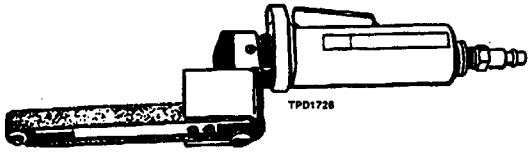
ARO®
Tool & Hoist Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION M10
MANUAL 192
Released: 5–31–94
Revised: 5–31–94

.35 H.P. ANGLE BELT SANDER
for
MODELS GR03A–12B–( ) AND GR03A–20B–( )



⚠ WARNING

IMPORTANT SAFETY INFORMATION ENCLOSED.
READ THIS MANUAL BEFORE OPERATING TOOL.

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

- Always operate, inspect and maintain this tool in accordance with American National Standards Institute Safety Code for Portable Air Tools (ANSI B186.1).
- For safety, top performance, and maximum durability of parts, operate this tool at 90 psig (6.2 bar/620 kPa) maximum air pressure at the inlet with 3/4" (19 mm) inside diameter air supply hose.
- Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.
- Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.
- Keep hands, loose clothing and long hair away from rotating end of tool.
- Anticipate and be alert for sudden changes in motion during start up and operation of any power tool.
- Check for excessive speed and vibration before operating.
- Belt may continue to run briefly after throttle is released.
- Do not lubricate tools with flammable or volatile liquids such as kerosene, diesel or jet fuel.
- Do not remove any labels. Replace any damaged label.
- Use accessories recommended by ARO Tool.

NOTICE

The use of other than genuine ARO Tool replacement parts may result in safety hazards, decreased tool performance, and increased maintenance, and may invalidate all warranties.

ARO Tool is not responsible for customer modification of tools for applications on which ARO Tool was not consulted.

Repairs should be made only by authorized trained personnel. Consult your nearest ARO Tool Authorized Servicenter.

It is the responsibility of the employer to place the information in this manual into the hands of the operator.

For parts and service information, contact your local ARO distributor, or the Customer Service Dept. of the Ingersoll–Rand Distribution Center, White House, TN at PH: (615) 672–0321, FAX: (615) 672–0601

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WARNING LABEL IDENTIFICATION

⚠ WARNING

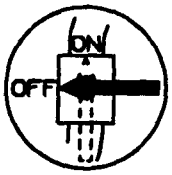
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

⚠ WARNING

Always wear eye protection when operating or performing maintenance on this tool.

⚠ WARNING

Always wear hearing protection when operating this tool.

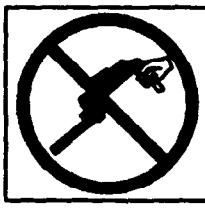


⚠ WARNING

Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

⚠ WARNING

Air powered tools can vibrate in use. Vibration, repetitive motions or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.



⚠ WARNING

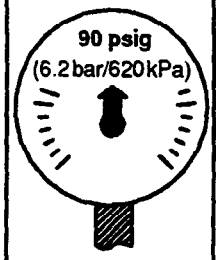
Do not carry the tool by the hose.

⚠ WARNING

Do not use damaged, frayed or deteriorated air hoses and fittings.

⚠ WARNING

Keep body stance balanced and firm. Do not overreach when operating this tool.



⚠ WARNING

Operate at 90 psig (6.2 bar/620 kPa) Maximum air pressure.

SANDER SPECIFIC WARNINGS

⚠ WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

- **Do not use this tool if actual free speed exceeds the nameplate rpm.**
- **Before mounting a sanding belt, after any tool repair or whenever a Sander is issued for use, check free speed of the tool with a tachometer to make certain its actual speed at 90 psig (6.2 bar/620 kPa) does not exceed rpm stamped or printed on the nameplate. Sanders in use on the job must be similarly checked at least once each shift.**
- **Always use the recommended ARO Tool Guard furnished with the Sander.**
- **Model GR03A–12 Angle Belt Sanders have a free speed of 12 000 rpm and a belt speed of 2 700 sfpm while Model GR03A–20 Angle Belt Sanders have a free speed Series of 20 000 rpm and a belt speed of 4 500 sfpm, when operated at 90 psig (6.2 bar/620 kPa) air pressure. Operation at higher air pressure will result in excessive speed.**
- **Do not operate a Belt Sander with the Cover removed.**

PLACING TOOL IN SERVICE

LUBRICATION

IRAX No. 10P	IRAX No. 67–1LB
IRAX No. 50P	IRAX No. 68–1LB
IRAX No. 63Z4	IRAX No. 77–1LB

Always use an air line lubricator with these Tools.
We recommend the following Filter–Lubricator–Regulator Unit:

For USA –IRAX No. C22–04–G00
For International –IRAX No. C26–C4–A29

After each two hours of operation, if an air line lubricator is not used, inject 1/2 to 1 cc of IRAX No. 10P Oil into the Air Inlet.
After each eight hours of operation, inject approximately 1/2 cc of IRAX No. 67–1LB or IRAX No. 77–1LB Grease into the Angle Grease Fitting (25).
Excessive lubrication will cause grease to work out around the Arbor.

Whenever a new Wick (27) is installed, thoroughly saturate the Wick with approximately 1–1/2 cc of IRAX No. 63Z4 Oil. **Do not substitute any other oil.**
Whenever the motor is disassembled, remove the old grease and refill the cavity behind the Rear Rotor Bearing (9) with 3/4 cc of IRAX No. 68–1LB Grease.

CAUTION

Do not mark any nonmetallic surface of this tool with customer identification codes. Such action could affect tool performance.

INSTALLING A SANDING BELT

When installing a new sanding belt, proceed as follows:

1. **For 18" models,** slide the Cover (35B) rearward toward the handle of the Sander until it is free. It may require a light tap on the front edge of the Cover to disengage it from its locking points.
2. Compress the Idler Wheel (45) and slip the old belt off the Drive Sleeve (33). Release the pressure on the Idler Wheel and remove the belt.
3. Position a new belt on the Idler Wheel.
4. Compress the Idler Wheel with the belt and slip the opposite end of the belt onto the Drive Sleeve around the Spindle Cap (32). Release the pressure on the Idler Wheel.
5. **For 18" models,** align the Cover with the Guard (34) and slide it forward toward the Idler Wheel until it snaps into position and stays there.
6. Operate the Sander at low speed to determine if the new belt is tracking properly. If the belt fails to track properly, realign the Clevis (36) by tightening or loosening one or both of the Clevis Mounting Screws (37).

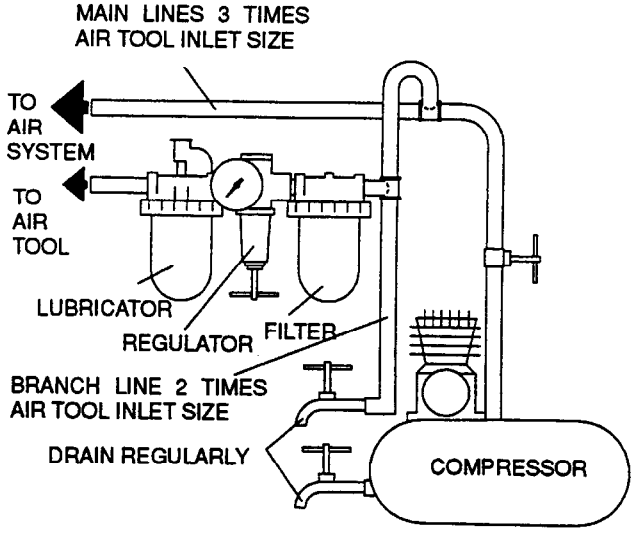
TOOL OPERATION

Sand using any portion of the exposed sanding belt. For best results, sand on that portion of the belt being pulled by the Drive Wheel.

INSTALLATION

Air Supply and Connections

Always use clean, dry air at 90 psig. maximum air pressure. Dust, corrosive fumes and/or excessive moisture can ruin the motor of an air tool.
An air line filter can greatly increases the life of an air tool. The filter removes dust and moisture.
Make sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for a typical piping arrangement.

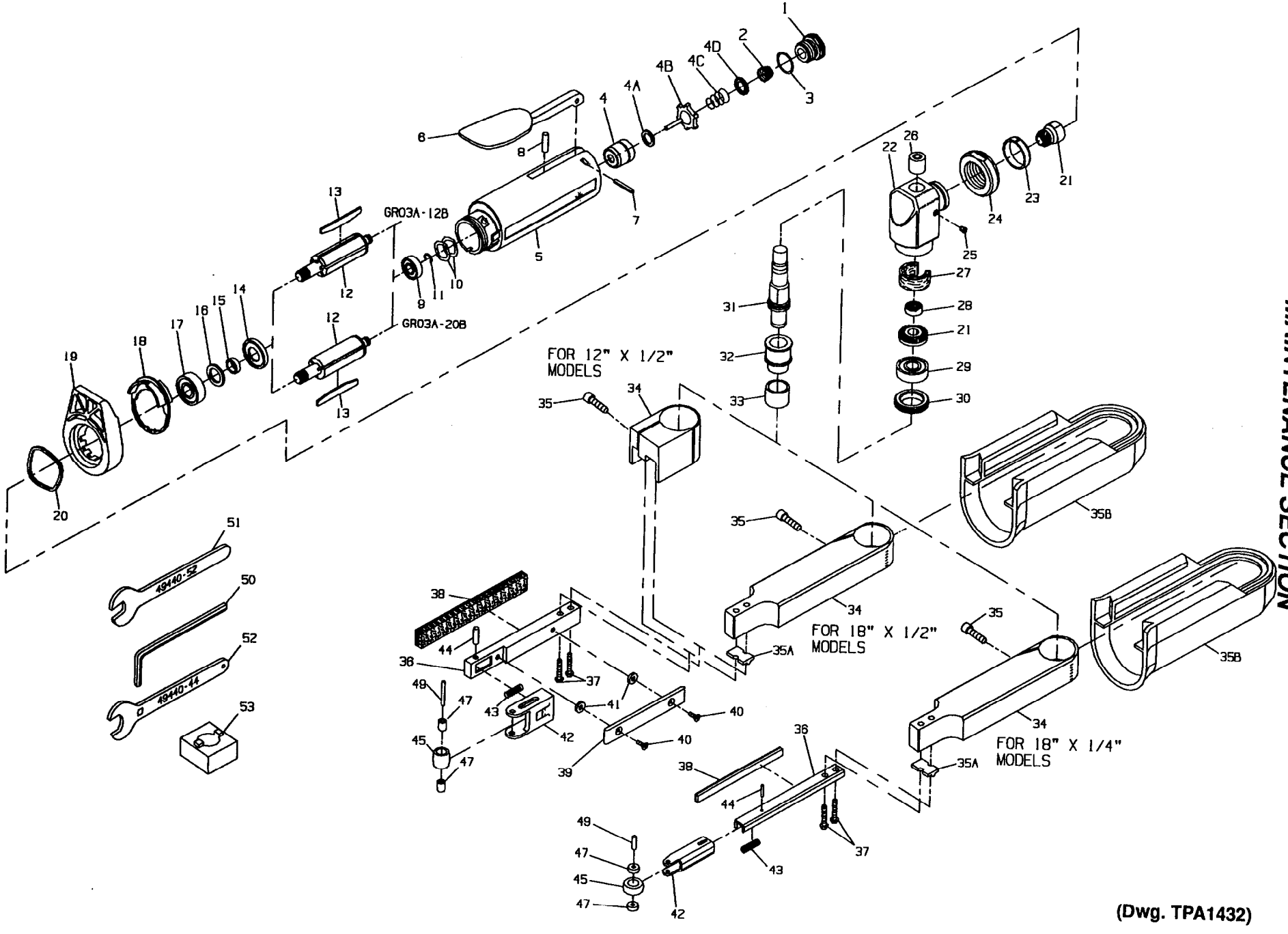


(Dwg. TPD905–1)

GR03A Angle Belt Sanders are designed for work in the metal fabricating industry, woodworking and foundry applications. These small Angle Belt Sanders are very efficient at sanding weld bead, slag and parting lines while leaving a fine finish.

HOW TO ORDER GR03A ANGLE BELT SANDERS

ANGLE BELT SANDERS WITH 12" x 1/2" BELT		
Model	**Arbor Speed rpm**	**Belt Speed sfpm**
GR03A–20B–3	20 000	4 500
GR03A–12B–3	12 000	2 700
ANGLE BELT SANDERS WITH 18" x 1/4" BELT		
GR03A–20B–5	20 000	4 500
GR03A–12B–5	12 000	2 700
ANGLE BELT SANDERS WITH 18" x 1/2" BELT		
GR03A–20B–4	20 000	4 500
GR03A–12B–4	12 000	2 700


GR03A-12B
GR03A-20B
FOR 12" X 1/2" MODELS
FOR 18" X 1/2" MODELS
FOR 18" X 1/4" MODELS
49140-52
49140-44

(Dwg. TPA1432)

		PART NUMBER FOR ORDERING
	1	Inlet Assembly 49440–1
	2	Inlet Screen 49440–2
•	3	Inlet Seal 49440–3
		Throttle Valve Kit 49440–145
	4	Throttle Valve Cartridge Case 49440–146
	4A	Throttle Valve Seat 49440–148
	4B	Throttle Valve 49440–147
	4C	Throttle Valve Spring 49460–5
	4D	Throttle Valve Spring Seat 49440–149
	5	Motor Housing 49440–5
	6	Throttle Lever 49440–6
	7	Throttle Lever Pin 49440–7
	8	Throttle Valve Plunger 49440–8
	9	Rear Rotor Bearing 49440–9
•	10	Rear Rotor Bearing Spacer (2) 49440–10
•	11	Rear Rotor Bearing Retainer 49440–11
	12	Rotor
		for GR03A–12 (5 vane slots) 49440–46
		for GR03A–20 (3 vane slots) 49440–45
•	13	Vane Packet (set of 5 Vanes) 49440–13
	14	Front End Plate 49440–14
	15	Front End Plate Spacer 49440–15
•	16	Front Seal Cup 49440–16
	17	Front Rotor Bearing 49440–17
	18	Flow Ring
		for GR03A–12 (brown) 49440–48
		for GR03A–20 (red) 49440–50
	19	Flange 49440–19
	20	Flange Clamp 49440–20

		PART NUMBER FOR ORDERING
	21	Bevel Pinion and Bevel Gear
		(sold only as a matched set)
		for GR03A–12 49440–53
		for GR03A–20 49440–54
	22	Angle Housing Assembly 49440–55
	23	Clamp Spacer 49440–56
	24	Clamp Nut 49440–22
	25	Grease Fitting 49440–57
	26	Upper Arbor Bearing 49440–58
+	27	Wick
		for GR03A–12 49440–59
		for GR03A–20 49440–60
	28	Bevel Gear Nut 49440–61
	29	Lower Arbor Bearing 49440–24
	30	Arbor Bearing Cap 49440–62
	31	Arbor 49440–65
	*	Warning Label 49385
	*	Nameplate
		for GR03A–12 49384–4
		for GR03A–20 49384–5
		Belt Sander Assembly
		for 12" x 1/2" models 49440–156
		for 18" x 1/2" models 49767
		for 18" x 1/4" models 49440–157
	32	Spindle Cap 49440–86
	33	Drive Sleeve 49440–87
	34	Guard
		for 12" models 49440–88
		for 18" models 49440–107

* Not illustrated.

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.

\+ The 49440–55 Angle Housing Assembly is furnished with two Wicks. Use Wick 49440–60 with the notch on GR03A–20 models.

		PART NUMBER FOR ORDERING
35	Guard Clamp Screw	49440–89
35A	Alignment Block (for 18" models only)	49440–108
35B	Cover (for 18" models only)	49440–111
36	Clevis Assembly	
	for 12" x 1/2" and 18" x 1/2" models	49440–139
	for 18" x 1/4" models	49440–127
*	Belt Speed Label	49440–109
37	Clevis Mounting Screw (2)	
	for 12" x 1/2" and 18" x 1/4" models	49440–142
	for 18" x 1/2" models	49440–155
38	Belt Pad	
	for 12" x 1/2" and 18" x 1/2" models	49440–92
	for 18" x 1/4" models	49440–125
39	Belt Plate (for 12" x 1/2" and 18" x 1/2" models only)	49440–93
40	Belt Plate Retaining Screw (for 12" x 1/2" and 18" x 1/2" models only) (2)	49440–94
41	Belt Plate Spacer (for 12" x 1/2" and 18" x 1/2" models only) (2)	49440–143
42	Yoke	
	for 12" x 1/2" and 18" x 1/2" models	49440–140
	for 18" x 1/4" models	49440–129
43	Yoke Spring	49440–97
44	Yoke Retaining Pin	
	for 12" x 1/2" and 18" x 1/2" models	49440–141
	for 18" x 1/4" models	49440–154

		PART NUMBER FOR ORDERING
45	Idler Wheel Assembly	
	for 12" x 1/2" and 18" x 1/2" models	49440–138
	for 18" x 1/4" models	49440–159
47	Idler Wheel Bearing (2)	
	for 12" x 1/2" and 18" x 1/2" models	49440–144
	for 18" x 1/4" models	49440–122
49	Idler Wheel Shaft	
	for 12" x 1/2" and 18" x 1/2" models	49440–103
	for 18" x 1/4" models	49440–128
50	Guard Clamp Screw Wrench (5/32" hex)	49440–158
*	Sanding Belt Pack (includes 10 belts)	
	for 12" x 1/2" models	
	60 Grit	49440–104
	80 Grit	49440–105
	100 Grit	49440–106
	for 18" x 1/2" models	
	60 Grit	49440–119
	80 Grit	49440–120
	100 Grit	49440–121
	for 18" x 1/4" models	
	60 Grit	49806–60
	80 Grit	49806–80
	100 Grit	49806–100
51	Collet Body Wrench (7/16")	49440–52
52	Clamp Nut Wrench	49440–44
53	Arbor Bearing Cap Wrench	49440–77
*	Variable Speed Control Assembly (with piped away exhaust)	49440–64
*	Piped Away Exhaust Kit	49440–63
*	Locking Throttle Lever Assembly	49440–117
*	Front Exhaust Flange	49440–113

* Not illustrated.

MAINTENANCE SECTION

⚠ WARNING

Always wear eye protection when operating or performing maintenance on this tool.

Always turn off the air supply and disconnect the air supply hose before installing, removing or adjusting any accessory on this tool, or before performing any maintenance on this tool.

DISASSEMBLY

General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. When grasping a tool or part in a vise, always use the surface of the part or tool and help prevent distortion. This is particularly true of threaded members and housings.
3. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for repairs or replacement.
4. Do not disassemble the tool unless you have a complete set of new gaskets and O–rings for replacement.
5. Do not press any needle bearing from a part unless you have a new needle bearing on hand for installation. Needle bearings are always damaged during the removal process.

Disassembly of the Sanding Arm

1. **For 18" models,** slide the Cover (35B) rearward toward the handle of the Sander until it is free. It may require a light rap on the front edge of the Cover to disengage it from its locking points.
2. Using the Guard Clamp Screw Wrench (50), loosen the Guard Clamp Screw (35) and remove the Guard (34) and assembled sanding arm from the Angle Housing (22).
3. Using a screwdriver, remove the two Clevis Mounting Screws (37) and separate the Clevis (36) from the Guard.
4. **For 12" x 1/2" and 18" x 1/2" models,** use a screwdriver, to remove the two Belt Plate Retaining Screws (40), two Belt Plate Spacers (41) and the Belt Plate (39).
5. If the Belt Pad (38) must be replaced, peel the Pad from the side of the Clevis or Yoke (42) and scrape the surfaces clean.
6. To separate the Yoke from the Clevis, press the Yoke Retaining Pin (44) out of the Yoke and Clevis with an arbor press.

⚠ WARNING

Be careful not to allow the compression of the Yoke Spring (43) to expel the Yoke or Clevis in an unsafe manner when the pressing plug is withdrawn from the Yoke.

7. Press the Idler Wheel Shaft (49) out of the Yoke and Idler Wheel (45).
8. The Idler Wheel contains an Idler Wheel Bearing (47) at each end. Simultaneously press both Bearings out of the Wheel.

Disassembly of the Angle Head

1. Grasp the tool in leather–covered or copper–covered vise jaws with the Spindle Cap (32) upward. Using the Collet Body Wrench (50) on the flats of the Arbor (31), unscrew the Spindle Cap. If the Drive Sleeve (33) needs replacement, cut the old one from the Spindle Cap.
2. Using the Arbor Bearing Cap Wrench (53), unscrew and remove the Arbor Bearing Cap (30). This is a **left–hand** thread. Rotate the Cap Wrench **clockwise** to remove the Cap.
3. Using the Clamp Nut Wrench (52), loosen the Clamp Nut (24) and pull the Angle Housing Assembly (22) away from the Motor Housing (5). This is a **left–hand** thread. Rotate the Nut Wrench **clockwise** to loosen the Nut.

NOTICE

Do not allow the Angle Head to rotate when separating it from the Motor. Components may fall from the Angle Head.

4. Grasp the Arbor and pull the assembled Arbor out of the Angle Head. If the Wick (27) needs replacement, pull it out of the Angle Housing.
5. If the Upper Arbor Bearing (26) needs replacement, place the Angle Head on the table of an arbor press, arbor end down, and press the Bearing out of the Angle Head.
6. Grasp the Arbor in leather–covered or copper–covered vise jaws with the collet end downward. Using an adjustable wrench, unscrew and remove the Bevel Gear Nut (28) and lift the Bevel Gear off the Arbor.
7. If the Lower Arbor Bearing (29) must be replaced, use a piece of tubing to support the Bearing on the table of an arbor press and press the Arbor from the Bearing.

MAINTENANCE SECTION

Disassembly of the Motor

1. Pull the Flange (19) and Flow Ring (18) off the front of the Motor Housing (5).
2. Grasp the Bevel Pinion (21) and pull the assembled motor out of the Motor Housing. Remove the two Rear Rotor Bearing Spacers (10) from the bottom of the Housing.
3. Remove the Vanes (13) from the Rotor (12).
4. Grasp the Rotor in leather–covered or copper–covered vise jaws with the Bevel Pinion upward. Using a 1/2" wrench, unscrew and remove the Bevel Pinion (21).
5. If the Front Rotor Bearing (17) must be replaced, support the Front End Plate (14) between two blocks on the table of an arbor press. Place the blocks as close to the body of the Rotor as possible and press the Rotor from the Bearing and End Plate. Remove the Front End Plate Spacer (15) and Front Seal Assembly (16) from the hub of the Rotor.
6. If the Rear Rotor Bearing (9) must be replaced, use snap ring pliers to remove the Rear Rotor Bearing Retainer (11) and then remove the two Rear Rotor Bearing Spacers (10).
7. Using a bearing puller, pull the Rear Rotor Bearing off the hub of the Rotor.

Disassembly of the Inlet and Throttle

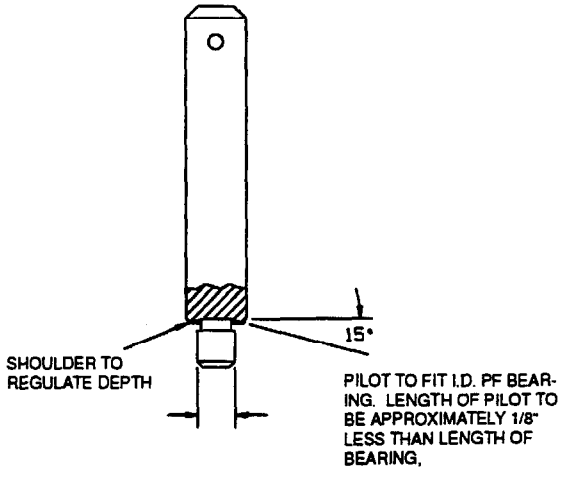
1. Using a 3/4" wrench, unscrew and remove the Inlet Assembly (1).
2. Remove the Inlet Seal (3) and Inlet Screen (2) from the Inlet.
3. Remove the Throttle Valve Spring Seat (4D), Throttle Valve Spring (4C) and Throttle Valve (4B) from the Motor Housing.
4. If the Throttle Valve Seat (4A) must be replaced, insert a hooked tool through the central opening of the Seat and, catching the underside of the Seat, pull it from the Housing.
5. If the Throttle Valve Cartridge Case (4) must be replaced, insert two hooked tools through the central opening of the Case approximately 180 degrees apart and, catching the underside of the Case, pull it from the Housing.
6. Press the Throttle Lever Pin (7) from the Housing and remove the Throttle Lever (6). Remove the Throttle Valve Plunger (8).

ASSEMBLY

General Instructions

1. Always press on the **inner** ring of a ball–type bearing when installing the bearing on a shaft.
2. Always press on the **outer** ring of a ball–type bearing when pressing the bearing into a bearing recess.
3. Whenever grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws. Take extra care not to damage threads or distort housings.
4. Always clean every part and wipe every part with a thin film of the recommended oil before installation.
5. Check every bearing for roughness. If an open bearing must be cleaned, wash it thoroughly in a clean, suitable cleaning solution and dry with a clean cloth. **Sealed or shielded bearings should not be cleaned.** Work grease into every open bearing before installation.
6. Apply a film of o–ring lubricant to every O–ring before installation.
7. Unless otherwise noted, always press on the stamped end of a needle bearing when installing a needle bearing into a recess. Use a bearing inserting tool similar to the one shown in Dwg. TPD786.

NEEDLE BEARING INSERTING TOOL



(Dwg. TPD786)

Assembly of the Throttle and Inlet

1. Insert the Throttle Valve Plunger (8) into the Motor Housing (5).
2. Position the Throttle Lever (6) on the Motor Housing and using an arbor press, press the Throttle Lever Pin (7) into the Housing and Lever. The Lever will retain the Plunger in the Housing.

3. If the Throttle Valve Cartridge Case (4) was removed, lubricate the outside and the throttle stem end of the Case with o–ring lubricant. Using a wooden dowel, push the Case, open end trailing, into the Motor Housing.
4. If the Throttle Valve Seat (4A) was removed, use a wooden dowel with a flat end to push the Seat into the Case.
5. Push the small end of the Throttle Valve Spring (4C) onto the end of the Throttle Valve (4B) with the short stem until the Spring snaps into position around the hub and remains there. Install the dish end of the Throttle Valve Spring Seat (4D) onto the large end of the Throttle Valve Spring.
6. Holding the Housing with the Lever downward, make sure the Plunger is out of the way and insert the assembled Valve, long stem end leading, into the Cartridge Case.
7. Push the Inlet Screen (2), closed end leading, into the Inlet Assembly (1). After moistening the Inlet Seal (3) with o–ring lubricant and being careful not to nick the Seal on the threads of the Inlet, install the Seal on the Inlet.
8. Thread the Inlet Assembly into the Housing and tighten it between 13 to 15 ft–lb (17.6 to 20.3 Nm) torque.

Assembly of the Motor

1. If the Rear Rotor Bearing (9) was removed, stand the Rotor (12) upright on the table of an arbor press with the threaded end downward. Place the threaded rotor hub into a hole of a drilled block so that the Rotor rests against the large rotor body. Press the Rear Rotor Bearing onto the hub of the Rotor.

NOTICE

Press the Rotor Bearing onto the shaft with the shielded side of the Bearing against the rear end plate.

2. Install the Rear Rotor Bearing Retainer (11) in the groove on the hub of the Rotor.
3. Place the Front End Plate Spacer (15) onto the threaded hub of the Rotor and install the Front End Plate (14) around the Spacer, counterbored end trailing. Press the Front Seal Assembly (16), felt end trailing, onto the Spacer until the trailing end is flush with the Spacer. Lubricate the felt with IRAX No. 50P Oil.
4. Stand the Rotor on the table of an arbor press with the threaded end upward and press the Front Rotor Bearing (17) onto the hub of the Rotor.

NOTICE

The Front Rotor Bearing is a double flush ground bearing and must be installed in a specific manner. The end of the Bearing with a black stain or hash marks must be away from the Spacer.

5. Grasp the assembled Rotor in leather–covered or copper–covered vise jaws with the threaded rotor hub upward.
6. Thread the Bevel Pinion (21) onto the Rotor and using a torque wrench, tighten the Bevel Pinion between 9 and 10 ft–lb (12.2 and 13.6 Nm) torque.
7. Inject approximately 0.7 cc of IRAX No. 68–1LB Grease into the small recess at the bottom of the motor housing bore. Drop the two Rear Rotor Bearing Spacers (10) into the bottom of the motor housing bore.
8. Wipe each Vane (13) with a light film of oil and insert a Vane into each vane slot in the Rotor.
9. Grasp the Bevel Pinion and insert the assembled Rotor into the Motor Housing (5).
10. Assemble the Flow Ring (18) with the Flange (19) before installing the Flange on the Housing. Mate the Flow Ring to the end of the Flange without perforations. Align the notched projection on the edge of the Flow Ring with the letter "R" on the Housing, If the tool is to be used with front exhaust, purchase a Front Exhaust Flange (Part No. 49440–113) and align the notched projection on the edge of the Flow Ring with the letter "F" on the Housing.
11. Install the assembled Flange, Flow Ring leading, onto the front of the Motor Housing.

Assembly of the Angle Head

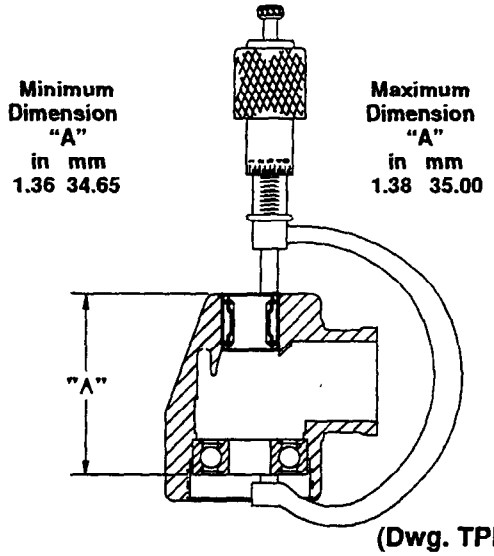
1. If the Upper Arbor Bearing (26) was removed and a new Bearing must be installed, proceed as follows:
   a. Support the machined face of the Angle Head (22) on the table of an arbor press with the upper arbor bearing bore upward.
   b. Press a new Upper Arbor Bearing into the bore, flush with the top of the Angle Housing.

NOTICE

Always press on the stamped or closed end of the Bearing.

2. If the Lower Arbor Bearing (29) is being installed, it is necessary to note the identification marks on the Lower Arbor Bearing. The side of the Bearing having black stains or black hash marks on the side of the inner and outer races is opposite the flush ground side.

3. Using your hand, push the Lower Arbor Bearing, **flush ground side inward,** into the recess at the machined end of the Angle Head.
4. Using a 2" micrometer, take a measurement from the inner ring of the Lower Arbor Bearing to the stamped or closed end of the Upper Arbor Bearing. See Dwg. TPD687.



(Dwg. TPD687)

5. Additional pressing of the Upper Arbor Bearing may be required to finally attain the correct dimension as indicated in the table above.
6. Remove the Lower Arbor Bearing.

NOTICE

In the following step, make certain any shims included with the Lower Arbor Bearing are installed onto the Arbor between the Bevel Gear (21) and the Bearing.

7. Using a sleeve that contacts the inner ring of the Lower Arbor Bearing, press the Bearing, **flush ground side of the Bearing trailing** onto the Arbor (31).
8. Slide the Bevel Gear, geared face trailing, onto the small threaded end of the Arbor, aligning the integral keys of the gear with the slotted keyways in the Arbor.

NOTICE

The Bevel Gear and Bevel Pinion are specially matched sets. Replace these parts only as a matched set.

9. Thoroughly clean the small threads on the Arbor above the Bevel Gear and the threads in the Bevel Gear Nut (28).
10. Apply a thin coat of Loctite 271 W/T Primer* (M. I. Hernon Grade 427) to the threads of the Bevel Gear Nut and the Nut threads on the Arbor. Thread the Bevel Gear Nut onto the Arbor to retain the Bevel Gear and tighten the Nut to 10 to 12 ft–lb (13.5 to 16.2 Nm) torque. Grease the Bevel Gear with 1.5 cc of IRAX No. 67–1LB Grease.
11. Form the Wick (27) into a horseshoe shape and insert it into the Angle Head. Push the Wick into the opening until it is compressed approximately 0.030" below the bevel gear bore. Soak the Wick with approximately 0.5 cc of IRAX No. 63Z4 Oil. **Do no substitute any other oil.**
12. Carefully grasp the assembled motor in leather–covered or copper–covered vise jaws with the Throttle Lever Upward.
13. Install the motor Clamp Nut (24), threaded end trailing, onto the motor end of the Angle Head. Spread the Clamp Spacer (23) and install it on the motor end of the Angle Head against the Clamp Nut.
14. Position the output end of the Angle Head upward in alignment with the Throttle Lever and thread the Clamp Nut onto the Motor Housing. Using the Clamp Nut Wrench (52), tighten the Nut to 20 to 25 ft–lb (27 to 34 Nm) torque. This is a **left–hand** thread, turn **counterclockwise** to tighten.
15. Insert the assembled Arbor into the Angle Head, bevel gear end first, making sure the teeth on the Bevel Gear and Pinion mesh. Rotate the Arbor manually to determine that they are rotating smoothly.
16. Thoroughly clean the internal threads of the Angle Head and the threads on the Arbor Bearing Cap (30).
17. Carefully apply a uniform coat of Vibra–Tite VC3 No. 205 ** to both sets of threads and allow the compound to cure for 10 to 20 minutes.
18. Using the Arbor Bearing Cap Wrench (53), install the Arbor Bearing Cap and tighten to 12 to 15 ft–lb (16.2 to 20.3 Nm) torque. The Bearing Cap has a **left–hand** thread: turn **counterclockwise** to install.
19. If the Drive Sleeve (33) is being replaced, slide a new Sleeve onto the Spindle Cap (32) until it is captured between the two outer lipped edges.
20. Using the Collet Body Wrench (50) to hold the Arbor, install the Spindle Cap onto the Arbor.

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Assembly of the Sanding Arm

NOTICE

In the following step, ball bearings used in models having 1/4" wide belts must have the bearing seal facing outward.

1. If the Idler Wheel Bearings (47) were removed, press one Bearing into the Idler Wheel (45) until it is flush with the edge of the Wheel. Invert the Wheel. Press the remaining Bearing into the Wheel until it is flush with the edge of the Wheel.

NOTICE

In the following step, one hole in the Yoke is slightly larger than the other one. Determining which hole is larger will enable you to use finger pressure to insert the Shaft through that side of the Yoke.

2. Position the assembled Idler Wheel between the two ears of the Yoke (42) and press the Idler Wheel Shaft through the Yoke and assembled Idler Wheel.
3. **For 12" x 1/2" and 18" x 1/2" models,** place the Yoke Spring (43) into the hole in the end of the Clevis (36) and position the assembled Yoke over the Spring at the end of the Clevis. Make certain the slots in the Yoke align with the pin hole in the Clevis. Compress the Spring with the Yoke and press the Yoke Retaining Pin (44) through the Clevis and Yoke.
   For 18" x 1/4" models, place the Yoke Spring (43) inside the end of the Yoke opposite the Idler Wheel until it stops against the tab. Position the Clevis (36) to slide into the Yoke making certain the Spring enters the slot in the end of the Clevis. Make certain the slot in the Yoke aligns with the pin hole in the Clevis. Compress the Spring with the Yoke and press the Yoke Retaining Pin (44) through the Clevis and Yoke.
4. **For 12" x 1/2" and 18" x 1/2" models,** insert one of the Belt Plate Retaining Screws (40) through one of the holes in the Belt Plate (39). Install one of the Belt Plate Spacers (41) on the Screw and start the Screw into the Clevis at the guard end. Insert the remaining Screw into the hole in the Plate at the yoke end and install the remaining Spacer on that Screw between the Plate and Clevis. Tighten both Screws with a screwdriver.
5. If the Belt Pad (38) is being replaced, peel the protective tape off the Pad and place the adhesive side of the Pad against the side of the Clevis opposite the Belt Plate.
6. **For 12" models,** using a screwdriver, attach the Clevis to the Guard (34) with the two Clevis Mounting Screws (37).
   For 18" models, position the Alignment Block (35A) between the Clevis and the Guard (34) and secure it in position by attaching the Clevis to the Guard with the two Clevis Mounting Screws (37).
7. Position the Guard (34) on the Angle Head (22) and secure it by tightening the Guard Clamp Screw (35) between 2 and 3/4 ft-lb (2.7 and 3.7 Nm) torque.
8. Install a new sanding belt over the Spindle Cap and around the Idler Wheel.
9. **For 18" models,** align the Cover (35B) with the Guard and slide it forward toward the Idler Wheel until it snaps into position and stays there.
10. Operate ths Sander at low speed to determine if the new belt is tracking properly. If the belt fails to track properly, realign the Clevis by tightening or loosening one or both of the Clevis Mounting Screws.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Low power or low free speed	Insufficient air pressure	Check air line pressure at the Inlet of the tool. It must be 90 psig (6.2 bar/620 kPa).
	Clogged muffler elements	Disassemble the tool and agitate the bare Motor Housing and Flange in a clean, suitable cleaning solution. If the elements cannot be cleaned, replace the Motor Housing and/or the Flange.
	Plugged Inlet Screen	Clean the Inlet Screen in a clean, suitable, cleaning solution or replace the Screen.
	Worn or broken Vanes	Install a **complete** set of new Vanes.
	Loose Clamp Nut	Tighten the Nut to 20 to 25 ft–lb (27 to 34 Nm) torque.
	Worn or broken Motor Housing	Replace the Motor Housing.
	Internal air leakage in the Motor Housing indicated by high air consumption/low speed or air leaking out the front and rear exhaust simultaneously.	Replace the Motor Housing.
	Grit buildup under the Throttle Lever restricting full Throttle Valve Plunger movement.	Remove the Throttle Lever and clean the groove in the Motor Housing.
	Bent stem on Throttle Valve	Replace the Throttle Valve
	Front Seal Cup dragging against the shield of the Front Rotor Bearing	Reposition or replace the Front Seal Cup.
Scoring	Worn Front End Plate Spacer or Front End Plate	Install a new Front End Plate Spacer and Front End Plate.
	Worn Front Rotor Bearing	Install a new Front Rotor Bearing.
Sanding Belt not tracking properly	Worn Idler parts	Install a new Idler Wheel Assembly
	Misalignment	Adjust the Clevis Mounting Screws
	Sanding on push side of Clevis	Sand on pull side of the Clevis.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Leaky Throttle Valve	Dirt accumulation on Throttle Valve or Valve Seat	Disassemble, inspect and clean parts.
	Worn Throttle Valve or Valve Seat	Replace the Throttle Valve and/or Throttle Valve Seat.
Exhausts at wrong location	Incorrect orientation of the Flow Ring	Reverse the face of the Flow Ring against the Motor Housing.
Front Rotor Bearing runs hot	Incorrect installation of the Front Seal Cup	Reposition the Front Seal Cup flush with the face of the Front End Plate Spacer.
	Front End Plate Spacer rubbing the bore of the Front End Plate	Replace the Front End Plate and Front End Plate Spacer combination.
	Incorrect Front Rotor Bearing installation orientation	If a black stain or black hashmarks are not visible on the face of the Bearing when it is assembled with the End Plate and Rotor, the Bearing is backwards. If possible, remove the Bearing and install it correctly or replace the Bearing.
Slow tool idle	Bent or leaky Throttle Valve	Replace the Throttle Valve.
Air leakage around Flow Ring	Damaged, mutilated or missing Flange Clamp	Replace the Flange Clamp.
	Damaged Flow Ring	Replace the Flow Ring
Rough operation/vibration	Improper lubrication or dirt build-up	Disassemble the tool and clean in a clean, suitable, cleaning solution. Assemble the tool and inject 3 cc of the recommended oil into the Inlet and run the Sander long enough to coat the internal parts with the oil.
	Worn or broken Rear Rotor Bearing or Front Rotor Bearing	Replace the worn or broken Bearings. Examine the Front End Plate, Front End Plate Spacer, Front Seal Cup and Rear Rotor Bearing Spacers and replace any damaged parts. If the rear end plate is damaged, replace the Rotor.
	Worn or broken Upper Arbor Bearing or Lower Arbor Bearing	Replace the worn or broken Bearing.
	Worn or broken Bevel Gear or Bevel Pinion	Examine the Bevel Gear and Bevel Pinion. If either is worn or damaged, replace both the Gear and Pinion because they are a matched set and must not be used separately.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.

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