CONTROLS AND INSTRUMENTS
POWER SHUTTLE MACHINES WITH ANALOG INSTRUMENTS
Figure 2-10

1. Turn Signal Indicator, Mainbeam Selection, Front Windshield Wiper stalk and Front Windshield Washer Control

2. Gear Lever (with integrated Transmission Disconnect Switch)

3. Foot Throttle Pedal

4. Loader Lever (with integrated Transmission Disconnect Switch)

5. Heater Control Panel (cab unit only)

6. Key Start (cab unit)
(Dotted line-Key start ROPS unit)

7. Side Mounted Instrument Panel

8. Parking Brake

9.Hand Throttle Lever

10.Stabilizer Leg Levers

11.Air Flow Direction Outlet

12.Hydraulically Extendible Dipper, H.E.D Operating Pedal (Optional Equipment)

3.Backhoe Control Lever Patterns

Standard:
2 Lever - Cross Pattern with Horn Button

Optional:
4 Lever - Fore/Aft Pattern

14.Hammer Operating Pedal (Optional Equipment)

15.Air Flow Direction Outlet

16. De Luxe Seat with Document Pouch to the rear

17. Cigar Lighter/12 volt Auxiliary Outlet

18. Radio Placement / Miscellaneous Objects Holder

19. Drink Holder

20. Mechanical Differential Lock Pedal

21. Independent Brake Pedals and Pedal Latch

IMPORTANT: *When travelling on the road the brake pedals must be latched together for straight line braking.*
If the pedals are not latched pressure applied to one pedal only could result in the machine veering severely to the left or right hand side.

22. Four Way Flasher Button

23.Power Shuttle 4x4 – Transmission Forward/Reverse Lever with Integral Horn Button

24. Air Flow Direction Outlet (cab units only)

25. Steering Wheel

26. Front Instrument Panel

27.Air Flow Direction Outlet

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SECTION 4

LUBRICATION AND MAINTENANCE

This section covers all of the service procedures necessary to maintain your machine at peak efficiency.

WARNING: *Before any maintenance or service is performed on the machine ensure the parking brake is on and the wheels are chocked/blocked to prevent machine movement, refer to Figure 4-1.*

On pages 2 and 3, are the items that are protected by warning lights that must be investigated should they illuminate between service intervals.

WARNING: *Do not mix different types of manufactured fluids or lubricants. Use only what is recommended for your machine as shown in the Specifications section.*

On page 4, the lubrication and maintenance chart provides a ready reference to service requirements.

IMPORTANT: *Ensure all used oils and used oil filters are disposed of safely to protect people and the environment from contamination. Adhere to local regulations in your country.*

FILLING AND SERVICE POINTS, Figure 4-1.

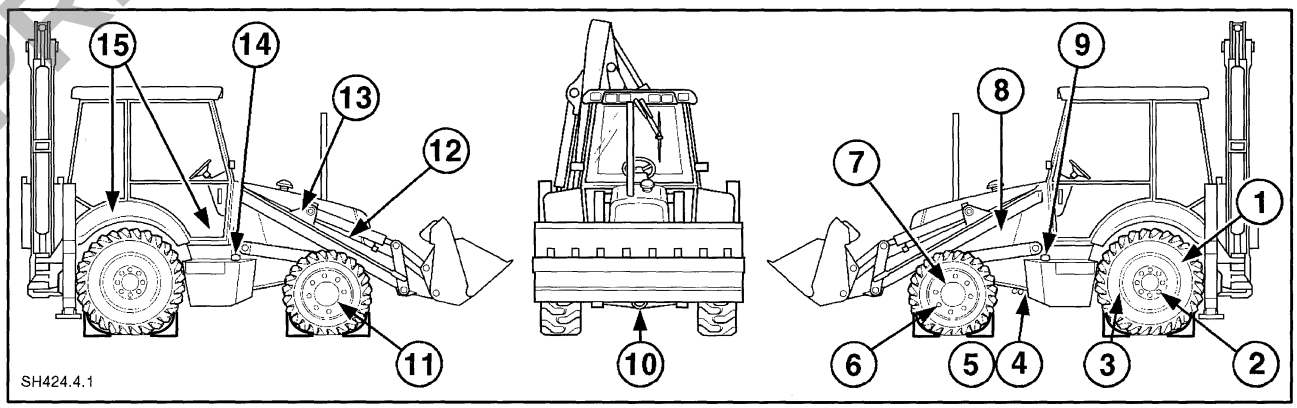
- FUEL TANK – Filler Cap (9)
  Capacity = 28 gallons – 106 Litres
- HYDRAULIC OIL RESERVOIR – Filler Cap (14)
  Capacity = 28 gallons – 106 Litres

Regular service operations listed should be checked every 10 hours or daily during the first 50 hours of operation.

NOTE: *Ensure that the machine is on level ground and that the cylinders are in the transport position, before checking oil levels. See 'Specifications' for lubricant quantities and types. To prevent dirt ingress when changing oils or filters, always clean the area around the filler, filters, level plugs and dipsticks before checking or changing.*

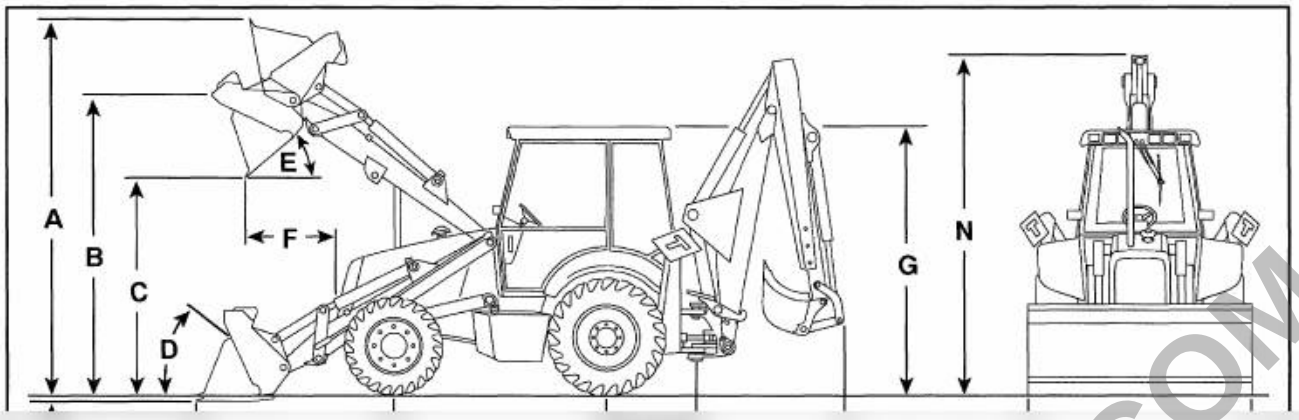
At the first 50 hour service (from new) ensure that the following service operations are carried out:

- Rear axle oil level check (1)
- Wheel nuts check for tightness (2&6)
- Hydraulic oil filter Change, check oil level (3)
- Transmission oil filter change, check oil level (5)
- Clean, inspect / grease front wheel bearings 2wd only (7)
- Engine oil filter change, check oil level (8)
- Differential oil check (four wheel drive only) (10)
- Axle hub oil check (four wheel drive only) (11)
- Check and adjust fan belt tension (12)
- Check brake oil level (15)



4-1

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SECTION 5

SYSTEM TROUBLESHOOTING

IMPORTANT: *The following trouble shooting table is designed for your guidance only. If any repairs are required beyond routine maintenance, your machine must be returned to your dealer who has the correct tools, facilities and knowledge to perform repairs to the correct specification and safe standard.*

QUICK REFERENCE GUIDE

Page No	Component
5-1	Engine
5-3	Transmission
5-4	Electrical
5-5	Whole Unit
5-5	Brakes
5-6	Cab

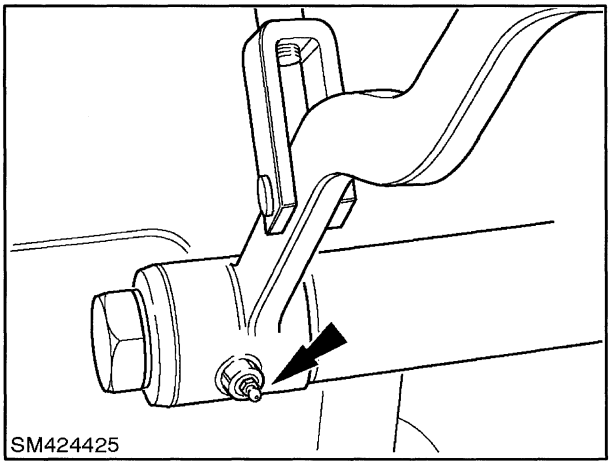
ENGINE

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine will not start, or starts with difficulty	Incorrect starting procedure	Review starting procedures
	Low or no fuel	Check fuel level
	Air in fuel lines	Bleed fuel system
	Incorrect engine oil viscosity	Use correct viscosity oil
	Incorrect fuel for operating temperature	Use correct type fuel for temperature conditions
	Contaminated fuel system	Clean system
	Clogged sedimenter	Clean sedimenter
	Clogged fuel filter	Replace filter element
	Malfunctioning fuel injector(s)	See your authorized dealer
	Malfunctioning fuel solenoid or solenoid relay	See your authorized dealer
Engine runs rough and/or stalls	Clogged sedimenter or fuel filter	Clean sedimenter and replace filter

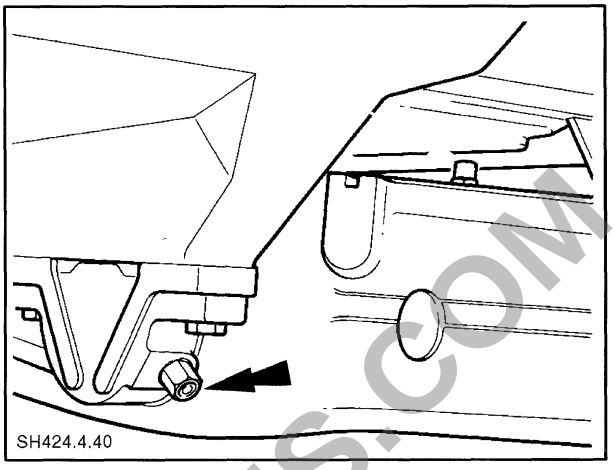
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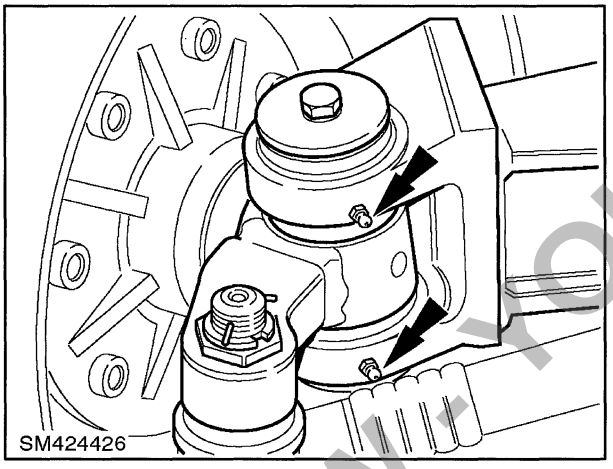
GREASE THE FOLLOWING LUBRICATION FITTINGS



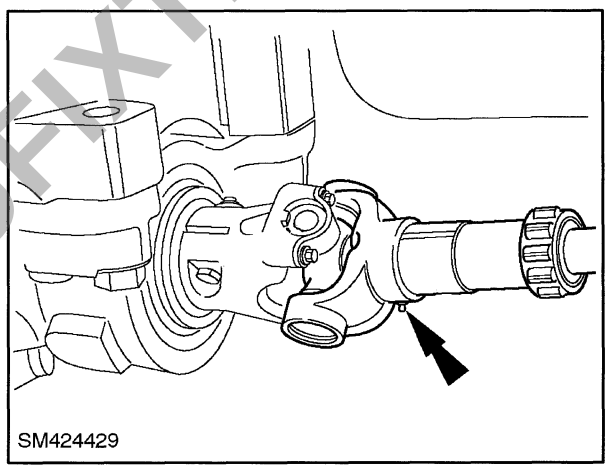
Differential Lock Linkage (1 of) 4-26



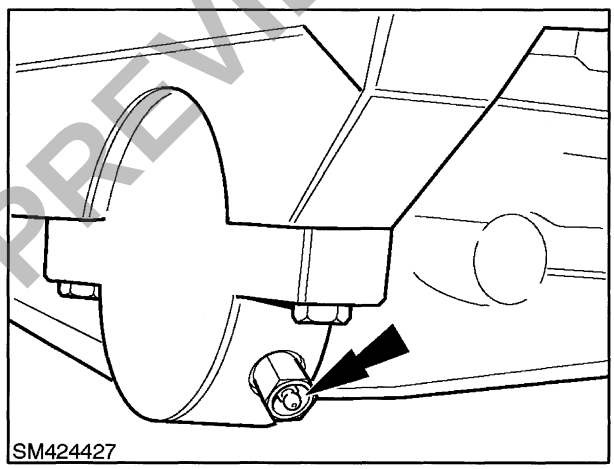
Front Axle Trunnion Bearings FWD (2 of) 4-29



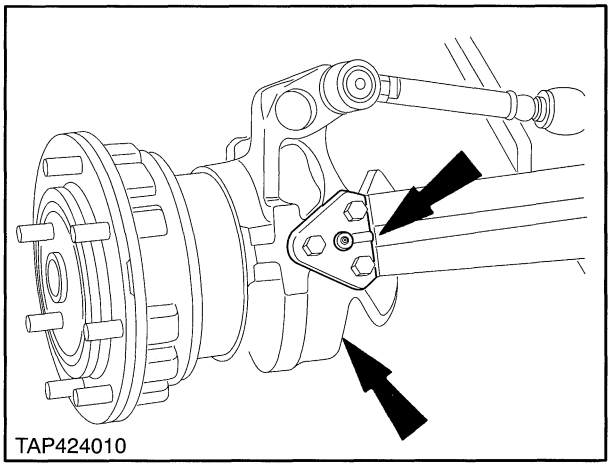
Front Wheel Spindles 2WD (4 of) 4-27



Drive Shaft Couplings – Front and Rear (12 of) 4-30



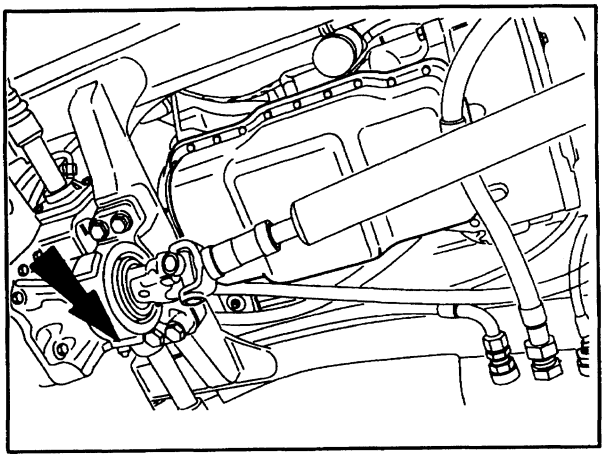
Front Axle Trunnion Bearing 2WD (2 of) 4-28



Front Wheel Drive Hub Swivel Bearings (6 of) 4-31

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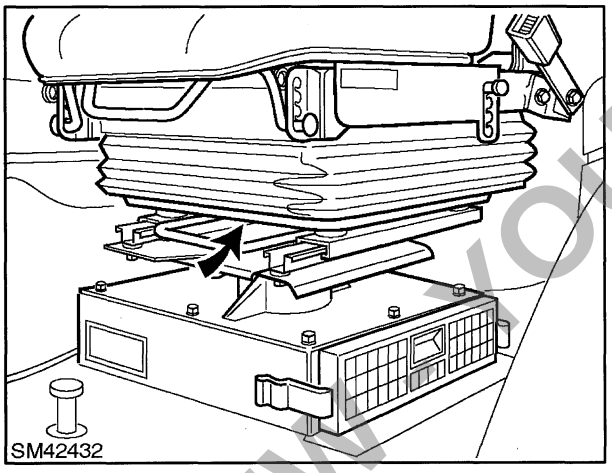
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4-32

FRONT AXLE SWIVEL BEARINGS (FOUR WHEEL DRIVE ONLY), Figure 4-32.

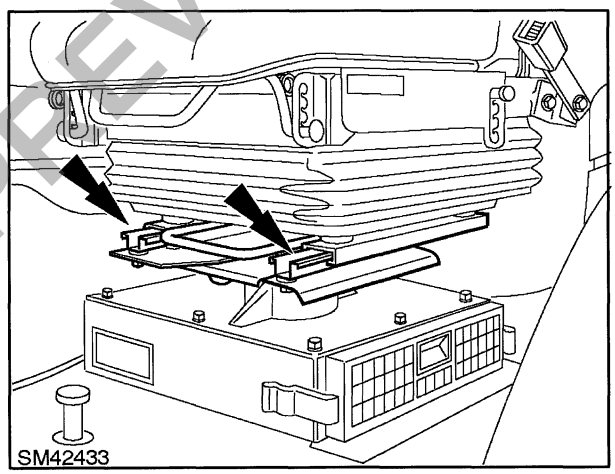
Swivel bearing shown requires greasing, ensure all points are greased.



4-33

SEAT SUSPENSION, Figure 4-33.

Position seat in the full height position and expose the suspension. Wipe clean all moving parts and apply a thin coating of (Dry Moly Coat Grease only) to ease adjustment.



4-34

SEAT RAILS, Figure 4-34.

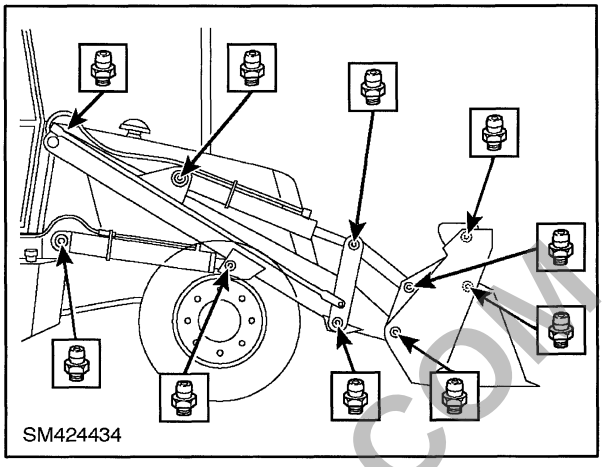
Place seat in full forward position, wipe the rails clean, lightly grease the rails, then place the seat in the full rearward position and service the front rails.

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LOADER GREASE FITTINGS, Figure 4-35 .

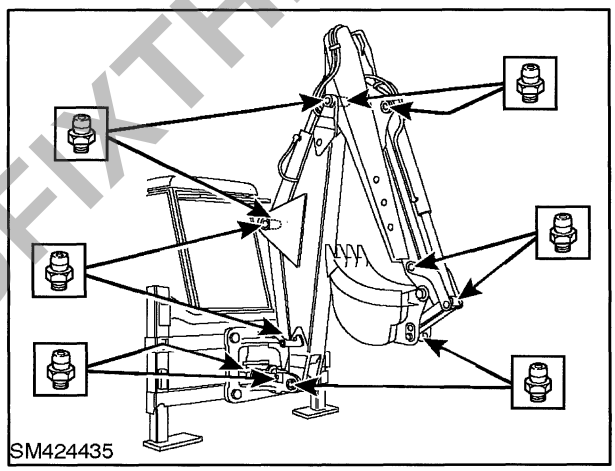
Lubricate the grease fittings on the loader and bucket, these can total up to (24 of) dependant upon the bucket fitted. Use the recommended grease as shown in Specifications, Section 6 and check all pivot pins and snap rings on the loader for wear or damage.



4-35

BACKHOE GREASE FITTINGS – SIDESHIFT, Figure 4-36.

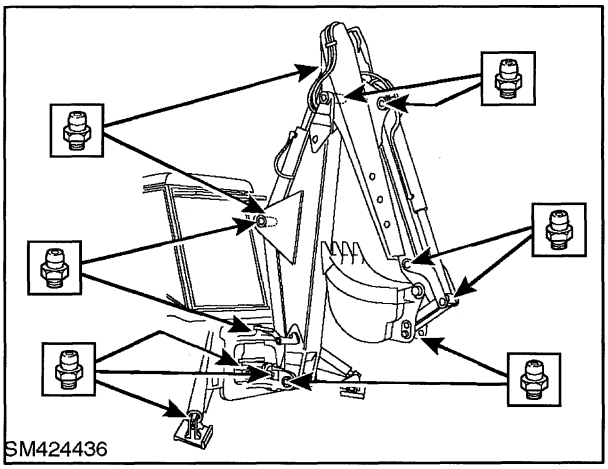
Lubricate the grease fittings on the backhoe and bucket, these can total up to (24 of) dependant upon the attachments fitted. Use the recommended grease as shown in Specifications, Section 6. Use sufficient clean grease to force out the old. When greasing the swing cylinder trunnions pump sufficient grease into each trunnion to force clean grease through the top of each trunnion. This operation should be carried out more frequently under adverse operating conditions.



4-36

BACKHOE GREASE FITTINGS – CENTER PIVOT, Figure 4-37.

Lubricate the grease fittings on the backhoe and bucket, these can total up to (30 of) dependant upon the attachment fitted. Use the recommended grease, see Specifications Section 6. Use sufficient clean grease to force out the old. This operation should be carried out more frequently under adverse operating conditions.



4-37

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ENGINE (Continued)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine runs rough and/or stalls	Contaminated fuel system	Clean system
	Fuel solenoid not properly adjusted	See your authorized dealer
	Malfunctioning fuel injector(s)	See your authorized dealer
Engine does not develop full power	Engine overloaded	Shift to lower gear or reduce load
	Air cleaner restricted	Service air cleaner
	Clogged sedimenter or fuel filter	Clean sedimenter and replace filter
	Incorrect type of fuel	Use correct fuel
	Engine overheated	See Engine Overheats
	Low engine operating temperature	Check thermostats
	Incorrect valve clearance	Check and adjust
	Malfunctioning fuel injector(s)	Have authorized dealer check injectors
	High idle speed is low	See your authorized dealer
Engine knocks	Low oil level	Add correct grade of oil
	Low oil pressure	See your authorized dealer
	Engine overheated	See Engine Overheats
Low engine operating temperature	Malfunctioning thermostat(s)	Replace thermostat(s)
Low oil pressure	Low oil level	Add oil as required
	Wrong grade or viscosity oil	Drain and refill with correct grade and viscosity oil
Excessive oil consumption	Engine oil level too high	Reduce oil level
	Incorrect viscosity oil	Use correct viscosity
	External oil leaks	Repair leaks
	Plugged breather tube vent filter	Replace vent filter
Engine overheats	Dirty radiator core	Clean

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ENGINE (Continued)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine overheats	Excessive engine load	Shift to a lower gear or reduce load
	Low engine oil level	Add oil as required.
	Low coolant level	Fill coolant recovery tank. Check cooling system for leaks.
	Faulty radiator cap	Replace cap
	Loose or worn fan belt	Check automatic tensioner. Replace belt if worn
	Cooling system plugged	Flush cooling system
	Malfunctioning thermostat(s)	Check thermostats
	Hose connection leaking	Tighten hose connection
	Malfunctioning temperature gauge or sender	See your authorized dealer
Excessive fuel consumption	Incorrect type of fuel	Use correct fuel
	Clogged or dirty air cleaner	Service air cleaner
	Engine overloaded	Shift to lower gear or reduce load
	Incorrect valve clearance	Check and adjust
	Implement incorrectly adjusted	See implement operator's manual for proper operation
	Low engine temperature	Check thermostats
	Excessive ballast	Adjust ballast to current load
	Fuel injection nozzles dirty	Have authorized dealer service the injectors

TRANSMISSION (POWER SHUTTLE)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Transmission will not operate	Low oil supply	Fill system with oil and check pump pressure
Transmission operation poor or jerky	Modulator valve sticking or requires resetting	Consult you authorized dealer
	Electrical Connections Loose	Check electrical continuity
	Torque Convertor Worn	Replace as necessary

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TRANSMISSION (POWER SHIFT)

PROBLEM	POSSIBLE CAUSE	CORRECTION
Transmission will not operate	Low oil supply	Fill system with oil and check pump pressure
	Modulator Valve/Solenoid Failure	Consult you authorized dealer
	Power Shift Microprocessor disabled drive detecting a fault in the transmission	Consult you authorized dealer
Transmission operation poor or jerky	Modulator valve sticking	Consult your authorized dealer
	Electrical Connections Loose	Check electrical continuity
	Low Oil Pressure	Consult your authorized dealer
Transmission Overheating Torque Convertor Slipping	Low oil supply	Fill system with oil
	Oil cooler air flow blocked	Clean all debris away from radiator
	Torque Convertor Worn	Consult your authorized dealer
	Handbrake dragging on	Adjust brake disc clearance

ELECTRICAL SYSTEM

PROBLEM	POSSIBLE CAUSE	CORRECTION
Electrical system is inoperative	Loose or corroded battery connections	Clean and tighten connections
	Sulphated batteries	Check battery open circuit voltage for 12.6 volts minimum. Check electrolyte level and specific gravity.
	Battery Isolator switch turned 'off'	Re–instate isolator switch
	Main machine fuse link blown	Establish reason of failure and replace fuse link
Starter speed low and engine cranks slowly	Loose or corroded connections	Clean and tighten loose connections
	Low battery output	Check battery open circuit voltage for 12.6 volts minimum. Check electrolyte level and specific gravity.
	Incorrect viscosity engine oil	Use correct viscosity oil for temperature conditions
Starter inoperative	Transmission shift lever in gear	Place shift lever in neutral
	Loose or corroded connections	Clean and tighten loose connections
	Dead batteries	Charge or replace batteries.

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PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements ("CAUTION", "WARNING", and "DANGER") followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.



CAUTION: THE WORD "CAUTION" IS USED WHERE A SAFE BEHAVIORAL PRACTICE ACCORDING TO OPERATING AND MAINTENANCE INSTRUCTIONS AND COMMON SAFETY PRACTICES WILL PROTECT THE OPERATOR AND OTHERS FROM ACCIDENT INVOLVEMENT.



WARNING: THE WORD "WARNING" DENOTES A POTENTIAL OR HIDDEN HAZARD WHICH HAS A POTENTIAL FOR SERIOUS INJURY. IT IS USED TO WARN OPERATORS AND OTHERS TO EXERCISE EVERY APPROPRIATE MEANS TO AVOID A SURPRISE INVOLVEMENT WITH MACHINERY.



DANGER: THE WORD "DANGER" DENOTES A FORBIDDEN PRACTICE IN CONNECTION WITH A SERIOUS HAZARD.

FAILURE TO FOLLOW THE "CAUTION", "WARNING", AND "DANGER" INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

MACHINE SAFETY

Additional precautionary statements ("ATTENTION" and "IMPORTANT") are followed by specific instructions. These statements are intended for machine safety.

ATTENTION: The word "ATTENTION" is used to warn the operator of potential machine damage if a certain procedure is not followed.

IMPORTANT: The word "IMPORTANT" is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.

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