Hydraulic Control Components

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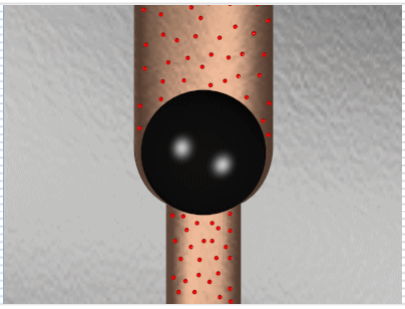
Hydraulic Control Compontnents

- Used to control the flow of fluid for the operation of the transmission.
- Controls:
  - Flow (on/off)
  - Flow amount
  - Flow direction
  - Flow timing

Components

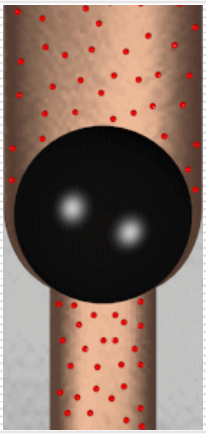
- Check ball
- Shuttle ball
- Poppet valve
- Puck
- Spool valve
- Orifice

Check ball

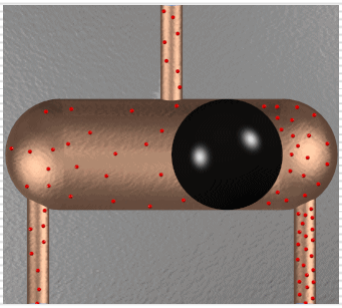


- Used to allow flow of fluid in only one direction.
- Pressure down seats the ball and stops the flow.
- Pressure up unseats the ball and allows the flow.

Check Ball Operation

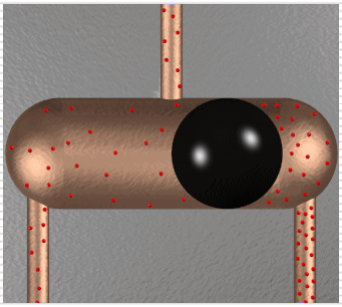


Shuttle Ball

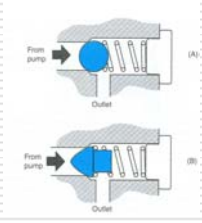


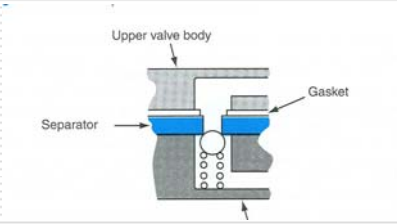
- Used to allow only one exit for two possible entries.
- Pressure from bottom right forces ball to left sealing bottom left, this only allows fluid flow out top.

Shuttle Ball Operation



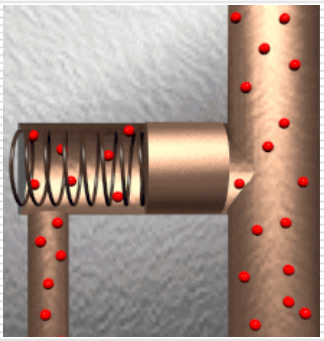
Poppet ball/valve



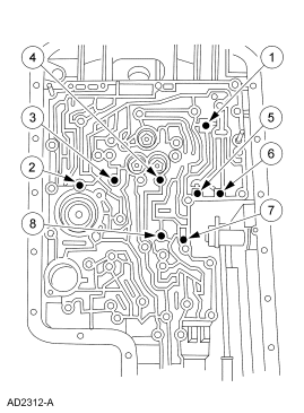


- Controls the pressure maximum applied to a circuit
- Can be a puck, ball, or needle style.

Poppet Valve Operation

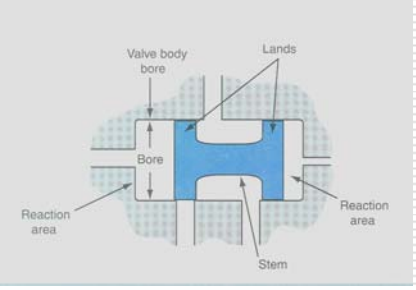


Check balls/ Shuttle balls/ Poppet valves



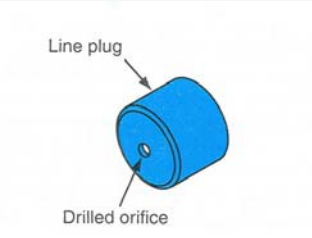
- Placement is extremely important.
- Locations may depend on model build date, vehicle model, load range, and engineer's whim.

Spool Valve



- Used to control fluid flow and pressure.
- Valve parts:
  - Lands
  - Reaction area
  - Stem
- The valve body, case, or pump houses the valves.

Orifice

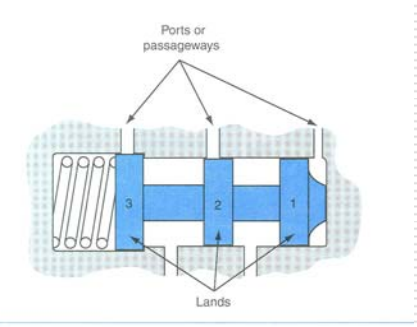


- May be a poppet style orifice or simply an orifice in the separator plate.
- Used to create a pressure drop after or a pressure rise before.

Pressure types

- Static pressure:
  - Pressure within a fluid when the fluid is not moving.
  - Pressure will be equal on each side of the orifice in static pressure
- Dynamic pressure:
  - Pressure within a fluid when the fluid is moving.
  - Pressure will not be equal on each side of the orifice in a dynamic pressure

Differential pressure valve



- Pressure applied to a differential pressure valve stem will cause it to move.