HMD 23000 Series Transmission

COMPONENT TECHNICAL MANUAL

HMD 23000 Series Service Manual

CTM201 10MAY05 (ENGLISH)

John Deere Power Systems
LITHO IN U.S.A.

Introduction

Foreword

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 on the machine or in this manual, be alert to the potential for personal injury.

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

Component Technical Manuals (CTM) are concise guides for specific machines. They are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

DX,TMIFC -19-22MAY92-1/1

Warning Tag

NOTE: This service manual contains data referred to by warning tag on each transmission.

The above tag is attached to each unit when it is shipped. It is for your protection and should not be removed until the unit has been properly serviced under the instructions of this manual.

Warning Tag

DPSG,YZ07927,196 -19-28SEP99-1/1

Contents

INDX

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.

HMD 23000 Transmission

Contents

Recognize Safety Information

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

Follow recommended precautions and safe operating practices.

T81389 –UN–07DEC88

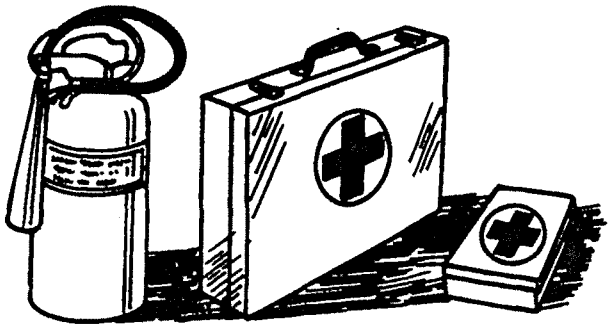
DX,ALERT –19–07DEC88–1/1

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.



TS291 –UN–23AUG88

DX,FIRE2 –19–03MAR93–1/1

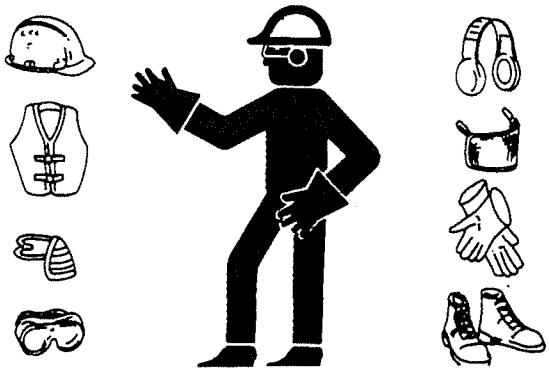
Wear Protective Clothing

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.



TS206 –UN–23AUG88

DX,WEAR –19–10SEP90–1/1

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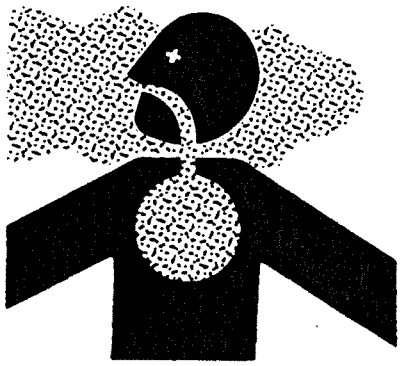
Work In Ventilated Area

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.



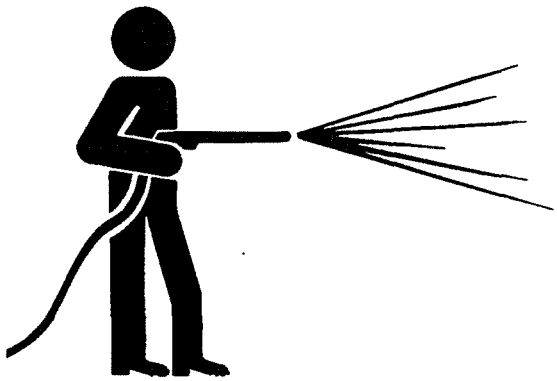
TS220 –UN–23AUG88

DX,AIR –19–23AUG88–1/1

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.

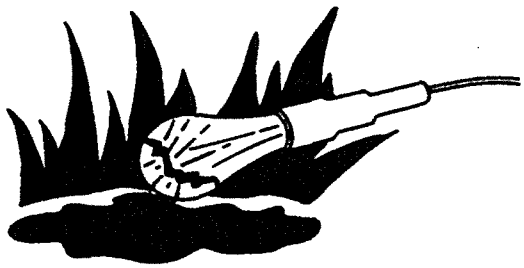


T6642EJ –UN–18OCT88

DX,CLEAN –19–04JUN90–1/1

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.



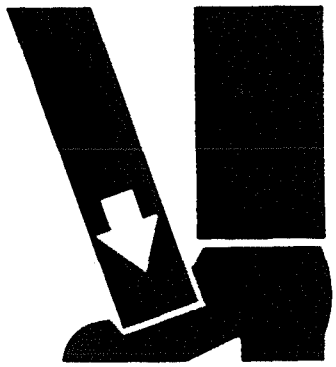
TS223 –UN–23AUG88

DX,LIGHT –19–04JUN90–1/1

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.



TS226 –UN–23AUG88

DX,LIFT –19–04JUN90–1/1

Use Proper Tools

TS779 –UN–08NOV89

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.

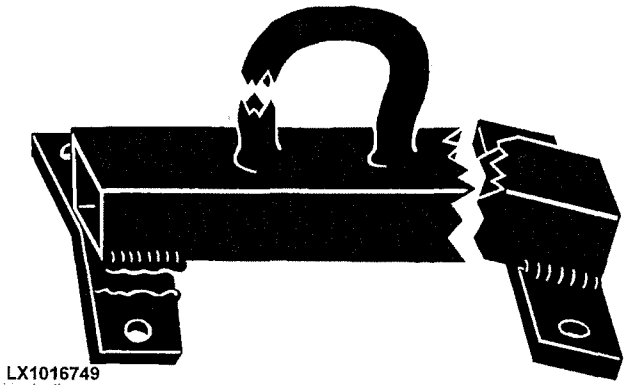
Use only service parts meeting John Deere specifications.

DX,REPAIR –19–04JUN90–1/1

Using Special Tools

Faulty or broken tools can result in serious injury. When constructing tools, use proper, quality materials and good workmanship.

Do not weld tools unless you have the proper equipment and experience to perform the job.



LX1016749 –UN–01JUL97

LX1016749

Special Tools

DPSG,YZ07927,121 –19–06JUL99–1/1

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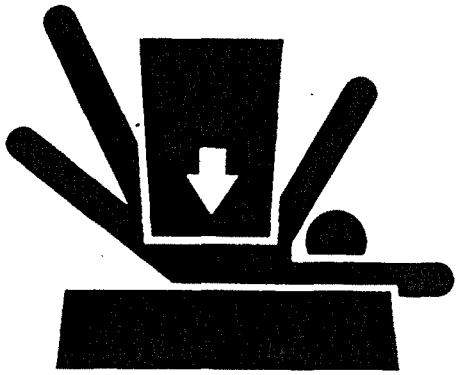
Support Machine Properly

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–23AUG88

DX,LOWER –19–04JUN90–1/1

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.

TS227 –UN–23AUG88

DX,FLAME –19–04JUN90–1/1

Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

TS204 –UN–23AUG88

DX,SPARKS –19–03MAR93–1/1

Prevent Acid Burns

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

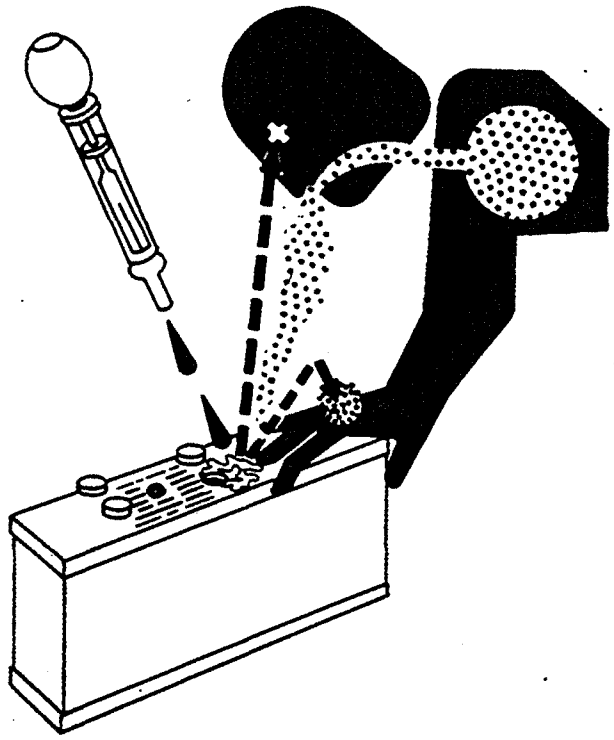
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203 –UN–23AUG88

DX,POISON –19–21APR93–1/1

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.

TS953 –UN–15MAY90

DX,TORCH –19–03MAR93–1/1

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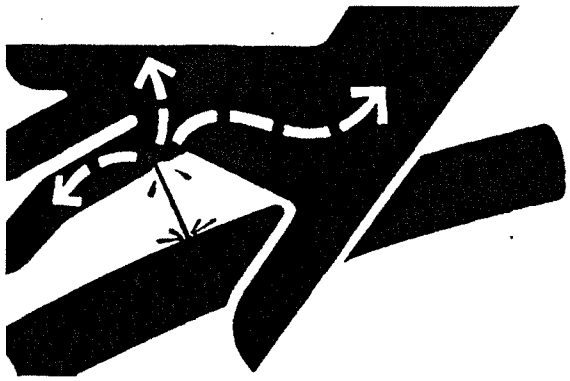
Avoid High-Pressure Fluids



X9811 –UN–23AUG88

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.

DX,FLUID –19–03MAR93–1/1

Live With Safety

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

TS231 –19–07OCT88

DX,LIVE –19–25SEP92–1/1

Specification

Item	Measurement	Specification
Oil Specifications		
Maximum operating oil temperature	Temperature	107°C (225 °F)
Oil	First time fill	Approximately 3 quarts
Oil type	Recommended Lubricants	Must conform to MIL-L-2105C or API-GL-5 specifications
Oil change	First time Normal operating conditions	After 500 hours Every six months of operation
Ambient temperature	23°C (10°F)	75W
Ambient temperature	-22°C—37°C (-10°F—100°F)	80W-90W
Ambient temperature	Above 37°C (Above 100°F)	85W-140W
Input adapter cap screw-to-housing	Torque	144 N•m (106 lb-ft.)

DPSG,YZ07927,181 –19–24SEP99–1/1

Abbreviations and Acronyms

- **CTM**: Component Technical Manual
- **HMD**: Hydraulic Motor Driven
- **Attn.**: Attention
- **Spec**: Specification
- **°C**: Degrees Celsius. 1 unit is 1/100th of the difference between the temperature of melting ice and boiling water at standard temperature and pressure.
- **°F**: Degrees Fahrenheit. 1 unit is 1/80th of the difference between the temperature of melting ice and boiling water at standard temperature and pressure.
- **FEPM**: Funk Engineering Procedures Manual
- **RTV**: Room Temperature Vulcanizing

DPSG,YZ07927,209 –19–20OCT99–1/1

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Parts Ordering Instructions

Should repair parts be required, please specify the model, specification and serial numbers of your unit as well as the name and number of the parts accompanying your purchase order.

This information tag is attached to your unit.

You may write to:

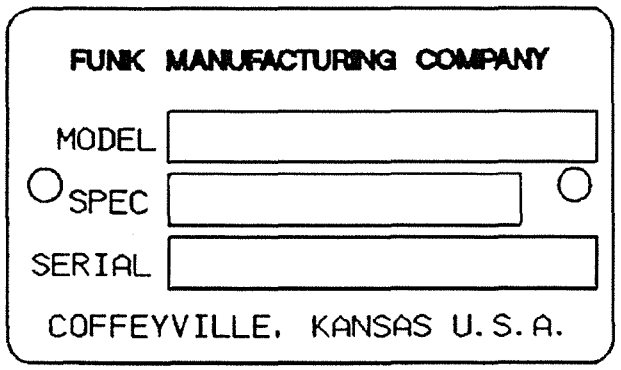
- Funk Manufacturing Company
  Attn.: Parts Department
  Industrial Park, Hwy. 169 N.
  P.O. Box 577
  Coffeyville, KS 67337-0577

or Telephone:

- Area Code (316) 251-3400 or 800-844-1337
  Ask for Customer Service Representative.

Fax:

- (316) 252-3252



YZ1503 -UN-01MAY98

Identification Tag

DPSG,YZ07927,195 -19-28SEP99-1/1

Description

The series 23000 is a three or four speed non-syncronized, mechanical shift transmission. The gear ranges are selected by means of sliding shift collars.

The power from the engine is transmitted to the series 23000 by means of drive line components or a hydrostatic transmission.

DPSG,YZ07927,182 -19-24SEP99-1/1

Operation

Like all mechanical equipment, the 23000 will need attention and servicing. Routine checks will help prevent down time.

Because the unit operates in 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.

DPSG,YZ07927,183 –19–24SEP99–1/1

Rules of Operation

1. Check the oil level weekly. Clean the area around the check plug before removing.

CAUTION: Gear range shifts must not be attempted when the vehicle is moving.

3. The maximum operating oil temperature is 107°C (225 °F).

DPSG,YZ07927,184 –19–24SEP99–1/1

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Service

AIR TEMPERATURE RANGE	
Prevailing Ambient TemperatureOil Spec	Oil Spec
Below–23°C (10°F)	75W
Below -23°C—37.8°C (10°F—100°F)	80W-90W
Above 37.8°C (100°F)	85W-140W

The type of service and operating conditions will determine the maintenance interval. However, it is recommended that the oil level be checked weekly, at the same time checking for oil leaks. Because the lubrication system is the hear of the unit, it is especially important that the oil be kept clean.

1. When servicing the unit for the first time after vehicle installation and /or after repair, the unit is to be filled to the level check plug. Approximately three quarts (2.84 1) will be required.

IMPORTANT: Do not overfill. To do so will result in overheating and will shorten the life of the transmission.

2. Use only lubricants that conform to MIL-L-2105C or API-GL-5 specifications. The following must be adhered to:

1. It is recommended that the oil be changed after the first 500 hours of service.
2. Thereafter, and under normal operating conditions, it is recommended that the oil be changed after every six months of operation. The oil should be changed whenever the oil shows traces of dirt or effects of high temperature, evidenced by discoloration or strong odor.
3. When changing the oil, the dirty oil should be drained while the unit is warm and examined for contamination.
4. Clean magnetic drain plug before replacing.
5. Refill using clean oil from clean containers.

DPSG,YZ07927,185 –19–24SEP99–1/1

Extended Storage

PRESERVATION OF TRANSMISSION AND RELATED COMPONENTS.

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

The following will protect the unit or component from internal rust and /or corrosion damage for approximately one (1) year, provided they are stored under shelter.

INTERNAL PRESERVATION

1. Seal **ALL** openings with moisture proof covers or tape.
2. Spray (4) ounces of atomized NOX RUST VCI No. 10 oil into drain hole. This fluid is covered and approved per (MIL-P-46002 and MIL-I-23310).

EXTERNAL PRESERVATION

1. Dip, spray, or brush **ALL** exposed unpainted surfaces with NOX RUST X-110. This includes shafts, flanges, seals, etc.
   NOX RUST X-110 meets MIL-C-16173 Grade 4 specifications.

Nox Rust is purchased from:

- Daubert Chemical Company
  1200 Jorie Boulevard
  Oak Brook, IL 60521
  (312) 990-4600

RESTORING UNITS TO SERVICE

1. Wash off **ALL** external grease with solvent.
2. Remove covers or tape from all openings.
3. Fill the unit with Funk Manufacturing approved transmission fluid.

DPSG,YZ07927,186 –19–27SEP99–1/1

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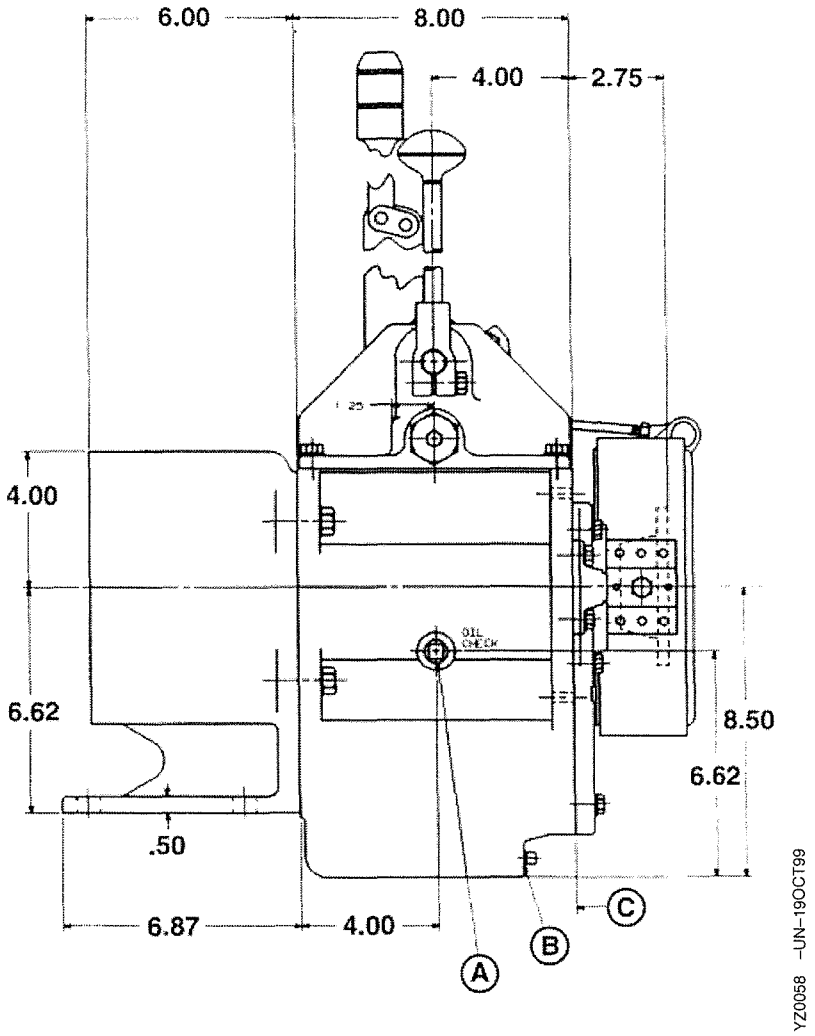
Installation Side View



Hmd23000 Side View

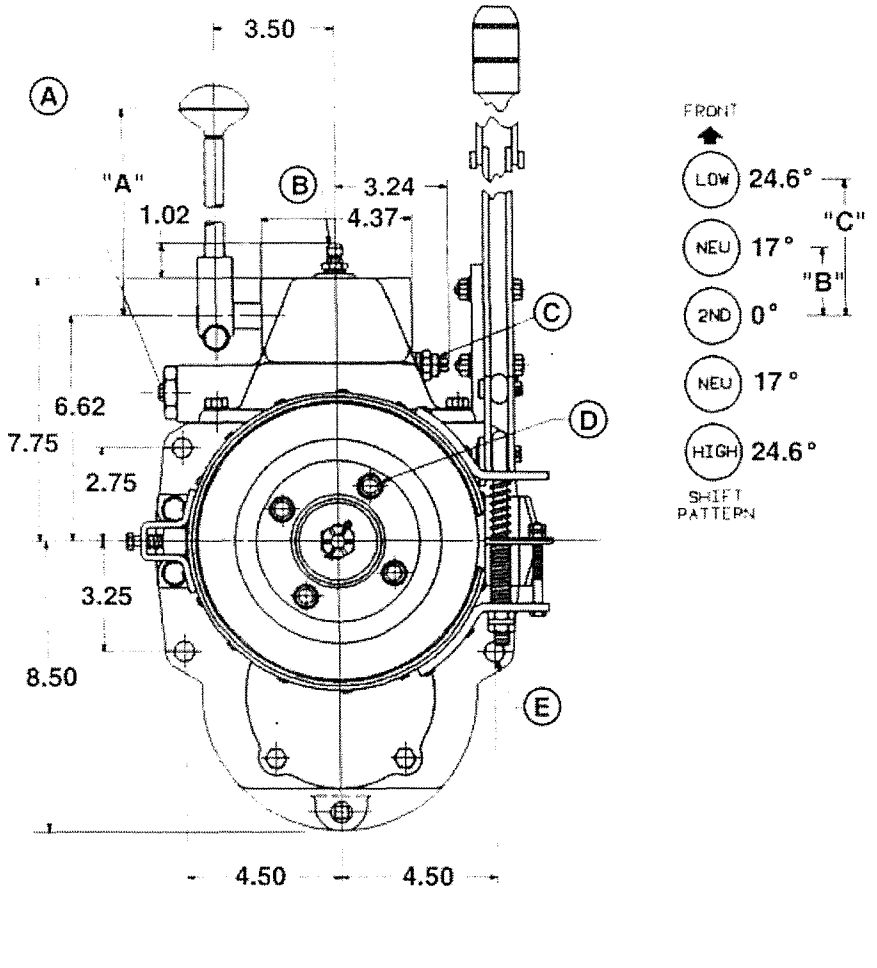
A—3/8 N.P.T. Oil level check plug

B—1/4 N.P.T. Magnetic drain plug

C—Mounting face (4) 5/8 Diameter holes

DPSG,YZ07927,207 –19–19OCT99–1/1

Installation Rear View



HMD23000 Rear View

A—150 — 500 PSI (.42 CU. IN.) Required to retract locking piston.
B—Breather & Oil Fill
C—12 V DC 5 AMP, 24 V DC 3 AMP, (mechanical), normally open or normally closed switch for out-of-gear indicator.
D—7/16 diameter bolt, 4 places, 95.25 mm (3.750 BCD ref)
E—5/8 drill, 4 holes

Handle Length	Length of Shift Throw	
"A" Inches	"B" Inches	"C" Inches
76.2 mm (3 in)	23.37 mm (.92 in)	34.80 mm (1.37 in)
101.6 (4 in)	30.99 mm (1.22 in)	46.48 mm (1.83 in)
304.8 mm (12 in)	93.22 mm (3.67 in)	139.45 mm (5.49 in)
406.4 (16 in)	124.21 mm (4.89 in)	186.18 mm (7.33 in)

DPSG,YZ07927,208 –19–19OCT99–1/1

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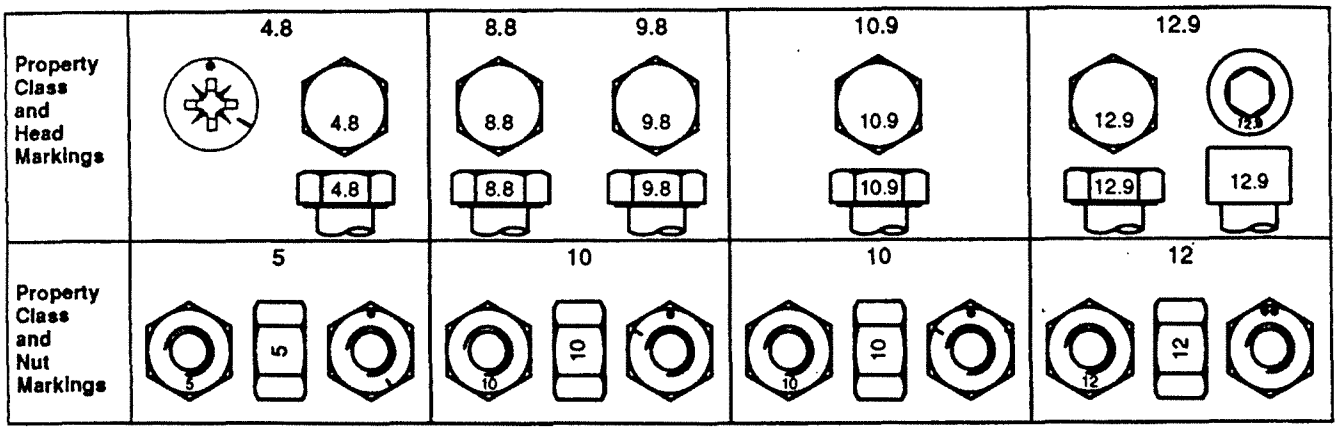
Metric Bolt And Cap Screw Torque Values



Metric

Applies to non-lubricated plain or zinc plated fasteners.

FEPM METRIC TORQUE SPECIFICATIONS 14.1					
Size	-	Class 8.8		Class 10.9	
-	-	N •m	lb-ft	N•m	lb-ft
M5	-	6.1	4.5	9.0	6.6
M6	-	10.4	7.7	15.3	11.3
M8	-	25	19	37	27
M10	-	50	37	73	54
M12	-	87	64	128	94
M14	-	139	102	204	150
M16	-	216	160	318	234
M20	-	435	321	620	457
M24	-	730	555	1072	790
M30	-	1450	1103	2129	1570
M36	-	2533	1927	3721	2744

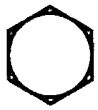
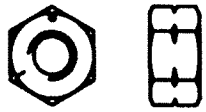
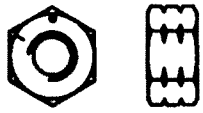
NOTE: Torque tolerance is ± 20%

Do not use these values if a different torque value or tightening procedure is given for a specific application.

METRIC BOLT AND CAP SCREW TORQUE VALUES chart meets Funk Engineering Procedures Manual (FEPM) Torque Specifications.

DPSG,YZ07927,14 –19–30APR99–1/1

Unified Inch And Cap Screw Torque Values

SAE Grade and Head Markings	NO MARK	1 or 2[b]		5	5.1	5.2	8	8.2
SAE Grade and Nut Markings	NO MARK	2		5			8	

TS1162 –19–04MAR91

FEPM INCH TORQUE SPECIFICATIONS 14.2				
Size	Grade 5		Grade 8	
-	N•m	lb-ft	N•m	lb-ft
1/4-20	11.1	8.2	16	11.6
1/4-28	12.8	9.4	18	13.3
5/16-18	23	16.9	32	23.9
5/16-24	25	18.7	36	26.4
-	-	-	-	-
3/8-16	41	30	57	42
3/8-24	46	34	65	48
7/16-14	65	48	92	68
7/16-20	73	54	103	76
-	-	-	-	-
1/2-13	99	73	140	103
1/2-20	111	82	159	117
9/16-12	144	106	202	149
9/16-18	160	118	225	166
5/8-11	198	146	280	206
5/8-18	224	165	316	233
3/4-10	350	258	495	365
3/4-16	392	289	554	408
-	-	-	-	-
7/8-9	566	417	799	589
7/8-14	624	460	881	649
1-8	848	625	1199	884
1-12	928	684	1312	967

Applies to non-lubricated plain or zinc plated fasteners.

DPSG,YZ07927,20 –19–11MAY99–1/1

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Suggested Wrenching Torque For Tapered Pipe Thread[1]

FEPM TORQUE SPECIFICATIONS 14.4		
TAPERED PIPE THREAD WITH SEALANT CHART		
Thread Size	**N• m**	**lb-ft**
1/16-27 UNF	15	10
1/8-27 UNF	20	15
1/4-18 UNF	25	20
3/8-18 UNF	35	25
1/2-14 UNF	45	35
3/4-14 UNF	60	45
1-11 1/2 UN	75	55
1-1/4-11 1/2 UN	95	70
1-1/2-11 1/2 UN	110	80
2-11 1/2 UN	130	95

FEPM TORQUE SPECIFICATIONS 14.4		
TAPERED PIPE THREAD WITHOUT SEALANT CHART		
Thread Size	**N•m**	**lb-ft**
1/16-27 UNF	20	15
1/8-27 UNF	25	20
1/4-18 UNF	35	25
3/8-18 UNF	45	35
1/2-14 UNF	60	45
3/4-14 UNF	75	55
1-11 1/2 UN	90	65
1-1/4-11 1/2 UN	110	80
1-1/2-11 1/2 UN	130	95
2-11 1/2 UN	160	120

[1]SUGGESTED WRENCHING TORQUE FOR TAPERED PIPE THREAD charts meet Funk Engineering Procedures Manual Torque Specifications FEP 14.4.

DPSG,YZ07927,8 –19–30APR99–1/1

Other Materials

Number	Name	Use
- (U.S.)	Loctite safety solvent	Preparing surface for jointing.
- (U.S.)	RTV-732	For jointing oil retaining surfaces.

DPSG,YZ07927,199 –19–04OCT99–1/1

Specifications

Item	Measurement	Specification
Torque Values		
Input adapter group cap screw-to-gear and case group.	Torque	65 N•m (48 lb-ft).
Shift control assembly cap screw-to-gear and case group.	Torque	41 N•m (30 lb-ft).
Companion flange cap screw-to-gear and case group.	Torque	65 N•m (48 lb-ft).

DPSG,YZ07927,197 –19–30SEP99–1/1

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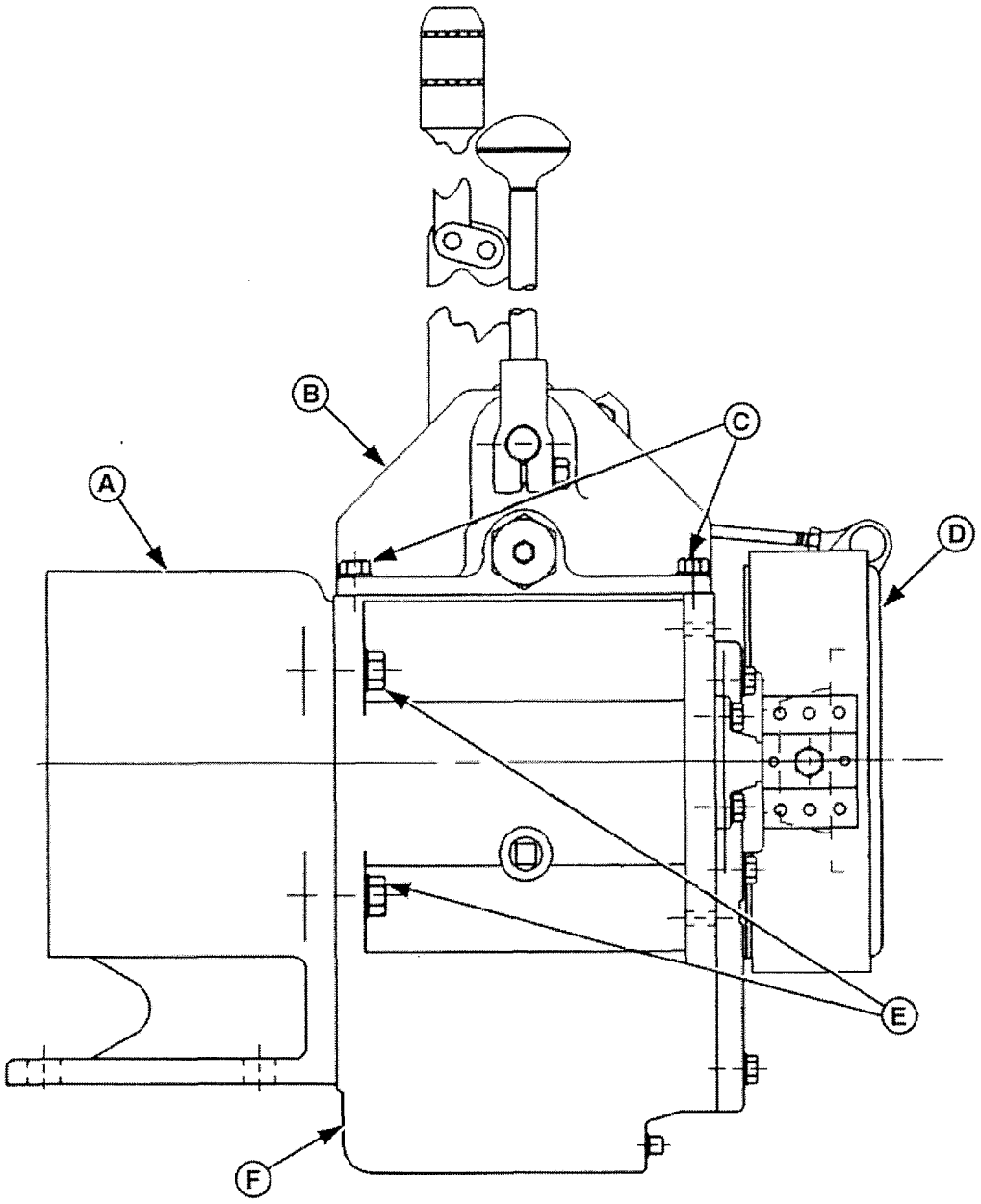
HMD23000 Major Component Groups



Major Component Groups

A—Input Adapter Group
B—Shift Cap Group
C—Shifter Cap cap screw-to-main case
D—Park Brake Group
E—Input Adapter Group cap screw-to-main case
F—Gear and Main Case Group

The models HMD2315, HMD2325, HMD2326 and HMD2355 may be disassembled into major component groups as follows:

1. Remove the cap screws that attach the input adapter group (A) to the main case group.

Continued on next page

Specification	
Input adapter group cap screw-to-gear and case group.—Torque	144 N•m (106 lb-ft)

Separate the input adapter group (A) from the transmission case and refer to group 25 for further disassembly of the input adapter group (A).

2. Remove the cap screws that attach the shift cap group (B) to the gear and case group

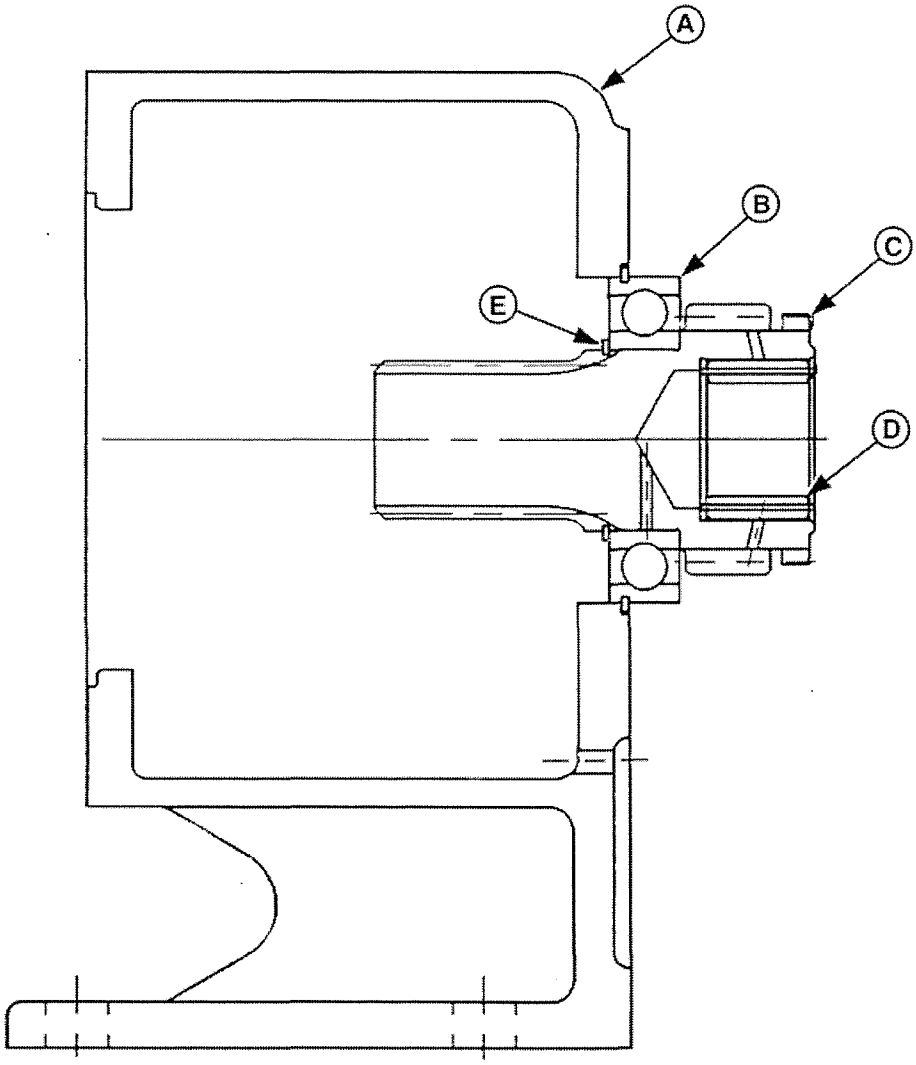
Specification	
Shift control assembly cap screw-to-gear and case group.—Torque	41 N•m (30 lb-ft)

Lift the shifter cap group off the main case. Refer to section 3 for disassembly of the shifter cap group.

3. The gear and case group (ref. #1) is now ready for disassembly. Refer to section 4 for this procedure.
4. If the unit is supplied with a parking brake, refer to section 5 for assembly and adjustment procedure.
5. Prior to assembling the component groups into a complete transmission, the mating surfaces of the main case and motor adapter housing should be cleaned with a non-hydrocarbon solvent such as Loc-Tite Safety Solvent.
   A thin bead of RTV 732 Silicon sealant is then applied to the main case.

DPSG,YZ07927,187 –19–27SEP99–2/2

Remove and Assemble Input Adapter Assembly



YZ0051 –UN–19OCT99

Input Adapter Assembly

A—Snap Ring **C—Bearing** **D—Input Shaft** **E—Pilot Bearing**
B—Input Adapter group

All HMD23000 Models

1. Slide pilot bearing (E) from input shaft (D).
2. Drive the input shaft (D) from inside the adapter housing (B) outward.
3. Remove snap ring (A) from input shaft and pull the bearing (C) from the input shaft.
4. To assemble, reverse the disassembly procedure.

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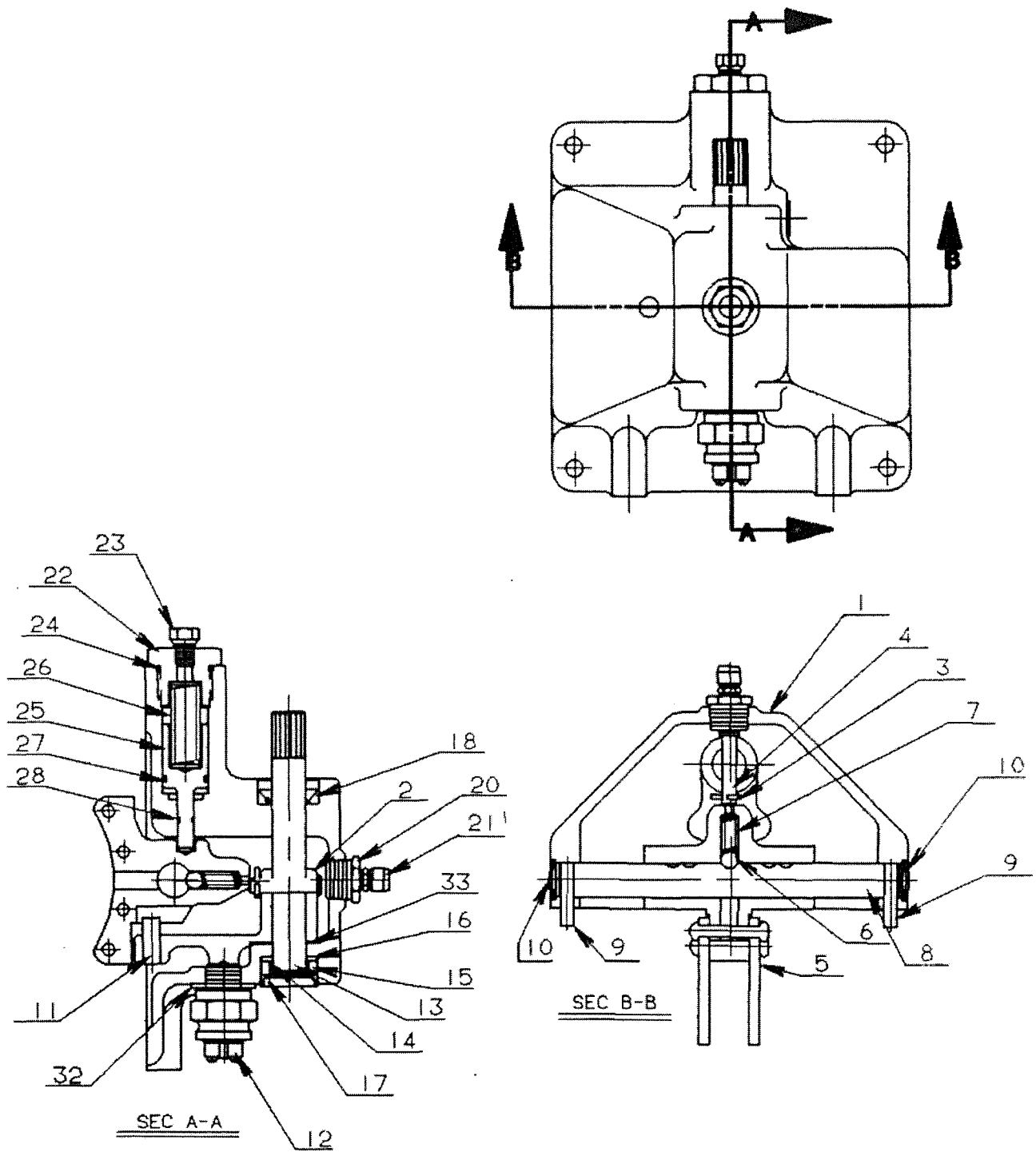
Shift Cap Assembly (Locking)



Locking Shift Cap

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DPSG,YZ07927,191 -19-27SEP99-1/2

1—Shift cap
2—Shift lever
3—Cotter pin
4—Clevis pin
5—Shift fork
6—Detent ball
7—Detent spring
8—Shaft rail
9—Roll pin
10—Expansion plug
11—
12—Switch
13—Shift shaft
14—
15—Spacer
16—Washer
17—
18—
19—
20—Plug
21—
22—Cap
23—
24—
25—Piston
26—Spring
27—O-ring
28—
29—
30—
31—
32—Washer
33—Spring washer

LOCKING HMD MODELS 2315, 2325 and 2326

1. Remove cap (22).
2. Extract spring (26) and piston (25). O-ring (27 and 28) will come out with piston.
3. Remove switch (12) and washer (32).
4. Remove roll pins (9).
5. Dislodge one expansion plug (10) with a punch.
6. Drive the shaft rail (8) to dislodge the other expansion plug (10).

CAUTION: When removing the rail, the opening in the shift fork should be shielded, as the detent spring (7) will propel the detent ball (6).

7. Rotate the shift rail (8) approximately 90° and withdraw it from the shift cap (1).
8. The shift fork (5) is now free and can be removed from the shift cap. Be sure to retrieve the ball (6) and spring (7).
9. Remove plug (20).
10. Remove the cotter pin (3) and clevis pin (4).
11. Drive the shift shaft (13) from the serrated end toward the cup plug. The shift shaft (13) may now be withdrawn. This frees the shift lever (2) and the spring washer (33) for removal. The washer (16) and spacer (15) may be removed as well.
12. To assemble, reverse the disassembly procedure.

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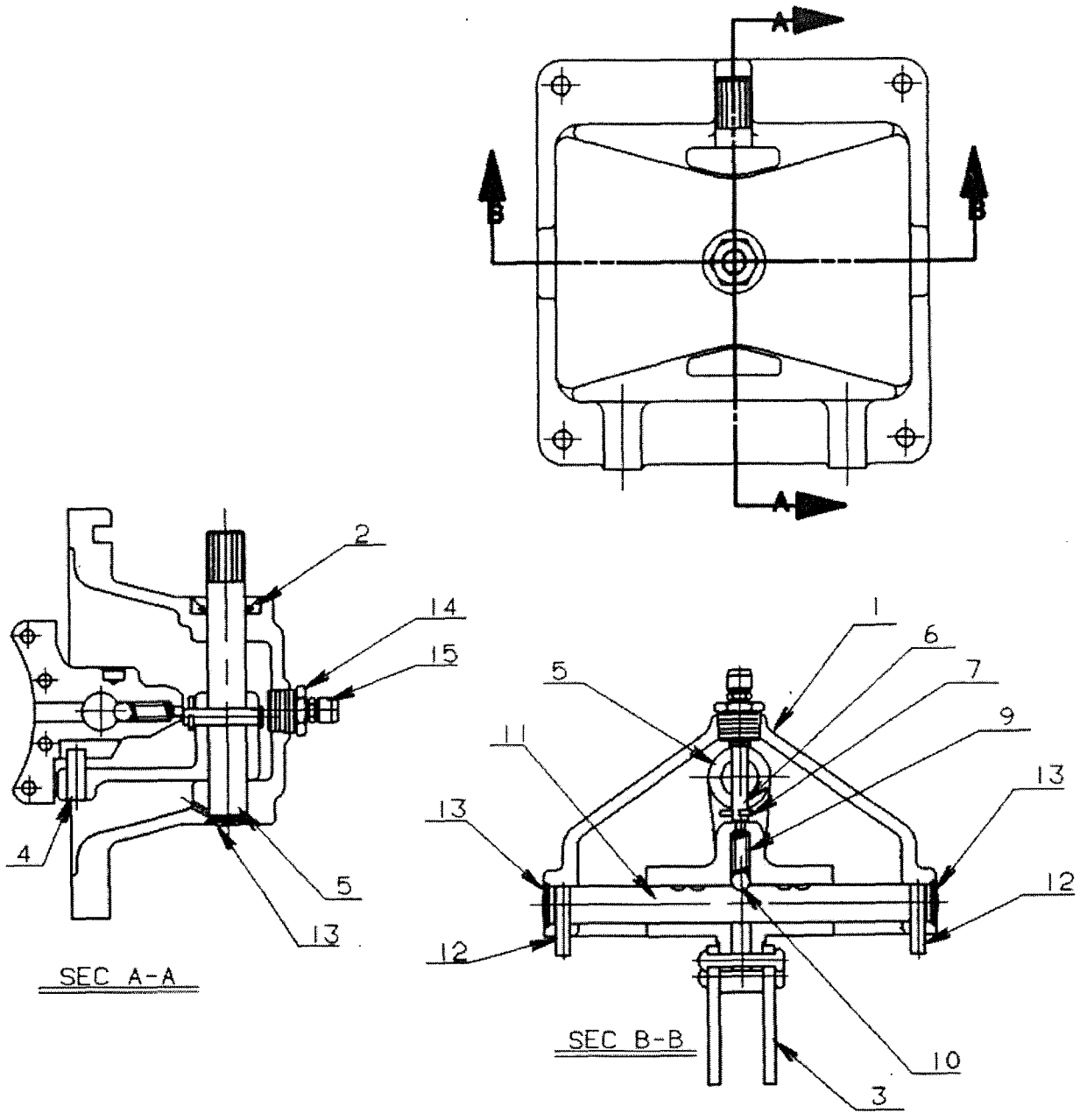
Shift Cap Assembly (Non-Locking)



Non-Locking Shift Cap

1—Shift cap	5—	9—Spring	13—Expansion plug
2—	6—Clevis pin	10—Ball	14—Plug
3—Shift lever	7—Cotter pin	11—Shift rail	15—Breather
4—	8—	12—Roll pin	

NON-LOCKING HMD MODELS 2315, 2325, and 2326

1. Remove roll pin (12).
2. Dislodge one expansion plug (13) with a punch.
3. Drive the shift rail (11) to dislodge the other expansion plug.

Continued on next page

CAUTION: When removing the rail, the opening in the shift fork should be shielded, as the detent spring will propel the detent ball.

Rotate the shift rail (11) approximately 90° and withdraw it from the shift cap (1).

4. The shift fork (3) is now free and can be removed from the shift cap. Be sure to retrieve the ball (10) and spring (9).
5. Remove the breather (15) and fill plug (14).
6. Remove the cotter pin (7) and withdraw the clevis pin (6) through the fill hole.
7. Drive the shift shaft (5) from the serrated end, dislodging the plug (13). The shift shaft is now withdrawn. This frees the shift lever for removal.
8. For assembly, the disassembly procedure is reversed.

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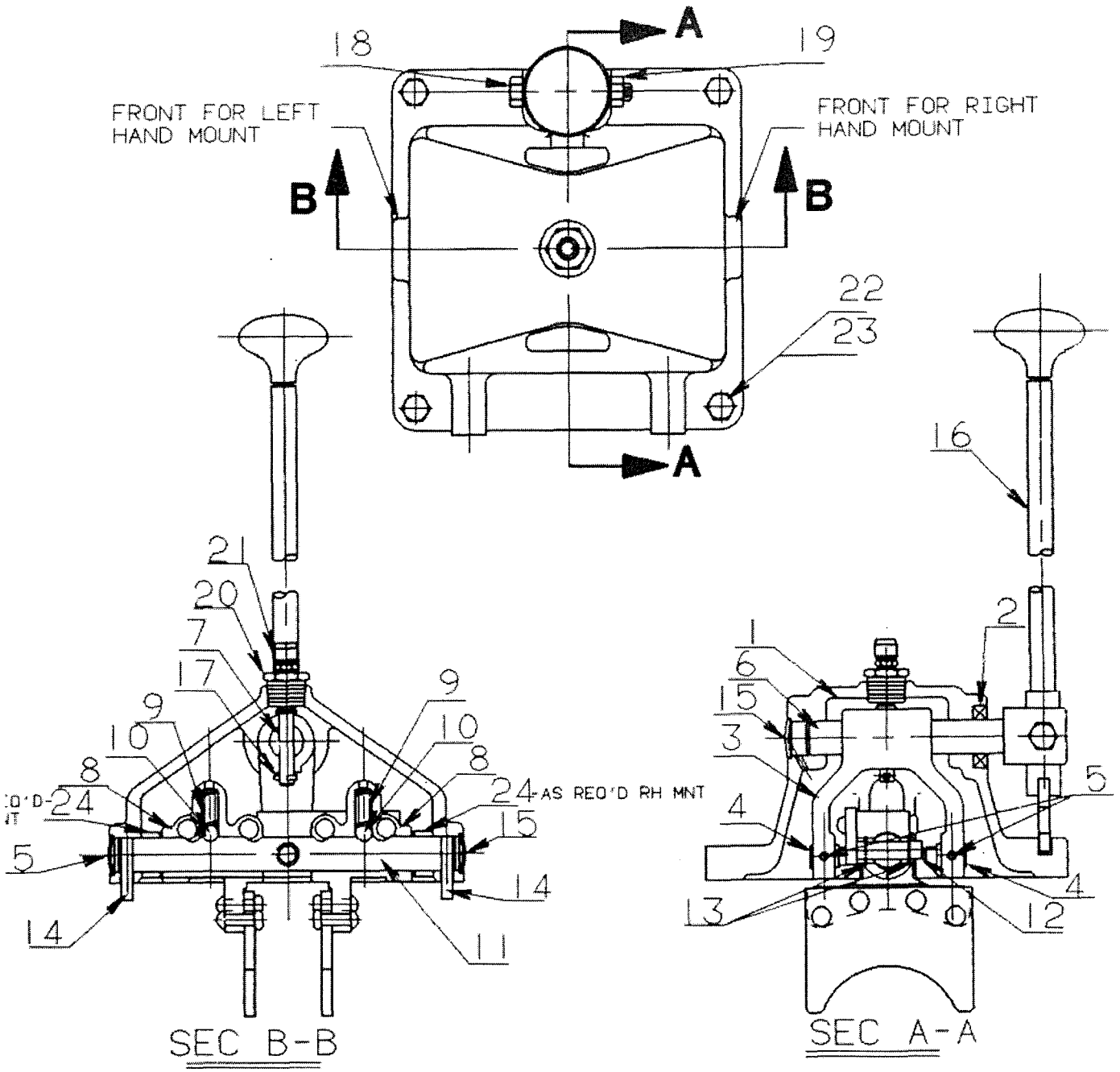
Shift Cap Group



HMD Model 2355

1—Shift cap	6—Shift shaft	11—Shift rail	16—Handle
2—	7—Clevis pin	12—Inhibitor pin	17—Cotter pin
3—Shift lever	8—Shift forks	13—Retainer ring	18—Bolt
4—Pin	9—Detent spring	14—Roll pins	19—Nut
5—Roll pin	10—Detent ball	15—Expansion plugs	20—Reducer bushing

HMD MODEL 2355

1. Remove nut (19), bolt (18) and handle (16).

Continued on next page

2. Remove reducer bushing (20).
3. Remove roll pins (14).
4. Remove expansion plugs (15), one at each end of the shift rail (11).
5. Remove the plugs by dislodging one with a punch and then driving the shift rail (11) to dislodge the other.
6. Position both the shift rail (11) so that approximately 1/2 inch protrudes outside the shift cap (1).
7. Position both shift forks (8) in a neutral detent. The inside faces of the forks will be approximately 1 1/2 inches apart when they are positioned correctly.
8. Remove retainer ring (13) from the inhibitor pin (12).
9. Insert a drift or punch in the protruding end of the shift rail (11). Rotate the shift rail (11) slightly at the same time withdrawing the inhibitor pin (12).

CAUTION: When removing the shift rail, the exposed opening in the shift fork (8) should be shielded as the detent spring (9) will propel the detent ball (10).

10. The shift rail can now be withdrawn.
11. Remove shift forks (8).
12. Remove the cotter pin (17) and clevis pin (7). The clevis pin should drop through the hole in top of the shifter cap.
13. The shift shaft (6) can now be withdrawn from the shift lever (3) and both parts removed from the shift cap (1).
14. The shift lever can be further disassembled by driving out roll pins (5) and removing pins (4).
15. To assemble, the disassembly procedure is reversed.

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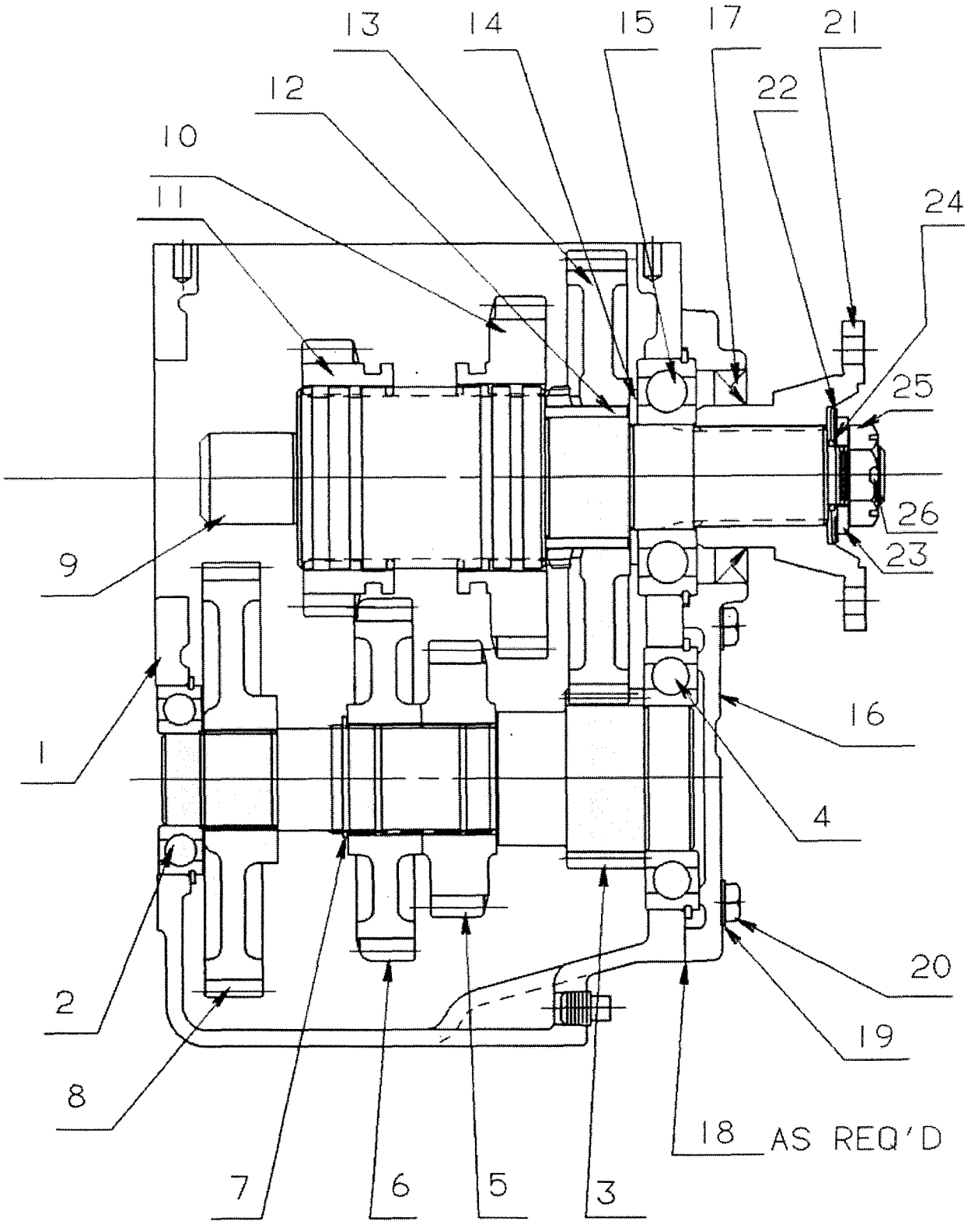
Gear and Case Model 2355



Model 2355 Gear and Case

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DPSG,YZ07927,204 -19-11OCT99-1/2

1—Main case
2—Front support bearing
3—Counter shaft
4—
5—Center gear
6—Center gear
7—Snap ring
8—Counter shaft drive gear
9—Main shaft
10—Shift gear
11—Shift gear
12—Needle rollers
13—Output gear
14—Thrust washer
15—Rear support bearing
16—Rear cover
17—
18—Rear cover gasket
19—Washer
20—Cap screw
21—Output flange
22—Gasket
23—Washer
24—O-ring
25—Nut
26—Cotter pin

HMD Model 2355

1. Remove the cotter pin (26), nut (25), washer (23), gasket (22), O-ring (24) and output flange (21).
2. Remove the cap screws (20) and washers (19) that attach the rear cover (16) to the main housing (1).
3. Remove the rear cover (16) and rear cover gasket (18).
4. Drive the main shaft (9), from the output end, through the rear support bearing (15). Care must be taken to prevent damage to the threads on the main shaft. Remove the main shaft by passing it through the output gear (13), shift gears (10,11) and the input side of the main case (1).
5. The shift gears (10,11), and output gear (13) are now loose and can be removed from the main housing. Care must be taken to retrieve all thirty-nine needle rollers (12) and the thrust washer (14).
6. Remove the rear support bearing (15) by driving it, from the inside of the main housing, outward.
7. Remove the snap ring (7) from the counter shaft (3). Drive the counter shaft (3) from the input side of the main housing toward the output side until it is free of the front support bearing (2). It should be expected that the front support bearing (2) will become dislodged from its bore in the housing. Allowing the center gears (5,6) to rest against the back wall of the main housing. The counter shaft (3) can be withdrawn from the main housing.
8. The front support bearing (2), counter shaft drive gear (8) and the center gears (5, 6) can now be removed from the main housing.
9. For assembly, the disassembly procedure is reversed.

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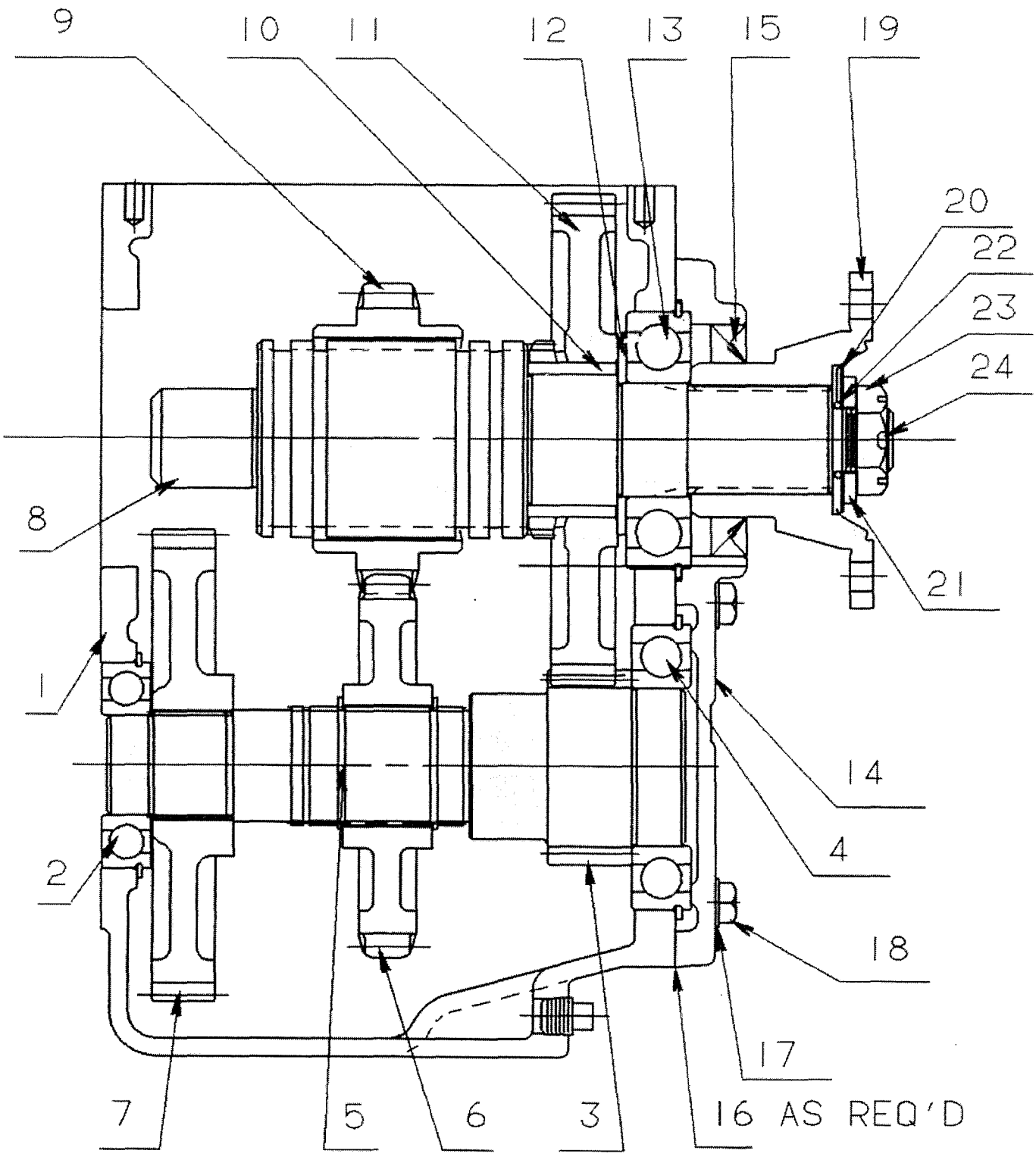
Gear and Case Model 2315, 2325, 2326



HMD2315, 2325, 2326 Gear and Case Group

Continued on next page

1—Main case
2—Front support bearing
3—Counter shaft
4—
5—Snap ring
6—Center gear
7—Counter shaft drive gear
8—Main shaft
9—Shift gears
10—Needle rollers
11—Output gear
12—Thrust washer
13—Rear support bearing
14—Rear cover
15—
16—Gasket
17—Washers
18—Cap screw
19—Output flange
20—Gasket
21—Washer
22—O-ring
23—Nut
24—Cotter pin

HMD Model 2315, 2325, 2326

1. Remove the cotter pin (24), nut (23), washer (21), gasket (20), O-ring (22) and output flange (19).
2. Remove the cap screws (18) and washers (17) that attach the rear cover (14) to the main housing (1).
3. Remove the rear cover (14) and rear cover gasket (16).
4. Drive the main shaft (8), from the output end, through the rear support bearing (13). Care must be taken to prevent damage to the threads on the main shaft. Remove the main shaft by passing it through the output gear (11), shift gears (9) and the input side of the main case (1).
5. The shift gears (9), and output gear (11) are now loose and can be removed from the main housing. Care must be taken to retrieve all thirty-nine needle rollers (10) and the thrust washer (12).
6. Remove the rear support bearing (13) by driving it, from the inside of the main housing, outward.
7. Remove the snap ring (5) on the input side of the center gear (6) on the counter shaft (3).
8. Drive the counter shaft (3) from the input side of the main housing toward the output side until it is free of the front support bearing (2). It should be expected that the front support bearing (2) will become dislodged from its bore in the housing. Allowing the center gears (6) to rest against the back wall of the main housing. The counter shaft (3) can be withdrawn from the main housing.
9. The front support bearing (2), counter shaft drive gear (7) and the center gears (6) can now be removed from the main housing.
10. For assembly, the disassembly procedure is reversed.

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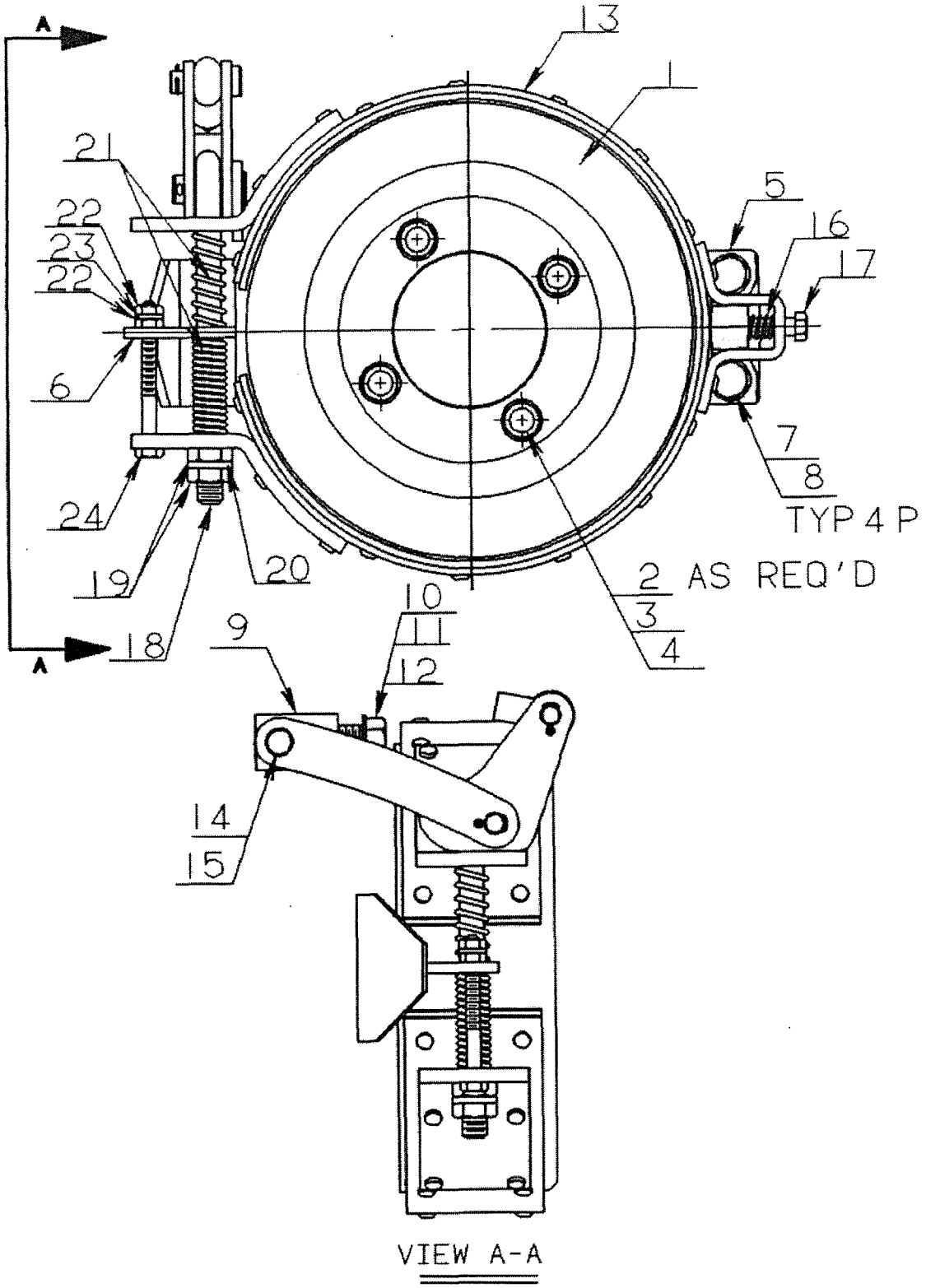
Brake Assembly and Adjustment



Brake Assembly

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1—Brake drum
2—Bolt
3—Nut
4—Lock washer
5—Brake band anchor
6—Brake bracket
7—Cap screw
8—Lock washer
9—Brake link anchor
10—Bolt
11—Nut
12—Lock washer
13—Brake band
14—
15—
16—Anchor spring
17—Anchor bolt
18—Brake adjustment bolt
19—Adjustment springs
20—Jam nut
21—Lock washer
22—Screw
23—Jam nut
24—Lock washer

1. Mount the brake band anchor (5) with cap screws and lock washers (7,8) in the center holes at the right edge of the rear face of the transmission housing.
2. Mount the brake bracket (6) with cap screws and lock washers (7,8) in the center holes at the left edge of the rear face of the transmission housing.
3. Mount the brake link anchor (9) with a bolt, nut and lock washer (10,11,12) in the upper left corner of the rear face of the transmission housing. The brake link anchor (9) must be installed so that the tab points toward the input end of the transmission.
4. Mount the brake drum (1) on the output flange with four bolts, nuts and lock washers (2,3,4).
5. Remove brake adjustment bolt, adjustment springs, jam nuts, and lock washer (18,19,20,21).
6. Remove anchor bolt and anchor spring (16,17).
7. Remove screw, jam nuts, and lock washer (22,23,24)
8. Slide brake band (13) over drum (1).
9. Insert anchor spring (16) between brake band anchor (5) and brake band. Install anchor bolt (17) abut do not completely tighten.
10. Insert a brake adjustment spring (21) on each side of the brake bracket (6). Install brake adjustment bolt, lock washer, and jam nuts (18,19,20) do not fully tighten at this point.
11. Install screw, lock washer, and jam nuts (22,23,24).
12. With the transmission in neutral, rotate the brake drum (1) at the same time tightening the anchor bolt (17) until a slight drag is felt. Secure the bolt by wiring through the head and brake band.
13. Continue rotating the brake drum, tighten screw (24) until a slight drag on the drum is felt. The same procedure is to be used on the brake adjustment bolt (18).
14. Tighten jam nuts (19,22).

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