



**100-C, 100-B
M-100, M-70**

motor graders

service manual

TRANSMISSION

Form 70693862 English

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TOPIC 3 - LUBRICATING SYSTEM

A. DESCRIPTION

Oiling system of the pressure lubricated transmission consists basically of a gear type oil pump (driven from transmission top shaft), a full flow filter, an oil pressure gauge, and necessary tubing, etc.

Fig. 2: Oil flow is as follows: pump (8) draws oil through strainer (22), forces it through oil filter (11) and to top shaft front bearing retainer (6). Part of this oil is used to lubricate top shaft components; remainder of oil is directed through exterior tubing (7)(12) to intermediate shaft front bearing retainer (15) and reverse shaft (32). Restricted connectors

(14) maintain backpressure to permit a portion of the oil to flow to bottom shaft bushings and rear bearing. Bottom shaft front bearing is lubricated by "spill over" oil from intermediate shaft front bearing. Note: oil flowing to bottom shaft is directed through cross shaft housing (28).

B. OIL PUMP

The fixed displacement pump supplies oil to transmission at approximately 3.5 gpm. Pump pressure is limited by a relief valve which bypasses oil back to inlet side of pump when pressure exceeds 80-100 psi. Normally, valve will open only if system has not

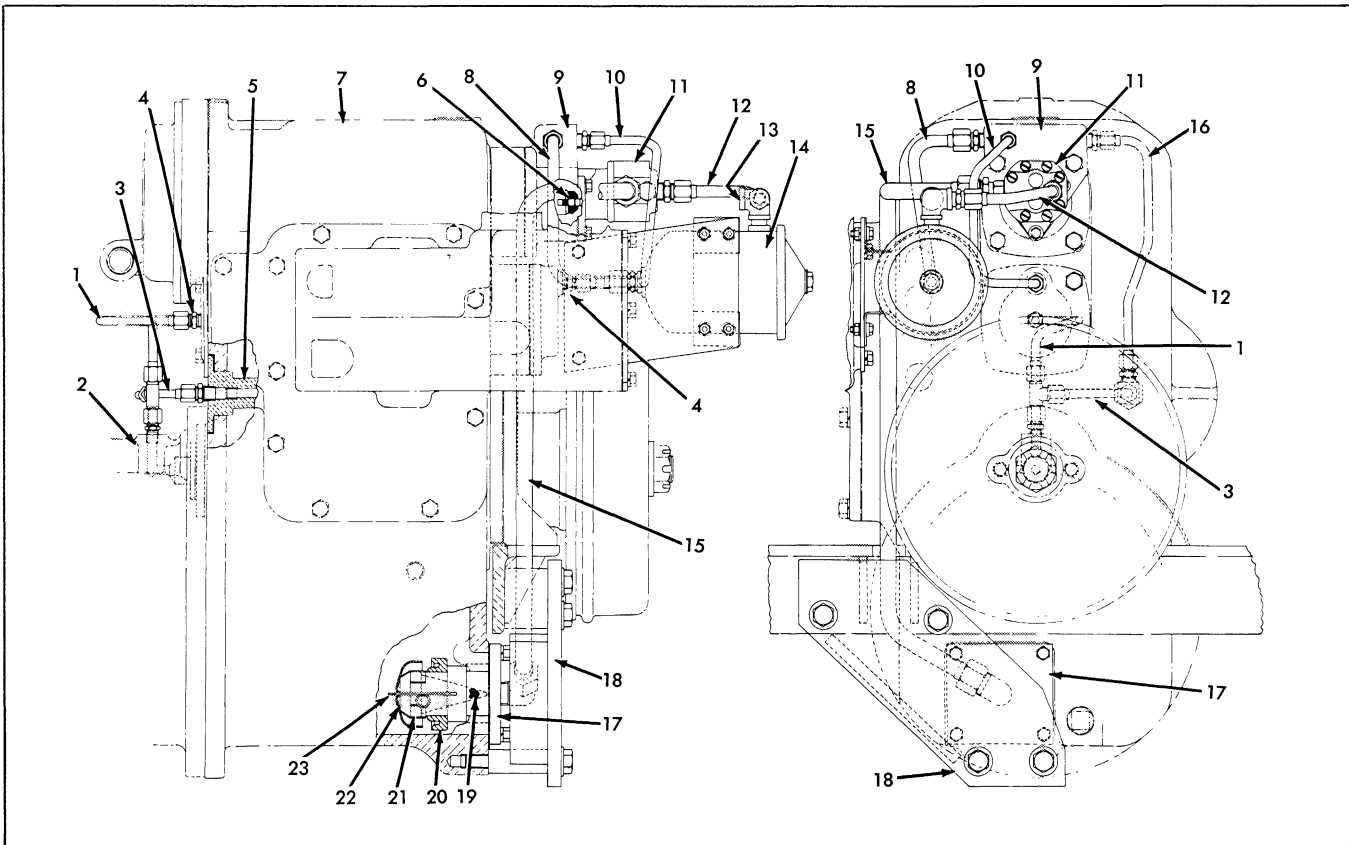
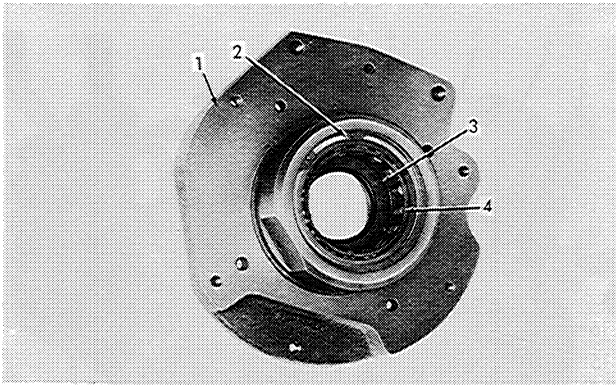


Fig. 1 Lubricating Components
(T-35091)

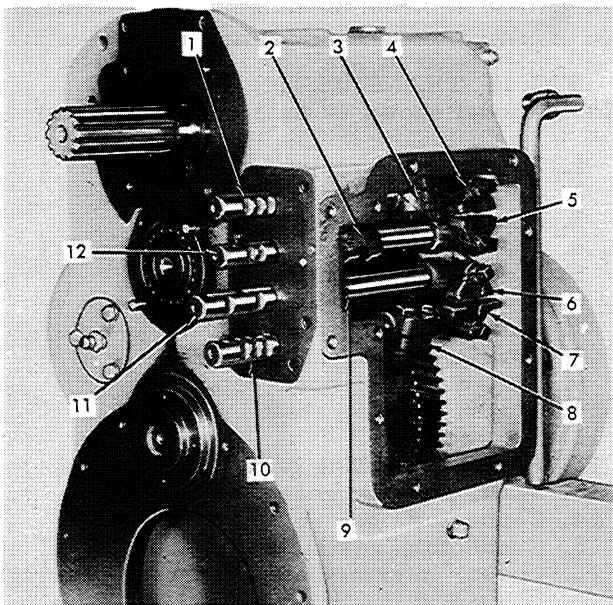
- | | | |
|------------------------------------|---|--------------------------------------|
| 1. Tube, tee-to-intermediate shaft | 9. Retainer, top shaft front bearing | 16. Tube, top shaft-to-reverse shaft |
| 2. Housing, cross shaft | 10. Tube, top shaft-to-intermediate shaft | 17. Cover, oil strainer |
| 3. Tube, to reverse shaft | 11. Pump, oil | 18. Plate, suction line guard |
| 4. Connector (restricted) | 12. Tube, pump-to-filter | 19. Strainer, suction line |
| 5. Shaft, reverse | 13. Fitting, to-oil pressure gauge | 20. Magnet, suction line |
| 6. Coupling, pump drive | 14. Filter, oil | 21. Baffle support |
| 7. Transmission | 15. Tube, pump suction line | 22. Baffle |
| 8. Tube, filter-to-top shaft | | 23. Wire bail |



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FIG. 12 TRANSMISSION CASE ADAPTER

- 1. Adapter
- 2. Snap ring
- 3. Seal, oil
- 4. Bearing, rear roller

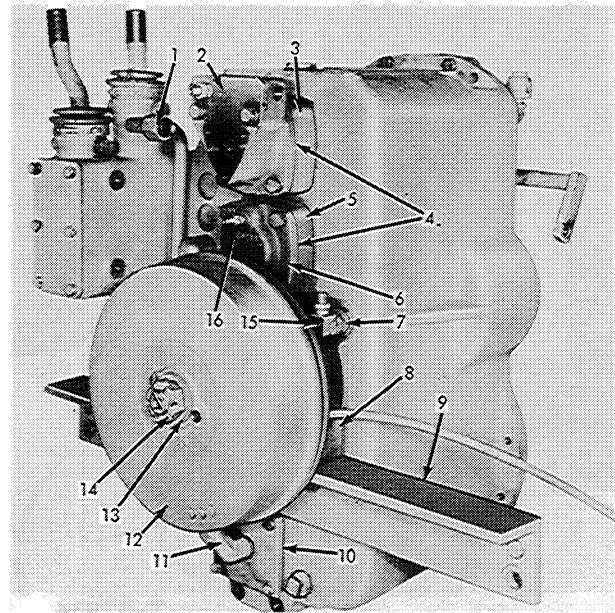


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FIG. 13 SHIFTING SHAFTS, FORKS AND GUIDES INSTALLED (Early model shown -- Late model similar)

- 1. Shaft, shifting (2nd, 3rd, 5th, 6th)
- 2. Fork, shifting (1st, 4th)
- 3. Fork, shifting (2nd, 3rd, 5th, 6th)
- 4. Guide, shifting (2nd, 3rd, 5th, 6th)
- 5. Guide, shifting (1st, 4th)
- 6. Guide, shifting, reverse
- 7. Guide, shifting, high-low range
- 8. Fork, shifting, high-low range
- 9. Fork, shifting, reverse
- 10. Shaft, shifting, high-low range
- 11. Shaft, shifting, reverse
- 12. Shaft, shifting (1st, 4th)

7. Remove the four shifting shaft interlocking detents from shifting shaft inner locking plate. Slide locking plate and gasket from shifting shafts.



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FIG. 14 TRANSMISSION -- LEFT FRONT VIEW

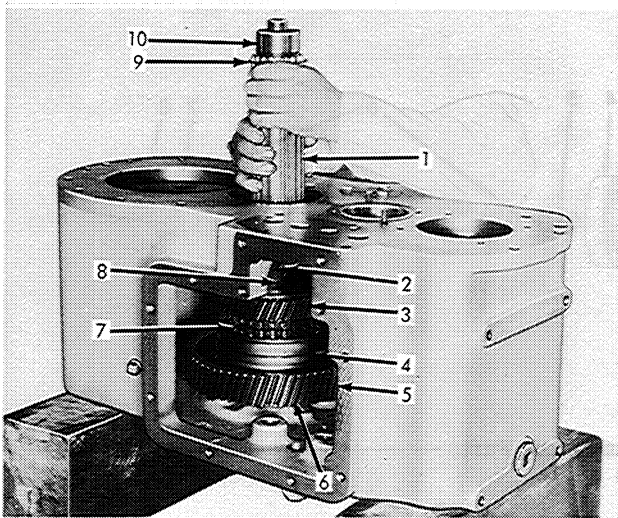
- 1. Tube, suction
- 2. Retainer, top shaft front bearing
- 3. Carrier, top shaft front bearing
- 4. Shims, retainer adjustment
- 5. Carrier, intermediate shaft front bearing
- 6. Retainer, intermediate shaft front bearing
- 7. Plug
- 8. Retainer, parking brake
- 9. Angle, supporting
- 10. Cover, strainer
- 11. Elbow
- 12. Drum, brake
- 13. Washer, drum retaining
- 14. Nut
- 15. Connector, reverse shaft oil tube
- 16. Connector, restricted

8. Remove gear shift housing assembly and gasket from transmission case.

9. Fig. 13: Cut and remove locking wires from shifter guide setscrews and shifting fork retaining capscrews.

10. Remove capscrew securing reverse shifting fork to shifting shaft. Loosen (do not remove) capscrews securing the three remaining shifting forks to shifting shafts. Loosen jam nuts on shifter guide setscrews, and loosen setscrews until shifter guides are loose on shafts.

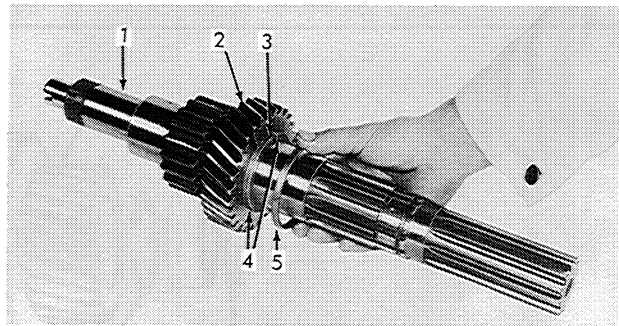
11. Pull shifting shafts out, and remove forks as they become free of shafts.



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FIG. 26 POSITIONING BOTTOM SHAFT

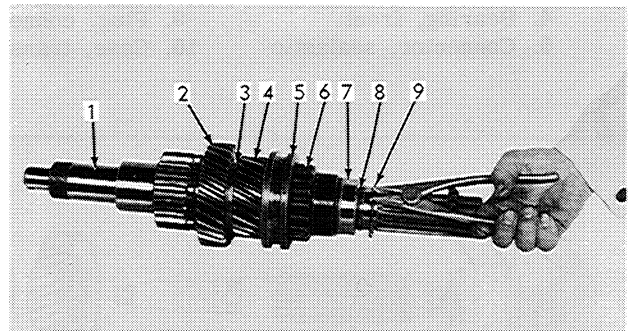
1. Shaft, bottom
2. Gear, forward and reverse
3. Gear, high range
4. Collar, high-low
5. Gear, low range
6. Washer, retaining
7. Hub, gear, high-low
8. Spacer, gear
9. Snap ring
10. Race, inner



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FIG. 27 INSTALLING SPLIT THRUST WASHER AND RETAINING RING

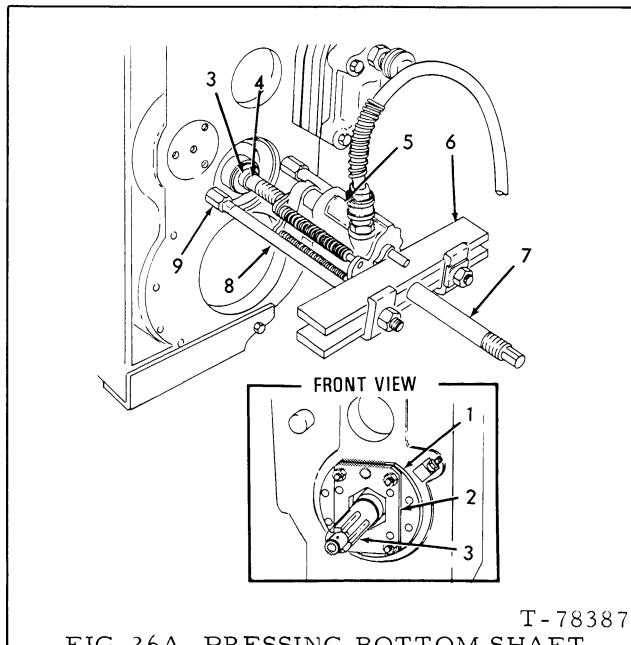
1. Shaft, top
2. Gear, 2nd and 5th (29T)
3. Pin, thrust washer drive
4. Thrust washer, split
5. Ring, retaining



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FIG. 28 INSTALLING SNAP RING

1. Shaft, top
2. Gear, 2nd and 5th (29T)
3. Ring, retaining
4. Gear, 1st and 4th (23T)
5. Collar, 1st and 4th shifting
6. Hub, driving
7. Race, rear bearing inner
8. Drilled oil passage
9. Snap ring



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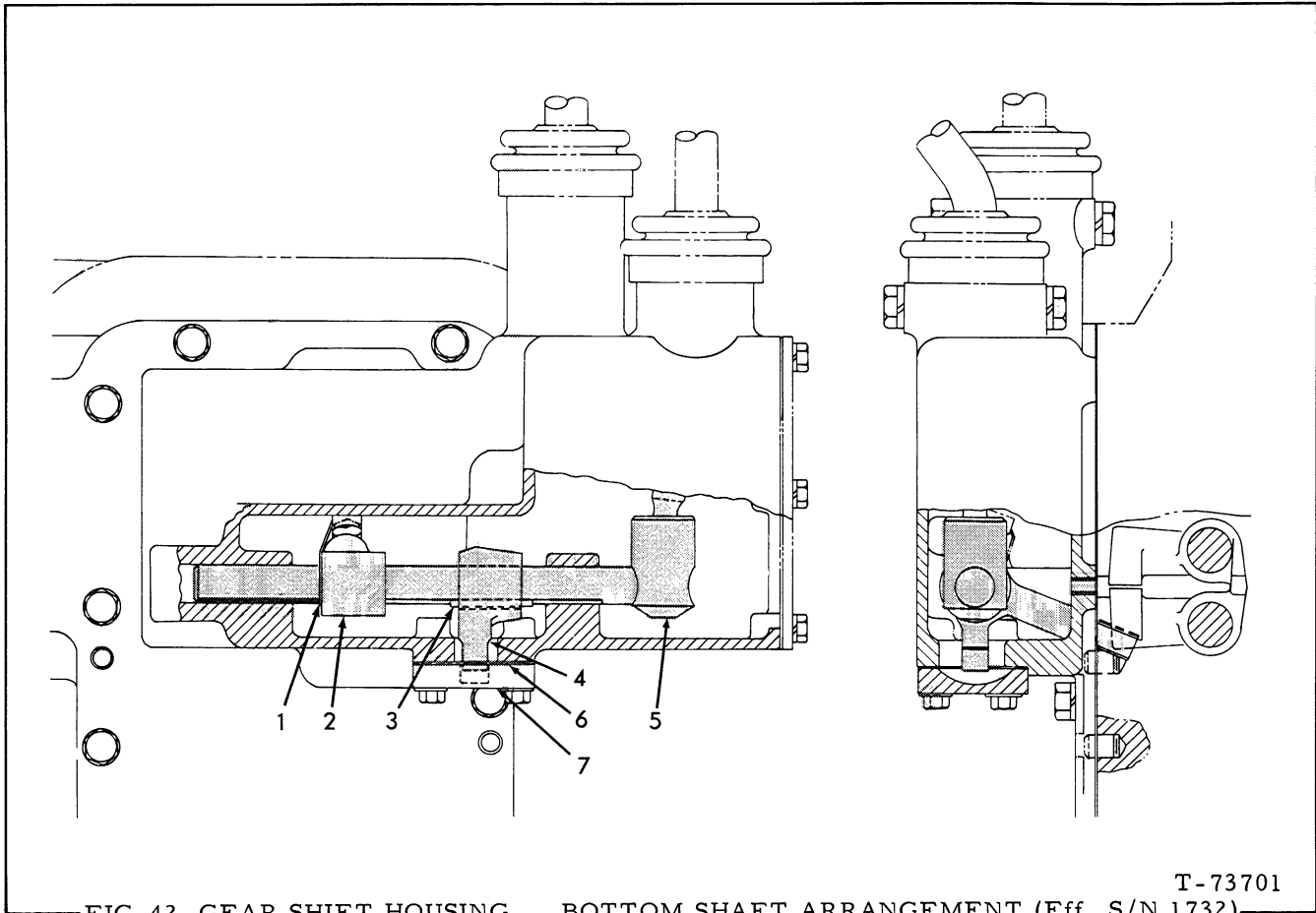
FIG. 26A PRESSING BOTTOM SHAFT INTO FRONT BEARING

- | | |
|--------------------|--------------------|
| 1. Bearing carrier | 6. Push - puller |
| *2. Tool | 7. Forcing screw |
| 3. Bottom shaft | 8. Puller leg |
| 4. Shaft protector | 9. Adapter |
| 5. Hydraulic ram | *See Service Tools |

ents for each shaft on their respective shafts, and check for free fit between gears and splines, bushings and hubs, hubs and shafts, washers and shafts, shifting collars on speed range gears, etc. Remove components from shafts and keep them in order.

1. REVERSE GEAR AND SHAFT INSTALLATION

- a. Fig. 24: Install snap rings in bore of reverse gear. Press rear bearing (double row ball bearing) in bore of helical gear. Press front bearing (single row bearing) in bore of straight tooth gear.



1. Lockwire
2. Arm, selector
3. Key
4. Arm, locking

5. Shaft
6. Gasket
7. Block

8. Connect parking brake cable to operating lever bracket; install clips attaching cable to main frame. Turn operating lever adjusting knob (at top of lever) until a positive overcenter action on lever is obtained.
9. Install center battery supporting brace, battery boards and batteries, battery hold downs, seat adjusting latch mechanism, seat and seat frame, and seat and tank assembly front covers.
10. Be certain transmission oil drain plug is installed and tighten securely. Fill

transmission with specified lubricant until oil level is even with oil level plug in right side of transmission.

11. Operate engine at 1/2 throttle with high-low range shift lever in LO. Transmission oil pressure must be within operating range on gauge. Check transmission oil lines for leaks; correct any leaks found.
12. Stop engine; install right floor plate. Install center floor plate with decelerator control rod and connect rod.
13. Install shifting levers.

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