

DISASSEMBLY & ASSEMBLY of the R180FS TRANSMISSION

The following instructions will cover the disassembly and assembly of the transmission in a sequence that would normally be followed after the transmission has been removed from the machine

CAUTION: Cleanliness is of extreme importance and an absolute must in the repair and overhaul of this transmission. Before attempting any repairs, the exterior of the unit must be thoroughly cleaned to prevent the possibility of dirt and foreign matter entering the mechanism.

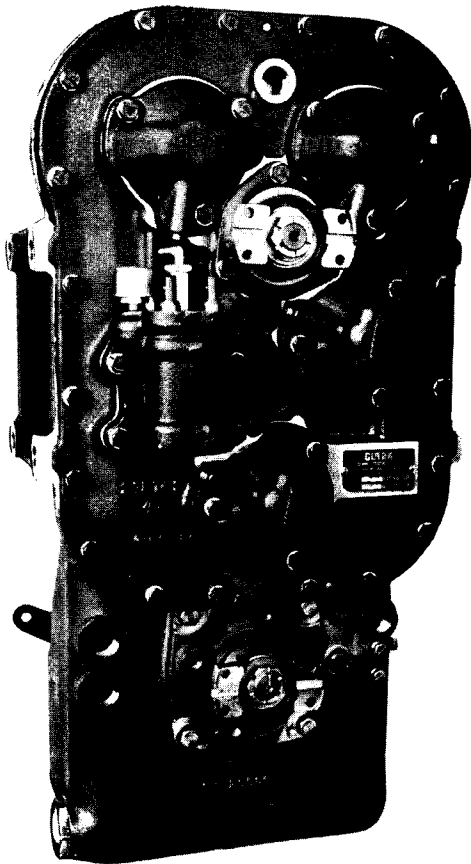


Fig. 1

Remove all exterior bearing caps and control valve.
Remove transmission cover bolts and lockwashers.

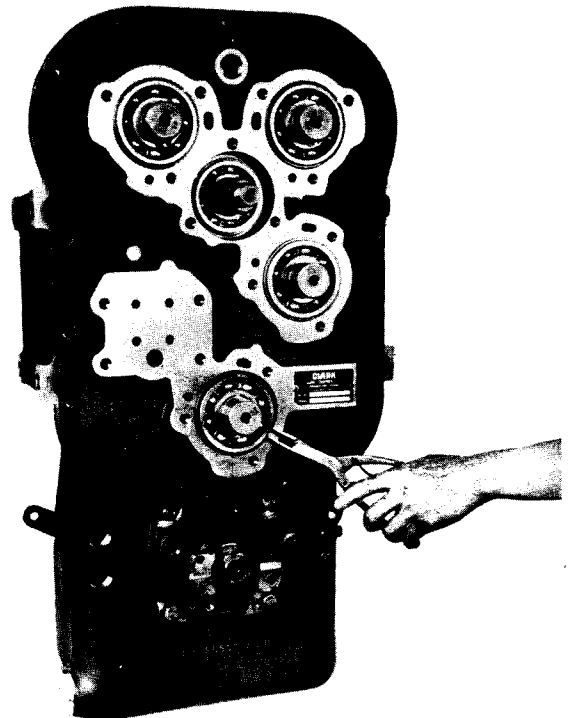


Fig. 2

Each bearing has a locating ring on it; remove these rings five (5) in all.

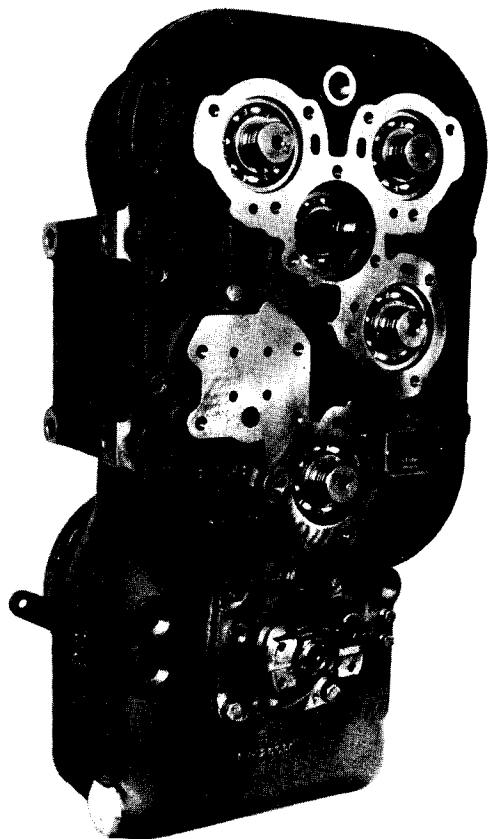


Fig. 3

Using a suitable tool, pry cover from transmission.

NOTE: As cover is being pryed from case, tap each shaft with a soft hammer to prevent them from coming out with cover.

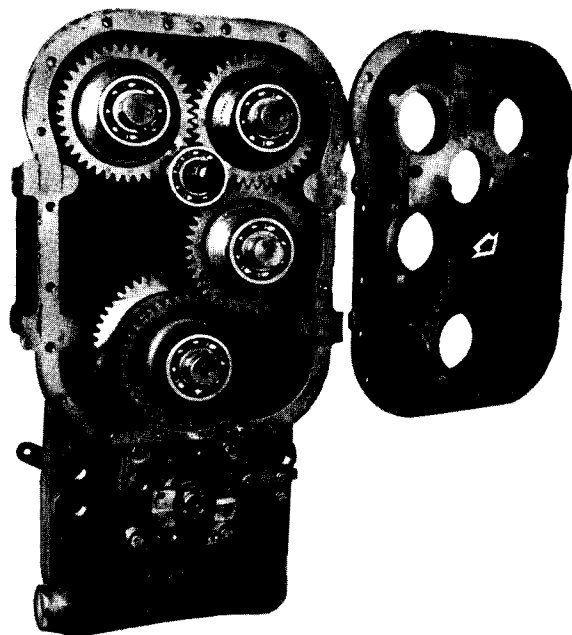


Fig. 4

Under the transmission cover is the oil circuit plate. It is recommended when repairs are made; this plate be removed and checked for dirt and foreign matter.

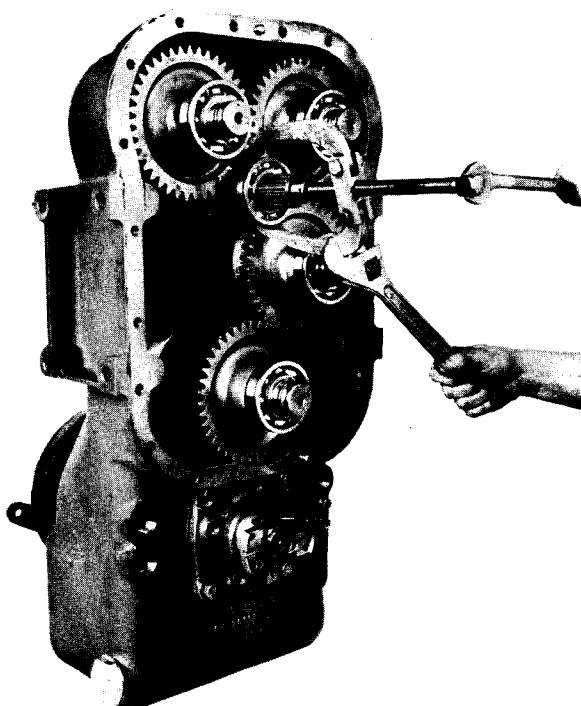


Fig. 5

Remove input shaft bearing.

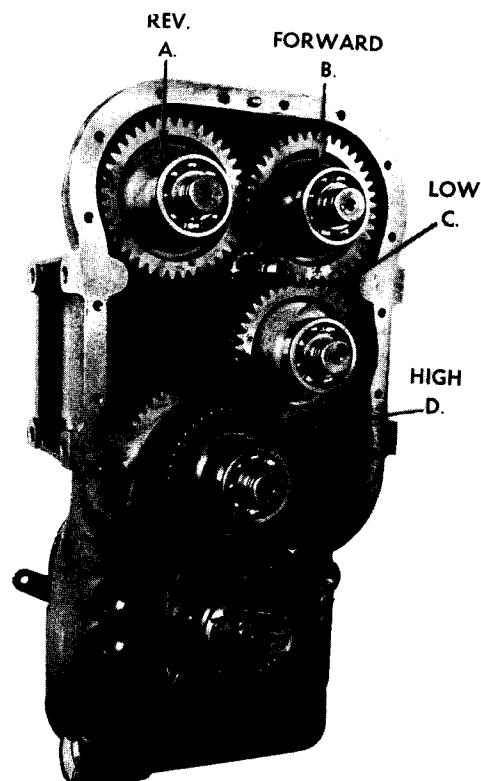


Fig. 6

The clutch packs must be removed in sequence such as A, B, C, D. Pull clutch B, out of case about 5/8". This is to allow clutch A to pass clutch B. Pull clutch A from case.

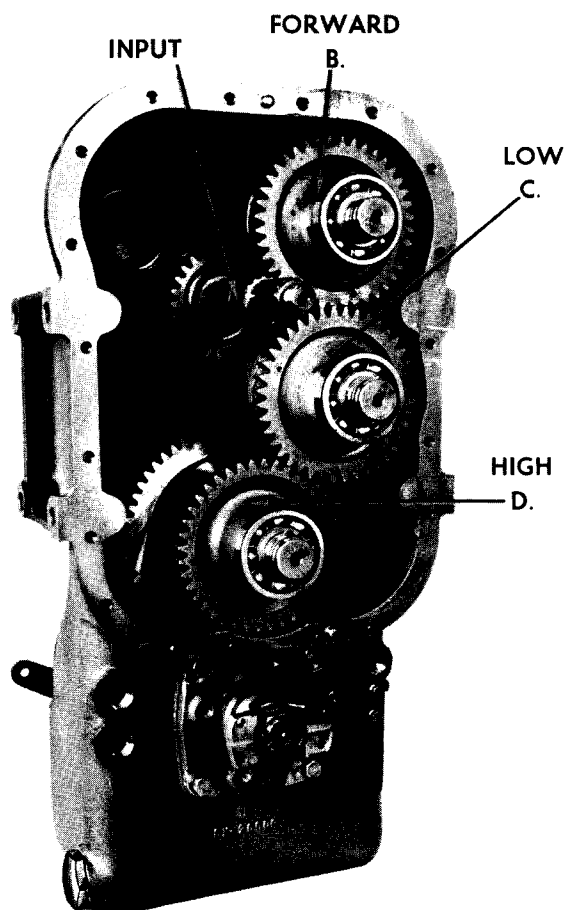


Fig. 7

With clutch A removed, tap clutch B back in case. Pull clutch C out of case about $5/8$ ". This is to allow clutch B to pass clutch C. Tap clutch C back in case and pull clutch D out of case about $5/8$ ". This is to allow clutch C to pass clutch D. After clutch C has been removed; remove clutch D. Pull input shaft from case.

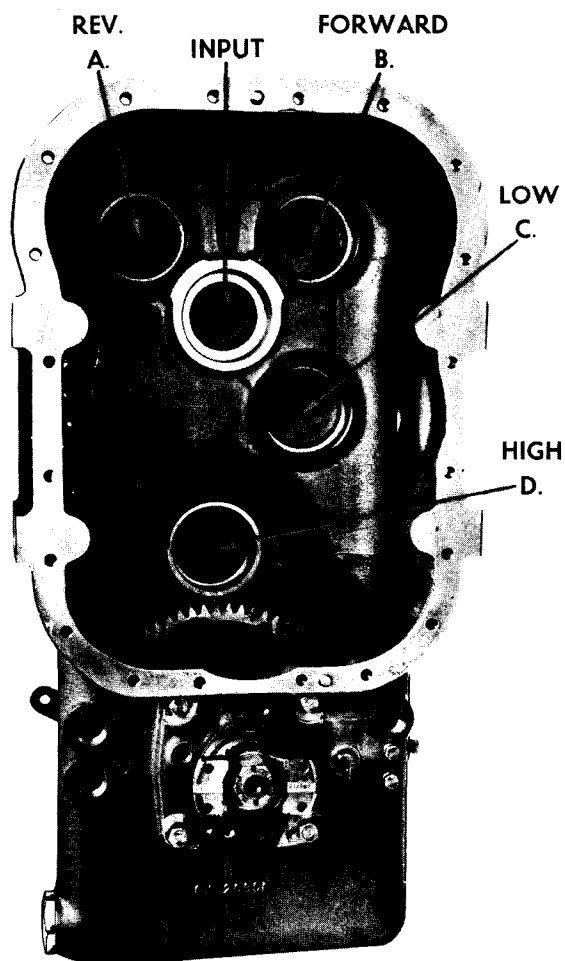


Fig. 8

Case after input shaft and clutches have been removed. Remove front flange nut, flange and bearing cap.

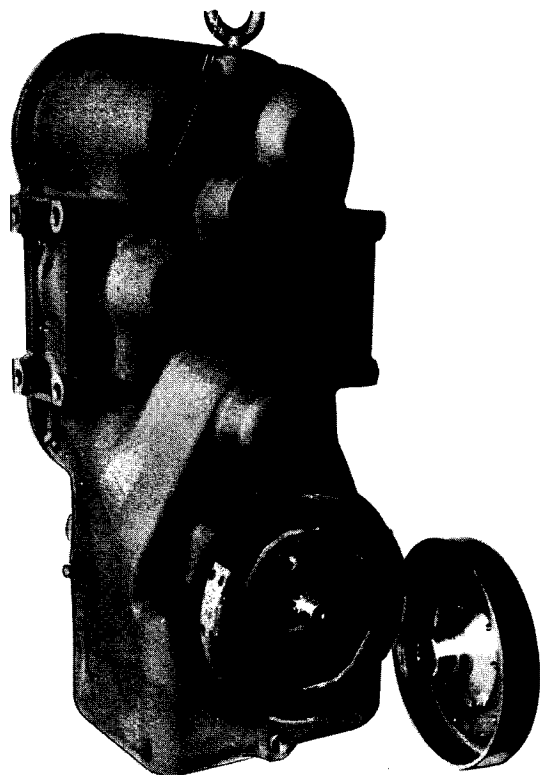


Fig. 9

Remove brake drum flange nut and brake drum. Remove brake band retaining springs and brake bands.

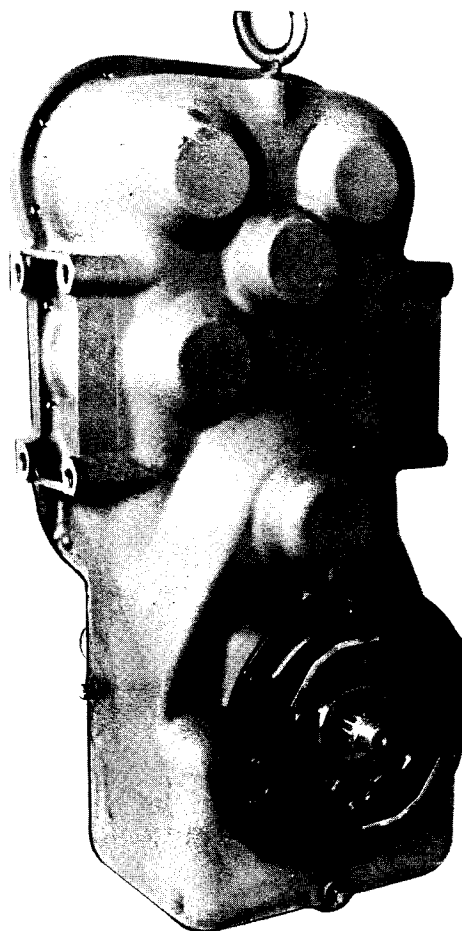


Fig. 10

Remove brake backing plate assembly.

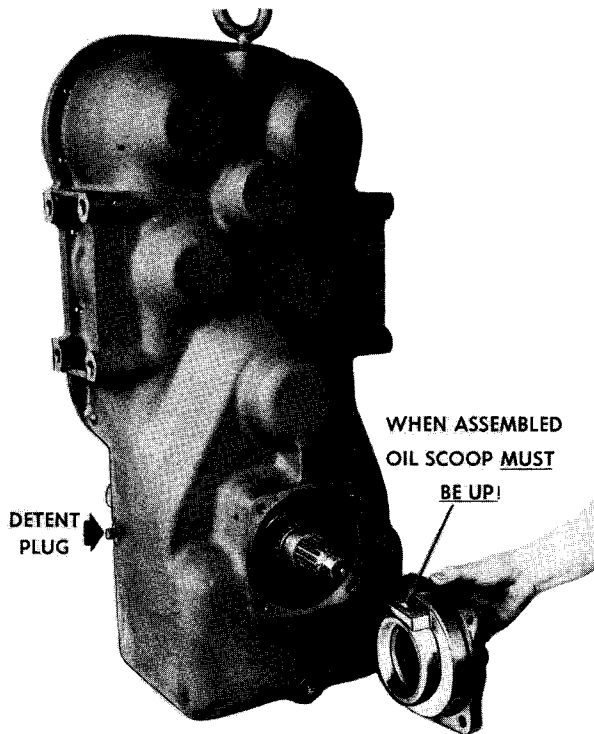


Fig. 11

Remove rear bearing cap.
Remove range shift rail detent plug.
Remove detent spring and ball.
Remove range shift fork lock-screw.
Remove range shift fork rail and shift fork.

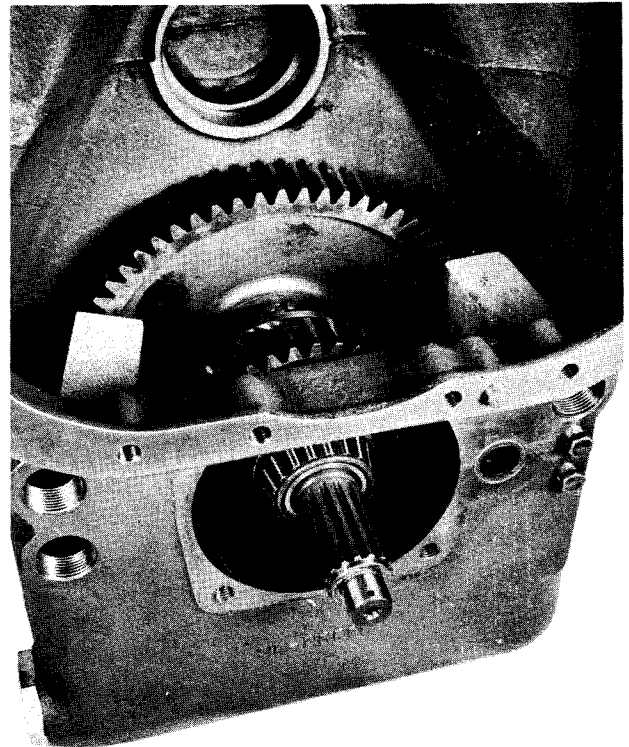


Fig. 12

Block low gear (as shown) using a soft hammer at the brake end of the output shaft, drive the shaft, high gear front bearing from transmission case.

NOTE:

High gear will pass through bore in case, but caution must be used to prevent damage of gear teeth or transmission case bore.

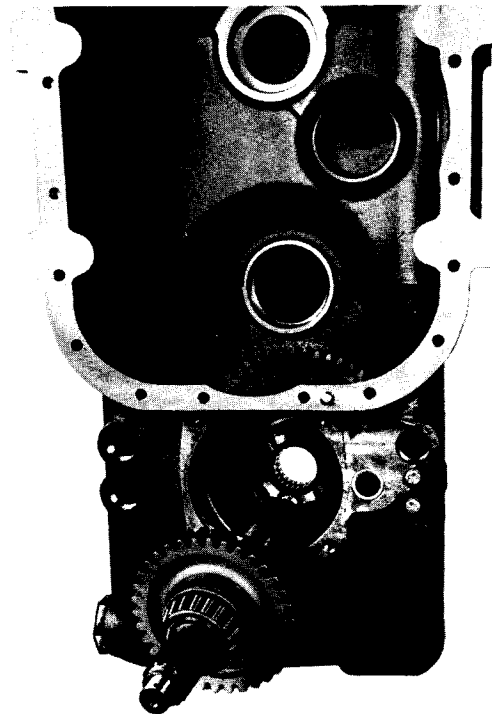


Fig. 13

Remove output shaft, high gear and bearing as an assembly from the case.
Press bearings from high and low gears, only if bearings are to be replaced.

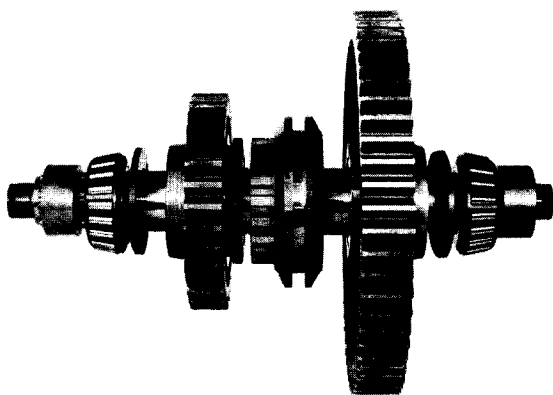


Fig. 14

Output shaft with sequence of parts assembled on it.

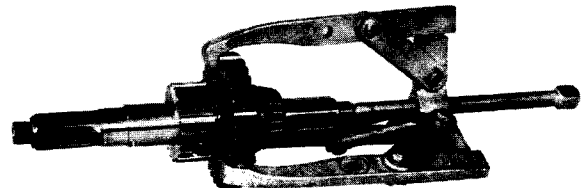


Fig. 15

Recommended procedure for removing high gear and bearing from output shaft.

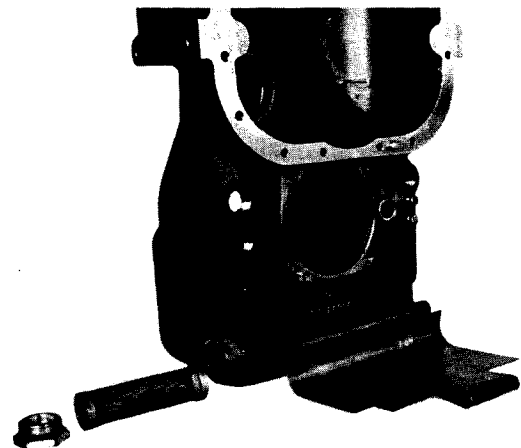


Fig. 16

Remove oil sump screen and oil baffle plate to facilitate cleaning.

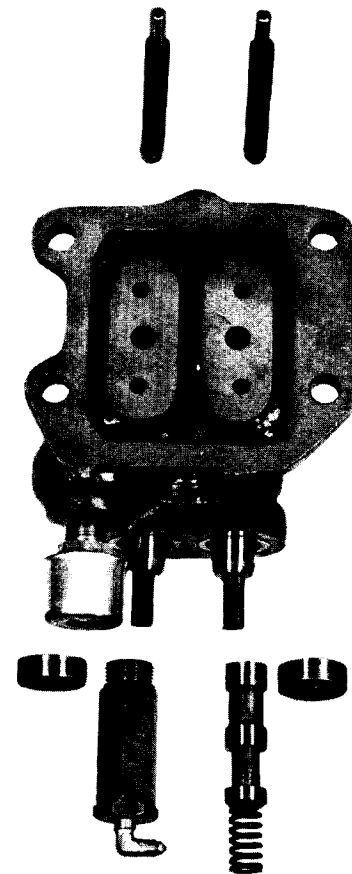


Fig. 17

Control valve showing sequence of parts (partially disassembled.)

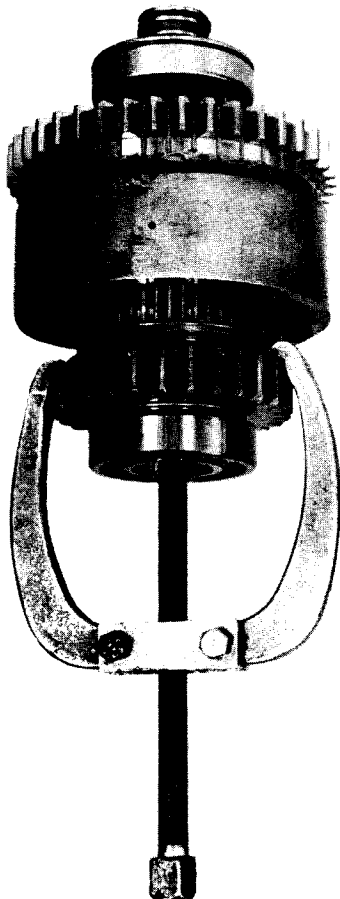


Fig. 18

Forward-Reverse and low clutch disassembly.
Remove bearing retainer ring. Using suitable puller, remove clutch disc hub gear and front gear bearing.

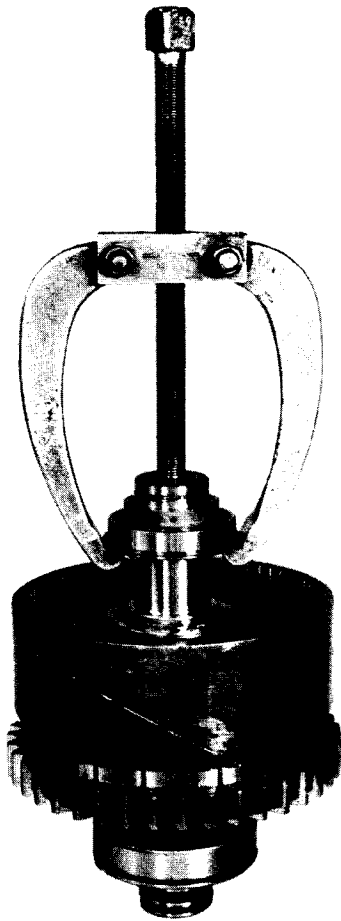


Fig. 19

Using a suitable puller, remove rear gear bearing. Remove end plate retainer ring and end plate. Remove inner and outer clutch disc.

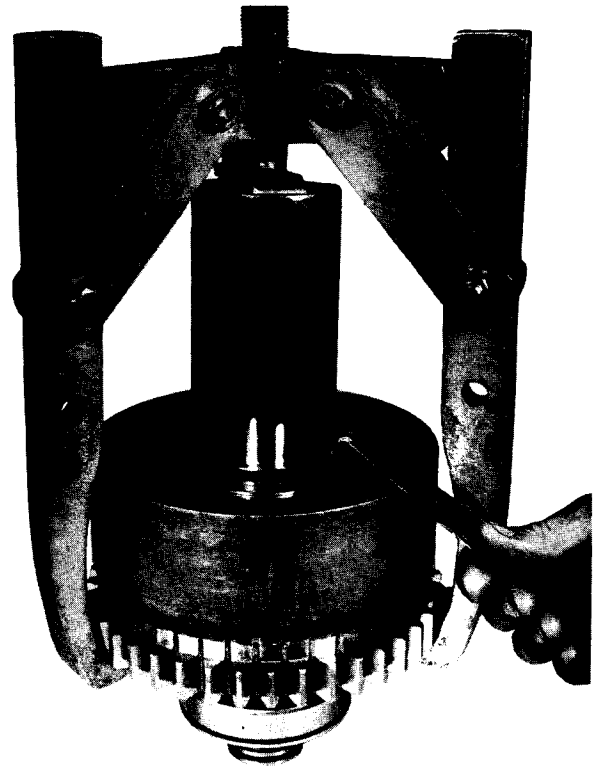


Fig. 20

A special sleeve with a portion removed is recommended for removing the piston return spring snap ring.

Return spring washer must be compressed to allow snap ring to be removed.

Sleeve shown is a piece of common pipe with a 2 1/2" I.D., 2 3/4" O.D. and 5" long.

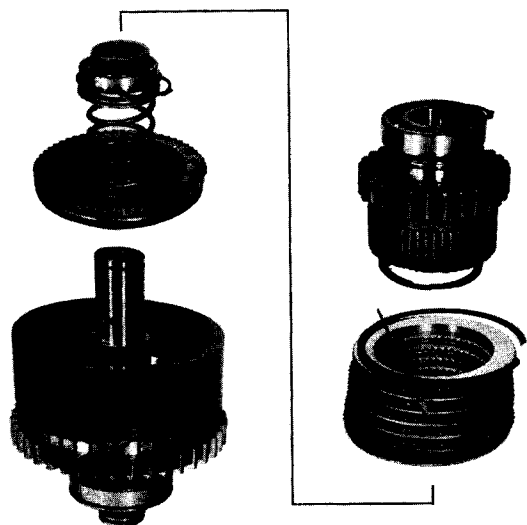


Fig. 21

Remove clutch piston return spring and clutch piston.

NOTE: High clutch disassembles the same as the low-reverse and forward, except clutch shaft oil sealing rings are on the same end as the clutch disc hub and must be removed first instead of later, as in the other three clutches.

Cleanliness of the respective parts is absolutely necessary in re-assembling. Dirt in its many forms can and will cause trouble. Therefore, before re-assembling the transmission or any of its parts be sure all parts have been thoroughly cleaned with a suitable cleaning fluid. After cleaning, all parts should be dried with moisture free compressed air.

A thorough visual examination of all parts should be made before re-assembly. Any parts that show excessive wear or

damage should be replaced. Small nicks or burrs may be removed with a hone or crocus cloth. It is recommended that all gaskets, oil seals, piston sealing rings, "O" rings and internal lockwashers be replaced.

The use of grease is recommended when positioning new gaskets in their respective locations. Piston sealing rings and "O" rings should be coated with type "A" Automatic Transmission Fluid to facilitate assembly.

REASSEMBLY

Clutch Assembly:

Before re-assembling the clutch, lubricate all parts with a light coating of Type "A" Automatic Transmission Fluid.

1. Install new piston outer sealing ring on piston.
2. Install new piston inner sealing ring on clutch shaft.
3. Install piston in clutch drum.
4. Install piston return spring on clutch shaft.
5. Install return spring washers and retainer ring.
6. Compress spring and washers as shown in Fig. 20 and install washer retaining ring.
7. Install one bronze disc. Each steel disc has a .015 to .020 dish in them. Each steel disc has two oil grooves 180° apart on the outer diameter.
8. Install one steel disc with dish away from repairman.

9. Install one bronze disc.
 10. Install second steel disc with dish away from repairman and oil grooves lined up with oil grooves in first steel disc.
 11. Follow this sequence until five steel disc and six bronze disc have been installed, being sure the dish on the steel discs are away from the repairman and the oil grooves are all lined up.
 12. Install end plate and retainer ring. NOTE: There should be about $1/8$ " clearance between the last bronze disc and the end plate.
 13. Install one disc hub bearing (bearing ring down) on the clutch shaft.
 14. Install bearing spacer - oil groove down on the clutch shaft.
 15. Install clutch disc hub into clutch drum, aligning the internal teeth on the bronze disc into the spline on the disc hub - the hub bearing on the clutch shaft will have to be worked in the clutch disc hub - it is a slip fit and must not be forced.
- CAUTION: Be sure clutch disc hub is in full position with teeth on all bronze disc.

On the reverse, forward and low clutch, the distance between the bottom face of the clutch disc hub gear teeth and the clutch end plate is about $7/16$ ". The high clutch has a distance of about $5/32$ " - a measurement larger than those given

will indicate the bottom bronze disc is not engaged with the clutch disc hub.

16. Press second disc hub bearing (bearing ring up) in disc hub.

NOTE: Bearing ring will not bottom on disc hub - bearing bottoms on bearing spacer in hub.

18. Install clutch shaft rear bearing and bearing retainer ring.

Transmission Re-assembly:

1. Install oil baffle plate and oil sump screen.

2. If bearings were pressed from high and low gears, proceed as follows:

- a. Press one bearing in gear - press second bearing on top of first bearing - bearings will be together in the center of the gear. NOTE: Bearings must be from .015 to .025 from face of gear hub. Check both sides of gear hub to be sure bearings are below face of gear.

3. Install high gear (34 teeth) and bearing assembly on output shaft - clutching teeth on gear to go toward hub on output shaft. Install thrust washer next to high gear.

4. Press cone bearing on shaft to bottom on washer.

NOTE: Press bearing against thrust washer tight enough that washer will not turn on shaft.

5. Install low gear (61 teeth) and bearing assembly, in housing with clutching teeth on gear toward center of case. (See Fig. 13).

6. Install range selector shift hub on shaft. Install high gear and shaft assembly through case bore and into low gear.
7. If disconnect is not used, install companion flange spacer - install new "O" ring on front bearing cap.
8. If disconnect output is being used, install new "O" ring on housing.

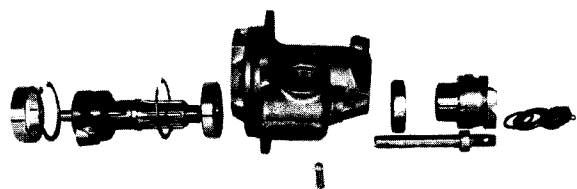


Fig. 22

Disconnect Assembly showing sequence of parts.

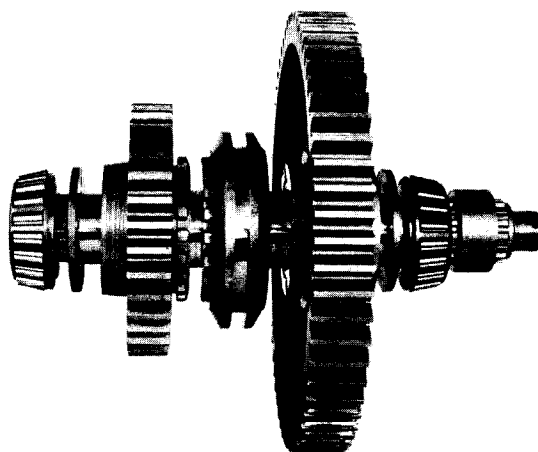


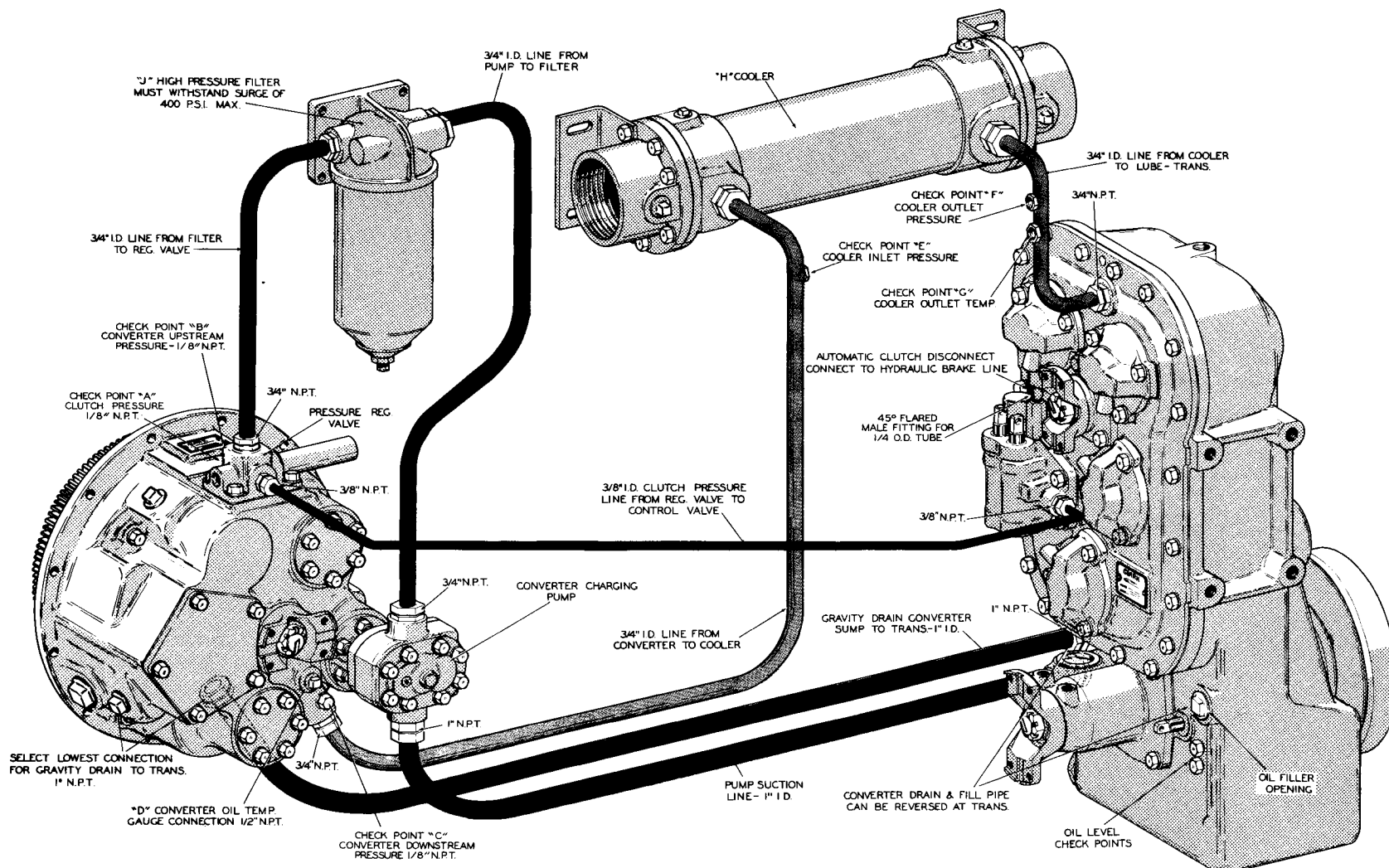
Fig. 23

Output shaft used with disconnect.

9. Install front bearing cap or disconnect on output. **CAUTION:** Oil hole in housing or bearing cap must be up - install bolts and lockwashers - tighten securely.
10. Install low gear thrust washer on rear end of output shaft.
11. Drive rear bearing on output shaft. **NOTE:** Bearing must be tight enough against thrust washer that washer will not turn on shaft - install companion flange spacer.
12. Press oil seal in rear bearing cap - lip of seal in - install new "O" ring on cap.

13. Install shims on bearing cap - install bearing cap assembly to transmission housing. NOTE: Oil hole must be up. Shims may be added or omitted to obtain 6 to 10 lbs. inches torque on cone bearing. NOTE: Use caution not to damage bearing cap "O" ring.
14. When proper preload is obtained, install brake backing plate, brake band assembly and brake drum.
15. Install range selector fork in shift hub.
Install range selector rail in fork and secure with lockscrew and lockwire - install detent ball, spring and plug in detent hole (arrow Fig. 11).
16. Install input shaft gear and bearing assembly in center bore of transmission case (See Fig. 8).
17. Install clutch D in bottom bore of case. Pull clutch D out of case about $5/8$ ", this is to allow clutch C to pass clutch D. Tap clutch D back in case and pull clutch C out of case about $5/8$ ". This is to allow clutch B to pass clutch C. Tap clutch C back in case and pull clutch B out of case about $5/8$ ". This is to allow clutch A to pass clutch B. Tap clutch B back in case. Tap all clutch shafts until they bottom in bore of case.
18. Install input shaft front bearing.
19. Install new case housing cover gasket.

20. Be sure oil circuit plate is in place and tightened securely.
21. Align clutch shaft bearings with bearing bores in case housing cover - tap cover on case housing; install bolts and lockwashers and tighten evenly, all the way around cover. CAUTION: Make sure input shaft bearing is not binding in cover.
22. In the end of each clutch shaft is a 7/16 - 20 threaded hole - by using a 7/16" x 20 bolt in the threaded hole in the clutch shaft; pry each shaft out enough to allow the assembly of the bearing locating rings (five (5) in all). Make sure rings are properly seated. Tap each shaft until bearing ring shoulders against case cover. NOTE: Check clutch shaft oil sealing rings. Make sure none are broken or damaged and all are locked properly.
23. Install new gaskets and "O" rings on clutch distributor bearing caps.
24. Press new oil seal in input shaft bearing cap. NOTE: Lip of oil seal in and oil seal must be pressed 5/16" from front face of bearing cap.
25. Install all bearing caps with bolt and lockwashers and tighten securely.
26. Install "O" rings, flange nut washers, and flange nuts; secure with cotter pins.
27. With detent ball, spring and pins in position; install control valve assembly.



CLARK EQUIPMENT COMPANY

TRANSMISSION DIVISION

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-  HIGH PRESSURE
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-  GRAVITY & SUCTION

EXTERNAL OIL FLOW DIAGRAM
C-270 SERIES CONVERTER WITH
2000 SERIES TRANSMISSION

OIL PRESSURE RECOMMENDATIONS

for C-270 SERIES CONVERTERS with 2000 SERIES TRANSMISSION

Make all checks after complete system is up to normal operating temperature (200° F.
minimum measured at Point "D").

A. Converter Pressure Check

Operate engine at 2000 R.P.M.

Place transmission direction and speed levers
in neutral.

Check Point	Oil Pressure P.S.I.
A. Clutch	160 to 200
B. Converter Upstream	60 Maximum
C. Converter Downstream	40 Maximum*
E. Cooler Inlet	35 Maximum
F. Cooler Outlet	10 Maximum

*Cooler and line pressure restrictions must be 20 P.S.I.
minimum to maintain normal converter performance.

B. Transmission Clutch Pressure Check

Operate engine at idle. (400 to 600 R.P.M.)

Check Point	Oil Pressure Minimum	Clutch Engaged
A.	160	Forward & Low
A.	160	Forward & High
A.	160	Reverse & Low
A.	160	Reverse & High

NOTE

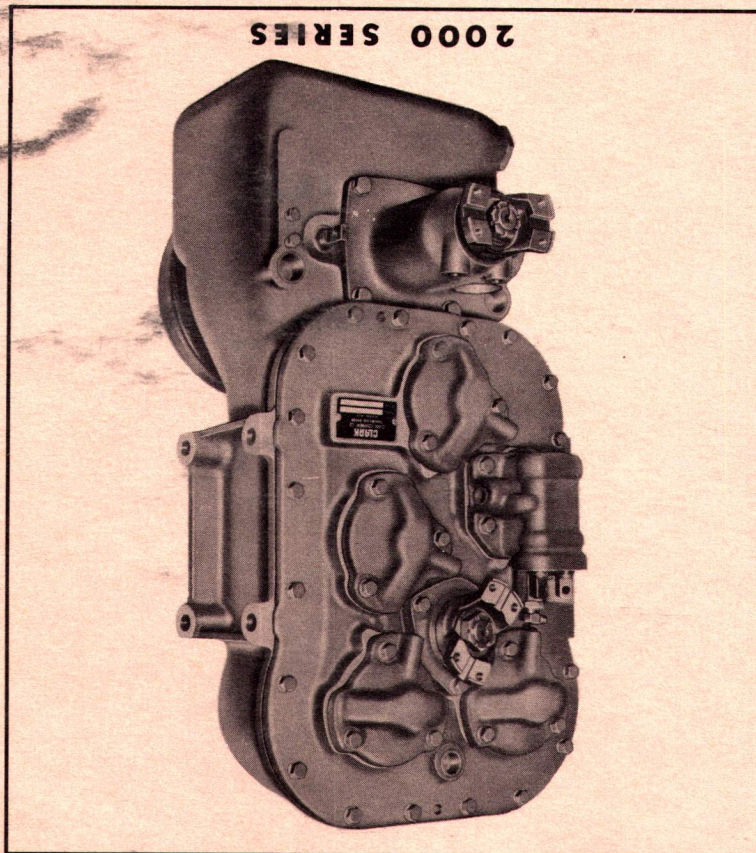
When installing the High Pressure Oil Filter between the Converter Charging Pump and the Pressure Regulating Valve, it is an **ABSOLUTE MUST** that the line from the Pump be connected to the **IN** side of the Filter and the line to the Pressure Regulating Valve be connected to the **OUT** side of the Filter. (The words IN and OUT are stamped by the Filter Line openings.)

NOTE

GENERAL NOTES

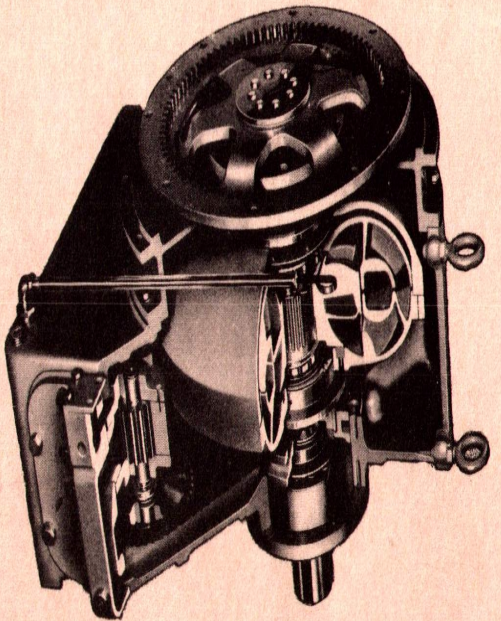
1. Use Type "A" Automatic Transmission Fluid only.
2. Use Clark 215508 Oil Filter only.
3. Use Clark 215502 Oil Filter Element only.
4. Use line size as called for on PD-2000 or larger.
5. Use minimum number of Pipe and Hose Fittings.
6. Gravity drain from converter sump to transmission must be of minimum length and have no "U" bends to trap air or oil.
7. Cooler capacity for normal application, 30 per cent of net engine horsepower at governed speed.
8. Check oil level with engine idling and transmission in neutral.

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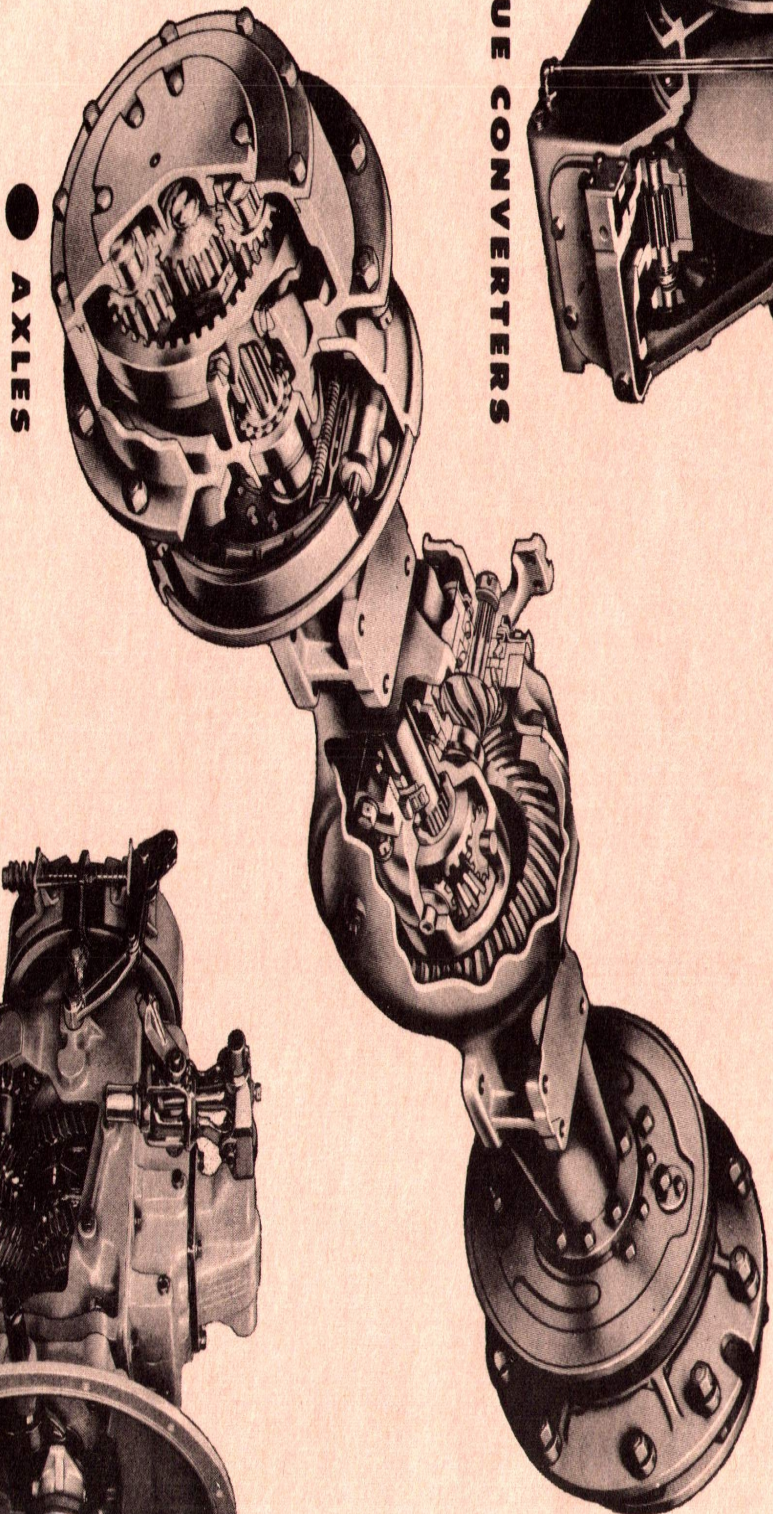


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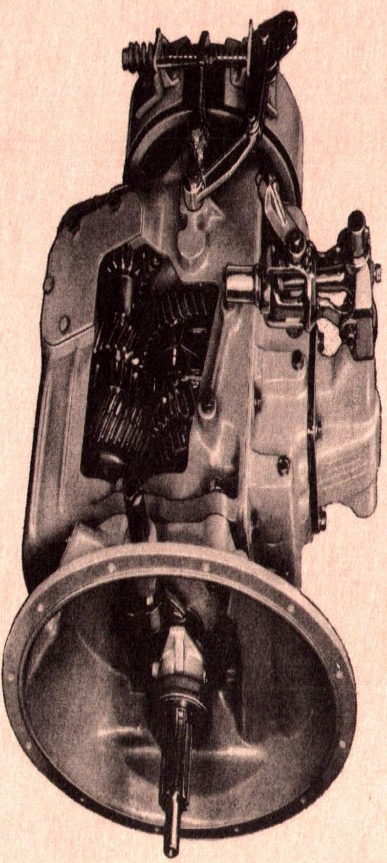
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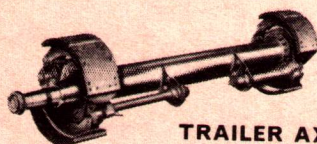
● **TORQUE CONVERTERS**



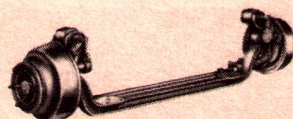
● **AXLES**



● **TRANSMISSIONS**



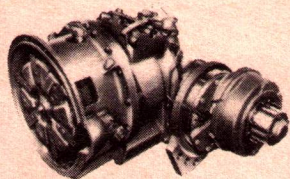
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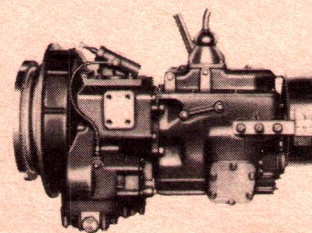
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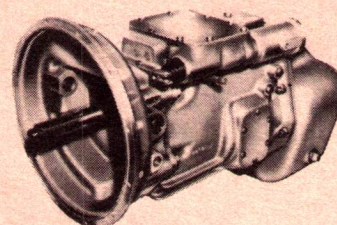


TRANSVERTERS
torque converter-clutch-
transmission packages

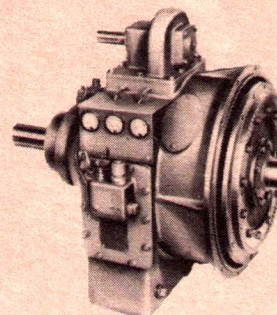
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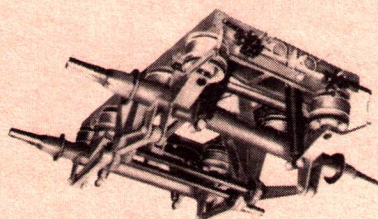
of course



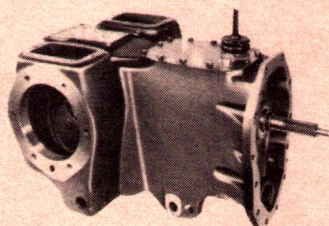
TRANSMISSIONS
50 to 1400 lb-ft torque ratings



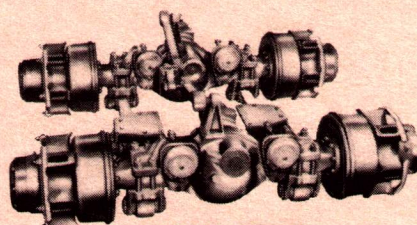
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9" to 28" diameters



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single, tandem, and spreads;
up to 36,000 lbs



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