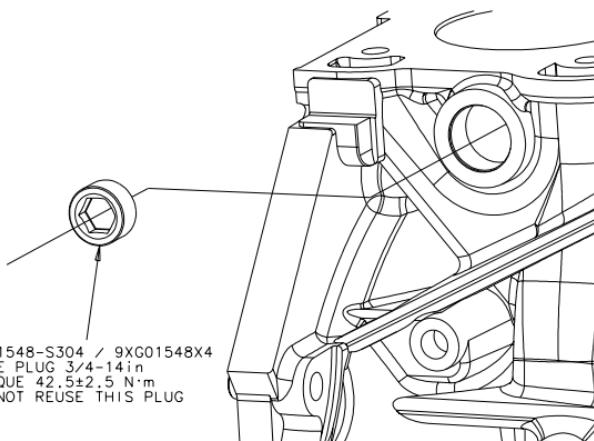
RESTRICTIONS				PART NAME/TITLE VALVE ASY-ENG PISTON OIL COOL			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	H	EN00 E 11007392 000	99-09-06	2001 2.0L-4V NON DI CD132	11	11-D	

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



W702287-S300 / 9XG02287X0  
PLUG AVDEL

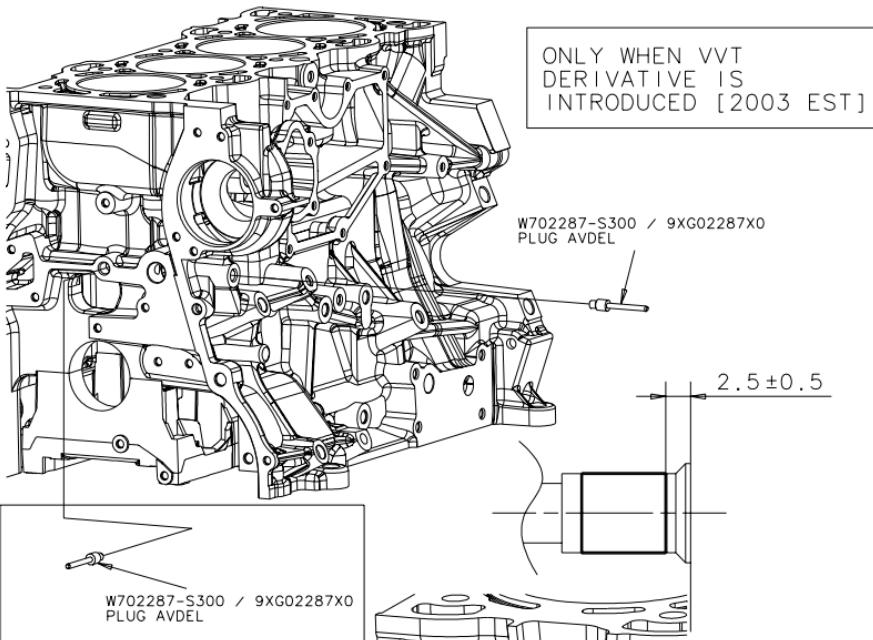
$2.5 \pm 0.5$



W701548-S304 / 9XG01548X4  
PIPE PLUG 3/4-14in  
TORQUE 42,552.5 N·m  
DO NOT REUSE THIS PLUG

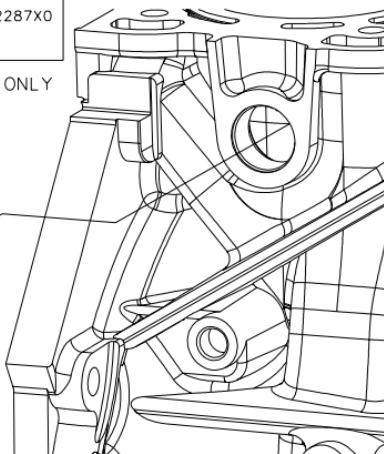
RESTRICTIONS				PART NAME/TITLE PLUG-OIL GALLERY			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	BD	E 11271059 000	01-11-02	2001 2.0L-4V NON DI CD132	12	12-A	

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



NOTE:FOR NON VVT ENGINE ONLY

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



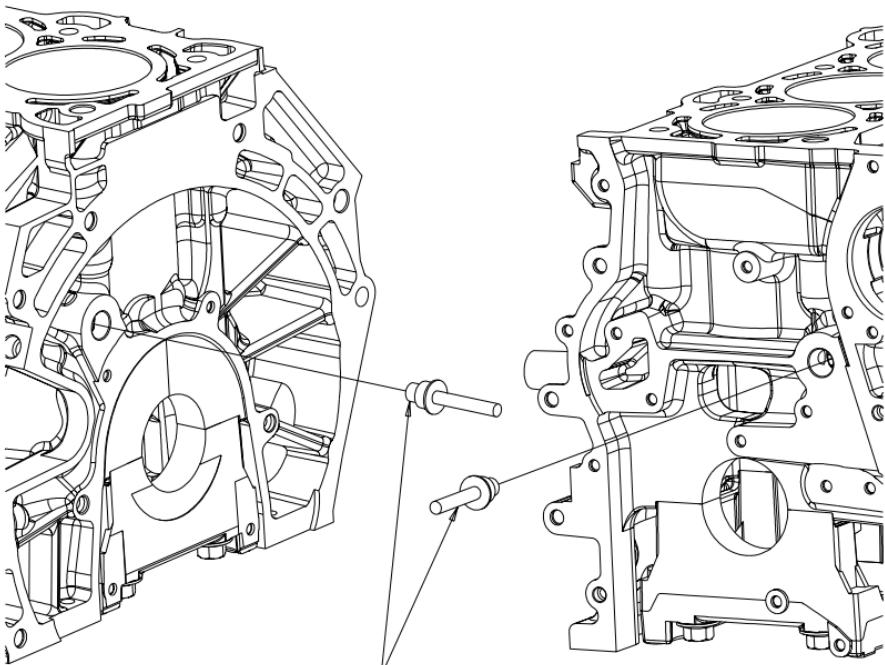
**RESTRICTIONS**

**PART NAME/TITLE**

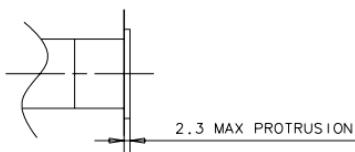
**PLUG-OIL GALLERY**

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	BD	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

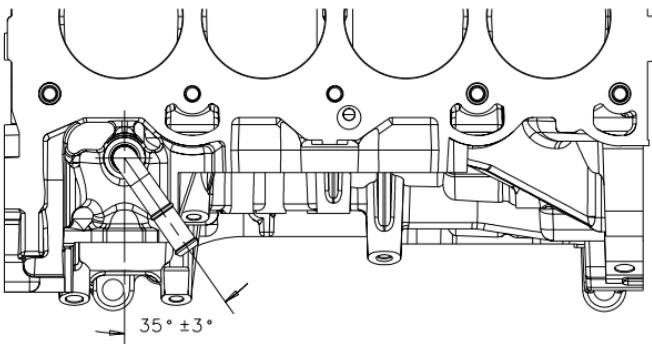


W704456-S1300 / 9XG04456X0  
PLUG AVDEL  
2 PLACES

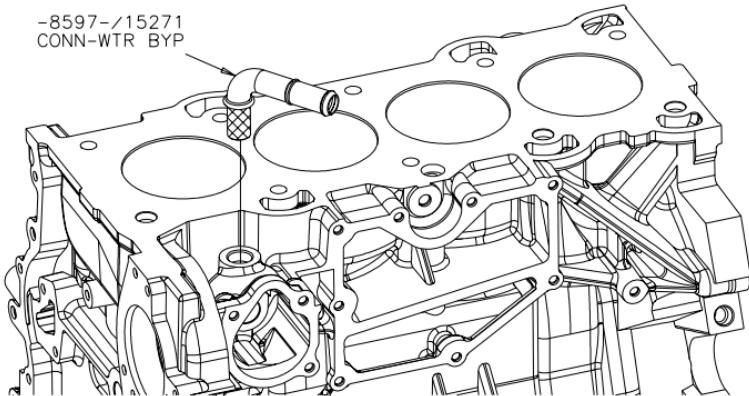


RESTRICTIONS				PART NAME/TITLE <b>PLUGS-OIL GALLERY</b>			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	AS	EN00 E 11200123 000	01-07-02	2001 2.0L-4V NON DI CD132	13	14	

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



-8597-/15271  
CONN-WTR BYP

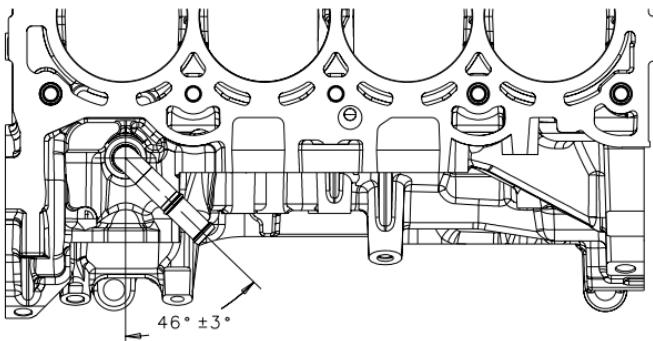


**NOTES**

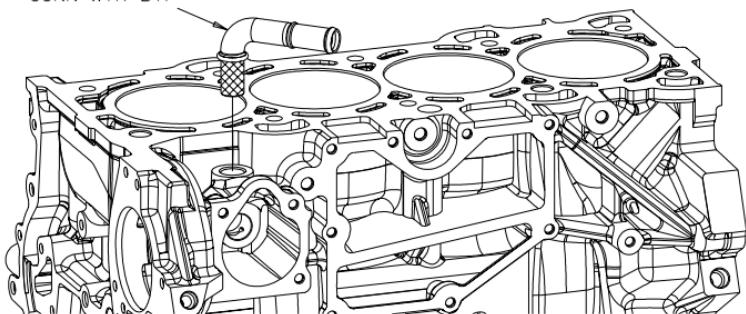
1. PRESS IN PIPE TO BLOCK FULLY UNTIL IT MEETS THE PIPE COLLAR.
2. USE THE COLLAR TO PRESS IN THE PIPE. NOT THE PIPE ITSELF.
3. SEALANT [WSK-M2G349-A7 (LOCTITE 243) OR WSS-M2G349-A13 (LOCTITE 962T) OR "THREE BOND 1386D"] TO BE APPLIED TO THE PIPE IN THE AREA HATCHD.
4. PARTS THAT HAVE BEEN DAMAGED OR 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. C1S7G-543-AC	REV AY	RELEASE NO. EN00 E 11255546 001	DATE 01-09-29	MODEL 2001 2.0L-4V NON DI CD132	SHEET 14	14-A

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



-8597-/15271  
CONN-WTR BYP

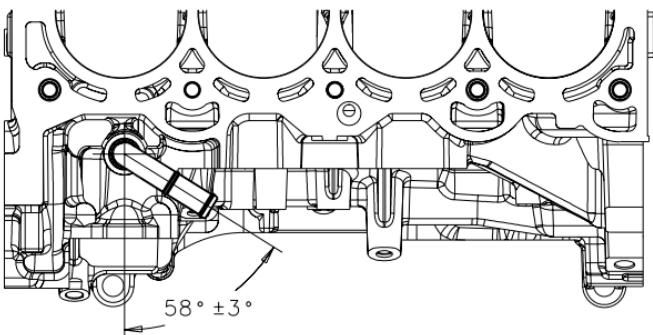


**NOTES**

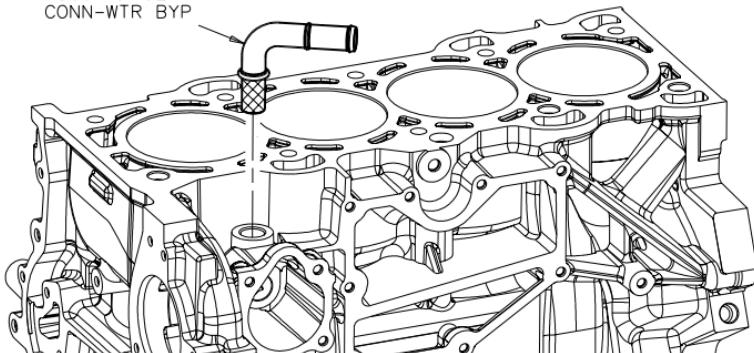
1. PRESS IN PIPE TO BLOCK FULLY UNTIL IT MEETS THE PIPE COLLAR.
2. USE THE COLLAR TO PRESS IN THE PIPE. NOT THE PIPE ITSELF.
3. SEALANT[WSK-M2G349-A7(LOCTITE 243) OR WSS-M2G349-A13(LOCTITE 962T) OR "THREE BOND 1386D"] TO BE APPLIED TO THE PIPE IN THE AREA HATCHD.
4. PARTS THAT HAVE BEEN DAMAGED OR HAVE 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		PIPE CONNECTOR-BYPASS				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	PART NAME/TITLE
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**

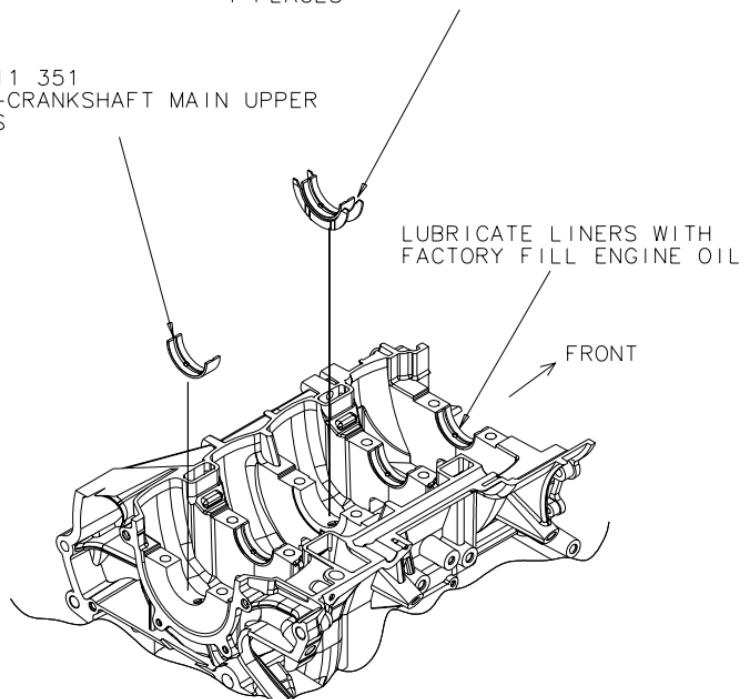
1. PRESS IN PIPE TO BLOCK FULLY UNTIL IT MEETS THE PIPE COLLAR.
2. USE THE COLLAR TO PRESS IN THE PIPE. NOT THE PIPE ITSELF.
3. SEALANT [WSK-M2G349-A7 (LOCTITE 243) OR WSS-M2G349-A13 (LOCTITE 962T) OR "THREE BOND 1386D"] TO BE APPLIED TO THE PIPE IN THE AREA HATCHD.
4. PARTS THAT HAVE BEEN DAMAGED OR 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		PIPE NAME/TITLE PIPE CONNECTOR-BYPASS				
SPECIFICATION NO. C1S7G-543-AC	REV AU	RELEASE NO. EN00E11212646000	DATE 01-08-07	MODEL 2003 2.3L-4V NON-DI	SHEET 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	CONT'D.
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.

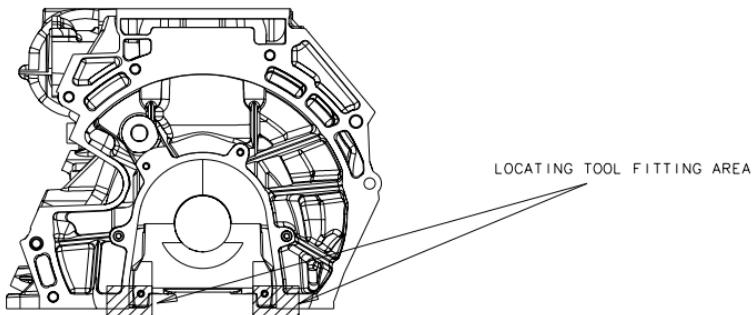
OIL "MOBIL 1409" TO BE APPLIED ON SIDE FIT SURFACE OF THE MAIN BEARING BEAM WHEN THE MAIN BEARING BEAM IS ASSEMBLED.

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  $0.335 \pm 0.115$ 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			PROCEDURE-MAIN BEARING LINER			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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 ( $\mu\text{m}$ )
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.

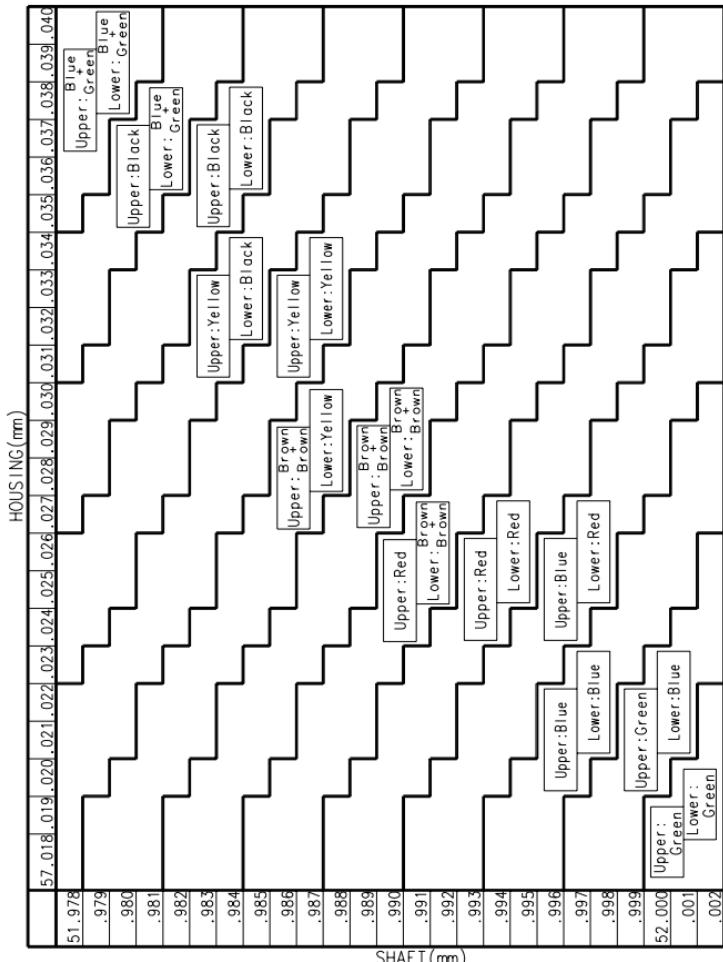
EACH CRANKSHAFT MAIN BEARING JOURNAL TO BE MEASURED IN THE CENTRE OF THE JOURNAL ON AN AXIS PARALLEL TO THE TOP DEAD CENTRE POSITION.

LINER THICKNESS TO BE SELECTED FROM THE GRADING TABLE.

RESTRICTIONS			MAIN BEARING CLEARANCES			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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



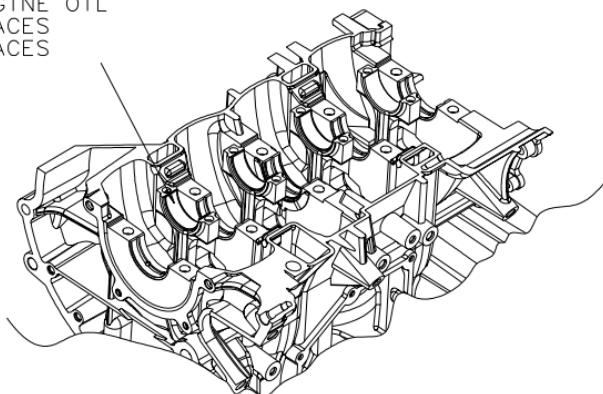
RESTRICTIONS			MAIN BEARING COLOUR CODING			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	H	EN00 E 11007392 000	99-09-06	2001 2.0L-4V NON DI CD132	18	19

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

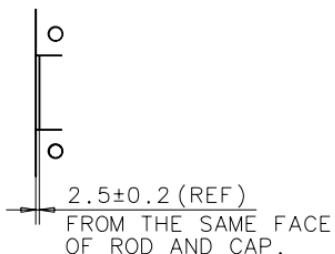
-6211-/11 225  
BEARING-CONNECTING ROD  
14:4 PLACES  
15:5 PLACES



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



TOLERANCE OF POSITION  
BETWEEN LINER AND ROD.  
(ALIGNMENT)



RESTRICTIONS			PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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

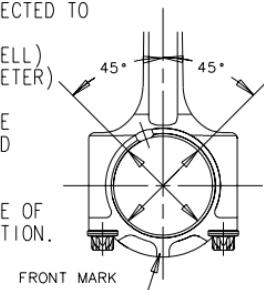
CONNECTING ROD/CRANKPIN LINERS ARE GRADED AND ARE TO BE SELECTED TO GIVE A TOTAL CLEARANCE OF 0.026mm TO 0.052mm.

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

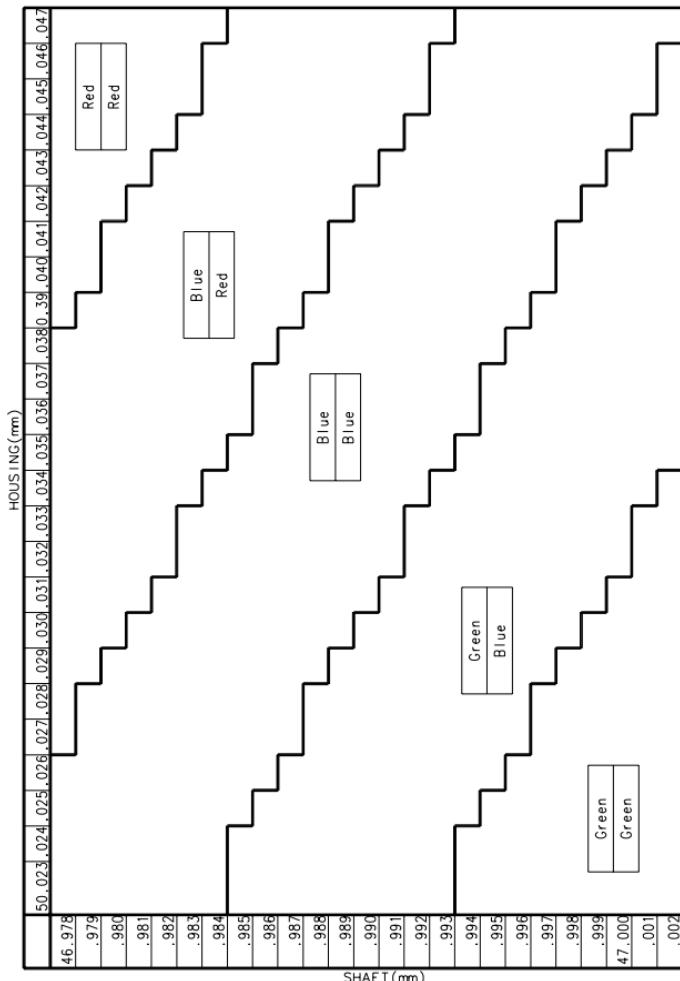
1. REMOVE CAPS FROM CONNECTING RODS.
2. SELECT LINERS AND ASSEMBLE, PRESSING LINERS TO DEPTH, SEE NOTE ON SHEET 19 LINERS IN RESPECTIVE HOUSINGS.
3. LUBRICATE UPPER BEARINGS IN CONNECTING RODS WITH RELEASED FACTORY FILL ENGINE OIL.
4. LUBRICATE JOURNALS ON CRANKSHAFT WITH RELEASED FACTORY FILL ENGINE 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			PROCEDURE-CONROD BEARING LINER				PART NAME/TITLE	
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.		
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)

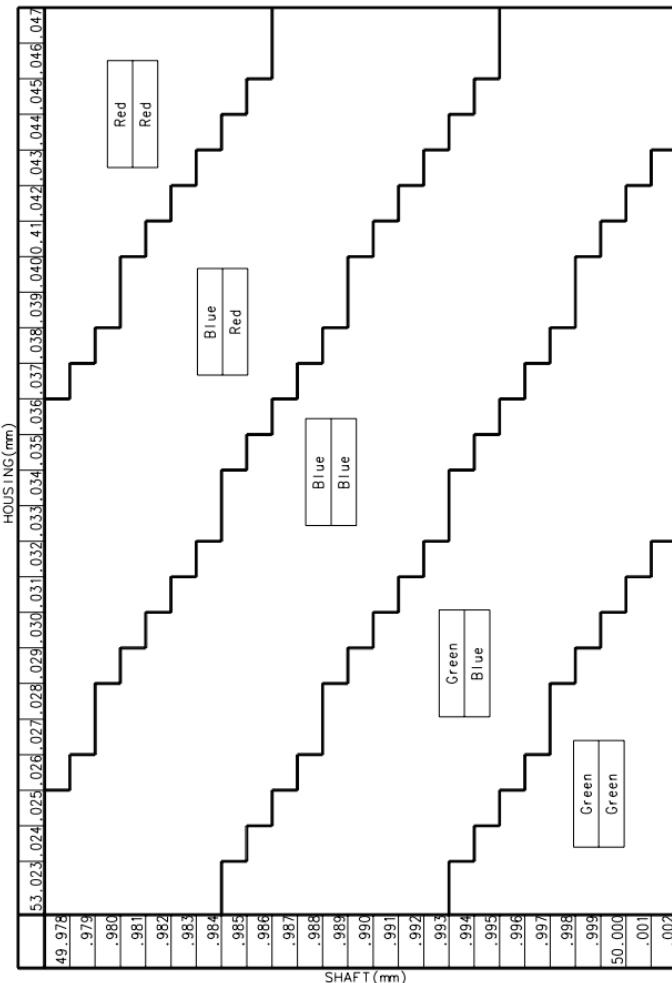


THE POSITION (UPPER OR LOWER) OF CONROD BEARINGS DO NOT CONTROL  
FOR INSTALLATION.

RESTRICTIONS			PART NAME/TITLE				
SPECIFICATION NO.	REV	RELEASE NO.	CONROD BEARING COLOUR CODING				
C1S7G-543-AC	H	EN00 E 11007392 000	DATE	2001	2.0L-4V NON DI	CD132	SHEET 21-A CONT'D. 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  
**CONROD BEARING COLOUR CODING**

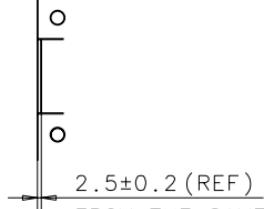
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	T	EN00 E 11007392 000	99-09-06	2003 2.8L-4V NON DI RANGER	21-B	22

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

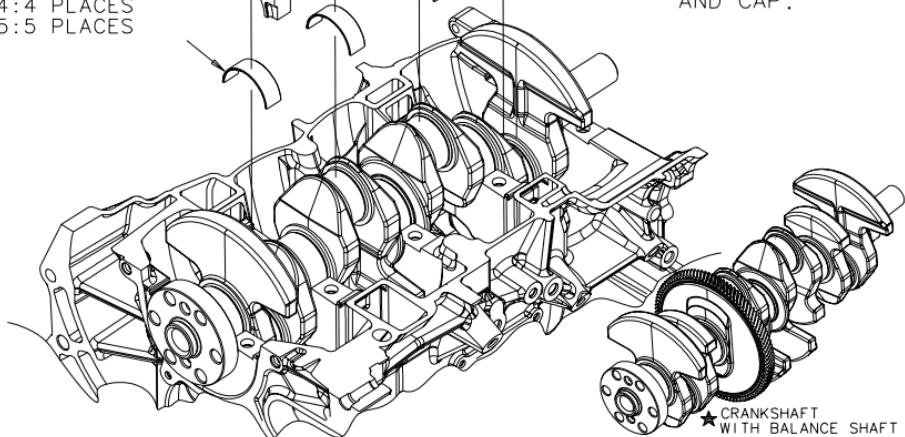
-6214-/11 214  
BOLT CON ROD  
14: 8 PLACES  
15:10 PLACES  
SNUG TORQUE  $29 \pm 3$  N·m  
TURN ON  $90^\circ \pm 10^\circ$   
TO BE RUN DOWN  
SIMULTANEOUSLY  
PER CONROD

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

TOLERANCE OF POSITION  
(ALIGNMENT) BETWEEN  
LINER AND CAPS.



$2.5 \pm 0.2$  (REF)  
FROM THE SAME  
FACE OF ROD  
AND CAP.



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

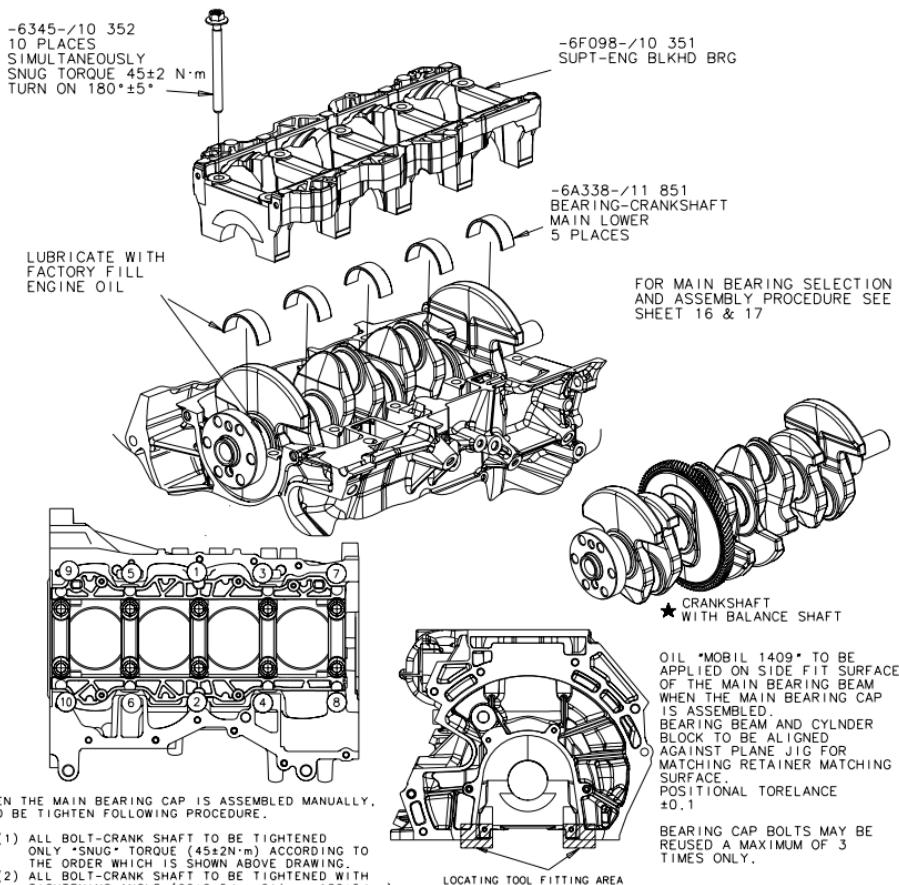
Q.C.CHECK:  
DO NOT REUSE CONROD BOLT, IN CASE BOLT LENGTH IS OVER 46 mm. (REF)

★ 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	CONT'D.
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



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

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

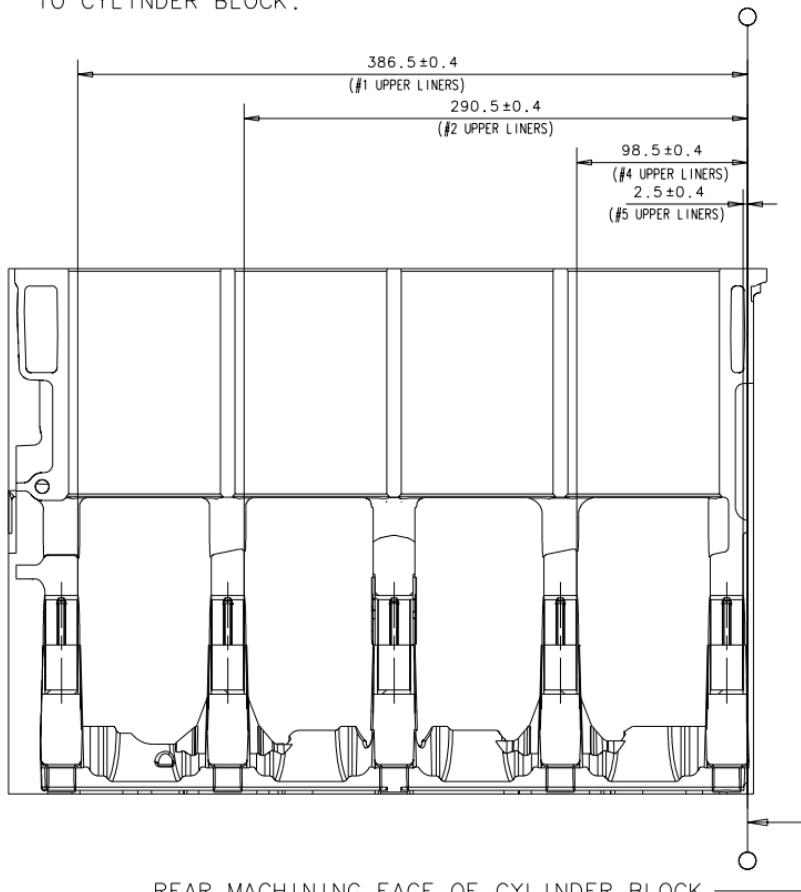
★ NO HAMMERED MARKS/FLAWS ON GEAR TEETH OF CRANKSHAFT WHICH END UP WITH UNEXPECTED NOISE. (GEAR ACCURACY SPECIFIED ON THE DRAWING TO BE SATISFIED BUT THE GEAR ACCURACY IS NOT REQUIRED TO BE MEASURED IN THE ENGINE PLANT)

★ - IT ONLY APPLYS TO BALANCE SHAFT ENGINE.

RESTRICTIONS			PART NAME/TITLE MAIN BEARING LADDER BEAM & BOLTS			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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.

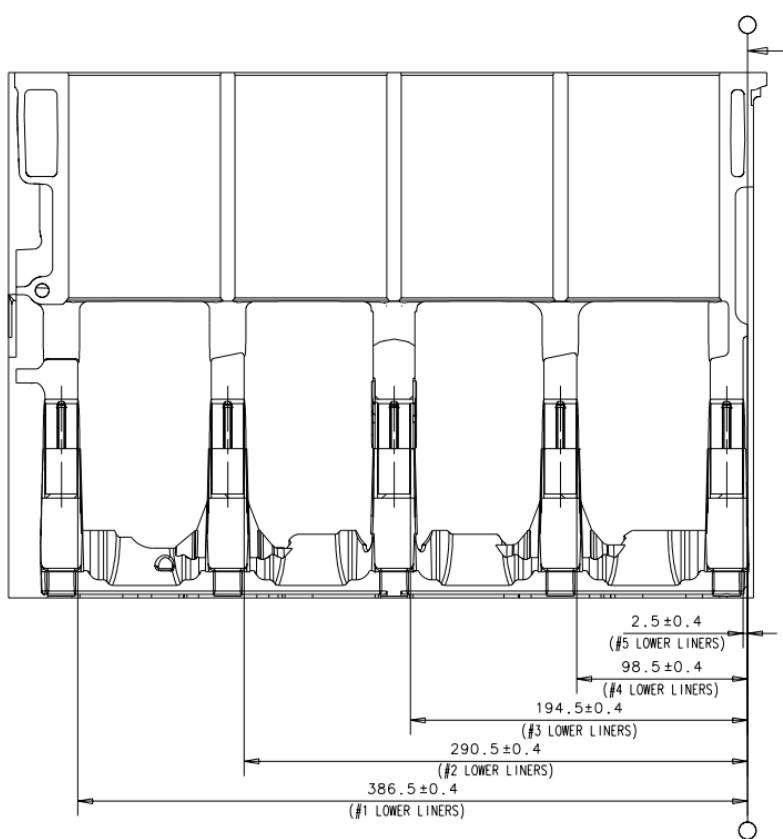


RESTRICTIONS			PART NAME/TITLE MAIN BEARING UPPER			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AB	E 11136863 000	00-12-04	2001 2.0L-4V NON DI CD132	23-B	23-C

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

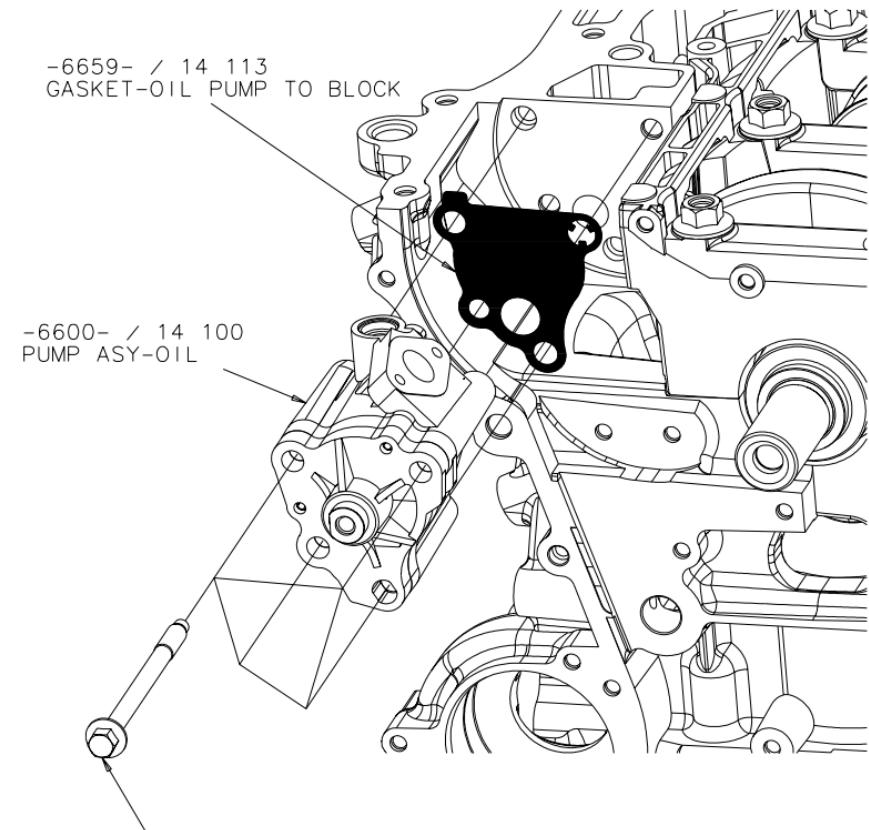
LOWER LINERS FOR MAIN BEARING IS POSITIONED SO THAT THE DISTANCES OF LINERS REAR EDGE FROM REAR MACHINING FACE MUST BE KEPT FOLLOWING AFTER BEARING BEAM IS ASSEMBLED TO CYLINDER BLOCK.

REAR MACHINING FACE OF BEARING BEAM.



RESTRICTIONS			PART NAME/TITLE MAIN BEARING LOWER			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AB	E 11136863 000	00-12-04	2001 2.0L-4V NON DI CD132	23-C	23-D

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



W703647-S309 / 9XG03647X9  
FASTNER M8 X 103

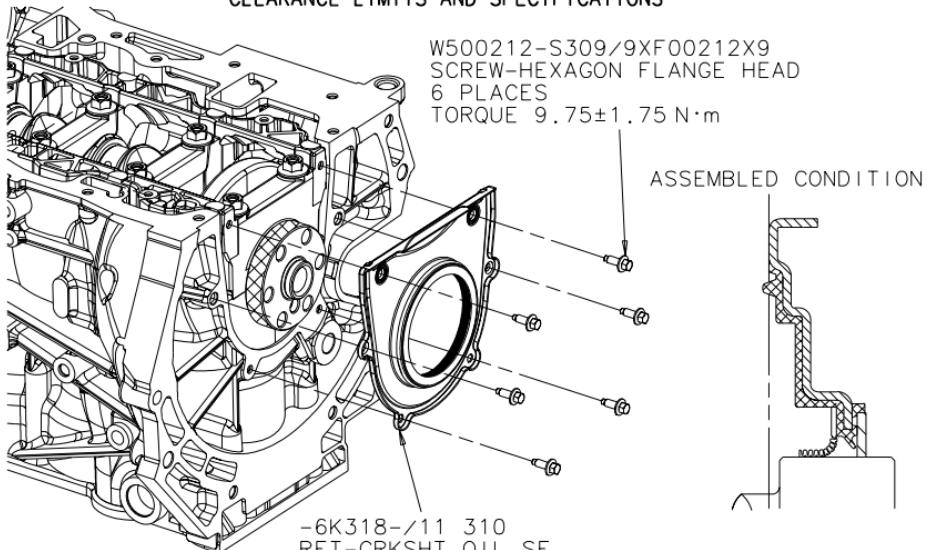
4PLACES

**BOLT TIGHTENING PROCEDURE :**

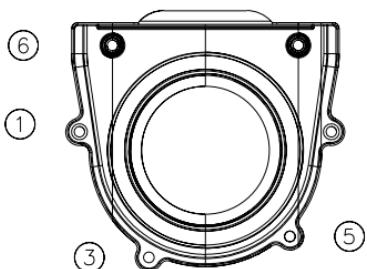
- ① TIGHTEN THE BOLTS AT SIMULTANEOUSLY OR  
CROSSWISE WITH THE PRE-TORQUE OF  $10 \pm 2$  N·m
- ② TIGHTEN THE BOLTS AT SIMULTANEOUSLY OR  
CROSSWISE WITH THE TORQUE OF  $22.5 \pm 2.5$  N·m

RESTRICTIONS			PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	K	EN00 E 11026968 000	99-12-13	2001 2.0L-4V NON DI CD132	24	25-A

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



### FASTENING PROCEDURE



### (AUTOMATIC MACHINE)

- ① Snag torque:  $3.0 \pm 0.5 \text{ N}\cdot\text{m}$ , then Final torque:  $9.75 \pm 1.75 \text{ N}\cdot\text{m}$
- ② Tightening speed: 10 rpm
- 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)

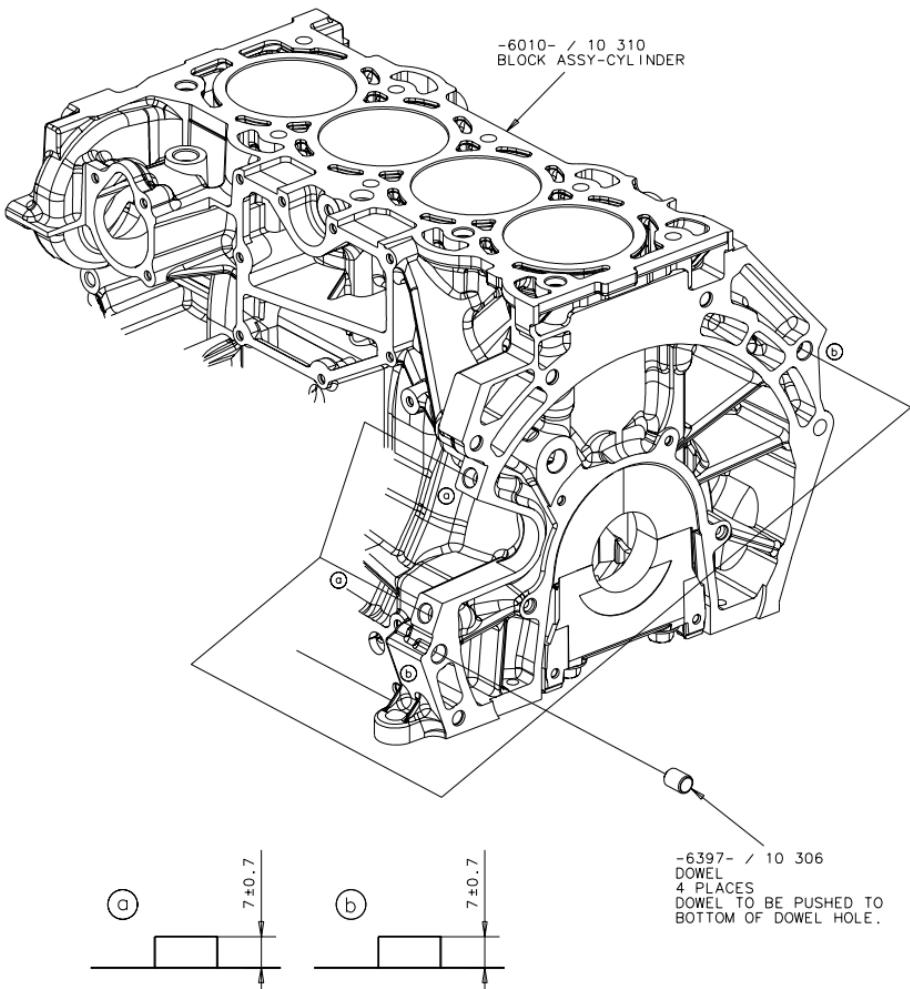
ALL BOLT TO BE TIGHTNED ACCORDING TO THE ORDER WHICH IS SHOWN IN LEFT HAND DRAWING.  
TIGHTENING ORDER : ① - ⑥

### 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					
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
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**



## RESTRICTIONS

PART NAME/TITLE

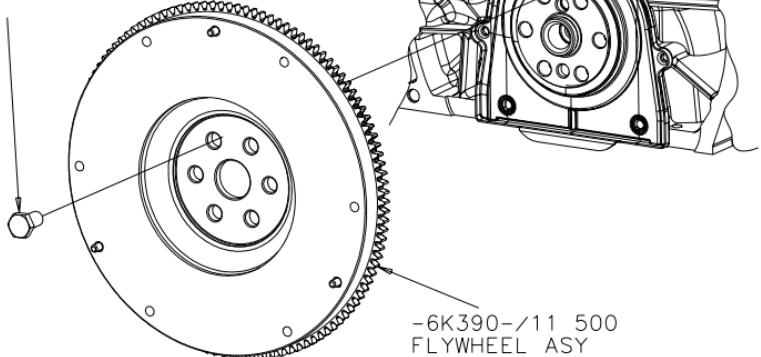
DOWEL ASY-CYLINDER BLOCK

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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**

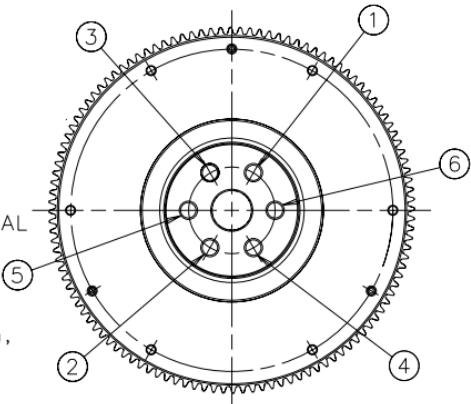
-6379-/11 511  
BOLT FLYWHEEL  
6 PLACES  
SIMULTANEOUSLY

▽ TORQUE  $112 \pm 4 \text{ N}\cdot\text{m}$



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

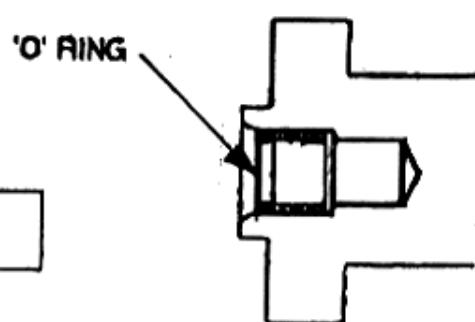
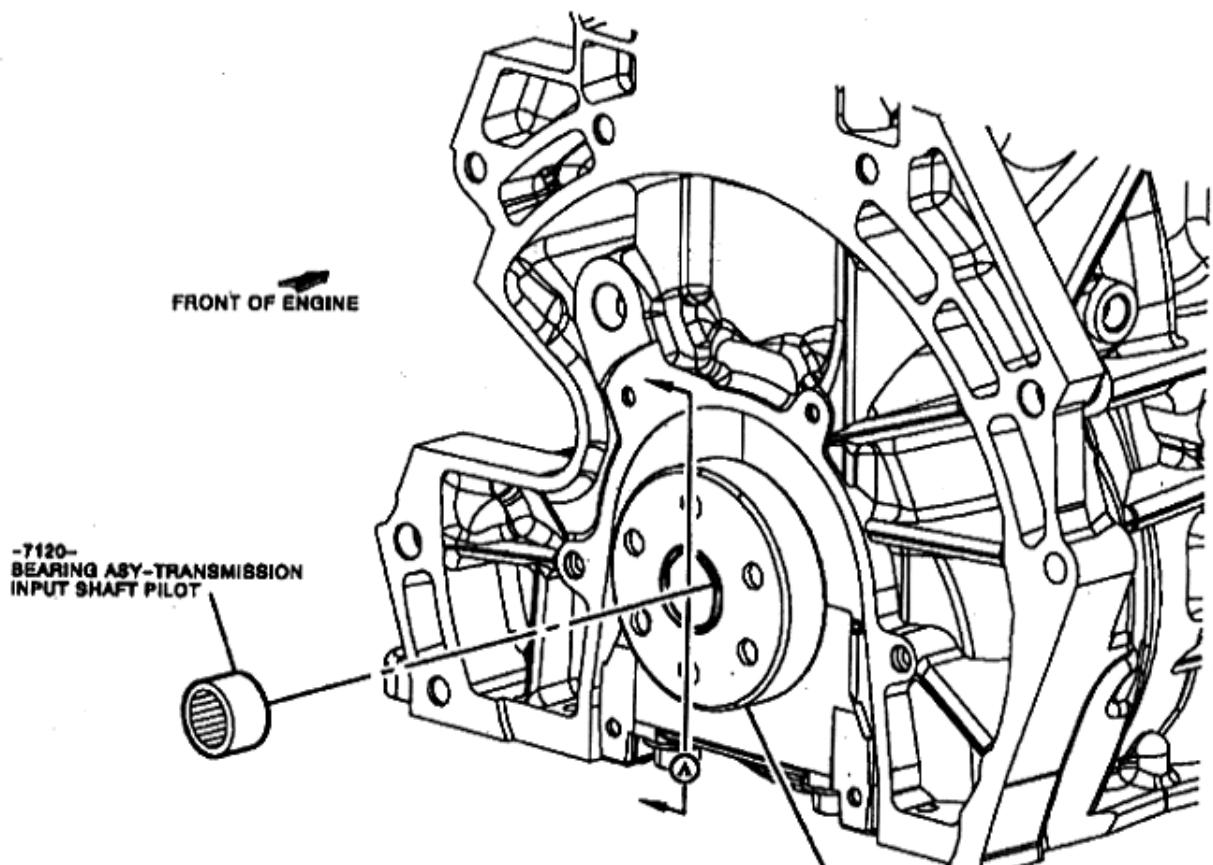
TORQUE STEPS  
1ST  $50 \pm 4 \text{ N}\cdot\text{m}$ , 2ND  $80 \pm 4 \text{ N}\cdot\text{m}$ ,  
▽ 3RD  $112 \pm 4 \text{ N}\cdot\text{m}$



**RESTRICTIONS**

**PART NAME/TITLE**  
**FLYWHEEL ASY**

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	P	EN00 E 11045491 000	00-03-31	2001 2.3L-4V NON DI RANGER	28	28-A

**PILOT BEARING  
(MANUAL TRANSMISSION)**

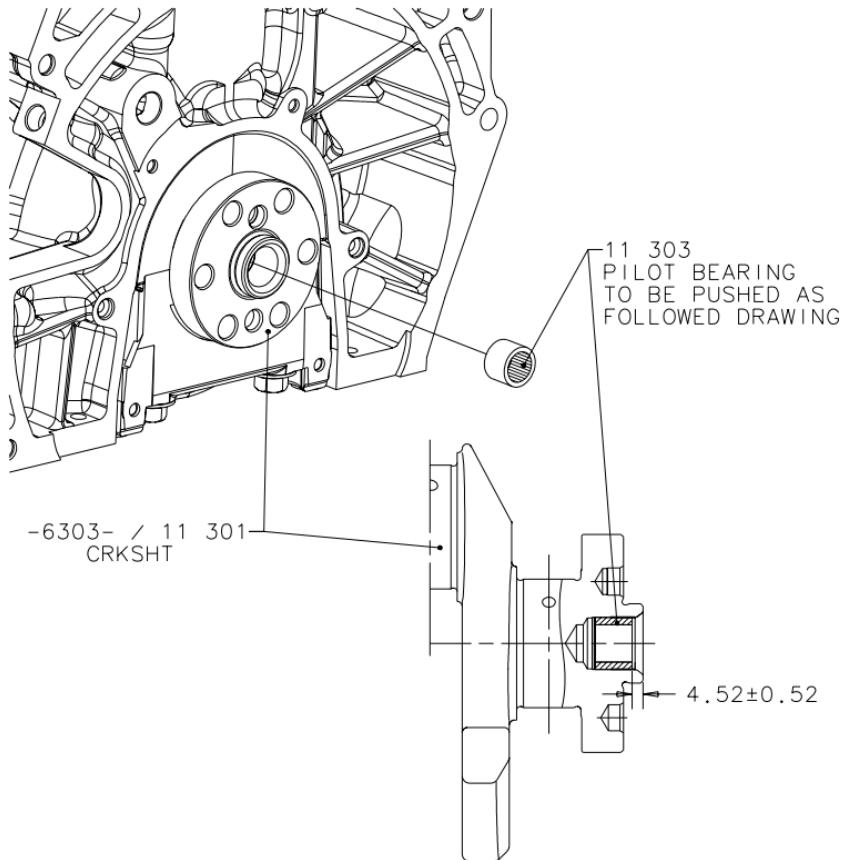
SECTION A

**NOTE:**  
INSTALL BEARING WITH SEAL END TOWARD  
TRANSMISSION.

031101

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

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS

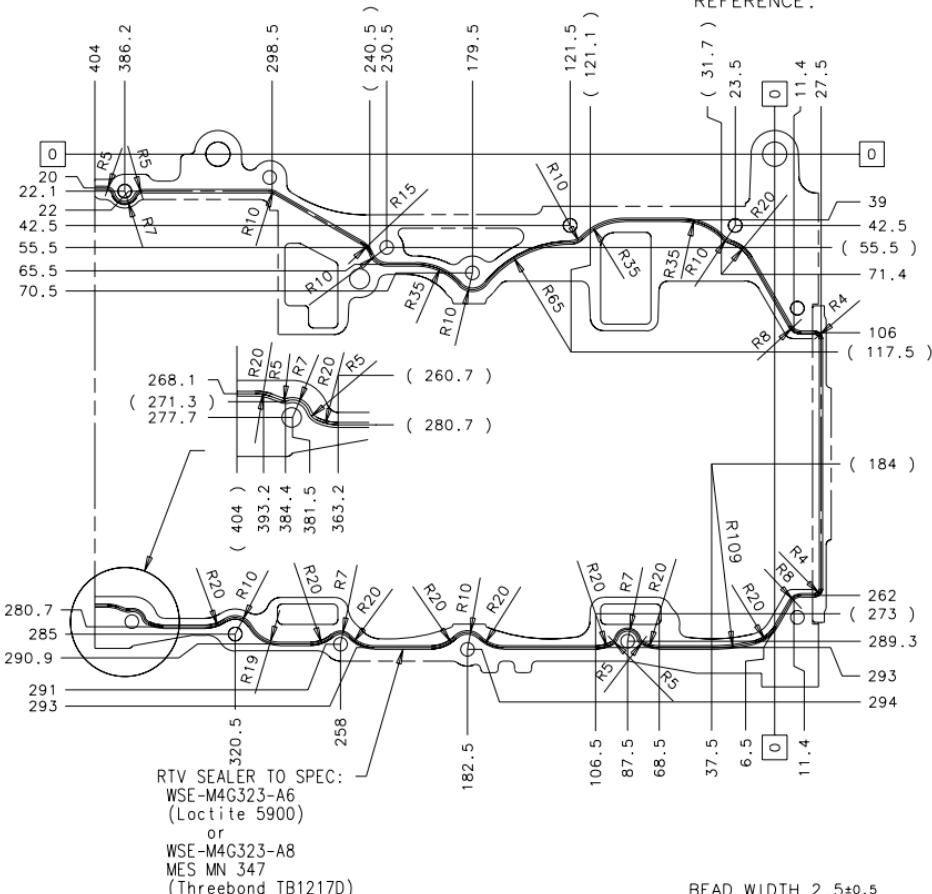


RESTRICTIONS				PART NAME/TITLE				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	PILOT BEARING				
C1S7G-543-AC	AN	EN00 E 11208966 001	01-06-08	2003 2.3L-4V NON DI J56A/F/J	MODEL	SHEET	28-D	CONT'D. 29

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

## CLEARANCE LIMITS AND SPECIFICATIONS

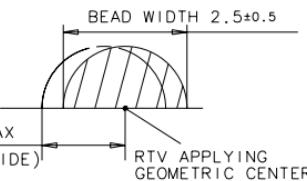
ALL DIMENSION ARE REFERENCE.



## 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

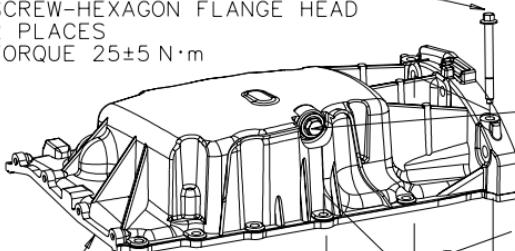
## RTV SEALER - OIL PAN

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	N	EN00E11030674000	00-02-10	2001 2.0L-4V NON DI CD132	29	29-D

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

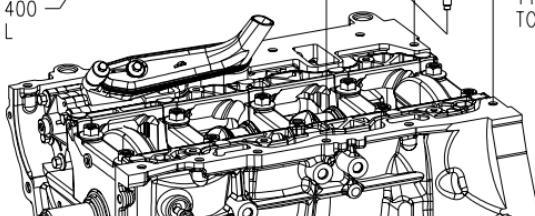
## CLEARANCE LIMITS AND SPECIFICATIONS

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



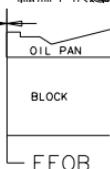
REF: ONLY  
-6730- / 10 404  
PLC-OIL PAN DRN  
TORQUE  $27.5 \pm 2.5$  N·m

-6675-/10 400  
PAN ASY-OIL

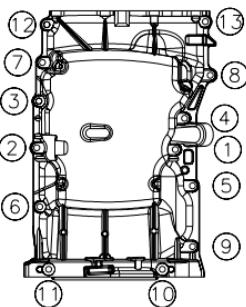


W500224-S309 / 9XF00224X9  
SCREW-HEXAGON FLANGE HEAD  
11 PLACES  
TORQUE  $25 \pm 5$  N·m

OIL PAN TO FLUSH  $\pm 0.05$ mm



FASTENING PROCEDURE (SINGLE SPINDLE METHOD).



## OIL FILL QUANTITIES

TOTAL FACTORY OIL FILL (DRY ENGINE) =  $4.6 \pm 0.05$  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	CONT'D.	
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

### ENGINE NUMBER STAMPING POSITION

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

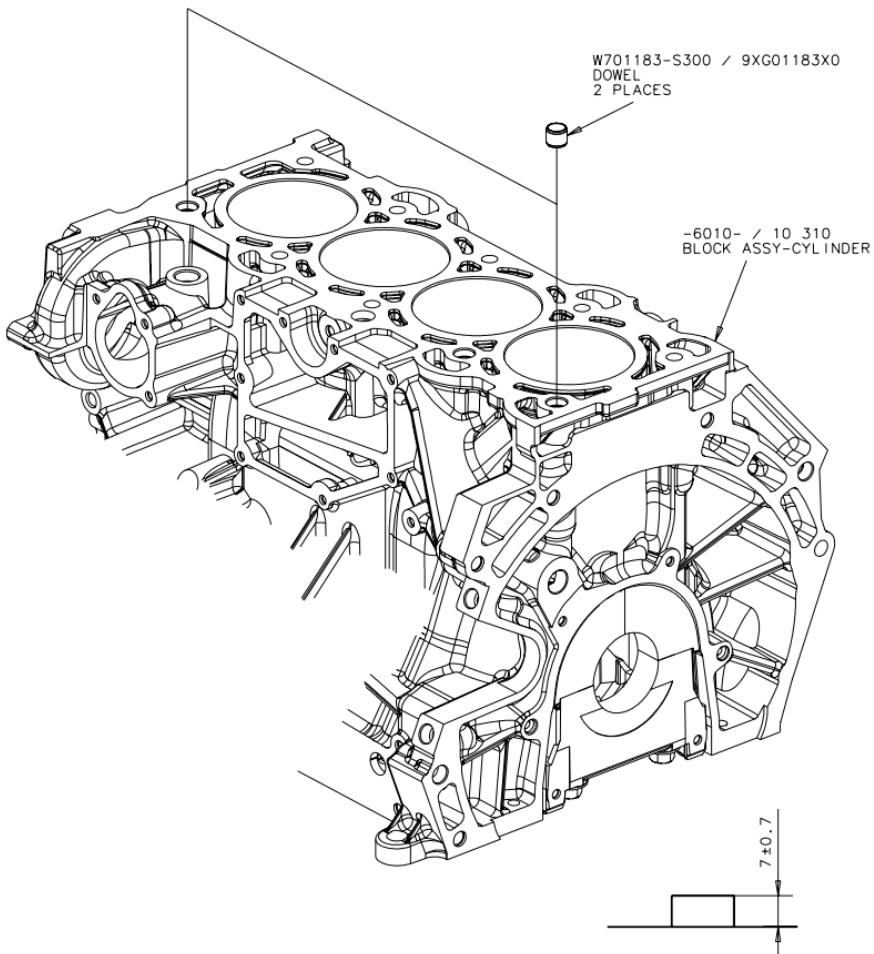
ENGINE TYPE MARKING	L8 TYPE {0.0018 m3} LF TYPE {0.002 m3} L3 TYPE {0.0023 m3}
SPEC OF ENGRAVING	CONFORM TO MES W7102-1003.
LOCATION OF MARKING	<p>FRONT</p> <p>REAR</p> <p> ENGINE TYPE &amp; NUMBER STAMPING POSITION</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p style="text-align: center;"><b>DETAIL</b></p> <p style="text-align: center;"> <span style="background-color: black; color: white; padding: 2px 5px;">■</span> ENGINE TYPE  <span style="border: 1px solid black; padding: 2px 5px;">□</span> 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	CONT'D.
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	CONT'D.	
C1S7G-543-AC	BD	E 11271059 000	01-11-02	2001 2.0L-4V NON DI CD132	32	32-D	

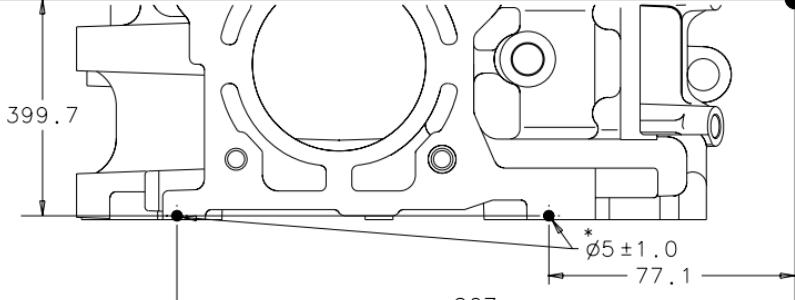
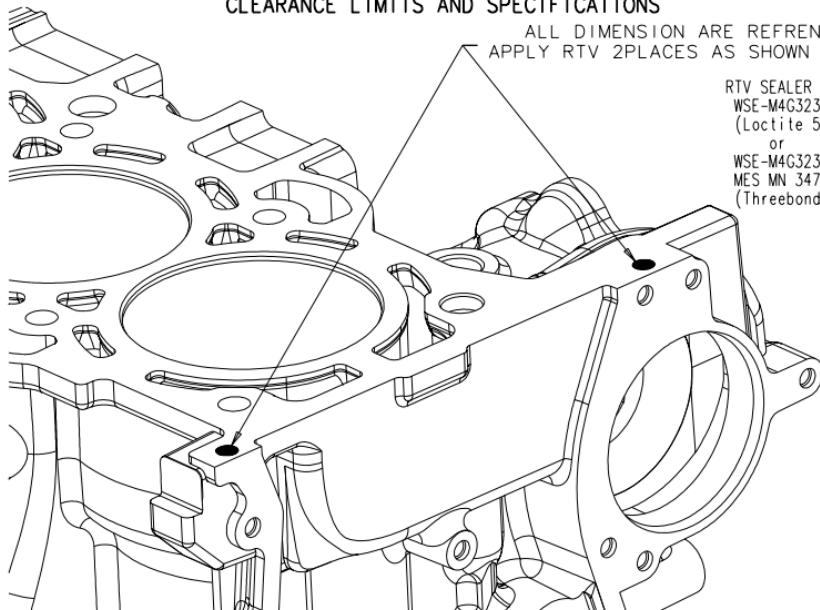
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

### CLEARANCE LIMITS AND SPECIFICATIONS

ALL DIMENSION ARE REFRENCE.

APPLY RTV 2PLACES AS SHOWN BELOW.

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

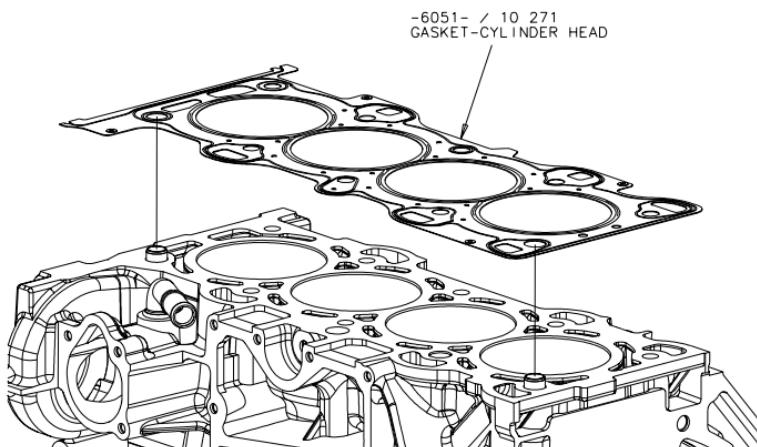


#### NOTES

- 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			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	RTV SEALER - CYL HEAD GASKET			
C1S7G-543-AC	BG	EN00E11282537000	01-11-09	MODEL	2001 2.0L-4V NON DI CD132	SHEET	33
						CONT'D.	34

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

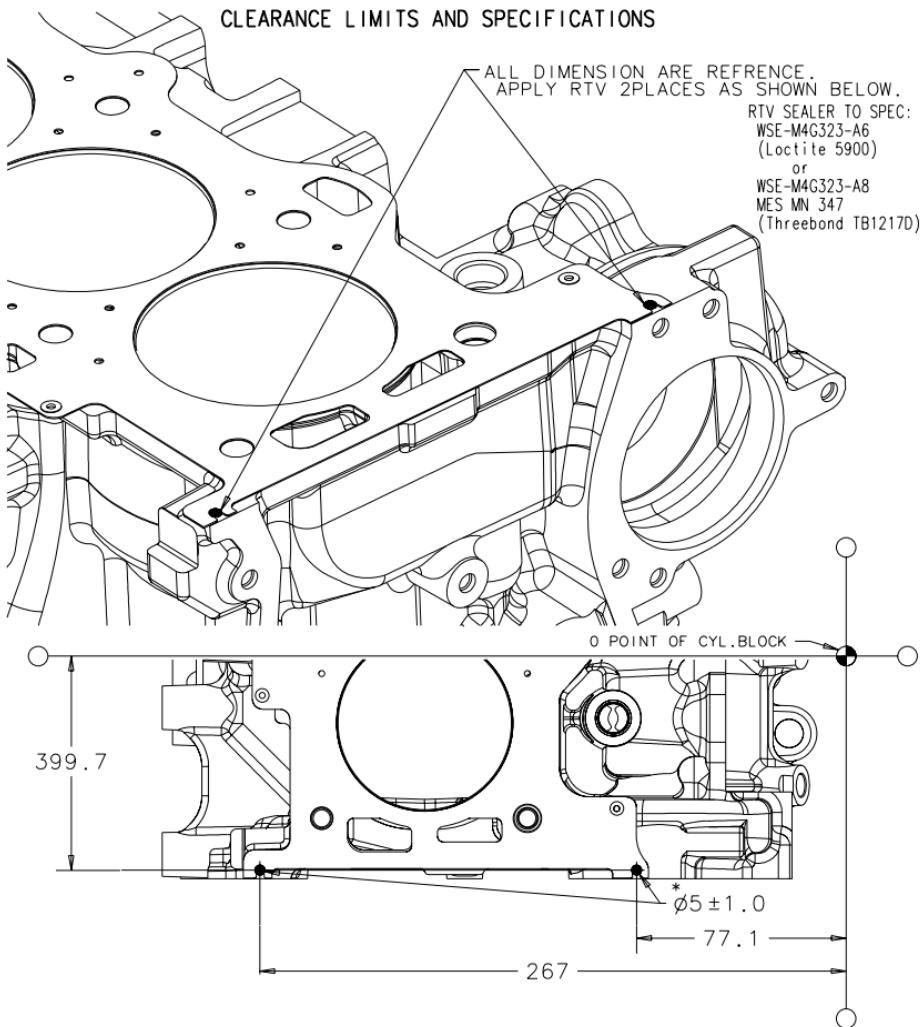


	Z3	Z1	Z2
1.8L Non-DI			○
1.8L DI		○	○
2.0L+2.3L		○	
2.4L	○	○	
2.8L	○		

CAUTION: DO NOT RE-USE GASKET

RESTRICTIONS			PART NAME/TITLE GASKET-CYLINDER HEAD			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	BG	EN00111282537000	01-11-09	2001 2.0L-4V NON DI CD132	34	34-A

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

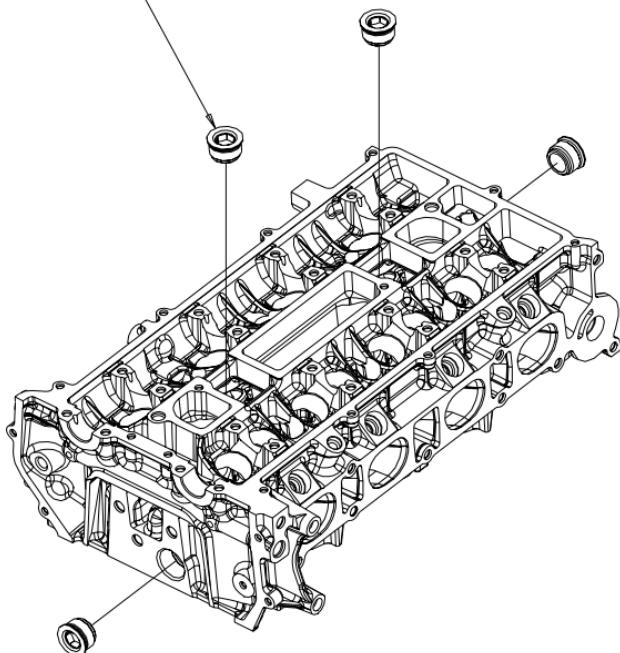
**NOTES**

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

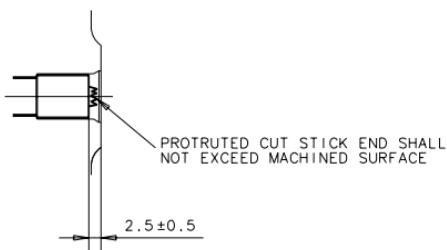
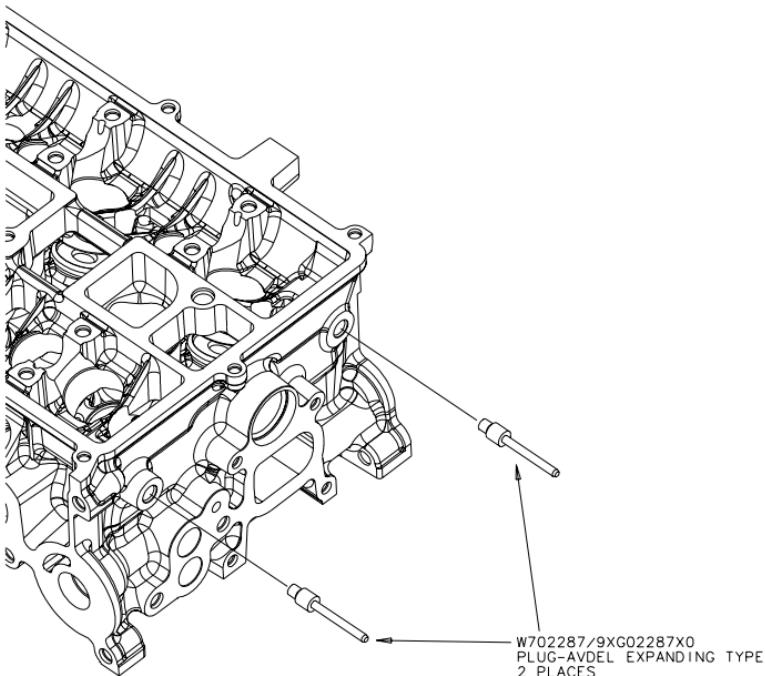
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

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



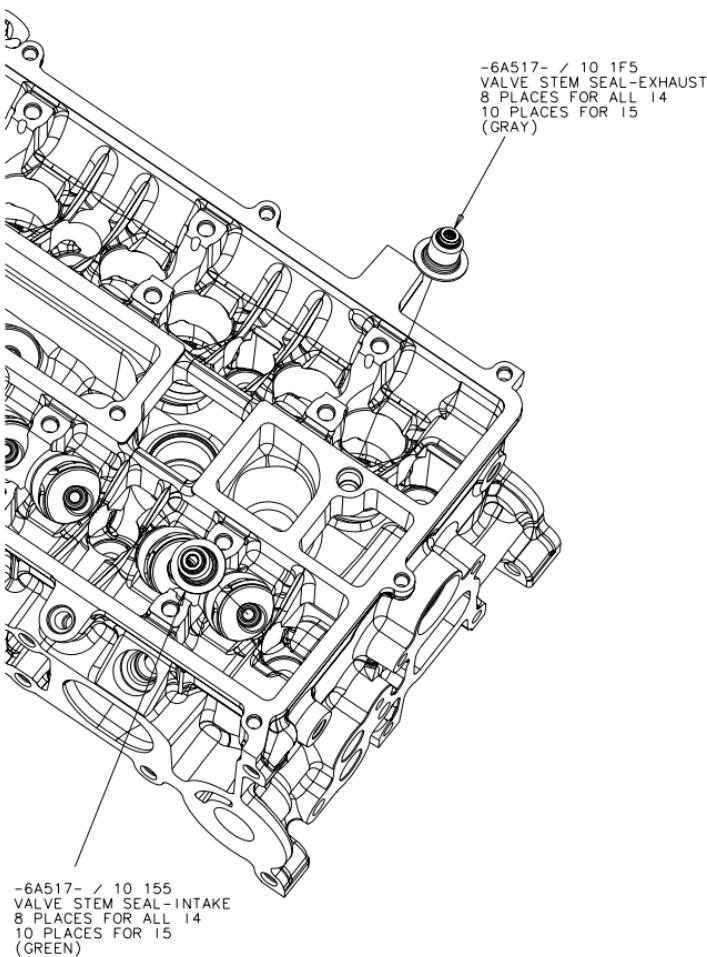
RESTRICTIONS			PART NAME/TITLE PLUG-CYLINDER HEAD			
SPECIFICATION NO. <b>C1S7G-543-AC</b>	REV <b>AP</b>	RELEASE NO. <b>EN00E11189361000</b>	DATE <b>01-06-22</b>	MODEL <b>2001 2.0L-4V NON DI CD132</b>	SHEET <b>35</b>	CONT'D. <b>36</b>

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



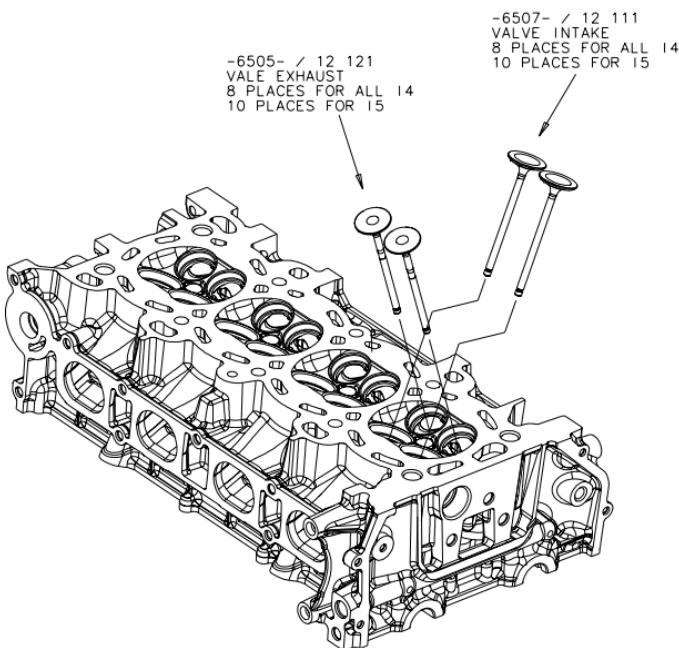
RESTRICTIONS			PART NAME/TITLE PLUG-AVDEL			
SPECIFICATION NO. <b>C1S7G-543-AC</b>	REV <b>C</b>	RELEASE NO. <b>EN00110819645017</b>	DATE <b>99-02-25</b>	MODEL <b>2001 2.0L-4V NON DI CD132</b>	SHEET <b>36</b>	CONT'D. <b>37</b>

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS			PART NAME/TITLE <b>VALVE STEM OIL SEALS</b>			
SPECIFICATION NO. <b>C1S7G-543-AC</b>	REV <b>H</b>	RELEASE NO. <b>EN00E11007392000</b>	DATE <b>99-09-06</b>	MODEL <b>2001 2.0L-4V NON DI CD 132</b>	SHEET <b>37</b>	CONT'D. <b>38</b>

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



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

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

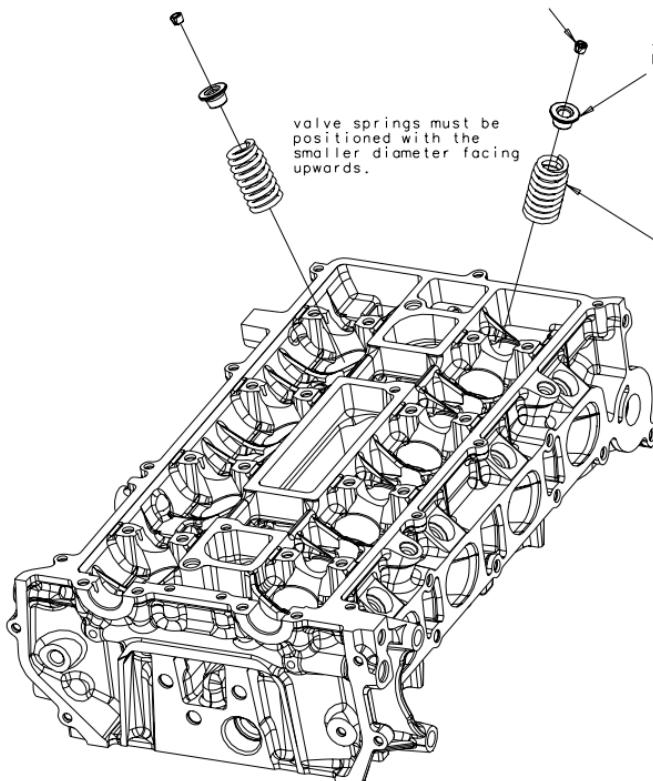
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

-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 cm<sup>3</sup> [normal]/min (PER ONE PORT)

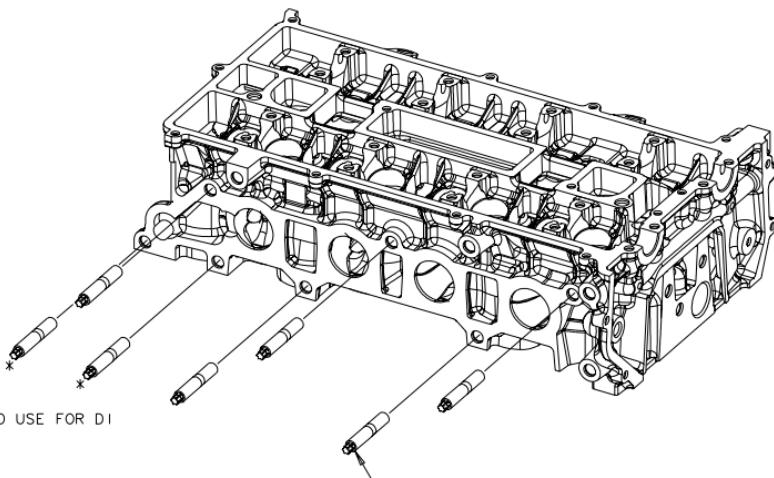
EXHAUST PORT : WITHIN 100 cm<sup>3</sup> [normal]/min (PER ONE PORT)

TOLERABLE LEAKAGE FOR THE OTHER ENGINE

INTAKE & EXHAUST PORT : WITHIN 15 cm<sup>3</sup> [normal]/min (PER ONE PORT)

RESTRICTIONS			PART NAME/TITLE VALVE SPRINGS & RETAINERS			
SPECIFICATION NO. <b>C157G-543-AC</b>	REV <b>BC</b>	RELEASE NO. <b>EN00E11185527000</b>	DATE <b>01-10-30</b>	MODEL <b>2.0L-4V NON DI CD132</b>	SHEET <b>39</b>	CONT'D. <b>40</b>

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



\* NO USE FOR DI

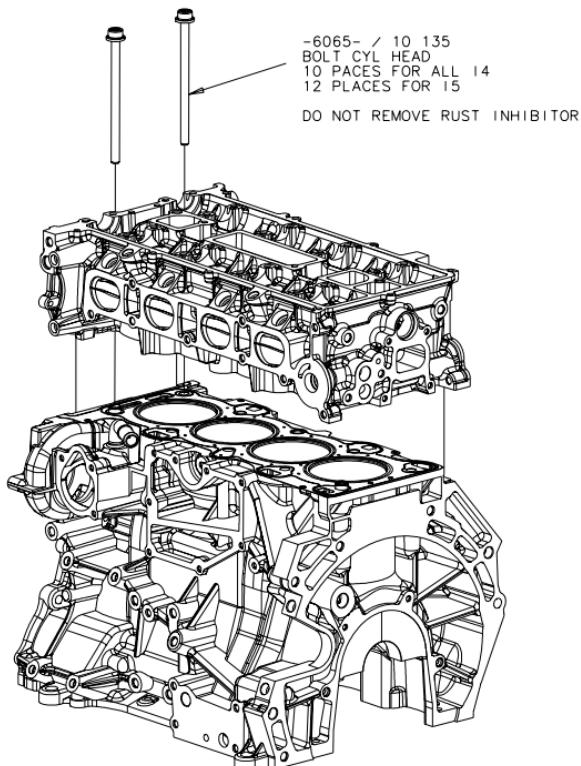
-W704474- / 9XG044474  
STUD M10  
5 PLACES FOR DI  
7 PLACES FOR OTHER 14  
TORQUE  $17 \pm 2$  Nm

### NOTE :

STUDS MAY BE ASSEMBLED ON MAIN ENGINE LINE

RESTRICTIONS			PART NAME/TITLE <b>STUDS-EXHAUST MANIFOLD</b>			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AU	EN00E11212646000	01-08-07	2001 2.0L-4V NON DI CD132	40	41

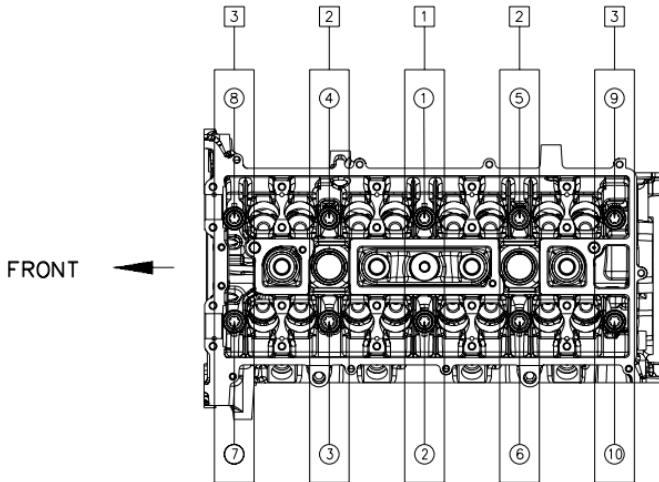
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



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

RESTRICTIONS			PART NAME/TITLE CYLINDER HEAD & BOLTS			
SPECIFICATION NO. C1S7G-543-AC	REV D	RELEASE NO. EN00E10967761000	DATE '99-04-28	MODEL 2001 2.0L-4V NON DI CD132	SHEET 41	CONT'D. 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  $15\pm 2$  Nm.
3. RUNDOWN ALL BOLTS TO  $45\pm 1$  Nm.
4. TIGHTENING SEQUENCE AS SHOWN IN THE SKETCH ABOVE. ①~③
5. TURN ALL BOLTS SIMULTANEOUSLY  $180^\circ\pm 4^\circ$ .

**SINGLE WRENCH METHOD.**

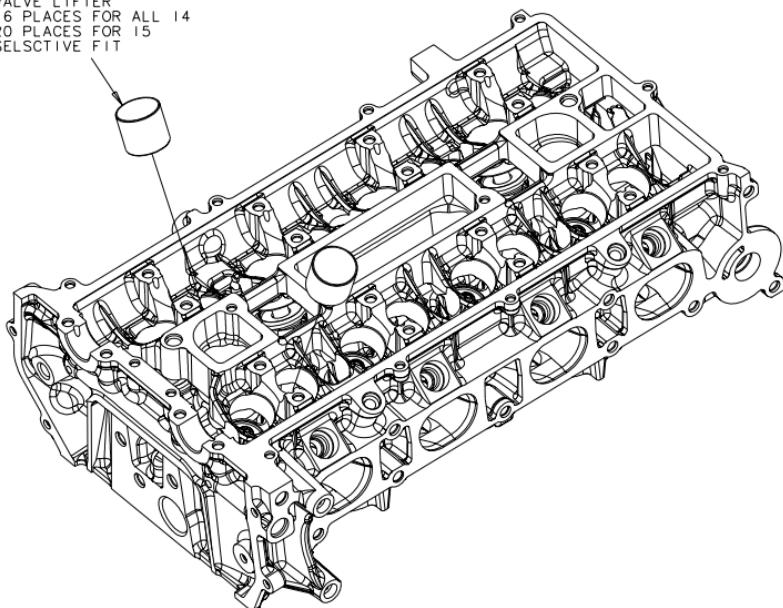
1. RUNDOWN ALL BOLTS TO 5 Nm.
  2. RUNDOWN ALL BOLTS TO  $15\pm 2$  Nm.
  3. RUNDOWN ALL BOLTS TO  $45\pm 1$  Nm.
  4. TURN ALL BOLTS  $90^\circ\pm 2^\circ$ .
  5. TURN ALL BOLTS  $90^\circ\pm 2^\circ$ .
- TIGHTENING SEQUENCE AS SHOWN IN THE SKETCH ABOVE. ①~⑩

RESTRICTIONS			PROCEDURE - CYLINDER HEAD BOLTS			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	E	EN00E10986253000	'99-06-30	2001 2.0L-4V NON DI CD132	42	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  
SELSCTIVE FIT



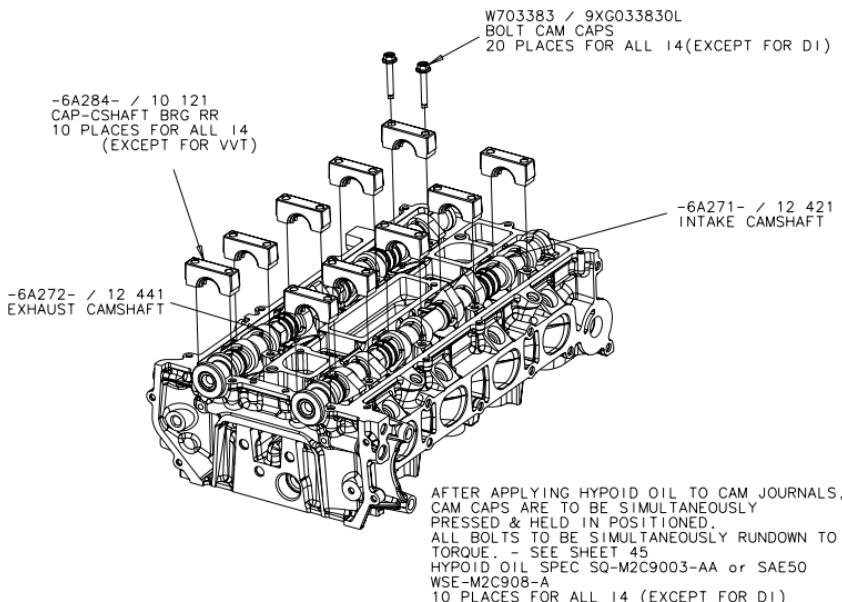
NOTE: LUBRICATE VALVE LIFTER BORE WITH FACTORY FILL ENGINE OIL  
BEFORE ASSEMBLY OF VALVE LIFTER

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

RESTRICTIONS			PART NAME/TITLE VALVE LIFTERS			
SPECIFICATION NO. C1S7G-543-AC	REV D	RELEASE NO. EN00E10967761000	DATE '99-04-28	MODEL 2001 2.0L-4V NON DI CD132	SHEET 43	CONT'D. 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)

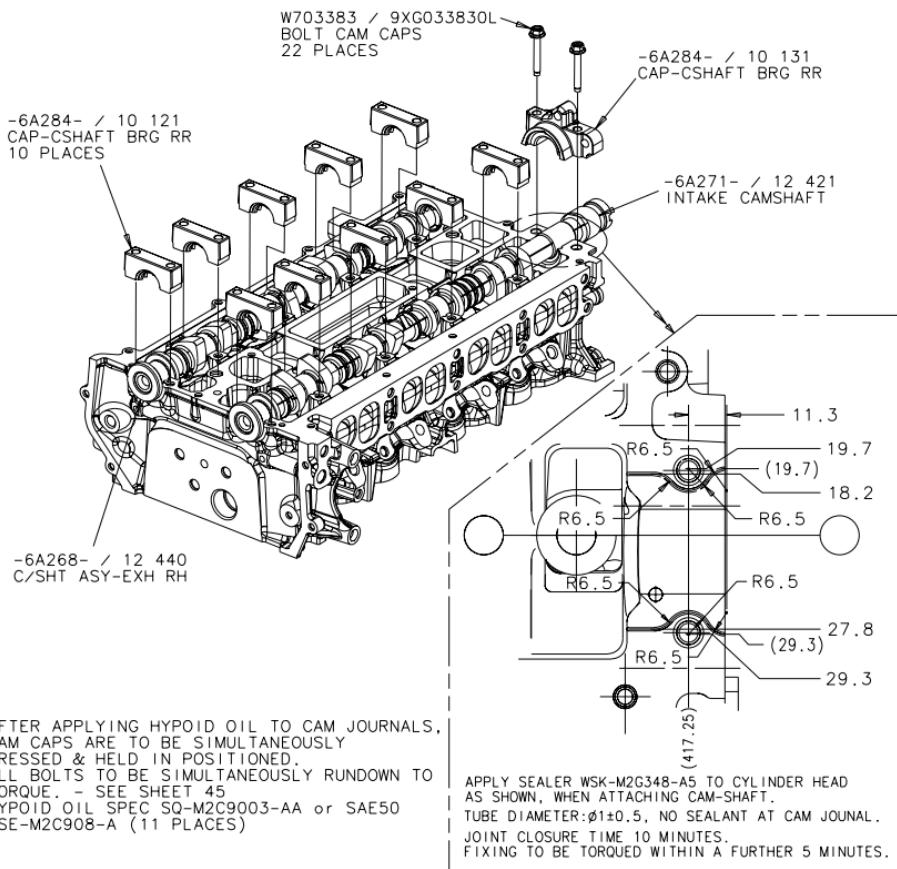
**CAUTION:**

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

RESTRICTIONS			PART NAME/TITLE <b>CAM SHAFT &amp; CAM CAP</b>			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AU	EN00E11212646000	01-08-07	2001 2.0L-4V NON DI 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.

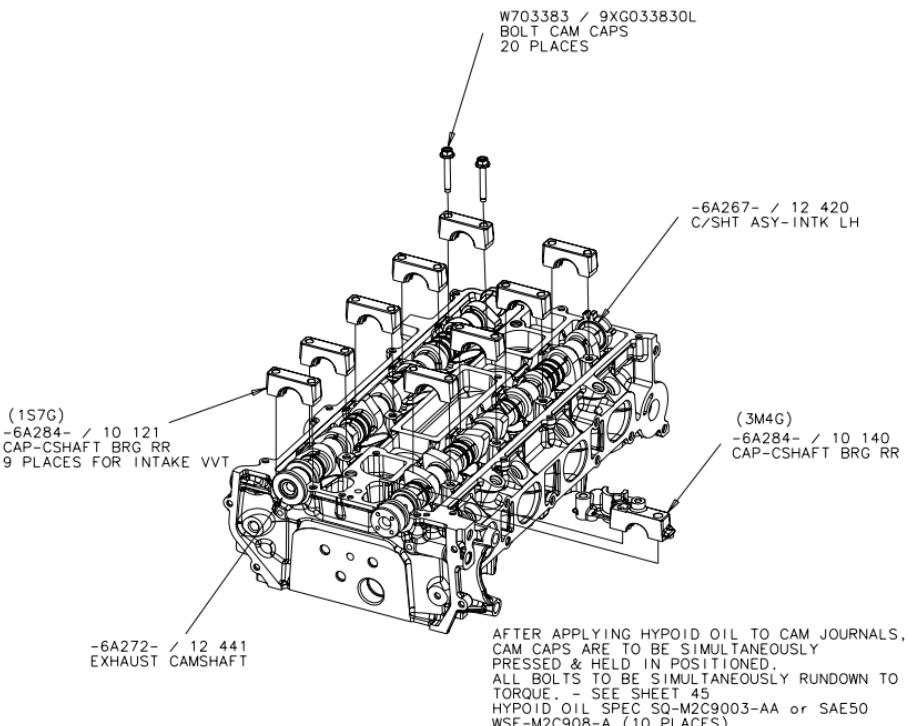
CAMSHAFT THRUST CLEARANCE 0.09-0.24 (INFORMATION ONLY)

**CAUTION:**

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

RESTRICTIONS				PART NAME/TITLE <b>CAM SHAFT &amp; CAM CAP</b>			
SPECIFICATION NO. <b>C1S7G-543-AC</b>	REV <b>AU</b>	RELEASE NO. <b>EN00E11212646000</b>	DATE <b>01-08-07</b>	MODEL <b>2003.5 1.8L-4V DI CD132</b>	SHEET <b>44-C</b>	CONT'D. <b>44-D</b>	

**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)

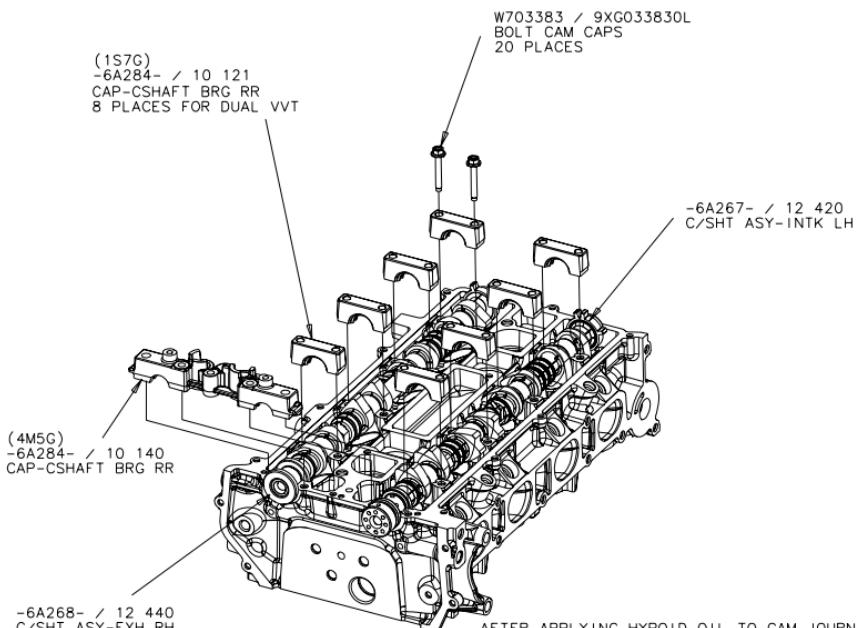
**CAUTION:**

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

RESTRICTIONS		PART NAME/TITLE <b>CAM SHAFT &amp; CAM CAP</b>				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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 SO-M2C9003-AA or SAE50  
WSE-M2C908-A (10 PLACES)

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

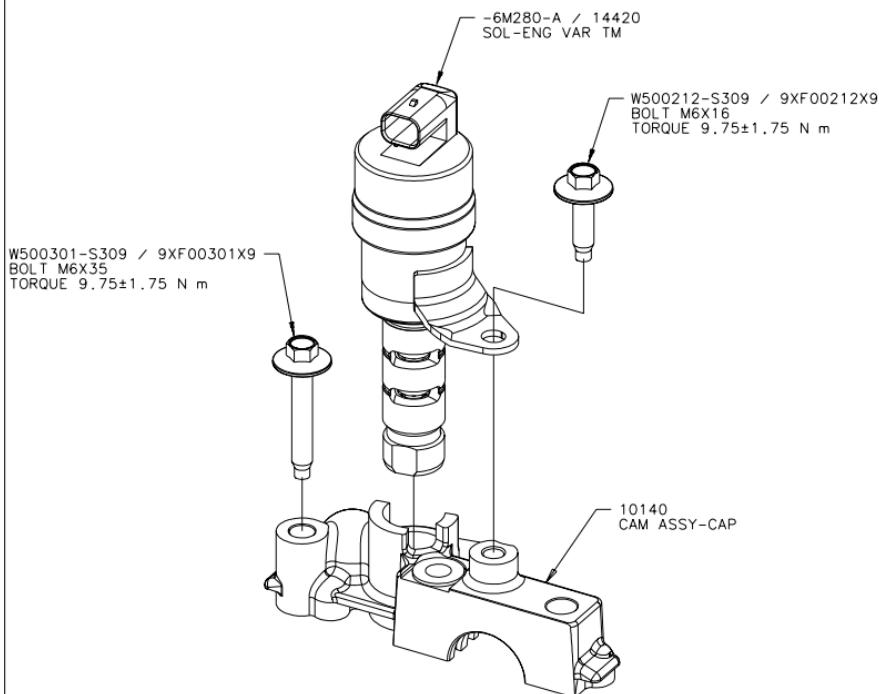
CAMSHAFT THRUST CLEARANCE 0.09-0.24 (INFORMATION ONLY)

**CAUTION:**

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

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

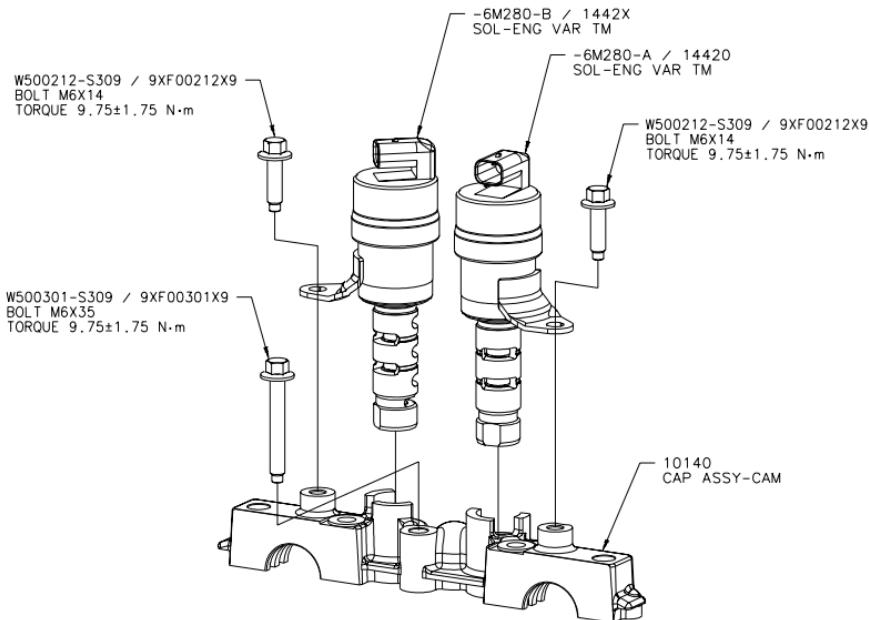
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**



1. TIGHTEN THE "BOLT M6X35".
2. ASSEMBLE THE "SOL-ENG VAR TM".
3. TIGHTEN THE "BOLT M6X16".

RESTRICTIONS		PART NAME/TITLE <b>SOL-ENG VAR TM</b>				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AH	EN00E11190272000	01-03-28	2003 2.3L-4V NON DI	44-G	44-H

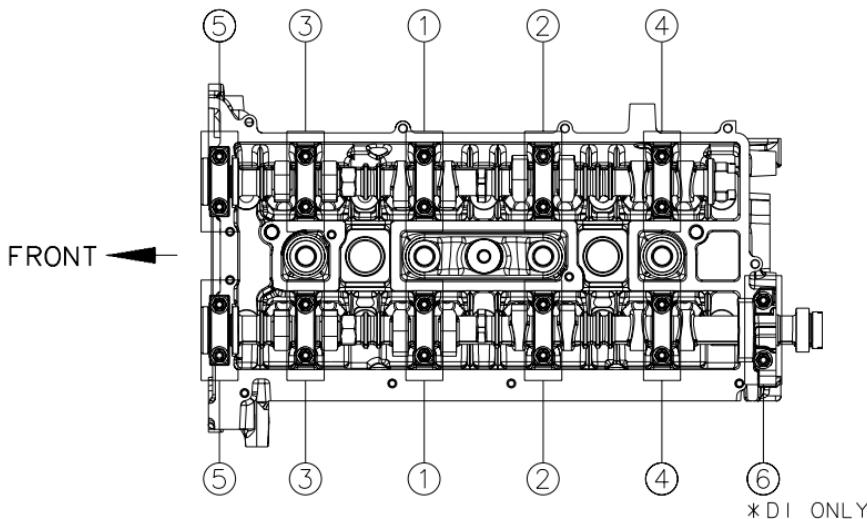
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**



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

RESTRICTIONS			PART NAME/TITLE <b>SOL-ENG VAR TM</b>			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AH	EN00E11190272000	01-03-28	2003 2.3L-4V NON DI	44-H	45

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



**MULTI-SPINDLE METHOD.**

1. RUNDOWN ALL BOLTS SIMULTANEOUSLY TO  $7 \pm 2$  Nm.
2. RUNDOWN ALL BOLTS SIMULTANEOUSLY TO  $15.5 \pm 1.5$  Nm.

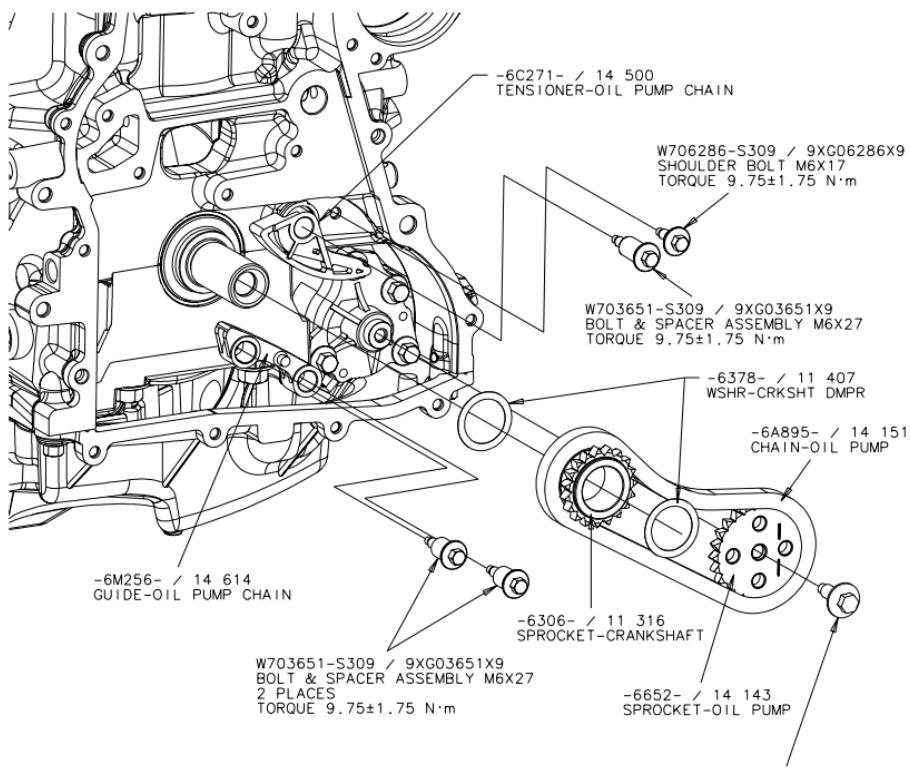
**SINGLE WRENCH METHOD.**

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

RESTRICTIONS			PROCEDURE - CAMCAP BOLT			
SPECIFICATION NO. <b>C1S7G-543-AC</b>	REV <b>H</b>	RELEASE NO. <b>EN00E11007392000</b>	DATE <b>99-09-06</b>	MODEL <b>2001 2.0L-4V NON DI CD132</b>	SHEET <b>45</b>	CONT'D. <b>45-D</b>

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

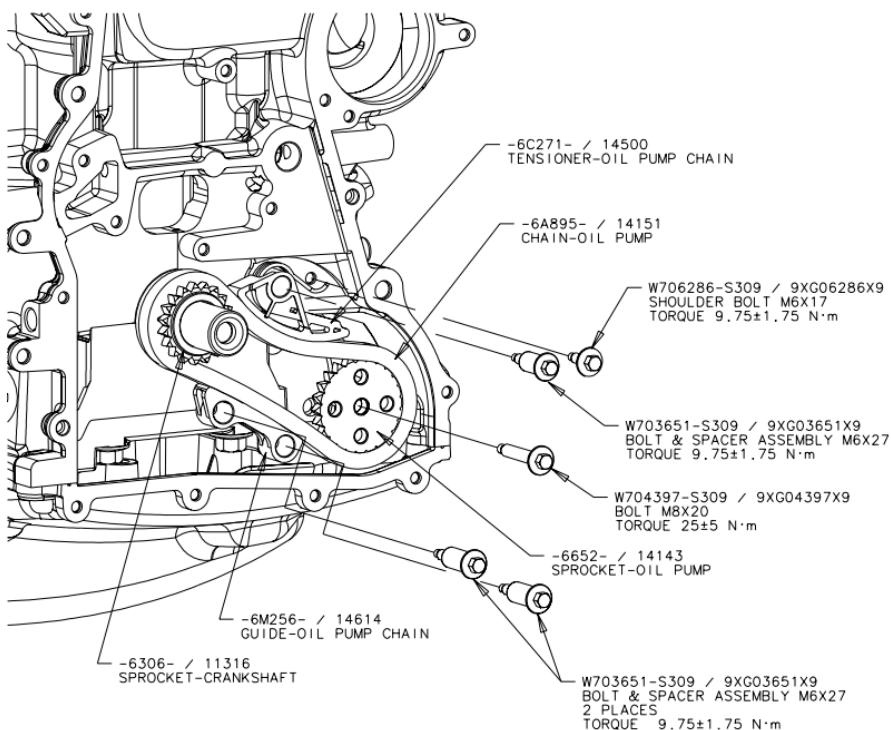
### CLEARANCE LIMITS AND SPECIFICATIONS



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			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AX	EN00 E 11183682 001	01-09-27	2001 2.0L-4V NON DI CD132	46	46-A

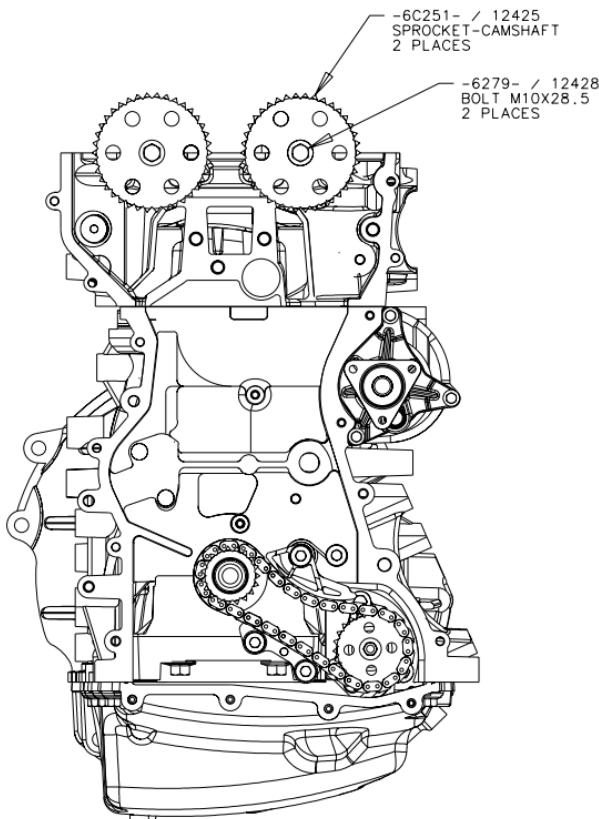
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**



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

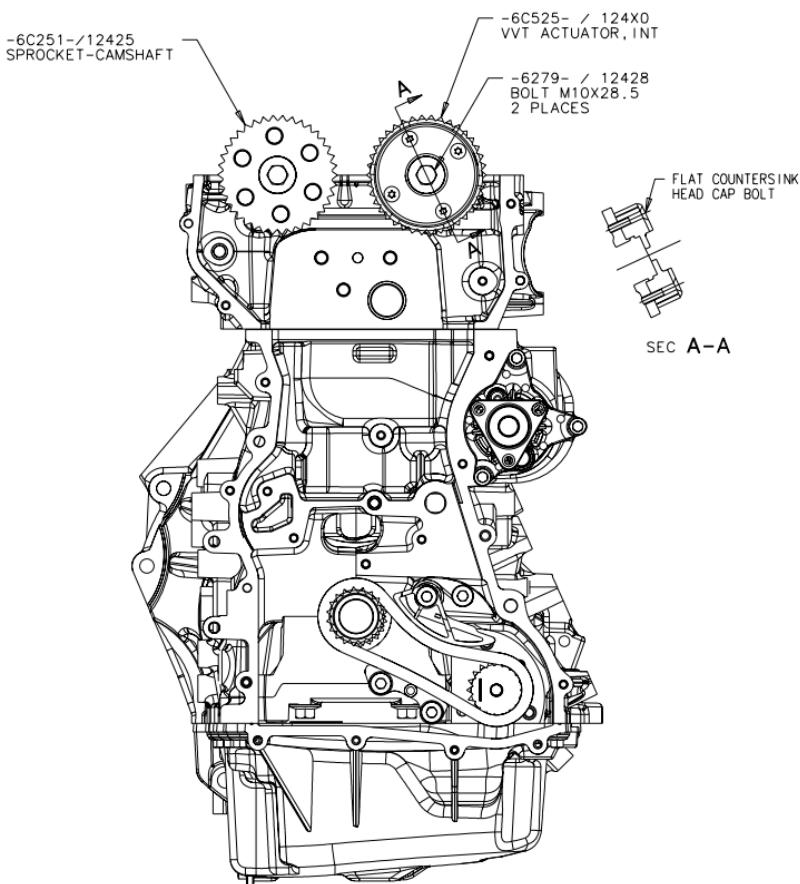
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



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

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

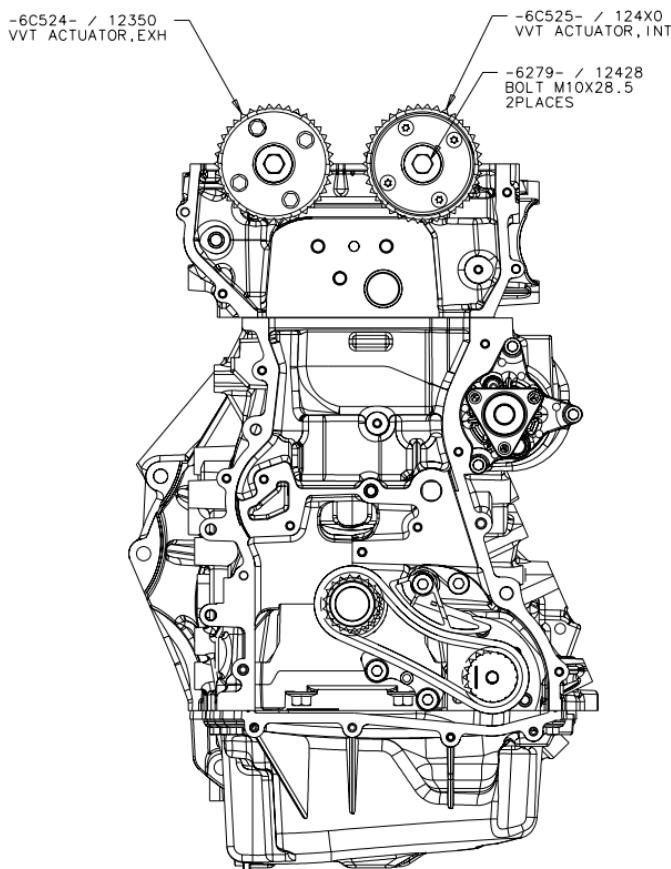
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



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

RESTRICTIONS		PART NAME/TITLE <b>SPROCKET-CAMSHAFT</b>					
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	AW	EN00E11114191001	01-09-11	2003 2.3L-4V NON DI	47-E	47-F	

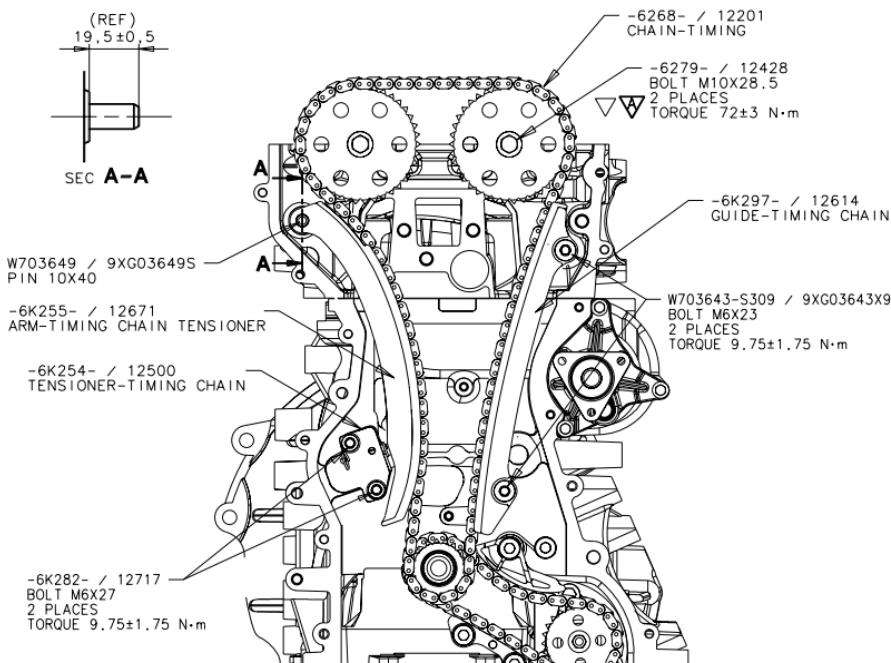
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



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

RESTRICTIONS		PART NAME/TITLE SPROCKET-CAMSHAFT				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AW	EN00E11114191001	01-09-11	2003 2.3L-4V NON DI	47-F	48

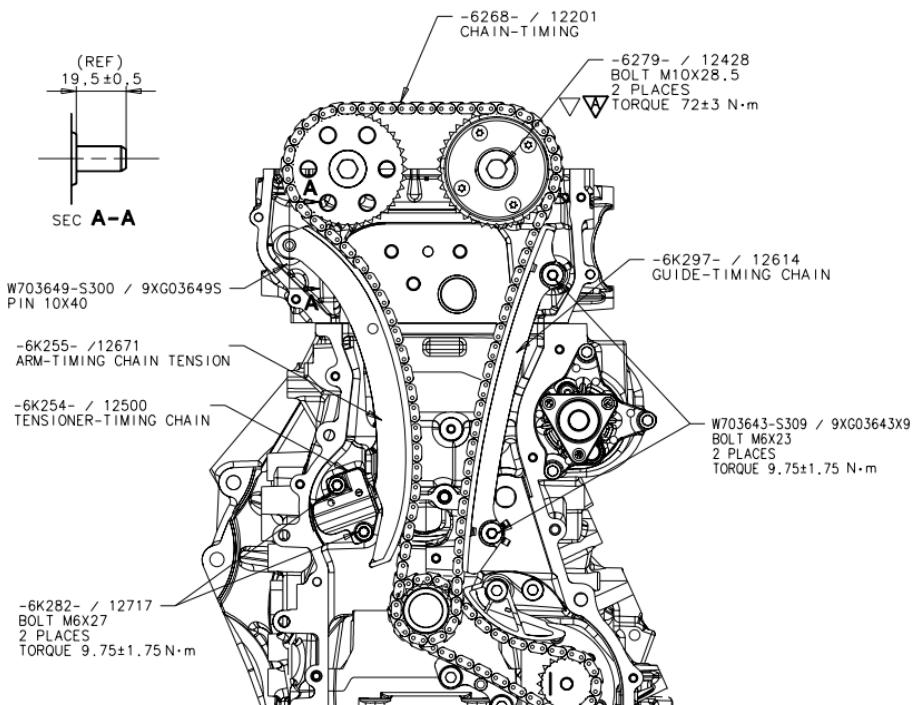
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



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	CONT'D.
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

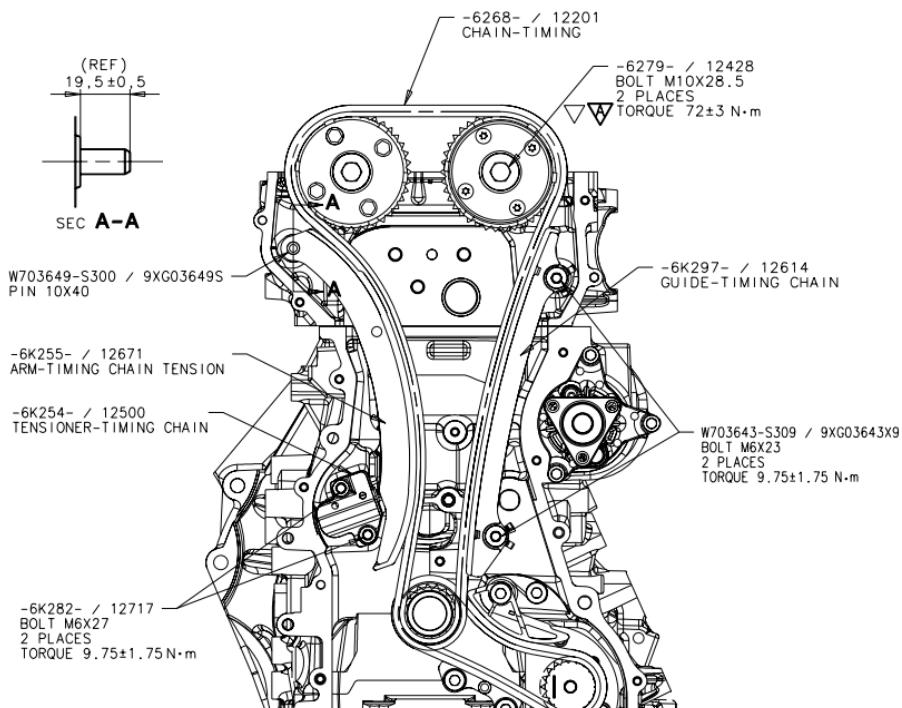


- ASSEMBLE THE CHAIN OVER "SPROCKET-CAMSHAFT", "VVT ACTUATOR" AND "SPROCKET-CRANKSHAFT" (NO TIMING MARK SPECIFIED).
- ASSEMBLE THE "GUIDE-TIMING CHAIN" AND FASTEN TIGHTLY.
- ASSEMBLE THE "ARM-TIMING CHAIN TENSIONER" IN THE PIVOT.  
ASSEMBLE "TENSIONER-TIMING CHAIN" AND TIGHTEN THE BOLTS.
- PULL THE PIN OF "TENSIONER-TIMING CHAIN". THE CHAIN IS NOW IN TENSION.
- 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.
- INSERT SPECIAL TOOL IN THE BACK END SLOTS OF CAMSHAFTS TO SET THEM IN THE RIGHT POSITION.
- 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 <b>CHAIN-TIMING / GUIDE-TIMING CHAIN</b>				
SPECIFICATION NO. <b>C1S7G-543-AC</b>	REV <b>AX</b>	RELEASE NO. <b>EN00E11183682001</b>	DATE <b>01-09-27</b>	MODEL <b>2003 2.3L-4V NON DI</b>	SHEET <b>48-E</b>	CONT'D. <b>48-F</b>

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

### CLEARANCE LIMITS AND SPECIFICATIONS



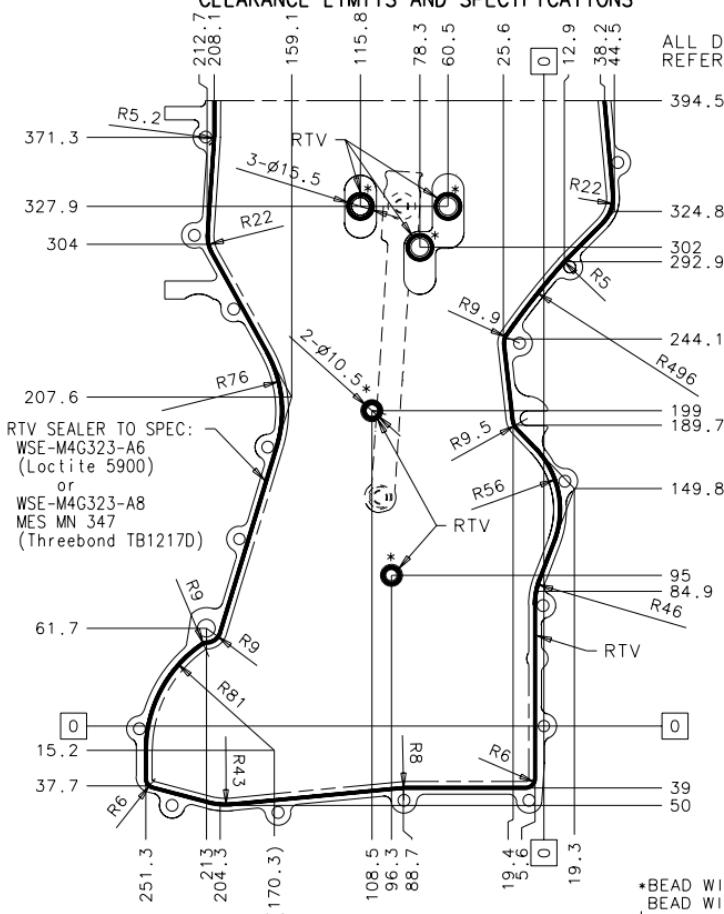
- ASSEMBLE THE CHAIN OVER "VVT ACTUATOR INT", "VVT ACTUATOR EXH" AND "SPROCKET-CRANKSHAFT" (NO TIMING MARK SPECIFIED).
  - ASSEMBLE THE "GUIDE-TIMING CHAIN" AND FASTEN TIGHTLY.
  - ASSEMBLE THE "ARM-TIMING CHAIN TENSIONER" IN THE PIVOT.
  - ASSEMBLE "TENSIONER-TIMING CHAIN" AND TIGHTEN THE BOLTS.
  - PULL THE PIN OF "TENSIONER-TIMING CHAIN". THE CHAIN IS NOW IN TENSION.
  - 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.
  - INSERT SPECIAL TOOL IN THE BACK END SLOTS OF CAMSHAFTS TO SET THEM IN THE RIGHT POSITION.
  - 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. <b>C1S7G-543-AC</b>	REV <b>AX</b>	RELEASE NO. <b>EN00E11183682001</b>	DATE <b>01-09-27</b>	MODEL <b>2003 2.3L-4V VVT / BS</b>	SHEET <b>48-F</b>	CONT'D. <b>49-A</b>

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

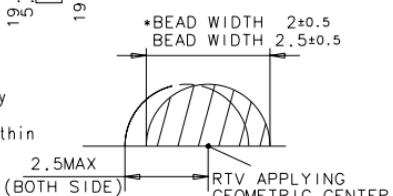
### CLEARANCE LIMITS AND SPECIFICATIONS

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.)



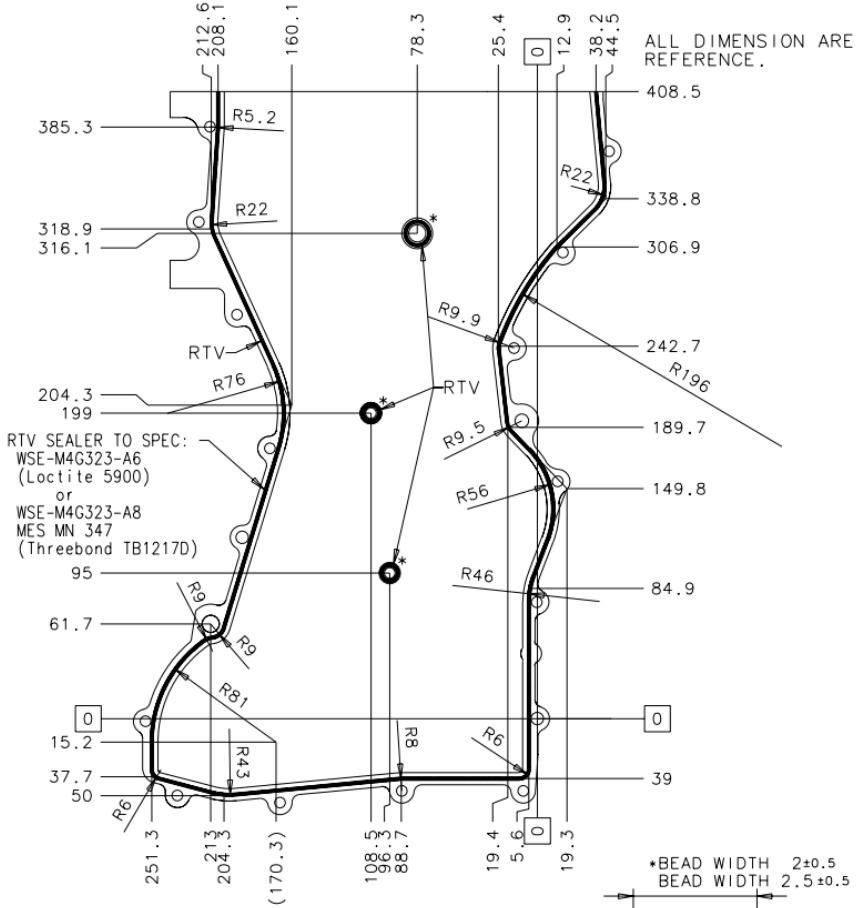
#### RESTRICTIONS

#### PART NAME/TITLE RTV SEALER-FRONT COVER

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

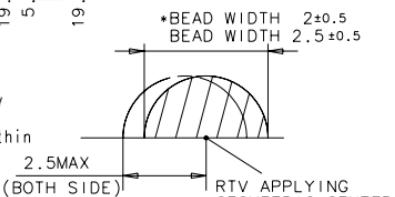
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

## CLEARANCE LIMITS AND SPECIFICATIONS



## NOTES

- No sticking of stain, dust, etc is allowed on RTV apply surface of cylinder block.
- 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.)



PART NAME/TITLE

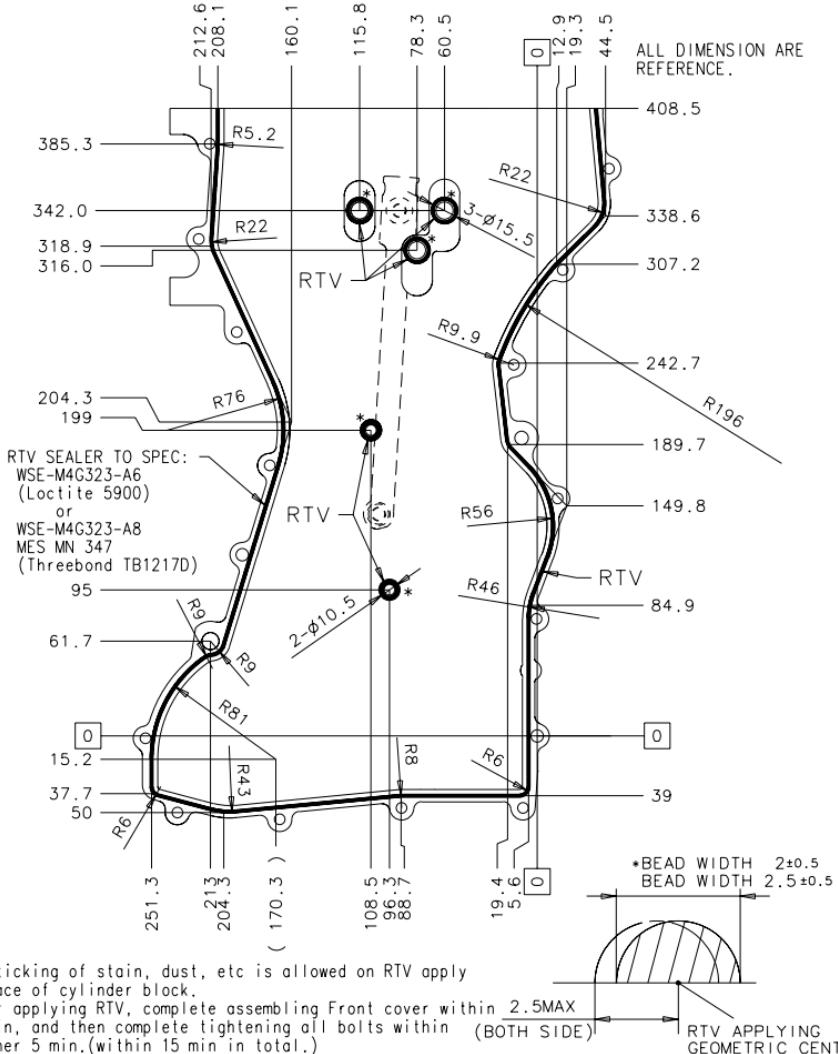
RTV SEALER-FRONT COVER

## RESTRICTIONS

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
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

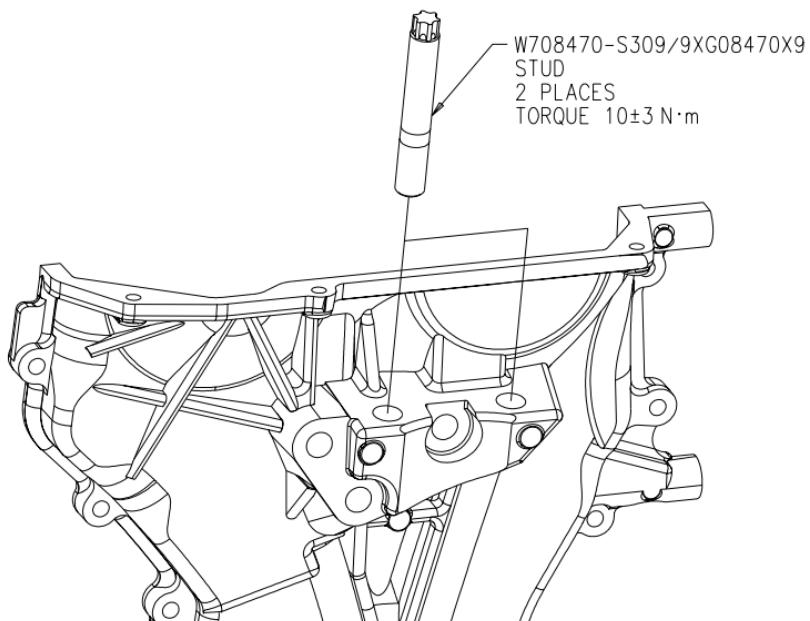


## RESTRICTIONS

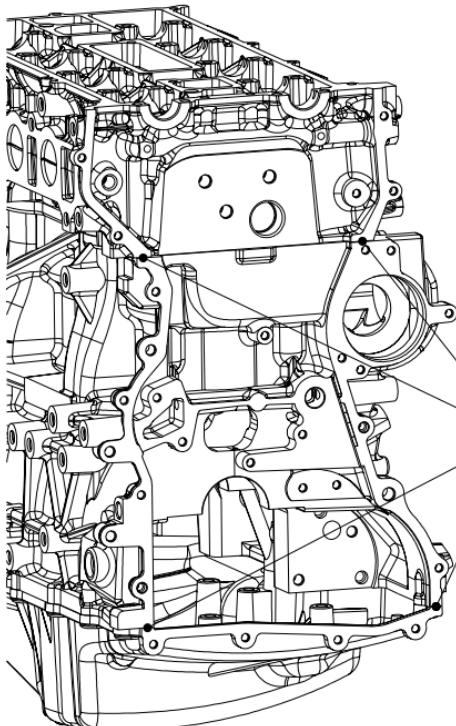
PART NAME/TITLE  
RTV SEALER-FRONT COVER

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	BG	EN00E11282537000	01-11-09	2002 2.3L-4V NON DI J56J	49-E	50

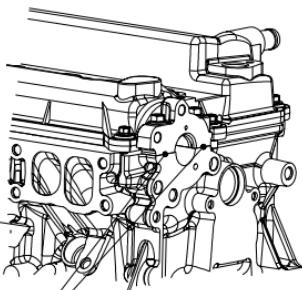
ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS



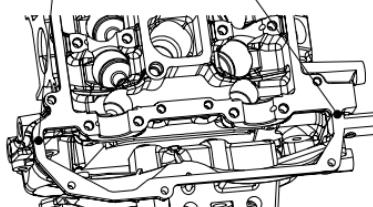
RESTRICTIONS			PART NAME/TITLE STUD-ENGINE MOUNT			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	BC	EN00E11282537000	01-11-09	2001 2.0L-4V NON DI CD132	50	50-A

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS

## ADDITIONAL PROCEDURE FOR DI



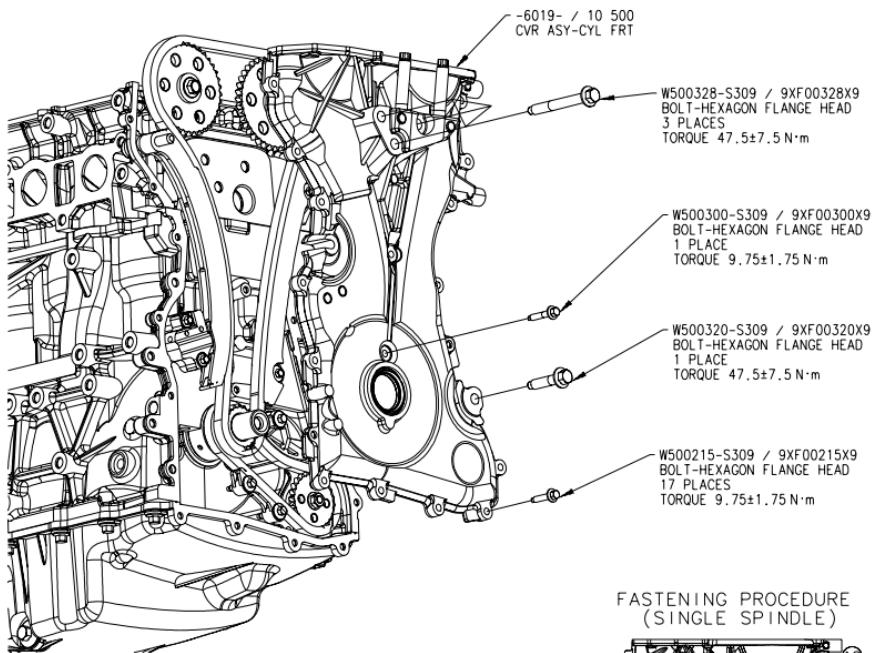
EXPOSED SURFACE :  
ENSURE THAT EXCESS RTV MATERIAL  
IS REMOVED FROM "T-JOINT"  
PRIOR TO SEALING THE JOINT LATER  
IN THE PROCESS.



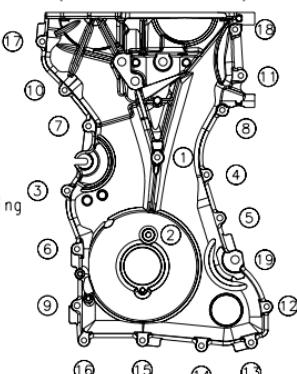
RESTRICTIONS			PART NAME/TITLE EXCESS RTV REMOVING			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON DI CD132	51	52-A

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

### CLEARANCE LIMITS AND SPECIFICATIONS

**NOTES**

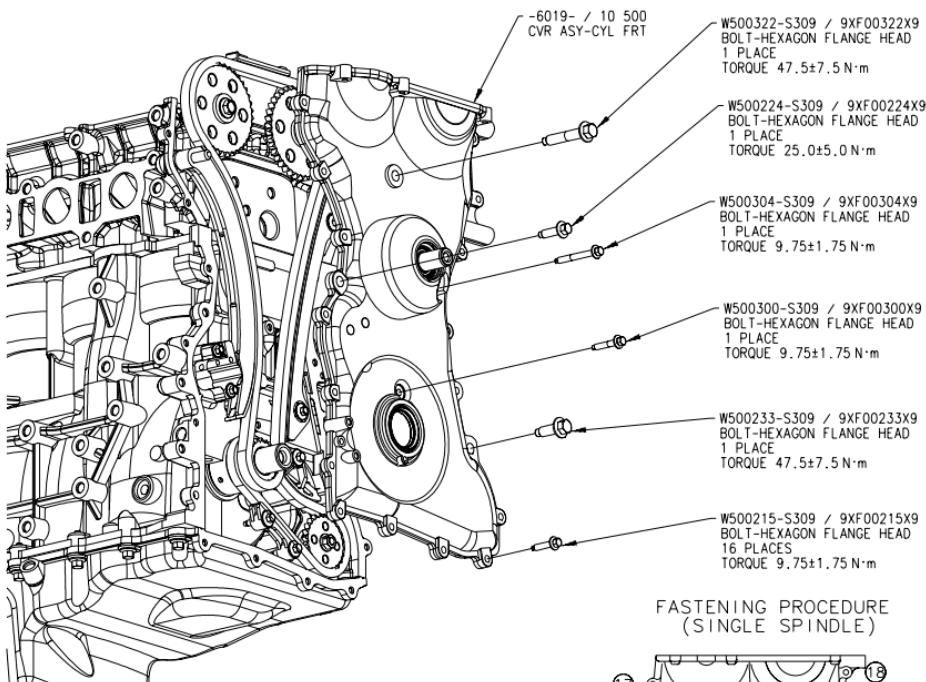
- 1.No sticking of stain, dust, etc is allowed on front cover sealing surface of cylinder block, cylinder head, front cover.
- 2.If parts have scratch on seal face of front cover assembly. which might give negative effect on sealability, those have to be replaced with good part.



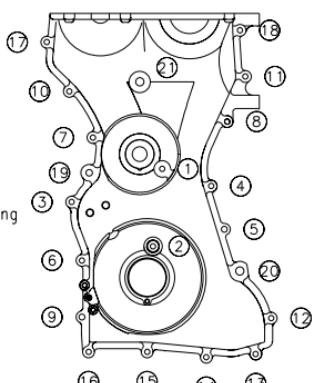
RESTRICTIONS				PART NAME/TITLE COVER ASY-CYL FRONT			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	R	EN00E11069681001	00-04-20	2001 2.0L-4V NON DI CD132	52-A	52-B	

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

### CLEARANCE LIMITS AND SPECIFICATIONS



#### FASTENING PROCEDURE (SINGLE SPINDLE)



#### NOTES

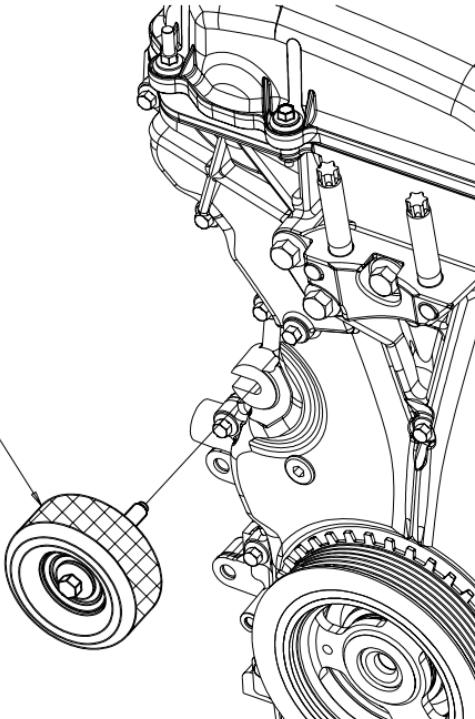
1. No sticking of stain, dust, etc is allowed on front cover sealing surface of cylinder block, cylinder head, front cover.
2. If parts have scratch on seal face of front cover assembly, which might give negative effect on sealability, those have to be replaced with good part.

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

CONT'D.

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS

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



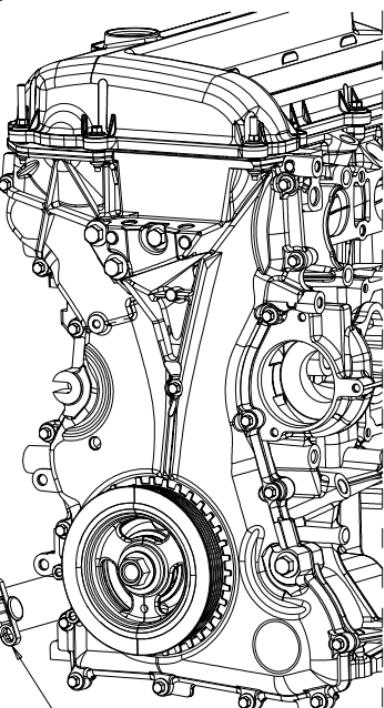
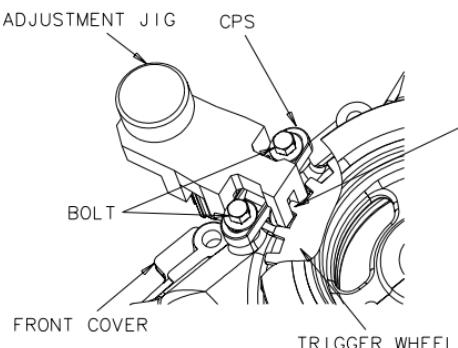
## NOTES

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.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	H	EN00E11007392000	'99-09-06	2001 2.0L-4V NON DI CD132	52-E	53-A

# ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

## CLEARANCE LIMITS AND SPECIFICATIONS



W701219-S309 / 9XG01219X9  
BOLT FLNG HEAD M6X16  
2 PLACES  
TORQUE  $6.5 \pm 1$  N·m      -6  
                                  SE

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

**NOTE:**

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

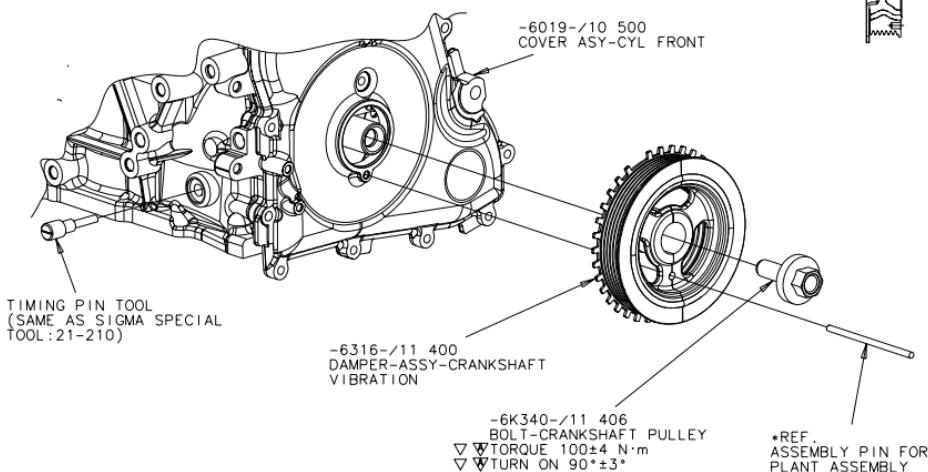
RESTRICTIONS				PART NAME/TITLE SENSOR-CRANKSHAFT POSITION			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON DI CD132	54	55	

## 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 THEM 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.

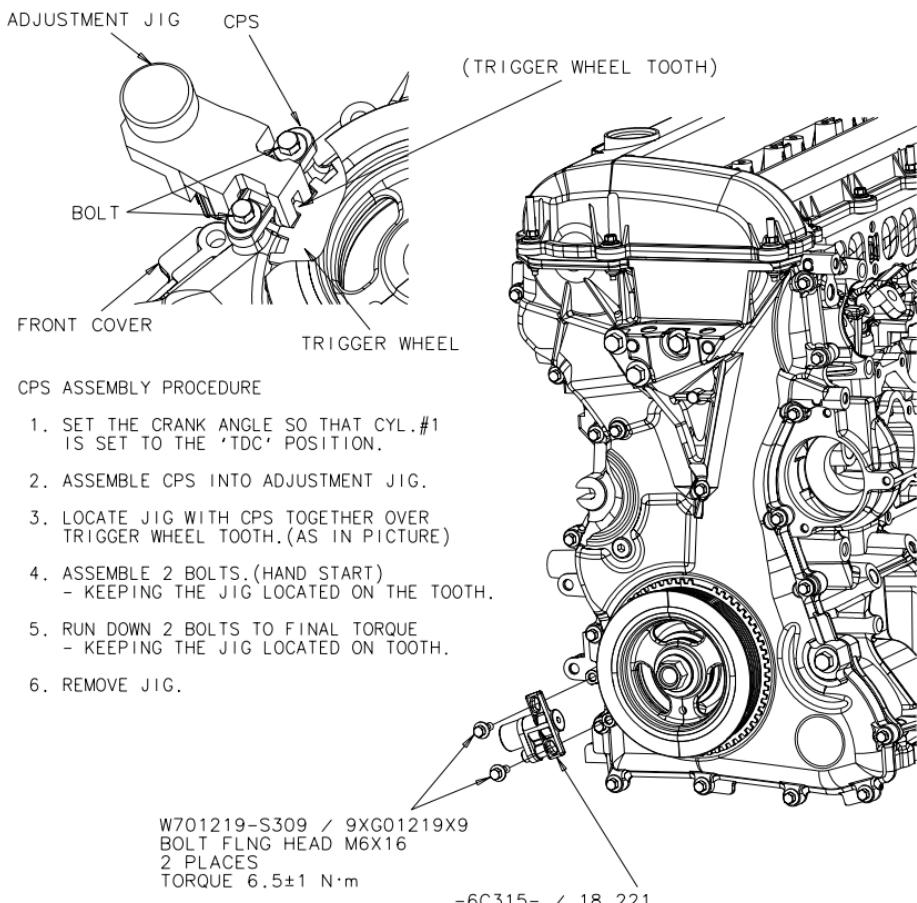
ADD FACTORY FILL  
ENGINE OIL ON PULLEY  
SEALING SURFACE,  
PRIOR TO INSTALL  
ON TO CRANKSHAFT.



NOTE:- DO NOT REUSE DAMPER BOLT.

RESTRICTIONS			PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AN	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

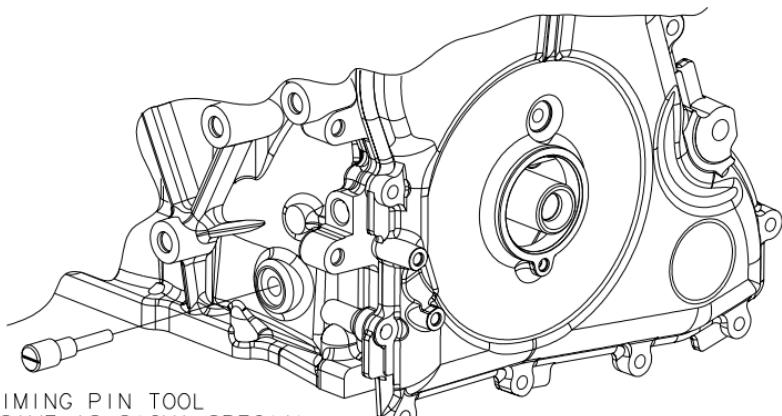
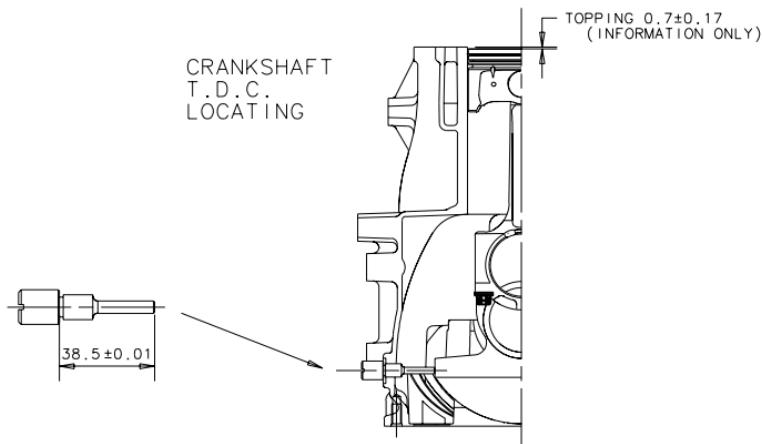


NOTE :

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. C1S7G-543-AC	REV R	RELEASE NO. EN00E11069681001	DATE 00-04-20	MODEL 2002 1.8L-4V DI CD132	SHEET 56-C	CONT'D. 57	

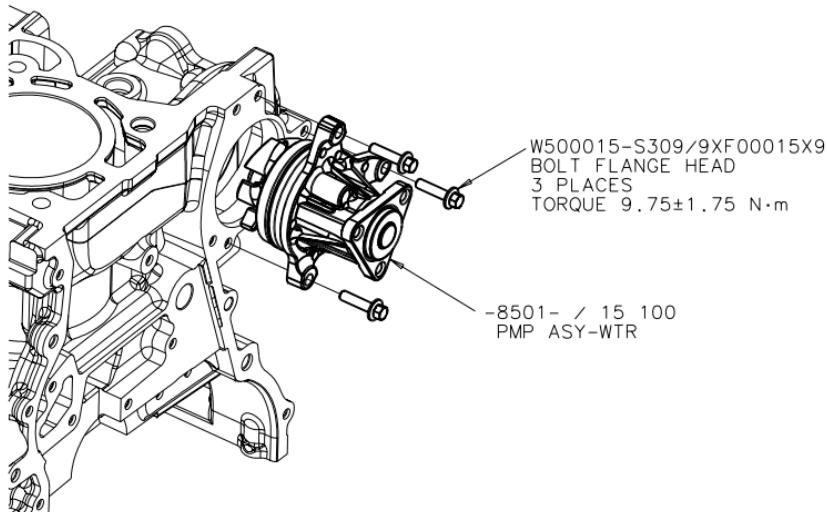
## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



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

RESTRICTIONS				PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	SPROCKET-CRANKSHAFT & TIMING PLATE			
C1S7G-543-AC	AE	EN00 E 11157486 001	01-01-31	2001	2.0L-4V NON DI	CD132	SHEET 57 CONTD. 58

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



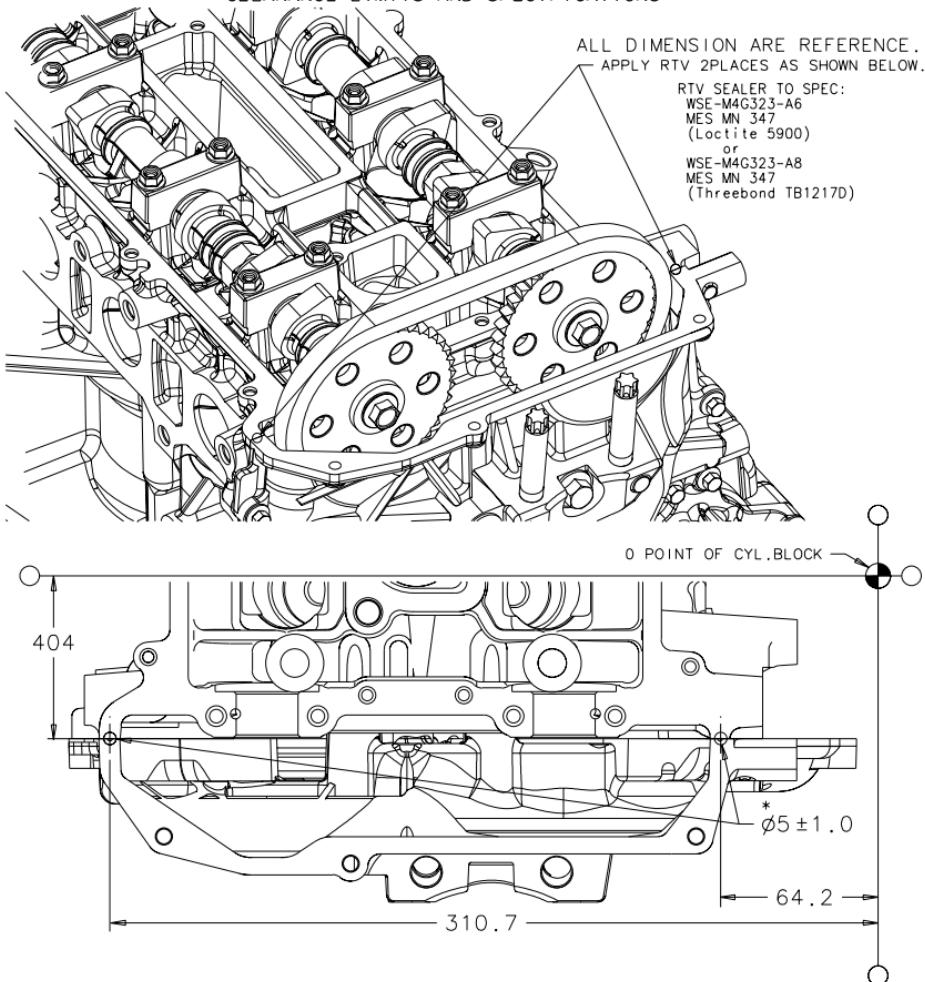
### NOTES

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 2.0L-4V NON DI 2.3L-4V NON DI	CD132 RANGER	SHEET 59	CONT'D. 60

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

## CLEARANCE LIMITS AND SPECIFICATIONS

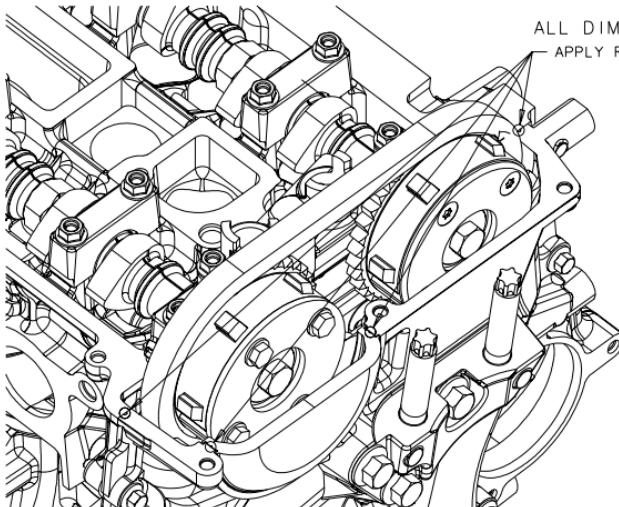


## NOTES

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			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	RTV SEALER - CAM COVER		SHEET	CONT'D.
C1S7G-543-AC	AA	EN00E11087761000	00-11-17	2001 2.0L-4V NON DI 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

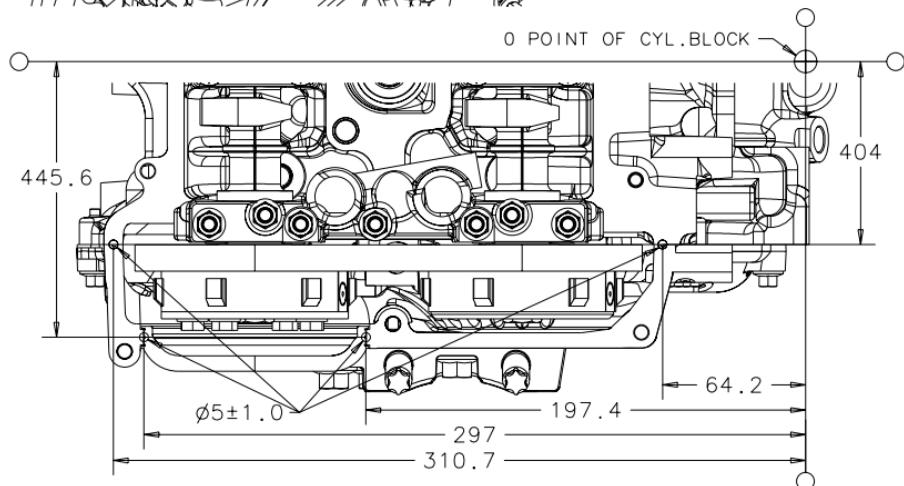
(Loctite 5900)

or

WSE-M4G323-A8

MES MN 347

(Threebond TB1217D)

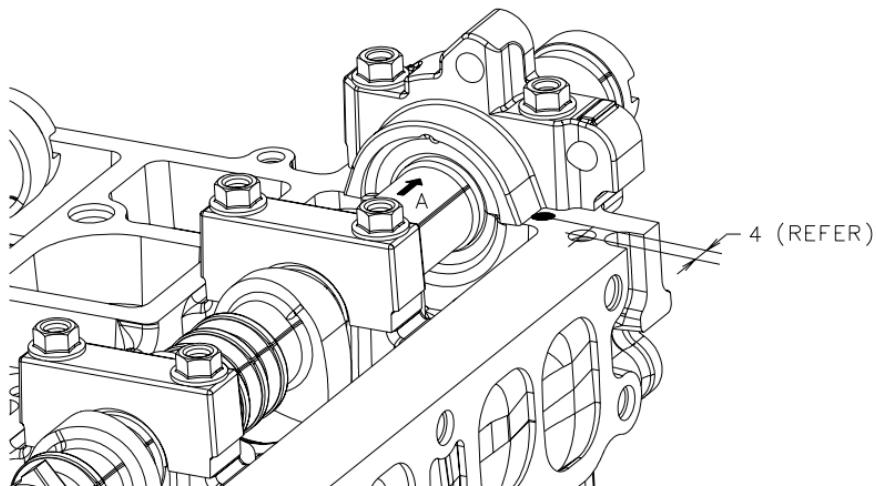


### NOTES

- 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.)

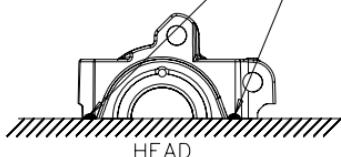
RESTRICTIONS		PART NAME/TITLE RTV SEALER - CAM COVER				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AA	EN00E11087761000	00-11-17	2003 2.3L-4V DUAL-VVT U204	60-A	60-C

**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)  
2PLACES AS SHOWN BELOW

Ø5 (REFER)



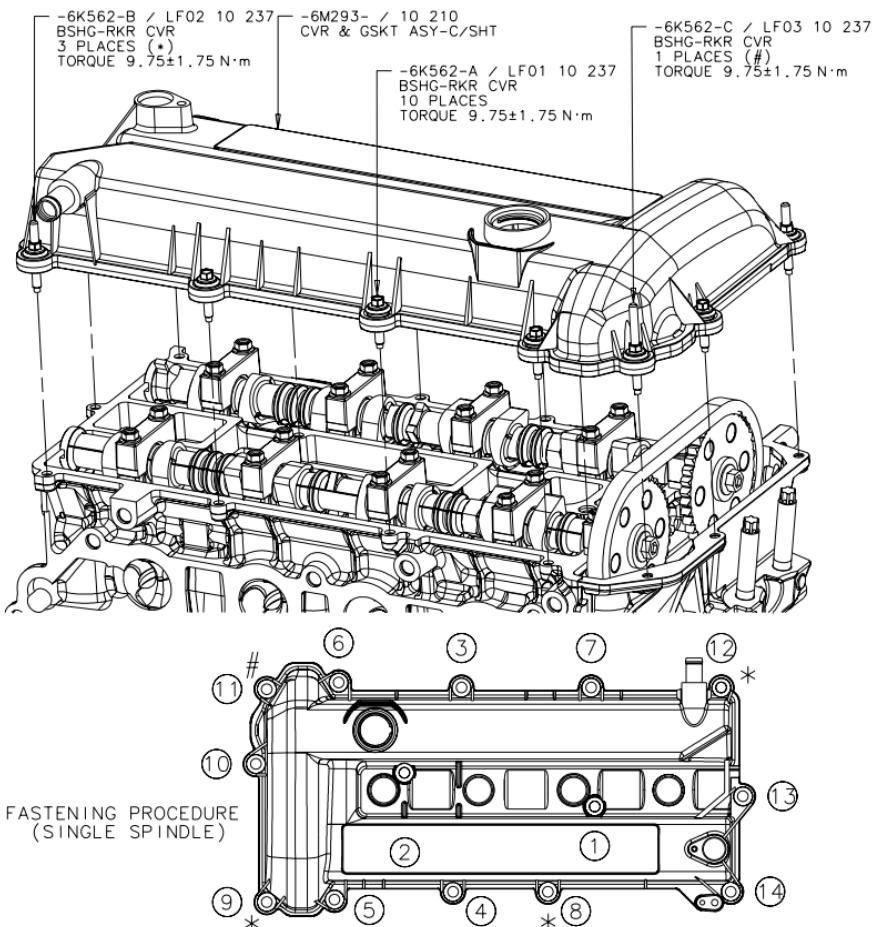
VIEW A

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

RESTRICTIONS				PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	CAM COVER & GASKET ASSEMBLY			
C1S7G-543-AC	U	EN00E11085584000	00-07-11	MODEL	SHEET	CONT'D.	60-C 61-A

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

## CLEARANCE LIMITS AND SPECIFICATIONS



## 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.

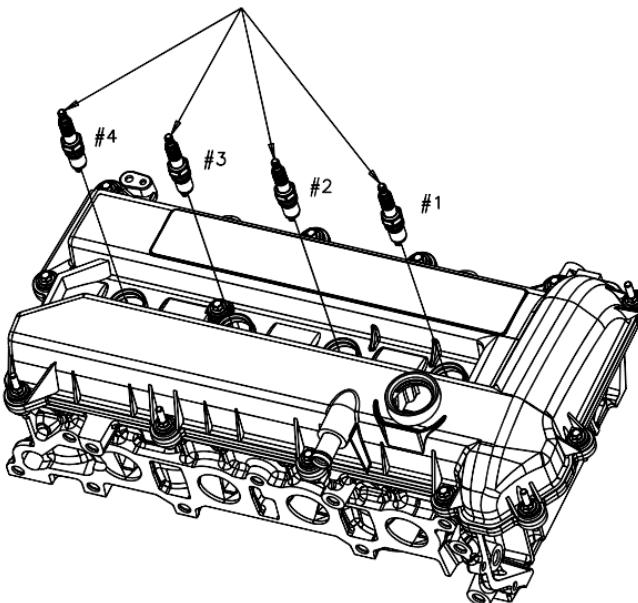
RESTRICTIONS		PART NAME/TITLE CAM COVER & GASKET ASSEMBLY					
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	H	EN00E11007392000	99-09-06	2001 2.0L-4V NON DI CD132	61-A	61-B	

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

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

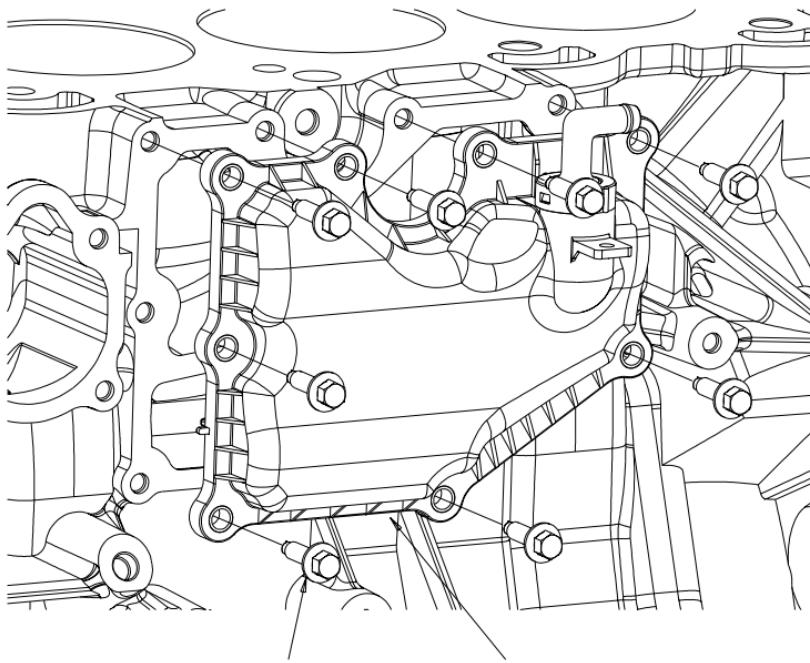
ENG.	PLUG TYPE	ID. COLOR	QUANTITY
1.8/2.0L EW (*)	PTR6F-13	GREEN	4
2.3L NS	PTR5F-11	WHITE	4
2.3L EW (*)	PTR6F-11	YELLOW	4
1.8L DI EW	HGR 7 HOPEO	BLUE	4
PZEV, J56A/F/J, J16L, C1	ITR 6F-13	PINK	4

-12405- / 18 110  
SPARK PLUG  
TORQUE  $12 \pm 2$  N·m



RESTRICTIONS			PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	SPARK PLUG			
C1S7G-543-AC	BL	EN00E11271652000	DATE	MODEL	SHEET	CONT'D.
			01-11-15	2001 2.0L-4V NON DI	62-A	62-B

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



W500214/9XF00214  
BOLT M6  
8 PLACES  
TORQUE  $9.75 \pm 1.75$  N·m

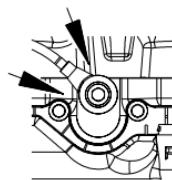
-6A785-/13 570  
CRANKCASE VENTILATION COVER ASY

## 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 GOOVE BEFORE ASSEMBLY.
  3. DO NOT ASSEMBLE PARTS THAT HAVE DAMAGE.

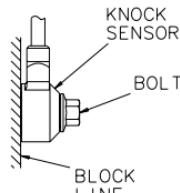
RESTRICTIONS				PART NAME/TITLE			
				CRANKCASE VENTILATION COVER			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	BL	EN00E11271652000	01-11-15	2001 2.0L-4V NON DI CD132	64	65-A	

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

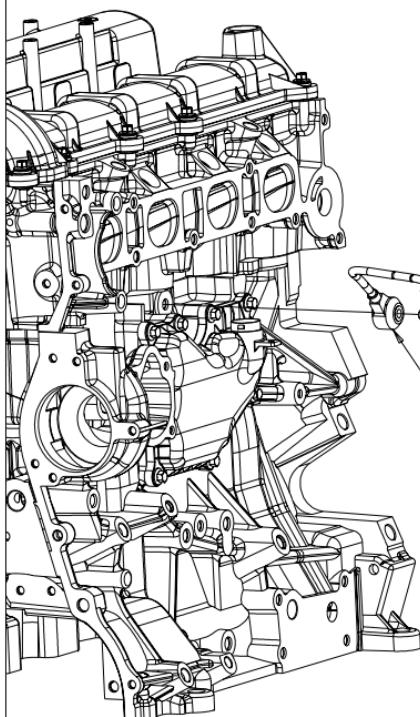


VIEW A

ROTATE SENSOR AS FAR ANTICLOCKWISE AS POSSIBLE, WITHOUT TOUCHING CRANKCASE VENT COVER.



NOTE: ORIENTATION RELATIVE TO BLOCK (SIDE VIEW)



W500025-S309/9XF00025X9  
SCREW M8X30  
TORQUE 20±4 N·m

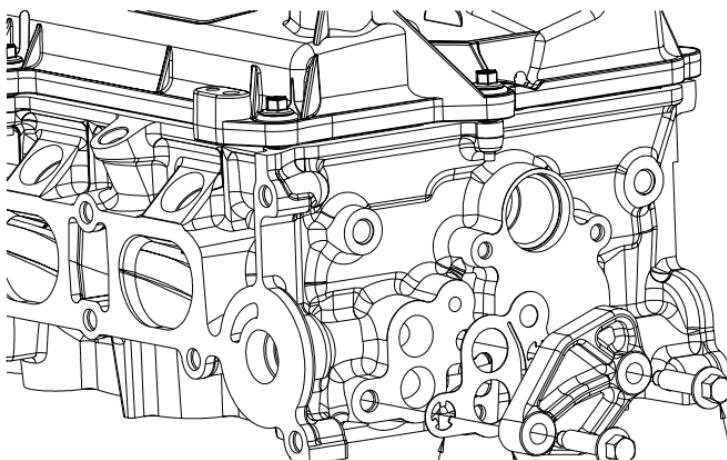
-12A699-/18 921  
KNOCK SENSOR

## RESTRICTIONS

PART NAME/TITLE  
**SENSOR-KNOCK**

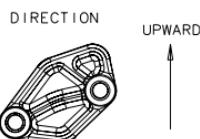
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	R	EN00E11069681001	00-04-20	2001 2.3L-4V NON DI RANGER	65-B	65-C

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



-7081-/20 301  
PLATE-BLANKING  
-9D476-/20 305  
GASKET-E G R VALVE

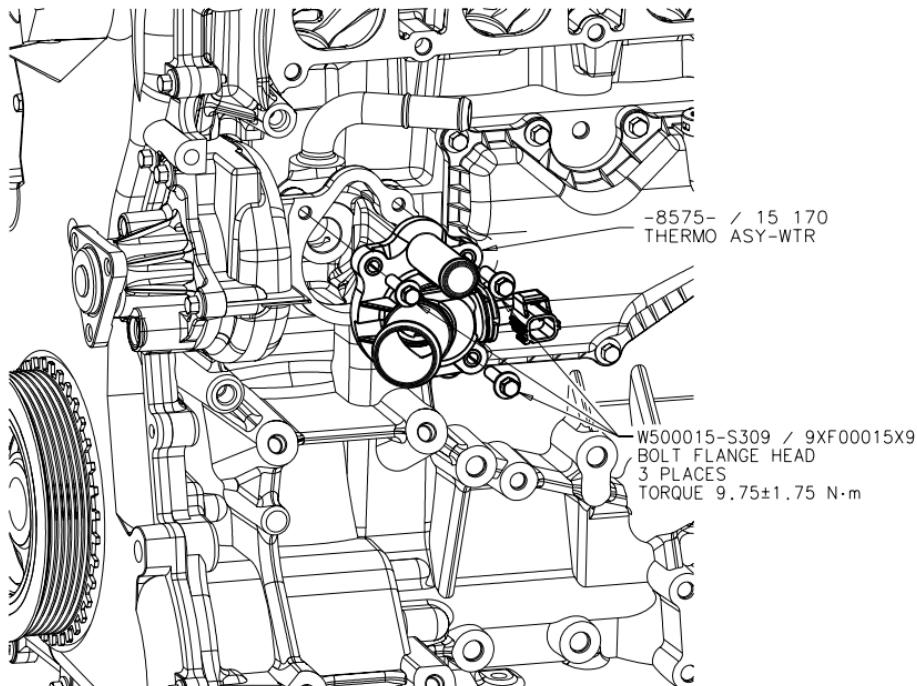
W500225/9XF00225  
BOLT M8  
2 PLACES  
TORQUE 25±5 N·m



FOR GASHOL/LEADED, ONLY

RESTRICTIONS			PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	N	EN00E11030674000	00-02-10	2001 2.0L-4V NON DI CD132	67-B	67-D

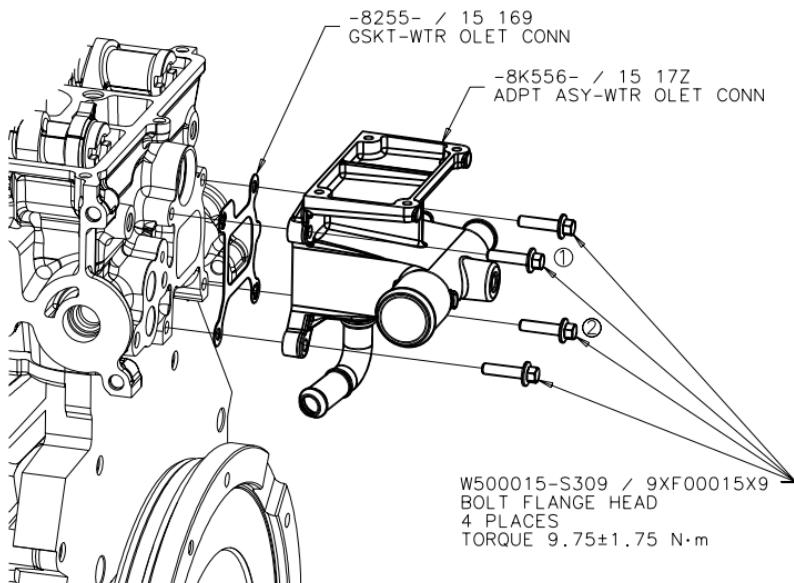
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**

**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 <b>THERMOSTAT</b>					
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	H	EN00E11007392000	'99-09-06	2001 2.0L-4V NON DI CD132 2001 2.3L-4V NON DI RANGER	68	69-C	

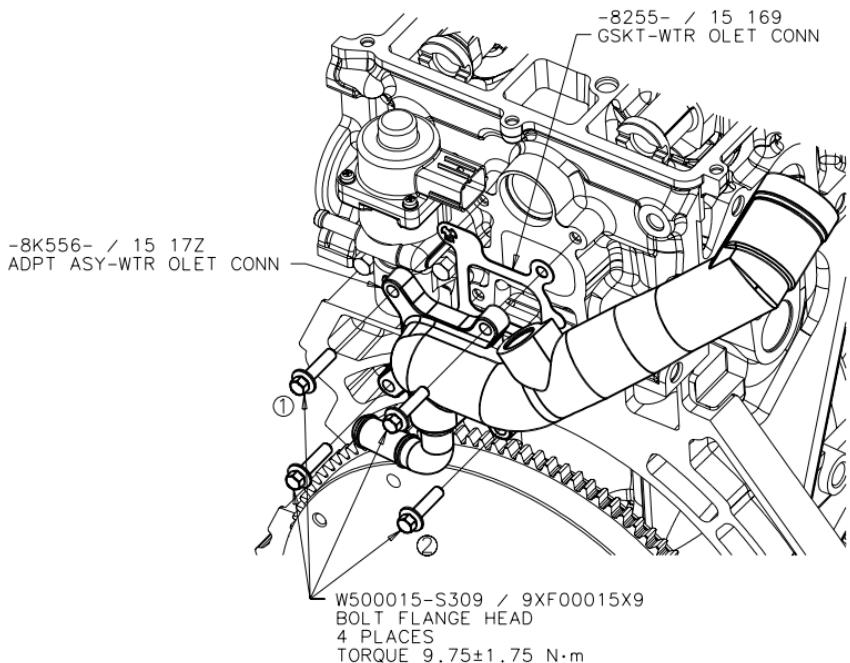
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**

**NOTES**

1. BOLTS ① AND ② WILL HELP TO RETAIN THE GASKET TO WATER OUTLET DURING ASSEMBLY.
2. ENSURE GASKET TAB IS AT EXHAUST SIDE. (SEE SKETCH)
3. DO NOT ASSEMBLE PARTS WHERE THERE ARE SCRATCHES OR GLEASE/OIL/FOREIGN MATTER WHICH WILL AFFECT SEALABILITY. (INCLUDING CYLINDER HEAD)

RESTRICTIONS		PART NAME/TITLE				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	H	EN00E11007392000	'99-09-06	2001 2.0L-4V NON DI CD132	71-A	71-B

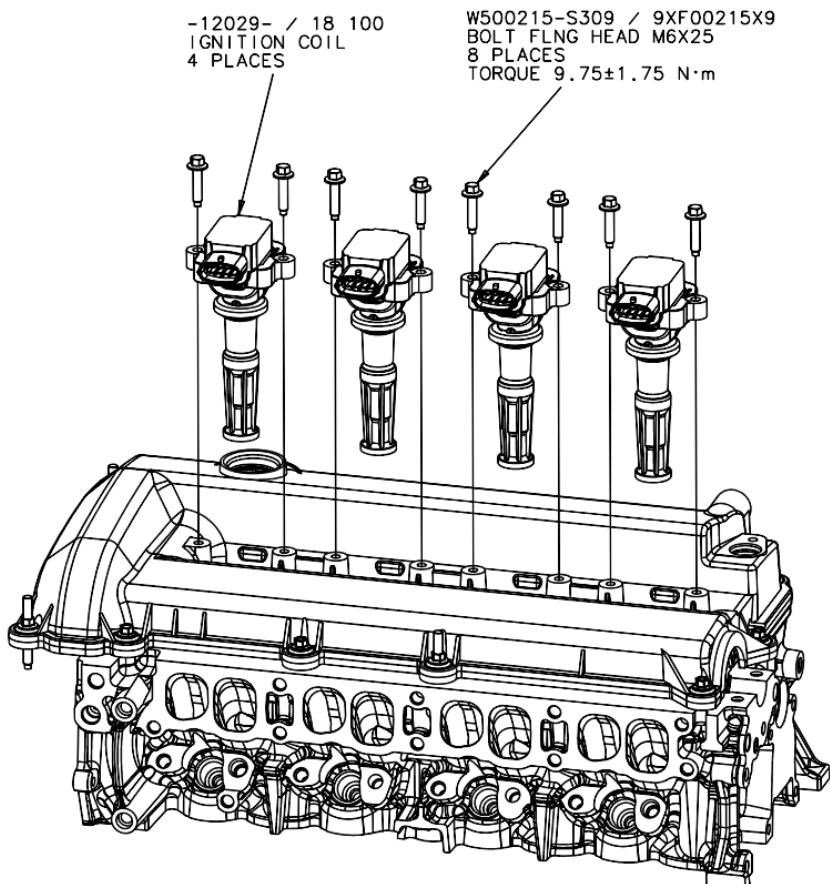
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**

**NOTES**

1. BOLTS ① AND ② WILL HELP TO RETAIN THE GASKET TO WATER OUTLET DURING ASSEMBLY.
2. ENSURE GASKET TAB IS AT EXHAUST SIDE. (SEE SKETCH)
3. DO NOT ASSEMBLE PARTS WHERE THERE ARE SCRATCHES OR GLEASE/OIL/FOREIGN MATTER WHICH WILL AFFECT SEALABILITY. (INCLUDING CYLINDER HEAD)

RESTRICTIONS		PART NAME/TITLE WATER OUTLET CONNECTOR & GASKET				
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	H	EN00E11007392000	'99-09-06	2001 2.3L-4V NON DI RANGER	71-B	71-C

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS

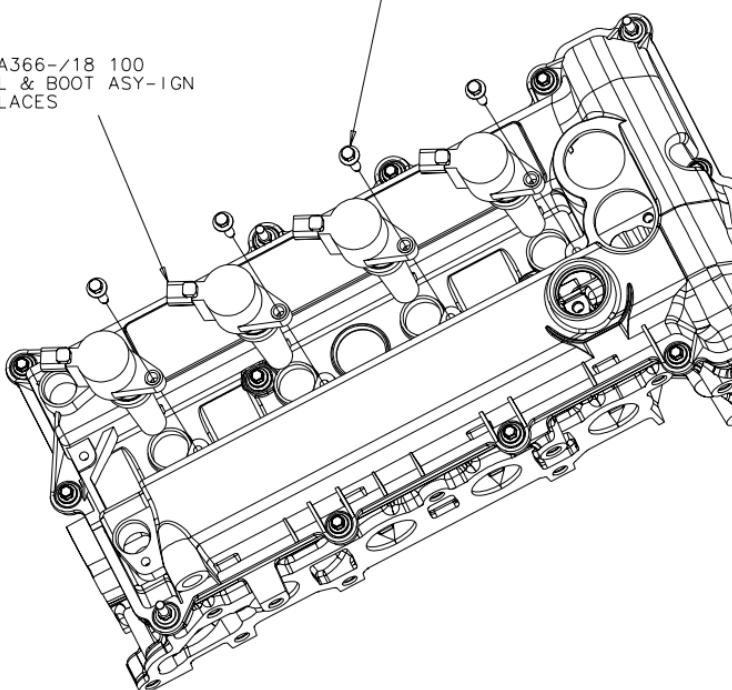


RESTRICTIONS		PART NAME/TITLE					
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	BL	EN00E11271652000	01-11-15	2002 1.8L-4V DI CD132	73-C	73-D	

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS

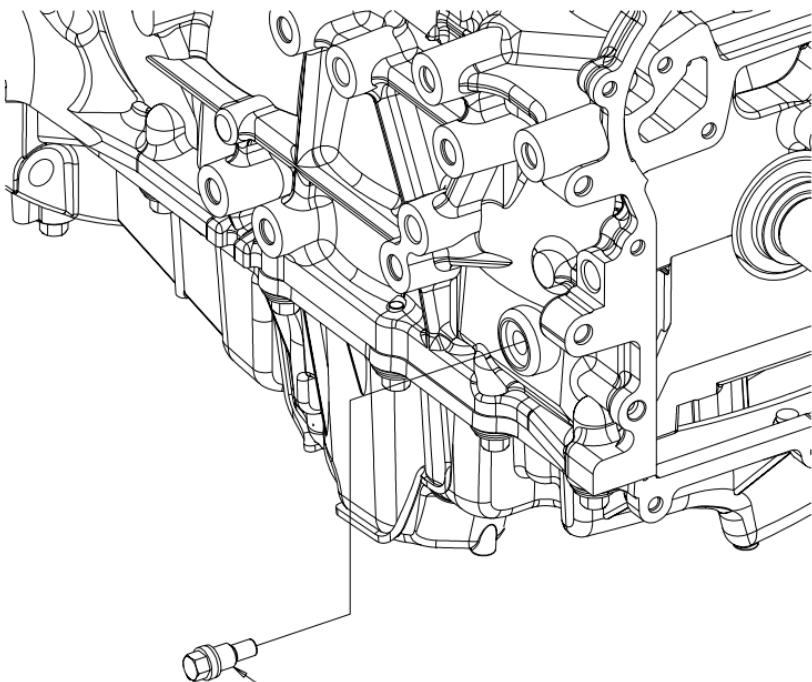
W500215-S309/9XF00215X9  
BOLT M6X25  
4 PLACES  
TORQUE  $9.75 \pm 1.75$  N·m

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



RESTRICTIONS			PART NAME/TITLE IGNITION COIL			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	AH	EN00E11190272000	01-03-28	2003 2.3L-4V NON DI	73-E	74-C

ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS



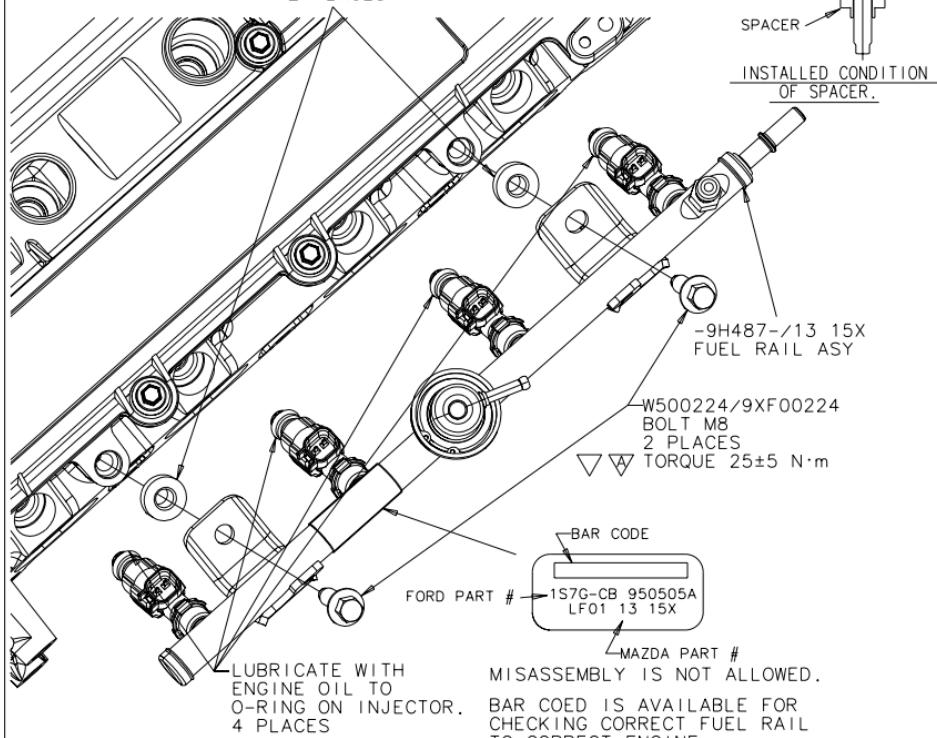
W700115-S309 / 9XG00115X9  
PLUG AND WASHER ASY  
TORQUE 20±2 N·m  
TIMING PIN HOLE  
FIT PLUG AFTER COMPLETING  
CRANKSHAFT TIMING PROCEDURE

RESTRICTIONS				PART NAME/TITLE PLUG-TIMING PIN HOLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	BD	E 11271059 000	01-11-02	2001 2.0L-4V NON DI CD132	75	76-A	

# ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

## CLEARANCE LIMITS AND SPECIFICATIONS

-9U550-/13 158

SPACER  
2 PLACES**PROCEDURE**

1. INSERT THE SPACERS INTO CYLINDER HEAD.
2. INSTALL THE FCA UNTIL THE BRACKETS CONTACT TO THE SPACERS.
3. ENGAGE THE BOLTS IN THREAD.
4. TIGHTEN BOLTS TO SPECIFIED TORQUE.

NOTE: INTAKE MANIFOLD  
OMMITTED FOR CLARITY.

ENGINE	FORD PART #	MAZDA PART #
1.8L	1S7G-D*	L801 13 15X
2.0L	1S7G-C*	LF01 13 15X
2.3L E/W	2L8G-A*	L305 13 15X

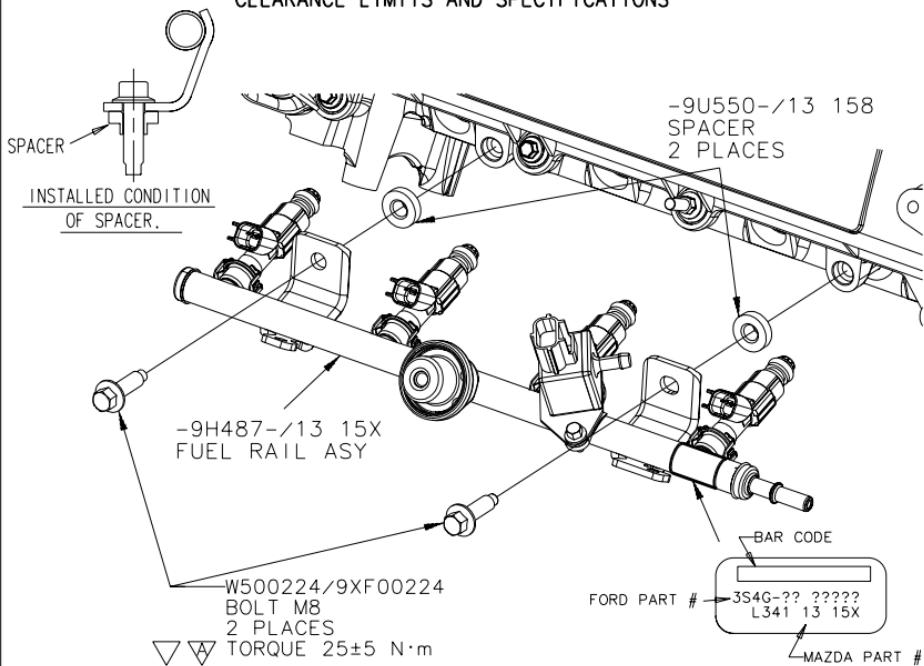
\*:REVISION NUMBER

ENGINE	INJECTOR COLOR
1.8L NON-DI	LIGHT GRAY
2.0L NON-DI	BLACK
2.3L NON-DIE/W	BLACK

**RESTRICTIONS****FUEL RAIL ASSEMBLY**

SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	R	EN00E11069681001	00-04-20	2001 2.0L-4V NON DI CD132	78-A	78-B

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

**PROCEDURE**

1. INSERT THE SPACERS INTO CYLINDER HEAD.
2. INSTALL THE FCA UNTIL THE BRACKETS CONTACT TO THE SPACERS.
3. ENGAGE THE BOLTS IN THREAD.
4. TIGHTEN BOLTS TO SPECIFIED TORQUE.

**MISASSEMBLY IS NOT ALLOWED.**BAR COED IS AVAILABLE FOR  
CHECKING CORRECT FUEL RAIL  
TO CORRECT ENGINE.

ENGINE	FORD PART #	MAZDA PART #
2.3LE/W	3S4G-A*	L341 13 15X

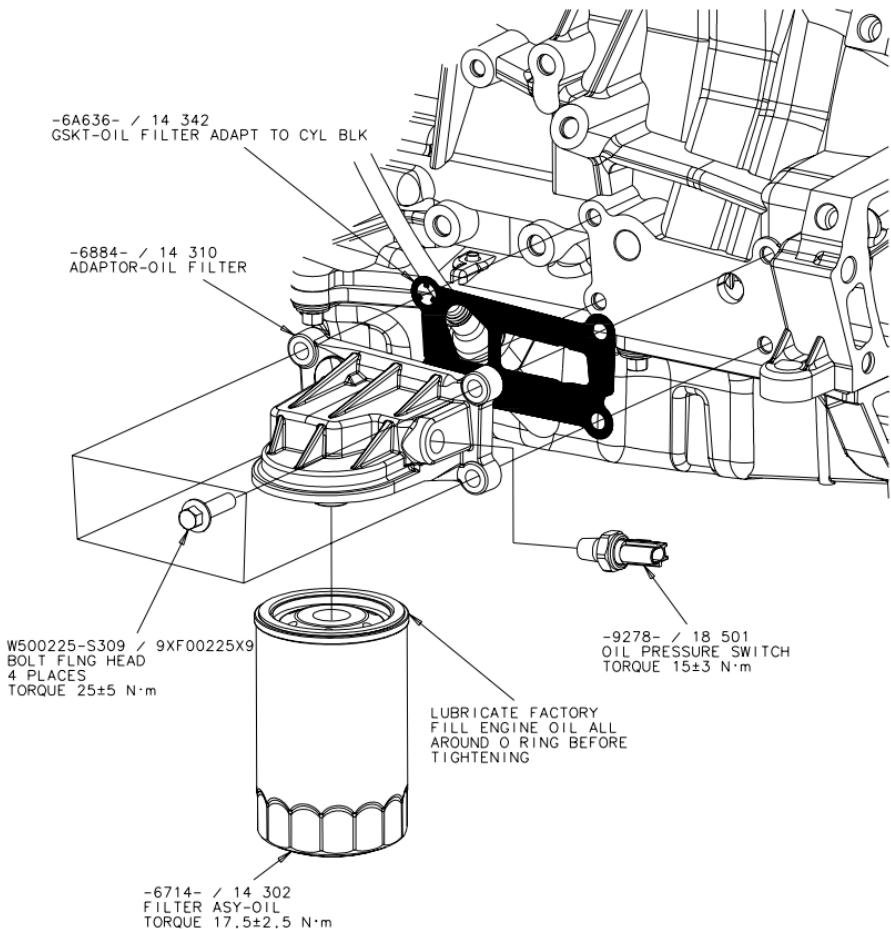
\*:REVISION NUMBER

NOTE: INTAKE MANIFOLD  
OMMITTED FOR CLARITY.

ENGINE	INJECTOR COLOR
2.3L NON-DIE/W	FIRE RED

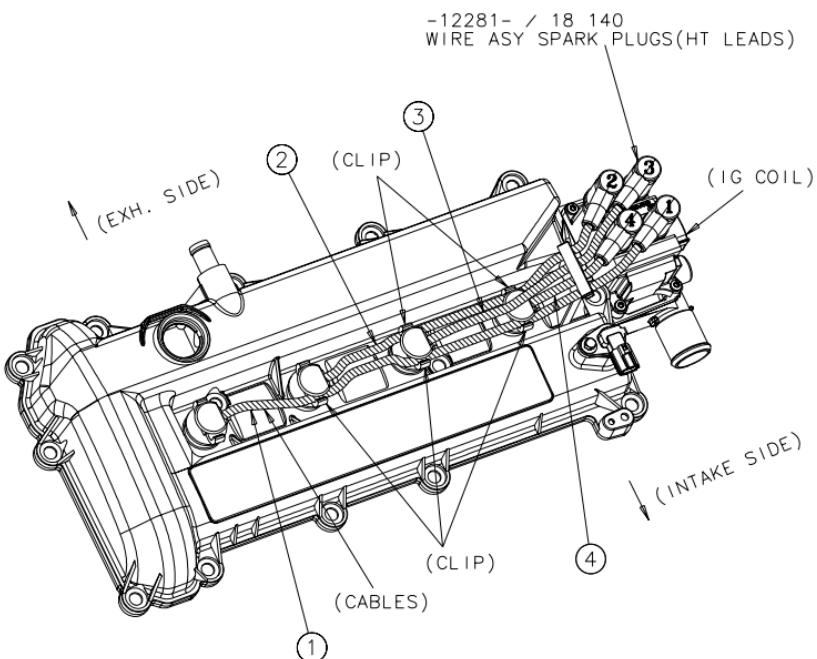
RESTRICTIONS			PART NAME/TITLE <b>FUEL RAIL ASSEMBLY</b>			
SPECIFICATION NO. C3S4G-543-AC	REV AV	RELEASE NO. EN00 E 11252991 000	DATE 01-08-11	MODEL 2003 2.3L-4V NON DI C170	SHEET 78-F	CONT'D. 79-C

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



RESTRICTIONS			PART NAME/TITLE			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.
C1S7G-543-AC	W	E 11140144 000	00-10-01	2001 2.3L-4V NON DI RANGER	93-B	94

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



**NOTES:**

INSTALL EACH HT LEAD CONNECTOR STRAIGHT ON TO THE APPROPRIATE IG COIL TERMINAL.

DO NOT APPLY ANY DYNAMIC FORCE ON TO ANY PORTION OF THE HT LEAD.  
(E.G. DO NOT STRIKE USING HAMMERS)

INSTALLATION SEQUENCE : INSTALL CABLES IN SEQUENCE FROM EXHAUST SIDE  
TO INTAKE SIDE. (IN THE ORDER OF #2,#3,#4,#1)

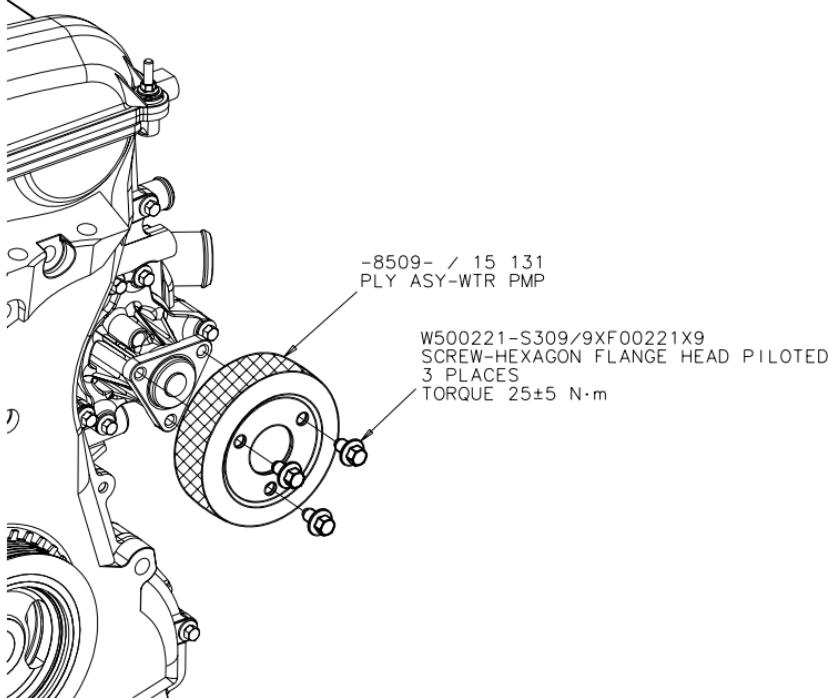
CLIP OF CABLES : SET THE CABLES(#1,#2) IN THE APPROPRIATE CLIPS  
MOUNTED ON THE PLUG CAPS.

FIRING ORDER : #1,#3,#4,#2

RESTRICTIONS				PART NAME/TITLE SPARK PLUG LEADS			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	R	EN00E11069681001	00-04-20	2001 2.0L-4V NON DI CD132	98-A	98-B	

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS

### CLEARANCE LIMITS AND SPECIFICATIONS

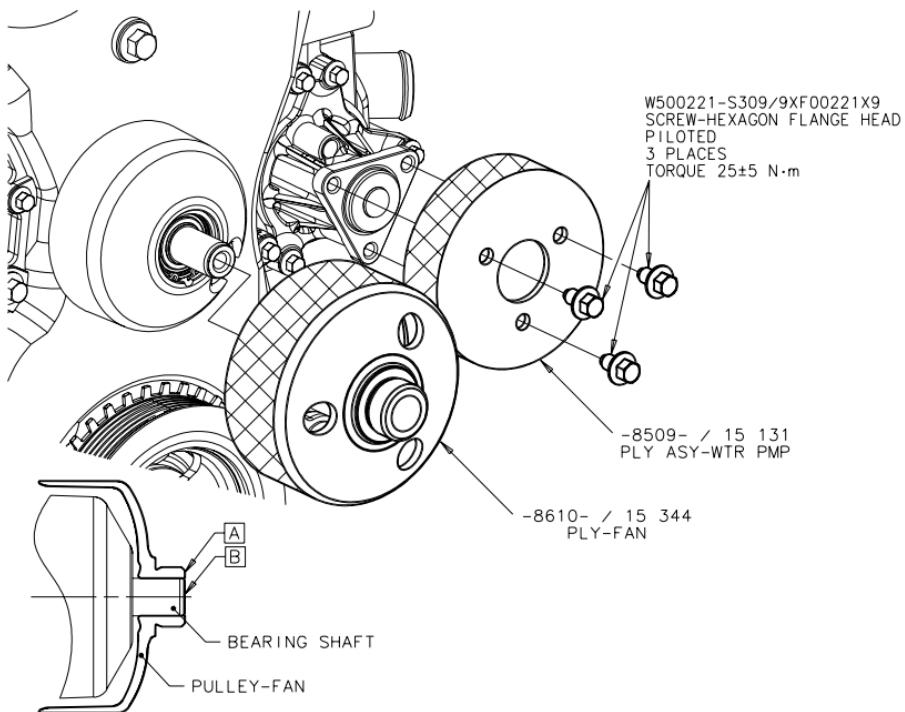


#### NOTES

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 WATER PUMP PULLEY					
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	N	EN00E11030674000	00-02-10	2001 2.0L-4V NON DI CD132	107-A	107-B	

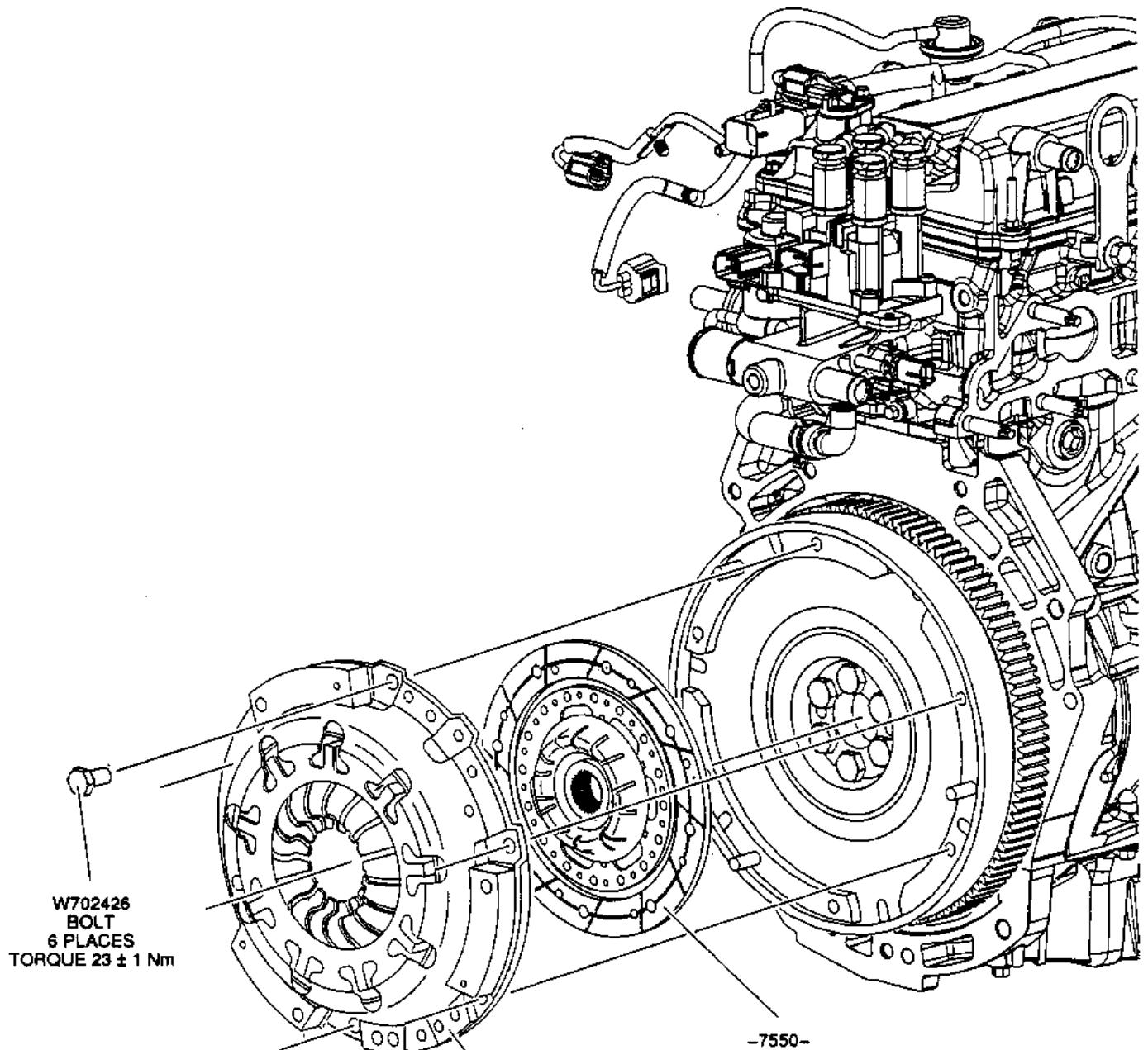
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**

**NOTES**

1. FAN PULLEY TO BE PRESSED-IN INTO BEARING SHAFT PULLEY **[A]** AND **[B]**  
SHALL BE FLUSH( $\pm 0.2$ mm)
2. ENSURE THERE IS NOT ANY GREASE,OIL OR FOREIGN MATTER ON THE HATCHED AREA BEFORE SHIPMENT.
3. DAMAGED PULLEY MUST NOT BE ASSEMBLED.
4. THE PULLEY MUST NOT CONTACT ANY OTHER PARTS OF THE ENGINE DURING ROTATION.

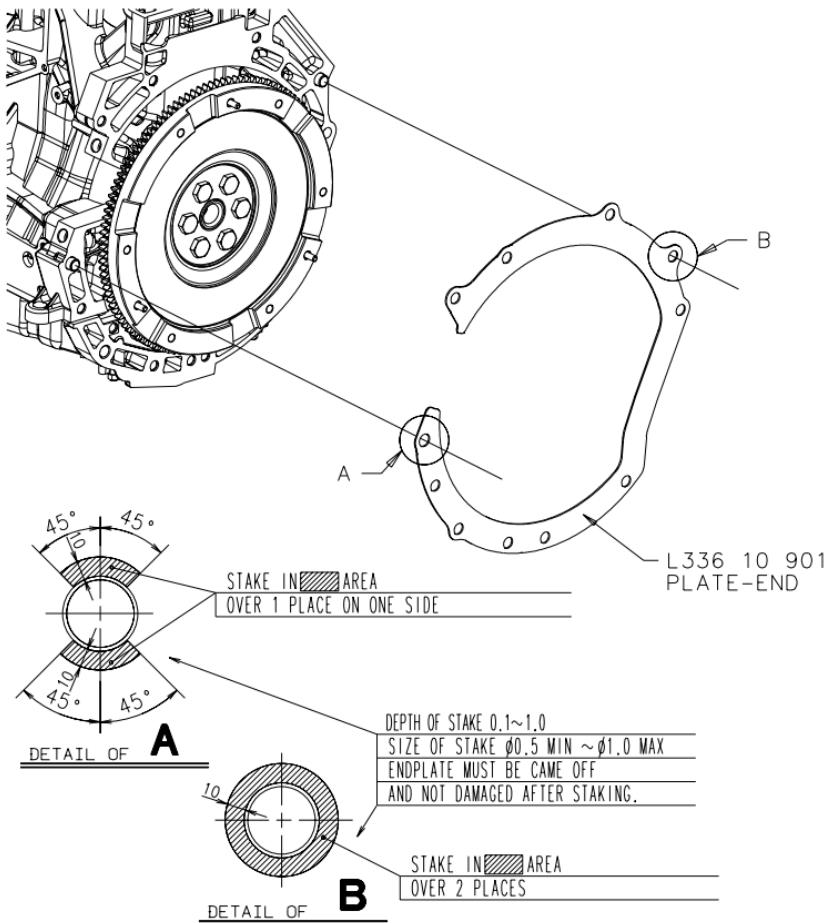
RESTRICTIONS		PART NAME/TITLE					
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONT'D.	
C1S7G-543-AC	AF	EN00E11151946000	01-02-09	2001 2.3L-4V NON DI RANGER	107-B	108	

## ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS CLEARANCE LIMITS AND SPECIFICATIONS



RESTRICTIONS				PART NAME/TITLE <b>INSTALLATION DUAL MASS FLYWHEEL</b>			
SPECIFICATION NO.	REV	RELEASE NO.	DATE	MODEL	SHEET	CONTD.	
C1S7G-543-AC	BH	EN00 E11266219 000	01-11-12	2001 2.0L-4V NON DI CD132	110	110-A	

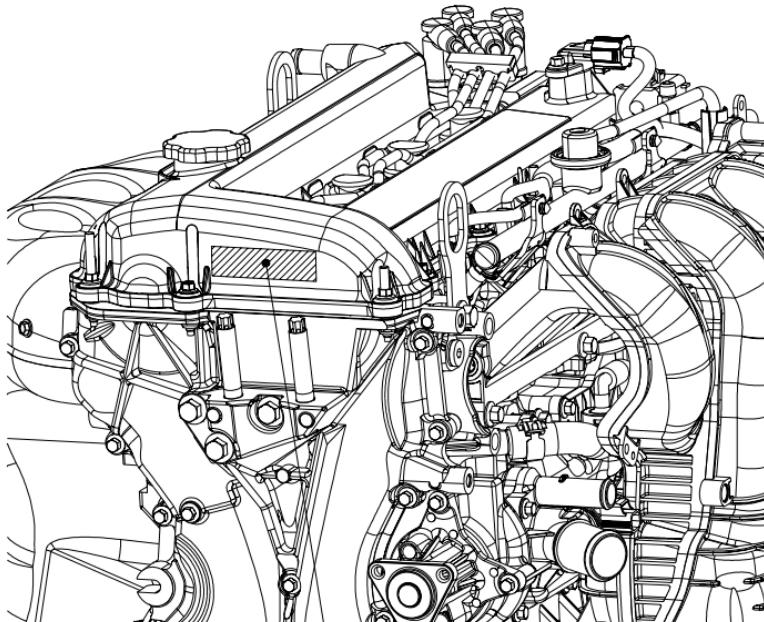
**ENGINE ASSEMBLY PROCEDURES AND INSTRUCTIONS  
CLEARANCE LIMITS AND SPECIFICATIONS**



UNIQUE TO MAZDA ONLY.

RESTRICTIONS			PART NAME/TITLE PLATE END			
SPECIFICATION NO. C1S7G-543-AC	REV BH	RELEASE NO. EN00 E 11266219 000	DATE 01-11-12	MODEL 2002 2.3L-4V NON DI J16	SHEET 110-A	CONT'D. 111

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



Eng.Size/Prefix/Suffix: Eng.Parts No.

Buyoff Date Code

Barcode

1.8 1A-139-AA	C 24/05/2000
	H 019
E	Engine Derivative Number
P 000507	

CHEP 5/19 2000 18:07:11  
UNIQUE ENGINE NUMBER

REFER TO CAM COVER DRAWING  
FOR LOCATION DIMENSIONS.

Sequence Number

RESTRICTIONS		PART NAME/TITLE BARCODE			
SPECIFICATION NO.	REV.	RELEASE NO.	DATE	MODEL	SHEET
C1S7G-543-AC	T	EN00E11095813000	00-06-30	2001 2.0L-4V NON DI CD132	1 11 END