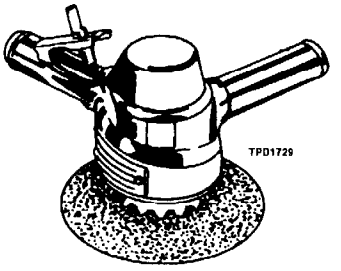
ARO®
Tool & Hoist Products

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

SECTION MANUAL M10 189
Released: 5–31–94
Revised: 5–31–94

MODELS GVS18A–05S–9 AND GVS20A–06S–7
2.0 H.P. VERTICAL SANDERS



⚠ 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.
- Tool shaft may continue to rotate 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

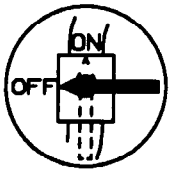
FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

⚠ 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

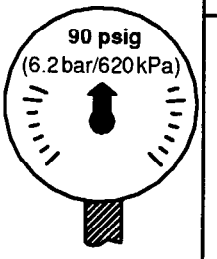
Do not carry the tool by the hose.

⚠ 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

- **These Sanders will operate at the free speed specified on the nameplate if the air supply line furnishes 90 psig (6.2 bar/620 kPa) air pressure at the tool. Operation at higher air pressure will result in excessive speed.**
- **Use only a sanding pad, buffing wheel or polishing bonnet with these tools. Do not use any grinding wheel, bur or metal removing accessory with these tools. Never use an accessory having a maximum operating speed less than the free speed of the Sander in which it is being used.**
- **When using a pad on a threaded arbor, make certain the flange nut is tightened securely. Check the tightness of the flange before operating a Sander to make certain it will not loosen during operation.**
- **Do not attempt to disassemble the Controller. The Controller is available only as a unit and is guaranteed for the life of the tool if it is not abused.**
- **When installing a new Cylinder Case Assembly, always select the correct Assembly for the motor package that you are using.**

PLACING TOOL IN SERVICE

LUBRICATION

IRAX No. 50P

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

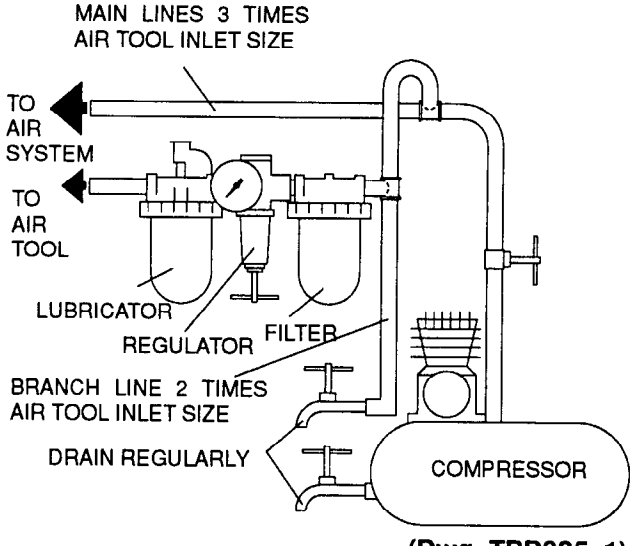
For USA – IRAX No. C22–04–G00
For International –IRAX No. C26–C4–A29

Before starting the Tool, unless the air line lubricator is used, detach the air hose and inject about 1.5 cc of IRAX No. 50P Oil into the air inlet. Remove the Oil Chamber Plug (23) and fill the chamber.
After each eight hours of operation, or as experience indicates, replenish the oil supply in the Handle.

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 increase the life of an air tool. The filter removes dust and moisture. Low pressure (under 90 psig; 6.2 bar/620 kPa) reduces the speed of all air tools. Be sure all hoses and fittings are the correct size and are tightly secured. See Dwg. TPD905–1 for a typical piping arrangement.



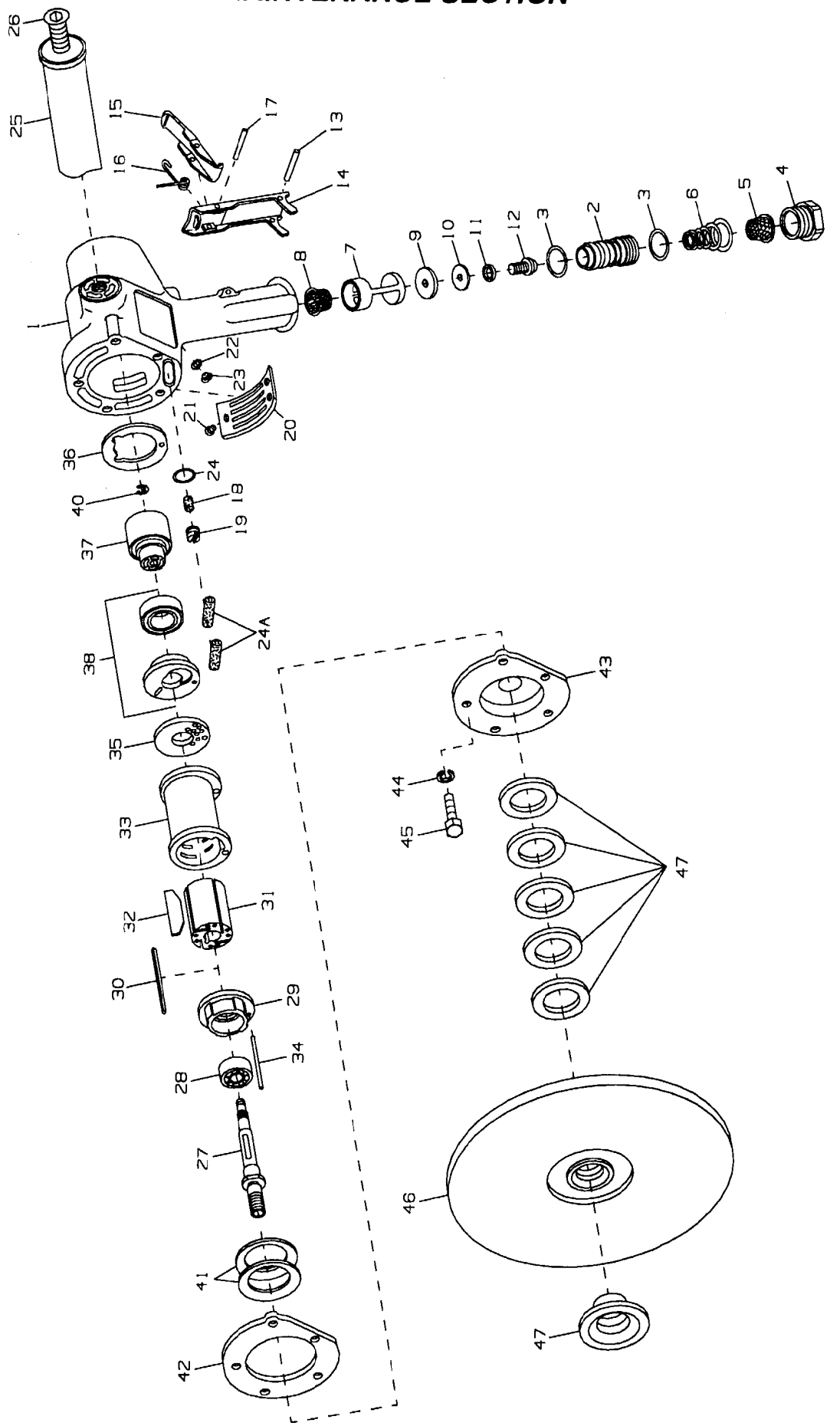
(Dwg. TPD905–1)

GVS Vertical Air Sanders are designed for heavy duty sanding and polishing operations where space limitations are a factor.

HOW TO ORDER A SANDER

VERTICAL DISK WHEEL SANDER

Model	Free Speed, rpm	Spindle and Back Up Pad
GVS18A–05S–9	4 500	5/8–11, 9"
GVS20A–06S–7	6 000	5/8–11, 7"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(Dwg. TPA719–4)

		PART NUMBER FOR ORDERING
1	Cylinder Case Assembly	
	for GVS18A–05S–9	49845–220
	for GVS20A–06S–7	49845–221
2	Throttle Valve Assembly	49845–108
• 3	Seal (2)	49845–109
4	Inlet Bushing	49845–110
• 5	Inlet Bushing Screen	49845–111
• 6	Throttle Valve Spring	49845–112
7	Throttle Valve Seat Support Assembly	49845–113
• 8	Air Strainer Screen	49845–111
• 9	Valve Seat	49845–115
10	Valve Seat Washer	49845–116
11	Valve Screw Lock Washer	49845–117
12	Valve Seat Screw	49845–118
• 13	Throttle Lever Pin	49845–119
14	Locking Lever Assembly	49845–120
15	Lever Lock	49845–121
16	Lever Lock Spring	49845–122
17	Lever Lock Pin	49845–123
18	Oiler Felt	49845–124
19	Oiler Adjusting Screw	49845–125
*	Nameplate	
	for GVS18A–05S–9	49845–222
	for GVS20A–06S–7	49845–223
*	Nameplate Screw (4)	49843–128
*	Warning Label	49843–129

		PART NUMBER FOR ORDERING
20	Exhaust Deflector	49845–135
21	Exhaust Deflector Screw (3)	49845–136
22	Oiler Plug Washer	49845–139
23	Oiler Plug	49845–140
• 24	Oiler Seal O–ring	49845–141
24A	Oiler Felt (2)	49845–142
25	Dead Handle	49845–143
26	Dead Handle Screw	49845–144
27	Arbor	
	for GVS18A–05S–9 (4500 rpm) (brown)	49845–215
	for GVS20A–06S–7 (6000 rpm) (blue)	49845–216
*	Arbor Wrench (double end 5/8" x 3/4")	49845–217
28	Front Rotor Bearing	49845–148
29	Front End Plate	49845–149
• 30	Rotor Key	49845–150
31	Rotor	49845–151
• 32	Vane Packet (set of 4 Vanes)	49845–152
33	Cylinder	49845–153
• 34	Cylinder Dowel	49845–218

* 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.

		PART NUMBER FOR ORDERING			PART NUMBER FOR ORDERING
35	Rear End Plate	49845–155	*	Piped–Away Exhaust Kit	49845–192
• 36	Rear End Plate Gasket	49845–156	*	Exhaust Hose	49845–193
37	Controller Assembly		*	Exhaust Hose Clamp	49845–194
	for GVS18A–05S–9 (4500 rpm)		*	Exhaust Elbow	49845–195
	(brown)	49845–219	*	Exhaust Elbow Gasket	49845–196
	for GVS20A–06S–7 (6000 rpm)		*	Exhaust Elbow Screw (3)	49845–197
	(blue)	49845–235	*	Exhaust Hose Band (4)	49845–200
38	Rotor Bearing Seal Assembly	49845–160	*	Exhaust Hose Band Screw (4)	49845–201
40	Controller Retaining Ring	49845–161	*	Screw (2)	49845–198
41	Motor Clamp Belleville Washer (2)	49845–162	*	Exhaust Hose Band Nut (6)	49845–199
• 42	Cylinder Case Gasket	49845–163	*	Controller Wrench (for removing or	
43	Motor Retaining Plate	49845–236		installing the Controller Assembly)	49845–203
44	Cylinder Case Screw Lock Washer (5)	49845–237	*	Seal Pressing Tool (for pressing off the	
45	Cylinder Case Screw (5)	49845–238		Controller Assembly from the Rear Rotor	
46	Sanding Pad Assembly			Bearing)	49845–204
	with 5" Sanding Pad	49845–224	*	Bearing Clamp (for clamping the outer	
	with 7" Sanding Pad (medium)	49845–225		race of the Rear Rotor Bearing to	
	with 7" Sanding Pad (firm)	49845–226		release the Controller)	49845–205
	with 9" Sanding Pad	49845–227	*	Controller Maintenance Kit (includes	
47	Pad Mounting Kit	49845–228		49845–203, 49845–204 and 49845–205)	49845–202

* 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.

MAINTENANCE SECTION

⚠ WARNING

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

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

LUBRICATION

Whenever a GVS Sander is disassembled for overhaul or replacement of parts, lubricate as follows:

1. Inject about 1.5 cc of IRAX No. 50P Oil into the Inlet Bushing (4) after assembly. Fill the oil chamber. After each eight hours of operation, replenish the oil supply.
2. If the Sander is used in an extremely dirty environment, **once each week or after each forty hours of operation**, pour a liberal amount of a clean, suitable, cleaning solution into the slots in the handle. Work the throttle lever vigorously to wash the cleaning solution around, then pour the solution and accumulated dirt from the handle. Repeat this process until the cleaning solution is clean when it comes out of the handle. Immediately after flushing with the cleaning solution, inject a liberal amount of IRAX No. 50P Oil in the slots and, again, work the throttle lever vigorously to lubricate the cleaned parts.

OILER ADJUSTMENT

The built–in lubricator has been properly adjusted at the factory. A lack of oil indicates the Oiler Felt (18) is clogged. Replace the Felt as follows:

1. Remove the Sander Pad (46). Remove the Cylinder Case Screws (45), the Lock Washers (44), the Cylinder Case Gasket (42), the two Motor Clamp Washers (41) and the Motor Retaining Plate (43).
2. Pour the oil from the oil chamber.
3. Remove the wool with tweezers.
4. With a thin blade screwdriver, remove the Oiler Adjusting Screw (19).
5. Using tweezers or a piece of bent wire, remove the Oiler Felt (18) and install a new one.
6. Replace the Oiler Adjusting Screw installing it slightly below flush, and replace the wool.
7. Replenish the oil supply.

DISASSEMBLY

General Instructions

1. Do not disassemble the tool any further than necessary to replace or repair damaged parts.
2. Whenever grasping a tool or part in a vise, always use leather–covered or copper–covered vise jaws to protect the surface of the part 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 Sander unless you have a complete set of new gaskets and O–rings for replacement.

Disassembly of the Motor

1. Grasp the flats of the live air handle in leather–covered or copper–covered vise jaws with the Spindle upward.
2. Remove the Cylinder Case Screws (45), the Lock Washers (44), the Motor Retaining Plate (43), Cylinder Case Gasket (42) and the two Motor Clamp Washers (41).
3. Remove the Sander from the vise and turn it over to pour the oil from its reservoir.
4. Grasp the Arbor (27) in leather–covered or copper–covered vise jaws. Lift off the Cylinder Case (1) to expose the motor.

NOTICE

Use only the special No. 49845–203 Controller Wrench for removing the Controller Assembly (37). Do not attempt to disassemble the Controller. It is available only as a unit and is guaranteed for the life of the tool if it is not abused.

5. Remove the Controller Retaining Ring (40) and unscrew the Controller Assembly which has a **left–hand thread** that requires a **clockwise rotation** for removal.
6. Lift off the Rotor Bearing Seal Assembly (38) and the Rear End Plate (35).
7. Lift off the Cylinder (33).
8. Remove the Vanes (32).
9. Withdraw the Rotor (31) and lift out the Rotor Key (30).
10. Remove the arbor and end plate assembly from the vise. Grasp the Front End Plate (29) in one hand and tap the small diameter end of the Arbor with a soft hammer to remove the End Plate.

11. If the Front Rotor Bearing (28) is to be replaced, press it from the Arbor.
12. Insert the Controller into the No. 49845–205 Bearing Clamp and tighten the nut on the fixture. Insert the No. 49845–204 Seal Pressing Tool in the center and press off the Controller. Release the clamp.
13. Place the Cylinder Case in leather–covered or copper–covered vise jaws to remove the Inlet Bushing (4), Inlet Bushing Screen (5) and the Throttle Valve Spring (6). The Bushing has an interference thread and is tightly fit.

Disassembly of the Throttle and Inlet

1. Drive out the Throttle Lever Pin (13) to release the Lever Assembly (14).
2. Using a 3/32" hex wrench, reach inside the handle and remove the Valve Seat Screw (12) from the Throttle Valve Seat Support Assembly (7).
3. Thread a No. 8–32 screw about 5" (127 mm) long into the Throttle Valve Seat Support in place of the removed Valve Seat Screw. A piece of 5/32" welding rod can be threaded on one end to serve the same purpose.
4. Grasp the protruding end of the screw in a vise, and while tapping lightly on the housing or handle with a plastic hammer, pull on the housing or handle to withdraw the throttle parts.
5. The Air Strainer Screen (8) can now be removed and cleaned.

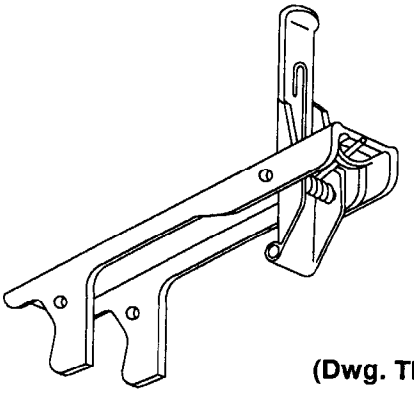
ASSEMBLY

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. Apply a film of o–ring lubricant to all O–rings before final assembly.
6. 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 bearing should never be cleaned.** Work grease thoroughly into every open bearing before installation.

Assembly of the Throttle and Inlet

1. Assemble the Valve Seat Support parts (7, 8, 9, 10, 11 and 12). Tighten the Valve Seat Screw to 12 in–lb (1.4 Nm) torque.
2. Insert the assembly into the handle, large diameter first. Position a punch against the flat of the screw head and tap it with a hammer until the assembly is firmly seated.
3. Apply O–ring lubricant to the Seals (3). Fit the seals to the Throttle Valve (2) and push the assembly, small diameter first, into the handle until it seats firmly.
4. Assemble the Locking Lever Assembly (14) as illustrated in Dwg. TPD563:



(Dwg. TPD563)

Locking Lever Assembly

5. Align the holes in the Lever Assembly with the slots in the Cylinder Case. With a soft face hammer, tap the Throttle Lever Pin (13) through the Lever Assembly. File off any sharp edges. Operate the mechanism internally by hand to assure operation.
6. Insert the Throttle Valve Spring (6) small end first.

NOTICE

The Inlet Bushing (4) has an interference thread. Apply a light film of the recommended oil to the threads before assembling.

7. Clean the face of the Inlet Bushing and the Inlet Bushing Screen (5) with a clean, suitable, cleaning solution and allow to air dry. Insert the parts into the live air handle. Grasping the flats of the Cylinder Case with a wrench, tighten to 125 ft–lb (170 Nm) torque.

Assembly of the Motor

1. Using an arbor press against the inner race of the bearing, install the Front Rotor Bearing (28) onto the Arbor (27).
2. Inspect the Front End Plate (29) for nicks or burrs. If replacement is necessary, wipe the part with oil. Press the Front Rotor Bearing into the Front End Plate.
3. Hold the Arbor in leather–covered or copper–covered vise jaws. Insert the Rotor Key (30) into the slot of the Rotor (31). The Rotor has a staked keyway on one end. Place that end up and slide the Rotor and key over the Arbor. Apply a light film of the recommended oil to each Vane (32) and insert one Vane, straight edge out, into each slot in the Rotor. If any new Vanes are required, replace the entire set.
4. Place the Cylinder (33) over the Rotor aligning the Cylinder Dowel hole with the alignment hole in the Front End Plate and with the kidney port to the right of the dowel hole.
5. Apply the Rear End Plate (35) with the air holes to the right of the dowel hole.

NOTICE

If the Controller Assembly (37) needs to be replaced, you must also replace the Rotor Bearing Seal Assembly (38) which consists of a rear rotor bearing and a rotor bearing seal. If either the rear rotor bearing or rotor bearing seal needs to be replaced, BOTH must be replaced with a new bearing and seal. DO NOT MIX OLD AND NEW PARTS.

NOTICE

Take all measurements 30 degrees to the left of the dowel hole when facing the hub side of the Seal. Install the Rotor Bearing Seal hub down.

6. Check the outside diameter and large inside diameter of the Rotor Bearing Seal Assembly for wear. If the outside diameter is worn to 1.176" (29.88 mm) or smaller, and/or the large inside diameter is worn to 0.910" (23.12 mm) or larger, install a new Rotor Bearing Seal Assembly.
7. Press the Rear Rotor Bearing onto the hub of the Controller.

NOTICE

Use only the special 49845–203 Controller Wrench for installing the Controller Assembly.

⚠ WARNING

Tighten the Controller between 14 and 16 ft–lb (19.0 and 21.7 Nm) torque. Do not exceed 16 ft–lb. (21.7 Nm). The Controller may be damaged if this torque is exceeded. Always check the free speed of a Sander after it has been reassembled and before it is put back into service. Refer to the Test and Inspection Procedure.

Never use a Sander which runs in excess of the maximum speed listed in the Test and Inspection Procedure.

8. Thread the Controller Assembly onto the end of the Arbor. Rotate the Controller **counterclockwise** since this is a **left–hand thread.**
9. Install the Controller Retaining Ring (40) onto the Arbor with the concave face closest to the Controller.
10. Place the live air handle in leather–covered or copper–covered vise jaws, Cylinder Case Assembly up. Lightly dampen the Rear End Plate Gasket (36) with oil. Line the hole in the Gasket with the hole in the Cylinder Case, and align the notch in the Gasket with the notch in the motor seat.
11. With an assembly dowel, line up the motor in the Cylinder Case. Remove the assembly dowel and insert the Cylinder Dowel (34).
12. Install the two Motor Clamp Washers (41) concave or dish side **up**.
13. Apply the Cylinder Case Gasket (42), the Motor Retaining Plate (43), the Cylinder Case Screw Lock Washers (44) and the five Screws (45). Slightly tighten opposite screws, make sure the arbor is free, and tighten all screws to 14 ft–lb (19 Nm) torque.
14. Rotate the Arbor manually to make certain it is free.
15. The Dead Handle (25) may be adjusted to two positions. Loosen the Dead Handle Screw (26) and change the position of the Handle. Use a piece of 3/16" hex steel approximately 5" long to tighten the screw to 9 ft–lb (12 Nm) torque.
16. Install the Exhaust Deflector (20) and Screws (21).
17. Fill the oil chamber with the recommended oil and install the Washer (22) and Oiler Plug (23). Tighten the Plug to 4 ft–lb (5.4 Nm) torque.

TEST AND INSPECTION PROCEDURE

⚠ WARNING

Disconnect the Sander from the air supply hose or shut off air to the tool and bleed the air from the line before proceeding with the Test and Inspection Procedure.

Run the performance tests at 90 psig (6.2 bar/620 kPa) air pressure at the inlet of the tool with an eight foot length of 3/4" (19 mm) diameter air supply hose.

1. Without a sanding pad on the tool, operate the Sander with the Throttle Lever fully actuated and check the free speed by applying a hand-held tachometer to the spindle end. Record the Sander serial number, date of test and actual free speed in a permanent file. The minimum and maximum allowable free speeds are as follows:

Model	Stamped	Free Speed, rpm	
		Min.	Max.
GVS18A-05S-9	4500	4050	4550
GVS20A-06S-7	6000	5650	6050

2. Attach the power test adapter to the spindle and test the GVS18A-05S-9 using a 4F Test Fan and test the GVS20A-06S-7 using an R3 Fan. The minimum allowable speed for GVS18A-05S-9 is 3 000 rpm; for GVS20A-06S-7, it is 4 700 rpm.
3. There must be no objectionable leaks in any non-exhaust area. The Throttle must not leak when it is closed.
4. There must be no leaks past the closed Throttle that will run the motor.
5. The Sander must start smoothly when the Throttle Lever is actuated and must shut off completely when the Throttle Lever is released.
6. The Sander must be equipped with a spring-loaded window style Lock (15). The Lock must return to the locked position when the Throttle Lever is released and must prevent operation of the Throttle.
7. The tool must run smoothly without noticeable vibration or unusual sound.
8. The Arbor (27) must turn freely with no evidence of brinnelled bearings.
9. The threads on the Arbor must be free of nicks and damage.
10. The Nameplate must be legible, in place and securely fastened. Make replacement if necessary.

TROUBLESHOOTING GUIDE

Trouble	Probable Cause	Solution
Low power or low free speed	Low air pressure at the Inlet	Check the air pressure at the Inlet. The pressure must not exceed 90 psig (6.2 bar/620 kPa).
	Plugged Inlet Bushing Screen	Clean the Screen in a clean, suitable, cleaning solution. If it cannot be cleaned, replace it. **⚠ WARNING** **Never operate a Sander without an Inlet Screen. Ingestion of dirt into the Sander can, in some cases, cause an unsafe condition.**
	Worn or broken Vanes	Replace a **complete** set of Vanes.
	Worn or broken Cylinder	Replace the Cylinder if it is worn or broken or if the bore is scored or wavy.
	Improper lubrication or dirt build–up in the motor	Lubricate the Sander as instructed in **LUBRICATION SPECIFICATION.** If lubrication does not result in satisfactory operation, disassemble the motor and inspect and clean all parts.
Rough operation	Worn or broken Rear Rotor Bearing or Front Rotor Bearing	Examine each Bearing. Replace the Rear Rotor Bearing Seal Assembly if worn or damaged or replace the Front Rotor Bearing.
	Worn Rotor Key	Replace the Key. Check the Arbor and Rotor for key slot wear and replace if necessary.
	Bent Arbor	Mount the Arbor on centers. Check the bearing diameter runout with an indicator. Replace the Arbor if runout exceeds 0.002" Total Indicator Reading.
Scoring	Improper assembly	Make certain that all motor parts are properly aligned prior to clamping the motor assembly.
	Rotor Bearing Seal misalignment	Loosen the Cylinder Case Screws. Rotate the Spindle by hand to align the Seal. Retighten the Screws to 14 ft–lb (19 Nm) torque. The Spindle must rotate freely.
Air leaks	Worn Valve Seat or Valve Seat Washer	Replace worn parts.
	Worn Throttle Valve Seals	Replace both Seals.
	Oiler Plug and Oiler Plug Washer not tight	Tighten the Plug. If the problem persists, replace it.

NOTICE

SAVE THESE INSTRUCTIONS. DO NOT DESTROY.

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