

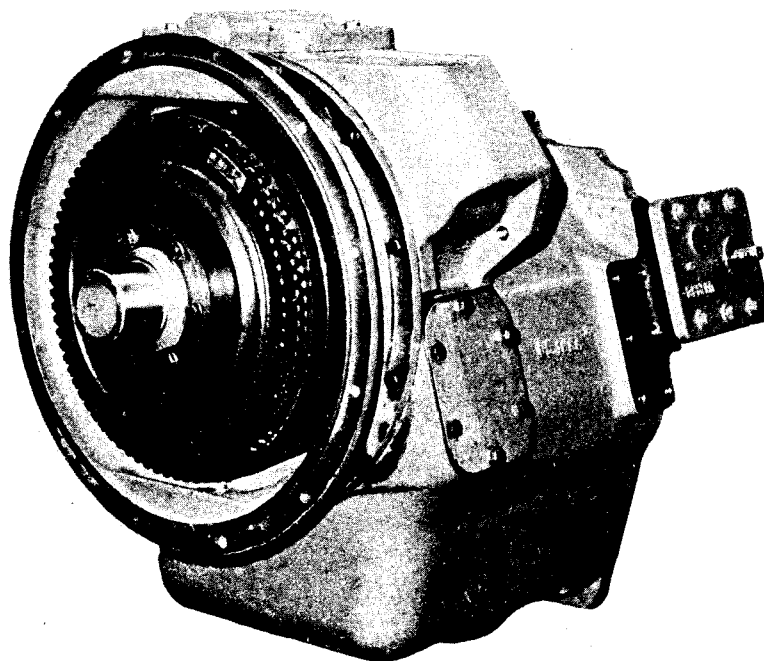
MAINTENANCE MANUAL-YB01-46-01

ISSUE 4

Models

TDC-22-400 Series

TDC-44-400 Series



POWER SHIFT TRANSMISSION



BRITISH TWIN DISC LTD

KNIGHT ROAD, STROOD, ROCHESTER, KENT

Telephone: Medway 78661-2-3-4

MAINTENANCE MANUAL-YB01-46-01

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POWER SHIFT TRANSMISSION



BRITISH TWIN DISC LTD

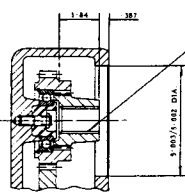
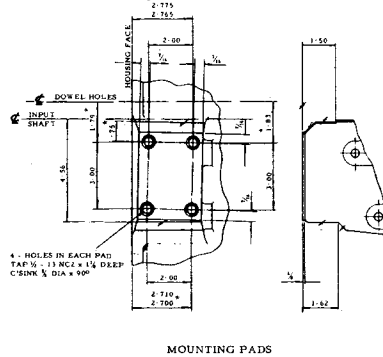
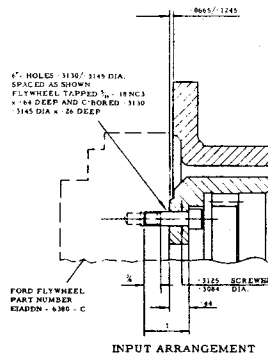
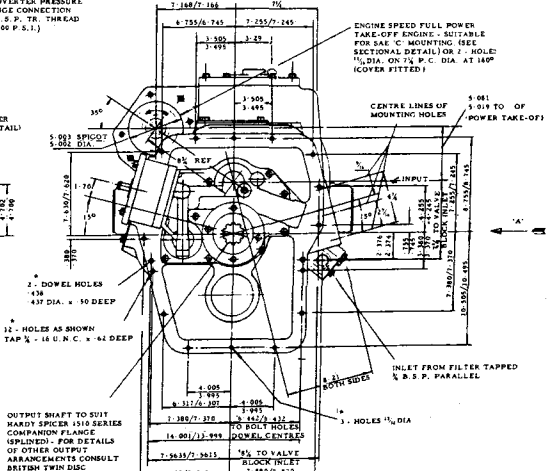
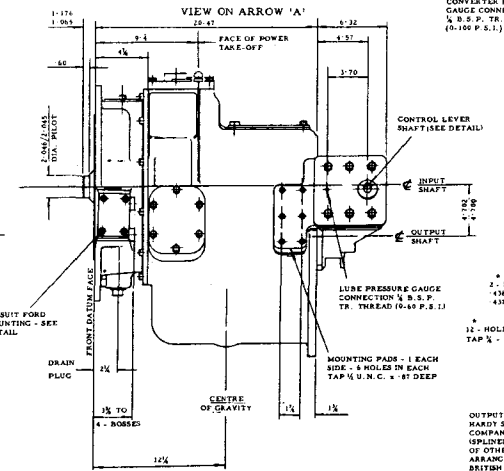
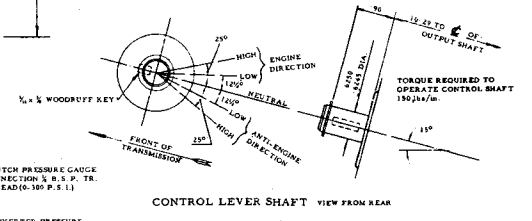
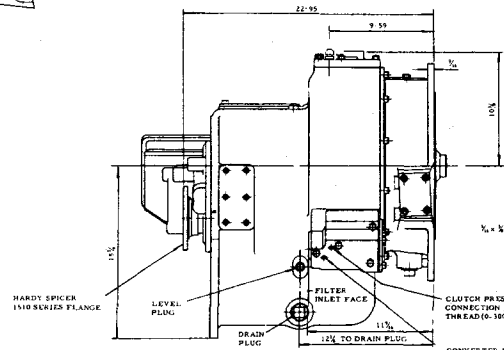
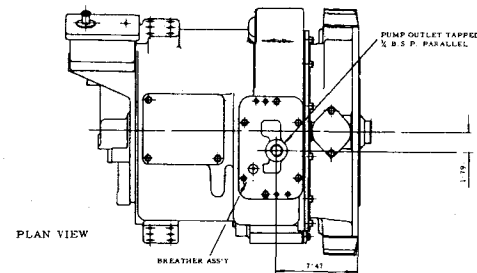
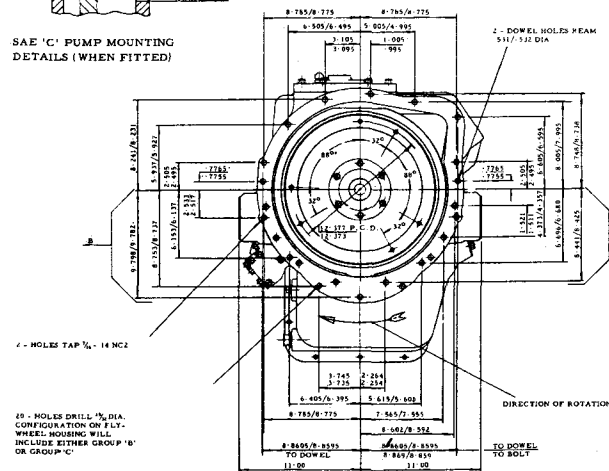
KNIGHT ROAD, STROOD, ROCHESTER, KENT

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CONTENTS

	Page No.
VARIATIONS FROM STANDARD MODELS	11
INSTRUCTION BOOK	12
TROUBLE SHOOTING	17
DISASSEMBLY PROCEDURE (a) SHORT UNIT	18
(b) DROP BOX	19
PARTS LIST (Index to Drawings)	
Pump Group	UXC 1499 22
Control Valve Group	UXB 1989 24
Converter Group	UXC 1987 26
Range Selector Valve Group	UXB 1988 28
Main Housing Group	UXD 1666 30
Forward Clutch Group	UXB 1990 32
Reverse Clutch Group	UXB 1991 34
Output Shaft	UXB 1992 36
Output Group	UXC 1931 38
Disconnect Group	UXB 1615 38
Rear Housing Group	UXD 1932 40
Intermediate Shaft Group	UXB 1929 42
Output Shaft Group	UXB 1928 44
Output Shaft Group	UXB 1613 46
Hydraulic Torque Converter	UXC 1997 48
Hydraulic Torque Converter (detail)	UXC 1997 50
Variations from UXD 1666	53
Variations from UXD 1666	55

* NOTE

CENTRE LINES OF HOLES AND
MACHINED SURFACE ABOVE
HOLES ARE NOT PARALLEL
TO HORIZONTAL OF HOUSINGSAE 'C' PUMP MOUNTING
DETAILS (WHEN FITTED)

MODEL TDC - 22 - 406 - F SHORT TRANSMISSION

TO SUIT INDUSTRIAL FORD TYPE FLYWHEEL HOUSINGS

GENERAL DATA

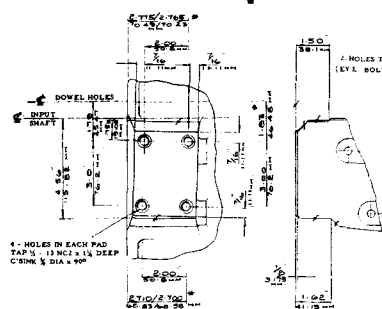
MOMENT OF INERTIA OF ENGINE DRIVEN
PARTS 1440 lb-in²

TOTAL FLUID CAPACITY - 5 IMPERIAL GALLONS

ESTIMATED WEIGHT WITH DRIVING RING, NO OIL - 150 lb

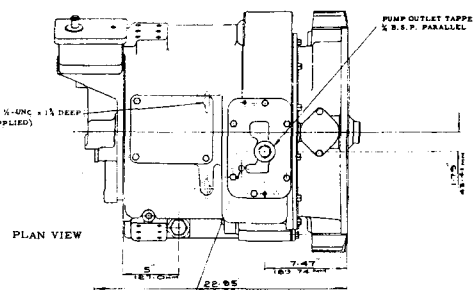
MAX. SLOPE FOR CONTINUOUS OPERATION WITH NORMAL
OIL LEVEL - 1 in 3.5

* HOLES MARKED THIS
MAY BE USED FOR MOUNTING

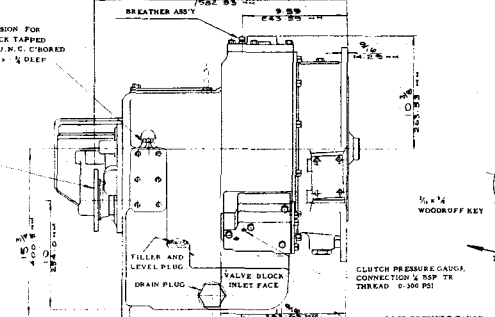


INPUT ARRANGEMENT

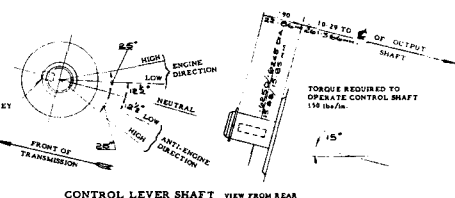
MOUNTING PADS



PLAN VIEW



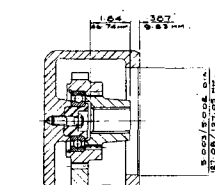
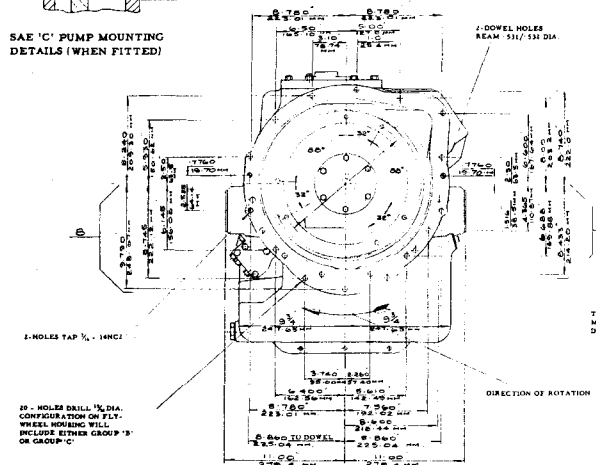
VIEW ON ARROW 'A'



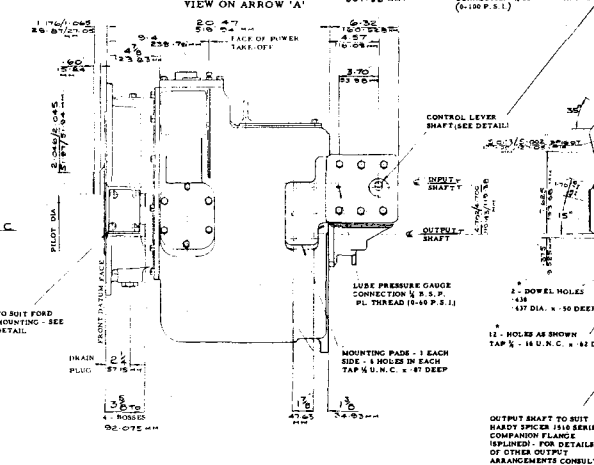
CONTROL LEVER SHAFT VIEW FROM REAR

INTERNAL SPLINE DATA

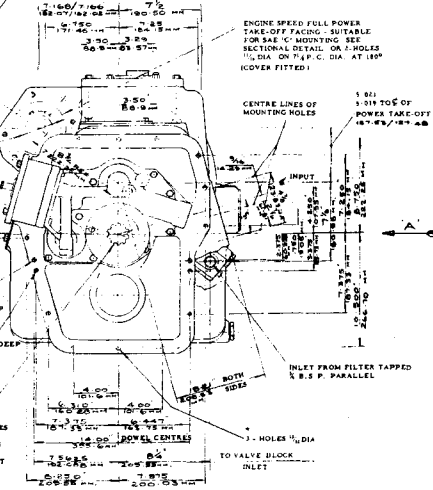
NUMBER OF INVOLUTE SPLINES	14
DIAMETRAL PITCH	12/24
PRESSURE ANGLE	30°
PITCH DIA (NOMINAL)	1.166
MAJOR DIA	1.250
MINOR DIA	1.085
TRUE INVOLUTE FORM DIA (MIN)	1.237
ARC TOOTH SPACE:-	
MAX. DIMENSIONAL	1.234
MIN. EFFECTIVE	1.204

SAE 'C' PUMP MOUNTING
DETAILS (WHEN FITTED)

DIRECTION OF ROTATION

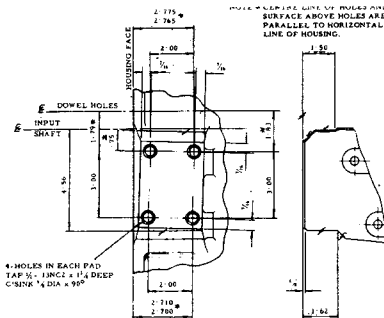


CONTROL LEVER
SHAFT/SEE DETAIL

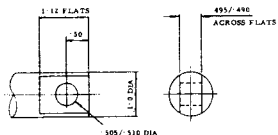


*| HOLES MARKED THUS
MAY BE USED FOR MOUNTING

MODEL TDC - 22 - 406 - F SHORT TRANSMISSION
TO SUIT INDUSTRIAL FORD TYPE FLYWHEEL HOUSINGS

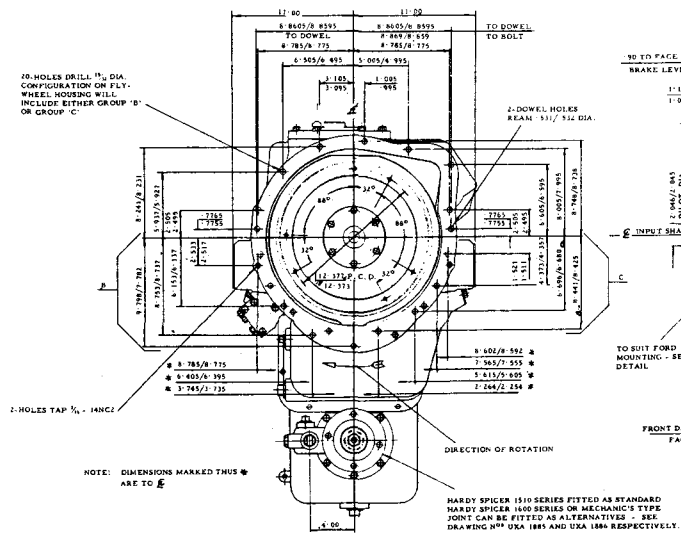


MOUNTING PADS

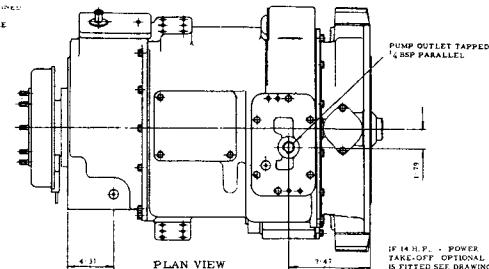


MECHANICAL RANGE SELECTOR

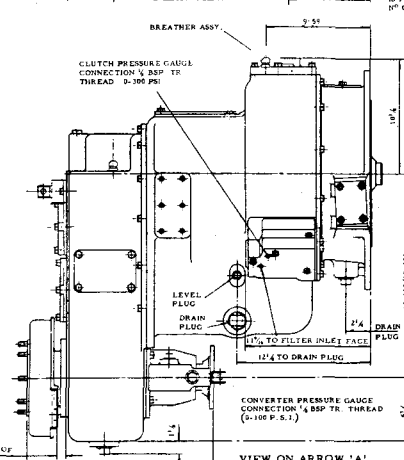
STEADY PULL REQUIRED TO OPERATE RANGE SELECTOR - 175lb



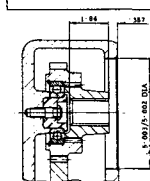
HARDY SPICER 1510 SERIES FITTED AS STANDARD
HARDY SPICER 1600 SERIES OR MECHANIC'S TYPE
JOINT CAN BE FITTED AS ALTERNATIVES - SEE
DRAWING N^o UXA 1885 AND UXA 1886 RESPECTIVELY.



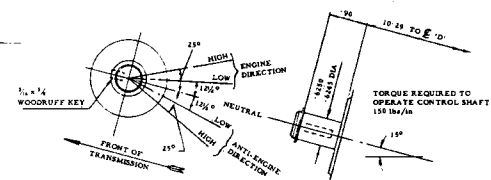
PLAN VIEW



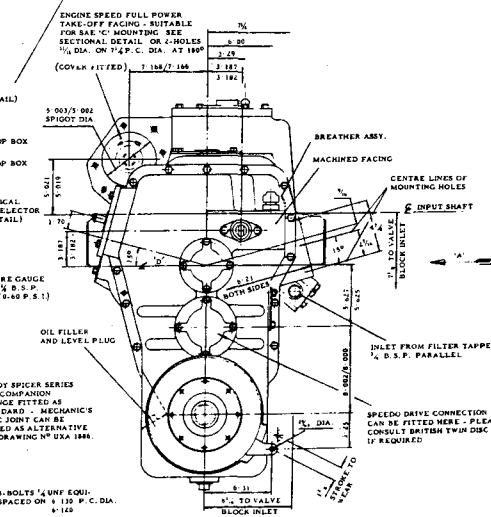
VIEW ON ARROW 'A'



SAE 'C' PUMP MOUNTING DETAILS WHEN FITTED



CONTROL LEVER SHAFT VIEW FROM REAR



MOMENT OF INERTIA OF ENGINE DRIVEN PARTS 1360 lbs/in
 FLUID CAPACITY 'MAIN BOX' - 5 IMPERIAL GALLONS
 FLUID CAPACITY 'DROP BOX' - 1 IMPERIAL GALLON
 ESTIMATED WEIGHT, WITH DRIVING RING, NO OIL 915 lbs
 MAX. SLOPE FOR CONTINUOUS OPERATION WITH NORMAL OIL LEVEL - 1 IN 3.5

NUMBER OF INVOLUTE SPLINES	14
DIAMETRAL PITCH	12/24
PRESSURE ANGLE	30°
PITCH DIA. NOMINAL	1.3667
MAJOR DIA.	1.2500
MINOR DIA.	1.0858
TRUE INVOLUTE FORM DIA. MIN.	1.237
ARC TOOTH SPACE.	
MAX. DIMENSIONAL	1.334
MIN. EFFECTIVE	1.309

MODEL TDC - 44 - 412 - F SHORT TRANSMISSION WITH 'DROPBOX'

TO SUIT INDUSTRIAL FORD TYPE FLYWHEEL HOUSINGS

This manual is based on the Twin Disc TDC-22-406 transmission to drawing UXD 1502.

IMPORTANT

The following variations for other models of this Transmission must be taken into account when ordering spares and for maintenance purposes.

Drawing Nos. of Variations from UXD 1502

STANDARD DRAWING NUMBER	Model UXD 1502	Model UXD 1673	Model UXD 1611	Model UXD 1659	Model UXD 1783	Model UXD 1786	Model UXD 1939	Model UXD 2202
Pump UXC 1499								
Control Valve UXB 1989								
Converter UXC 1987		UXC 1715		UXC 1715	UXC 1997	UXC.1997		UXC 2217
Range Selector UXB 1988					UXB 1677		UXB 1772	
Housing UXD 1666		UXD 1790	UXD 1553	UXD 1741	UXD 1787	UXD 1787	UXD 2104	UXD 2215
Forward Clutch UXB 1990					UXB 1607		UXB 1777	
Reverse Clutch UXB 1991					None		UXB 1774	
Output Shaft UXB 1992			UXB 1613 UXB 1928 Mk 2	UXB 1613 UXB 1928 Mk 2	UXB-1605		UXB 1725	UXB 2320
Layshaft Group	None	None	None	None	None	None	UXB 1775	None
Intermediate Shaft Group	None	None	UXB 1587 UXB 1929 Mk 2	UXB 1587 UXB 1929 Mk 2	None	None	None	None
Disconnect Group	None	None	UXB 1615	UXB 1615	None	None	None	None
Output Group	None	None	UXC 1595 UXC 1931 Mk 2	UXC 1595 UXC 1931 Mk 2	None	None	None	None
Rear Housing Group	None	None	UXD 1569 UXD 1932 Mk 2	UXD 1569 UXD 1932 Mk 2	None	None	None	None

Mk 2 versions of the transmission are identified by Mk 2 appearing after the model number on the nameplate.

Optional Extra Equipment

Power Take-off Full Power (Not available with UXD 1497 and UXD 1656)	UXB 1568
Power Take Off 14 h.p.	UXC 1689
Clutch Pressure Warning Light	UA 1600
Heat Exchanger	UXB 1392 or UXB 1402
Boom Lowering Freewheel	UXC 1997

INSTRUCTION BOOK

400 SERIES POWER SHIFT TRANSMISSION

Models: TDC-22-406 TDC-44-412 TDC-20-406 TDC-31-406

INTRODUCTION This Manual provides a simple outline of facts which the owner and operator should know, and of the duties they must perform to obtain the best service from this Twin Disc Hydraulic Transmission. For engineering details and performance characteristics of the Transmission, consult British Twin Disc Ltd., Knight Road, Strood, Rochester, Kent.

The Transmissior is available in the following forms :-

DRAWING NO.	TRANSMISSION	INPUT ARRANGEMENT	OUTPUT ARRANGEMENT	SPEEDS		
				FORWARD	REVERSE	
UXD 1502	TDC-22-406-F	Ford	Hardy Spicer 1510	2	2	Short version
UXD 1611	TDC-44-412-F	Ford	Hardy Spicer Front 1510 Rear 1610	4	4	Same as UXD 1502 but with addition of transfer case providing four wheel drive and range splitter.
UXD 1783	TDCO-20-406-F	Ford	Hardy Spicer 1510	2	0	Includes freewheel.
UXD 1673	TDC-22-406-2	SAE 2	Hardy Spicer 1510	2	2	Same as UXD 1502 but with SAE 2 input.
UXD 1659	TDC-44-412-2	SAE 2	Hardy Spicer Front 1510 Rear 1610	4	4	Same as UXD 1611 but with SAE 2 input.
UXD 1939	TDC-31-406-F	Ford	Hardy Spicer 1510	3	1	Anti engine rotation in the forward ratios.
UXD 1786	TDCO-22-406-F	Ford	Hardy Spicer 1510	2	2	Includes freewheel.
UXD 2202	TDC-22-406-XL	Ford	Ford	2	2	Interchangeable with the standard gearbox on the new Ford 5,000 series Tractor

INSTRUCTIONS FOR ORDERING SPARE PARTS

Spare or replacement parts can be obtained from British Twin Disc Ltd., or their Distributors.

Parts lists and Drawings for the various sub-assemblies of this Transmission are given in this Manual. This information is compiled only on the basis of the short Transmission, to UXD 1502, variations from UXD 1502 being tabulated on page 11 while Drawings and lists to cover these variations are given at the end of this Manual.

When ordering parts give Transmission Serial No., part number, Item and Drawing Nos., description and Spec. No.

CAUTION

Be sure that any variations from UXD 1502 are checked before ordering.

DESCRIPTION

The transmission includes the Twin Disc 11" or 13" single stage torque converter with a type 6 circuit. This gives efficient operation over a wide speed range and overall torque multiplication of up to 3.4:1.

The transmission is of the countershaft type having constant mesh spur gears giving two forward and two reverse ratios. The gears are engaged through two 6" diameter self adjusting duplex clutchpacks, each incorporating sintered metal drive plates cooled by a positive radial oil flow. The transmission permits instantaneous changes between any two gear ratios at full engine speed and power without the risk of damage and the hydraulic gear shifting system incorporates a controlled rise of pressure valve, which ensures smooth engagement.

LIMITING CONDITIONS

- (a) Speed: Maximum safe speed 3000 R.P.M.
- (b) Fluid Temperature: Normal operating 180°F (82°C) to 220°F (105°C)
Absolute Intermittent Maximum 250°F (121°C)
- (c) Side Load: No side load on output shaft permissible.
- (d) Torque: The converter is to be matched to the engine so that the converter output torque does not exceed 620 lbs. ft. at or near stall with the standard model or 750 lbs. ft. with the heavy duty model. For any application in excess of this consult British Twin Disc.

HYDRAULIC SYSTEM

The Hydraulic System is shown on Sheet P1138, Page 15. Approximate pressures are:-

- (a) Basic Converter pressure 40-80 psi.
- (b) Lubricating pressure 8-12 psi.
- (c) Clutch pressure 180-220 psi according to application.

Total oil flow is 7.5 imperial gallons at 2,000 R.P.M. engine speed. Fluid capacity is shown on the installation drawing.

LUBRICATION

All moving parts of the Transmission are lubricated by the oil in the Transmission sump. No further lubrication is required.

The oil level in the Transmission sump should be checked regularly.

The Transmission should be filled to the level of the oil level plug, and after it has been run for a few minutes, (which permits the Torque Converter to become fully charged) it should again be topped up to this point. A third filling is frequently needed, both the second and third fillings normally take about two pints. This should be done with a suitable oil whilst the engine is running. SAE10W or 5-20HD oil to meet service class MS is recommended, and British Twin Disc have produced transmission fluid TC/SS for this purpose. Other proprietary oils known to be satisfactory are:-

Sternol Lynx Type A	Esso Torque Fluid 47	Mobil Delvac Oil Special
BP Energol ATF Type A	Castrol TQ	National Benzol ATF
Shell Donax T6	Gulf ATF Type A Suffix A	R.P.M. Delo Special SAE '10'
	Dasco ATF Type A	Filtrate AQATF-1261-A

DROP BOX LUBRICATION

The drop box when fitted requires separate lubrication and should be filled to the level of its own oil level plug.

If desired, the drop-box may be lubricated by means of a suitable SAE 20 oil.

Throughout the transmission as a whole the use of unsuitable oils will result in an immediate deterioration in performance. Oil should be changed every 1,000 hours or every three months whichever occurs first. Filter Service Kit U.A. 1507 should be used when making an oil change.

DRAINING

A drain plug is provided on the bottom of the transmission. Access to the converter is possible through a plate in the top of the transmission. Two diametrically opposed hex-socket head pipe plugs should be removed from the rotating housing in order to drain the converter, taking care not to drop them inside the transmission.

INSTALLATION

The drive ring provided with the unit is first mounted upon the engine flywheel. On Ford engines, Part No. EAIDDN 6380C. Bolts, Twin Disc Pt. No. UA 1769, should be used and torqued to 20 lbs. ft. while with SAE 2 flywheels standard studs and nuts should be used. It is essential to check the concentricity of the drive ring with the engine crankshaft by means of a dial indicator. The run out on face and 13.520 - 13.515 internal diameter adjacent to driving teeth should not exceed .005" TIR. 2 holes, $\frac{1}{64}$ " dia, are provided in the driving ring and may be used, when opened up, to dowel the driving ring to the flywheel in its correct position.

A thin coating of anti-scuffing paste containing molybdenum disulphide should be applied to the rotating housing and drive ring teeth, the flywheel pilot and pilot bore. It is important that only a small quantity should be used as entry of this grease into the transmission would cause clutch slip.

A product known to be suitable is:-

Rocol M.T. LM

The rubber ring Item 4 Drawing UXC.1987 must be fitted in its groove on the outside of the rotating housing, Item 7. The transmission can then be mated to the engine, taking care that the drive ring teeth are properly engaged with the teeth on the torque converter before pulling up the housing to the engine. Removal of the top cover plate will permit observation so as to ensure that these parts are correctly assembled.

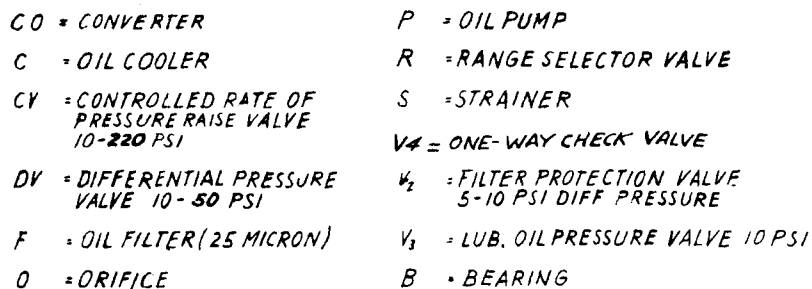
On transmissions fitted with flywheel housing flanges to suit Ford engines it is essential that the two flywheel housing dowels called for on the installation Drawings UXD 1502 or UXD 1611 are in place.

If the control is to be through remote linkage, it is essential to ensure that the selector falls fully into its detent in each gear. The use of further detents at the driving control lever is not recommended. If a gear clutch is only partially engaged, due to the selector valve being only partly opened, the clutch will slip and burn out.

Transmission oil requires cooling and $\frac{3}{4}$ " internal diameter piping with $\frac{3}{4}$ " B.S.P. connections should be used for the transfer of the oil to either a heat exchanger or an additional radiator normally mounted in front of the engine radiator. The filter supplied must be installed in this pipework and should be mounted vertically. The pipework and heat exchanger must be capable of withstanding temperatures up to 300°F and pressures of 300 P.S.I. Sharp elbow joints should be avoided.

It is the general practice to fit an instrument panel in the cab carrying torque converter fluid temperature and pressure gauges, lubricating oil pressure gauge, and clutch operating oil pressure gauge.

The minimum requirement is for a pressure switch to give a coloured light warning should the clutch pressure drop below 180 P.S.I.



P-1138-D

TROUBLE SHOOTING

SYMPTOM	CAUSE	REMEDY
Overheating No. 1.	Insufficient Heat Exchanger capacity.	Install Heat Exchanger of sufficient capacity.
	Incorrect Oil Level.	Drain or fill sump to correct level.
	Oil in sump too heavy.	Drain and re-fill with recommended oil as on Pages 13 and 14.
	Restriction in cooling circuit.	Clear or replace connecting lines and/or heat exchanger. Avoid sharp bends.
	Slipping clutch due to low oil pressure.	See low oil pressure No. 3.
	Low water level in vehicle radiator.	Fill radiator to correct level.
Poor Performance No. 2.	Low Oil Pressure.	Refer to low oil pressure No. 3.
	Incorrect oil in sump.	Drain and re-fill with recommended oil as on Pages 13 and 14.
	Incorrect Oil Level.	Drain or fill sump to correct level.
	Engine Speed too low.	The Torque Converter absorbs and transmits power in proportion to the cube of the engine speed. The Converter is carefully matched at the rated speed of the engine. When the machine is brought to stall the engine speed should be pulled down. Slight exhaust smoke at full Converter stall usually indicates that engine and Converter are functioning properly.
Low Oil Pressures No. 3.	Slipping Clutch.	Refer to low clutch pressure No. 4.
	Partially clogged screen (generally) in pump suction pipe.	Remove and clean suction pipe screen.
	Partially clogged element in external oil filter.	Remove and fit new filter element.
	Air in the system due to low sump oil level or long periods of inactivity.	Top up sump to correct level. Release air at pressure gauge connections. The Transmission should clear itself within a few minutes.
Low Clutch Pressure No. 4.	Pressure Piston Item 19 Drg. UXB 1989 stuck in open position.	Remove cover and orifice plates with gaskets, Items 1 — 4. (care should be taken to see the ball and spring behind the orifice plate are not lost during this operation). Remove Piston Item 5, springs Items 6 and 7, then check that Piston Item 19 is free in the valve block. Cleanliness is very important when checking this, 2 new gaskets Items 2 and 4 will be required on re-assembly.
Low lub. oil Pressure No. 5.	Check spring Item 15 Drg. UXB 1989 in valve block; a weak or damaged spring will cause low oil pressure.	Remove plug Item 16 from valve block this will reveal the spring Item 15. Replace this spring if necessary. Cleanliness is again extremely important.
No Oil Pressure No. 6.	Low oil level or empty sump.	Check for any external leakage and re-fill to the correct level.
	Fully clogged suction screen.	Remove and clean suction pipe screen.
	Fully clogged external filter.	Remove and fit new filter element.
	Damaged or worn oil pump.	Remove oil pump assembly and replace.
	Broken piston ring in collector housing.	Remove collector housing Item 1 Drg. UXD 1666 and replace piston ring Item 26 Drg. UXB 1990 and UXB 1991.

DISASSEMBLY PROCEDURE
to be used with the Short Housing and Drop Box Versions

After the unit has been removed from the machine it should be thoroughly cleaned externally before attempting any disassembly. Select a clean dust free location. Cleanliness is very important when working on the Transmission.

On drop box units the drop box itself should first be removed as on Page 19. This then leaves a basic Short Transmission Unit.

The disassembly of the transmission can now be broken down into eight main groups which are as follows:-

- A. Pump Group.
- B. Control Valve Group.
- C. Converter Group.
- D. Range Selector Valve Group.
- E. Housing Group.
- F. Forward Clutch Group.
- G. Reverse Clutch Group.
- H. Output Shaft Group.

These groups are removed from the main housing in the following order:-

A. Pump Group UXC 1499

- 1. Remove the six bolts Item 2 holding the pump group to the main housing.
- 2. Insert two of the bolts ($\frac{3}{8}$ " UNC) in the jacking holes provided and free the pump group from its dowel pins.
- 3. Remove the pump group complete from the main housing.

B. Control Valve Group UXB 1989

- 1. Remove the four bolts Items 10 and 13 holding the valve body to the main housing.
- 2. Remove the control valve group complete.
- 3. Remove the two tubes Item 26 Drawing UXD 1666.

C. Converter Group UXC 1987

Before proceeding further, remove the six drive screws Item 6 and the cover plate Item 3, Drawing No. UXD 1666. Now stand the Transmission vertically on the casting flange at the output end of the main housing, supporting where necessary with suitable blocks of wood.

Working through the two holes left in the housing by the removal of the pump group and cover plate

- 1. Remove the nut M-2027-N from the power take off idler gear and withdraw idler gear UB 1549 complete with bearing and retainer.

NOTE: On units not fitted with power take off, this gear is omitted during assembly.

- 2. Remove the six socket headed screws Item 29 Drawing UXC 1987 which hold the stator carrier, Item 36, into the main housing.
- 3. Remove two diametrically opposed screws Item 25, from the pilot flywheel Item 2. and insert lifting eyes $\frac{3}{8}$ " UNC. Then with the aid of a hoist slowly withdraw the converter from the housing taking care to keep it square or damage to the oil seal, Item 18, Drawing UXD 1666 will result.

D. Range Selector Valve Group UXB 1988

- 1. Lay the transmission down again.
- 2. Remove the six bolts, Item 1, from the valve body.
- 3. Lift the Range Selector Valve group from the housing complete.

E. Housing Group UXD 1666

- 1. Remove the six screws, Item 19, and 2 cap screws, Item 39.
- 2. Free the gasket face and gently withdraw the collector housing, Item 1, taking care not to damage the piston rings in the process.
- 3. Remove the piston rings Item 26, Drawings UXB 1990 and UXB 1991 from the ends of the clutch shafts.
- 4. Stand the transmission vertically again as in Section C.

5. Remove the twelve screws, Item 19, holding the adaptor housing to the main housing.
6. Remove the adaptor housing, Item 15.
7. Remove the six screws, Item 14, in the front bearing carrier.
8. Fit three jacking screws $\frac{3}{8}$ " UNC to the bearing carrier and slowly ease the carrier, Item 12, off its dowels lightly tapping the ends of the clutch shaft with a soft hammer to ensure the bearings also come free from the bearing carrier.
9. Remove the bearing carrier.
10. Fit lifting eyes to the ends of the clutch shafts ($\frac{3}{8}$ " UNF)
11. With the aid of a hoist lift both the clutches upwards together about 4" (the output shaft follows along).
12. Swing the reverse clutch group and the output shaft group back into the bottom of the housing, this then allows the forward clutch to come straight out.
13. Lift out the reverse clutch group.

F Output Shaft Group

1. Lift output shaft and gears out of housing.
2. With a soft hammer tap output shaft flange complete with its bearing out of the housing.

This completes the main disassembly of the transmission. Further disassembly of the main groups can now be continued by referring to the exploded drawings.

Assembly

For re-assembly, carry out the disassembly procedure in the reverse order.

DROP BOX SECTION

Procedure for removing and disassembling the drop box unit.

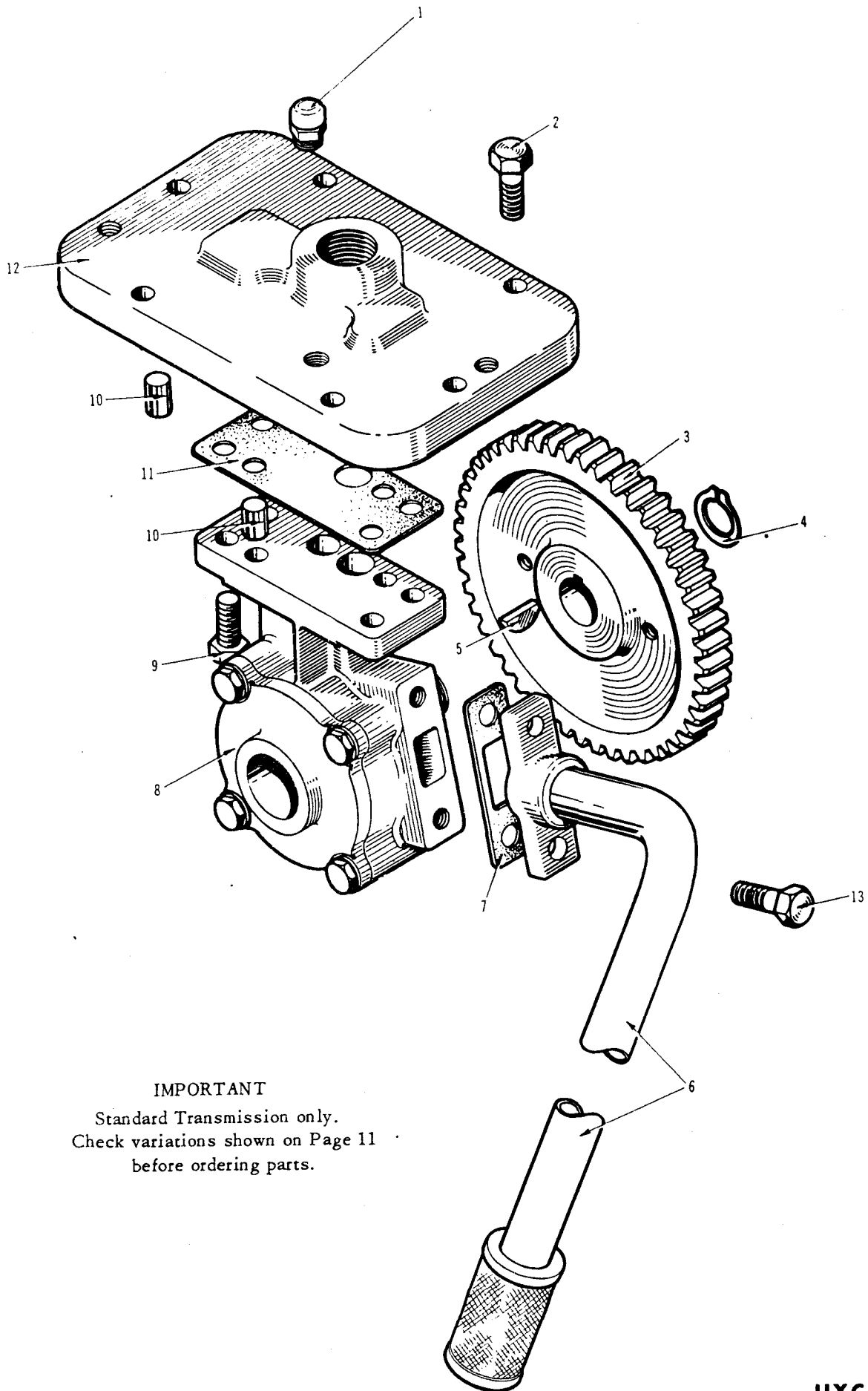
1. Support the transmission in a convenient manner so that the drop box is facing uppermost.
Care should be taken to ensure the weight is taken on its housing.
2. Remove the 12 retaining screws, Item 17, and 3 bolts item 5 Drawing UXD 1932.
3. Remove the 2 screws, Item 14, retaining the seal carrier for the high, low range selector.
4. Remove the selector rod cover, Item 2, complete with seal and gasket.
5. Take out the 4 screws, Item 22, retaining the intermediate shaft bearing retainer.
6. Remove the bearing retainer, Item 21.
7. Using three $\frac{3}{8}$ " UNC bolts in the jacking holes provided, gently ease the drop box off the dowels, Item 12, at the same time tap the end of the intermediate shaft with a soft hammer so that when the drop box is removed the intermediate shaft stays in the main housing.
8. Withdraw the drop box housing vertically upwards taking care that it does not jam the high, low range selector shaft, Item 4. This shaft is left in place after the housing has been removed, i.e. the housing slides over it.
9. Lift out the selector shaft and its fork, Items 4 and 11.
10. Lift the intermediate shaft out complete with its gears.
11. Remove the 5 screws, Item 6, round the 4 wheel drive disconnect housing, Item 17, Drawing UXB 1615.
12. Withdraw the housing complete with shaft, Item 3, selector fork, Item 20, and coupling Item 2, drawing UXB 1615.
13. Remove screws, Item 1, and retaining washer, Item 2. Remove the six screws, Item 16, retaining the brake assembly. Drawing UXC 1931.
14. Withdraw brake assembly complete from splines on the output shaft.
15. From the front of the housing drive the output shaft through the gear, Item 10, and bearing Item 9, and withdraw it.
16. Remove the gear and bearing from the housing.
17. Remove the snap ring, Item 1, and using a suitable extractor, withdraw the bearing Item 2 from the main housing output shaft. Drawing UXB 1928.

18. Remove the gear, Item 3, drawing UXB 1928.
19. Carefully withdraw the gear, Item 3, from the shaft taking care not to lose the 2 balls Item 8., and the spring, Item 7, which will be released directly the gear is moved. Drawing UXB 1928.

NOTE

Should it be required to disassemble the main transmission and remove the clutch packs, following the removal of the drop box it will first be necessary to remove the main collector housing, Item 1, Drawing UXD 1666 complete with output bearing Item 36 and sleeve UA 1558. Failure to adhere to this will make it impossible to push the output shaft to one side whilst removing the clutch packs.

Re-assembly of the transmission and drop box should be carried out in the reverse order of the above procedure.



IMPORTANT
Standard Transmission only.
Check variations shown on Page 11
before ordering parts.

PUMP GROUP UXC 1499

Item	Part No.	Description	No Off
1	UA 1785	ASSEMBLY , breather,	1
2	M-2002-AA	BOLT , hex. hd. cap, $\frac{3}{8}$ " U.N.C. x $1\frac{1}{4}$ " long	6
3	UB 2109	GEAR	1
4	A.2915-Q	RING, snap	1
5	M-2022-D	KEY, woodruff, $\frac{1}{2}$ " dia x $\frac{1}{8}$ " thick	1
6	UXB-1473	TUBE, suction assembly	1
7	202017	GASKET, suction pipe	1
8	UC-1480	PUMP, "Hobourn"	1
9	M-2002-U	SCREW, hex. hd. cap, $\frac{3}{8}$ " U.N.C. x 1" long	4
10	M-1927-AK	PIN, dowel, $\frac{3}{8}$ " dia x $\frac{5}{8}$ " long	4
11	UA-1467	GASKET, pump to plate	1
12	UB-1449	PLATE, ($\frac{1}{8}$ " N.P.T.F. Tapping)	1
13	M-2002-G	BOLT , hex. hd. cap, $\frac{3}{8}$ " U.N.C. x $\frac{3}{4}$ " long	2

ALTERNATIVES

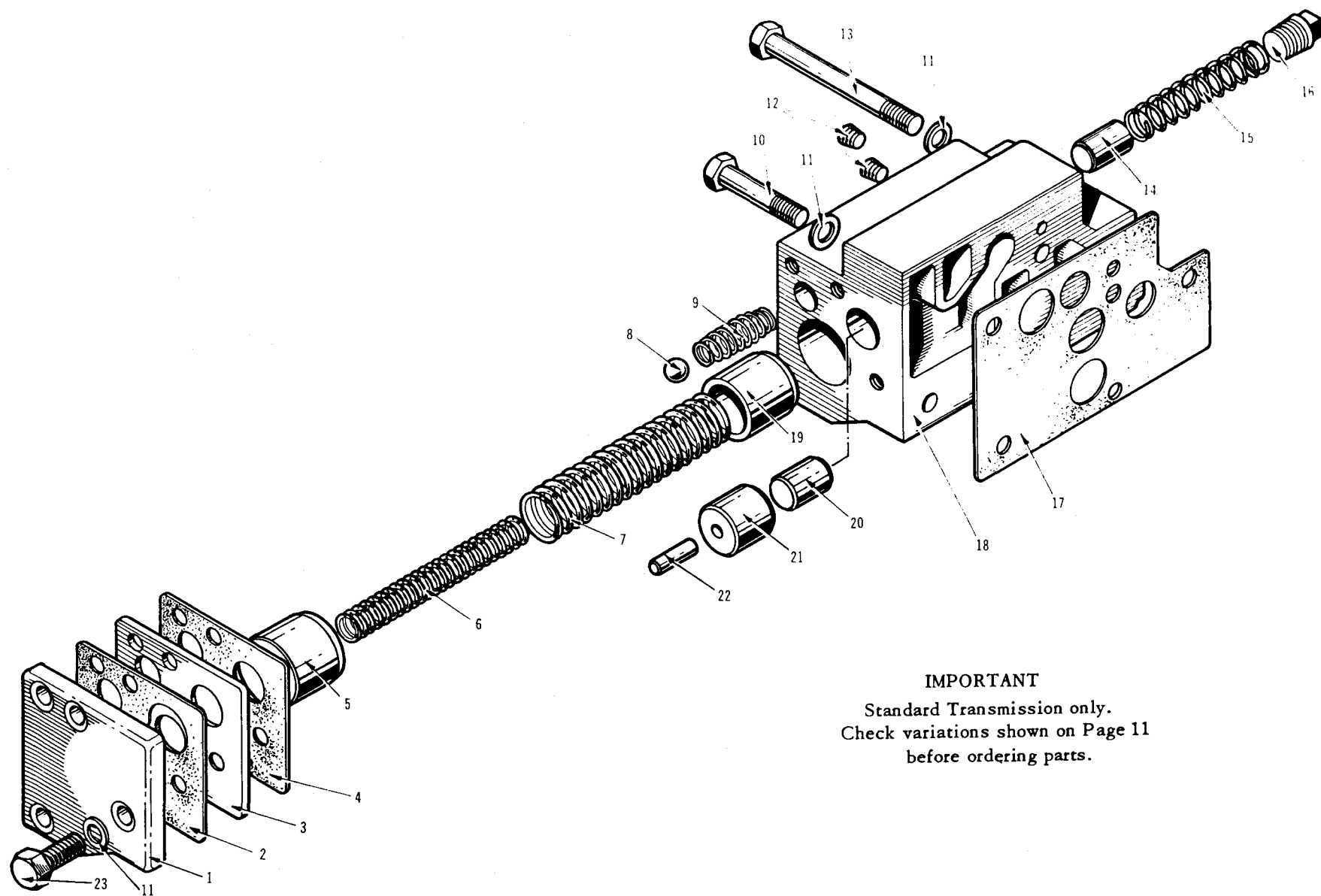
12	UB-1781	PLATE, pump with side outlet	1
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FOR PUMP AND P.T.O. GROUP UXC 1689

Substitute in UXC 1499

2	M-2002-AA	BOLT , hex. hd. cap $\frac{3}{8}$ " U.N.C. x $1\frac{1}{4}$ " long	4
4	A.2915-Q	RING, snap	2
12	UD-1683	HOUSING, pump	1
13	M-2002-G	BOLT , hex. hd. cap	5
Add.			
	UA-1686	BEARING, roller	1
	M-1060	BEARING, ball	1
	UA-1690	FLANGE, output	1
	UB-1681	GEAR, output	1
	UA-1687	GASKET, (Bearing Retainer)	1
	B.1048-K	RING, snap	1
	UA-1684	RETAINER	1
	M-2002-CN	SCREW, hex. hd. $\frac{3}{8}$ "/16 x $4\frac{1}{2}$ "	2
	M-2002-X	SCREW, hex. hd. $\frac{3}{8}$ "/24 x 1"	1
	UA-1682	SHAFT, output	1
	UA-1685	SEAL, oil	1
	UA-1688	WASHER, retainer	1

Note: Do not order on part numbers only; see Page 12



IMPORTANT
 Standard Transmission only.
 Check variations shown on Page 11
 before ordering parts.

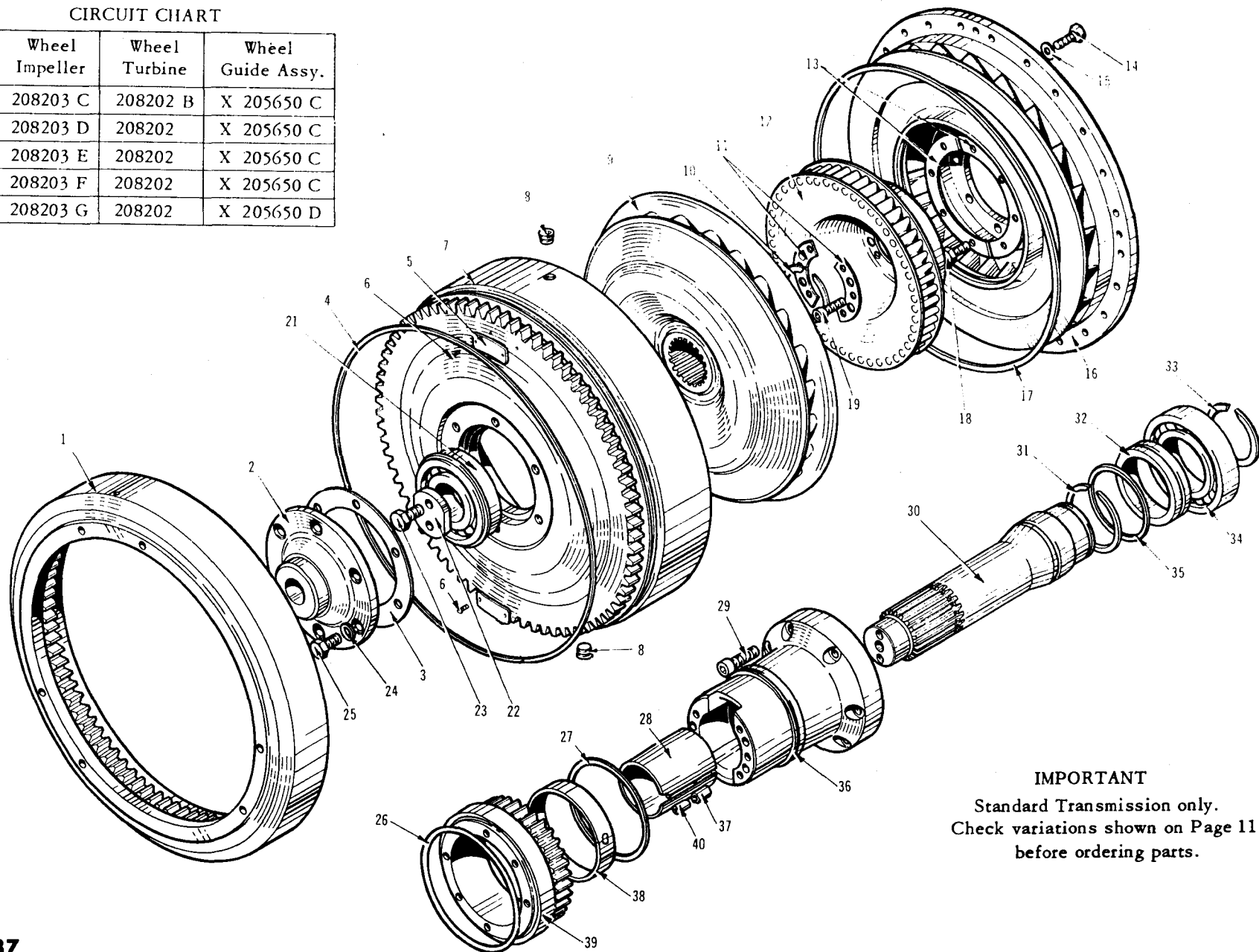
CONTROL VALVE GROUP UXB 1989

Item	Part No.	Description	No Off
1	P-1092	PLATE, cover	1
2	P-1083	GASKET, cover plate	1
3	P-1091	PLATE, orifice	1
4	P-1093	GASKET, orifice plate	1
5	B-1399	PISTON, pressure rise valve	1
	XA-2707-AB	SPRING ASSEMBLY, consists of	
6	A-2703-Z	SPRING, pressure rise valve	1
7	A-2707-AB	SPRING, pressure rise valve	1
8	M-1990-H	BALL	1
9	A-2703-P	SPRING, check valve	1
10	M-2002-AV	BOLT, hex. hd. cap, $\frac{3}{8}$ " U.N.C. x 2" long	1
11	M-201365	WASHER, copper, $\frac{3}{8}$ " i.d.	8
12	UA-1479-A	PLUG, pipe $\frac{1}{8}$ " B.S.P.	2
13	M-2002-CE	BOLT, hex. hd. cap $\frac{3}{8}$ " U.N.C. x 4" long	3
14	P-1087	PISTON	1
15	P-1090	SPRING	1
16	UA-1479-B	PLUG, spring retainer, $\frac{1}{2}$ " B.S.P.	1
17	P-1094	GASKET, housing	1
18	P-1085-A	HOUSING	1
19	UA-1739	PISTON, pressure rise valve	1
20	P-1086	PISTON	1
21	P-1089	CYLINDER	1
22	A-2711-AE	PISTON	1
23	M-2002-U	BOLT, hex. hd. cap, $\frac{3}{8}$ " U.N.C. x 1" long	4

Note: Do not order on part numbers only; see Page 12

CIRCUIT CHART

MS	Wheel Impeller	Wheel Turbine	Wheel Guide Assy.
200	208203 C	208202 B	X 205650 C
235	208203 D	208202	X 205650 C
280	208203 E	208202	X 205650 C
335	208203 F	208202	X 205650 C
400	208203 G	208202	X 205650 D



IMPORTANT
 Standard Transmission only.
 Check variations shown on Page 11
 before ordering parts.

CONVERTER GROUP UXC 1987

Item	Part No.	Description	No Off
1	P-1099	RING, driving,	1
2	P-1051	PILOT, flywheel	1
3	202080	GASKET, pilot flywheel	1
4	201963-C	GASKET, ring, rotating housing	1
5	P-1102-A	NAME, plate	1
6	M-422	SCREW, drive	2
7	P-1050	HOUSING, rotating	1
8	M-2051-F	PLUG, $\frac{1}{8}$ "	2
9	208202-Series	WHEEL, turbine (See Chart)	1
10	A-2622-Z	RING, external snap, turbine wheel	1
11	201930-C	PLATE, clamp	2
12	X-205650-Series	WHEEL, guide assembly (See Chart)	1
13	201951	PLATE, clamp	2
14	M-2001-M	SCREW, hex. hd. cap, $\frac{5}{16}$ " U.N.C. x $\frac{7}{8}$ " long	24
15	A-2888-AF	WASHER, flat $\frac{3}{16}$ "	24
16	208203-Series	WHEEL, impeller (See Chart)	1
17	201471-AQ	GASKET, ring impeller	1
18	M-2001-K	SCREW, hex. hd. cap, $\frac{5}{16}$ " U.N.C. x $\frac{3}{4}$ " long	8
19	M-1732-S	SCREW, socket hd. cap, $\frac{5}{16}$ " U.N.C. x 1" long	6
21	M-2363	BEARING, ball	1
22	UA-1487	WASHER, retainer	1
23	M-2596-E	SCREW, hex. hd. cap, $\frac{3}{8}$ " U.N.F. x 0.97 long	2
24	M-201365	WASHER, copper $\frac{3}{8}$ " i.d.	6
25	M-2002-G	SCREW, hex. hd. cap, $\frac{3}{8}$ " U.N.C. x $\frac{3}{4}$ " long	6
26	M-201399-AN	RING, 'O' impeller	1
27	M-1904-U	RING, piston	1
28	201836-C	SLEEVE, split	1
29	M1732-W	BOLT, Soc. Hd. cap, $\frac{3}{8}$ " U.N.C. x $1\frac{1}{2}$ " long	6
30	P-1049	SHAFT, turbine	1
31	A-2622-B	RING, external snap, piston ring carrier	1
32	P-1056	CARRIER, piston ring	1
33	A-2622-U	RING, external snap	1
34	M-2293	BEARING, ball	1
35	M-1904-AH	RING, piston, turbine shaft	1
36	P-1046	CARRIER, guide	1
37	M-1927-BM	PIN, roll, $\frac{7}{32}$ " dia x $\frac{5}{8}$ " long	4
38	201821	BUSHING, steel backing bronze	1
39	UB-1968	GEAR, pump drive	1
40	M-1927-AK	PIN, roll	4

FOR CONVERTER GROUP UXC 1715

Substitute in UXC 1987

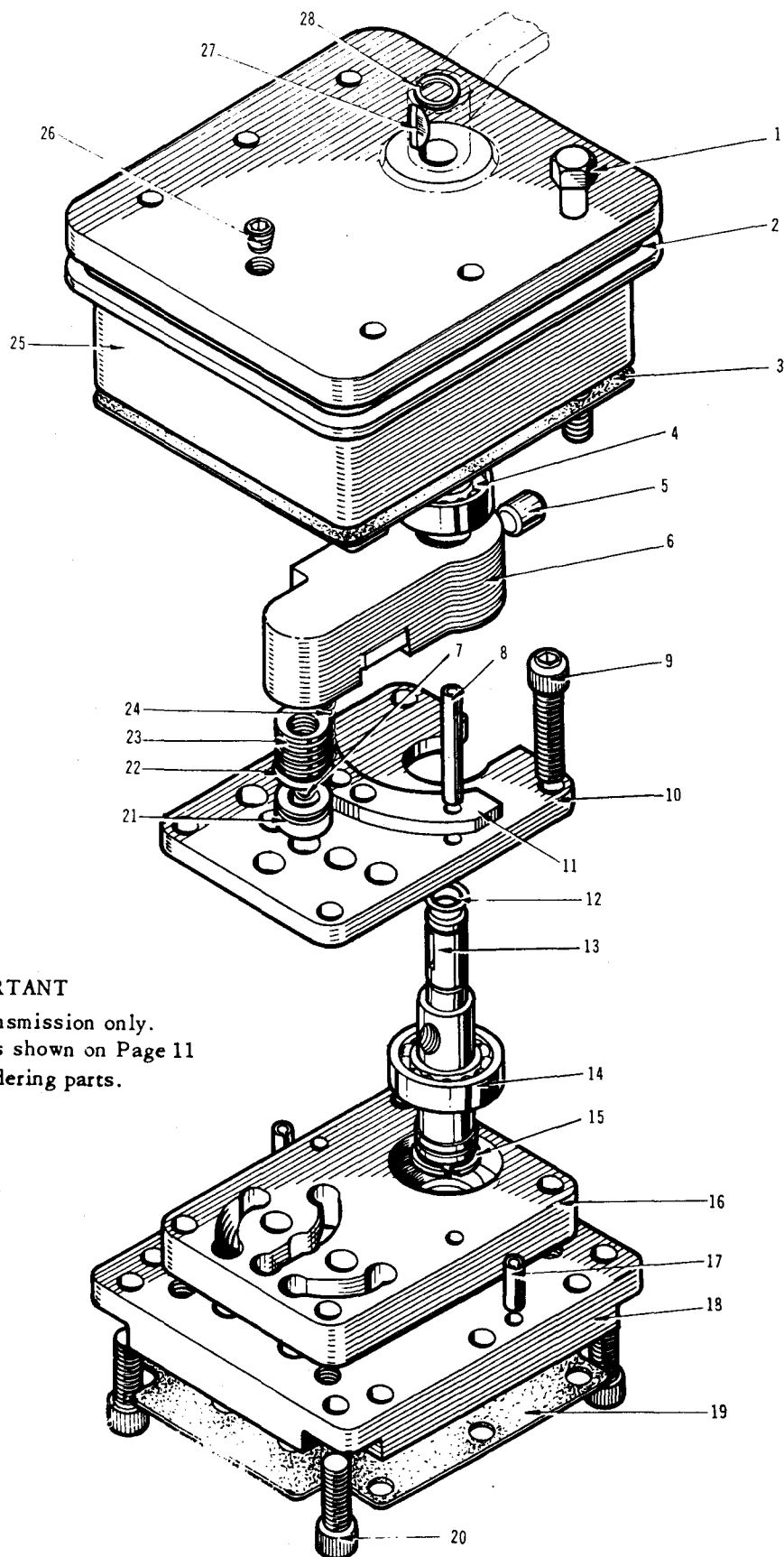
1	UC-1692A	RING, driving,	1
2	UA-1749 or UA-1693	PILOT, flywheel	1

FOR CONVERTER GROUP UXC 2217

Substitute in UXC 1987

1	UC-2193	RING driving	1
2	UA-2197	PILOT, flywheel	1
ADD	UA-2207	DOWEL (.403 dia x 1.75)	1
	UA-2208	SCREW, socket hd. cap,	8
	P-1101	TAG, instruction	1
DELETE			
19	M-1732-S	SCREW, socket hd. cap, $\frac{5}{16}$ " U.N.C. x 1" long	6
20	P-1102	PLATE, name	1
29	M-1732-W	SCREW, socket hd. cap, $\frac{3}{8}$ " U.N.C. x $1\frac{1}{2}$ " long	6

Note: Do not order on part numbers only; see Page 12



IMPORTANT
 Standard Transmission only.
 Check variations shown on Page 11
 before ordering parts.

RANGE SELECTOR VALVE GROUP UXB 1988

Item	Part No.	Description	No Off
1	M-2002-CK	BOLT , hex.hd. cap, $\frac{3}{8}$ " U.N.C. x $4\frac{1}{4}$ " long	6
	M-201365	with WASHER, copper	6
2	UA-1481	GASKET, ring	1
3	UA-1483	GASKET, selector valve	1
4	M-2167	BEARING	1
5	A-2711-AB	PIN, dowel	1
6	P-1126	VALVE	1
7	M-1990-E	BALL	1
8	M-1927-AH	PIN, roll, $1\frac{7}{8}$ " long	2
9	M-1732-W	SCREW, socket hd. cap, $\frac{3}{8}$ " U.N.C. x $1\frac{1}{2}$ " long	4
10	P-1211	PLATE, base	1
11	P-1080	PLATE, detent	1
12	UA-1879	RING, 'O'	1
13	P-1213	SHAFT	1
14	P-1210	BEARING	1
15	UA-3352	RING, 'O'	1
16	P-1212	PLATE, ditch	1
17	M-1927-BN	PIN, roll, $1\frac{1}{16}$ " long	2
18	UB-1441	PLATE, cover	1
19	UA-1485	GASKET, selector valve to collector housing	1
20	M-1732-J	SCREW, socket hd. cap, $\frac{3}{8}$ " U.N.C. x 1" long	4
21	P-1082	WIPER	1
22	A-2916-CB	RING, 'O'	1
23	P-1128	WASHER, belleville	10
24	UA. 2096	SPRING	1
25	UB-1442	HOUSING, valve	1
26	UA-2755	PLUG, pipe, $\frac{1}{8}$ " B.S.P. used in conjunction with fibre washer UA-2770	1
27	M-2022-M	KEY, woodruff	1
28	A2903-W	RING, snap	1

FOR RANGE SELECTOR VALVE GROUP UXB 1677

Substitute in UXB 1988

10	UA-1676	PLATE, base	1
11	UA-1675	PLATE, detent	1
29	M-1927-M	PIN, roll	1

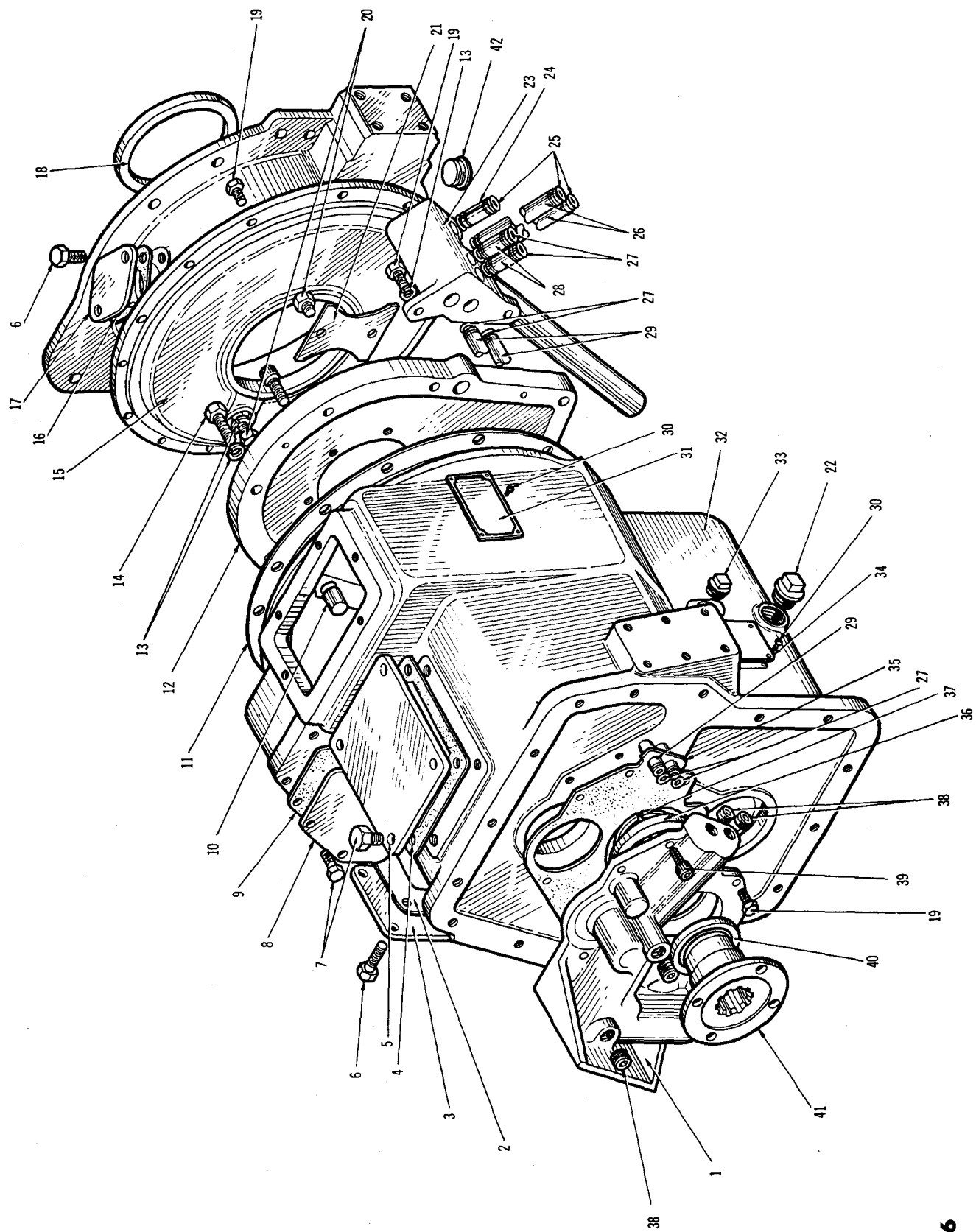
FOR RANGE SELECTOR VALVE GROUP UXB 1772

Substitute in UXB 1988

16	UB-1744	PLATE, ditch	1
18	UB-1746	PLATE, cover	1

Prior to Transmission Serial No. TR.1987 substitute part 201341-CP for UA.2096 and note that valve P.1126 did not incorporate a raised boss to accommodate the longer spring now fitted.

Note: Do not order on part numbers only; see Page 12



MAIN HOUSING GROUP UXD 1666

Item	Part No.	Description	No Off
1	UXB-1552	HOUSING, collector assy. (consists of):	1
	UD-1439	HOUSING, collector	1
	UA-1493	PIN, dowel ($1\frac{17}{32} \times \frac{1}{2}$ ")	1
2	P-1069	GASKET, cover plate	1
3	P-1053	PLATE, cover	1
4	UA-1469	GASKET, top middle	1
5	UA-1463	PLATE, cover (Top Middle)	1
6	M-2002-G	SCREW, $\frac{3}{8}$ " $\times$ $\frac{3}{4}$ " (Covers)	8
7	M-2004-A	SCREW, $\frac{1}{2}$ " $\times$ $\frac{3}{4}$ " (Top Cover)	8
8	UA-1701	PLATE, cover (P.T.O. Face)	1
9	UA-1702	GASKET, P.T.O. Face	1
10	P-1104	PIN, dowel	2
11	UC-1548	GASKET, adaptor to housing	1
12	UC-1451	CARRIER, bearing	1
13	M-2046-S	WASHER	19
14	M-2002-AG	SCREW, $\frac{3}{8}$ " $\times$ $1\frac{1}{2}$ " (Brg. Carrier to Hsg.)	6
15	UXB-1871	ADAPTOR, assembly (consists of):	1
	UD-1496	ADAPTOR	1
	UA-1874	TUBE	1
16	UA-1547	GASKET, top front	1
17	UA-1546	PLATE, cover (Top Front)	1
18	M-2347	SEAL, converter	1
19	M-2002-U	SCREW, $\frac{3}{8}$ " $\times$ 1" (Coll. Hsg., Con. Bl., Adaptor)	20
20	M-2002-G	SCREW, $\frac{3}{8}$ " $\times$ $\frac{1}{2}$ " (Brg. Retainer)	3
21	P-1070	RETAINER, bearing	1
22	UA-1974-C	PLUG, drain ($1\frac{1}{4}$ BSP) with washer UA-1975-C	1
23	UXA-1474	BLOCK, connecting (Front) Assy. (consists of):	1
	UB-1461	BLOCK, Front connecting	1
	P-1075	TUBE, return oil	1
24	UA-1477	TUBE, return, $\frac{7}{8}$ "	1
25	A-2916-BL	RING, "O" ($\frac{7}{8}$ ")	6
26	UA-1475	TUBE, converter, $\frac{7}{8}$ "	2
27	UA-1482	RING, "O" ($\frac{3}{4}$ ")	8
28	UA-1478	TUBE, connecting ($\frac{3}{4}$ ")	2
29	UA-1476	TUBE, main, $\frac{3}{4}$ "	2
30	M-422	SCREW, drive	8
31	UA-1859	PLATE, name	1
32	UD-1505	HOUSING, main	1
33	UA-1974-A	PLUG, level ($\frac{1}{2}$ BSP) with washer UA-1975-A	1
34	UA-1674	PLATE, instruction	1
35	UB-1484	GASKET, collector housing	1
36	M-2208	BEARING, ball (213-SG)	1
37	A-2952-E	RING, snap	1
38	M-2051-S	PLUG, pipe ($\frac{3}{8}$ " NPTF)	7
39	M-1732-J	SCREW, socket hd. ($\frac{3}{8}$ " - 16 $\times$ 1)	2
40	UA-1488	SEAL, output	1
41	UB-1614	FLANGE, output	1
42	UA-1974-C	PLUG, drain, (with washer UA-1975-C)	1

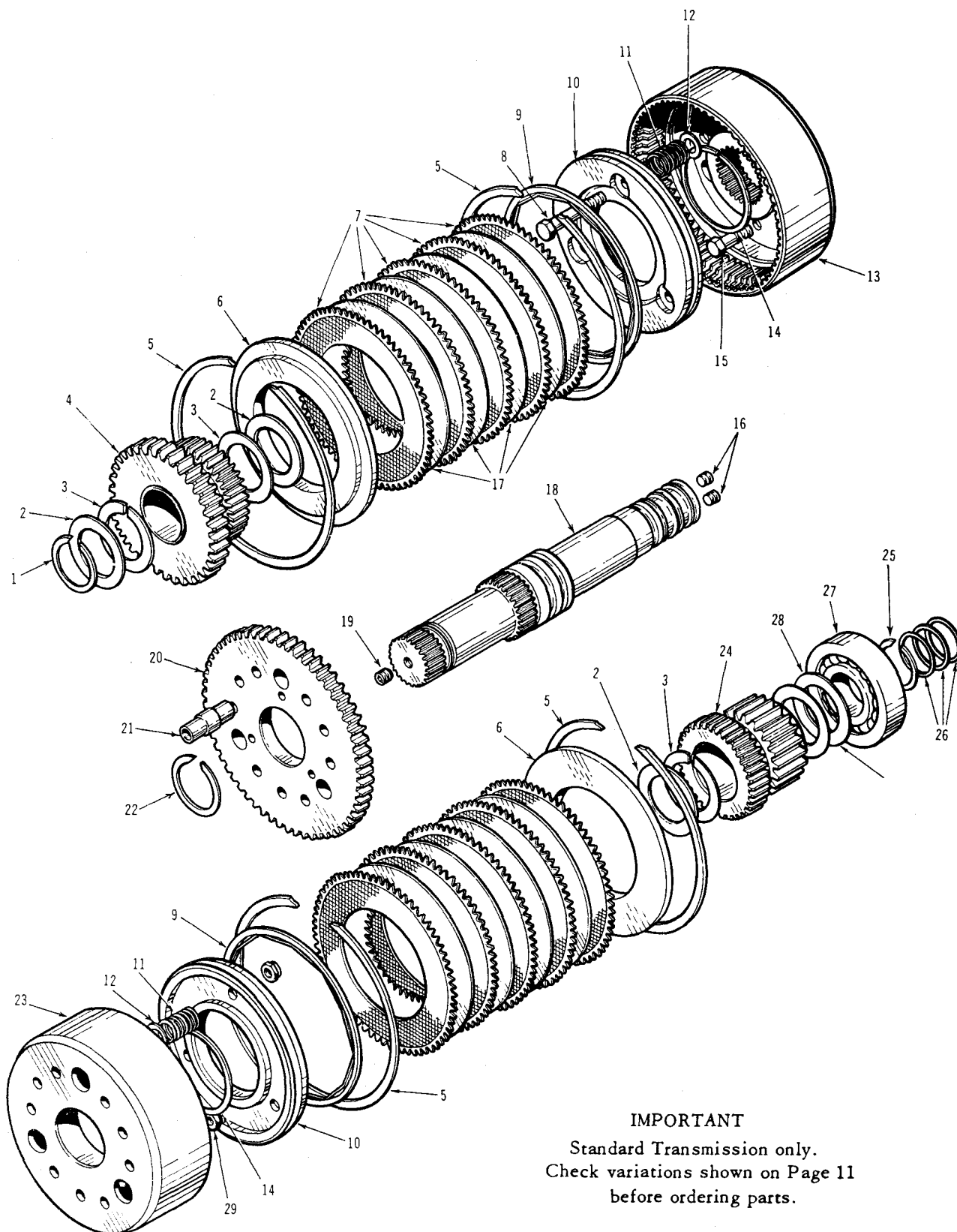
As from Serial No. TR-4882 4 additional Screws- Part No. M-2023-D used in conjunction with item 5. UA-1463

Not shown

	UA-1853	TUBE, drain	1
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VARIATIONS FROM HOUSING GROUP UXD 1666 will be found on pages 53 and 55

Note: Do not order on part numbers only; see Page 12



IMPORTANT
 Standard Transmission only.
 Check variations shown on Page 11
 before ordering parts.

FORWARD CLUTCH GROUP UXB 1990

Item	Part No.	Description	No Off
1	A-2903-S	RING, external, snap	1
2	M-2086-N	RACE, thrust	3
3	P-1193	WASHER, thrust	4
4		GEAR, Assembly, High	1
5	A-2669-BY	RING, internal snap	4
6	UA-2279	PLATE, clutch, back	2
7	A-4480-B	PLATE, sintered	10
8	P-1196	BOLT, hex. hd. cap $\frac{3}{8}$ " U.N.F. x 2.80" long	3
9	M-2059-X	RING, piston, 6.125" o.d.	2
10	206313	PISTON, clutch	2
11	UA-1899	SPRING, piston return	6
12	A-2888-AH	WASHER, spring retainer	6
13	206318	SPIDER, clutch	1
14	M-1904-E	RING, piston, 3.00" o.d.	2
15	M-2002-C	BOLT, hex. hd. cap $\frac{3}{8}$ " U.N.F. x 1.46" long	9
16	M-2051-F	PLUG, pipe, $\frac{1}{8}$ "	2
17	A-4481-A	PLATE, steel	8
18	P-1195	SHAFT, clutch	1
19	P.1187	PLUG, orifice	1
20	206309	GEAR, reverse input - 56T	1
21	202299	RETAINER, spring and spacer	3
22	A-2622-W	RING, external snap	1
23	206311	SPIDER, clutch	1
24		GEAR, Assembly, Low	1
25	A-2903-M	RING, external, snap	1
26	M-1904-BJ	RING, piston, 1.50" o.d.	3
27	M-2363-A	BEARING, ball	1
28	P-1192	SPACER, bearing	1
29	M-2060-E	NUT, hex slotted lock $\frac{3}{8}$ " U.N.F.	12

ALTERNATIVES

4	X.206293	Gear Assy. 37T	1 / 1	1
4	UXB.1722	Gear Assy. 41T	.8 / 1	1
4	UXB.1565	Gear Assy. 46T	.6 / 1	1
4	UXB.2017	Gear Assy. 31T	1.42 / 1	1
24	UXB.1560	Gear Assy. 21T	1.42 / 1	1
24	X.206307	Gear Assy. 23T	2.26 / 1	1
24	UXB.1501	Gear Assy. 22T	2.4 / 1	1
24	UXB.2148	Gear Assy. 26T	1.88 / 1	1

FOR FORWARD CLUTCH GROUP UXB 1777

Substitute in UXB.1990

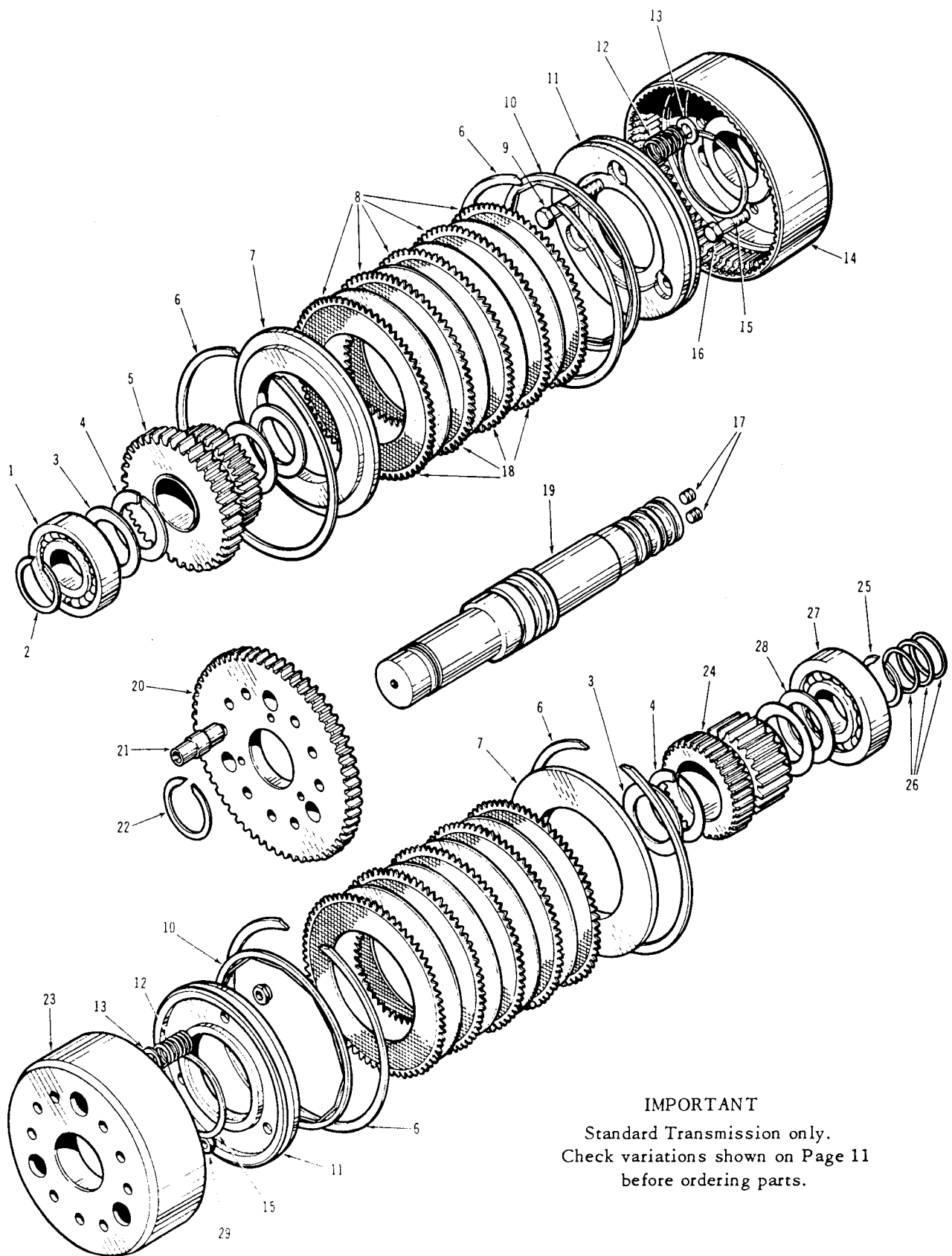
4	UXB-1722	GEAR, and bushing assembly. 41T	1
27	UA-1778	BEARING, roller	1

FOR FORWARD CLUTCH GROUP UXB-1607

Substitute in UXB.1990

4	X.206293	GEAR, Assembly, High 37T	1
24	X.206307	GEAR, Assembly, Low 23T	1

Note: Do not order on part numbers only; see Page 12



IMPORTANT
 Standard Transmission only.
 Check variations shown on Page 11
 before ordering parts.

REVERSE CLUTCH GROUP UXB 1991

Item	Part No.	Description	No Off
1	M-201411	BEARING, ball	1
2	A-2903-S	RING, external, snap	1
3	M-2086-N	RACE, thrust	3
4	P-1193	WASHER, thrust	4
5		GEAR, Assembly, High	1
6	A-2669-BY	RING, internal snap	4
7	UA-2279	PLATE, clutch, back	2
8	A-4480-B	PLATE, sintered	10
9	P-1196	BOLT, hex. hd. cap, $\frac{3}{8}$ " U.N.F. x 2.80 long	3
10	M-2059-X	RING, piston, 6.125" o.d.	2
11	206313	PISTON, clutch	2
12	UA-1899	SPRING, piston return	6
13	A-2888-AH	WASHER, spring retainer	6
14	206324	SPIDER, clutch	1
15	M-1904-E	RING, piston, 3 "00" o.d.	2
16	M-2002-C	BOLT, hex. hd. cap, $\frac{3}{8}$ " U.N.F. x 1.46" long	9
17	M-2051-F	PLUG, pipe, $\frac{1}{8}$ "	2
18	A-4481-A	PLATE, steel	8
19	P-1194	SHAFT, clutch	1
20	206309	GEAR, reverse input - 56T	1
21	202299	RETAINER, spring and spacer	3
22	A-2622-W	RING, external snap	1
23	206311	SPIDER, clutch	1
24		GEAR, Assembly, Low	1
25	A-2903-M	RING, external, snap	1
26	M-1904-BJ	RING, piston, 1.50" o.d.	3
27	M-2363-A	BEARING, ball	1
28	P-1192	SPACER, bearing	1
29	M-2060-E	NUT, hex, slotted lock, $\frac{3}{8}$ " U.N.F.	12

ALTERNATIVES

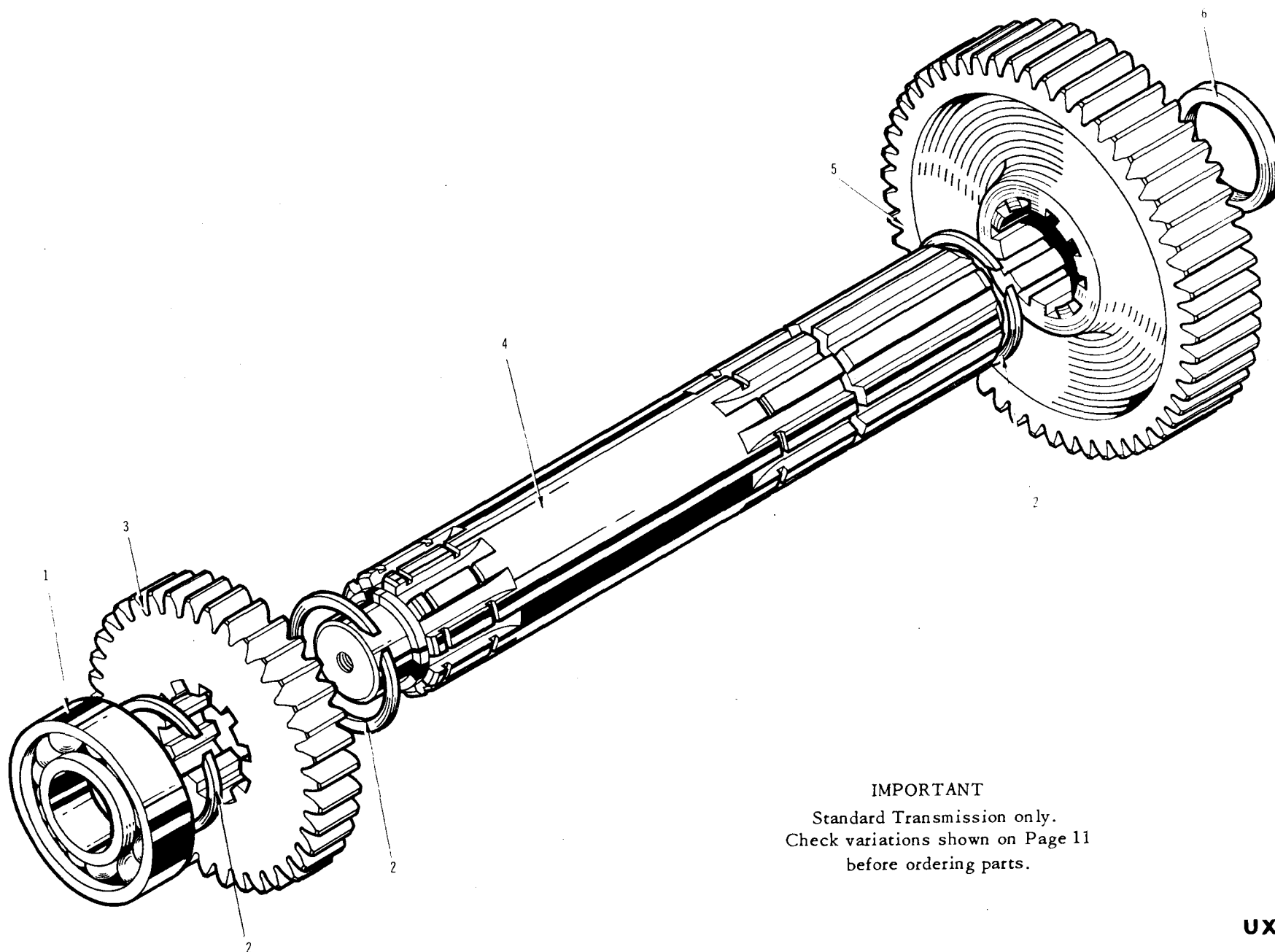
5	X.206293	Gear Assy. 37T	1 / 1	1
5	UXB.1722	Gear Assy. 41T	.8 / 1	1
5	UXB.1565	Gear Assy. 46T	.6 / 1	1
5	UXB.2017	Gear Assy. 31T	1.42 / 1	1
24	UXB.1560	Gear Assy. 31T	1.42 / 1	1
24	X.206307	Gear Assy. 23T	2.26 / 1	1
24	UXB.1501	Gear Assy. 22T	2.4 / 1	1
24	UXB.2148	Gear Assy. 26T	1.88 / 1	1

FOR REVERSE CLUTCH GROUP UXB 1774

Substitute in UXB 1991

1	UA-1778	BEARING, roller	1
2	A-2903-S	RING, external snap	0
5	X-206293	GEAR AND BUSHING ASSEMBLY	0
19	UB-1756	SHAFT, clutch	1
27	UA-1778	BEARING, roller	1

Note: Do not order on part numbers only; see Page 12



IMPORTANT
Standard Transmission only.
Check variations shown on Page 11
before ordering parts.

UXB 1992

OUTPUT SHAFT UXB 1992

Item	Part No.	Description	No Off
1	M-172	BEARING, ball (307-M)	1
2	A-2622-W	RING, external snap	3
3		GEAR, high output,	1
4	206306	SHAFT, output	1
5		GEAR, low output,	1
6	M-2074-X	RING, lathe cut rubber seal	1

ALTERNATIVES

3	UB.1561	Gear 28T .6 / 1	1
3	UB.1726	Gear 33T .8 / 1	1
3	206308	Gear 37T 1 / 1	1
3	UB.1906	Gear 44T 1.4 / 1	1
5	UB.1563	Gear 44T 1.4 / 1	1
5	206292	Gear 52T 2.26 / 1	1
5	UB.1492	Gear 53T 2.4 / 1	1
5	UD-2135	Gear 49T 1.88 / 1	1

FOR OUTPUT SHAFT GROUP UXB 2320

Substitute in UXB 1992

4	UB-2196	SHAFT, output	1
ADD	UB-2191	SLEEVE, Output	1

LAYSHAFT GROUP UXB 1775

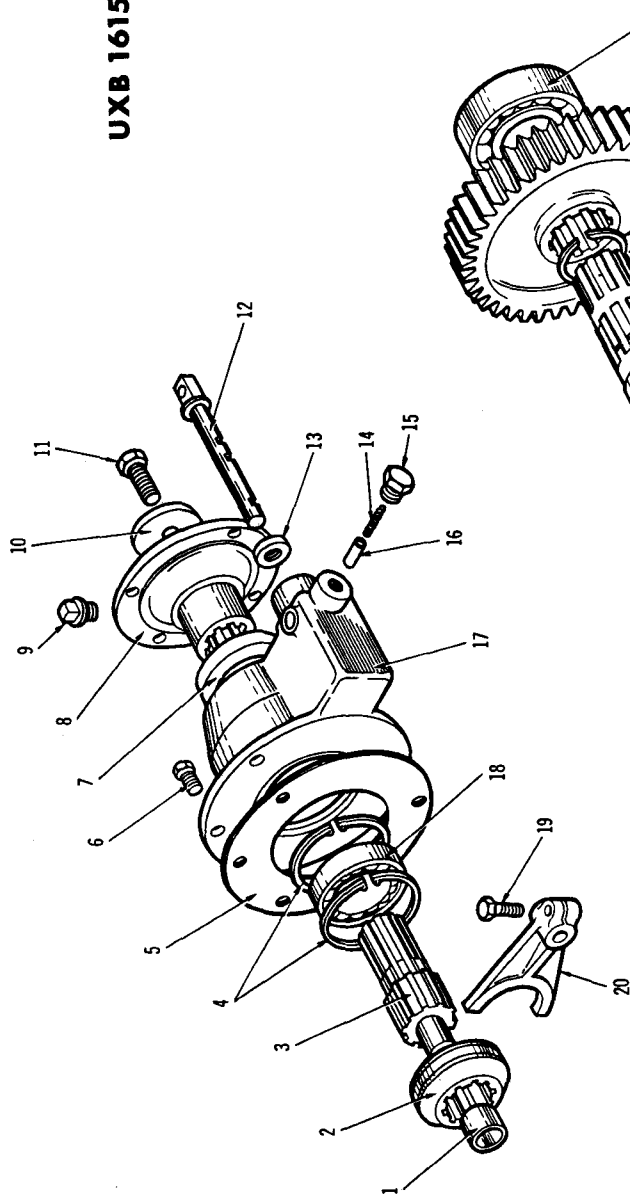
	UA-1778	BEARING, roller	2
	UA-1758	PIECE, distance	1
	UB-1492	GEAR, 53T	1
	UB-1747	GEAR, 36T	1
	A-2622-W	RING, snap	3
	A-2903-M	RING, snap	1
	UB-1759	LAYSHAFT	1

POWER TAKE-OFF GROUP UXB 1568

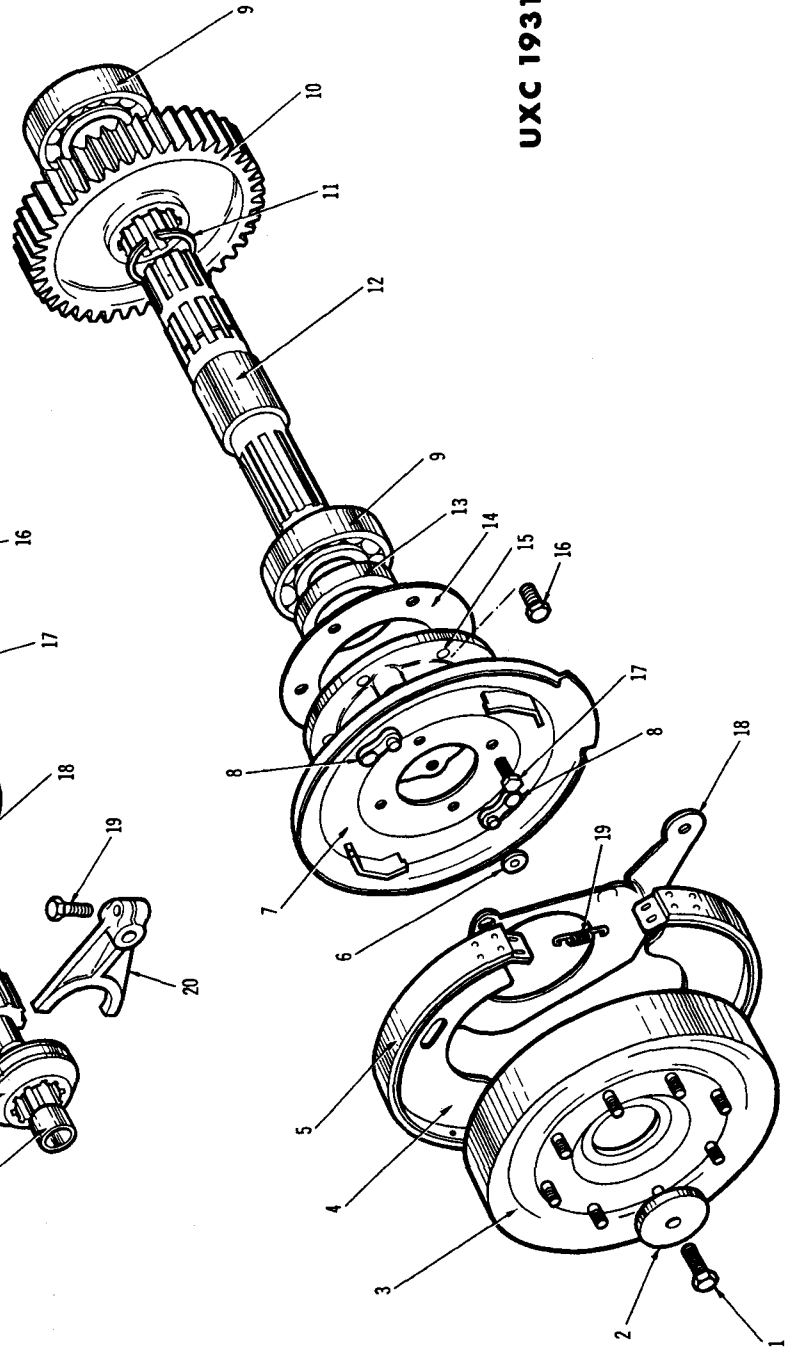
	M-143-A	BEARING, ball (207-S)	2
	UB-1549	GEAR, idler	1
	UB-1967	GEAR, driven	1
	206003-A	HUB, splined	1
	M-2027-N	NUT	2
	A-2669-S	RING, snap	2
	202083	RETAINER, bearing	2
	A-2695-AW	STUD	2

Note: Do not order on part numbers only; see Page 12

UXB 1615



UXC 1931



OUTPUT GROUP UXC 1931 (MARK 2 DROP BOX)

Item	Part No.	Description	No Off
1	M-2006-K	SCREW, $\frac{3}{8}$ " x $1\frac{1}{2}$ " (Shaft)	1
2	B-1504-AE	PLATE, clamp	1
3	UXB-1596	OUTPUT FLANGE ASSY. (Consists of):	1
	UB-1596	FLANGE, output	1
	UA-1669	CAPSCREW, hex.hd.	8
	UB-1670	BRAKE DRUM	1
4	M-2556-2	LINING ASSEMBLY	2
5	M-2556-3	LINING	2
6	M-2556-7	ROLLER	1
7	UXB-1671	BACKING PLATE ASSY.	1
8	M-2556-4	RIVET	20
9	M-201041	BEARING, ball (310-S)	2
10	UB-1920	GEAR, output (48 T)	1
11	M-201213-W	RING, snap	1
12	UB-1921	SHAFT, output	1
13	UA-1597	SEAL, oil	1
14	UA-1603	GASKET, carrier to housing (.030)	1
	UA-1891	GASKET, shim as required (.020)	
	UA-1892	GASKET, shim as required (.010)	
15	UB-1609	CARRIER, brake	1
16	M-2002-N	SCREW, $\frac{3}{8}$ " x $\frac{7}{8}$ " (Carrier to housing)	6
17	M-2004-C	SCREW, $\frac{1}{2}$ " x 1" (Brake to Carrier)	4
18	M-2556-6	LEVER	1
19	M-2556-5	SPRING, return	2

FOR MARK I DROP BOXES UXC 1595

Substitute in UXC 1931

10	UB-1601	GEAR OUTPUT 48T	1
12	UB-1598	SHAFT OUTPUT	1

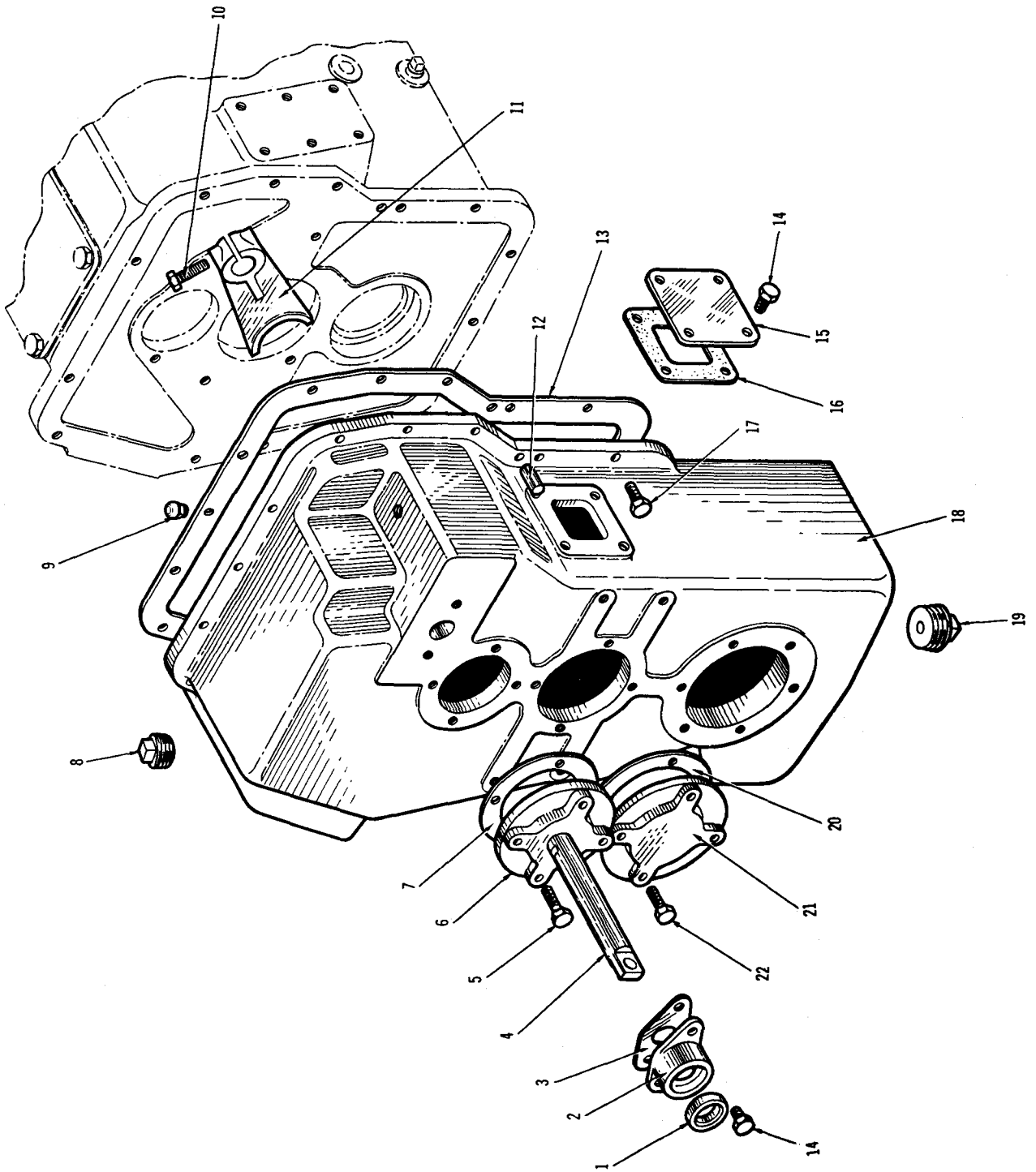
Alternative

3	UXB 1788	OUTPUT FLANGE ASSEMBLY (Consists of)	1
	UB-1788	OUTPUT FLANGE	1
	M-2556-8	BRAKE DRUM	1
	M-2002-X	SCREW, $\frac{3}{8}$ " x 1"	4
	M-1930-F	NUT	4

DISCONNECT GROUP UXB-1615

Item	Part No.	Description	No Off
1	A-2527-Y	BUSHING, Oilite	1
2	A-4827	SLEEVE, sliding	1
3	A-4831	SHAFT, disconnect	1
4	A-2669-AN	RING, snap	2
5	UA-1591	GASKET, (.030)	1
	UA-1893	GASKET, (.020) shim as required	1
	UA-1894	GASKET, (.010)	1
6	M-2002-N	SCREW, $\frac{3}{8}$ " x $\frac{7}{8}$ " (Housing)	5
7	UA-1608	SEAL, oil (Output Flange)	1
8	UB-1585	FLANGE, output	1
9	UA-1479-E	PLUG	1
10	B-1504-AE	PLATE, clamp	1

Note: Do not order on part numbers only; see Page 12



DISCONNECT GROUP UXB-1615 (Continued)

11	M-2006-K	SCREW $\frac{3}{8}$ " x $1\frac{1}{2}$ " (Shaft)	1
12	UA-1594	ROD, disconnect	1
13	M-2429	SEAL, oil (Disconnect Rod)	1
14	A-2700-AE	SPRING	1
15	M-2006-C	SCREW, $\frac{3}{8}$ " x $\frac{7}{16}$ " (Detent)	1
16	B-1139-A	PLUNGER	1
17	UC-1612	HOUSING, disconnect	1
18	M-2294	BEARING, ball (209-S)	1
19	M-2002-AE	BOLT, $\frac{3}{8}$ " x $1\frac{1}{4}$ " (Fork)	1
20	A-4848	FORK, shifter	1

REAR HOUSING GROUP UXD 1932

Item	Part No.	Description	No Off
1	UA-1593	SEAL, oil	1
2	UA-1579	COVER, selector rod	1
3	UA-1599	GASKET, selector rod cover	1
4	UA-1933	ROD, selector	1
5	M-2002-AG	BOLT, $\frac{3}{8}$ " x $1\frac{1}{2}$ " (Top cover and Housing)	4
6	UA-1572	COVER, top rear	1
7	UA-1571	GASKET, top cover	1
8	UA-1974-A	PLUG, filler, $\frac{1}{2}$ B.S.P. with washer UA-1975-A	1
9	UA-1785	BREATHER, assembly	1
10	M-2002-AS	SCREW, $\frac{3}{8}$ " x $1\frac{1}{4}$ " (Fork)	1
11	UA-1910	FORK, selector	1
12	UA-1668	PIN, dowel	4
13	UC-1556	GASKET, housing	1
14	M-2002-G	SCREW, $\frac{3}{8}$ " x $\frac{3}{4}$ "	6
15	UA-1460	PLATE, cover	1
16	UA-1470	GASKET, cover plate	1
17	M-1731-BJ	SCREW, $\frac{3}{8}$ " x $1\frac{1}{8}$ " (Housing)	5
18	UD-1570	HOUSING, rear	1
19	UA-1974-C	PLUG, drain, $\frac{1}{4}$ B.S.P. with washer UA-1975-C	1
20	UA-1577	GASKET, bottom cover	1
21	UA-1580	COVER, bottom rear	1
22	M-2002-AA	SCREW, $\frac{3}{8}$ " x $1\frac{1}{4}$ " (Bottom Cover)	4

Not shown

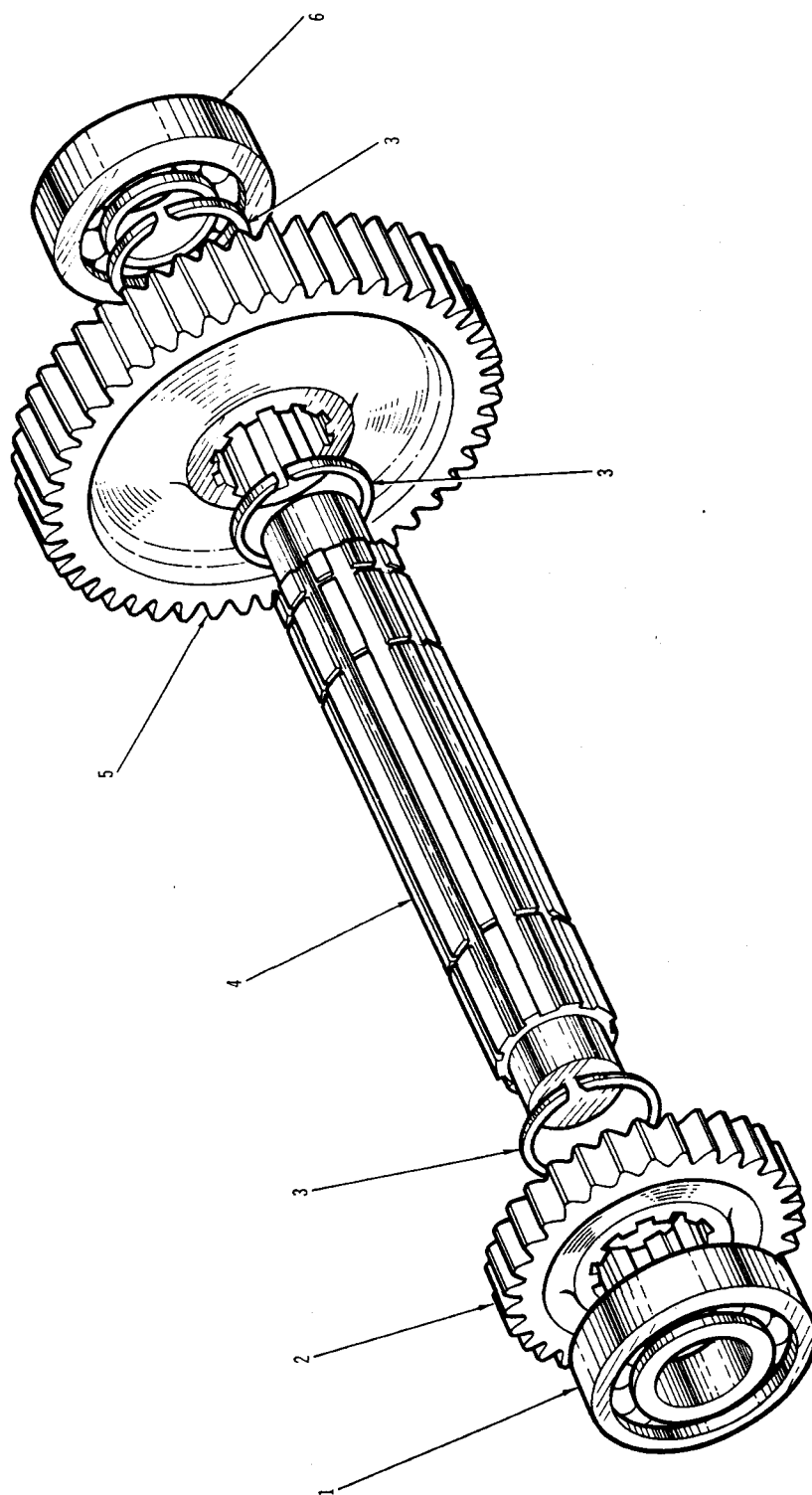
	M-1732-W	SCREW, socket head (Housing)	5
	M-1732-J	SCREW, socket head (Housing)	10

FOR MARK I DROP BOXES UXD 1569

Substitute

4	UA-1933	ROD, selector	1
12	UA-1910	FORK, selector	1

Note: Do not order on part numbers only; see Page 12



INTERMEDIATE SHAFT GROUP UXB 1929

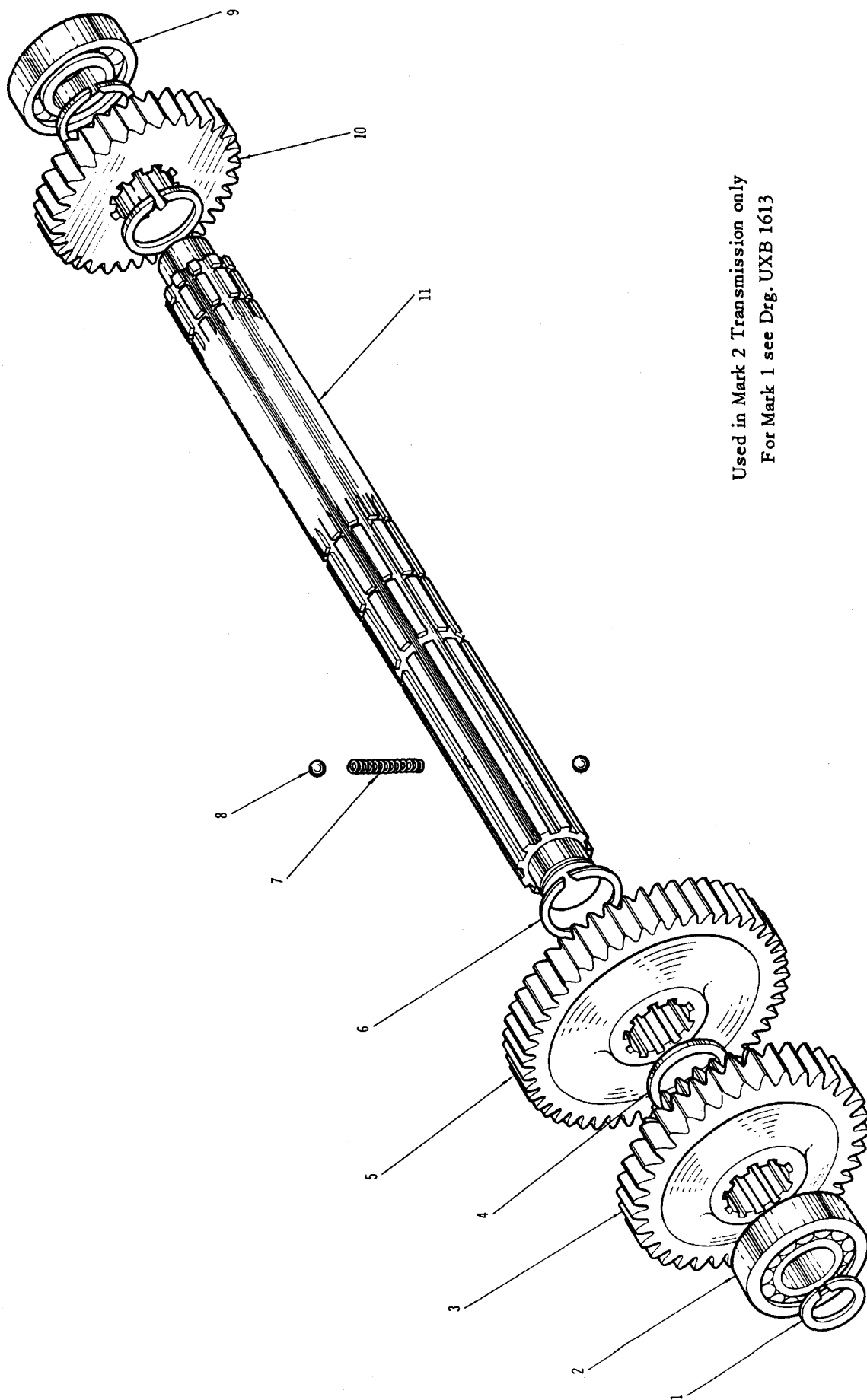
Item	Part No.	Description	No Off
1	M-179-A	BEARING, ball (309-S)	1
2	UB-1914	GEAR, high, 31T	1
3	M.201213-W	RING, snap	3
4	UB-1918	SHAFT, intermediate	1
5	UB-1915	GEAR, low, 48T	1
6	UA-1592	BEARING, roller (B-1309-L)	1

FOR MARK I DROP BOXES UXB 1587

Substitute in UXB 1929

2	UB-1589	GEAR, high, 31T	1
4	UB-1590	SHAFT, intermediate	1
5	UB-1588	GEAR, low, 48T	1

Note: Do not order on part numbers only; see Page 12



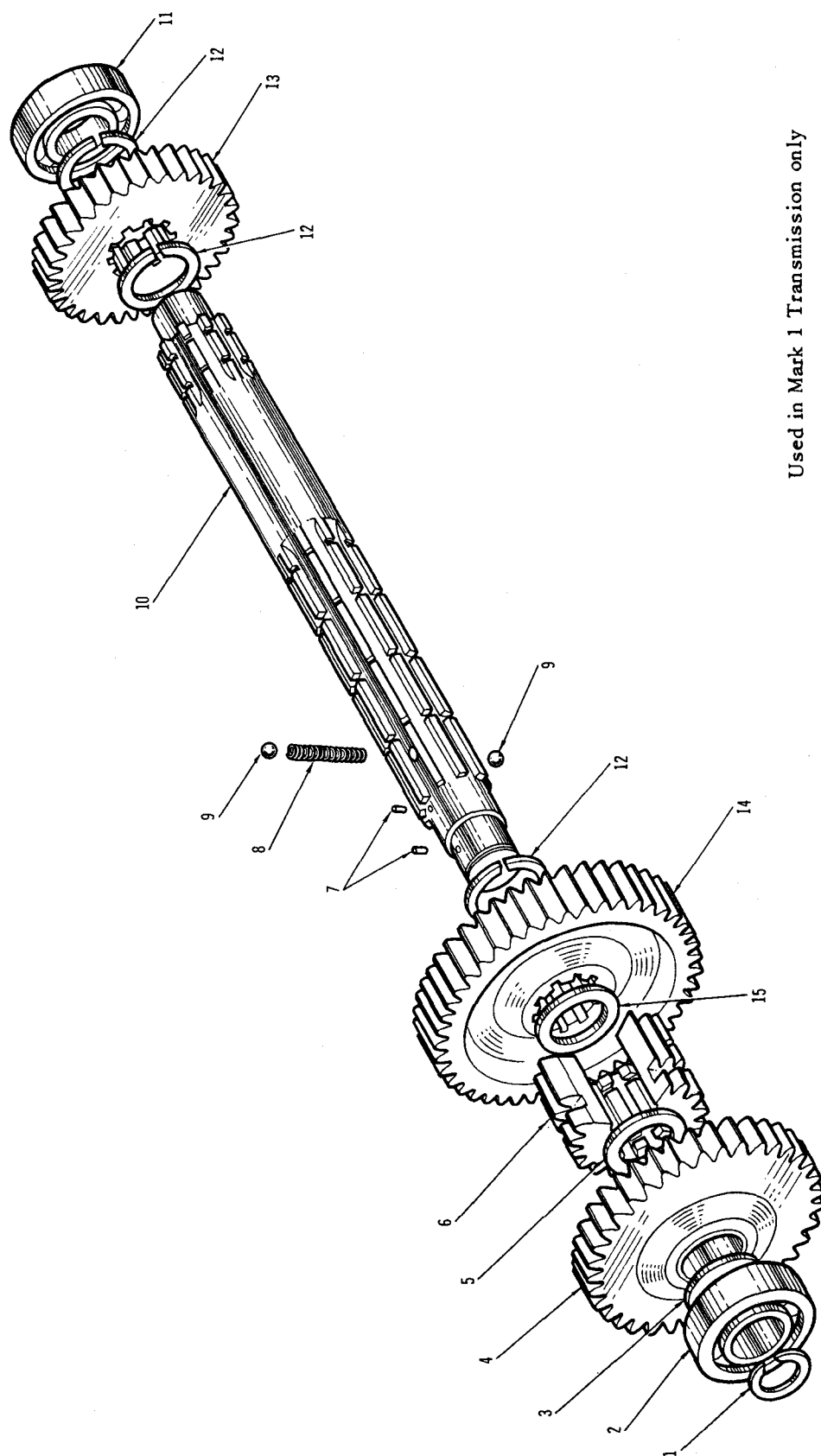
Used in Mark 2 Transmission only
For Mark 1 see Drg. UXB 1613

OUTPUT SHAFT GROUP UXB-1928
Mark 2 Drop Boxes Only

Item	Part No.	Description	No Off
1	A-2903-Z	RING, snap	1
2	UA-1554	BEARING, roller (MR-1307-EL)	1
3	UB-1916	GEAR, sliding (19 and 36 T)	1
4	M-2074-X	RING, lathe cut	1
5	UB-1492	GEAR, low output (53T)	1
6	A-2622-W	RING, snap	3
7	UA-1801	SPRING	1
8	M-1990-D	BALL, steel	2
9	M-172	BEARING, ball (307-M)	1
10	206308	GEAR, high output (37 T)	1
11	UB-1917	SHAFT, output	1

As from Serial No. TR-4765 Output Shaft Group UXB 1928 becomes Output Shaft
Group UXB-3325 with following part changes

Item	Part No.	Description	No Off
3	UB-3324	GEAR, sliding (19 and 36 T)	1
7	UA-3334	SPRING	1
8	M-1990-E	BALL, steel	2
11	UB-3322	SHAFT, output	1



Used in Mark 1 Transmission only

OUTPUT SHAFT GROUP UXB 1613

Mark 1 Drop Boxes Only.

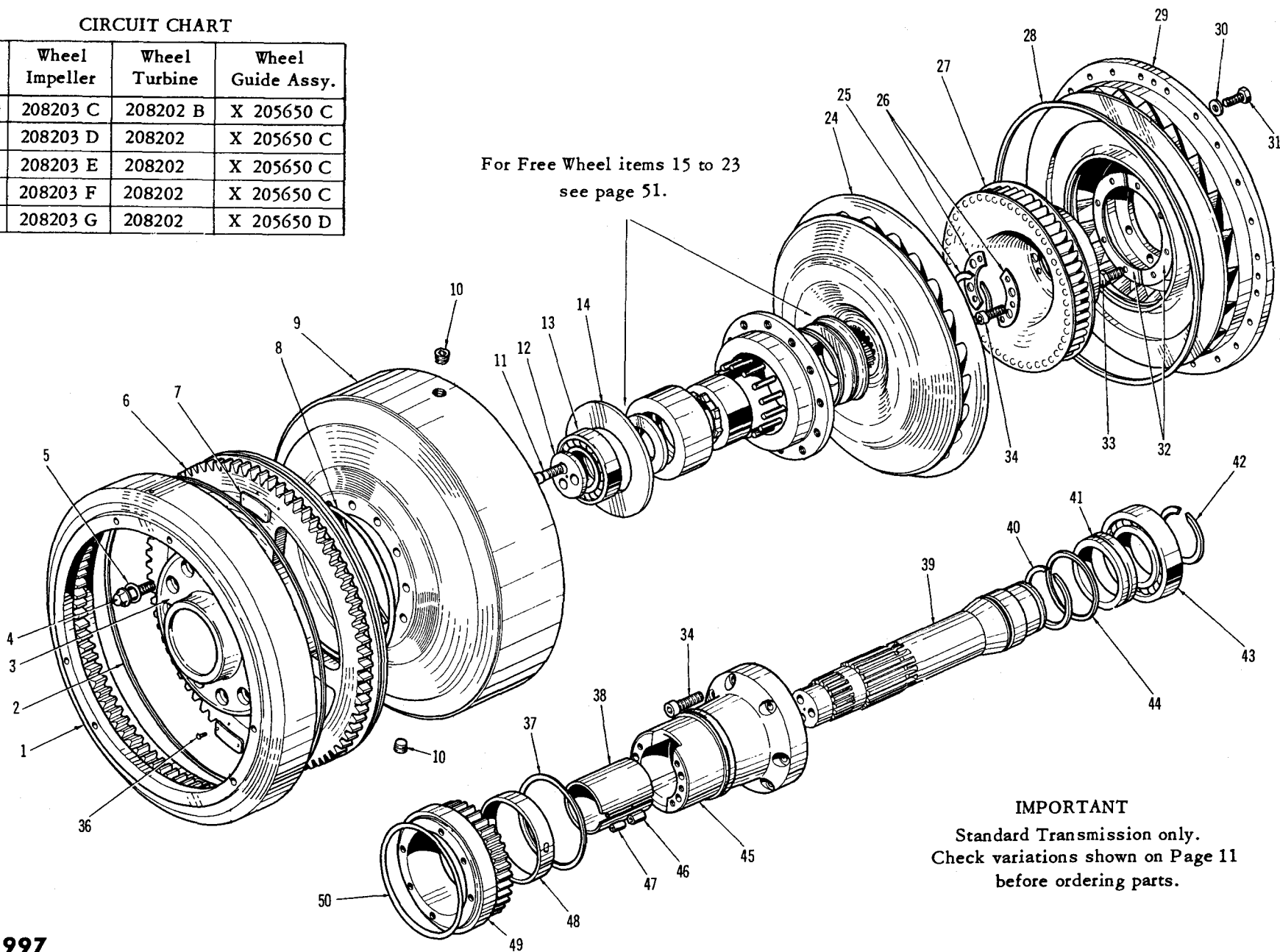
Item	Part No.	Description	No Off
1	A-2903-Z	RING, snap	1
2	UA-1554	BEARING, roller (MR-1307-EL)	1
3	UA-1582	WASHER, thrust ($1\frac{3}{8}$ bore)	1
4	UXB-1573	GEAR, high driver assy. (consists of):	1
	UB-1574	GEAR, (36 T)	1
	UA-1575	BUSHING	1
5	UA-1559	WASHER, thrust ($1\frac{3}{8}$ bore)	1
6	UB-1799	GEAR, sliding (19 T)	1
7	UA-1663	PIN, roll ($\frac{1}{8}$ " x $\frac{3}{8}$ ")	2
8	UA-1801	SPRING	1
9	M-1990-D	BALL, steel	2
10	UB-1800	SHAFT, output	1
11	M-172	BEARING, ball (307-M)	1
12	A-2622-W	RING, snap	3
13	UB-1561	GEAR, high output (28 T)	1
14	UB-1563	GEAR, low output (44 T)	1
15	M-2074-X	RING, lathe cut.	1

Note: Do not order on part numbers only; see Page 12

CIRCUIT CHART

MS	Wheel Impeller	Wheel Turbine	Wheel Guide Assy.
200	208203 C	208202 B	X 205650 C
235	208203 D	208202	X 205650 C
280	208203 E	208202	X 205650 C
335	208203 F	208202	X 205650 C
400	208203 G	208202	X 205650 D

For Free Wheel items 15 to 23
see page 51.

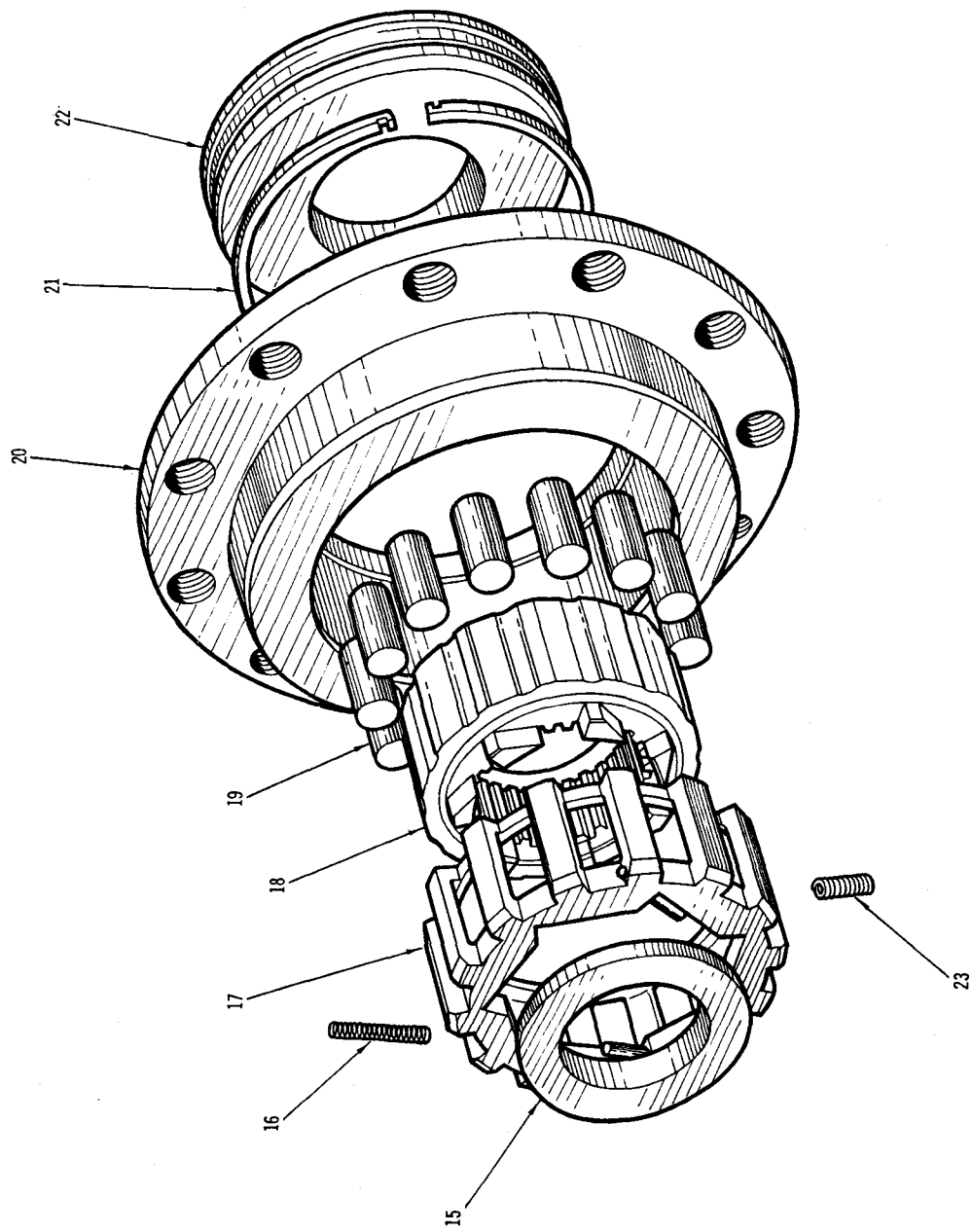


IMPORTANT
Standard Transmission only.
Check variations shown on Page 11
before ordering parts.

HYDRAULIC TORQUE CONVERTER UXC.1997

Item	Part No.	Description	No Off
1	P-1099	RING, driving	1
2	201963-C	GASKET, ring	1
3	M-1927-AX	PIN, roll ($\frac{1}{8}$ " x $\frac{7}{8}$ "	2
4	PM-1253-B	SCREW, hex. washer hd. ($\frac{3}{8}$ " - 24 x 1.37)	12
5	A-2916-BY	RING, "O" (.56" O.D.)	12
6	P-1249	SPIDER, drive	1
7	P-1102-A	PLATE, name	1
8	A-2916-AH	RING, "O" (6.5" O.D.)	1
9	P-1270-A	HOUSING, rotating	1
10	M-2051-F	PLUG, pipe ($\frac{1}{8}$ "	2
11	M-1731-AJ	SCREW, socket head cap. ($\frac{3}{16}$ " - 24 x .75)	3
12	P-1271	WASHER, clamp	1
13	M-2104	BEARING, ball (208-S)	1
14	P-1256	WASHER, bearing	1
15	P-1250	SPACER, freewheel	1
16	201341-AB	SPRING, return	2
17	205388	CAGE, freewheel	1
18	208530	CAM, freewheel	1
19	201633	ROLLER	14
20	208531-B	RACE, freewheel outer	1
21	M-1904-BW	RING, piston (3.50" Dia.)	1
22	P-1255-A	CARRIER, piston ring	1
23	201341-AC	SPRING, bumper	5
24	208202 Series	WHEEL, turbine See Circuit Chart, page 48	1
25	A-2622-Z	RING, external snap (Turbine Wheel)	1
26	201930-C	PLATE, clamp	2
27	X-205650-C Series	WHEEL, guide assembly (consists of): See Circuit Chart, page 48	1
	205651	RING, guide	1
	201855	BLADE, guide	48
	205650-C	WHEEL, guide	1
	203475	DEFLECTOR, guide	1
28	201471-AQ	GASKET, ring (Impeller)	1
29	208203-D Series	WHEEL, impeller See Circuit Chart, page 48	1
30	A-2888-AF	WASHER, flat ($\frac{3}{16}$ "	24
31	M-2001-M	SCREW, hexagon head cap. ($\frac{3}{16}$ " - 18 x .87)	24
32	201951	PLATE, clamp	2
33	M-2001-K	SCREW, hexagon head cap. ($\frac{3}{16}$ " - 24 x .75)	8
34	M-1732-S	SCREW, socket head cap. ($\frac{3}{16}$ " - 18 x 1.0)	6
36	M-422	SCREW, drive	2
37	M-1904-U	RING, piston (3.687" Dia.)	1
38	201836-C	SLEEVE	1
39	P-1272	SHAFT, output	1
40	A-2622-B	RING, external snap (Piston Ring Carrier)	1
41	P-1056	CARRIER, piston ring	1
42	A-2622-U	RING, external snap	1
43	M-2293	BEARING, ball (211-S)	1
44	M-1904-AH	RING, piston (3.00" Dia.)	1
45	P-1046	CARRIER, guide	1
46	M-1927-BM	PIN, roll, ($\frac{7}{32}$ " x $\frac{5}{8}$ "	4
47	M-1927-AK	PIN, roll, ($\frac{3}{8}$ " x $\frac{5}{8}$ "	4
48	201821	BUSHING	1

Note: Do not order on part numbers only; see Page 12



HYDRAULIC TORQUE CONVERTER UXC.1997 (Continued)

49	UB-1968	GEAR, pump drive	1
50	M-201399-AN	RING, "O" (5.0" O.D.)	1
51	P-1101	TAG, instruction	1

ALTERNATIVE

6	UC-1854	SPIDER, drive	1
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VARIATIONS FROM HOUSING GROUP UXD 1666 (page 31)

FOR HOUSING GROUP UXD 1790

Substitute in UXD 1666

Item	Part No.	Description	No Off
42	UXB-1872	ADAPTOR, assembly (consists of):	1
	UD 1694	ADAPTOR	1
	UA-1875	TUBE	1
	UA 1696	GASKET, top front	1
	UA 1695	PLATE, cover, top front	1
	UA-1974-A	PLUG, drain (with washer UA-1975-A)	1

FOR HOUSING GROUP UXD 1553

Substitute in UXD 1666

41	UB 1614	FLANGE, output	1 delete
	UA 1558	SLEEVE, output	1 add

FOR HOUSING GROUP UXD 1741

Substitute in UXD 1666

42	UXB-1872	ADAPTOR, assembly (consists of):	1
	UD 1694	ADAPTOR	1
	UA 1875	TUBE	1
	UA 1696	GASKET, top front	1
	UA 1695	PLATE, cover, top front	1
	UA 1558	SLEEVE, output	1
42	UA-1974-A	PLUG, drain (with washer UA-1975-A)	1

FOR HOUSING GROUP UXD 1787

Substitute in UXD 1666

16	UA-1470	GASKET, top front	1
ADD	201963-C	GASKET RING, front bulkhead	1
	UA-1471	GASKET, top rear	1
DELETE			
11	UC-1548	GASKET, adaptor to housing	1

FOR HOUSING GROUP UXD 2104

Substitute in UXD 1666

Item	Part No.	Description	No Off
12	UC-2613	CARRIER, bearing	1
32	UD-1856	HOUSING, main	1
ADD	UA-1754	GASKET, (Bearing Retainer)	1
	UA-1753	RETAINER, Bearing	1
	UA-1760	RETAINER, Bearing	1

Not shown

	UA-1876	TUBE, drain	1
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FOR HOUSING GROUP UXD 2215

Substitute in UXD 1666

Item	Part No.	Description	No Off
15	UD 2137	ADAPTOR front	1
16	UA 2195	GASKET, top front	1
17	UA-2194	PLATE, cover, top front	1
41	UA 1558	SLEEVE, output	1
ADD	UC-1556	GASKET, extension housing	1
	UD-2180	HOUSING, extension	1
	M-2027-N	NUT, hex, $\frac{3}{8}$ -24 (Ext Hsg.)	3
	UA-1974-D	PLUG, drain ($\frac{3}{4}$ " BSP)	2
	M-2002-AZ	SCREW, (Ext.Hsg.)	12
	M-2002-AS	SCREW, (Ext.Hsg.)	3
	UA-1975-D	WASHER	1
DELETE	A-2952-E	RING, snap	1

When used with Drop Box, Item 21 (See P.31), should include additional Bearing Retainer, Part No. UA-2354 - 1 off, Shim Plate Part No. UA-2353 - 1 off, Shim Set Part No. UA-2356-A/D as required and Retaining Screws Part No. M-2082-E - 4 off.