



TIRE SERVICE INTERNATIONAL

TROUBLESHOOTING & MAINTENANCE GUIDE



EXPANDING HUB & RIM ASSEMBLIES

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HOW THE EXPANDING HUB WORKS

Compressed air is introduced to the expanding hub assembly via an “air swivel”. Air pressure is directed either to the expanding hub cylinder or to the expanding rim. Air flow and pressure is controlled by air valves and regulators located on the control panel of the machine.

THE OUTER HOUSING

The outer housing is a steel casting with twelve (12) slotted openings. The slotted openings allow for placement of stems which are used to expand the various expanding rims that work in conjunction with the expandable hub. The outer housing serves as the slide chamber (cylinder) for the internal piston.

THE STEM COMPONENTS

The STEMS (paddles) are made of composite plastic. They are placed in the slotted openings of the outer housing with their bottom end resting on the internal piston. Two springs are threaded through the STEMS to hold them in place. The top side of each STEM slides snugly into the molded casting on the underside of each expanding rim. Four (4) of the STEMS are equipped with locking mechanisms. They are termed “locking paddles”. There are eight (8) other stems and they are termed “plain paddles”.

THE PISTON

The piston consists of a machined casting cone configuration. When moved forward by channeled air pressure the piston fills the outer housing cavity and pushes the stems outward. The stems in turn push the expanding rim to the desired rim size for tire bead seating. When the air pressure is released the piston returns to the closed position. The expanding rim collapses to its smallest rim diameter size allowing the operator to remove the tire.

HIGH PRESSURE SIDE

When activated, the “high side” of the air swivel channels air through a port and into a small diameter hollow tube known as the “guide” or transfer tube. The transfer tube is centered inside a larger diameter, hollow main shaft. The piston slides on the guide tube. The large end of the piston is sealed against the wall of the rear housing cylinder via a U-cup, and the net result is a pressurized system. When under “high side” pressure the piston moves forward towards the front of the assembly allowing air to pressurize the expanding hub.

LOW PRESSURE SIDE

When activated the “low side” of the air swivel directs air to the expanding rim. The low side pressure is used to fill a tire with air allowing the operator to check for leaks and other visible problems. **The low side pressure must always be released prior to releasing the high side air pressure to the expanding hub.**

TROUBLESHOOTING TIPS

PROBLEM: RIM AND OR HUB NOT EXPANDING PROPERLY

Possible Causes:

1. **INTERNAL HUB COMPONENTS LACKING LUBRICATION: Action Required:** Follow instructions for Expanding Hub Preventive Maintenance. Lubricate internal piston and shafts. Use Marine Grease TSI Part #10787.
2. **WORN EXPANDING RIM SEGMENTS: Action Required:** Check for excessive (more than .020) play in the locking slot with a locking stem. (Note: stem will fit properly only one way.) Return rim to TSISSG for Rim Reconditioning Services.
3. **U-CUP SEALS WORN: Action Required:** Follow instructions for Expanding Hub Preventive Maintenance to remove the expanding hub outer housing. Inspect u-cup on rear of piston for wear or damage. Replace if worn. Lubrication- lubricate rear housing cylinder surface, piston and guide tube with Marine Grease TSI Part #10787. (see attached Expanding Hub Preventive Maintenance Bulletin)
4. **BENT OR DAMAGED GUIDE TUBE: Action Required:** Follow instructions for Expanding Hub Preventive Maintenance to remove the expanding hub outer housing. Inspect guide tube for gouges, nicks or bends. Replace guide tube with appropriate part number for your assembly.
5. **INSUFFICIENT AIR PRESSURE: Action Required:** Verify air pressure coming into machine meets manufacture suggested minimum operation pressure and correct as necessary.
6. **WATER EXTRACTOR MALFUNCTIONING: Action Required:** Inspect internal water extractor for proper operation: Water extractor should be allowing air flow while removing excess moisture to vent from bottom of unit. Replace if extractor plugged.
7. **REGULATORS MALFUNCTIONING: Action Required:** Inspect regulator for proper operation. Adjust regulators to different pressures and verify pressure gauge changes. If regulator not adjusting replace regulator.
8. **AIR VALVE MALFUNCTIONING: Action Required:** Check to see if valve when opened is makes a “hissing” noise. Replace valve if leaking.
9. **KINKS IN AIR LINES: Action Required:** Inspect internal air lines for kinks. Correct as necessary.
10. **DAMAGED OR WORN PISTON: Action Required:** Follow instructions for Expanding Hub Preventive Maintenance to remove the expanding hub outer housing. Inspect piston for grooves, gouging and or excessive wear. Replace piston.
11. **AIR INLET HUB MISALIGNED: Action Required:** Inspect air inlet hub #4903 (opposite end of front housing). Air inlet hub (#4903) should slide on to main shaft (#5780). Air inlet when in correct position will slide forward towards the bearing housings with approximately 1/16” space between front of air inlet hub and shoulder on the main shaft (#5780). Once in the correct position the air inlet hub is held in place by an adjustable “L” bracket (#462.111)

PROBLEM: TIRE NOT SEATING AND/OR LEAKING AIR

Possible Causes:

1. **HUB NOT FULLY EXPANDING: Action Required:** Check incoming air pressure to machine (125lbs psi. minimum). Check regulated pressure to the "Hub" on front of machine. Adjust as needed but do NOT exceed 90lbs psi.
2. **BELT LACKING LUBRICATION: Action Required:** Lubricate belt with an approved oil soap. Caution: DO NOT USE SUBSTITUES AS BELT DETERIORATION WILL RESULT.
3. **INTERNAL HUB COMPONENTS LACKING LUBRICATION: Action Required:** Follow instructions for Expanding Hub Preventive Maintenance. Lubricate internal piston and shafts. Use Marine Grease TSI Part #10787.
4. **TIRE AIR PRESSUE INADEQUATE: Action Required:** Increase air pressure to "tire side" of machine to 30 to 32lbs psi. WARNING: DO NOT EXCEED 32lbs psi. When the tire seats regulate the pressure back to manufacture suggested pressure.
5. **WORN STEMS: Action required:** Check all stems for excessive wear and or bending. Replace all stems if worn.
6. **WORN PISTON: Action required:** Check for excessive wear, grooves, pitting, and or scuffing. Replace cone as needed.

NOTE: Some rims will leak air when the tire is mounted. Because of the nature of the rim design leakage cannot be prevented. Please accept some leakage as a normal situation.

PROBLEM: HUB AND OR RIM WILL NOT COLLAPSE

Possible Causes:

1. **BELT IS WORN: Action Required:** Inspect belt on expanding rim for excessive wear. Replace as needed.
2. **BELT LACKS LUBRICATION: Action Required:** Inspect belt for dryness. Lubricate as needed. Use oil soap.
3. **AIR REGULATOR MALFUNCTION: Action Required:** Inspect regulator for proper operation. Adjust regulators to different pressures and verify pressure gauge changes. If regulator not adjusting replace regulator.
4. **HUB IS DIRTY OR LACKS LUBRICATION: Action Required:** Follow instructions for Expanding Hub Preventive Maintenance. Lubricate internal piston and shafts. Use Marine Grease TSI Part #10787.

5. **WORN PISTON: Action required:** Check for excessive wear and or grooving. If pitted or scuffed, sand piston with 360 grit emery cloth, grease and reassemble. Replace cone as needed.

6. **BENT OR DAMAGED GUIDE TUBE: Action Required:** Follow instructions for Expanding Hub Preventive Maintenance to remove the expanding hub outer housing. Inspect guide tube for gouges, nicks or bends. Replace guide tube with appropriate part number for your assembly. See parts drawing.

7. **SLIDE PLATES DAMAGED: Action Required:** Inspect expanding rim for slide plate misalignment and or damage. Return to TSISSG for rim reconditioning.

NOTE: RIMS AND HUBS SHOULD BE KEPT AWAY FROM WATER

NOTE: The shop air supply to these machines should be equipped with an automatic water extractor to prevent water from entering the TSISSG #5840 Hub assembly. Water in the hub will prevent the machine from operating properly.