

## **GROUP 2 OPERATIONAL CHECKS AND TROUBLESHOOTING**

### **1. OPERATIONAL CHECKS**

#### **1) BRAKE PIPING**

- (1) Check pipes, hoses and joints for damage, oil leakage or interference.
- (2) Operate brake pedal and check operating force when pedal is depressed. Check also change in operating force, and change in position of pedal when pedal is kept depressed.
- 2) The brakes generate a high temperature when operating, this means that the casing will be hot to touch, this condition is normal.

## 2. TROUBLESHOOTING

Problem	Cause	Remedy
Insufficient braking force	<ul style="list-style-type: none"> <li>· Hydraulic system leaks oil.</li> <li>· Hydraulic system leaks air.</li> <li>· Disk worn.</li> <li>· Hydraulic system clogged.</li> </ul>	<ul style="list-style-type: none"> <li>· Repair and add oil.</li> <li>· Bleed air.</li> <li>· Replace.</li> <li>· Clean.</li> </ul>
Brake acting unevenly. (Machine is turned to one side during braking.)	<ul style="list-style-type: none"> <li>· Tires unequally inflated.</li> <li>· Brake out of adjustment.</li> <li>· Disk surface roughened.</li> <li>· Wheel bearing out of adjustment.</li> <li>· Hydraulic system clogged.</li> </ul>	<ul style="list-style-type: none"> <li>· Adjust tire pressure.</li> <li>· Adjust.</li> <li>· Repair by polishing or replace.</li> <li>· Adjust or replace.</li> <li>· Clean.</li> </ul>
Brake trailing.	<ul style="list-style-type: none"> <li>· Pedal has no play.</li> <li>· Piston cup faulty.</li> <li>· Hydraulic system clogged.</li> <li>· Wheel bearing out of adjustment.</li> </ul>	<ul style="list-style-type: none"> <li>· Adjust.</li> <li>· Replace.</li> <li>· Clean.</li> <li>· Adjust or replace.</li> </ul>
Brake chirps	<ul style="list-style-type: none"> <li>· Brake trailing.</li> <li>· Piston fails to return.</li> <li>· Disk worn.</li> <li>· Disk surface roughened.</li> </ul>	<ul style="list-style-type: none"> <li>· See above. Brake trailing.</li> <li>· Replace.</li> <li>· Replace.</li> <li>· Repair by polishing or replace.</li> </ul>
Brake squeaks	<ul style="list-style-type: none"> <li>· Disk surface roughened.</li> <li>· Disk worn.</li> </ul>	<ul style="list-style-type: none"> <li>· Repair by polishing or replace.</li> <li>· Replace.</li> </ul>
Large pedal stroke	<ul style="list-style-type: none"> <li>· Brake out of adjustment.</li> <li>· Hydraulic line sucking air.</li> <li>· Oil leaks from hydraulic line, or lack of oil.</li> <li>· Disk worn.</li> </ul>	<ul style="list-style-type: none"> <li>· Adjust.</li> <li>· Bleed air.</li> <li>· Check and repair or add oil.</li> <li>· Replace.</li> </ul>
Pedal dragging.	<ul style="list-style-type: none"> <li>· Twisted push rod caused by improperly fitted brake valve.</li> </ul>	<ul style="list-style-type: none"> <li>· Adjust.</li> </ul>

Problem	Cause	Remedy
One or more brakes do not apply. (Brake travel not excessive, brake not pulling to one side)	<ul style="list-style-type: none"> <li>· Master cylinder fault.</li> <li>· Friction and free plate distortion.</li> </ul>	<ul style="list-style-type: none"> <li>· Check master cylinder in single and coupled pedal modes to identify fault area, service as required.</li> <li>· Check friction and free plates.</li> </ul>
Pedal travel excessive. (But not touching floor)	<ul style="list-style-type: none"> <li>· Air in hydraulic system.</li> <li>· Leak in hydraulic system.</li> <li>· Friction and free plate distortion.</li> </ul>	<ul style="list-style-type: none"> <li>· Check fluid reservoir level. Check for fluid and air leaks, repair as required.</li> <li>· Check for fluid loss at master cylinder and brake piston, all pipes and fittings for loose connections. Repair as required.</li> <li>· Renew friction and free plates - both sides.</li> </ul>
Applying one brake (pedal unlocked) also partially engages the other brake.	<ul style="list-style-type: none"> <li>· Valve stem seal inside (non active) master cylinder piston not sealing.</li> </ul>	<ul style="list-style-type: none"> <li>· Renew master cylinder piston.</li> </ul>
Pedal hard to operate.	<ul style="list-style-type: none"> <li>· Tightness at pedal pivot.</li> <li>· Fluid contamination and seal damage.</li> <li>· Misaligned push rod or pedal.</li> <li>· Kinked or crushed brake pipes.</li> </ul>	<ul style="list-style-type: none"> <li>· Inspect pedal pivot. Free-off and lubricate.</li> <li>· Flush system and renew all hydraulic seals.</li> <li>· Check and repair as required.</li> <li>· Check and renew brake pipework.</li> </ul>
Pedal touches floor under constant pressure-no fluid loss.	<ul style="list-style-type: none"> <li>· Master cylinder fault.</li> <li>· Friction and free plate distortion.</li> <li>· Air in hydraulic system.</li> </ul>	<ul style="list-style-type: none"> <li>· Check master cylinder in single and coupled pedal modes to identify fault area, service as required.</li> <li>· Renew friction and free plates - both sides.</li> <li>· Check fluid reservoir level. Check for fluid and air leaks, repair as required.</li> </ul>
Pedal touches floor under constant pressure-and fluid loss.	<ul style="list-style-type: none"> <li>· External fluid leaks.</li> <li>· Internal fluid leaks.</li> </ul>	<ul style="list-style-type: none"> <li>· Visually check brake circuit for fluid loss, service as required.</li> <li>· Do brake piston seal leakage test.</li> </ul>
Pulling to one side when pedals locked together.	<ul style="list-style-type: none"> <li>· Compensating feature not working.</li> <li>· Braking system inoperative on one side.</li> <li>· Friction plates worn beyond limits or distorted on one side.</li> <li>· Badly adjusted push rods.</li> </ul>	<ul style="list-style-type: none"> <li>· Inspect master cylinder compensating operation. Check if blockage in bridging pipe. Service as required.</li> <li>· Unlatch pedals to test circuits individually.</li> <li>· Renew friction and free plates - both sides.</li> <li>· Adjust push rod (1mm minimum)</li> </ul>

Problem	Cause	Remedy
Poor braking (not pulling to one side).	<ul style="list-style-type: none"> <li>· Friction plates worn beyond limits or distorted.</li> <li>· Master cylinder fault.</li> <li>· Incorrect or low axle oil.</li> </ul>	<ul style="list-style-type: none"> <li>· Renew friction and free plates - both sides of relevant axle.</li> <li>· Check master cylinder in single and coupled pedal modes to identify fault area, service as required.</li> <li>· Fill axle with correct type of oil.</li> </ul>
Brakes not releasing.	<ul style="list-style-type: none"> <li>· Brake pedal spring fault.</li> <li>· Master cylinder fault (plunger stuck in bore).</li> <li>· Blocked hole in master cylinder reservoir cap.</li> <li>· Brake pedal free travel incorrect.</li> <li>· Fluid contamination and seal damage.</li> <li>· Kinked or crushed brake pipes.</li> <li>· Friction and free plates not free on splines or dowels.</li> </ul>	<ul style="list-style-type: none"> <li>· Fit a new spring.</li> <li>· Check master cylinder in single and coupled pedal modes to identify fault area, service as required.</li> <li>· Fit a new reservoir cap.</li> <li>· Adjust pedal free travel.</li> <li>· Flush system and renew hydraulic seals.</li> <li>· Check and renew pipes as required.</li> <li>· Check friction and free plates for free movement, renew if required - both sides of relevant axle.</li> </ul>
Excessive brake noise in operation.	<ul style="list-style-type: none"> <li>· Deterioration of axle oil or wrong type of axle oil.</li> <li>· Axle oil loss.</li> <li>· Friction plates worn beyond limits.</li> <li>· Friction and free plates in poor condition.</li> </ul>	<ul style="list-style-type: none"> <li>· Change axle oil.</li> <li>· Refill axle with correct oil and check for leaks.</li> <li>· Renew friction and free plates.</li> <li>· Check for distortion or surface pitting and roughness of friction and free plates (annular grooving of free plates is acceptable).</li> </ul>
Fluid loss when machine standing for instance - overnight.	<ul style="list-style-type: none"> <li>· Severe damage or slight cut or nick in the brake piston seal. Do brake piston seal leakage test.</li> </ul>	<ul style="list-style-type: none"> <li>· Strip axle, replace seal.</li> </ul>