PART NO. TO4GC-E-00

HITACHI

Technical Manual
Operational Principle

ZW

220
250
Wheel Loader

Service Manual consists of the following separate Part No;

Technical Manual (Operational Principle)	:	Vol. No. TO4GC-E
Technical Manual (Troubleshooting)	:	Vol. No. TT4GC-E
Workshop Manual	:	Vol. No. W4GC-E

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HYDRAULIC CIRCUIT

ZW220
Main Circuit

Main circuit contains a parallel circuit, which enables compound operations.

Main circuit (between the pump and the cylinder) is provided with the main relief valve. The main relief valve prevents pressure inside the main circuit from increasing over the set pressure during operation (when any control lever is operated).
Front circuit (between the control valve and the cylinder) of the lift arm bucket is provided with the overload relief valve. Overload relief valve prevents surge pressure from being developed be external loads in the front circuit and from increasing over the set pressure at neutral position of the spool (neutral position of the control lever).

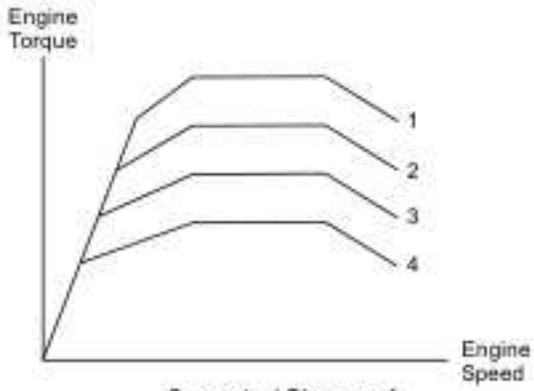
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Engine Torque Control

Purpose: Improving fuel consumption rate by changing the torque curve in response to input signals from the work mode selector switch, shift switch, and vehicle speed sensor

Operation:

1. When the signal of the selected work mode is transmitted to the MC, it detects signals from the main pump delivery pressure sensor, shift switch, torque converter input speed sensor, and torque converter output speed sensor.
2. MC has programmed torque curves to be selected in response to the combination of work mode, speed shift, torque converter speed ratio, and pump delivery pressure, and outputs to the ECM the selection command signal most suitable to each time.
   - When the light mode (L) is selected, Torque Curve 4 or 3 is primarily used, which is advantageous in making much of low fuel consumption at light-load work.
   - When normal mode (N) is selected, Torque Curve 3 or 2 is primarily used, which is advantageous in making much of production as well as low fuel consumption.
   - When the power mode (P) is selected, Torque Curve 1 or 2 is primarily used, which is advantageous in making much of production mainly as well as low fuel consumption slightly.
3. ECM controls torque curves in response to the inputted torque curve selection command signal.



Conceptual Diagram of Engine Torque Curve

NOTE: In case the signal from the work mode selector switch is not transmitted to the MC, back-up control of fixing the work mode to the normal mode is made.

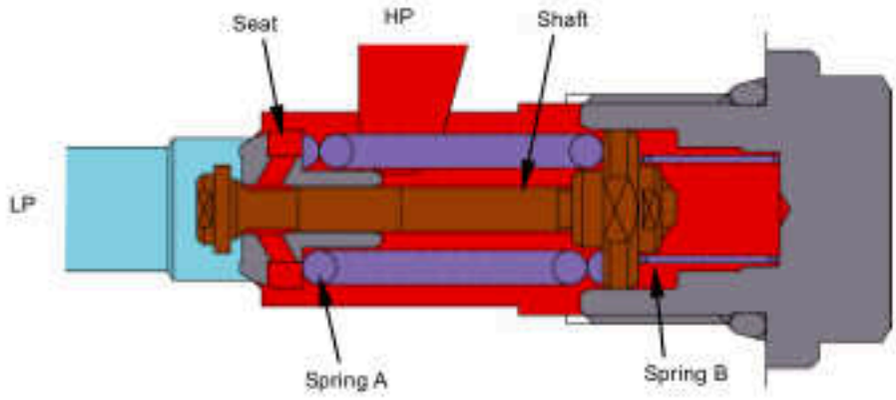
NOTE: In case the signal from the shift switch is not transmitted to the MC, back-up control of fixing to Torque Curve 2 is made.

NOTE: Each mode switch of the mode selector switch is supplied with respectively different voltages from the monitor unit, and when the switch selects a mode, the MC judges which mode has been selected by the input voltage.

NOTE: Shift switch has two switches, and the combination of their ON varies depending on each speed shift. Controller judges which speed shift has been selected by the combination of the two input signals.

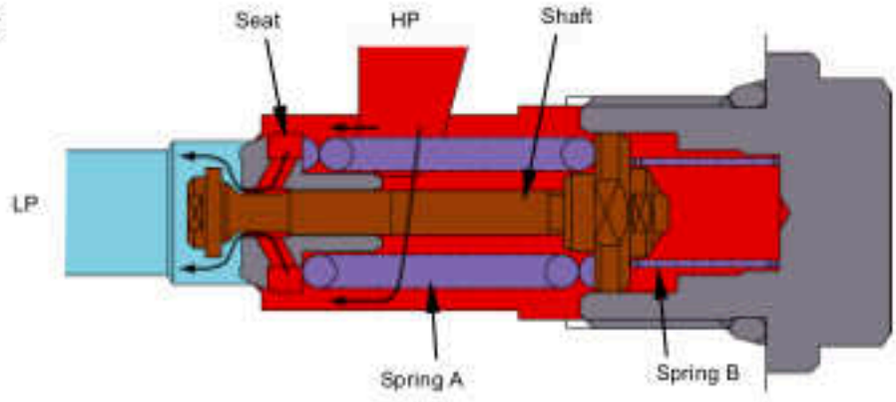
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In Normal Condition:



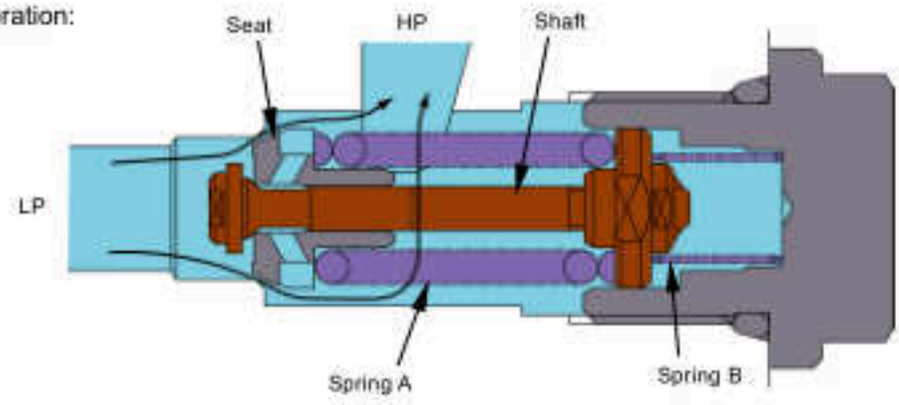
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When Relieving:



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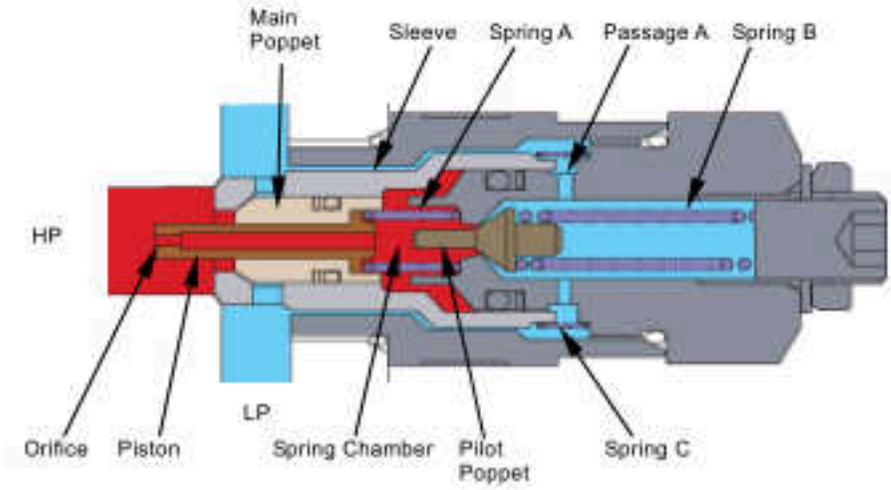
In Make-up Operation:



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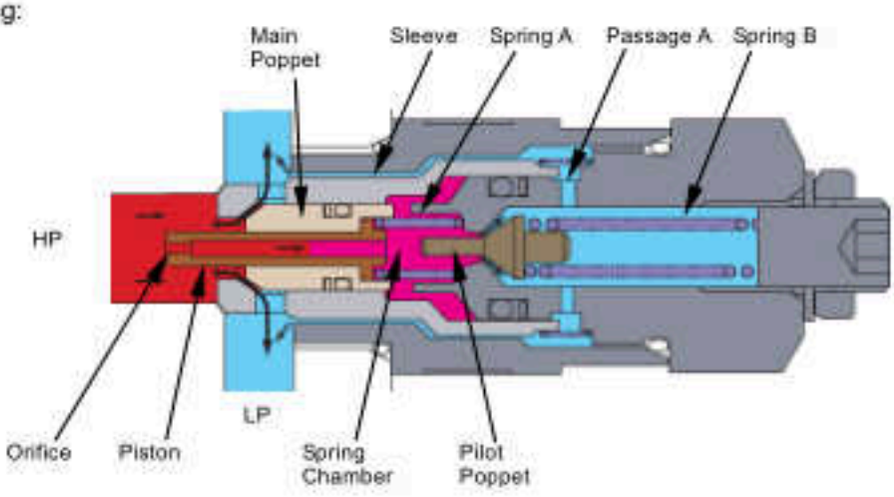
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Normally (When not Relieving):



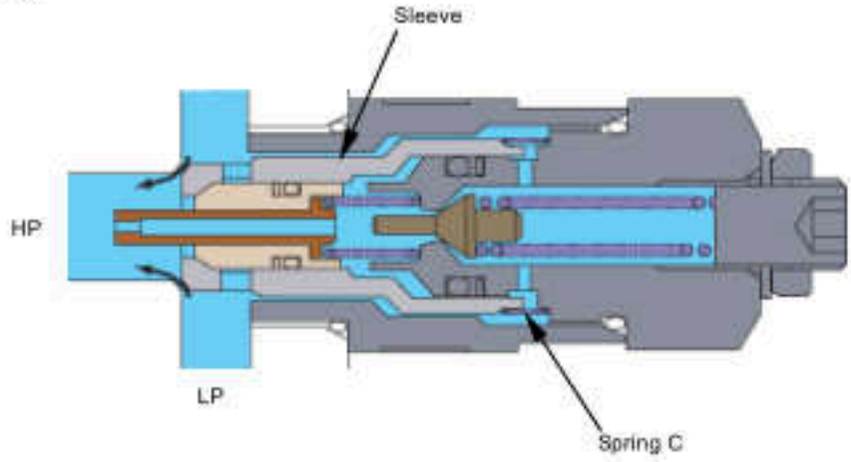
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When Relieving:



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In Make-up Operation:



T4OB-03-02-032

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