Manual No. :KM-18D-E
Vol. No. :TO18D-E-00

Technical Manual

(Operational Principle)

EX3600-5

Excavator

CUMMINS ENGINE SPEC.

Service Manual (Manual No. KM-18D-E) consists of the following three separate volumes;

Technical Manual (Operational Principle)	:Vol. No. TO18D-E
Technical Manual (Troubleshooting)	:Vol. No. TT18D-E

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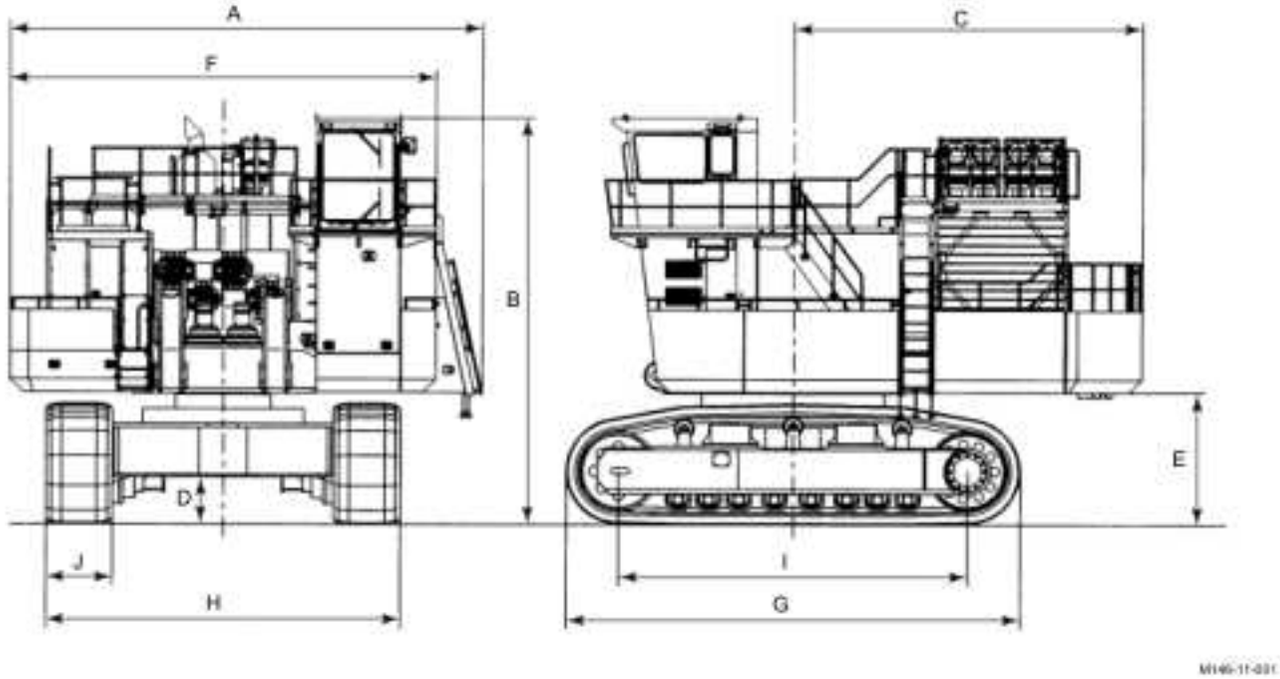
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SPECIFICATIONS



Model	EX3600-5 Hydraulic Excavator	
Type of Front-End Attachment	Loading Shovel	Backhoe
Bucket Capacity (Heaped)	PCSA 20.0 m^3 (26.2 yd^3)	PCSA 20.6 m^3 (26.9 yd^3)
Operating Weight	348000 kg (766000 lb)	350000 kg (770000 lb)
Basic Machine Weight	250000 kg (550000 lb)	250000 kg (550000 lb)
Engine	Cummins QSK60-C 1491 kW/1800 min^{-1} (2027 PS/1800 rpm)	
A: Overall Width	9025 mm (29 ft 7 in)	
B: Cab Height	7750 mm (25 ft 5 in)	
C: Rear End Swing Radius	6650 mm (21 ft 10 in)	
D: Minimum Ground Clearance	*905 mm (3 ft 0 in)	
E: Counterweight Clearance	*2535 mm (8 ft 4 in)	
F: Overall Width of Upper Structure	8150 mm (26 ft 9 in)	
G: Undercarriage Length	8700 mm (28 ft 7 in)	
H: Undercarriage Width	6700 mm (22 ft 3 in)	
I: Sprocket Center to Idler Center	6660 mm (21 ft 10 in)	
J: Track Shoe Width	1270 mm (4 ft 0 in) (Grouser shoe)	
Ground Pressure	180 kPa (1.84 kgf/cm^2, 26.2 psi)	
Swing Speed	3.2 min^{-1} (rpm)	
Travel Speed (Fast/Slow)	2.2/1.7 km/h (1.4/1.1 mph)	
Gradeability	30° (tanθ = 0.70)	

*NOTE: * The dimensions do not include the height of the shoe lug.*

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Regulator Operation

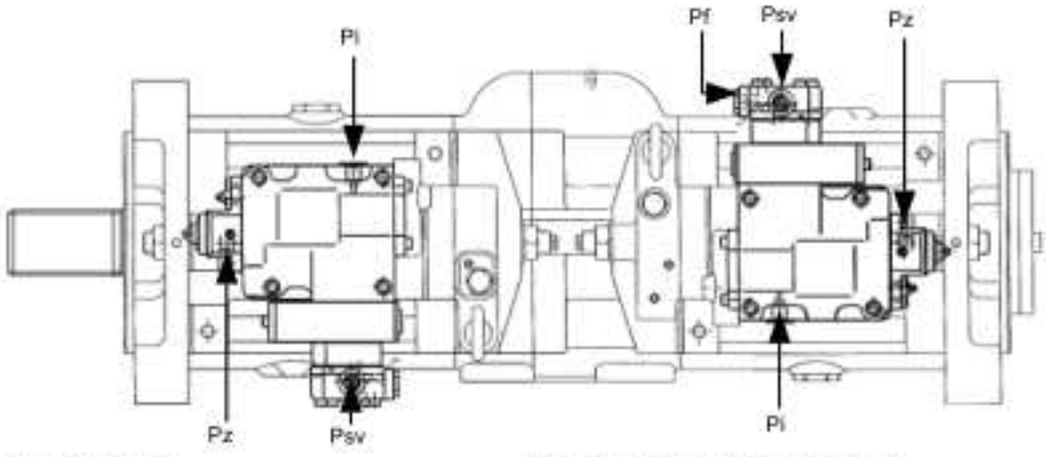
- Torque Constant Control (Main Pump and Fan Motor Drive Pump)
  Controls the pump flow rate depending on the pump delivery pressure in order to maximize utilization of the engine horsepower efficiently. The control includes the following two operations:
  (1) Overload Prevention Operation
  As the pump delivery pressure increases, the swash plate angle is reduced to reduce the pump flow rate.
  (2) Flow Rate Recover Operation
  As the pump delivery pressure decreases, the swash plate angle is increased to increase the pump flow rate.
- Flow Rate Control (Main Pump and Fan Motor Drive Pump)
  Routes flow control oil pressure (Pi) from the selector valves (P25, P26, and P27) to change the swash plate angle so that the pump flow rate is controlled in response to the control lever operation.

NOTE: The fan motor drive pump flow rate is controlled by routing the pilot pressure oil from oil cooler fan control solenoid valve (P32) and radiator fan speed control solenoid valve (P33) as flow rate control pressure (Pi) to change the swash plate angle.

- Power Reducing Control (Main Pump Only)
  Reduces pump driving power by routing power reducing control pressure (Pf) from the power reducing solenoid valve to reduce the swash plate angle to the minimum when the engine speed slows to 1400 min^{-1} or less. (Refer to the pages for Pump Control in the SYSTEM / Control System group.)
- Power Increasing Control (Main Pump Only)
  Increases pump driving power by routing power increasing control pressure (Pz) from the power increasing solenoid valve to increase the swash plate angle when the engine speed increases to 1600 min^{-1} or more. (Refer to the pages for Pump Control in the SYSTEM / Control System group.)
- Smaller Swash Angle (Flow Rate) Signal Priority Control
  When more than one signals are given, the pump is driven by the smallest swash angle signal over other signals.

NOTE: The symbols in ( ) behind the component names correspond to the ones used in the hydraulic circuit diagrams. In addition, the regulator port symbols correspond to the ones in the hydraulic circuit diagrams as shown in the following table.

Regulator Port Symbols	Symbols in Hydraulic Circuit Diagram
Pi	i1 to i8
Pf	j1 to j8
Pz	k1 to k8
Psv	p1 to p8



T1T-02-01-004

P - Pump Delivery Pressure

Psv - Pump Servo Assist Pressure (From Pilot Pump)

Pi - Flow Rate Control Pressure
(From Selector Valves P25, P26, and P27)

Pf - Power Reducing Control Pressure
(From Power Reducing Solenoid Valve)

Pz - Power Increasing Control Pressure
(From Power Increasing Solenoid Valve)

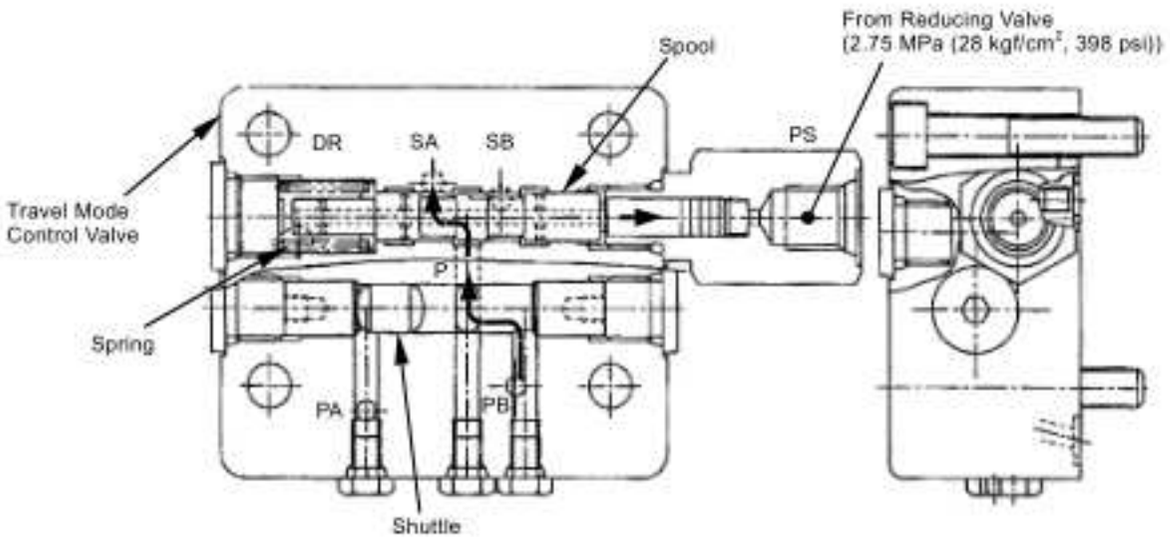
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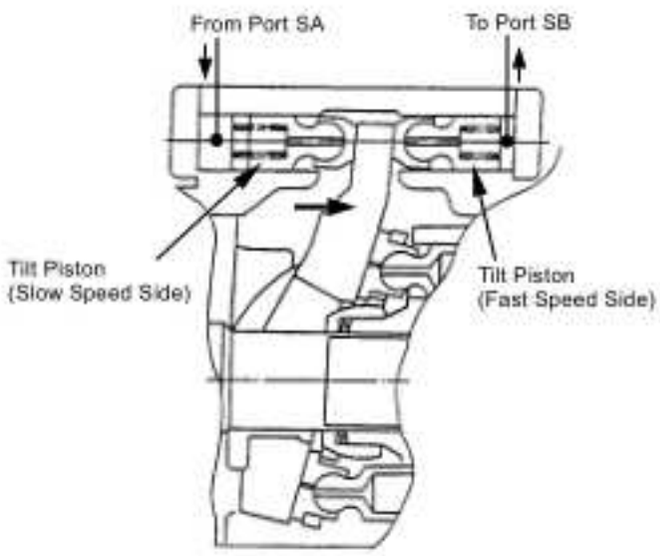
TRAVEL MODE CONTROL

Slow Speed Mode

Ports PA and PB of the travel mode control valve are connected to the travel main hydraulic circuit. When travel operation either forward or reverse is made, main hydraulic pressure oil passes through port PA or PB, pushes the shuttle, and enters port P. When the travel mode switch is turned OFF (slow mode), the pilot pressure oil is routed to port PS of the travel mode control valve after being reduced to 2.75 MPa (28 kgf/cm^2, 398 psi). As long as the pilot oil pressure stays at 2.75 MPa (28 kgf/cm^2, 398 psi), the spring force is higher so that the spool is pushed to the right.

Then, the main hydraulic pressure oil is routed from port P to port SA through the notch on the spool and acts on the slow speed side tilt piston, increasing the swash plate angle to the maximum. Accordingly, the travel speed is changed to the slow speed mode. Hydraulic oil in the fast speed side tilt piston is routed to port DR via port SB and the passage in the spool and flows back to the hydraulic oil tank. (Refer to the SYSTEM / Control System group.)

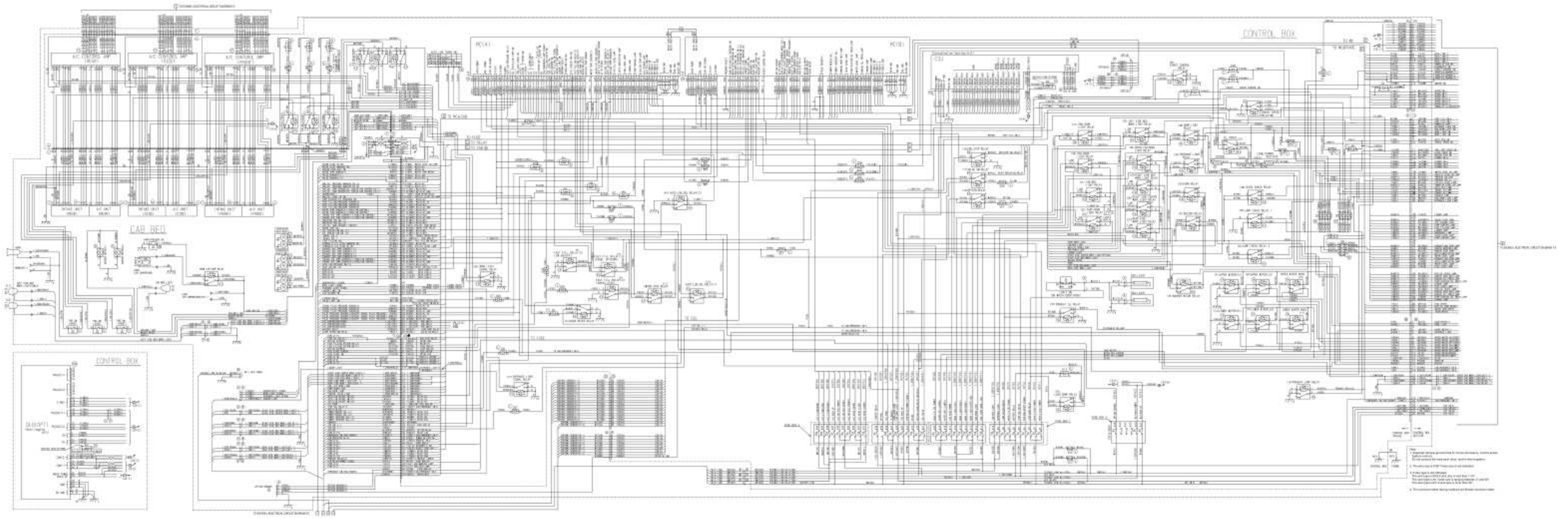




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EX3600-5 ELECTRICAL CIRCUIT DIAGRAM 2/3



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