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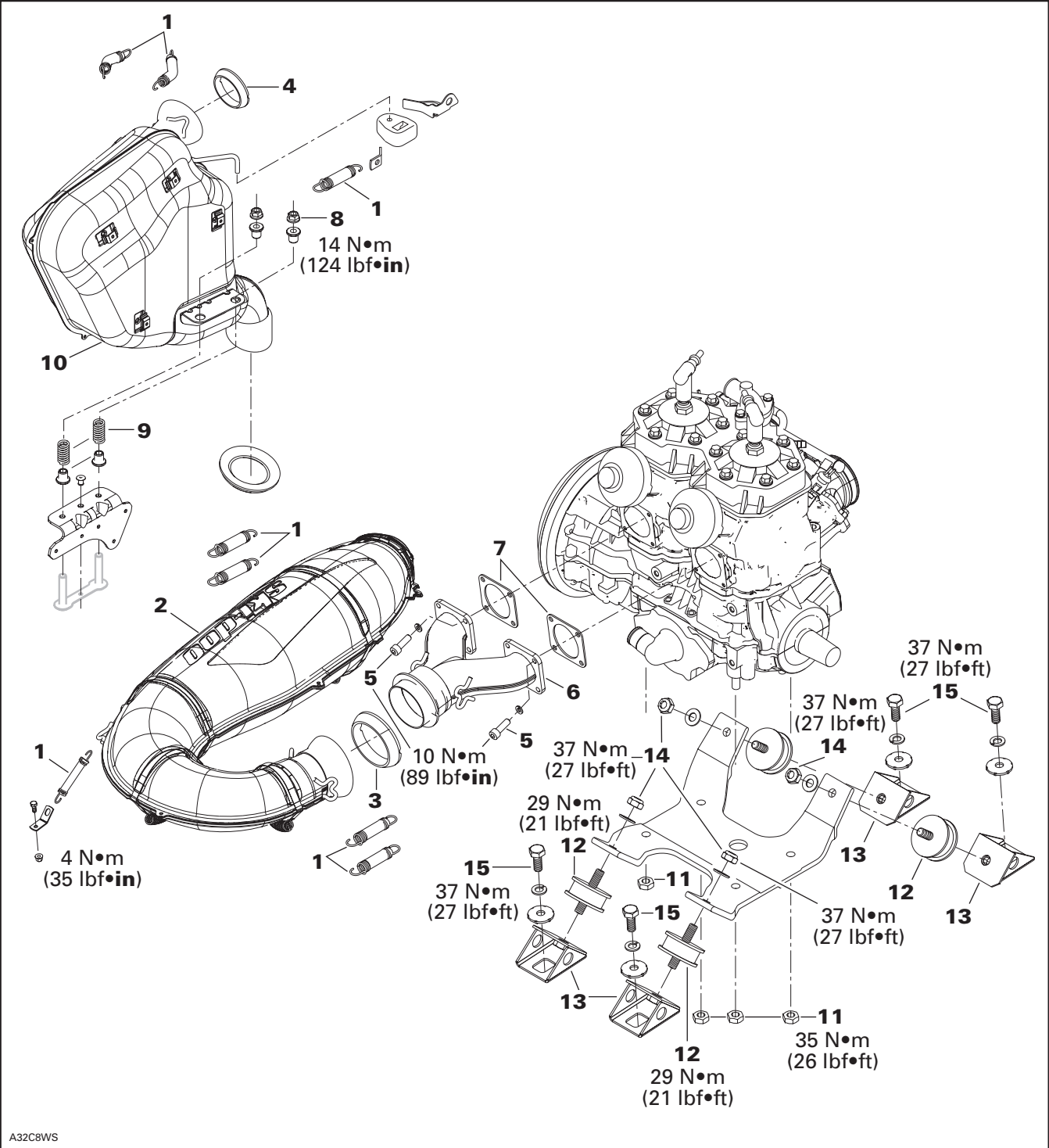
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793 SDI ENGINE



Section 03 ENGINE

Subsection 02 (793 SDI ENGINE)

EXHAUST SYSTEM

Tuned Pipe

Removal

Open hood.

Remove:

- all exhaust springs **no. 1**
- tuned pipe **no. 2**
- both exhaust gasket **no. 3** and **no. 4**.

Inspection

Check:

- tuned pipe shield for damages
- tuned pipe ends for cracks or damages.

Installation

Install doughnut shaped exhaust gasket **no. 3** with both of its notches aligned with Y-manifold protrusions.

If the gaskets are damaged, replace them.

NOTE: No RTV sealant required on doughnut shaped exhaust gaskets.



MUFFLER SIDE

Install all exhaust springs.

Manifold

Removal

Remove:

- tuned pipe **no. 2**
- doughnut shaped exhaust gasket **no. 3**
- screws **no. 5**
- manifold **no. 6**
- gaskets **no. 7**.

Inspection

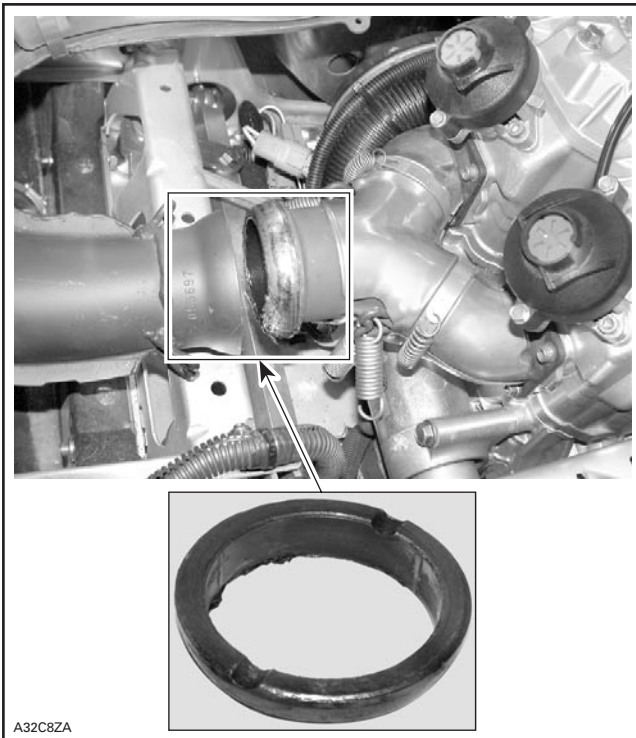
Check if the manifold is cracked or damaged. Replace if necessary.

Installation

Install the manifold with new gaskets.

Torque manifold screws **no. 5** to 10 N•m (89 lbf•in).

Install tuned pipe.



MANIFOLD SIDE

Muffler

Removal

Remove tuned pipe **no. 2**.

Disconnect the EGTS (Exhaust Gas Temperature Sensor).

Remove nuts **no. 8** and springs **no. 9** retaining the muffler **no. 10**.

Remove the muffler.

Inspection

Check the muffler for cracks or other damages.

Refer to the COMPONENT INSPECTION AND ADJUSTMENT section to verify the EGT.

Installation

For installation, reverse the removal procedure.

ENGINE REMOVAL

Open hood.

Disconnect BLACK (-) cable from battery, then RED (+) cable.

WARNING

Always disconnect battery or starter cables exactly in the specified order, BLACK (-) cable first. It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

Using B.U.D.S. software, remove the pressure in the fuel system. Refer to ENGINE MANAGEMENT further in this supplement.

Remove tuned pipe and muffler.

Drain engine coolant.

Remove or unplug the following then lift off engine from engine compartment.

NOTE: Use of a hoist is recommended.

- drive belt guard
- air silencer
- drive belt
- rewind starter handle
- drive pulley (not necessary if engine does not have to be disassembled) refer to DRIVE PULLEY in *2003 Shop Manual ZX series* (P/N 404 200 042)

- hood, refer to BODY in *2003 Shop Manual ZX series* (P/N 404 200 042)
- spark plug cables, knock sensor and temperature sensor
- throttle body
- impulse hose and electrical connectors
- oil injection inlet line at oil injection pump, install hose pincher
- oil pump cable
- coolant hoses between cylinder head and radiator
- coolant by-pass hose
- coolant hose at front of coolant reservoir
- engine support screws
- engine stopper (left rear of engine).

Remove spark plugs and install spark plug lift rings (P/N 529 035 830) into spark plug holes.

Install the lifting tool (P/N 529 035 940). Using a hoist, lift and remove the engine from vehicle.

ENGINE INSTALLATION

To install engine on vehicle, reverse removal procedure. However, pay attention to the following.

Torque engine/support nuts **no. 11** to 35 N•m (26 lbf•ft).

Torque rubber mounts **no. 12** to support bracket **no. 13** to 29 N•m (21 lbf•ft).

Torque rubber mount/support nuts **no. 14** to 37 N•m (27 lbf•ft).

Torque support brackets/chassis screws **no. 15** to 37 N•m (27 lbf•ft).

After torquing procedure, reinstall all removed parts by using the appropriate component/system reinstallation procedures described throughout this *Shop Manual Supplement* and in *2003 Shop Manual ZX series* (P/N 404 200 042).

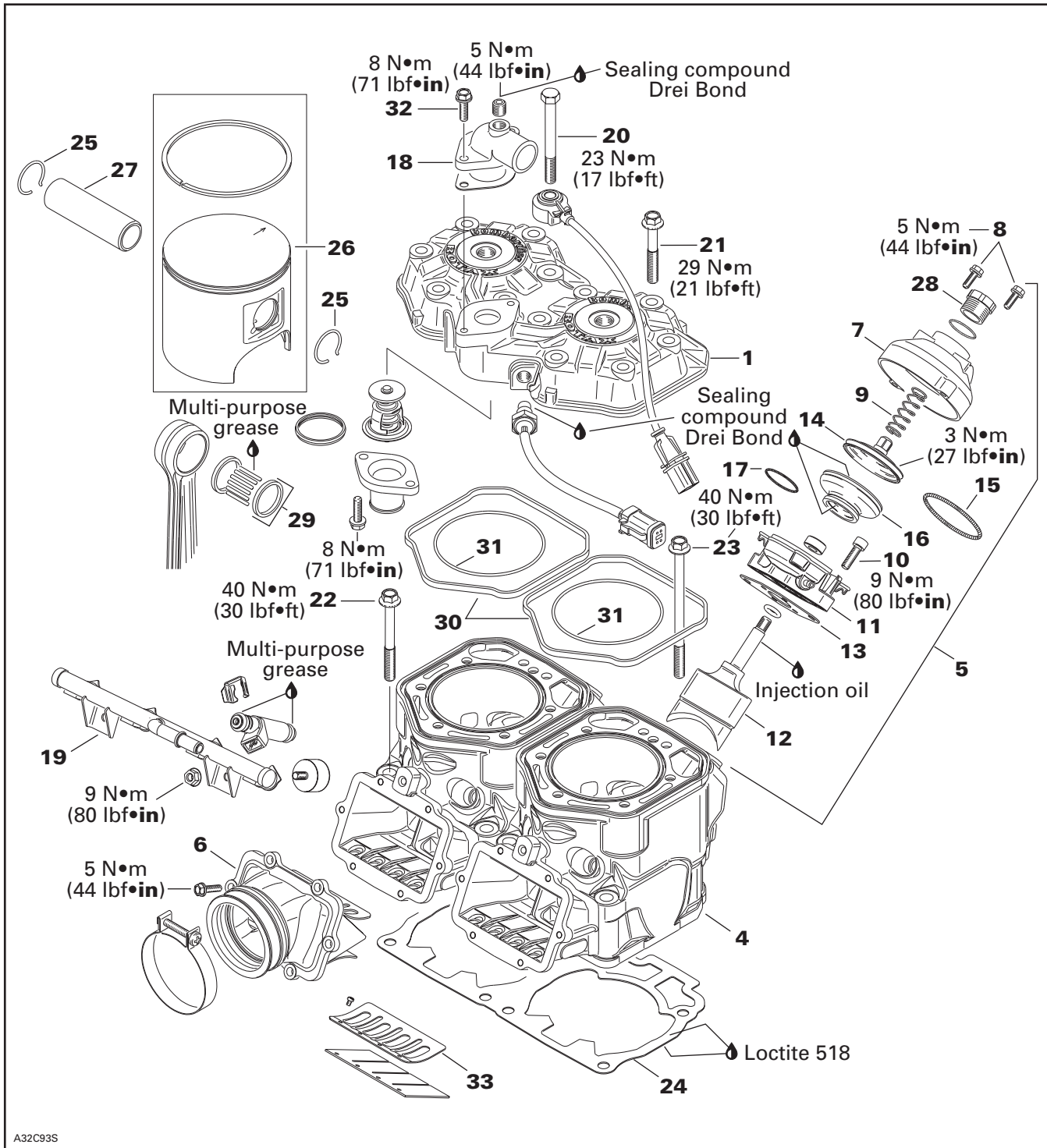
The following items must be performed with a special attention.

- After throttle cable installation, check throttle body maximum throttle opening and oil injection pump adjustment.
- Check pulley alignment and drive belt tension.

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Subsection 02 (793 SDI ENGINE)

TOP END



A32C93S

TROUBLESHOOTING

Before completely disassembling the engine, check air tightness. Refer to LEAK TEST AND ENGINE DIMENSION MEASUREMENT.

NOTE: The following procedures can be done without removing the engine from the chassis.

COMPONENT REMOVAL WITH THE ENGINE INSTALLED

Most engine components can be removed with engine on vehicle such as:

- cylinder head no. 1
- piston(s) no. 2
- piston ring(s) no. 3
- cylinder(s) no. 4
- rewind starter
- oil pump
- water pump
- magneto flywheel
- RAVE valve(s) no. 5
- reed valve(s) no. 6.

CLEANING

Discard all gaskets and O-rings.

Clean all metal components in a non-ferrous metal cleaner.

Scrape off carbon formation from cylinder exhaust port cylinder head and piston dome using a wooden spatula.

NOTE: The letters "AUS" (over an arrow on the piston dome) must be visible after cleaning.

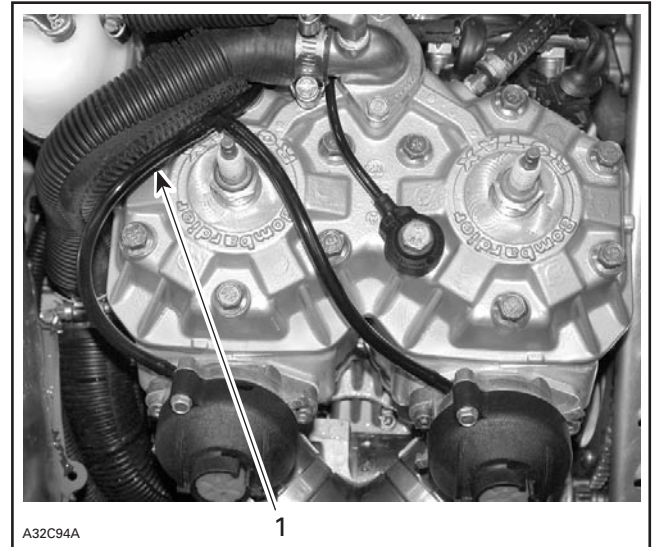
Clean the piston ring groove with a groove cleaner tool or with a piece of broken ring.

Check piston circlip tightening.

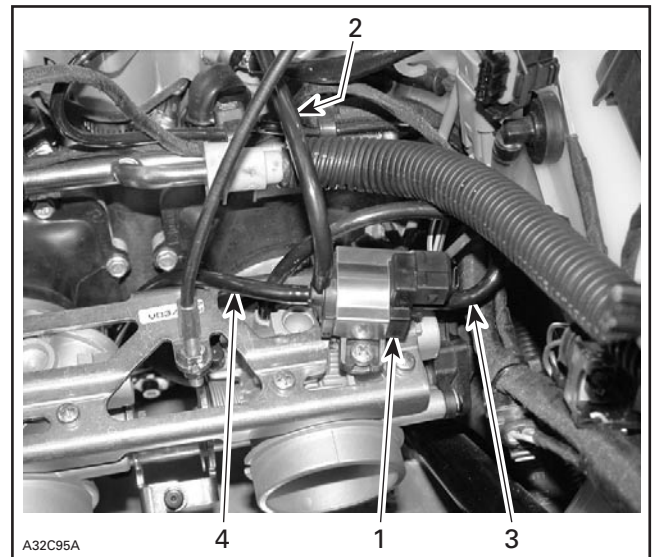
RAVE VALVE BASIC OPERATION

The RAVE valves change the height of the exhaust port. The RAVE valve solenoid, which is controlled by the ECM, allows positive crankcase pressure to inflate the bellows and open the RAVE valves.

To open the RAVE valves, the ECM activates a solenoid which directs the pressure to the valves.



1. Pressure from solenoid



1. Solenoid
2. Pressure to RAVE valves
3. Vent to throttle body
4. Vent with check valve from crankcase

To close the RAVE valves, the ECM deactivates the solenoid. The RAVE valves are opened to the atmosphere.

Maintenance

There are no wear parts anywhere in the system and there are no adjustments to be periodically checked. The only possible maintenance required would be cleaning of carbon deposits from the guillotine slide. Cleaning intervals would depend upon the user's riding style and the quality of the oil used.

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Subsection 02 (793 SDI ENGINE)

We suggest annual cleaning of the valve. If a customer uses a lower quality oil, than recommended, more frequent cleaning may be required.

No special solvents or cleaners are required when cleaning the valve.

With recommended oil, we suggest to clean the valve once a year; clean more often if lower quality oil is used. Check if solenoid heating element is still functional once a year, (the element should be warm after one minute of idling).

Boring Precaution

In its stock configuration, the RAVE valve guillotine has a minimum of 0.5 mm (.020 in) clearance to the cylinder bore measured at the center line of the cylinder. This is the minimum production clearance.

There is only a first oversize piston available for this engine. That piston is 0.25 mm (.010 in) larger in diameter than the stock piston. When the oversize is installed, the guillotine will have a minimum clearance of 0.375 mm (.015 in) with the cylinder bore. This is the minimum operating clearance the guillotine should be used with. Clearance less than 0.375 mm (.015 in) will require reworking of the guillotine to achieve the proper clearance and radius.

DISASSEMBLY

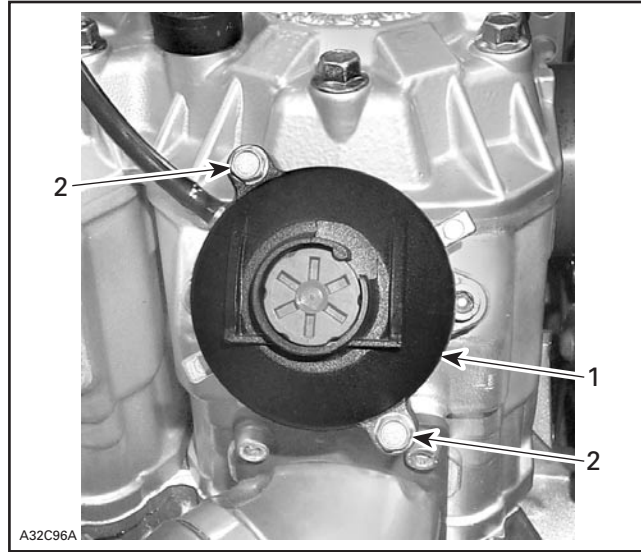
RAVE System

NOTE: RAVE stands for Rotax Adjustable Variable Exhaust.

Remove RAVE valve cover no. 7 by removing screws no. 8.

WARNING

Firmly hold cover to valve base. The compression spring inside the valve is applying pressure against the cover.



1. RAVE valve cover
2. Screws

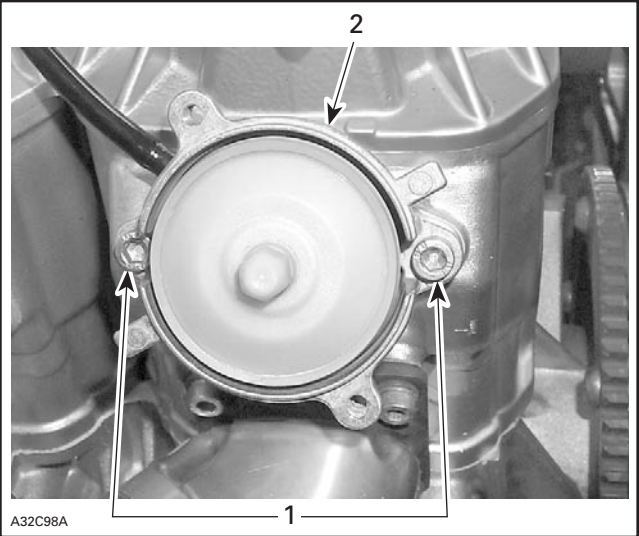
Remove the compression spring no. 9.



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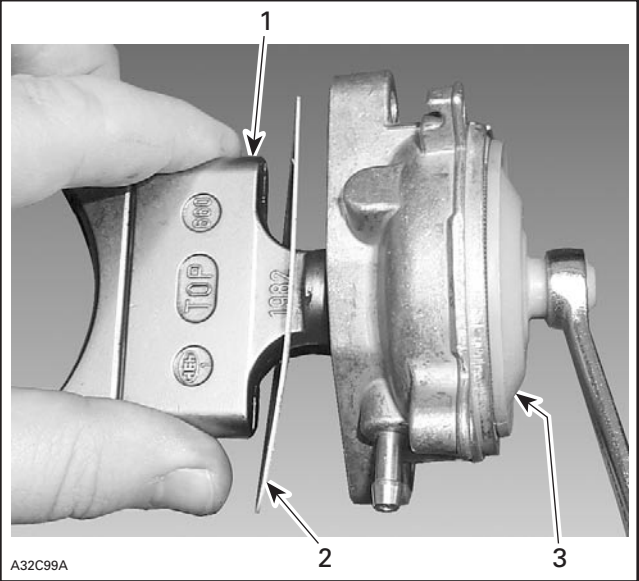
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Subsection 02 (793 SDI ENGINE)

Unscrew the Allen socket screws no. 10 then remove the RAVE valve base no. 11.



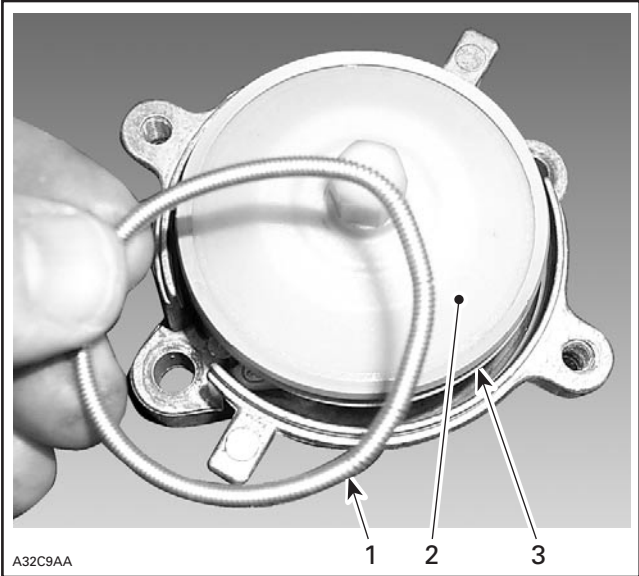
1. Allen socket screws
2. RAVE valve base

Unscrew and remove the guillotine no. 12 from the valve piston no. 14 than remove the gasket no. 13.



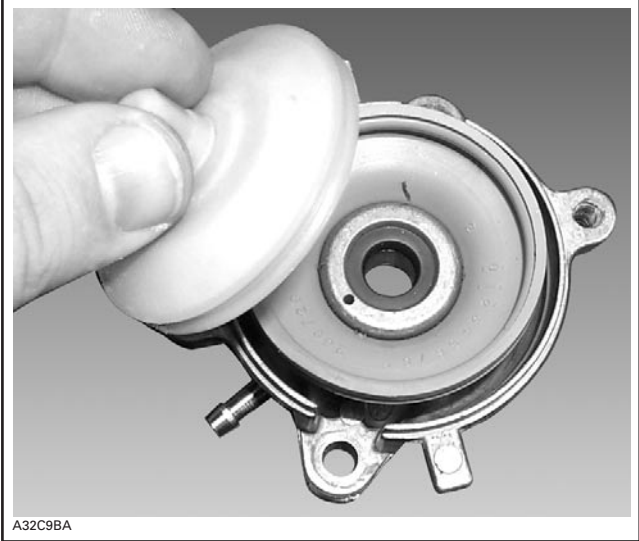
1. Guillotine
2. Gasket
3. Valve piston

Remove spring no. 15 retaining bellows no. 16 to valve piston.



1. Spring
2. Valve piston
3. Bellows

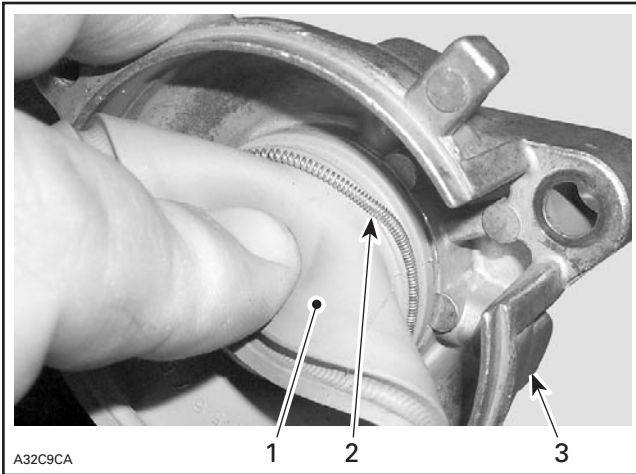
Remove the valve piston.



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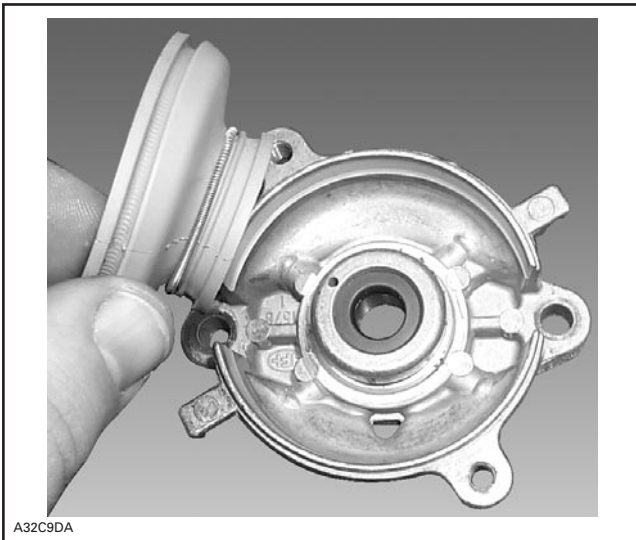
Subsection 02 (793 SDI ENGINE)

Remove the small spring no. 17 retaining bellows to valve base.



1. Bellows
2. Small spring
3. Valve base

Remove bellows from valve base.



Cylinder Head

Remove spark plugs, coolant outlet no. 18. Unscrew cylinder head screws no. 20 and no. 21 then remove the cylinder head no. 1.

Cylinder

Remove cylinder head no. 1.

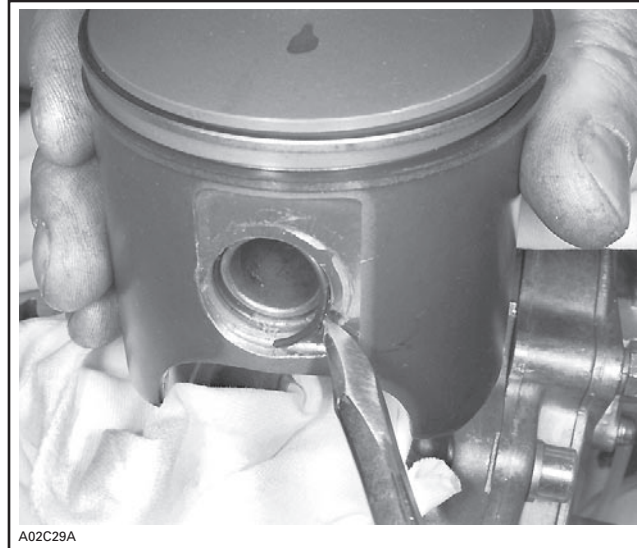
If necessary, remove fuel rail no. 19, RAVE valve no. 5, exhaust manifold and reed valve no. 6.

Unscrew cylinder bolts no. 22 and no. 23.

Remove cylinder no. 4 and the gasket no. 24.

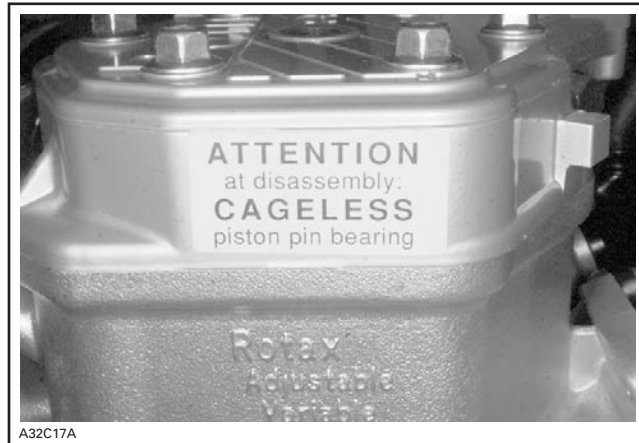
Piston

Place a clean cloth or rubber pad (P/N 529 023 400) over crankcase. Then with a pointed tool inserted in piston notch, remove both circlips no. 25 from piston no. 26.



TYPICAL

This engine is equipped with cageless piston pin bearings.



TYPICAL

Use piston pin puller (P/N 529 035 503) along with 20 mm sleeve kit (P/N 529 035 542). Use also a locating sleeve.

NOTE: The locating sleeve is the same that contains new cageless bearing.

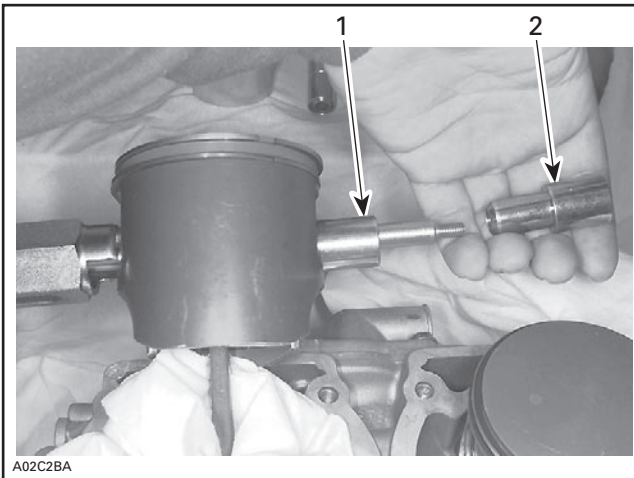
Insert piston pin puller making sure it sits squarely against piston.



TYPICAL

1. Properly seated all around

Install sleeve then shouldered sleeve over puller rod.



TYPICAL — INSTALLATION OF SLEEVE KIT

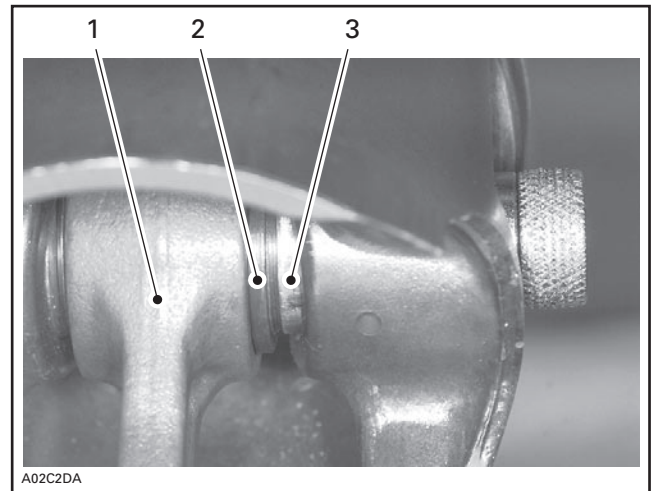
1. Sleeve
2. Shouldered sleeve

Screw (LH threads) extracting nut.

Pull out piston pin **no. 27** by unscrewing puller until shouldered sleeve end is flush with thrust washer of piston pin bearing.



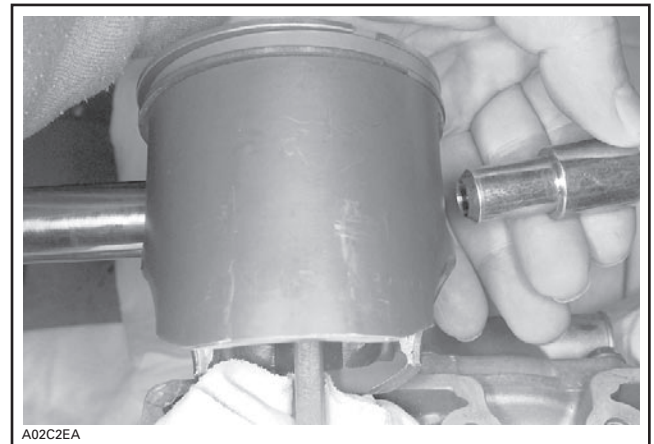
TYPICAL — PISTON PIN EXTRACTION



TYPICAL

1. Sleeve inside bearing
2. Thrust washer
3. Shouldered sleeve end

Remove puller. Pull out shouldered sleeve carefully.



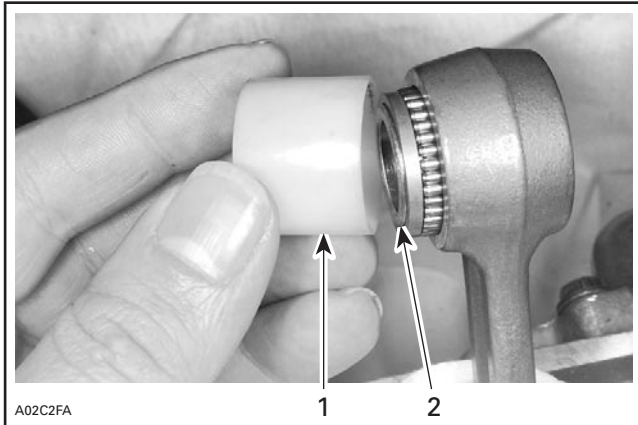
TYPICAL

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Subsection 02 (793 SDI ENGINE)

Remove piston from connecting rod.

Install locating sleeve. Then push needle bearings along with thrust washers and sleeve.



TYPICAL

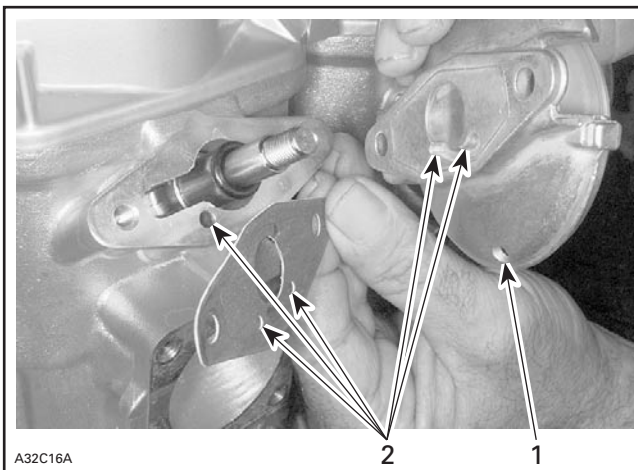
1. Locating sleeve
2. Sleeve

INSPECTION

NOTE: Refer to LEAK TEST AND ENGINE DIMENSIONS MEASUREMENT in this supplement.

RAVE System

Check RAVE valve base no. 11 and cylinder for clogged passages.



1. Draining hole
2. Passages

NOTE: Oil dripping from draining hole indicates a loosen spring or damaged bellows.

Rave Valve Bellows

Check for cracked, dried or perforated RAVE valve bellows no. 16.

RAVE Valve Spring

Check if the proper RAVE valve spring no. 9 is used.

ENGINE TYPE	793 SDI	
SPRING P/N	420 239 941	
COLOR	Light blue	
WIRE DIA.	mm (in)	0.8 (.031)
FREE LENGTH	mm (in)	52.5 (2.07)
PRELOAD IN N (LBF) AT COMPRESSED LENGTH OF 14 mm (.551 in)		10.5 (2.36)

Cylinder Head Cover, Cylinder Head and Cylinder

Make sure parts sealing surfaces are flat. Refer to LEAK TEST AND ENGINE DIMENSION MEASUREMENT and look for CYLINDER HEAD WARPAGE.

ASSEMBLY

RAVE System

Apply sealing compound Drei Bond (P/N 420 297 906) in the groove of valve base and in the piston valve groove, then install bellows.

Install RAVE valve with its mention top as illustrated in the following photo.



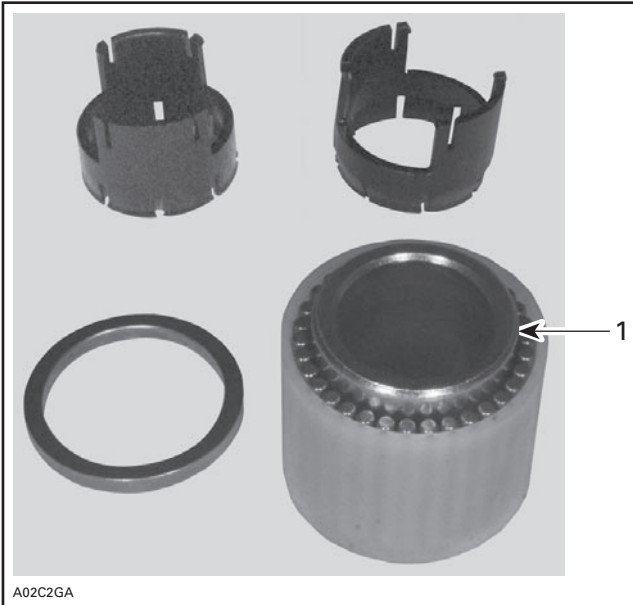
RAVE VALVE PARTIALLY INSERTED

Tighten red cap no. 28 screw to bottom.

Piston

When installing a new cageless bearing no. 29, replace half plastic cages with sleeve.

NOTE: 793 SDI engine cageless bearings have 28 needles.



A02C2GA

TYPICAL

1. Sleeve

Apply a small amount of multi-purpose grease on needle bearing. Grease thrust washers and install them on each end of needles.

Insert cageless bearing into connecting rod.



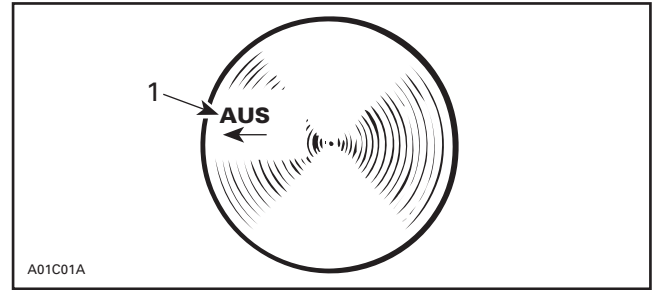
A02C2HA

TYPICAL — CAGELESS BEARING AND SLEEVE INSTALLED

Heat piston with a 100 W lamp or a heat gun before piston installation.

CAUTION: Piston temperature must not exceed 46°C (115°F). Never use direct flame to heat the piston and never freeze the pin.

At assembly, place the pistons over the connecting rods with the letters "AUS" (over an arrow on the piston dome) facing towards the exhaust port.



A01C01A

1. Exhaust

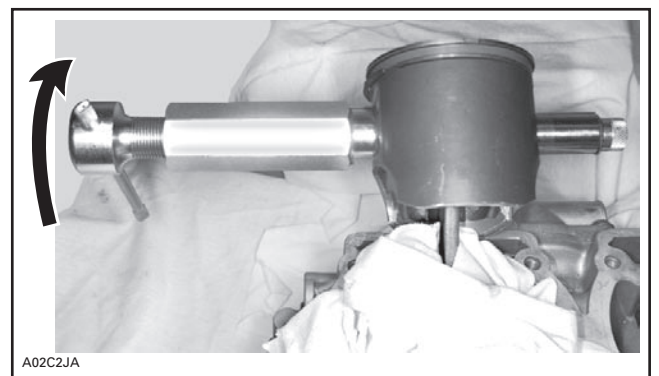
Install shouldered sleeve.



A02C21A

TYPICAL — SHOULDERED SLEEVE INSTALLATION

Install piston pin puller and turn handle until piston pin is correctly positioned in piston.



A02C2JA

TYPICAL

Use circlip installer (P/N 529 035 686) to install new mono-hook circlips no. 25.

CAUTION: Always install new circlips.

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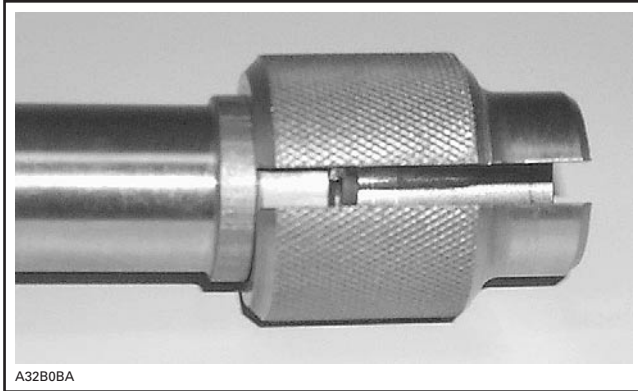
Subsection 02 (793 SDI ENGINE)

To minimize the effect of acceleration forces on circlip, install each circlip so the circlip break is at 6 o'clock as illustrated further.

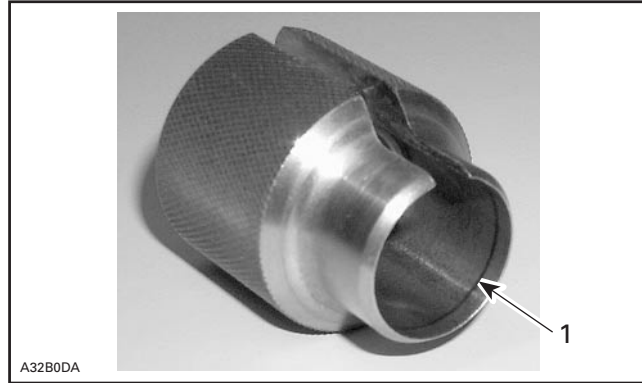
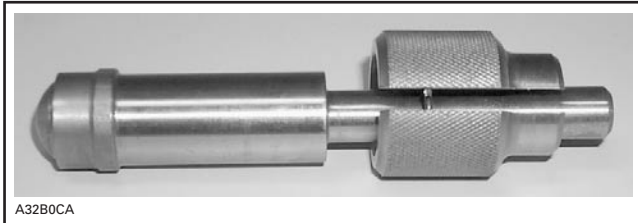
Insert circlip into support so that, when installed in piston groove, the tab faces upward.



With round end of pusher, position circlip perpendicularly to the support axis.



With the other end of the pusher, push circlip into the support groove.

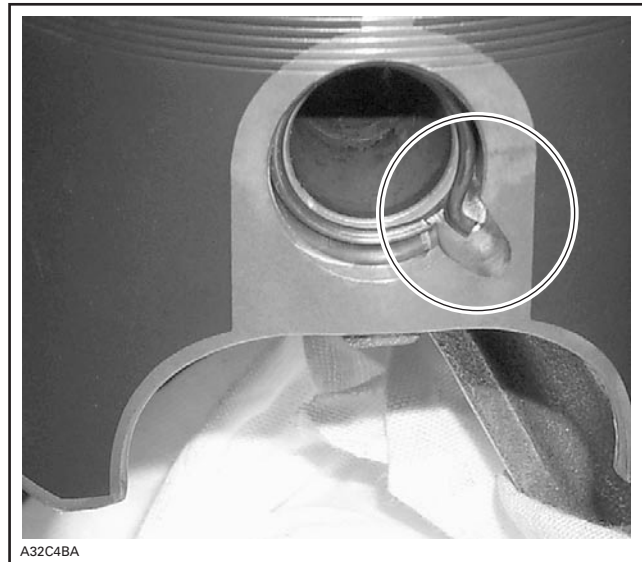


1. Groove



CIRCLIP READY TO BE INSTALLED ON PISTON

Using a plastic hammer, tap pusher to put circlip in place. Make sure to install new circlips with tab toward top as per following photo.



TAB TOWARD TOP

CAUTION: Always install new mono-hook circlips. If circlip installation fails at the first attempt, always retry with a new one because, on a second attempt, the circlip will lose its normal retaining capabilities.

CAUTION: Circlips must not move freely after installation; if so, replace them.

Cylinder and Cylinder Head

Clean cylinders and crankcase mating surfaces with Loctite Chisel (P/N 413 708 500).

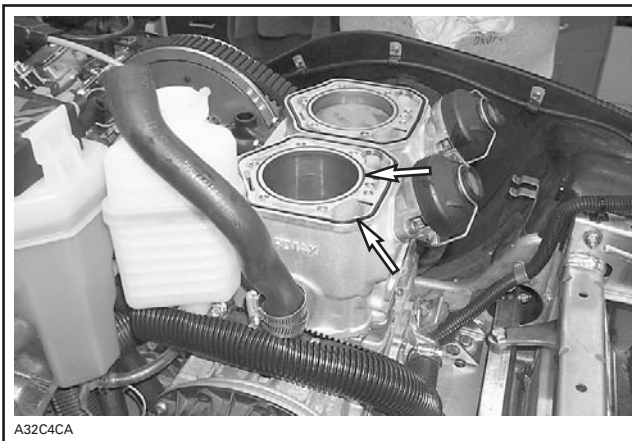
Coat crankcase mating surface with Loctite 518 (P/N 293 800 038). Choose the right gasket thickness according to combustion chamber volume. Refer to LEAK TEST AND ENGINE DIMENSION MEASUREMENT. Install it on crankcase. Coat gasket with Loctite 518.

CAUTION: Always install a gasket of the proper thickness. Failure to do so may cause detonation and severe engine damage.

Before inserting piston no. 26 in cylinder no. 4, lubricate the cylinder with new injection oil or equivalent.

Install cylinders. Do not tighten.

Install new rubber ring no. 30 and round O-rings no. 31 on each cylinder.



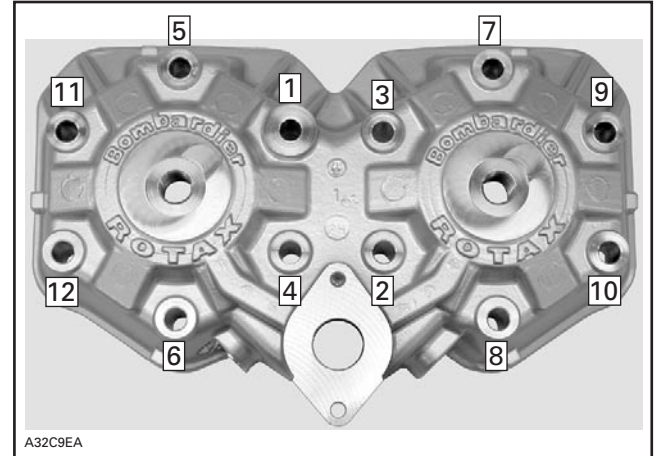
TYPICAL

NOTE: Carefully clean all screws before reinstallation, specifically under screw head.

Install exhaust manifold with gaskets. Do not tighten yet.

Torque cylinder screws no. 22 and no. 23 in a criss-cross sequence to 40 N•m (30 lbf•ft).

At assembly, torque cylinder head screws no. 20 and no. 21 to 29 N•m (21 lbf•ft) in the following illustrated sequence.



Tighten exhaust manifold bolts to 23 N•m (17 lbf•ft) in a criss-cross sequence.

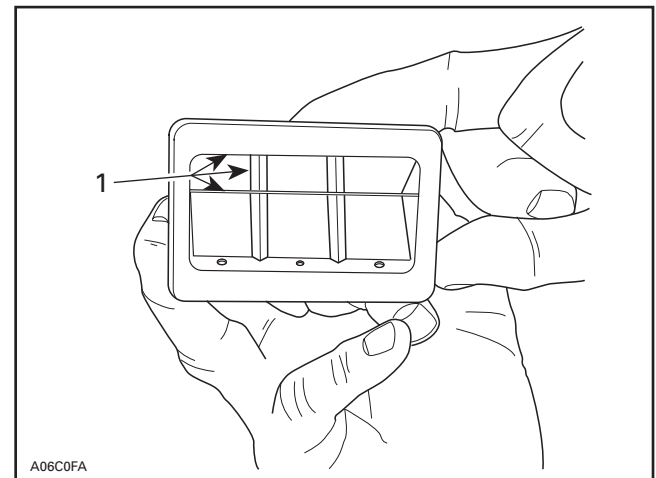
Install outlet socket and tighten screws no. 32 to 8 N•m (71 lbf•in).

Reed Valve

Blades have a curved shape. Install with their curve facing reed block.

With blade stopper no. 33 removed, check reed valve no. 6 for proper tightness. There must not be any play between blade and valve body when exerting a finger pressure on blade at blade stopper location.

In case of a play, turn blade upside down and recheck. If there is still a play, replace blade and/or valve body.

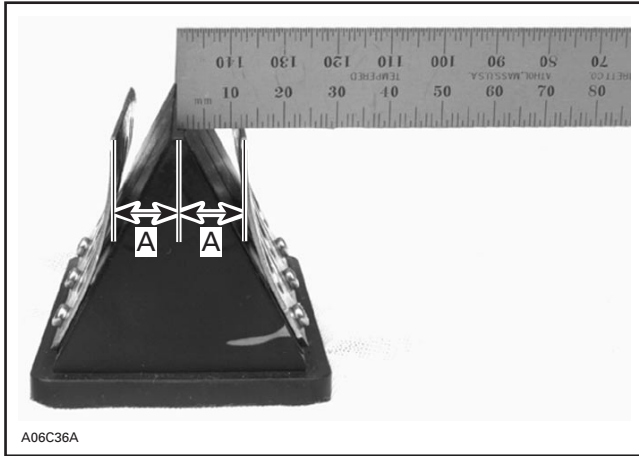


1. No play

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Check distance from blade stopper outer edge and distance from center of reed valve block.



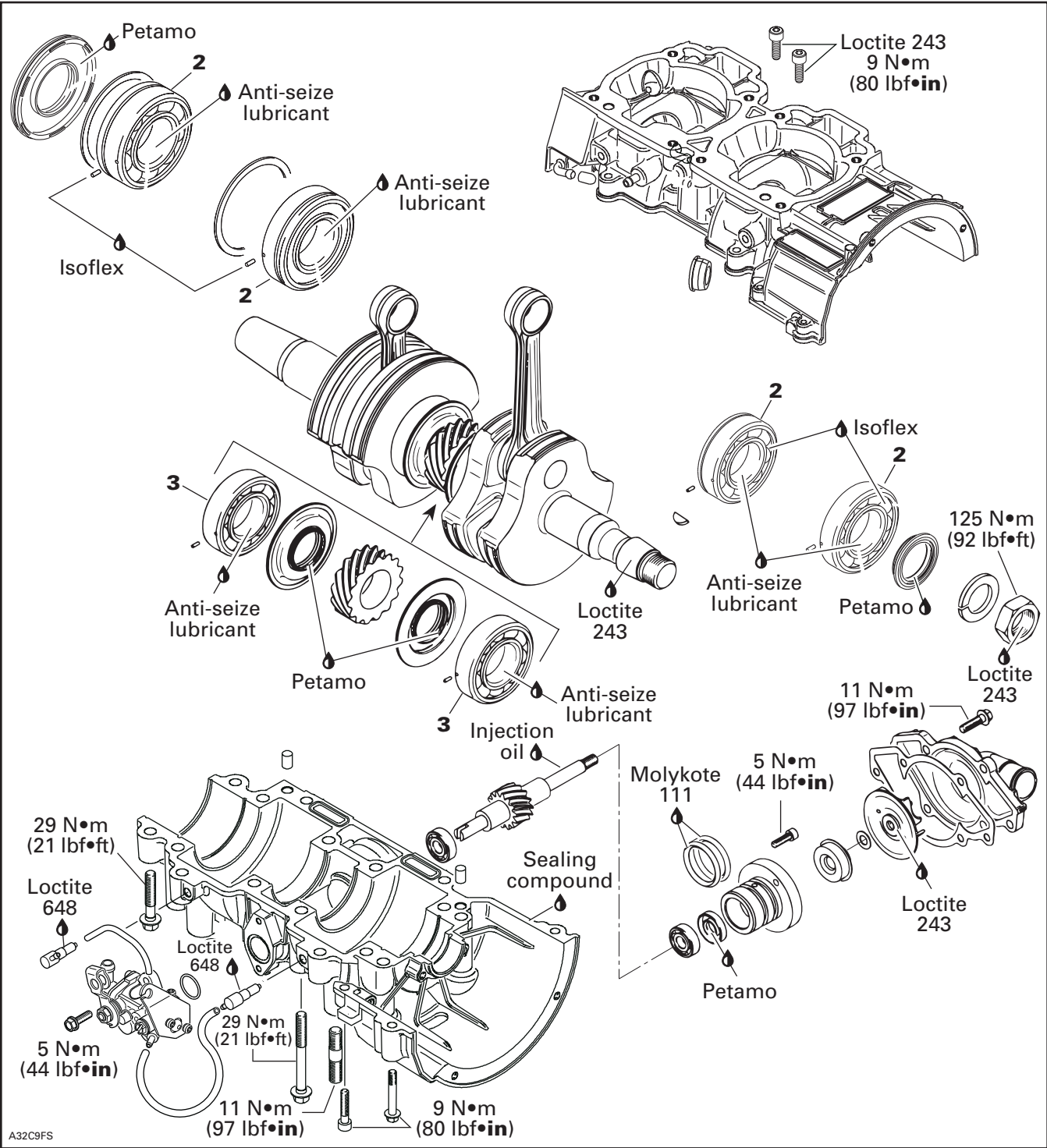
TYPICAL

A. 17.0 - 0, + 0.75 mm (.669 - 0, + .030 in)

Bent blade stopper as required to obtain the proper distance.

Blade stoppers may slightly interfere with cylinder during installation. Adjusted distance will be reduced automatically upon installation.

BOTTOM END



A32C9FS

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NOTE: Engine must be removed from chassis to perform the following procedures.

CLEANING

Discard all oil seals, gaskets, O-rings and sealing rings.

Clean all metal components in a non-ferrous metal cleaner. Use Gasket remover (P/N 413 708 500) accordingly.

Remove old paste gasket from crankcase mating surfaces with Gasket remover (P/N 413 708 500).

CAUTION: Never use a sharp object to scrape away old sealant as score marks incurred are harmful to crankcase sealing.

DISASSEMBLY

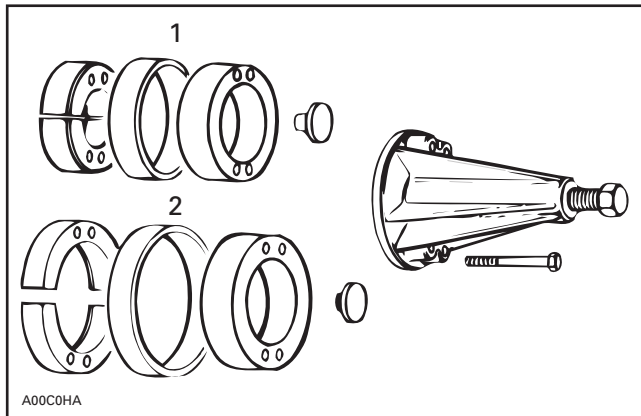
General

To remove drive pulley, refer to DRIVE PULLEY in *2003 Shop Manual ZX series* (P/N 404 200 042).

To remove magneto, refer to MAGNETO SYSTEM in this supplement.

Crankshaft Bearing

To remove bearings **no. 1** and **no. 2** from crankshaft **no. 3**, use a protective cap and special puller, as illustrated.



1. PTO side
2. MAG side

INSPECTION

NOTE: Refer to LEAK TEST AND ENGINE DIMENSIONS MEASUREMENT in this supplement.

ASSEMBLY

Coat lip of all seals with Petamo grease (P/N 420 899 271).

Crankshaft Bearing

Smear anti-seize lubricant (P/N 293 800 070) on part of crankshaft where bearing fits.

Prior to installation, place bearings into an oil container filled with injection oil previously heated to 75°C (167°F). This will expand bearing and ease installation.

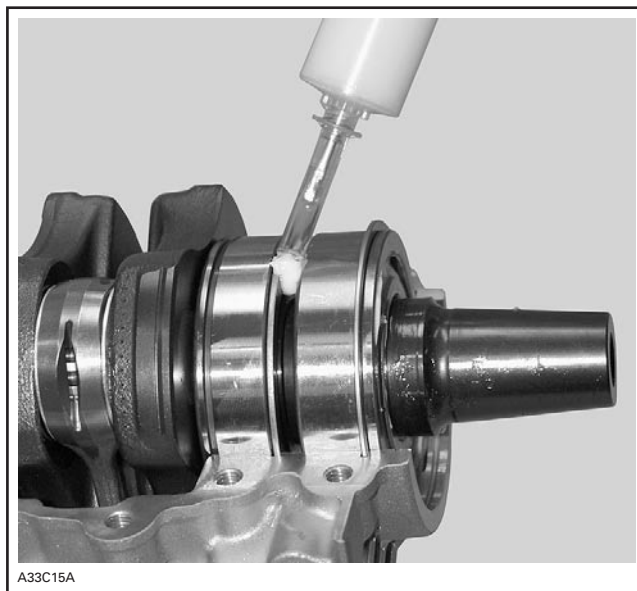
The bearings **no. 2** must be lubricated with Isoflex grease (P/N 293 550 021).

CAUTION: Use only the recommended Isoflex grease. Make sure not to push Isoflex grease between outside bearing race and half crankcase.

NOTE: The 50 g tube corresponds to 50 mL of grease.

Put 50 to 55 mL of grease in a syringe.

Fill inner side of PTO side bearing with Isoflex grease (about 10 mL).



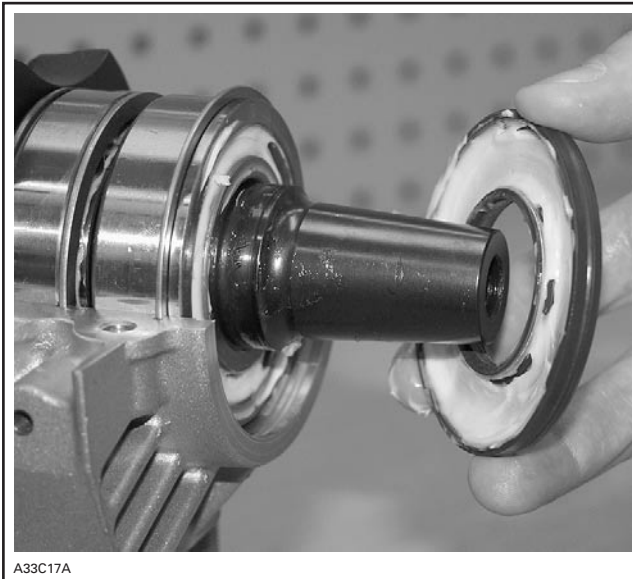
PTO SIDE BEARING FILLED WITH ISOFLEX GREASE

With the syringe, fill the outer ball bearing with 40 to 45 mL of Isoflex grease.



A33C16A

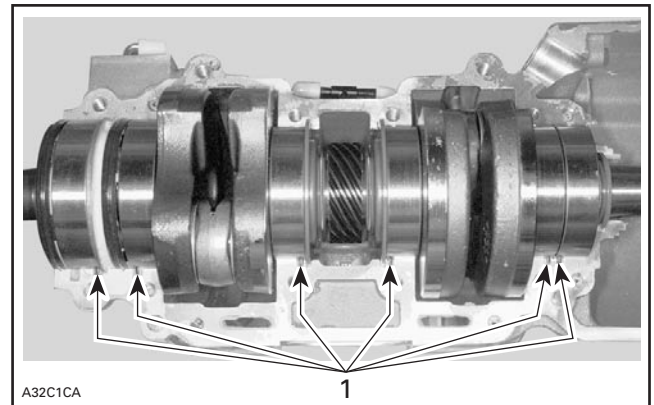
BALLS COATED WITH A SEAM OF GREASE



A33C17A

FILL WITH GREASE AND SET IN PLACE

Apply 6 mL of grease to MAG side outer bearing.
NOTE: If replaced with new bearing, do not apply grease. New bearings come already greased.
At crankshaft installation, position drive pins as illustrated.

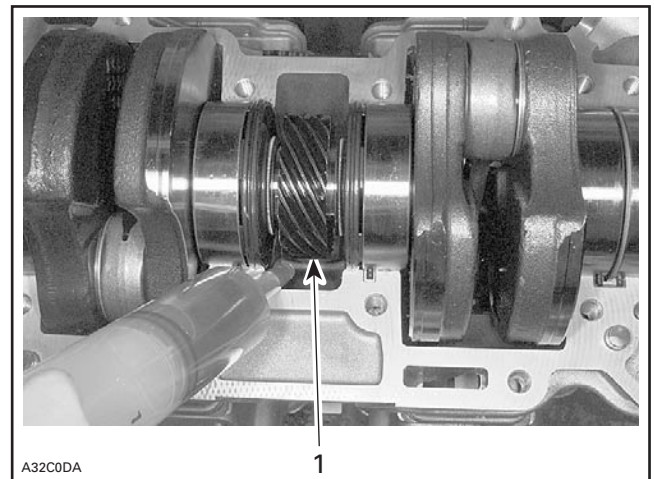


A32C1CA

1

1. Position pins

Pour 50 mL (2 U.S. oz) of injection oil in the pan under central gear to lubricate pump gearing as per photo.



A32C0DA

1

1. Oil bath

Crankcase Assembly

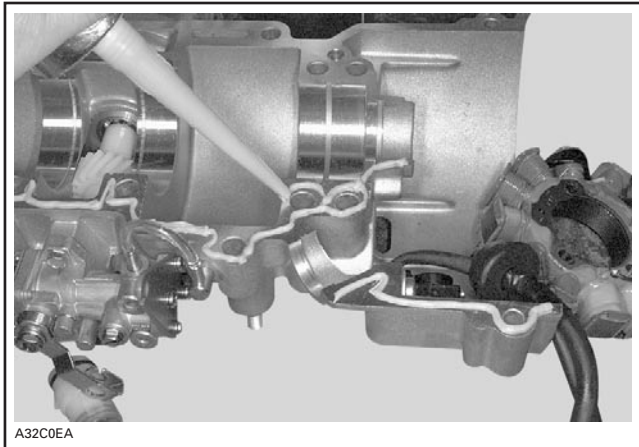
IMPORTANT: The total assembly sequence, including sealing compound spreading, screwing and torquing of bolts according to the proper sequence, must be performed within 10 minutes. **Do not wait between each bolt torquing. All bolts must be torqued in a row.**

Before screwing both parts of crankcase, seal it with sealing compound (P/N 420 297 906). Make sure surfaces are clean and degreased before applying sealing compound.

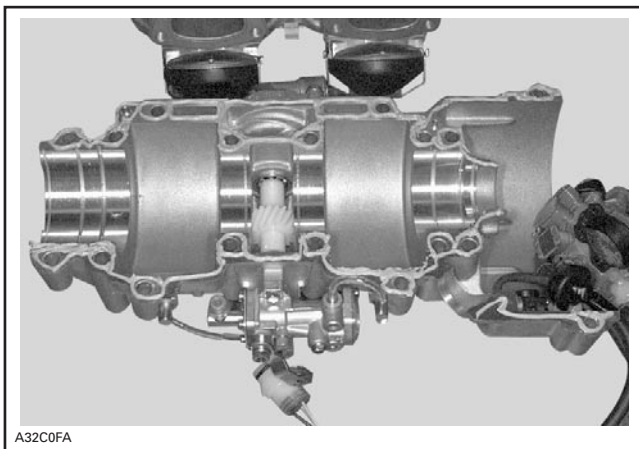
Section 03 ENGINE

Subsection 02 (793 SDI ENGINE)

Spread a seam of 1.2 mm (1/16 in) maximum in diameter on surface of lower crankcase half.

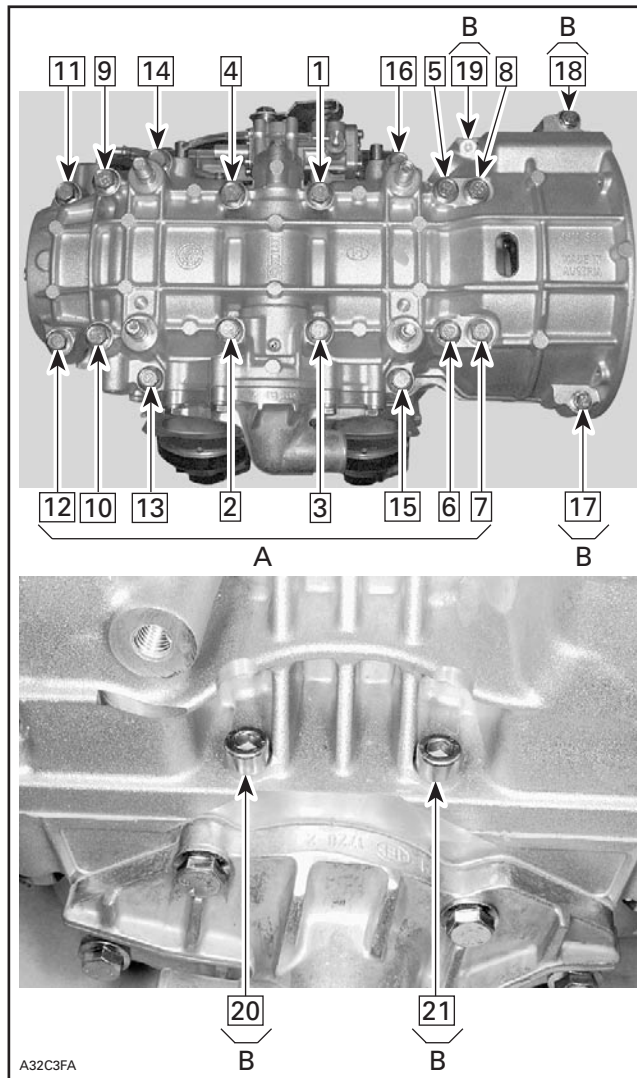


As far as possible, sealing compound must be applied in one run to avoid any risks of leakage through the crankcase.



SEAMING COMPLETED — CONTACT SURFACES COVERED AND SCREW HOLES SURROUNDED

Screw all crankcase bolts in place in the following sequence and to the appropriate torque; this must be done in two steps: first, screw bolts up to 60% of the final torque (18 N•m (159 lbf•in) for most of the bolts), then, tighten to the required torque (i.e. 29 N•m (21 lbf•ft)).



A. Torque bolts 1 through 16 to 29 N•m (21 lbf•ft)
B. Torque bolts 17 through 21 to 9 N•m (80 lbf•in)

BREAK-IN

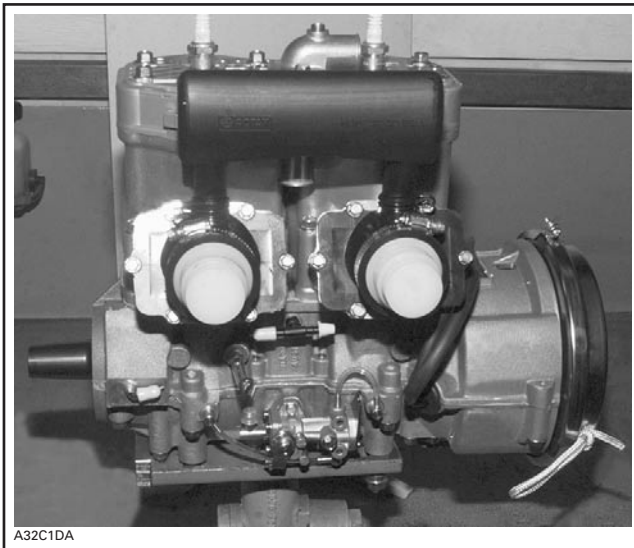
After rebuilding an engine, always observe a break-in period as described in *Operator's Guide*.

LEAK TEST AND ENGINE DIMENSION MEASUREMENT

LEAK TEST

PREPARATION

1. Remove tuned pipe.
2. Install plug over exhaust manifold.
3. Remove throttle body assembly.
4. Unplug fuel inlet line from fuel rail.
5. Insert plugs in intake rubber boots. Tighten with existing clamps.

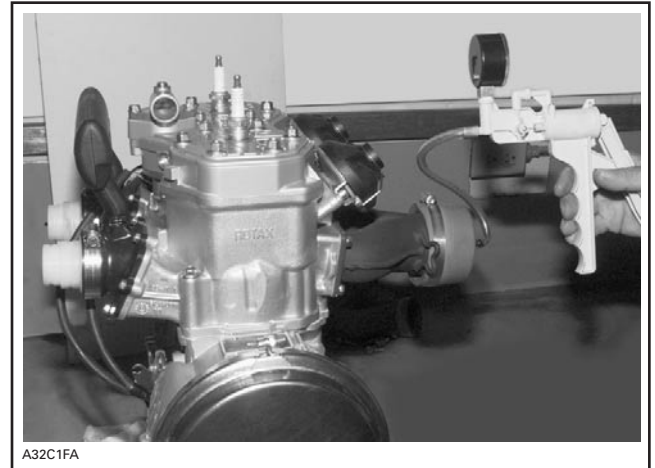


TYPICAL

6. Using a hose pincher (P/N 295 000 076), block impulse hose.
7. Install air pump on exhaust plug.

NOTE: If necessary, lubricate air pump piston with mild soap.

CAUTION: Using hydrocarbon lubricant (such as engine oil) will damage rubber seal of pump piston.



TYPICAL

8. Activate pump and pressurize engine to 34 kPa (5 PSI). Do not exceed this pressure.
9. Engine must stand this pressure during 3 minutes. If pressure drops before 3 minutes, check tester kit by spraying a soapy solution on pump cylinder, all plugs and fittings.
 - If tester kit is leaking, bubbles will indicate where leak comes from.
 - If tester kit is not leaking, check engine as per following procedure.

PROCEDURE

NOTE: A flow chart has been prepared as a visual reference. See last page of this chapter.

Using flow chart and following text, pressurize area to be tested and spray soapy solution at the indicated location.

**TEST PRESSURE: 34 kPa (5 PSI)
for 3 minutes**

- If there is a leak at the tested location, it is recommended to continue testing next items before overhauling engine. There is a possibility of more than one leak.
- If there is no leak at the tested location, continue pumping to maintain pressure and continue with next items until leak is found.

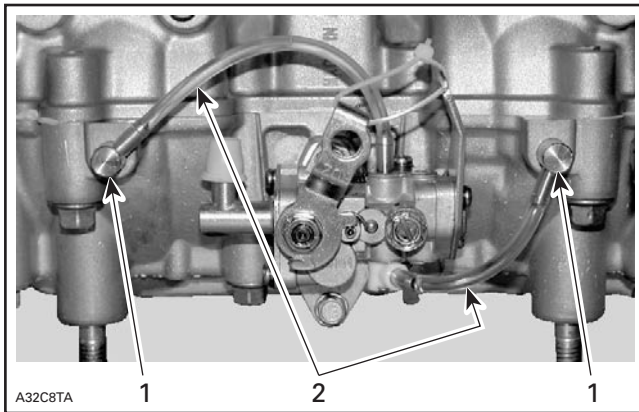
Section 03 ENGINE

Subsection 03 (LEAK TEST AND ENGINE DIMENSION MEASUREMENT)

Engine

Check the following:

1. All jointed surfaces and screw/stud threads of engine:
 - fuel injector base
 - fuel rail inlet nipple
 - spark plug base, insulator
 - cylinder head
 - RAVE valve bellows, piston, housing and controlled pressure nipple
 - cylinder
 - crankcase halves (joint)
 - oil injection pump mounting flange (O-ring)
 - coolant pump housing
 - bleed screws/plugs.
2. Small injection oil lines coming from pump.



1. Injection nipples
2. Small injection oil lines

Check for air bubbles or oil column going toward pump. It indicates defective check valve in injection nipples.

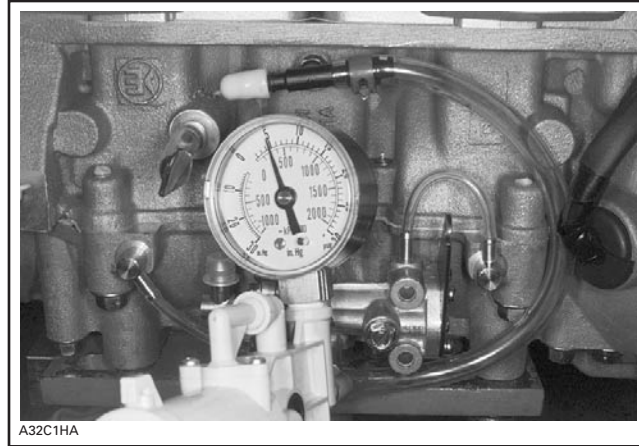
3. Remove cooling system cap.

Check for air bubbles in antifreeze. It indicates defective cylinder head O-ring or cylinder base gasket.

4. Remove drive pulley then check crankshaft outer seal.
5. Remove rewind starter and magneto system then check crankshaft outer seal.
6. Check pump shaft gear oil reservoir.

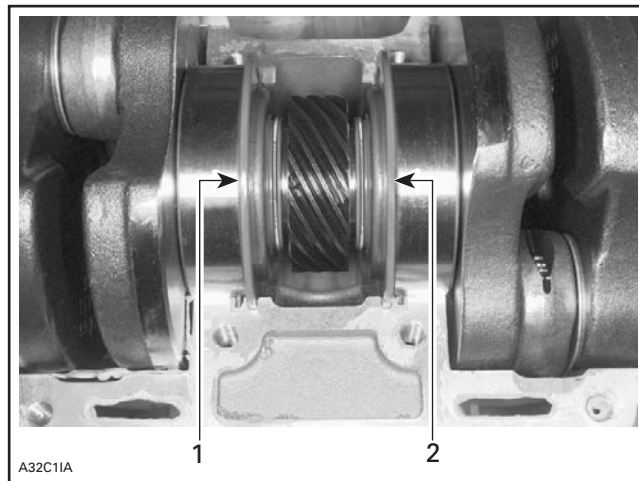
Pump Shaft Oil Gear Reservoir

Install air pump on nipple and pressurize as above.



TYPICAL

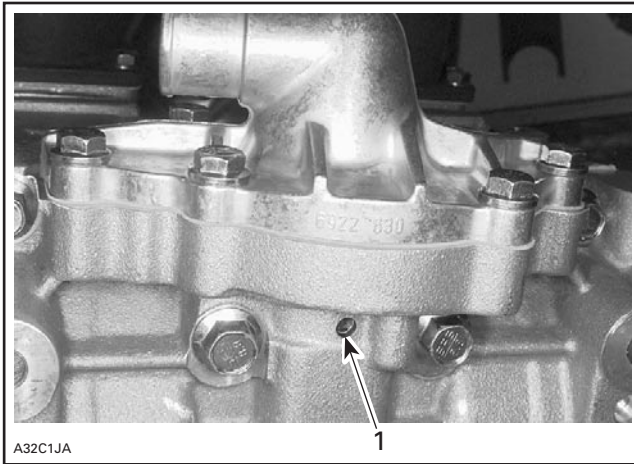
If pressure drops, it indicates a defective crankshaft inner seal.



TYPICAL — CRANKSHAFT INSTALLED IN UPPER HALF CRANKCASE

1. Crankshaft inner seal on PTO side
2. Crankshaft inner seal on MAG side

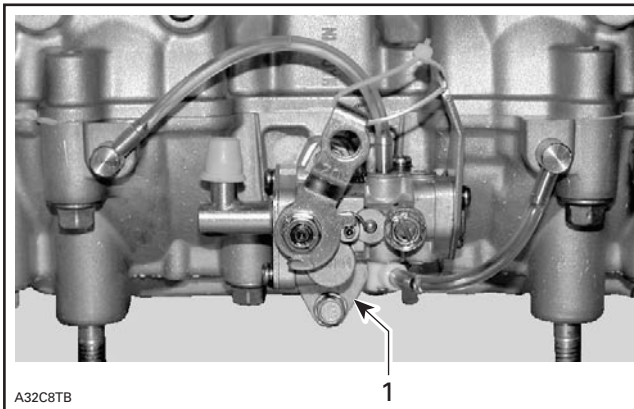
1. Check weep hole below coolant pump housing with soapy water.



1. *Weep hole*

If there is a leak, it indicates that a pump shaft is defective (oil seal beside coolant ceramic seal).

2. Leaks can be also on oil pump side. Check mounting area for leaks.



1. *Check mounting area*

3. If leak still persists, it indicates a defective casting somewhere in engine.

Disassemble engine and carefully check for defects in castings. Pay attention to tapped holes which may go through engine sealed area and thus lead to leakage.

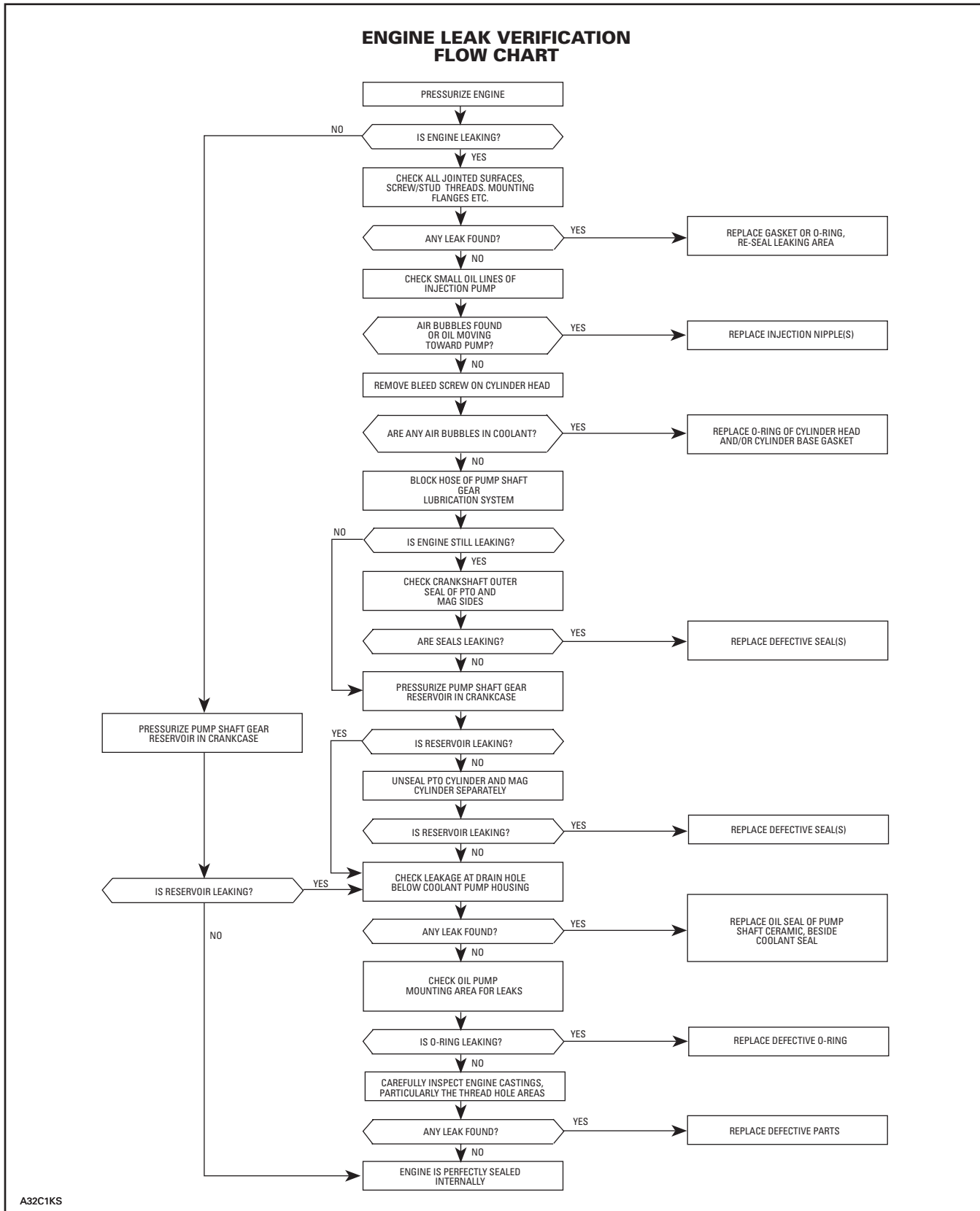
FINALIZING REASSEMBLY

After reassembling engine, always recheck for leakage.

Section 03 ENGINE

Subsection 03 (LEAK TEST AND ENGINE DIMENSION MEASUREMENT)

ENGINE LEAK VERIFICATION FLOW CHART



ENGINE DIMENSION MEASUREMENT

CYLINDER HEAD WARPAGE

ENGINE TYPE	WEAR LIMIT
793 SDI	0.05 mm (.002 in) per 50 mm (2 in) of surface
	0.5 mm (.020 in) for total length of cylinder head

Check gasketed surface of the cylinder head with a straightedge and a feeler gauge.

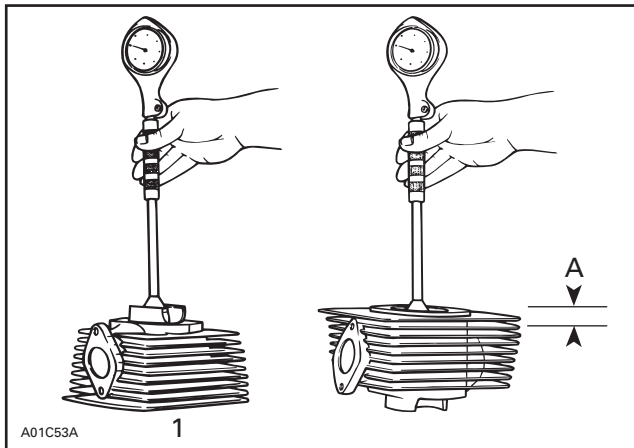
CYLINDER TAPER

ENGINE TYPE	WEAR LIMIT
793 SDI	0.10 mm (.004 in)

Compare cylinder diameter 16 mm (5/8 in) from top of cylinder to just below its intake port area.

If the difference exceeds the specified dimension the cylinder should be rebored and honed or should be replaced. Nikasil cylinder can be honed using diamond hone but can not be rebored.

NOTE: Be sure to restore the chamfer around all cylinder sleeve port openings.



TYPICAL

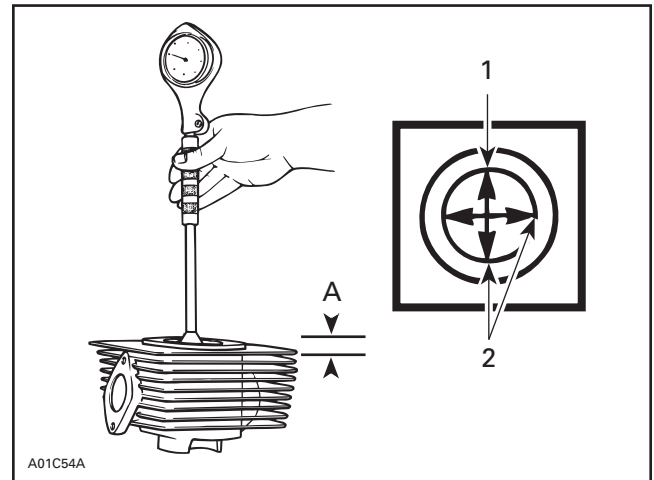
- 1. Below the intake port
- A. 16 mm (5/8 in) from top

CYLINDER OUT OF ROUND

ENGINE TYPE	WEAR LIMIT
793 SDI	0.08 mm (.003 in)

Measuring 16 mm (5/8 in) from top of cylinder with a cylinder gauge, check if the cylinder out of round is more than the specified dimension. If larger, cylinder should be rebored and honed or should be replaced. Nikasil cylinder can be honed using diamond hone but cannot be rebored.

NOTE: Be sure to restore the chamfer around all cylinder sleeve port openings.

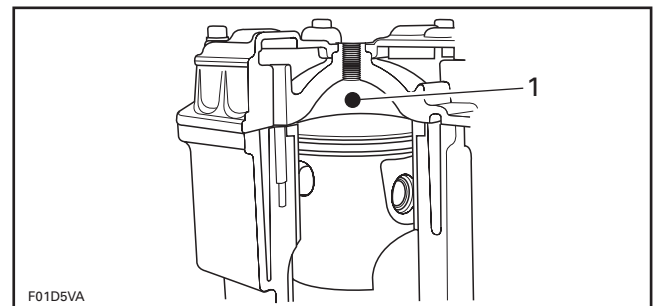


TYPICAL

- 1. Piston pin position
- 2. Measures to be compared
- A. 16 mm (5/8 in)

COMBUSTION CHAMBER VOLUME MEASUREMENT

The combustion chamber volume is the region in the cylinder head above the piston at Top Dead Center. It is measured with the cylinder head installed on the engine.



TYPICAL

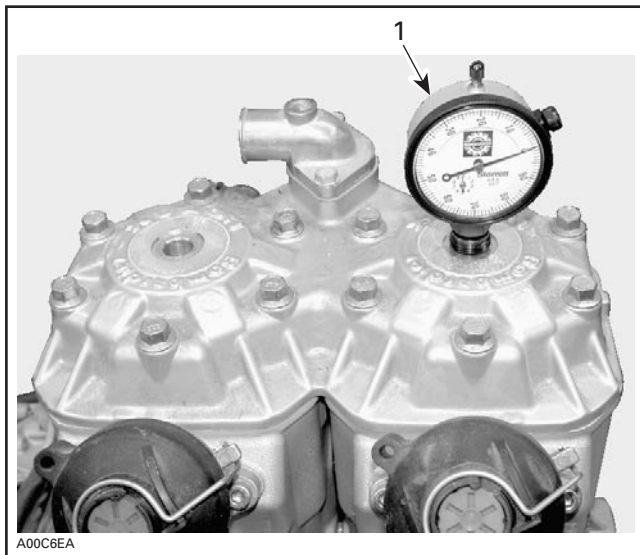
- 1. Combustion chamber

Section 03 ENGINE

Subsection 03 (LEAK TEST AND ENGINE DIMENSION MEASUREMENT)

NOTE: When checking the combustion chamber volume, engine must be cold, piston must be free of carbon deposits and cylinder head must be leveled.

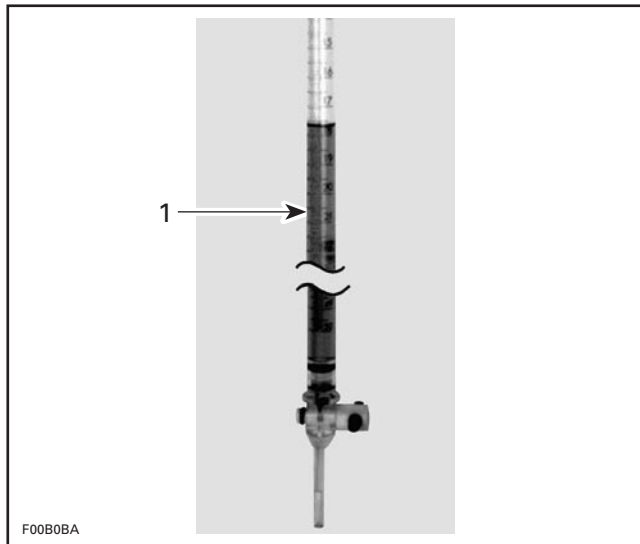
1. Remove both spark plugs and bring one piston to Top Dead Center using a TDC gauge.



TYPICAL

1. Bring piston to TDC

2. Obtain a graduated burette (capacity 0 - 50 cc) and fill with an equal part (50/50) of gasoline and injection oil.

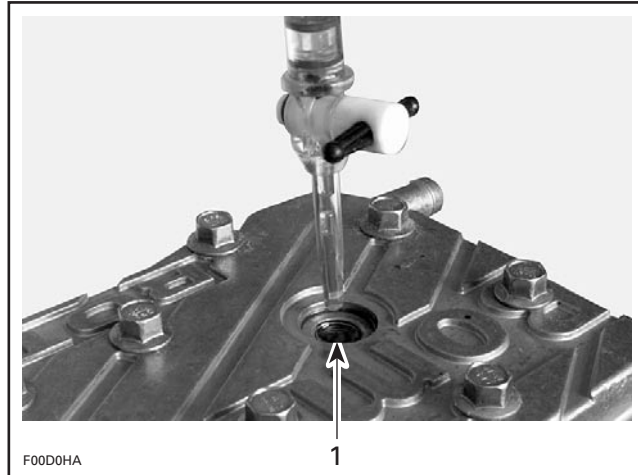


TYPICAL

1. Graduated burette (0 - 50 cc)

3. Open burette valve to fill its tip. Add liquid in burette until level reaches 0 cc.

4. Inject the burette's content through the spark plug hole until the liquid touches the top of the spark plug hole.



TYPICAL

1. Top of spark plug hole

NOTE: The liquid level in cylinder must not drop for a few seconds after filling. If so, there is a leak between piston and cylinder. The recorded volume would be false.

5. Let burette stand upward for about 10 minutes, until liquid level is stabilized.
6. Read the burette scale to obtain the quantity of liquid injected in the combustion chamber.

NOTE: When the combustion chamber is filled to top of spark plug hole, it includes an amount of 2.25 cc corresponding to the spark plug hole.

7. Repeat the procedure for the other cylinder.

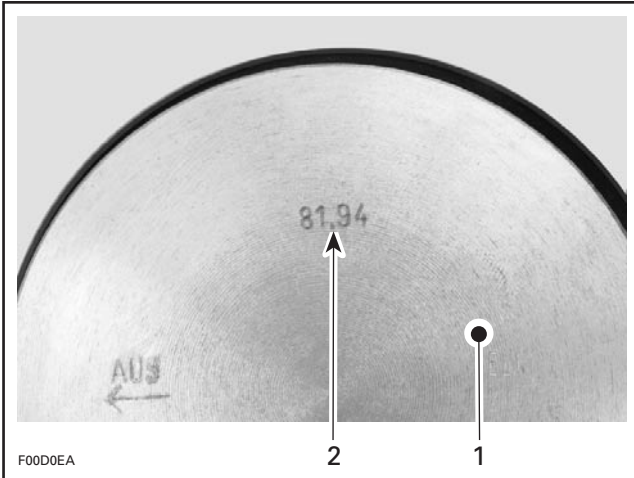
ENGINE TYPE	COMBUSTION CHAMBER VOLUME (cc) (up to top thread of spark plug hole)
793 SDI	38.59 ^{+ 1.7} _{- 1.6}

8. Install a thicker or thinner cylinder/crankcase gasket (refer to *Parts Catalogs*) in order to obtain the specified combustion chamber volume or the nearest.

ENGINE TYPE	CHANGE IN COMBUSTION CHAMBER VOLUME (cc) FOR EVERY 0.1 mm (.004 in) OF GASKET THICKNESS
793 SDI	0.52

USED PISTON MEASUREMENT

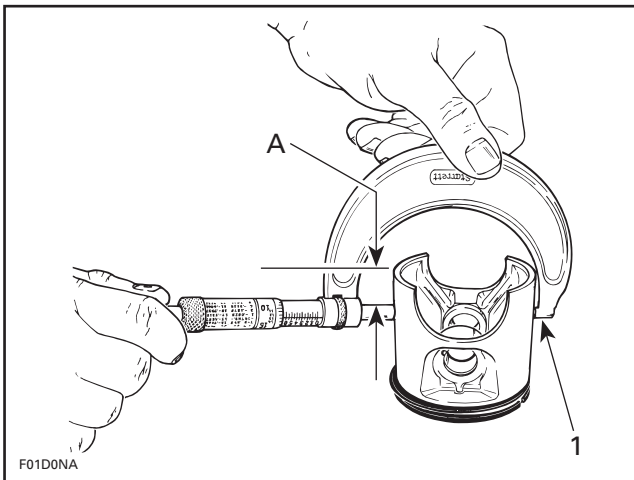
Note the measurement engraved on the piston dome.



TYPICAL

1. Piston dome
2. Piston measurement

Using a micrometer, measure piston skirt at 15 mm (.590 in) perpendicularly (90°) to piston pin.



TYPICAL

1. Measuring perpendicularly (90°) to piston pin axis
- A. 15 mm (.590 in)

ENGINE TYPE	MAXIMUM PISTON SKIRT WEAR mm (in)
793 SDI	0.10 (.004)

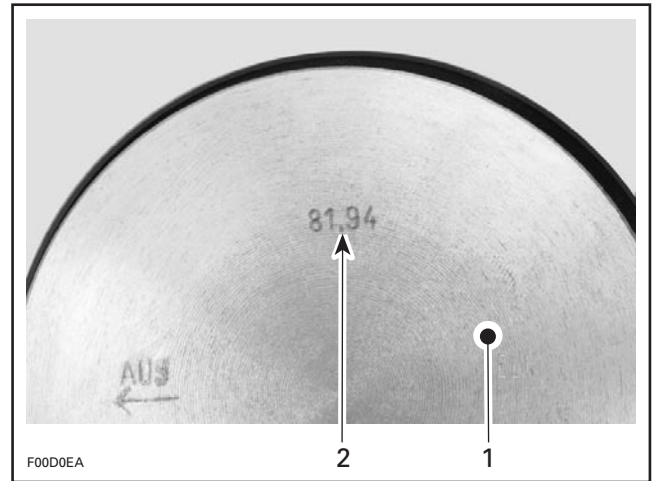
The measured dimension must not be less than 0.10 mm (.004 in) of the one engraved on piston dome. Otherwise, install a new piston.

CYLINDER/PISTON CLEARANCE

Used and New Pistons

IMPORTANT: Make sure used piston is not worn more than specified. See USED PISTON MEASUREMENT above.

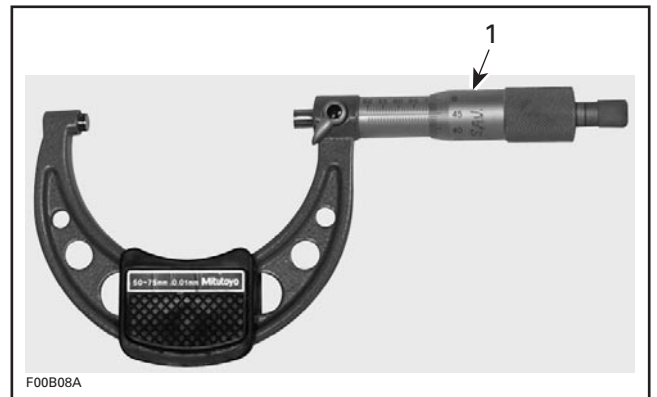
Take the measurement on the piston dome.



TYPICAL

1. Piston dome
2. Piston measurement

Adjust and lock a micrometer to the specified value on the piston dome.



TYPICAL

1. Micrometer set to the piston dimension

Section 03 ENGINE

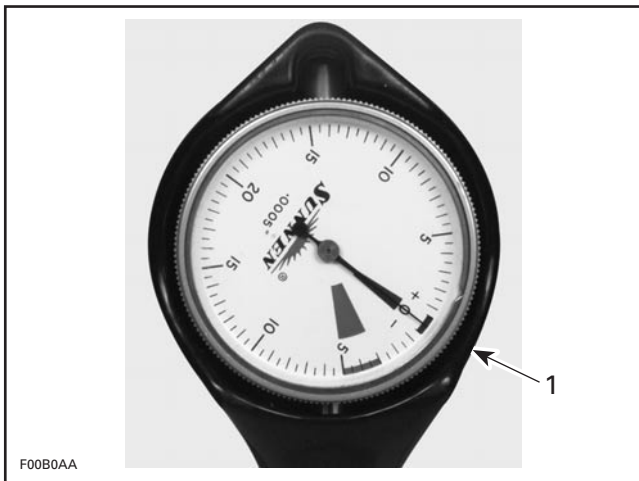
Subsection 03 (LEAK TEST AND ENGINE DIMENSION MEASUREMENT)

Set the micrometer to the piston dimension, adjust a cylinder bore gauge to the micrometer dimension and set the indicator to 0.



TYPICAL

1. Use the micrometer to set the cylinder bore gauge
2. Dial bore gauge

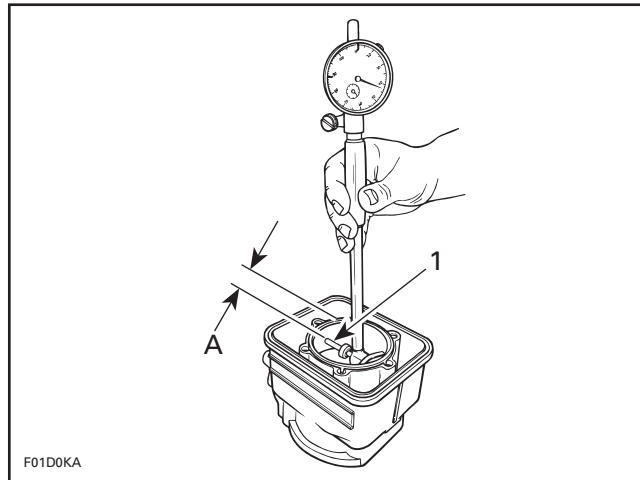


TYPICAL

1. Indicator set to 0 (zero)

IMPORTANT: Always remove cylinders from crankcase before measuring.

Position the dial bore gauge at 16 mm (5/8 in) below cylinder top edge.



TYPICAL

1. Measuring perpendicularly (90°) to piston pin axis
A. 16 mm (5/8 in)

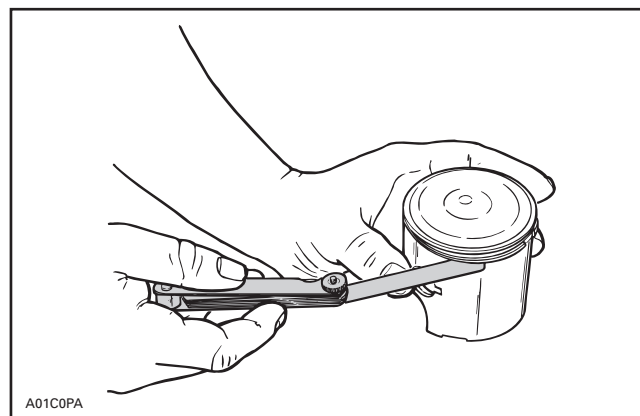
Read the measurement on the cylinder bore gauge. The result is the exact piston/cylinder wall clearance. If clearance exceeds specified tolerance, replace cylinder or rebore and install oversize piston depending on engine type. Refer to TECHNICAL DATA.

NOTE: Make sure the cylinder bore gauge indicator is set exactly at the same position as with the micrometer, otherwise the reading will be false.

IMPORTANT: The total piston/cylinder clearance (actual cylinder diameter minus actual piston skirt diameter) should be within 0.25 mm (.01 in).

RING/PISTON GROOVE CLEARANCE

Using a feeler gauge check clearance between rectangular ring and groove. Replace piston if clearance exceeds specified tolerance. Refer to TECHNICAL DATA.



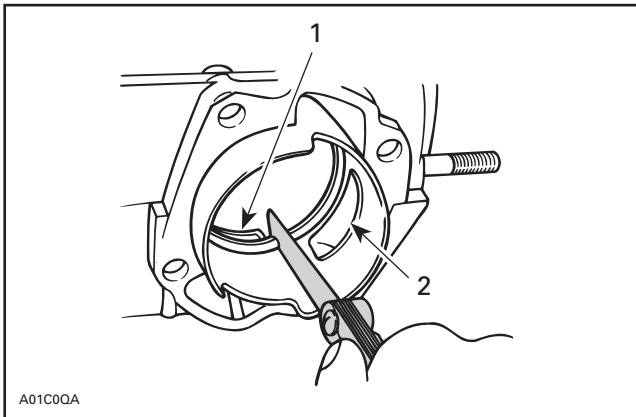
TYPICAL

RING END GAP

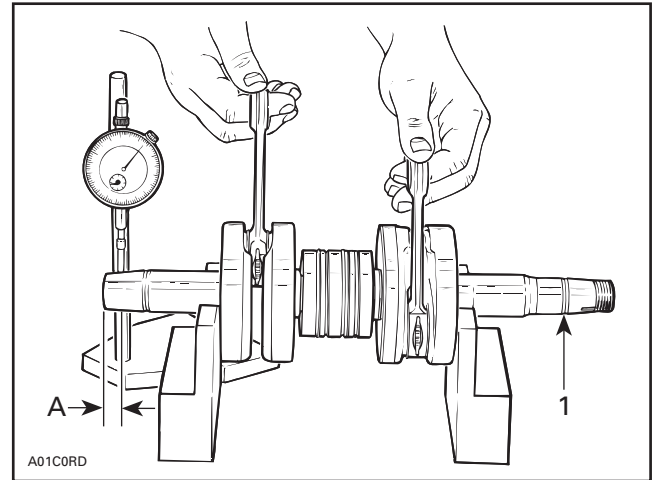
Position ring half-way between transfer port and intake port.

NOTE: In order to correctly position the ring in the cylinder, use piston as a pusher.

Using a feeler gauge, check ring end gap. Replace ring if gap exceeds specified tolerance. Refer to TECHNICAL DATA.



TYPICAL
 1. Transfer port
 2. Intake port



TYPICAL
 1. Measure at mid point between the key and the first thread
 A. 3 mm (1/8 in)

Crankshaft Deflection on PTO Side

ENGINE TYPE	MAXIMUM ON PTO SIDE mm (in)
793 SDI	0.06 (.0024)

Crankshaft Deflection on MAG Side

ENGINE TYPE	MAXIMUM ON MAG SIDE mm (in)
793 SDI	0.05 (.0020)

Crankshaft Deflection in Center of Crankshaft

ENGINE TYPE	MAXIMUM IN CENTER OF CRANKSHAFT mm (in)
793 SDI	0.08 (.0031)

NOTE: Crankshaft deflection cannot be correctly measured between centers of a lathe.

If the deflection exceeds the specified tolerance, crankshaft should be repaired or replaced.

CRANKSHAFT DEFLECTION

Crankshaft deflection is measured with a dial indicator.

Measuring (in crankcase)

First, check deflection with crankshaft in crankcase. If deflection exceeds the specified tolerance, recheck deflection using V-shaped blocks to determine which part(s) is (are) defective. See below.

Measuring (on bench)

Once engine is disassembled, check crankshaft deflection on V-shaped blocks. If deflection exceeds the specified tolerance, it can be worn bearings or a bent crankshaft. Remove crankshaft bearings and check deflection again on V-shaped blocks to determine which part(s) is (are) defective. See measurement A in following illustration.

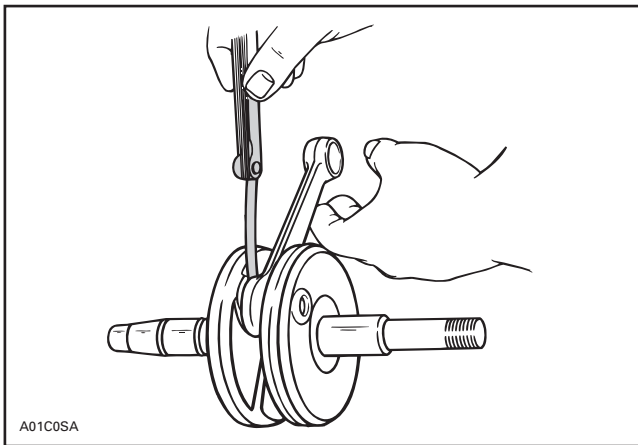
Section 03 ENGINE

Subsection 03 (LEAK TEST AND ENGINE DIMENSION MEASUREMENT)

CONNECTING ROD BIG END AXIAL PLAY

ENGINE TYPE	NEW PARTS MIN. - MAX.	WEAR LIMIT
793 SDI	0.39 - 0.68 mm (.015 - .027 in)	1.20 mm (.047 in)

Using a feeler gauge, measure distance between thrust washer and crankshaft counterweight. If the distance exceeds specified tolerance, repair or replace the crankshaft.



TYPICAL

CRANKSHAFT END-PLAY

End-play is not adjustable but it should be between 0.10 - 0.30 mm (.004 - .012 in).

CHECKING CRANKSHAFT ALIGNMENT

Install a degree wheel (P/N 529 035 607) on crankshaft end.

Remove both spark plugs.

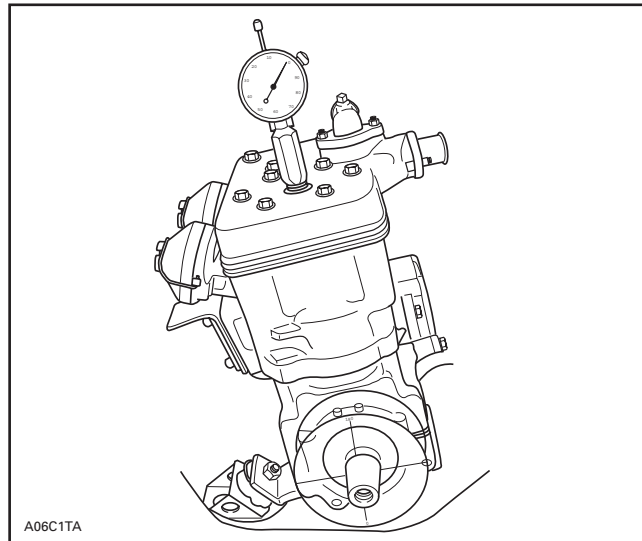
Install a TDC gauge (P/N 414 104 700) in spark plug hole on MAG side.

Bring MAG piston at top dead center.

Rotate degree wheel (not crankshaft) so that 360° mark aligns with center of crankcase. Scribe a mark on crankcase.

Remove TDC gauge and install it on center cylinder.

Bring PTO piston to top dead center. Degree wheel must rotate with crankshaft.



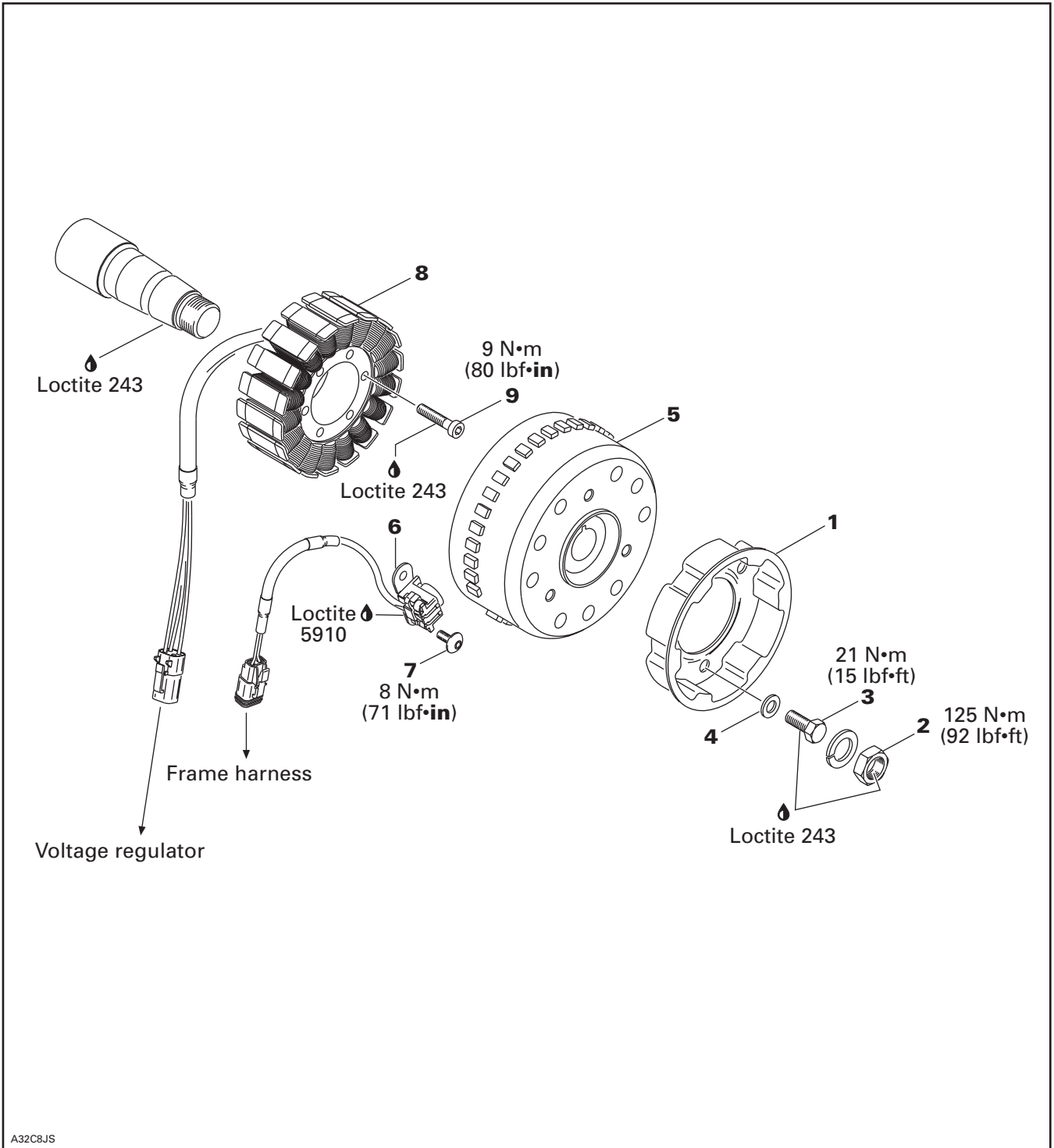
TYPICAL

Interval between cylinders must be $180^\circ \pm 0.5$.

Any other reading indicates a misaligned (twisted) crankshaft.

MAGNETO SYSTEM

793 SDI Engines



Section 03 ENGINE

Subsection 04 (MAGNETO SYSTEM)

NOTE: The following procedures can be done without removing the engine. To facilitate magneto removal, hold drive pulley with appropriate tool.

CLEANING

Clean all metal components in a non-ferrous metal cleaner.

CAUTION: Clean stator and magneto using only a clean cloth.

DISASSEMBLY

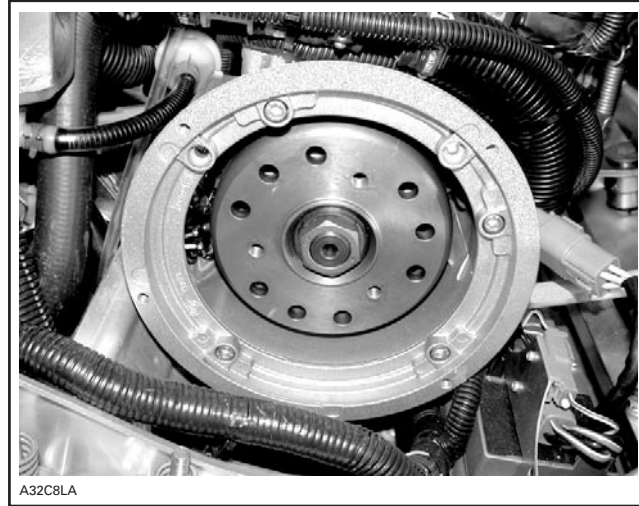
Magneto Flywheel

To gain access to magneto assembly, remove the following parts:

- tuned pipe and muffler
- rewind starter
- starting pulley **no. 1**

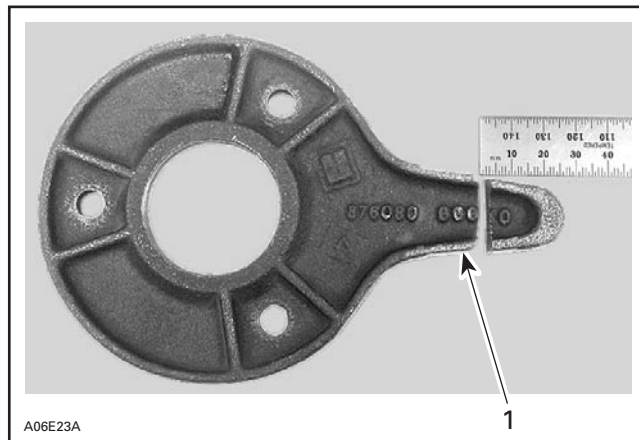


- connecting flange.



To remove magneto flywheel retaining nut **no. 2**:

- Use magneto puller ring (P/N 420 876 080). Former puller must be modified as shown.



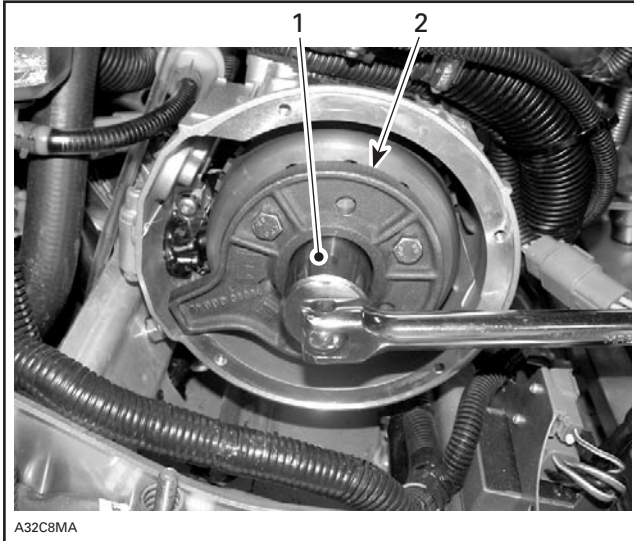
1. Cut by 25 mm (1 in)

- Install puller ring with its tab in magneto housing opening.

CAUTION: Use bolts **no. 3** retaining starting pulley without lock washers **no. 4**.

- Remove magneto flywheel nut with a 30 mm socket. This socket must have an outside diameter of 40 mm over 16 mm long. Machine accordingly.

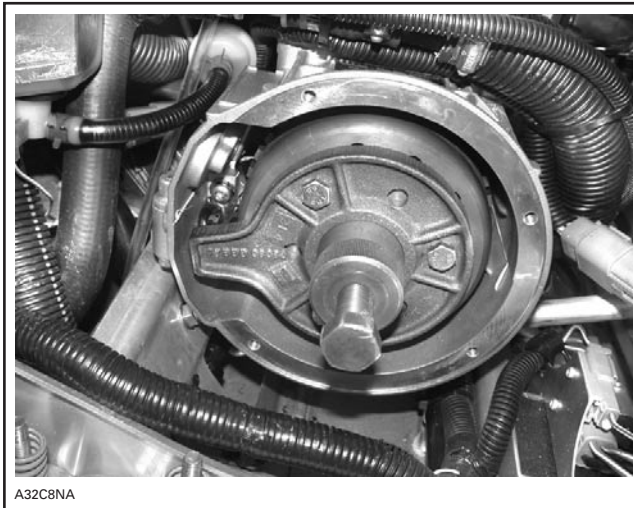
NOTE: To correctly remove a threadlocked fastener, first tap on the fastener to break threadlocker bond. This will avoid thread breakage.



TYPICAL

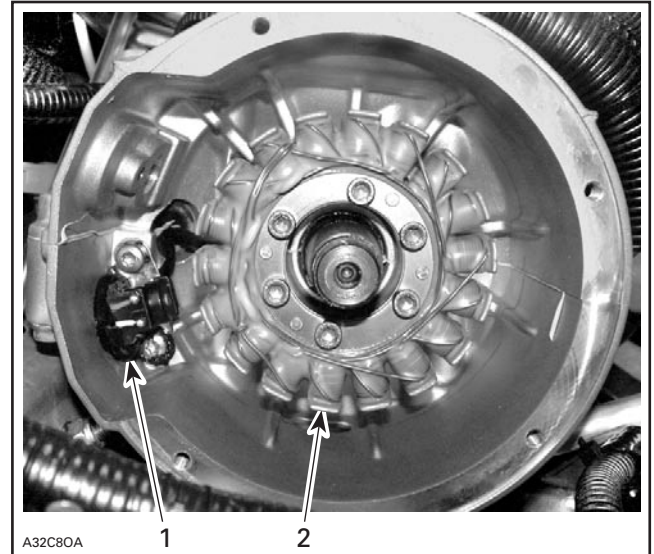
1. Modified 30 mm socket
2. Magneto puller ring (P/N 420 876 080)

To remove magneto flywheel **no. 5**, install crankshaft protector (P/N 420 876 557) on crankshaft end. Screw puller (P/N 529 022 500) into puller ring.



- Tighten puller bolt and at the same time, tap on bolt head using a hammer to release magneto flywheel from its taper.

CPS (Crankshaft Position Sensor)



1. CPS
2. Stator

NOTE: Always check the CPS **no. 6** before replacing it. Refer to OVERVIEW section.

To replace the CPS:

Remove:

- magneto flywheel (see above)
- air intake silencer to allow an access to the CPS connector then disconnect it
- grommet from crankcase where CPS wires exit magneto housing
- retaining screws **no. 7**
- CPS and carefully pull wires.

Section 03 ENGINE

Subsection 04 (MAGNETO SYSTEM)

Stator

Before removing the stator **no. 8**, perform the following test:

MAGNETO STATOR TESTING (SDI ENGINES — 480 W)			
PART		Magneto stator	
TEST TO BE PERFORMED		Output	Stator insulation
WIRE COLOR		YL and YL and YL	YL and engine
MULTIMETER PROBE CONNECTION		2-MO-(A,B,C)-F and 2-MO-(A,B,C)-F	2-MO-(B,C)-F and engine
RESISTANCE Ω	VALUE (ohms)	0.0 - 0.5 3 times	0.L
	MULTIMETER SCALE	00.0 Ω or auto range	00.0 $M\Omega$ or auto range
VOLTAGE V	VALUE (volts)	2.5 - 5.5 3 times	—
	MULTIMETER SCALE	00.0 ^V _{vac}	—
NOTE		Do the test between A and B, A and C and B and C using manual starter.	The term "engine" refers to the engine metal parts connected to the magneto housing.

Remove:

- magneto flywheel **no. 5**
- all Allen socket screws **no. 9** retaining stator to magneto housing
- grommet from crankcase where CPS and stator wires exit magneto housing.

Unplug the CPS connector and pull the wires through the grommet location.

NOTE: To pass the stator connector into the grommet location it is necessary to pass the CPS connector first.

Unplug the stator connector and remove the stator.

ASSEMBLY

For installation, use the torque values and Loctite products from the exploded views. Clean threads before using Loctite when reinstalling the screws.

WARNING

Torque wrench tightening specifications must strictly be adhered to.

Locking devices (ex.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

Stator

Insert the stator connector into crankcase grommet then the CPS connector.

Install the grommet on crankcase.

During installation, make sure the stator harness is located on the left side.

Apply Loctite 243 on threads of stator screws **no. 9** then torque them to 9 N•m (80 lbf•in).

Reinstall all others removed parts.

CPS

For installation, reverse the removal procedure.

Magneto Flywheel

Clean crankshaft extension (taper) and apply Loctite 243 (blue) on taper, then position Woodruff key, flywheel and lock washer on crankshaft.

Clean nut threads and apply Loctite 243 (blue) then tighten nut to 125 N•m (92 lbf•ft).

At reassembly coat all electric connections except Deutsch housings (waterproof gray housing) with silicone dielectric grease (P/N 293 550 004) to prevent corrosion or moisture penetration.

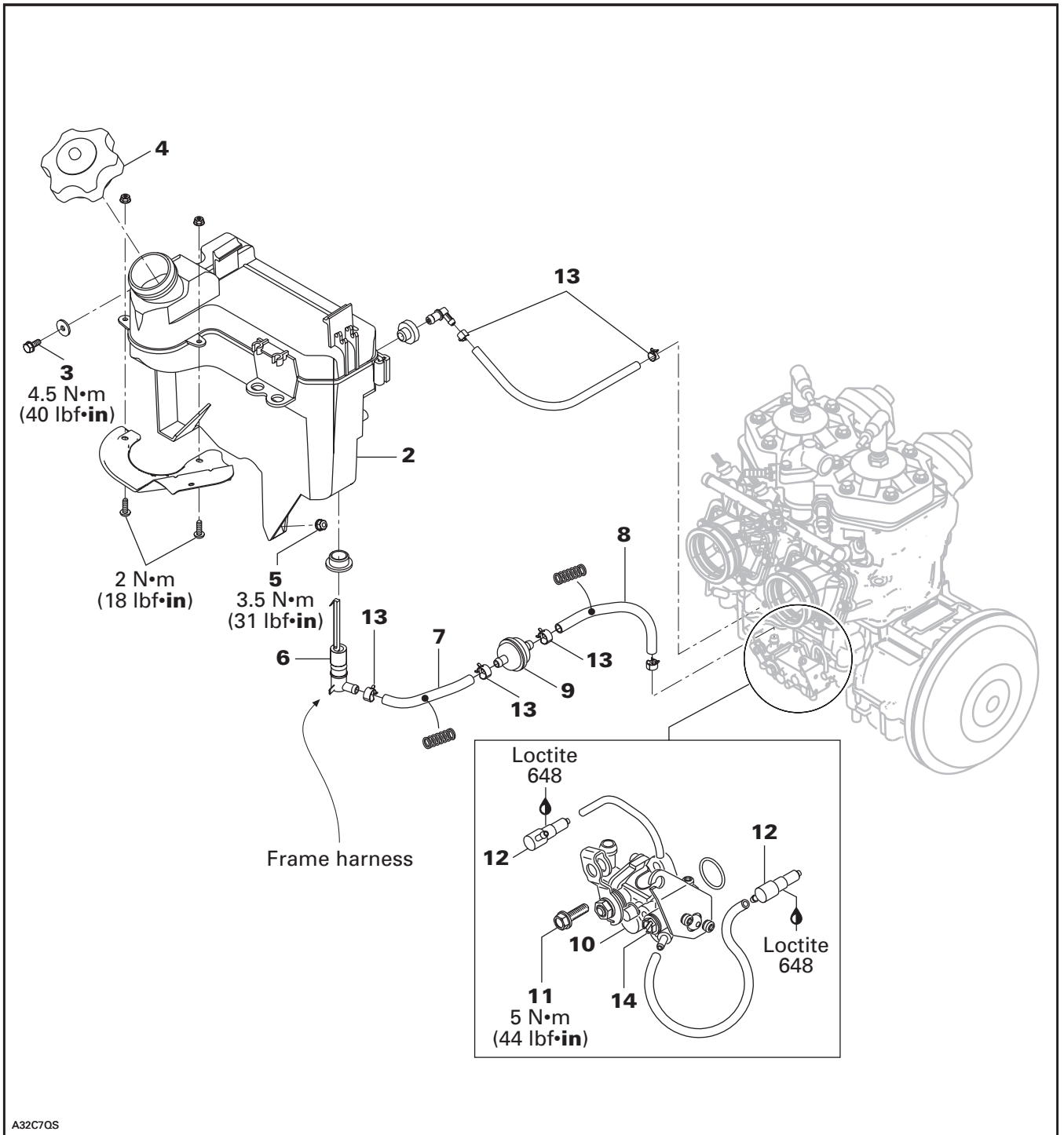
CAUTION: Do not use silicone "sealant"; this product will corrode contacts. Do not apply silicone dielectric grease on any Deutsch housing otherwise housing seal will be damaged.

Ignition Timing

Check as described in IGNITION TIMING.

OIL INJECTION SYSTEM

793 SDI Engines



A32C7QS

Section 03 ENGINE

Subsection 05 (OIL INJECTION SYSTEM)

WARNING

Wipe off any oil spills. Oil is highly flammable.

OIL TYPE

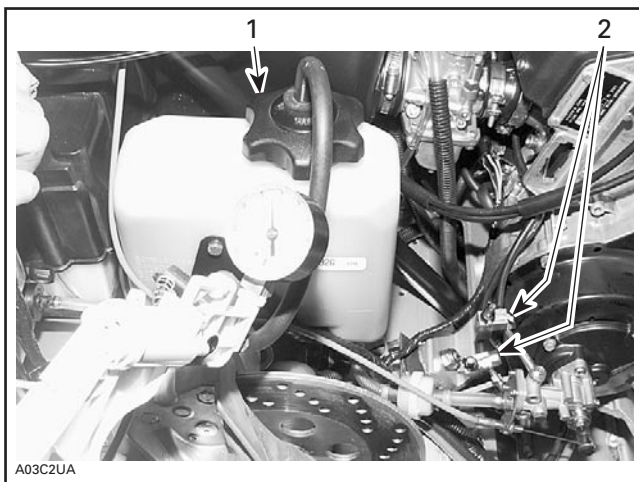
Use only the synthetic injection oil Bombardier Formula XP-S II (P/N 293 600 245 or 293 600 246).

OIL SYSTEM LEAK TEST

The following test will indicate any leak from oil reservoir.

Install on oil reservoir special cap of leak testing kit (P/N 529 033 100).

Install hose pinchers (P/N 295 000 076) on outlet hoses.



TYPICAL

1. Special cap on reservoir
2. Hose pinchers on outlet hoses

Connect leak testing kit pump to special cap.

Pressurize oil system to 21 kPa (3 PSI). That pressure must not drop during 3 minutes.

If pressure drops, locate leak(s) and repair/replace leaking component(s).

OIL PUMP IDENTIFICATION

Pump Lever

Different engines need different pumps. See identification on lever no. 1.

CAUTION: Always mount proper pump on engine.

ENGINE TYPE	OIL PUMP IDENTIFICATION
793 SDI	01

NOTE: The following procedures can be done without removing the engine from chassis.

CLEANING

Clean all metal components in a non-ferrous metal cleaner.

DISASSEMBLY

Throttle/Oil Pump Cable

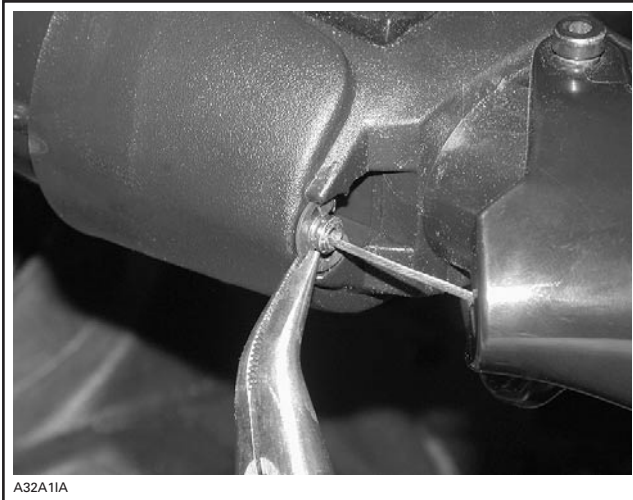
NOTE: Before removing the cable from vehicle, note its routing for installation.

Remove:

- handlebar adjusting lever



- steering cover and its padding
- retaining circlip.



Using long nose pliers to hold the cable, push the end of cable out of its location.

Unhook the cable sheath then remove cable from handle.

Remove air intake silencer.

Disconnect the cable end from throttle body.

Disconnect cable end from oil pump.

NOTE: The throttle body can be removed to allow an easier access to the oil pump.

Injection Oil Reservoir

Empty injection oil reservoir **no. 2** by siphoning injection oil.

Remove:

- tuned pipe
- fuse box
- upper screw **no. 3** (near reservoir cap **no. 4**)
- lower nut **no. 5**.

NOTE: Cut the ties retaining the wiring harness if necessary.

Injection Oil Level Switch

Before replacing the injection oil level switch **no. 6**, check it according to the following procedure:

- Remove tuned pipe.
- Disconnect switch connectors and place a jumper wire between them.

- If the oil light turns on, replace the switch.
- If the light stay off, check the light and the wiring harness.

To remove the switch, use the following procedure.

Remove tuned pipe.

Siphon injection oil reservoir.

Unplug switch connectors.

Pull oil level switch **no. 6** out of reservoir.

Injection Oil Filter

Remove tuned pipe.

Siphon injection oil reservoir.

Disconnect oil filter hose **no. 7** from the reservoir **no. 2**.

Remove air box and throttle body.

Disconnect oil hoses **no. 7** and **no. 8** from the oil filter **no. 9** and remove it.

Injection Oil Pump

NOTE: Before removing the injection oil pump **no. 10**, check its operation. Refer to the end of this section.

Remove:

- air box
- throttle body
- screw **no. 11**.

Unplug all hoses connected to oil pump **no. 10**.

NOTE: Mark hose locations for installation.

Disconnect the oil pump cable.

Check Valve

NOTE: Before removing check valve **no. 12**, check its operation. Refer to the end of this section.

Remove air box and throttle body.

Clean check valve area to remove oil or dirt.

Heat check valve **no. 12** then pull it out of crank-case.

Section 03 ENGINE

Subsection 05 (OIL INJECTION SYSTEM)

ASSEMBLY

NOTE: During installation, always check for spring clips no. 13 tightness.

Throttle/Oil Pump Cable

For installation, reverse the removal procedure.
To adjust throttle and oil pump cables see further in this section.

Injection Oil Reservoir

For installation, reverse the removal procedure.

Injection Oil Level Switch

For installation, reverse the removal procedure.

Injection Oil Filter

For installation, reverse the removal procedure.

NOTE: The filter must be installed with the arrow pointing toward the pump.

Injection Oil Pump

For installation, reverse the removal procedure. However, pay attention to the following.

Torque the screws no. 11 to 5 N•m (44 lbf•in).

Make sure cable barrel is well seated in oil pump lever.

Secure barrel with plastic washer and circlip.

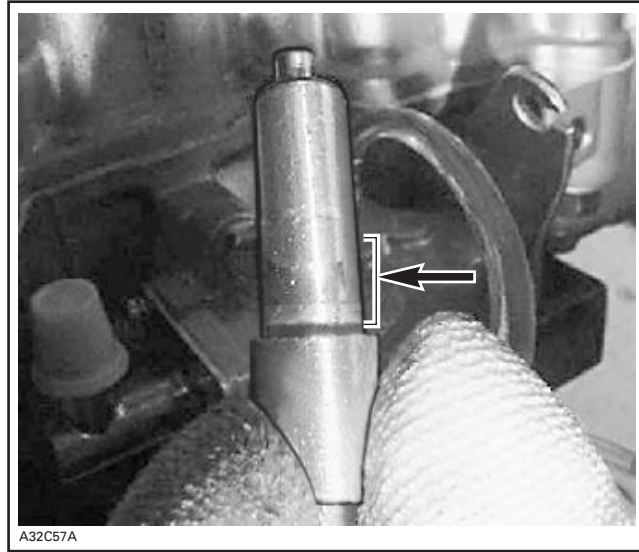
Install cable lock washer on left side of support.

Verify cable and oil pump lever operation then adjust cable.

Check Valve

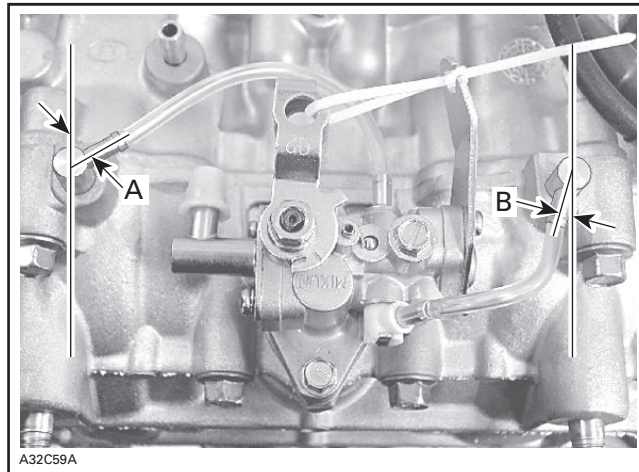
Apply Loctite 648 (green) (P/N 413 711 400) on the outer diameter of the check valve (machined section). Take care that Loctite is ONLY in this area.

NOTE: Prior to coating it with Loctite, make sure check valve body is clean and dry. Clean from dirt or oil, if any, with Pulley flange cleaner (P/N 413 711 809).



APPLY LOCTITE ON THIS AREA ONLY

Install the check valve in the correct position as described on next photos into the crankcase lower side.



TYPICAL — POSITION FOR LIQUID COOLED ENGINES

A. PTO side $45^\circ \pm 5^\circ$ from cylinder axis to the top

B. MAG side $20^\circ \pm 5^\circ$ from cylinder axis to the bottom

Punch in the check valve carefully with a plastic hammer.

Clean the crankcase from surplus of Loctite 648 with a rag.

ADJUSTMENT

Throttle Cable

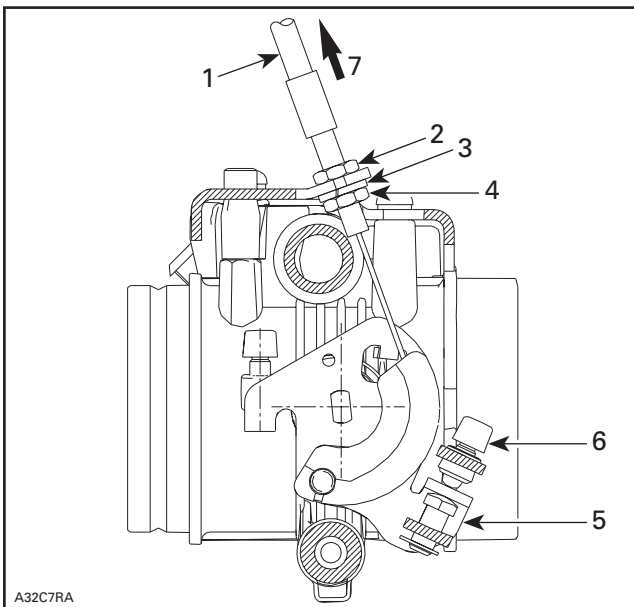
Press handle at wide open throttle position and keep it until the following instructions are done.

Stretch the adjusting cable through a maximum force of 50 N (11 lbf).

Torque the upper nut to 1 N•m (9 lbf•in) then torque the lower nut to 4.5 N•m (40 lbf•in).

Activate throttle lever a few times and check if the throttle lever stopper leans against the adjusting screw.

NOTE: The cable must be tight but not stretched.



1. Cable sheath
2. Upper nut
3. Lock washer
4. Lower nut
5. Throttle lever
6. Adjusting screw
7. Pull in this direction

Start the engine and check if the idle speed changes when the handlebar position is modified. If necessary, use the cable adjuster to readjust the cable tension.

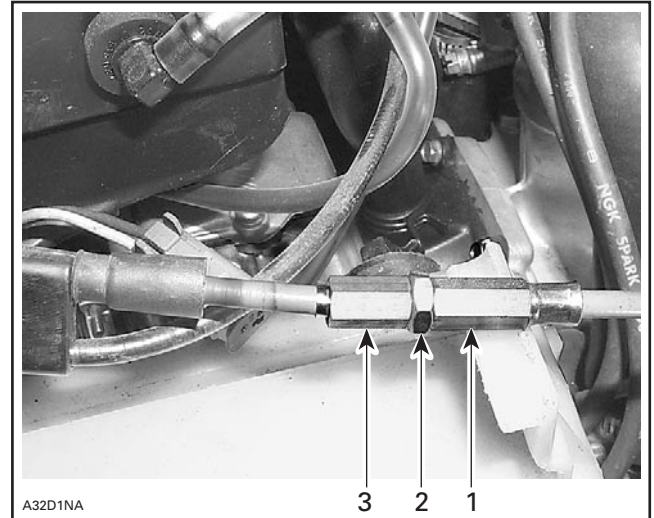
Oil Pump Cable

Prior to adjusting the pump, make sure throttle cable adjustment is completed and engine is stopped.

Stretch the adjusting cable through a maximum force of 34 N (7.6 lbf).

NOTE: It is better to have two persons to check the cable distance.

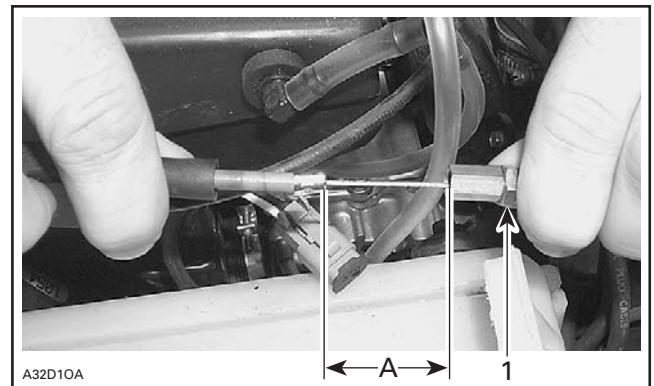
Check the visible distance of the stretched cable, while one person is stretching it and other checking the distance.



TYPICAL

1. Adjusting cable
2. Lock nut
3. Adjusting screw

The visible stretched distance of the cable should be 19.5 ± 0.3 mm ($.770 \pm .012$ in).



TYPICAL

1. Lock nut
- A. Visible distance = 19.5 ± 0.3 mm ($.770 \pm .012$ in)

If the visible distance is less or more than specified above, adjust the cable distance accordingly. To do so, loosen lock nut, turn adjusting screw in or out, retighten lock nut.

Section 03 ENGINE

Subsection 05 (OIL INJECTION SYSTEM)

To Bleed Oil Lines

Bleed main oil line (between reservoir and pump) by loosening the bleeder screw **no. 14** until air has escaped from the line. Add injection oil as required.

Reinstall all parts.

Bleed the small oil line between pump and engine by running engine at idle while holding the pump lever in fully open position.

NOTE: Make a J hook out of mechanical wire to lift the lever.

WARNING

No ensure not operate carburetor throttle mechanism. Secure the rear of the vehicle on a stand.

CHECKING OPERATION

Oil Pump

On Vehicle

NOTE: Main oil line must be full of oil. See bleeding procedure above.

Lift rear of vehicle and support with a mechanical stand. Unplug small oil lines from pump. Start engine and stop it as soon as it fires.

Check that oil in small oil lines has been sucked up (this will be indicated by a clear section of small oil lines). Repeat the procedure until this condition is attained.

Reconnect small oil lines, start engine and run at idle while holding the pump lever in fully open position. Oil columns must advance into small oil lines.

If not, remove pump assembly and check the pump gear and drive shaft (if applicable) for defects, replace as necessary. Test pump as describes below.

NOTE: Through normal use, oil level must not drop in small tubes. If oil drops, verify check valve operation in injection nozzle. Replace as necessary.

Test Bench

Connect a hose filled with injection oil to main line fitting. Insert other hose end in an injection oil container. Using a clockwise rotating drill rotate pump shaft. Oil must drip from outer fittings while holding lever in a fully open position. If not replace pump.

Check Valve

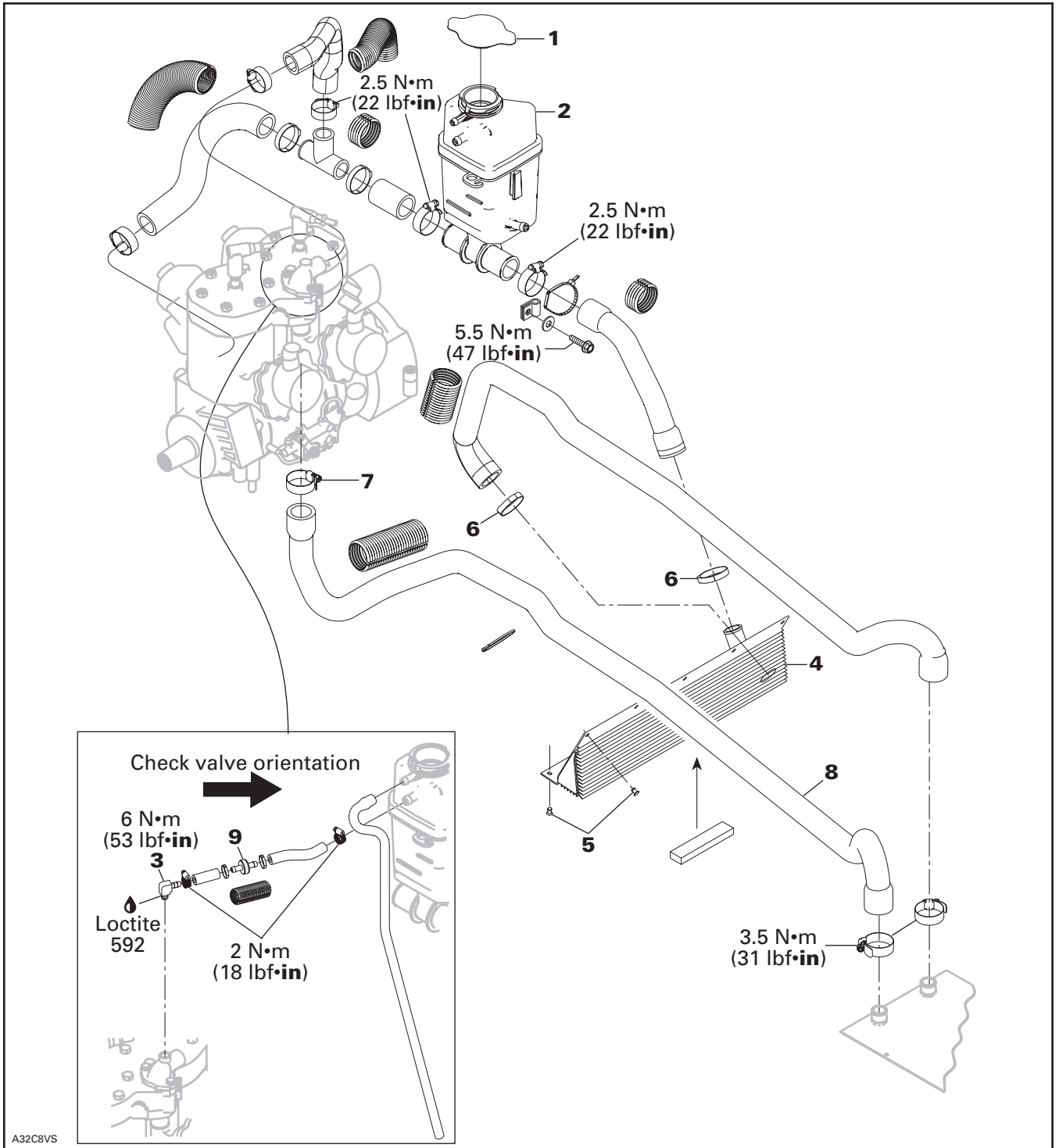
For engine 793 SDI, check valve is part (built-in) of injection nozzle.

To verify the check valve, proceed the same as for checking pump operation on vehicle. First unplug oil line from check valve. After restarting the engine, check that a clear section in small oil line is present. Reconnect oil line.

Run engine at idle. Oil column must advance. If the check valve is faulty, oil column will go back and forth. Replace if so.

LIQUID COOLING SYSTEM

SDI Engines



Section 03 ENGINE

Subsection 06 (LIQUID COOLING SYSTEM)

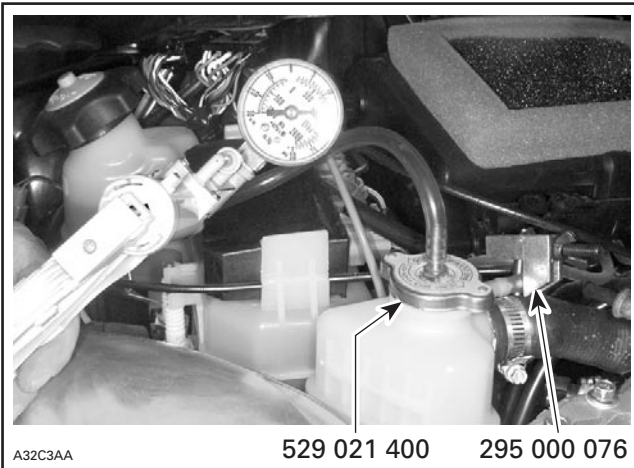
COOLING SYSTEM LEAK TEST

WARNING

To prevent burning yourself, do not remove the radiator cap if the engine is hot.

Install special radiator cap (P/N 529 021 400) included in engine leak tester kit (P/N 861 749 100) on coolant tank. Install hose pincher (P/N 295 000 076) on overflow hose. Using pump also included in kit pressurize all system through coolant reservoir to 100 kPa (15 PSI).

Check all hoses and cylinder/base for coolant leaks. Spray a soap/water solution and look for air bubbles.



TYPICAL

INSPECTION

Check general condition of hoses and clamp tightness.

DRAINING THE SYSTEM

WARNING

Never drain or refill the cooling system when engine is hot.

To drain the cooling system, siphon the coolant mixture from the coolant tank **no. 2**. Disconnect hose at water pump to drain coolant from engine.

When the coolant level is low enough, lift the rear of vehicle to drain the radiator.

DISASSEMBLY AND ASSEMBLY

Water Pump

Refer to BOTTOM END section in *2003 Shop Manual ZX Series* (P/N 484 200 042).

Pressure Cap

Check if the cap **no. 1** pressurizes the system. If not, install a new 90 kPa (13 PSI) cap (do not exceed this pressure).

Coolant Tank

Removal

Drain cooling system before removing coolant tank **no. 2**.

Remove all hoses from coolant tank.

Slide down the coolant tank to disengage it from oil tank.

Inspection

Check if the tank is cracked or melted. Replace if necessary.

Installation

For installation, reverse the removal procedure.

NOTE: It may be necessary to move oil tank for an easier installation of coolant tank.

Elbow

Apply Loctite 592 (P/N 293 800 018) thread sealant on elbow **no. 3** to avoid leaks.

Check Valve

Removal

Drain cooling system.

Remove air intake silencer.

Unclip both ends of check valve **no. 9** then separate check valve from hoses.

Installation

Blow into the check valve to know the flow direction. Install the check valve so that flow direction goes from engine towards coolant tank.

Refill the cooling system. See further in this section for the procedure.

Front Radiator

Cleaning

Remove all debris between radiator fins. A clean radiator is more efficient than a dirty one.

Inspection

Check if the radiator fins are damaged. Replace the front radiator **no. 4** if necessary.

NOTE: A radiator with many broken fins does not work properly.

Disassembly

Drain cooling system.

Remove rear suspension (refer to REAR SUSPENSION).

Using Supertanium™ bit (P/N 529 031 800), drill all rivets **no. 5** retaining front radiator to the frame or grind the rivets with a grinding disk.

Pull the radiator a little and remove the Oetiker clamps **no. 6**.

Assembly

For installation, reverse the removal procedure.

Rear Radiator and Rear Radiator Protector

Refer to FRAME for rear radiator removal/installation procedures.

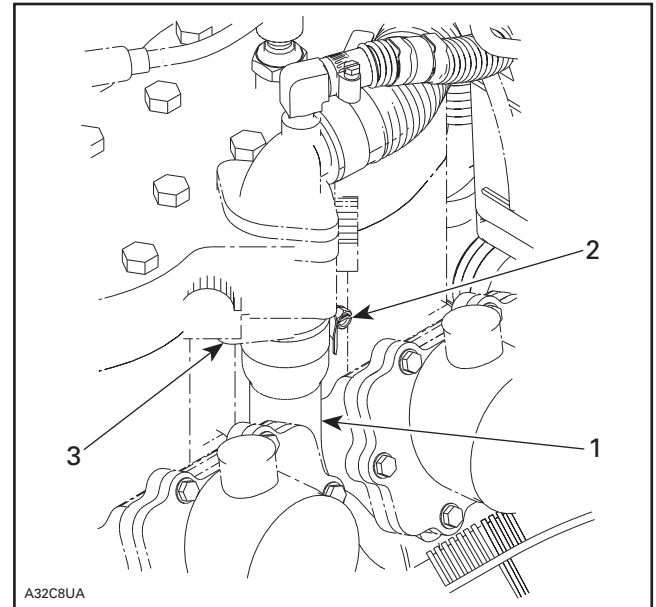
For cleaning and inspection refer to FRONT RADIATOR.

Thermostat

Disassembly

Drain the cooling system (see above).

Unscrew clamp **no. 7** retaining hose **no. 8** to the water outlet socket.



1. Hose
2. Clamp
3. Water outlet socket

Remove:

- water outlet socket screws
- gasket
- thermostat.

Inspection

To check thermostat, put in water and heat water. Thermostat should start to open when water temperature reaches the following degree.

ENGINE	OPENING TEMPERATURE
793 SDI	42°C (108°F)

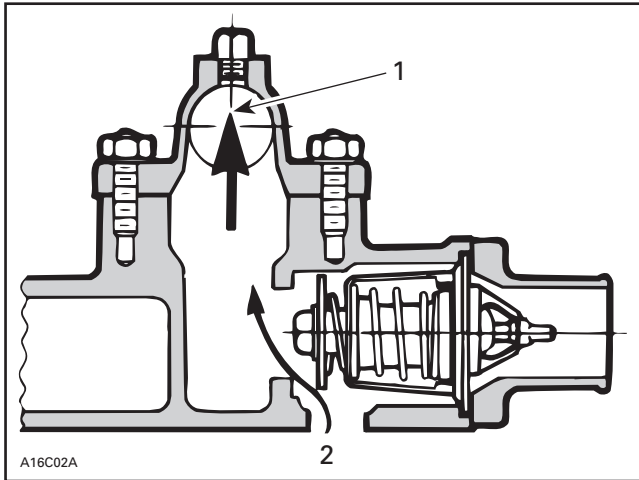
It will be almost fully open at 50°C (122°F).

Thermostat is a double action type.

- a. Its function is to give faster warm up of the engine by controlling the circuit, water pump — engine — coolant tank. This is done by bypassing the radiator circuit.

Section 03 ENGINE

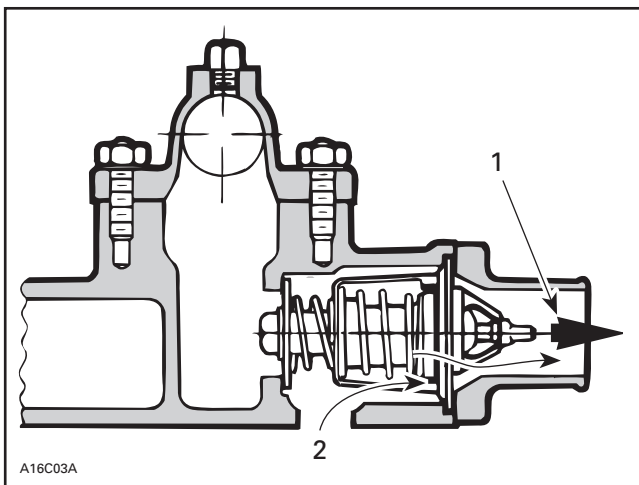
Subsection 06 (LIQUID COOLING SYSTEM)



TYPICAL — CLOSED THERMOSTAT, COLD ENGINE

1. To reservoir
2. From cylinders

- b. When the liquid is warm enough, the thermostat opens progressively the circuit, water pump — engine — radiators — coolant tank to keep the liquid at the desired temperature. (See the diagram of the exploded view).



TYPICAL — OPEN THERMOSTAT, WARM ENGINE

1. To radiators
2. From cylinders

These 2 functions have the advantage of preventing a massive entry of cold water into the engine.

Assembly

For installation, reverse the removal procedure.

COOLING SYSTEM REFILLING PROCEDURE

CAUTION: To prevent rust formation or freezing condition, always replenish the system with the Bombardier premixed coolant or with 50% antifreeze and 50% water. Pure antifreeze without water freezes (like slush ice). Always use ethylene glycol antifreeze containing corrosion inhibitors specifically recommended for aluminum engines.

System Capacity

Refer to TECHNICAL DATA.

Refilling Procedure

IMPORTANT: USE THE 50/50 PREMIXED COOLANT - 37°C (-35°F) (P/N 293 600 038).

Do not reinstall pressure cap.

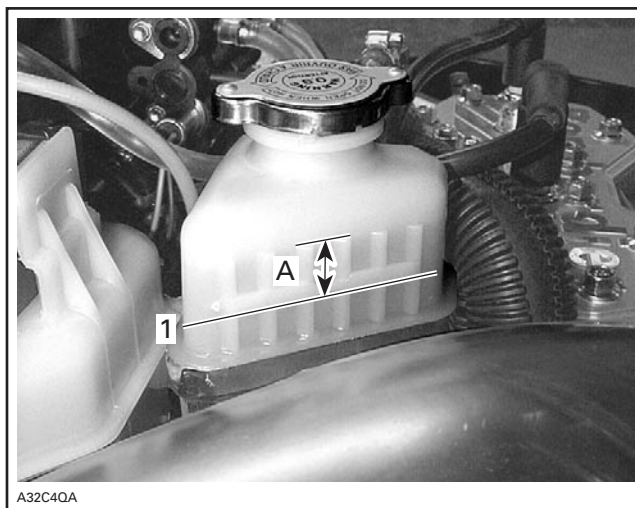
With engine cold, refill coolant tank up to COLD LEVEL line. Start engine. Refill up to line while engine is idling until rear radiators are warm to the touch (about 4 to 5 minutes). Always monitor coolant level while filling tank to avoid emptying. Install pressure cap.

Lift rear of vehicle and support it safely.

Activate throttle lever 3 - 4 times to bring engine speed to 7000 RPM.

Apply the brake.

Lower vehicle back on ground and add coolant up to 15 mm (1/2 in) above the COLD LEVEL line.



TYPICAL

1. Cold level line
- A. 15 mm (1/2 in)

Lift front of vehicle of 60 cm (24 in) and support it safely. Let the vehicle idle for two minutes.

Put vehicle back on ground and add coolant up to 15 mm (1/2 in) over COLD LEVEL line.

When engine has completely cooled down, re-check coolant level in coolant tank and refill up to line if needed.

Check for coolant mixture freezing point. Specification is - 37°C (- 35°F). Adjust as necessary.