



**FUNK
MANUFACTURING
COMPANY**

Subsidiary of Deere & Company

FUNK

POWER

**DF SERIES 150 AND 250
TRANSMISSION**

**ASSEMBLY/DISASSEMBLY
MANUAL YZ103053**

Introduction

FOREWORD

Component Technical Manuals (CTM) are concise service guides for specific components. Component technical manuals are written as stand-alone manuals covering multiple machine applications.

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.



This is the safety-alert symbol. When you see this symbol in the manual or on the machine, be alert to the potential for personal injury.



WARNING VEHICLE RUNAWAY HAZARD

Avoid serious or fatal injury. This transmission is not a braking system. Install it only if there is a braking system capable of stopping vehicle with dead engine, disengaged transmission, or loss of hydrostatic retardation. Otherwise, vehicle may roll freely, resulting in loss of control.

Use this component technical manual in conjunction with the machine technical manual. See the machine technical manual for information on component removal and installation, and gaining access to the components.

This manual is divided in three parts; repair, theory of operation, and troubleshooting and tests:

- Repair groups contain necessary instructions to repair the component.
- The theory of operation group describes how the component operates and functions.
- Troubleshooting and test groups help you identify the majority of routine failures quickly and then allows you to perform certain tests.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable service equipment and tools, other materials needed to do the job, specifications, and torque values.

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All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

CTM84-19-02SEP94

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A John Deere ILLUSTRATION Manual

⚠ **WARNING VEHICLE RUNAWAY HAZARD** Avoid serious or fatal injury. This transmission is not a braking system. Install it only if there is a braking system capable of stopping vehicle with dead engine, disengaged transmission, or loss of hydrostatic retardation. Otherwise, vehicle may roll freely, resulting in loss of control.

YZ,WARN -19-28APR94

HANDLE FLUIDS SAFELY—AVOID FIRES

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



-JUN-23AUG88
TS227

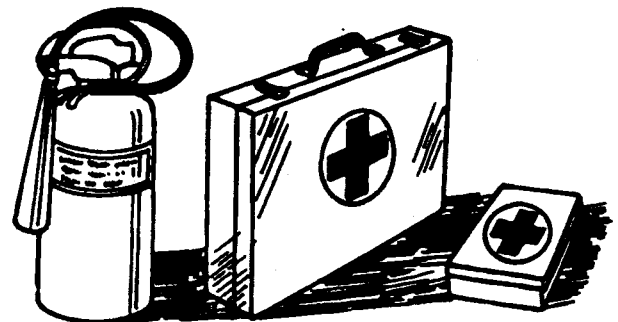
DX,FLAME -19-04JUN90

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



-JUN-23AUG88
TS291

DX,FIRE2 -19-03MAR93

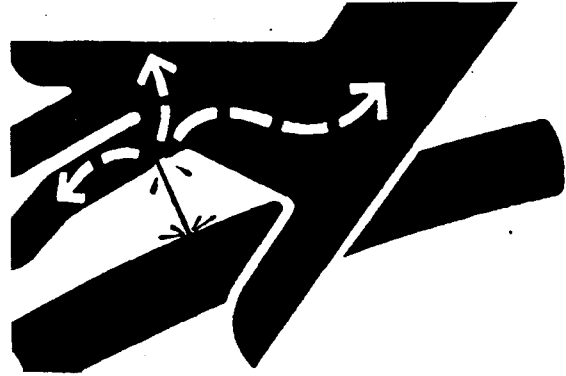
AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



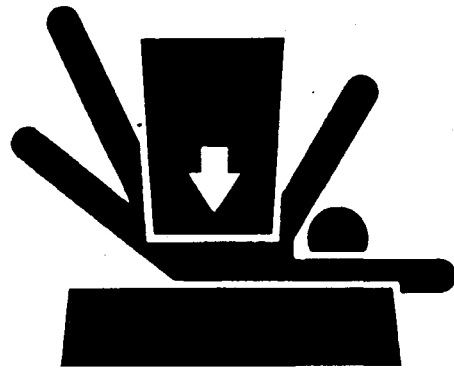
X9811 -UN-23AUG88

DX,FLUID -19-03MAR93

SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



TS229 -UN-29AUG88

DX,LOWER -19-04JUN90

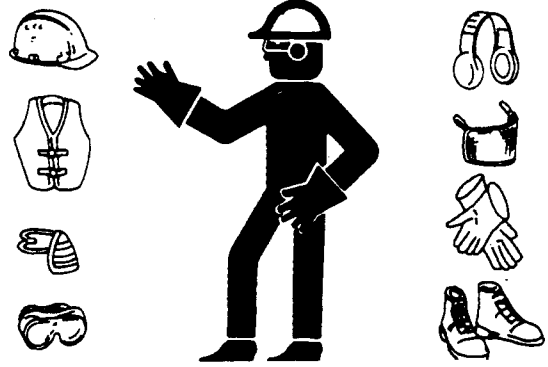
WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



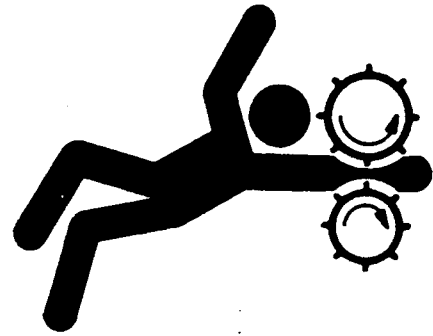
DX,WEAR -19-10SEP90

TS206 -UN-23AUG88

SERVICE MACHINES SAFELY

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing, or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.



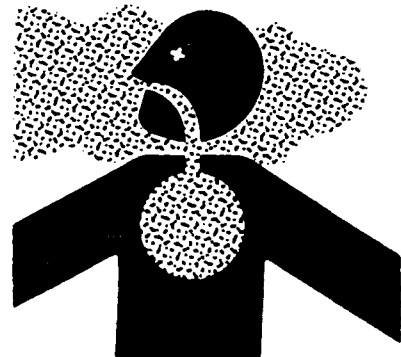
DX,LOOSE -19-04JUN90

TS228 -UN-23AUG88

WORK IN VENTILATED AREA

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.



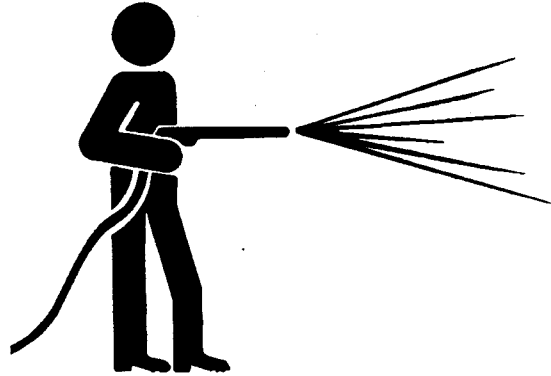
DX,AIR -19-04JUN90

TS220 -UN-23AUG88

WORK IN CLEAN AREA

Before starting a job:

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



DX,CLEAN -19-04JUN90

T6642EJ -UN-18OCT88

REMOVE PAINT BEFORE WELDING OR HEATING

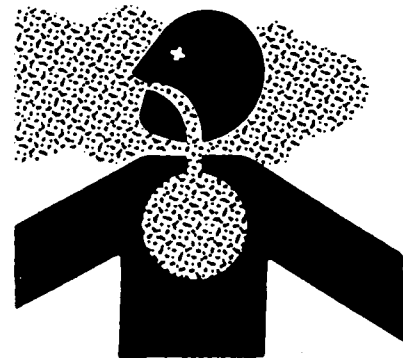
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



DX,PAINT -19-03MAR93

TS220 -UN-23AUG88

AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

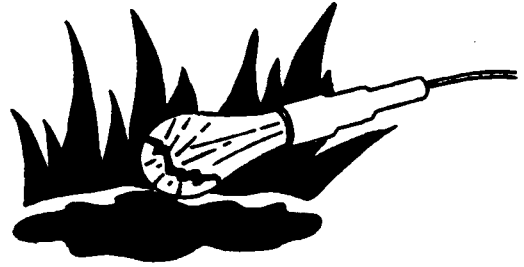


DX,TORCH -19-03MAR93

TS953 -UN-15MAY90

ILLUMINATE WORK AREA SAFELY

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



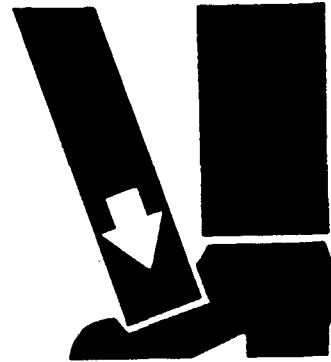
DX,LIGHT -19-04JUN90

TS223 -UN-23AUG88

USE PROPER LIFTING EQUIPMENT

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.



DX,LIFT -19-04JUN90

TS226 -UN-23AUG88

PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.



DX,SERV -19-03MAR93

TS218 -UN-23AUG88

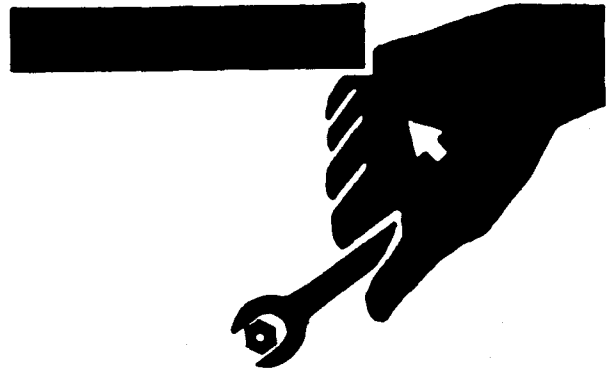
USE PROPER TOOLS

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting John Deere specifications.



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TS779

DX,REPAIR -19-04JUN90

DISPOSE OF WASTE PROPERLY

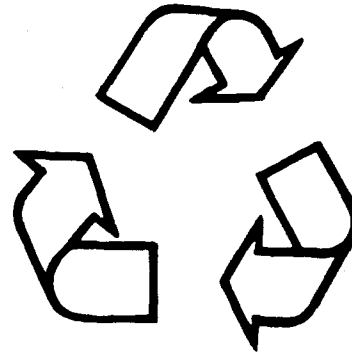
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



-JUN-26NOV90
TS1133

DX,DRAIN -19-03MAR93

LIVE WITH SAFETY

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.



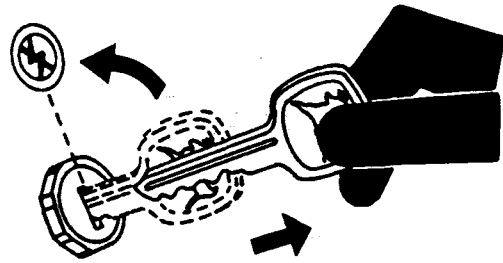
DX,LIVE -19-25SEP92

TS231 -19-07OCT88

PARK MACHINE SAFELY

Before working on the machine:

- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a "DO NOT OPERATE" tag in operator station.



DX,PARK -19-04JUN90

TS230 -UN-24MAY89

STAY CLEAR OF ROTATING DRIVELINES

Entanglement in rotating driveline can cause serious injury or death.

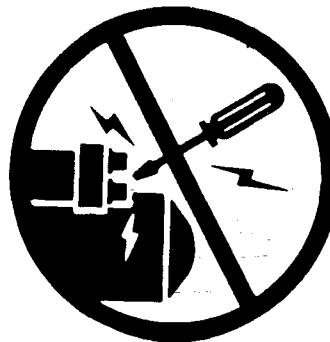
Keep tractor master shield and driveline shields in place at all times. Make sure rotating shields turn freely.

Wear close fitting clothing. Stop the engine and be sure PTO driveline is stopped before making adjustments, connections, or cleaning out PTO driven equipment.



DX,PTO -19-03MAR93

TS198 -UN-23AUG88



DX,BYPASS1 -19-13JAN94

TS177 -UN-11JAN89

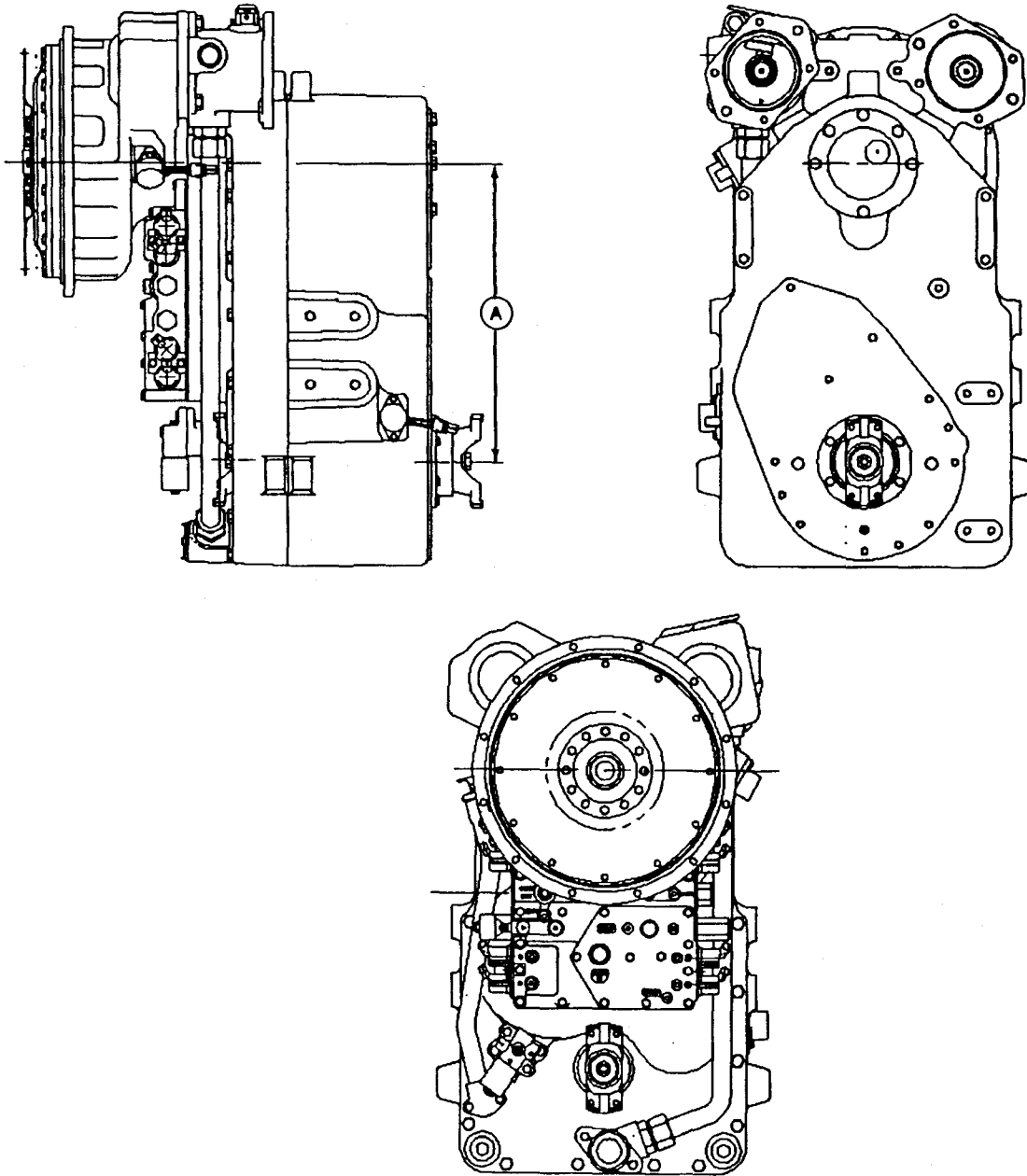
SPECIFICATIONS

| Item | Measurement | Specification |
|-------------|--------------------|----------------------|
| • DF-150 | Weight | 567 Kg (1250 lbs) |
| • DF-250 | Weight | 703 Kg (1550 lbs) |

Weights will vary depending on installed options.

YZ,CTM84,10,SPC-19-13JAN94

DF SERIES 150 TRANSMISSION

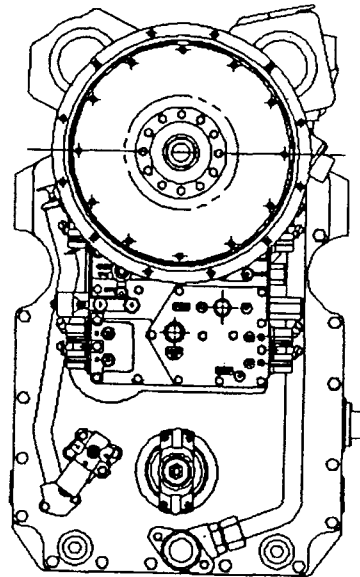
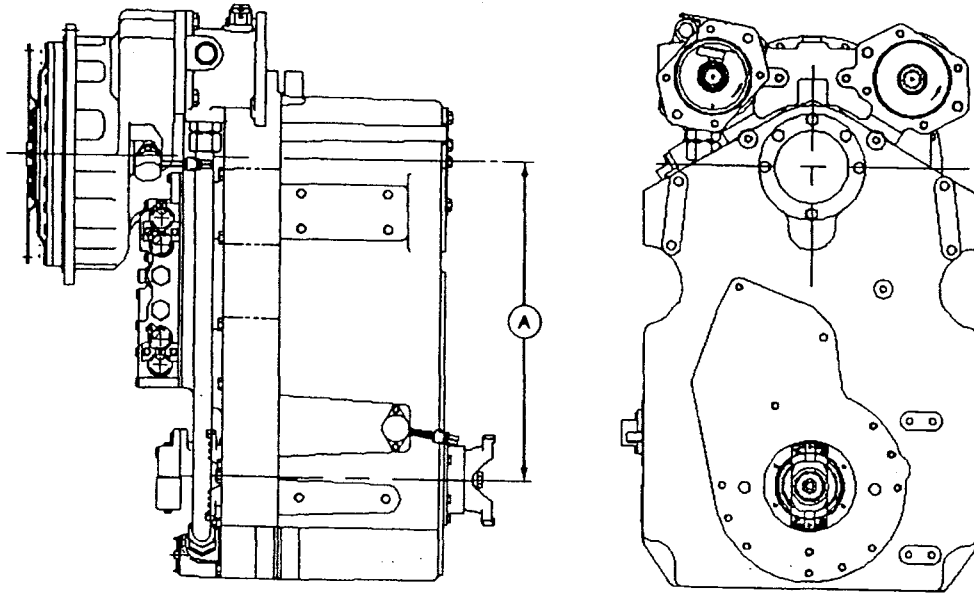


Dimension "A" - 500mm (19.69 in)
Approximate weight 567Kg (1250 lbs)

YZ,CTM84,10,15 -19-13JAN94

YZ694 -JUN-25OCT93

DF SERIES 250 TRANSMISSION



Dimension "A" - 550mm (21.65 in)
Approximate weight 703 Kg (1550 lbs)

YZ,CTM84,10,16 -19-13JAN94

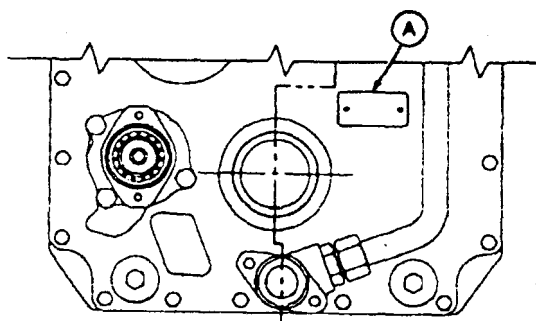
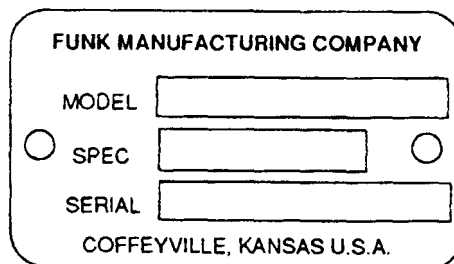
YZ695 -UN-25OCT93

IDENTIFICATION AND SERIAL NUMBER PLATE

The identification plate (A) is located on the engine side of the transmission, near the bottom of the main case front housing. The exact location varies depending on installed options and model number. All information on ID plate is needed when contacting FUNK concerning transmission.

Contact:

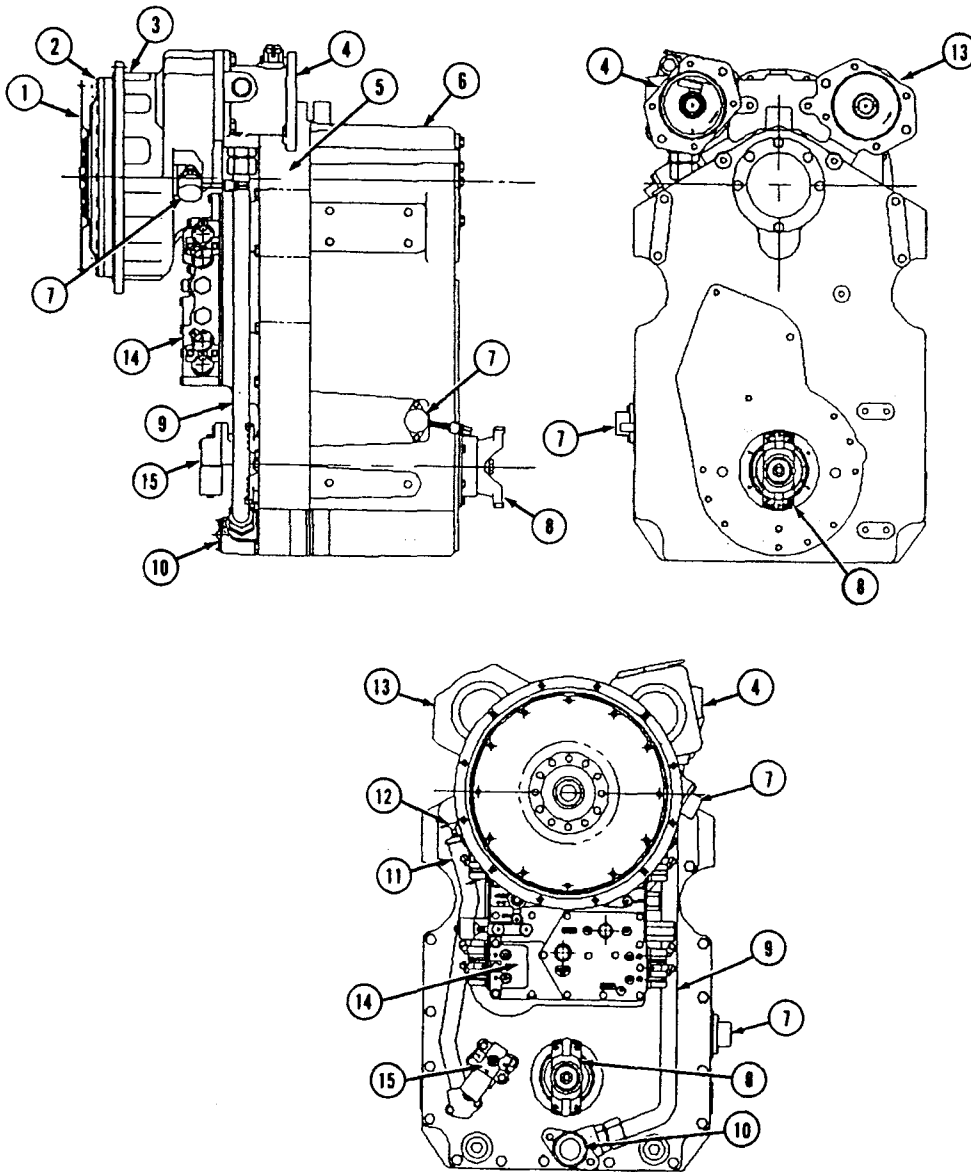
Funk Manufacturing Company
Attention: Parts Department
Industrial Park, Highway 169 North
P.O. Box 577
Coffeyville, Kansas 67337-0577
Telephone: Area Code (316)-252-3400
Ask for Parts Department
FAX:(316)-252-3252



YZ,CTM84,10,13 -19-22MAR94

YZ798
-JUN-12APR94

DF 150 OF DF250 CONVERTER DRIVEN TRANSMISSION COMPONENT IDENTIFICATION



- 1. Drive plate assembly
- 2. Torque converter assembly
- 3. Front cover assembly
- 4. Charge pump group
- 5. Main case front housing
- 6. Main case rear housing
- 7. Magnetic pick up

- 8. Output fitting
- 9. Suction tube
- 10. Suction screen
- 11. Dipstick tube assembly
- 12. Dipstick gauge
- 13. Rear housing auxiliary pump drive
- 14. Control valve group
- 15. Front axle disconnect

YZ,CTM84,10,12 -19-13JAN94

RECOMMENDED LUBRICANTS

AMBIENT AIR TEMPERATURE CHART Select an oil viscosity, from the chart, based on the air temperature range expected between oil changes.

| AIR TEMPERATURE RANGE | | | | | | | | | | | |
|-----------------------|-----|-----|-----|-----|-----|----|----|----|----|-----|-----|
| Fahrenheit (°F) | -67 | -40 | -22 | -4 | 14 | 32 | 50 | 68 | 86 | 104 | 122 |
| Celsius (°C) | -55 | -40 | -30 | -20 | -10 | 0 | 10 | 20 | 30 | 40 | 50 |
| | | | | | | | | | | | |

USE HYDRAULIC TRANSMISSION FLUID TYPE C-4.

IMPORTANT: Do not use hydraulic transmission fluids that contain an “EP” additive or a multi-viscosity lubricant.

NOTE: The words “oil”, “fluid” and “transmission fluid” are used in this manual to mean, HYDRAULIC TRANSMISSION FLUID, the operating and lubricating oil for this transmission.

HOT WEATHER OPERATION

Use higher viscosity grades (i.e.,SAE 30) for:

- Ambient temperatures consistently above 30°C (86°F).
- Frequent stop-and-go driving in hot weather.
- High grade climbing in hot weather.

COLD WEATHER OPERATION

IMPORTANT: Viscosity grade selection is critical for cold weather operation of the transmission. Preheat and proper start-up procedures are required when operating transmission below the oil’s **MINIMUM** critical temperature which is viscosity grade dependant.

*NOTE: The chart indicates the **MINIMUM** transmission operating temperature for several standard SAE viscosity grades.*

PREHEAT TRANSMISSION FLUID WITH AUXILIARY SOURCE

- Preheat the transmission fluid to the **MINIMUM** temperature before operating.

ALTERNATE WARM-UP PROCEDURE:

- Operate transmission in neutral for approximately 20 minutes or until oil is warmed to the **MINIMUM** temperature.

YZ737 -19-29AUG94

FILL THE TRANSMISSION WITH OIL

AFTER INSTALLING TRANSMISSION IN VEHICLE:

- Park machine on level surface.
- Engage parking brake, block wheels.
- Put transmission in neutral.
- Remove dipstick, the dipstick tube is the normal oil fill location.
- Begin filling operation by adding 19 liters (5 gal) of recommended oil.
- Start the engine, run at idle speed to fill the converter and oil lines.
- Check oil level on dip stick with engine running at idle speed.

IMPORTANT: Do not overfill transmission. This will cause overheating. Damage to the transmission will result.

- Fill transmission to the full mark on dipstick with engine running at idle speed.
- Check oil level again when the transmission has reached normal operating temperature 27—49°C (80—120°F).

YZ,CTM84,10,2 -19-13JAN94

CHECK AND SERVICE TRANSMISSION REGULARLY

Routine checks will help prevent down time. The operator can aid in preventative maintenance by reporting signs of leaks or malfunctions.

The transmission operates in and by oil, most of the maintenance is concerned with oil replenishment and oil cleanliness. The type of service and operating conditions shall determine the maintenance interval.

NOTE: Engage park brake before checking oil level.

OIL LEVEL

IMPORTANT: The DF series transmission should always be in the neutral position before starting the engine, or when the vehicle is parked and the engine is running.

CHECK THE OIL LEVEL DAILY

- Set parking brake.
- Put the gear selector lever in neutral position.
- Operate the engine at idle speed.
- Make sure the transmission oil temperature is at 27—49°C (80—120°F).
- Clean area around dipstick before removing.
- Keep oil level at the "FULL" mark on the dipstick.

YZ,CTM84,10,1 -19-13JAN94

INTERVALS FOR CHANGING TRANSMISSION OIL AND FILTERS

IMPORTANT: Change oil and filter after the first 50 hours of transmission operation. The oil and filter change intervals given here are for normal service conditions. If the transmission is to be operated in severe conditions contact the Funk Service Department for additional recommendations.

FIRST OIL AND FILTER CHANGE:

- Change oil and filter after first 50 hours of transmission operation.

ROUTINE OIL AND FILTER MAINTENANCE:

IMPORTANT: Some vehicles are equipped with devices to alert the operator when oil is bypassing the filter. Change the oil filter if a "Filter Bypass Signal" is indicated and the transmission is at normal operating temperature.

- Change oil filter anytime the transmission is at normal operating temperature and a "Filter Bypass Signal" is indicated.
- Change oil and filter anytime there are signs of contamination in the oil or the oil has a burnt odor.
- Change filter at every 500 hours, change filter and oil every 1000 hours of transmission operation.

YZ,CTM84,10,4 -19-13JAN94

OIL ANALYSIS

IMPORTANT: Change the oil and filter if an analysis of the used transmission oil indicates any of the following limits are exceeded.

- Glycol (Anti-freeze), must not exceed 0% by volume.
- Water, must not exceed 0.05% by volume.
- Viscosity increase at 37°C (100°F), not more than 40% over new oil value.
- Total Acid Number (TAN) per ASTM D664, limit of 3.0 over new lubricant value.

YZ,CTM54,10,20 -19-13JAN94

OIL CHECK, FILL, AND DRAIN LOCATIONS

OIL LEVEL CHECK:

- The transmission is equipped with a dipstick gage (A).

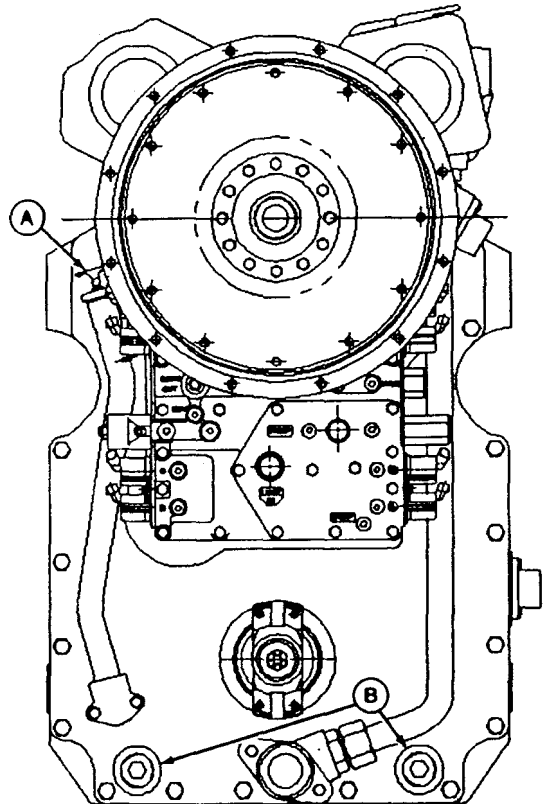
OIL FILL:

- The dipstick tube is the oil fill location.

NOTE: The Actual location of dipstick may vary depending on application.

OIL DRAIN:

- Oil drain location (B), remove oil strainer assembly.



YZ693
-UN-25OCT93

YZ,CTM84,10,14 -19-13JAN94

COLD WEATHER STARTUP

Cold starts will sometimes cause the oil filter bypass signal to activate, indicating the oil is bypassing the filter. This should be an intermittent condition and should not continue after the transmission oil has reached 38° C (100° F) operating temperature.

IMPORTANT: Transmission oil should be warm before operating the transmission. If the transmission (converter out) oil temperature remains below the normal operating range after a reasonable warm-up period, stop the machine and warm the oil by stalling the torque converter.

If necessary to maintain the recommended oil temperature, operate the machine in a higher gear.

STALLING THE TORQUE CONVERTER:

- Park vehicle away from personnel and obstacles.
- Set brakes.
- Shift transmission to the highest gear.

IMPORTANT: Do not operate transmission at full governed engine rpm for more than 30 seconds. Do not allow converter out oil temperature to exceed 121°C (250°F).

- Run engine for a maximum of 30 seconds at full governed engine speed.
- Stop the stall procedure when oil temperature is in the normal operating range. Do not allow oil temperature to exceed 121°C (250°F) at anytime.

YZ,CTM54,10,19 -19-13JAN94

OIL TEMPERATURE WARNING SIGNAL

- If the oil temperature gauge, indicating the converter oil-out temperature, rises to 121°C (250°F) or the transmission oil temperature warning light comes on, stop the vehicle immediately. Shift to neutral and run the engine at 1000—1200 rpm.

IMPORTANT: Do not stop the engine when the transmission is overheating if the cooling system is known to be in working order.

- The transmission oil temperature should soon lower to the engine water temperature, or if an air-to-oil exchanger is used, the temperature should soon lower to ambient air temperature across the heat exchanger. If the temperature does not lower, trouble is indicated.
- Correct overheating problem before the vehicle is operated again.

YZ,CTM54,10,18 -19-13JAN94

TOWING THE VEHICLE

AVOID DAMAGE TO TRANSMISSION:

- Run engine at idle speed to lubricate the clutches.
- If the engine cannot be run:
 - Disconnect drive line from transmission
- If drive line can not be disconnected:
 - Do not exceed 5 km/h (3 mph)
 - Tow no further than 2 km (1 mile)

YZ,CTM54,10,17 -19-13JAN94

PUT TRANSMISSION IN STORAGE

This procedure applies to those transmissions and components that have been tested according to Funk Manufacturing test specifications and have had the oil drained from them prior to shipment.

The following actions will help protect the unit and component items from internal rust and corrosion damage for approximately one year, provided the transmissions are stored in a dry area:

- Seal all openings with moisture-proof covers or tape.
- Spray 113 mL (4 oz) of atomized NOX RUST® VCI No. 10 oil or an equivalent into oil drain hole. This fluid is covered and approved per (MIL-P-46002 and MIL-I-23310).
- Dip, spray, or brush all exposed unpainted surfaces with NOX RUST X-110 or an equivalent.

NOX RUST is a trademark of Daubert Chemical Company.

YZ,CTM84,10,5 -19-13JAN94

REMOVE TRANSMISSION FROM STORAGE

- Wash off all external grease with a safety solvent.
- Remove covers or tape from all openings.
- Drain transmission completely.
- Tag transmission to indicate it needs to be filled with oil after installing in vehicle.

YZ,CTM84,10,6 -19-08JAN94

INSTALL TRANSMISSION TO THE ENGINE

⚠ CAUTION: Vehicle runaway hazard. Avoid serious or fatal injury. This transmission is not a braking system. Install only if there is a braking system capable of stopping the vehicle with dead engine, disengaged transmission, or loss of hydrostatic retardation. Otherwise, vehicle may roll freely, resulting in loss of control.

1. Check engine crankshaft endplay, it should comply with engine manufactures tolerances.
2. Remove the flywheel housing access cover. Rotate the engine flywheel until one of the mounting holes for the drive plate is aligned with the flywheel housing access hole.
3. Support the transmission assembly so that it can be positioned directly in line DF with the engine crankshaft. Align the pilot sleeve with the flywheel pilot bore. Align one of the cap screw holes in the drive plate with one of the mounting holes in the flywheel.

IMPORTANT: If the transmission does not close up to the flywheel, do not proceed, Forcing the transmission up to the engine with the assembly bolts could preload the engine crankshaft and cause engine or transmission problems later, Remove the transmission and check previous assembly steps to determine the problem. Take corrective action before proceeding.

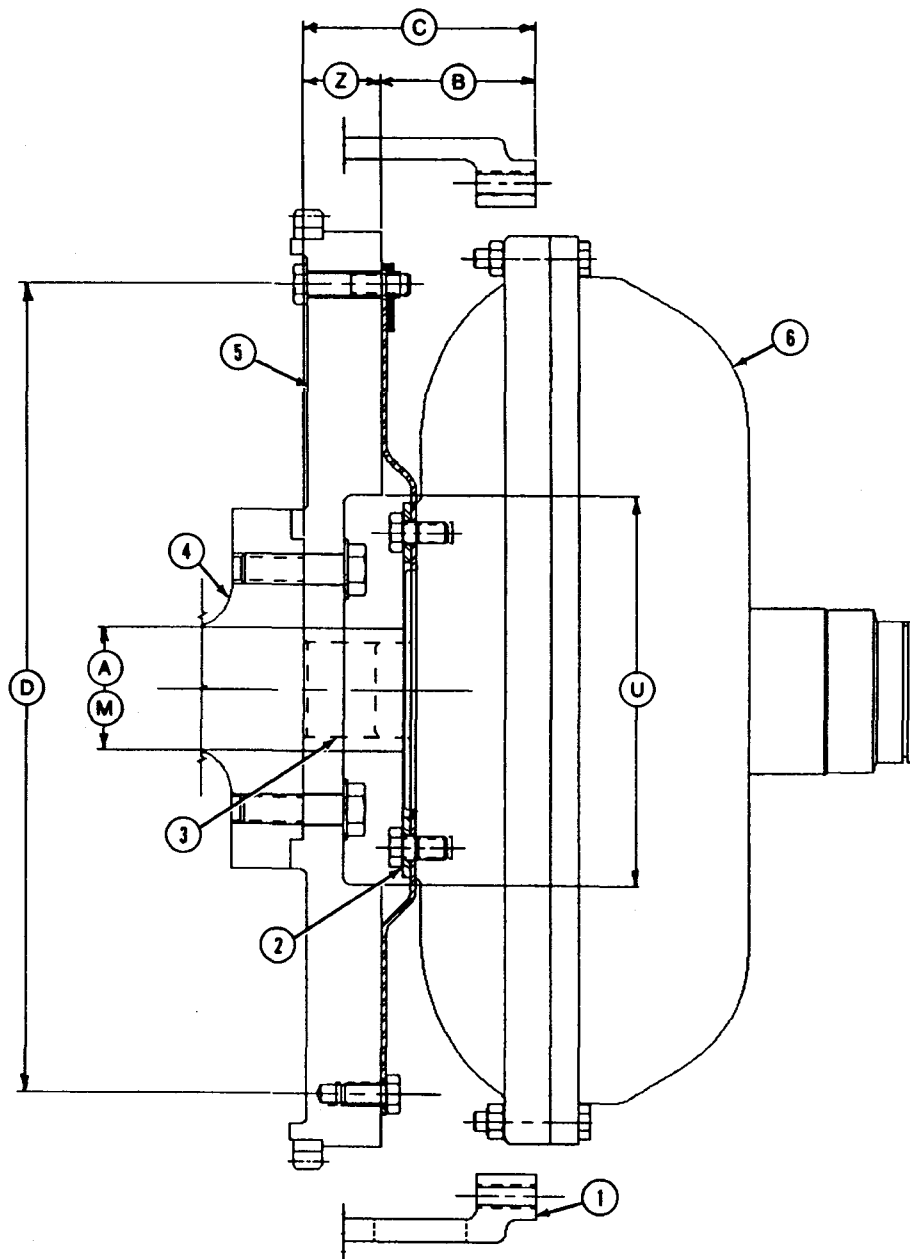
4. Push the transmission to the engine.
5. Fasten the transmission input housing (converter housing) to the engine flywheel housing.
6. Attach the drive plate to the flywheel. Install and hand tighten cap screws through the engine flywheel housing access hole. After all the cap screws have been installed, tighten to proper torque values.

IMPORTANT: Check the engine crankshaft endplay.

7. Check the engine crankshaft endplay. It should comply with the engine manufacturer's specifications. If end play is less than specified the crankshaft may have been preloaded at assembly with the transmission. The engine should not be run until the preload condition is corrected.
8. Install the flywheel access hole cover.
9. Connect all drive line, mechanical linkages, hydraulic lines and electronic connectors required by transmission.
10. Fill transmission with oil as described in this section of the manual.

YZ.CTM84,10,7 -19-13JAN94

CONVERTER-TO-ENGINE FLYWHEEL DIMENSIONS



- 1-Engine Flywheel Housing
- 2-Converter Drive Plate Group
- 3-Converter Pilot Sleeve
- 4-Engine Crank Shaft
- 5-Engine Flywheel

- 6-Converter Assembly
- 7-Housing Spacer (as required)
- 8-Flywheel End Stop
- 9-Flywheel Shoulder Stop
- 10-Pilot Sleeve End Stop
- 11-Pilot Sleeve Shoulder Stop

ENGINE TO TORQUE CONVERTER SPECIFICATIONS

IMPORTANT: Engine to torque converter dimensions must be checked anytime the following has occurred:

CHECK THE ENGINE TO TORQUE CONVERTER SPECIFICATIONS ANYTIME:

- The engine has been changed.
- The engine flywheel has been changed.
- The engine flywheel housing has been changed.
- The torque converter has been replaced with a different part number.
- The drive plate has been replaced with a different part number.

**SPECIAL FLYWHEEL APPLICATIONS
B= FLYWHEEL HOUSING FACE TO FLYWHEEL FACE**

| | | |
|---|--------------------------------|------------------------------|
| Z+0.2 -0.2 mm (Z+0.01 -0.01 in.) | "B" REFERENCE | "R" MAXIMUM |
|---|--------------------------------|------------------------------|

| | | | | |
|------------------|-------|-----------|-------|-----------|
| STANDARD 46.2 mm | | 53.3 mm | | 31.7 mm |
| (1.82 in) | | (2.12 in) | | (1.25 in) |

See preceding page for drawing with installation dimensions.

Standard length pilot sleeves are setup for 2.046/2.048, 2.44/2.442 and 2.833/2.835 flywheel pilot bores and dimension "Z" 33.4 ± 0.2 mm (1.315 ± .01) from the flywheel drive plate mounting face to the flywheel pilot bore stop in the bottom of the pilot bore.

CHECK THE FOLLOWING ENGINE AND TRANSMISSION DIMENSIONS TO ASSURE PROPER INSTALLATION:

1. Dimension "U" 165.1 mm (6.50) minimum to clear the drive plate and converter assembly.

2. Check and determine the type of pilot sleeve that is being used in your application (end stop or shoulder stop).

3. Check dimension "Y" and "Z" on the flywheel depending on the type of pilot sleeve, measure dimension "Z" from flywheel drive plate mounting face to the flywheel pilot bore stop in the bottom of the pilot bore on dimension "Y" on the flywheel from flywheel drive plate mounting face to the flywheel pilot bore shoulder stop.

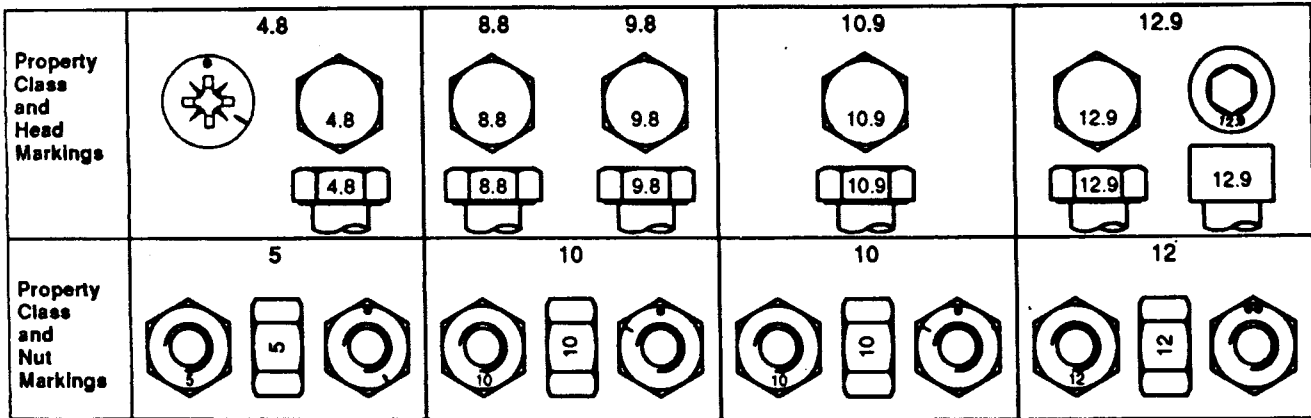
4. Place sleeve on the converter front cover pilot knob and push back to the converter front cover. Check dimension "Y" or "Z" on the converter drive plate pilot sleeve assembly depending on the type of pilot sleeve, or measure dimension "Y" from the drive plate mounting face that will be mounted to the flywheel out to the shoulder on the pilot sleeve.

5. The converter, drive plate and pilot assembly dimension "Z" or "Y" (step 4) should be .03 to .10 shorter than flywheel dimension "Z" or "Y" (step 3). The pilot sleeve is not preloaded between the converter assembly and flywheel.

6. Check the diameter of the flywheel pilot bore dimension "M" and converter pilot sleeve dimension "A" for a proper fit. There should be 0.01—0.07 mm (0.0005—0.003 in.) diametric clearance. Flywheels that do not fit within this tolerance will require a special sleeve to accurately pilot the converter assembly. If the above dimensions check out, the assembly can continue.

7. Check the engine crankshaft endplay. It should comply with the engine manufacturer's tolerance.

METRIC BOLT AND CAP SCREW TORQUE VALUES



TS1163 -19-04MAR91

| Size | Class 4.8 | | | | Class 8.8 or 9.8 | | | | Class 10.9 | | | | Class 12.9 | | | |
|------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|
| | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | |
| | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft | N·m | lb-ft |
| M6 | 4.8 | 3.5 | 6 | 4.5 | 9 | 6.5 | 11 | 8.5 | 13 | 9.5 | 17 | 12 | 15 | 11.5 | 19 | 14.5 |
| M8 | 12 | 8.5 | 15 | 11 | 22 | 16 | 28 | 20 | 32 | 24 | 40 | 30 | 37 | 28 | 47 | 35 |
| M10 | 23 | 17 | 29 | 21 | 43 | 32 | 55 | 40 | 63 | 47 | 80 | 60 | 75 | 55 | 95 | 70 |
| M12 | 40 | 29 | 50 | 37 | 75 | 55 | 95 | 70 | 110 | 80 | 140 | 105 | 130 | 95 | 165 | 120 |
| M14 | 63 | 47 | 80 | 60 | 120 | 88 | 150 | 110 | 175 | 130 | 225 | 165 | 205 | 150 | 260 | 190 |
| M16 | 100 | 73 | 125 | 92 | 190 | 140 | 240 | 175 | 275 | 200 | 350 | 255 | 320 | 240 | 400 | 300 |
| M18 | 135 | 100 | 175 | 125 | 260 | 195 | 330 | 250 | 375 | 275 | 475 | 350 | 440 | 325 | 560 | 410 |
| M20 | 190 | 140 | 240 | 180 | 375 | 275 | 475 | 350 | 530 | 400 | 675 | 500 | 625 | 460 | 800 | 580 |
| M22 | 260 | 190 | 330 | 250 | 510 | 375 | 650 | 475 | 725 | 540 | 925 | 675 | 850 | 625 | 1075 | 800 |
| M24 | 330 | 250 | 425 | 310 | 650 | 475 | 825 | 600 | 925 | 675 | 1150 | 850 | 1075 | 800 | 1350 | 1000 |
| M27 | 490 | 360 | 625 | 450 | 950 | 700 | 1200 | 875 | 1350 | 1000 | 1700 | 1250 | 1600 | 1150 | 2000 | 1500 |
| M30 | 675 | 490 | 850 | 625 | 1300 | 950 | 1650 | 1200 | 1850 | 1350 | 2300 | 1700 | 2150 | 1600 | 2700 | 2000 |
| M33 | 900 | 675 | 1150 | 850 | 1750 | 1300 | 2200 | 1650 | 2500 | 1850 | 3150 | 2350 | 2900 | 2150 | 3700 | 2750 |
| M36 | 1150 | 850 | 1450 | 1075 | 2250 | 1650 | 2850 | 2100 | 3200 | 2350 | 4050 | 3000 | 3750 | 2750 | 4750 | 3500 |

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.












Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES

| | | | | | | |
|-----------------------------|---|--|---|---|---|---|
| SAE Grade and Head Markings | 1 or 2 ^b | 5 | 5.1 | 5.2 | 8 | 8.2 |
| | NO MARK  |  |  |  |  |  |
| SAE Grade and Nut Markings | 2 | 5 | | 8 | | |
| | NO MARK  |  |  |  |  | |

TS1162 -19-04MARB1

| Size | Grade 1 | | | | Grade 2 ^b | | | | Grade 5, 5.1, or 5.2 | | | | Grade 8 or 8.2 | | | |
|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|-------------------------|-------|------------------|-------|
| | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | | Lubricated ^a | | Dry ^a | |
| | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft | N-m | lb-ft |
| 1/4 | 3.7 | 2.8 | 4.7 | 3.5 | 6 | 4.5 | 7.5 | 5.5 | 9.5 | 7 | 12 | 9 | 13.5 | 10 | 17 | 12.5 |
| 5/16 | 7.7 | 5.5 | 10 | 7 | 12 | 9 | 15 | 11 | 20 | 15 | 25 | 18 | 28 | 21 | 35 | 26 |
| 3/8 | 14 | 10 | 17 | 13 | 22 | 16 | 27 | 20 | 35 | 26 | 44 | 33 | 50 | 36 | 63 | 46 |
| 7/16 | 22 | 16 | 28 | 20 | 35 | 26 | 44 | 32 | 55 | 41 | 70 | 52 | 80 | 58 | 100 | 75 |
| 1/2 | 33 | 25 | 42 | 31 | 53 | 39 | 67 | 50 | 85 | 63 | 110 | 80 | 120 | 90 | 150 | 115 |
| 9/16 | 48 | 36 | 60 | 45 | 75 | 56 | 95 | 70 | 125 | 90 | 155 | 115 | 175 | 130 | 225 | 160 |
| 5/8 | 67 | 50 | 85 | 62 | 105 | 78 | 135 | 100 | 170 | 125 | 215 | 160 | 240 | 175 | 300 | 225 |
| 3/4 | 120 | 87 | 150 | 110 | 190 | 140 | 240 | 175 | 300 | 225 | 375 | 280 | 425 | 310 | 550 | 400 |
| 7/8 | 190 | 140 | 240 | 175 | 190 | 140 | 240 | 175 | 490 | 360 | 625 | 450 | 700 | 500 | 875 | 650 |
| 1 | 290 | 210 | 360 | 270 | 290 | 210 | 360 | 270 | 725 | 540 | 925 | 675 | 1050 | 750 | 1300 | 975 |
| 1-1/8 | 400 | 300 | 510 | 375 | 400 | 300 | 510 | 375 | 900 | 675 | 1150 | 850 | 1450 | 1075 | 1850 | 1350 |
| 1-1/4 | 570 | 425 | 725 | 530 | 570 | 425 | 725 | 530 | 1300 | 950 | 1650 | 1200 | 2050 | 1500 | 2600 | 1950 |
| 1-3/8 | 750 | 550 | 950 | 700 | 750 | 550 | 950 | 700 | 1700 | 1250 | 2150 | 1550 | 2700 | 2000 | 3400 | 2550 |
| 1-1/2 | 1000 | 725 | 1250 | 925 | 990 | 725 | 1250 | 930 | 2250 | 1650 | 2850 | 2100 | 3600 | 2650 | 4550 | 3350 |

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

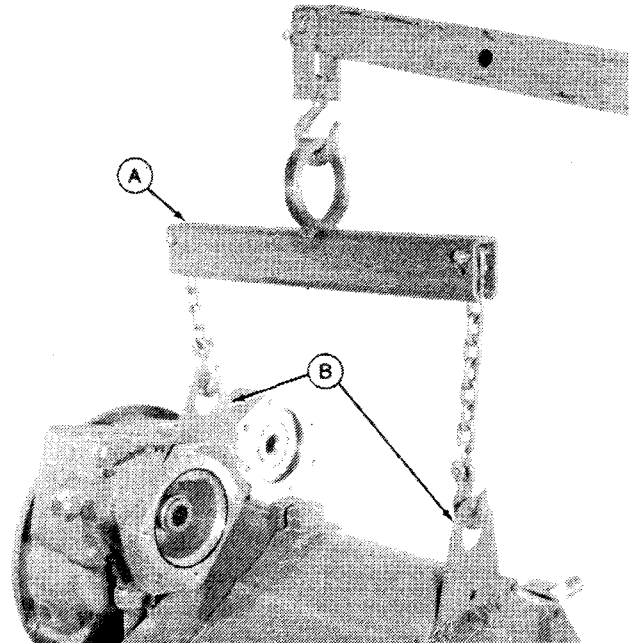
Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

^a "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.

^b Grade 2 applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. Grade 1 applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.

TRANSMISSION LIFTING PROCEDURE

Use a lift sling similar to (A). It should hold the transmission level without bending the lift hangers (B).



YZ545 -JUN-25OCT93

YZ,CTM84,15,3 -19-13JAN94

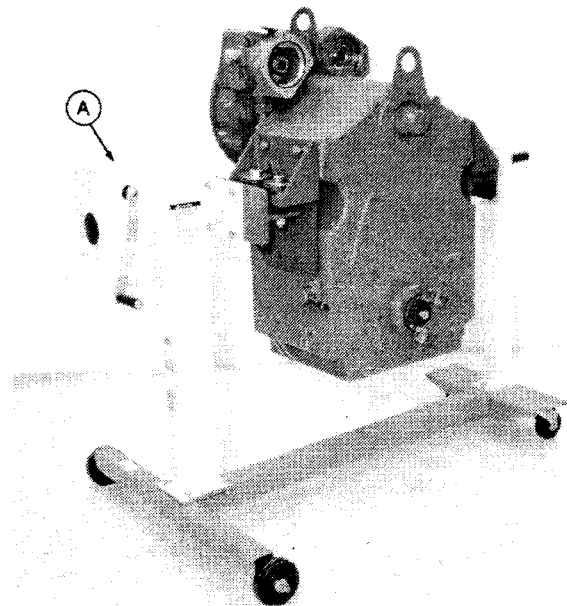
TRANSMISSION REPAIR STAND

NOTE: The repair stand (A) used in this manual is OTC DIVISION part number 1735, capacity is 907 Kg (2000)lbs.

OTC Division
Sealed Power Corporation
655 Eisenhower Drive
Owatonna, Mn 55060

When any other stand is used, consult the Manufacturer's instructions for mounting.

Approximate dry weights:
Model DF150 = 545 Kg (1250 lbs).
Model DF250 = 703 Kg (1550 lbs).



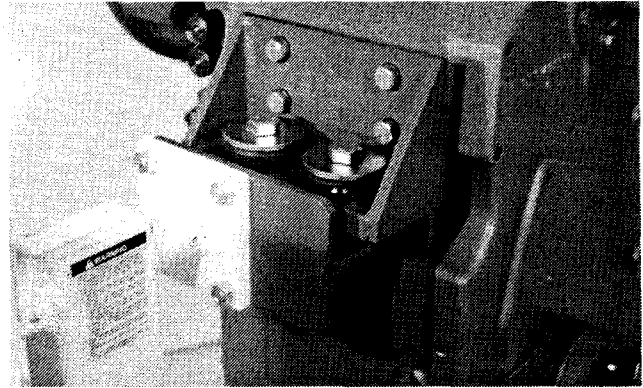
YZ501 -JUN-25OCT93

Actual weights depend on the options included.

YZ,CTM84,15,1 -19-13JAN94

MOUNTING DF SERIES TRANSMISSION TO REPAIR STAND

Adapters must be made to attach transmission to repair stand. See fabricated tools, Group 99, in this manual.



YZ687
-UN-25OCT93

YZ,CTM84,15,4 -19-13JAN94

⚠ CAUTION: Do not allow any part of the body to be under the transmission while it is being lifted or after it is suspended on the repair stand. Do not exceed maximum capacities for the repair stand. Use only high grade fasteners in good condition. Personal injury could result.

SAFETY PRECAUTIONS

- This stand should be used only by qualified service technicians familiar with this equipment.
- Fabricate transmission mounting adapters to specifications provided in fabricated tools, Group 99, of this manual.
- Use SAE Grade 8 or better cap screws to attach adapters or mount transmission.
- Make sure tapped holes in adapters and transmission are clean and not damaged.
- Minimum cap screw thread engagement should be equal to 1-1/2 screw diameters.
- Do not exceed the maximum capacity rating of stand.
- Be sure transmission is solidly mounted before releasing from lifting device.
- Never permit any part of the body to be positioned under a load being lifted or suspended. Accidental slippage may result in personal injury.

YZ,CTM84,15,2 -19-13JAN94

OTHER MATERIAL

| Number | Name | Use |
|---------|---|--------------------------------------|
| T43513* | LOCTITE® Thread Lock & Sealer (High Strength) # 262 | Impeller hub-to-impeller cap screws. |

LOCTITE is a trademark of the Loctite Corporation.

**John Deere part number reference.*

YZ,CTM84,20,OTH-19-13JAN94

SPECIFICATIONS

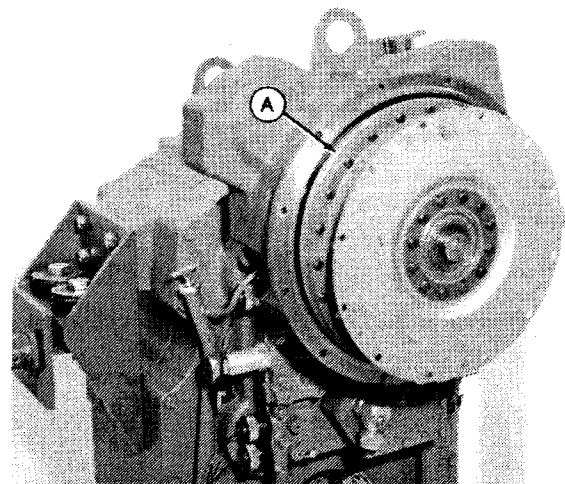
| Item | Measurement | Specification |
|--|-------------|-------------------|
| Impeller Hub-to-Impeller Cap Screws | Torque | 31 N·m (23 lb-ft) |
| Front Cover-to-Impeller Cap Screws | Torque | 35 N·m (26 lb-ft) |
| Drive Plates and Retainer Ring-to-Front Cover Cap Screws | Torque | 50 N·m (37 lb-ft) |

YZ,CTM84,20,SPC-19-13JAN94

REMOVE TORQUE CONVERTER AND DRIVE PLATE ASSEMBLY.

⚠ CAUTION: Torque converter assembly weighs approximately 32 Kg (70 lbs). Torque converter is not attached to transmission. Do not allow torque converter to fall out of transmission input housing. Personal injury could result.

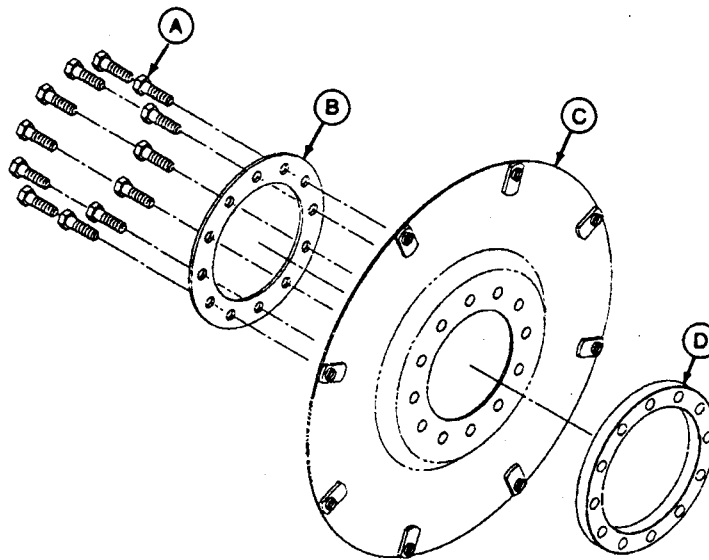
1. Remove torque converter assembly (A) straight away from transmission input housing.
2. Drain oil through impeller hub, check for contaminates, dispose of oil properly.
3. Place torque converter assembly on work surface with drive plate assembly up.
4. Place support blocks under torque converter impeller to prevent tipping.



-UN-25OCT83
YZ502

YZ,CTM84,20,3 -19-13JAN94

DISASSEMBLE AND ASSEMBLE DRIVE PLATE GROUP



A—Cap screw (12 used)

B—Ring
C—Drive plate assembly
D—Ring

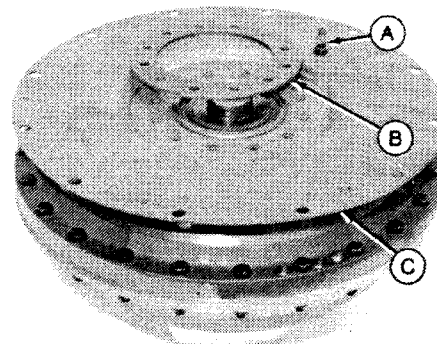
YZ797 -JUN-12APR94

Ring (D) is used only with the 11.75 converter.

YZ,CTM84,20,38 -19-01JUN94

DISASSEMBLE DRIVE PLATE GROUP

1. Remove 12 cap screws (A).
2. Remove ring (B) and drive plate assembly (C).
3. Inspect for wear or damage. Look closely at drive plate (C) for signs of fatigue, cracks or elongated bolt holes.

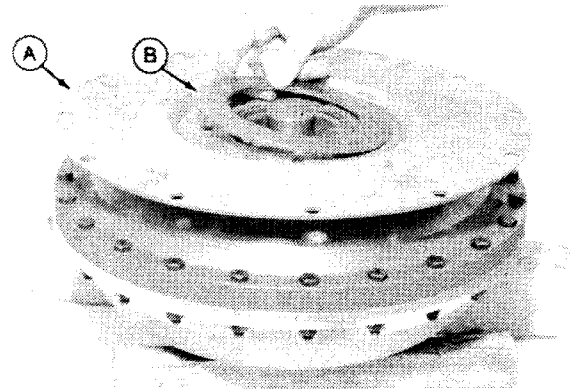


YZ,CTM84,20,4 -19-13JAN94

YZ503 -JUN-25OCT93

ASSEMBLE DRIVE PLATE GROUP

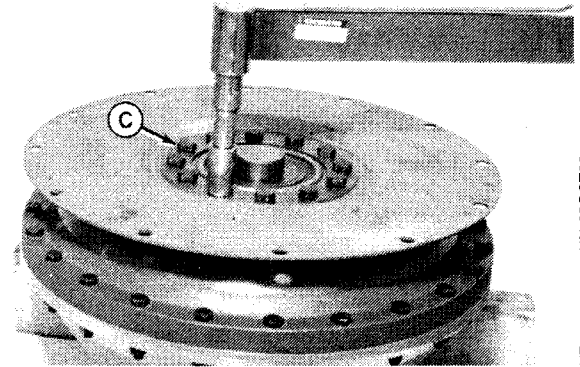
1. Install drive plate assembly (A) and ring (B).



YZ538 -UN-25OCT93

2. Install cap screws (C) and tighten evenly. Alternating front to rear and side to side.

3. Tighten to 50 N·m (37 lb-ft).

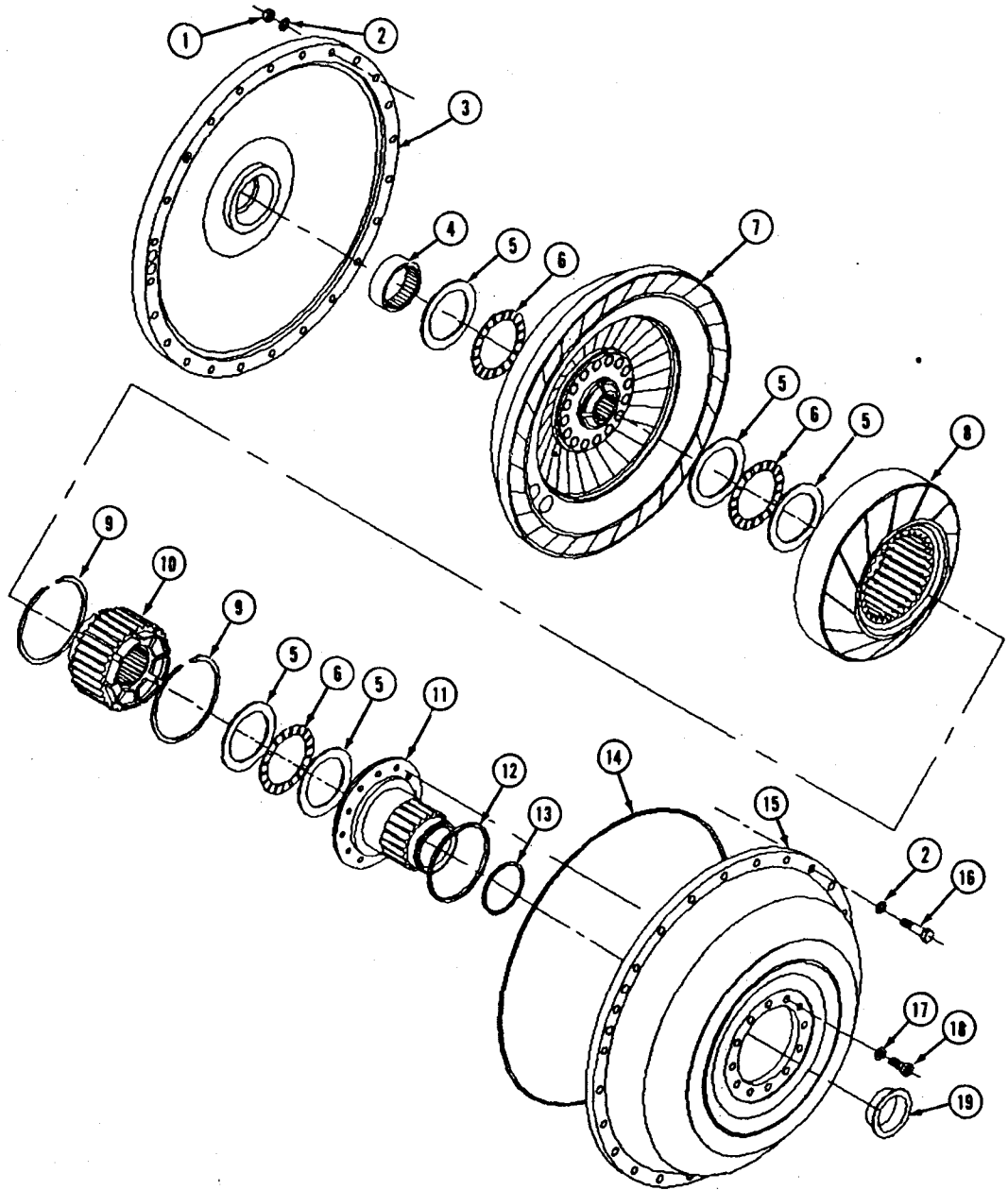


YZ539 -UN-25OCT93

YZ,CTM84,20,26 -19-13JAN94

Torque Converter

DISASSEMBLE AND ASSEMBLE 12 3/4 INCH TORQUE CONVERTER WITH FIXED STATOR



- 1—Hex nut (24 used)
- 2—Flat washer (24 used)
- 3—Front cover
- 4—Bearing
- 5—Thrust washer (5 used)

- 6—Needle thrust washer (3 used)
- 7—Turbine assembly
- 8—Converter stator
- 9—Retainer ring (2 used)

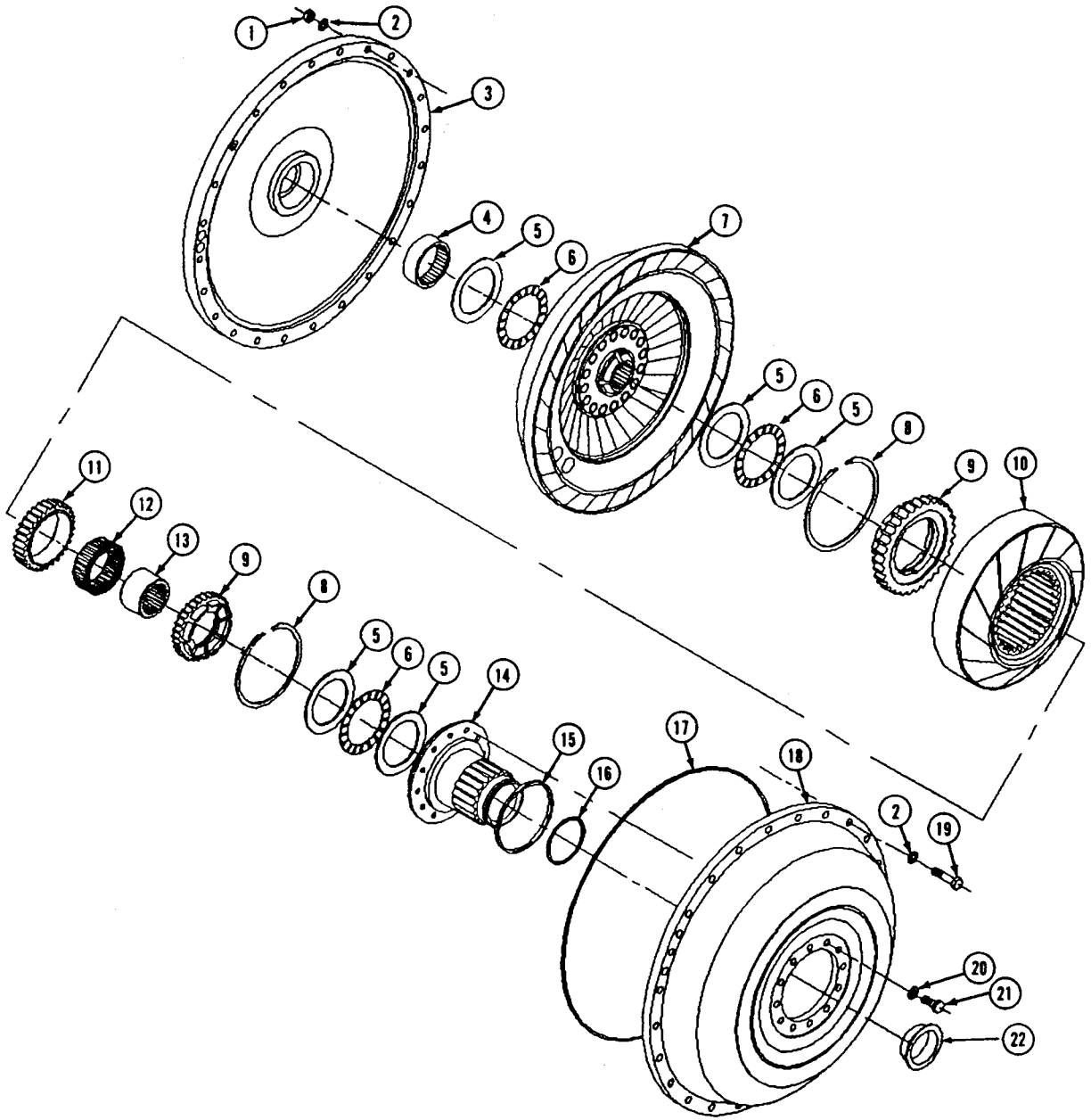
- 10—Fixed stator hub
- 11—Impeller hub
- 12—O-ring
- 13—Seal ring
- 14—Gasket O-ring

- 15—Converter impeller
- 16—Cap screw (24 used)
- 17—Washer (12 used)
- 18—Cap screw (12 used)
- 19—Shipping plug

YZ541 -JUN-25OCT93

YZ,CTM84,20,28 -19-13JAN94

DISASSEMBLE AND ASSEMBLE 12.75 INCH TORQUE CONVERTER WITH FREE STATOR



- 1—Hex nut (24 used)
- 2—Flat washer (24 used)
- 3—Front cover
- 4—Bearing
- 5—Thrust washer (5 used)
- 6—Needle thrust washer (3 used)

- 7—Turbine assembly
- 8—Retainer ring (2 used)
- 9—Clutch retainer (2 used)
- 10—Converter stator
- 11—Outer clutch race
- 12—Sprag clutch assembly

- 13—Inner clutch race
- 14—Impeller hub
- 15—O-ring
- 16—Seal ring
- 17—Gasket O-ring

- 18—Converter impeller
- 19—Cap screw (24 used)
- 20—Washer (12 used)
- 21—Cap screw (12 used)
- 22—Shipping plug

YZ540 JUN-25OCT93

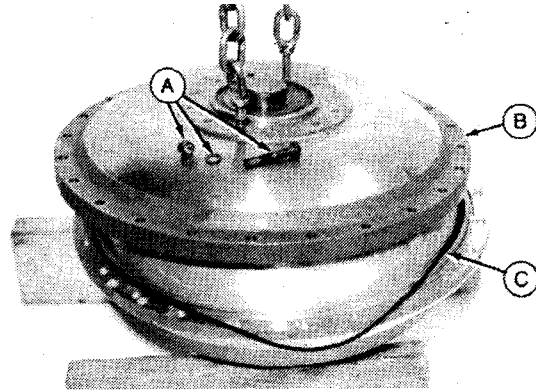
REMOVE FRONT COVER

IMPORTANT: Note from which side of the converter the cap screws are installed and the arrangement of flat washers. They must be installed the same when reassembled.

1. Remove 24 cap screws hex nuts and flat washers (A).

IMPORTANT: Do not use pry bars to remove front cover (B), damage to aluminum impeller casting could result.

2. Lift front cover (B) and remove.
3. Remove O-ring gasket (C).

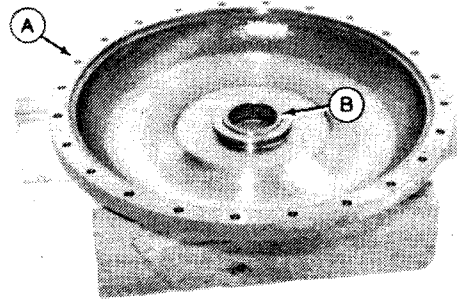


YZ,CTM84,20,5 -19-13JAN94

YZ504 -JUN-25OCT93

REMOVE AND INSTALL BEARING IN FRONT COVER

1. Position front cover (A) with the bearing up.
2. Block front cover to prevent tipping.
3. Remove bearing (B).
4. Install new bearing.

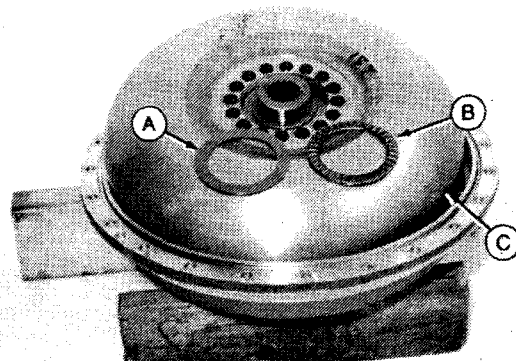


YZ,CTM84,20,6 -19-13JAN94

YZ505 -JUN-25OCT93

REMOVE TURBINE ASSEMBLY

1. Remove thrust washer (A).
2. Remove needle thrust bearing (B).
3. Remove turbine assembly (C) and inspect .

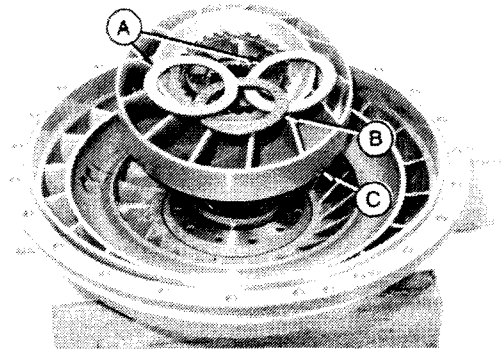


YZ,CTM84,20,7 -19-13JAN94

YZ506 -JUN-25OCT93

REMOVE STATOR ASSEMBLY

1. Remove two thrust washers (A) and one needle thrust bearing (B).
2. Remove stator assembly (C).



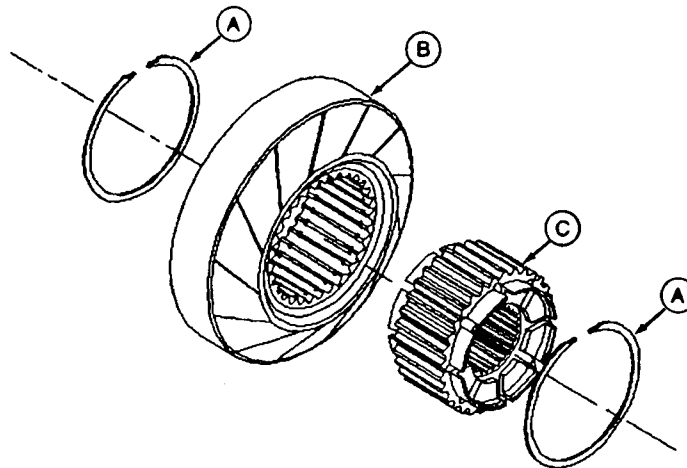
YZ,CTM84,20,8 -19-13JAN94

YZ507
-JUN-25OCT93

THE CONVERTER ASSEMBLY MAY CONTAIN EITHER A "FREE STATOR ASSEMBLY" OR A "FIXED STATOR ASSEMBLY" DEPENDING ON APPLICATION. THIS MANUAL ILLUSTRATES AND DESCRIBES BOTH STATOR TYPES.

YZ,CTM84,20,9 -19-13JAN94

DISASSEMBLE AND ASSEMBLE FIXED STATOR ASSEMBLY



A—Retaining ring (2)

B—Stator

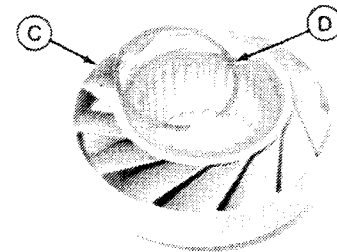
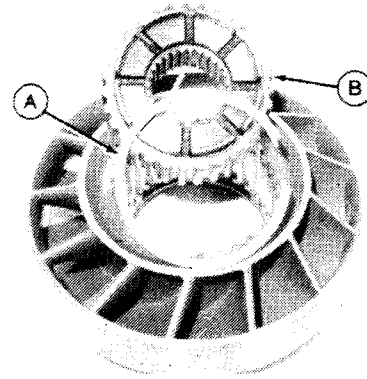
C—Fixed stator hub

YZ698
-JUN-25OCT93

YZ,CTM84,20,35 -19-13JAN94

DISASSEMBLE FIXED STATOR ASSEMBLY

1. Remove retainer ring (A).
2. Remove fixed stator hub (B).
3. Turn stator (C) over.
4. Remove retainer ring (D).
5. Inspect parts for wear or damage.



YZ,CTM84,20,10 -19-13JAN94

-UN-25OCT93

YZ508

-UN-25OCT93

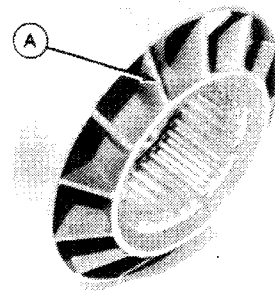
YZ509

STATOR FRONT AND BACK SIDE IDENTIFICATION

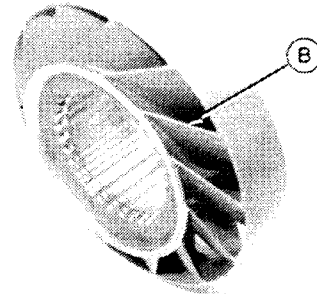
IMPORTANT: Do not assemble stator wrong. The torque converter will not work properly and damage will occur.

NOTE: Throughout the assembly process of the torque converter the stator "FRONT" and "BACK" sides will be referred to. The stator casting is not marked, it must be identified by the characteristics of the cast vanes.

The "FRONT" of the stator casting is identified by the vanes being thicker (A) on this side.



The "BACK" of the stator casting is identified by the vanes being thinner (B) on this side.



YZ510 -UN-25OCT93

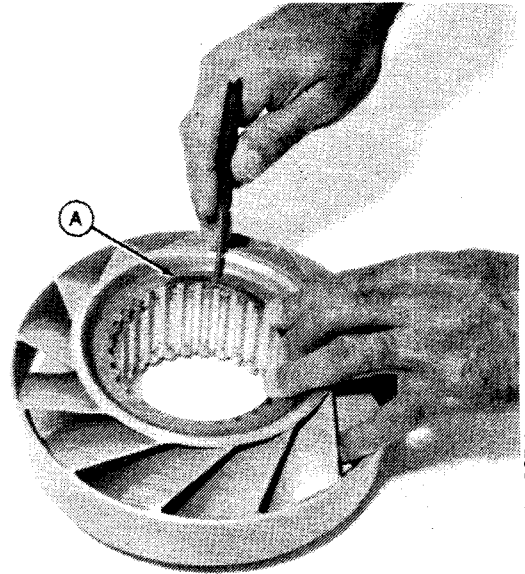
YZ511 -UN-25OCT93

YZ,CTM84,20,11 -19-13JAN94

ASSEMBLE FIXED STATOR ASSEMBLY

⚠ CAUTION: Wear eye protection when installing or removing retaining rings.

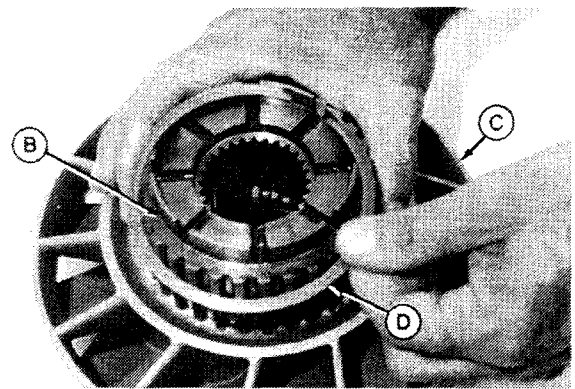
1. Position stator with back side up.
2. Install retaining ring (A) in groove.



3. Turn stator over.

NOTE: Stator hub (B) may be installed with either side up.

4. Install fixed stator hub (B) into stator (C).
5. Install retaining ring (D) into groove.

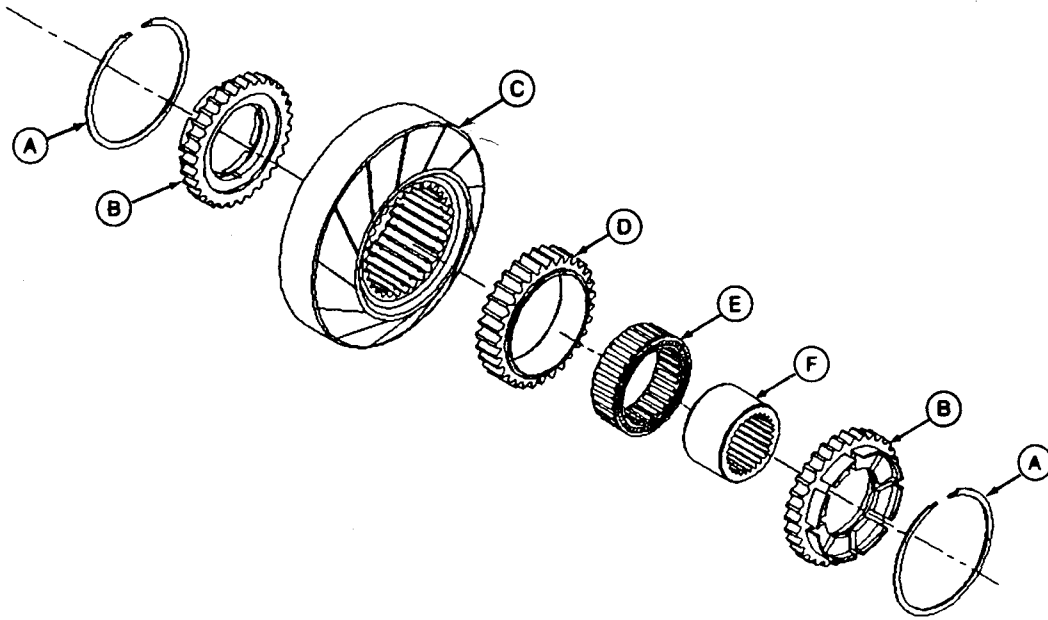


YZ.CTM84,20,12 -19-13JAN94

YZ512 -JUN-25OCT93

YZ513 -JUN-25OCT93

DISASSEMBLE AND ASSEMBLE FREE STATOR ASSEMBLY



A—Retaining ring (2)
B—Clutch retainer (2)

C—Stator
D—Outer clutch race

E—Clutch sprag assembly

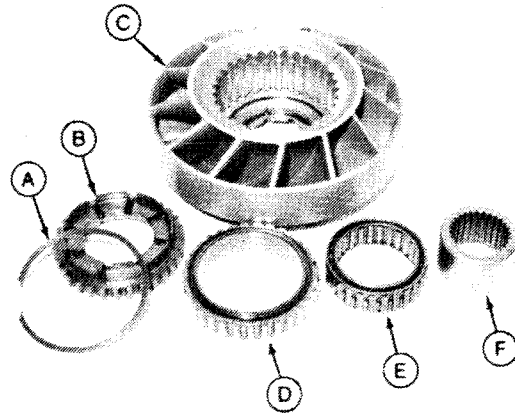
F—Inner clutch race

YZ,CTM84,20,34 -19-13JAN94

YZ736 -JUN-03DEC93

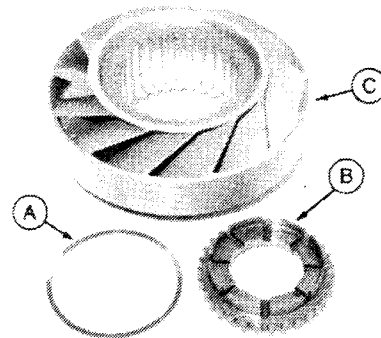
DISASSEMBLE FREE STATOR ASSEMBLY

1. Remove retaining ring (A) from stator (C).
2. Remove clutch retainer (B).
3. Remove inner clutch race (F).
4. Remove sprag clutch assembly (E).
5. Remove outer clutch race (D).



NOTE: Clutch retainer (B) will slide out of stator when turned over.

6. Turn stator (C) over.
7. Remove retaining ring (A).
8. Remove clutch retainer (B).
9. Inspect parts for wear or damage.



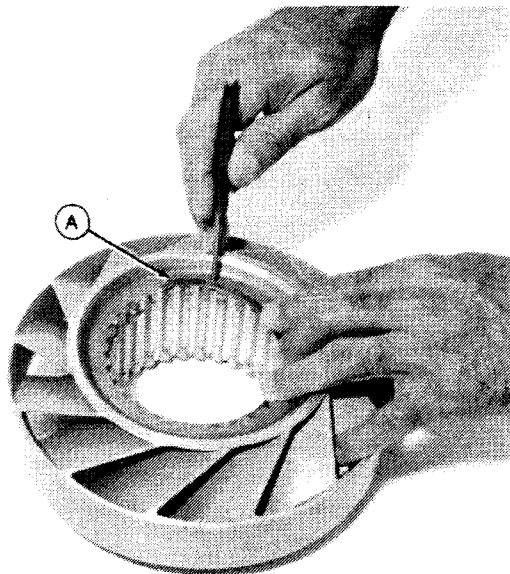
YZ.CTM84,20,13 -19-13JAN94

YZ514 -JUN-25OCT93

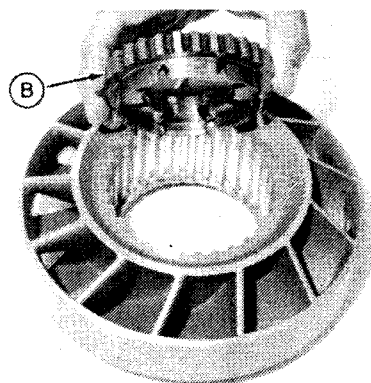
YZ515 -JUN-25OCT93

ASSEMBLE FREE STATOR ASSEMBLY

1. Position stator with "BACK" side up.
2. Install retaining ring (A) into groove.



3. Turn stator, position "FRONT" side up.
4. Install clutch retainer (B) with slotted face down.



-UN-25OCT93

YZ512

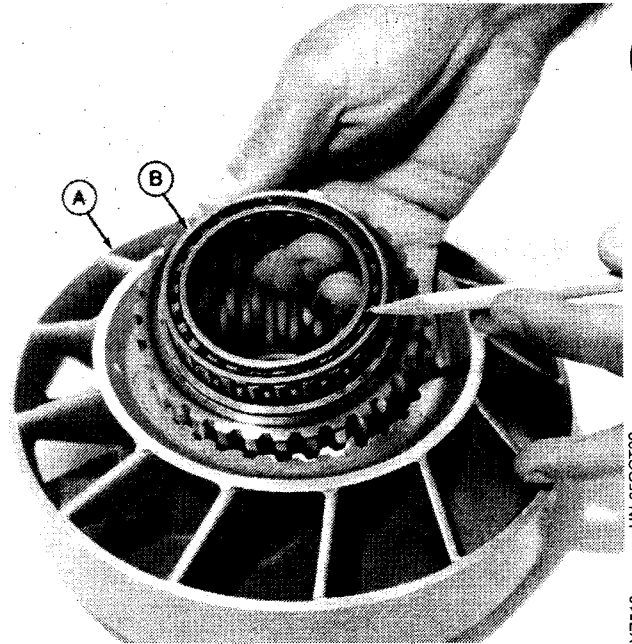
-UN-25OCT93

YZ517

YZ.CTM84,20,14 -19-13JAN94

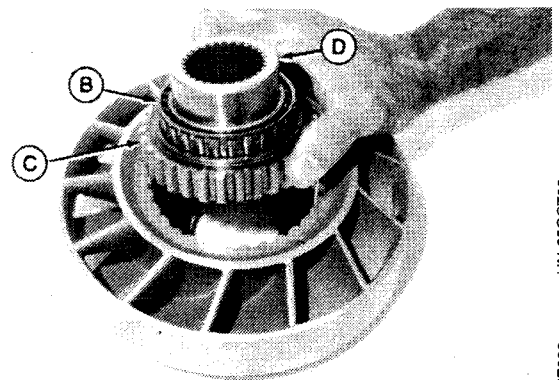
5. Position stator (A) "FRONT" side up.
6. Lubricate all clutch parts with clean transmission fluid.

IMPORTANT: Install outer cage flange of sprag clutch up. Stator must freewheel counter-clockwise viewed from front side.



NOTE: Cage flange is up.

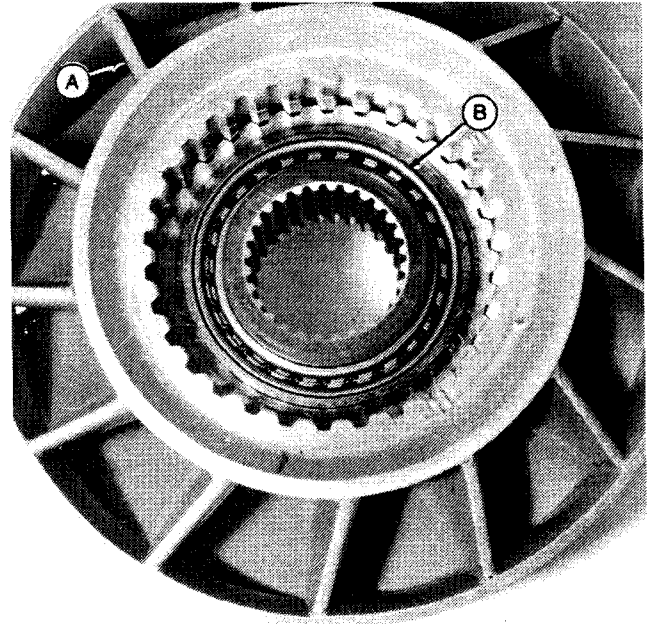
7. Install sprag clutch (B) to about one half its depth into the outer clutch race (C).
8. Install inner clutch race (D) to about one half its depth into the sprag clutch (B).
9. Push all parts together.
10. Install assembled parts into stator.
11. Compare the assembly to the "free stator clutch assembly" photograph.



YZ,CTM84,20,15 -19-13JAN94

FREE STATOR CLUTCH ASSEMBLY

IMPORTANT: The photo shows how the stator and sprag clutch will look if properly assembled, the thick vanes (A) indicating the stator front is up. The cage flange of the sprag clutch assembly (B) is up.

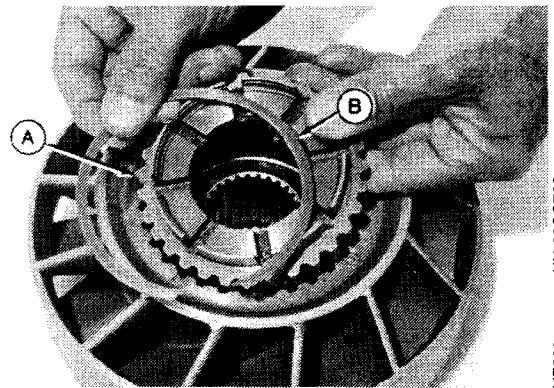


-UN-25OCT93

YZ519

YZ,CTM84,20,16 -19-13JAN94

12. Install clutch retainer (A) slotted face up.
13. Install retainer ring (B) into groove.



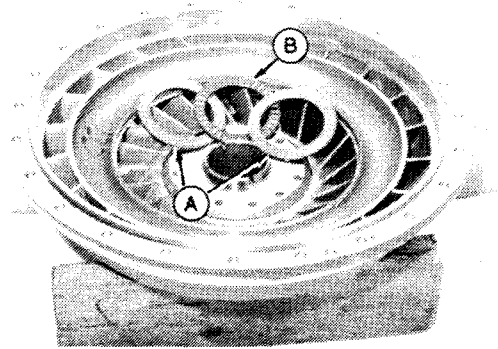
-UN-25OCT93

YZ520

YZ,CTM84,20,17 -19-13JAN94

DISASSEMBLE CONVERTER IMPELLER

1. Remove two thrust washers (A) and one needle thrust bearing (B).



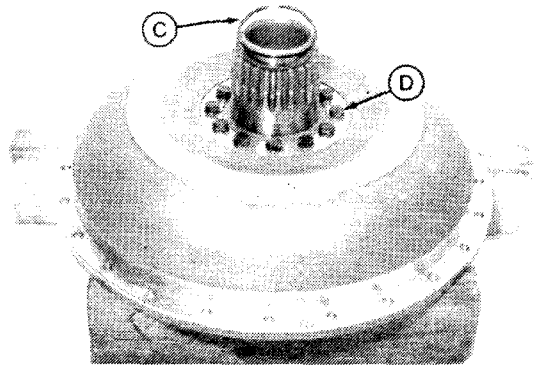
-UN-25OCT93

YZ521

2. Turn impeller over.

3. Remove seal ring (C).

4. Remove twelve cap screws (D) and washers.



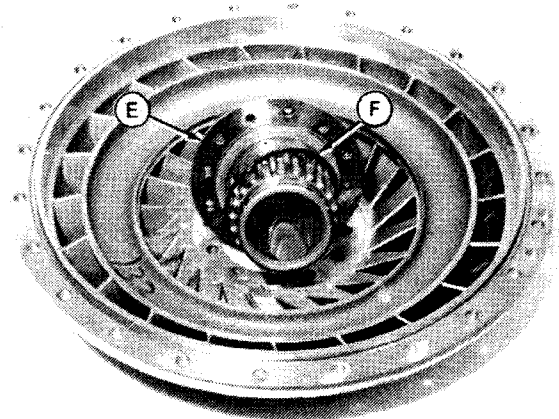
-UN-25OCT93

YZ522

5. Turn impeller over.

6. Remove impeller hub (E) and O-ring (F).

7. Inspect splines, seal and bearing surfaces.



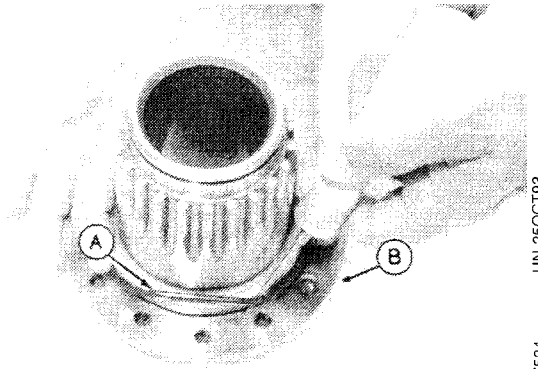
-UN-25OCT93

YZ523

YZ,CTM84,20,18 -19-13JAN94

ASSEMBLE CONVERTER IMPELLER AND HUB

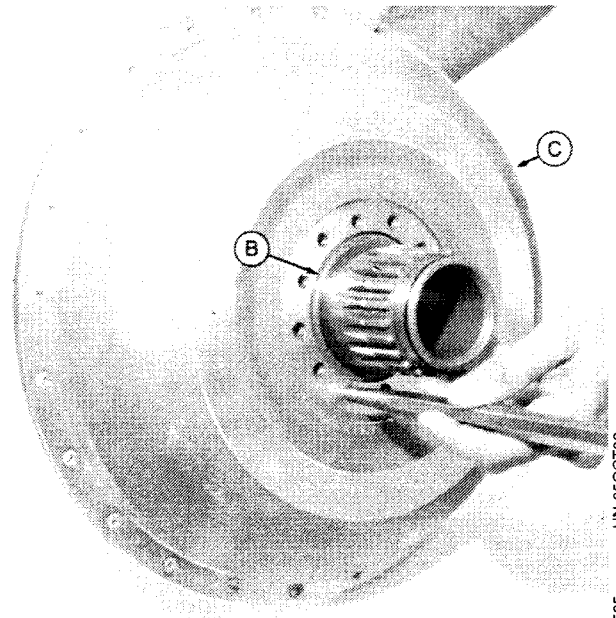
1. Lubricate O-ring (A) with clean transmission fluid.
2. Install O-ring (A) into groove on impeller hub (B).



3. Install impeller hub (B) into impeller (C).

NOTE: There are two bolt hole patterns in the impeller hub. Be certain all holes are aligned.

4. Align holes in impeller hub (B) with holes in impeller (C).



-UN-25OCT93

YZ524

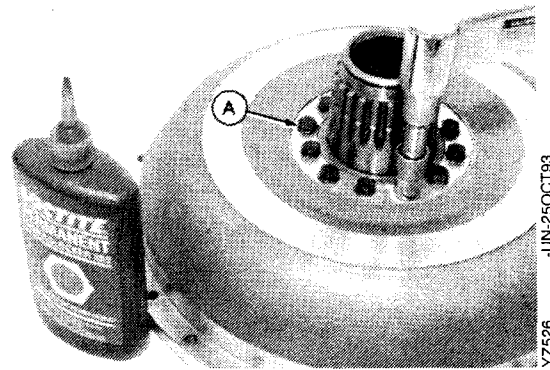
-UN-25OCT93

YZ525

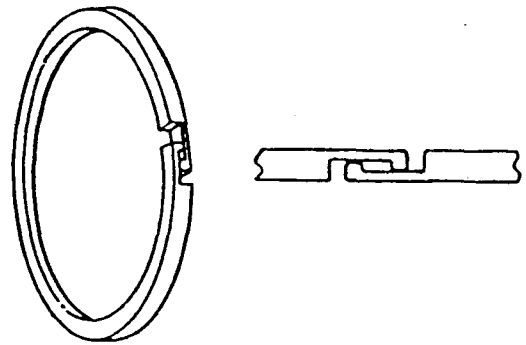
YZ,CTM84,20,19 -19-13JAN94

Torque Converter

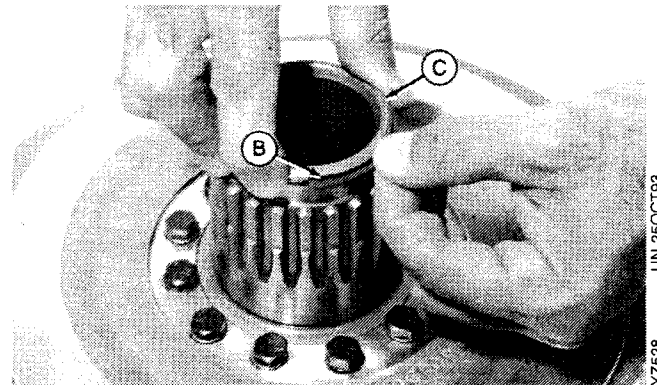
5. Apply a small drop of LOCTITE® #262 to cap screws.
6. Install 12 cap screws and washers (A).
7. Tighten cap screws to 31 N·m (23 lb-ft).



IMPORTANT: Seal ring ends must be hooked together.



8. Install seal ring (B) into groove on impeller hub (C) and lock ends.



LOCTITE is a trademark of the Loctite Corporation.

YZ.CTM84,20,20 -19-02JUN94

ASSEMBLE STATOR TO IMPELLER

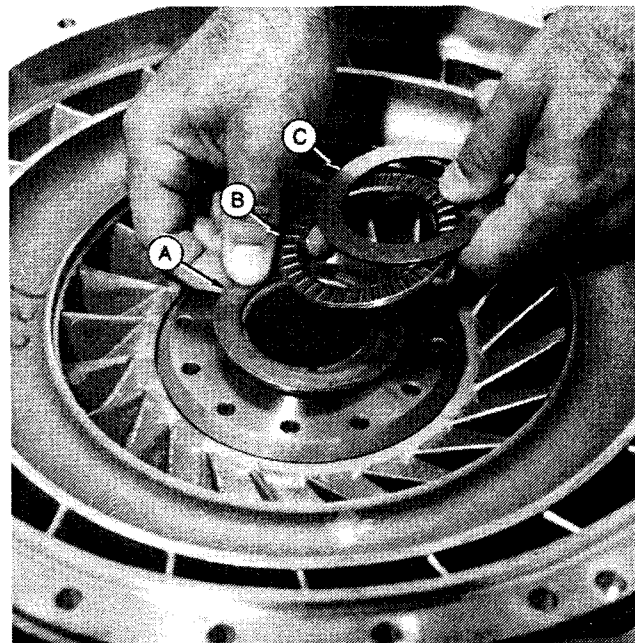
1. Position impeller with vanes up.
2. Lubricate one needle thrust bearing and two thrust washers with clean transmission fluid.
3. Install new thrust washer (A) onto impeller hub.
4. Install new needle thrust bearing (B) onto thrust washer.
5. Install new thrust washer (C) onto thrust bearing.

NOTE: Thrust washers (A) and (C) are identical parts.

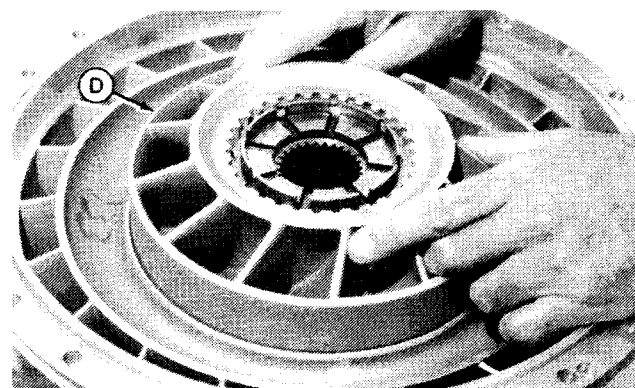
6. Install stator assembly (D) with front side up (refer to STATOR FRONT AND BACK SIDE IDENTIFICATION in this group).

NOTE: If Stator is installed improperly it will not turn freely on thrust bearing.

7. Rotate stator assembly several turns to be sure it is properly seated on the thrust bearings.



YZ529 -UN-25OCT93



YZ530 -UN-25OCT93

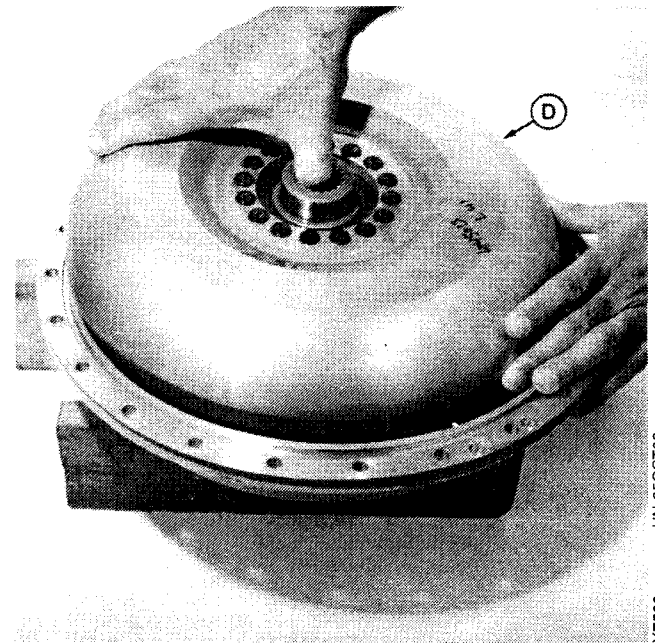
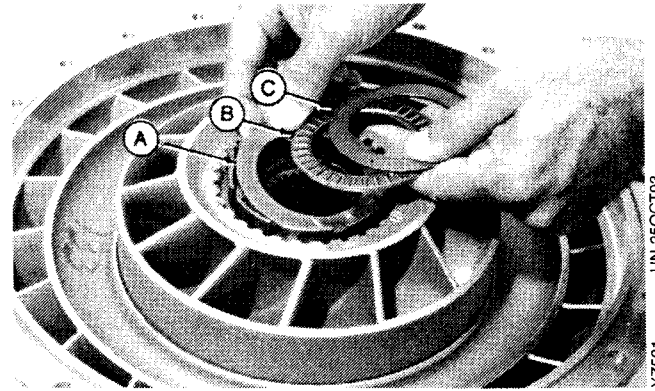
YZ,CTM84,20,21 -19-13JAN94

ASSEMBLE TURBINE TO STATOR

1. Lubricate needle thrust bearing and thrust washers with clean transmission fluid.
2. Install new thrust washer (A).
3. Install new needle thrust bearing (B).
4. Install new thrust washer (C).

NOTE: Thrust washers (A) and (C) are identical parts.

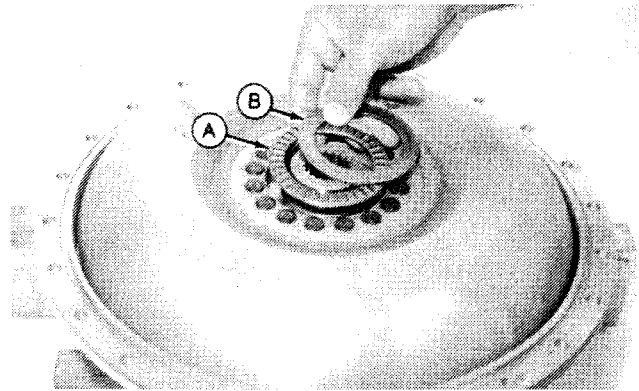
5. Install turbine assembly (D).
6. Rotate turbine assembly several turns to be sure it is properly seated on the thrust bearings.



YZ.CTM84,20,22 -19-13JAN94

ASSEMBLE FRONT COVER TO TURBINE AND IMPELLER

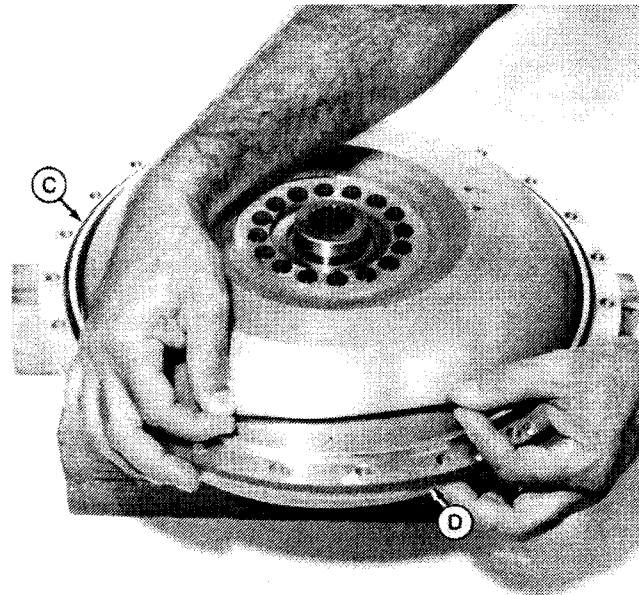
1. Lubricate needle thrust bearing and thrust washer with clean transmission fluid.
2. Install new needle thrust bearing (A).
3. Install new thrust washer (B).



-UN-25OCT93

YZ533

4. Lubricate new gasket O-ring (C) with clean transmission fluid.
5. Install new gasket O-ring (C), in groove in impeller (D). Be certain the gasket O-ring is not twisted and is laying flat in the groove.



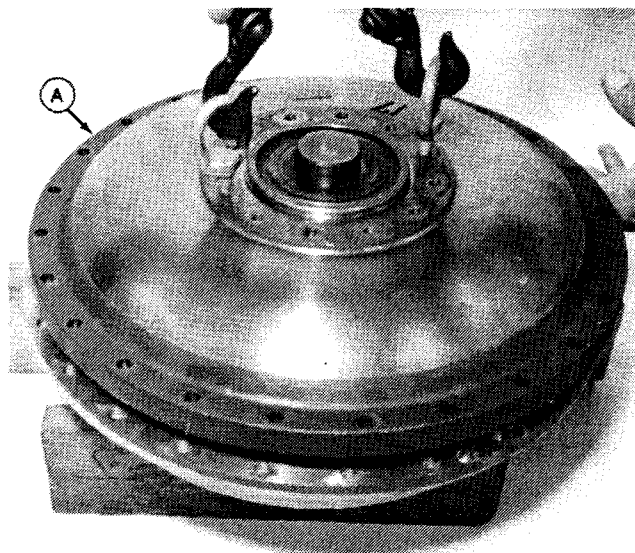
-UN-25OCT93

YZ534

YZ,CTM84,20,23 -19-13JAN94

Torque Converter

6. Install front cover (A), the mating surfaces meet evenly without binding. Align cap screw holes.



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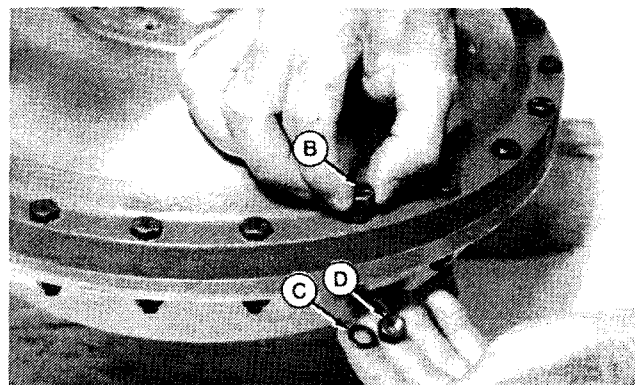
YZ535

7. Install cap screws (B) from same direction as originally installed.

NOTE: The cap screws are usually installed from the front cover side.

8. Install flat washers (C) the same as originally installed.

NOTE: The flat washers may be found installed on either or both sides of the converter. They are usually under the hex nut on the turbine side of the converter.

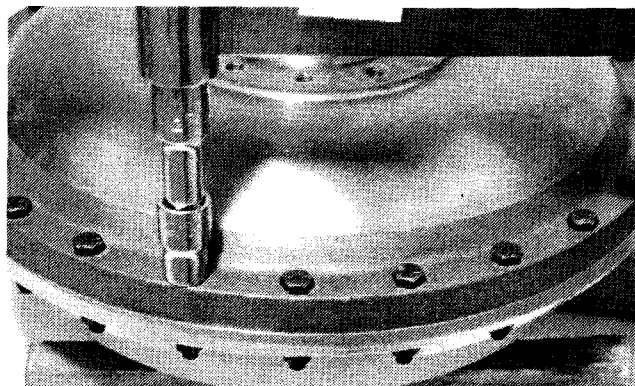


-JUN-25OCT93

YZ536

9. Install hex nuts (D).

10. Tighten cap screws to 35 N·m (26 lb-ft), alternating front to rear and side to side.



-JUN-25OCT93

YZ537

YZ,CTM84,20,24 -19-13JAN94

OTHER MATERIAL

| Number | Name | Use |
|---------------|---|---------------------------------|
| T43513* | LOCTITE® Thread Lock & Sealer (High Strength) #262 | On spring plunger and oil seal. |

LOCTITE is a trademark of the Loctite Corporation.

**John Deere part number reference.*

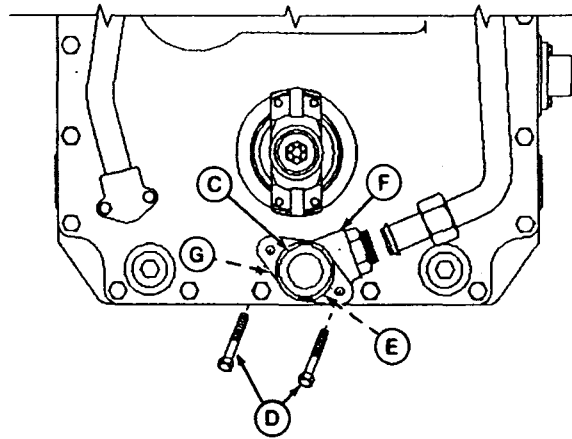
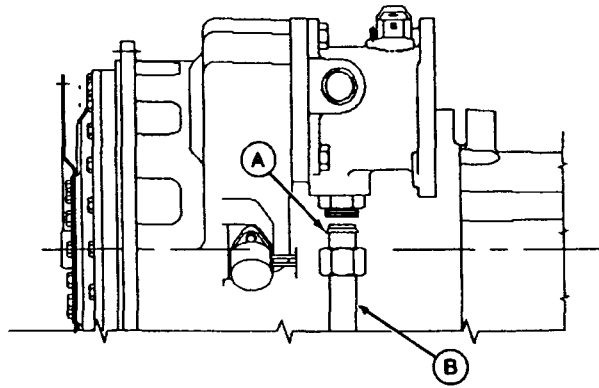
YZ,CTM84,25,OTH-19-02JUN94

SPECIFICATIONS

| Item | Measurement | Specification |
|---|--------------------|----------------------|
| Charge pump-to-front cover cap screws. | Torque | 87 N·m (64 lb-ft) |
| Suction Manifold-to-Front Cover cap screws. | Torque | 25 N·m (18 lb-ft) |

YZ,CTM84,25,SPC-19-13JAN94

DISASSEMBLE SUCTION TUBE GROUP



A—O-ring fitting (2 used)
B—Suction tube

C—Suction screen assembly
D—Cap screw (2 used)

E—Gasket
F—Suction manifold

G—O-ring

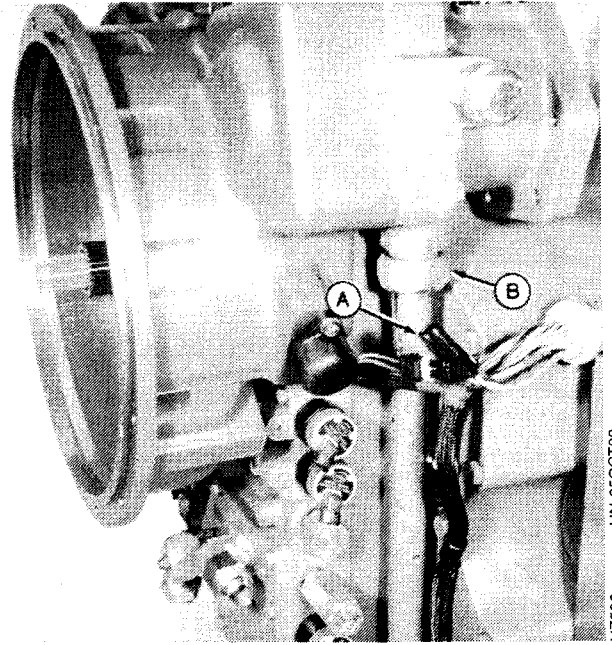
YZ728 -UN-06DEC93

YZ.CTM84,25,14 -19-13JAN94

REMOVE SUCTION TUBE ASSEMBLY

IMPORTANT: All oil should be drained from transmission before beginning disassembly.

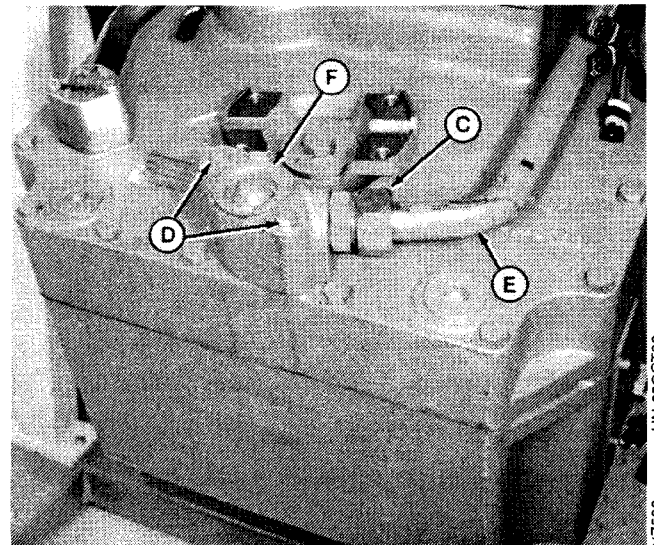
1. Remove wire harness connector (A) from magnetic pickup.
2. Loosen nut (B) on suction tube.



YZ582
-JUN-25OCT93

YZ,CTM84,25,1 -19-13JAN94

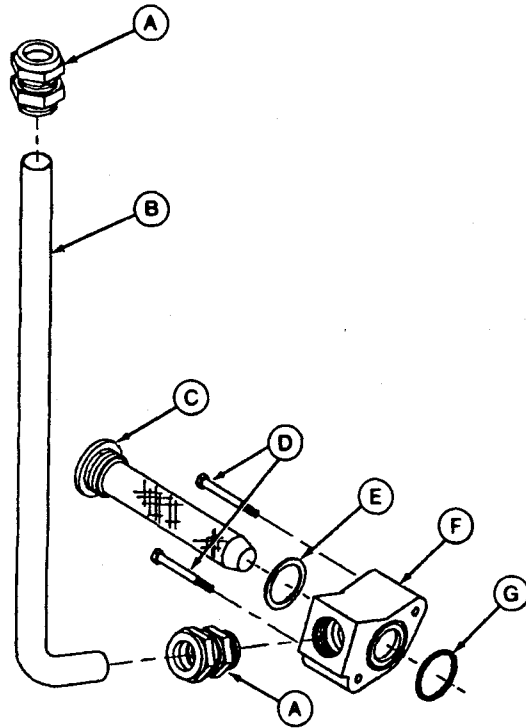
3. Remove suction screen assembly (F). Clean and inspect.
4. Loosen nut (C) connecting tube to suction manifold.
5. Remove two cap screws (D) from suction manifold.
6. Remove suction manifold and O-ring in groove on back of manifold.
7. Remove suction tube (E).



YZ583
-JUN-25OCT93

YZ,CTM84,25,12 -19-13JAN94

ASSEMBLE SUCTION TUBE GROUP



YZ750 -UN-10DEC93

A—O-ring fitting (2 used)
B—Suction tube

C—Suction screen assembly
D—Cap screw (2 used)

E—Gasket
F—Suction manifold

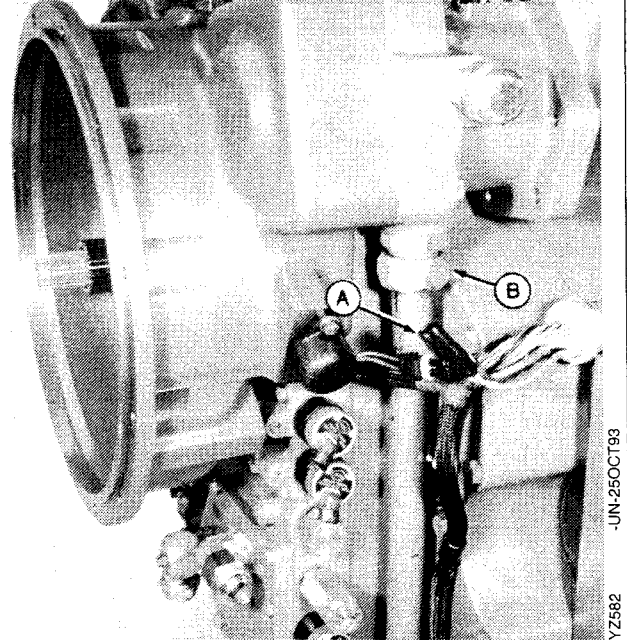
G—O-ring

YZ,CTM84,25,19 -19-13JAN94

INSTALL SUCTION TUBE

IMPORTANT: There must not be any suction leaks. Use care assembling and installing the suction tube. A leak may cause the transmission to not operate properly or the charge pump to fail.

1. Place suction tube (E) into fitting on charge pump.



YZ582
-JUN-25OCT93

2. Install O-ring on back side of suction manifold.

3. Start one cap screw into suction manifold.

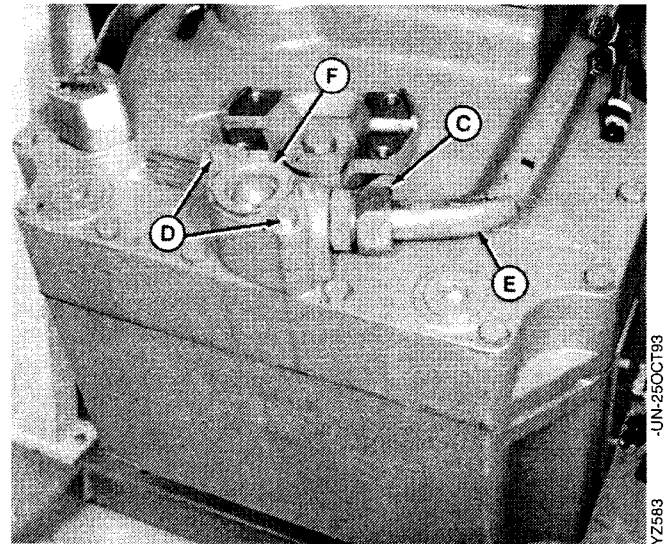
4. Position suction tube (E) into suction manifold.

5. Install and tighten cap screws (D) to 25 N·m (18 lb-ft).

6. Tighten nuts (B) and (C) at both ends of suction tube (E).

7. Install suction screen assembly.

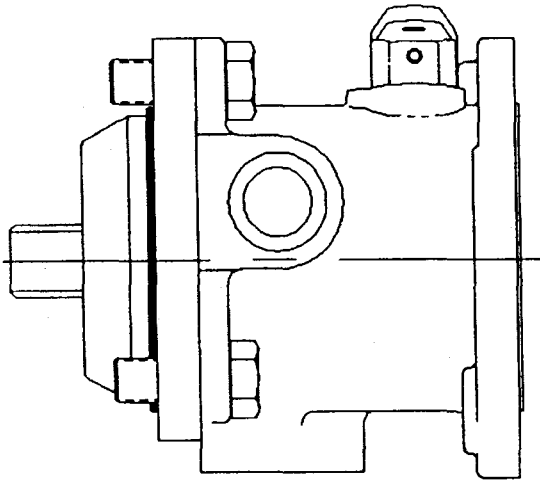
8. Connect wiring harness (A) to magnetic pickup.



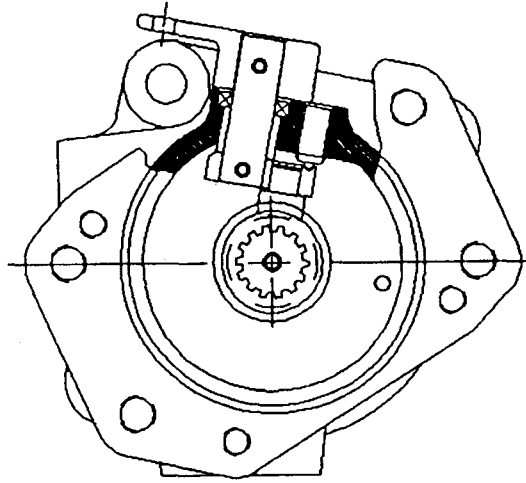
YZ583
-JUN-25OCT93

YZ_CTM84,25,9 -19-02JUN94

CHARGE PUMP GROUP



THE CHARGE PUMP IS NOT SERVICEABLE. THE PUMP MUST BE REPLACED IF FOUND DEFECTIVE.



THE AUXILIARY PUMP DRIVE DISCONNECT PARTS MAY BE SERVICED.

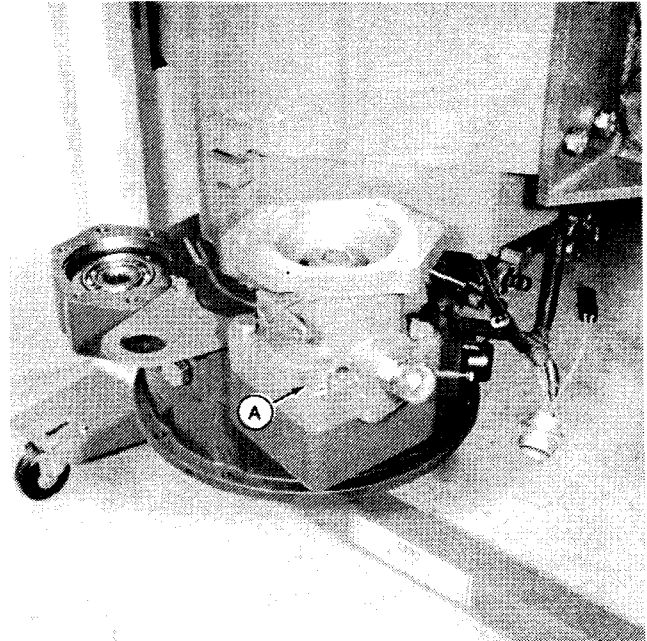
YZ,CTM84,25,4 -19-13JAN94

YZ701 -JUN-25OCT93

REMOVE CHARGE PUMP GROUP

NOTE: Transmission is shown with the front cover down.

1. Remove three cap screws (A).



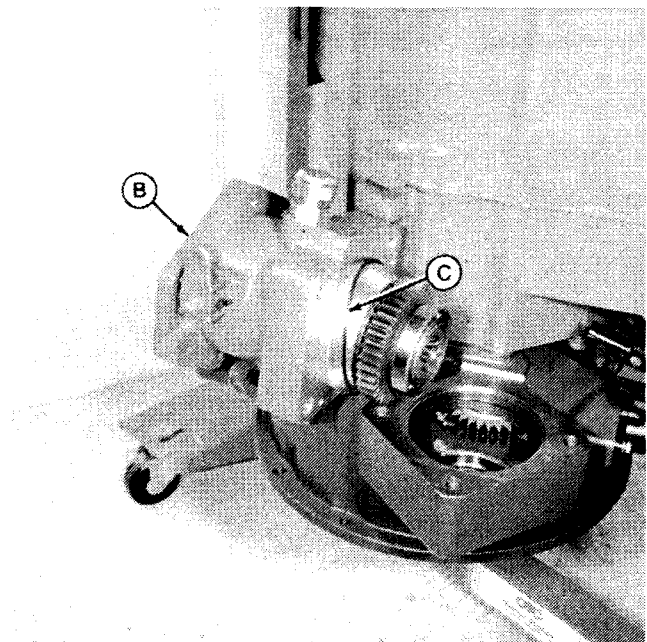
-UN-25OCT93

YZ584

⚠ CAUTION: The driven gear and support bearings will usually stay with the charge pump when removed from front cover. Do not allow these parts to fall from the charge pump, personal injury or damage could result.

NOTE: The driven gear and support bearings are considered part of the Front Cover Group, but they will usually come out with the charge pump when it is removed. For information concerning these parts see Group 30 (Front Cover) in this manual.

2. Remove charge pump (B) from front cover.
3. Remove O-ring (C).



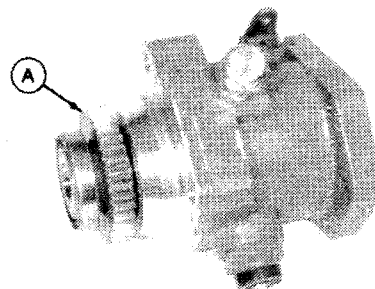
-UN-25OCT93

YZ585

YZ,CTM84,25,2 -19-13JAN94

REMOVE DRIVEN GEAR AND BEARING ASSEMBLY

1. Remove driven gear and bearing assembly (A) from charge pump.
2. Inspect for wear and damage.

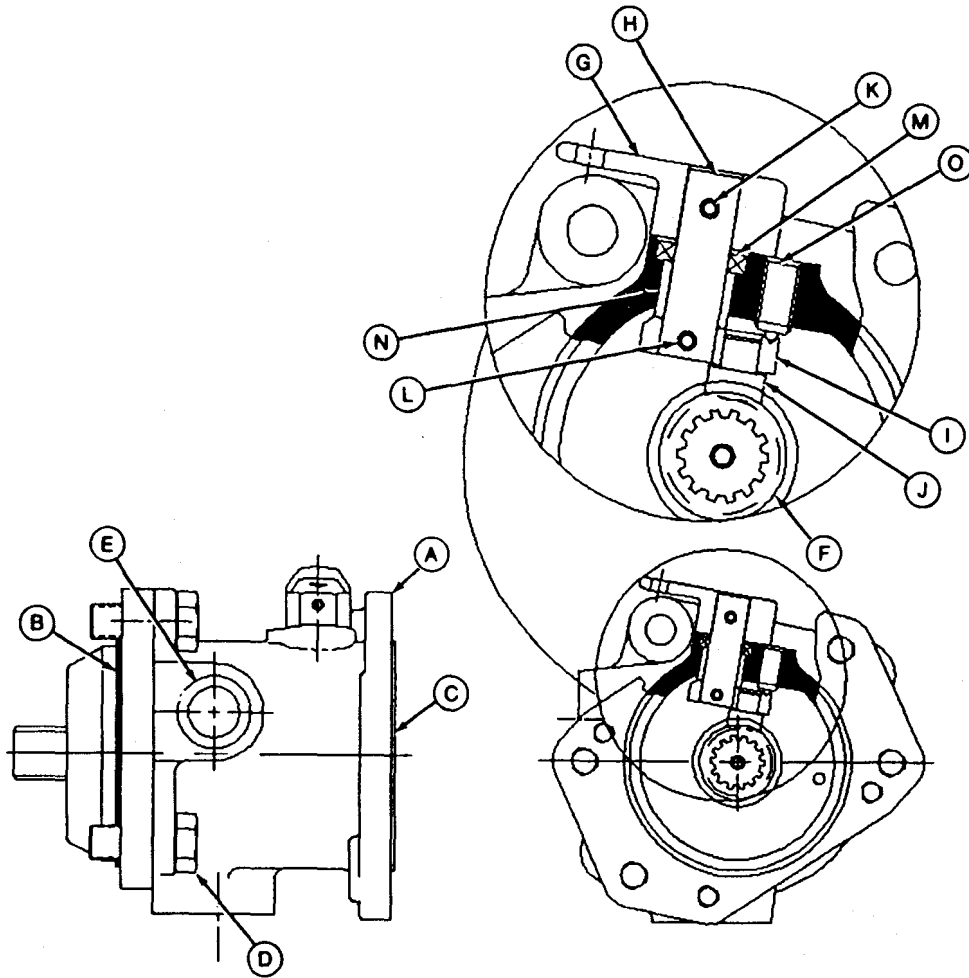


-UN-25OCT93

YZ586

YZ,CTM84,25,3 -19-13JAN94

DISASSEMBLE AND ASSEMBLE CHARGE PUMP GROUP WITH AUXILIARY PUMP DRIVE DISCONNECT



A—Oil pump
 B—O-ring
 C—Shipping plug
 D—Cap screw

E—Shipping plug
 F—Disconnect sleeve
 G—Disconnect shift arm
 H—Disconnect lever shaft

I—Detent shift block
 J—Disconnect fork
 K—Roll pin
 L—Roll pin

M—Oil seal
 N—Inner ring bearing
 O—Spring Plunger

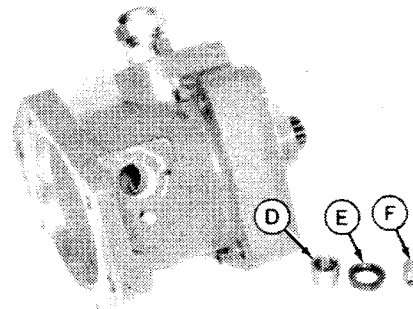
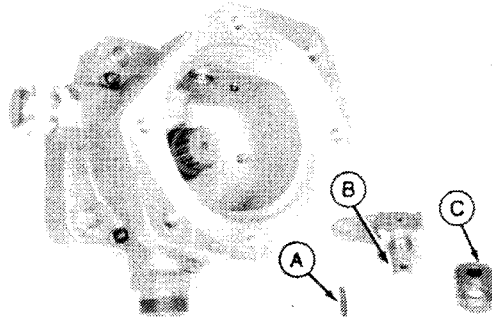
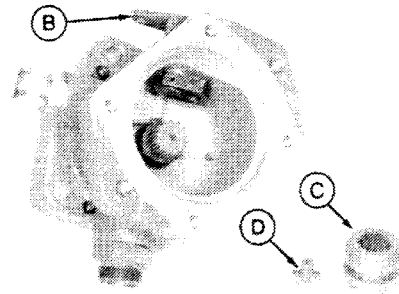
YZ,CTM84,25,11 -19-13JAN94

YZ702 -JUN-25OCT93

DISASSEMBLE AUXILIARY PUMP DRIVE DISCONNECT

NOTE: Depending on the application, the charge pump may be equipped with a mechanical disconnect to disengage the auxiliary pump drive.

1. Rotate disconnect shift arm (B) counter clockwise, remove disconnect sleeve (C) and disconnect fork (D).
2. Inspect pump shaft, disconnect sleeve and disconnect fork for wear and damage.
3. Drive roll pin (A) through disconnect lever shaft (B) and detent shift block (C).
4. Remove detent shift block (C) from disconnect lever shaft (B).
5. Remove disconnect lever shaft (B) from charge pump.
6. Inspect parts for wear or damage.
7. Remove oil seal (E).
8. Remove inner ring bearing (D).
9. Remove spring plunger (F).
10. Inspect parts for wear and damage.



-UN-25OCT93

YZ587

-UN-25OCT93

YZ588

-UN-25OCT93

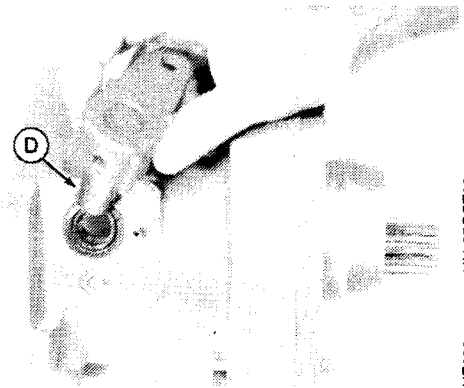
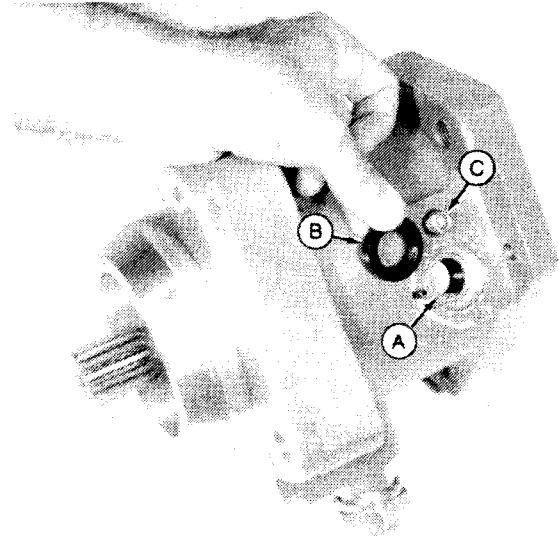
YZ589

YZ.CTM84,25,15 -19-13JAN94

ASSEMBLE AUXILIARY PUMP DRIVE DISCONNECT

1. Install inner ring bearing (A).
2. Apply LOCTITE® # 262 to outside diameter of oil seal (B).
3. Install oil seal (B).
4. Apply LOCTITE® # 262 to threads of spring plunger (C).
5. Install spring plunger (C) into charge pump.

6. Install disconnect lever shaft (D) through inner ring bearing (A).



YZ.CTM84,25,5 -19-02JUN94

-UN-25OCT93

YZ590

-UN-26OCT93

YZ600

Charge Pump

NOTE: Detent shift block (E) has depressions in one side of the block. The side with the depressions will go toward the spring plunger (C).

7. Install detent shift block (E) onto disconnect lever shaft.

8. Install roll pin.

9. Adjust spring plunger (C) to hold shift block at the detent until manually shifted.

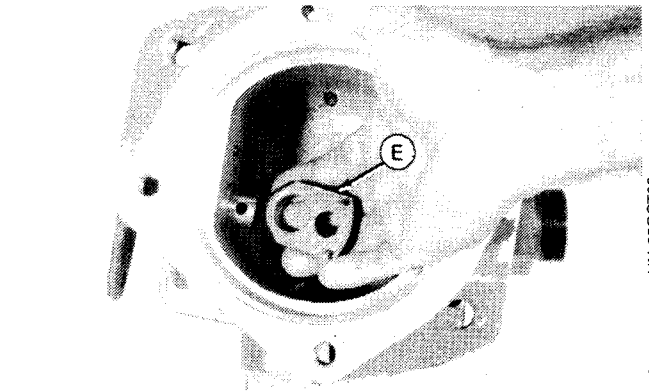
10. Rotate disconnect shift arm (A) toward charge pump opening.

11. Install disconnect fork (B) into detent shift block.

NOTE: Hold disconnect fork against detent shift block while installing disconnect sleeve groove against detent shift block and onto end of splined shaft.

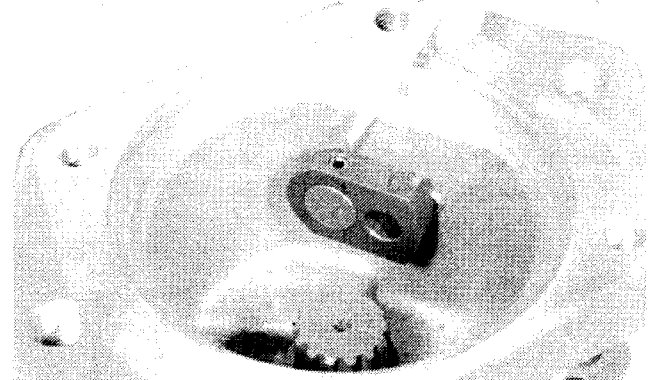
12. Install disconnect sleeve (C).

13. Rotate disconnect shift arm (A) away from pump opening to hold sleeve on pump shaft.



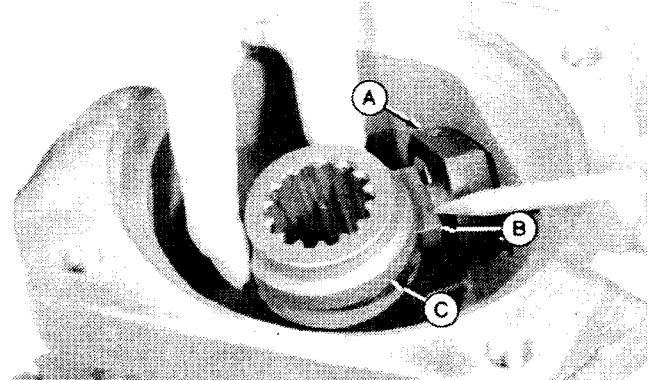
-UN-25OCT93

YZ591



-UN-25OCT93

YZ689



-UN-25OCT93

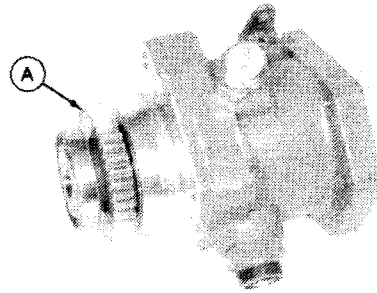
YZ592

YZ,CTM84,25,13 -19-02JUN94

INSTALL DRIVEN GEAR AND BEARING ASSEMBLY (CHARGE PUMP)

NOTE: Refer to Group 30 (Front Cover) for information on disassembling and assembling driven gear assembly (A).

- Install driven gear assembly (A) onto charge pump.



YZ,CTM84,25,7 -19-13JAN94

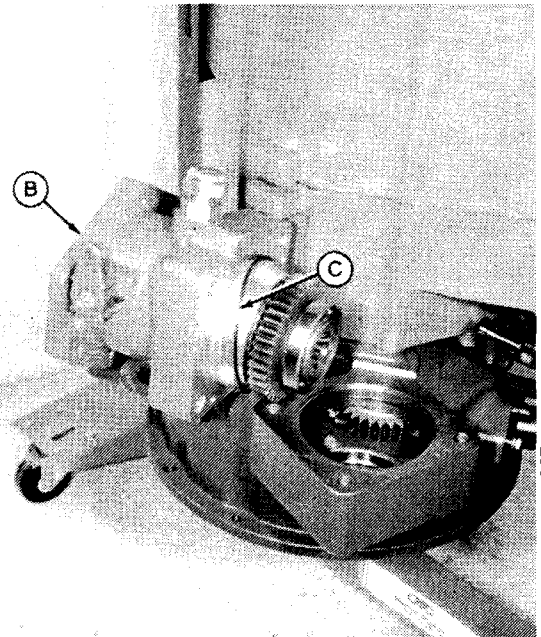
-JUN-25OCT93
YZ586

INSTALL CHARGE PUMP TO FRONT COVER

1. Lubricate O-ring (C) install onto charge pump (B).

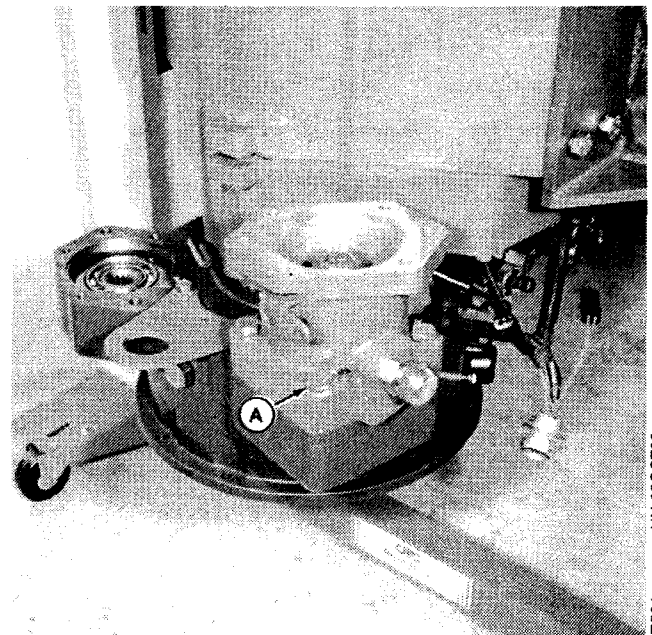
NOTE: The driven gear on the charge pump must mesh with the idler gear. Refer to Group 30, Front Cover (install driven gear assemblies).

2. Install charge pump (B) into front cover.



3. Install three cap screws (A) through charge pump into front cover.

4. Tighten cap screws to 87 N-m (64 lb-ft).



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-JUN-25OCT93
YZ585

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YZ584

OTHER MATERIAL

| Number | Name | Use |
|--------|--------------------|------------------|
| | LOCTITE #620 | Oil seal |
| | Grease | O-ring |
| | Transmission fluid | All moving parts |

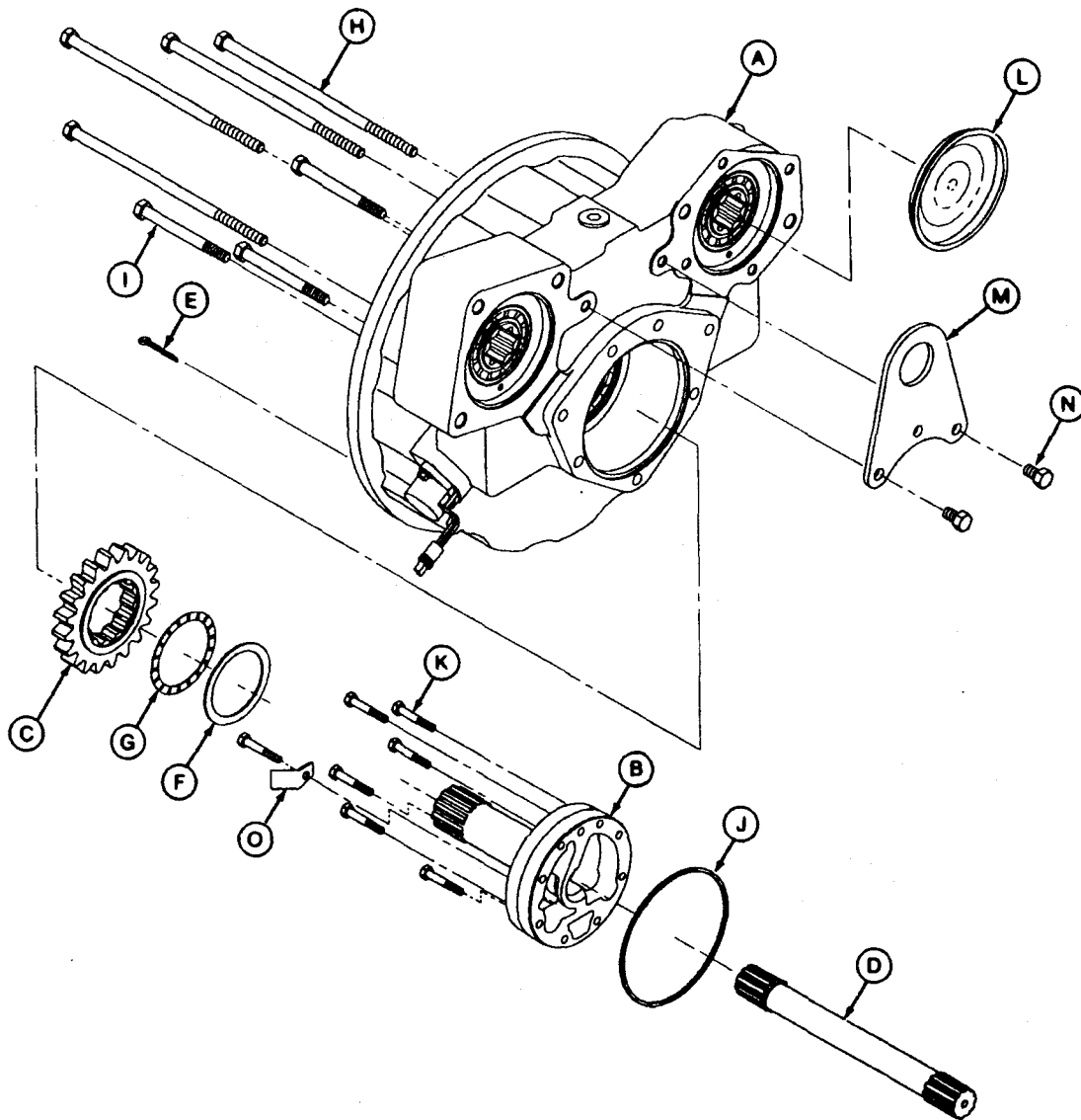
YZ,CTM84,30,OTH-19-13JAN94

SPECIFICATIONS

| Item | Measurement | Specification |
|---|-------------|--------------------|
| Stator Support Tube-to-Main Case Front Housing Cap Screws. | Torque | 37 N·m (27 lb-ft) |
| Magnetic Pickup-to-Main Case Front Housing Cap Screws. | Torque | 10.4 N·m (7 lb-ft) |
| Front Cover Assembly-to-Main Case Front Housing Cap Screws. | Torque | 87 N·m (64 lb-ft) |

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DISASSEMBLE FRONT COVER GROUP



A—Input housing (SAE 3)
 B—Stator support tube
 C—Gear, 43T
 D—Converter input shaft
 E—Cotter pin

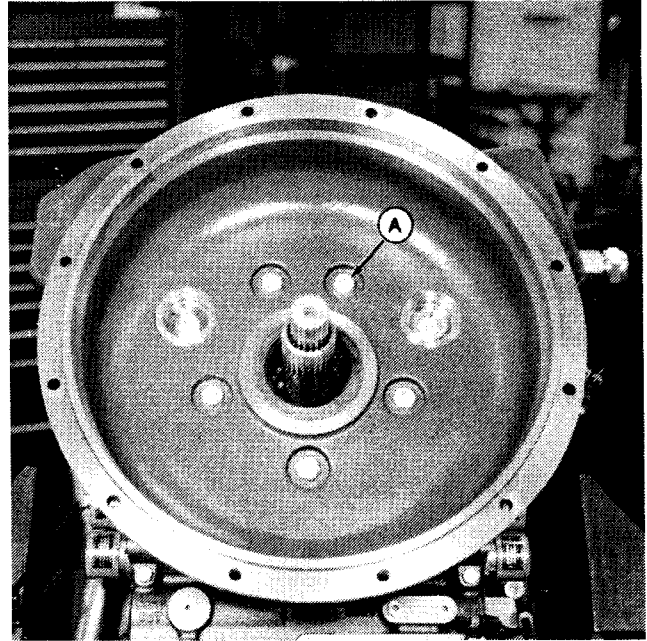
F—Thrust race
 G—Needle bearing
 H—Hex cap screw,
 12x280mm (4 used)
 I—Hex cap screw, 12x172mm
 (3 used)

J—O-ring
 K—Hex cap screw, 8x50mm
 (7 used)
 L—Shipping plug

M—Lift hanger
 N—Cap screw (2 used)
 O—Deflector

REMOVE FRONT COVER AND INPUT ASSEMBLY

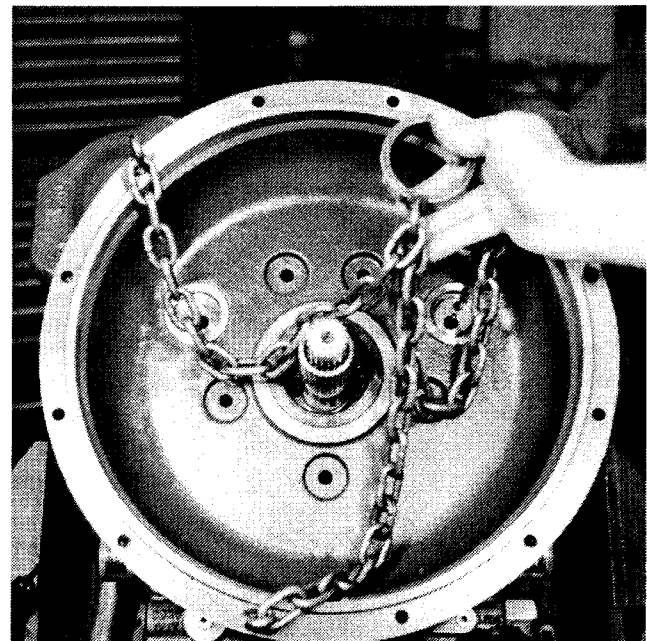
1. Position transmission with front cover up.
2. Remove bolts (A).



YZ729 -UN-06DEC93

YZ,CTM84,30,1 -19-13JAN94

3. Install lifting device.

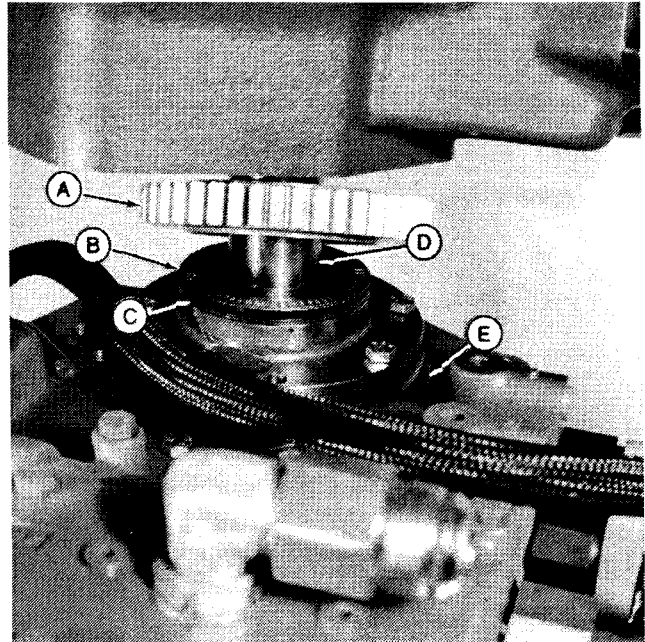


YZ730 -UN-06DEC93

YZ,CTM84,30,23 -19-13JAN94

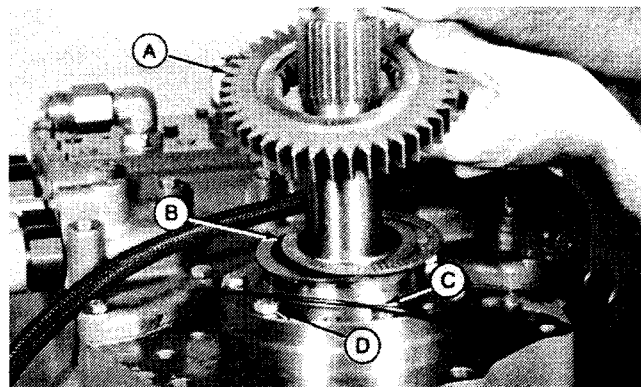
Front Cover

4. Lift front cover carefully from transmission. The 43 tooth gear (A), needle thrust bearing (B), thrust race (C), stator tube (D), and O-ring (E) should stay with transmission.



YZ,CTM84,30,24 -19-13JAN94

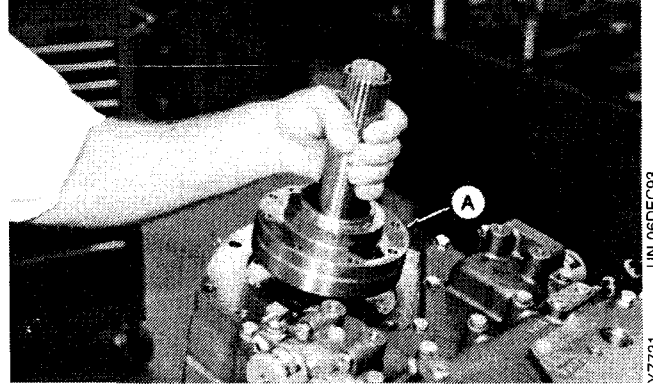
5. Remove 43 tooth gear (A).
6. Remove needle bearing and thrust race (B).
7. Remove O-ring (C).
8. Remove bolts (D) and deflector (not shown).



YZ,CTM84,30,12 -19-13JAN94

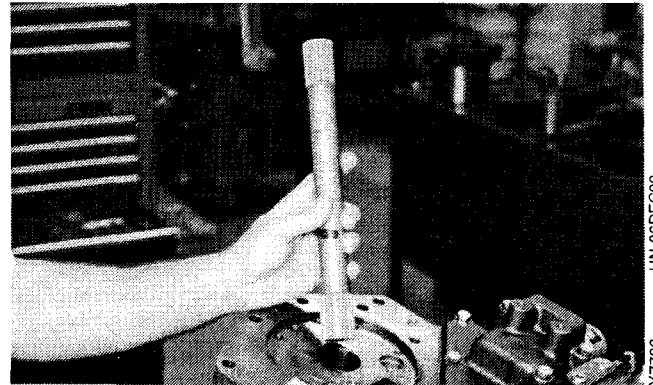
Front Cover

9. Remove stator support tube (A).



YZ731
-UN-06DEC93

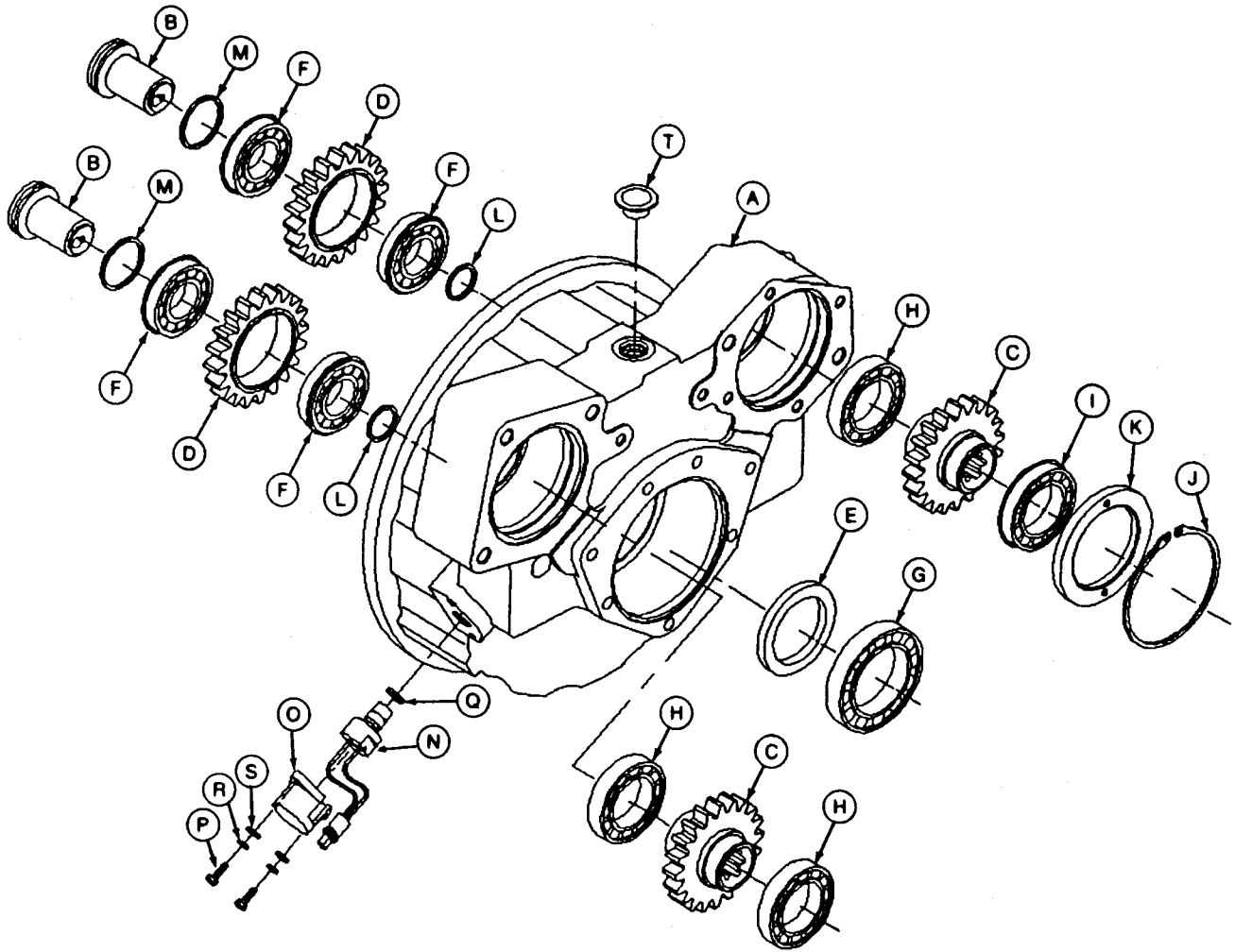
10. Remove converter input shaft.



YZ733
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DISASSEMBLE INPUT ASSEMBLY



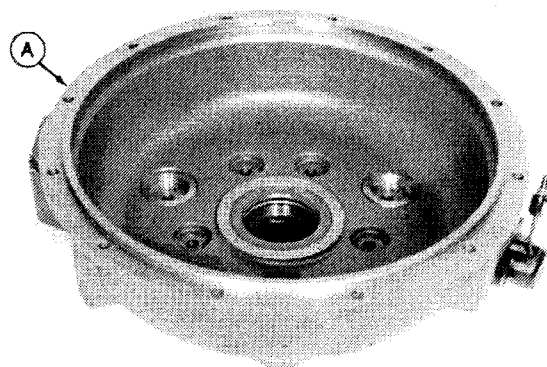
- | | | | |
|------------------------|--------------------|--------------------------|--------------------------|
| A—Input housing | F—Bearing (4 used) | K—Bearing spacer | P—Hex cap screw (2 used) |
| B—Idler shaft (2 used) | G—Ball bearing | L—O-ring (2 used) | Q—O-ring |
| C—Driven gear (2 used) | H—Bearing (3 used) | M—O-ring (2 used) | R—Lock washer (2 used) |
| D—Idler gear (2 used) | I—Bearing | N—Magnetic pickup sensor | S—Washer (2 used) |
| E—Oil seal | J—Snap ring | O—Magnetic pickup cover | T—Hex socket plug |

YZ.CTM84,30,27 -19-13JAN94

YZ704 -JUN-25OCT93

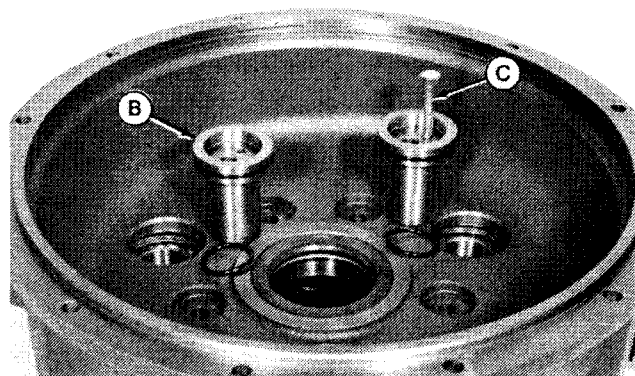
DISASSEMBLE FRONT COVER

1. Position front cover assembly (A) converter side up.



YZ548 -UN-25OCT93

2. Install a bolt (C) into threaded hole in idler shaft (B). Use this bolt to pull idler shafts, the shafts are a slip fit in their bores



YZ549 -UN-25OCT93

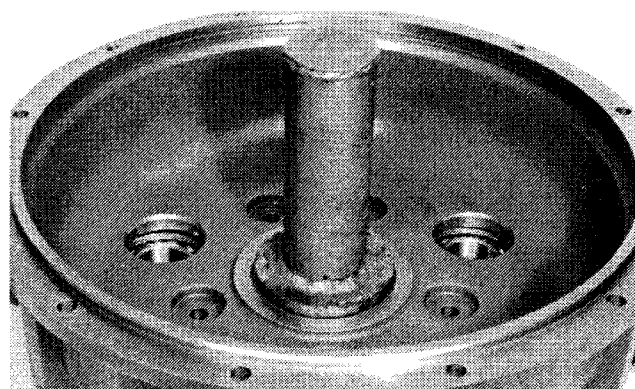
3. Remove idler shafts (B).

4. Remove O-rings from bottom of idler shaft bores.

5. Inspect idler shaft for wear or damage.

YZ,CTM84,30,2 -19-13JAN94

6. Use a driving tool to remove oil seal and bearing from front cover.



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YZ,CTM84,30,3 -19-13JAN94