DX31, DX34
REPAIR MANUAL
COMPLETE CONTENTS

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The following pages are the collation of the contents pages from each section and chapter of the DX31, DX34 Repair manual. Complete Repair part # 87535061.

The sections used through out all Case IH product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the DX31, DX34 Tractors.

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87535066 3/06

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SECTION 00 - GENERAL INFORMATION

BOOK 1 - 87535062

Chapter 1 - General Information

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PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements ("**DANGER**", "**WARNING**", and "**CAUTION**") 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.

⚠ DANGER ⚠

This word "DANGER" indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is RED.

⚠ WARNING ⚠

This word "WARNING" indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is ORANGE.

⚠ CAUTION ⚠

This word "CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

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

MACHINE SAFETY

The precautionary statement ("**IMPORTANT**") is followed by specific instructions. This statement is intended for machine safety.

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.*

INFORMATION

NOTE: *Instructions used to identify and present supplementary information.*

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SPECIFICATIONS

	Model DX31—Hydrostatic/Gear	Model DX34—Hydrostatic
ENGINE		
Type	Diesel	Diesel
Engine Gross Horsepower	23.1 kw (31)	26.1 kw (35)
Cylinders	3	3
Bore	84 mm (3.31″)	84 mm (3.31″)
Stroke	80 mm (3.15″)	100 mm (3.94″)
Displacement	1.33 L (81.2 cu. in.)	1.65 L (101.1 cu. in.)
Compression Ratio	22.7:1	22.2:1
Firing Order	1-2-3	1-2-3
Low Idle Speed	1000 RPM	1000 RPM
Maximum Speed:		
High Idle	2840 ± 25 RPM	2840 ± 25 RPM
Rated	2600 RPM	2600 RPM
Valve Clearance (Cold):		
Intake	0.20 mm (0.008″)	0.20 mm (0.008″)
Exhaust	0.20 mm (0.008″)	0.20 mm (0.008″)
CAPACITIES		
Fuel Tank	27.6 liters/ 7.3 U.S. gals.	27.6 liters/ 7.3 U.S. gals.
Cooling System	5.2 liters/ 5.5 U.S. qts.	5.2 liters/ 5.5 U.S. qts.
Engine Crankcase:		
With Filter	4.0 liters/ 4.2 U.S. qts.	4.0 liters/ 4.2 U.S. qts.
Rear Axle & Transmission (Includes Hydraulics)		
Gear	32.5 liters/ 8.6 U.S. gals.	
HST	33.3 liters/ 8.8 U.S. gals.	33.3 liters/ 8.8 U.S. gals.
Front Axle Final Reduction	0.8 liters/ 0.85 U.S. qts.	0.8 liters/ 0.85 U.S. qts.
Differential Gear Case	1.4 liters/ 1.5 U.S. qts.	1.4 liters/ 1.5 U.S. qts.

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MINIMUM HARDWARE TIGHTENING TORQUES

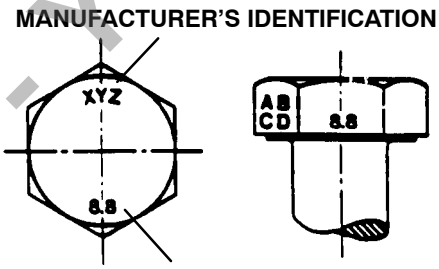
IN NEWTON-METERS (FOOT POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS

METRIC NON-FLANGED HARDWARE AND LOCKNUTS

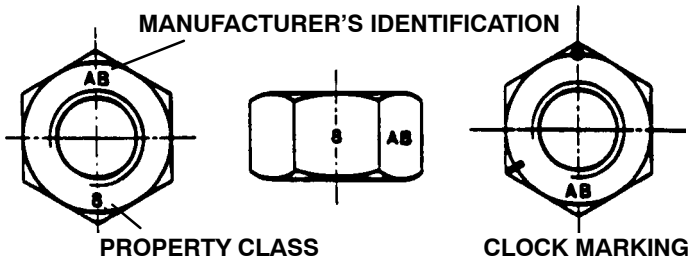
NOMINAL SIZE	CLASS 5.8		CLASS 8.8		CLASS 10.9		LOCKNUT CL.8 W/CL8.8 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	
M4	1.7 (15)*	2.2 (19)*	2.6 (23)*	3.4 (30)*	3.7 (33)*	4.8 (42)*	2.3 (20)*
M6	5.8 (51)*	7.6 (67)*	8.9 (79)*	12 (102)*	13 (115)*	17 (150)*	7.8 (69)*
M8	14 (124)*	18 (159)*	22 (195)*	28 (248)*	31 (274)*	40 (354)*	19 (169)*
M10	28 (21)	36 (27)	43 (32)	56 (41)	61 (45)	79 (58)	38 (28)
M12	49 (36)	63 (46)	75 (55)	97 (72)	107 (79)	138 (102)	66 (49)
M16	121 (89)	158 (117)	186 (137)	240 (177)	266 (196)	344 (254)	164 (121)
M20	237 (175)	307 (226)	375 (277)	485 (358)	519 (383)	671 (495)	330 (243)
M24	411 (303)	531 (392)	648 (478)	839 (619)	897 (662)	1160 (855)	572 (422)

NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION
HEX CAP SCREW AND CARRIAGE BOLTS
CLASSES 5.6 AND UP



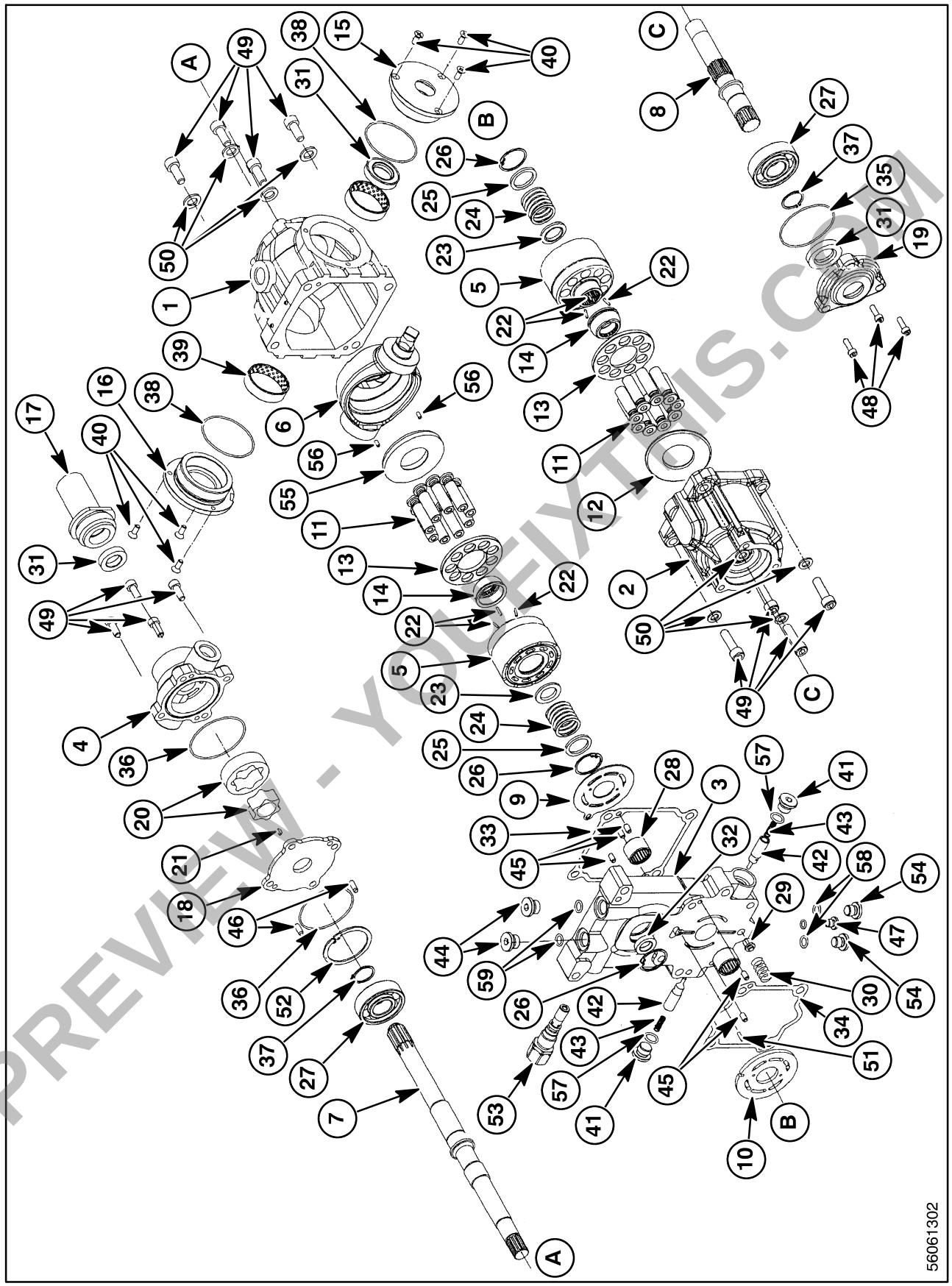
HEX NUTS AND LOCKNUTS
CLASSES 05 AND UP



86529681 REV F 5.1

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ELECTRICAL SCHEMATIC DIAGRAM 87301211
CASE IH CLASS 2 NAR COMPACT TRACTOR

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GROUNDS	15
HAZARD MODULE/SWITCH	12
INSTRUMENTS	10
MAIN LIGHTS	11
SAFETY SYSTEM	8,9
STARTING SYSTEM	7
WARNING/POSITION LIGHTS	13

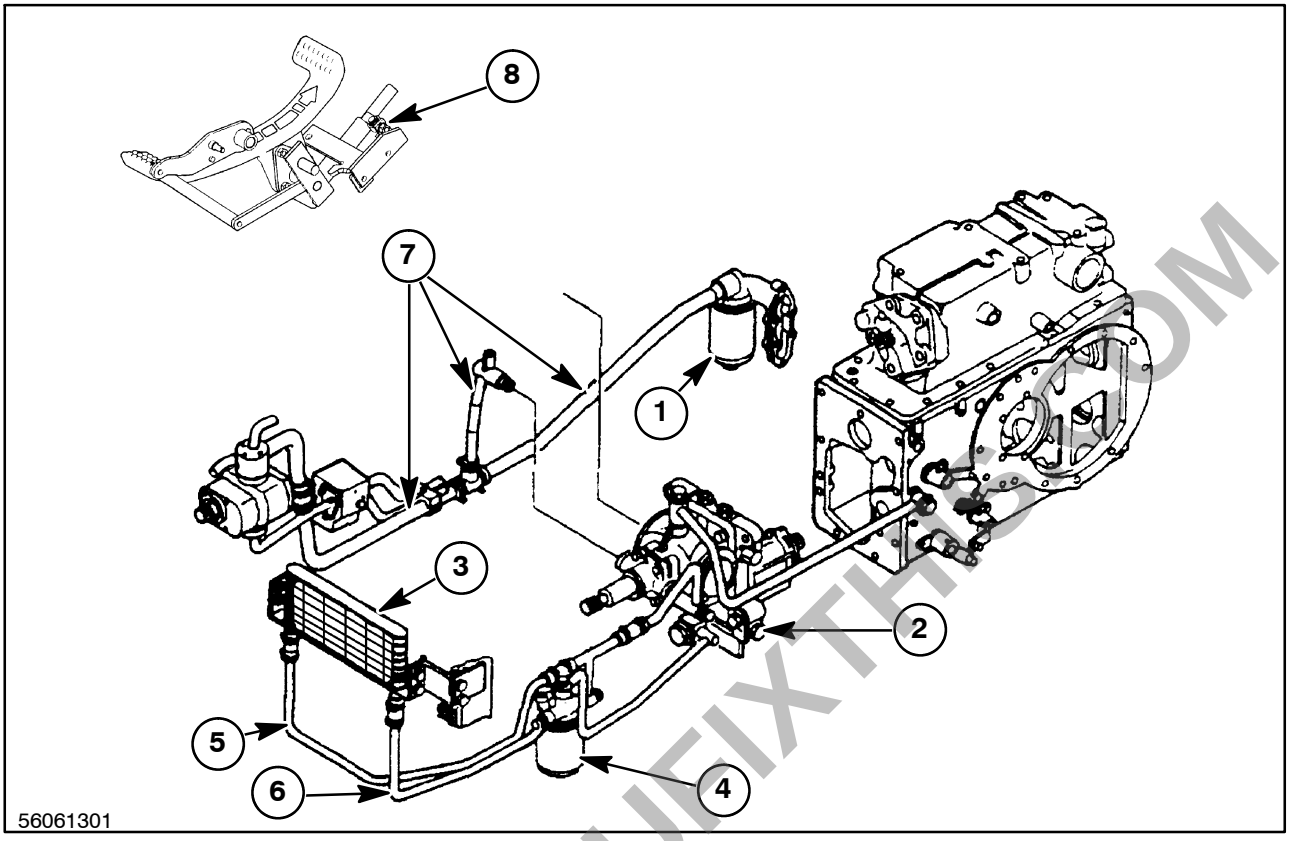


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PAGE 1

1

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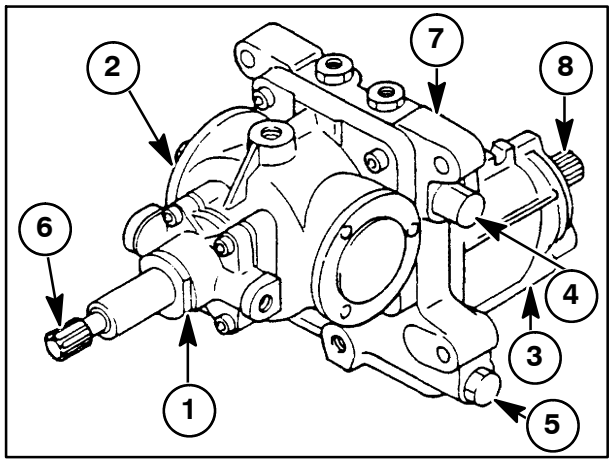


4

1. Suction Filter (Hydraulic)
2. Hydrostatic Unit
3. Oil Cooler
4. Filter (HST)
5. Oil Line To Cooler
6. Oil Line From Cooler
7. Suction Tube
8. Foot Pedal Control

The hydrostatic unit uses fluid contained in the rear axle and transmission gearbox reservoir compartment. The hydrostatic system consists of an inlet (suction) filter, 1, hydrostatic transmission unit, 2, transmission fluid cooler, 3, HST filter, 4, and connecting tubing, 5, 6 and 7.

The hydrostatic unit consists of a charge pump, 1, variable displacement piston type pump, 2, fixed displacement piston type motor, 3, high pressure relief valve, 4, two feed (check) valves and neutral valve assemblies, 5, and an internal charge pump relief valve. The input shaft, 6, driven by the engine clutch, is splined to the variable displacement piston pump and extends out the port block, 7, to drive the PTO shaft. The charge pump, 1, driven by the input shaft, 6, draws fluid from the transmission sump and charges the hydraulic system with fluid under pressure at all times. High pressure fluid supplied by the piston pump, 2, drives the motor, 3, and powers the transmission assembly, through drive shaft, 8.



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TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Engine does not develop full power	Clogged air cleaner	Inspect and replace air cleaner if necessary
	Fuel line obstructed	Check for crimped fuel line. Inspect fuel filter for cleanliness
	Improper injection timing	Repair/ replace components as required
	Improper nozzle injection pressure and angle	Check injection timing Inspect for proper injection pressure an angle
	Low cylinder compression	Check engine compression
	Insufficient fuel injection	Repair at authorized shop
	Improper valve lash adjustment	Adjust valves to correct tolerances
	Burned, worn or sticking valves	Inspect and replace as necessary
	Blown head gasket	Replace head gasket
	Worn or sticking piston rings	Overhaul as necessary
	Faulty engine stop solenoid	Replace stop solenoid
Low oil pressure	Engine oil level low	Fill to proper level
	Wrong grade of oil	Replace with correct grade oil
	Clogged oil pump filter	Change oil and filter
	Faulty oil pressure relief valve	Replace relief valve
	Worn oil pump drive shaft gears, or broken oil pipe	Inspect oil system and components. Replace defective components
	Excessive main or connecting rod bearing clearances	Replace bearings or shaft if necessary
	Oil pump axial clearance not properly set	Check pump clearance and shim as needed to proper tolerance
Engine will not stop	Faulty engine stop solenoid	Replace the stop solenoid
	Faulty starter switch	Replace starter switch
Low cylinder compression	Burned, worn or sticking valves	Replace valves
	Bent valve stem	Replace valves
	Broken or weak valve spring	Replace valve spring
	Blown cylinder head gasket	Replace head gasket
	Worn or sticking piston rings	Replace piston rings
	Scored piston	Replace piston
Poor engine idling	Improper injection timing	Correct the injection timing
	Air in injection pump	Purge air from the system
	Improper governor adjustment	Adjust the governor

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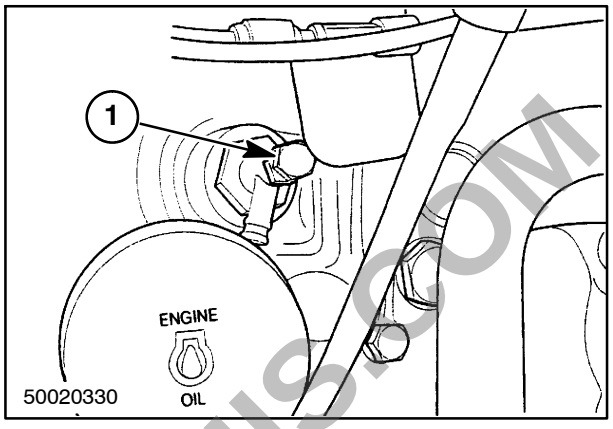
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OVERHAUL – ENGINE

ENGINE

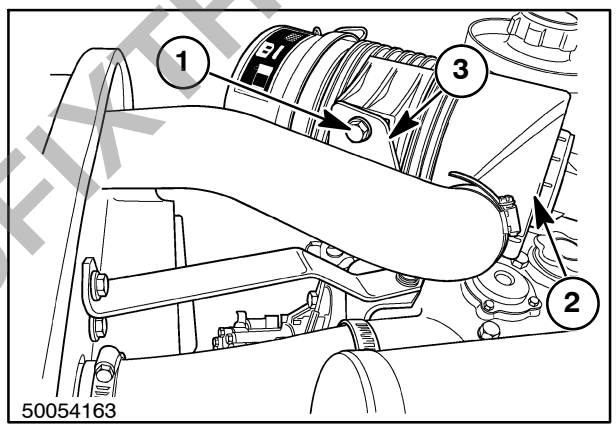
Preparation

1. Turn coolant tap bolt, 1, counterclockwise to drain fluid. Remove the radiator assembly. See “Radiator Removal”, discussed later in this section.



6

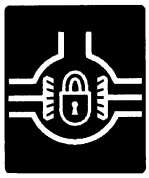
2. Remove bolts, 1, fastening the air cleaner assembly, 2, to the tractor. Remove the mounting bracket, 3, from engine.



7

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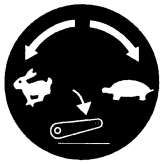
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Differential Lock
PART NO:
86532901
LOCATION:
Left Side Operator's Platform (HST)
Right Side Operator's Platform (Gear)



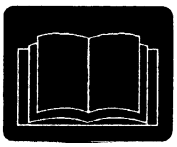
Starter Switch
PART NO:
86400175
LOCATION:
Right Console Panel



Flow Control Valve
PART NO:
86532897
LOCATION:
Top of Flow Control Knob



Engine Oil
PART NO:
86532916
LOCATION:
Engine Oil Filler Cap



Hyd. Manifold Operation
(See Operator's Manual)
PART NO:
86532914
LOCATION:
Top Side of Hyd. Manifold/Air Filter Cap



(Optional)
Coupler-Extending
PART NO:86532920



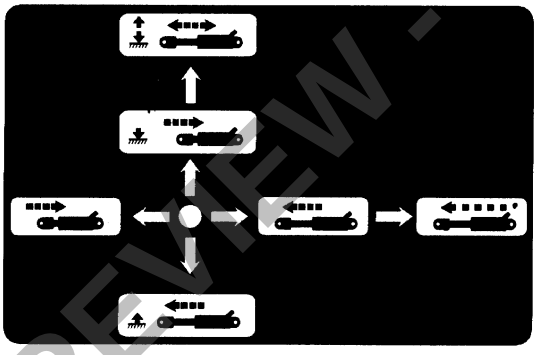
(Optional)
Coupler-Retracting
PART NO:86532919



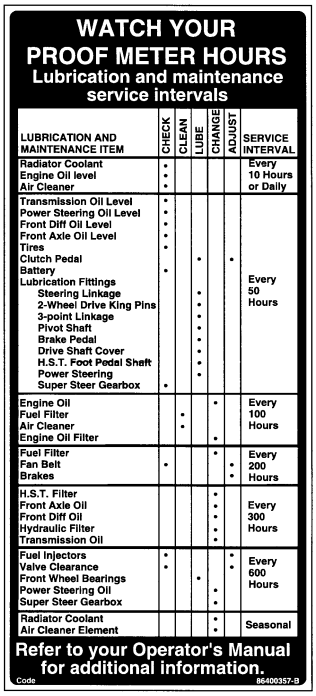
(Optional)
Coupler-Extending
PART NO:86532921



(Optional)
Coupler-Retracting
PART NO:86532922



Optional)
Operating Remote Control Valve-Double Spool
PART NO:
86532911
LOCATION:
Cover of 2-Spool Remote Valve



WATCH YOUR PROOF METER HOURS
Lubrication and maintenance service intervals

LUBRICATION AND MAINTENANCE ITEM	CHECK	CLEAN	LUBE	CHANGE	ADJUST	SERVICE INTERVAL
Radiator Coolant	•					Every 10 Hours or Daily
Engine Oil level	•					
Air Cleaner	•					
Transmission Oil Level	•					Every 50 Hours
Power Steering Oil Level	•					
Front Diff Oil Level	•					
Front Axle Oil Level	•					
Tires	•					
Clutch Pedal			•		•	
Battery	•					
Lubrication Fittings						
Steering Linkage			•			
2-Wheel Drive King Pins			•			
3-point Linkage			•			
Pivot Shaft			•			
Brake Pedal			•			
Drive Shaft Cover			•			
H.S.T. Foot Pedal Shaft			•			
Power Steering			•			
Super Steer Gearbox	•					
Engine Oil				•		Every 100 Hours
Fuel Filter		•				
Air Cleaner		•				
Engine Oil Filter				•		
Fuel Filter				•		Every 200 Hours
Fan Belt	•				•	
Brakes					•	
H.S.T. Filter				•		Every 300 Hours
Front Axle Oil				•		
Front Diff Oil				•		
Hydraulic Filter				•		
Transmission Oil				•		
Fuel Injectors	•				•	Every 600 Hours
Valve Clearance	•				•	
Front Wheel Bearings			•			
Power Steering Oil				•		
Super Steer Gearbox				•		
Radiator Coolant					•	Seasonal
Air Cleaner Element					•	

Refer to your Operator's Manual for additional information.

Code 86400357-B

Lubrication and Maintenance Intervals
PART NO:
86400357
LOCATION:
Inside of Hood

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INSTRUCTION DECALS

Range Selector Lever (Gear)
PART NO: 87301630
LOCATION: Left-Hand POD Top



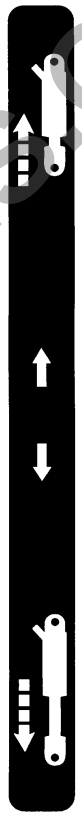
Range Selector Lever (Hydrostatic)
PART NO: 87301627
LOCATION: Left-Hand POD Top



Position Control Lever
PART NO: 86571897
LOCATION: Right-Hand POD Top



(Optional) Operating Remote Control Valve-Single Spool
PART NO: 86532910
LOCATION: Right-Hand POD Top



Front-Wheel Drive Control Lever
PART NO: 86532913
LOCATION: Left-Hand POD Top (Super Steer™ only)



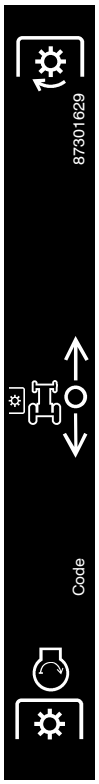
Front-Wheel Drive Control Lever
PART NO: 86532900
LOCATION: Left-Hand POD Top



PTO Control Lever (Rear)
PART NO: 87301628
LOCATION: Left-Hand POD Top



PTO Control Lever (Mid)
PART NO: 87301629
LOCATION: Left-Hand POD Top



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SECTION 10 - ENGINE

BOOK 1 - 87535062

Chapter 1 - Engine Systems (Continued)

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	Removal	32
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	Removal	33
10 101	Cylinder Head	34
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MINIMUM HARDWARE TIGHTENING TORQUES

IN NEWTON-METERS (FOOT POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS

INCH NON-FLANGED HARDWARE AND LOCKNUTS

NOMINAL SIZE	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		LOCKNUTS		NOMINAL SIZE
	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	GR.B w/GR5 BOLT	GR.C w/GR8 BOLT	
1/4	6.2 (55)*	8.1 (72)*	9.7 (86)*	13 (112)*	14 (121)*	18 (157)*	8.5 (75)*	12.2 (109)*	1/4
5/16	13 (115)*	17 (149)*	20 (178)*	26 (229)*	28 (250)*	37 (324)*	17.5 (155)*	25 (220)*	5/16
3/8	23 (17)	30 (22)	35 (26)	46 (34)	50 (37)	65 (48)	31 (23)	44 (33)	3/8
7/16	37 (27)	47 (35)	57 (42)	73 (54)	80 (59)	104 (77)	50 (37)	71 (53)	7/16
1/2	57 (42)	73 (54)	87 (64)	113 (83)	123 (91)	159 (117)	76 (56)	108 (80)	1/2
9/16	81 (60)	104 (77)	125 (92)	163 (120)	176 (130)	229 (169)	111 (82)	156 (115)	9/16
5/8	112 (83)	145 (107)	174 (128)	224 (165)	244 (180)	316 (233)	153 (113)	215 (159)	5/8
3/4	198 (146)	256 (189)	306 (226)	397 (293)	432 (319)	560 (413)	271 (200)	383 (282)	3/4
7/8	193 (142)	248 (183)	495 (365)	641 (473)	698 (515)	904 (667)	437 (323)	617 (455)	7/8
1	289 (213)	373 (275)	742 (547)	960 (708)	1048 (773)	1356 (1000)	654 (483)	924 (681)	1

NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION
CAP SCREWS AND CARRIAGE BOLTS



SAE GRADE 2 | SAE GRADE 5 | SAE GRADE 8

REGULAR NUTS | SAE GRADE 5 HEX NUTS | SAE GRADE 8 HEX NUTS

LOCKNUTS



GRADE IDENTIFICATION
GRADE A NO NOTCHES
GRADE B ONE CIRCUMFERENTIAL NOTCH
GRADE C TWO CIRCUMFERENTIAL NOTCHES



GRADE IDENTIFICATION
GRADE A NO MARKS
GRADE B THREE MARKS
GRADE C SIX MARKS
MARKS NEED NOT BE LOCATED AT CORNERS



GRADE A NO MARK
GRADE B LETTER B
GRADE C LETTER C

GRADE IDENTIFICATION

86529681 REV F 5.2

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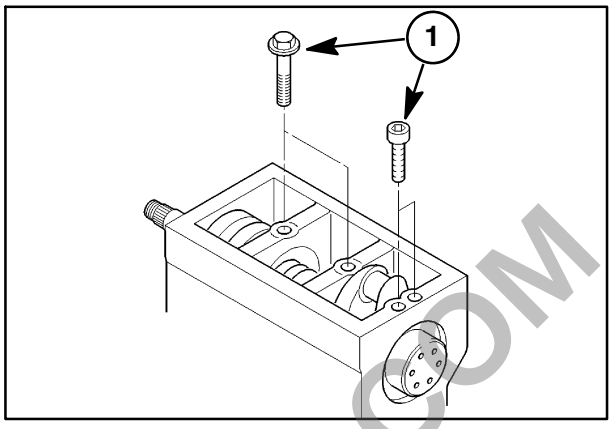
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CRANKSHAFT AND BEARING HOLDER

Installation

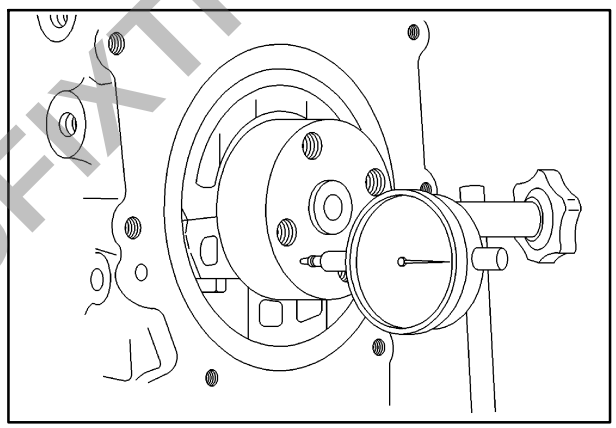
1. Install the crankshaft with bearing holders through the rear of the cylinder block.
2. Align the threaded holes on the bearing holders with the bolt holes in the cylinder block.
3. At the flywheel end install the two socket head hex bolts, at each center bearing install the hex head bolt. Torque the socket head bolts to 24 - 31 N·m (18 - 22 ft. lbs.). Torque the hex head bolts to 49 - 54 N·m (36 - 40 ft. lbs.).
4. Using a dial indicator, measure the crankshaft end float (thrust).If the thrust is not within the allowable limit, remove the crankshaft and check the thrust washers.

Standard Thrust	Allowable Limit
0.1 - 0.4 mm (0.004 - 0.016″)	0.5 mm (0.020″)



82

1. Bearing Holder Bolts



83

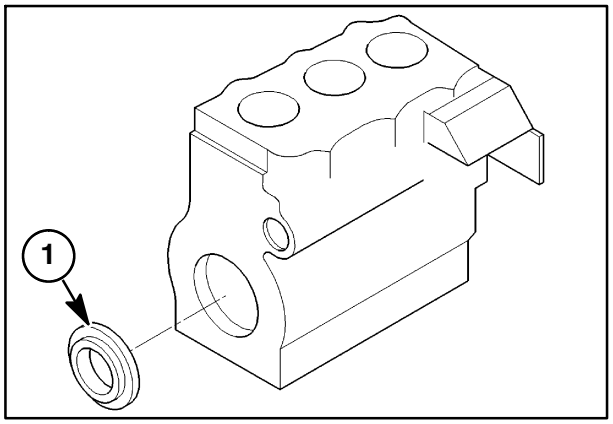
REAR OIL SEAL AND BACKPLATE

Installation

1. Install the rear oil seal, 1, over the rear of the crankshaft.

NOTE: *The rear oil seal is a press fit retained by the backplate.*

2. Apply liquid gasket sealer to the backplate attaching bolts,install the back and tighten the back plate bolts to 14 - 18 N·m (10 - 13 ft. lbs.).



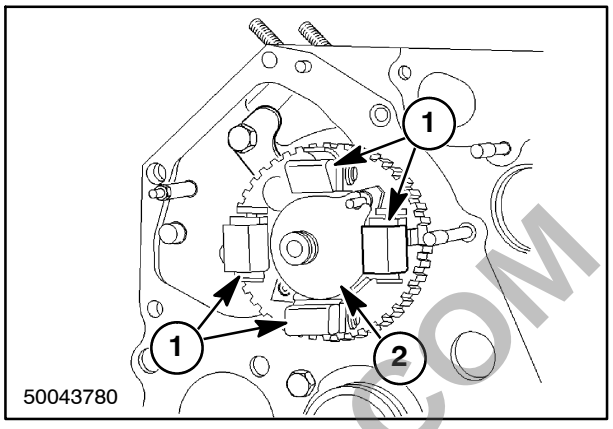
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As the engine speed decreases the governor weights, 1, pivot inward allowing the slider cone, 2, to move rearward.

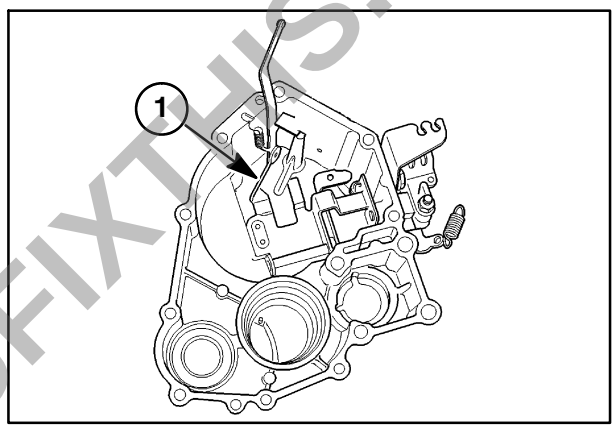
As the slider cone, 2, moves rearward, the governor linkage arm, 1, allows the fuel injection pump rack to move rearward to the full fuel position and the engine speed increases.



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Engine speed depends upon several factors. The throttle setting determined by governor spring tension. The pressure exerted by the slider cone on the governor linkage, and positioning of the injection pump rack.

All the governor linkage parts are located inside the engine timing gear cover, 1. To inspect or replace any of the governor linkage parts, the timing gear case and injection pump must be removed from the engine. As discussed earlier in Section 1.



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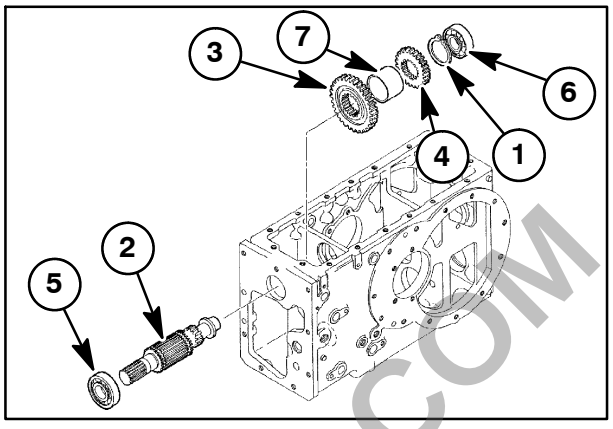
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REAR MAIN SHAFT AND GEARS

Removal

1. Remove the snap ring, 1, from it's shaft groove and slide it to the rear of the shaft, 2.
2. While sliding the gears, 3 and 4, rearward on the shaft, gently drive the shaft forward, removing it from the case.
3. Remove bearings, 5 and 6, from the shaft.
4. Remove snap ring, 1, high gear (36T), 3, mid range gear (24T), 4, and collar, 7, from the main shat, 2.

NOTE: *The low range gear (11T) is part of the main shaft.*



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RANGE GEAR SHIFT RAIL, ARM AND FORK

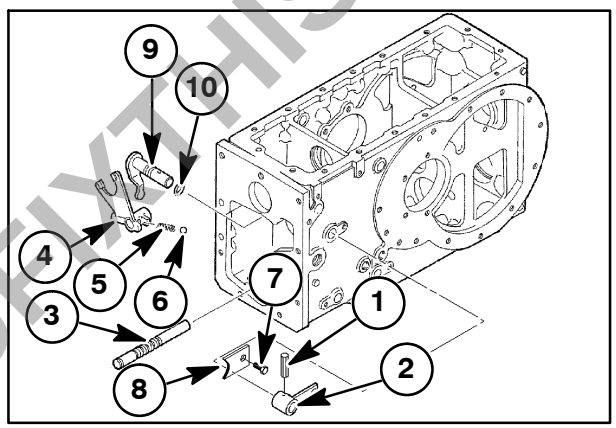
Removal

NOTE: *To remove shifter arm, 9, the drive pinion shaft must first be removed. See "Drive Pinion Removal" in Section 27-Differential.*

1. Drive the roll pin, 1, from the change lever, 2. Remove the change lever.
2. Pull the shift rail, 3, forward and remove from the front of the case.

NOTE: *Use care not to lose the detent ball and spring when the shift rail is separated from the shift fork.*

3. Remove the shift fork, 4, detent spring, 5, and detent ball, 6.
4. Remove bolt, 7, and retaining plate, 8.
5. Remove the shift arm, 9, and O ring, 10.



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DRIVE PINION AND GEARS

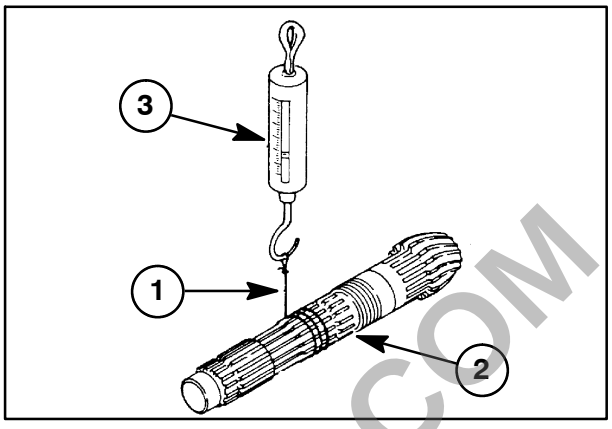
Removal

See "Section 27 – Differential" for Removal and disassembly procedures.

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5. Adjust the pinion bearing preload using a strong cord, 1, wrapped around the pinion shaft, 2, and pull scale, 3. Tighten the pinion locknut to obtain the specified pounds of constant pull to rotate the pinion assembly. Preload for new bearings at a constant load should be 13 - 17 kg (29 - 38 lbs.), for original bearings preload should be 6.5 - 8.5 kg (14.3 - 18.8 lbs.).

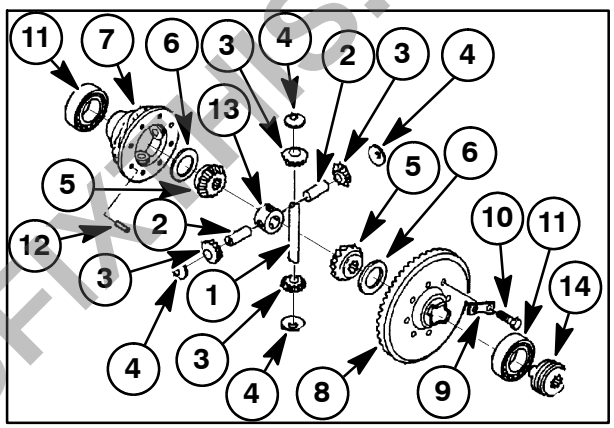


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DIFFERENTIAL

Assembly and Installation

1. Assemble the differential pinion shafts, 1 and 2, pinion gears, 3, thrust washers, 4, and side gears, 5, with thrust washers, 6, into the differential housing, 7.
2. Install the ring gear, 8, and lock plates, 9. Using new bolts, 10, tighten to 40 - 63.7 N·m (36.2 - 47 ft. lbs.). Bend lock plates over bolt heads to prevent hardware from loosening.



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1. Pinion Shaft
2. Pinion Shaft (2)
3. Pinion Gears (4) - 10T
4. Thrust Washer
5. Differential Side Gears (2) - 16T
6. Thrust Washer
7. Differential Housing
8. Ring Gear - 47T
9. Locking Plate (4)
10. Bolt
11. Ball Bearing
12. Dowel Pin
13. Joint
14. Differential Lock Clutch

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NEUTRAL VALVE

Disassembly

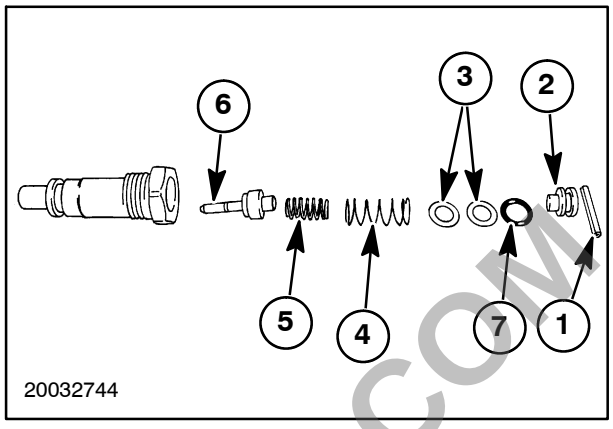
1. The neutral valves can be disassembled if needed. Drive roll pin, 1, from valve body, remove end cap, 2, shims, 3, outer spring, 4, inner spring, 5, and valve poppet, 6. O ring, 7, can be replaced on end cap if needed.

Inspection

2. Check valve body for damage to the poppet seat or for contamination. Insert poppet into valve body and check for binding during poppet travel in valve bore.

Assembly

3. To reassemble, insert poppet, 6, inner spring, 5, outer spring, 4, shims, 3, end cap, 2, with O ring, 7. While pushing end cap into valve body drive roll pin, 1, into valve body.



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CHARGE PUMP RELIEF VALVE

The charge pump relief valve, 1, functions to maintain approximately 5.2 - 6.6 bar (75 - 95 psi) of pressure in the oil supply system to the piston pump at all times. Excess oil not required by the piston pump is returned to the sump via the charge pump relief valve.

Disassembly

Remove the spring and valve, 1, from the hydrostatic motor side of the port block, 2.

Inspection

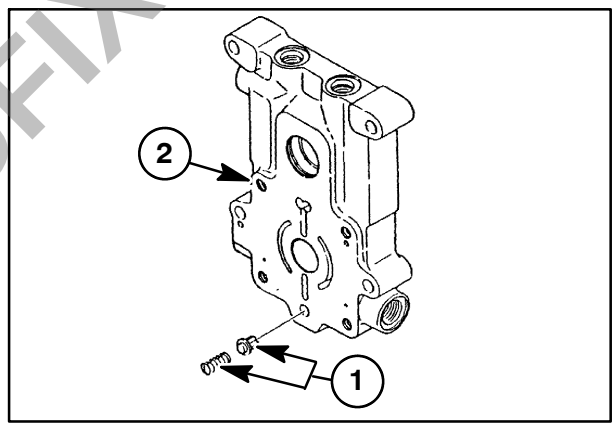
1. Inspect the valve seat for excess wear or scoring. Check the valve in the bore for a sticking or binding condition.
2. Inspect the valve spring for wear or damage.

NOTE: *If damage is observed, replace the valve and spring as a kit assembly.*

Assembly

Install the valve and spring, 1, in the motor side of the port block, 2.

NOTE: *Use petroleum jelly to retain spring to motor housing during assembly. Do not use grease.*



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SECTION 35 - HYDRAULIC SYSTEM

Chapter 1 - Hydraulic System

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SPECIFICATIONS

Oil Pump Capacity
- Model DX31/DX34 . . . . . 19.3 Lpm (5.1 gpm) @ 2600 Engine rpm

POWER STEERING TYPE . . . . . Full Hydraulic

STEERING CYLINDER
- Stroke-FWD
  - DX31/DX34 . . . . . 185 ± 1.25 mm (7.21 ± 1/16 in.)
- Inside Diameter
  - DX31/DX34 . . . . . 35 mm (1.36 in.)

RELIEF VALVE PRESSURE
- All Models . . . . . 100 bar (1450 psi)

OIL SPECIFICATION . . . . . Hy-Tran Ultra

STEERING CYLINDER
- Piston-to-Tube Clearance . . . . . 0.7 mm (0.027 in.) max.
- Anchor Pin-to-Bushing Clearance
  - Piston Rod Eye . . . . . 0.5 mm (0.019 in.) max.
  - Tube Eye . . . . . 0.5 mm (0.019 in.) max.
- Cylinder Rod-to-Gland
  - Bushing Clearance . . . . . 0.3 mm (0.012 in.) max.

TORQUE SPECIFICATIONS

P/S Cylinder Rod End Pivot Pin Retaining Nuts: . . . . . Top Nut: 275 - 333 N·m (203 - 245 ft. lbs.)
Bottom Nut: 157 - 193 N·m (116 - 142 ft. lbs.)

P/S Cylinder Base End Pin Retaining Bolt . . . . . 23 - 28 N·m (17 - 21 ft. lbs.)

Tie Rod Ball Joint Retaining Nut . . . . . 43 - 55 N·m (32 - 41 ft. lbs.)

P/S Cylinder Gland Head . . . . . 127 N·m (94 ft. lbs.)

P/S Cylinder Piston Nut . . . . . 35 N·m (26 ft. lbs.)

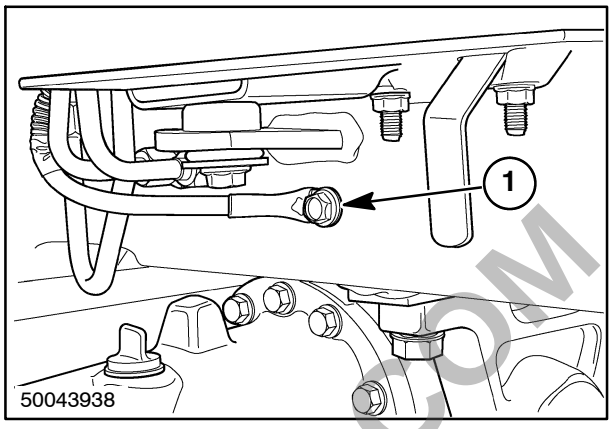
POWER STEERING PUMP BOLTS . . . . . 21 - 27 N·m (16 - 20 ft. lbs.)

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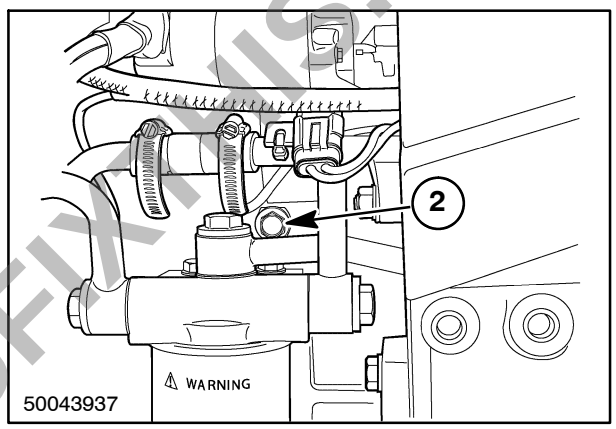
GROUNDS

1. Right side front frame



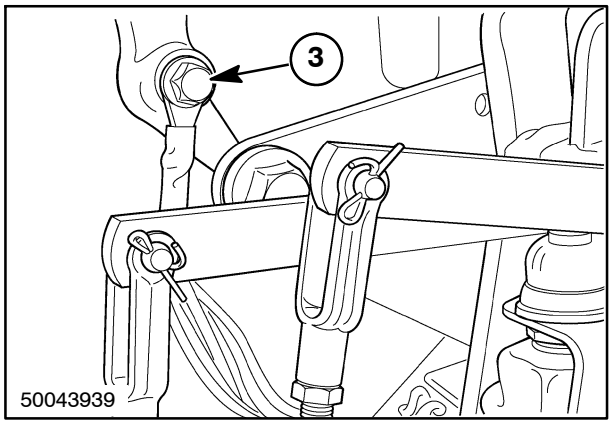
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2. Left side of engine (below starter)



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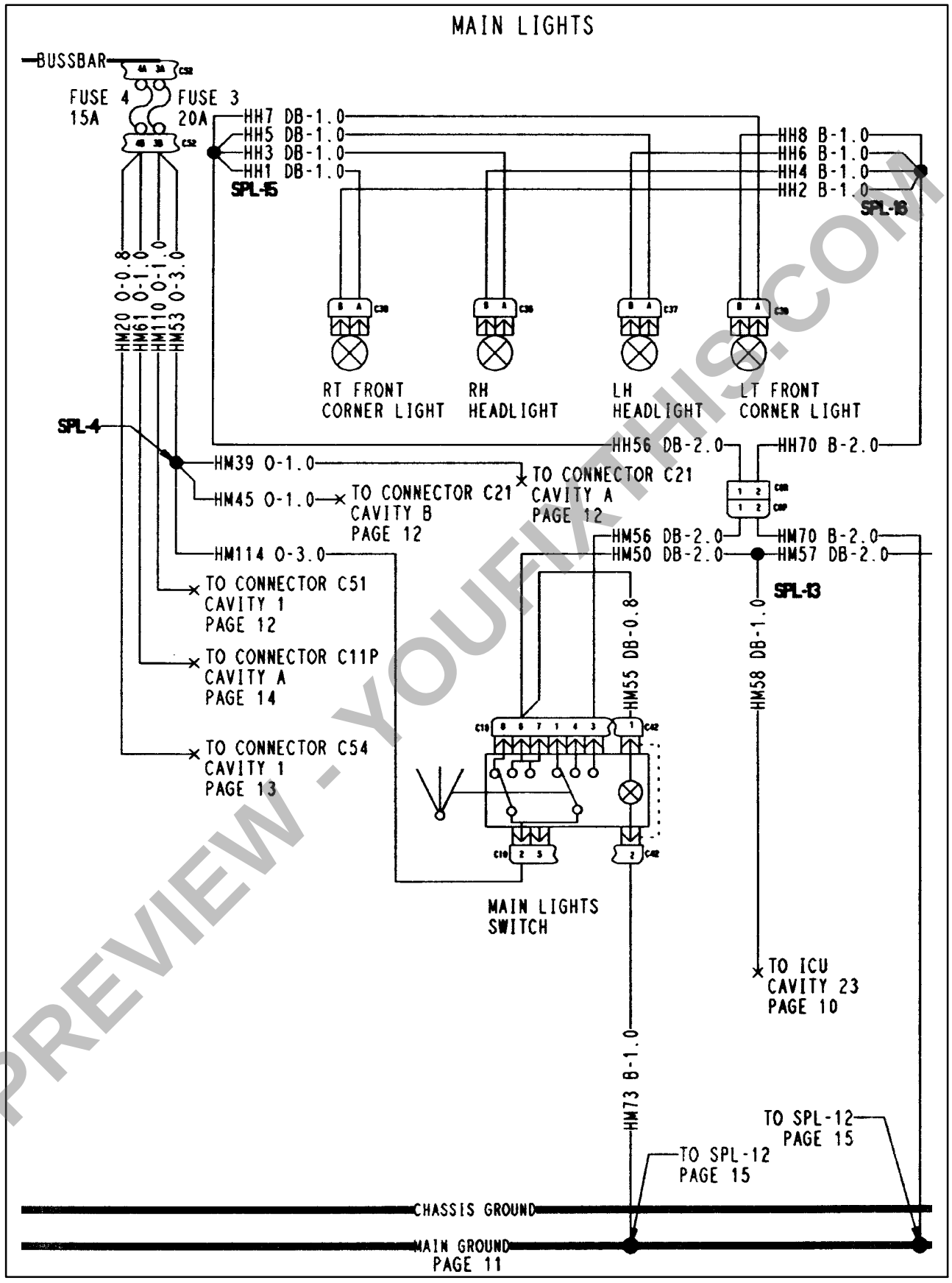
3. Left side behind rear tire on HPL housing



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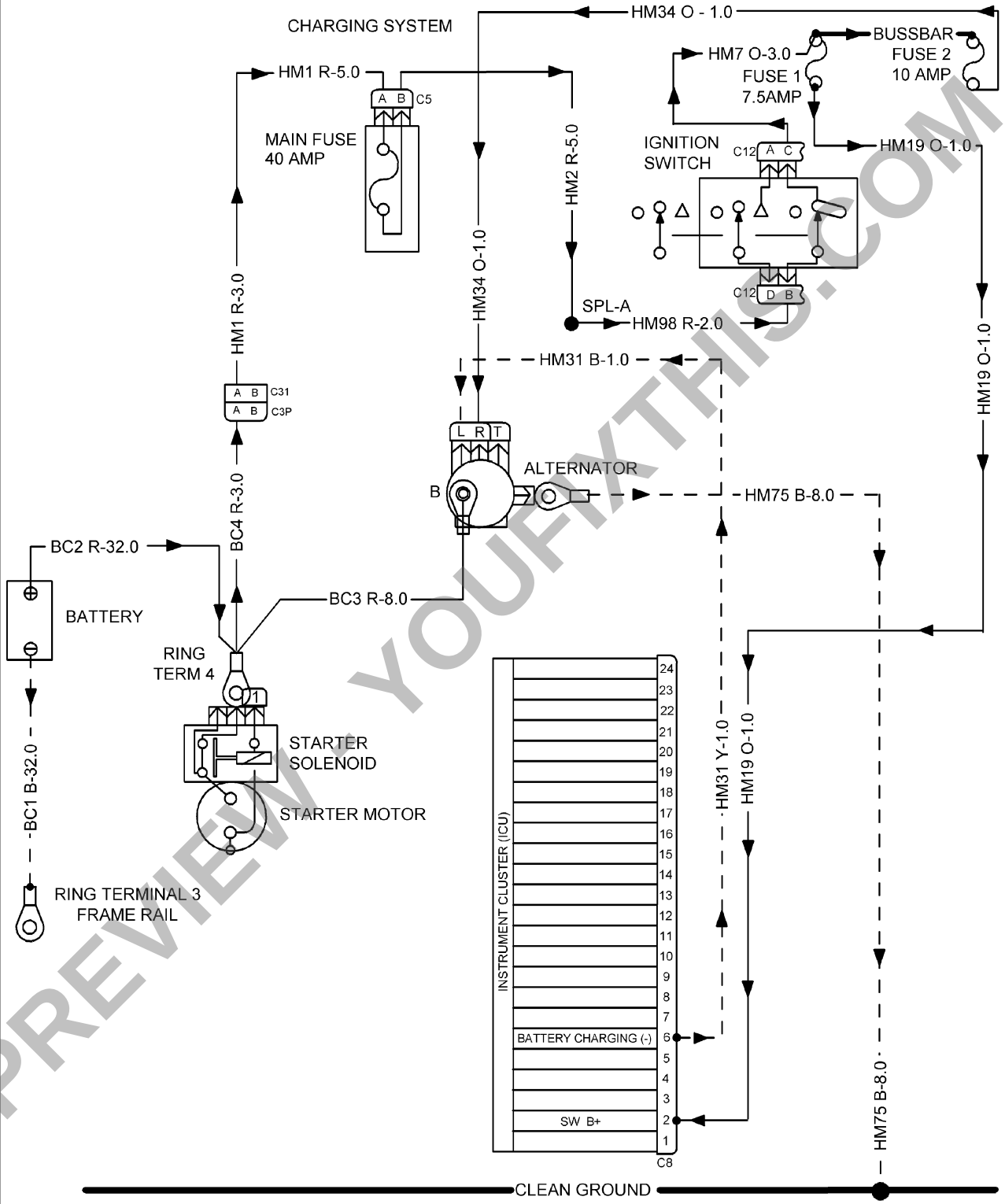
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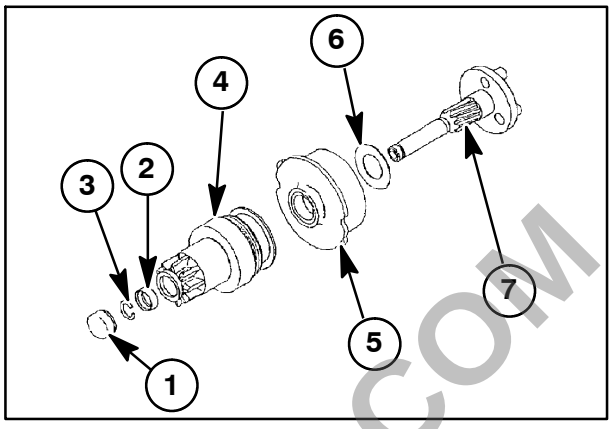
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CHARGING CIRCUIT



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10. To remove the overrunning clutch, 4, from the pinion shaft assembly, 5, 6, 7, remove the plastic cap, 1, from the end of the pinion gear.
11. Slide a piece of appropriately sized metal tubing over the pinion shaft, against the stop ring, 2. Tap the pipe with a hammer to remove the stop ring and expose the snap ring, 3.
12. Remove the tubing and then use snap ring pliers to remove the snap ring, 3.
13. Separate the overrunning clutch from the pinion shaft assembly.

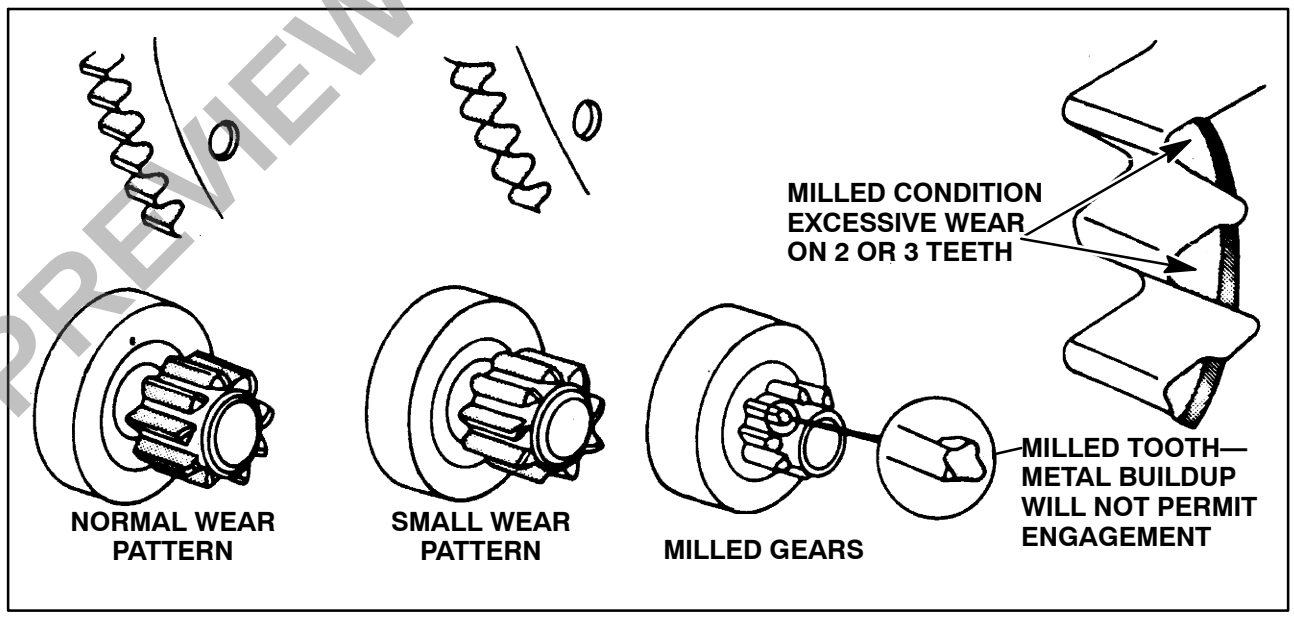


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1. Plastic cap
2. Stop ring
3. Snap ring
4. Overunning clutch
5. Internal gear assembly
6. Washer
7. Gear shaft

Inspection

1. Inspect the gear splines on the pinion clutch, the pinion, the armature, the orbital gear, and the planetary gears for damaged or missing splines. Replace any damaged parts.
2. Hold the pinion clutch housing and rotate the pinion. The pinion should rotate smoothly, although not necessarily easily, in one direction only. If the pinion can spin in both directions, the clutch is defective and needs replaced.



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