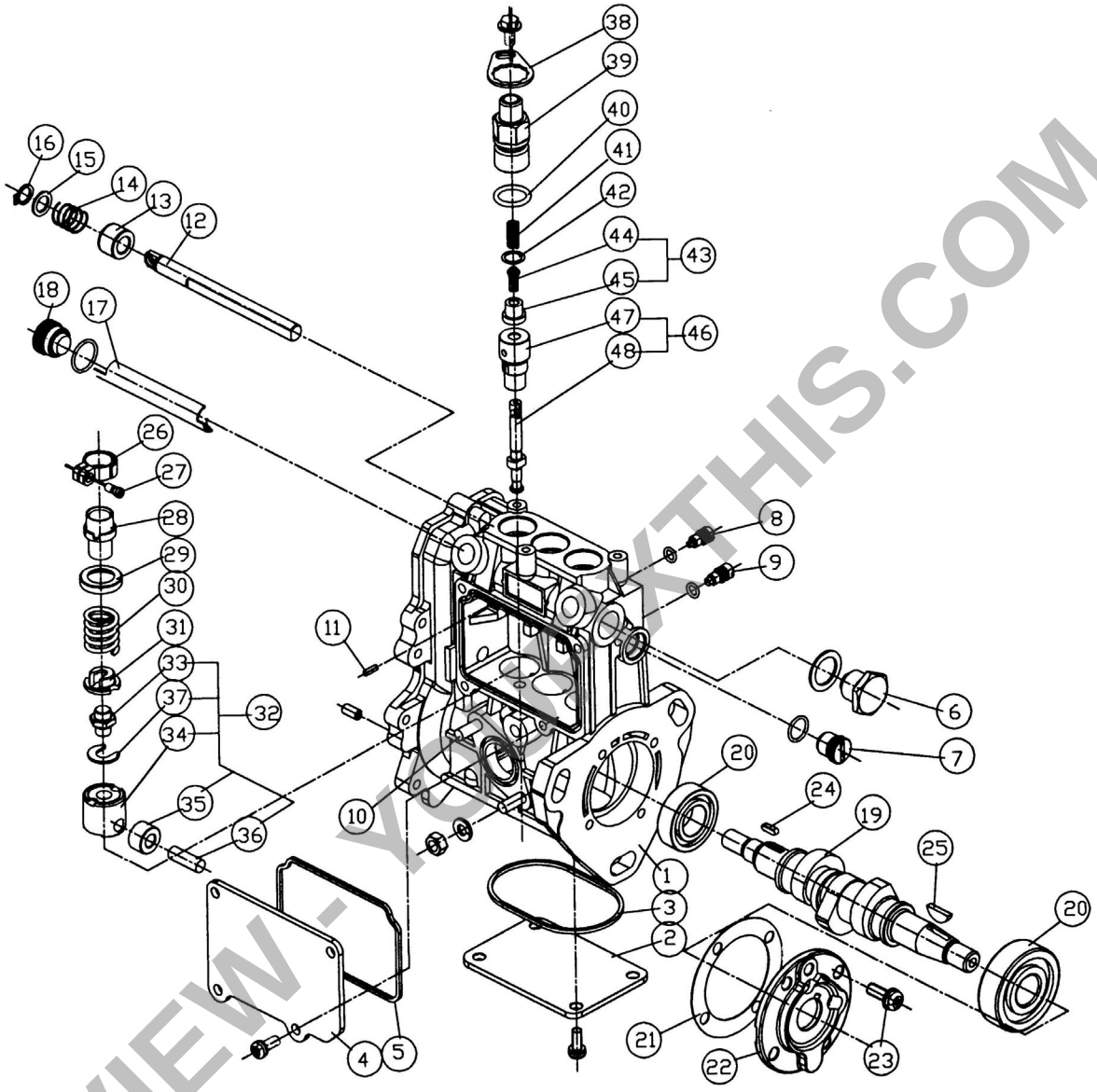
Pump



1	Fuel injection pump	17	Deflector plug	33	Adjust bolt(Φ8．5
2	Pump bottom cover	18	Deflector plug (A	34	Roller tappet
3	Bottom cover packing	19	Cam shaft	35	Roller
4	Pump side cover	20	Cam shaft stopper	36	Pin (Tappet roller
5	Side cover packing	21	Cam shaft adjust shim	37	Fuel injection timing adjust shim
6	Deflector plug	22	Cam shaft support	38	Holder loose stopper
7	Control rack plug	23	Bolt	39	Delivery valve holder
8	Control rack wheel stopper	24	Feather key	40	O ring (Delivery
9	Roller guide wheel stopper	25	Wood ruff key	41	Delivery valve spring
10	Fuel feed pump stud bolt	26	Pinion	42	Delivery valve sheet packing
11	Barrel wheel stop pin	27	Pinion bolt (M4	43	Delivery valve complete
12	Control rack	28	Control pinion (B	44	Delivery valve
13	Bushing (Rack	29	Plunger spring holder	45	Delivery valve sheet
14	Rack sub spring	30	Plunger spring	46	Plunger complete(Φ6
15	Rack sub spring washer	31	Spring holder(Φ8．5	47	Plunger barrel(Φ6
16	C ring (Control rack	32	Roller tappet Assy.	48	Plunger(Φ6

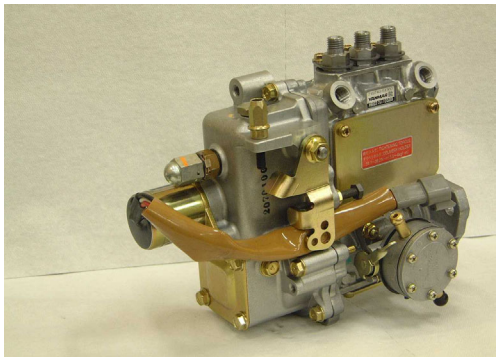
NOTE:

1. Some models are equipped with ball bearings and some with taper roller b earings.
2. Oil seal: Some models are equipped with oil seals and some are not. The shape of the bearing holder differs for models with and without oil seals.

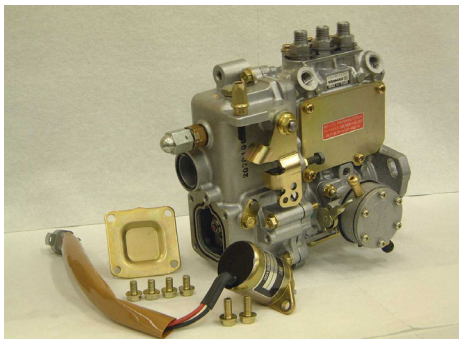
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3.1. Governor disassembly



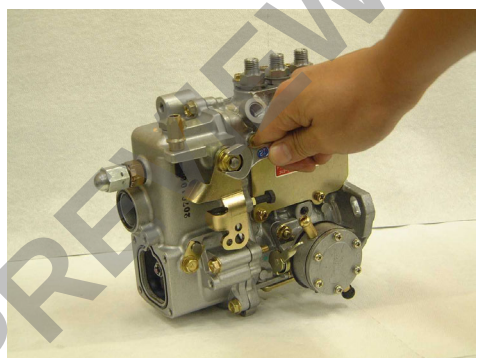
Pump Assembly



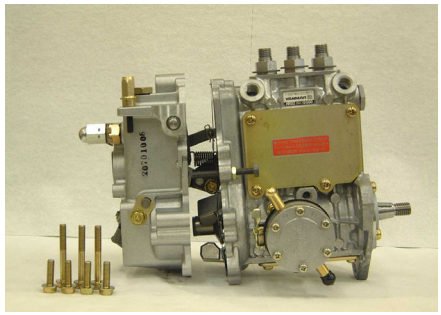
(1) Remove the stop solenoid and governor case cover.

NOTE:

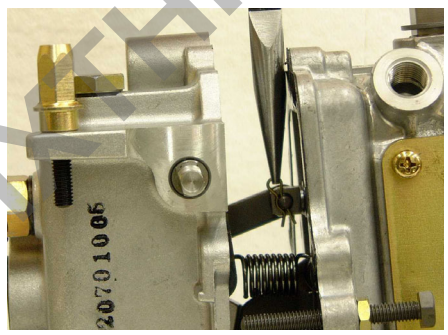
Loosen the hex nut on models with an angleich spring .



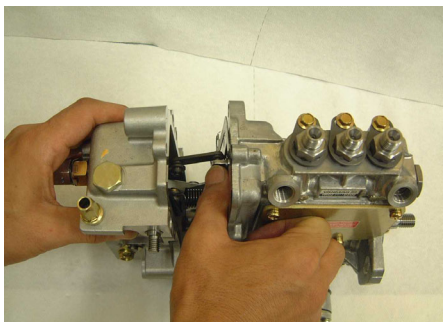
(2) Remove the control lever hex nut, and pull out the control lever from the control lever shaft.



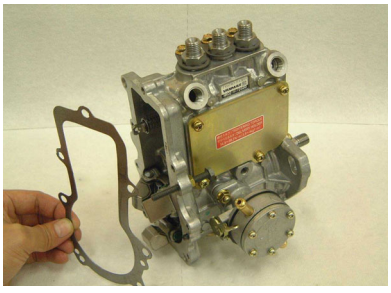
(3) Remove the governor case bolt. Remove the governor case (Spring pin) from the fuel pump unit while lightly tapping the governor case with a wood hammer. Create a gap between the governor case and fuel pump by moving only the moving parts of the governor lever gap between the governor case and fuel pump by moving only the moving parts of the governor lever.



(4) Pull out the governor link snap pin by inserting needle nosed pliers between the fuel pump and governor case.



(5) The governor and fuel pump come apart by sliding the governor case and fuel pump apart and pulling out the link pin of the fuel control rack.



(6) Remove the governor case packing

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7. Troubleshooting

7.1. Troubleshooting of fuel injection pump

Complete repair means not only replacing defective parts, but finding and eliminating the cause of the trouble as well. The cause of the trouble may not necessarily be in the pump itself, but may be in the engine or the fuel system. If the pump is removed prematurely, the true cause of the trouble may never be known. Before removing the pump from the engine, at least go through the basic checkpoints given here.

Basic checkpoints

- Check for breaks or oil leaks throughout the fuel system, from the fuel tank to the nozzle.
- Check the injection timings for all cylinders. Are they correctly adjusted? Are they too fast or too slow?
- Check the nozzle spray.
- Check the fuel delivery. Is it in good condition? Loosen the fuel pipe connection at the injection pump inlet and test operate the fuel feed pump.

7.2. Major faults and troubleshooting

Fault		Cause	Remedy
1. Engine won't start.	Fuel not delivered to injection pump.	(1) No fuel in the fuel tank.	Resupply
		(2) Fuel tank cock is closed.	Open
		(3) Fuel pipe system is clogged.	Clean
		(4) Fuel filter element is clogged.	Disassemble and clean, or replace element
		(5) Air is sucked into the fuel due to defective connections in the piping from the fuel tank to the fuel pump.	Repair
		(6) Fuel feed pump is damaged.	Replace
		(7) Fuel freeze.	Replace with a fuel for cold weather.
	Fuel delivered to injection pump.	(1) Defective connection of control lever and accel. rod of injection pump.	Repair or adjust
		(2) Plunger is worn out or stuck.	Repair or replace
		(3) Delivery valve is stuck.	Repair or replace
		(4) Control rack doesn't move.	Repair or replace
		(5) Injection pump coupling is damaged, or the key is broken.	Replace
		(6) Air sucking.	Bleed air.
		(7) Plunger/Distribution shaft is seized.	Replace pump.
		(8) Tappet is seized.	Replace pump.
		(9) Stop solenoid is damaged.	Replace
		(10) Low cranking speed.	Replace battery.
		(11) Governor is damaged.	Replace
		(12) Barrel crack	Replace pump.
		(13) Transmission shaft is seized. Gear slip.	Replace

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The Yanmar Model YPES-ML fuel injection pump is an in-line type pump with a governor.

A camshaft is built into the fuel Injection pump, which has a drive cam for the fuel feed pump and tappet-drive cams for the plunger. A timing gear and drive gear are mounted on the drive side of the camshaft, and a governor weight on the opposite side.

As the plunger rises, the fuel oil opens the delivery valve and damper valve and goes through the damper valve and the high pressure pipe to the fuel injection nozzles.

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- Roller Guide
  Replace if the outer roller pinhole is extensively worn or there are many scratches.
  Replace if clearance of the roller guide assembly pin/roller is 0.2mm or more.
- Injection timing adjustment bolt
  Replace if the surface in contact with the plunger side is unevenly or excessively worn.

(6) Inspection of rack and pinion



- Rack
  Inspect for bending of rack and wear or deformation of fit with pinion.
- Pinion
  Inspect for wear or deformation of fit with rack.

NOTE:

If the tooth surface or sliding surface is not in good working order, rack resistance increases, affecting the condition of the engine (rough rpm, over running, etc.).

(7) Inspection of plunger spring and delivery spring

Inspect springs for scratches, cracks, breakage, uneven wear and rust.

(8) Inspection of roller guide stop

Inspect the side of the tip, replace if excessively worn.

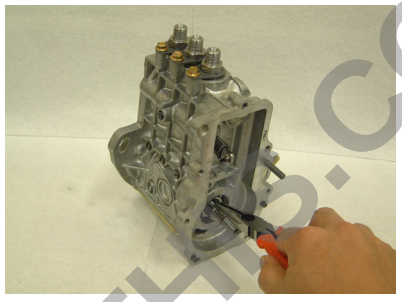
(9) Inspection of O-rings

Inspect and replace if they are burred or cracked.

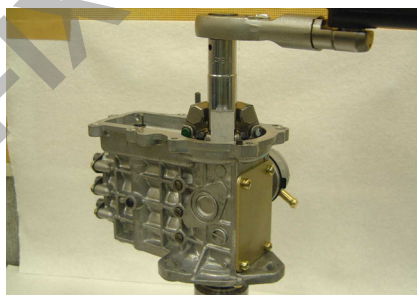
3.5. Assembling governor

Inspect all parts after disassembly and replace any parts as necessary. Before starting reassembly, clean new parts and parts to be reused, and put them in order.

Make sure to readjust the unit after reassembly to obtain the specified performance.



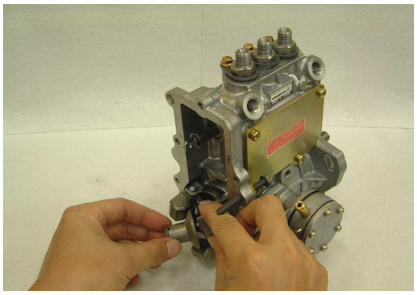
(1) Install the weight key(parallel key).



(2) Insert the governor weight assembly in the taper portion at the end of the fuel pump camshaft, stopping it with the hole in the fuel coupling ring or holding the coupling with a vise, mount the rest, and tighten the governor weight support nut.

N-m(kg-m)

Governor weight nut tightening torque	68.6 – 73.5(7.0 – 7.5)



(3) Open the governor weight to the outside, and insert the sleeve in the end of the fuel pump camshaft.

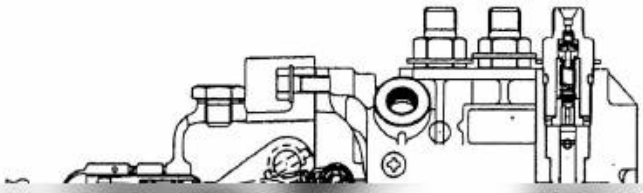
NOTE:

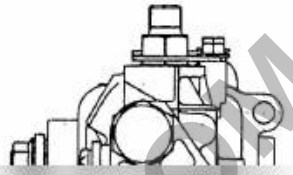
Make sure that the sleeve moves smoothly after inserting it.

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2.1. Fuel injection pump construction





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1. For Safe Servicing

- Most accidents are caused by negligence of basic safety rules and precautions. For accident prevention, it is important to avoid such causes before development to accidents.
  Please read this manual carefully before starting repair or maintenance to fully understand safety precautions and appropriate inspection and maintenance procedures.
  Attempting at a repair or maintenance job without sufficient knowledge may cause an unexpected accident.

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