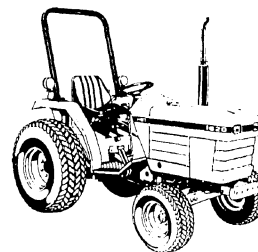


Tractors
1320
1520
1620
1715
1720



SERVICE MANUAL



NEW HOLLAND

Reprinted

PART 1

ENGINE SYSTEMS

MODELS 1320-1520-1720

Chapter 1

ENGINE AND LUBRICATION SYSTEM

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B. ENGINE OVERHAUL	2

Chapter 2

COOLING SYSTEM

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Chapter 3

TROUBLE SHOOTING, SPECIFICATIONS AND SPECIAL TOOLS

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returns to the main oil gallery in the area of the drilled bolt located on the side of the block. Oil flow in the main oil gallery extends to the four main bearings. Oil flow to the main bearings passes through drilled passages in the crankshaft to the three connecting rod bearings. The remaining portion of the oil flow is directed through the external tube to the rocker arm assembly. Oil flows from the external tube into a passage in the rocker arm bracket to the rocker shaft.

Oil leakage from clearance between the rocker arms and the shaft overflows in the valve cover and lubricates the valve stems, push rods and tappets.

The relief valve is mounted in the side of the block and intersects the main oil passage. When the oil pressure exceeds the rated pressure, oil is by-passed through the relief valve directly to sump.

The cylinder walls, pistons and piston pins are splash lubricated by the crankshaft.

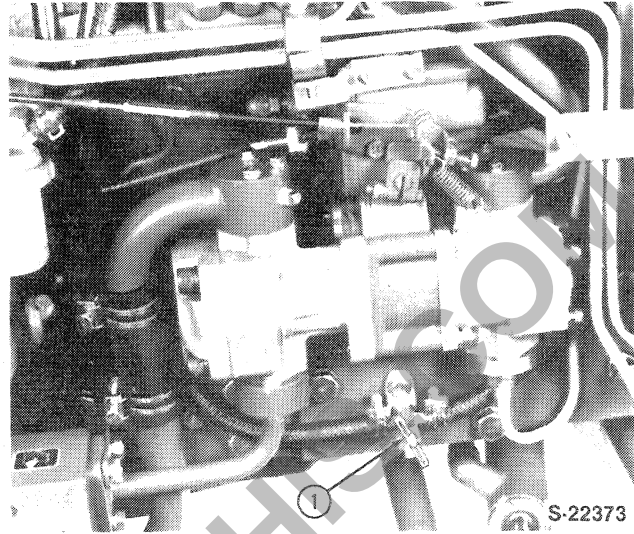


Figure 1
Radiator Drain Cock

1. Coolant Drain Cock

B. ENGINE OVERHAUL

CYLINDER HEAD AND RELATED COMPONENTS

REMOVAL

1. Drain the radiator assembly, Figure 1.

2. Remove the air cleaner assembly along with the air cleaner hoses, Figure 2.
3. Remove the upper radiator hose from the cylinder head, Figure 2.
4. Remove the exhaust muffler and manifold assembly, Figure 3.

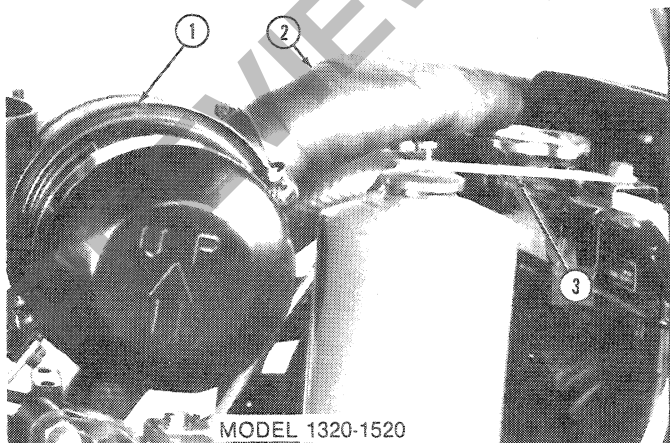
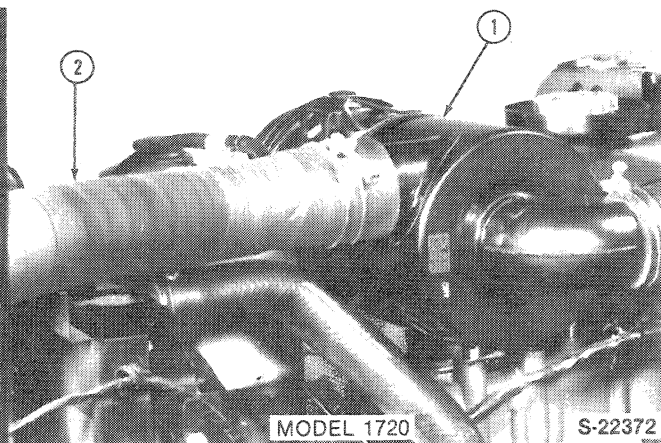


Figure 2
Air Cleaner Removal

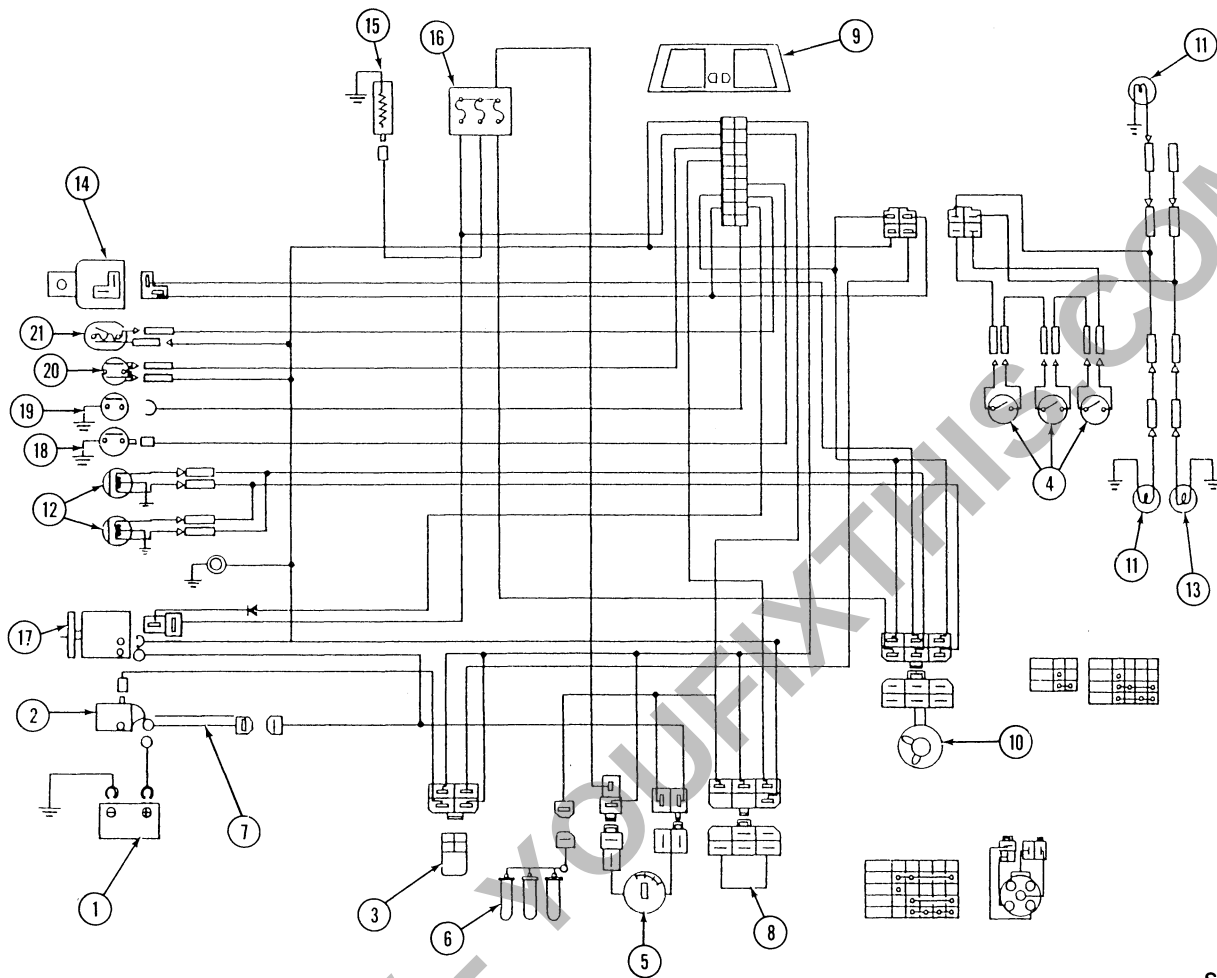
- | | |
|-------------------------|---|
| 1. Air Cleaner Assembly | 3. Radiator Support Brace (Model 1320/1520) |
| 2. Air Intake Tube | |

METRIC BOLT TORQUE SPECIFICATIONS

Bolt Size	Grade No.	Coarse Thread			Fine Thread		
		Pitch (mm)	Pounds-Feet	Newton-Meters	Pitch (mm)	Pounds-Feet	Newton-Meters
M6	4T   	1.0	3.6— 5.1	4.9— 6.9	—	—	—
	7T   		6.1— 8.3	8.3— 11.3			
	10T  		8.7— 11.6	11.8— 15.7			
M8	4T	1.25	9.4— 12.3	12.7— 16.7	1.0	11.2— 14.8	15.2— 20.1
	7T		16.6— 21.0	22.6— 28.4		19.5— 25.3	26.5— 34.3
	10T		21.0— 26.8	28.4— 36.3		22.4— 29.7	30.4— 40.2
M10	4T	1.5	18.8— 24.6	25.5— 33.3	1.25	21.0— 26.8	28.4— 36.3
	7T		32.5— 41.2	44.1— 55.9		36.2— 46.3	49.0— 62.8
	10T		39.8— 51.4	53.9— 69.6		42.7— 54.2	57.9— 73.5
M12	4T	1.75	27.5— 34.7	37.3— 47.1	1.25	31.8— 40.5	43.1— 54.9
	7T		48.5— 61.5	65.7— 83.4		55.0— 69.4	74.5— 94.1
	10T		68.0— 85.4	92.2— 116		73.1— 93.3	99.0— 127
M14	4T	2.0	46.3— 59.3	62.8— 80.4	1.5	51.4— 64.4	69.6— 87.3
	7T		76.7— 96.9	104 — 131		86.1— 109	117 — 148
	11T		102 — 129	139 — 175		108 — 137	147 — 186
M16	4T	2.0	63.6— 81.0	86.3— 110	1.5	67.3— 84.6	91.2— 115
	7T		110 — 136	149 — 184		116 — 142	157 — 192
	11T		152 — 188	206 — 255		163 — 199	221 — 270
M18	4T	2.0	83.9— 104	114 — 141	1.5	96.9— 120	131 — 163
	7T		145 — 174	196 — 235		170 — 206	230 — 279
	11T		203 — 246	275 — 333		221 — 271	299 — 368
M20	4T	2.5	106 — 132	144 — 179	1.5	127 — 156	172 — 211
	7T		177 — 213	240 — 289		203 — 246	275 — 333
	11T		268 — 325	363 — 441		293 — 358	397 — 485

C. SPECIAL TOOLS

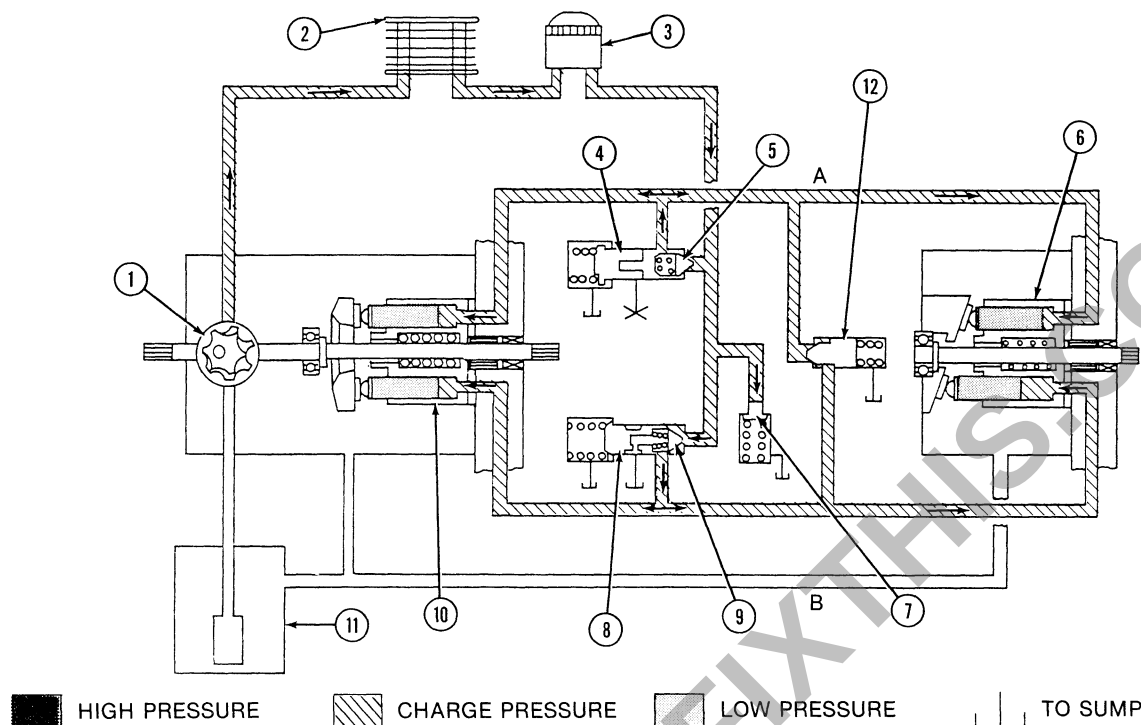
	Tool No.
Seal Protector — Timing Gear Cover — Crankshaft	1584
Driver — Piston Pin	1585
Valve Guide Seal — Installer	1587
Socket — 27 mm Special Injector Socket	1588
Adaptor — Compression Test	FNH 00120
Driver Handle — Use With Tools 1585 & 1587	7778
Dial Indicator — (Magnetic Base)	1345
Micrometer	0-1 inch
Micrometer	1-2 inch
Micrometer	2-3 inch
Small Hole Gauge	3/4-1 inch
Cylinder Bore Gauge	2-3 inch
Cylinder Bore Gauge	1-2 inch



S-22416

Figure 1
Wiring Diagram — Model 1320-1520

- | | | | |
|-------------------------|------------------------|-------------------------|-------------------------|
| 1. Battery | 9. Instrument Warning | 13. Taillight | 18. Temperature Sender |
| 2. Starter Motor | Lights | 14. Flasher Unit | Unit |
| 3. Neutral Start Relay | 10. Combination Switch | 15. Engine Stop | 19. Oil Pressure Sender |
| 4. Neutral Start Switch | (Flasher/Headlights) | Solenoid | Unit |
| 5. Key Start Switch | 11. Flasher Warning | 16. Fuse Box | 20. Air Cleaner Sender |
| 6. Glow Plugs | Lights | 17. Alternator Assembly | Unit |
| 7. Fuse Link Wire | 12. Headlights | | 21. Fuel Sender Unit |
| 8. Quick Start Timer | | | |
| Relay | | | |



S-22857

Figure 37

Oil Flow — Neutral Position

- | | | | |
|------------------|-----------------------------|----------------------|--------------------------------|
| 1. Charge Pump | 5. Feed Valve "A" | 8. Neutral Valve | 12. High Pressure Relief Valve |
| 2. Cooler | 6. Hydrostatic Motor | 9. Feed Valve "B" | |
| 3. Filter | 7. Charge Pump Relief Valve | 10. Hydrostatic Pump | |
| 4. Neutral Valve | | 11. Reservoir | |

Oil discharged from the motor in passage "B" flows back to the pump to complete the cycle.

When oil leakage in the system causes a drop in pressure on the suction passage "B," below 61-81 psi pressure setting, feed valve (8) opens and provides make-up oil from the charge pump.

Surplus oil from the charge pump is returned to sump via the charge pump relief valve (7).

OIL FLOW — REVERSE POSITION

Reference — Figure 39

When the foot pedal is depressed in the reverse position, oil flows from the piston pump into passage "B" to the motor. The neutral valve and feed valve (8) and (9), Figure 39, are closed due to pressure in passage "B." Oil pressure acting on the motor pistons causes the motor to rotate in the reverse direction. Oil discharged from the motor flows back through passage "A" to the pump.

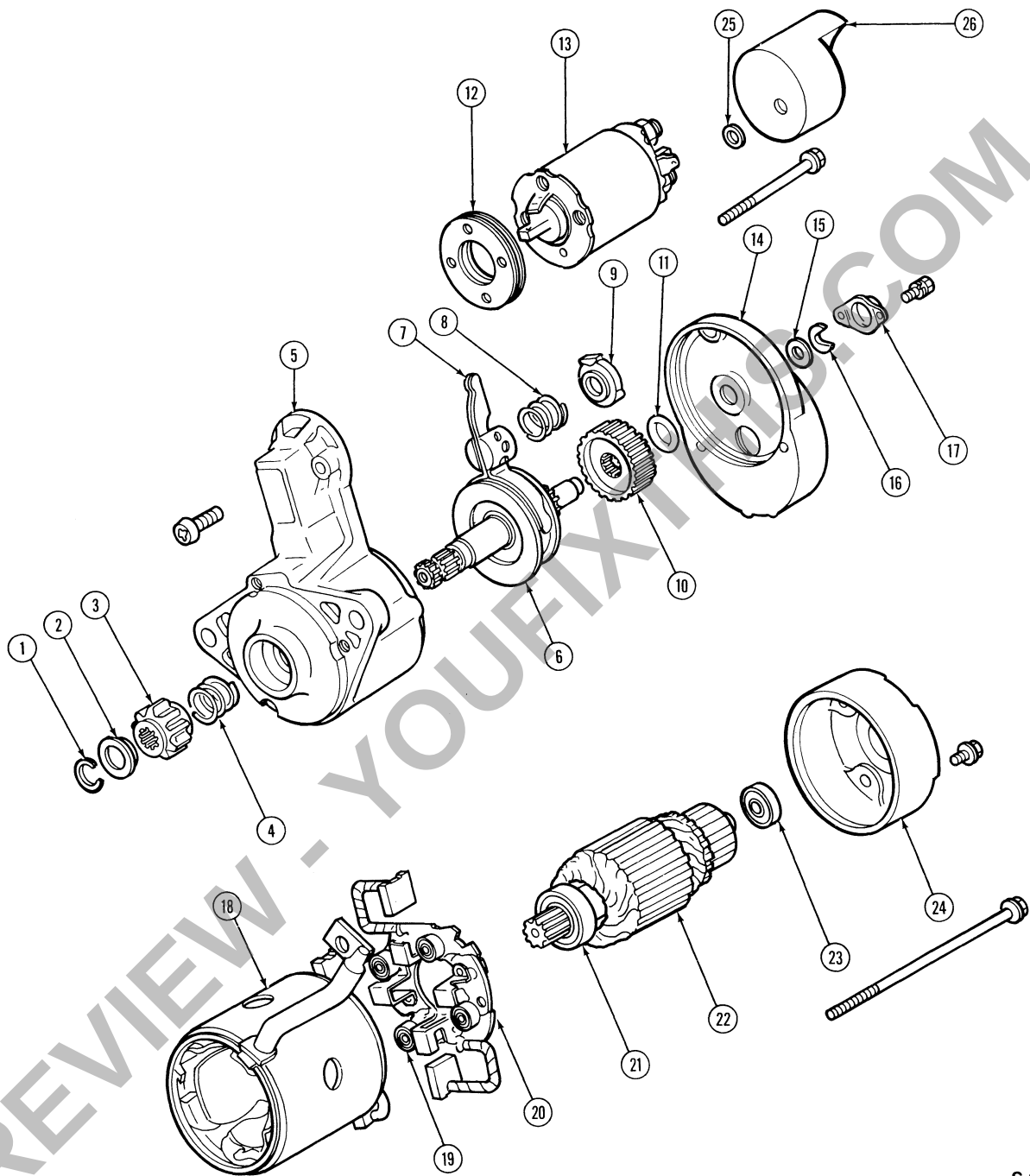
B. OVERHAUL

REMOVAL

1. Drain the transmission oil.
2. Separate the tractor between the engine and clutch housing. See "Separating the Tractor," Part 12.

HYDROSTATIC UNIT — REMOVAL

1. Remove the two test port adaptors (1), Figure 40.
2. Disconnect the HST control rod (1), Figure 41.
3. Remove the clutch housing attaching bolts and remove the clutch housing, Figure 40.
4. Remove the hydrostatic unit retaining bolts and nuts and remove the hydrostatic unit from the transmission case, Figure 42.



S-22427

Figure 56
Starter Motor Assembly

- | | | | |
|--------------------------|--------------------|------------------------------|-----------------------|
| 1. Snap Ring | 8. Spring | 16. "C" Snap Ring | 21. Bearing |
| 2. Stop Ring | 9. Guide | 17. Cover | 22. Armature Assembly |
| 3. Pinion Gear | 10. Gear | 18. Field and Frame Assembly | 23. Bearing |
| 4. Spring | 11. Shim | 19. Brush Assembly | 24. Rear Cover |
| 5. Housing | 12. Shims | 20. Brush Holder Assembly | 25. Washer |
| 6. Pinion Shaft Assembly | 13. Solenoid Coil | | 26. Cover-Switch |
| 7. Fork | 14. Center Housing | | |
| | 15. Shim | | |

PART 1

ENGINE SYSTEMS

MODELS 1320-1520-1720

Chapter 3

TROUBLE SHOOTING, SPECIFICATIONS AND SPECIAL TOOLS

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A. TROUBLE SHOOTING

ENGINE

CONDITION	POSSIBLE CAUSES
Engine Does Not Develop Full Power	<ol style="list-style-type: none"> 1. Clogged air cleaner. 2. Fuel line obstructed. 3. Improper injection timing. 4. Improper nozzle injection pressure and angle. 5. Low cylinder compression. 6. Insufficient fuel injection. 7. Improper valve lash adjustment. 8. Burned, worn or sticking valves. 9. Blown head gasket. 10. Worn or sticking piston rings. 11. Faulty engine stop solenoid.
Engine Will Not Stop	<ol style="list-style-type: none"> 1. Faulty engine stop solenoid. 2. Faulty starter switch.
Low Cylinder Compression	<ol style="list-style-type: none"> 1. Burned, worn or sticking valves. 2. Bent valve stem. 3. Broken or weak valve spring. 4. Blown cylinder head gasket. 5. Worn or sticking piston ring. 6. Scored piston.
Poor Engine Idling	<ol style="list-style-type: none"> 1. Improper injection timing. 2. Air in injection pump. 3. Improper governor adjustment.

B. SPECIFICATIONS

GENERAL SPECIFICATIONS

Tractor Model	1320	1520	1720
Engine Model	J823	J843	N843
Number of Cylinders	3	3	3
Bore x Stroke	3.22 x 3.15 in. (82 x 80 mm)	3.31 x 3.15 in. (84 x 80 mm)	3.31 x 3.54 in. (84 x 90 mm)
Displacement	77.2 cu. in.	81.1 cu. in.	91.2 cu. in.
Compression Ratio	22:1	22:1	22.5:1
Rated Speed (rpm)	2500	2500	2500
Muffler	Vertical	Vertical	Vertical
Firing Order	1-2-3	1-2-3	1-2-3
Idle Speed	850 ± 50 rpm	850 ± 50 rpm	850 rpm
Maximum No Load Speed	2650 ± 50 rpm	2650 ± 50 rpm	2700 rpm
Cylinder Arrangement	In-line Vertical	In-line Vertical	In-line Vertical
Valve Arrangement	Overhead	Overhead	Overhead

CYLINDER BLOCK

	1320	1520	1720
Bore			
Standard	3.228-3.229 in. (82-82.019 mm)	3.307-3.308 in. (84-84.019 mm)	3.307-3.308 in. (84.0-84.019 mm)
Maximum	3.276 in. (83.2 mm)	3.354 in. (85.2 mm)	3.354 in. (85.2 mm)
Head Surface Warp			
Standard	.002 in. (.05 mm)	.002 in. (.05 mm)	.002 in. (.05 mm)
Maximum	.005 in. (.12 mm)	.005 in. (.12 mm)	.005 in. (.12 mm)
Re-Bore Size			
.020 oversize	3.236-3.256 in. (82.2-82.7 mm)	3.315-3.334 in. (84.2-84.7 mm)	3.327-3.328 in. (84.5-84.519 mm)
.5 mm			
.040 oversize	3.256-3.276 in. (82.7-83.2 mm)	3.334-3.354 in. (84.7-85.2 mm)	3.346-3.347 in. (85.0-85.019 mm)
1.0 mm			

CYLINDER HEAD

	1320	1520	1720
Head Warp			
Standard	.002 in. (.05 mm)	.002 in. (.05 mm)	.002 in. (.05 mm)
Maximum	.005 in. (.12 mm)	.005 in. (.12 mm)	.005 in. (.12 mm)
Valve Seat Width			
Standard	0.063-0.071 in. (1.6-1.8 mm)	0.063-0.071 in. (1.6-1.8 mm)	.063-.071 in. (1.6-1.8 mm)
Maximum	.098 in. (2.5 mm)	.098 in. (2.5 mm)	.1 in. (2.5 mm)
Valve Seat Sink			
Standard	.0334-.0453 in. (0.85-1.15 mm)	.0334-.0453 in. (0.85-1.15 mm)	.0334-.0453 in. (.85-1.15 mm)
Maximum	.071 in. (1.8 mm)	.071 in. (1.8 mm)	0.071 in. (1.8 mm)
Valve Angle	45°	45°	45°

PREVIEW - YOUFIXTHIS.COM

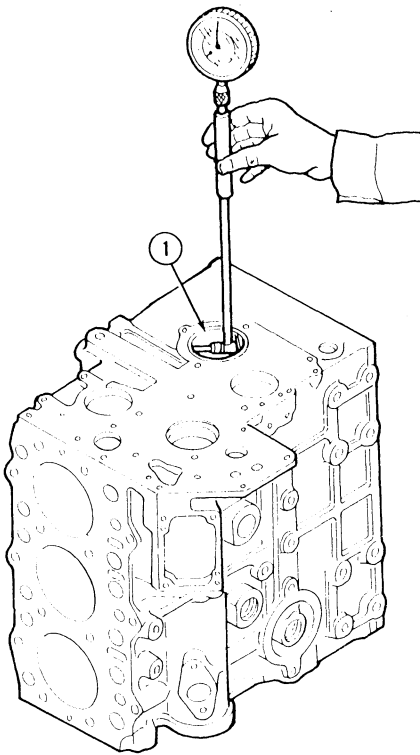


Figure 75

Crankshaft Bushing Wear Check

1. Front Bushing

Replace the bearing or the crankshaft components, or grind the crankshaft and install an oversize bushing as required. See "Specifications," Chapter 3.

2. Check the main crankshaft bearing clearance prior to installing in the engine block.

Position a piece of plastigauge of the correct size across the full width of each bearing liner at approximately 1/4 inch off center, Figure 76.

3. Install the bearing holder and tighten the bolts to the specified torque, Figure 77.

NOTE: Do not permit the bearing holder to rotate, even the slightest amount.

4. Remove the bearing holders and measure the width of the flattened plastigauge using the gauge printed on the plastigauge package.

Replace components, or grind the crankshaft to the next oversize bearing as required to obtain the correct clearance. See "Specifications," Chapter 3.

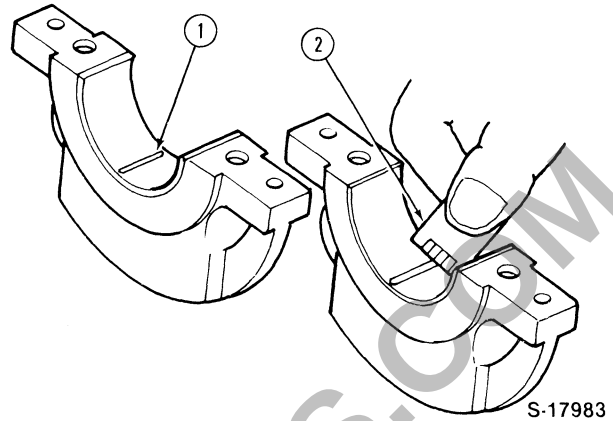


Figure 76

Main Bearing Liner Clearance Check

1. Plastigauge
2. Scale

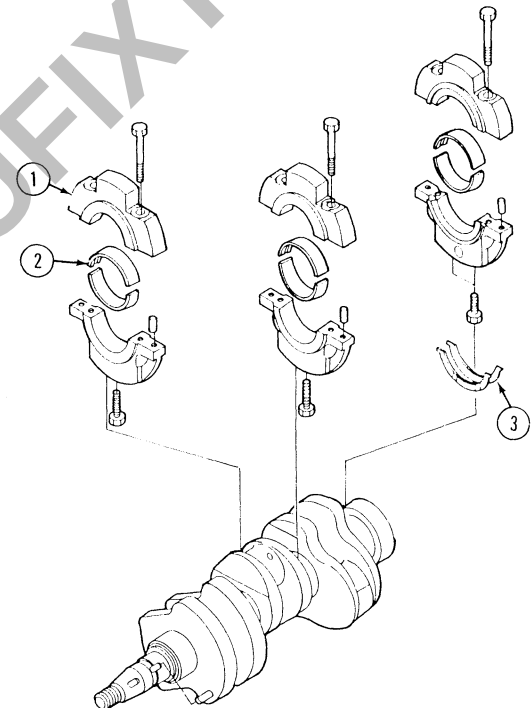


Figure 77

Bearing Holder Installation

1. Holder
2. Main Liner
3. Thrust Bearing

NOTE: The width of the plastigauge at the widest point establishes the minimum clearance and at the narrowest point the maximum clearance. The difference between the two readings indicates the taper.

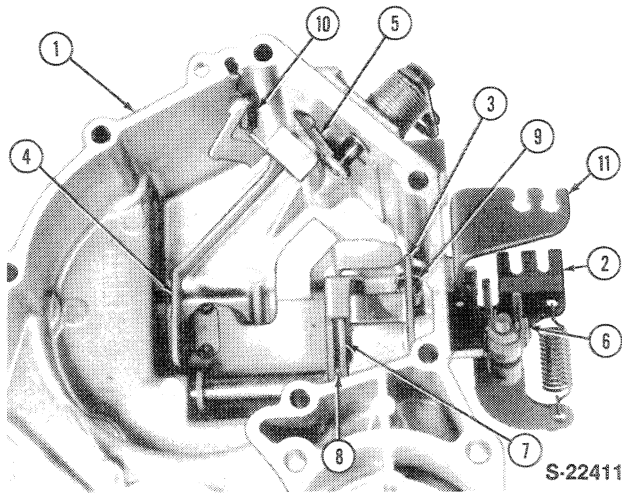
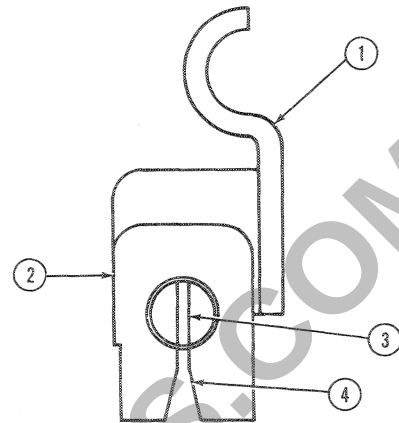


Figure 16

Timing Gear Cover and Governor Linkage Assembly

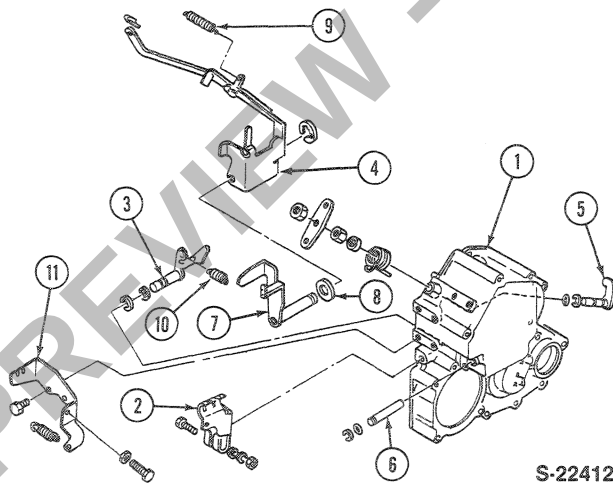
- | | |
|----------------------|------------------|
| 1. Timing Gear Cover | 7. Spring Holder |
| 2. Lever | 8. Washer |
| 3. Arm | 9. Spring |
| 4. Lever | 10. Spring |
| 5. Arm Assembly | 11. Stay |
| 6. Shaft | |



S-22690

Figure 18
Governor and Adjustment

- | | |
|-----------------|-----------|
| 1. Lever | 3. Groove |
| 2. Governor Arm | 4. Slot |



S-22412

Figure 17

Governor Linkage Components

- | | |
|----------------------|------------------|
| 1. Timing Gear Cover | 7. Spring Holder |
| 2. Lever | 8. Washer |
| 3. Arm | 9. Spring |
| 4. Lever | 10. Spring |
| 5. Arm Assembly | 11. Stay |
| 6. Shaft | |

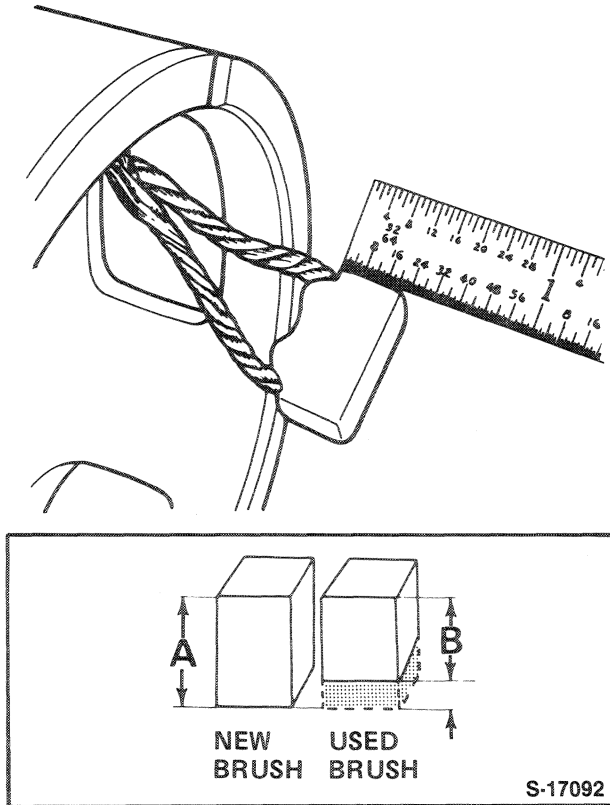


Figure 42

Starter Motor Brush Wear Inspection

1. "A" New Brush Length
2. "B" Used Brush Length

Model	New	Wear Limit
ALL	1.26 in. (32 mm)	1.22 in. (31 mm)

13. Position the armature in V-blocks and measure the commutator runout, Figure 45. If the commutator runout exceeds .020 in. (.5 mm), the commutator may be turned on a lathe.

NOTE: Do not reduce the diameter below the minimum diameter specifications.

14. Measure the distance from the top of the mica insulator to the top of the commutator segment, Figure 46. If the distance is not within specifications the mica can be undercut using a suitable tool. If the insulator cannot be properly undercut, replace the armature.

15. Position the armature in a set of V-blocks and measure the shaft runout, Figure 47. If the shaft runout exceeds .002 in. (0.05 mm) replace the armature.

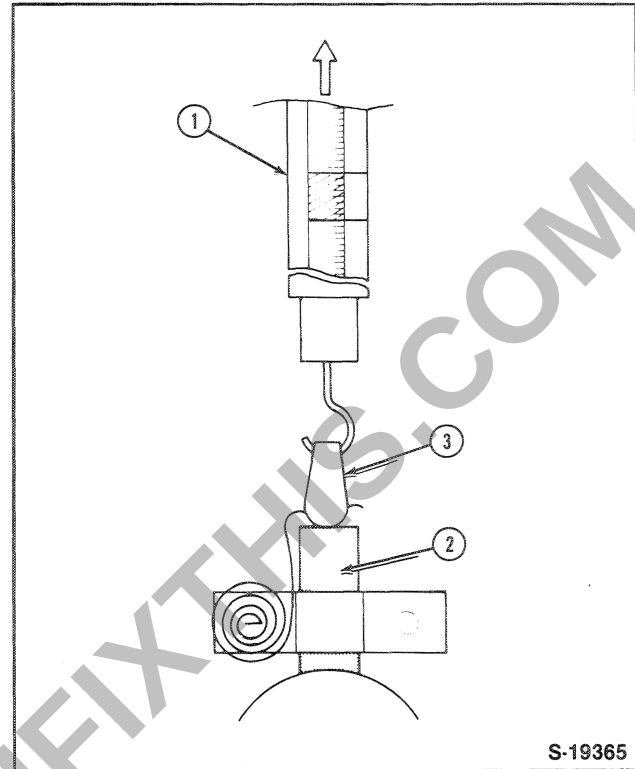


Figure 43

Starter Motor Brush Spring Tension Check

1. Spring Scale
2. Brush
3. Cloth Sling

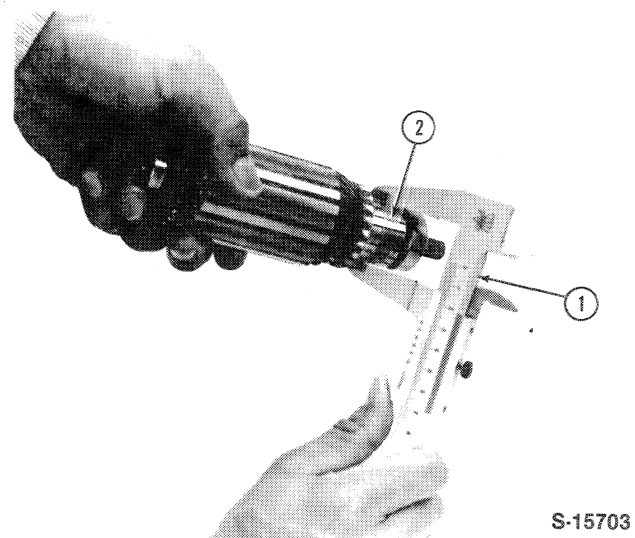
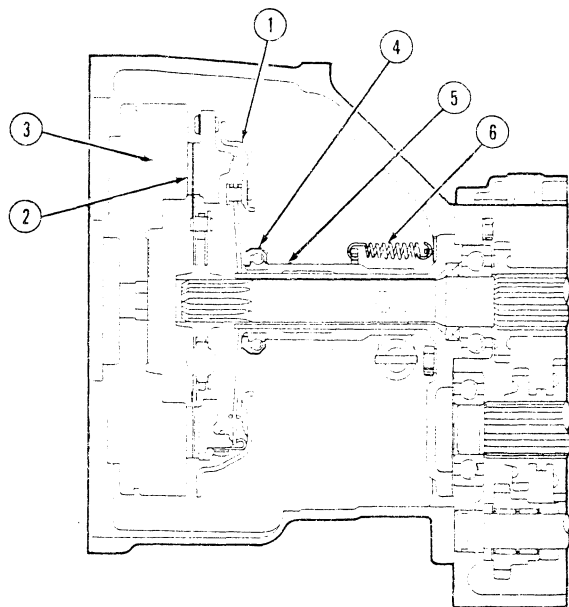


Figure 44

Commutator Wear Check

1. Caliper
2. Commutator Segment

engine flywheel. The power flow from the engine is transmitted by the friction between the clutch disc linings and the surfaces of the flywheel and the clutch pressure plate.



S-22448

Figure 2

Single Clutch Assembly — Model 1720

- | | |
|--------------------------|---------------------------|
| 1. Clutch Pressure Plate | 4. Clutch Release Bearing |
| 2. Clutch Disc | 5. Hub |
| 3. Flywheel | 6. Return Spring |

Reference — Figure 3

The clutch pedal assembly (4) is connected by an adjustable rod (1) to a bellcrank and cross shaft assembly (3) on which a fork is mounted.

The fork engages a sliding release bearing hub assembly. When the clutch pedal is applied, the release bearing comes in contact with the ends of the clutch release levers in the pressure plate. Depressing the clutch pedal causes the cross shaft and fork to move the release bearing forward and depress the pressure plate release levers. This action draws the pressure plate away from the clutch disc releasing the disc from contact with the flywheel.

The friction drive from the engine is then disconnected to enable gear changes to take place.

After a gear change is made and the clutch pedal is released, the release bearing and hub are returned to the free position by a spring attached to a hanger.

The main springs of the pressure plate assembly then reassert pressure on the plate moving it forward to press the clutch disc into contact with the flywheel and re-establish the drive to the transmission.

The release bearing is pre-lubricated and never requires lubrication.

The pressure plate assembly is not repairable and must be replaced as a complete assembly if service is required.

1320/1520:

The release lever height on the 1320 and 1520 is adjustable and should be checked whenever the clutch is removed or a new clutch is installed.

1720:

The release lever height on the 1720 is not adjustable.

B. ADJUSTMENT

FREE-PLAY ADJUSTMENT

The only single clutch adjustment that can be made without using the overhaul procedure is to check the clutch pedal free travel. This is the amount of pedal movement from the fully released position to the point where resistance is first encountered.

1. Remove the cotter pin securing the adjustment rod (1) to the bellcrank, Figure 3.
2. Lengthen or shorten the clevis to obtain .79-1.18 in. (20-30 mm) of free-play in the pedal travel.
3. Reposition the adjustment rod to the bellcrank and secure with a new cotter pin.

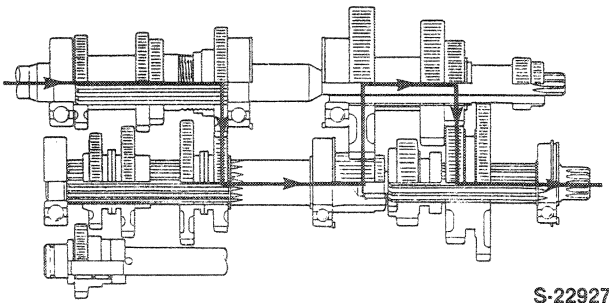
C. OVERHAUL

The single clutch is serviced as a complete assembly only. Overhaul of the single clutch is limited to removing the clutch inspection and adjustment of the release lever height.

The range gear shift lever is located to the left of the operator's seat and controls high, low and mid-range gear ratios of the main transmission.

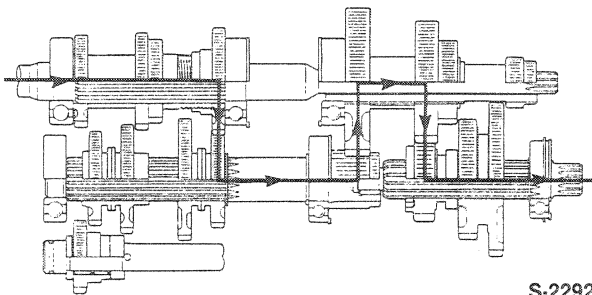
MAIN TRANSMISSION SHIFT LEVER — OVERHAUL

1. Remove the center steering shroud and the left side shroud panel.
2. Remove the lower snap ring (13), drive the pin (14) out of the universal joint and shaft, Figure 30.
3. Remove the lever bracket (4) from the steering column. Raise the linkage assembly and disconnect the universal joint from the lower lever shaft.
4. Using conventional repair procedures, overhaul the linkage assembly as required.



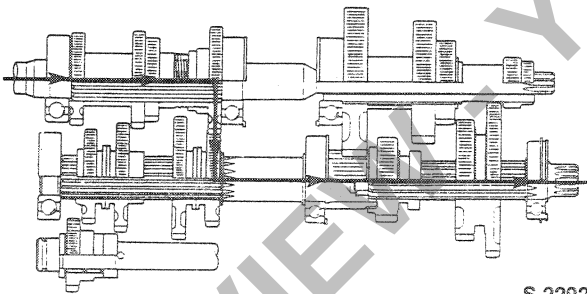
S-22927

Figure 113
Power Flow — 3rd Gear — 2nd Range



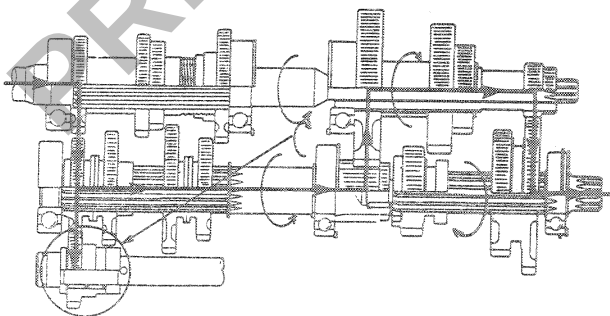
S-22928

Figure 114
Power Flow — 3rd Gear — 3rd Range



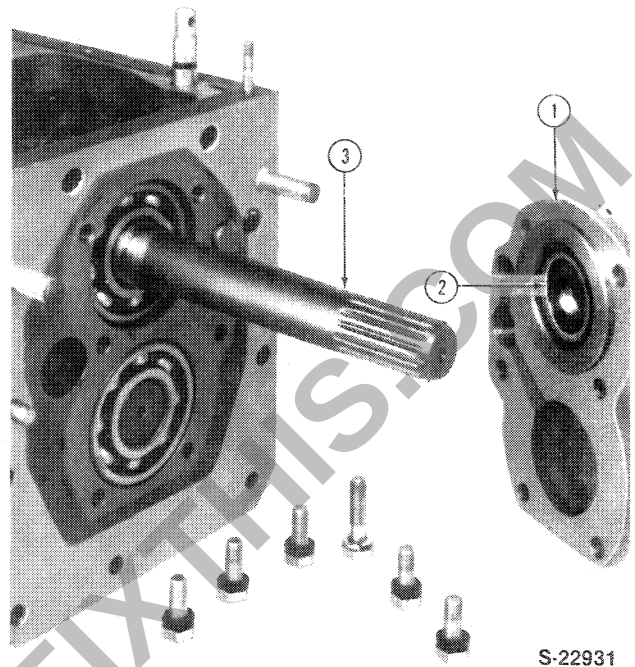
S-22929

Figure 115
Power Flow — 3rd Gear — 4th Range



S-22930

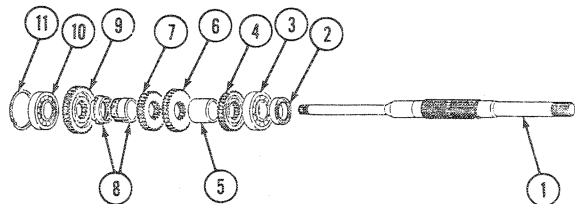
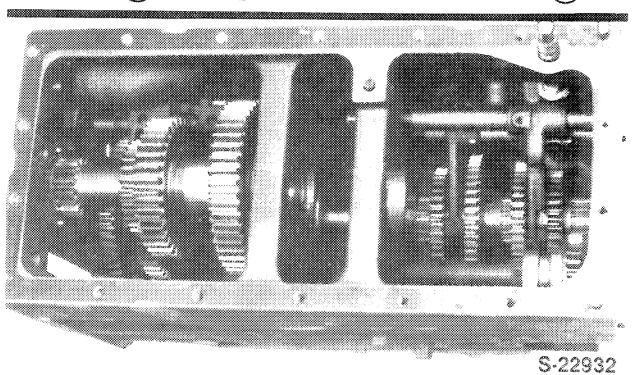
Figure 116
Power Flow — Reverse Gear — 1st Range



S-22931

Figure 117
Transmission Disassembly (Single Clutch)

- | | |
|-------------|----------------|
| 1. Retainer | 3. Input Shaft |
| 2. Oil Seal | |



S-22932

Figure 118
Main Transmission Input Shaft and Fixed Gear
Removal (Single Clutch)

- | | |
|----------------|---------------|
| 1. Input Shaft | 7. Gear (1st) |
| 2. Seal | 8. Collar |
| 3. Bearing | 9. Gear (3rd) |
| 4. Gear (Rev) | 10. Bearing |
| 5. Spacer | 11. Snap Ring |
| 6. Gear (2nd) | |

B. SPECIFICATIONS

9 x 3 GEAR TRANSMISSION

MODEL 1320-1520

Gear Backlash	.0016-.0063 in. (0.04-0.16 mm)
Wear Limit	.0236 in. (0.6 mm)
Clearance Between Slide Gear and Shifter Fork	.008-.016 in. (0.2-0.4 mm)
Wear Limit	.0394 in. (1.0 mm)
Clearance Between Shifter Rod and Housing Bearing	.00118-.0039 in. (0.03-0.1 mm)
Wear Limit	.0018 in. (0.3 mm)

HYDROSTATIC TRANSMISSION

MODEL 1320-1520

Type	HVFD - 23C 23-M3
Theoretical displacement of the pump	0-1.41 cu. in./rev. (0-23.4 cc/rev.)
Theoretical displacement of the motor	1.41 cu. in./rev. (23.4 cc/rev.)
Theoretical displacement of the charge pump	.38 cu. in./rev. (6.2 cc/rev.)
Maximum input speed	2700 rpm
High pressure relief valve	3981 psi (274 bars)
Output Speed	2510 rpm - at 2133 psi (147 bars)
Output Torque	59 lbs. ft. (79 Nm) at (274 bars), 3981 psi
Charge pump relief valve	61-81 psi (4.2-5.5 bars) at 2500 rpm
Swash plate tilt angle (pump)	0-18 degree
Swash plate tilt angle (motor)	18 degree
Operating moment	Max. 13 lbs. ft. (17.6 Nm) N = 1000 260 rpm hp = 50 200 kg/cm ²

NON-SYNCHROMESH 12 x 4 GEAR TRANSMISSION

MODEL 1720

Gear Backlash	.0016-.0063 in. (0.04-0.16 mm)
Allowable Backlash	.0236 in. (0.6 mm)
Clearance Between Slide Gear and Shifter Fork	.008-.016 in. (0.2-0.4 mm)
Allowable Clearance Limit	.0394 in. (1.0 mm)
Clearance Between Shifter Rod and Housing Bearing	.00118-.0039 in. (0.03-0.1 mm)
Allowable Clearance Limit	.0118 in. (0.3 mm)

SYNCHROMESH 12 x 12 SHUTTLE TRANSMISSION

MODEL 1720

Gear Backlash	.0016-.0063 in. (.04-.16 mm)
Allowable Backlash	.0236 in. (0.6 mm)
Clearance Between Slide Gear and Shifter Fork	.008-.016 in. (0.2-0.4 mm)
Allowable Clearance Limit	.039 in. (1.0 mm)
Clearance Between Synchronizer Ring and Gear	.059 in. (1.5 mm)
Allowable Clearance Limit	.031 in. (0.8 mm)

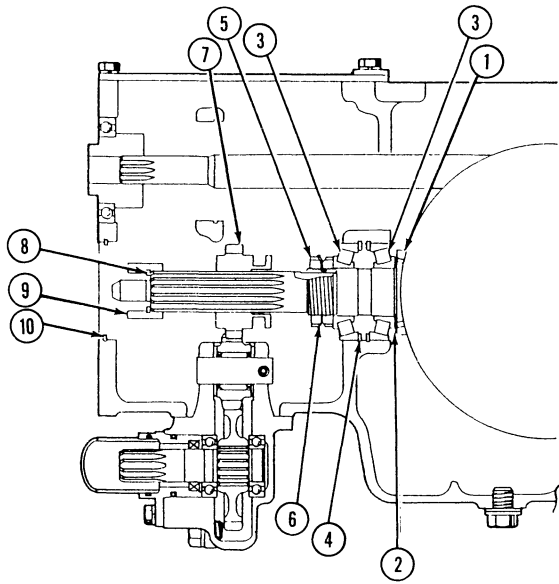
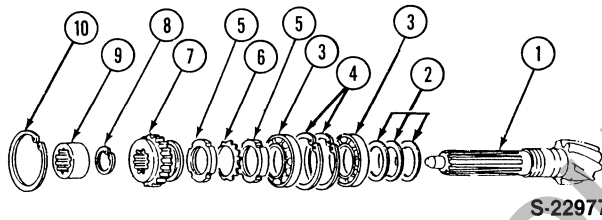


Figure 20

**Pinion Gear Assembly — FWD Model Shown
Model 1720**

- | | |
|-----------------|---------------------|
| 1. Pinion Gear | 6. Lock Washer |
| 2. Shims | 7. 4WD Sliding Gear |
| 3. Ball Bearing | 8. Snap Ring |
| 4. Snap Ring | 9. Collar |
| 5. Lock Nut | 10. Snap Ring |

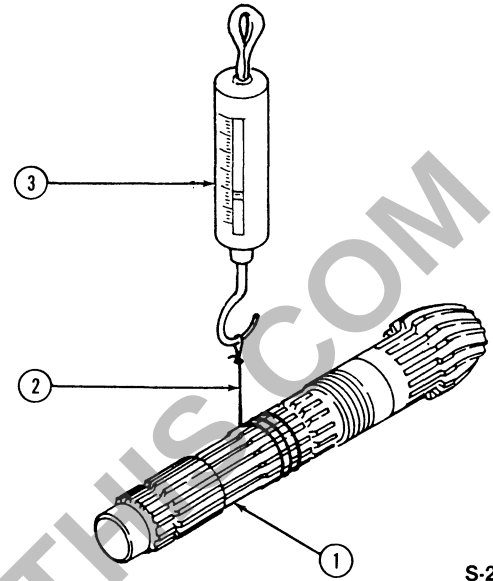
4. Drive the axle shaft outward and remove from the axle housing.

INSPECTION

Clean the axle components in a suitable solvent and air dry.

1. Inspect the bearings for excess wear or damage.
2. Inspect the final reduction gear teeth for excess wear or damage.

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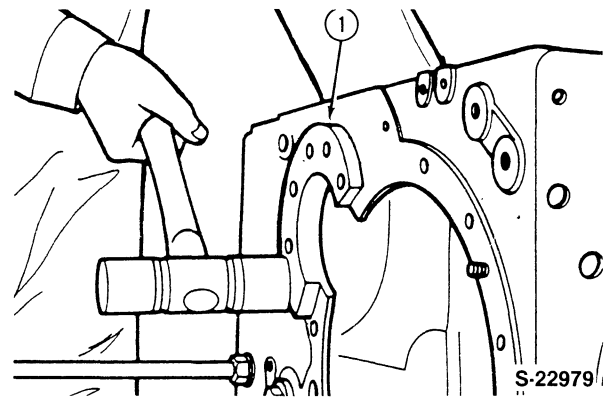


S-22479

Figure 21

Pinion Preload Adjustment

- | | |
|-----------------|---------------|
| 1. Pinion Shaft | 3. Pull Scale |
| 2. String | |



S-22979

Figure 22

Differential Assembly

1. Bearing Carrier

HYDRAULIC PUMP (1320-1520)

Reference — Figure 56

The only parts serviced on the hydraulic pumps are the shaft seal and internal O-ring seals. If trouble shooting indicates a faulty pump, replace the pump with a new assembly.

DISASSEMBLY

1. Place the pump in a soft jawed vise with the drive shaft facing downward.
2. Scribe a line on the cover and the pump body for ease in assembly.
3. Remove the four bolts securing the cover and remove the cover.
4. Push outward on the drive shaft and remove the outer wear plate.
5. Remove the drive and driven gears from the housing.
6. Using a brass hook, or dental pick, remove the inner wear plate.

NOTE: The inner and outer wear plates are not the same. Be sure during assembly that the wear plates are assembled correctly.

7. Remove the pump body from the vise. Remove the snap ring and shaft seal from the pump body.

INSPECTION AND REPAIR

1. Wash all parts in clean solvent and air dry.
2. Discard all O-rings and seals.
3. Inspect the parts for damage or wear, and if necessary, replace the pump.

ASSEMBLY

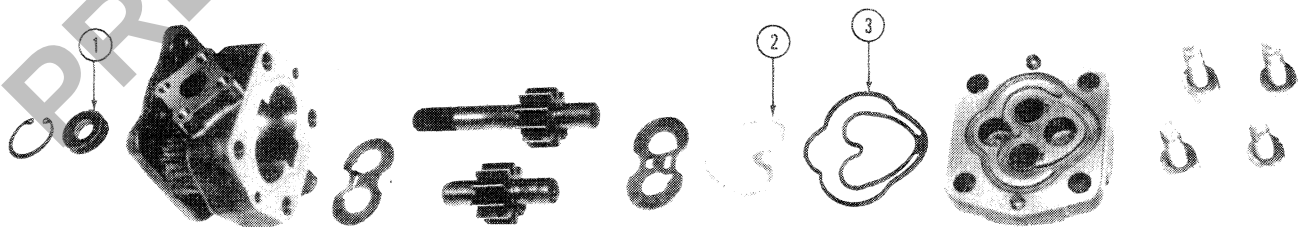
Assembly follows disassembly procedures in reverse, however the following must be observed.

- Lubricate all parts during assembly with the correct grade of hydraulic oil.
- The inner and outer gear wear plates are not the same. The rectangular slots in the wear plates should be installed to the pump pressure side, and the wear plate with two openings is installed on the cover side of the gears.
- Make sure the cover bolts are torqued, see specifications.

HYDRAULIC PUMP (1720)

Reference — Figure 57

The only parts serviced on the hydraulic pump are the shaft seal, internal O-ring and internal seals and back-up rings. If trouble shooting indicates a faulty pump, replace the pump with a new assembly.



S-24137

Figure 56
Hydraulic Pump Components —
1320-1520 Tractors

1. Shaft Seal 2. Back-Up Ring 3. Seal

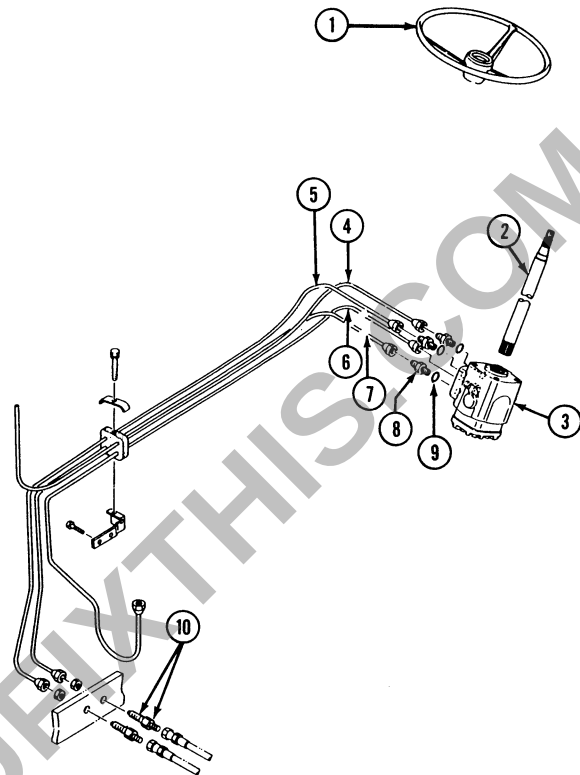
Start the engine and cycle the steering system by turning the steering wheel to the extreme right and left several times with the engine idling. Make sure the relief valve operates. Stop the engine and refill the tank to the proper level. Check for possible leaking fittings or connections.

POWER STEERING TUBES

Reference — Figure 34

Power steering tubes should not be in contact with other parts on the tractor. Be sure mounting clamps are installed correctly and secured to prevent loosening.

Always use sealing tape on the tube fittings and tighten to the specified torque. See Specifications, Chapter 2.



S-23093

Figure 34
Power Steering Tubes — Model
1320/1520 Shown

- | | |
|---------------------------|-------------|
| 1. Steering Wheel | 7. Pipe — R |
| 2. Steering Shaft | 8. Adapter |
| 3. Steering Control Valve | 9. O-Ring |
| 4. Pipe — T | 10. Adapter |
| 5. Pipe — L | |
| 6. Pipe — P | |

<div> <div>WHEEL POSITION</div> <div>AXLE POSITION</div> </div>	MODEL 1520 AG.		MODEL 1520 TURF	MODEL 1720 AG.	
	39.1 (99.5)	41.3 (105.0)	42.7 (108.3)		
	43.5 (110.5)	45.6 (116.0)	47.0 (119.3)		
	47.8 (121.5)	50.0 (127.0)	51.3 (130.3)		
				43.5 (110.5)	47.4 (120.5)
				46.9 (119.0)	50.8 (129.0)
				50.2 (127.5)	54.1 (137.5)
				53.5 (136.0)	57.5 (146.0)

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Figure 3
Tread Width Setting — Inch (cm)

Connecting Rod

Rod Twist

Standard	0.003 in. (0.08 mm)
Maximum	0.008 in. (0.2 mm)

Rod Bend

Standard	0.0020 in. (0.05 mm)
Maximum	0.0060 in. (0.15 mm)

Connecting Rod Side Play

Standard	0.004-0.012 in. (0.1-0.3 mm)
Maximum	0.028 in. (0.7 mm)

Crankshaft Bearing Clearance

Standard	0.001-0.003 in. (0.035-0.085 mm)
Maximum	0.008 in. (0.2 mm)

Crankshaft**1620**

Journal Diameter

Standard	2.281-2.282 in. (57.957-57.97 mm)
Minimum	2.259 in. (57.4 mm)

Crankpin Diameter

Standard	1.730-1.731 in. (43.96-43.97 mm)
Minimum	1.708 in. (43.4 mm)

Runout

Standard	0.0012 in. (0.03 mm)
Maximum	0.0024 in. (0.06 mm)

Endplay

Standard	0.004-0.016 in. (0.1-0.4 mm)
Maximum	0.019 in. (0.5 mm)

Thrust Washer Thickness

Standard	0.116-0.118 in. (2.95-3.0 mm)
Minimum	0.110 in. (2.8 mm)

Front Main Bearing Diameter

Standard	2.283 x 2.441 in. (58 x 62 mm)
Maximum	2.289 in. (58.14 mm)

Journal to Cylinder Block Bearing Clearance

Standard	0.0017-0.0045 in. (0.044-0.116 mm)
Maximum	0.008 in. (0.2 mm)

Main Journal Regrind Size

0.010 undersize (0.25 mm)	2.271-2.272 in. (57.707-57.720 mm)
0.020 undersize (0.50 mm)	2.262-2.263 in. (57.457-57.470 mm)

Crankpin Regrind Size

0.010 in. undersize (0.25 mm)	1.721-1.722 in. (43.714-43.725 mm)
0.020 in. undersize	1.711-1.712 in. (43.464-43.475 mm)

Center Bearing to Crankshaft Clearance

Standard	0.0017-0.0040 in. (0.044-0.102 mm)
Maximum	0.0079 in. (0.2 mm)

Camshaft

Cam Height-Valve

Standard	1.341-1.343 in. (34.065-34.12 mm)
Minimum	1.327 in. (33.7 mm)

Bend

Standard	0.001 in. (0.03 mm)
Maximum	0.004 in. (0.1 mm)

Cam Height-Fuel

Standard	1.651-1.656 in. (41.94-42.06 mm)
Minimum	1.646 in. (41.8 mm)

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SECTION 5

TRANSMISSION SYSTEM



Shift Levers

- A Range shift lever
- B Main shift lever

Figure 5-1

DESCRIPTION AND OPERATION

The standard 9 x 3 gear transmission is a three range gearbox with each range having three forward and one reverse speed, for a total of nine forward and three reverse speeds.

Two gearshift levers control the operation of the transmission.

The range selector lever, A, Figure 5-1, controls operation of the range transmission.

The main shift lever, B, controls the three forward and one reverse speeds of the main transmission.

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