# Case International 385 485 585 685 885 Tractor

# Service Manual

C-39

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# SHOP MANUAL

# CASE/INTERNATIONAL

## MODELS
## 385—485—585—685—885

Engine serial number is stamped on right side of engine crankcase on all models. Tractor model and serial number are stamped on a plate attached to right side of front axle support. Transmission serial number is stamped on a plate attached to the right rear side of rear main frame. Model and serial number plate for front drive axle is located on left rear of axle housing.

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When reassembling, make certain that oil passages in housing and shafts are clean. Lubricate shafts and weight gear bushings and place drive weight gear (4) in housing. Install weight shaft from roll pin side of housing through the weight gear. Align roll pin hole in shaft with roll pin hole in housing, then tap shaft into position. Install double roll pins (8) as shown in Fig. 54.

**NOTE: Roll pins must be shorter than shaft diameter.**

Install roll pins to a depth of 1.375 inches (31.4 mm) in roll pin bosses. Place idler weight in housing and with both weights down, mesh teeth so that timing marks are aligned. Install second shaft and secure with double roll pin. Using a dial indicator, check backlash between weight gears. Backlash should be 0.007-0.009 inch (0.18-0.23 mm). If backlash is excessive, renew weight gear assemblies.

To install balancer assembly, first rotate crankshaft to position number two piston at TDC of compression stroke. Place new "O" ring (6—Fig. 53) in recess on balancer. Then, with weights toward bottom of balancer housing and weight gear timing marks aligned, install balancer so that timing mark on balancer drive weight is aligned with timing mark on balancer drive gear (2). Use new "O" rings and install oil pump pressure and suction pipe assembly. Using a dial indicator, check backlash between balancer drive weight gear (4) and balancer drive gear (2). Backlash should be 0.010-0.016 inch (0.25-0.40 mm) on D-206 and D-239 engines or 0.009-0.020 inch (0.23-0.51 mm) on D-268 engine.

**NOTE: When backlash between weight gears is satisfactory and backlash between weight gear (4) and balancer drive gear (2) is excessive, drive gear (2) is excessively worn and should be renewed.**

Install oil pan with new pan gasket and fill crankcase to proper level with new oil.

**57. RENEW BALANCER DRIVE GEAR.** To renew balancer drive gear (2—Fig. 53), first remove crankshaft from engine. Remove worn or damaged drive gear by using a chisel and hammer and splitting the gear. Remove any burrs which might be present on gear mounting surface of crankshaft. Heat new gear to 360-390° F (180-200° C), align the single timing mark (below tooth space of drive gear) with the notch on crankshaft flange and slide drive gear on crankshaft. The two marked teeth on drive gear should be toward flywheel end of crankshaft.

**WARNING: Always wear heat protective gloves when handling heated parts.**

## OIL PUMP AND RELIEF VALVE

### All Models

**58.** The internally mounted gear type oil pump is driven from the crankshaft gear and is accessible after removing the oil pan on all models and the timing gear cover on D-206, D-239 and D-268 engines. The pump is mounted to the front main bearing cap on all models.

On D-155 and D-179 engines, remove the main bearing cap and oil pump as an assembly. Leave bearing cap on pump when repairing oil pump.

On D-206, D-239 and D-268 engines, use an Allen wrench and remove the two upper pump retaining bolts, then working through holes in idler gear, remove the remaining two retaining bolts. Unbolt pressure and suction pipe assembly, then remove oil pump assembly.

To disassemble the oil pump, remove pressure and suction pipe assembly (16—Fig. 55) and "O" rings (15 and 21). Remove nut (3) and pull idler gear (8) and bearings from front cover (10). Remove bearings (4 and 7) washer (5) and snap ring (6) from idler gear. Remove nuts from rear of body bolts (1) and remove rear cover (14). Remove body (11) and driven pump

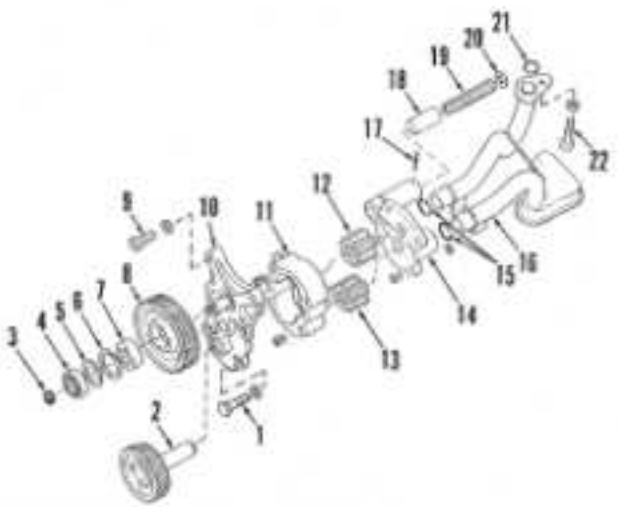



*Fig. 55—Exploded view of the oil pump used on all models.*

1. Body bolt (4)
2. Drive gear & shaft
3. Nut
4. Tapered roller bearing assy.
5. Washer
6. Snap ring
7. Tapered roller bearing assy.
8. Idler gear
9. Socket head cap screw (4)
10. Front cover
11. Body
12. Driven pump gear
13. Drive pump gear
14. Rear cover
15. "O" rings
16. Pressure & suction pipes
17. Cotter pin
18. Relief valve
19. Spring
20. Washer
21. "O" ring
22. Socket head cap screw



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clearance between retaining ring (33) and clutch back plate (34) is 0.030-0.040 inch (0.762-1.016 mm). If not, recheck shimming procedures.

Install sprague clutch (31) in low drive gear (30) and install the brass cup ring. Install oil seal (32) until seal is 0.050 inch (1.27 mm) below gear face. When low drive gear and sprague clutch assembly is installed on shaft, make certain that gear will rotate clockwise (viewed from front) and will lock to shaft in opposite direction. See Fig. 98.

Reinstall speed gearbox to engine. Apply Loctite 515 gasket eliminator to mounting face of range section, then reconnect speed gearbox to range section. Tighten bolts securing speed gearbox to engine and speed gearbox to range section to a torque of 80 ft.-lbs. (108 N-m).

| Dimension C | Shim required |
|---|---|
| 0 to 0.015 inch (0 to 0.381 mm) | No shim required |
| 0.015 to 0.025 inch (0.381 to 0.635 mm) | 0.014 inch (0.355 mm) |
| 0.026 to 0.035 inch (0.660 to 0.899 mm) | 0.024 inch (0.609 mm) |
| 0.036 to 0.045 inch (0.914 to 1.143 mm) | 0.036 inch (0.914 mm) |
| 0.046 to 0.055 inch (1.168 to 1.397 mm) | 0.014 inch + 0.036 inch (0.355 mm + 0.914 mm) |
| 0.056 to 0.065 inch (1.422 to 1.651 mm) | 0.024 inch + 0.036 inch (0.609 mm + 0.914mm) |
| 0.066 to 0.080 inch (1.676 to 2.032 mm) | 0.036 inch x 2 (0.914 mm x 2) |

*Fig. 98—Low drive gear and sprague clutch should rotate freely in clockwise direction (viewed from front) and lock to shaft when rotated in counterclockwise direction.*

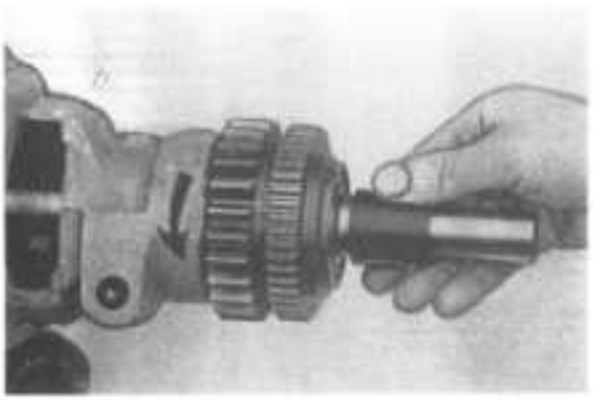


*Fig. 97—Chart used in selecting shim to adjust correct thickness of direct drive (high) clutch components. Refer to text.*

# FORWARD-REVERSE TRANSMISSION

## OPERATION

### Models So Equipped

**105.** All models except Model 885, may be equipped with a Forward-Reverse shuttle transmission located in front of the speed transmission. The Forward-Reverse unit is controlled by a lever on left side of instrument panel. This lever is linked to the hydraulic spool in the Forward-Reverse clutch housing. Movement of this lever engages one clutch and releases the other. To prevent damage to transmission, control lever cannot be moved until engine clutch release pedal is depressed. The range transmission, on models equipped with the Forward-Reverse unit, does not have a reverse; only a high and low. This gives the tractor a total of eight forward speeds and eight reverse speeds.

## TROUBLE SHOOTING

### Models So Equipped

**106.** Some of the problems which may occur during operating of the Forward-Reverse transmission and their possible causes are as follows:

1. No drive through Forward-Reverse transmission. Could be caused by:
   a. Mechanical linkage disconnected.
   b. Low oil pressure.
   c. Regulator valve stuck open.
2. Slipping Forward-Reverse clutches. Could be caused by:
   a. Faulty regulator valve.
   b. Damaged piston "O" ring seals.
   c. Damaged or excessively worn clutch plates.



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