



MAINTENANCE AND PARTS MANUAL

Metal Working



ENGINE LATHE MODEL: PL-1860E-1.0

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Book 2 of 3

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LUBRICATION AND MAINTENANCE

⚠ WARNING: Make sure the electrical disconnect is OFF before working on the machine.

Maintenance should be performed on a regular basis by qualified personnel. Always follow proper safety precautions when working on or around any machinery.

Daily Maintenance

- Do a general cleaning by removing dust and metal chips from the machine.
- Top off the coolant tank. (80% of full tank capacity)
- Clean drain screen.
- Check that any guarding, shields, and emergency stop are in good working order.
- Inspect brake pedal and brake switch for proper operation.
- Wipe down and re-oil slideways.

Check before start the motor.

- Clean-up of machine. Dust, chips and other articles should be removed from sliding surface of machine to make the rotating or sliding parts performing easy and smoothly. All other static parts are often also cleaned to avoid the corrosion.
- Regular oiling should be done every day to keep the machine properly lubricated.
- Check all the running parts not too tight, or loose. Bearings of headstock, longitudinal and cross feed, tool holders etc. would be examined and adjusted by hand to proper fitness.
- Check the sensitivity & reliability of all manual control levers. To try the speed change rate function of headstock feeds and apron in gear box and inspect their starting, stopping and forward & reverse action whether they are sensitive and reliable or not.
- Fixture and jig of headstock, tailstock and tool holder. Tight clamping between tailstock and bed surface, close running fit of spindle in tailstock, clamp bolts of tool holder, and jigs on headstock.

Check after start the motor.

- To check electrical control system, try to put "on" and "off" button and examine the sensitiveness of starting, stopping and pilot lamp strictly.
- The sensitivity and reliability of mechanical control device. Control levers for forward and reverse main spindle, automatic feeds and threads change should be sensitive and reliable. Automatic control devices for longitudinal and cross feed, gear change threads change, carriage, and spindle direction change should be accurate also.



- Limitation of noise and vibration. When starting max speed of headstock spindle on no loading basis, check the noise and vibration whether they are over specified limit or not.
- Check the quantity of coolant oil and start the oil pump for inspecting its function and leakage.
- Examine all Lubricating system carefully and ensure all flowing line without obstacles.

Caution during operation:

- Temperature of bearings. Touch the main bearing by hand and feel the temperature is normal or not.
- Temperature of motor. Feel the temperature of motor bearing at the case of full load.
- Noise and vibration. If you find the noise and vibration of the machine are abnormal or irregular. Stop the machine immediately for inspection and adjustment.
- Quality of products. If you discover the quality of products is out of limit, stop the machine at once for finding the causes of defects.
- Safety affairs.
 - a. Must stop operation when you leave the machine.
 - b. When changing main spindle speed or feeding speed stop running first.
 - c. All tools and products are strictly not allowing to be left on sliding surface of bed.

Check after operation:

- Cleaning and collection of all tools. All tools should be kept clean first then put back to original position (tool cabinet).
- Proper position of tailstock, carriage & tool holder. Tailstock, carriage & tool holder should be placed to proper position.
- Clean-up of machine. All of the oily matters, chips etc., on the machine should be removed completely and put a thin lubricating oil on the sliding surface of machine to prevent the corrosion.

Weekly Maintenance

- Thoroughly clean the machine including the coolant tank.
- Check sight glasses for gear oil levels (add oil as needed)



3 Month Maintenance

- After initial 3 months replace the headstock, gearbox, and apron oil and then every six months after that.
- Dismantle and clean all the dust, chips and foreign matter from moving parts.
- Electrical system. Carefully examine the connection of all electrical wires, terminals and switches, which occasionally have been damaged by chips or other.

Semi-yearly Inspection:

- Change oil in gearbox. Remove the used oil from gearbox of headstock, feed and replenish with fresh oil.
- Check the wear and tear of all gears and packing. Inspect the damage of all gears in various box, spindle and bearings, and packing. Repair or replace it if necessary.
- Check the clearance fit of complicated feed mechanism. Check the clearance fit between feeding screw lever and nut and main screw spindle and nut whether they are right or not.
- The stability of machine body. Tighten up the foundation bolts of machine body to the ground and make the body stable.

Yearly Inspection:

- Positioning and leveling. According to the inspection regulation, recheck the positioning and leveling after a year service.
- Inspection for accuracy. Inspection work for accuracy should be rechecked. If the accuracy is over specified limit, the adjustment or alignment will be done accordingly.
- Bearing inspection. Reexamine the insulating materials and clearance fit & lubrication of all bearings.
- Inspection for appearance.
 - a. If paints are peeled off, repaint it with the same color.
 - b. Check the exposed parts whether they have been damaged, corroded, or deformed, repair or replace them if necessary.

Oil Disposal

Used oil products must be disposed of in a proper manner following your local regulations.



Accessing and Cleaning the Coolant System

The coolant tank is located at the back of the lathe and is an integral part of the frame.

- Remove either the end or the back cover for access to the reservoir. (back cover shown)
- To access the motor and pump remove the rear panel.
- Suction the coolant from the tank and wash out any dirt and debris. (Check for anything that might be obstructing the pump inlet.)
- Refill the tank with coolant solution. (80% of full tank capacity)
- Fill the coolant reservoir directly through the access cover openings or by carefully pouring fresh coolant into the drip tray under the lathe bed and allowing it to drain back to tank.
- Replace both access covers.



Oils for Lubricating Coolant

Any 10:1 (water to coolant) solution will work, however we recommend Baileigh B-Cool 20:1 (water to coolant) biodegradable metal cutting fluid. It has excellent cooling and heat transfer characteristics, is non-flammable, and extends tool and machine life. Each gallon of concentrate makes 21 gallons of coolant.

Headstock

- To fill the head stock, remove the plug at the top of the headstock.
- Fill with Shell Tellus #32 oil, approximately 3 gallons (11.4 liters) or until the level in the sight glass is at the halfway mark.
- The first oil change should be after 200 hours. Thereafter about every 6 months.
- To change the oil, remove the headstock top cover and use a hydraulic vacuum to empty the oil from the case.

Quick Change Gear Box

Access and remove the oil fill cap.

Fill with Shell Tellus #68 oil, approx. 1 1/4 gallon (5 liters) or until the level in the sight glass is at the halfway mark.

Change oil every 6 months.

The reservoir is an oil bath (dip).



Apron

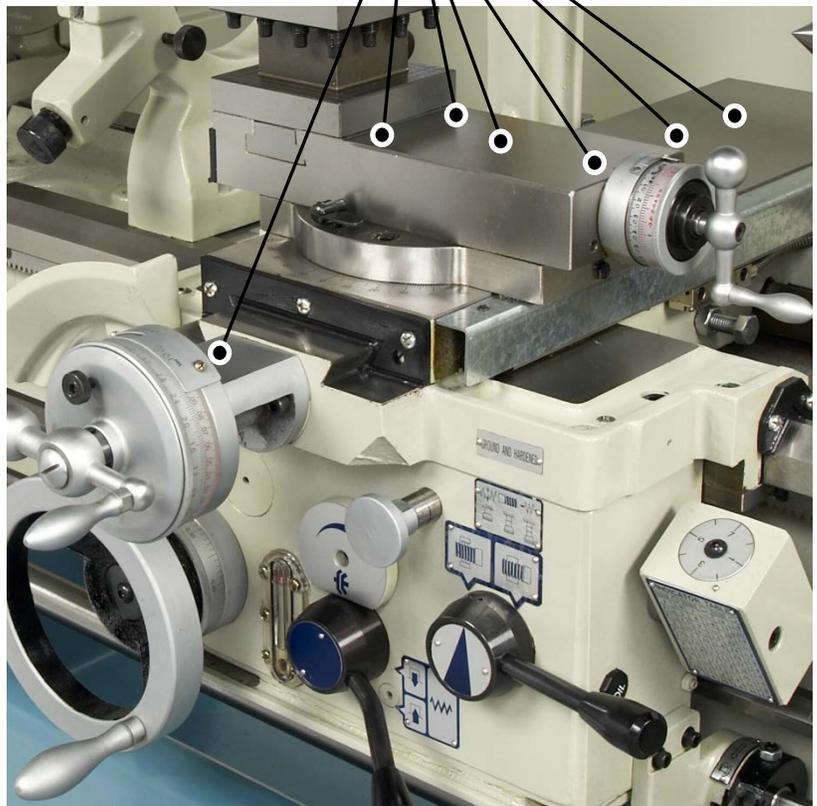
The apron is lubricated from an internal reservoir of oil. Ensure that the sight gauge shows oil at the halfway mark.

To fill the apron, remove the fill cap. Add 1/2 gallon (approx. 2 liters) of Shell Tellus #68 oil. The drain plug is located at the bottom of the apron.

Compound Rest, Cross Slide, Feed Screw, & Nut

Lubricate indicated fittings with 2 – 3 drops daily, or as needed, with a Shell Tellus 32 oil or equivalent.

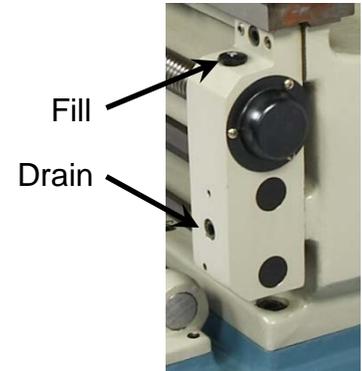
Oiler Points





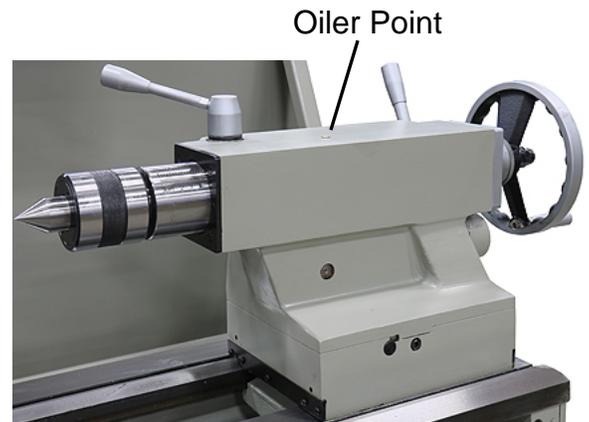
Lead screw, Feed Rod, and Half Nut

Lubricate surfaces daily with brush or cloth.
Lead screw must be cleaned and threads lightly oiled.
Remove cap on lead screw bracket to fill with Shell Tellus #32 oil.
To replace oil, remove the drain plug as shown.



Tail Stock

Oil the tailstock daily at the oil fittings located at the top of the tailstock.
Lubricate with 2 – 3 drops of light lubricating oil.



Storing Machine for Extended Period of Time

If the Lathe is to be inactive for a long period of time, prepare the machine as follows:

- Detach the plug from the electrical supply panel.
- Remove the chuck, steady rest, follow rest, tool post, and tail stock. Cover with a rust protectant.
- Empty and clean the coolant tank.
- Clean and grease the machine so no bare metal is left unprotected.
- Cover the machine



TROUBLESHOOTING

⚠ WARNING: Make sure the electrical disconnect is **OFF** before working on the machine.

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Motor Does Not Start	No power.	Check the power source.
	Emergency stop button not reset.	Release the emergency button by turning the knob to the right.
	Motor damaged.	Replace motor.
	Motor power cable not connected properly.	Check the cable connection and reconnect cable. Change cable if worn out.
	Motor circuit breaker tripped.	Reset the breaker to ON position.
	Magnetic switch damaged or burned out.	Replace switch.
	7. Transformer damaged.	Replace transformer.
	8. Forward/Reverse lever on the carriage is in neutral.	Make sure lever is either in Forward or Reverse position.
	9. Foot brake limit switch is faulty.	Replace limit switch.
Circuit Breaker Trips	1. Short circuit in power cord or plug.	Inspect cord or plug for damaged insulation or shorted wires.
	2. Loose connections or short circuit in motor.	Inspect all motor connections.
	3. Incorrect circuit breaker installed.	Install correct circuit breaker.
Excessive Machine Noise and Overheating	1. Excessive material removal from piece part.	Decrease depth of cut.
	2. Wrong feed rate or spindle speed.	Use correct feed rates and spindle feed values.



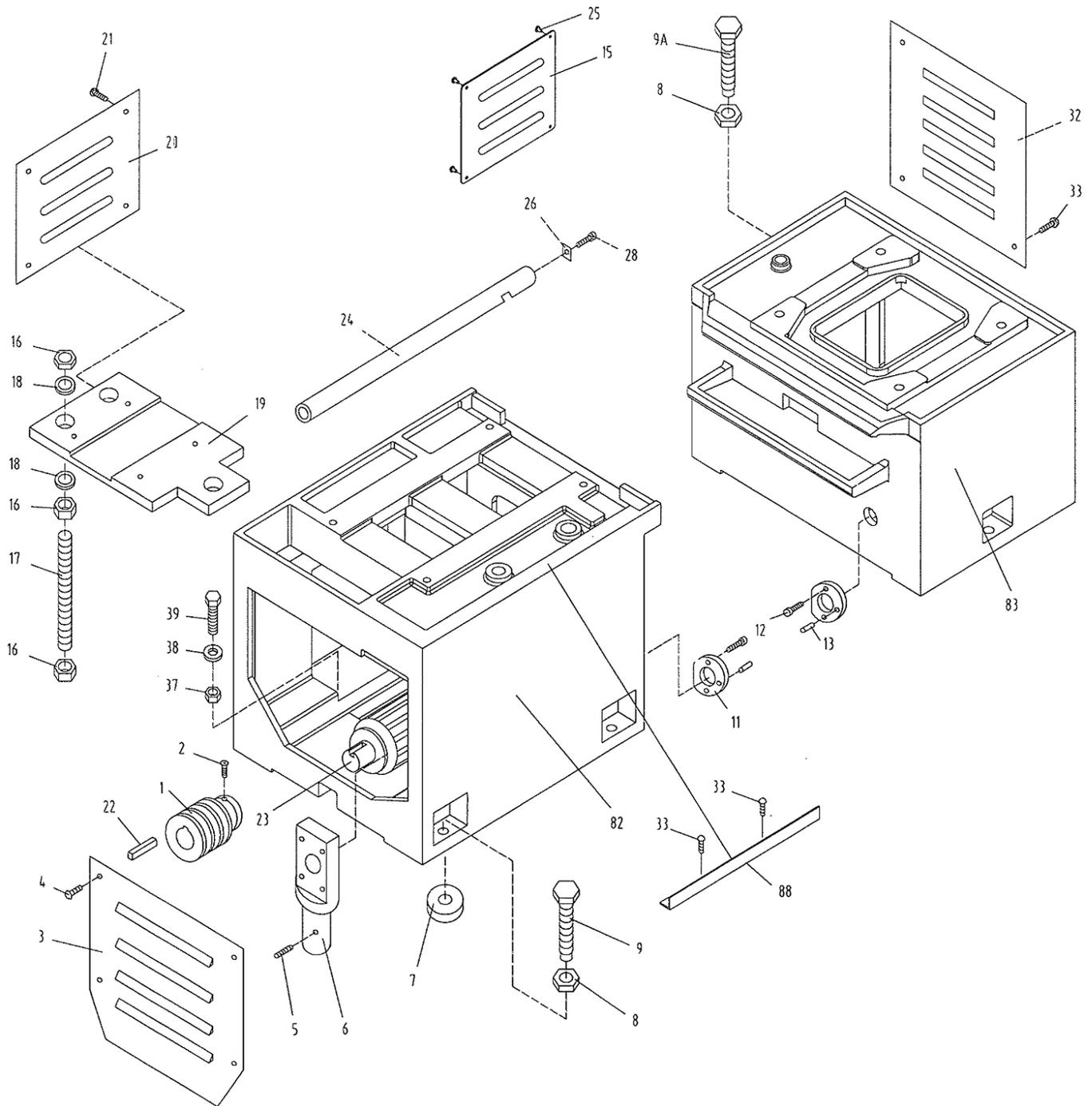
	3. V-Belts are slipping.	Inspect, tension, and replace belts.
Gear Change Levers Will Not Shift	1. Gears not aligned in headstock.	Maintain pressure on the lever while rotating the spindle by hand until the gear falls into place.
Poor Surface Finish	1. Incorrect spindle speed or feed rate. 2. Dull tool or improper tool selection. 3. Depth of cut too much. 4. Too much play in gibs.	Adjust for proper feed rate and spindle speed. Use sharp tools and select proper tool for the application. Use more passes to remove less material. Follow gib adjustment procedure.
Machine Vibrates Excessively at Startup and While Running	1. Piece part is not properly balanced. 2. Check for broken or worn gear. 3. Unbalanced chuck or faceplate.	Re-position piece part so it is centered with the spindle bore. Inspect gears and replace when necessary. Have chuck or faceplate either re-balanced or replaced.
Excessive Vibration of Tool or Machine While Cutting	1. Tool holder is loose. 2. Tool not properly supported in tool holder. 3. Removing too much material from piece part in one pass. 4. Gibs are not properly adjusted. 5. Cutting tool dull or broken.	Clean slide and re-tighten tool holder. No more than 1/3 of tool should extend from holder. Secure tool properly. Take more passes and reduce depth of cut. Check gibs and re-adjust if needed. Re-sharpen or replace cutting tool.
Cannot Remove Tool From Tailstock Barrel	1. Barrel is not retracted completely into tailstock.	Turn the tailstock hand wheel until it pushes the tool out from the barrel.



	2. Taper not properly cleaned before inserting tool.	Always clean barrel taper before inserting tool.
Cross Slide, Compound Rest, or Carriage Feed is Loose	<ol style="list-style-type: none"> 1. Gibs need adjustment. 2. Hand wheel is loose. 3. Mechanism for lead screw worn out or in need of adjustment. 	<p>Follow procedure to re-adjust gibs.</p> <p>Re-tighten fasteners on hand wheel.</p> <p>Tighten fasteners on lead screw mechanism. Adjust cross slide for backlash.</p>
Hand wheels are Hard to Turn	<ol style="list-style-type: none"> 1. Gibs are dirty. 2. Gibs may be too tight. 3. Cross slide backlash setting too tight. 	<p>Remove gibs, clean ways, lubricate, replace and re-adjust gibs.</p> <p>Loosen gibs slightly until wheel turns freely.</p> <p>Loosen slightly until free.</p>
Inconsistent Turning Results on Piece Part	<ol style="list-style-type: none"> 1. Headstock and tailstock not aligned to each other. 2. Bed ways are not level front-to-back or side-to-side. 	<p>Follow procedure to re-align.</p> <p>Re-level machine as necessary.</p>
Jaws of Chuck Will Not Move	1. Jaws filled with chips and debris.	Remove and clean the jaws, clean and lubricate chuck threads, replace jaws into chuck.
Carriage Will Not Feed or is Hard to Move	<ol style="list-style-type: none"> 1. Lock lever on carriage is over tightened. 2. Gears broken or not engaged. 3. Gibs may be over tightened. 	<p>Loosen lock lever so carriage is free to move.</p> <p>Adjust or replace gears.</p> <p>Loosen gibs slightly.</p>
Tool Has Short Edge Life	<ol style="list-style-type: none"> 1. Cutting speed too high for application. 2. Crossfeed set too high. 3. Insufficient cooling 	<p>Reduce cutting speed.</p> <p>Lower crossfeed.</p> <p>Increase amount of coolant to tool area.</p>



STAND ASSEMBLY PARTS DIAGRAM



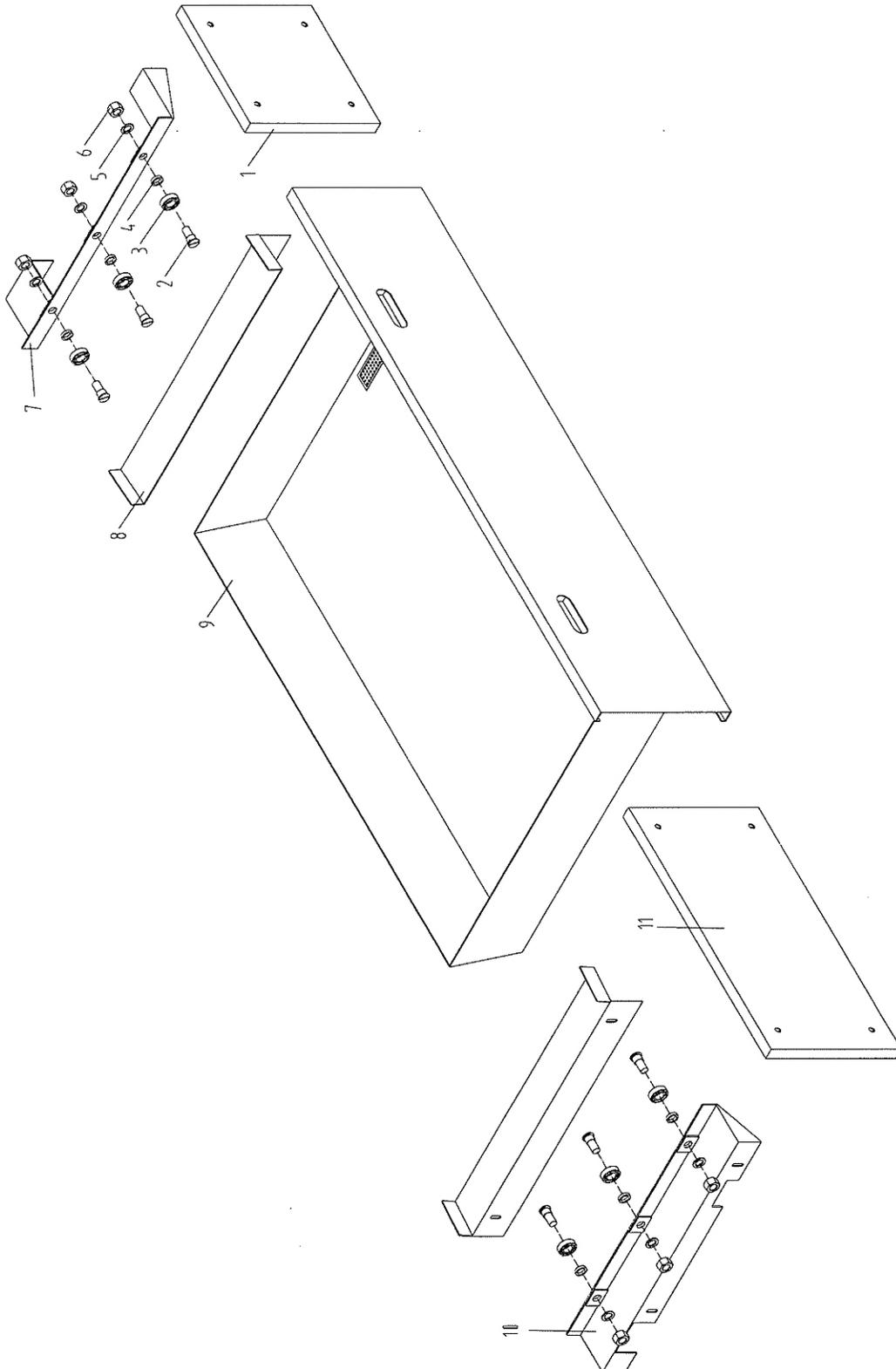


Stand Assembly Parts List

Item	Part No.	Description	Size	Qty.
1	ZX-01101A	Pulley		1
2	ZX-S2	Cylindrical End Set Screw	M8x16	1
3	C6136-01734	Cover		1
4	ZX-S4	Cross Head Screw	M6x14	4
5	ZX-S2	Cylindrical End Set Screw	M8x16	1
6	ZX-01701	Pedal Rod Support		1
7	ZX-01715	Lining		6
8	TS-1540231	Hex Nut	M24x2	6
9	ZX-01712	Hex Cap Bolt		3
9A	ZX-01713	Hex Cap Bolt		3
11	ZX-01703	Fixed Support		2
12	TS-150341	Socket Head Cap Screw	M6x14	4
13	ZX-S13	Taper Pin	5x20	2
15	C6136-01725	Bed Stand Back Cover		1
16	TS-1540121	Hex Nut	M20	9
17	ZX-01702	Bolt		3
18	TS-1550111	Flat Washer	M20	6
19	ZX-01122B	Motor Mounting Plate		1
20	C6136-01726	Cover		1
21	ZX-S4	Cross Head Screw	M6x14	4
22	ZX-S22	Key	10x8x70	1
23	ZX-S23B	Main Motor	5.5Kw, 6P, 230V, 3Ph	1
24	ZX-017609B	Wire Conduit		1
26	ZX-01706	Locking Plate		1
28	ZX-S15	Cross Head Screw	M4x6	1
32	C6136-01717	Cover		1
33	ZX-S4	Cross Head Screw	M6x14	6
37	TS-1540072	Hex Nut	M10	4
38	TS-1550071	Flat Washer	M10	4
39	TS-1491041	Hex Cap Bolt	M10x30	4
82	01105A	Front Bed Stand		1
83	01106A	Back Bed Stand		1
88	ZX-05753	Extending Plate		1



COOLANT DRAIN PAN ASSEMBLY PARTS DIAGRAM



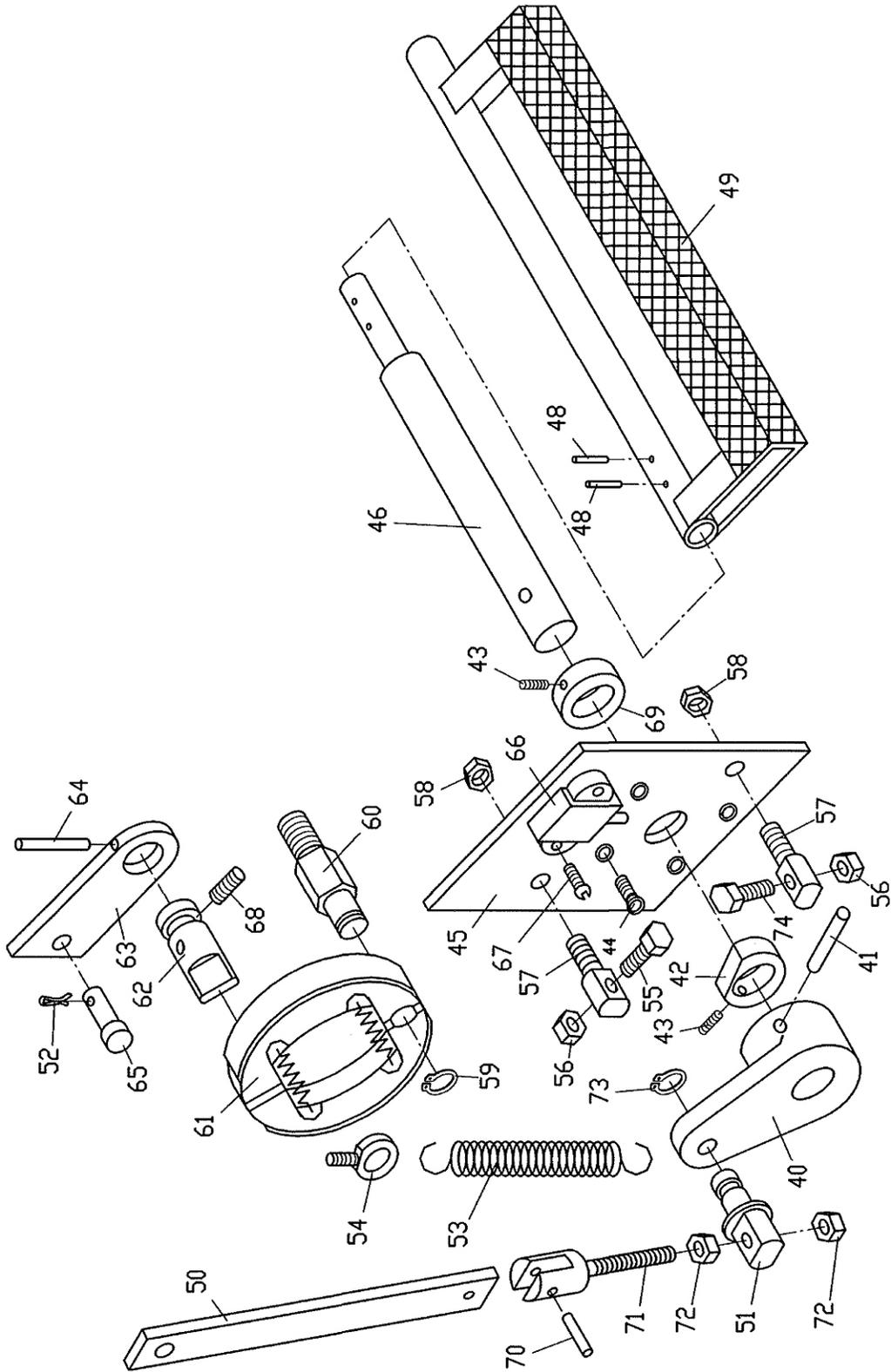


Coolant Drain Pan Assembly Parts List

Item	Part No.	Description	Size	Qty.
1	1660R12704	Right Front Splash		1
	GB2672	Hex Socket Asterisk Pan Head Screw	M6x10	4
2	1440R12707	Small Axle		6
3	6003	Bearing		6
4	1440R12708	Spacer		6
5	GB93	Spring Washer	M14	6
6	GB6172	Hex Thin Screw	M14	6
7	1440R12706	Right Bracket		1
	GB2672	Hex Socket Asterisk Pan Head Screw	M6x10	2
8	1440R12709	Splash Cover		2
	GB2672	Hex Socket Asterisk Pan Head Screw	M6x10	4
9	1660R12703A	Coolant Drain Pan		1
10	1440R12705	Left Bracket		1
	GB2672	Hex Socket Asterisk Pan Head Screw	M6x10	2
11	1660R12702A	Left Front Splash		1
	GB2672	Hex Socket Asterisk Pan Head Screw	M6x10	4



BRAKE ASSEMBLY PARTS DIAGRAM



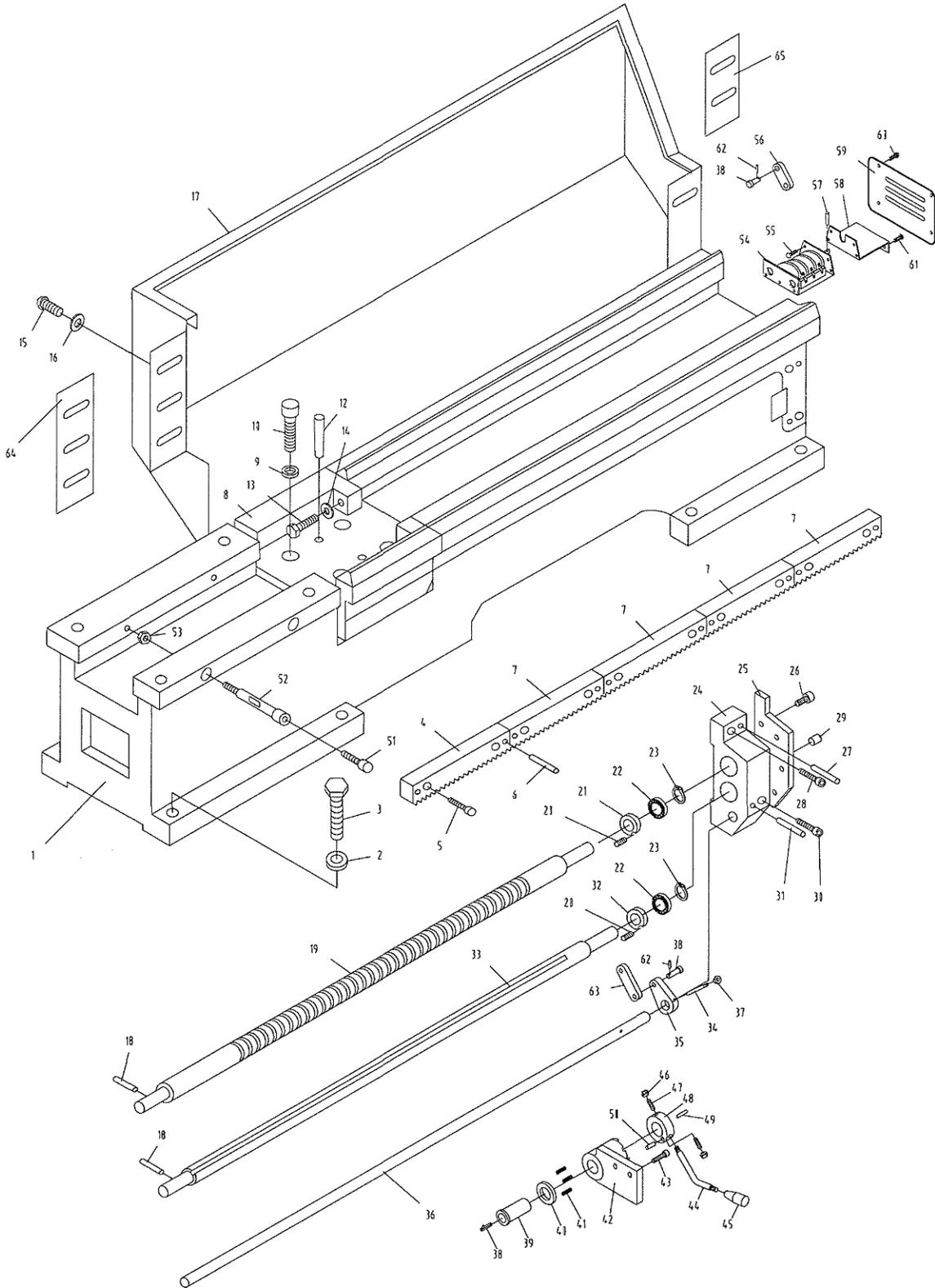


Brake Assembly Part List

Item	Part No.	Description	Size	Qty.
40	ZX-22101	Fork		1
41	ZX-S41	Spring Pin	8x40	1
42	ZX-22703	Butt Nail Support		1
43	TS-1524021	Socket Set Screw	M8x10	1
44	ZX-S44	Cross Head Screw	M5x20	4
45	ZX-22714	Positioning Plate		1
46	ZX-22704A	Driving Shaft-Longer		1
48	ZX-S48	Spring Pin	5x30	2
49	ZX-22712BE	Pedal		1
50	ZX-22710C	Draw Bar		1
51	ZX-22706	Connecting Shaft		1
52	ZX-S52	Split Pin	2x20	2
53	ZX-S53	Tensile Spring	3.5x26x190	1
54	ZX-S54	Eyebolt	M8	1
55	TS-1490091	Hex Cap Bolt	M8x50	1
56	TS-1540061	Hex Nut	M8	1
57	ZX-22707A	Butt Rod Support		1
58	TS-1540072	Hex Nut	M10	1
59	ZX-S59	C-Clip	8	1
60	ZX-22701	Positioning Shaft		1
61	ZX-S61	Brake Shoe		1
62	ZX-22702	Brake Shaft	1	
63	ZX-22708	Connecting Plate	1	
64	ZX-S64	Elastic Pin	5x25	1
65	ZX-22709	Connecting Shaft		1
66	ZX-S66	Stroke Switch		1
67	ZX-S67	Screw	M4x25	2
68	ZX-S68	Cylindrical End Set Screw	M5x10	1
69	ZX-22711	Butt Nail Support		1
70	ZX-S70	Pin	5n6x20	1
71	ZX-22715	Adjust Bolt		1
72	TS-1540061	Hex Nut	M8	1
73	ZX-S73	C-Clip	12	2
74	TS-149006	Hex Cap Screw	M8x35	1



BED ASSEMBLY PARTS DIAGRAM





Bed Assembly Parts List

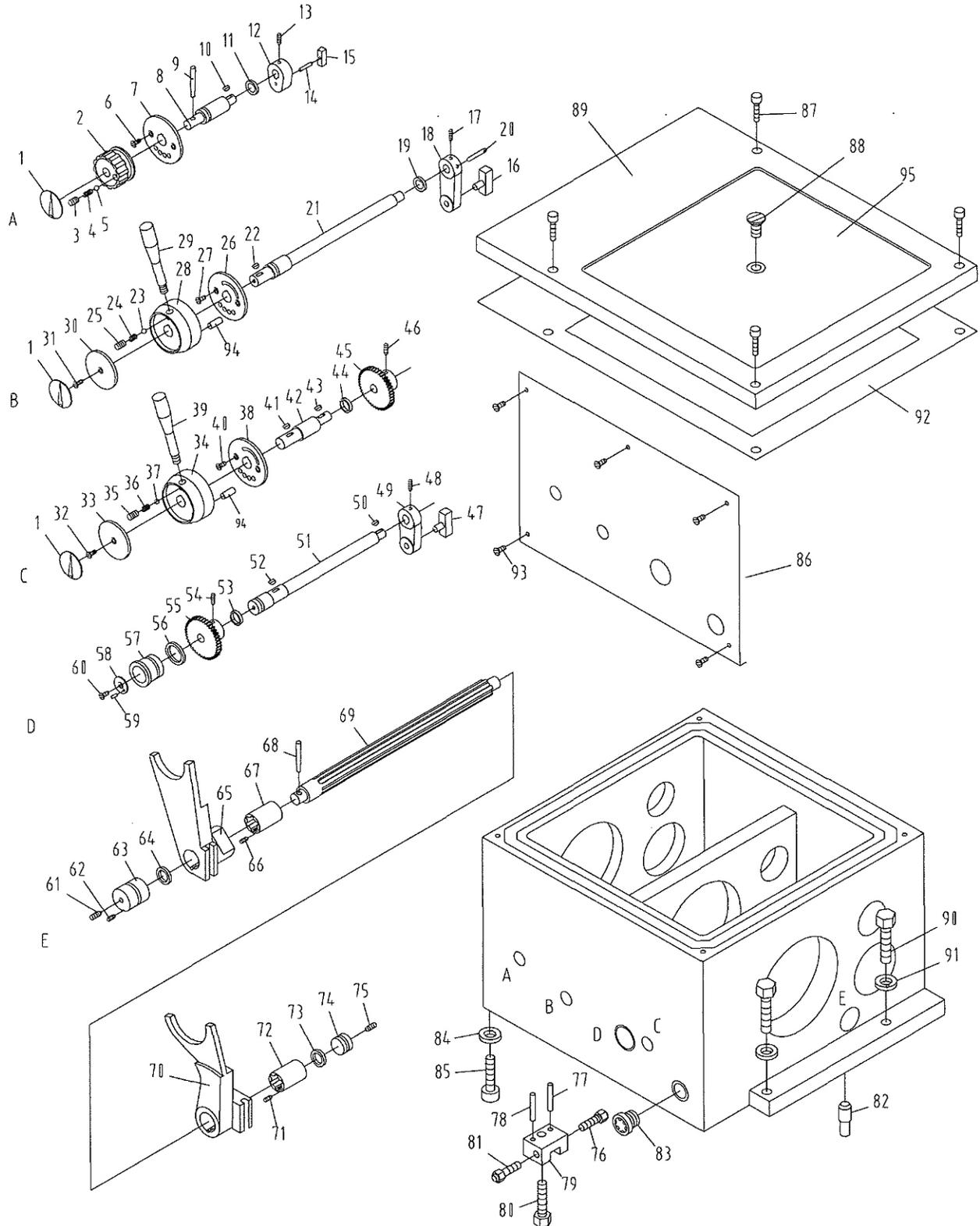
Item	Part No.	Description	Size	Qty.
1	ZX-01104B	Bed		1
2	TS-1550101	Flat Washer	M16	8
3	ZX-B3	Hex Cap Bolt	M16x50	8
4	C6136-01706	Rack		1
5	TS-1505051	Hex Socket Cap Screw	M10x35	14
6	ZX-B6	Taper Pin	8x50	14
7	C6136-01706A	Rack		6
8	ZX-01112	Saddle		1
9	TS-1551081	Lock Washer	M12	4
10	TS-1506091	Hex Socket Cap Screw	M12x55	4
12	ZX-B12	Thread Taper Pin	12x70	2
13	TS-1491101	Hex Cap Bolt	M10x55	2
14	TS-1550071	Washer	M10	2
15	TS-1503021	Hex Socket Cap Screw	M8x12	5
16	TS-1550041	Washer	M8	5
17	ZX-01741F	Splash Guard		1
18	ZX-B18	Shear Pin	5x35	2
19	ZX-01708BN	New Lead Screw		1
20	ZX-B20	Flat End Set Screw	M6x10	2
21	ZX-01109N	New Sleeve		1
22	ZX-1204	Double Row Spherical Ball Bearing	20x47x14	2
23	ZX-B23	C-Clip	20	2
24	ZX-01110N	New Bracket		1
25	ZX-01111	Cover		1
26	TS-1503041	Hex Socket Cap Screw	M6x16	4
27	ZX-B27	Taper Pin	6x60	1
28	TS-1505081	Socket Cap Screw	M10x50	1
29	ZX-B29	Oil Cup	10	2
30	GH2280ZX-1230	Socket Cap Screw	M10x100	1
31	ZX-831	Taper Pin	6x100	1
32	ZX-01108N	New Sleeve		1
33	ZX-01709BN	New Feed Rod		1
34	ZX-B34	Taper Pin	5x30	1



Item	Part No.	Description	Size	Qty.
35	ZX-01107	Poking Block		1
36	ZX-01707B	Control Rod		1
37	TS-1540031	Nut	M5	1
38	ZX-06720	Small Shaft		2
39	ZX-06001C-3	Sleeve		1
40	ZX-06001C-2	Spacer		1
41	ZX-B41	Spring	1x75x25	3
42	ZX-06001C-1	Bracket		1
43	TS-1504031	Hex Socket Cap Screw	M8x16	2
44	ZX-B44	Lever		1
45	ZX-06001C-4	Long Lever Sleeve		1
46	ZX-B46	Hex Nut	M8	2
47	ZX-B47	Set Screw	M8x28	2
48	ZX-06001C-5	Direction Change Ring		1
49	ZX-B49	Pin	8n6x20	1
50	ZX-B50	Taper Pin	3x20	1
51	TS-1505081	Socket Cap Screw	M10x50	2
52	ZX-05741	Threaded Tube		2
53	TS-1540081	Hex Nut	M12	2
54	ZX-B54	Drum Switch		1
55	ZX-S27	Cross Head Screw	M5x8	5
56	ZX-01718	Rocker		1
57	ZX-B57	Pin	3x16	1
58	ZX-01716	Bracket		1
59	ZX-01715C	Cover		1
60	ZX-B60	Cross Recessed Pan Head Screw	M6x18	4
61	TS-1482031	Hex Cap Bolt	M6x16	2
62	ZX-B62	Pin	2x15	2
63	ZX-01719	Rocker		1
64	ZX-LRG18	Rubber Washer		1
65	ZX-RRG	Rubber Washer		1



HEADSTOCK ASSEMBLY I PARTS DIAGRAM





Headstock Assembly I Parts List

Item	Part No.	Description	Size	Qty.
1	ZX-02306	Round Sign Plate		3
2	ZX-02122	Positioning Handle		1
3	ZX-H3	Flat End Set Screw	M10x12	1
4	ZX-H4	Spring	YI-1x8x25	1
5	ZX-H5	Steel Ball	8	1
6	ZX-H6	Countersunk Head Screw	M5x12	2
7	ZX-02743	Positioning Disc		1
8	ZX-02738	Shaft		1
9	ZX-H9	Taper Pin	5x55	1
10	ZX-H10	Woodruff Key	4x16	1
11	ZX-H11	Ring Seal	25x2.4	1
12	ZX-02116	Crank		1
13	TS-1523051	Set Screw	M6x16	1
14	ZX-H14	Pin	5n6x28	1
15	ZX-02302	Poking Block		1
16	ZX-02738C	Pin Block		1
17	TS-1523051	Set Screw	M6x16	1
18	ZX-02114	Crank		1
19	ZX-H11	Ring Seal	25x2.4	1
20	ZX-H20	Pin	5x30	1
21	ZX-02734	Shaft		1
22	ZX-H10	Woodruff Key	4x16	1
23	ZX-H5	Steel Ball	8	1
24	ZX-H4	Spring	YI-1x8x25	1
25	ZX-H3	Flat End Set Screw	M10x12	1
26	ZX-02733	Left Positioning Disc		1
27	ZX-H6	Countersunk Head Screw	M5x12	2
28	ZX-02113	Left Lever Support		1
29	ZX-02741	Handle		1
30	ZX-02732	Cover		1
31	ZX-H6	Countersunk Head Screw	M5x12	1
32	ZX-H6	Countersunk Head Screw	M5x12	1
33	ZX-02732	Cover		1



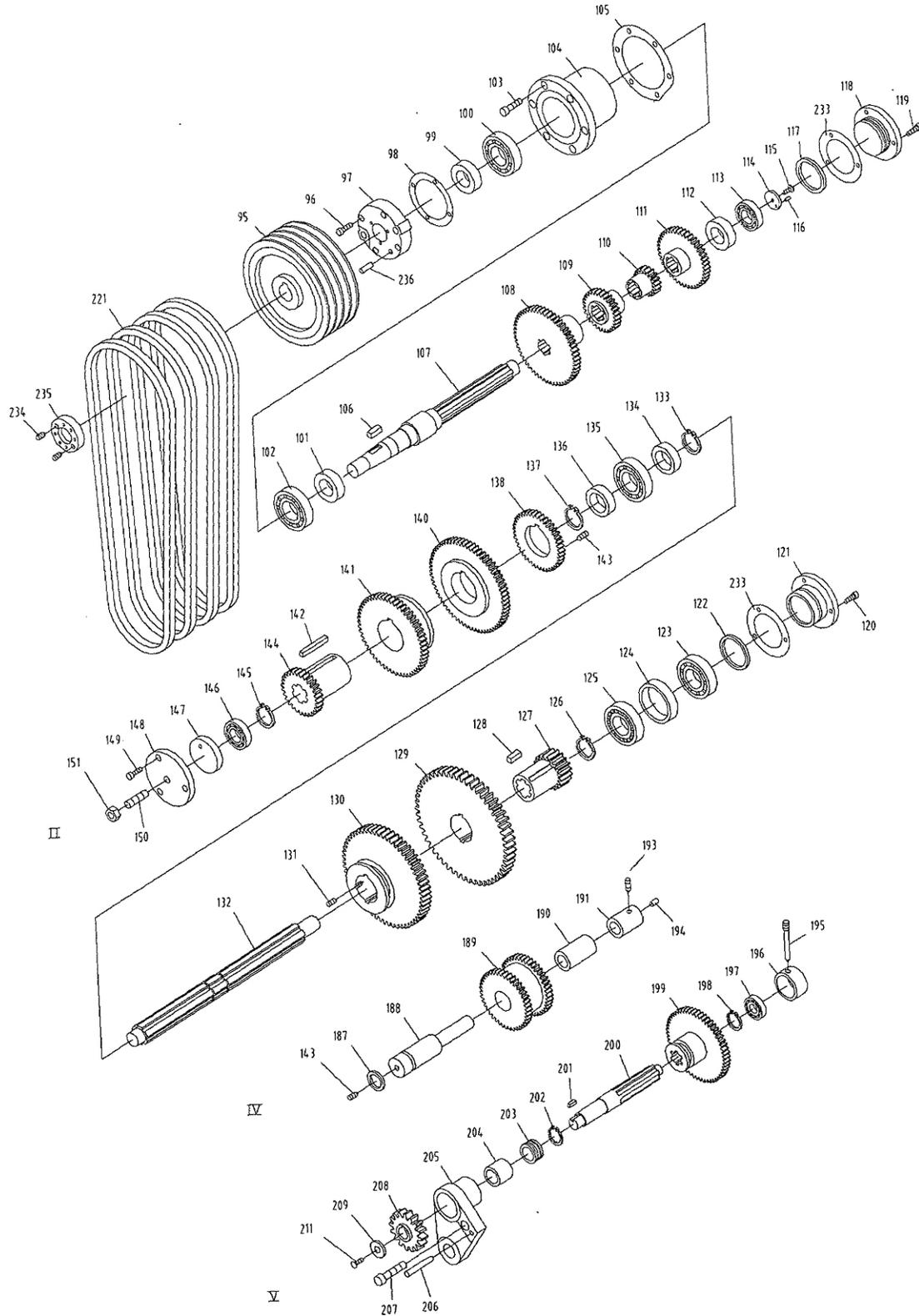
Item	Part No.	Description	Size	Qty.
34	ZX-02119	Right Lever Support		1
35	ZX-H3	Flat End Set Screw	M10x12	1
36	ZX-H4	Spring	YI-1x8x25	1
37	ZX-H5	Steel Ball	8	1
38	ZX-02728	Right Positioning Disc		1
39	ZX-02741	Handle		1
40	ZX-H6	Countersunk Head Screw	M5x12	2
41	ZX-H10	Woodruff Key	4x16	1
42	ZX-02727	Shaft		1
43	ZX-H10	Half Circle Key	4x16	1
44	ZX-H11	Ring Seal	25x2.4	1
45	ZX-02730	Gear	1.5m36T	1
46	TS-1523051	Set Screw	M6x16	1
47	ZX-02738C	Pin Block		1
48	TS-1523051	Set Screw	M6x16	1
49	ZX-02111	Crank		1
50	ZX-H10	Woodruff Key	4x16	1
51	ZX-02731/1	Control Shaft		1
52	ZX-H10	Woodruff Key	4x16	1
53	ZX-H11	Ring Seal	25x2.4	1
54	ZX-H54	Taper End Set Screw	M6x16	1
55	ZX-02732/2	Gear	1.5m36T	1
56	ZX-H56	Ring Seal	40x3.1	1
57	ZX-02110	Bushing		1
58	ZX-02729	Cover		1
59	ZX-H59	Pin	3n6x10	1
60	ZX-H6	Countersunk Head Screw	M5x12	1
61	ZX-H61	Countersunk Head Screw	M8x12	1
62	ZX-H62	Flat End Set Screw	M8x12	1
63	C6136-02115	Plug		1
64	ZX-H64	Ring Seal	40x3.1	1
65	ZX-02115	Left Fork		1
66	ZX-H66	Flat End Set Screw	M6x10	1
67	ZX-02120A/2	Bushing		1
68	ZX-H68	Taper Pin	6x35	1



Item	Part No.	Description	Size	Qty.
69	ZX-02736	Control Shaft		1
70	ZX-02112	Right Fork		1
71	ZX-H66	Flat End Set Screw	M6x10	1
72	ZX-02120A/2	Bushing		1
73	ZX-H73	Ring Seal	30x3.1	1
74	ZX-02735	Blocking Piece		1
75	ZX-H61	Countersunk Head Screw	M8x12	1
76	ZX-02744	Adjusting Screw		1
77	ZX-H77	Taper Pin	8x40	1
78	ZX-H77	Taper Pin	8x40	1
79	ZX-92124	Adjusting Block		1
80	ZX-H80	Hex Cap Bolt	M12x50	1
81	ZX-02744	Adjusting Screw		1
82	ZX-02736C	Positioning Pin		1
83	ZX-H83	Oil Sight Glass		1
84	ZX-H84	Washer	A16	2
85	ZX-H85	Hex Socket Cap Screw	M16x50	2
86	ZX-02301-216	Label		1
87	TS-1504071	Hex Socket Cap Screw	M8x35	4
88	ZX-H88	Countersunk Head Screw	M16x25	1
89	ZX-02117	Top Cover		1
90	ZX-H90	Hex Cap Bolt		2
91	ZX-H91	Washer	A16	2
92	ZX-02505	Paper Gasket		1
93	TS-1531012	Slotted Pan Head Screw	M3x6	7
94	ZX-H94N	Pin	4n6x15	2
95		Rubber Gasket		1



HEADSTOCK ASSEMBLY II PARTS DIAGRAM





Headstock Assembly II Parts List

Item	Part No.	Description	Size	Qty.
95	ZX-02107	Pulley		1
96	TS-1503061	Socket Cap Screw	M6x25	4
97	ZX-02106	Bearing Cover		1
98	ZX-02506	Gasket		1
99	ZX-H99	Ring Seal	32x52	1
100	BB-6207/P5	Ball Bearing	35x72x17	1
101	ZX-H102	Sleeve	30x10	1
102	BB-6207/P5	Ball Bearing	35x72x17	1
103	TS-1504051	Socket Cap Screw	M8x25	6
104	ZX-02105	Bearing Support		1
105	ZX-02502	Gasket		1
106	ZX-H106	Flat Key	10x8x35	1
107	ZX-02709	Shaft		1
108	ZX-02754X/6P	Gear	2.5m61T	1
109	ZX-02753X/6P	Gear	2.5m32T	1
110	ZX-02752X	Gear	2.5m18T	1
111	ZX-02751X/6P	Gear	2.5m47T	1
112	ZX-H112	Sleeve		1
113	BB6305/P5	Ball Bearing	25x62x17	1
114	ZX-H114	Shaft End Lock Ring	32	1
115	ZX-H115	Countersunk Head Screw	M6x20	1
116	ZX-H59	Pin	3n6x10	1
117	ZX-H117	Ring Seal	60x3.1	1
118	ZX-02104	Blocking Flange	1	
119	TS-1503041	Socket Cap Screw	M6x15	3
120	TS-1503041	Socket Cap Screw	M6x15	3
121	ZX-02103	Blocking Flange	1	
122	ZX-H117	Ring Seal	60x3.1	1
123	BB-6305/P5	Ball Bearing	25x62x17	1
124	ZX-H124	Sleeve	62x6	1
125	BB-6305/P5	Ball Bearing	25x62x17	1
126	ZX-H126	Circle Clip For Shaft	35	1
127	ZX-02705	Gear	3m19T	1



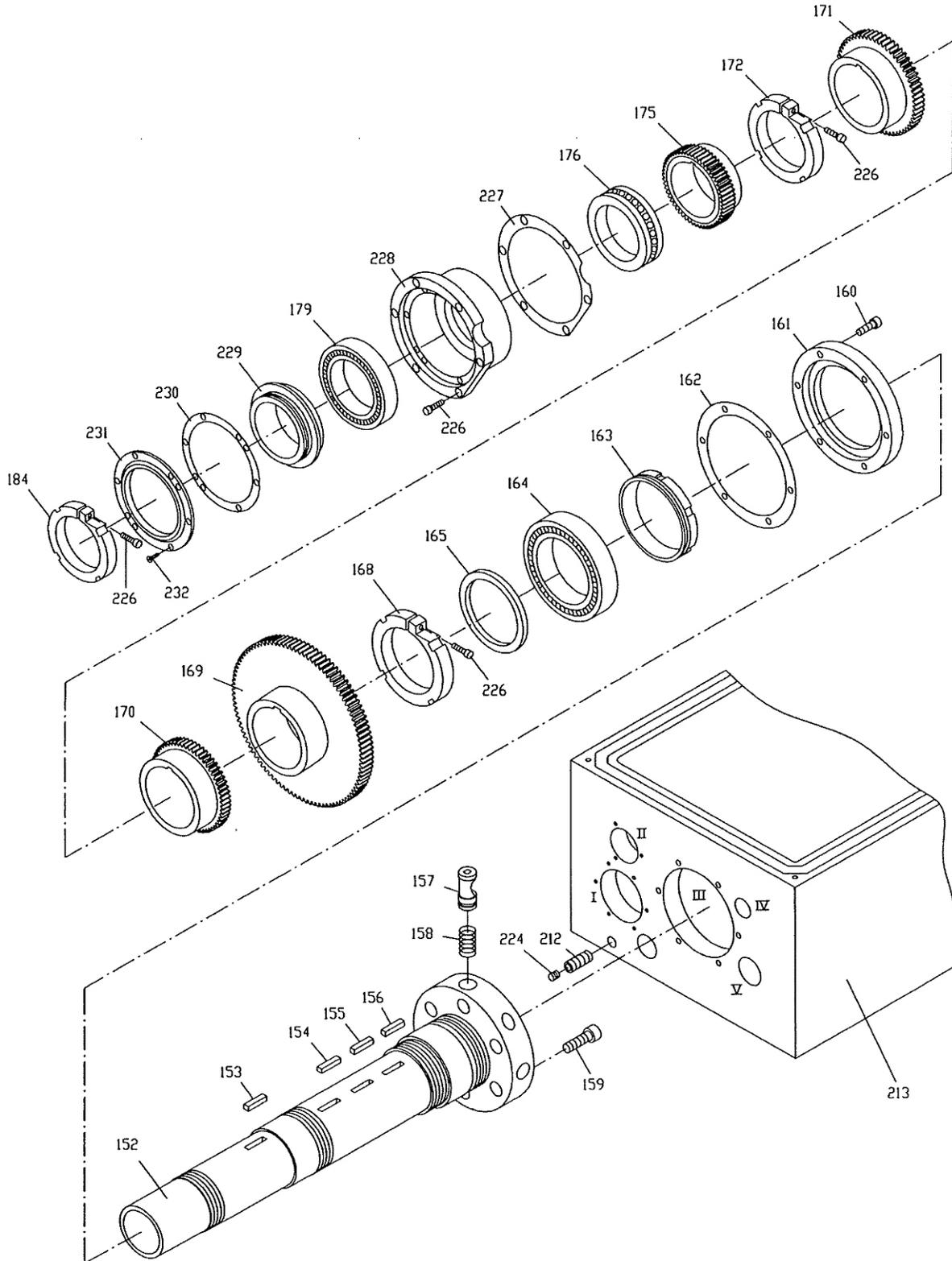
Item	Part No.	Description	Size	Qty.
128	ZX-H128	Flat Key	8x7x50	2
129	ZX-02706	Gear	3m67T	1
130	ZX-02707	Gear	3m59T	1
131	ZX-H62	Flat End Set Screw	M8x12	1
132	ZX-02708	Shaft		1
133	ZX-H133	C-Clip	35	1
134	ZX-H134	Sleeve	35x8	1
135	BB-6007/P5	Ball Bearing	35x62x14	1
136	ZX-H134	Sleeve	35x8	1
137	ZX-H133	C-Clip	35	1
138	ZX-02756/6P	Gear	2.5m36T	1
140	ZX-02757/6P	Gear	2.5m65T	1
141	ZX-02758/6P	Gear	2.5m51T	1
142	ZX-H142	Flat Key	10x6x60	2
143	ZX-H143	Flat Head Set Screw	M8x12	2
144	ZX-02755X/6P	Gear	2.5m22T	1
145	ZX-H133	C-Clip	35	1
146	BB-6305	Ball Bearing	25x62x17	1
147	ZX-H147	Pushing Disc	62	1
148	ZX-02109C	Cover		1
149	TS-1503041	Socket Cap Screw	M6x15	3
150	ZX-H150	Set Screw	M12x65	1
151	ZX-H151	Hex Nut	M12	1
187	ZX-H187	Ring Seal	35x3.1	1
188	ZX-02714	Shaft		1
189	ZX-02716	Double Gear	2m48T	1
190	ZX-02303	Copper Sleeve		1
191	ZX-02734C	Positioning Sleeve		1
193	TS-1524041	Set Screw	M8x15	1
194	ZX-02733C	Blocking Piece		1
195	ZX-02718	Taper End Set Screw		1
196	ZX-02114C	Sleeve		1
197	BB-6203	Ball Bearing	17x40x12	1
198	ZX-H198	C-Clip	28	1
199	ZX-02717	Gear	2m65T	1



Item	Part No.	Description	Size	Qty.
200	ZX-02715	Shaft		1
201	ZX-H201	Flat Key	5x5x1	1
202	ZX-H198	C-Clip	28	1
203	ZX-02722C	Sleeve		1
204	ZX-02301	Oil Bushing		1
205	ZX-08106B	Bracket (for Shaft V, Vb)		1
206	ZX-H77	Taper Pin	8x40	1
207	TS-1505031	Hex Socket Cap Screw	M10x25	1
208	TNMP-08706B(N)	Gear	4m16T	1
209	ZX-02724C	Washer		1
210	ZX-H59	Pin	3n6x10	1
211	ZX-H211	Countersunk Head Screw	M5x16	1
221	VB-A77	V-Belt	A-77	4
233	ZX-02506	Paper Gasket	2	
234	ZX-H234	Set Screw	M8x6	2
235	ZX-02743N	Clamping Round Nut	1	
236	ZX-H236	Pin	8 X 30	2



HEADSTOCK ASSEMBLY III PARTS DIAGRAM



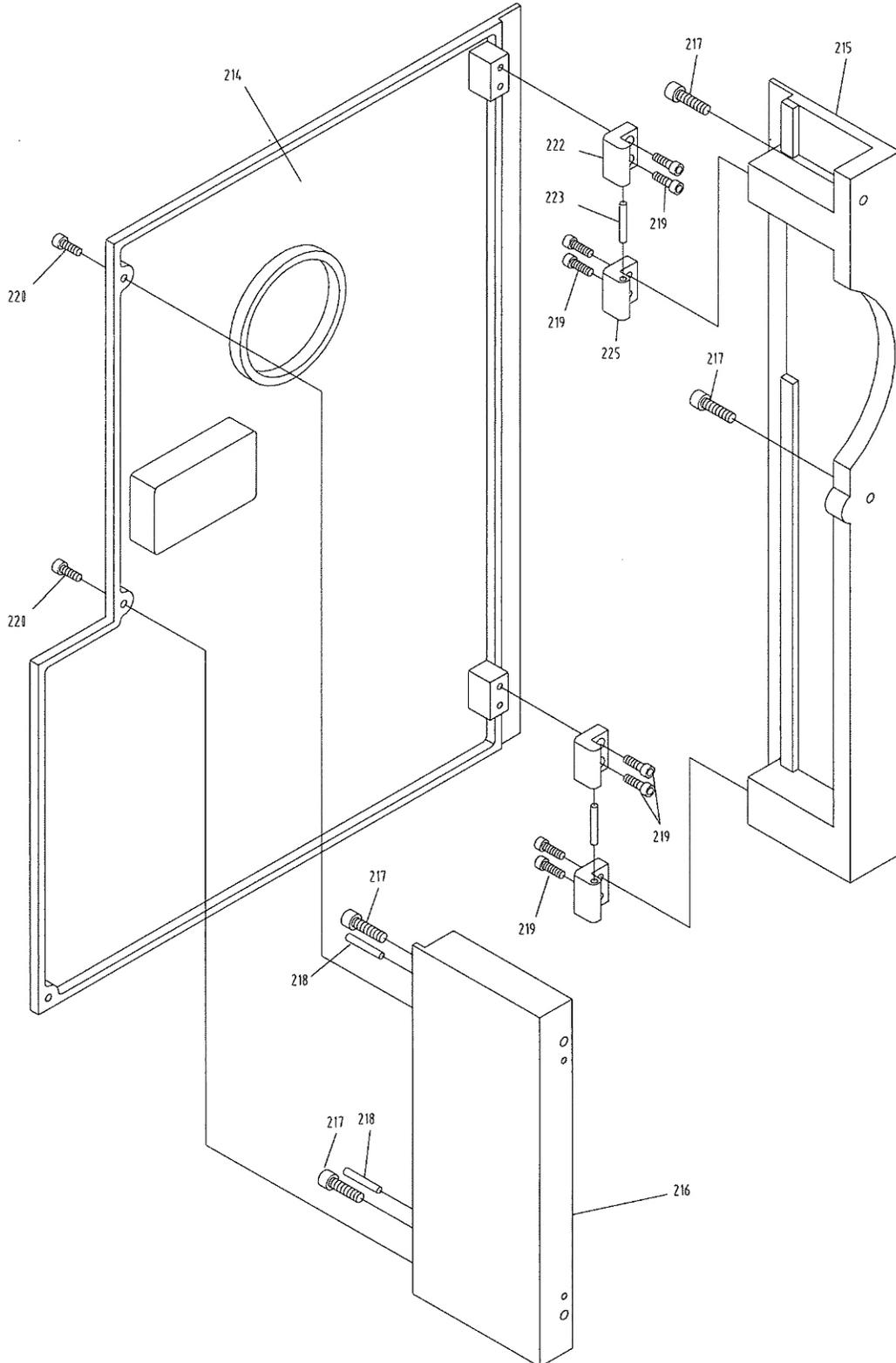


Headstock Assembly III Parts List

Item	Part No.	Description	Size	Qty.
152	ZX-02704	Spindle		1
153	ZX-H153	Flat Key	10x8x40	1
154	ZX-H154	Flat Key	10x8x50	1
155	ZX-H155	Flat Key	12x8x50	1
156	ZX-H156	Flat Key	14x9x50	1
157	ZX-02701	Cam Lock		6
158	ZX-H158	Spring	1x8x25	6
159	ZX-02703	Cam Positioning Screw		6
160	TS-1505041	Hex Socket Cap Screw	M10x28	6
161	ZX-02102	Bearing Front Cover		1
162	ZX-02501	Gasket		1
163	ZX-02702	Oil Splashing Ring		1
164	NN3024/P5	Taper Roller Bearing	120x180x46	1
165	ZX-02726	Lining		1
168	ZX-02725A	Round Nut w/Screw		1
169	ZX-02723	Gear	3m98T	1
170	ZX-02722	Gear	3m50T	1
171	ZX-02721	Gear	3m58T	1
172	ZX-02720A	Round Nut w/Screw		1
175	ZX-02710	Gear	2m65T	1
176	51120/P5	Thrust Bearing	100x135x25	1
179	BB-7020AC/P5	Angular Bearing	100x150x24	1
184	ZX-02713A	Round Nut w/Screw		1
212	ZX-H212A	Drain Plug		1
213	ZX-02101CN	Headstock Casting		1
224	ZX-G38-3A	Screw		1
226	ZX-H226	Hex Socket Cap Screw	M8x28	9
227	ZX-02502F	Gasket		1
228	ZX-02108F	Bearing Support		1
229	ZX-02711F	Sleeve		1
230	ZX-02510F	Gasket		1
231	ZX-02761F	Bearing Back Cover		1
232	ZX-H232	Screw	M5x10	6



HEADSTOCK ASSEMBLY IV PARTS DIAGRAM



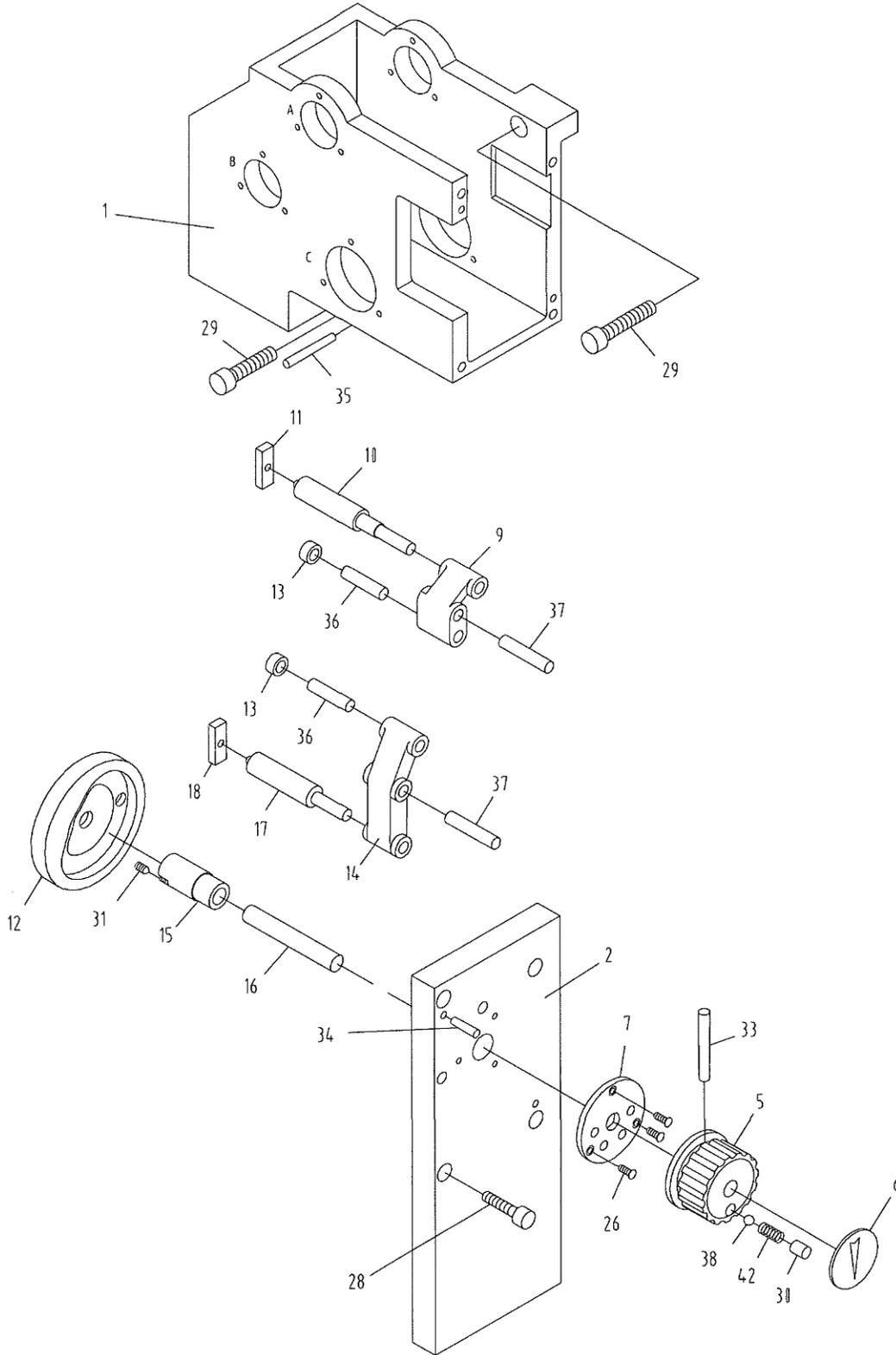


Headstock Assembly IV Parts List

Item	Part No.	Description	Size	Qty.
214	ZX-08302C	Back Cover		1
215	ZX-08114C	Rear Side Plate		1
216	ZX-08113C	Front Side Plate		1
217	TS-1504051	Socket Cap Screw	M8x25	4
218	ZX-H218	Taper Pin	6x25	2
219	TS-1503051	Socket Cap Screw	M6x20	8
220	TS-1514021	Socket Cap Screw	M6x15	3
222	ZX-08712	Upper Hinge		2
223	ZX-H223	Pin	6n6x40	2
225	ZX-08711	Lower Hinge		2



CHANGE GEAR BOX ASSEMBLY I PARTS DIAGRAM



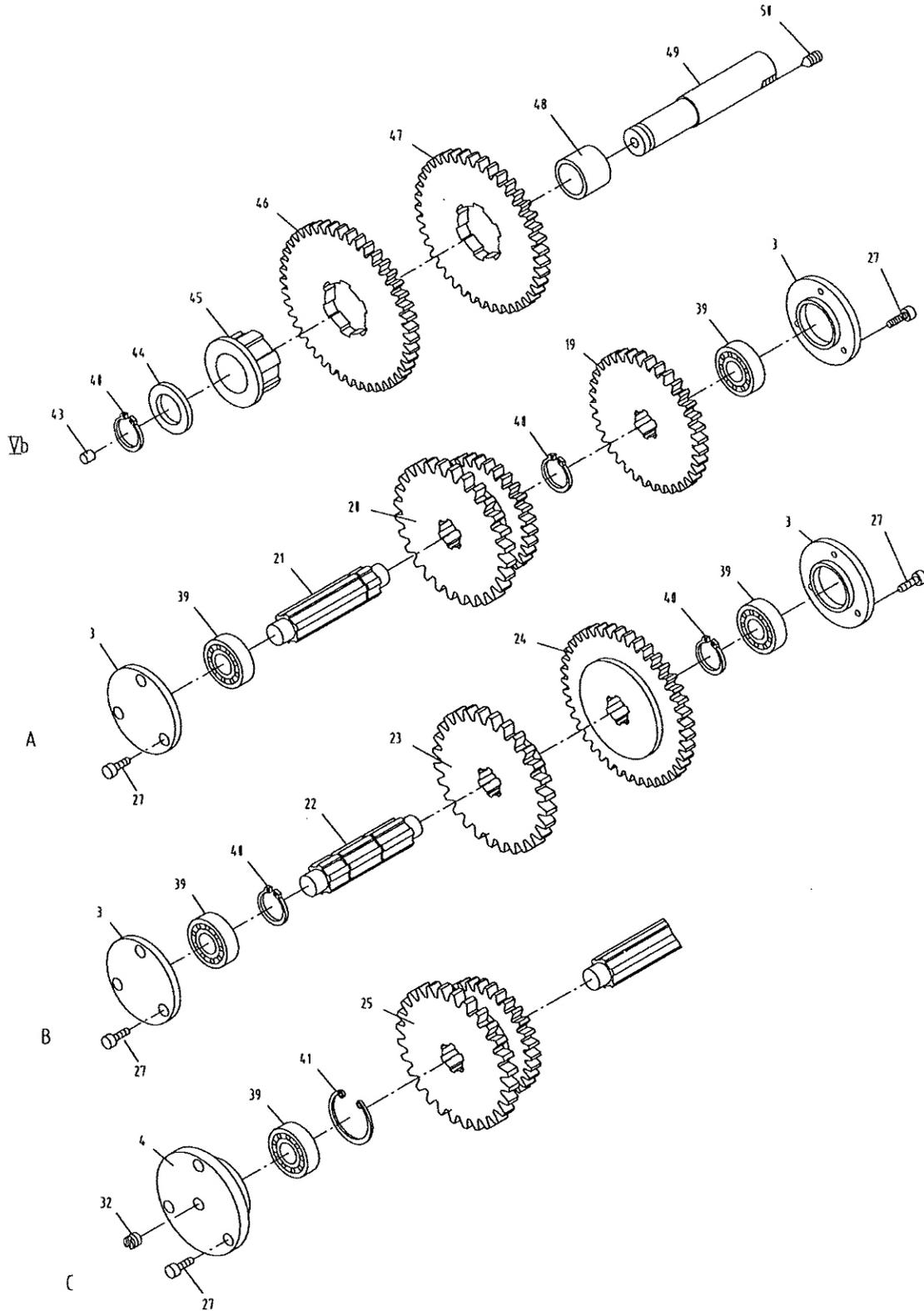


Change Gear Box Assembly I Parts List

Item	Part No.	Description	Size	Qty.
1	ZX-08101	Change Gear Box Casting		1
2	ZX-08108	Front Cover		1
5	ZX-05104C	Hand Wheel		1
6	ZX-05301C	Sign Plate		1
7	ZX-08708	Positioning Disc		1
9	ZX-08111	Crank		1
10	ZX-08705	Connecting Rod		1
11	ZX-08304	Sliding Block		1
12	ZX-05103C	Cam		1
13	ZX-05702C	Roller		2
14	ZX-08109	Crank		1
15	ZX-08110	Bushing		1
16	ZX-08704	Rotating Shaft		1
17	ZX-08703	Connecting Rod		1
18	ZX-08304	Sliding Block		1
26	ZX-C26	Cross Head Screw	M4x12	3
28	TS-1504051	Socket Cap Screw	M8x25	4
29	TS-1516051	Hex Socket Cap Screw	M10x40	2
30	TS-1525021	Set Screw	M10x12	1
31	ZX-C31	Flat Head Set Screw	M6x8	1
33	ZX-C33	Taper Pin	4x45	1
34	ZX-C34	Taper Pin	6x30	2
35	ZX-C35	Taper Pin	6x50	1
36	ZX-C36	Pin	10m6x40	2
37	ZX-C37	Pin	10m6x50	2
38	ZX-H5	Steel Ball	8	1
42	ZX-C42	Spring	1x8x30	1



CHANGE GEAR BOX ASSEMBLY II PARTS DIAGRAM



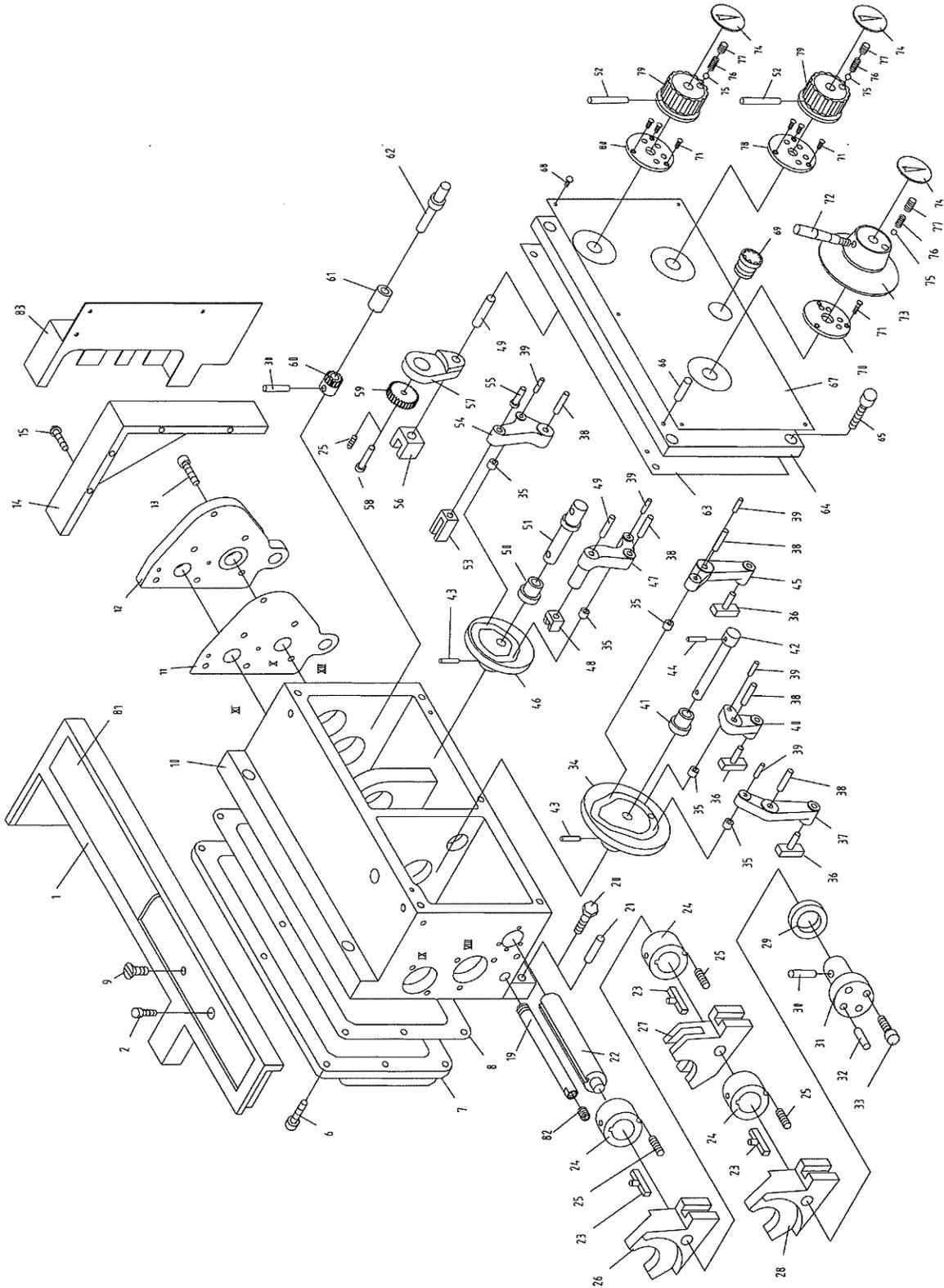


Change Gear Box Assembly II Parts List

Item	Part No.	Description	Size	Qty.
3	ZX-08104	End Cover		4
4	ZX-08103	Bearing Support		1
19	ZX-08107	Gear	3m36T	1
20	ZX-08105	Double Gear	3.75m28T/3m30T	1
21	ZX-08702	Shaft		1
22	ZX-08701	Shaft		1
23	ZX-08710	Gear	3.75m27T	1
24	ZX-08709	Gear	3m41T	1
25.	ZX-08102	Double Gear	3.75m30T/3m29T	1
27	ZX-C27	Slotted Cheese Head Screw	M5x12	15
32	ZX-C32	Flat Head Set Screw	M10x12	1
39	BB-6203ZZ/P6	Ball Bearing	17x40x12	5
40	ZX-C40	C-Clip	25	4
41	ZX-C41	C-Clip	40	1
43	ZX-C43	Oil Cup	8	1
44	TNMP08108	Washer		1
45	TNMP08102	Splined Sleeve		1
46	TNMP08504	Gear	3m41T	1
47	TNMP08501B	Gear	4m36T	1
48	ZX-05502C	Oil Bushing		1
49	ZX-08707	Shaft Vb		1
50	ZX-C50	Flat Head Set Screw	M8x10	1



QUICK CHANGE GEAR BOX I PARTS DIAGRAM





Quick Change Gear Box I Parts List

Item	Part No.	Description	Size	Qty.
1	KLS1740A-05152	Upper Cover		1
2	TS-1503071	Hex Socket Cap Screw	M6x30	2
6	TS-1504031	Hex Socket Cap Screw	M8x16	10
7	ZX-05109	Rear Cover		1
8	ZX-05502	Gasket		1
9	ZX-009	Countersunk Head Screw	M10x18	1
10	ZX-05101	Feedbox Casting		1
11	ZX-05501	Gasket		1
12	ZX-05108	Flange		1
13	TS-1504031	Hex Socket Cap Screw	M8x16	6
14	ZX-05151	Extending Plate		1
15	TS-1503131	Hex Socket Cap Screw	M6x60	4
19	ZX-019	Pipe	M10x10	1
20	TS-1491061	Hex Cap Bolt	M10x40	2
21	ZX-H68	Taper Pin	6x35	2
22	ZX-05738	Control Shaft		1
23	ZX-05739	Sliding Key		3
24	ZX-05128	Sliding Sleeve		3
25	ZX-025	Flat Head Set Screw	M5x8	4
26	ZX-05125	Right Fork		1
27	ZX-05126	Middle Fork		1
28	ZX-05127	Left Fork		1
29	ZX-029	Ring Seal	32x3.1	1
30	ZX-030	Taper Pin	4x25	2
31	ZX-05129	Cover		1
32	ZX-032	Pin	5n6x15	1
33	ZX-033	Cheese Head Screw	M5x16	3
34	ZX-05122	Cam		1
35	ZX-05728	Rolling Sleeve		5
36	ZX-05729	Poking Key		3
37	ZX-05123	Crank		1
38	ZX-038	Pin	8n6x32	5
39	ZX-039	Pin	6n6x20	5



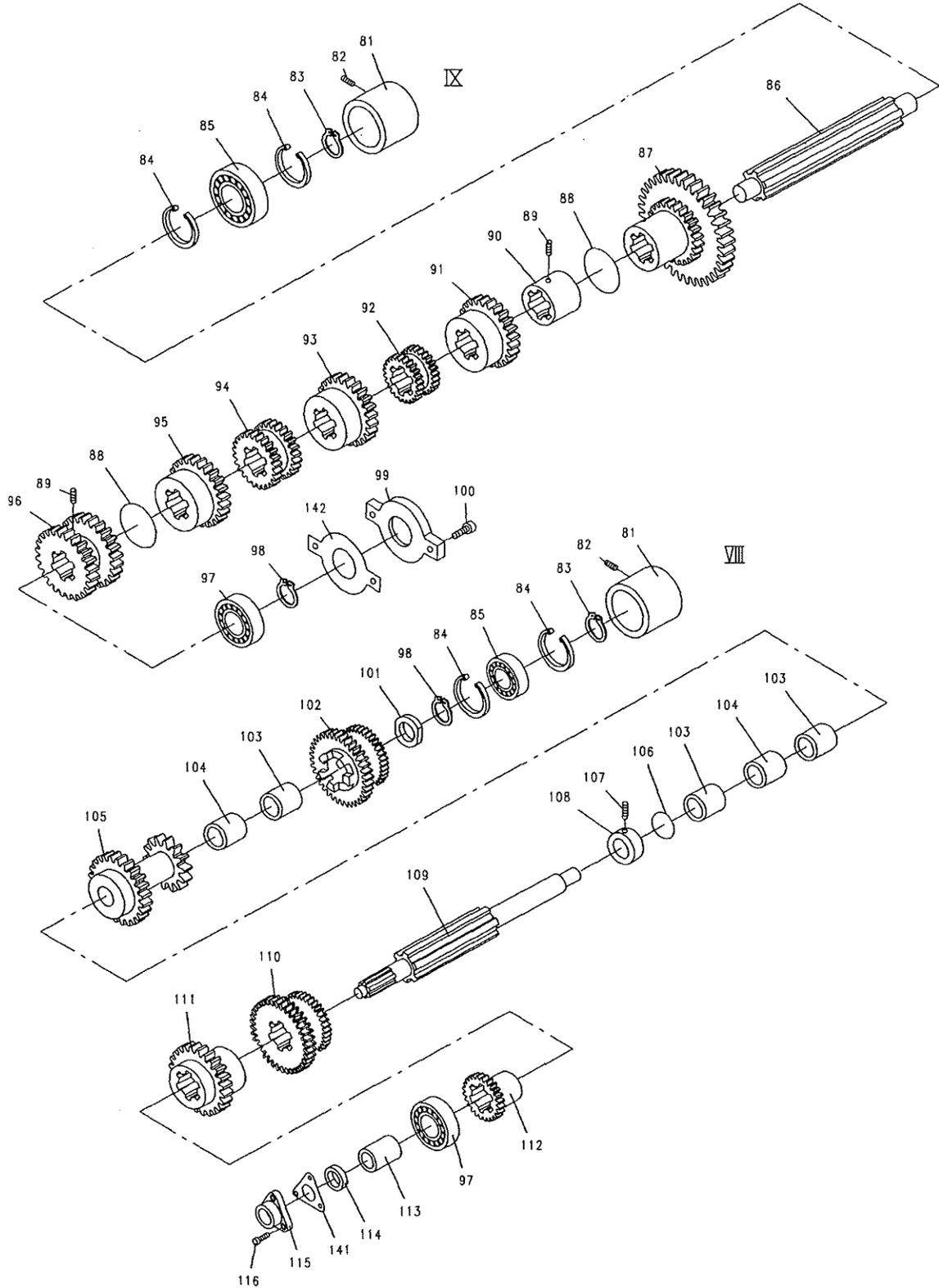
Item	Part No.	Description	Size	Qty.
40	ZX-05124	Crank		1
41	ZX-05111	Sleeve		1
42	ZX-05726	Lever Shaft		1
43	ZX-043	Taper Pin	4x32	2
44	ZX-044	Taper Pin	4x65	1
45	ZX-05121	Crank		1
46	ZX-05118	Cam		1
47	ZX-05120	Crank		1
48	ZX-05116	Fork		1
49	ZX-049	Pin	8n6x18	2
50	ZX-05117	Sleeve		1
51	ZX-05737	Lever Shaft		1
52	ZX-C33	Taper Pin	4x45	2
53	ZX-05115	Fork		1
54	ZX-05119	Crank		1
55	ZX-05735	Pin		1
56	ZX-05112	Fork		1
57	ZX-05113	Crank		1
58	ZX-05730	Small Shaft		1
59	ZX-05731	Big Gear	1m44T	1
60	ZX-05732	Small Gear	1m22T	1
61	ZX-05114	Sleeve		1
62	ZX-05734	Lever Shaft		1
63	ZX-05503	Gasket		1
64	ZX-05110	Front Cover		1
65	TS-1505021	Hex Socket Cap Screw	M10x20	5
66	ZX-066	Taper Pin	5x35	6
67	ZX-05303A	Sign Plate		1
68	ZX-068	Cross Head Screw	M3x6	7
69	ZX-069	Oil Sight Glass	20	1
70	ZX-05727	Positioning Disc		1
71	ZX-071	Countersunk Head Screw	M4x12	9
72	ZX-05740	Lever		1
73	ZX-05130A	Lever Support		1
74	ZX-05301	Sign Disc		3



Item	Part No.	Description	Size	Qty.
75	ZX-H5	Steel Ball	8	3
76	ZX-076	Compression Spring	YZ-1x8x25	3
77	ZX-H3	Flat End Set Screw	M10x12	3
78	ZX-05736	Positioning Disc		1
79	ZX-05140	Hand Wheel		2
80	ZX-05733	Positioning Disc		1
81	C6136ZK-05551	Rubber Washer		1
82	GB70	Hex Socket Cap Screw	M8 X 5	1
83	1440R-05752	Board		1



QUICK CHANGE GEAR BOX II PARTS DIAGRAM





Quick Change Gear Box II Parts List

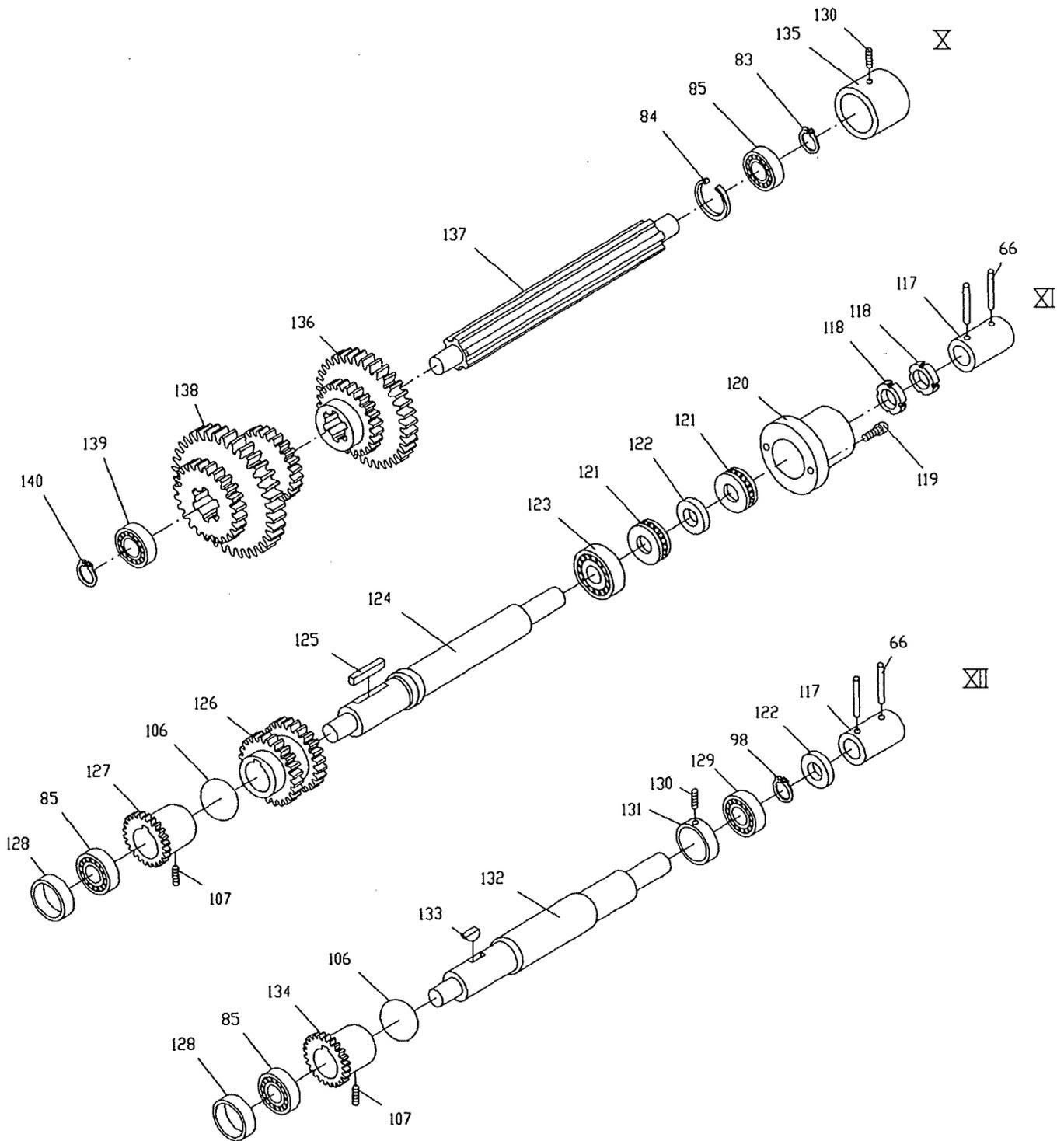
Item	Part No.	Description	Size	Qty.
81	ZX-05104	Middle Bearing Support	2	
82	ZX-082	Taper End Set Screw	M10x16	2
83	ZX-B23	C-Clip	20	3
84	ZX-084	C-Clip	42	5
85	BB-6004	Single Row Radial Ball Bearing	20x42x12	5
86	ZX-05721	Shaft		1
87	ZX-05722	Double Gear	2m26T/2m52T	1
88	ZX-088	Iron Wire	1x190	2
89	TS-1524051	Set Screw	M8x20	2
90	ZX-05720	Positioning Sleeve		1
91	ZX-05719	Gear	2.25m28T	1
92	ZX-05718	Double Gear	2m26T/2m28T	1
93	ZX-05717	Gear	3.5m20T	1
94	ZX-05716	Double Gear	3.5m18T/3.5m19T	1
95	ZX-05715	Gear	3.25m22T	1
96	ZX-05714	Double Gear	3.25m24T/3.25m23T	1
97	BB-6205	Single Row Radial Ball Bearing	25x52x15	2
98	ZX-C40	C-Clip	25	3
99	ZX-05125	Shaft End Cover		1
100	TS-1504041	Hex Socket Cap Screw	M8x18	2
101	ZX-05704	Spacer		1
102	ZX-05705	Double Gear	2m52T/2m26T	1
103	ZX-05502C	Oil Bushing		3
104	ZX-05105	Sleeve		2
105	ZX-05707	Double Gear	2m39T/2m26T	1
106	ZX-0106	Iron Wire	1x160	3
107	TS-1524031	Set Screw	M8x12	3
108	ZX-05714C	Fixed Bushing		1
109	ZX-05710	Shaft		1
110	ZX-05709	Double Gear	2m48T/2.25m42T	1
111	ZX-05711	Sliding Gear	3.5m24T	1
112	ZX-05712	Sliding Gear	3.25m24T	1
113	ZX-05713	Sleeve		1



Item	Part No.	Description	Size	Qty.
114	ZX-G51-1	Spacer	32	1
115	ZX-05106	Bearing Support		1
116	TS-1504051	Hex Socket Cap Screw	M8x25	3
141	ZX-05504	Gasket		1
142	ZX-05505	Gasket		1



QUICK CHANGE GEAR BOX III PARTS DIAGRAM





Quick Change Gear Box III Parts List

Item	Part No.	Description	Size	Qty.
66	ZX-066	Taper Pin	5x35	6
83	ZX-083	C-Clip	20	3
84	ZX-084	C-Clip	42	5
85	BB104	Single Row Radial Ball Bearing	20x42x12	5
98	ZX-098	C-Clip	25	3
106	ZX-0106	Iron Wire	1x160	3
107	TS-1524031	Set Screw	M8x12	3
117	ZX-05113C	Shaft Coupling		2
118	ZX-0118	Round Nut	M24x1.5	2
119	TS-1503021	Hex Socket Cap Screw	M6x10	2
120	ZX-05114C	Cover		1
121	BB-51105	Thrust Bearing	25x42x11	2
122	ZX-0122	Spacer	25	2
123	BB-6305	Ball Bearing	25x62x17	1
124	ZX-05725	Shaft		1
125	ZX-0125	Key	8x7x50	1
126	ZX-05724	Double Gear	2.25m35T/2.25m36T	1
127	ZX-05723	Gear	2.5m36T	1
128	ZX-05107	Sleeve		2
129	BB-6005	Ball Bearing	25x47x12	1
130	TS-1525021	Set Screw	M10x12	2
131	ZX-05103	Bearing Support		1
132	ZX-05701	Shaft		1
133	ZX-0133	Half Circle Key	6x22	1
134	ZX-05703	Gear	2.5m36T	1
135	ZX-05102	Bearing Support		1
136	ZX-05702	Double Gear	2.5m24T/2.25m35T	1
137	ZX-05708	Shaft		1
138	ZX-05706	Triple Gear	2m39T/2m52T/2m26T	1
139	BB-6203	Ball Bearing	17x40x12	1
140	ZX-0140	C-Clip	17	1



Apron Assembly I Parts List

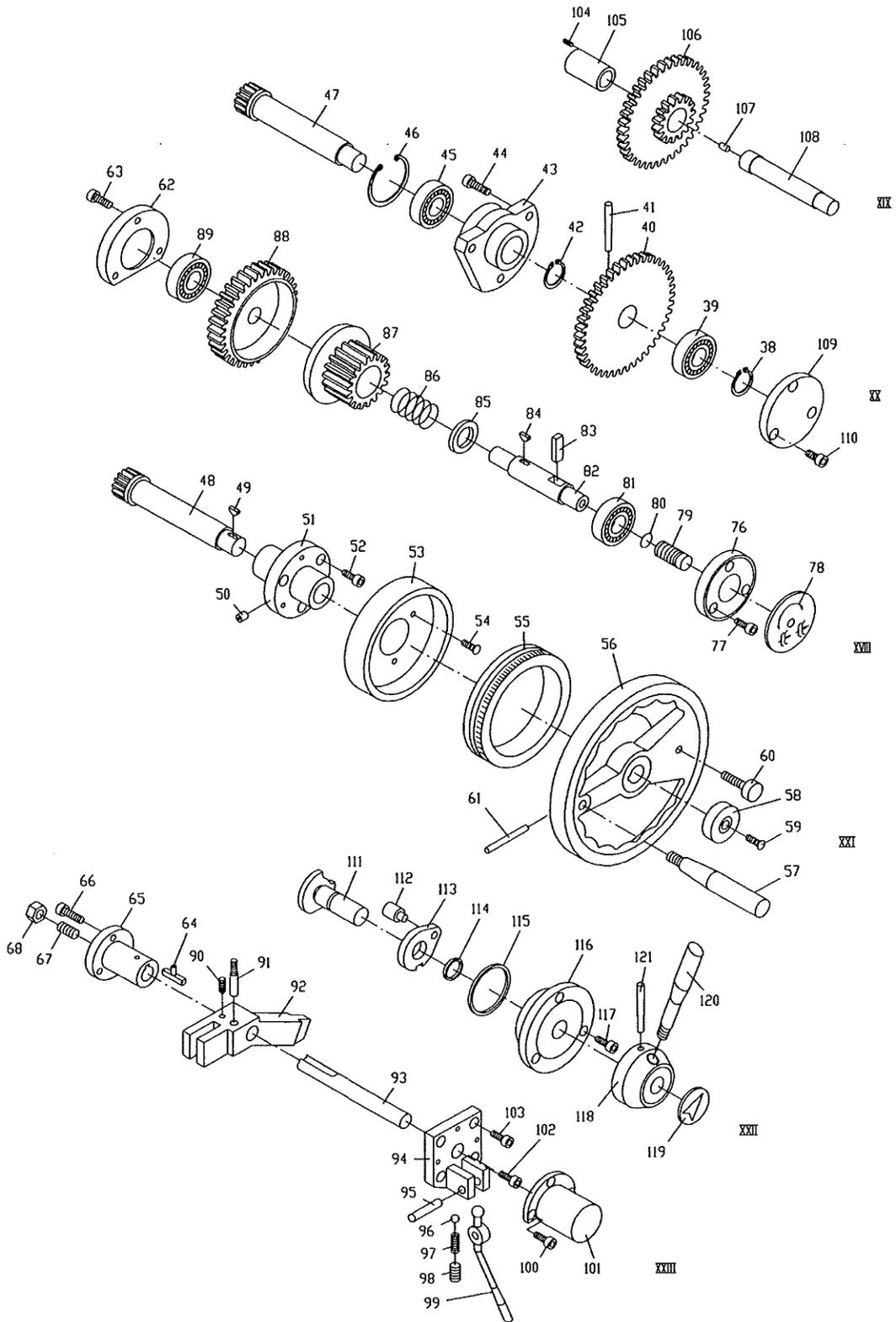
Item	Part No.	Description	Size	Qty.
1	TL06101	Apron Casting		1
2	TL06103	Bottom Cover		1
3	TS-1540072	Hex Nut	M10	1
4	ZX-A4	Flat Head Set Screw	M10x70	1
5	TL06502	Cushion Cap		1
6	ZX-A6	Pin	6n6x16	2
7	ZX-A7	Tensile Spring	Y11.2x9x50	1
8	TL06734	Lever		1
9	ZX-A9	Pin	8n6x30	1
10	ZX-A10	Pin	6n6x18	1
11	TL06701-A	Pushing Rod		1
12	ZX-A12	Oil Seal	15x2.4	1
13	BB60016	Ball Bearing	6x17x6	1
14	ZX-A6	Pin	6n6x16	1
15	GB70	Hex Socket Cap Screw	M8x6	1
16	ZX-B34	Taper Pin	5x30	2
17	TS-1504041	Hex Socket Cap Screw	M8x20	6
18	TL06501	Gasket		1
19	TL06307	Sign Plate		1
20	TL06716	Lever		1
21	ZX-06122	Lever Support		1
22	ZX-B27	Taper Pin	6x60	1
23	TL06717	Half Nut Shaft		1
24	TL06111	Positioning Block		1
25	ZX-A25	Thread Tail Taper Pin	6x25	1
26	TS-1523031	Set Screw	M6x10	1
27	ZX-06733	Half Nut Control Plate		1
28	ZX-A28	Taper Pin	6x55	1
29	ZX-06732	Pin		2
30	ZX-06302N	New Half Nut		1
31	TS-1540072	Hex Nut	M10	1
32	ZX-A32	Cylindrical End Set Screw	M10x60	1
33	ZX-06121	Gib		1



Item	Part No.	Description	Size	Qty.
34	ZX-06731	Cylindrical End Set Screw		3
35	TS-1540061	Hex Nut	M8	3
36	ZX-A36	Set Screw	M8x32	1
37	ZX-A37	Oil Sight Glass	20	1
69	TL06727N	New Gear	2m25T	1
70	TL06728	Sliding Key		2
71	TL06121N	New Spacer		2
72	TL06304N	New Positioning Sleeve		2
73	ZX-A73	Ring Seal For Rotating	3x55	2
74	ZX-A74	Oil Seal	35x3.1	1
75	TL06729N	New Sleeve		1
122	TL06302	Sign Plate		1
123	TL06730	Shaft		1
124	BB-51104	Thrust Bearing		2
125	TL06305	Sleeve		2
126	TL06726N	New Worm		1
127	TL06122N	New Worm Support		1
128	TL06720	Control Plate		1
129	TS-1514031	Hex Socket Cap Screw	M6x20	4
130	ZX-A130	Taper Pin	4x20	1
131	TS-1524031	Set Screw	M8x12	2
132	ZX-A132	Screw	M8x25	2
133	ZX-A133	Cylindrical Tensile Spring	LI-1.6x10x58	1
134	TL06503	Gasket		1
135	TL06114	Back Cover		1
136	TS-1514011	Hex Socket Cap Screw	M6x12	5
137	ZX-A137	Set Screw	M8x30	2
138	ZX-A138	Iron Wire	1x50	2
139	ZX-A139	Oil Conducting Cord	3x100	2
140	ZX-A140	Screw	M10x40	1
158	TS-1540041	Hex Nut	M6	1
159	TL06124	Bracket		1
160	ZX-A160	Taper Pin	5x25	2
163	TL06120	Sleeve		1



APRON ASSEMBLY II PARTS DIAGRAM





Apron Assembly II Parts List

Item	Part No.	Description	Size	Qty.
38	ZX-B23	C-Clip	20	1
39	BB-6204	Ball Bearing	20x47x14	1
40	TL06705	Gear	2m65T	1
41	ZX-A41	Taper Pin	6x40	1
142	ZX-C40	C-Clip	25	1
43	ZX-06127N	New Bearing Support		1
44	TS-1504041	Hex Socket Cap Screw	M8x18	3
45	BB-6205Z	Ball Bearing	25x52x15	1
46	ZX-A46	C-Clip	52	1
47	TL06704N	New Shaft	2m14T	1
48	TL06706	Hand Wheel Shaft	2mx15T	1
49	ZX-H10	Half Circle Key	4x16	1
50	ZX-A50	Oil Cup	8	1
51	TL06104	Lever Support		1
52	TS-1503051	Hex Socket Cap Screw	M6x18	3
53	TL06105	Dial Support		1
54	ZX-A54	Cross Head Screw	M5x12	3
55	TL06732	Dial		1
56	TL06107	Hand Wheel		1
57	ZX-06710	Shaft Driven Lever		1
58	TL06709	Shaft Cover		1
59	ZX-A54	Cross Head Screw	M5x12	1
60	TL06708	Screw		1
61	TL06707	Pin		1
62	TL06112	End Cover		1
63	TS-1503031	Hex Socket Cap Screw	M6x12	3
64	TL06733	T Shaped Flat Key		1
65	TL06115	Flange Sleeve		1
66	TS-1503031	Hex Socket Cap Screw	M6x12	3
67	ZX-A67	Flat End Set Screw	M6x30	1
68	TS-1540041	Hex Nut	M6	1
76	TL06109	Flange		1
77	TS-1503031	Hex Socket Cap Screw	M6x12	3



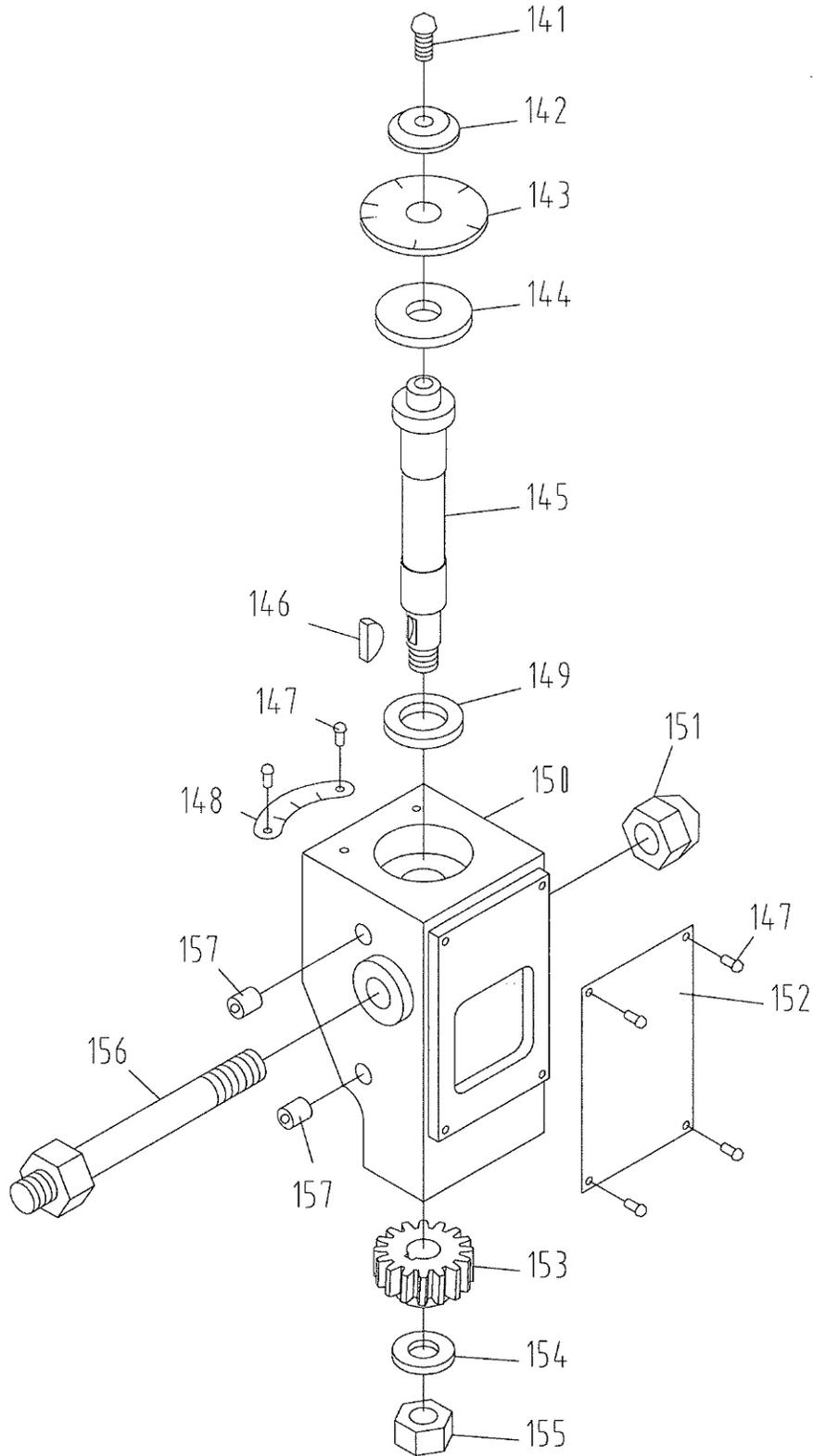
Item	Part No.	Description	Size	Qty.
78	TL06303	Sign Plate		1
79	TL06714	Adjusting Screw		1
80	ZX-A80	Oil Seal	8x1.9	1
81	BB-7203	Ball Bearing	17x40x12	1
82	TL06713	Shaft		1
83	TL06715	Adjusting Rod		1
84	ZX-H10	Half Circle Key	4x16	1
85	TL06712	Spring Cover		1
86	ZX-A86	Spring	YI-5x35x50	1
87	TL06718	Gear	2m28T	1
88	TL06113	Helical Gear	2.5m40T	1
89	BB7006/P6	Ball Bearing	30x55x13	1
90	TS-1523031	Set Screw	M6x10	1
91	ZX-A25	Thread Tail Taper Pin	6x25	1
92	TL06110	Fork		1
93	TL06721	Control Rod		1
94	TL06116	Lever Support		1
95	ZX-A9	Pin	8n6x30	1
96	ZX-H5	Steel ball	8	1
97	ZX-A97	Spring	YI-1x7x25	1
98	ZX-A98	Flat Head Set Screw	M10x16	1
99	TL06722	Lever		1
100	ZX-A100	Cross Head Screw	M5x10	3
101	TL06117	Cover		1
102	ZX-A102	Adjusting Screw	M6x30	1
103	TS-1503051	Hex Socket Cap Screw	M6x18	3
104	ZX-A104	Flat Head Set Screw	M4x8	1
105	TL06301	Sleeve		1
106	TL06710	Gear	2m21T/2m57T	1
107	ZX-A107	Pin	6n6x8	1
108	TL06711	Shaft		
109	TL06108	End Cover		1
110	TS-1503031	Hex Socket Cap Screw	M6x12	3
111	TL06723	Control Shaft		1
112	TL06725	Pin		1



Item	Part No.	Description	Size	Qty.
113	TL06724	Control Block		1
114	ZX-A114	Oil Seal	20x2.4	1
115	ZX-A115	Oil Seal	50x3.1	1
116	TL06119	Lever Flange		1
117	TS-1503031	Hex Socket Cap Screw	M6x12	3
118	TL06118	Lever Support		1
119	TL06307	Sign Plate		1
120	TL06716	Lever		1
121	ZX-827	Taper Pin	6x60	1



APRON ASSEMBLY III PARTS DIAGRAM



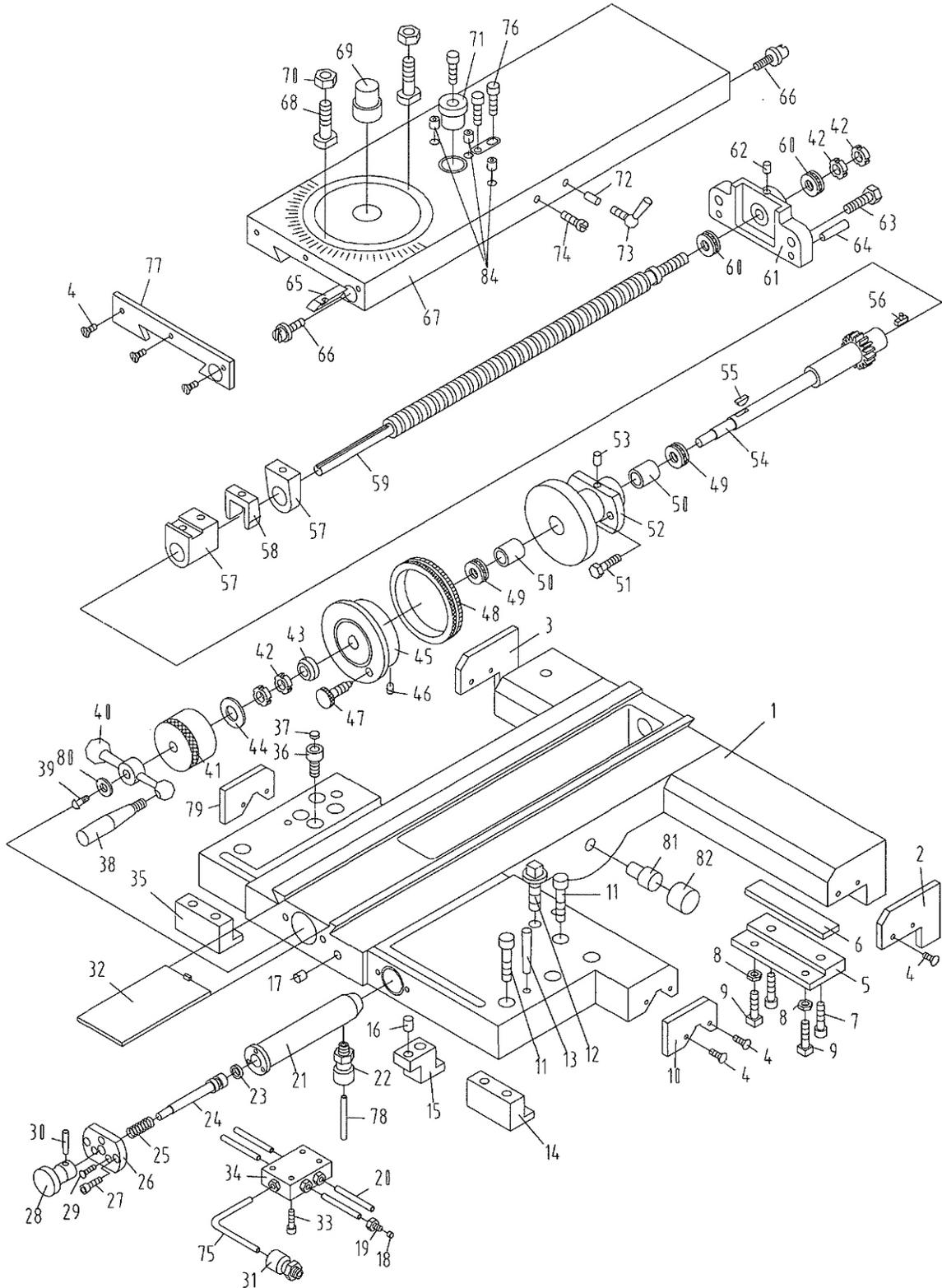


Apron Assembly III Parts List

Item	Part No.	Description	Size	Qty.
141	ZX-A141	Half Round Head Screw	M6x18	1
142	ZX-11704	Washer		1
143	ZX-11301	Dial		1
144	ZX-11105	Adjusting Washer		1
145	ZX-11701	Shaft		1
146	ZX-H10	Half Circle Key	4x16	1
147	ZX-A147	Half Round Head Screw	M3x6	6
148	ZX-11303	Positioning Sign Plate		1
149	ZX-11703	Adjusting Washer		1
150	ZX-11101	Casting		1
151	ZX-A151	Acorn Nut	M12	1
152	ZX-11304	Thread Chasing Label		1
153	ZX-11102	Helical Gear	2m16T	1
154	TS-1550071	Flat Washer	M10	1
155	TS-1540072	Hex Nut	M10	1
156	ZX-11702	Bolt		1
157	ZX-A157	Oil Cup	8	2



CARRIAGE ASSEMBLY PARTS DIAGRAM





Carriage Assembly Parts List

Item	Part No.	Description	Size	Qty.
1	ZX-K04101A	Saddle Casting		1
2	ZX-04505	Wipe Plate		1
3	ZX-04504	Wipe Plate		1
4	ZX-H211	Countersunk Head Screw	M5x16	11
5	ZX-04724	Clamping Block		2
6	ZX-04113	Lining Plate		2
7	TS-1505041	Hex Socket Cap Screw	M10x30	4
8	TS-1540061	Hex Nut	M8	4
9	ZX-CA09	Square Set Screw	M8x20	4
10	ZX-04506	Wipe Plate		1
11	TS-1505071	Hex Socket Cap Screw	M10x45	8
12	ZX-CA12	Square Cap Bolt	M12x70	1
13	ZX-CA13	Taper Pin	8x60	2
14	ZX-04729	Clamping Block		1
15	ZX-04730	Locking Plate		1
16	ZX-CA16	Pin	4n6x12	1
17	ZX-04772	Blocking Piece		1
18	ZX-CA18	Fitting Joint Seal	A4	8
19	ZX-CA19	Hollowed Bolt	A4	8
20	ZX-CA20	Copper Tube		4
21	ZX-04782	Manual Oil Pump Casting		1
22	ZX-04781A	In Valve		1
23	ZX-CA23	Oil Ring	15x2.4	1
24	ZX-04784	Piston		1
25	ZX-CA25	Spring	1.2x14x65	1
26	ZX-04785	Oil Pump Cover		1
27	TS-1502041	Hex Socket Cap Screw	M5x16	2
28	ZX-04783	Lever		1
29	ZX-CA29	Countersunk Head Screw	M4x16	3
30	ZX-A130	Taper Pin	4x20	1
31	ZX-04781B	Out Valve		1
32	ZX-04716	Chip Guard		1
33	ZX-CA33	Slotted Cheese Head Screw	M5x20	4



Item	Part No.	Description	Size	Qty.
34	ZX-04780	Oil Distributor		1
35	ZX-04740	Clamping Block		1
36	ZX-04750	Oil Cap		1
37	ZX-04301	Oil Indicator Cap		1
38	ZX-04721	Lever		1
39	ZX-CA39	Cross Head Screw	M5x16	1
40	ZX-04720	Handle		1
41	ZX-04769	Sleeve		1
42	ZX-CA42	Round Nut	M12x1.25	4
43	ZX-04719	Lining		1
44	ZX-04770	Disc Spring		1
45	ZX-04108	Flat Pan		1
46	ZX-04790	Pushing Rod		1
47	ZX-04789	Screw		1
48	ZX-04717	Dial		1
49	BB-51102	Thrust Bearing	15x28x9	2
50	ZX-04111	Sleeve		2
51	TS-1490041	Hex Cap Bolt	M8x25	2
52	ZX-04109	Screw Support		1
53	ZX-CA53	Oil Cup	8	1
54	ZX-04707-1	Gear Sliding Sleeve	2m16T	1
55	ZX-H10	Half Circle Key	4x16	1
56	ZX-04751	Flat Key		1
57	ZX-04302	Nut Assembly		1
58	ZX-04748	Wedge		1
59	ZX-04707-2	Lead Screw		1
60	BB-51101/P6	Thrust Bearing	12x26x9	2
61	ZX-04116	Bracket		1
62	ZX-CA62	Oil Cup	6	1
63	TS-1491041	Cap Screw	M10x30	2
64	ZX-CA64	Taper Pin	8x30	2
65	ZX-04731	Cross Slide Gib		1
66	ZX-04725C	Screw		2
67	ZX-04102A	Cross Slide		1
68	ZX-04714	Screw (for T-Slot)		2



Item	Part No.	Description	Size	Qty.
69	ZX-04732	Pin		1
70	TS-1540081	Hex Nut	M12	2
71	ZX-04709	Sleeve		1
72	ZX-04304	Pressing Pin		1
73	ZX-04746	Screw		1
74	ZX-04786	Set Screw		1
75	ZX-CA75	Long Copper Tube		1
76	TS-1504051	Socket Head Cap Screw	M8x22	3
77	ZX-04502	Wipe Plate		1
78	ZX-CA78	Copper Tube		6
79	ZX-04503	Wipe Plate		1
80	ZX-04771	Lining		1
81	ZX-04788	Stop Pin		1
82	ZX-04507	Stop Pin Cap		1
	ZX-CSNA	Crossfeed Screw & Nut Assy. (includes #57-59)		
	ZX-CDA	Crossfeed Dial Assy. (includes #41-50, 51-56)		
84	ZX-CA84	Oil Cup	10	3

NOTES



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