

## POWERSHUTTLE TRANSMISSION

## FAULT DIAGNOSIS

<b>OVERHEATING</b>  Normal temperature 60-80°C absolute maximum temperature 120°C	Incorrect operation	Select lower gear – avoid stalling the torque converter continuously.
	Oil cooler externally plugged	Thoroughly clean all coolers and radiator. Check for oil leaks. Use non-oily solvent if necessary.
	Low oil level	Check oil level and replenish, look for oil leaks.
	Fan belt loose	Re-tension belt.
	Wrong grade of oil	Drain transmission and both filters, then refill with correct oil.
	Oil contaminated	Drain transmission, and change filter. Refill with correct oil but investigate source of contamination and cure before continuing operation.
	Oil cooler supply/return pipe crushed	Check condition of all return pipes, particularly if non-standard equipment has been fitted.
	Venting valve stuck open	Check venting valve per operation 5D – 03 and 5D – 08.
	Clutches slipping	Do stall torque test per operation 5D – 01, also transmission output check 5D– 02, also pump flow check 5D – 03.
	Oil cooler internally plugged	Remove oil cooler and back-flush. Determine source of debris.
<b>NO DRIVE</b>	Low oil level	Check, replenish oil as necessary.
	Electrical system failure	Check function of solenoids and control valve per operation 5D – 17. Check de-clutch switches.
	Torque converter PMV stuck open	Test torque converter pressure per operation 5D - 05 and 5D – 06.
	Pump output low	Test pump flow per operation 5D – 03.
<b>DRIVE IN ONE DIRECTION ONLY</b>	Solenoids/valve defective	Test forward/reverse valve and solenoids per operation 5D – 17.
	Forward/reverse switch defective	Check switch contacts for damage.
	Oil feed blocked to one clutch pack, or internal leakage of supply	Check filter and 'O' ring seals on transfer tubes located beneath forward/reverse control valve. Check leakage per operation 5D – 07.  Broken sealing ring on clutch shaft. Check leakages per operation 5D – 07.
		Plugged filter gauze and/or restrictor in clutch shaft.
	Clutch piston seized	Contamination by debris, service transmission complete.

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<b>GEARS DIFFICULT TO SELECT</b>	Transmission drag	Wrong grade of oil in transmission.
	Clutch not fully disengaging	Determine whether problem occurs on only one clutch or both by selecting forward then neutral and reverse then neutral, trying gear selection on each occasion.  Warped clutch plates or broken piston return spring.
	Control spool partially selecting one of the clutches	Spool jammed. Check for debris in the spool valve or damage to solenoid armatures.
<b>DRIVE ENGAGEMENT SLOW</b> Normal shift time = 0.5 secs.	Partial selection of forward/reverse spool valve	Check function of control valve per 5D - 17.
	Blocked filter screen in transfer tubes below forward/reverse control valve	Remove valve and clean gauzes and also check 'O' ring seals.
	Sluggish operation of solenoids	Poor electrical connection to solenoids. Check voltage at terminals.
	Internal leakage in transmission	Check clutch leakage per 5D - 07.
<b>TRANSMISSION VERY SLOW TO ENGAGE AFTER MACHINE HAS BEEN PARKED FOR A TIME.</b> Normal vent time maximum 5 secs. after oil change	Venting valve inoperative	Check operation of vent spool and check spring, which if broken would prevent valve from operating.
<b>LOW STALL SPEED</b> Normal stall torque speed A4,236 and A4,248 engines  Transmission only 1875-1975 rpm	Engine giving low power	Check accelerator linkage to ensure full throttle being obtained.  Check engine stop linkage to ensure fuel pump delivery not restricted.
	Transmission with hydraulics 1225-1325 rpm	Torque converter stator slipping
<b>HIGH STALL SPEED</b>	Clutches slipping	Low oil pressure.  Check torque converter pressure per operation 5D - 05.  Check internal leakage per operation 5D - 07.
<b>NO DRIVE ON GRADIENTS BUT NORMAL DRIVE ON FLAT GROUND</b>	low oil level	check oil level and top-up as required.
	Pump intake tube turned upwards	Intake tube must face downwards. Refer to JOINT 3 SEPARATION in GROUP 2 of this manual.  Problem most likely to occur on machines fitted with MF 250 loader.

