MAXXFARM 40 & 50

Preliminary Service Manual

May 2009

47673550

NB: For Maxxfarm 40 & 50 refer to the R41 & R47 models listed in this manual

CASE IH AGRICULTURE

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General Notices

- When lifting the heavy things, you should use a hoist and wear the safety equipments such as working clothing, protection goggle, gloves, safety footwear etc.
- When arranging the holes, you should use the proper tools but never use the hands.

Notices in Assembling

- Assembling shall be proceeded in reverse order of disassembling and cares should be taken for tightening force or direction when assembling as the special disassembling process has been recorded.
- The spare parts should be replaced with new one.
- When assembling Oil-seal, apply the grease slightly to Operating side.

2. Transmission

Power transition ---------- 3
Dimension (Mechanical) ---------- 4
Dimension (HST) ---------- 5
Clutch Housing ---------- 6
Shuttle lever ---------- 7
Creeper lever ---------- 8
Shuttle and Creeper ---------- 12
Main change and counter gear ---------- 13

Clutch housing (HST) ---------- 16
Hydraulic pipe ---------- 17
HST unit ---------- 18

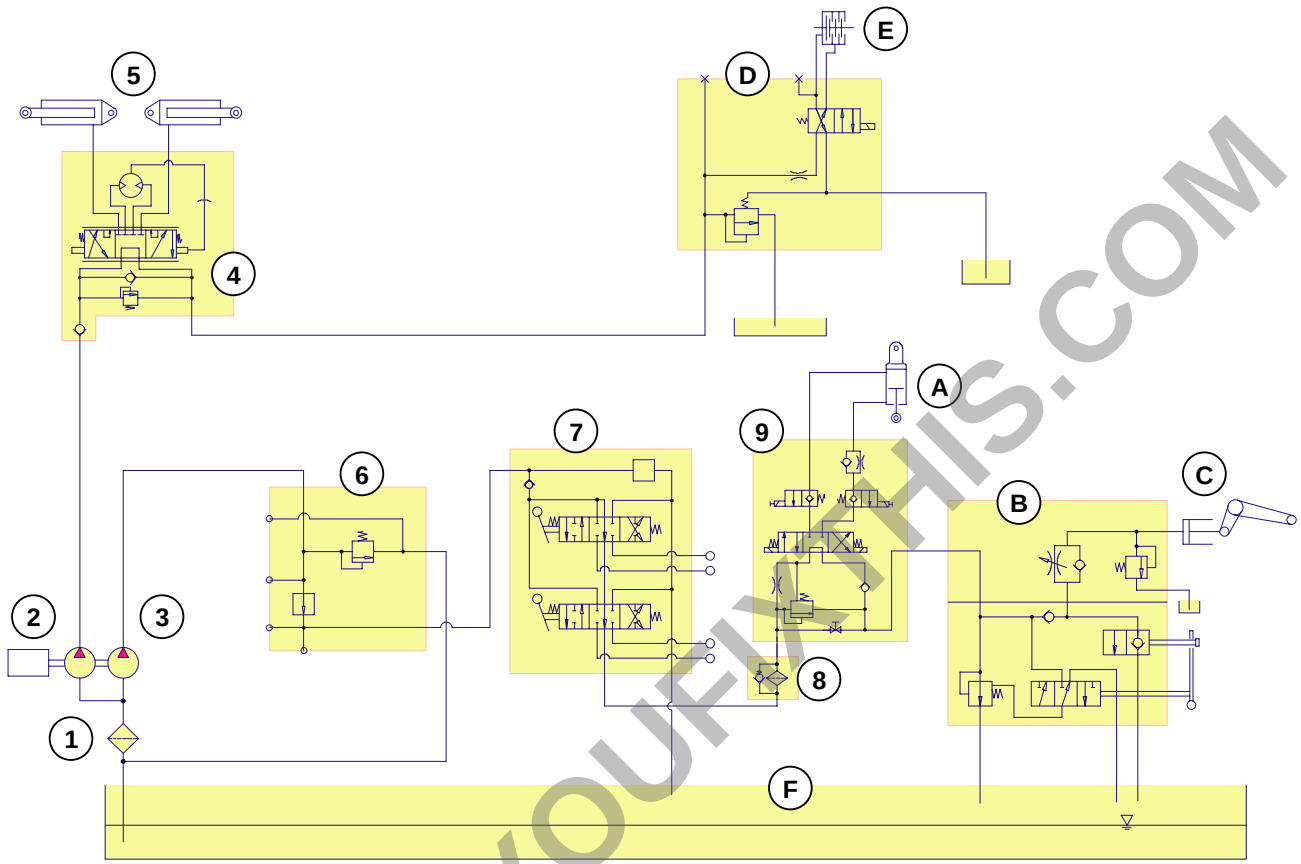
Range ---------- 20
4WD ---------- 23
4WD (Quick Turn) ---------- 27
Final drive ---------- 30

Independent PTO ---------- 36

Final drive shaft ---------- 42

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Hydraulic circuit diagram



	NAME	R 41	R 47
1	Filter	(45㎛)	
2	Steering Pump	6.0cc/rev @ 2,600rpm	6.0cc/rev @ 2,700rpm
3	Main Pump	12cc/rev @ 2,600rpm	12cc/rev @2,700rpm
4	Steering Unit	62cc/rev, 145kgf/㎠ @ 15Liter/min	
5	Valve block	Relief valve 170~175kgf/㎠ @ 30liter/min	
6	Steering Cylinder	Diameter 35 x Stroke 181	
7	Remote Valve	-	
8	Line Filter	20 ㎛ , Safety valve 7bar	
9	Auto Leveler control	6liter/min	
A	Cylinder	Diameter 50 x Diameter 22.4 X Stroke 130	
B	Safety	Safety Valve 200kgf/㎠	
C	Cylinder	Diameter 80 x Stroke 113	
D	PTO Control	SQ: 15~16kgf/㎠ @ 15liter/min PTO clutch lubrication : 3.2~3.6liter (Diameter ¢ 1.3)	
E	PTO Clutch	-	
F	Oil tank (Transmission)	SAE80W	

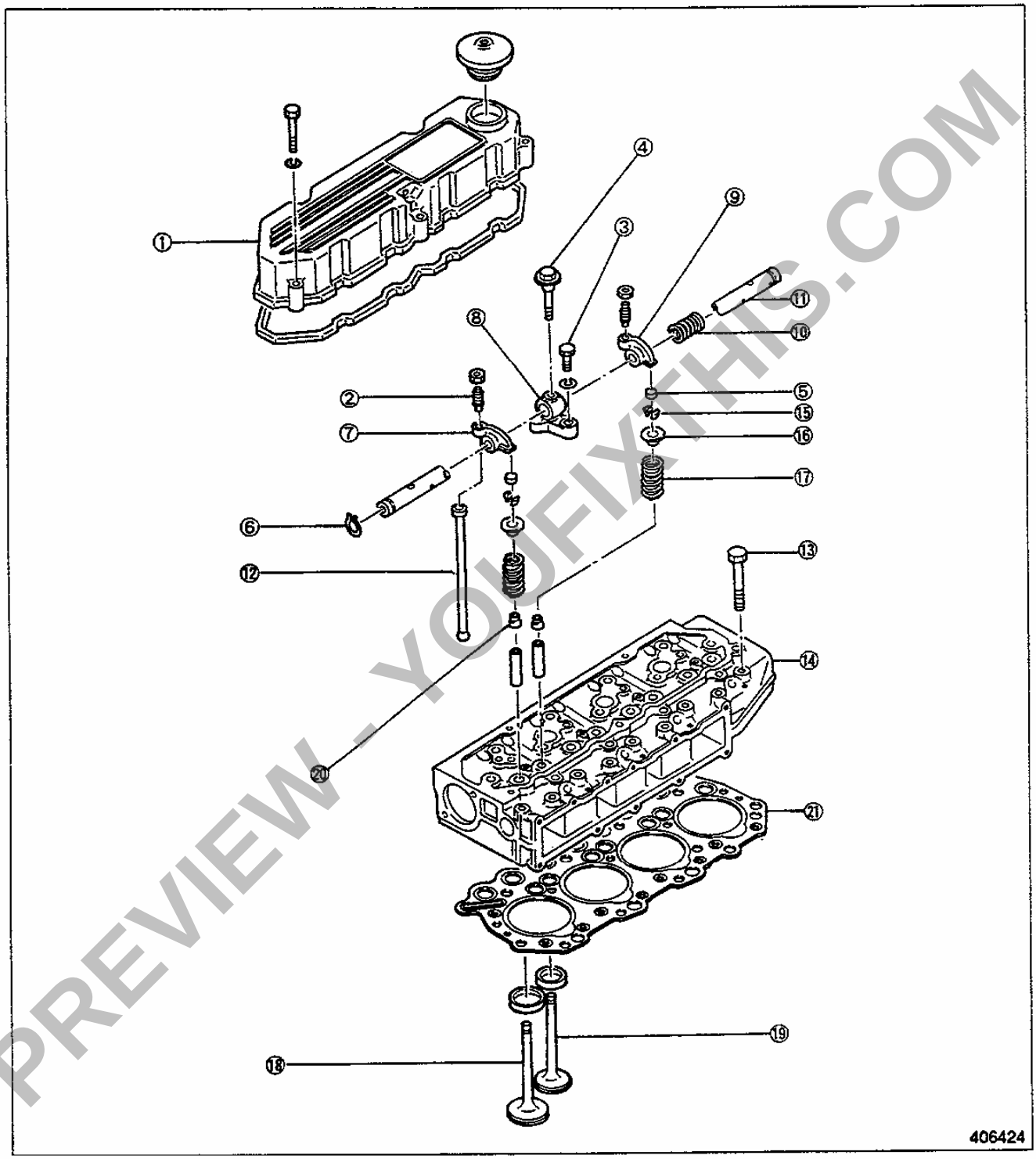
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1. CYLINDER HEAD AND VALVE MECHANISM

1.1 Disassembly



① Rocker cover
② Adjusting screw
③ Bolt (short)
④ Bolt (long)
⑤ Valve cap
⑥ Snap ring
⑦ Inlet valve rocker arm
⑧ Rocker shaft bracket
⑨ Exhaust valve rocker arm
⑩ Rocker shaft spring
⑪ Rocker shaft
⑫ Valve push rod
⑬ Cylinder head bolt
⑭ Cylinder head
⑮ Valve cotters
⑯ Valve retainer
⑰ Valve spring
⑱ Valve (inlet)
⑲ Valve (exhaust)
⑳ Valve stem seal
㉑ Cylinder head gasket

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2. TIGHTENING TORQUES

2.1 Major bolts and nuts

Parts to be fastened	Thread dia. x pitch, mm	Width across flats, mm	Torque		
			kgf·m	lbf·ft	N·m
Cylinder head	M12 x 1.75	19	12.0±0.5	87±4	118±5
Rocker cover	M8 x 1.25	12	1.2±0.1	9±1	12±1
Rocker shaft bracket (long bolt)	M8 x 1.25	12	1.5±0.2	11±1	15±2
Main bearing cap	M12 x 1.75	12	8.5±0.5	61±4	83±5
Connecting rod cap	M10 x 1	14	5.5±0.5	40±4	54±5
Flywheel	M12 x 1.25	17	8.5±0.5	61±4	83±5
Camshaft thrust plate	M8 x 1.25	12	1.2±0.1	9±1	12±1
Front end plate	M8 x 1.25	12	1.2±0.1	9±1	12±1
Timing gear case and cover	M8 x 1.25	12	1.2±0.1	9±1	12±1
Crankshaft pulley	M24 x 1.5	34	40±1	289±7	392±10
Rear housing	M10 x 1.25	14	5.5~6.7	39.8~48.5	54~66
Balancer shaft gear	M10 x 1.25	14	3.0±0.3	22±2	30±3
Oil pan	M8 x 1.25	12	1.7±0.2	12±1	7±2
Oil pan drain plug	M14 x 1.5	22	4.0±0.4	29±3	39±4
Oil filter shaft	M20 x 1.5	—	5.0±0.5	36±4	49±5
Oil filter	M20 x 1.5	—	1.2±0.1	9±1	12±1
Fuel injection nozzle	M20 x 1.5	21	6.0±0.6	43±4	59±6
Fuel leak-off pipe	M12 x 1.5	17	2.3±0.2	17±1	23±2
Fuel injection pump gear (distributor type)	M14 x 1.5	22	8.3±0.5	60±4	81±5
B terminal of starter	M8 x 1.25	12	1.1±0.1	8±1	11±1
Glow plug (body) (terminal)	M10 x 1.25 M4 x 0.7	12 8	1.8±0.2 0.13±0.02	13±1 0.94±0.14	18±2 1.3±0.2
Pressure relief valve	M22 x 1.5	27	5.0±0.5	36±4	49±5
Coolant drain plug	1/4–18NPTF	14	4.0±0.4	29±3	39±4
Fuel injection pipe	M12 x 1.5	19	3.0±0.3	22±2	29±3
Fuel return pipe	M10 x 1.25	14	2.0±0.2	14±1	20±2
Oil pump set bolt	M12 x 1.75	17	3.5±0.4	25±3	34±4
Overheat warning unit (thermoswitch)	M16 x 1.5	19	2.3±0.2	17±1	23±2
Drain plug	M16 x 1.5	24	4.5±0.5	33±4	44±5

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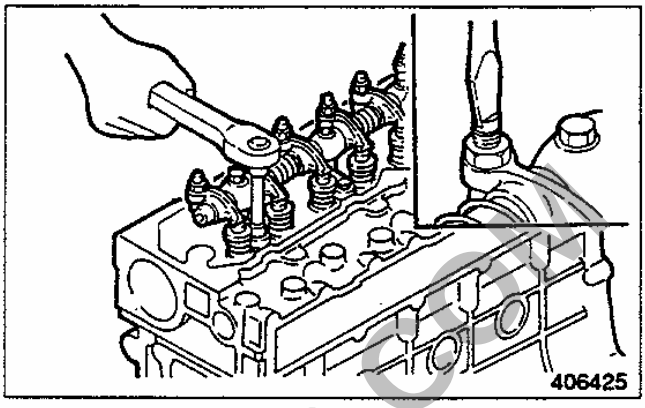
(1) Removing rocker shaft assemblies

(a) Loosen the adjusting screw one turn.

(b) Loosen the bolts, long and short, that hold the rocker shaft bracket to the cylinder head. Be sure to loosen the short bolt first. Remove the rocker shaft assembly from the cylinder head.

⚠ CAUTION

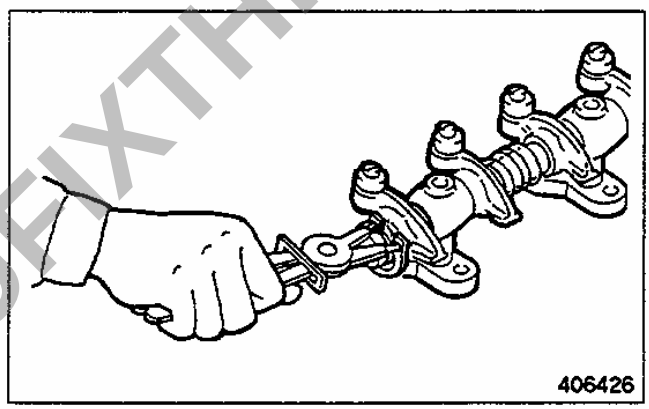
If the long bolt is loosened first, the rocker shaft bracket might suffer damage.



Removing rocker shaft assembly

(2) Disassembling rocker shaft assemblies

The rocker arms must be restored to the rocker shafts from which they were removed during disassembly. After removing the rocker arms, mark them for their rocker shafts to insure the original clearance between the arm and shaft at the time of assembly.



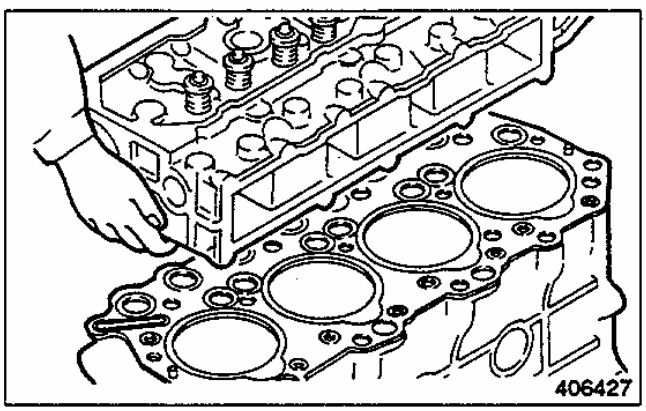
Disassembling rocker shaft assembly

(3) Removing cylinder head

Remove the bolts that hold the cylinder head. Lift off the cylinder head from the crankcase.

NOTE

If any parts of the cylinder head are faulty, check the cylinder head bolts for torque with a torque wrench before removing them.



Removing cylinder head

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Cause \ Complaint		Hard starting: Engine will turn: No exhaust smoke	Hard starting: Engine will turn: Little exhaust smoke	Hard starting: Engine will turn: Excessive exhaust smoke	Hard starting: Cranking speed low	Hard starting: Engine will not turn: Engine can be cranked manually	Hard starting: Engine will not turn: Engine cannot be cranked manually	Glow plug indicator does not glow red	Glow plug indicator glows red	Not enough power: Little exhaust smoke	Not enough power: Excessive white exhaust smoke	Not enough power: Excessive black exhaust smoke	Exhaust smoke abnormal: During idling	Exhaust smoke abnormal: During operation: White	Exhaust smoke abnormal: During operation: Black	Engine knocks excessively	Engine noisy	Engine runs rough	Engine hunts: During idling	Engine hunts: During operation
Fuel system	No fuel to injection pump	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—
	Greater variance of fuel injection quantity	—	—	○	—	—	—	—	—	—	—	○	○	—	○	○	—	○	○	○
	Injection pump oil seals defective	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Insufficient injection quantity	○	○	—	—	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—
	Excessive injection quantity	—	—	—	—	—	—	—	—	—	—	—	—	—	○	—	—	—	—	—
	Injection nozzle defective	—	—	○	—	—	—	—	—	—	—	○	○	○	○	○	—	○	○	○
	Excessive fuel return from injection nozzles	—	○	—	—	—	—	—	—	○	—	—	—	—	—	—	—	○	○	—
	Injection timing advanced	—	—	○	—	—	—	—	—	—	○	—	—	○	○	○	—	—	—	—
	Injection timing retarded	—	—	○	—	—	—	—	—	—	—	○	○	—	—	—	—	○	○	—
	Engine speed too low	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	○	—
	Failure to stop	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Bad quality fuel	—	—	○	—	—	—	—	—	—	○	○	○	○	○	○	—	—	—	—
	Fuel oil viscosity high	○	○	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lubrication system	Bad quality oil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Oil viscosity high	—	—	—	—	○	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Oil viscosity low	—	—	—	—	—	—	—	—	—	—	—	—	○	—	—	—	—	—	—
	Oil pressure low	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Oil leaks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Excessive pumping up of oil	—	—	—	—	—	—	—	—	—	—	—	—	○	○	○	—	—	—	—
	Oil filter clogged	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Oil pressure switch or lamp defective	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Air intake system	Not enough air for combustion	—	—	○	—	—	—	—	—	—	—	○	—	—	○	—	—	—	—	—
	Poor compression	—	—	○	—	—	—	—	—	—	○	○	○	○	○	○	—	—	○	○
	High temperature or low barometric pressure at high altitude	—	—	—	—	—	—	—	—	—	—	○	—	—	○	—	—	—	—	—

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2.SPECIFICATIONS

Engine model		S4Q-Y161GT	S4Q2-Y161GT
General	Type	In-line,water-cooled,4-stroke cycle	
	Firing order	1-3-4-2	
	Compression ratio	22	
	Combustion chamber,type	Swirl	
	Weight(dry),kg(lb)	245(540)	
	Number of cylinders	4	
	bore x stroke,mm(in.)	88 x 95(3.46 x 3.74)	88 x 103(3.46 x 4.06)
	Displacement,liter(cu in.)	2.311(141)	2.505(153)
Maximum permissible working angles for oil pickup level in oil pan,longitudinal and lateral		30°	
Fuel system	Injection pump type	Bosch A	
	Injection nozzle,type	Bosch throttle	
	Fuel filter,type	Spin-on	
Lubrication system	Type	Force feed	
	Oil filter,type	Spin-on cartridge of paper-element	
	Capacity,liter(U.S.gal.)	Oil pan:7(1.8),approx. Crankcase:8(2.1),approx.	
Cooling system	Type	Radiator	
	Capacity(water jacket), liter(U.S.gal.)	3.7(0.98)	
Electrical system	Starter,V－kW	12－2.2	
	Alternator,V－A	12－50	
	Battery recommended, V－Ah	12－80D26R	

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4. MAINTENANCE SCHEDULE

(1) Use the service meter to determine servicing intervals.

(2) The servicing intervals in the schedule are for an average operating conditions. Service the engine earlier than the scheduled intervals if necessary. (The intervals depends on application, operating conditions, and fuel oil and lube oil used in the engine. Adjust the intervals to meet the actual operating conditions.)

(3) Perform service on items at multiples of the original requirement. For example, at Every 250 service hours, also service those items listed under Every 50 service hours and Every 10 service hours.

○	Check, clean, wash or adjust.
●	Change.
Ⓢ	Rely on Mitsubishi dealer if necessary.
*	Items to be serviced after initial 50 hours of operation of a new, reconditioned or long-stored engine.

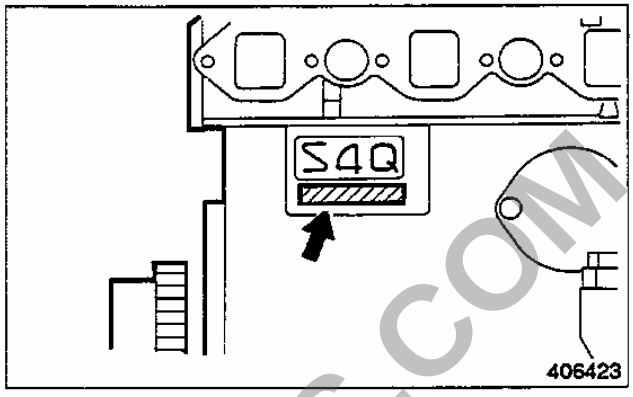
Group	Item		Interval					Remarks
			Every 10 service hours	Every 50 service hours	Every 250 service hours	Every 500 service hours	Every 1000 service hours	
General	Walk-around inspection	Check	○					
	Valve clearance	Check				○		Ⓢ
	Bolts and nuts (cylinder head bolts)	Retighten		*			○	Ⓢ
Lubrication system	Oil pan	Check oil level	○					
		Change oil		*	●			Ⓢ
	Oil filter (cartridge)	Change		*	●			
Fuel system	Fuel tank	Check oil level	○					
		Drain moisture		○				
	Fuel filter	Change				●		
	Injection nozzles	Check				○		Ⓢ
Cooling system	Radiator	Check coolant level	○					
		Change coolant	Every 2 years					
	Radiator fins	Clean			○			
	Fan belt	Check tension				○		
Air inlet system	Air cleaner (paper-element type)	Check indicator		○				Ⓢ
		Clean element				○		
		Change element					●	
Electrical system	Battery	Check electrolyte level and specific gravity		○				Check specific gravity from time to time
	Alternator	Check					○	Ⓢ
	Starter	Check					○	Ⓢ

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1.2 Engine serial number location

The engine serial number is located on the side of the crankcase.



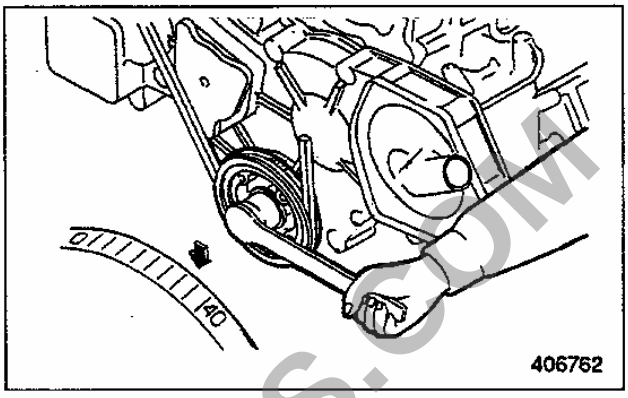
1.3 Engine model designation

S□□

- Series code
- Number of cylinders
- Initial of "Sagamihara Machinery Works"

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(2) Turn the crankshaft approximately 30° counterclockwise, as seen from the front (fan) end. Then turn it clockwise slowly until the "20° BTDC" line scribed on the crankshaft pulley is aligned with the pointer on the timing gear case.



Checking fuel injection timing (1)

(3) Check the injection timing.

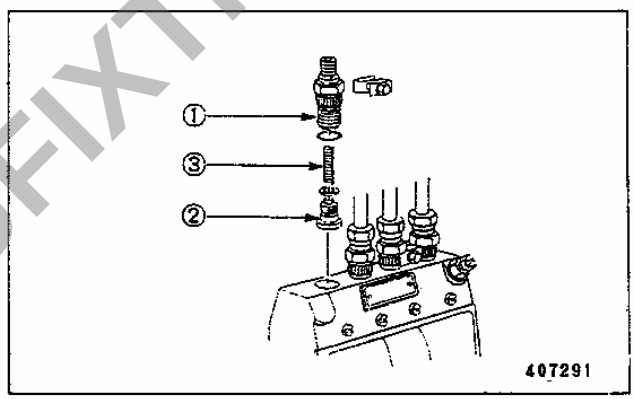
(a) Remove delivery valve holder ① from the No. 1 plunger of the injection pump. Remove delivery valve ②, spring ③ and stopper from the holder. Restore the holder to the pump.

(b) Connect a spare injection pipe to the No. 1 plunger, with its free end held downward so that you can observe the fuel flow from that end.

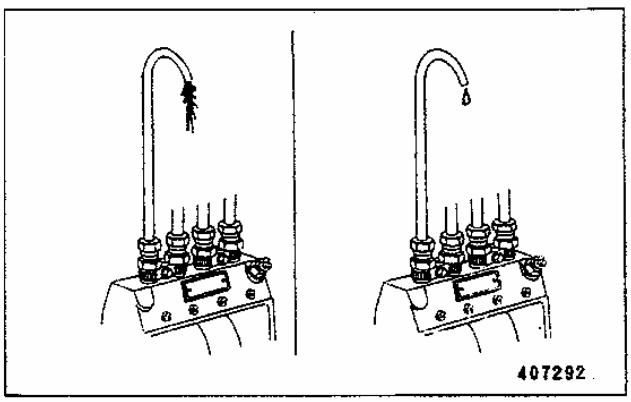
(c) Turn the crankshaft to bring the No. 1 piston to 60° position before top dead center on compression stroke.

(d) While operating the priming pump to allow the fuel to flow from the injection pipe, slowly turn the crankshaft in the normal direction. Stop turning the crankshaft when the fuel flow stops.

(e) Make sure the timing mark on the crankshaft pulley is aligned with the pointer.



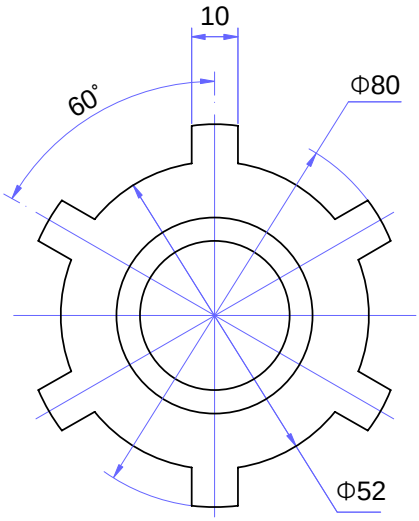
Checking injection timing — 1
(Removing delivery valve)

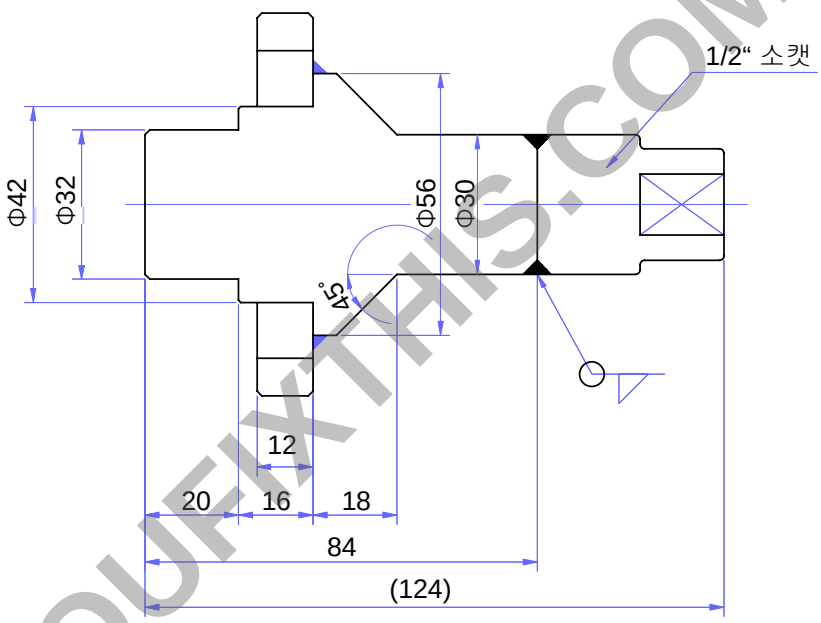


Checking injection timing — 2

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• **Special device for adjusting the gap of differential (AJ1T0009)**

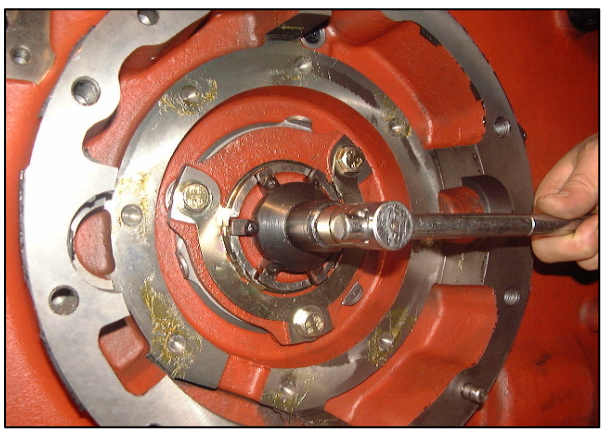




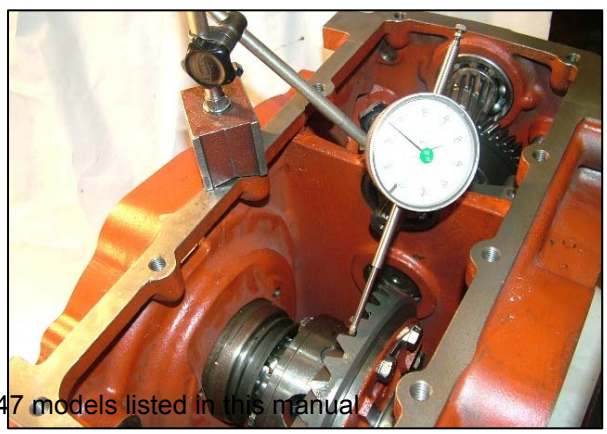
• If possible, use the special tool (AJ1T0009) when adjusting the clearance controlling bolt and adjust the clearance and torque.

Clearance (back lash)	0.15 ~ 0.25 mm
Torque	13 ~ 17 kg-f-cm

* Torque is measured at the pinion shaft in the condition that the differential gear is assembled.



• Adjustment of backlash and torque



• Let the ring gear touch on the pinion by light hand-tighten.

• Measure the clearance tightening the left side. Clearance check would rather be done at 3 points and get the equal results.

• Adjust the clearance through tightening or loosening right and left side properly

• After checking, adjust the torque by tightening right side.

• After adjustment, check the back lash again and it should be done at 3 ~ 4 points.

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