



دبلوم تطبيقات التحكم الأوتوماتيكي في نظم القوى الميكانيكية

MEP 599 Diploma Design Project-Spring Term 2016/2017

Investigation of Hydraulic Control Circuits of a Heavy Duty Crane

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Abstract: The project includes part of technical manual of crane hydraulic system. Hydraulic system may be considered as best mechanical system to run machinery equipments, a contemporary language & generates a very large force, a system has been used in the microkernel power plants and blessings of aircraft and the foredeck and heavy equipment, elevators and agricultural equipment, winches and open sluice gates and dams It is an easy system depends on where the oil pressure hydraulic pumps and cylinders or triggers.

DESCRIPTION

This section describes the hydraulic system, the components which make up the hydraulic system, and the components dependent upon the hydraulic system for their valves, and all hydraulic cylinders. Detailed descriptions and operation of individual hydraulic circuits are discussed within their individual sections as applicable. A complete hydraulic system schematic showing all options is at the back of this manual.

Description	Symbol	Description	Symbol	Description	Symbol
Hydraulic Reservoir - Stores, cools, and cleans machines hydraulic fluid supply.		Filter - Removes contamination from hydraulic fluid.		Manually Operated - Valve shifted manually with check to allow flow back to tank.	
Hydraulic Return Lines - Terminated at (1) below fluid level (2) above fluid level.		Filter with Bypass Valve - Bypass valve allows hydraulic fluid to bypass the filter if the filter becomes clogged.		Pneumatic Operated - Valve shifted by pneumatic device.	
Hydraulic Pump - (1) fixed displacement (2) variable displacement.		Accumulator - Used to either develop flow or absorb shock.		Pilot Operated - Valve shifted by pilot pressure.	
Power Source - Powers hydraulic pump (1) combustion engine, (2) electric motor.		Check Valve - Creates back pressure.		Electric Operated - Valve shifted by electrical energy.	
Hydraulic Motors - (1) unidirectional, (2) bidirectional.		Orifice - In-line fixed restriction.		Brake Valve - Activates swing brake.	
Pump Disconnect - Disconnects pump from power source.		Adjustable Orifice - In-line restriction used for control device.		Open Center Cylinder Spool - Directional control valve for hydraulic cylinder function that directs flow back to tank through the open center when in the neutral position	
Continuous Line - Supply or return lines.		Hydraulic Oil Cooler - Cools hydraulic fluid.		Open Center Motor Spool - Directional control valve for hydraulic motor function that directs flow back to tank through the open center when in the neutral position. Allows flow back to tank when the crane is shut down.	
Connecting Lines - Branch lines connected to main line.		Temperature Switch - Regulates the hydraulic fluid temperature.		Closed Center Cylinder Spool - Pressure compensated directional control valve for hydraulic cylinder which directs flow back to tank with an unloader valve cartridge.	
Dashed Line - Pilot pressure.		Hydraulic Pressure Switch - Senses hydraulic pressure to energize electrical components.			
Dotted Line - Case drain or load sense.		Flow Switch - Illuminates indicator light to indicate a fault.			
Chain Line - Enclosure of two or more functions contained in one unit.		Relief Valve - Protects system from being over pressurized.			
		Pressure Reducing Valve - Regulates maximum pressure.			
		Shuttle Valve - Used to direct maximum pressure to components.			

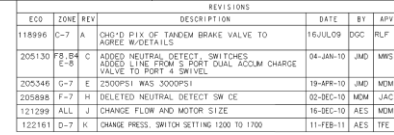
CRANE HYDRAULIC SYSTEM



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121219	Y-S	0	CHG'D REV OF TELE FOOT PEDAL CONTROLLER TO 15AUG10	2006	WHS	WHS
121209	ALA	0	CHG'D P16 OF CHANGE FLW AND MOTOR IN-REV	10DEC10	AES	WHS
121550	Y-S	0	UPROG'D P16 OF TELE PEDAL CONTROLLER TO 15AUG10	2006	WHS	WHS



GROVE
MODEL
HP
30-190
HOIST

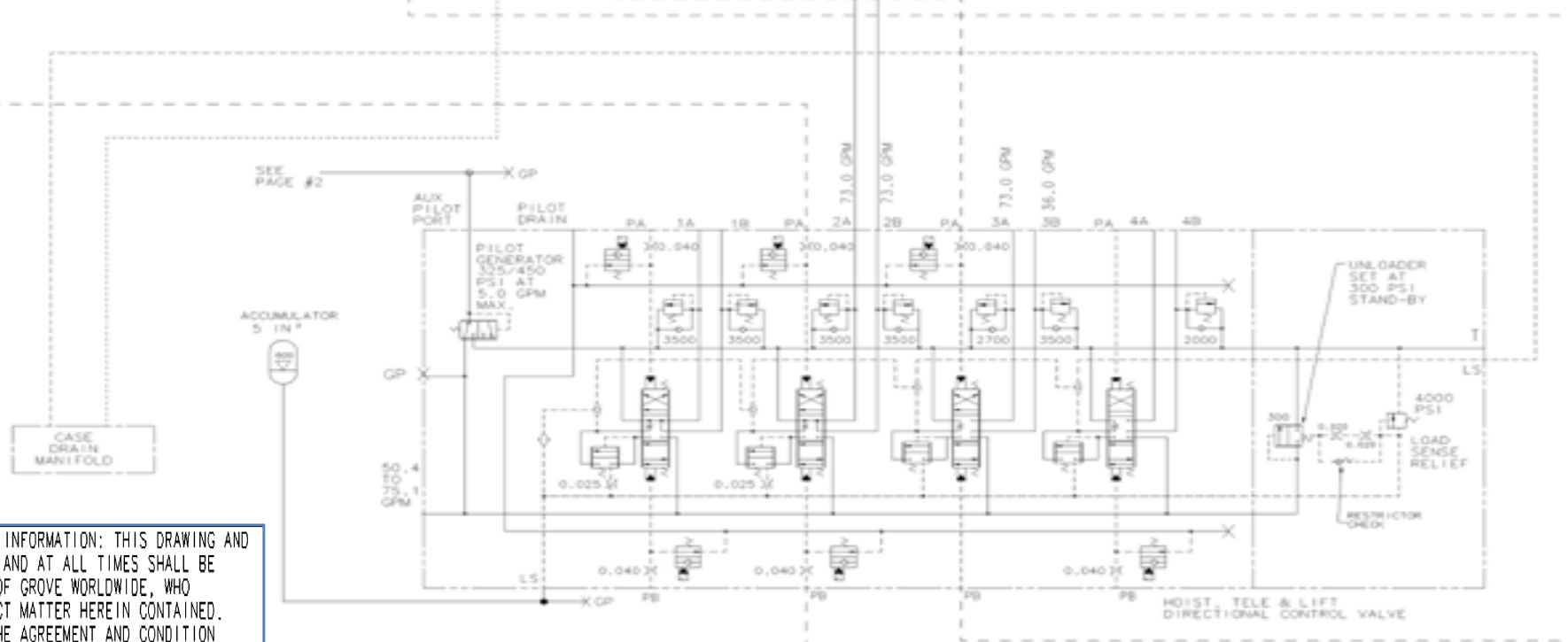
BRAKE
RELEASE

UP

DOWN

HOIST MOTOR
6.53 IN./REV. MAX.
3.72 IN./REV. MIN.

TO MAIN HOIST
CASE DRAIN LINE
(SEE PAGE 02 OF 05)



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HOIST
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