

Kysor On/Off Diagnostic Guide



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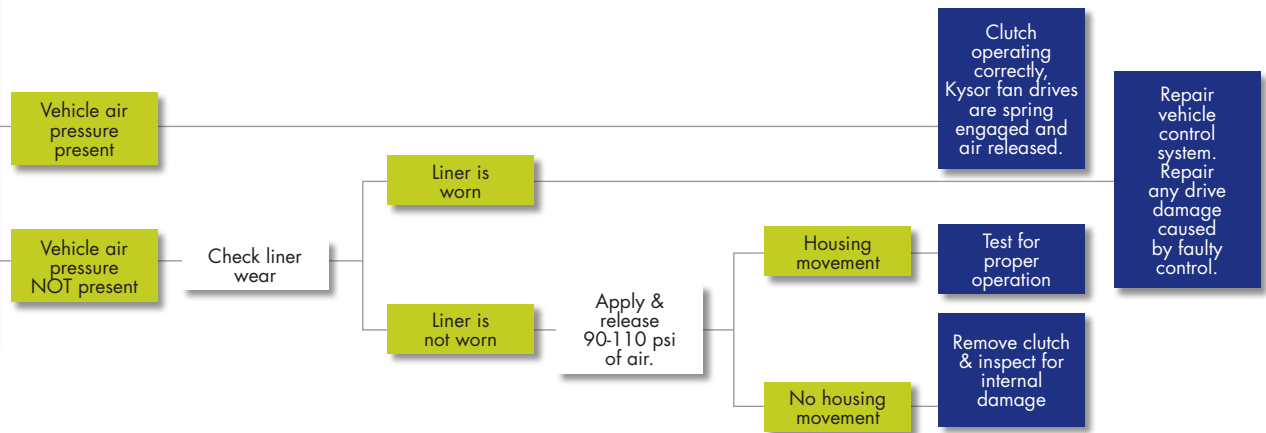
 **BorgWarner**

1. Air pressure must be checked at drive. A known source of dry and filtered air is recommended for all tests.
2. Refer to appropriate service manual for rebuild and repair instructions.
3. Proper precautions must be taken to prevent personal injury from contact with moving parts, unintended engine start or other hazards present when working with powered equipment. Refer to the vehicle owners manual and/or appropriate service manual for proper safety precautions before beginning any diagnostic or repair procedures.

CONDITION
TEST
ACTION

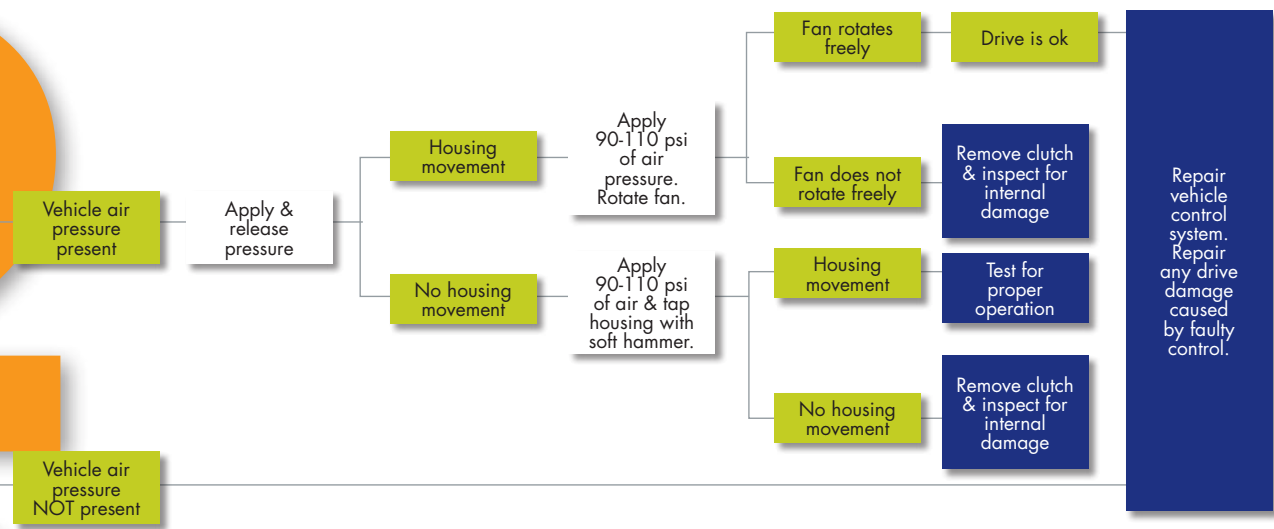
1

Clutch Will Not Engage



2

Clutch Will Not Disengage



3

Air Leak In Drive

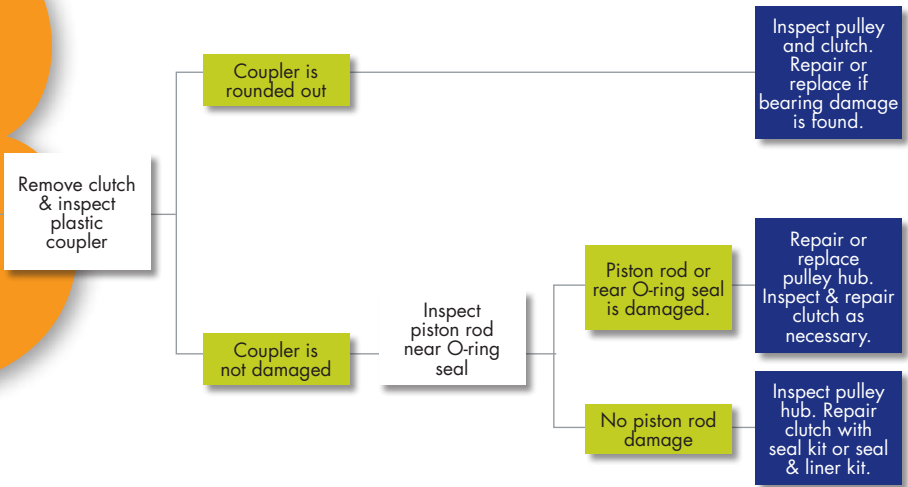




Figure 1 Pulley hub with coupler in place on shaft (Figure 1)

There is no load on the coupler during clutch operation. The coupler simply keeps the clutch piston rod (center shaft) from turning. It couples the piston rod to the shaft of the pulley hub by engaging both the flats of piston rod and the pulley hub shaft. The O-ring on the rear of the piston rod is the air seal between the clutch and pulley hub. (Figure 2)

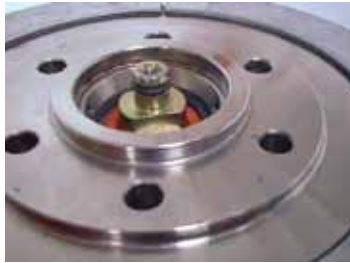


Figure 2 Clutch with rear O-ring on piston rod

Rounded out damage to the coupler and rear O-ring failure can occur when the clutch piston rod is forced to rotate. (Figure 3-2)

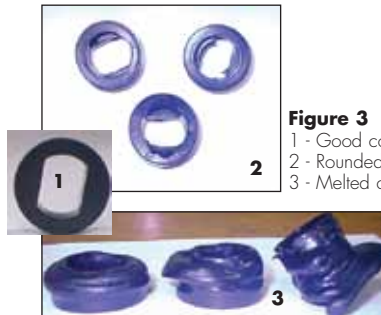


Figure 3
1 - Good coupler
2 - Rounded out coupler
3 - Melted couplers

This can be caused by a clutch bearing failure or improper clutch servicing. The clutch cylinder cap must be held stationary by hand when removing the front retainer nut.

If the coupler is rounded out, the clutch ball bearings

need to be inspected carefully. The clutch should be replaced if bearings are damaged or worn.

Always replace the coupler and rear O-ring when servicing the clutch or hub.

Overheated Fan Clutch (Melted Coupler)



Figure 4 Bluing effect

An overheated fan clutch can be recognized by the bluing effect (discoloration) present on the rear of the clutch. (Figure 4) The bluing effect will appear on the surface of the clutch that mounts against the pulley. The shape of the front face of the pulley may appear on the back of the clutch as a lighter steel color. The raised pilot on the back of the clutch may also be

Rounded Out Coupler Damage

The coupler is located between the rear of the fan clutch and the pulley hub center shaft. It is made of semi-hard black plastic, 1³/₈" diameter x 5/8" thick, with a flat sided hole through the center. (Figure 1)

blued along with other surfaces and components. The front face of the clutch may have dark streaks radiating outwards from the access hole area. (Figure 5) These deposits are caused by an overheated lining. Dark dusty deposits on the inside of the clutch housing also indicate overheating.



Figure 5 Dark streaks from overheating

Control problems causing excessive cycling or low air pressure are the most common causes of clutch overheating and lining failure. Mechanical obstructions to the clutch or fan will also cause lining slippage and overheating.

Correct any fan clutch control system defects that cause over cycling and slippage of the clutch. Extensive overheating may cause damage to the clutch bearings, seals and other internal components. In this case it is advisable to replace the clutch rather than repair it with a kit.

Fan Clutch Piston Rod Damage

Damage to the rear of the piston rod (center shaft) and rear O-ring is usually caused by worn or damaged pulley hub bearings. This may first be noticed as an air leak at the rear of the clutch.

The rear portion of the piston rod enters into the front of the pulley hub shaft. Bearing wear or damage in the pulley hub may cause the pulley to not run true on the shaft. Bearing wear can cause damage to the rear O-ring and eventually the piston rod. (Figure 6) There should be no play in the pulley hub bearings. Check for scuffed plating on the piston rod around the O-ring area. Check for worn metal at the rear of the piston rod. If the metal is not damaged, the clutch can be reused.

Always determine and correct the cause of failure. Inspect and make any pulley hub repairs or replace the pulley hub as required if worn or damaged. Pulley hub bearing kits are available for service.

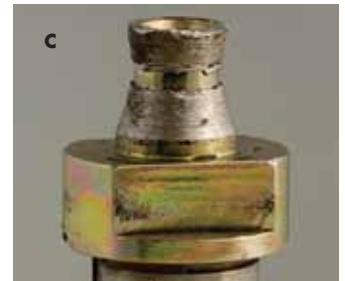
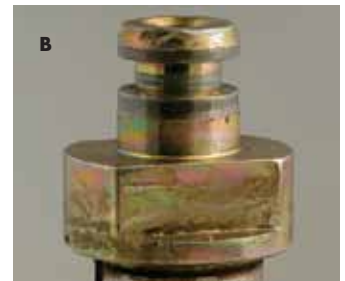


Figure 6 Oring area of new piston rod (Figure A), minor damage at rear of piston rod showing scuffed plating serviceable with repair kit (Figure B), and severe damage to rear of piston rod showing worn-away metal, not serviceable. (Figure C)

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