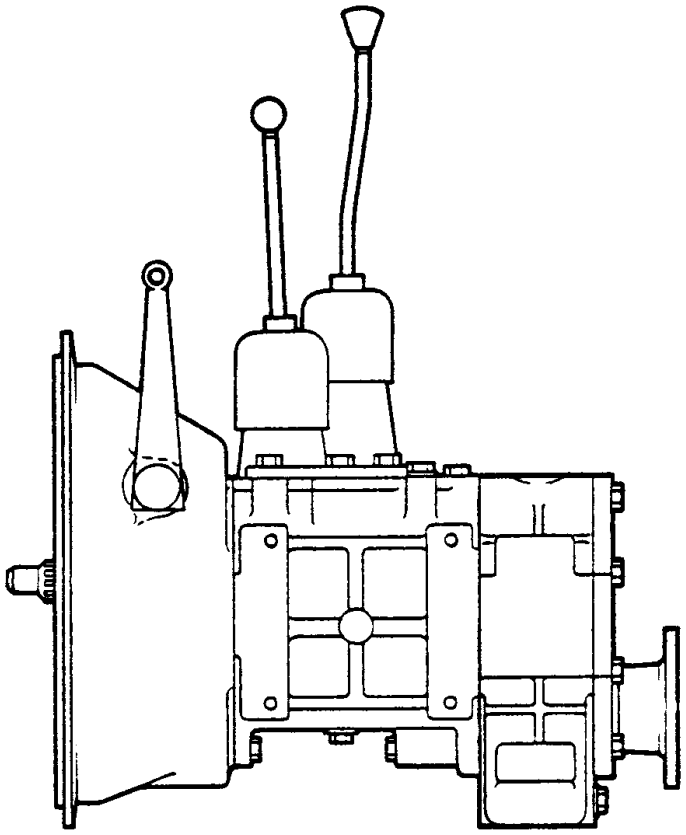
NEWAGE 29TRA GEARBOX



WORKSHOP MANUAL

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INTRODUCTION

Winget Limited gratefully acknowledge the assistance given by Newage Transmissions Limited in the preparation of this manual, however neither Winget Limited or Newage Transmissions can be held responsible for any errors or omissions.

The procedures described within this manual should enable experienced service personnel to strip, repair and re-build Newage 29TR Gearboxes fitted to Winget Site Dumpers in a safe and competent manner. The procedures are not intended to be used by personnel who are unfamiliar with Winget products nor mechanically inexperienced.

It is assumed that personnel are aware of the Health & Safety Regulations, which should be applied, but the following should act as a reminder.

Whenever possible any repairs or service should be carried out in a clean environment. If work must be carried out on site or in the field steps should be taken to ensure that dirt or foreign materials cannot enter the assembly.

Ensure all works tools are in good condition and only use the correct tool for the job in hand.

Always wear safety spectacles when using soft or hard-faced hammers, chisels, drifts or when using air tools. Wear safety spectacles when cleaning components or when grinding.

Do not misuse airlines and be aware of the damage compressed air can cause if misused.

Always make sure lifting equipment is in good condition and the Safe Working Load exceeds the weight of the component to be lifted.

Always use suitable supports i.e. axle stands or baulks of timber in conjunction with hydraulic jacks etc. Never rely on hydraulic jacks alone to support a machine.

Be aware of hot surface temperatures and take care when draining hot oils. Always dispose of waste oils in accordance with local and national regulations.

Whenever possible always disconnect the battery or battery isolator when working on the machine to prevent electrical shorts and unauthorised starting.

Refer to the operator's handbook for a guide to the correct sequence for assembling components and sub-assemblies.

Oils, fuels, silicone sealer etc can cause skin diseases if allowed to contaminate the skin. Always apply barrier creams, wear suitable protective clothing or when

contamination is unavoidable clean the area with soap and water as soon as possible. Do not use thinners or other solvents to clean skin.

Health & Safety is a matter of common sense. If common sense is applied correctly the risk of accidents can be reduced.

Spares for Newage Gearboxes fitted to Winget Equipment can only be obtained from Winget Limited or one of our authorised distributors and not from Newage Transmissions Limited.

Always quote your machine's serial number and model together with the gearbox serial number and model when ordering spare parts.

Newage Gearboxes are designed to operate under arduous conditions and providing they are regularly and correctly maintained they will provide long trouble free service.

The contents of this manual although correct at the time of publication, may be subject to alteration by the manufacturers without notice and Winget Limited can accept no responsibility for any errors or omissions contained within the following pages. Nor can we accept any liability whatsoever arising from the use of this manual howsoever caused.

Winget Limited operate a policy of continuous product development. Therefore, some illustrations or text within this publication may differ from your machine.

SERVICING INSTRUCTIONS FOR 29TR AND 39TR GEARBOXES.

BASIC GEARBOX WITH CLUTCH HOUSING; 29TRA AND 39TRA.

Dismantling procedure

1. Drain all oil from gearbox and dispose of correctly and in accordance with local environmental regulations.
2. Remove complete gear lever(s) and turret(s) by undoing six off 8mm screws.
3. Remove output coupling by bending back locking tab and unscrewing the 12mm screw. Pull off the coupling using a pulley extractor if necessary.
4. The back plate can now be removed by taking out six off 10mm screws and 2 off 10mm bolts.
5. Remove front plate by taking out six off 6mm screws, the tolerance shims from the ends of the primary and layshafts will now be exposed: remove them with care avoiding damage.
6. Unscrew the seven off 10mm screws (5 inside bell housing, 2 outside), and remove the bell housing. It may be necessary to remove the clutch operating lever first, so that the clutch cross shaft and fork can be moved to one side, in order to gain access to some of the screws. The input shaft can now be withdrawn from the box.
7. Undo the 6mm screw and remove the selector shaft locking plate at the rear of the gearbox.
8. The shaft assemblies including selector shaft and forks can now be withdrawn from the box.
9. Remove selector forks from selector shaft taking care not to lose the detent balls and springs.
10. Removal and re-assembly of the baulk plate is self explanatory.

N.B.

When dismantling shaft assemblies, general press techniques can be used, but special attention must be paid to ensure that no damage occurs to the taper roller bearings or their cages.

Re-assembling the gearbox

To re-build the gearbox, reverse the above procedure, paying special attention to the following points:

1. To re-assemble the forks to the selector shaft a simple method of retaining the ball and spring is to insert a short piece of ½" dia bar with a long leading edge into the fork; the selector shaft is then passed through the fork ejecting the 'Dummy' bar.
2. The re-building of shafts, gears and bearings is self explanatory, provided that care is taken to avoid damage.

Re-assembling the gearbox (contd.)

3. The main shaft layshaft, selector shaft and forks, can be fitted together as a sub-assembly, and replaced en bloc into the main case. Fit the locking strip to secure.
4. Stand the gearbox up on its end and fit the bell/housing.
5. The input shaft can now be fitted in place.
   Very Important: Make sure that the oil slot in the end of the shaft aligns with the slot in the slider.
6. When fitting the front plate care must be taken not to damage the lip seal on the splines of the input shaft.
7. Assuming that the same shafts and gears are being re-used with the original casing the original number of shims that came out can be used. If however, any of the above components have been replaced the gearbox will have to be re-shimmed, as described later.
8. When replacing the ratio change turret the gearbox must be in neutral gear.
9. The nut retaining the output coupling must be re-tightened to 150 lbf.ft (20.75 k.p.m.) torque.

Re-assembly - general notes

1. If the gearbox has been on continuous heavy duty it is advisable to replace bearings and oil seals as a matter of course.
2. Any gaskets, tab washers or circlips removed in the course of dismantling should be discarded and replaced by new ones. Oil seals should not be removed from their housings unless they are to be discarded and new ones fitted.
3. When fitting new oil seals they should be pressed in with a flat steel plate which covers their entire area, otherwise they may buckle and be spoiled.
4. Output couplings frequently show heavy wear where the seal has been in contact with them. When this condition is observed, the coupling should be replaced.
5. Ensure that the gearbox rotates freely in all gears.
   Check that all nuts and bolts are tight and fill the gearbox with the recommended oil to the level shown on the dipstick.
6. Ensure that the spring loaded baulk plate can pass freely over the tops of the selector forks.

Re-shimming procedure.
Layshaft

The layshaft is shimmed to size - 0.002" clearance. The method of measuring the clearance is as follows: Stand the gearbox with the bell housing facing upwards, press the outer cone of the bearing firmly down whilst rotating the shaft,

then using a depth micrometer, measure between the face of the housing and the top of the bearing outer, as shown in Fig. 1.
The shims are obtainable in thicknesses of 0.010" and 0.002".
If for example the measurement arrived at (after subtracting 0.006" for gasket thickness) is 0.023", then the correct shims to fit will be 2 off at 0.010" plus 1 off at 0.002", giving 0.001" float in the layshaft assembly.

N.B.

When fitting the shims use a light film of grease to retain them in the bore. (Care must be taken not to trap the shims between adjacent faces.)

Mainshaft:

The mainshaft is pre-loaded to 0.001" - 0.003 interference fit. Whilst rotating the shaft press the bearing outer cone firmly down then using a depth micrometer measure from the top of the cone to the face of the bell housing as shown in Fig 2, then measure the bore in the front plate as shown in Fig.3.
Subtract the measurement in Fig. 2 from the measurements in Fig 3.
The shims are obtainable in thicknesses of 0.010" and 0.002".
If for example the measurement arrived at (after subtracting 0.006" for gasket thickness) is 0.033" then the correct shims to fit would be 3 off at 0.010" plus 3 off at 0.002" giving 0.003" interference to the shaft assembly.

N.B.

a. The bell housing bolts must be tight when calculating shimming requirements.
b. After shimming and re-fitting of the front plate etc, check that there is no side play on the input shaft.

MEASURING END FLOATS AND SHAFT CLEARANCES

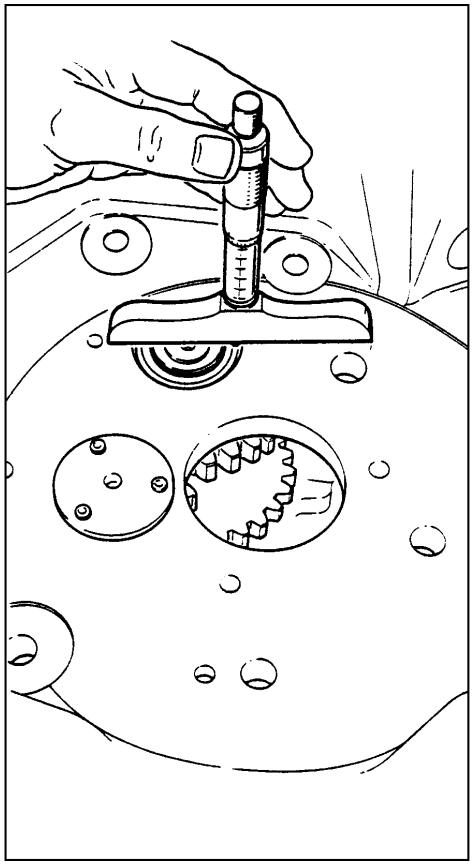


FIG 1, Measuring the layshaft end float

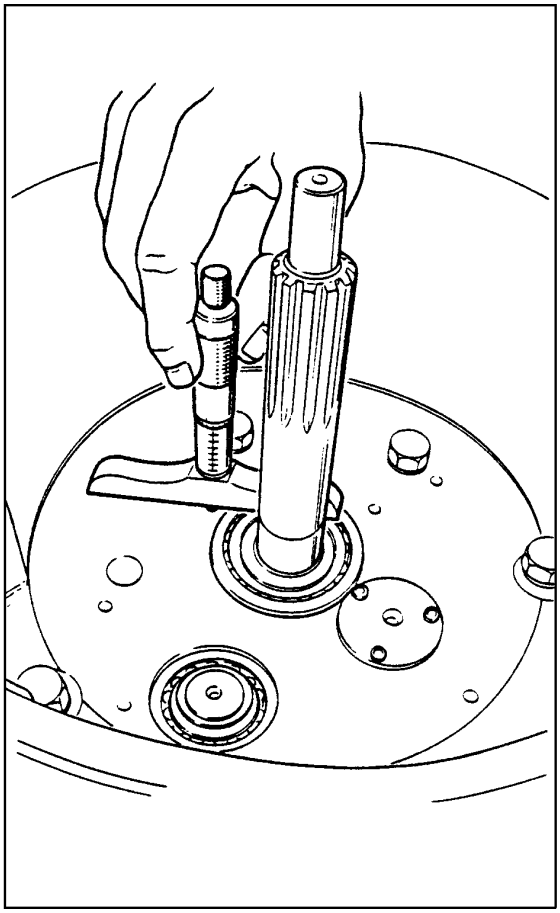


FIG 2, Measuring main shaft clearances

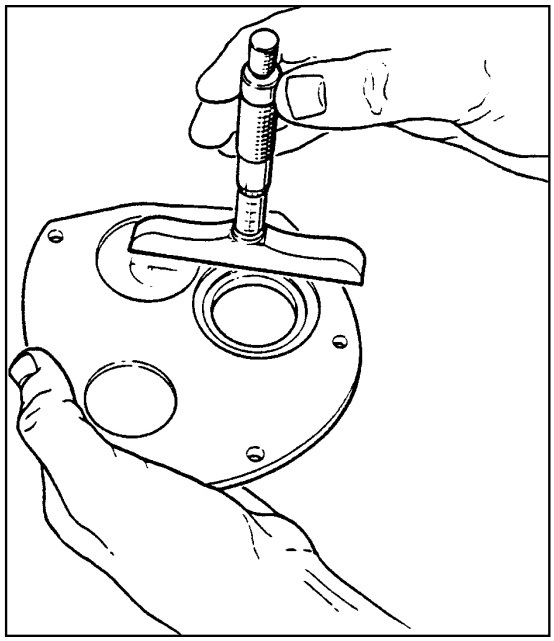


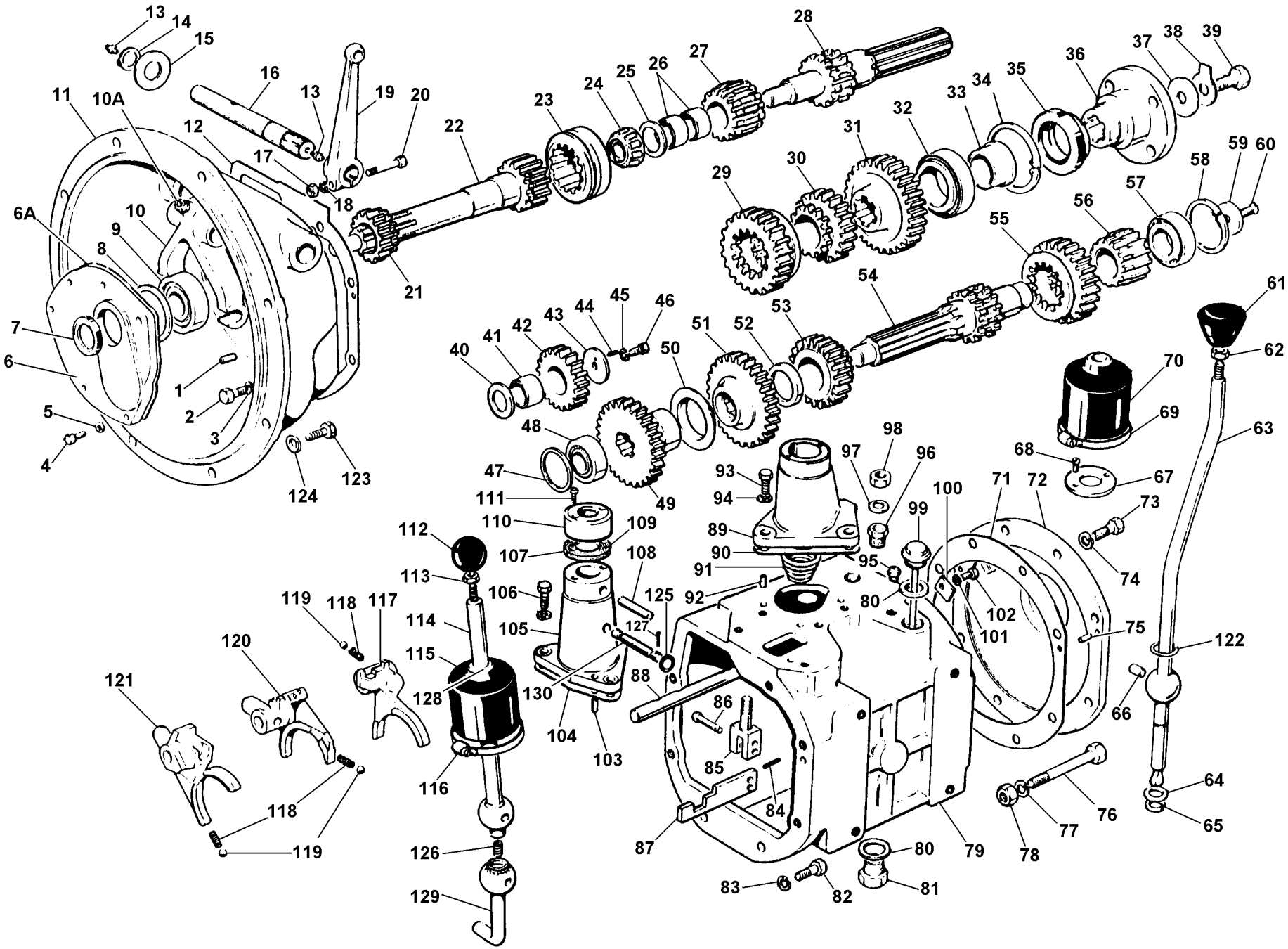
FIG 3, Measuring the depth of the bearing outer bore in the front plate.

NEWAGE 29TR GEARBOX

Item No	Description	Qty
	29TRA GEARBOX	
	Gearbox (Complete)	
1	Dowel 1/4" x 5/8" Long	2
2	Screw M10 x 30mm Long	5
3	Spring Washer M10	5
4	Screw M6 x 20mm Long	6
5	Washer, Nyltite	6
6	Front Cover	1
6A	Joint	1
7	Oil Seal	1
8	Shim	1
8	Shim	1
9	Taper Bearing	1
10	Clutch Fork	1
10A	Cotter Pin, Nut & Washer	1
11	Clutch Housing S/A	1
	Clutch Housing	1
	Clutch Shaft Bush (not illustrated)	2
	Idler Shaft (Not illustrated)	1
	Rivet (Not illustrated)	3
12	Gasket	1
13	Grease Nipple	2
14	Circlip	1
15	Washer	1
16	Clutch Shaft	1
17	Nut	1
18	Spring Washer	1
19	Clutch Release Lever	1
20	Bolt M6 x 40mm Long	1
21	Reverse Spd. Gear	1
22	Primary Shaft	1
23	Shifter Ring	1
24	Taper Bearing	1
25	Thrust Washer	1
26	Needle Bearing	2
27	Forward Pinion	1
28	Mainshaft	1
29	Sliding Gear	1
30	3rd Speed Wheel	1
31	1st Reduction Gear	1
32	Taper Bearing	1
33	Bearing Sleeve	1
34	Circlip	1
35	Oil Seal	1
36	Coupling	1
37	Washer	1
38	Lockwasher	1
39	Screw M12 x 25mm Long	1
40	Thrust Washer	1
41	Needle Bearing	1
42	Reverse Pinion	1
43	Thrust Washer	1
44	Spirol Pin 3mm dia x 8mm Long	1
45	Spring Washer	1
46	Screw	1
47	Shims	A/R
47	Shims	A/R
48	Taper Bearing	1
49	Reverse Wheel	1
50	Thrower	1
51	First Redn. Gear	1
52	Spacer	1
53	3rd Speed Wheel	1

FOR PART NUMBERS REFER TO RELEVANT PARTS & OPERATORS MANUAL

NEWAGE 29TRA GEARBOX



NEWAGE 29TR GEARBOX

Item No	Description	Qty
	29TRA GEARBOX	
54	Layshaft	1
55	Sliding Gear	1
56	First Speed Pinion	1
57	Taper Bearing	1
58	Circlip	1
59	Washer	1
60	Screw, csk. M8 x 16mm Long	1
61	Knob, Gear Lever	1
62	Nut	1
63	Gear Change Lever	1
64	Washer	1
65	Spring Ring	1
66	Dowel	1
67	Retaining Plate	1
68	Screw, ch. Head	2
69	Jubilee Clip	1
70	Cover	1
71	Gasket	1
72	End Plate	1
73	Screw M10 x 25mm Long	6
74	Spring Washer	6
75	Dowel	2
76	Bolt	2
77	Spring Washer	2
78	Nut	2
79	Gearbox Casing	1
80	Washer, Marseline	2
81	Drain Plug	1
82	Screw M10 x 30mm Long	2
83	Spring Washer	2
84	Split Pin	2
85	Interlock Stud	1
86	Clevis Pin	2
87	Baulk Plate	1
88	Selector Shaft	1
89	Turret	1
90	Joint	1
91	Spring	1
92	Spirol Pin 6mm dia x 14mm Long	2
93	Screw M8 x 20mm Long	3
94	Spring Washer	3
95	Breather	1
96	Support Plug	1
97	Wahser, Nyltite	1
98	Nut M8	1
99	Dipstick/Filler	1
100	Lock Strip	1
101	Spring Washer	1
102	Screw M6 x 16mm Long	1
103	Spirol Pin 6mm dia x 14mm Long	2
104	Joint	1
105	Turret	1
106	Spring Washer	3
107	Screw M8 x 20mm Long	3
108	Pivot Pin	1
109	Felt Washer	1
110	Retaining Plate	1
111	Screw, ch. Head	2
112	Knob, Fwd./Rev. Lever	1
113	Nut	1
114	Gearlever, Fwd./Rev.	1
115	Cover	1
116	Jubilee Clip	1

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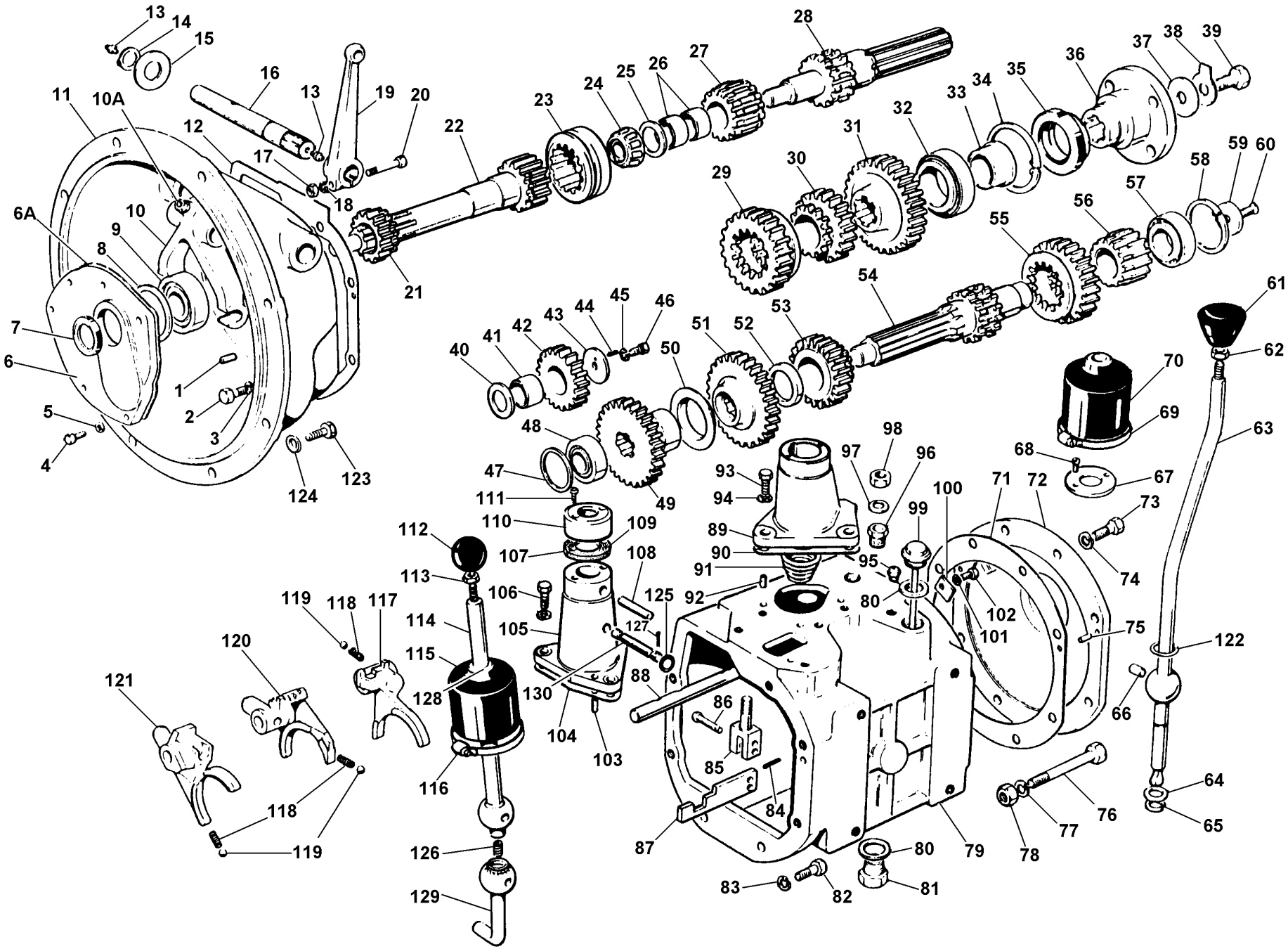

NEWAGE 29TR GEARBOX

Item No	Description	Qty
	29TRA GEARBOX	
117	Selector Fork	1
118	Spring	3
119	Detent Ball	3
120	Selector Fork	1
121	Selector Form, Fwd./Rev.	1
122	Spacing Ring	1
123	Bolt Hex. Hd. 3/8" UNC x 1 1/4" Long	8
124	Spring Washer	8
125	"O" Rings	2
126	Spring	1
127	Split Pin	2
128	Spring Retainer	1
129	Lever End	1
130	Pivot Pin	1

NEWAGE TRANSMISSIONS: TORQUE VALUES FOR FASTENERS WITH CLEAN & DRY THREADS

IMPERIAL IN POUNDS-FEET (LBF-FT) PLAIN THREADS									
	GRADE S			GRADE V			GRADE X		
SIZE	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.
1/4	8	10	7	11	13	10	14	16	12
5/16	17	19	14	23	26	19	28	32	23
3/8	30	35	26	41	47	35	50	58	43
7/16	48	55	40	65	75	55	79	91	67
1/2	73	84	62	100	115	85	121	140	103
5/8	146	168	124	200	230	170	243	279	206
3/4	255	294	217	349	402	297	423	487	360
1"	606	696	515	829	953	704	1004	1155	853

METRIC IN NEWTON/METRES (Nm) PLAIN THREADS									
	GRADE 8.8			GRADE 10.9			GRADE 12.9		
SIZE	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.
5	6	7	5	8	9	7	10	11	8
6	10	11	8	14	16	12	17	19	14
8	24	28	20	33	37	29	40	47	34
10	48	56	40	67	77	57	80	92	68
12	83	96	72	115	130	100	140	161	119
16	206	210	160	280	320	240	347	399	295
20	401	450	340	560	640	480	677	779	576
24	694	770	570	920	1040	800	1171	1347	995

IMPERIAL IN POUNDS-FEET (LBF-FT) COATED THREADS, ZINC & ZINC PASSIVATED									
	GRADE S			GRADE V			GRADE X		
SIZE	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.
1/4	10	12	9	14	16	12	17	20	15
5/16	21	24	18	28	33	24	35	40	29
3/8	38	43	32	52	59	44	63	72	53
7/16	59	68	51	81	94	69	99	113	84
1/2	91	105	78	125	144	106	152	174	129
5/8	183	210	156	250	288	213	303	349	258
3/4	319	367	271	437	502	371	529	609	450
1"	757	871	643	1036	1191	881	1255	1443	1067

METRIC IN NEWTON/METRES (Nm) COATED THREADS, ZINC & ZINC PASSIVATED									
	GRADE 8.8			GRADE 10.9			GRADE 12.9		
SIZE	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	MIN.
5	7	8	6	10	12	9	12	14	10
6	12	14	10	17	20	15	21	24	18
8	30	34	25	42	48	36	51	58	43
10	59	68	50	84	96	71	100	115	85
12	104	119	88	146	168	124	175	201	149
16	257	296	219	362	416	307	434	499	369
20	502	577	426	706	811	600	847	974	720
24	868	998	737	1220	1403	1037	1464	1684	1244