NEW HOLLAND

FORD
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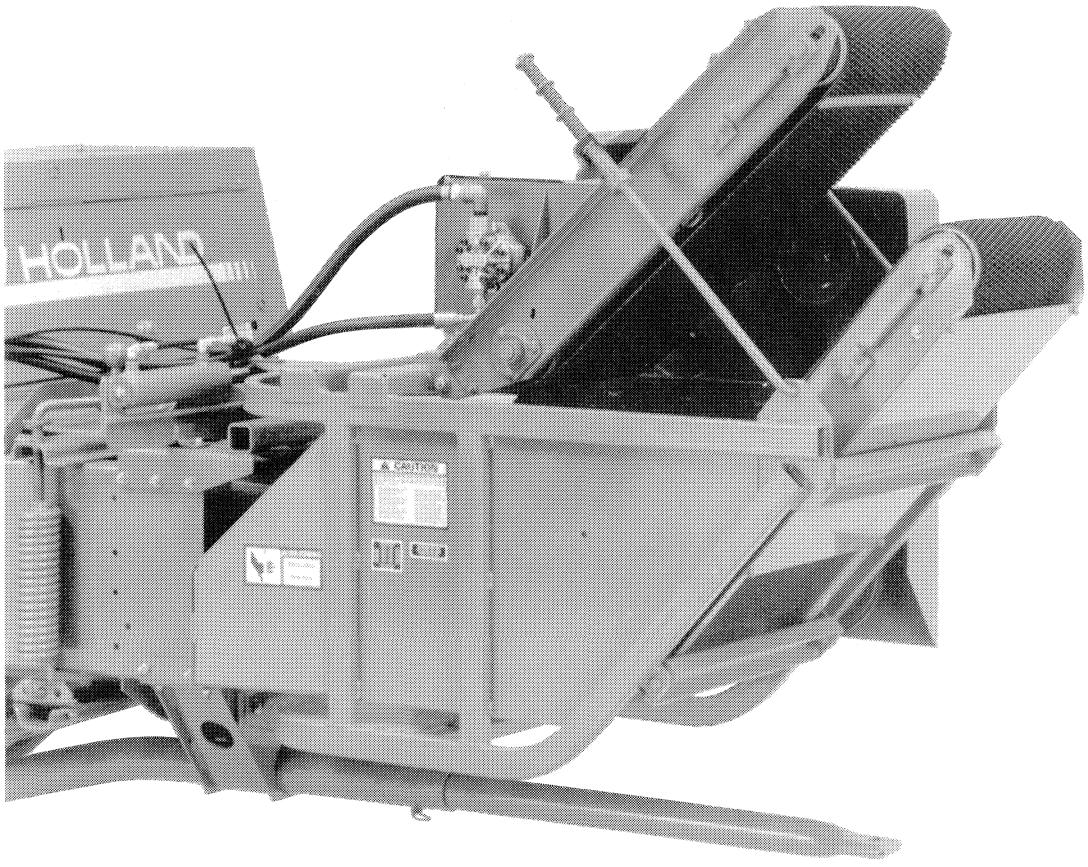
Service Manual

Hydraulic Drive Bale Throwers

Models 70 and 72 Belt Type
Models 75 and 77 Pan Type



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INTRODUCTION

This manual provides information for troubleshooting, repairing and adjusting hydraulic drive bale throwers. Models included are the 70 and 72 belt-type thrower and the 75 and 77 pan-type thrower.

GENERAL INFORMATION

On Ford New Holland equipment, left and right are determined by standing behind the unit, looking in the direction of travel.

CAUTION

MOST FARM IMPLEMENT ACCIDENTS CAN BE AVOIDED BY THE OBSERVANCE OF A FEW SIMPLE SAFETY PRECAUTIONS.

1. **DO NOT CLEAN, LUBRICATE, OR MAKE ANY ADJUSTMENTS ON THE BALER OR BALE THROWER WHILE IT IS IN MOTION!**
2. **DO NOT ENGAGE THE CLUTCH UNTIL YOU ARE CERTAIN THAT EVERYONE IS CLEAR OF THE MACHINE AND HAVE MADE SURE THAT NO TOOLS ARE LYING ON THE MACHINE!**
3. **DO NOT WORK AROUND THE BALER OR BALE THROWER IN LOOSE CLOTHING THAT MIGHT CATCH IN ANY OF THE MOVING PARTS!**
4. **DO NOT ATTEMPT TO PULL LOOSE HAY FROM ANY PART OF THE BALER OR BALE THROWER WHILE IT IS IN OPERATION!**
5. **WHEN BALING, KEEP ALL OTHERS OFF THE TRAILING WAGON TO AVOID INJURY OR DEATH CAUSED BY THROWN BALES!**
6. **KEEP ALL SHIELDS IN PLACE DURING OPERATION!**

BELT-TYPE THROWERS

MODELS 70 AND 72

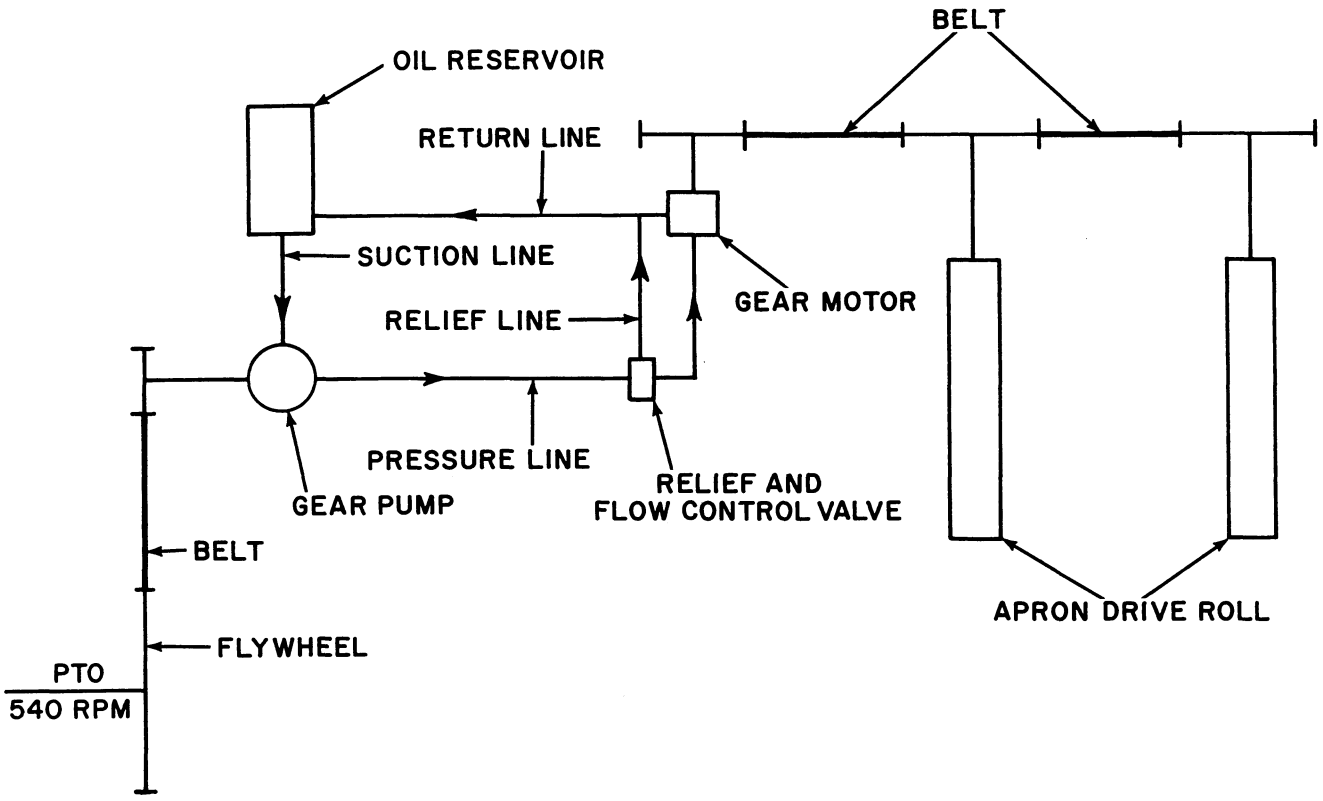

FIGURE 1

HYDRAULIC SYSTEM

Figure 1

The hydraulic system consists of a pump, relief and flow control valve, motor, and filter. The high pressure oil from the pump goes through the flow control and pressure relief valve and then to the motor. Return oil is filtered between the motor and the reservoir.

Check the oil level, per the operator's manual, weekly or every 10,000 bales (more often if a leak is discovered).

Change the oil and oil filter at the beginning of each season. Drain the oil by removing the plug in the bottom of the tank. Check the bottom of the tank for foreign particles. Clean the tank if necessary. Replace the plug. The filter can be removed with a standard oil filter wrench. Install the filter finger tight, then turn it 1/2 turn. Do not use a filter wrench to tighten the filter.

Refill the reservoir with approximately 5 gallons (18.9 L) of oil to the level of the check plug on the side of the reservoir. The following hydraulic oils may be used in the hydraulic system. Do not mix different types.

Type	Limitations
Ford 134	None
Dexron II A.T.F.	None
SAE 10W-20, 30, 40	Use 10W-20 in cool areas Use 10W-40 in hot areas
SAE 10	None

If a unit loses power, use the following procedure to troubleshoot the system.

1. Check the oil level in the reservoir as detailed in the operator's manual.
2. Check all drive and throwing belt tensions and the PTO slip clutch.
3. Change the oil filter.
4. Install appropriate gauges to test the relief pressure and/or oil flow following the instructions below.

   The Model 70 hydraulic drive gear pump has a capacity of 9.5 GPM at 1865 RPM when not under load.

   The Model 72 hydraulic drive gear pump has a capacity of 11.4 GPM at 2193 RPM when not under load.

   The relief valve in the flow control valve for both the Model 70 and 72 should be set at 2900 + 50 PSI.

WARNING: GAUGES, GAUGE FITTINGS, AND HOSES MUST HAVE OPERATING PRESSURE RATINGS AT LEAST 25% HIGHER THAN HIGHEST PRESSURES OF THE SYSTEM.

NEVER ADJUST RELIEF VALVES TO HIGHER PRESSURES THAN THOSE SPECIFIED BY THE EQUIPMENT MANUFACTURER.

WARNING: FLUID UNDER PRESSURE CAN HAVE SUFFICIENT FORCE TO PENETRATE THE SKIN, CAUSING SERIOUS PERSONAL INJURY. ALWAYS PROTECT THE SKIN AND EYES FROM ESCAPING FLUID UNDER PRESSURE.

IF INJURED BY ESCAPING FLUID, OBTAIN MEDICAL ASSISTANCE AT ONCE. SERIOUS INFECTION OR REACTION CAN DEVELOP IF MEDICAL TREATMENT IS NOT ADMINISTERED IMMEDIATELY.

BEFORE DISCONNECTING LINES OR FITTINGS, BE SURE TO RELIEVE ALL PRESSURE. BEFORE APPLYING PRESSURE TO THE SYSTEM, BE SURE ALL CONNECTIONS ARE TIGHT AND THAT LINES, PIPES, AND HOSES ARE NOT DAMAGED.

TEST PROCEDURES

TESTING PRESSURE ONLY

1. Remove the 1/2″ NPT plug from the tee between the flow control valve and the motor.
2. Install a pressure gauge in the tee.
3. Lock the apron drive flywheel so it cannot rotate.
4. Operate the tractor PTO at 540 RPM. Check the pump speed and adjust the PTO to obtain a pump speed of 2193 RPM for the Model 72 or 1865 for the Model 70.
5. Relief valve bypass pressure should be 2900 PSI + 50 PSI. To adjust the pressure, remove the cap nut at the rear of the valve, use a 5/16″ allen wrench to turn the adjusting screw clockwise to increase the pressure or counterclockwise to lower the pressure. Recheck the pressure after reinstalling the cap nut.
6. Remove the pressure gauge and reinstall the 1/2″ NPT plug.

TESTING FLOW AND BYPASS PRESSURE

1. Remove the 1/2″ NPT plug from the tee, between the flow control valve and motor.
2. Install the flow rater inlet line in the tee, between the flow control valve and hydraulic motor. The return line from the flow rater should be inserted in the fill port of the reservoir.
3. Remove the quadrant-indicator low side stop bolt (1/4″).
4. Lock the thrower flywheel to keep it from rotating.
5. Set the flow control valve to full low position (beyond the stop bolt location).
6. Turn the flow rater bypass pressure valve fully counterclockwise.
7. Start the tractor, engage the PTO, and run at 540 RPM.
8. Check the pump speed and adjust the tractor throttle if necessary to obtain 2193 RPM for the Model 72 or 1865 RPM for the Model 70. The pump should be at this speed when under load. If unable to obtain these speeds, recheck the PTO slip clutch and pump drive belt tension.
9. Set the speed indicator at 6 (top speed) and read the flow meter for GPM and pressure. The flow should be approximately 11.4 GPM for the Model 72 and 9.5 GPM for the Model 70 when not under pressure. The flow may drop to 9 GPM on the Model 72 or 7.5 GPM on the Model 70 under load.
10. Turn the flow rater pressure valve clockwise, watching the pressure gauge until full bypass pressure is obtained (2,900 PSI + 50 PSI). Do not bypass more than 10 seconds.
11. If the bypass pressure is too high or too low, adjust the relief valve on the flow control valve.
12. Remove the large cap nut at the rear of the valve. Using a 5/16″ allen wrench, turn the adjusting screw clockwise to increase the pressure or counterclockwise to decrease the pressure.
13. Install the cap nut to lock the adjusting screw and recheck the pressure.
14. Remove the flow rater and reinstall the 1/2″ NPT plug.

If the relief pressure cannot be adjusted or if the flow is low, disassemble and clean the valve. Inspect for wear or contamination damage. Repair or replace as required. Reinstall the valve and retest.

If the pressure and/or flow is still not correct, the problem is most likely with the pump. Remove the pump. Disassemble and clean to inspect for wear or contamination damage. Repair or replace as required.

NOTE: Be sure the pump is tested at rated RPM under load.

If the flow and pressure are correct, the problem is most likely with the motor. Remove the motor. Disassemble and clean to inspect for wear or contamination damage. Repair or replace as required.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Cannot fill the rear of the wagon	Wagon is too long	Recommended wagon length is 18′ (5.5 m).
	Bales too soft	Increase bale density by installing more hay wedges.
		Lower the upper throwing belt assembly.
		Increase pressure required to lift upper apron by:
		Model 70 - Replace #42038 spring with #180021 spring.
		Model 72 - Relocate a spacer on each support rod.
	Top of bale not firm	Adjust feeder and/or feeder back to produce solid, square bales.
	Bales too long	Set metering wheel trip arm so maximum bale length is: 36″ (914 mm) for Model 70, 38″ (960 mm) for Model 72.
	Bales too heavy	Adjust tension device and/or bale length to obtain a maximum weight of 80 lbs. (36 kg).
	Hitch too high	Adjust so bale case is level or slightly low in front.
	PTO speed too slow	Operate the baler at 540 PTO RPM.
	Roll drive belt too loose	Model 70 - Adjust to obtain approximately 1/8″ (3 mm) gap between coils of the spring.
		Model 72 - The spring should measure 11″ (280 mm) between hooks).
	PTO slip clutch set too light	Adjust per the baler operator's manual.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Cannot fill the rear of the wagon (continued)	Pump drive belt too loose	Model 70 - Adjust to 6″ (152.5 mm) from inside to inside spring hook. Model 72 - Be sure spring is installed correctly. It is not adjustable.
	Throwing belt too loose	Adjust belt tension per operator's manual.
	Throwing belt roll speed too slow	Test hydraulic system with a flow meter and pressure gauge. If the flow and pressure are correct, inspect the motor for wear. Model 70 - Replace the 8″ (203 mm) motor sheave with 8 3/4″ (222 mm) sheave halves, part numbers 859420 and 859421, plus a longer belt, part number 9600753. The 8″ sheave should produce a roll speed of approximately 1680 RPM. The 8 3/4″ sheave should produce a roll speed of approximately 1830 RPM.
	Hydraulic pressure or flow low due to:	Model 70 - With the PTO at 540 RPM, the pump should be operating at 1865 RPM. This should produce a pressure of 2900 PSI and a flow of 9.5 GPM, which should in turn produce a motor speed of 1940 RPM. Model 72 - With the PTO at 540 RPM, the pump should be operating at 2193 RPM. This should produce a pressure of 2900 PSI and a flow of 11.4 GPM, which should in turn produce a motor speed of 1973 RPM.
	A. Pump drive belt too loose	Model 70 - Adjust to 6″ (152.5 mm) from inside to inside spring hook. Model 72 - Be sure spring is installed correctly. It is not adjustable.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Cannot fill the rear of the wagon (continued)	B. PTO slip clutch	Adjust per baler operator's manual.
	C. Clogged filter or line	Replace filter, inspect lines.
	D. Low oil level	Add oil as required.
	E. Control valve spool sticking	Clean and polish as required.
	F. Relief valve set too low	Adjust to 2900 PSI.
	G. Pump worn	If the above adjustments are correct and flow is less than 7.5 GPM for the Model 70 or 9 GPM for the Model 72, repair or replace the pump as required after inspection.
Throws bales too far - will not load front of wagon	PTO speed too high	Operate at 540 PTO RPM.
	Throwing belt speed range too high	Install shims between the sheave halves of the sheave on the motor.
	Control valve stuck on fast	Clean and polish spool.
	Bales too light	Increase bale weight.
	Electric motor not moving control valve	Test switch, wiring and motor.
Throwing belts "burning" twine	Bales too long	Bales should not exceed 38″ (96 cm).
	Bales too soft	Increase bale density.
	Throwing belts improperly spaced	Raise or lower upper apron.
Twine breaking	Bales too heavy	Reduce pressure on tension rail.
	Poor quality twine - thick and thin spots	Use good quality twine.
	Knotter problem	Repair or adjust knotter.
Grooves worn in throwing belts in area contacted by the twine	This is normal wear and can be expected.	

MODELS 75 AND 77

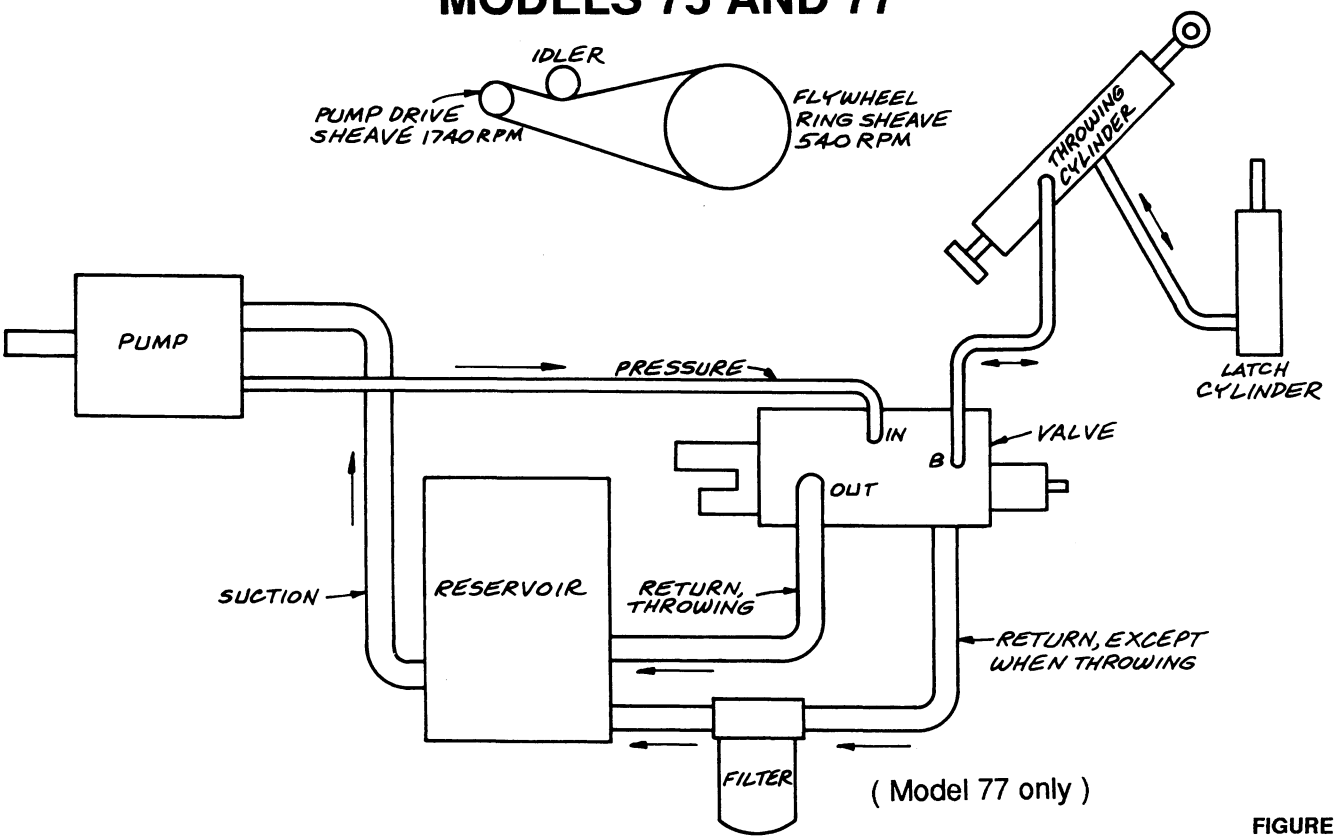

FIGURE 2

HYDRAULIC SYSTEM

Figure 2

The hydraulic system consists of a pump, control valve, throwing cylinder, latch cylinder, filter and reservoir.

Figure 2 shows a diagram of the hydraulic system and pump drive.

The hydraulic pump turns 1740 RPM when the baler is operated at recommended 540 RPM PTO speed.

Oil is drawn from the reservoir through the suction line. Oil is then pumped through the pressure line to the control valve. While the thrower valve is in the "home" position, oil flows through the valve from the "in" port to the "out" port and into the reservoir. On the Model 77, this oil goes through a spin-on filter. There is a filter on the suction line inside the reservoir on both models.

When the valve spool is moved forward, the oil to the valve is directed to both throwing cylinder and latch cylinder under pressure. The valve is reset automatically when the thrower pan reaches the end of its stroke. Oil from both cylinders is pushed back through the valve "B" port in the valve and into the reservoir through the "out" port.

There is an orifice plate in port "B" in the valve. The orifice plate allows full flow, under pressure, to the cylinders during the throw cycle. The plate restricts or slows the oil flowing back through the valve during the return to "home" position cycle.

IMPORTANT: The orifice plate must be installed with the slot in the orifice plate towards the cylinders. If installed backwards, bales will not be thrown to the rear of the wagon regardless of the setting on the distance control.