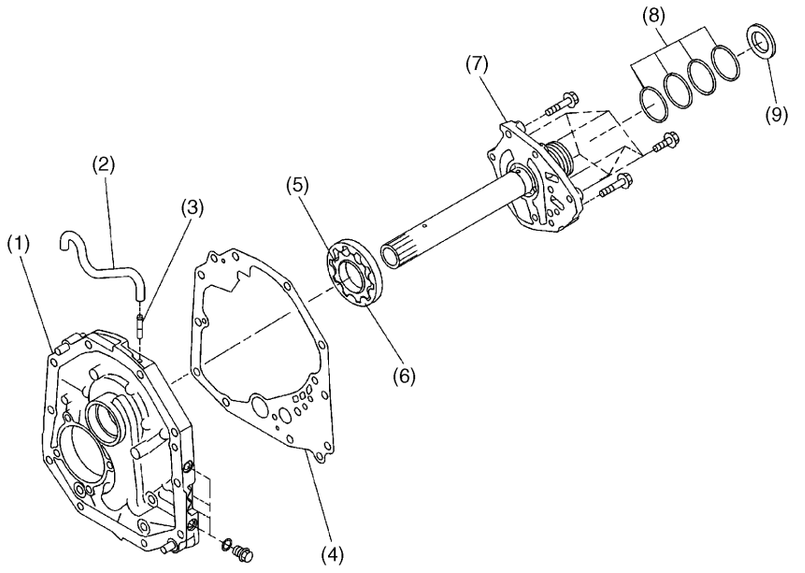
1. Oil Pump

A: CONSTRUCTION

The pump consists of a prachoid rotor pair, a housing and a cover. The inner rotor has nine teeth and the outer rotor has ten teeth.

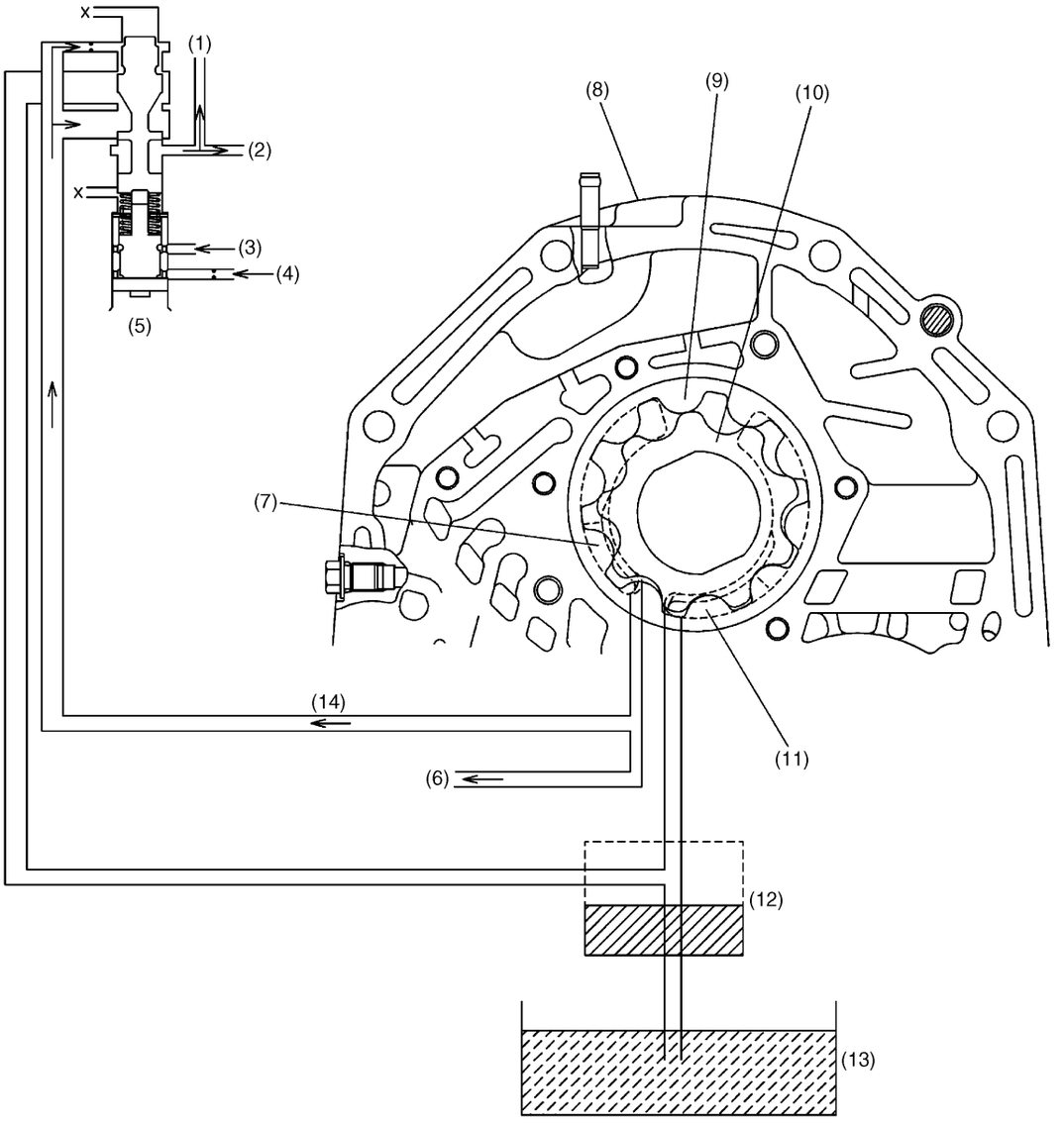


B3H0888A

(1) Oil pump housing
(2) Hose
(3) Nipple
(4) Gasket
(5) Inner rotor
(6) Outer rotor
(7) Oil pump cover
(8) Seal ring
(9) Thrust bearing

B: FUNCTION

- The pump draws automatic transmission fluid (ATF) from the oil pan through the oil strainer located under the hydraulic control valve assembly. The ATF then flows through a passage in the transmission case, and after passing through the oil pump housing and oil pump cover, it enters the suction port.
- As the inner rotor rotates, the outer rotor also rotates. This motion causes the ATF to be sucked up through the suction port and discharged from the discharged port.
- The discharged ATF flows through a passage in the oil pump cover and then a passage in the oil pump housing. It then goes through a passage in the transmission case to the pressure regulator valve in the control valve assembly, from which the ATF is directed to various clutches, brakes, and torque converter lock-up clutch for acting as hydraulic fluid and lubricating oil. Part of the ATF also flows, directly and after passing through the regulator valve, to the manual valve, from where it is distributed to the circuit corresponding to the range selected by the selector lever.
- As engine speed increases, the delivery rate of the oil pump also increases.



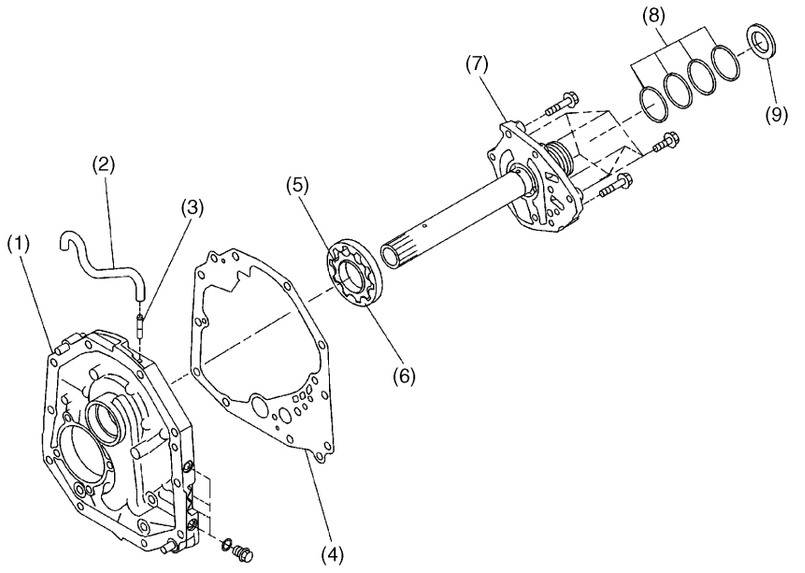
B3H1842A

(1) To torque converter regulator valve
(2) To manual valve
(3) From reverse clutch
(4) From pressure modifier valve
(5) Pressure regulator valve
(6) To manual valve
(7) Delivery port
(8) Oil pump housing
(9) Outer rotor
(10) Inner rotor
(11) Suction port
(12) Oil strainer
(13) Oil pan
(14) Line pressure

1. Oil Pump

A: CONSTRUCTION

The pump consists of a prachoid rotor pair, a housing and a cover. The inner rotor has nine teeth and the outer rotor has ten teeth.

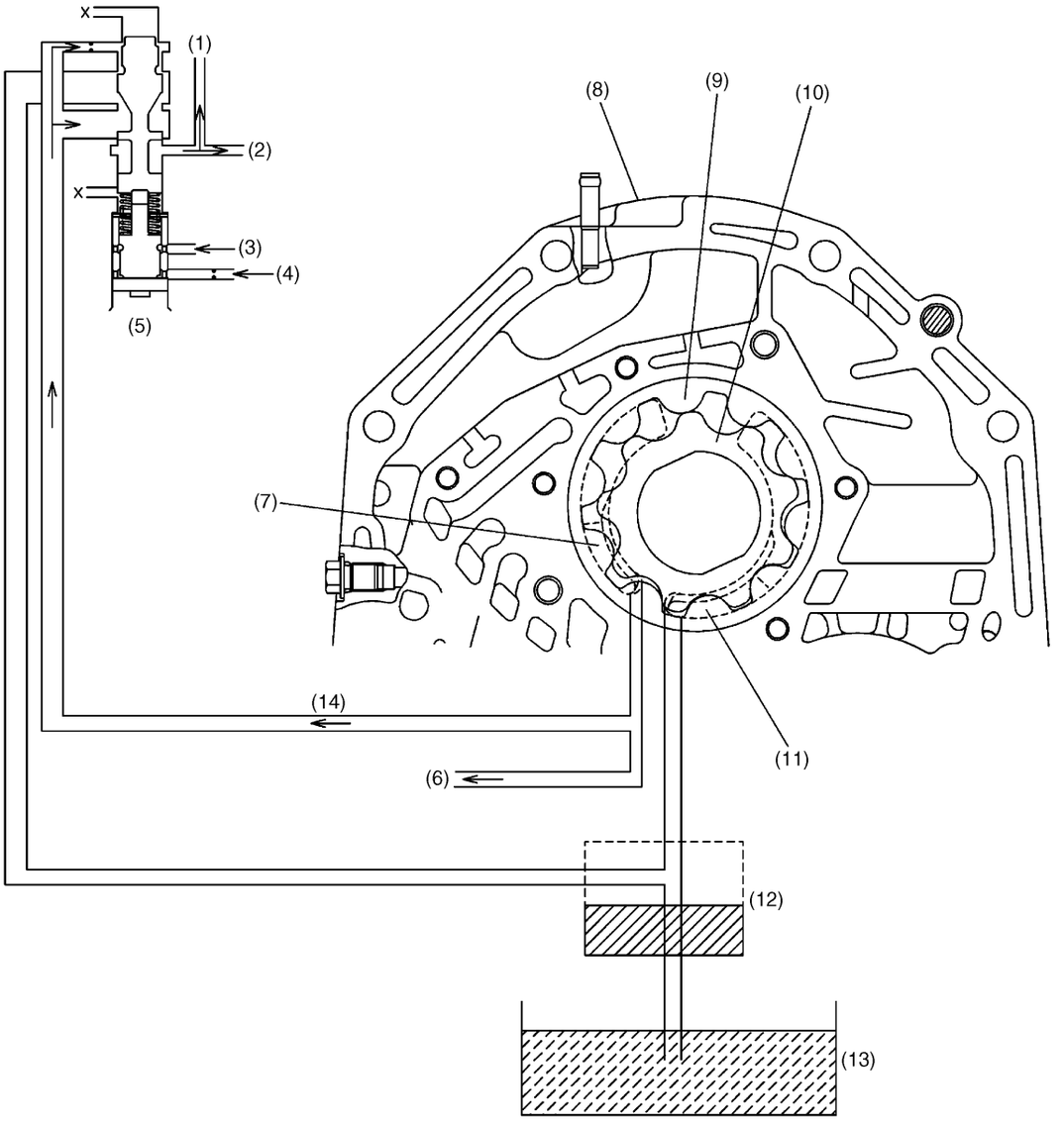


B3H0888A

(1) Oil pump housing
(2) Hose
(3) Nipple
(4) Gasket
(5) Inner rotor
(6) Outer rotor
(7) Oil pump cover
(8) Seal ring
(9) Thrust bearing

B: FUNCTION

- The pump draws automatic transmission fluid (ATF) from the oil pan through the oil strainer located under the hydraulic control valve assembly. The ATF then flows through a passage in the transmission case, and after passing through the oil pump housing and oil pump cover, it enters the suction port.
- As the inner rotor rotates, the outer rotor also rotates. This motion causes the ATF to be sucked up through the suction port and discharged from the discharged port.
- The discharged ATF flows through a passage in the oil pump cover and then a passage in the oil pump housing. It then goes through a passage in the transmission case to the pressure regulator valve in the control valve assembly, from which the ATF is directed to various clutches, brakes, and torque converter lock-up clutch for acting as hydraulic fluid and lubricating oil. Part of the ATF also flows, directly and after passing through the regulator valve, to the manual valve, from where it is distributed to the circuit corresponding to the range selected by the selector lever.
- As engine speed increases, the delivery rate of the oil pump also increases.

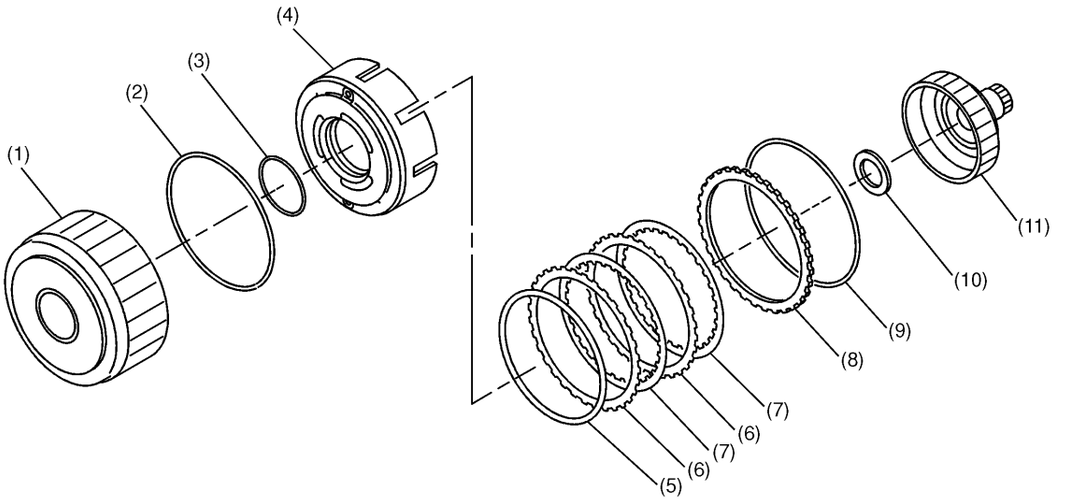


B3H1842A

(1) To torque converter regulator valve
(2) To manual valve
(3) From reverse clutch
(4) From pressure modifier valve
(5) Pressure regulator valve
(6) To manual valve
(7) Delivery port
(8) Oil pump housing
(9) Outer rotor
(10) Inner rotor
(11) Suction port
(12) Oil strainer
(13) Oil pan
(14) Line pressure

2. Reverse Clutch

A: CONSTRUCTION



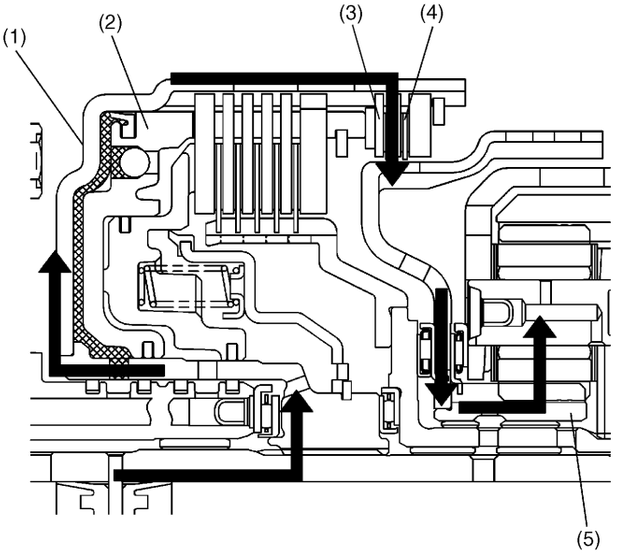
B3H0891A

(1) High clutch drum
(2) Lip seal
(3) Lathe cut seal ring
(4) Reverse clutch piston
(5) Dish plate
(6) Driven plate
(7) Drive plate
(8) Retaining plate
(9) Snap ring
(10) Thrust needle bearing
(11) High clutch hub

B: FUNCTION

1. WHEN REVERSE IS SELECTED

Hydraulic pressure from the hydraulic control valve is applied to the reverse clutch piston when a shift is made into the reverse. The drive and driven plates are pressed together by this pressure, so that the engine torque from the high clutch drum is transmitted to the front sun gear through the 2-4 brake hub.



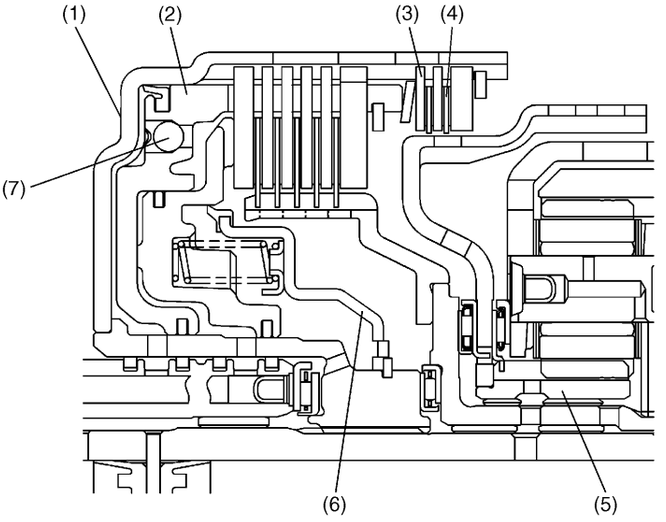
B3H2071A

(1) High clutch drum
(2) Reverse clutch piston
(3) Driven plate
(4) Drive plate
(5) Front sun gear

2. WHEN REVERSE IS NOT SELECTED

When the selector lever is in any position other than the reverse, no pressure is applied to the reverse clutch piston. Hence the drive and driven plates are separated from each other, transmitting no power to any element beyond them.

A check ball is built into the clutch piston. This check ball has a function of releasing the pressure which may build up in the fluid remaining behind the piston by centrifugal force generated by the idly rotating high clutch drum, thereby avoiding a half-engaged state of the clutch.

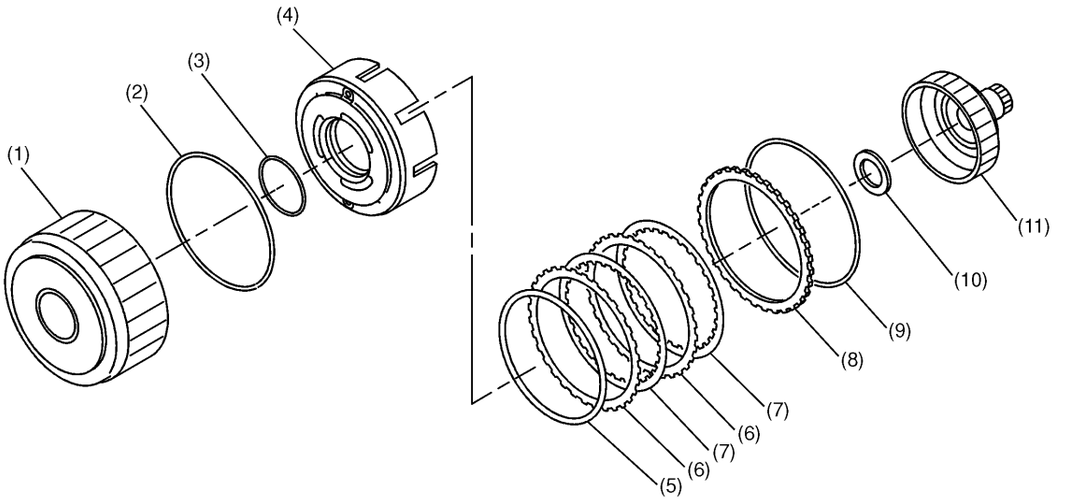


B3H2072A

(1) High clutch drum
(2) Reverse clutch piston
(3) Driven plate
(4) Drive plate
(5) Front sun gear
(6) Cover
(7) Check ball

2. Reverse Clutch

A: CONSTRUCTION



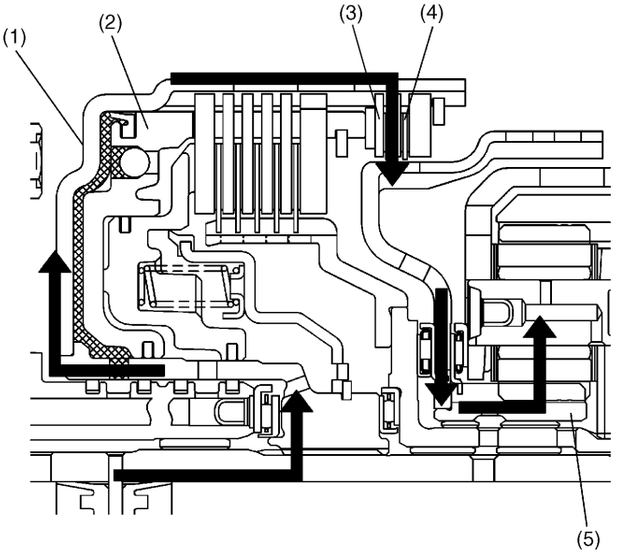
B3H0891A

(1) High clutch drum
(2) Lip seal
(3) Lathe cut seal ring
(4) Reverse clutch piston
(5) Dish plate
(6) Driven plate
(7) Drive plate
(8) Retaining plate
(9) Snap ring
(10) Thrust needle bearing
(11) High clutch hub

B: FUNCTION

1. WHEN REVERSE IS SELECTED

Hydraulic pressure from the hydraulic control valve is applied to the reverse clutch piston when a shift is made into the reverse. The drive and driven plates are pressed together by this pressure, so that the engine torque from the high clutch drum is transmitted to the front sun gear through the 2-4 brake hub.



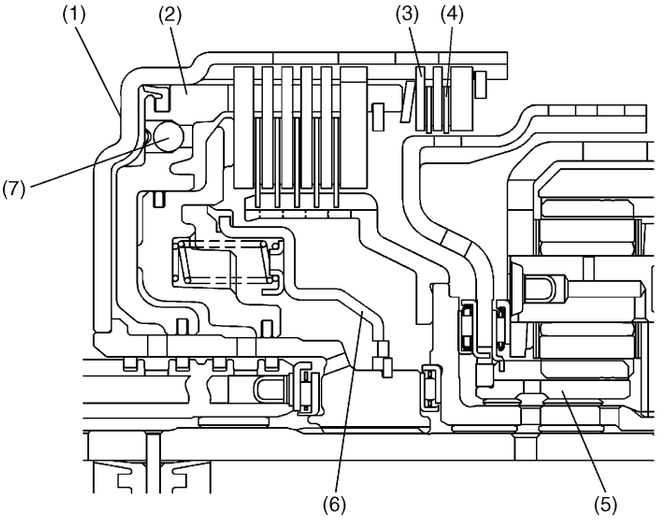
B3H2071A

(1) High clutch drum
(2) Reverse clutch piston
(3) Driven plate
(4) Drive plate
(5) Front sun gear

2. WHEN REVERSE IS NOT SELECTED

When the selector lever is in any position other than the reverse, no pressure is applied to the reverse clutch piston. Hence the drive and driven plates are separated from each other, transmitting no power to any element beyond them.

A check ball is built into the clutch piston. This check ball has a function of releasing the pressure which may build up in the fluid remaining behind the piston by centrifugal force generated by the idly rotating high clutch drum, thereby avoiding a half-engaged state of the clutch.



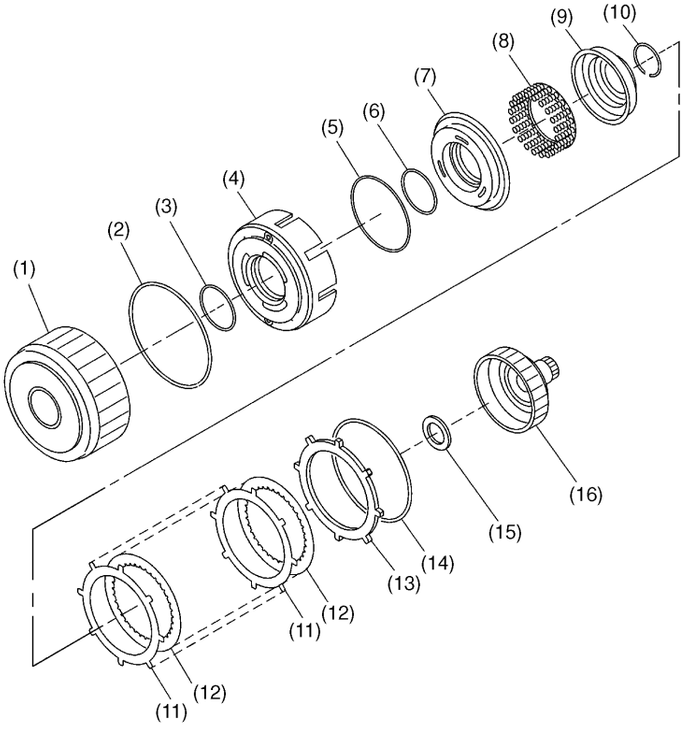
B3H2072A

(1) High clutch drum
(2) Reverse clutch piston
(3) Driven plate
(4) Drive plate
(5) Front sun gear
(6) Cover
(7) Check ball

3. High Clutch

When the 3rd or 4th gear is selected, hydraulic pressures are applied to the high clutch from the shift valve and pressure regulator valve. The clutch's drive and driven plates are pressed together, thus transmitting the engine power from the input shaft to the front planetary carrier through the high clutch hub.

A cover is placed inside the piston, and the space between the piston and the cover is filled with ATF. When the high clutch is not in engagement, the centrifugal force generated in the ATF inside the cover cancels out the centrifugal force generated in the ATF remaining behind the high clutch piston, thus preventing incomplete disengagement of the clutch.
When the high clutch is engaged, the pressure pushing the clutch piston is much larger than the counteracting force of the ATF in the cover, so the clutch remains engaged.



S3H0225A

(1) High clutch drum
(2) Lathe cut seal ring (outer)
(3) Lathe cut seal ring (inner)
(4) Reverse clutch piston
(5) Lathe cut seal ring (outer)
(6) Lathe cut seal ring (inner)
(7) High clutch piston
(8) Spring retainer
(9) Cover
(10) Snap ring
(11) Driven plate
(12) Drive plate
(13) Retaining plate
(14) Snap ring
(15) Thrust needle bearing
(16) High clutch hub

3. High Clutch

When the 3rd or 4th gear is selected, hydraulic pressures are applied to the high clutch from the shift valve and pressure regulator valve. The clutch's drive and driven plates are pressed together, thus transmitting the engine power from the input shaft to the front planetary carrier through the high clutch hub.

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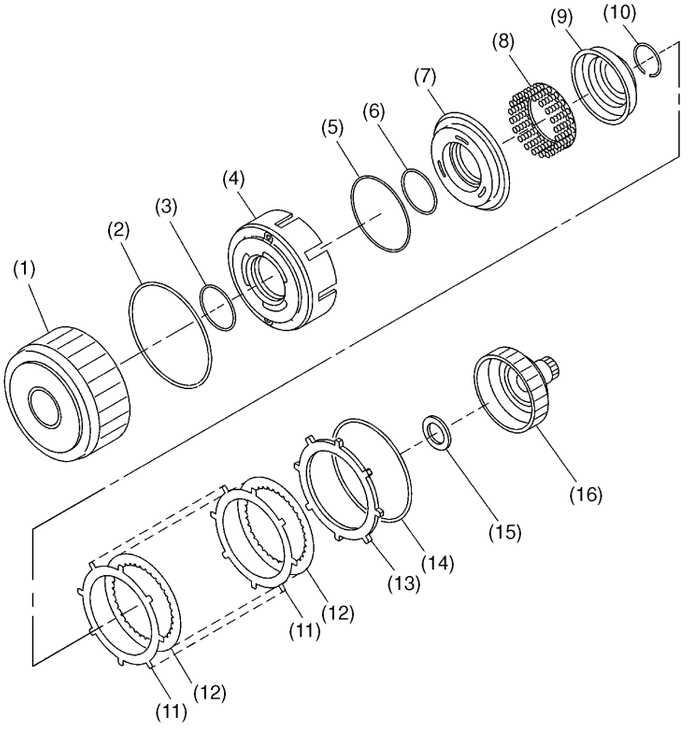


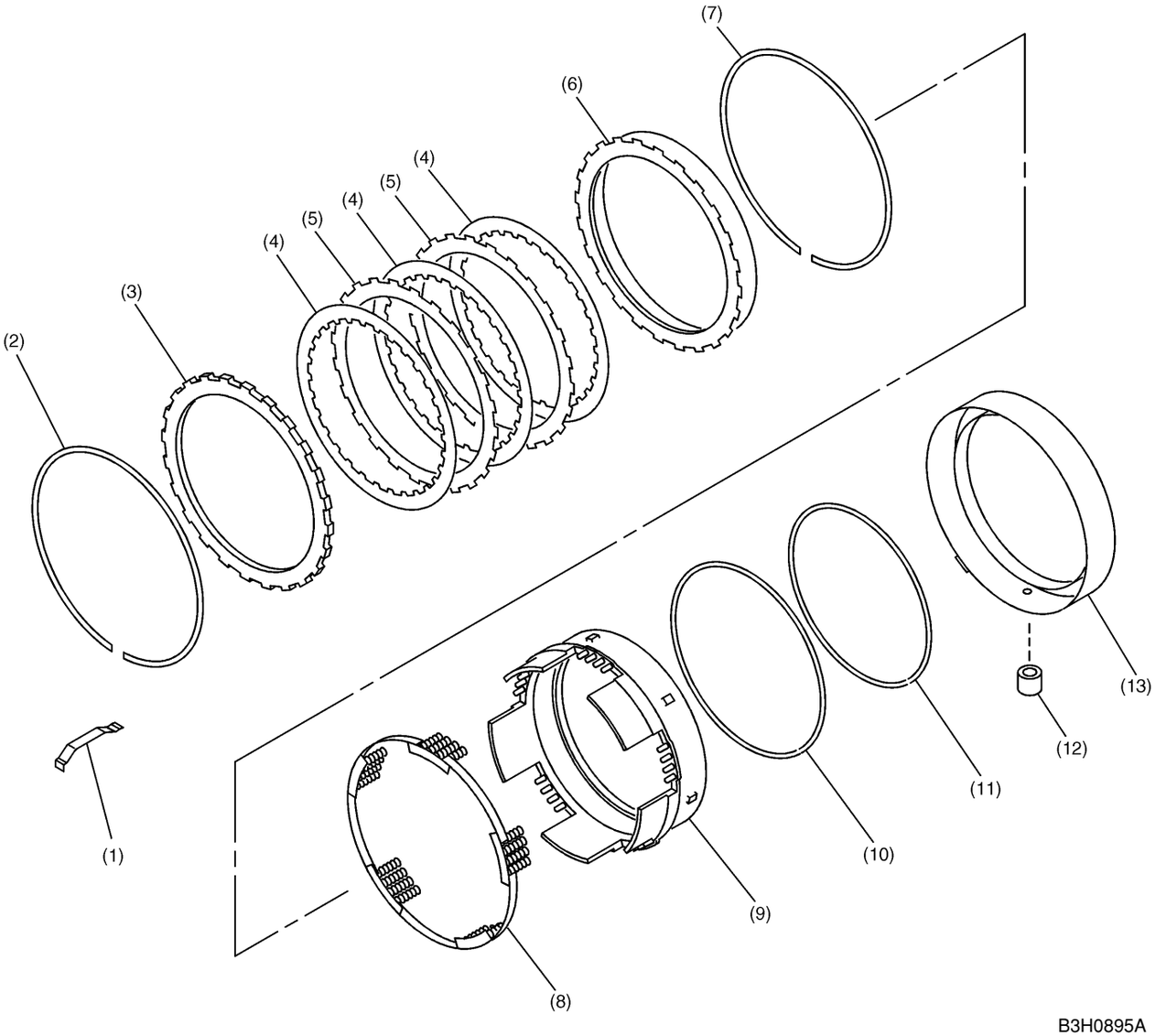
S3H0225A

(1) High clutch drum
(2) Lathe cut seal ring (outer)
(3) Lathe cut seal ring (inner)
(4) Reverse clutch piston
(5) Lathe cut seal ring (outer)
(6) Lathe cut seal ring (inner)
(7) High clutch piston
(8) Spring retainer
(9) Cover
(10) Snap ring
(11) Driven plate
(12) Drive plate
(13) Retaining plate
(14) Snap ring
(15) Thrust needle bearing
(16) High clutch hub

4. 2-4 Brake

A: CONSTRUCTION

The 2-4 brake consists of a 2-4 brake piston, a spring retainer, a pressure plate, drive plates and driven plates.
This brake is engaged by the hydraulic pressure from the transmission control valve and locks the front sun gear when the 2nd gear is selected in the D, 3 or 2 range, or when the 4th gear is selected in the D range.



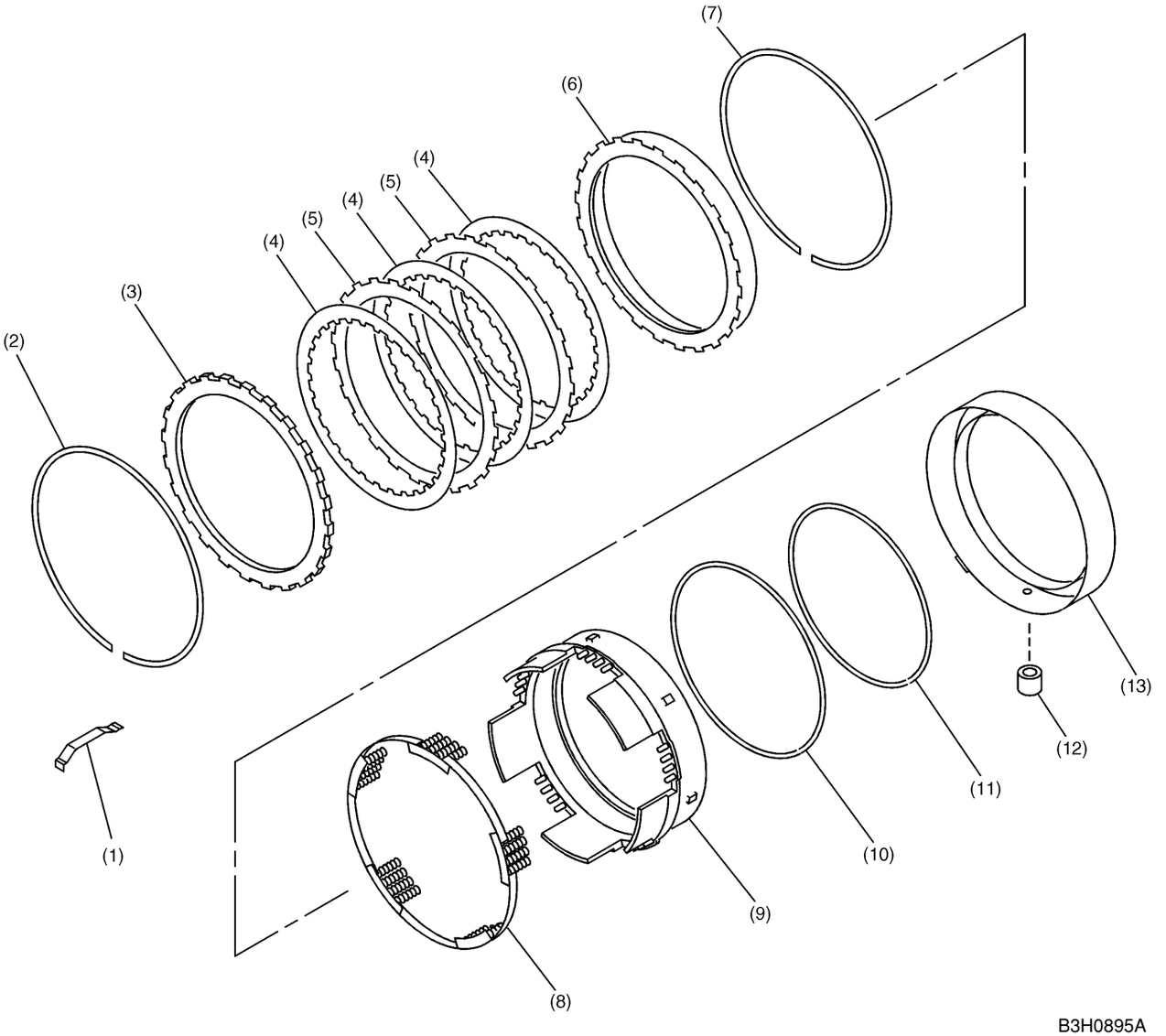
B3H0895A

(1) Leaf spring
(2) Snap ring
(3) Retaining plate
(4) Drive plate
(5) Driven plate
(6) Pressure rear plate
(7) Snap ring
(8) Spring retainer
(9) 2-4 brake piston
(10) Lathe cut seal ring
(11) Lathe cut seal ring
(12) 2-4 brake piston seal
(13) 2-4 brake piston retainer

4. 2-4 Brake

A: CONSTRUCTION

The 2-4 brake consists of a 2-4 brake piston, a spring retainer, a pressure plate, drive plates and driven plates.
This brake is engaged by the hydraulic pressure from the transmission control valve and locks the front sun gear when the 2nd gear is selected in the D, 3 or 2 range, or when the 4th gear is selected in the D range.



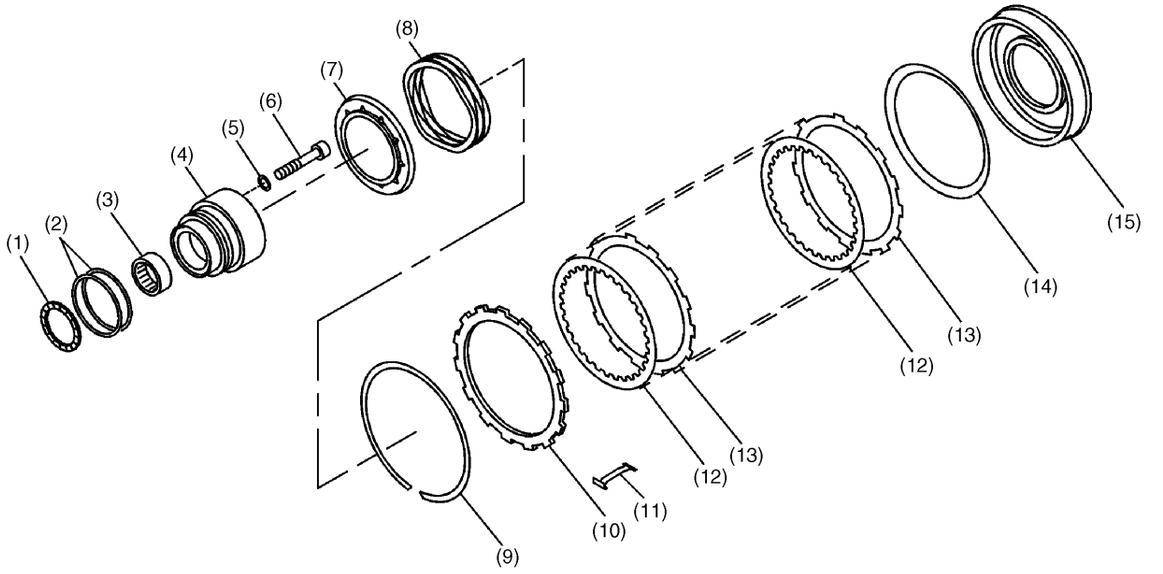
B3H0895A

(1) Leaf spring
(2) Snap ring
(3) Retaining plate
(4) Drive plate
(5) Driven plate
(6) Pressure rear plate
(7) Snap ring
(8) Spring retainer
(9) 2-4 brake piston
(10) Lathe cut seal ring
(11) Lathe cut seal ring
(12) 2-4 brake piston seal
(13) 2-4 brake piston retainer

5. Low & Reverse Brake

A: CONSTRUCTION

The low & reverse brake consists of a piston, a dish plate, drive plates, driven plates, a retaining plate and a snap ring that are placed in a housing formed in the transmission case.



B3H0897A

(1)	Thrust bearing	(6)	Bolt	(11)	Leaf spring
(2)	Seal ring	(7)	Spring retainer	(12)	Drive plate
(3)	Needle bearing	(8)	Return spring	(13)	Driven plate
(4)	One-way clutch inner race	(9)	Snap ring	(14)	Dish plate
(5)	Washer	(10)	Retaining plate	(15)	Low & reverse brake piston

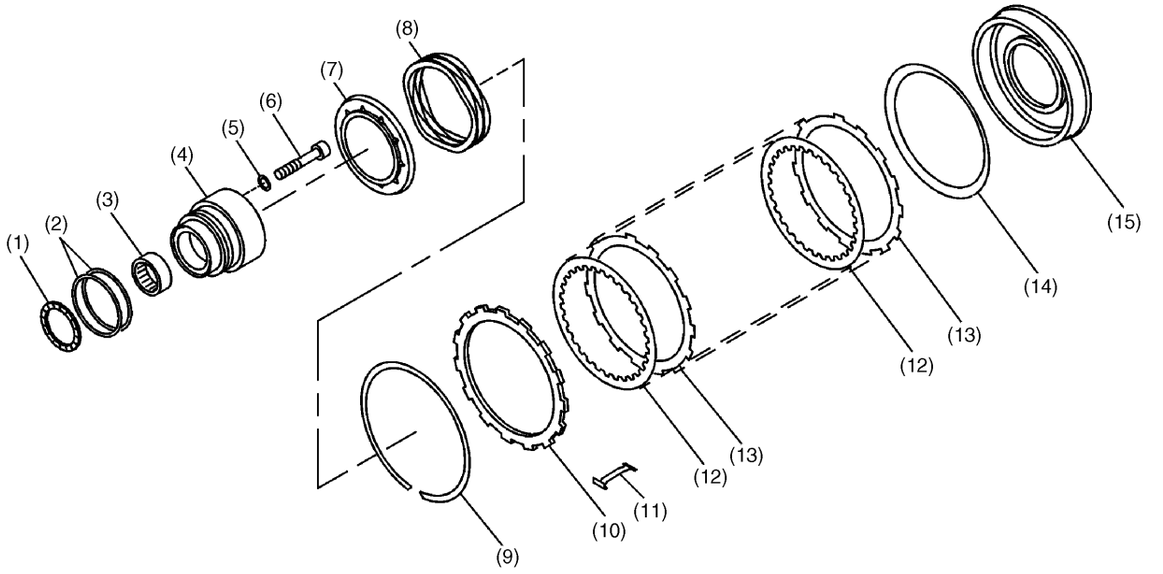
B: FUNCTION

When the 1st gear is selected in the 1 range or the reverse is selected, the pressure from the pressure regulator valve is applied to the low & reverse brake piston. The piston then presses the drive and driven plates together and causes the low clutch to lock.

5. Low & Reverse Brake

A: CONSTRUCTION

The low & reverse brake consists of a piston, a dish plate, drive plates, driven plates, a retaining plate and a snap ring that are placed in a housing formed in the transmission case.



B3H0897A

(1)	Thrust bearing	(6)	Bolt	(11)	Leaf spring
(2)	Seal ring	(7)	Spring retainer	(12)	Drive plate
(3)	Needle bearing	(8)	Return spring	(13)	Driven plate
(4)	One-way clutch inner race	(9)	Snap ring	(14)	Dish plate
(5)	Washer	(10)	Retaining plate	(15)	Low & reverse brake piston

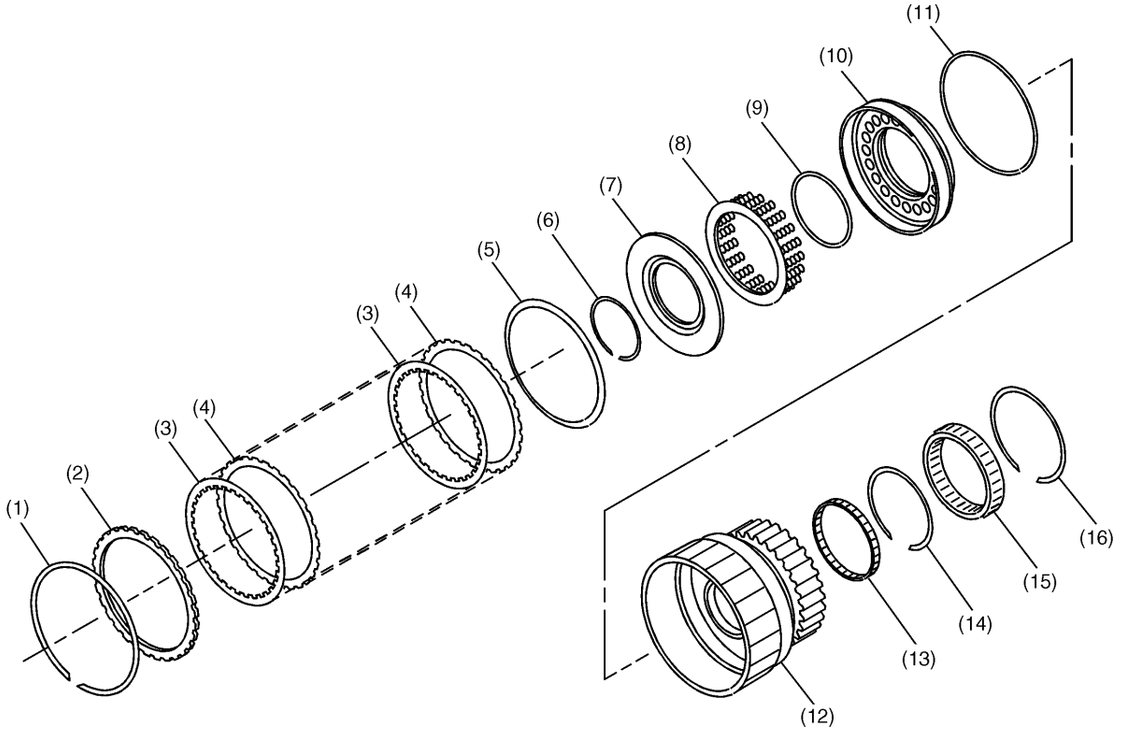
B: FUNCTION

When the 1st gear is selected in the 1 range or the reverse is selected, the pressure from the pressure regulator valve is applied to the low & reverse brake piston. The piston then presses the drive and driven plates together and causes the low clutch to lock.

6. Low Clutch

A: CONSTRUCTION

The low clutch consists of a drum, a piston, return springs, a cover, drive plates, driven plates, a one-way clutch, and other sealing and retaining elements.
The low clutch drum is made of a press-formed metal sheet. The drum's outer race and sleeve are welded together to the drum by an electron beam welding technique.



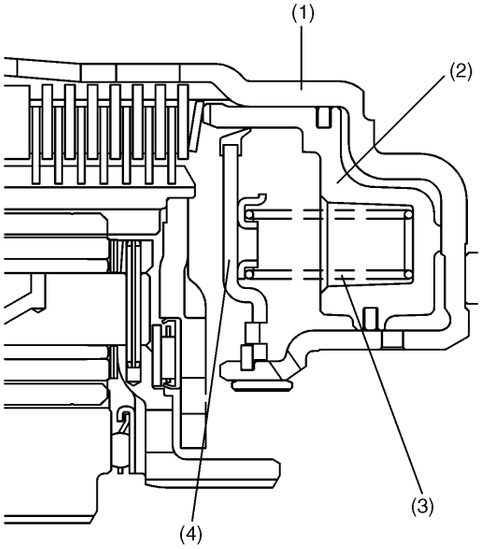
B3H0898A

(1) Snap ring
(2) Retainer
(3) Drive plate
(4) Driven plate
(5) Dish plate
(6) Snap ring
(7) Cover
(8) Spring retainer
(9) Lathe cut seal ring
(10) Low clutch piston
(11) Lathe cut seal ring
(12) Low clutch drum
(13) Needle bearing
(14) Snap ring
(15) One-way clutch
(16) Snap ring

B: FUNCTION

The low clutch operates in the D range (1st, 2nd, and 3rd gears), 3 range (1st, 2nd, and 3rd gears), 2 range (2nd and 3rd gears), and 1 range (1st, 2nd, and 3rd gears).
This clutch engages when the hydraulic pressure from the transmission control valve is applied to its piston, transmitting the power to the reduction drive shaft.

A cover is placed inside the piston, and the space between the piston and the cover is filled with ATF. When the low clutch is not in engagement, the centrifugal force generated in the ATF inside the cover cancels out the centrifugal force generated in the ATF remaining behind the low clutch piston, thus preventing incomplete disengagement of the clutch.
When the low clutch is engaged, the pressure pushing the clutch piston is much larger than the counteracting force of the ATF in the cover, so the clutch remains engaged.



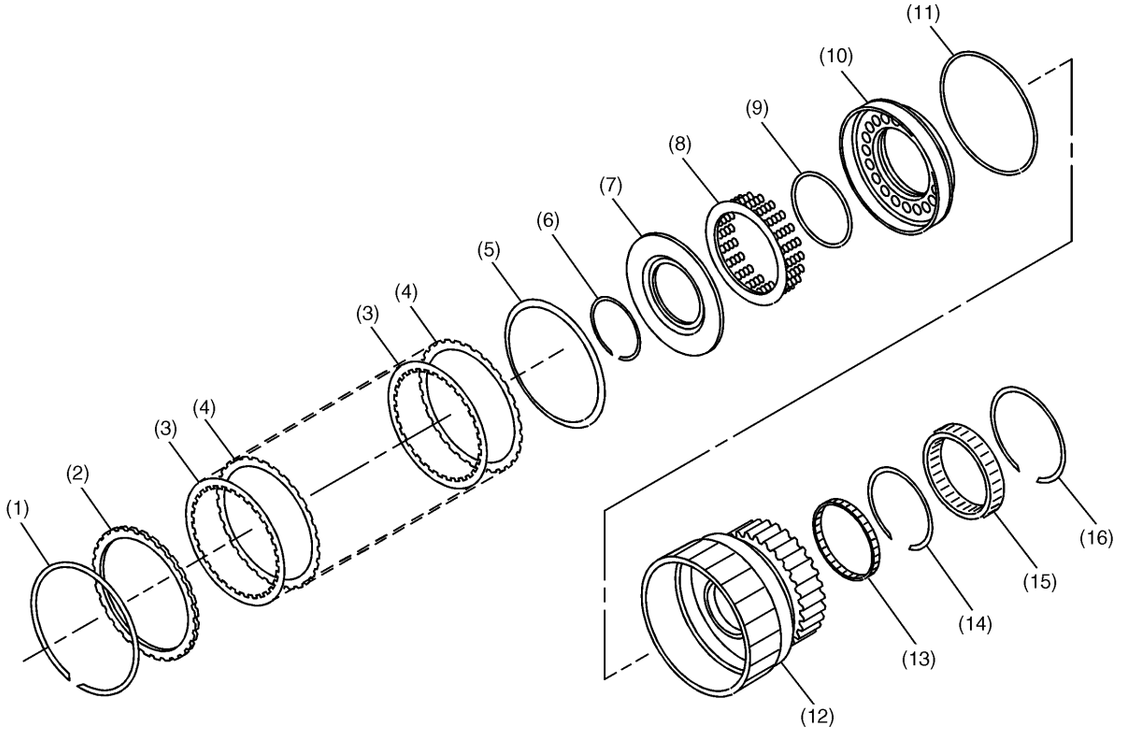
B3H0899A

(1) Low clutch drum
(2) Low clutch piston
(3) Spring retainer
(4) Cover

6. Low Clutch

A: CONSTRUCTION

The low clutch consists of a drum, a piston, return springs, a cover, drive plates, driven plates, a one-way clutch, and other sealing and retaining elements.
The low clutch drum is made of a press-formed metal sheet. The drum's outer race and sleeve are welded together to the drum by an electron beam welding technique.



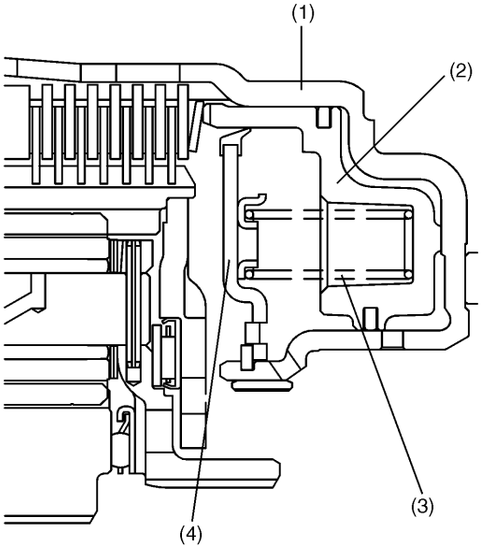
B3H0898A

(1) Snap ring
(2) Retainer
(3) Drive plate
(4) Driven plate
(5) Dish plate
(6) Snap ring
(7) Cover
(8) Spring retainer
(9) Lathe cut seal ring
(10) Low clutch piston
(11) Lathe cut seal ring
(12) Low clutch drum
(13) Needle bearing
(14) Snap ring
(15) One-way clutch
(16) Snap ring

B: FUNCTION

The low clutch operates in the D range (1st, 2nd, and 3rd gears), 3 range (1st, 2nd, and 3rd gears), 2 range (2nd and 3rd gears), and 1 range (1st, 2nd, and 3rd gears).
This clutch engages when the hydraulic pressure from the transmission control valve is applied to its piston, transmitting the power to the reduction drive shaft.

A cover is placed inside the piston, and the space between the piston and the cover is filled with ATF. When the low clutch is not in engagement, the centrifugal force generated in the ATF inside the cover cancels out the centrifugal force generated in the ATF remaining behind the low clutch piston, thus preventing incomplete disengagement of the clutch.
When the low clutch is engaged, the pressure pushing the clutch piston is much larger than the counteracting force of the ATF in the cover, so the clutch remains engaged.



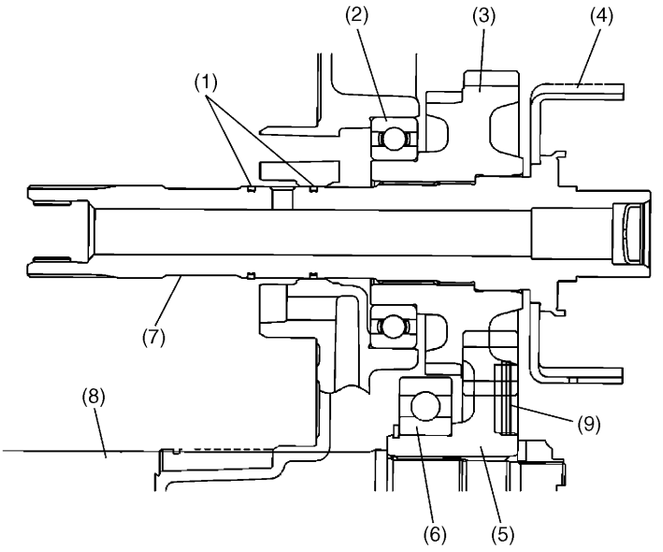
B3H0899A

(1) Low clutch drum
(2) Low clutch piston
(3) Spring retainer
(4) Cover

7. Reduction Gears

A: MPT MODELS

Engine torque is transmitted from the rear planetary carrier to the reduction drive shaft and the reduction drive gear. The torque is then transmitted to the front final gears through the reduction driven gear and drive pinion. The torque is also transmitted to the rear wheels from the transfer clutch hub (welded to the side of the reduction drive gear) through the transfer clutch and the following path: rear drive shaft → propeller shaft → rear differential.

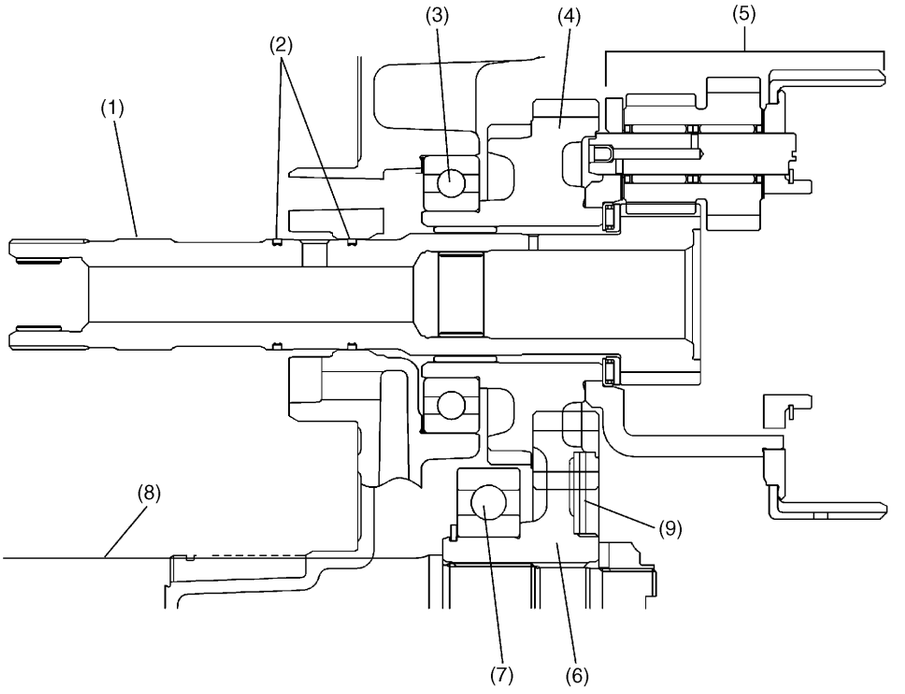


B3H2073A

(1) Seal ring
(2) Ball bearing
(3) Reduction drive gear
(4) Transfer clutch hub
(5) Reduction driven gear
(6) Ball bearing
(7) Reduction drive shaft
(8) Drive pinion shaft
(9) Snap ring

B: VTD MODELS

Engine torque is transmitted from the rear planetary carrier to the intermediate shaft and the center differential. The torque to the center differential is transmitted from the front sun gear which forms an integral part of the intermediate shaft. From the center differential, part of the torque is transmitted toward the front wheels by way of the center differential carrier, which forms an integral part of the reduction drive gear. The torque toward the rear wheels is transmitted by way of the center differential's rear sun gear which forms an integral part of the rear drive shaft. The front wheel drive torque is then transmitted to the final gear through the reduction driven gear and drive pinion shaft. The rear wheel drive torque is transmitted as follows: rear drive shaft → propeller shaft → rear differential.



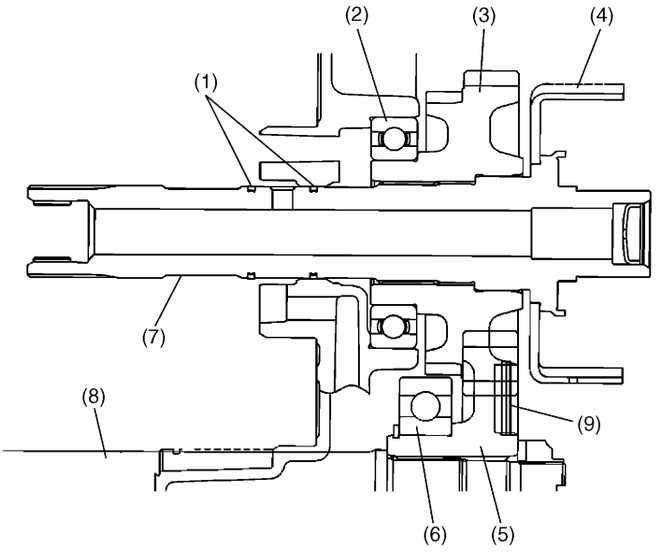
B3H2074A

(1) Intermediate shaft
(2) Seal ring
(3) Ball bearing
(4) Reduction drive gear
(5) Center differential assembly
(6) Reduction driven gear
(7) Ball bearing
(8) Drive pinion shaft
(9) Snap ring

7. Reduction Gears

A: MPT MODELS

Engine torque is transmitted from the rear planetary carrier to the reduction drive shaft and the reduction drive gear. The torque is then transmitted to the front final gears through the reduction driven gear and drive pinion. The torque is also transmitted to the rear wheels from the transfer clutch hub (welded to the side of the reduction drive gear) through the transfer clutch and the following path: rear drive shaft → propeller shaft → rear differential.

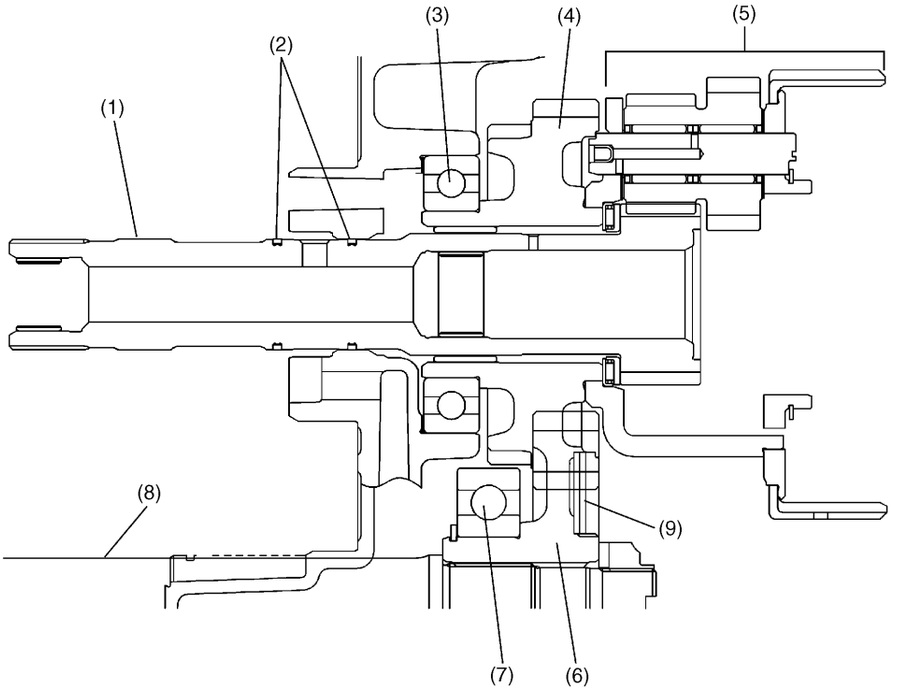


B3H2073A

(1) Seal ring
(2) Ball bearing
(3) Reduction drive gear
(4) Transfer clutch hub
(5) Reduction driven gear
(6) Ball bearing
(7) Reduction drive shaft
(8) Drive pinion shaft
(9) Snap ring

B: VTD MODELS

Engine torque is transmitted from the rear planetary carrier to the intermediate shaft and the center differential. The torque to the center differential is transmitted from the front sun gear which forms an integral part of the intermediate shaft. From the center differential, part of the torque is transmitted toward the front wheels by way of the center differential carrier, which forms an integral part of the reduction drive gear. The torque toward the rear wheels is transmitted by way of the center differential's rear sun gear which forms an integral part of the rear drive shaft. The front wheel drive torque is then transmitted to the final gear through the reduction driven gear and drive pinion shaft. The rear wheel drive torque is transmitted as follows: rear drive shaft → propeller shaft → rear differential.



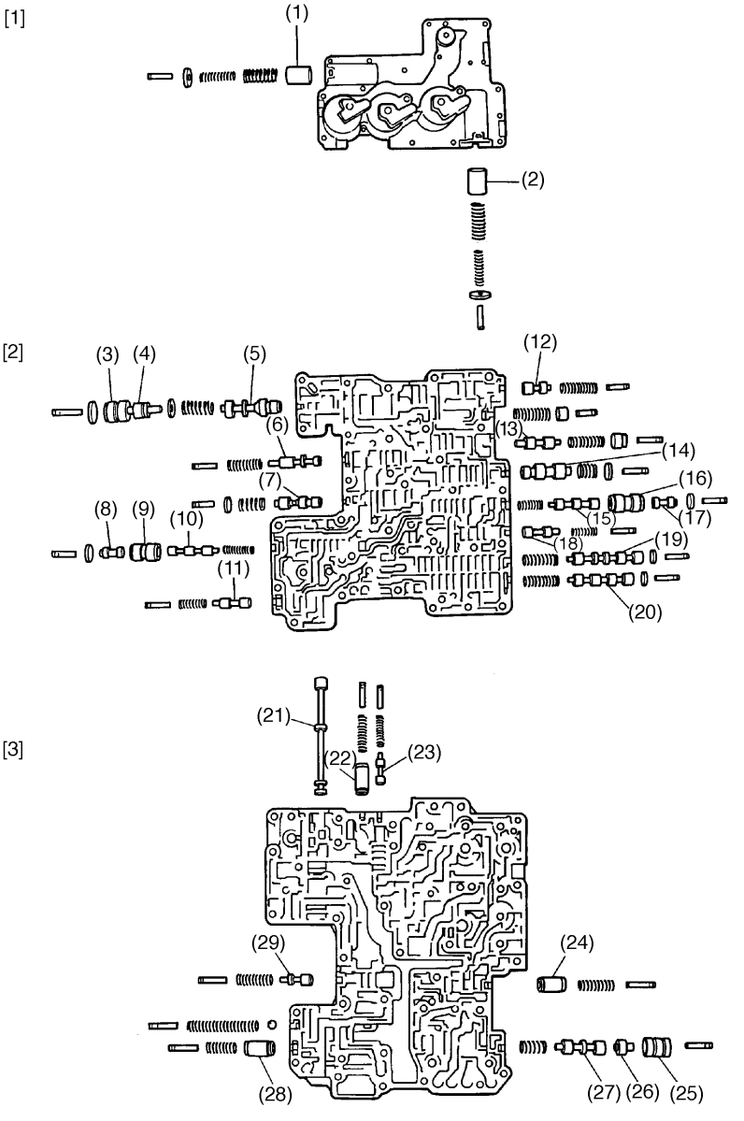
B3H2074A

(1) Intermediate shaft
(2) Seal ring
(3) Ball bearing
(4) Reduction drive gear
(5) Center differential assembly
(6) Reduction driven gear
(7) Ball bearing
(8) Drive pinion shaft
(9) Snap ring

8. Hydraulic Control Valve

The hydraulic control system of the automatic transmission consists of an oil pump, valve bodies containing valves, clutches, fluid passages and pipes. The operation of the system is initiated by driver's manual inputs and electric inputs from the TCM.

A: CONSTRUCTION

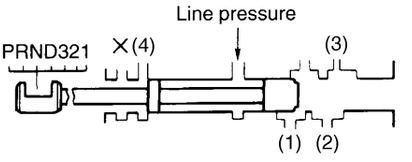


(1) High clutch accumulator piston B
(2) 2-4 brake accumulator piston B
(3) Pressure regulator sleeve
(4) Pressure regulator plug
(5) Pressure regulator valve
(6) Reverse inhibit valve
(7) Accumulator control valve B
(8) 2-4 brake timing plug A
(9) 2-4 brake timing sleeve A
(10) 2-4 brake timing valve A
(11) 2-4 brake timing valve B
(12) Torque converter regulator valve
(13) Pressure modifier valve
(14) Accumulator control valve A
(15) Low clutch timing valve A
(16) Low clutch timing sleeve A
(17) Low clutch timing plug A
(18) Low clutch timing valve B
(19) Shift valve B
(20) Shift valve A
(21) Manual valve
(22) Throttle accumulator piston B
(23) 1st reducing valve
(24) Throttle accumulator piston A
(25) Lock-up control sleeve
(26) Lock-up control plug
(27) Lock-up control valve
(28) Modifier accumulator piston
(29) Pilot valve

[1] Upper valve body
[2] Middle valve body
[3] Lower valve body

MEMO

B: FUNCTION

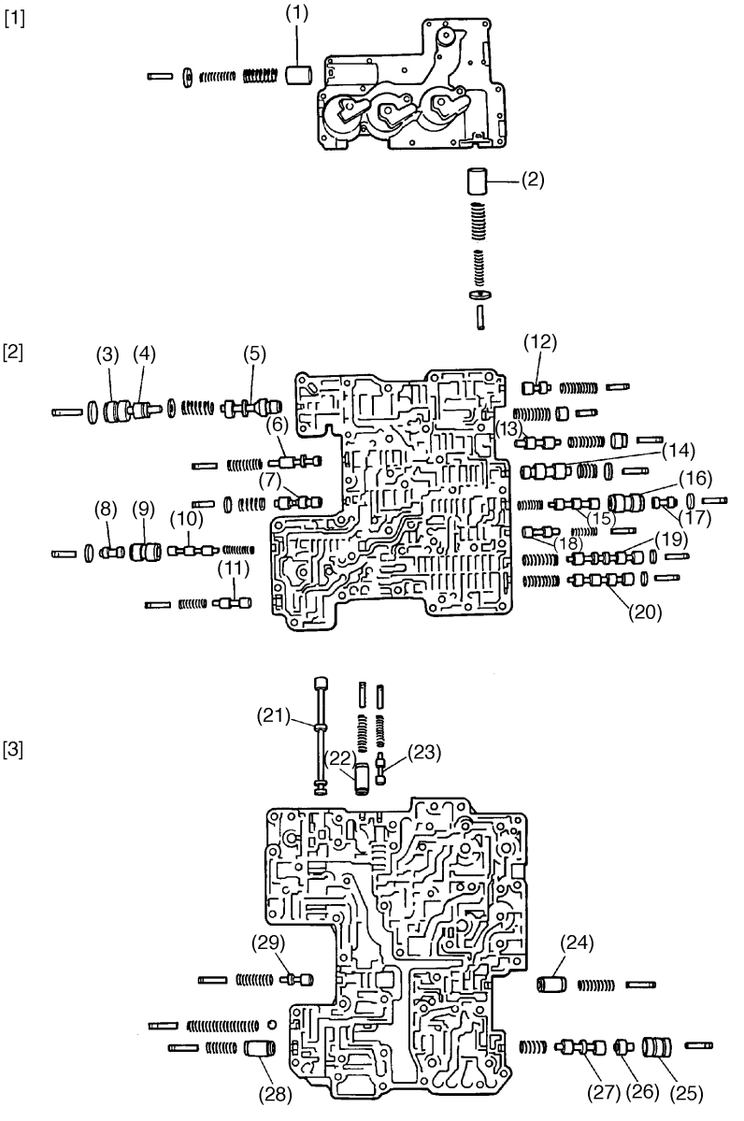
Name	Function
Pressure regulator valve	Regulates the pressure of ATF delivered from the oil pump to an optimum level (line pressure) corresponding to vehicle running conditions.
Pressure modifier valve	Adjusts the pressure modifier output pressure depending on the driving condition to keep the line pressure at the optimum level.
Pressure modifier accumulator piston	Cushions the pressure modifier valve output pressure to remove pulsation in line pressure.
Line pressure relief valve	Prevents excessive rise of the line pressure.
Manual valve	Allows the line pressure to the circuit corresponding to the selected range. Circuit / Range: (1) (2) (3) (4) P R ○ N D ○ 3 ○ 2 ○ ○ 1 ○ ○ ○  B3H0504 When the valve is placed in the position allowing the line pressure to go nowhere, the pressure is released.
Pilot valve	Reduces the line pressure to create a constant pressure (pilot pressure) for use in controlling the line pressure, lock-up pressure, and shifting and transfer clutch/brake pressures.
Torque converter clutch regulator valve	Prevents excessive rise of torque converter clutch pressure.
Lock-up control valve	Engages or disengages the lock-up clutch. Also regulates the lock-up clutch engaging pressure to prevent lock-up shocks.
Shift valve A	Simultaneously changes three different ATF passages using shift solenoid 1 output pressure which varies according to such operating condition factors as vehicle speed and throttle position. In combination with shift valve B, this valve creates 1st, 2nd, 3rd, and 4th speeds.
Shift valve B	Simultaneously changes three different ATF passages using shift solenoid 2 output pressure which varies according to such operating condition factors as vehicle speed and throttle position. In combination with shift valve A, this valve creates 1st, 2nd, 3rd, and 4th speeds.
Low clutch timing valve A	Switches the ATF passages when the 2-4 brake pressure rises to a certain level during 3rd-to-4th upshifting in order to drain the low clutch accumulator back-pressure and to release the low clutch. This ensures smoother shifting.
Low clutch timing valve B	Returns the low clutch timing valve A to the original position after 3rd-to-4th upshifting.
2-4 brake timing valve A	Switches the ATF passages when the high clutch pressure rises to a certain level during 2nd-to-3rd upshifting in order to drain the 2-4 brake accumulator A back-pressure and to release the 2-4 brake. This ensures smoother shifting.
2-4 brake timing valve B	Returns the 2-4 brake timing valve A to the original position after 2nd-to-3rd upshifting.
Reverse inhibit valve	Allows the ATF in the low & reverse brake circuit to drain during forward driving at a speed higher than the predetermined value, preventing shifting into the reverse even when R range is selected.
1st reducing valve	Reduces the low-reverse brake pressure so as to reduce engine braking shock when changing from the 2nd to the 1st in the 2 range.
Accumulator control valve A	Regulates the accumulator control A pressure (low clutch accumulator A back-pressure, high clutch accumulator A back-pressure, 2-4 brake timing control signal pressure) depending upon driving conditions.

Name	Function
Accumulator control valve B	Regulates the accumulator control B pressure (2-4 brake accumulator A back-pressure, low clutch timing control signal pressure) depending upon driving conditions.
Low clutch accumulator	Modulates the low clutch pressure gradually to damp shifting shocks when the low clutch is engaged and disengaged.
2-4 brake accumulator A	Modulates the 2-4 brake clutch pressure gradually to damp shifting shocks when the 2-4 brake clutch is engaged and disengaged.
2-4 brake accumulator B	Slows down the 2-4 brake clutch pressure increase rate during 3rd-to-4th upshifting to prevent timing variation which may occur when the low clutch timing valve A is switched (to damp shifting shocks).
High clutch accumulator A	Modulates the high clutch pressure gradually to damp shifting shocks when the high clutch is engaged and disengaged.
High clutch accumulator B	Slows down the high clutch pressure increase rate during 2nd-to-3rd upshifting to prevent timing variation which may occur when the 2-4 brake clutch timing valve A is switched (to damp shifting shocks).
Throttle accumulator A	Cushions the output pressure of the line pressure duty solenoid valve to remove pulsation.
Throttle accumulator B	Cushions the output pressure of the 2-4 brake duty solenoid valve to remove pulsation.

8. Hydraulic Control Valve

The hydraulic control system of the automatic transmission consists of an oil pump, valve bodies containing valves, clutches, fluid passages and pipes. The operation of the system is initiated by driver's manual inputs and electric inputs from the TCM.

A: CONSTRUCTION

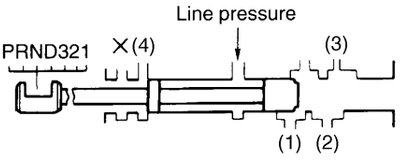


(1) High clutch accumulator piston B
(2) 2-4 brake accumulator piston B
(3) Pressure regulator sleeve
(4) Pressure regulator plug
(5) Pressure regulator valve
(6) Reverse inhibit valve
(7) Accumulator control valve B
(8) 2-4 brake timing plug A
(9) 2-4 brake timing sleeve A
(10) 2-4 brake timing valve A
(11) 2-4 brake timing valve B
(12) Torque converter regulator valve
(13) Pressure modifier valve
(14) Accumulator control valve A
(15) Low clutch timing valve A
(16) Low clutch timing sleeve A
(17) Low clutch timing plug A
(18) Low clutch timing valve B
(19) Shift valve B
(20) Shift valve A
(21) Manual valve
(22) Throttle accumulator piston B
(23) 1st reducing valve
(24) Throttle accumulator piston A
(25) Lock-up control sleeve
(26) Lock-up control plug
(27) Lock-up control valve
(28) Modifier accumulator piston
(29) Pilot valve

[1] Upper valve body
[2] Middle valve body
[3] Lower valve body

MEMO

B: FUNCTION

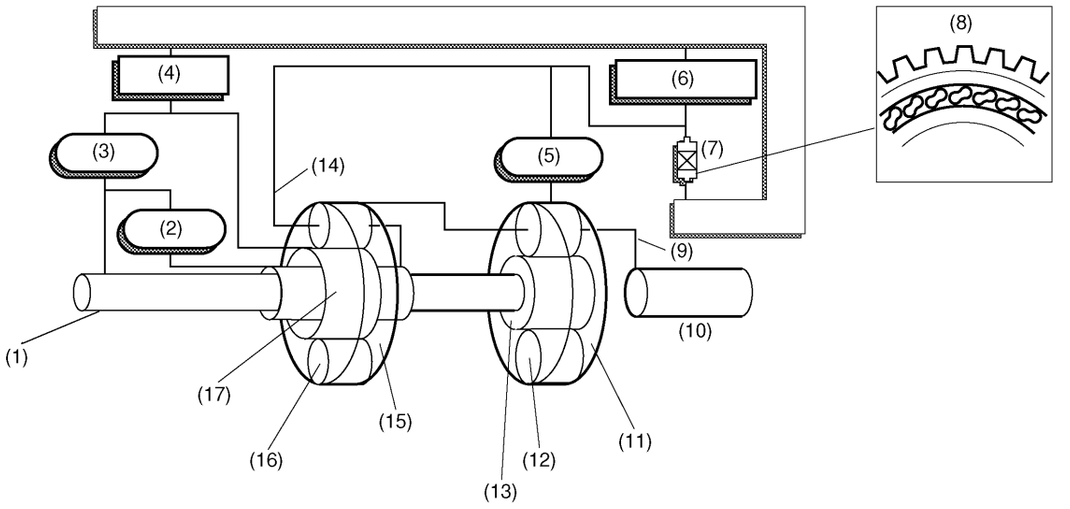
Name	Function
Pressure regulator valve	Regulates the pressure of ATF delivered from the oil pump to an optimum level (line pressure) corresponding to vehicle running conditions.
Pressure modifier valve	Adjusts the pressure modifier output pressure depending on the driving condition to keep the line pressure at the optimum level.
Pressure modifier accumulator piston	Cushions the pressure modifier valve output pressure to remove pulsation in line pressure.
Line pressure relief valve	Prevents excessive rise of the line pressure.
Manual valve	Allows the line pressure to the circuit corresponding to the selected range. Circuit / Range: (1) (2) (3) (4) P R ○ N D ○ 3 ○ 2 ○ ○ 1 ○ ○ ○  B3H0504 When the valve is placed in the position allowing the line pressure to go nowhere, the pressure is released.
Pilot valve	Reduces the line pressure to create a constant pressure (pilot pressure) for use in controlling the line pressure, lock-up pressure, and shifting and transfer clutch/brake pressures.
Torque converter clutch regulator valve	Prevents excessive rise of torque converter clutch pressure.
Lock-up control valve	Engages or disengages the lock-up clutch. Also regulates the lock-up clutch engaging pressure to prevent lock-up shocks.
Shift valve A	Simultaneously changes three different ATF passages using shift solenoid 1 output pressure which varies according to such operating condition factors as vehicle speed and throttle position. In combination with shift valve B, this valve creates 1st, 2nd, 3rd, and 4th speeds.
Shift valve B	Simultaneously changes three different ATF passages using shift solenoid 2 output pressure which varies according to such operating condition factors as vehicle speed and throttle position. In combination with shift valve A, this valve creates 1st, 2nd, 3rd, and 4th speeds.
Low clutch timing valve A	Switches the ATF passages when the 2-4 brake pressure rises to a certain level during 3rd-to-4th upshifting in order to drain the low clutch accumulator back-pressure and to release the low clutch. This ensures smoother shifting.
Low clutch timing valve B	Returns the low clutch timing valve A to the original position after 3rd-to-4th upshifting.
2-4 brake timing valve A	Switches the ATF passages when the high clutch pressure rises to a certain level during 2nd-to-3rd upshifting in order to drain the 2-4 brake accumulator A back-pressure and to release the 2-4 brake. This ensures smoother shifting.
2-4 brake timing valve B	Returns the 2-4 brake timing valve A to the original position after 2nd-to-3rd upshifting.
Reverse inhibit valve	Allows the ATF in the low & reverse brake circuit to drain during forward driving at a speed higher than the predetermined value, preventing shifting into the reverse even when R range is selected.
1st reducing valve	Reduces the low-reverse brake pressure so as to reduce engine braking shock when changing from the 2nd to the 1st in the 2 range.
Accumulator control valve A	Regulates the accumulator control A pressure (low clutch accumulator A back-pressure, high clutch accumulator A back-pressure, 2-4 brake timing control signal pressure) depending upon driving conditions.

Name	Function
Accumulator control valve B	Regulates the accumulator control B pressure (2-4 brake accumulator A back-pressure, low clutch timing control signal pressure) depending upon driving conditions.
Low clutch accumulator	Modulates the low clutch pressure gradually to damp shifting shocks when the low clutch is engaged and disengaged.
2-4 brake accumulator A	Modulates the 2-4 brake clutch pressure gradually to damp shifting shocks when the 2-4 brake clutch is engaged and disengaged.
2-4 brake accumulator B	Slows down the 2-4 brake clutch pressure increase rate during 3rd-to-4th upshifting to prevent timing variation which may occur when the low clutch timing valve A is switched (to damp shifting shocks).
High clutch accumulator A	Modulates the high clutch pressure gradually to damp shifting shocks when the high clutch is engaged and disengaged.
High clutch accumulator B	Slows down the high clutch pressure increase rate during 2nd-to-3rd upshifting to prevent timing variation which may occur when the 2-4 brake clutch timing valve A is switched (to damp shifting shocks).
Throttle accumulator A	Cushions the output pressure of the line pressure duty solenoid valve to remove pulsation.
Throttle accumulator B	Cushions the output pressure of the 2-4 brake duty solenoid valve to remove pulsation.

9. Gear Train

A: CONSTRUCTION

The gear train consists of two sets of planetary gears, three sets of multi-plate clutches, two sets of multi-plate brakes and one set of one-way clutch.



B3H0929A

(1) Input shaft
(2) High clutch (Operates at 3rd and 4th speeds)
(3) Reverse clutch (Operates while moving in reverse)
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) Free/Locked
(9) Rear planetary carrier
(10) Reduction drive shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Front planetary carrier
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear

B: OPERATION TABLE

1. NORTH AMERICAN MODEL

Selector lever operation			Reverse clutch	2-4 brake	High clutch	Low clutch	Low & reverse brake	One-way clutch
	P							
	R		○				○	
	N							
	D	1ST				○		○
		↑↓						
		2ND		○		○		
		↑↓						
		3RD			○	○		
		↑↓						
		4TH		○	○			
	3	1ST				○		○
		↑↓						
		2ND		○		○		
		↑↓						
		3RD			○	○		
		↑						
		4TH		○	○			
	2	1ST						
		↑						
		2ND		○		○		
		↑						
		3RD			○	○		
		↑						
		4TH		○	○			
	1	1ST				○	○	○
		↑						
		2ND		○		○		
		↑						
		3RD			○	○		
		↑						
		4TH		○	○			

B3H0998A

2. EXCEPT FOR NORTH AMERICAN MODEL

Selector lever operation			Reverse clutch	2-4 brake	High clutch	Low clutch	Low & reverse brake	One-way clutch
	P							
	R		○				○	
	N							
	D	1ST				○		○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			
	3	1ST				○		○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			
	2	1ST				○		○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			
	1	1ST				○	○	○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			

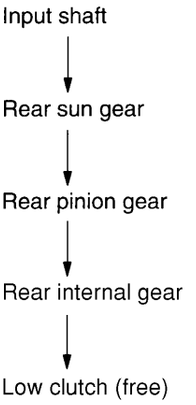
S3H0226B

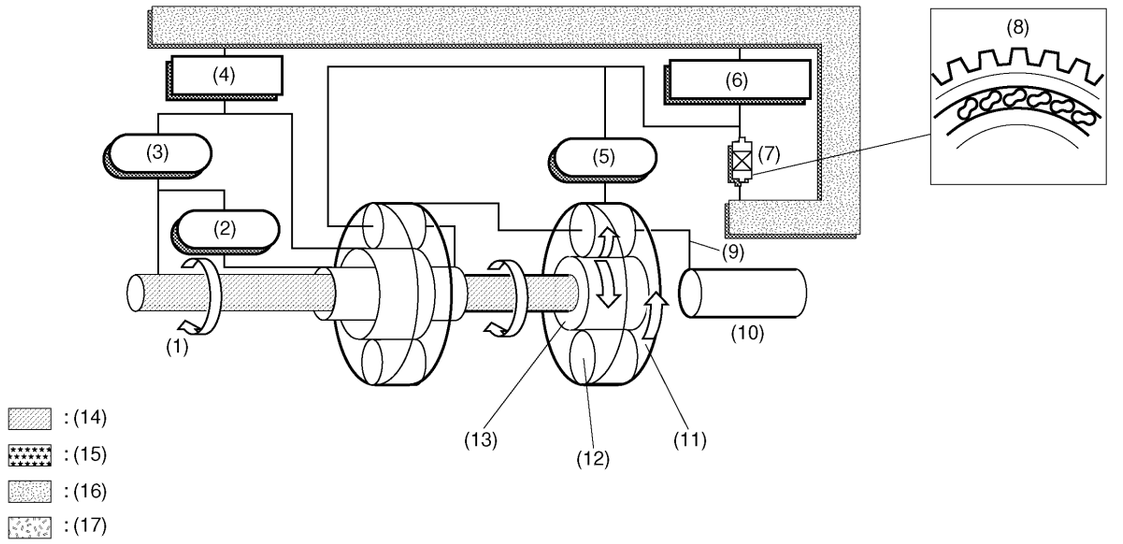
MEMO

C: N RANGE

Since the rear sun gear and the high clutch drum are in mesh with the input shaft, they rotate together with input shaft.
The high clutch drum does not transmit the torque to the planetary unit since the reverse clutch and the high clutch are not engaged.
The torque of the rear sun gear is transmitted to the rear internal gear through the pinion gear.
However, the torque of the rear sun gear is not transmitted to the rear planetary carrier since the low clutch is disengaged and, therefore, the rear internal gear is freewheeling.
As a result, the torque of the input shaft is not transmitted to the reduction drive shaft*.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	Power flow (in acceleration)
All clutches and brakes : Disengaged	 S3H0192B



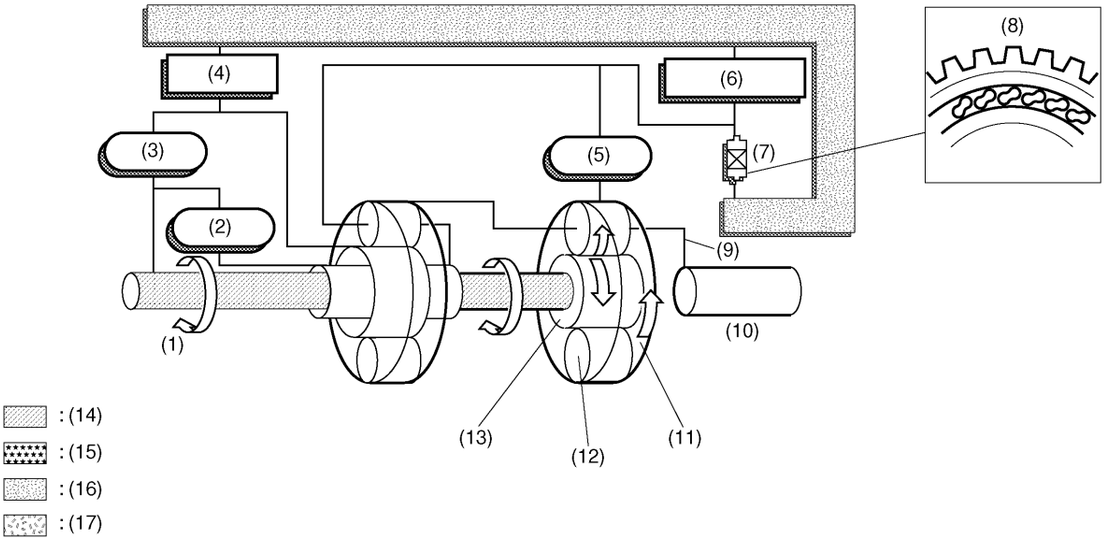
B3H0930A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) No effect
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

D: P RANGE

All the clutches and brakes are free, just as in the N range. The parking pawl engages with the parking gear which forms an integral part of the reduction drive gear, preventing the gear from rotating.

Operating condition of components	Power flow (in acceleration)
All clutches and brakes : Disengaged	Input shaft ↓ Rear sun gear ↓ Rear pinion gear ↓ Rear internal gear ↓ Low clutch (free) S3H0193B



B3H0930A

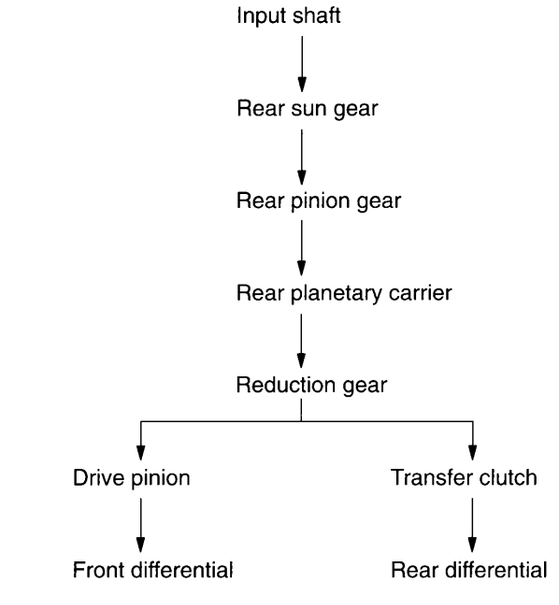
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) No effect
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

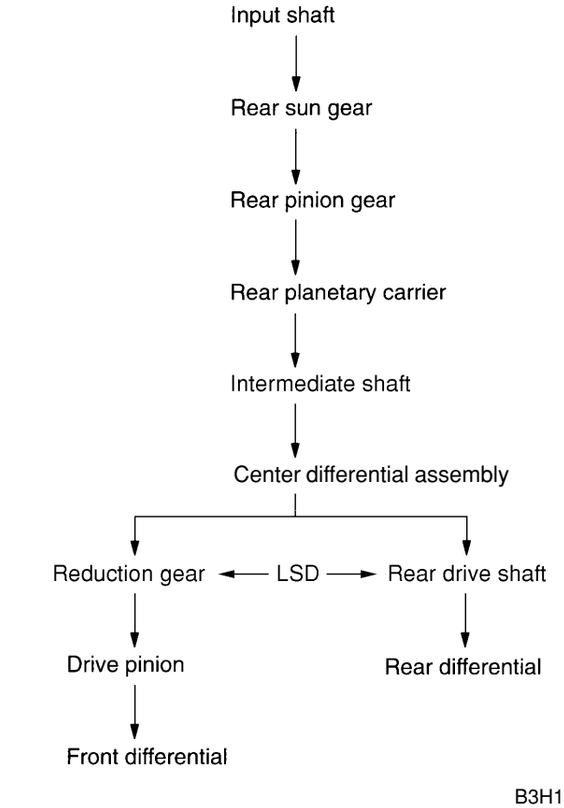
E: 1ST GEAR OF D OR 3 RANGE (D_1, 3_1) FOR NORTH AMERICAN MODEL

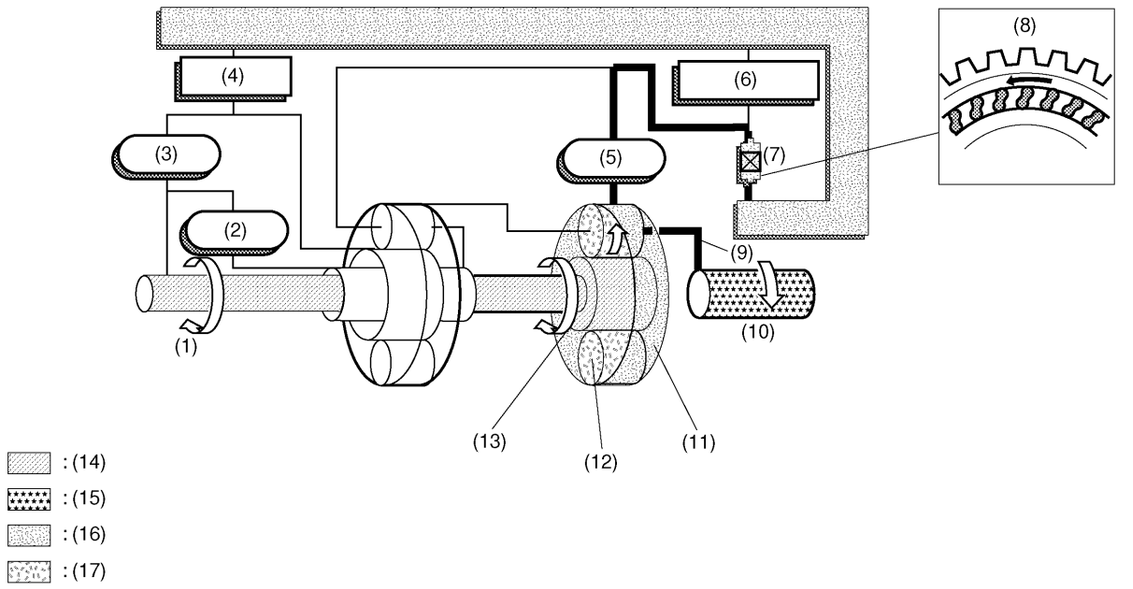
When the 1st gear is selected in the D or 3 range, only the low clutch is engaged. In this state, the rear internal gear attempts to rotate counterclockwise but it is impossible by the action of the one-way clutch which locks the internal gear to the transmission case. As a result, rotation of the rear sun gear causes the pinion gears to rotate around the sun gear. This causes the planetary carrier to rotate. In this way, rotation of the input shaft is transmitted to the reduction drive shaft* after being subjected to speed reduction by the planetary gear train.
On the other hand, the rear internal gear rotates clockwise if the reverse driving force is applied to it by the reduction drive shaft* during coasting. This clockwise rotation of the internal gear causes the one-way clutch to freewheel. Since the power path between the reduction drive shaft* and the input shaft is lost as a result, no engine braking effect is available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
Low clutch : Engaged One-way clutch : Locked	
Power flow (in acceleration)	
MPT models	**VTD models**







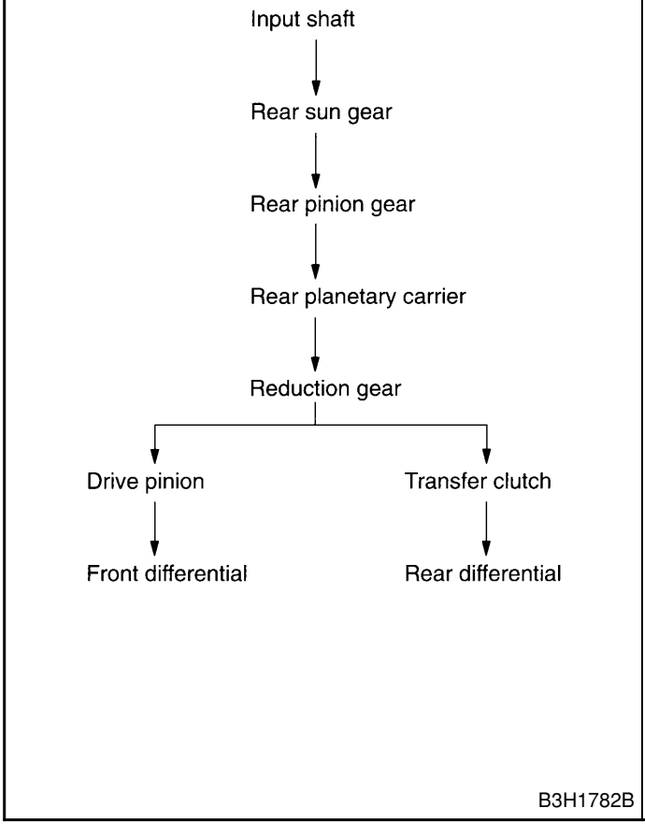
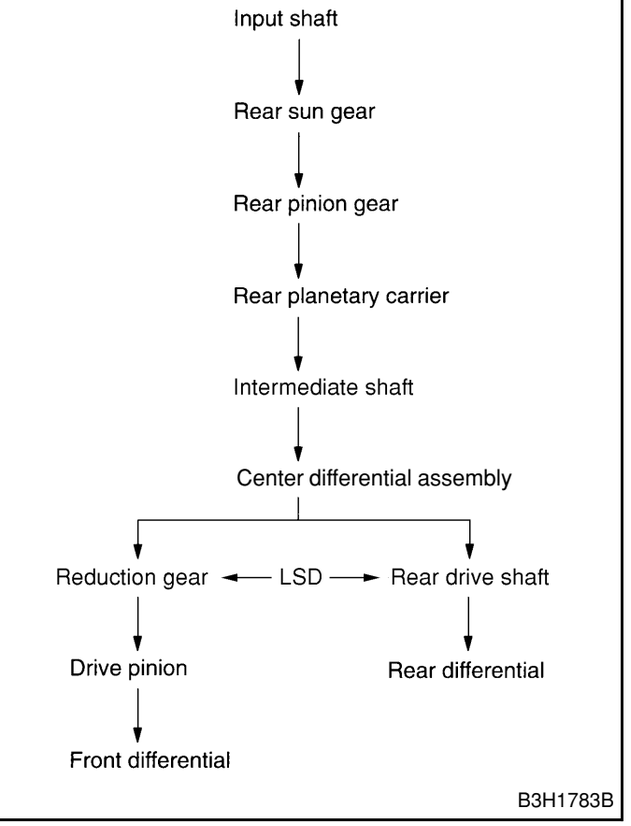
B3H0931A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) Locked
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

F: 1ST SPEED OF D, 3 OR 2 RANGE (D_1, 3_1, 2_1) EXCEPT FOR NORTH AMERICAN MODEL

When the 1st gear is selected in the D, 3 or 2 range, only the low clutch is engaged. In this state, the rear internal gear attempts to rotate counterclockwise but it is impossible by the action of the one-way clutch which locks the internal gear to the transmission case. As a result, rotation of the rear sun gear causes the pinion gears to rotate around the sun gear. This causes the planetary carrier to rotate. In this way, rotation of the input shaft is transmitted to the reduction drive shaft* after being subjected to speed reduction by the planetary gear train.
On the other hand, the rear internal gear rotates clockwise if the reverse driving force is applied to it by the reduction drive shaft* during coasting. This clockwise rotation of the internal gear causes the one-way clutch to freewheel. Since the power path between the reduction drive shaft* and the input shaft is lost as a result, no engine braking effect is available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

<table>
<tr><td colspan="2">Operating condition of components</td></tr>
<tr><td colspan="2">Low clutch : Engaged
One-way clutch : Locked</td></tr>
<tr><td colspan="2">Power flow (in acceleration)</td></tr>
<tr><td>MPT models
 
</td><td>VTD models
 
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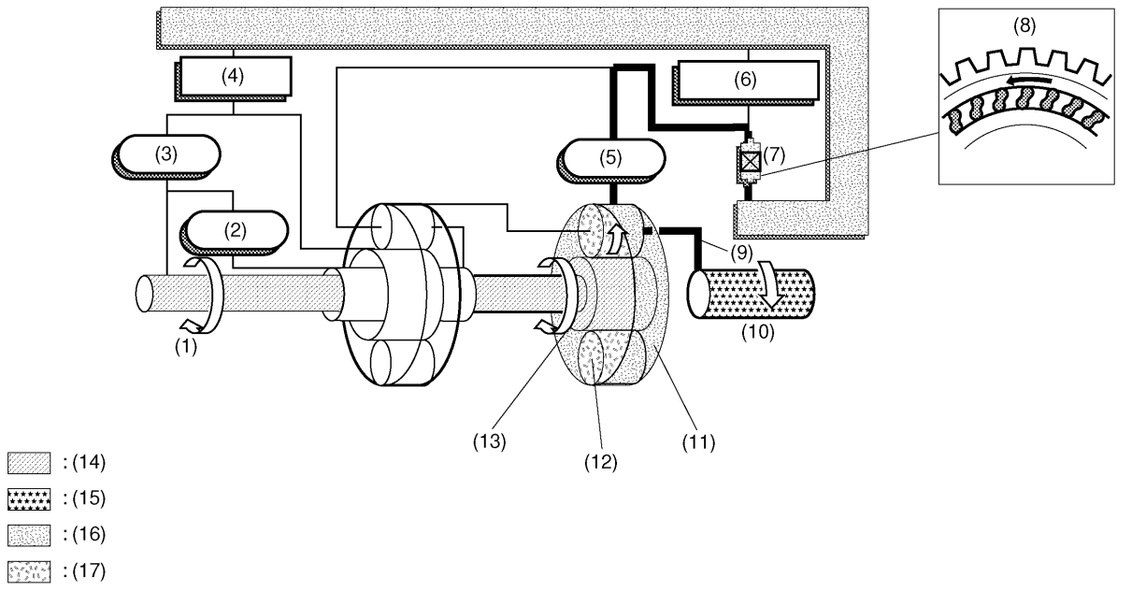


B3H0931A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) Locked
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

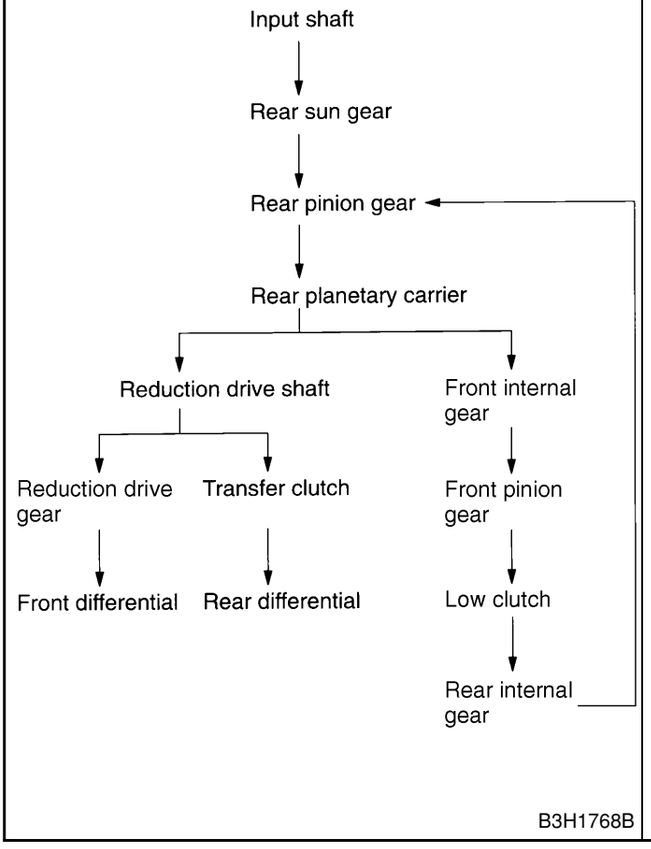
G: 2ND GEAR OF D, 3 OR 2 RANGE (D_2, 3_2, 2_2)

When the 2nd gear is selected in the D, 3 or 2 range, the 2-4 brake and the low clutch are engaged. The front sun gear is now locked to the transmission case due to engagement of the 2-4 brake. In this state, the torque of the rear sun gear is transmitted to the rear internal gear through the path of the front internal gear, front pinion gears, low clutch drum and low clutch. At this time, the one-way clutch is freewheeling since the low clutch drum is rotating clockwise.
In this power flow configuration, the rear pinion gears are rotated by the rear internal gear at a speed faster than that available from the configuration for the 1st gear, so the rotation speed of the reduction drive shaft is higher than that of the 1st gear.
Since the drive power is transmitted without passing through the one-way clutch in the 2nd gear, the backward driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

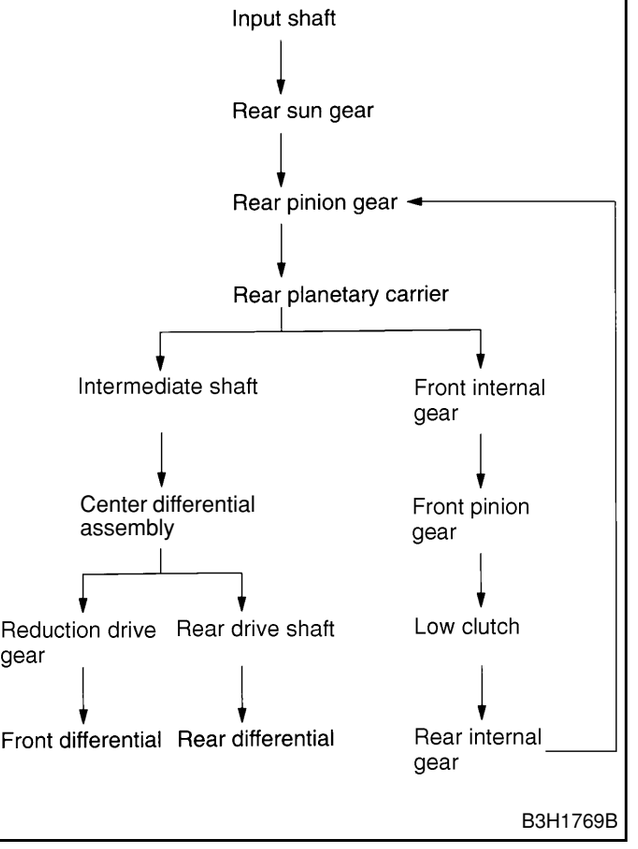
*: MPT models only. VTD models are equipped with an intermediate shaft.

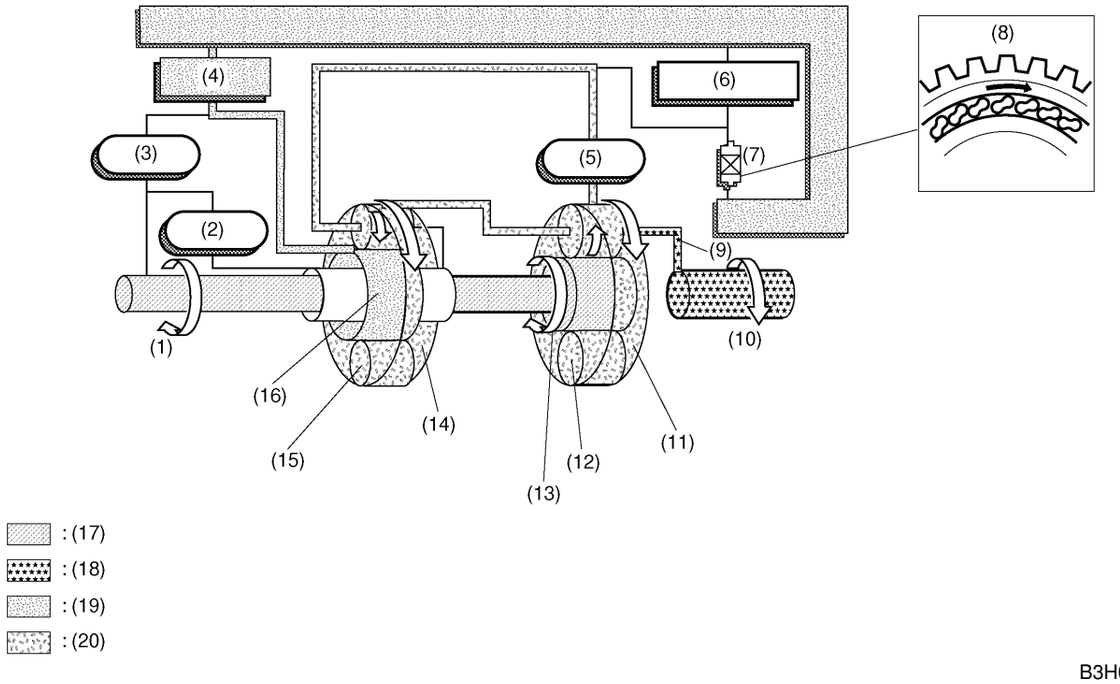
Operating condition of components
Low clutch : Engaged 2-4 brake : Engaged
Power flow (in acceleration)

MPT models



VTD models





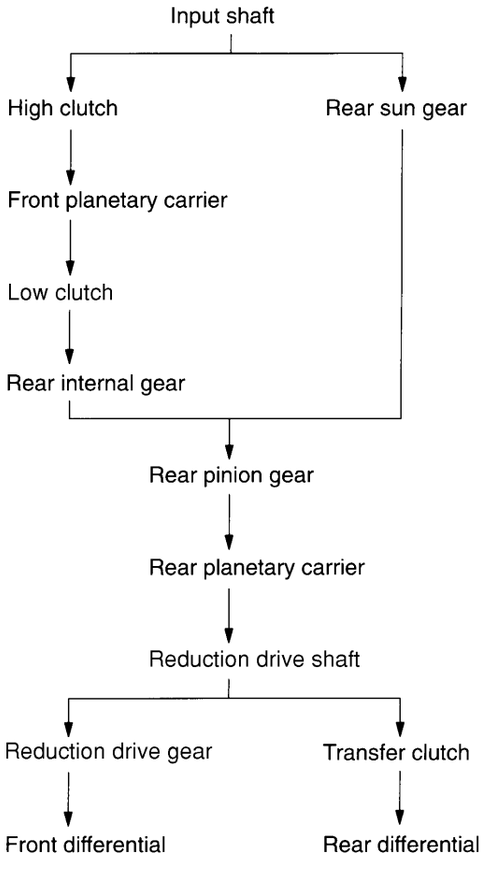
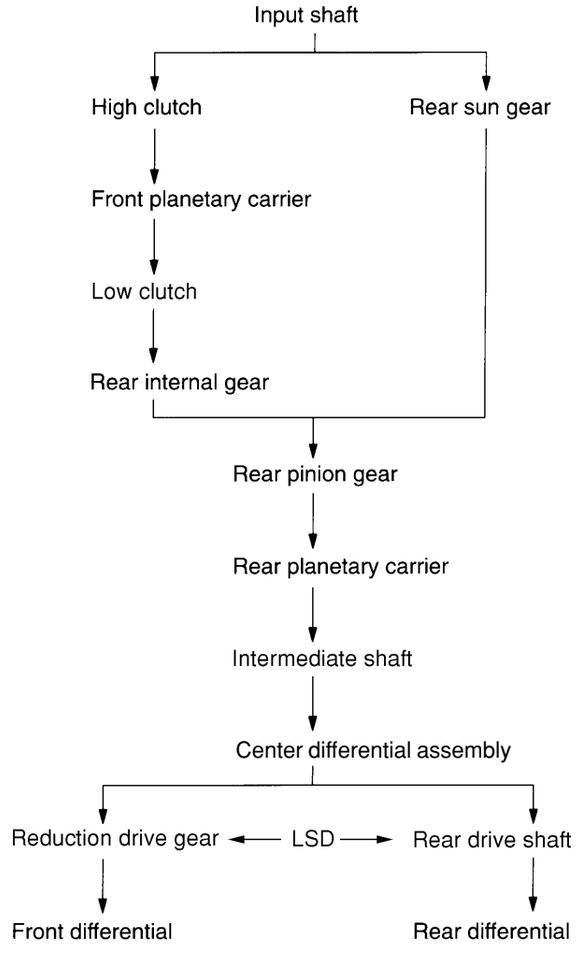
B3H0932A

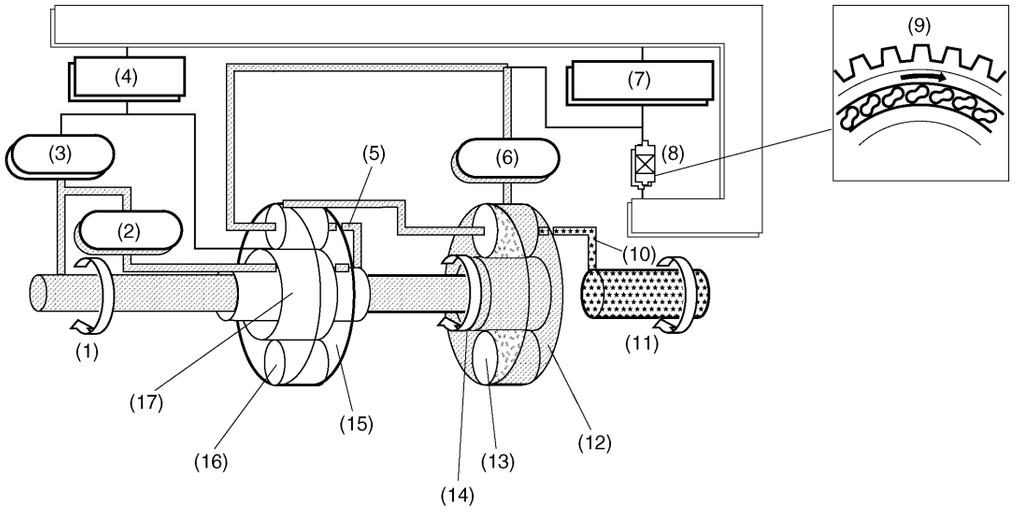
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse clutch
(7) One-way clutch
(8) Free
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Front internal gear
(15) Front pinion gear
(16) Front sun gear
(17) Input
(18) Output
(19) Locked
(20) Planetary gear component involved in power transmission

H: 3RD GEAR OF D OR 3 RANGE (D_3, 3_3)

When the 3rd gear is selected in the D or 3 range, the low clutch and the high clutch are engaged. The engaged high clutch rotates through its drum the front planetary carrier, and rotation of the carrier is transmitted to the rear internal gear through the engaged low clutch. In this power flow configuration, the rear sun gear and the rear internal gear rotate at the same speed since the rear pinion gears are solid on their axes and the whole planetary gear train rotates as a unit at the same speed as its sun gear. As a result, the input shaft and the reduction drive shaft rotate at the same speed.
In the 3rd gear, the one-way clutch is freewheeling because the low clutch is rotating clockwise. Since the drive power is transmitted without passing through the one-way clutch, the backward driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
High clutch : Engaged Low clutch : Engaged	
Power flow (in acceleration)	
MPT models	**VTD models**
 B3H1784B	 B3H1785B



B3H0933A

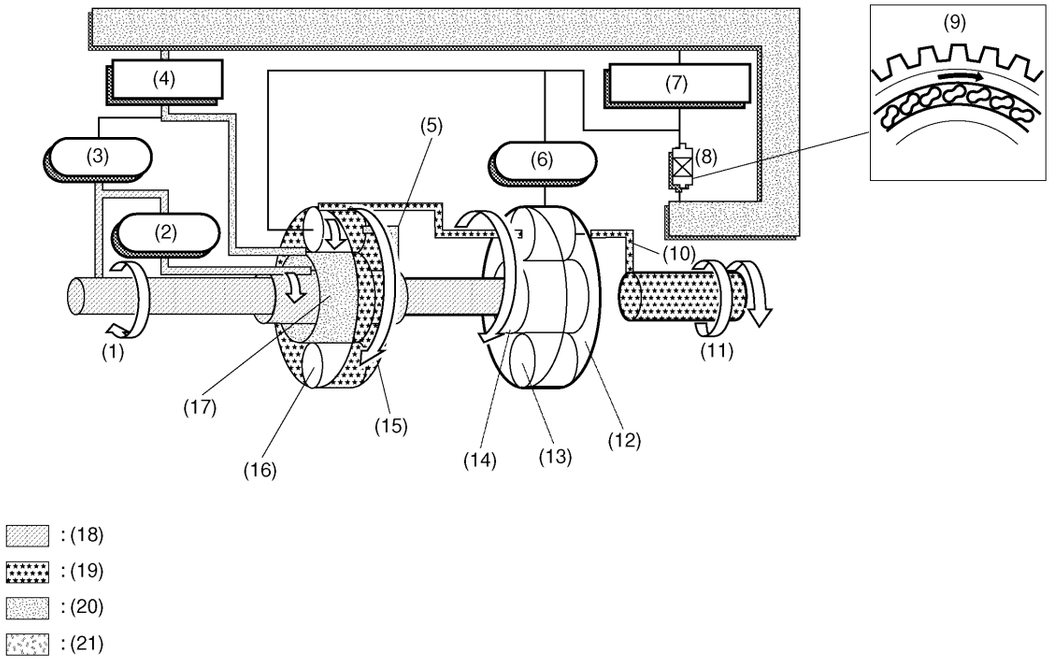
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) Free
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear component involved in power transmission

I: 4TH GEAR OF D RANGE (D_4)

When the 4th gear is selected in the D range, the high clutch and the 2-4 brake are engaged. The engaged high clutch causes the front planetary carrier to rotate, whereas the engaged 2-4 brake causes the front sun gear to be locked to the transmission case.
The front planetary carrier rotates at the same speed as the input shaft. The rotation of the front planetary carrier causes the front pinion gears to revolve around the stationary front sun gear, which causes the front internal gear to rotate faster than the input shaft.
As a result, the reduction drive shaft* is driven at a higher speed than the input shaft.
In the 4th gear, the one-way clutch is freewheeling because the low clutch is rotating clockwise. Since the drive power is transmitted without passing through the one-way clutch, the backward driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
2-4 brake : Engaged High clutch : Engaged	
Power flow (in acceleration)	
MPT models	**VTD models**
Input shaft ↓ High clutch ↓ Front planetary carrier ↓ Front pinion gear ↓ Front internal gear ↓ Rear planetary carrier ↓ Reduction drive shaft ↓ Reduction drive gear → Front differential Transfer clutch → Rear differential	Input shaft ↓ High clutch ↓ Front planetary carrier ↓ Front pinion gear ↓ Front internal gear ↓ Rear planetary carrier ↓ Intermediate shaft ↓ Center differential assembly ↓ Reduction drive gear ← LSD → Rear drive shaft ↓ ↓ Front differential Rear differential
B3H1786B	B3H1787B

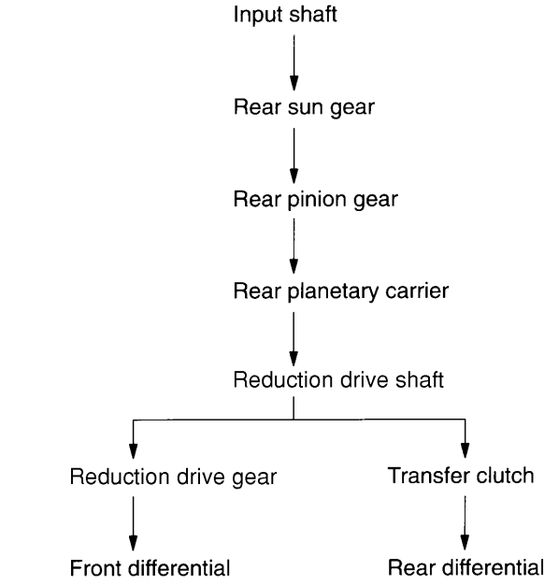
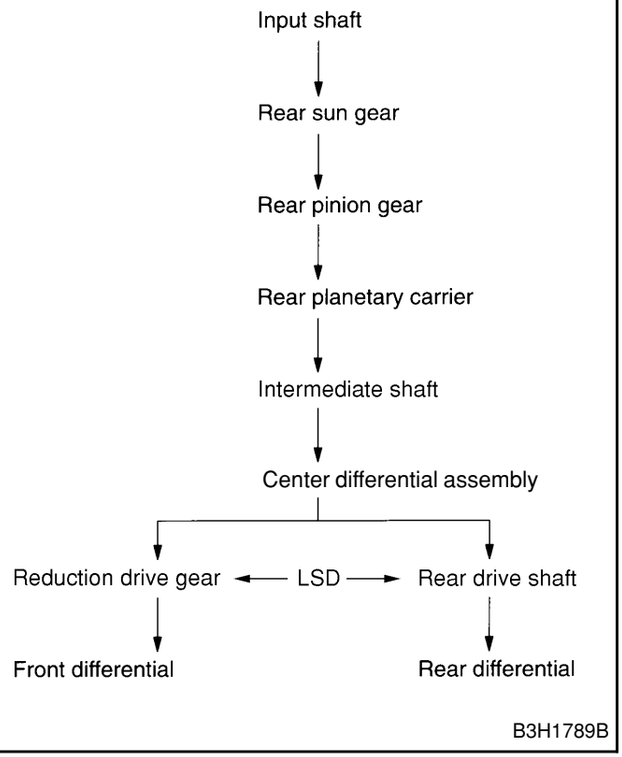


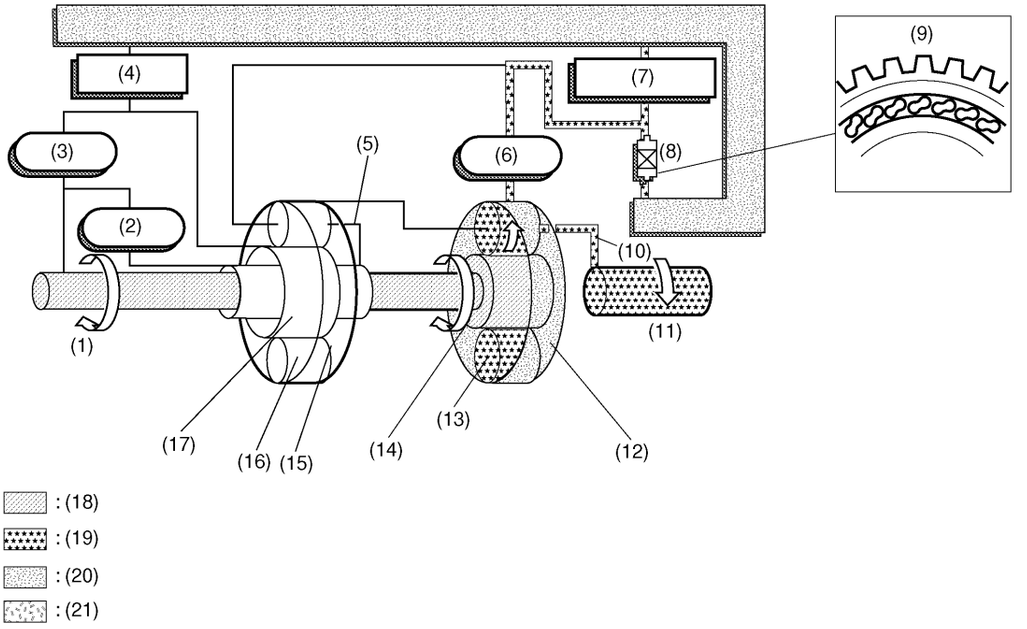
B3H0934A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) Free
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear components involved in power transmission

J: 1ST GEAR OF 1 RANGE (1_1)

When the 1st gear is selected in the 1 range, both the low clutch and the low & reverse brake are engaged. Although the power flow configuration is the same as that with the 1st gear in the D or 3 range, the one-way clutch produces no freewheeling effect because the low & reverse brake is locking the rear internal gear always to the transmission case.
During coasting, therefore, the backward driving force from the wheels is transmitted through the reduction drive gear to the input shaft. This means, unlike the 1st gear in D or 3 range, that the engine braking effect is available in this range.

Operating condition of components	
Low clutch : Engaged Low & reverse brake : Engaged One-way clutch : Operating	
Power flow (in acceleration)	
MPT models	**VTD models**
	



B3H0936A

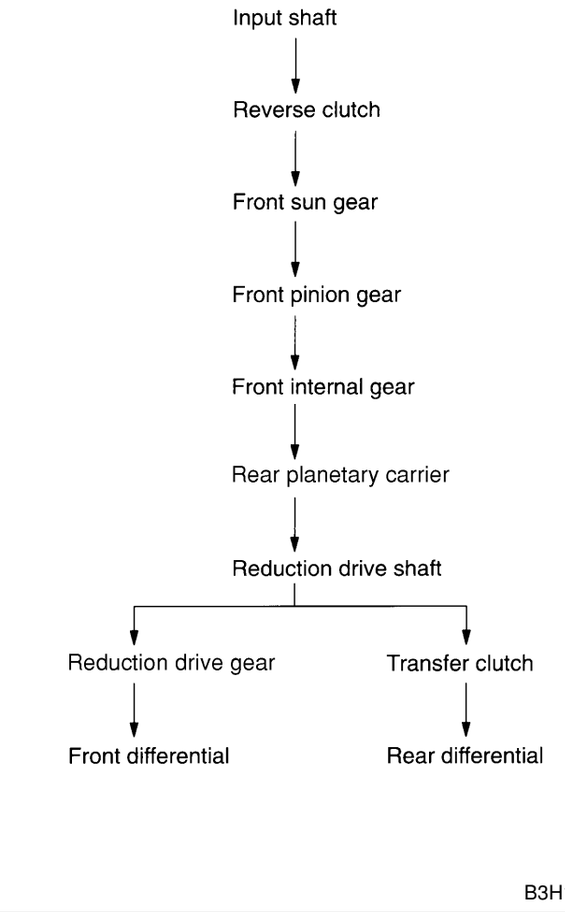
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) No effect
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear component involved in power transmission

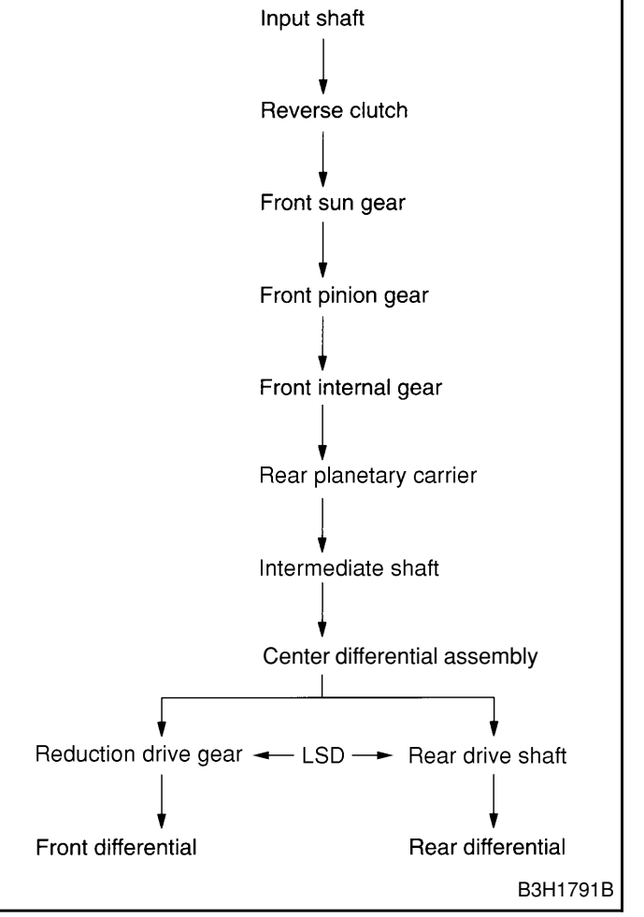
K: R RANGE

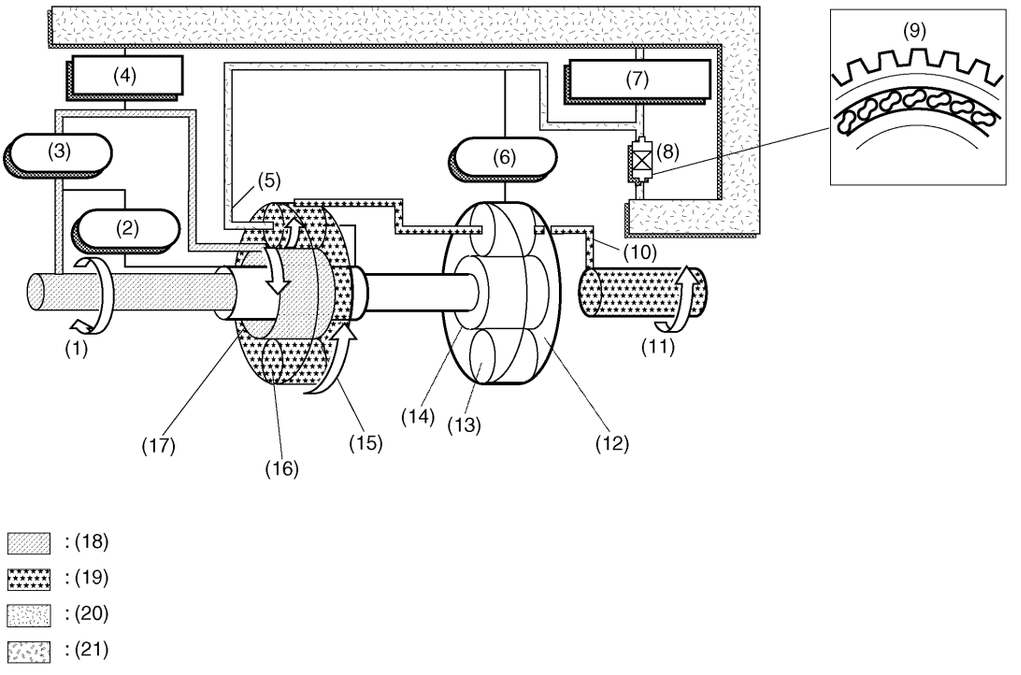
When the selector lever is placed in the R position, the reverse clutch and the low & reverse brake are engaged. The reverse clutch allows the input shaft torque to be transmitted to the front sun gear, while the low & reverse brake allows the low clutch drum to be interlocked with the transmission case.
Rotation of the front sun gear causes the front pinion gears to rotate in the reverse driving direction and, therefore, the front internal gear rotates in the same direction.
At this time, the rotation speed transmitted to the front internal gear is reduced through gearing between the front sun gear and the front pinion gears.
The one-way clutch produces no freewheeling effect because the low & reverse brake is in engagement.
In this range, since the power transmission is made without passing through the one-way clutch, the driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
Reverse clutch : Engaged Low & reverse brake : Engaged	
Power flow (in acceleration)	
MPT models	**VTD models**







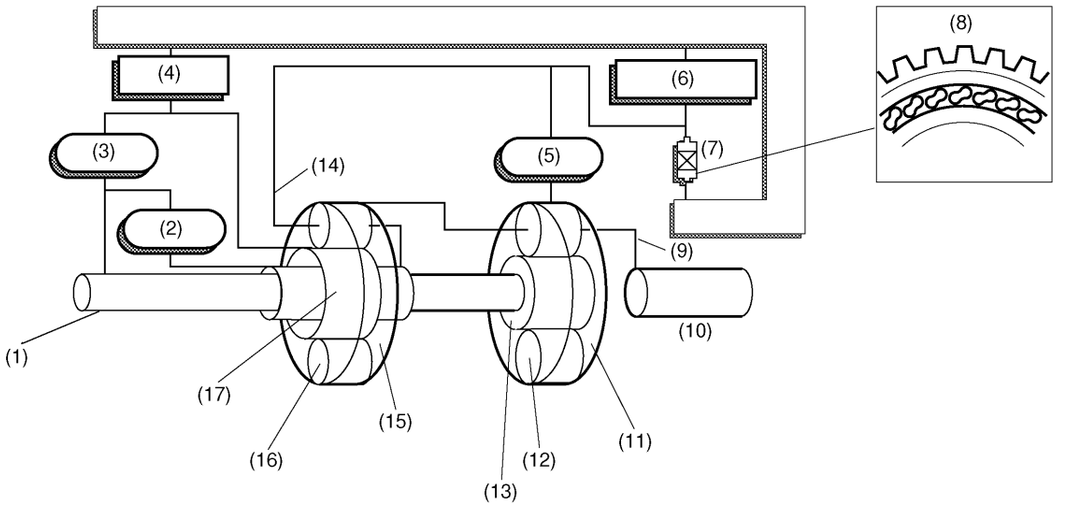
B3H0935A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) No effect
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear component involved in power transmission

9. Gear Train

A: CONSTRUCTION

The gear train consists of two sets of planetary gears, three sets of multi-plate clutches, two sets of multi-plate brakes and one set of one-way clutch.



B3H0929A

(1) Input shaft
(2) High clutch (Operates at 3rd and 4th speeds)
(3) Reverse clutch (Operates while moving in reverse)
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) Free/Locked
(9) Rear planetary carrier
(10) Reduction drive shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Front planetary carrier
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear

B: OPERATION TABLE

1. NORTH AMERICAN MODEL

Selector lever operation			Reverse clutch	2-4 brake	High clutch	Low clutch	Low & reverse brake	One-way clutch
	P							
	R		○				○	
	N							
	D	1ST				○		○
		↑↓						
		2ND		○		○		
		↑↓						
		3RD			○	○		
		↑↓						
		4TH		○	○			
	3	1ST				○		○
		↑↓						
		2ND		○		○		
		↑↓						
		3RD			○	○		
		↑						
		4TH		○	○			
	2	1ST						
		↑						
		2ND		○		○		
		↑						
		3RD			○	○		
		↑						
		4TH		○	○			
	1	1ST				○	○	○
		↑						
		2ND		○		○		
		↑						
		3RD			○	○		
		↑						
		4TH		○	○			

B3H0998A

2. EXCEPT FOR NORTH AMERICAN MODEL

Selector lever operation			Reverse clutch	2-4 brake	High clutch	Low clutch	Low & reverse brake	One-way clutch
	P							
	R		○				○	
	N							
	D	1ST				○		○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			
	3	1ST				○		○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			
	2	1ST				○		○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			
	1	1ST				○	○	○
		2ND		○		○		
		3RD			○	○		
		4TH		○	○			

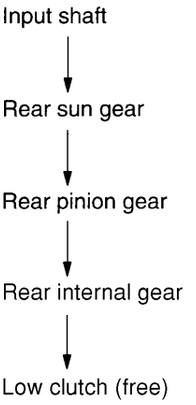
S3H0226B

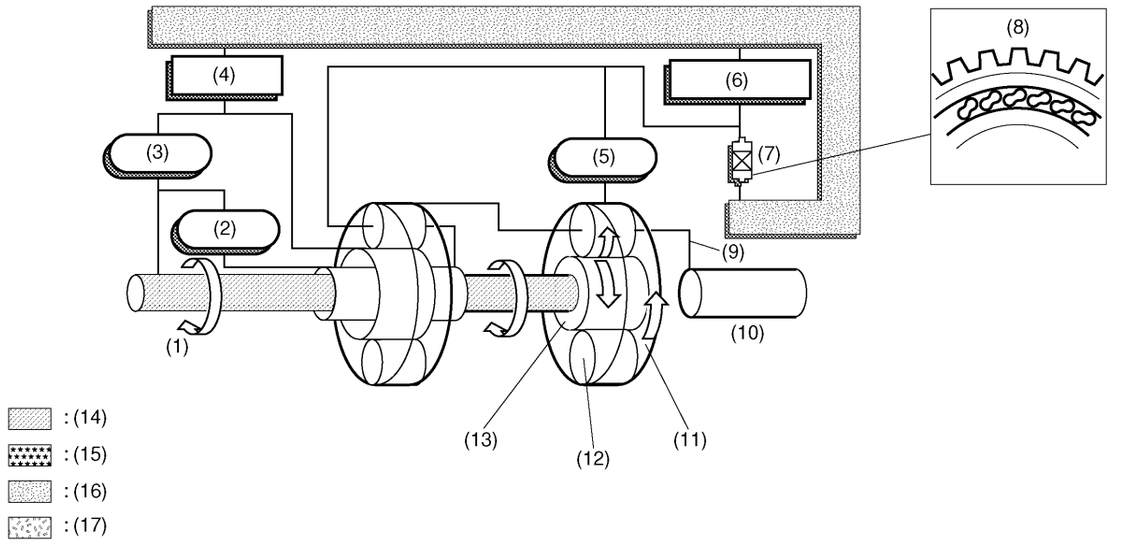
MEMO

C: N RANGE

Since the rear sun gear and the high clutch drum are in mesh with the input shaft, they rotate together with input shaft.
The high clutch drum does not transmit the torque to the planetary unit since the reverse clutch and the high clutch are not engaged.
The torque of the rear sun gear is transmitted to the rear internal gear through the pinion gear.
However, the torque of the rear sun gear is not transmitted to the rear planetary carrier since the low clutch is disengaged and, therefore, the rear internal gear is freewheeling.
As a result, the torque of the input shaft is not transmitted to the reduction drive shaft*.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	Power flow (in acceleration)
All clutches and brakes : Disengaged	 S3H0192B



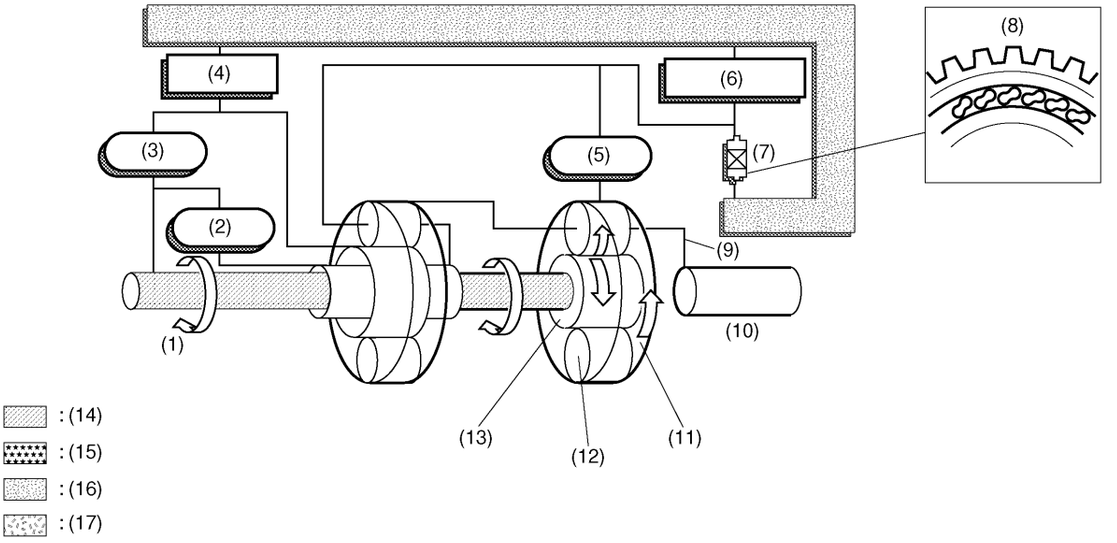
B3H0930A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) No effect
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

D: P RANGE

All the clutches and brakes are free, just as in the N range. The parking pawl engages with the parking gear which forms an integral part of the reduction drive gear, preventing the gear from rotating.

Operating condition of components	Power flow (in acceleration)
All clutches and brakes : Disengaged	Input shaft ↓ Rear sun gear ↓ Rear pinion gear ↓ Rear internal gear ↓ Low clutch (free) S3H0193B



B3H0930A

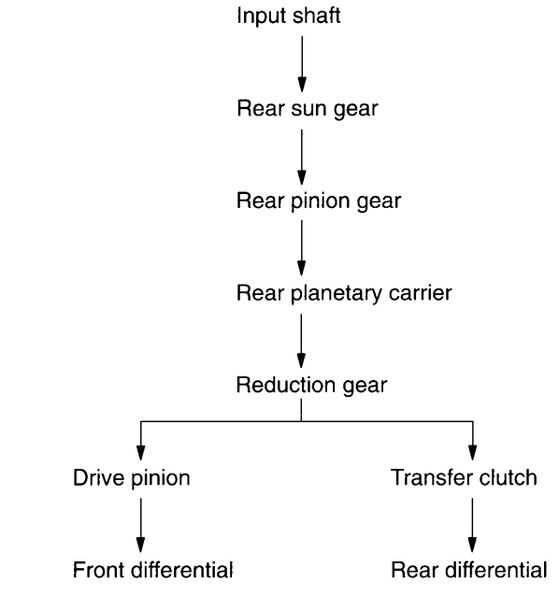
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) No effect
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

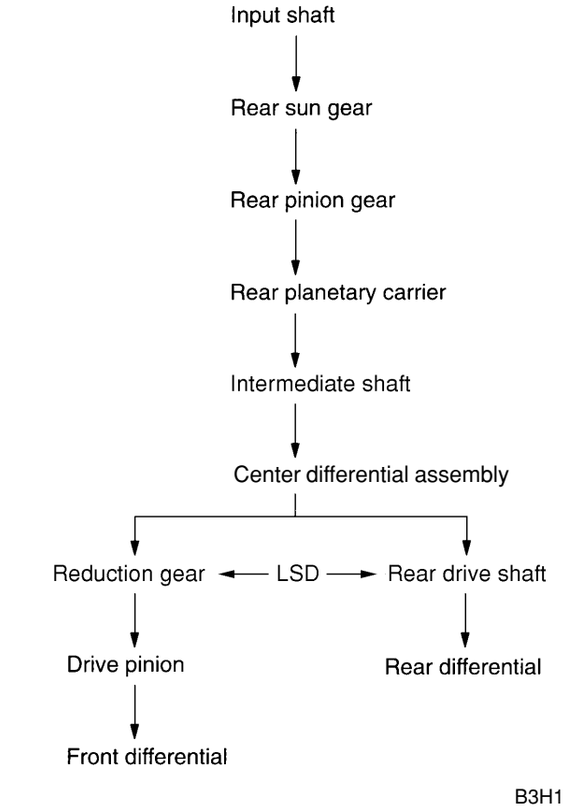
E: 1ST GEAR OF D OR 3 RANGE (D_1, 3_1) FOR NORTH AMERICAN MODEL

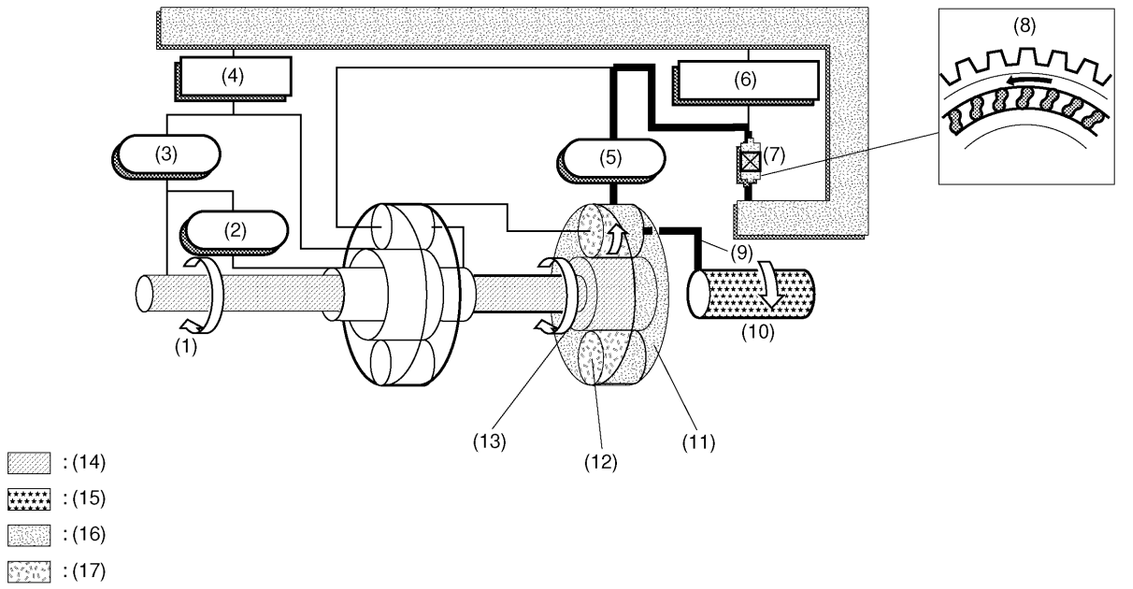
When the 1st gear is selected in the D or 3 range, only the low clutch is engaged. In this state, the rear internal gear attempts to rotate counterclockwise but it is impossible by the action of the one-way clutch which locks the internal gear to the transmission case. As a result, rotation of the rear sun gear causes the pinion gears to rotate around the sun gear. This causes the planetary carrier to rotate. In this way, rotation of the input shaft is transmitted to the reduction drive shaft* after being subjected to speed reduction by the planetary gear train.
On the other hand, the rear internal gear rotates clockwise if the reverse driving force is applied to it by the reduction drive shaft* during coasting. This clockwise rotation of the internal gear causes the one-way clutch to freewheel. Since the power path between the reduction drive shaft* and the input shaft is lost as a result, no engine braking effect is available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
Low clutch : Engaged One-way clutch : Locked	
Power flow (in acceleration)	
MPT models	**VTD models**







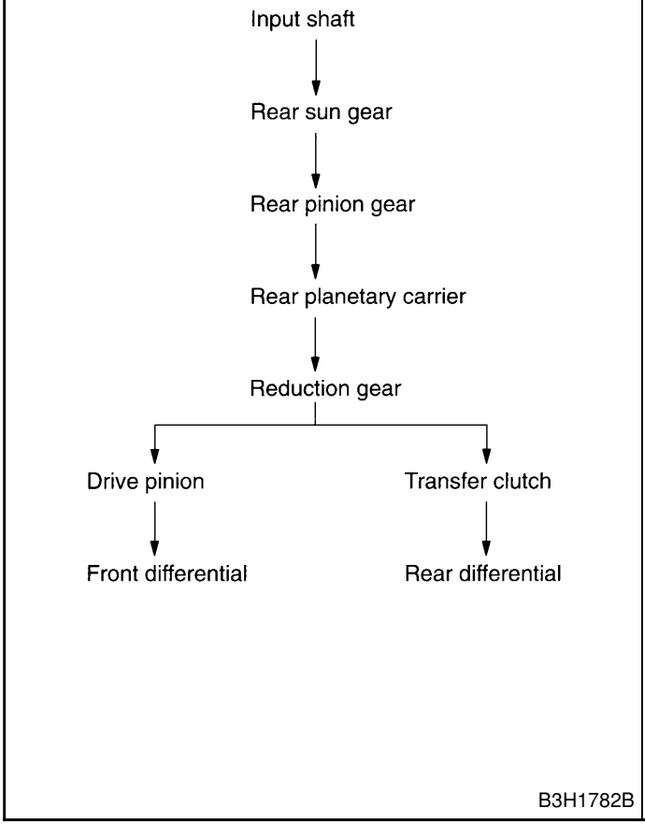
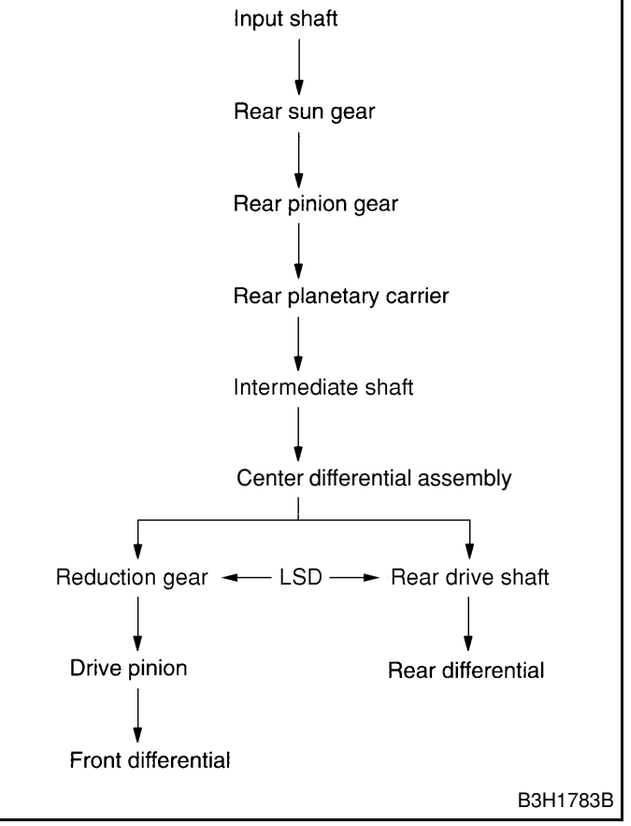
B3H0931A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) Locked
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

F: 1ST SPEED OF D, 3 OR 2 RANGE (D_1, 3_1, 2_1) EXCEPT FOR NORTH AMERICAN MODEL

When the 1st gear is selected in the D, 3 or 2 range, only the low clutch is engaged. In this state, the rear internal gear attempts to rotate counterclockwise but it is impossible by the action of the one-way clutch which locks the internal gear to the transmission case. As a result, rotation of the rear sun gear causes the pinion gears to rotate around the sun gear. This causes the planetary carrier to rotate. In this way, rotation of the input shaft is transmitted to the reduction drive shaft* after being subjected to speed reduction by the planetary gear train.
On the other hand, the rear internal gear rotates clockwise if the reverse driving force is applied to it by the reduction drive shaft* during coasting. This clockwise rotation of the internal gear causes the one-way clutch to freewheel. Since the power path between the reduction drive shaft* and the input shaft is lost as a result, no engine braking effect is available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

<table>
<tr><td colspan="2">Operating condition of components</td></tr>
<tr><td colspan="2">Low clutch : Engaged
One-way clutch : Locked</td></tr>
<tr><td colspan="2">Power flow (in acceleration)</td></tr>
<tr><td>MPT models
 
</td><td>VTD models
 
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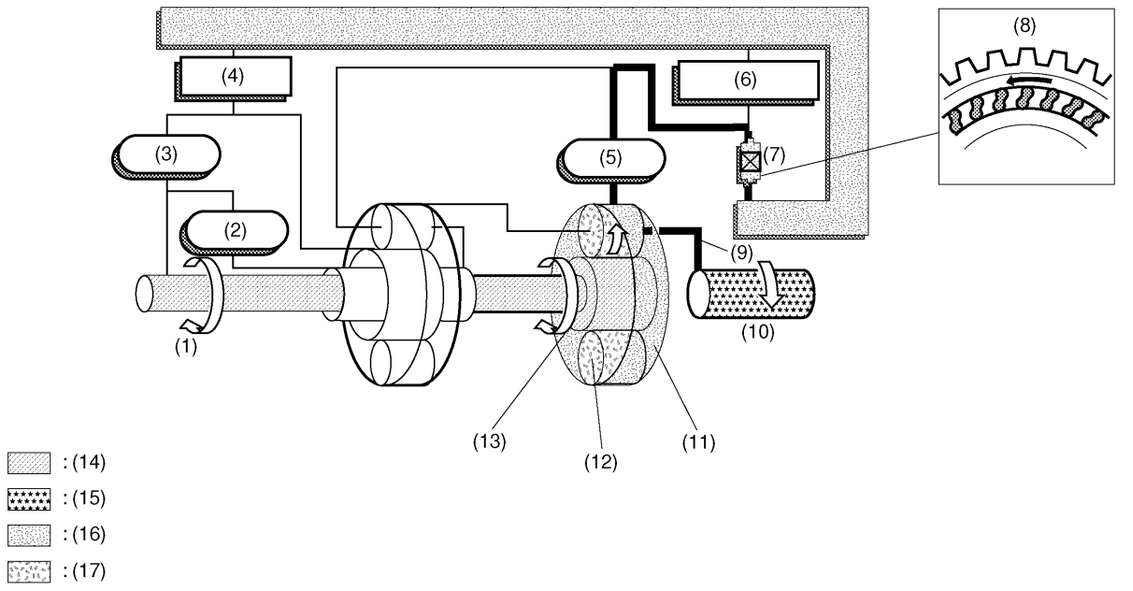


B3H0931A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse brake
(7) One-way clutch
(8) Locked
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Input
(15) Output
(16) Locked
(17) Planetary gear component involved in power transmission

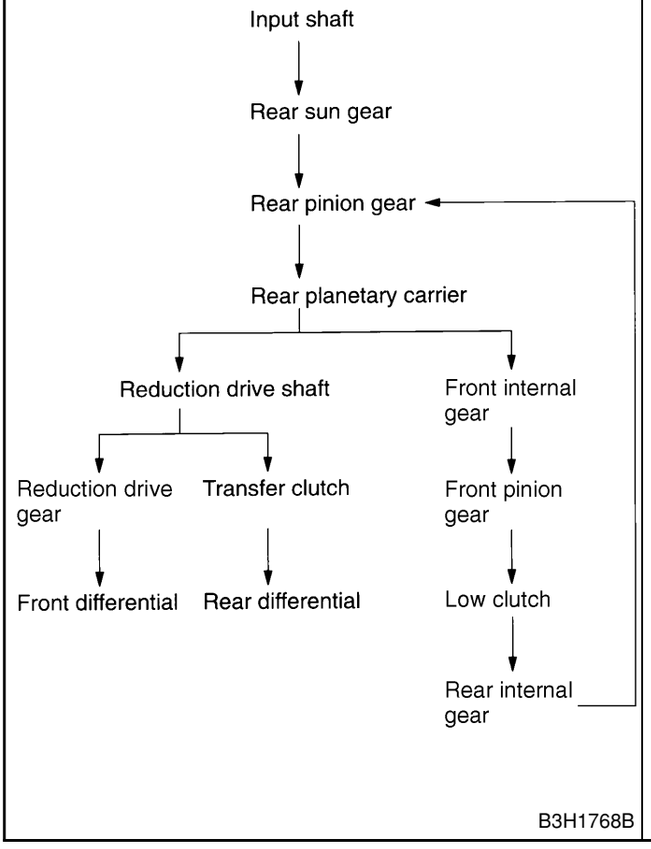
G: 2ND GEAR OF D, 3 OR 2 RANGE (D_2, 3_2, 2_2)

When the 2nd gear is selected in the D, 3 or 2 range, the 2-4 brake and the low clutch are engaged. The front sun gear is now locked to the transmission case due to engagement of the 2-4 brake. In this state, the torque of the rear sun gear is transmitted to the rear internal gear through the path of the front internal gear, front pinion gears, low clutch drum and low clutch. At this time, the one-way clutch is freewheeling since the low clutch drum is rotating clockwise.
In this power flow configuration, the rear pinion gears are rotated by the rear internal gear at a speed faster than that available from the configuration for the 1st gear, so the rotation speed of the reduction drive shaft is higher than that of the 1st gear.
Since the drive power is transmitted without passing through the one-way clutch in the 2nd gear, the backward driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

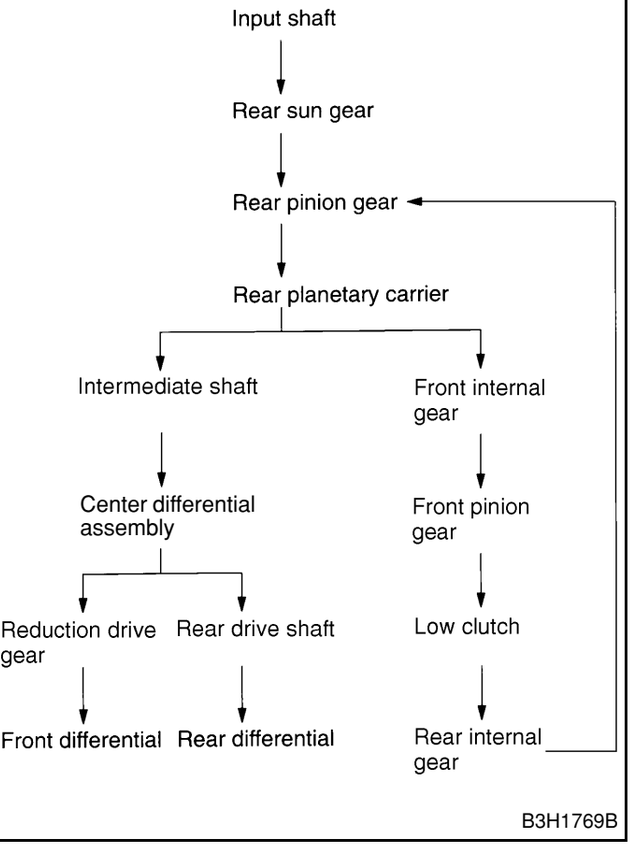
*: MPT models only. VTD models are equipped with an intermediate shaft.

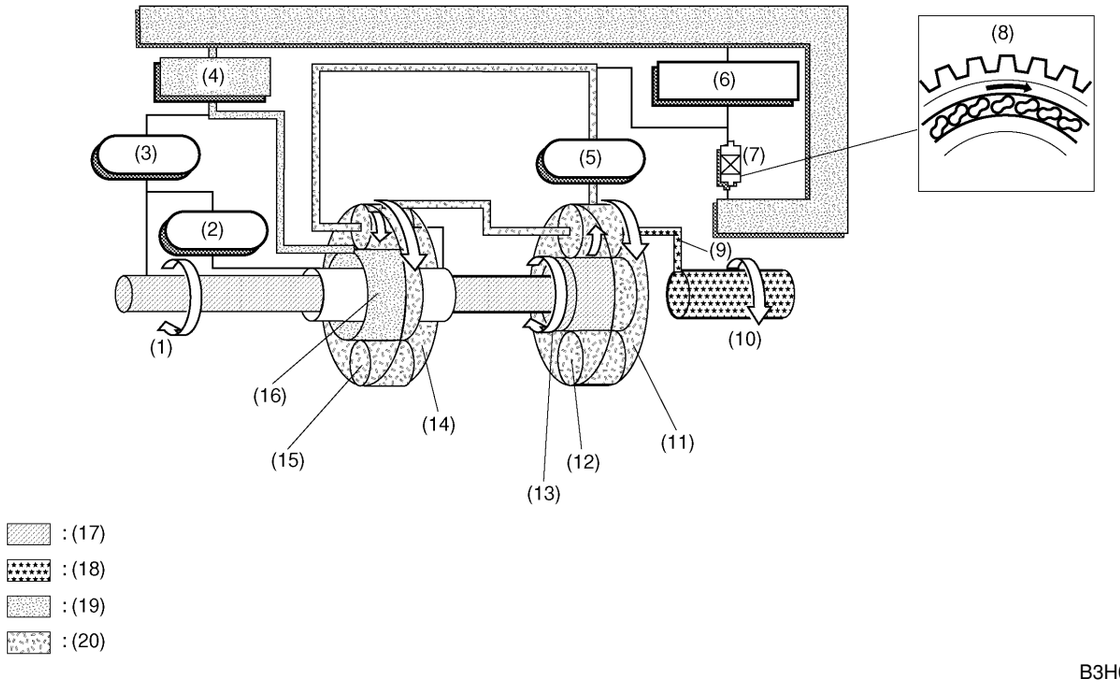
Operating condition of components
Low clutch : Engaged 2-4 brake : Engaged
Power flow (in acceleration)

MPT models



VTD models





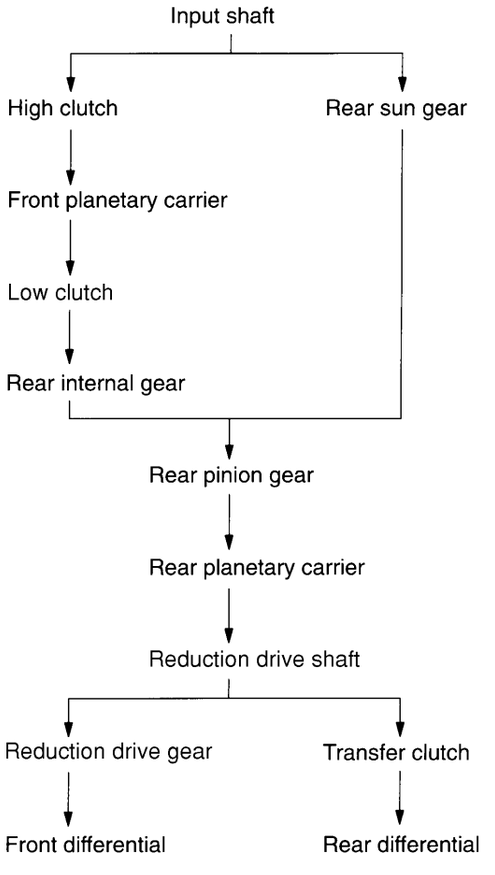
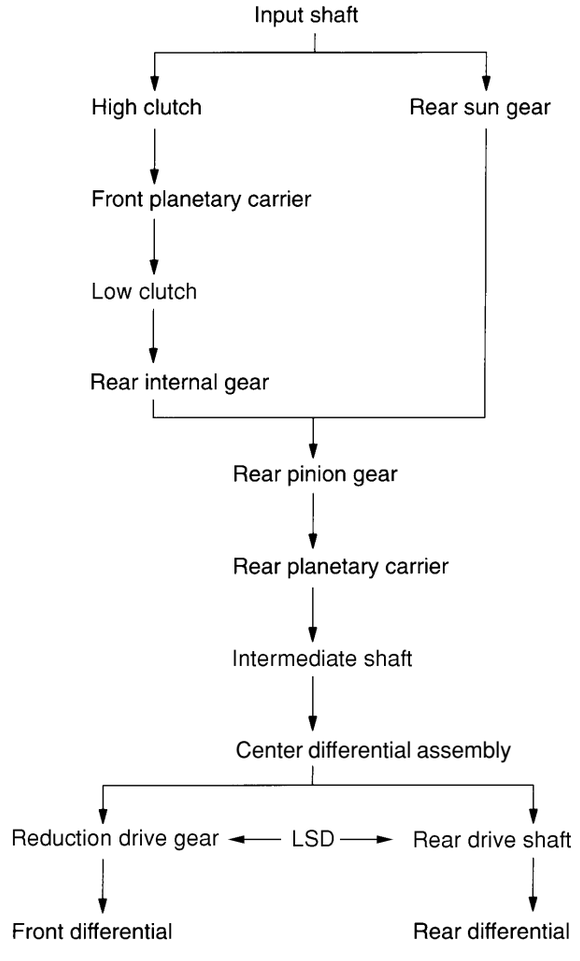
B3H0932A

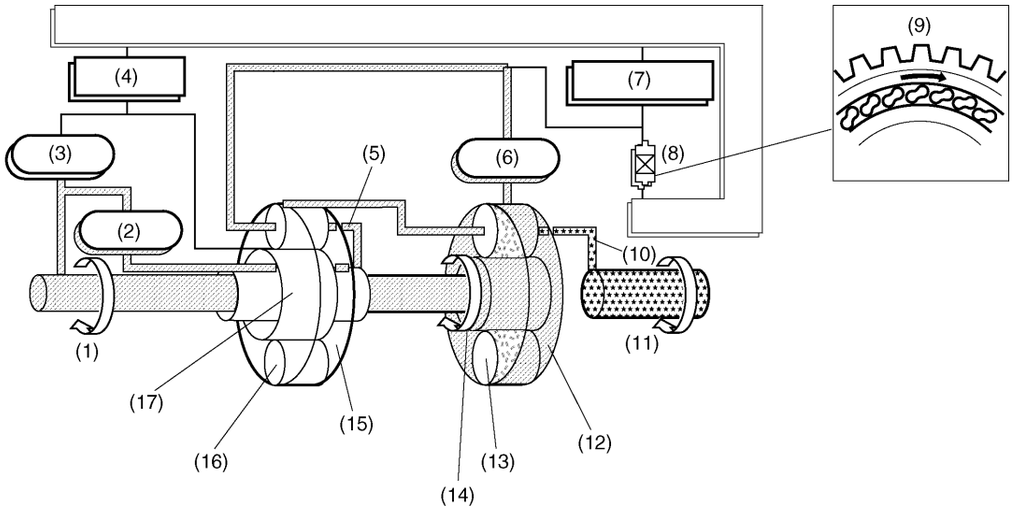
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Low clutch
(6) Low & reverse clutch
(7) One-way clutch
(8) Free
(9) Rear planetary carrier
(10) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(11) Rear internal gear
(12) Rear pinion gear
(13) Rear sun gear
(14) Front internal gear
(15) Front pinion gear
(16) Front sun gear
(17) Input
(18) Output
(19) Locked
(20) Planetary gear component involved in power transmission

H: 3RD GEAR OF D OR 3 RANGE (D_3, 3_3)

When the 3rd gear is selected in the D or 3 range, the low clutch and the high clutch are engaged. The engaged high clutch rotates through its drum the front planetary carrier, and rotation of the carrier is transmitted to the rear internal gear through the engaged low clutch. In this power flow configuration, the rear sun gear and the rear internal gear rotate at the same speed since the rear pinion gears are solid on their axes and the whole planetary gear train rotates as a unit at the same speed as its sun gear. As a result, the input shaft and the reduction drive shaft rotate at the same speed.
In the 3rd gear, the one-way clutch is freewheeling because the low clutch is rotating clockwise. Since the drive power is transmitted without passing through the one-way clutch, the backward driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
High clutch : Engaged Low clutch : Engaged	
Power flow (in acceleration)	
MPT models	**VTD models**
 B3H1784B	 B3H1785B



B3H0933A

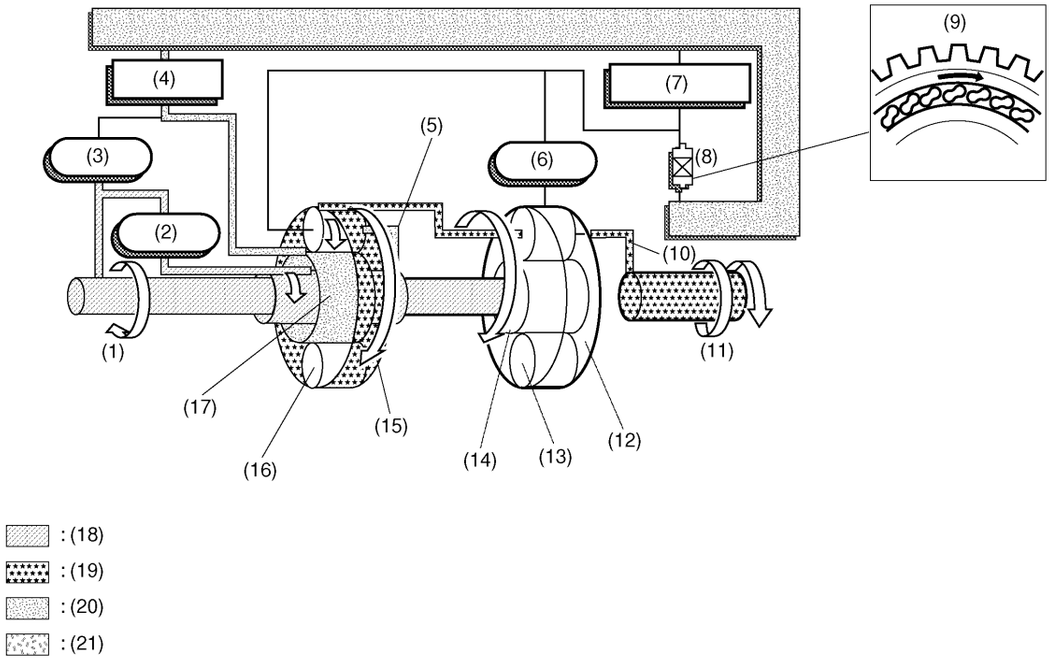
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) Free
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear component involved in power transmission

I: 4TH GEAR OF D RANGE (D_4)

When the 4th gear is selected in the D range, the high clutch and the 2-4 brake are engaged. The engaged high clutch causes the front planetary carrier to rotate, whereas the engaged 2-4 brake causes the front sun gear to be locked to the transmission case.
The front planetary carrier rotates at the same speed as the input shaft. The rotation of the front planetary carrier causes the front pinion gears to revolve around the stationary front sun gear, which causes the front internal gear to rotate faster than the input shaft.
As a result, the reduction drive shaft* is driven at a higher speed than the input shaft.
In the 4th gear, the one-way clutch is freewheeling because the low clutch is rotating clockwise. Since the drive power is transmitted without passing through the one-way clutch, the backward driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
2-4 brake : Engaged High clutch : Engaged	
Power flow (in acceleration)	
MPT models	**VTD models**
Input shaft ↓ High clutch ↓ Front planetary carrier ↓ Front pinion gear ↓ Front internal gear ↓ Rear planetary carrier ↓ Reduction drive shaft ↓ Reduction drive gear → Front differential Transfer clutch → Rear differential	Input shaft ↓ High clutch ↓ Front planetary carrier ↓ Front pinion gear ↓ Front internal gear ↓ Rear planetary carrier ↓ Intermediate shaft ↓ Center differential assembly ↓ Reduction drive gear ← LSD → Rear drive shaft ↓ ↓ Front differential Rear differential
B3H1786B	B3H1787B

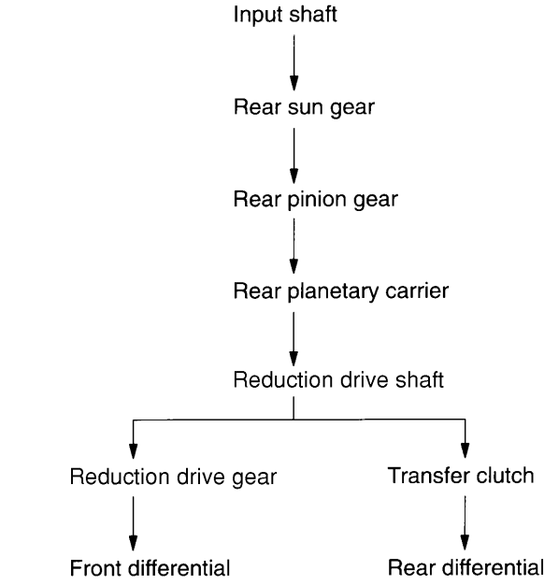
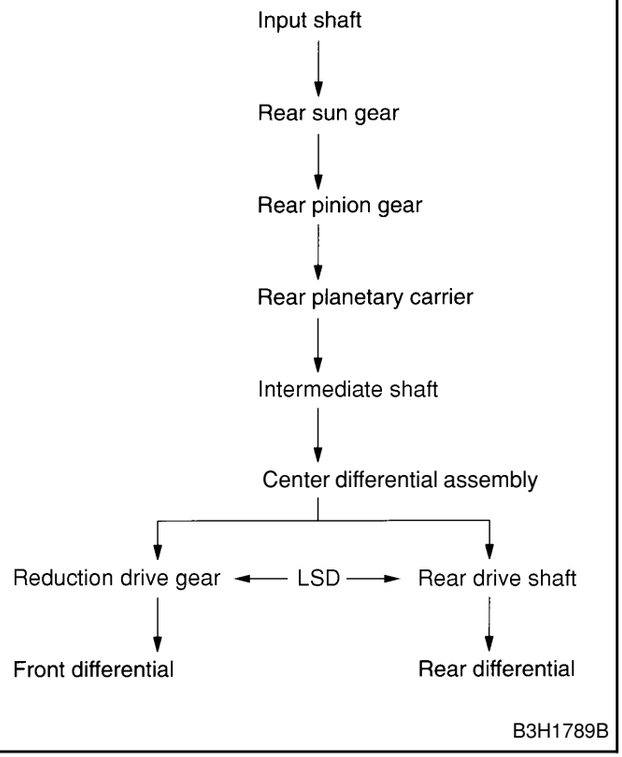


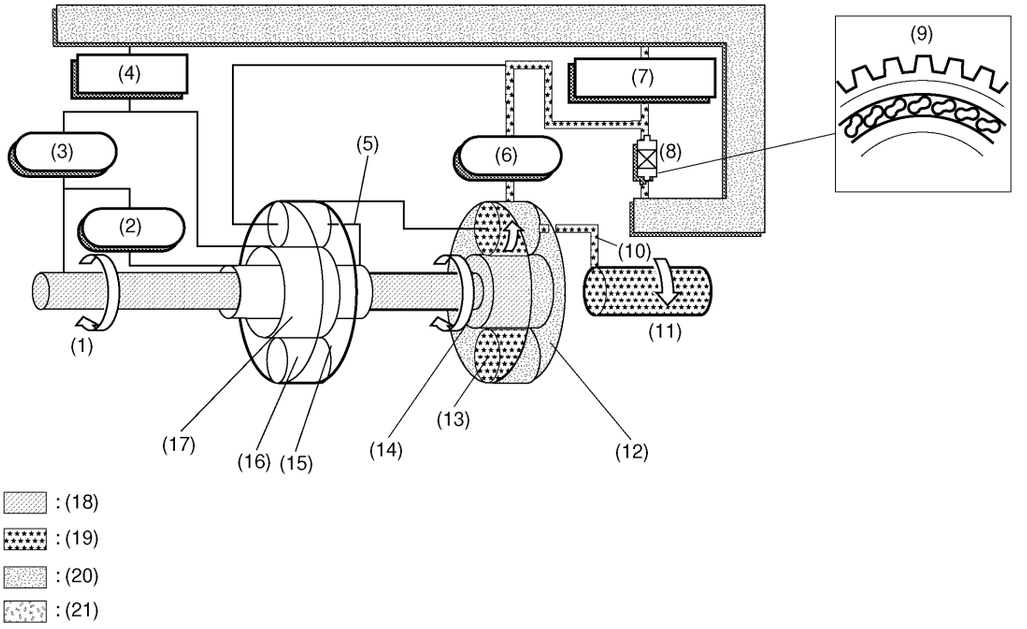
B3H0934A

(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) Free
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear components involved in power transmission

J: 1ST GEAR OF 1 RANGE (1_1)

When the 1st gear is selected in the 1 range, both the low clutch and the low & reverse brake are engaged. Although the power flow configuration is the same as that with the 1st gear in the D or 3 range, the one-way clutch produces no freewheeling effect because the low & reverse brake is locking the rear internal gear always to the transmission case.
During coasting, therefore, the backward driving force from the wheels is transmitted through the reduction drive gear to the input shaft. This means, unlike the 1st gear in D or 3 range, that the engine braking effect is available in this range.

Operating condition of components	
Low clutch : Engaged Low & reverse brake : Engaged One-way clutch : Operating	
Power flow (in acceleration)	
MPT models	**VTD models**
	



B3H0936A

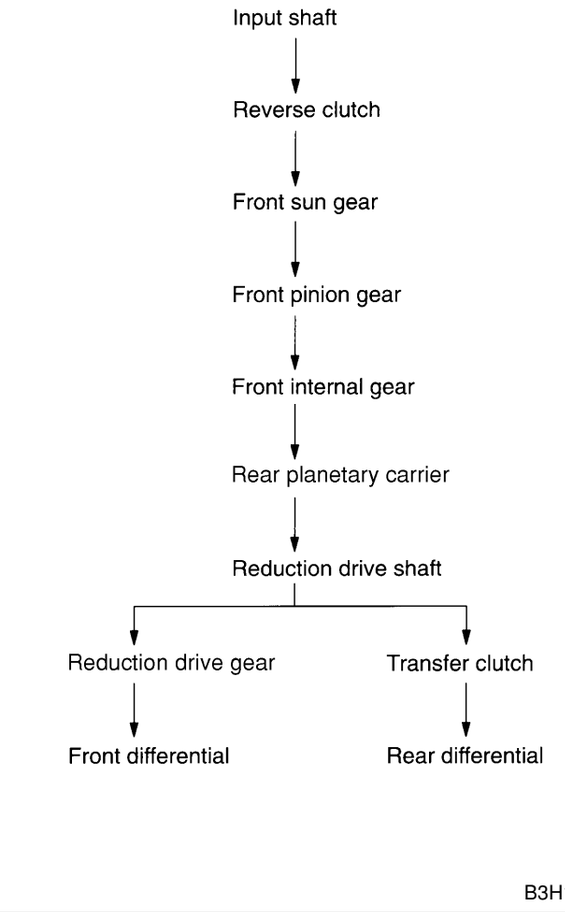
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) No effect
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear component involved in power transmission

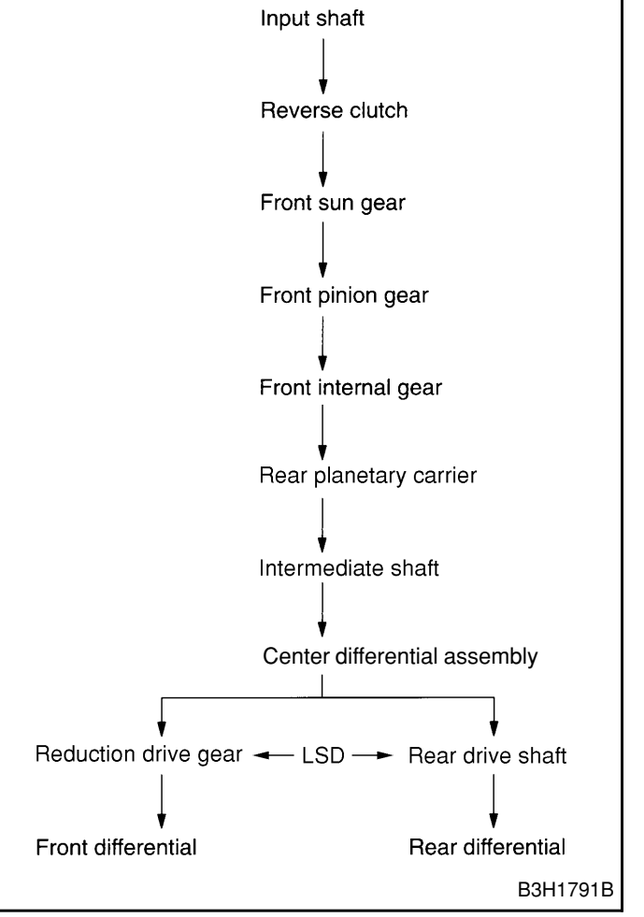
K: R RANGE

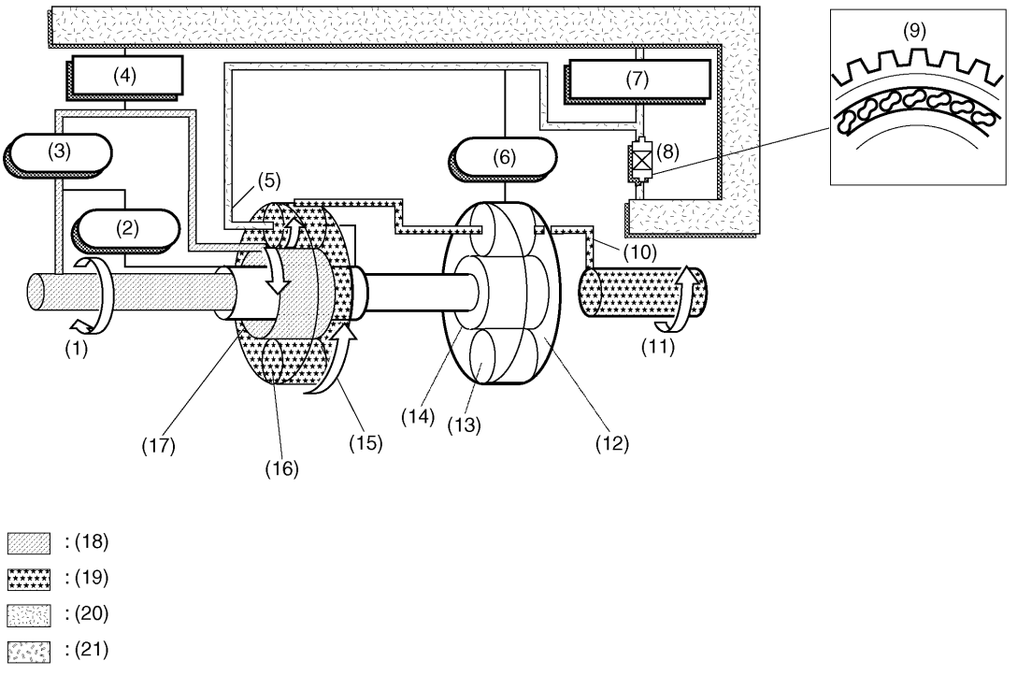
When the selector lever is placed in the R position, the reverse clutch and the low & reverse brake are engaged. The reverse clutch allows the input shaft torque to be transmitted to the front sun gear, while the low & reverse brake allows the low clutch drum to be interlocked with the transmission case.
Rotation of the front sun gear causes the front pinion gears to rotate in the reverse driving direction and, therefore, the front internal gear rotates in the same direction.
At this time, the rotation speed transmitted to the front internal gear is reduced through gearing between the front sun gear and the front pinion gears.
The one-way clutch produces no freewheeling effect because the low & reverse brake is in engagement.
In this range, since the power transmission is made without passing through the one-way clutch, the driving force from the wheels is transmitted through the reduction drive shaft* to the input shaft; this makes the engine braking effect available.

*: MPT models only. VTD models are equipped with an intermediate shaft.

Operating condition of components	
Reverse clutch : Engaged Low & reverse brake : Engaged	
Power flow (in acceleration)	
MPT models	**VTD models**







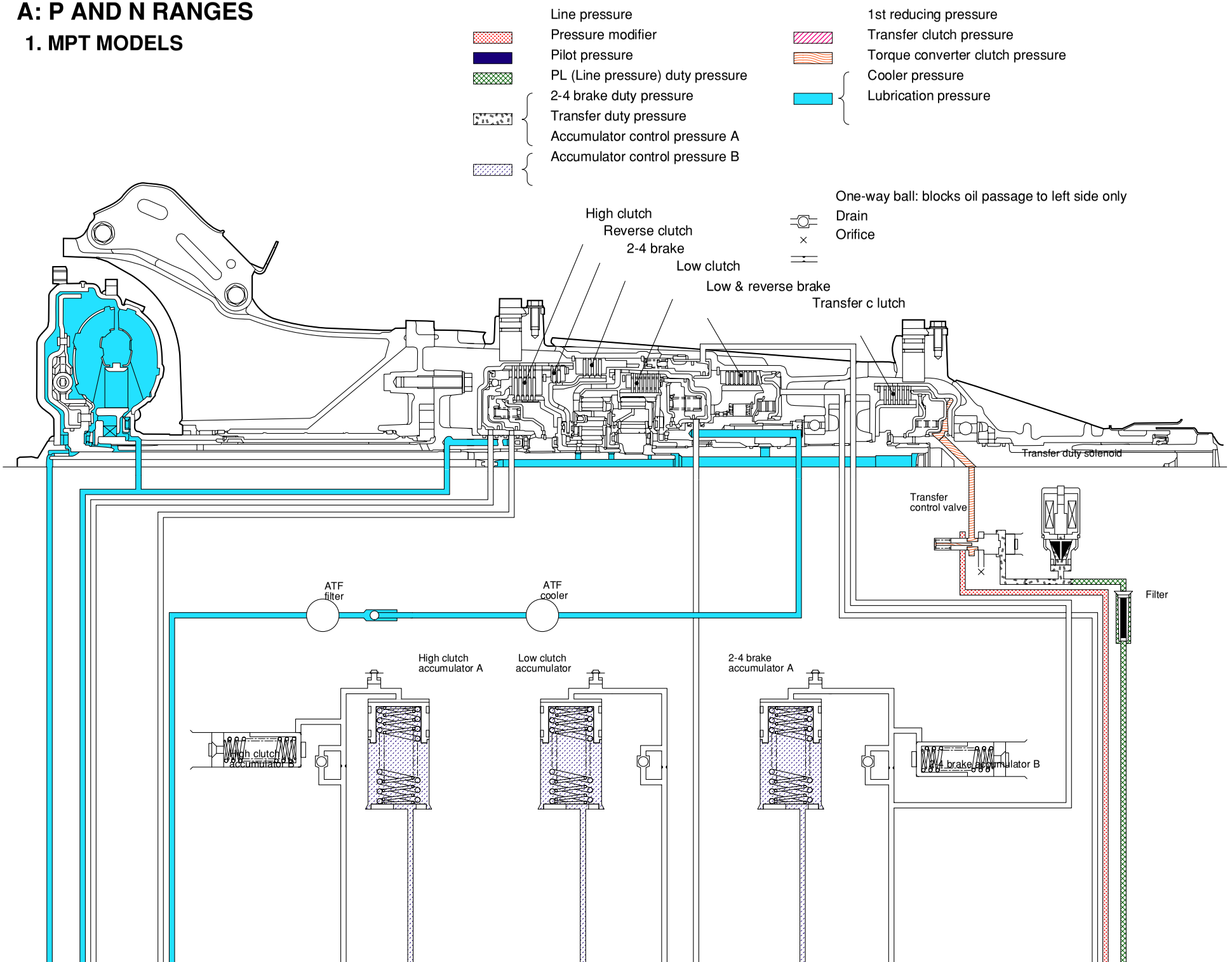
B3H0935A

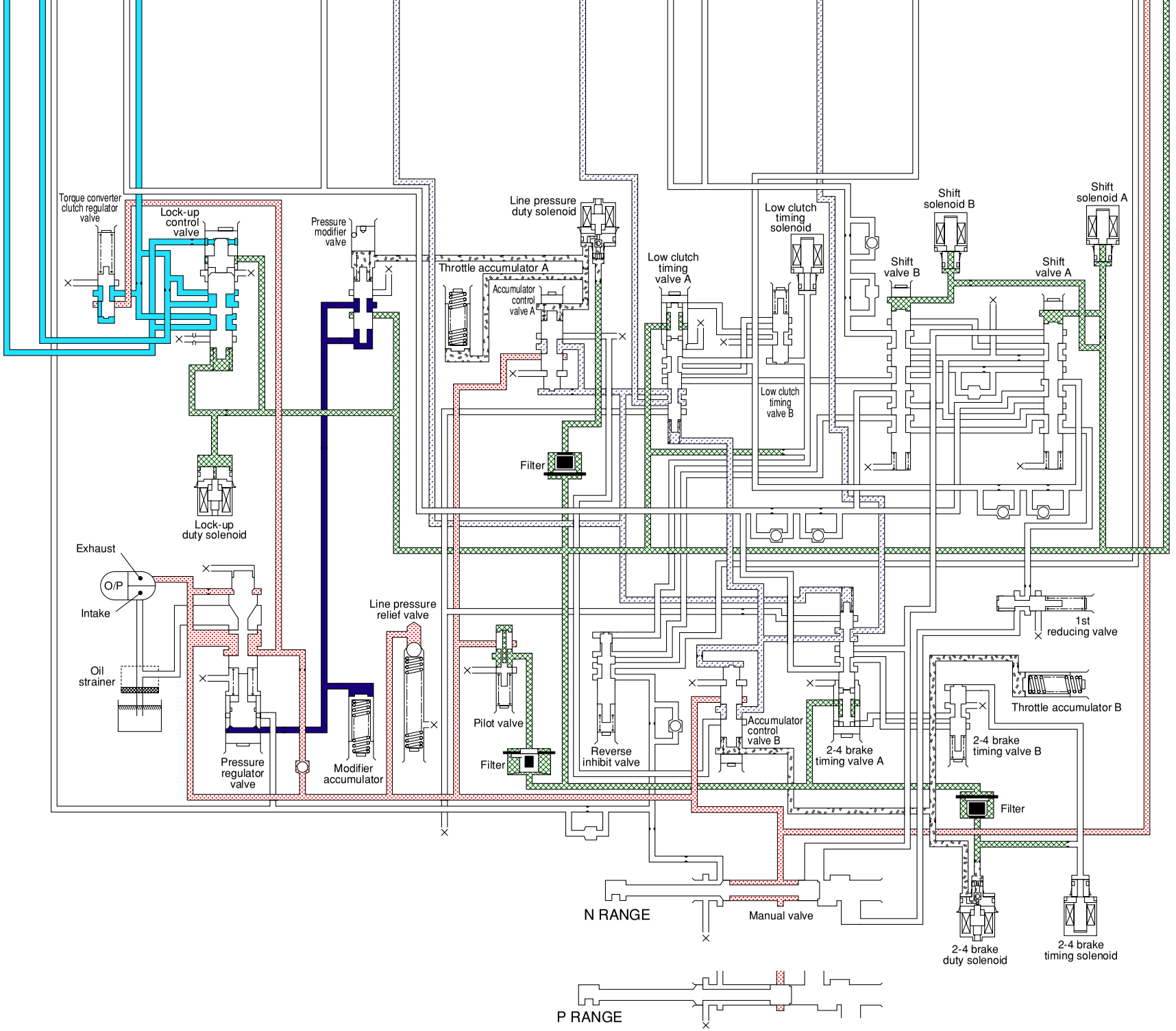
(1) Input shaft
(2) High clutch
(3) Reverse clutch
(4) 2-4 brake
(5) Front planetary carrier
(6) Low clutch
(7) Low & reverse brake
(8) One-way clutch
(9) No effect
(10) Rear planetary carrier
(11) MPT models: Reduction drive shaft
VTD models: Intermediate shaft
(12) Rear internal gear
(13) Rear pinion gear
(14) Rear sun gear
(15) Front internal gear
(16) Front pinion gear
(17) Front sun gear
(18) Input
(19) Output
(20) Locked
(21) Planetary gear component involved in power transmission

1 0. Schematic Drawing

A: P AND N RANGES

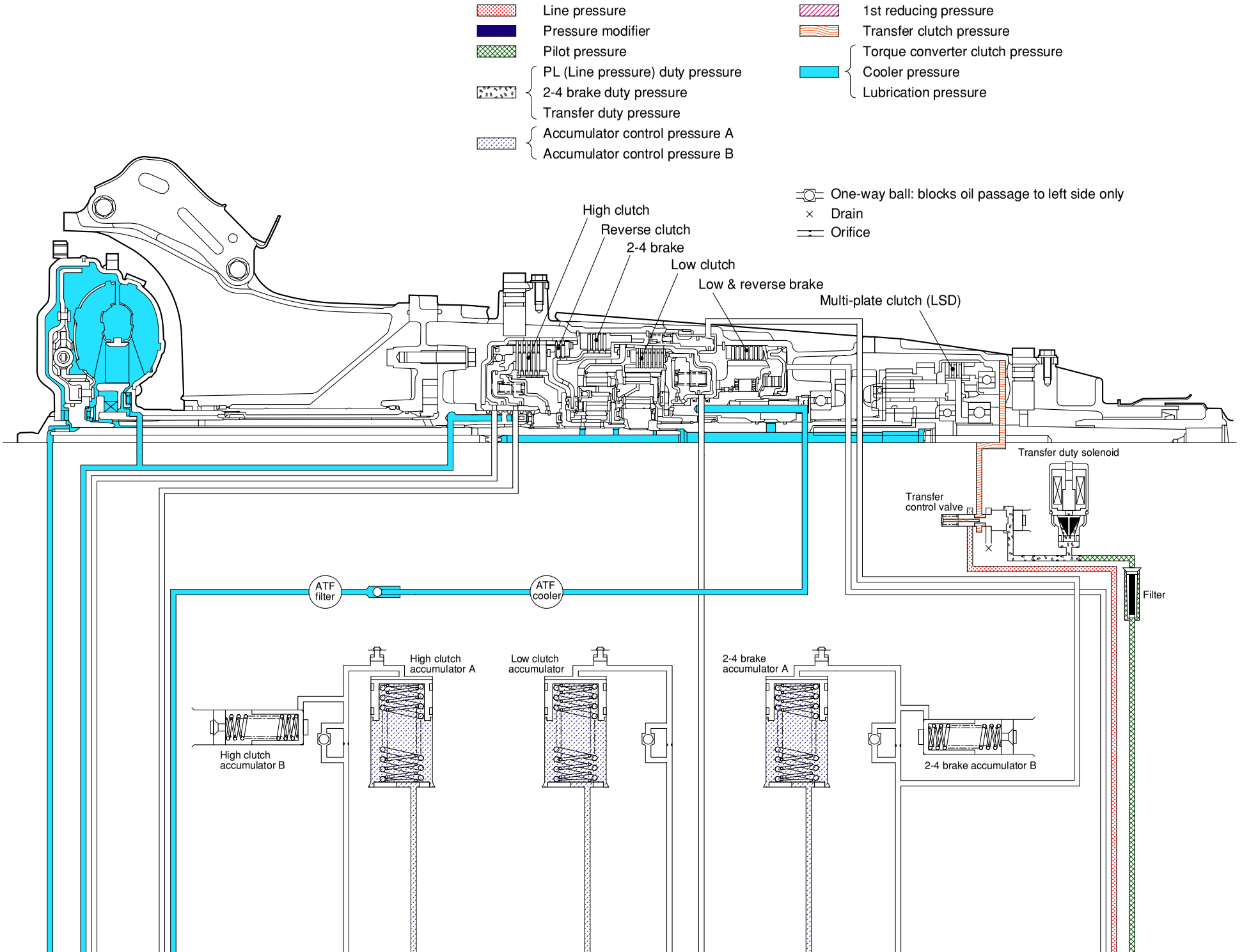
1. MPT MODELS

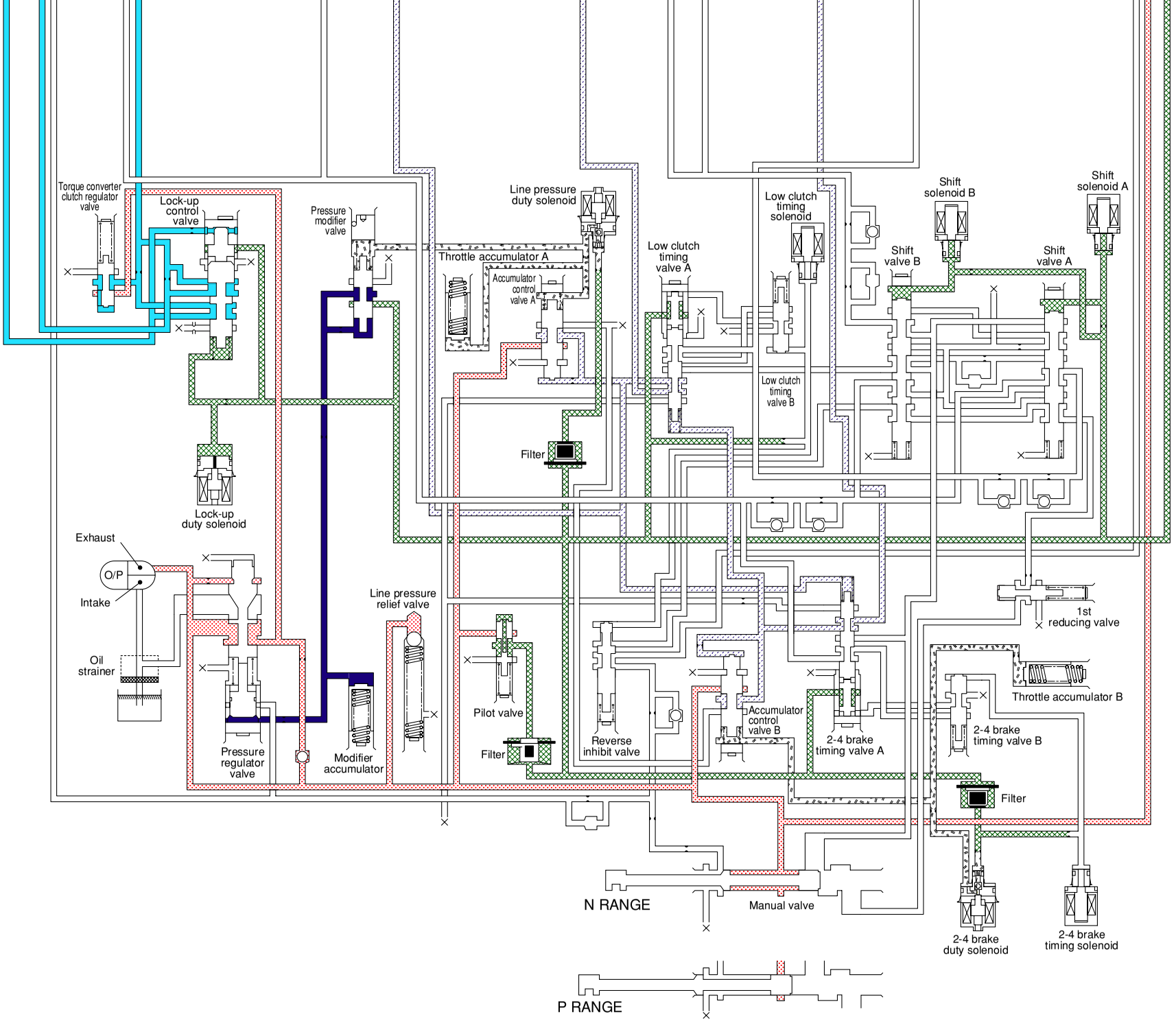



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Low clutch timing valve B
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
N RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
P RANGE

B3H2093A

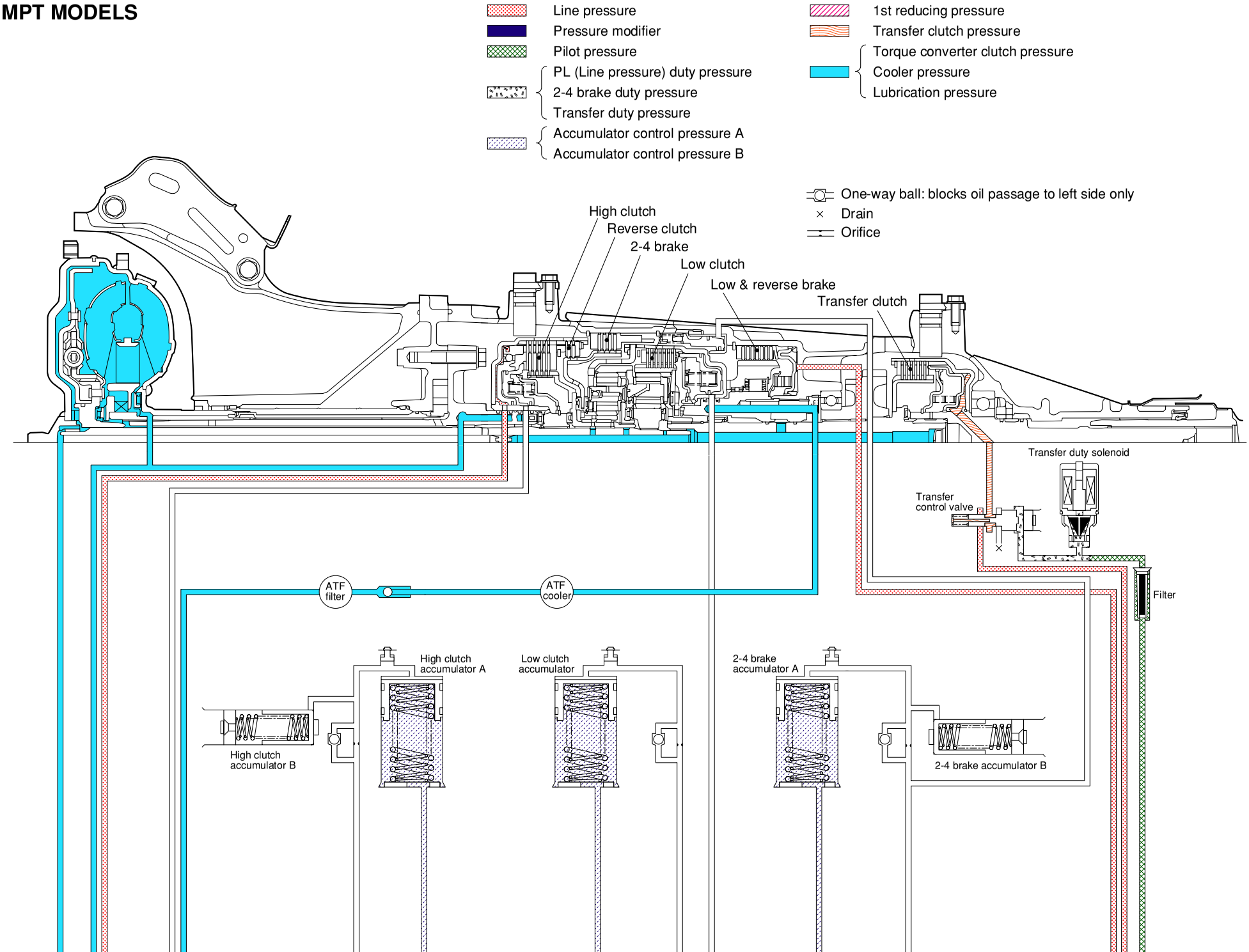
2. VTD MODELS

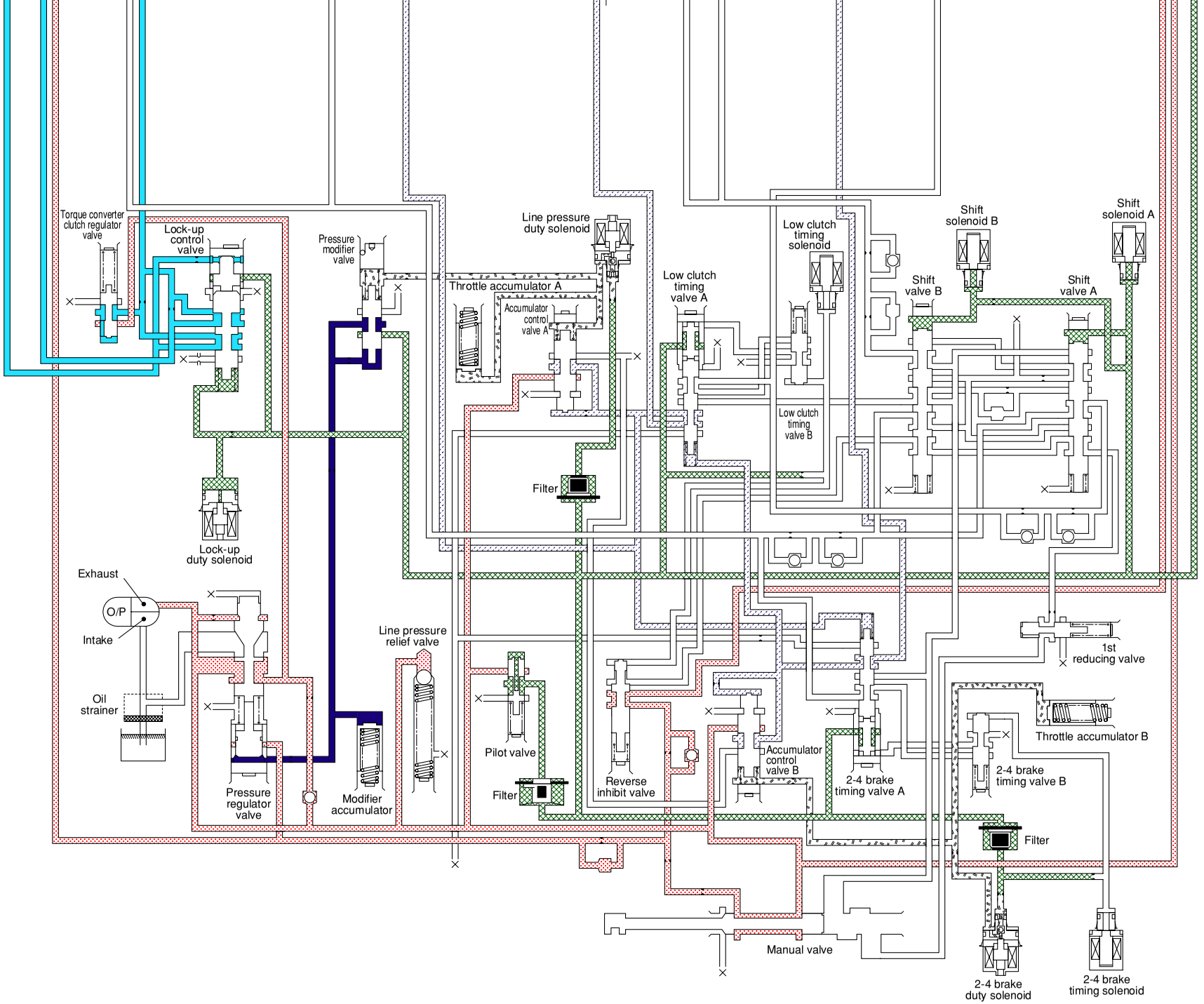

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B


Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
N RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
P RANGE

B3H2094A

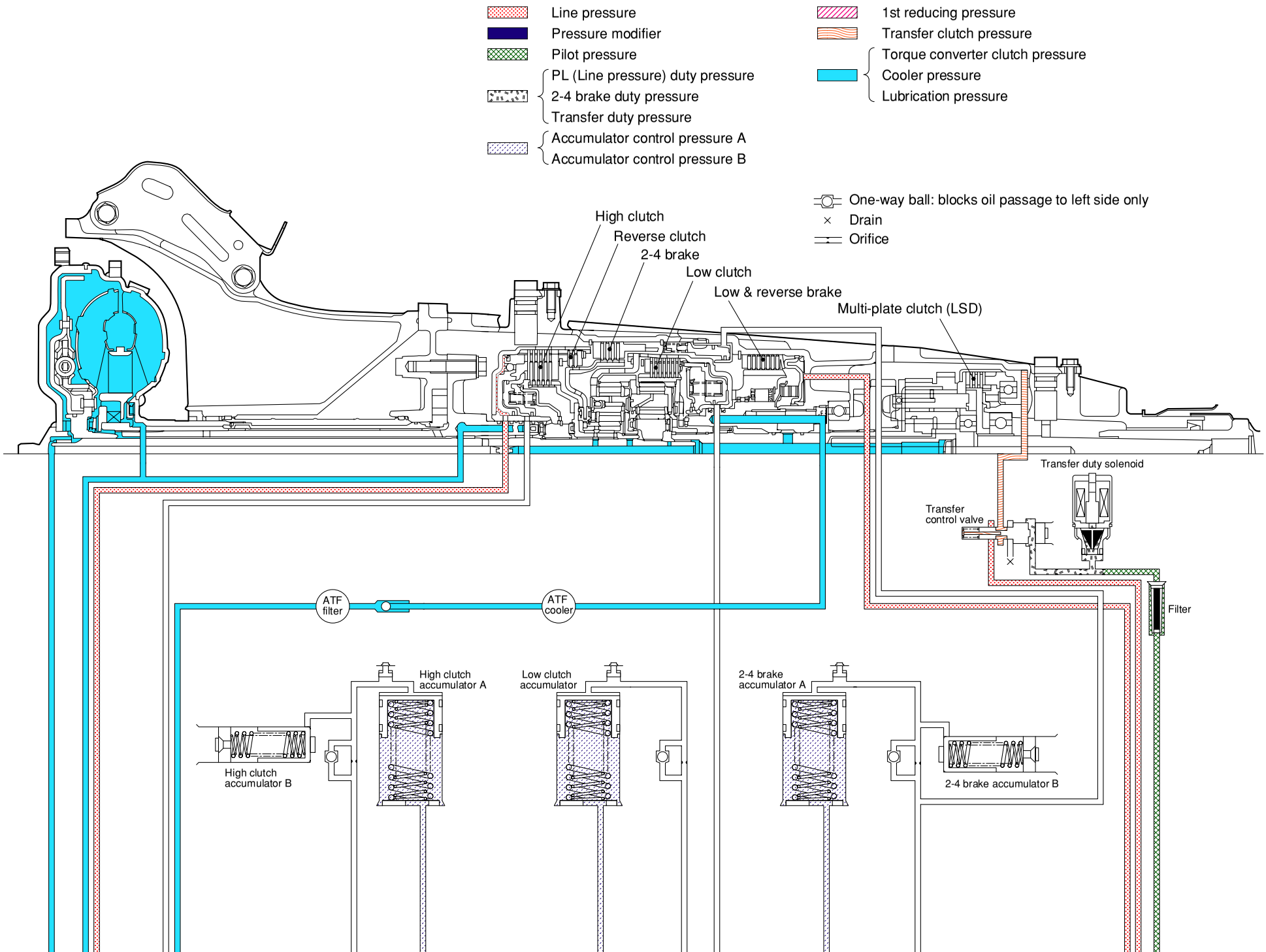
1. MPT MODELS

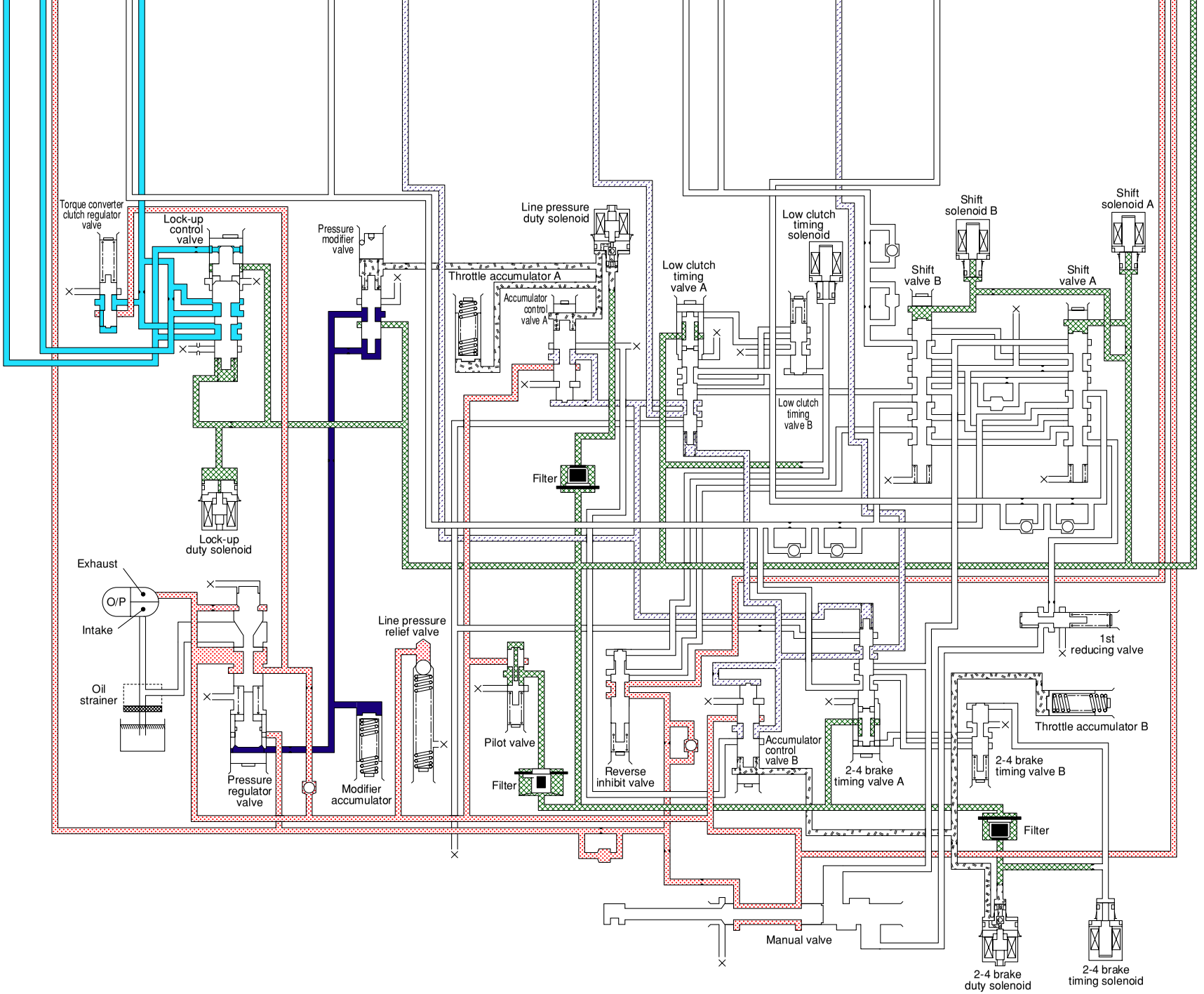

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Transfer clutch
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B


Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Low clutch timing valve B
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2095A

2. VTD MODELS

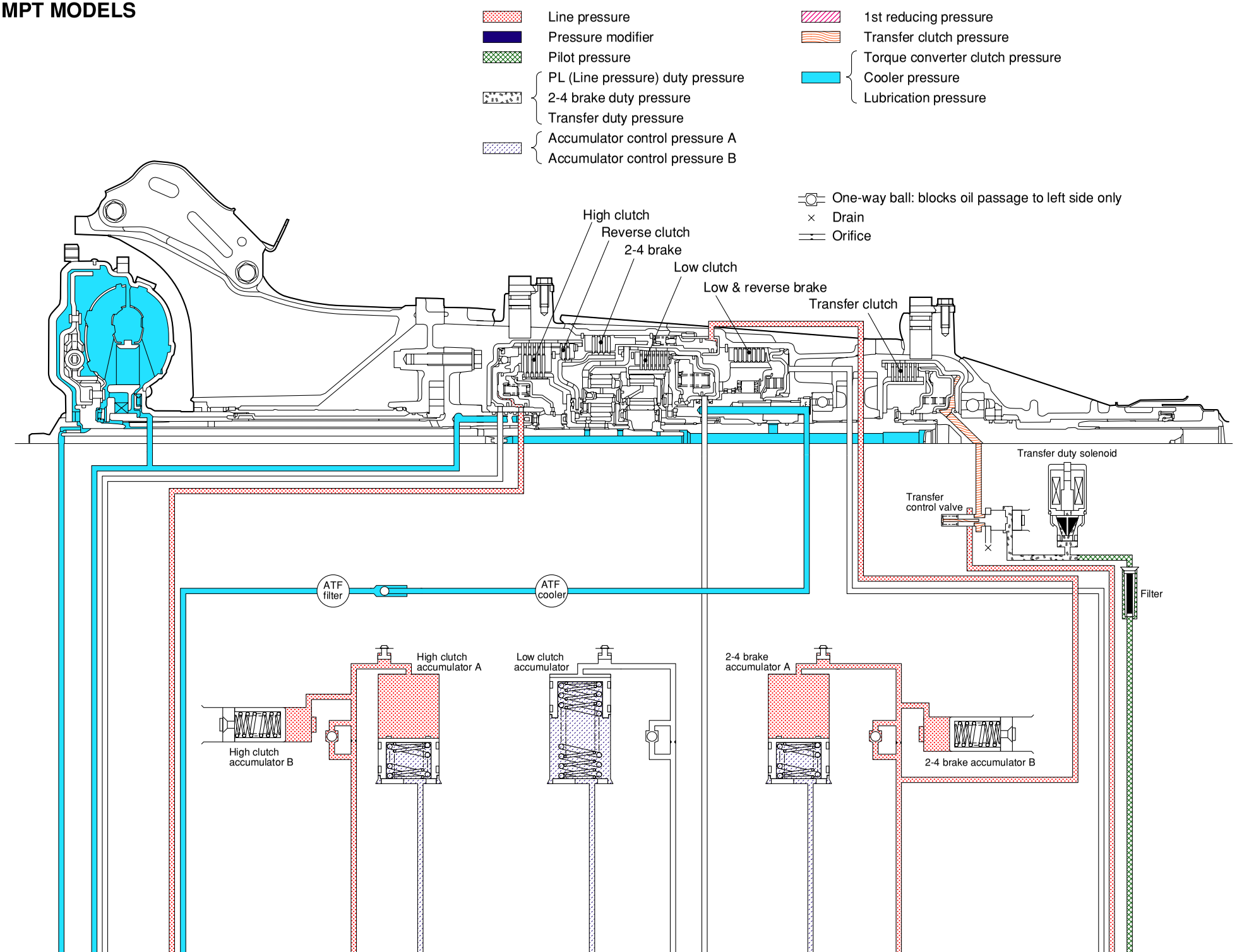

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B

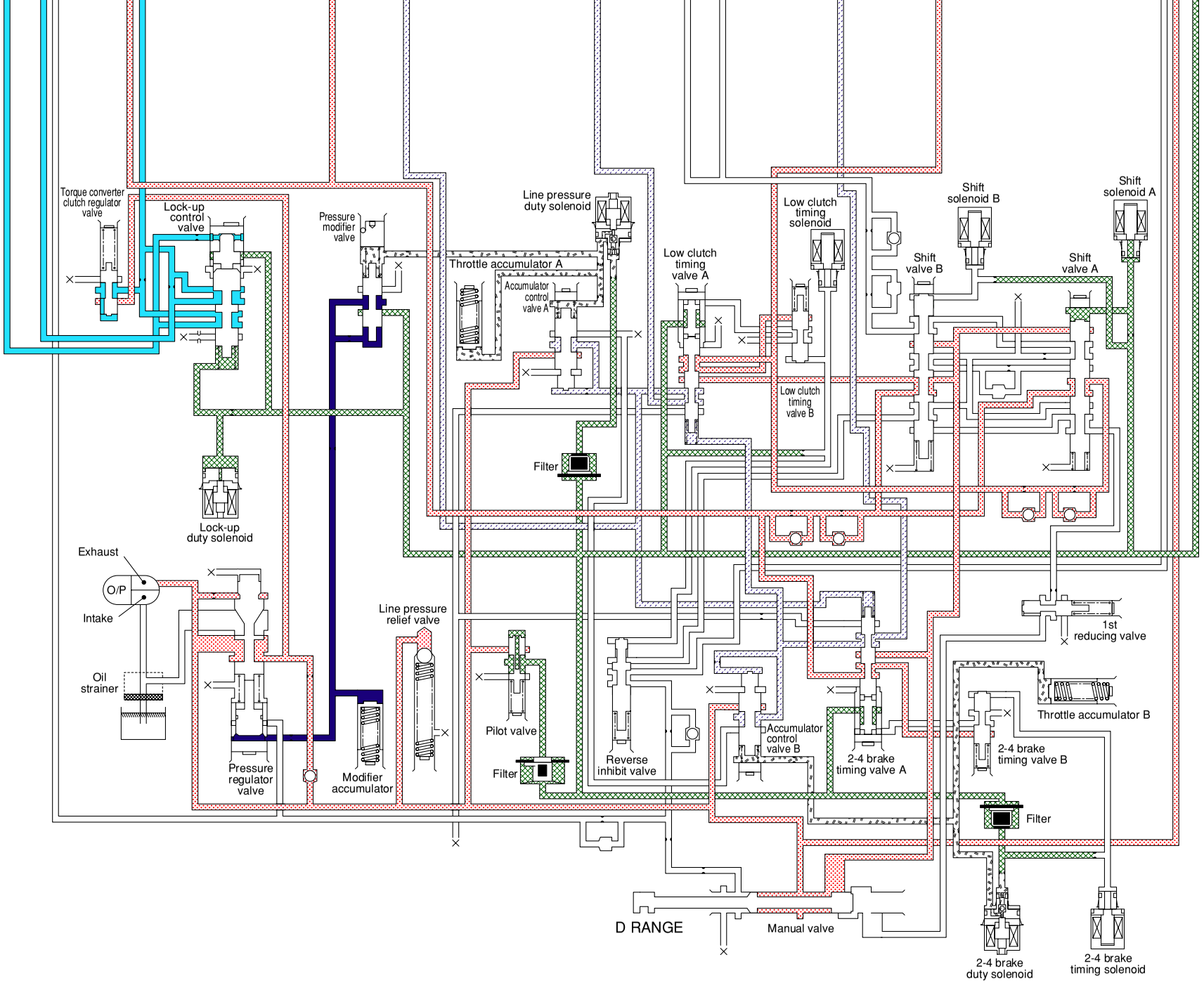

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2096A

C: 4TH GEAR OF D RANGE (LOCK-UP OFF)

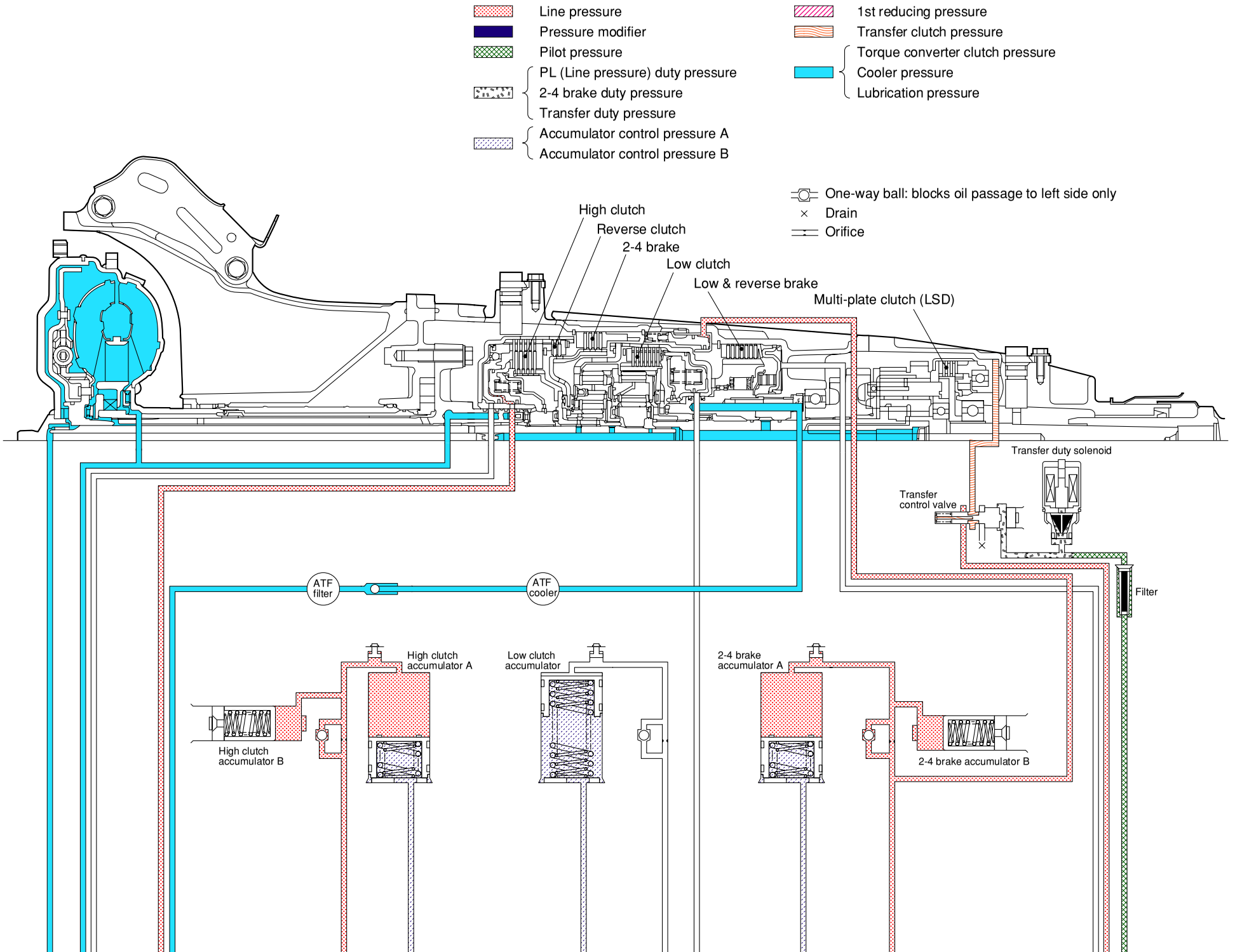
1. MPT MODELS

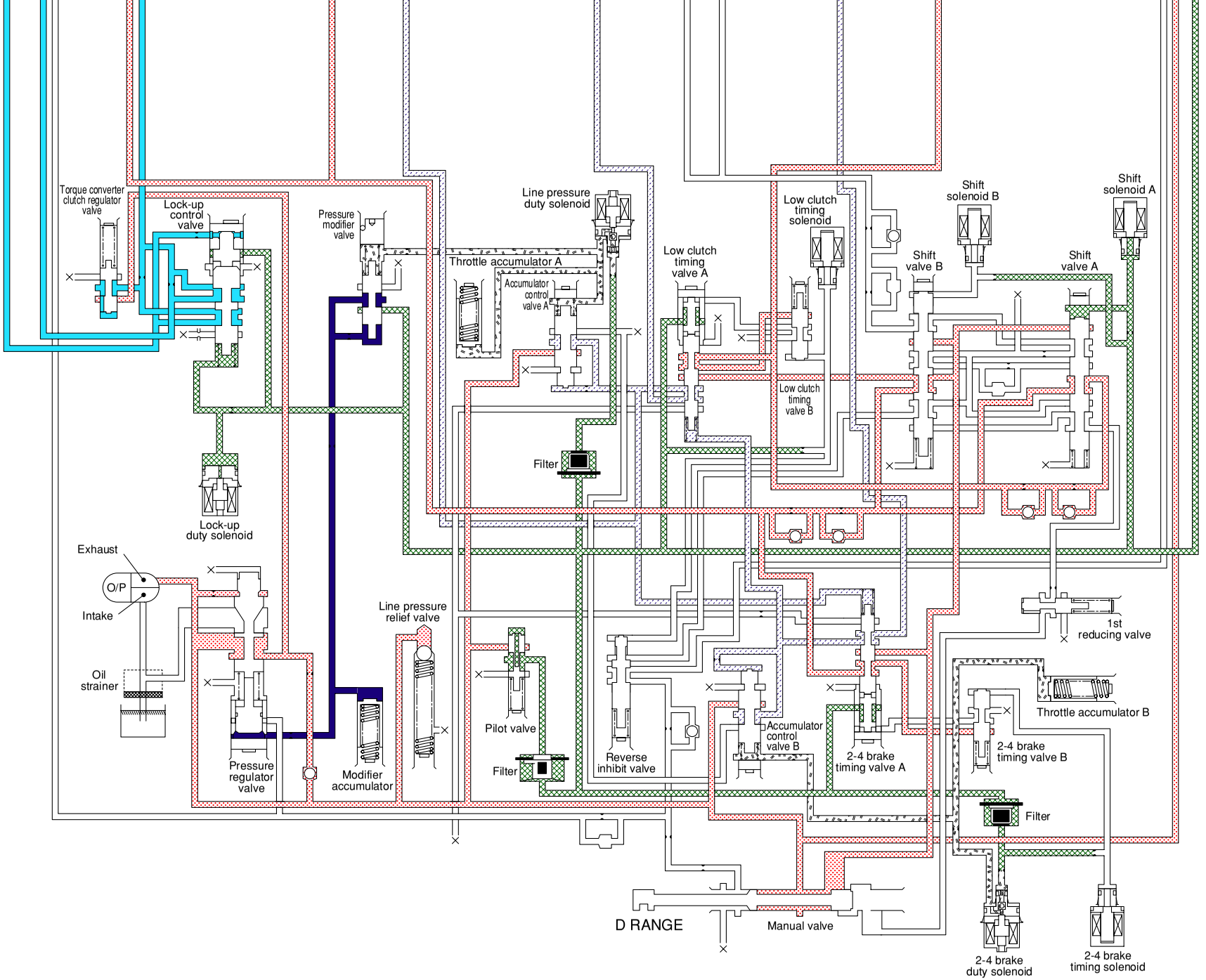



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
1st reducing valve
Throttle accumulator B
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2097A

2. VTD MODELS

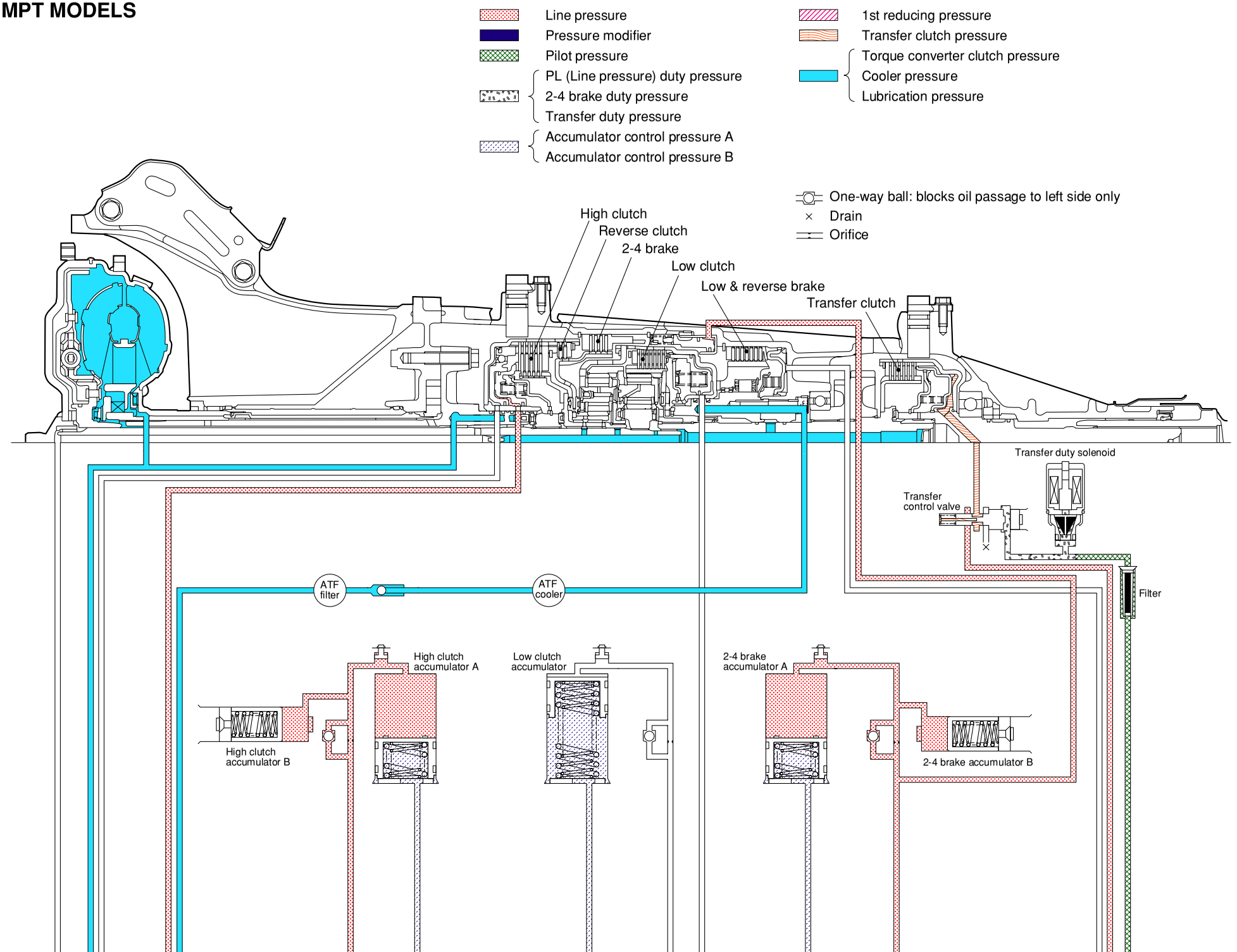

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

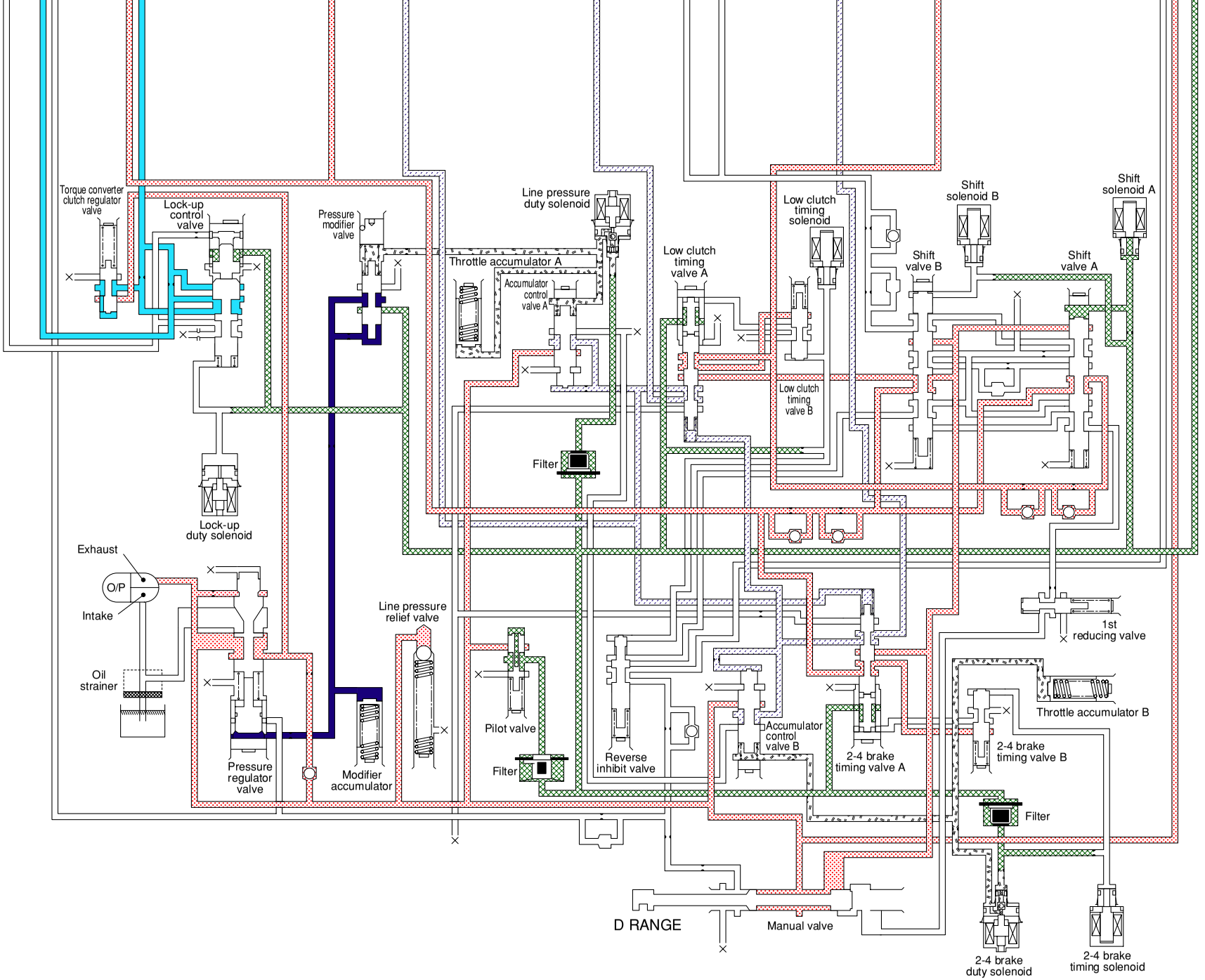

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2098A

D: 4TH GEAR OF D RANGE (LOCK-UP ON)

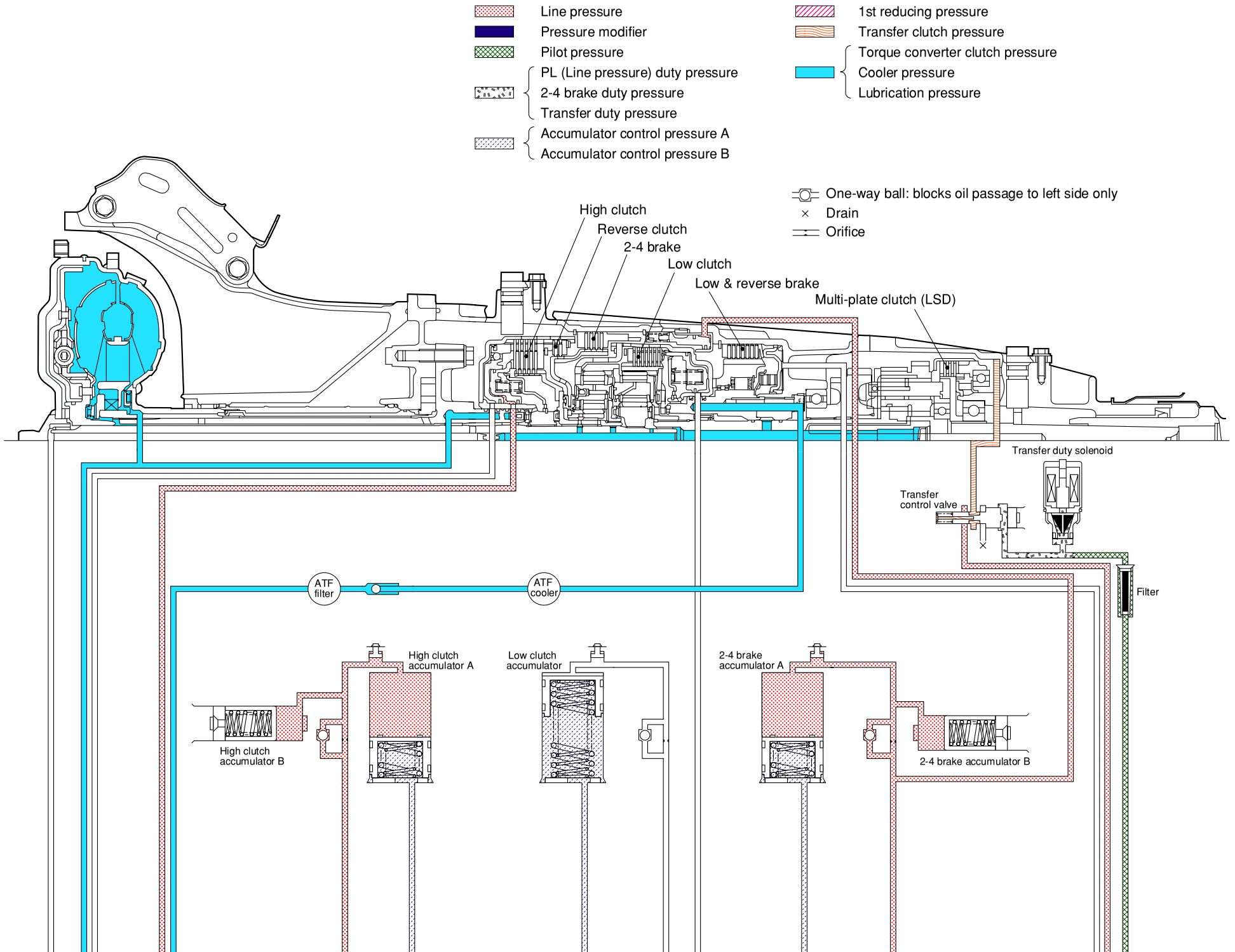
1. MPT MODELS

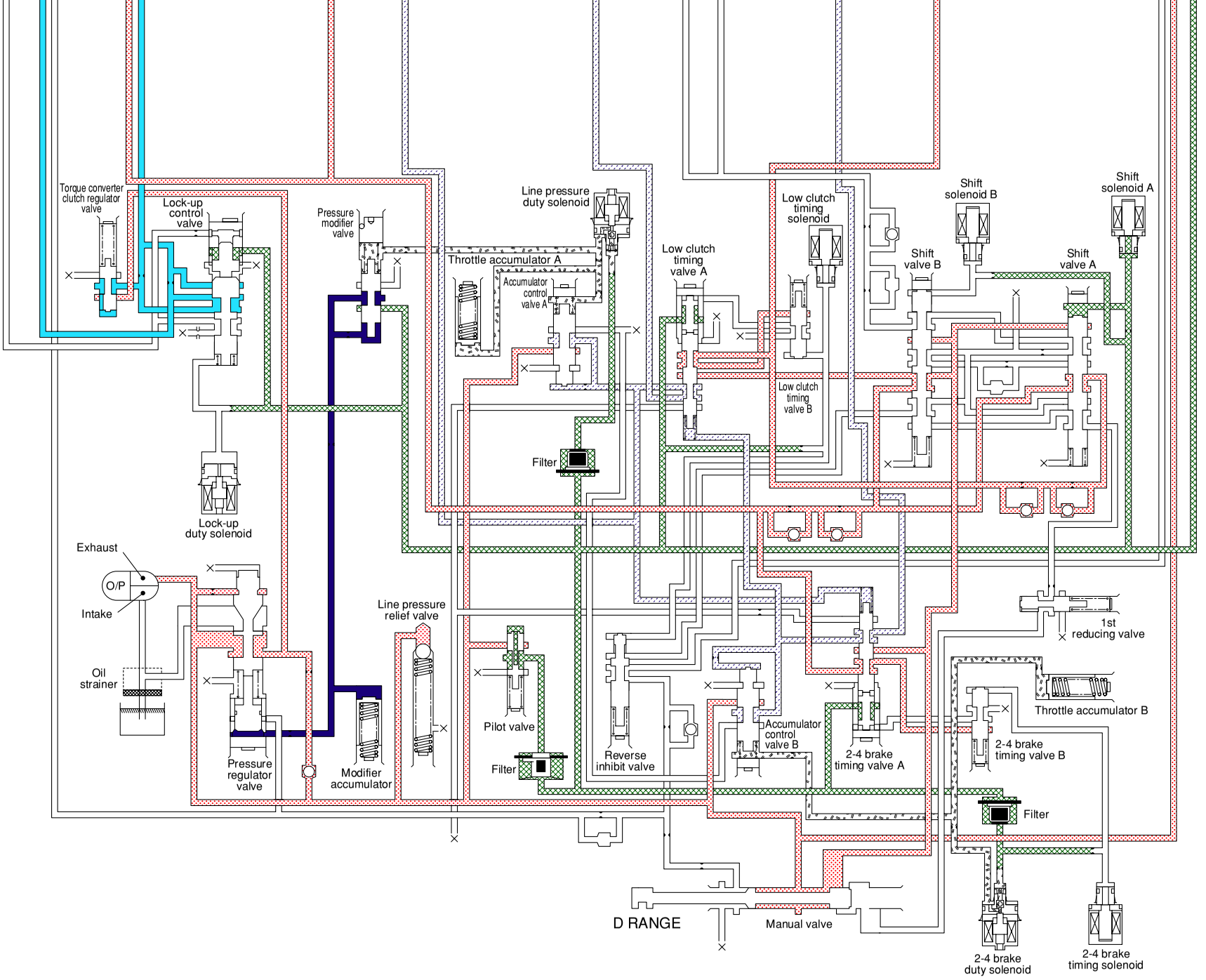



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2099A

2. VTD MODELS

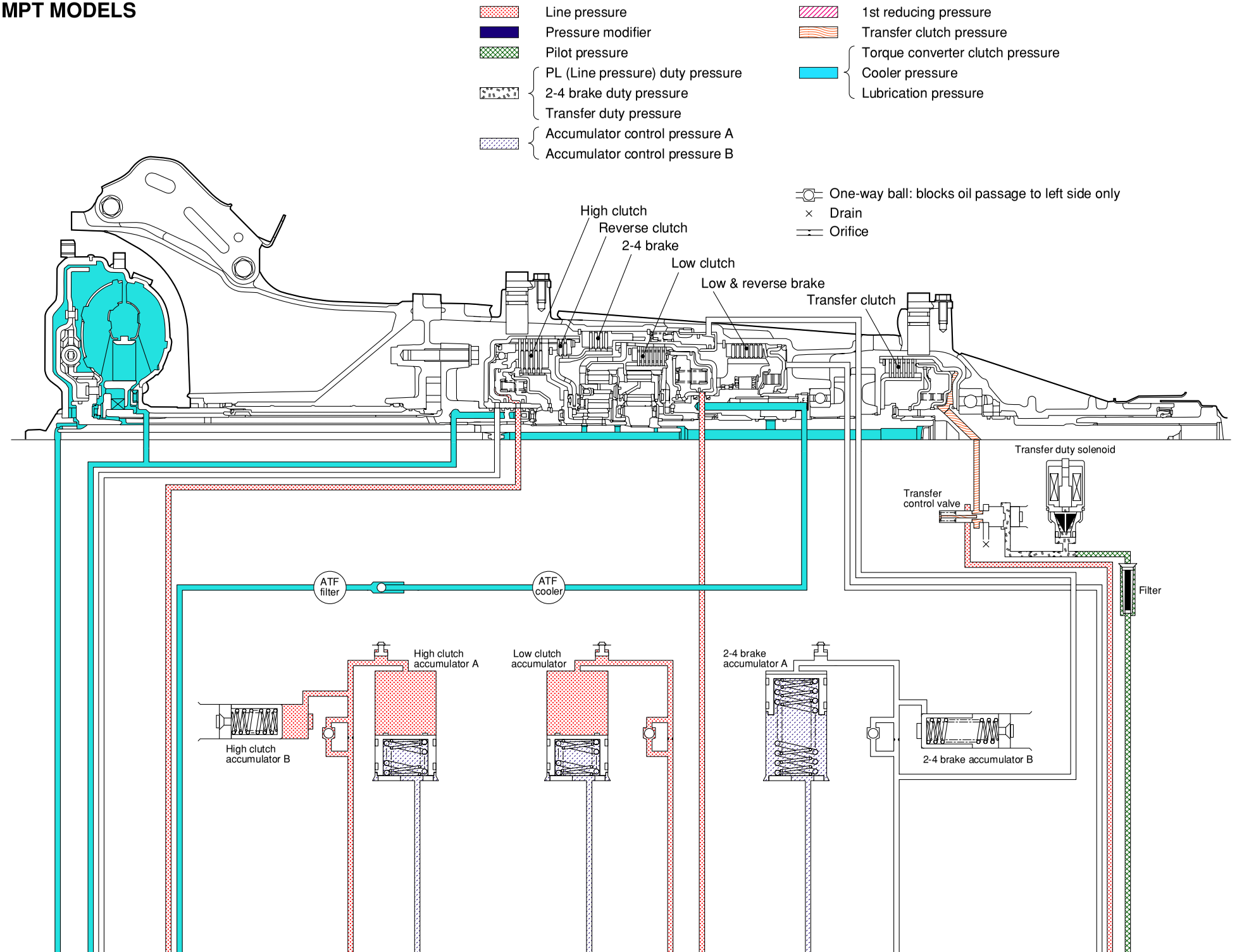

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B

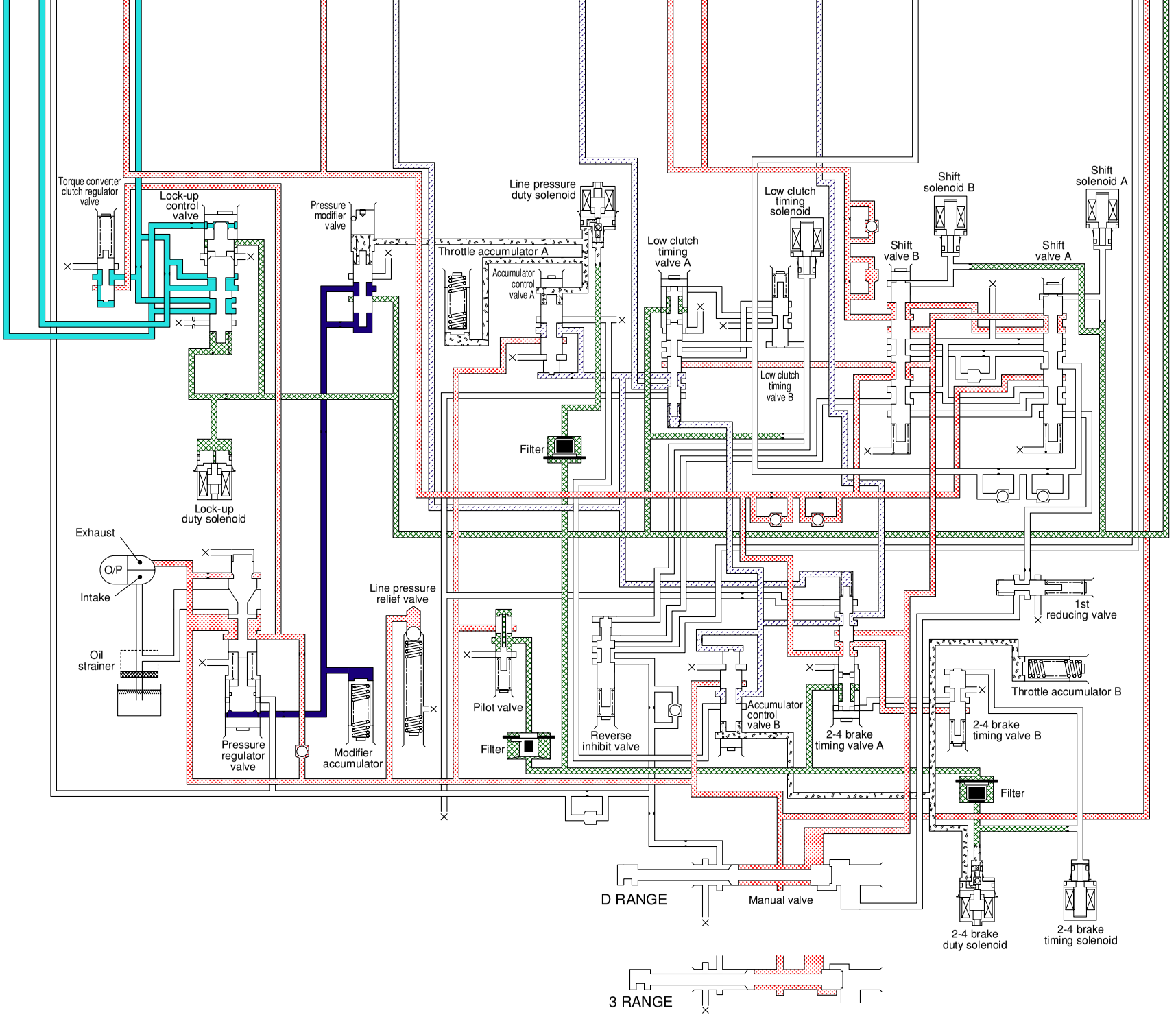

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2100A

E: 3RD GEAR OF D AND 3 RANGES

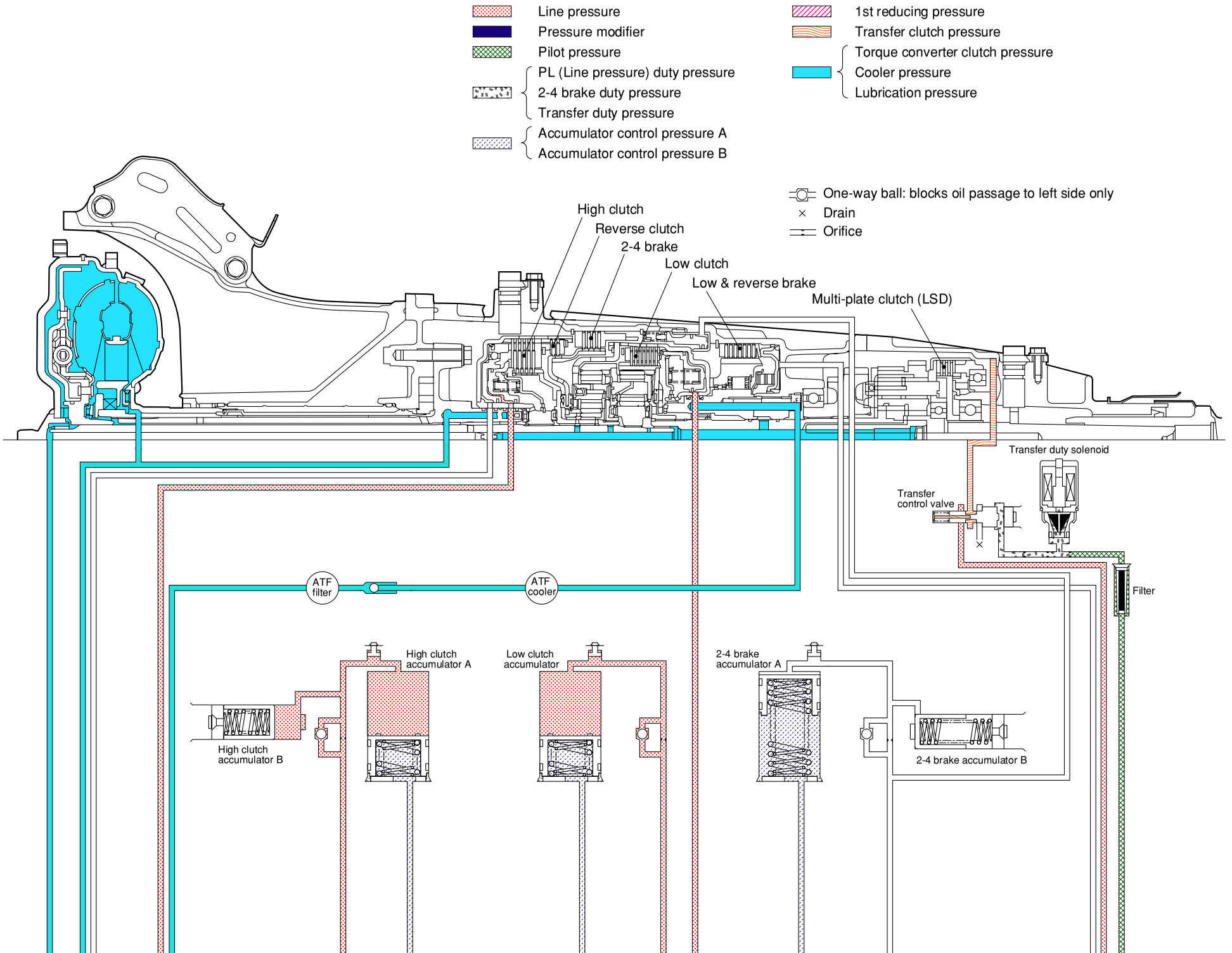
1. MPT MODELS

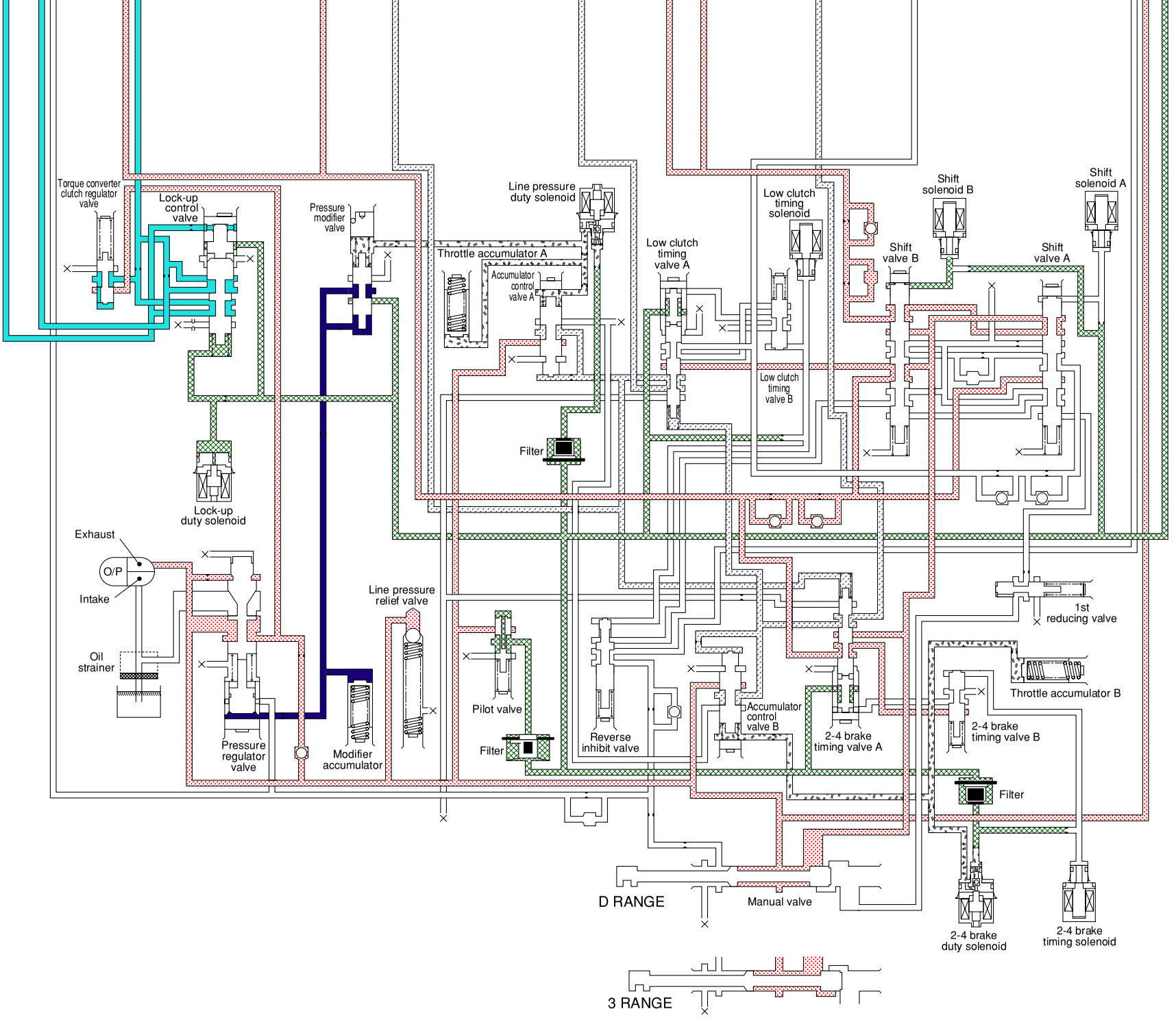



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
3 RANGE

B3H2101A

2. VTD MODELS

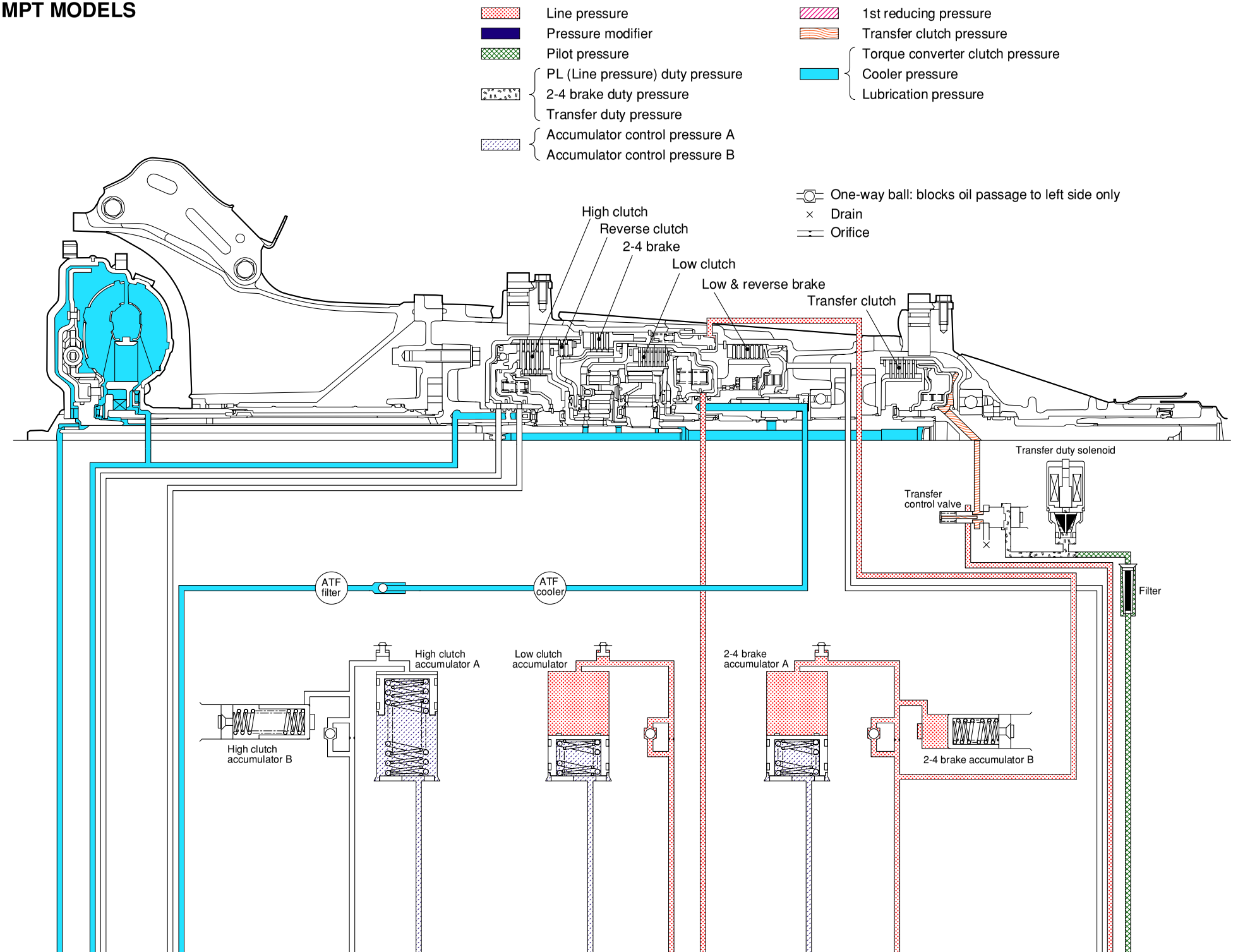

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

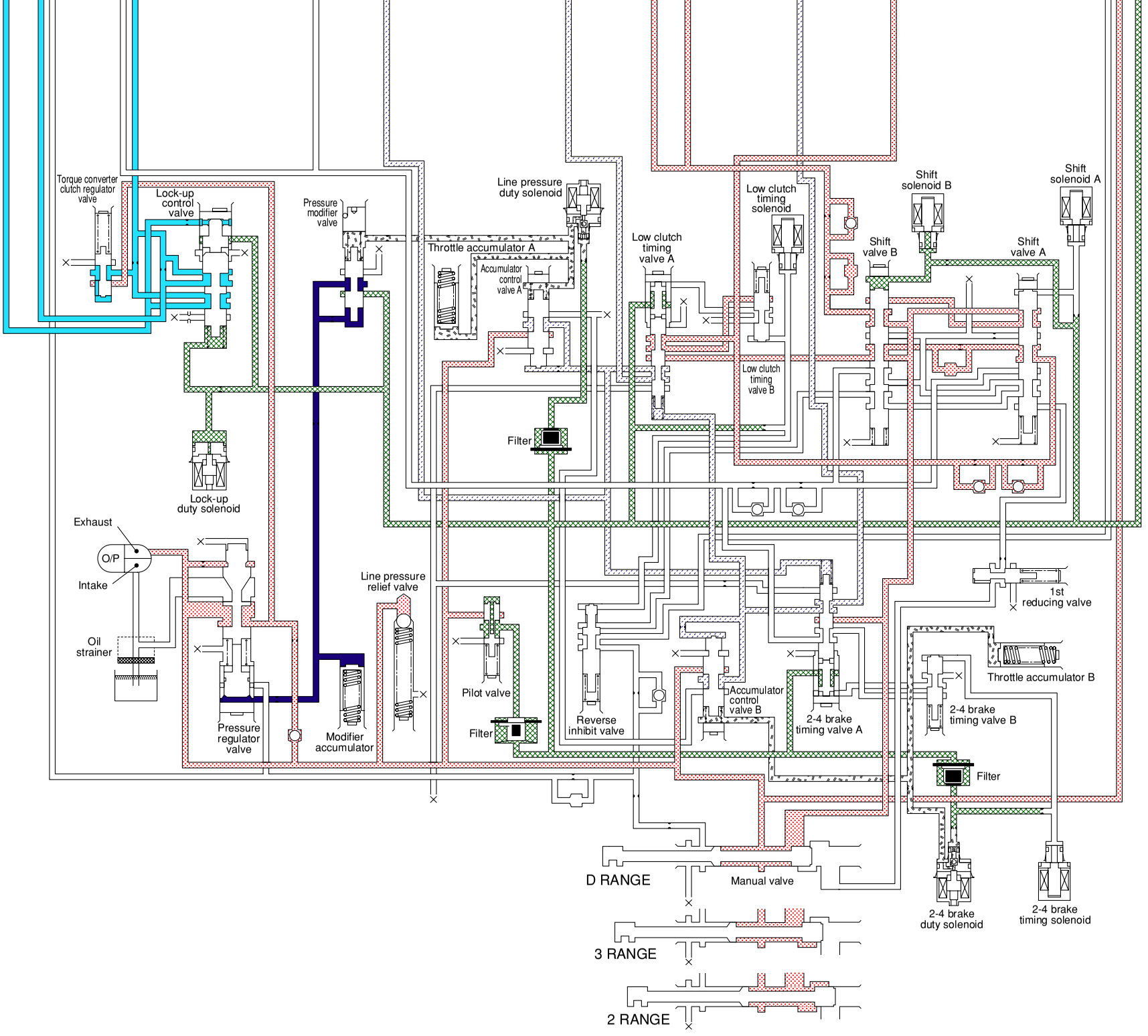

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
1st reducing valve
Throttle accumulator B
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
3 RANGE

B3H2102A

F: 2RD GEAR OF D, 3 AND 2 RANGES

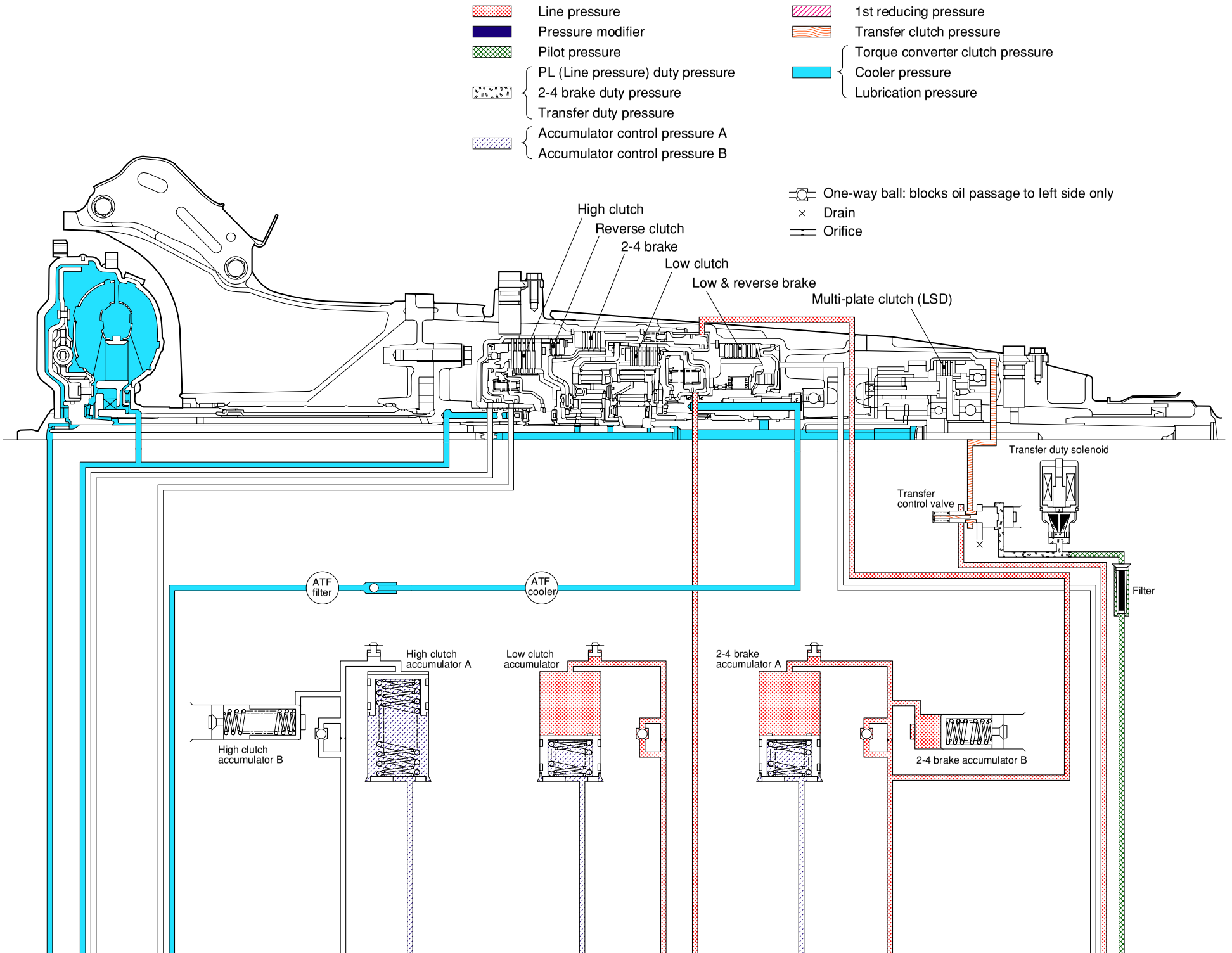
1. MPT MODELS

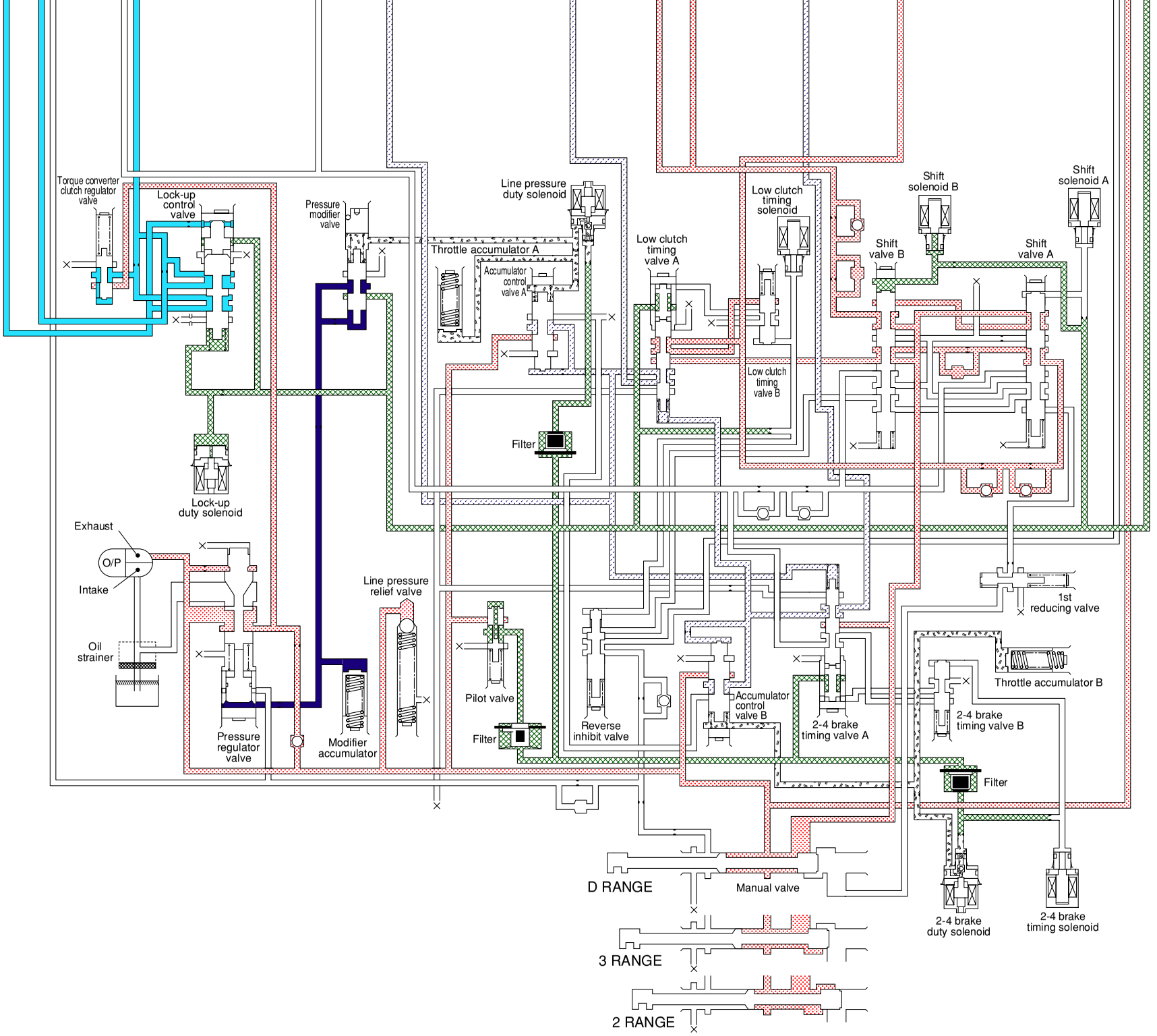



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2103A

2. VTD MODELS

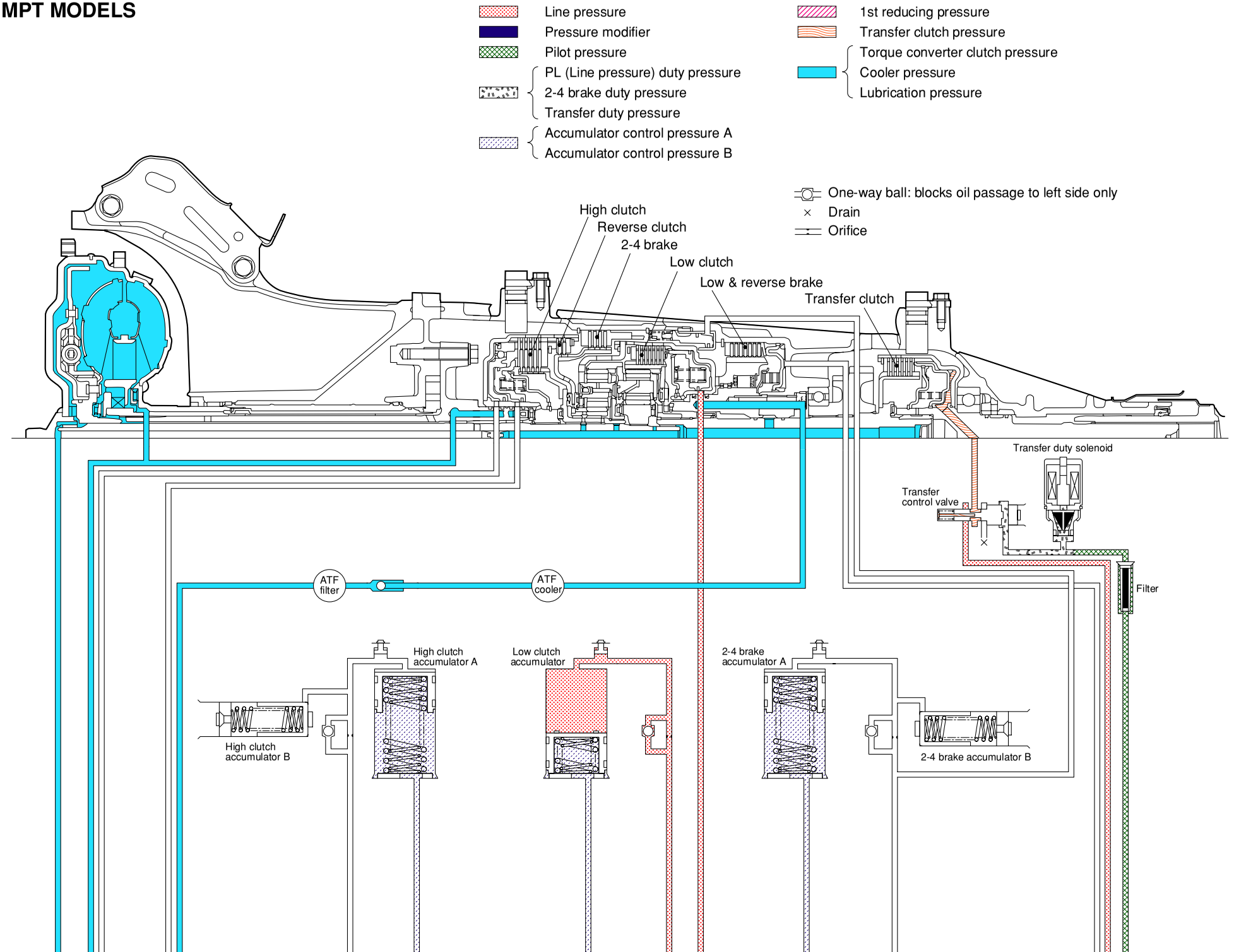

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

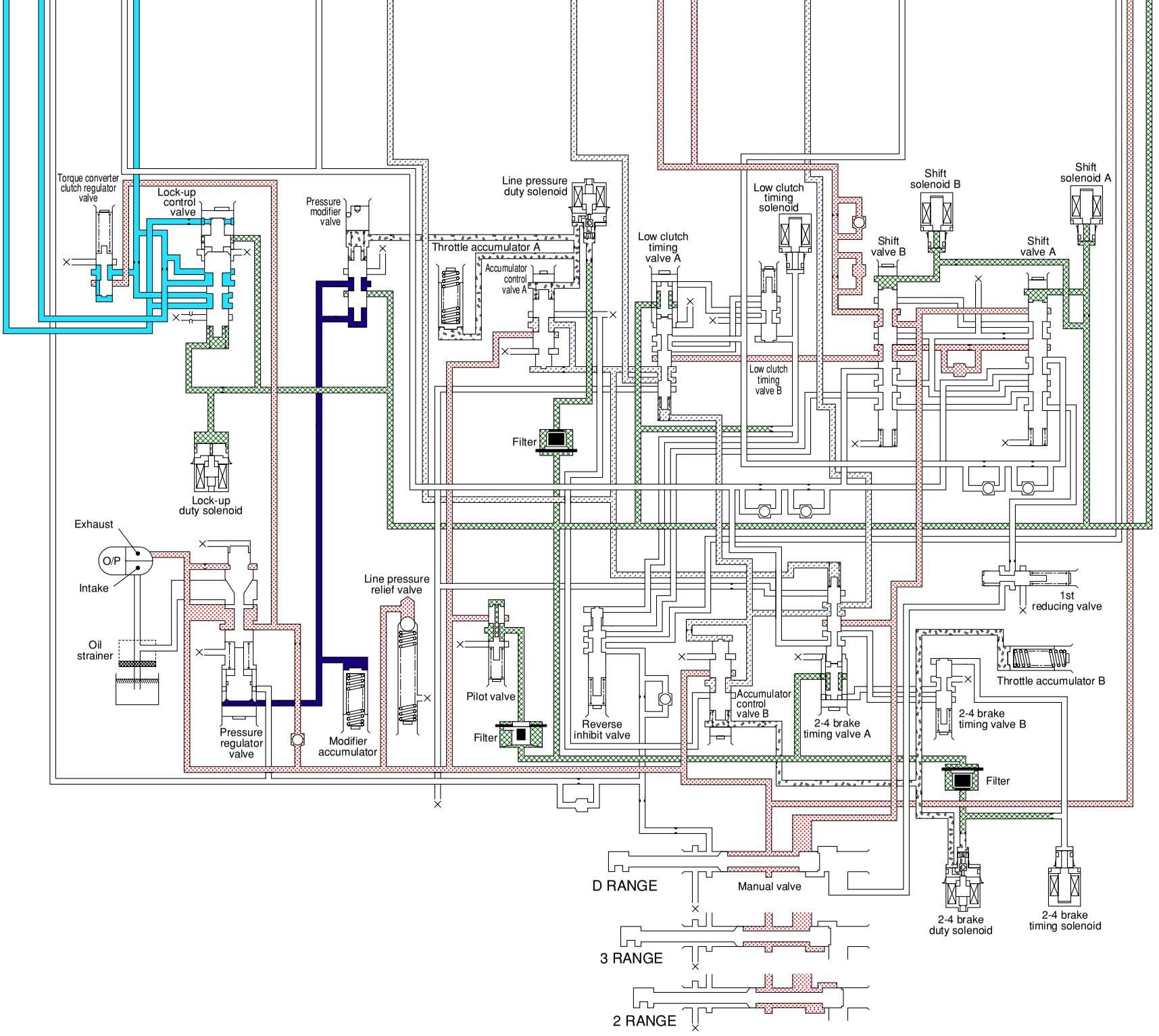

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2104A

G: 1ST GEAR OF D AND 3 RANGES

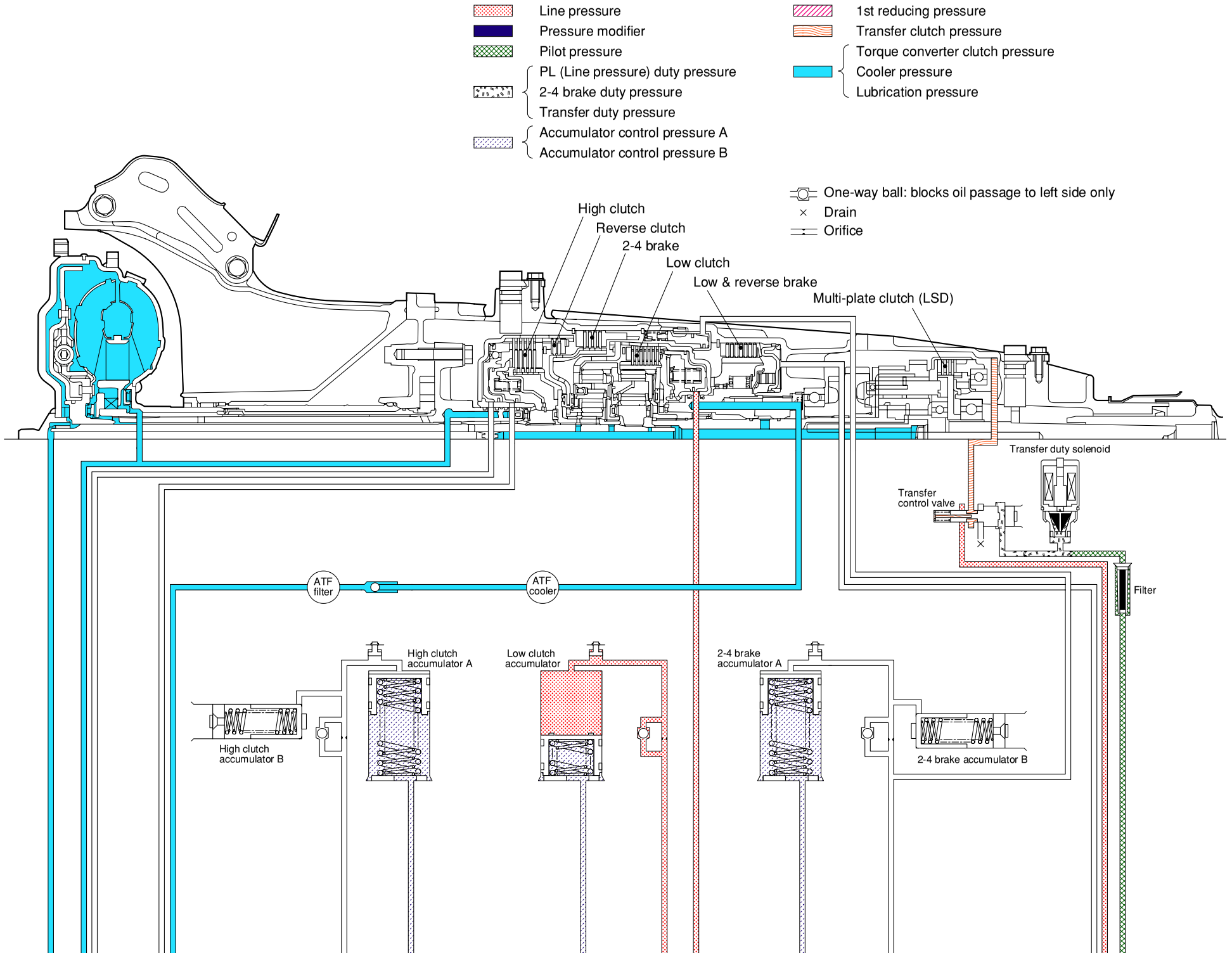
1. MPT MODELS

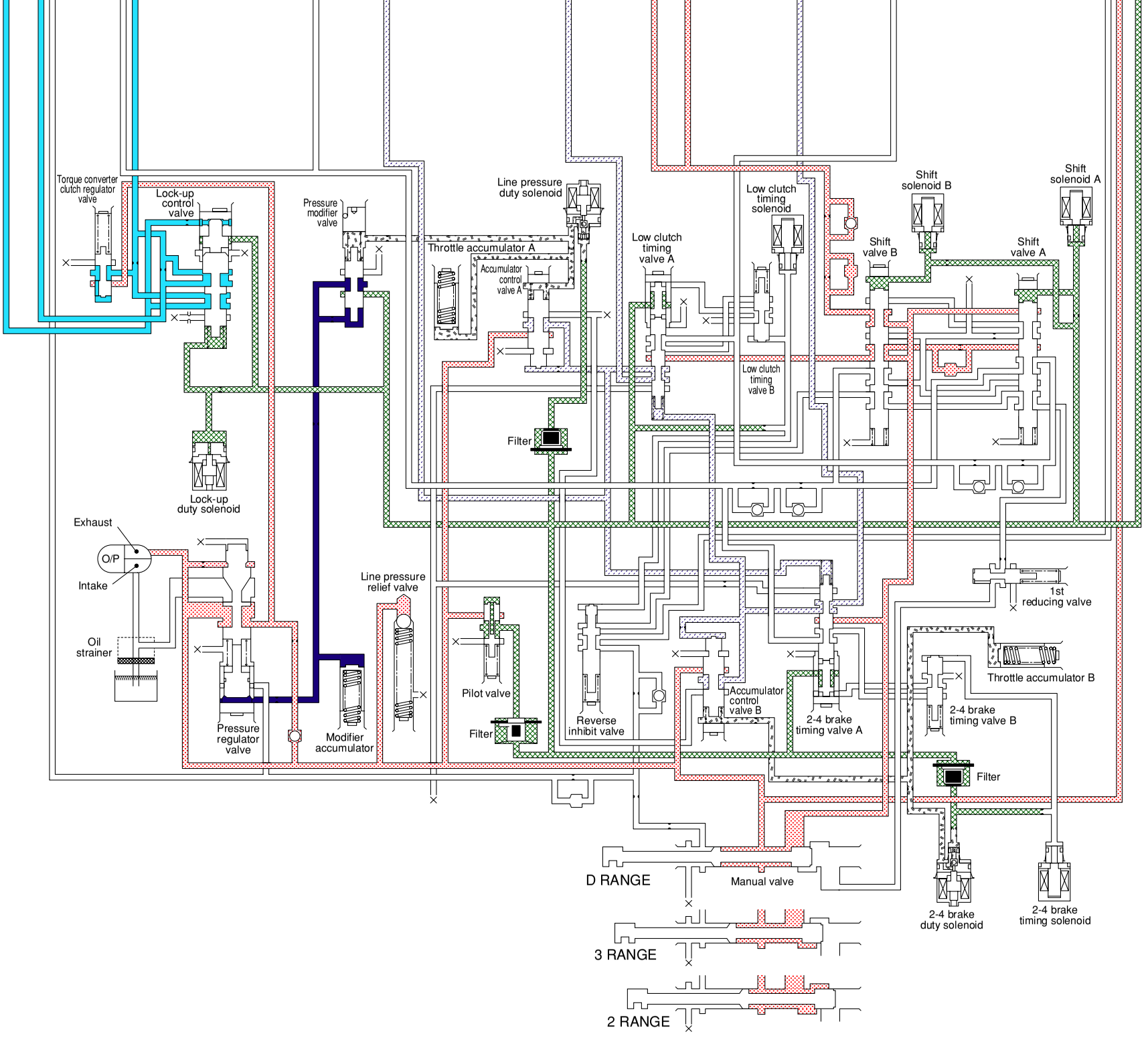



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pressure regulator valve
Modifier accumulator
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2105A

2. VTD MODELS

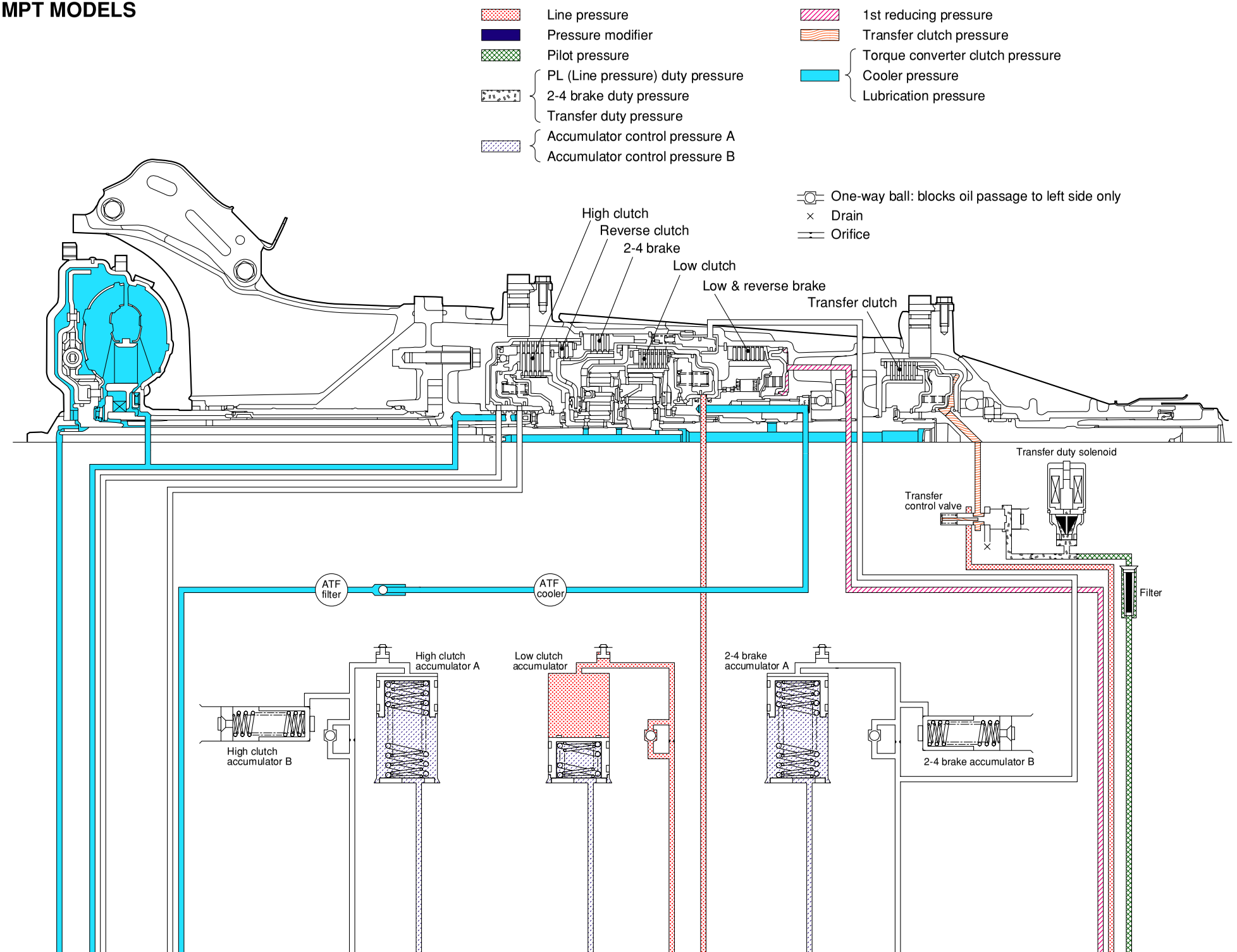

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
Filter
ATF filter
ATF cooler
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

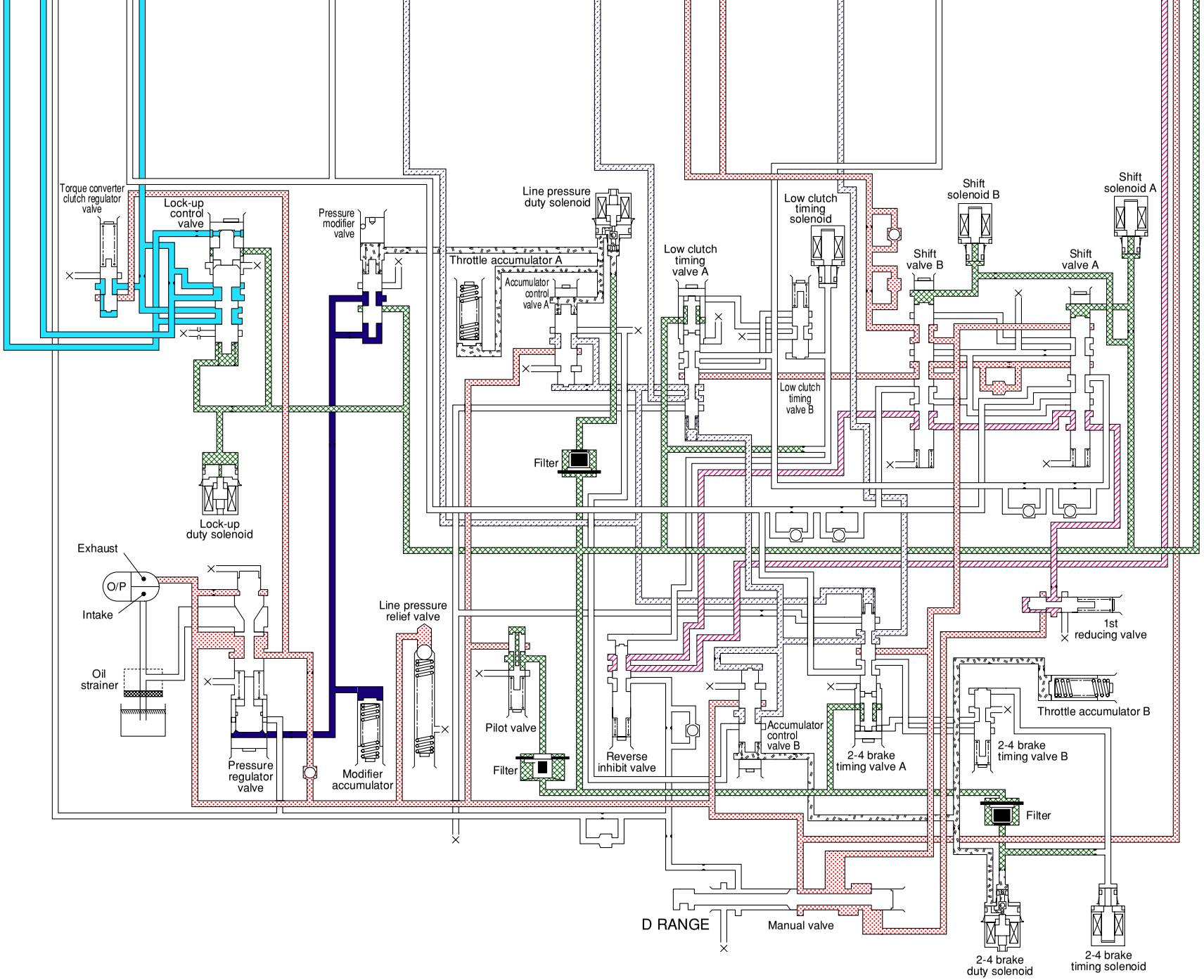

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2106A

H: 1ST GEAR OF 1 RANGE

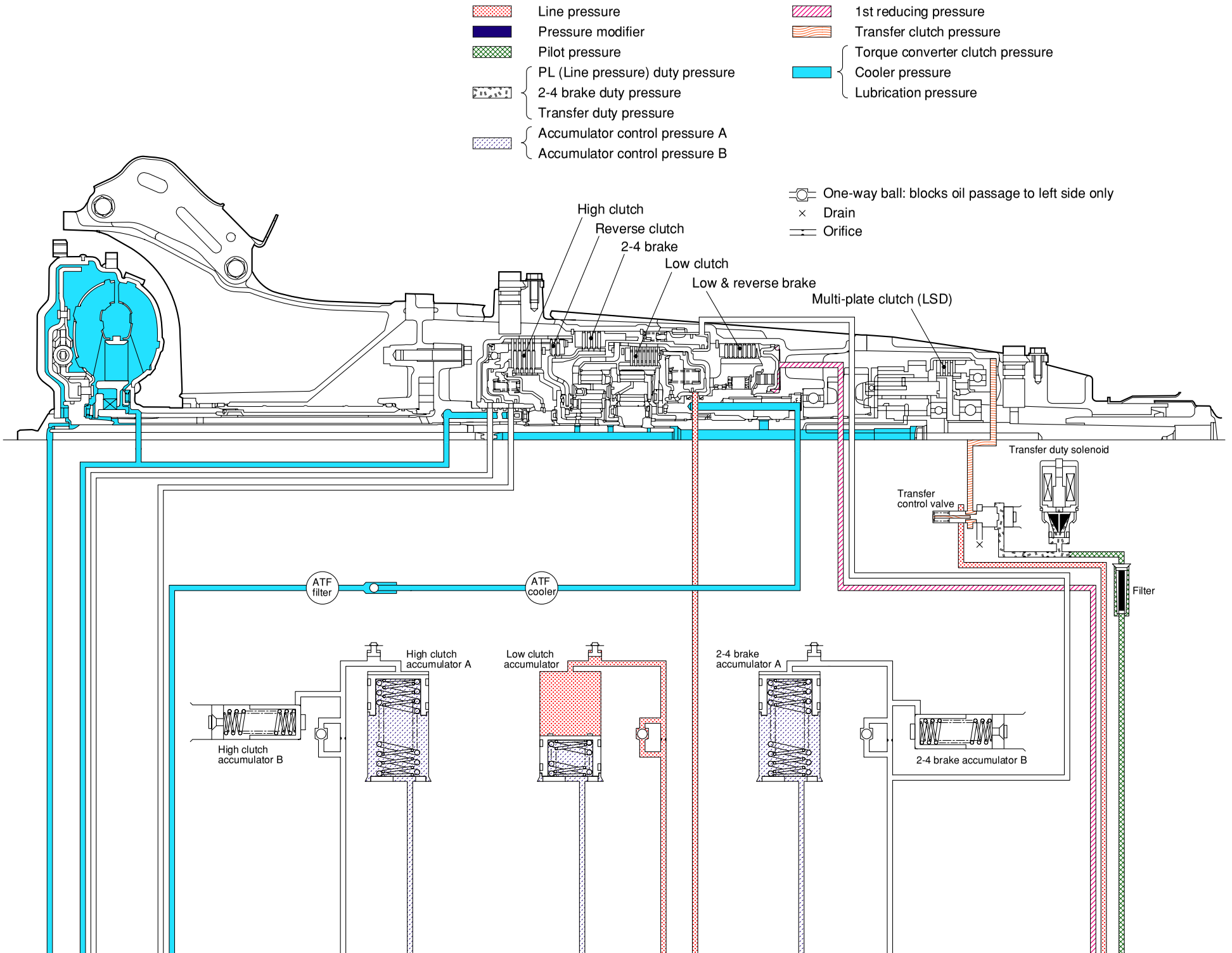
1. MPT MODELS

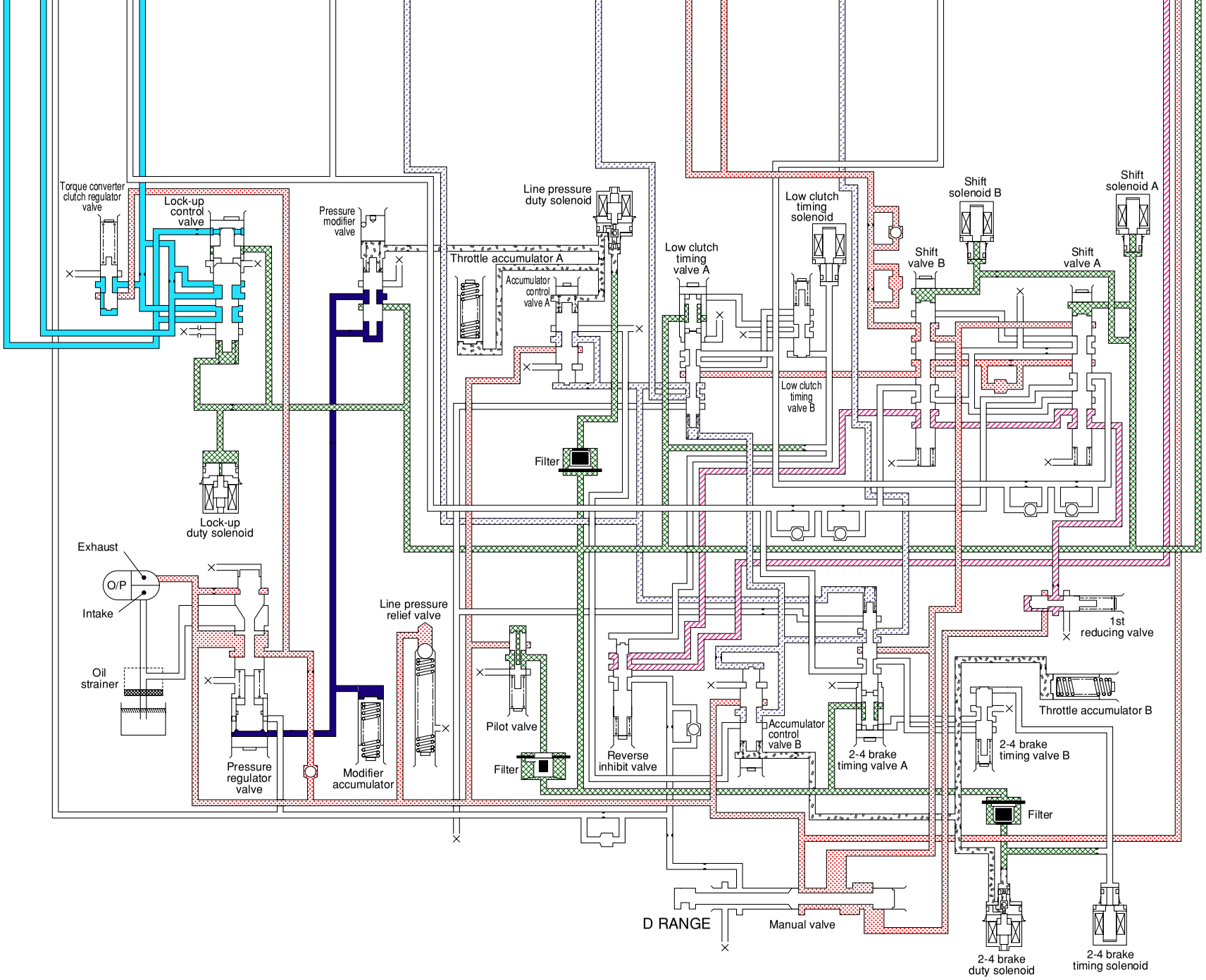



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Low clutch timing valve B
Shift valve B
Shift solenoid B
Shift valve A
Shift solenoid A
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2107A

2. VTD MODELS


Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

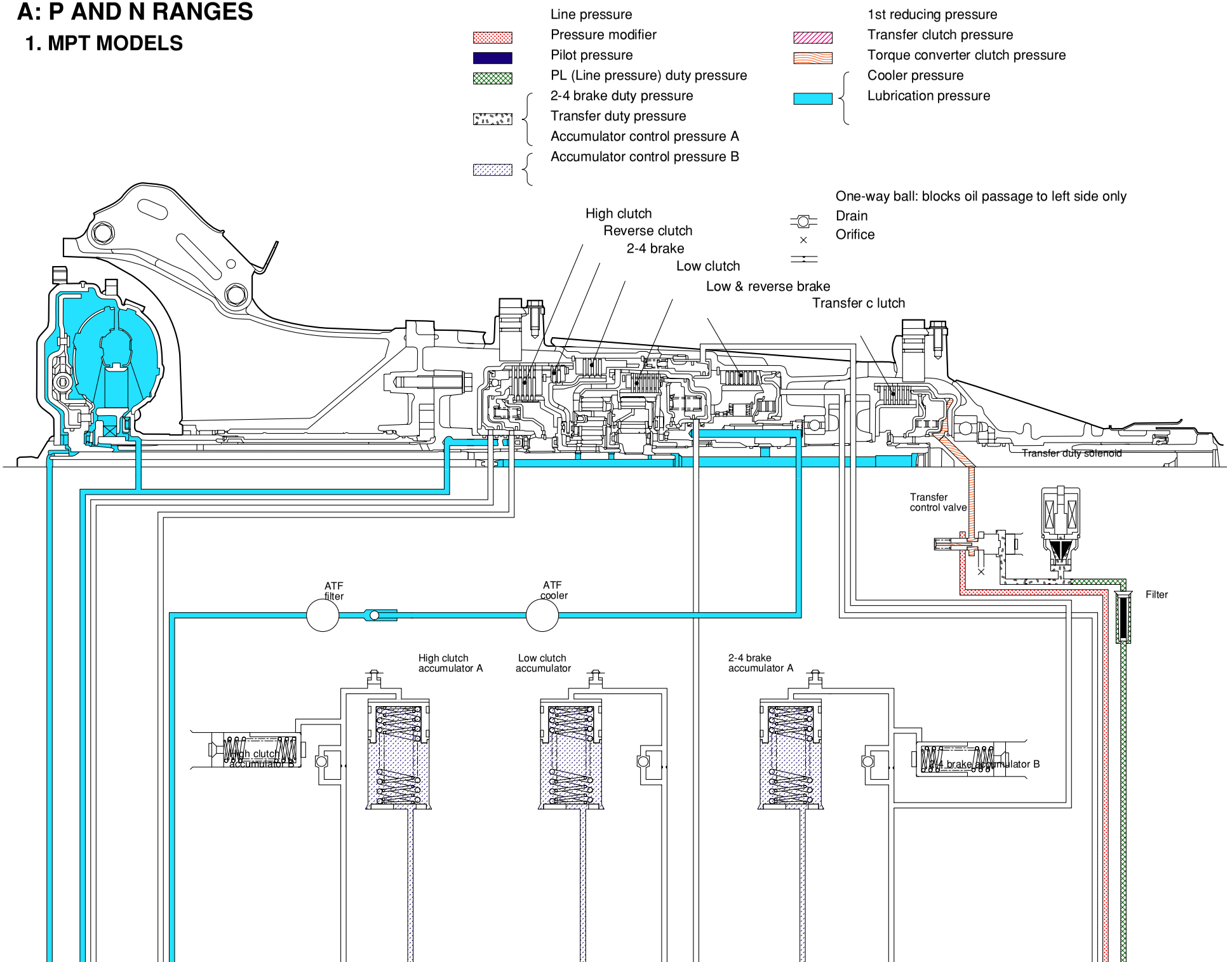

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
1st reducing valve
Throttle accumulator B
Pressure regulator valve
Modifier accumulator
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

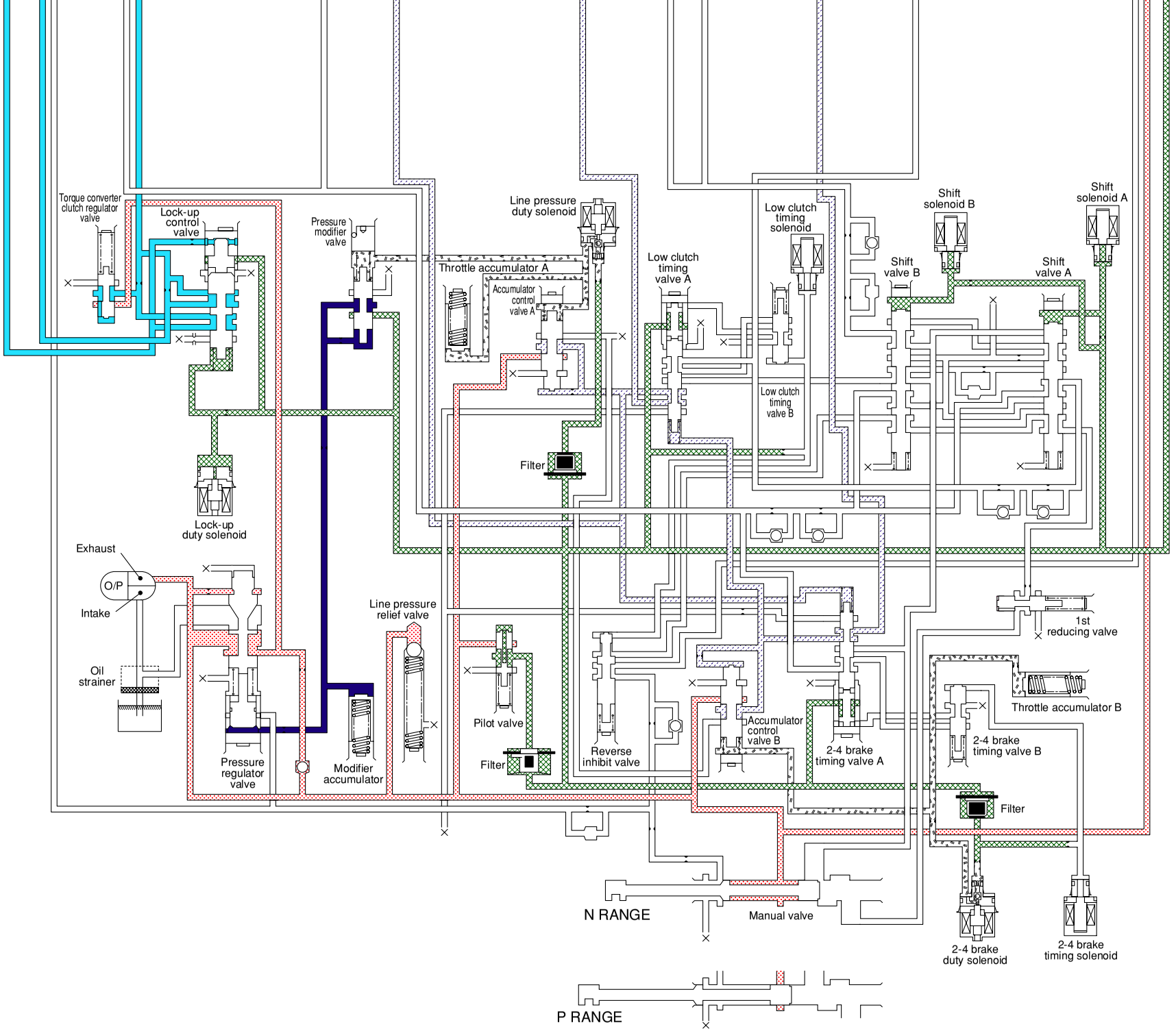
B3H2108A

1 0. Schematic Drawing

A: P AND N RANGES

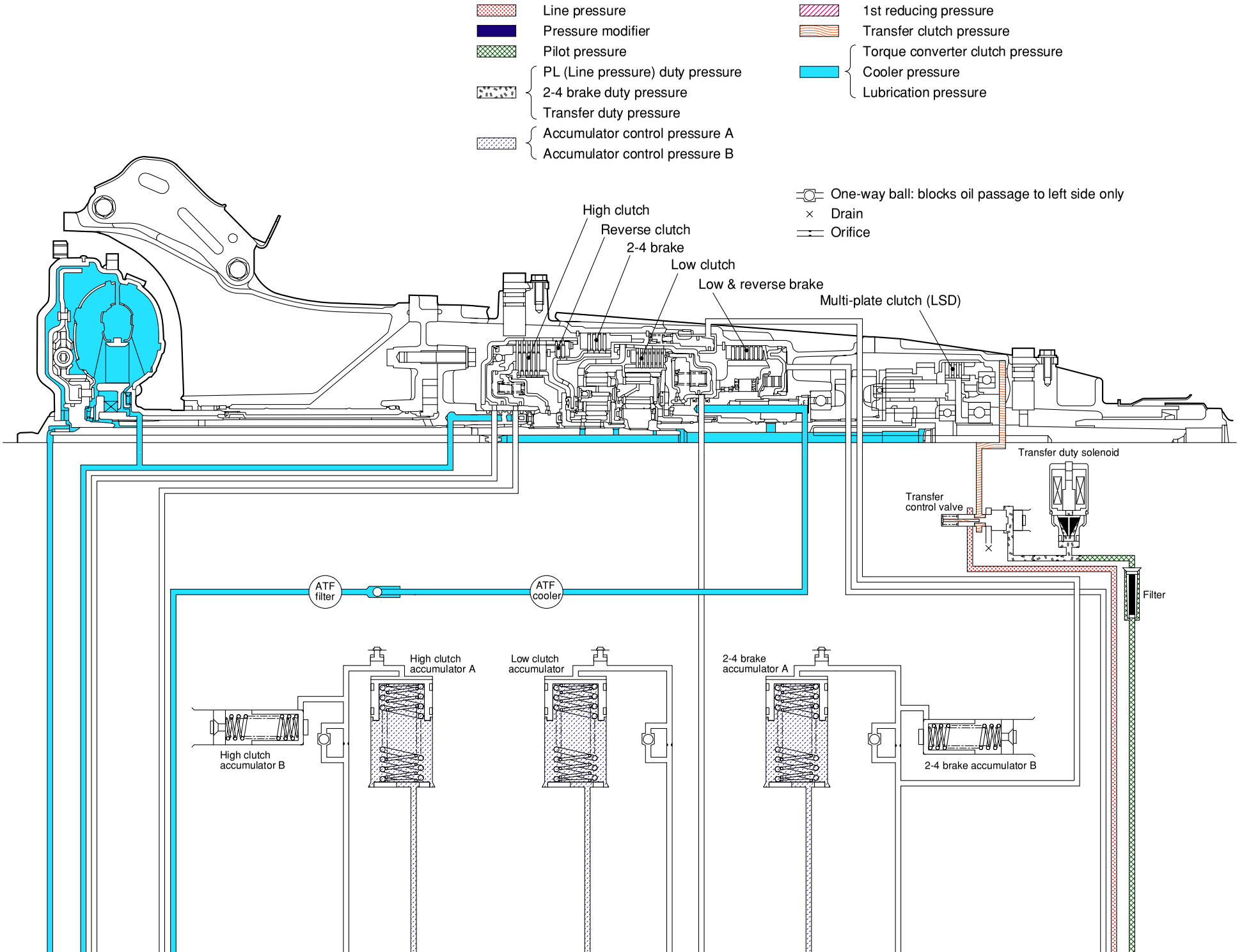
1. MPT MODELS

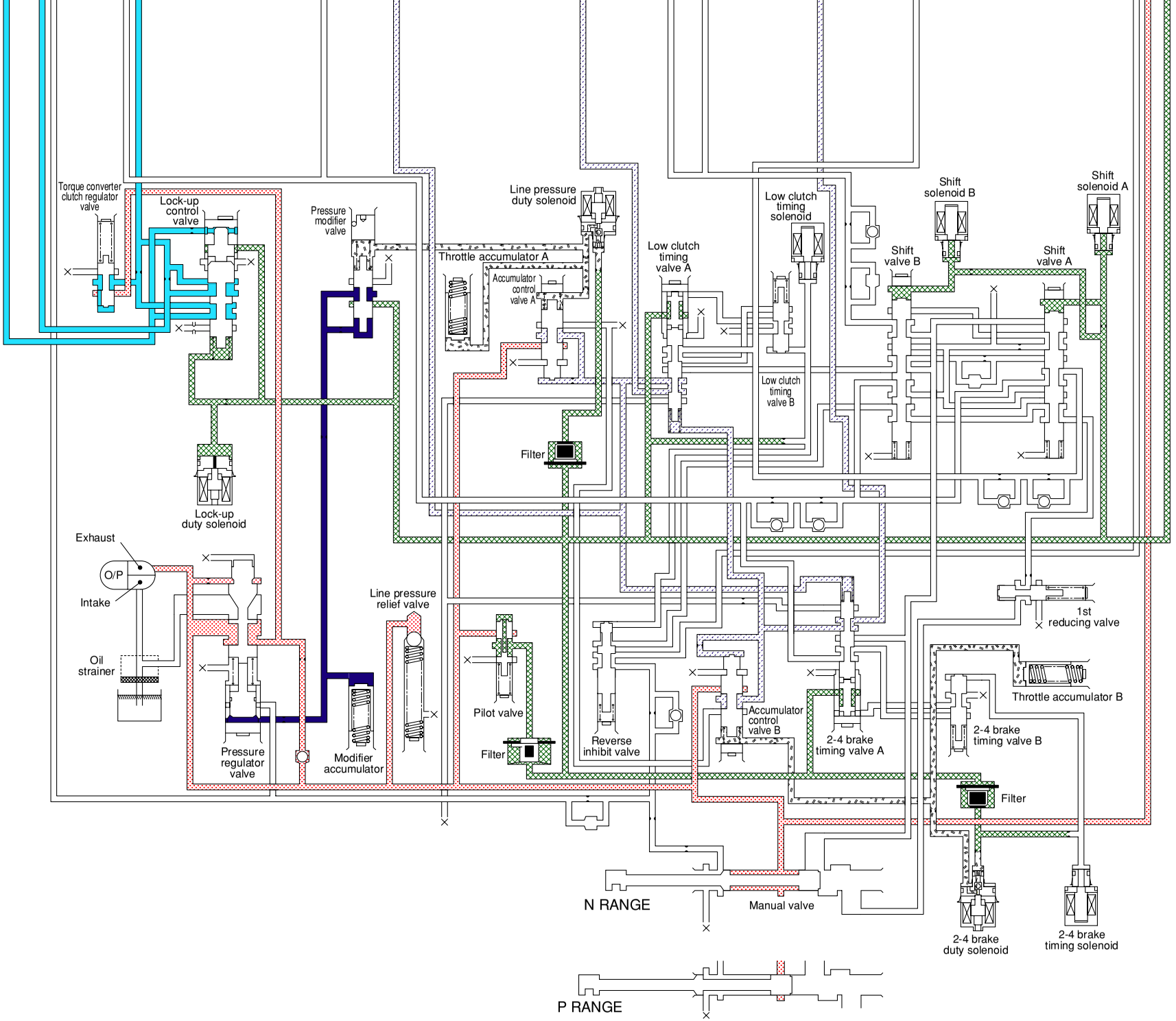



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Low clutch timing valve B
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
N RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
P RANGE

B3H2093A

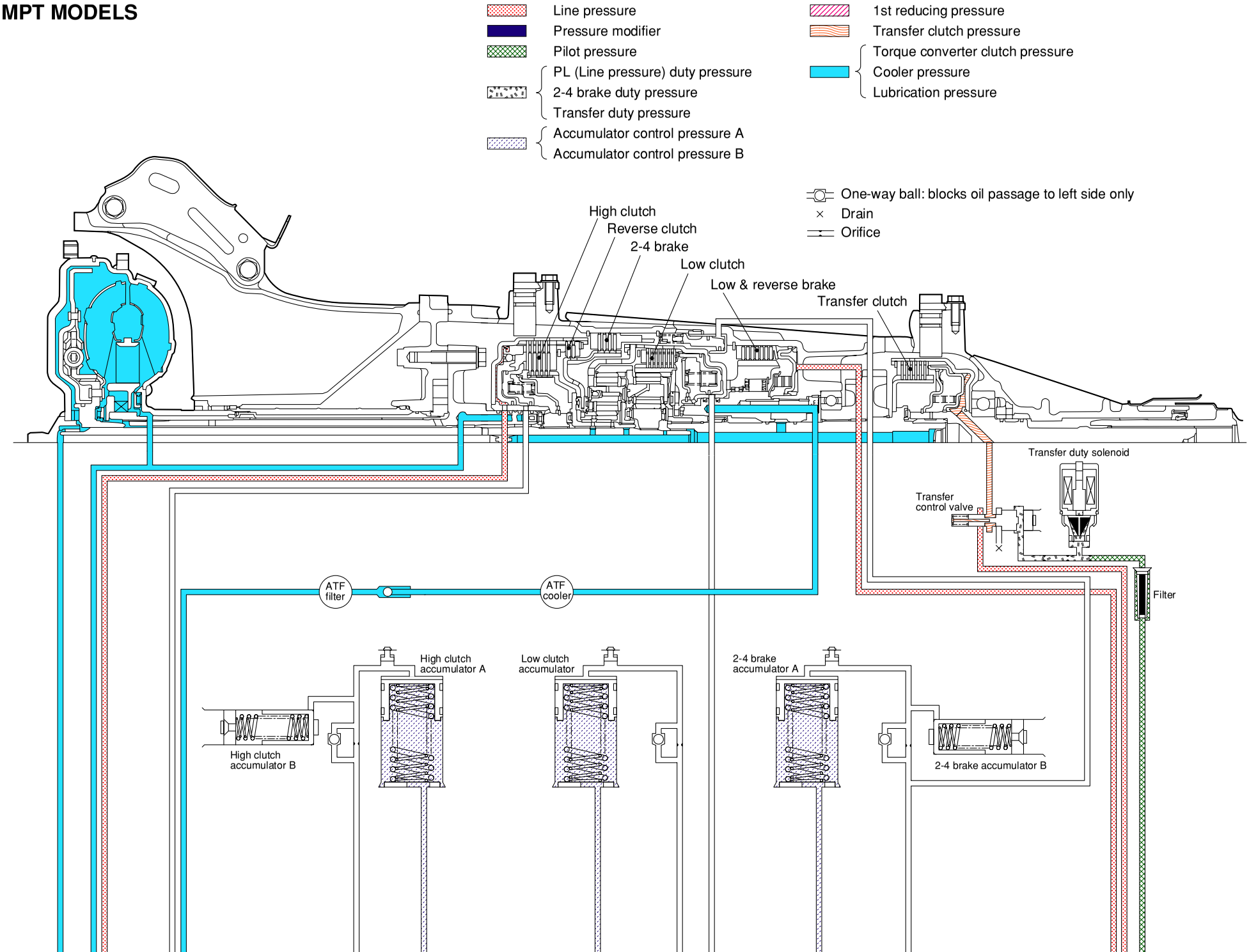
2. VTD MODELS

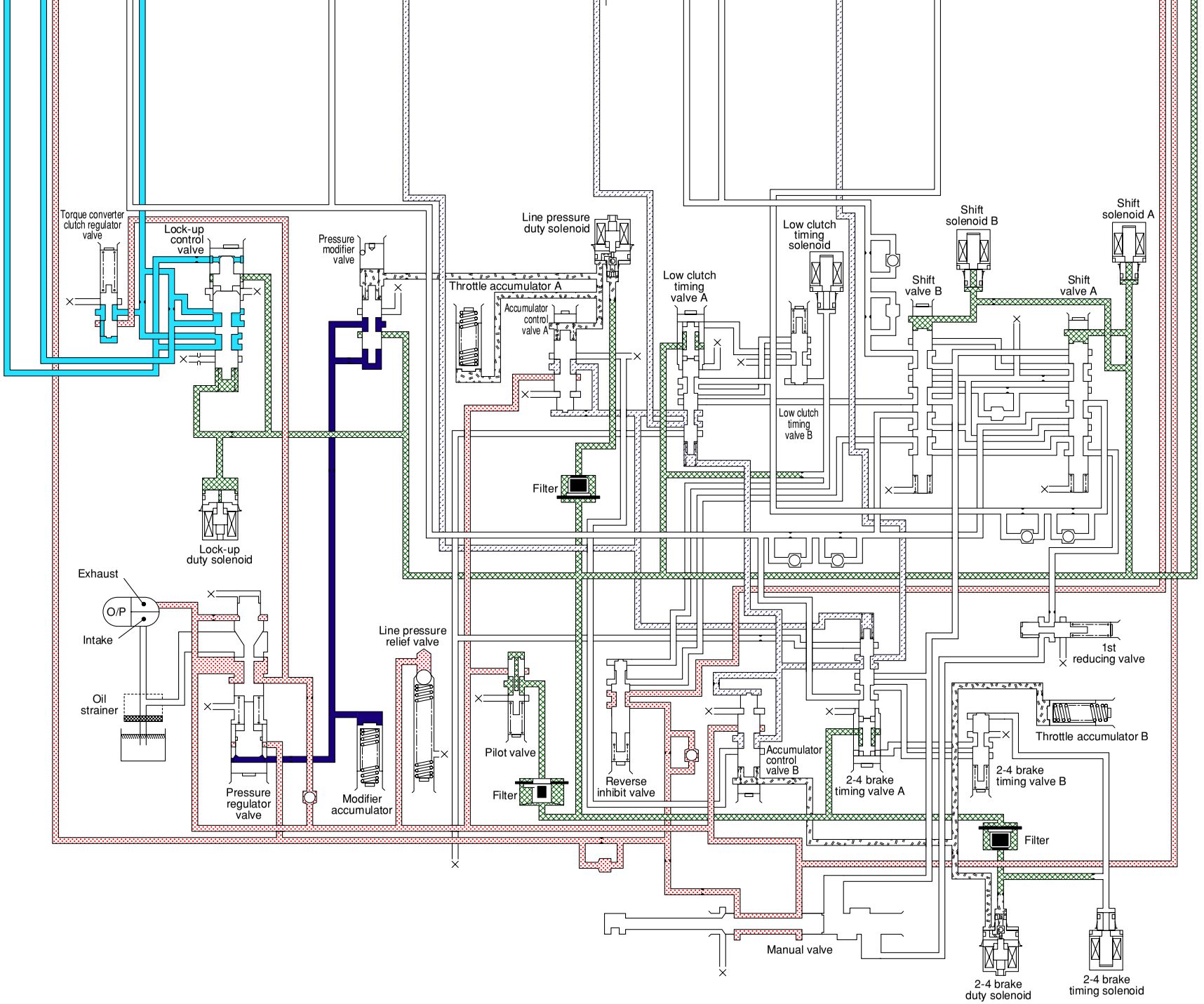

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B


Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
N RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
P RANGE

B3H2094A

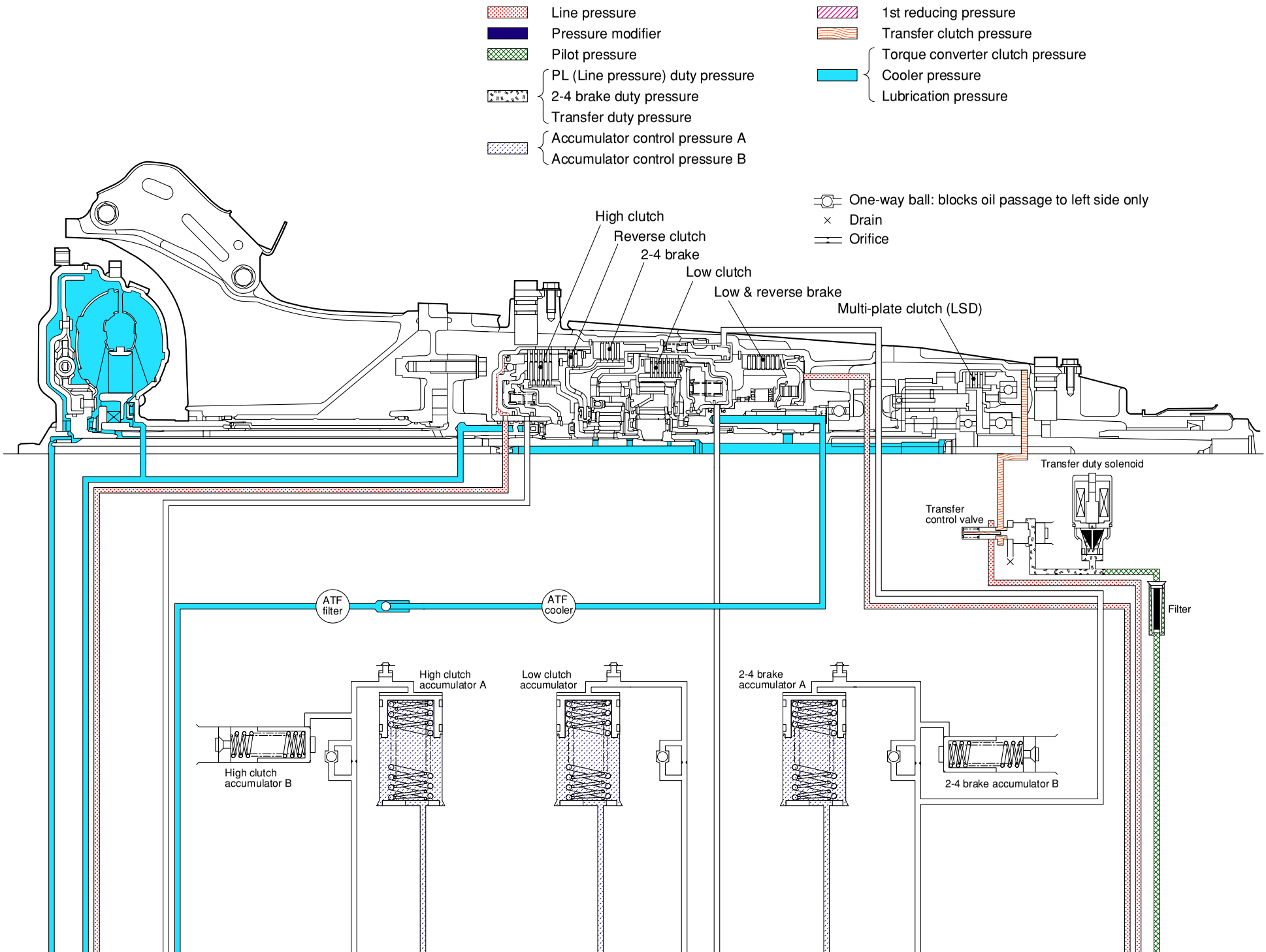
1. MPT MODELS

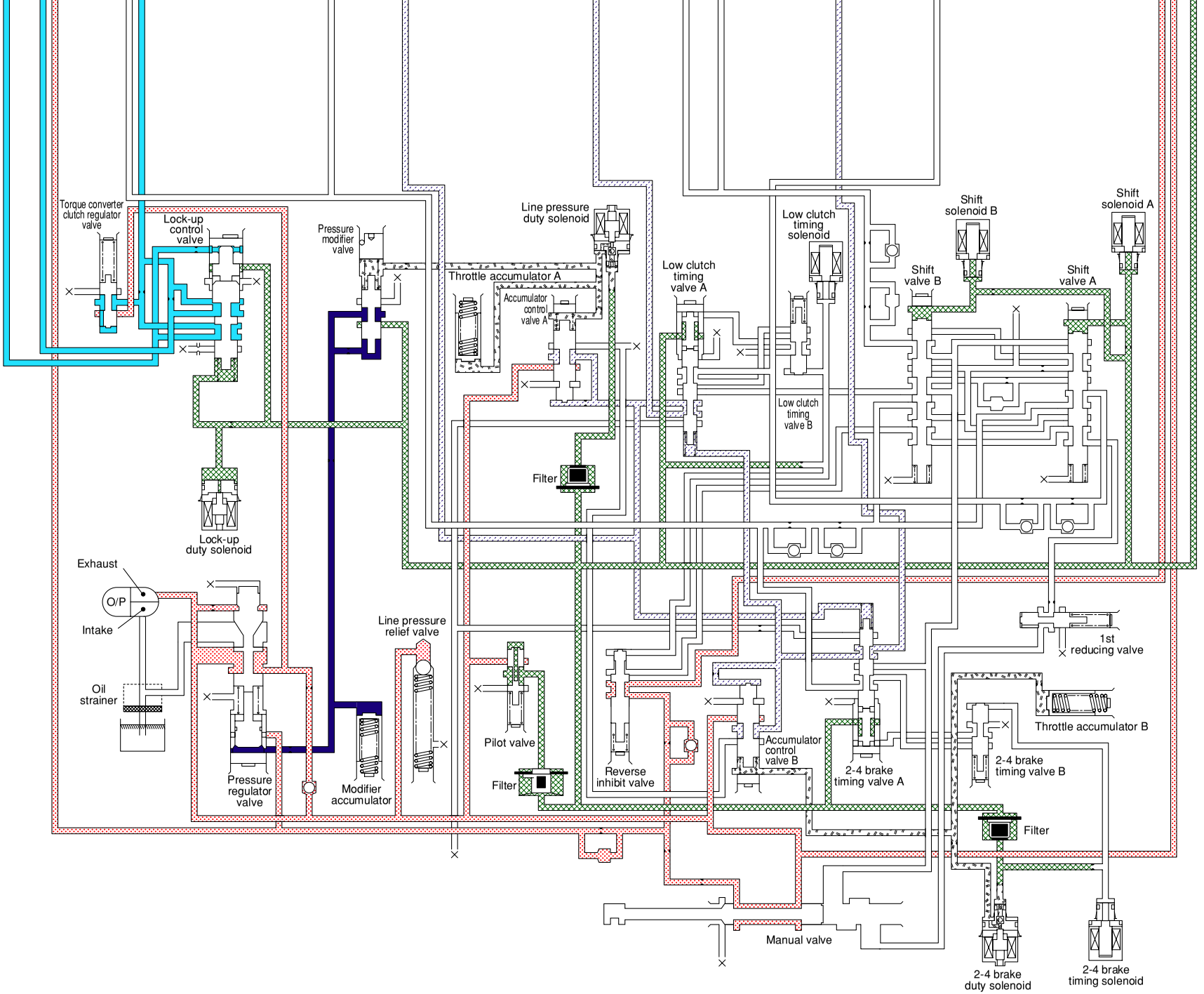

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Transfer clutch
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B


Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Low clutch timing valve B
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2095A

2. VTD MODELS

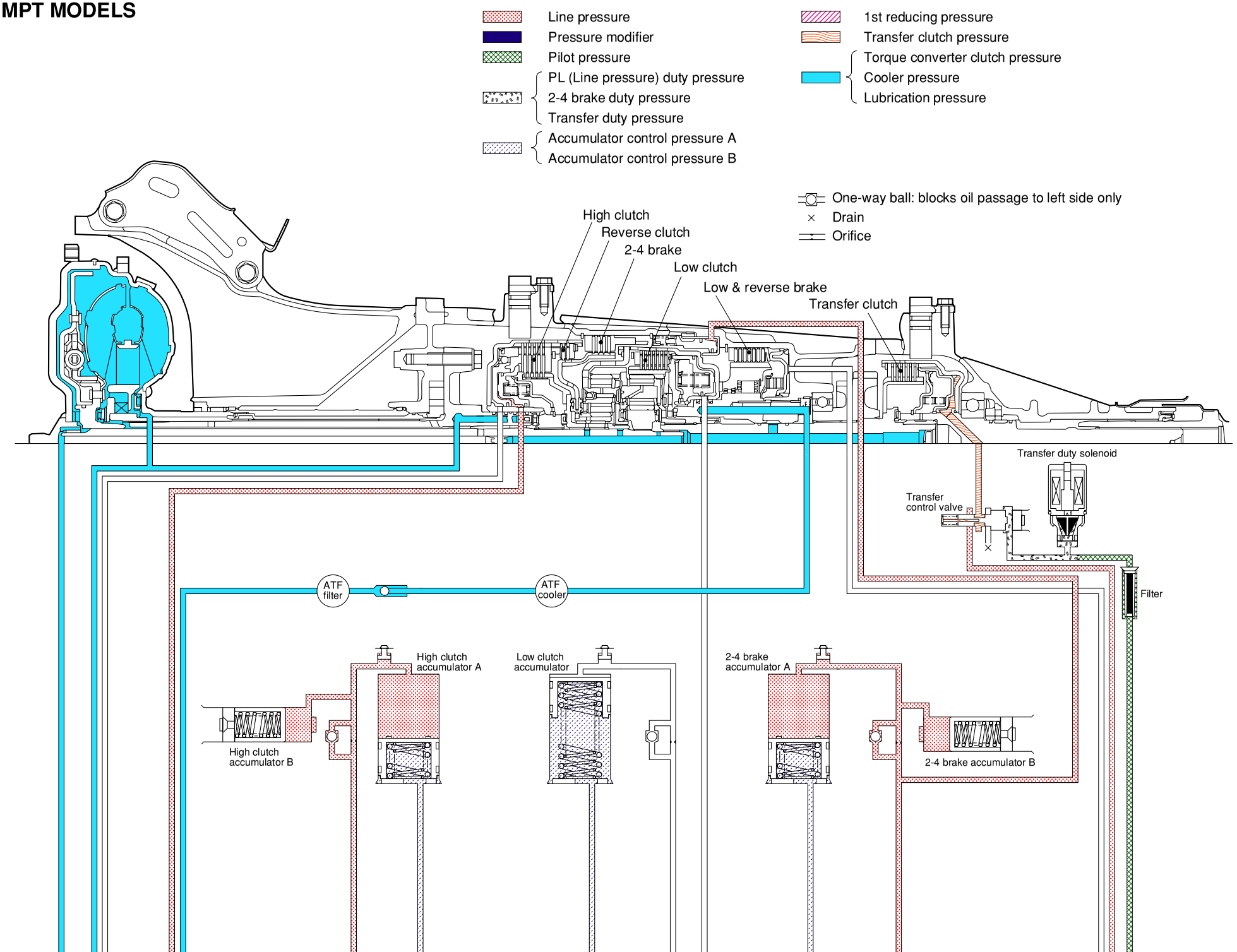

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B

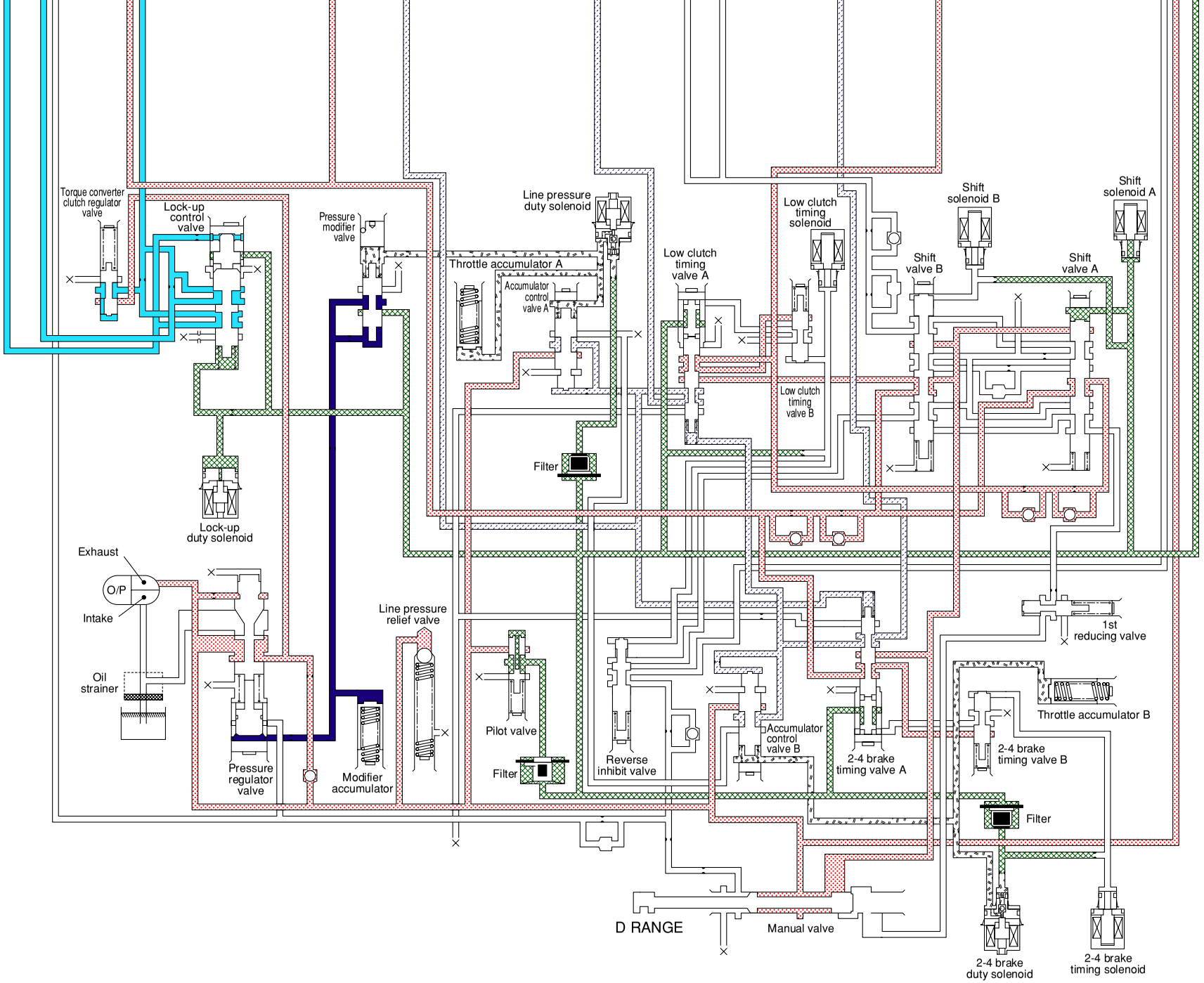

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2096A

C: 4TH GEAR OF D RANGE (LOCK-UP OFF)

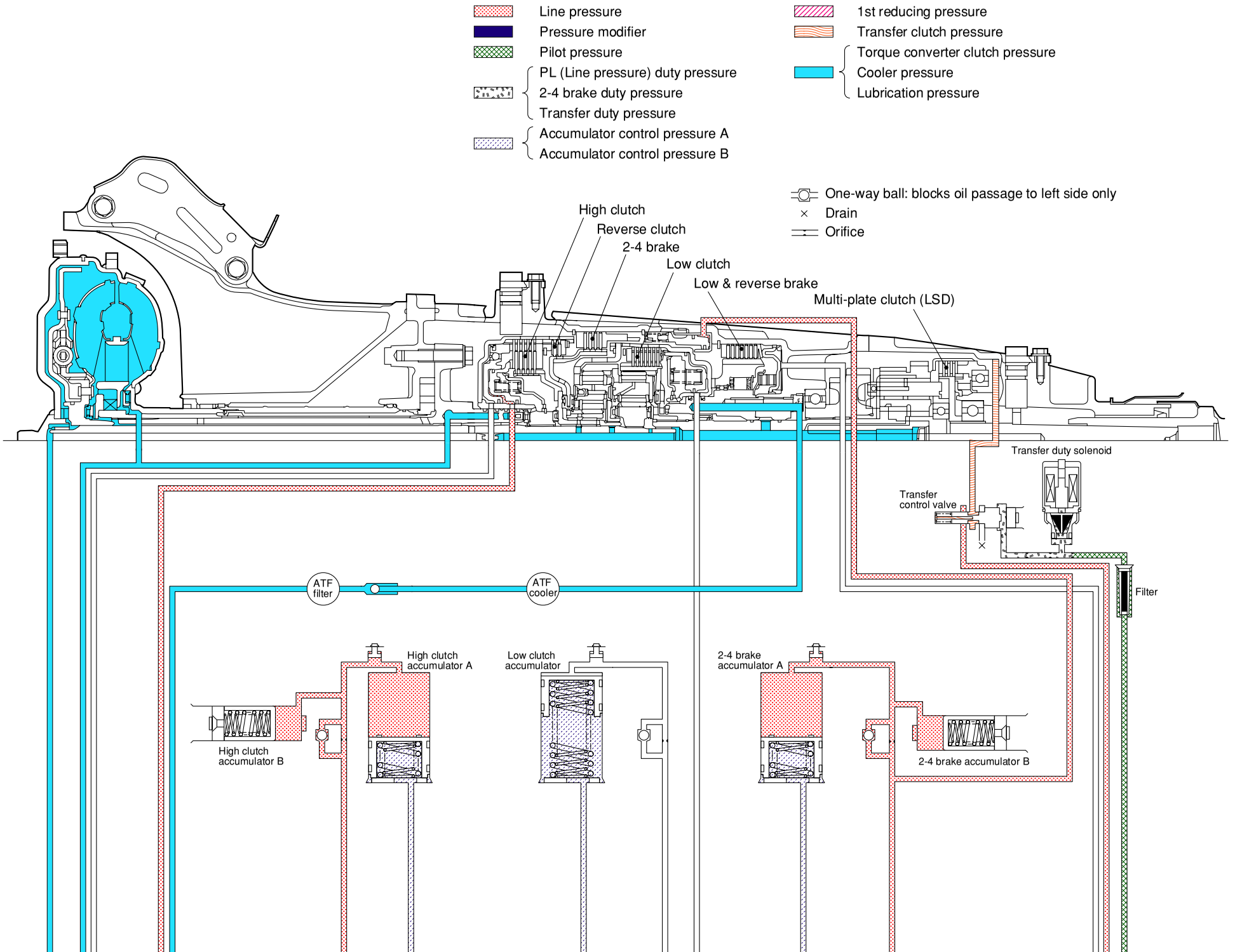
1. MPT MODELS

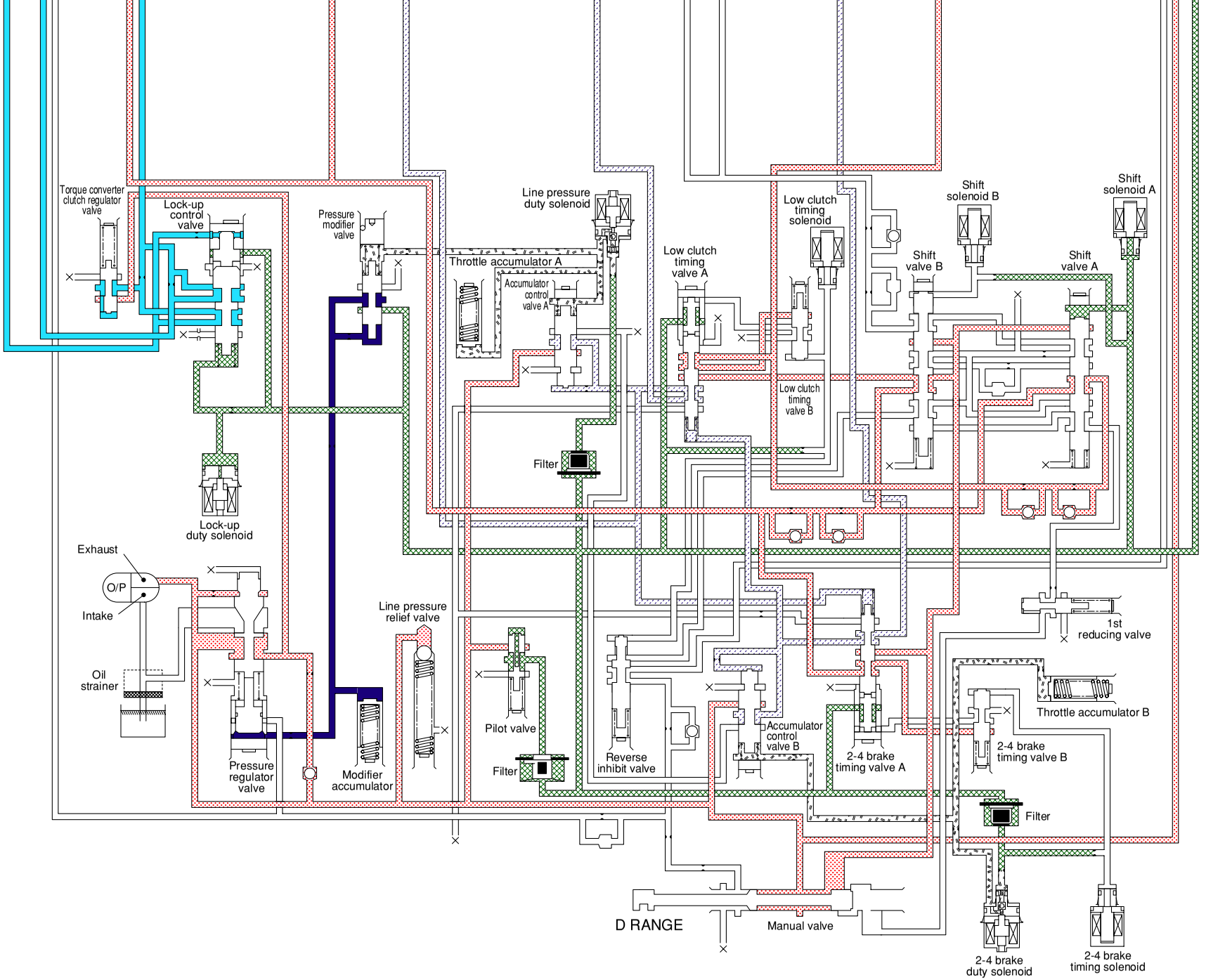



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
1st reducing valve
Throttle accumulator B
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2097A

2. VTD MODELS

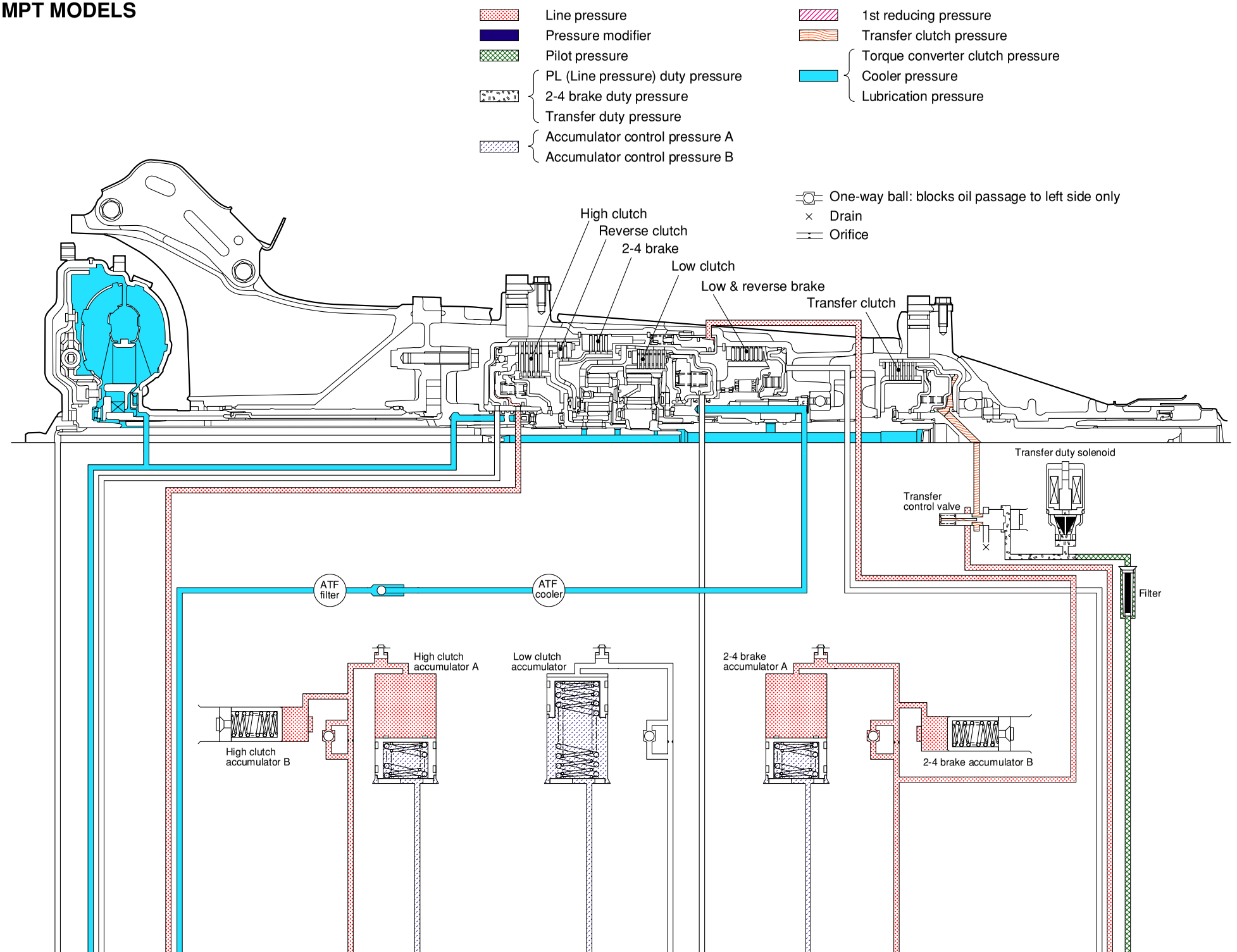

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

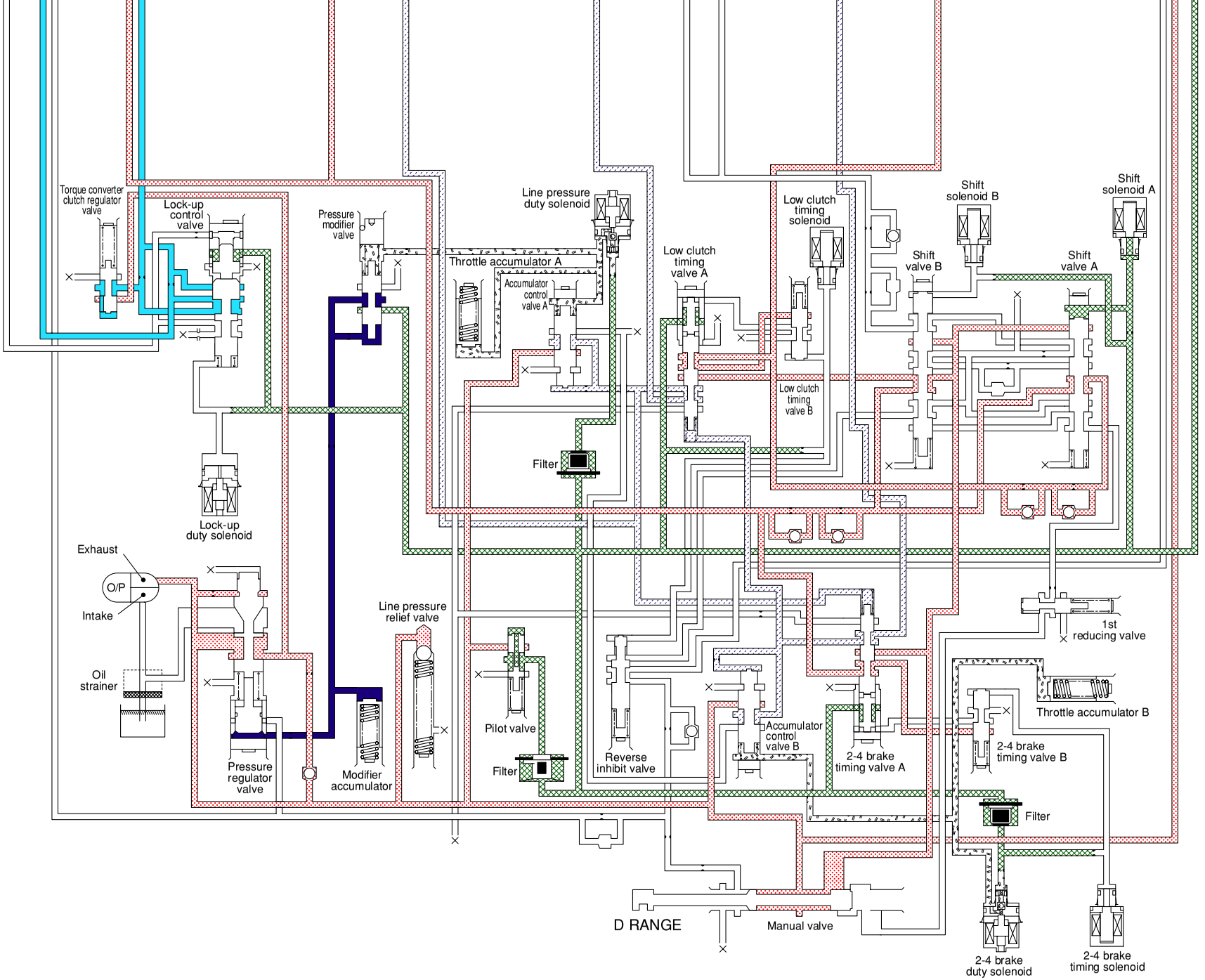

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2098A

D: 4TH GEAR OF D RANGE (LOCK-UP ON)

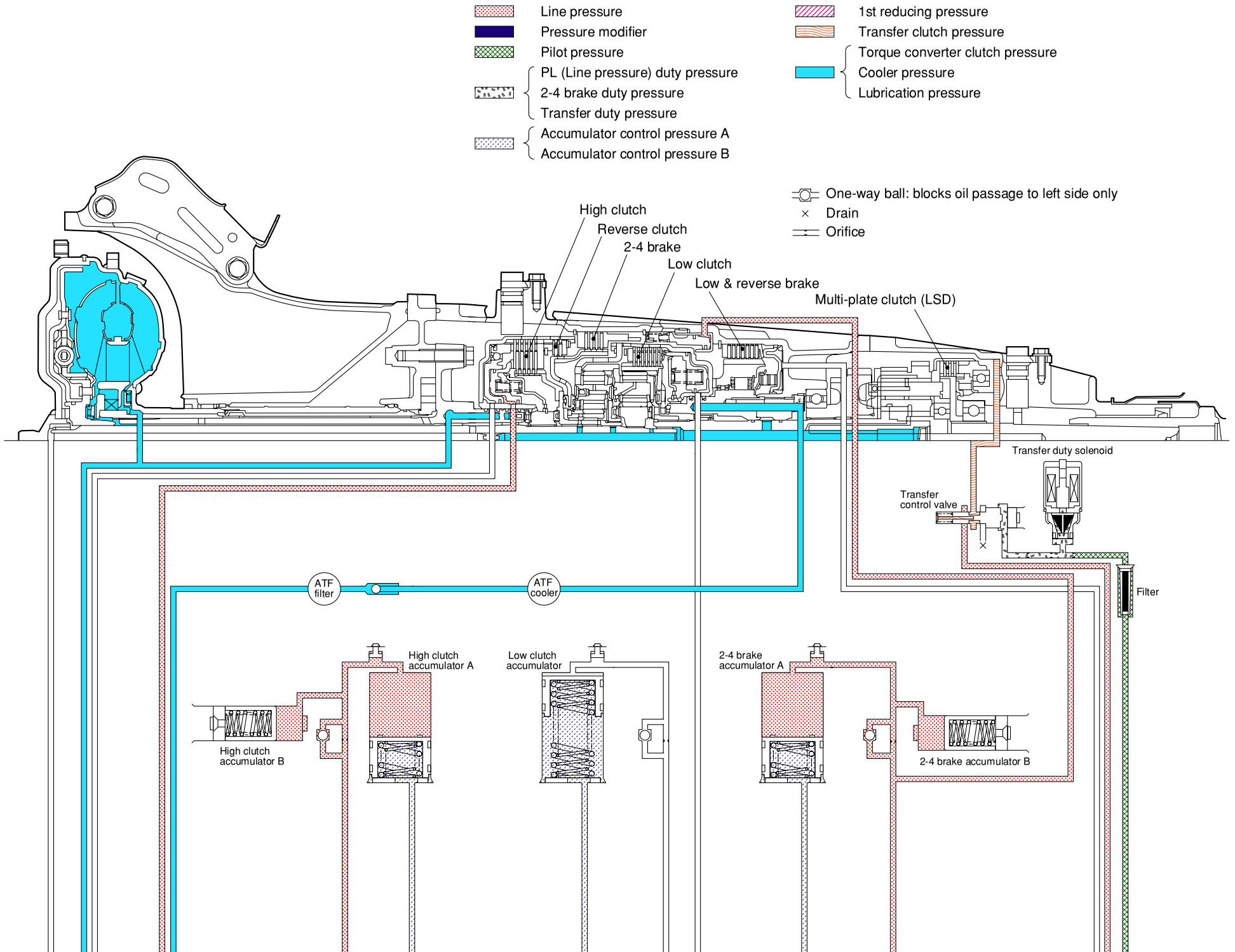
1. MPT MODELS

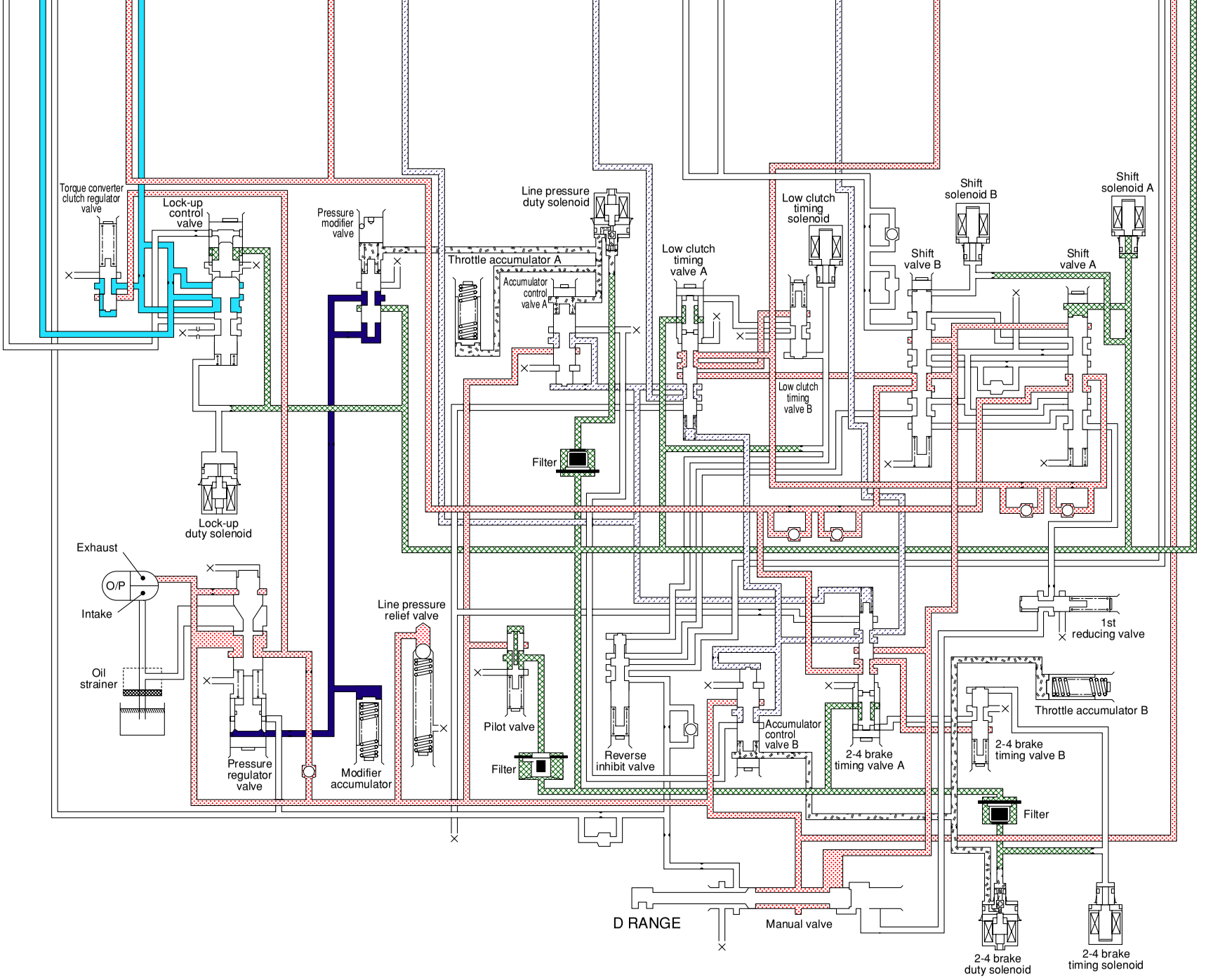



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2099A

2. VTD MODELS

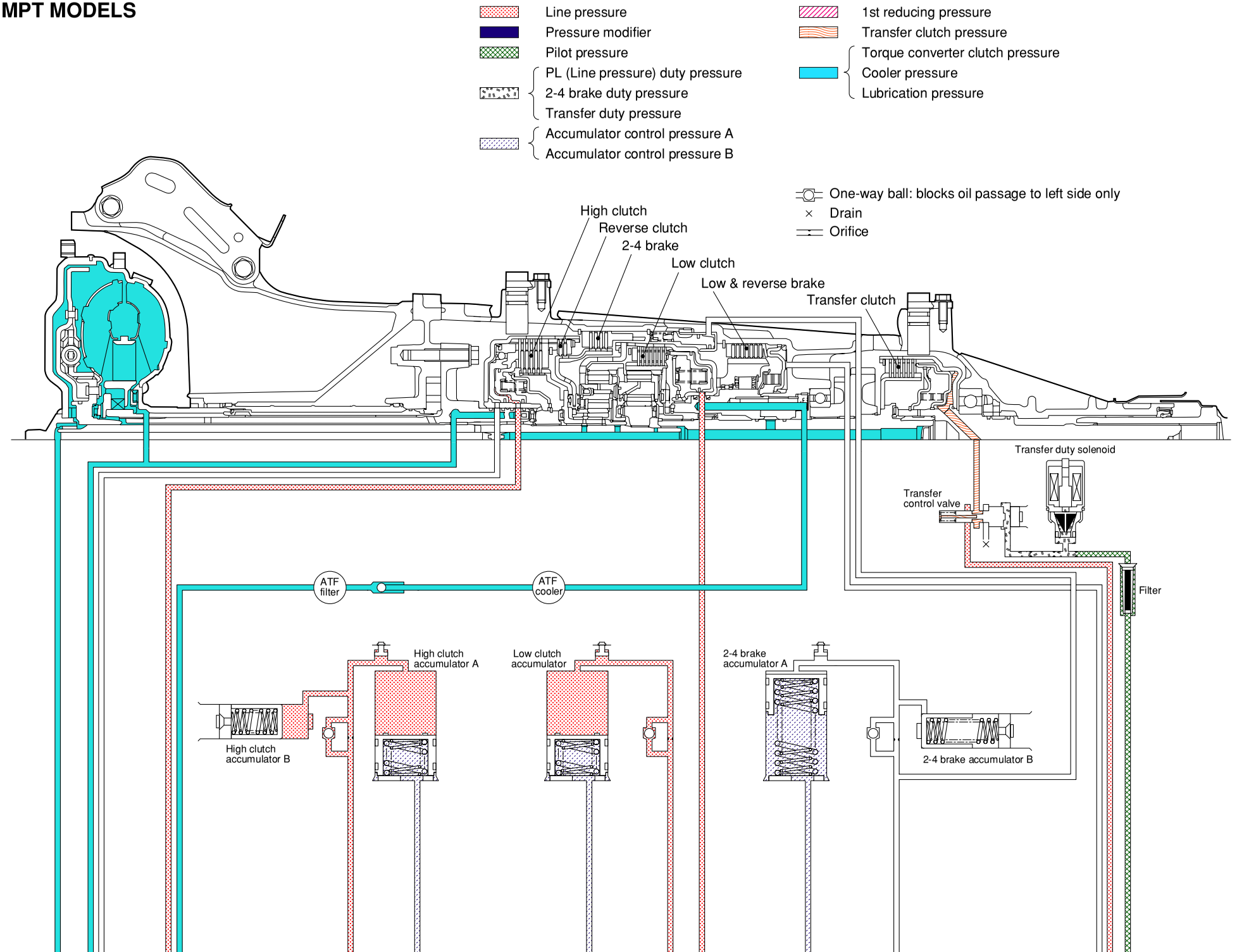

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
Low clutch accumulator
2-4 brake accumulator A
High clutch accumulator B
2-4 brake accumulator B

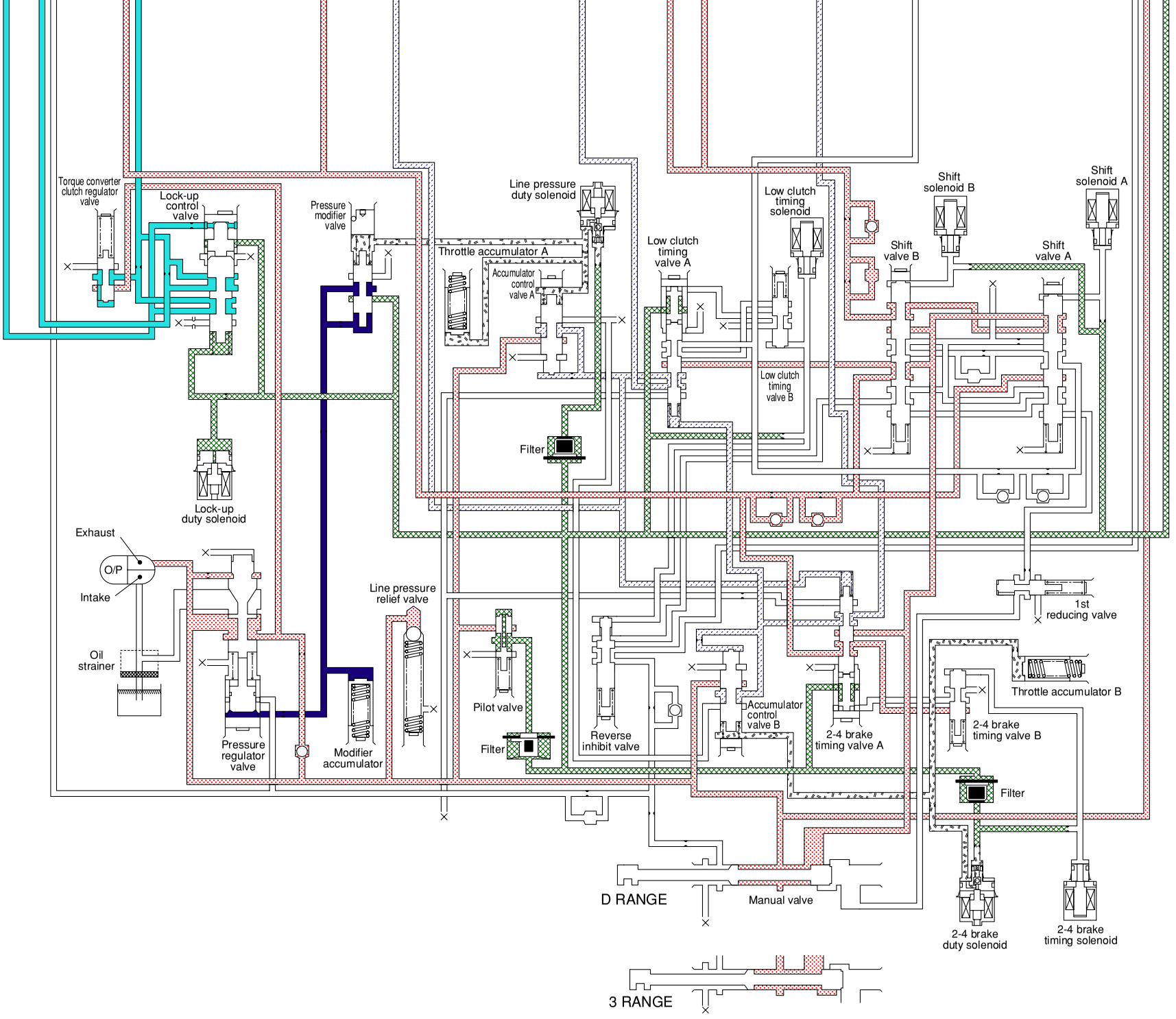

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2100A

E: 3RD GEAR OF D AND 3 RANGES

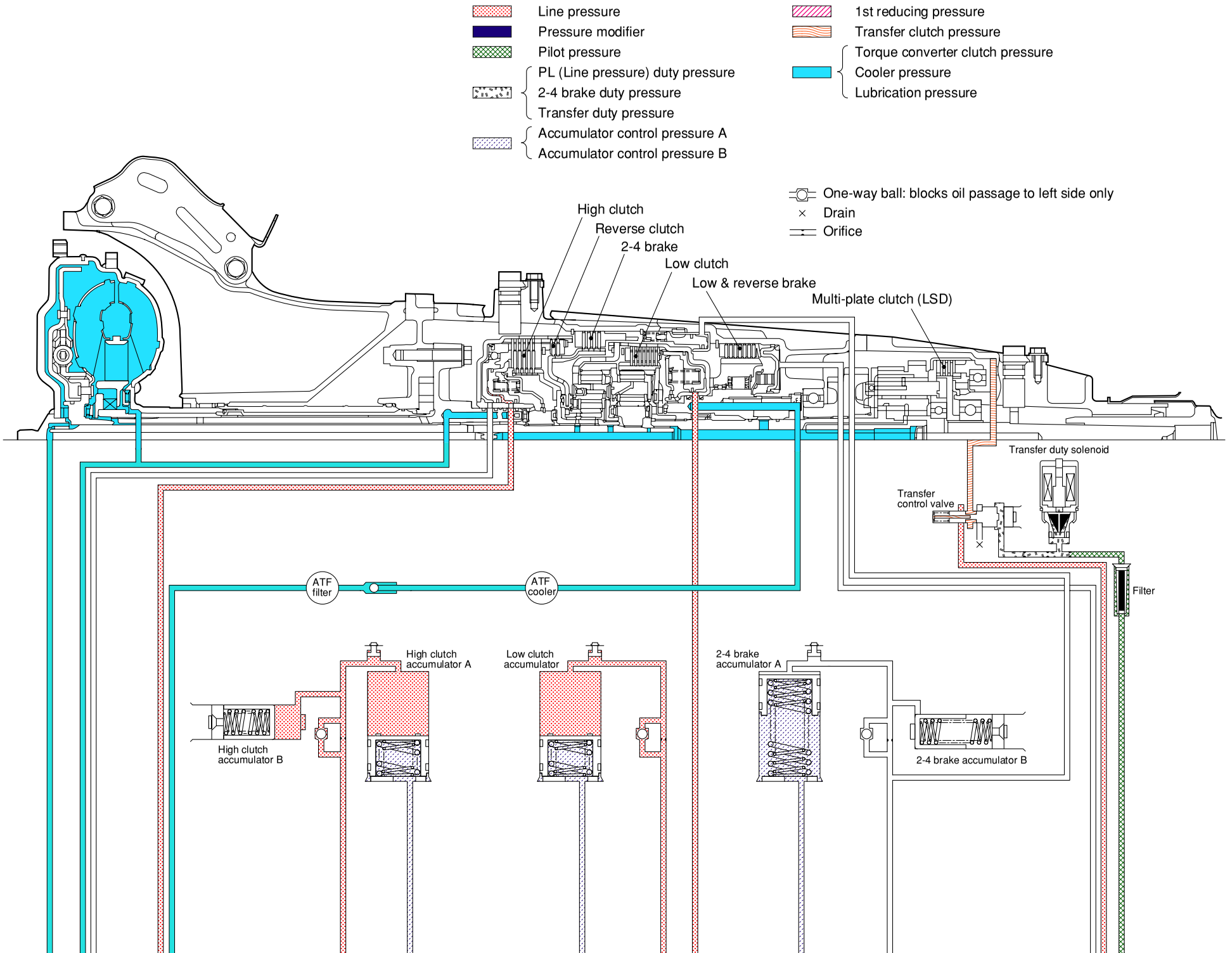
1. MPT MODELS

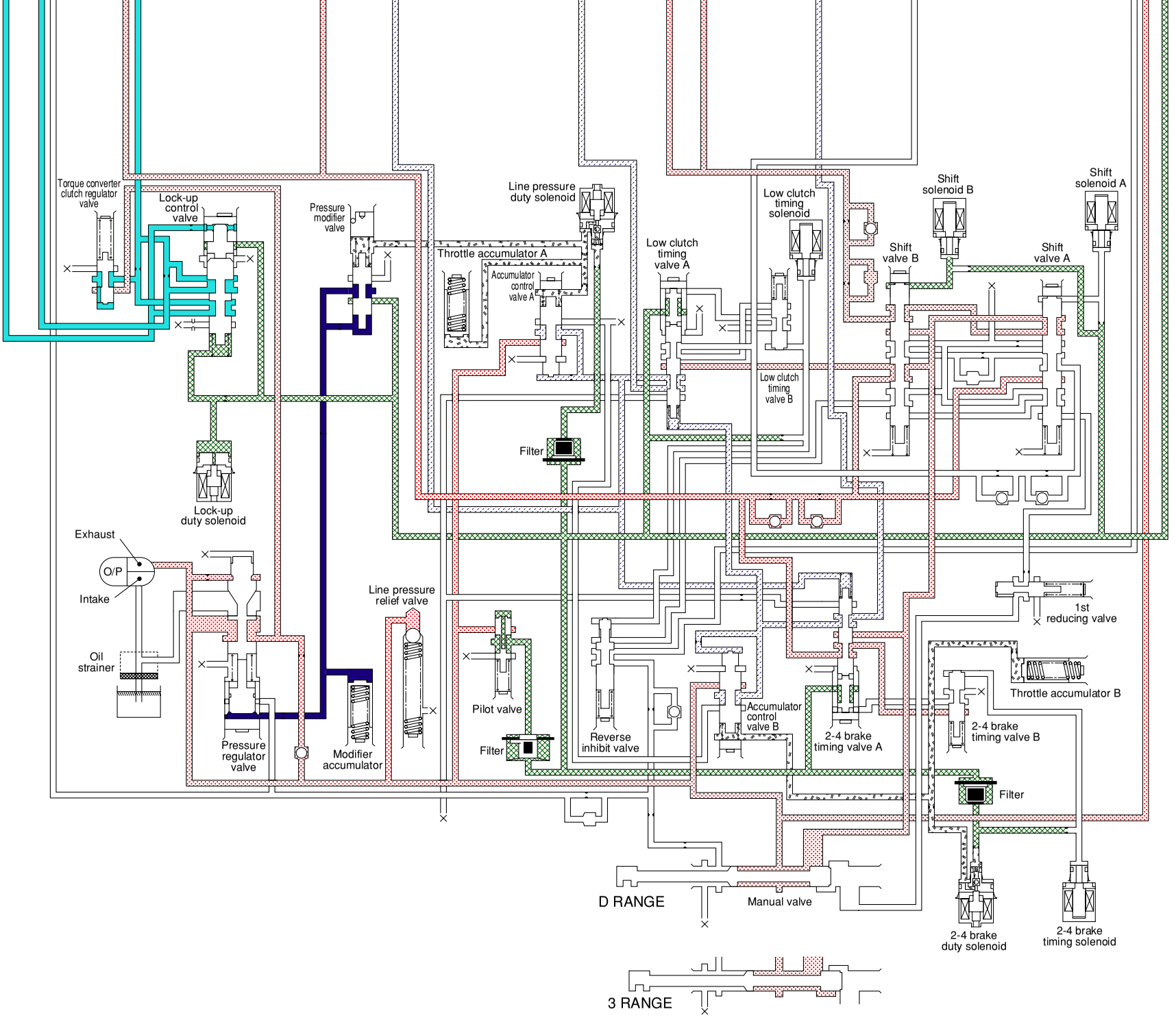



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
3 RANGE

B3H2101A

2. VTD MODELS

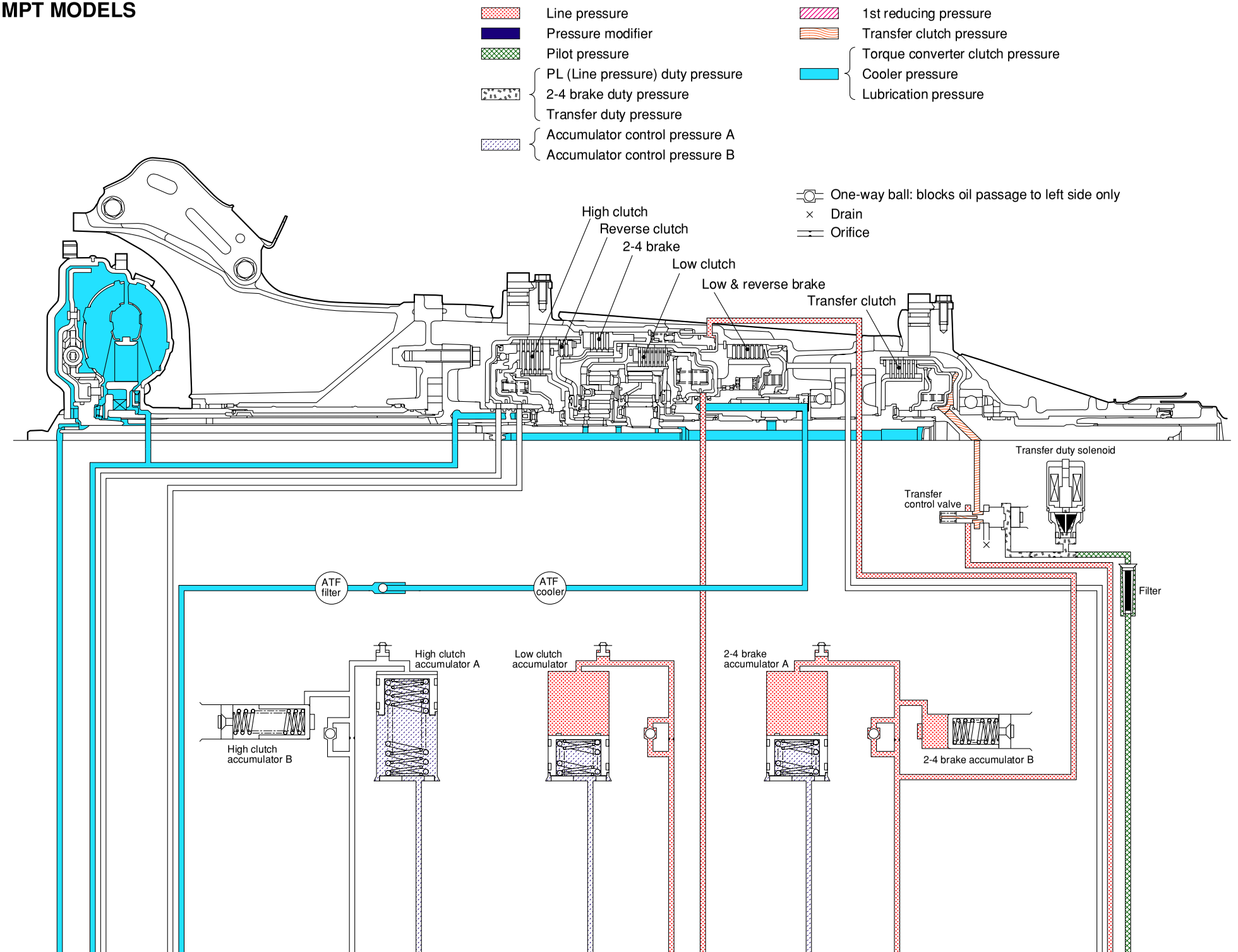

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

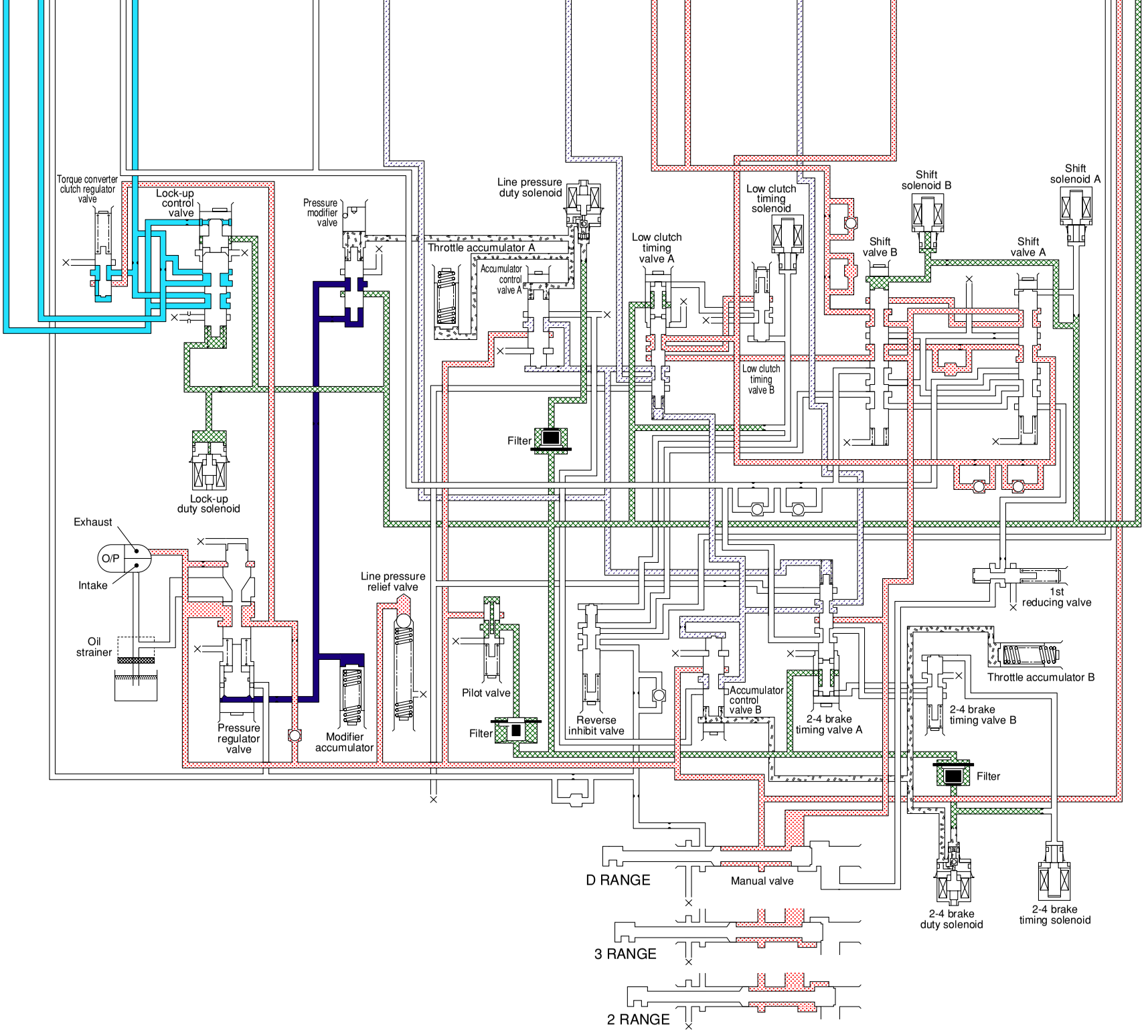

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
1st reducing valve
Throttle accumulator B
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
2-4 brake timing valve B
Filter
Pressure regulator valve
Modifier accumulator
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid
3 RANGE

B3H2102A

F: 2RD GEAR OF D, 3 AND 2 RANGES

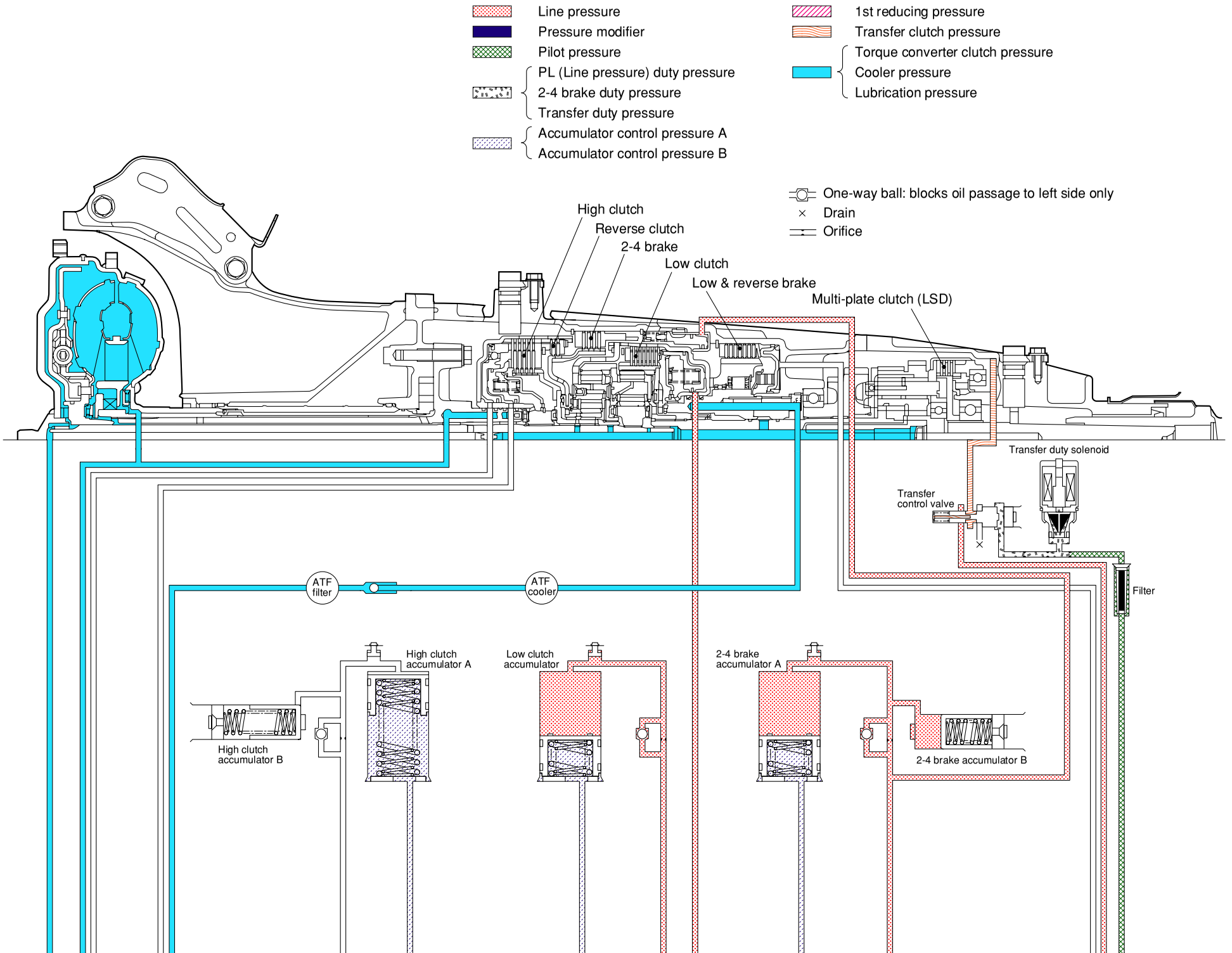
1. MPT MODELS

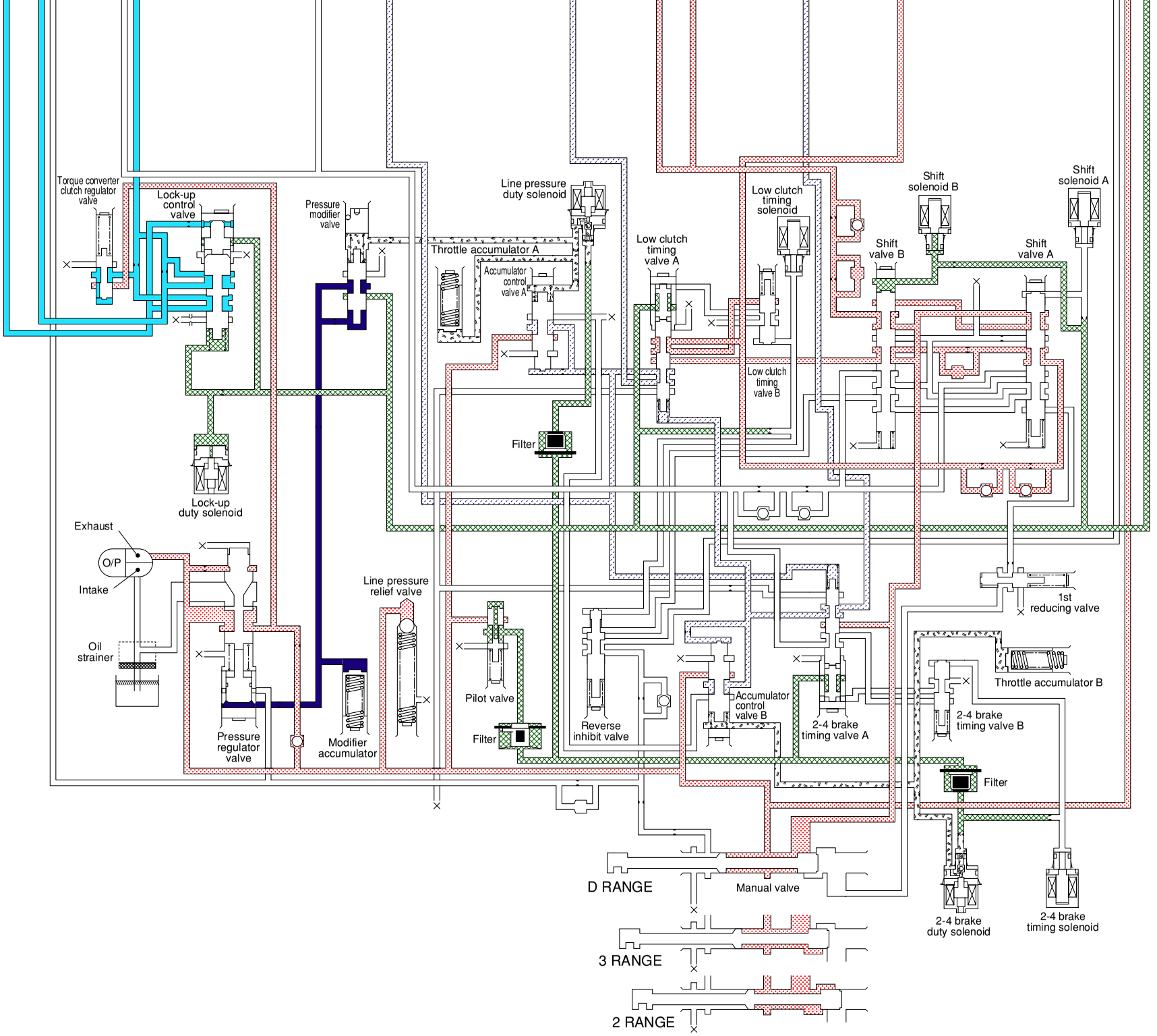



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2103A

2. VTD MODELS

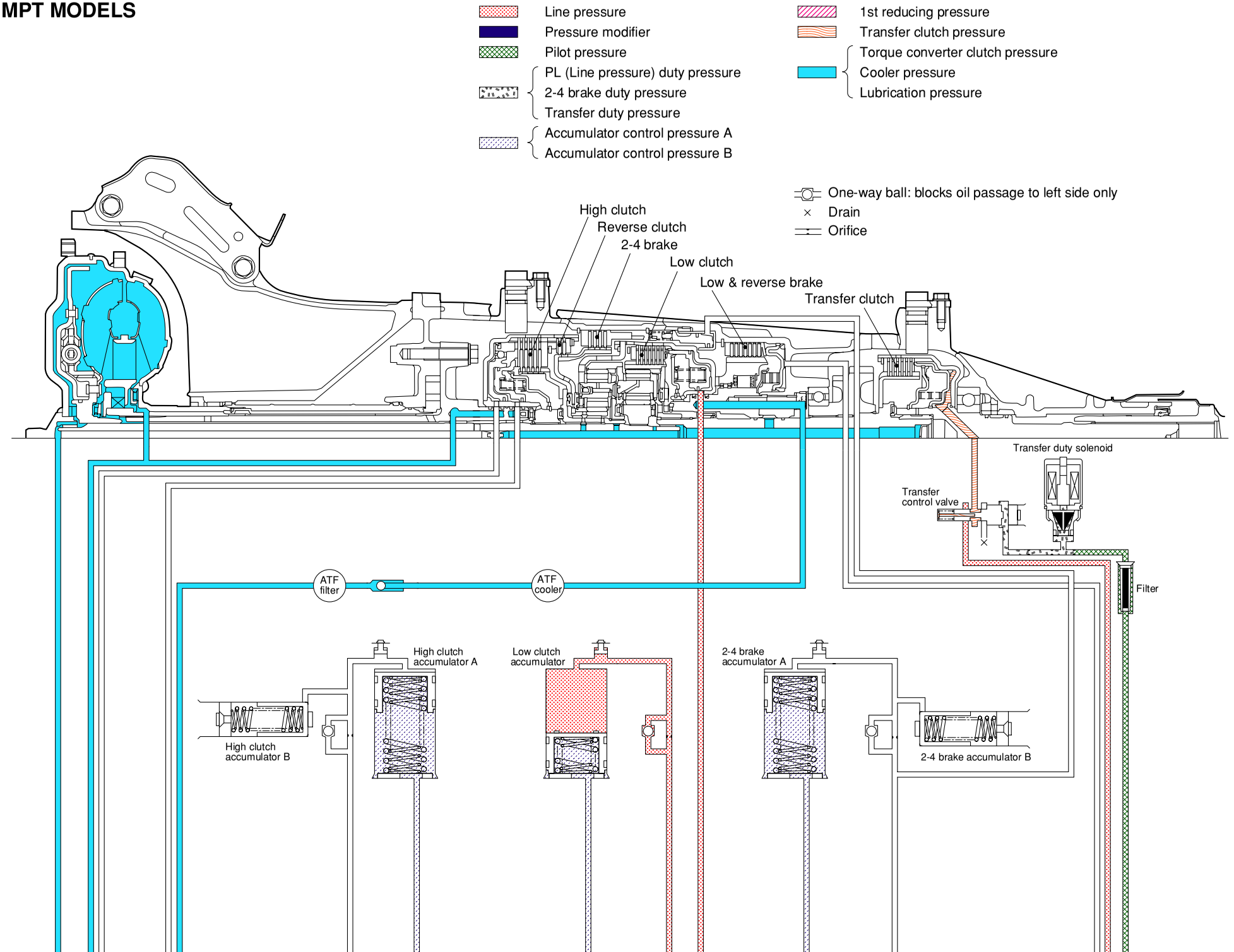

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

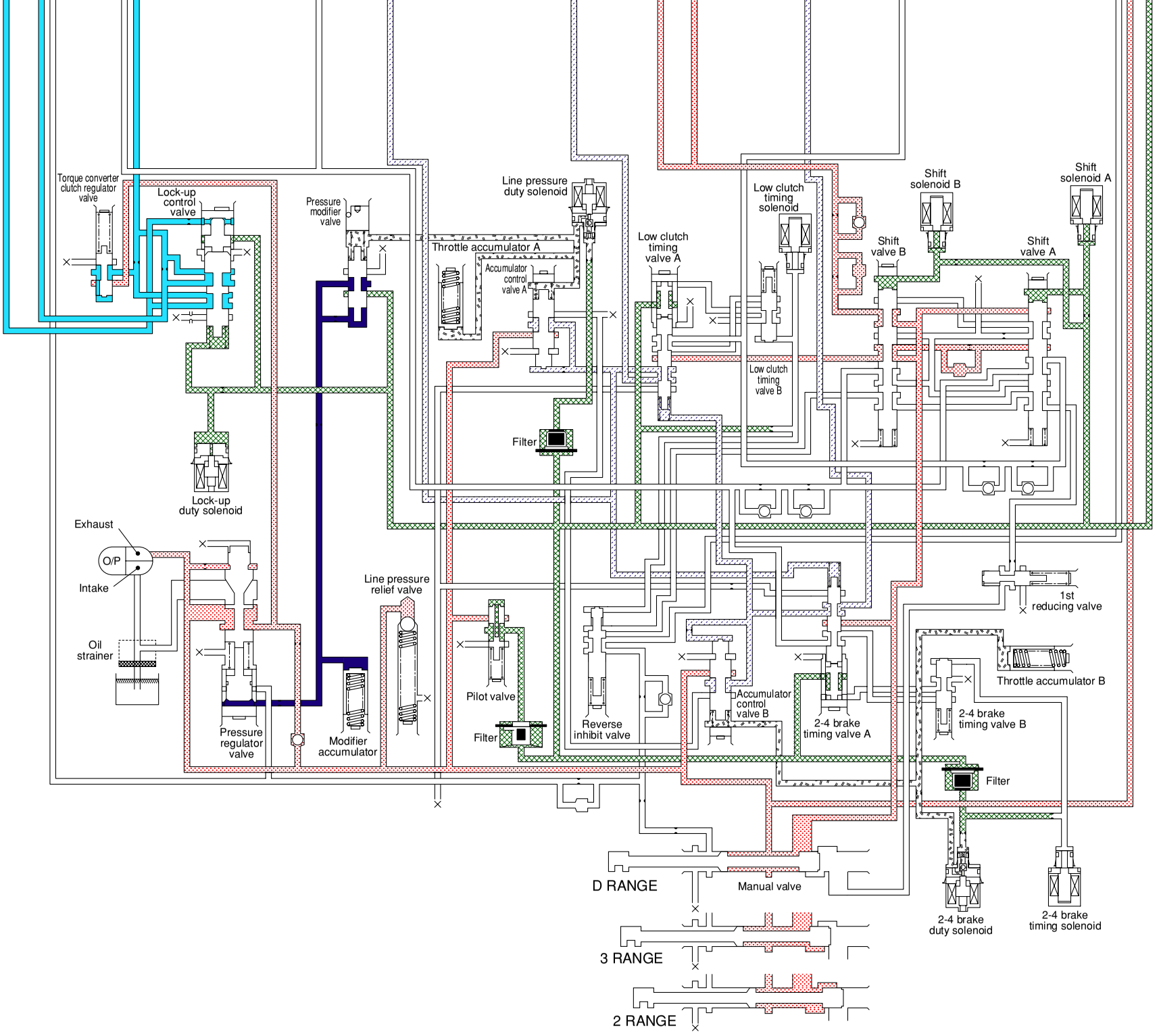

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2104A

G: 1ST GEAR OF D AND 3 RANGES

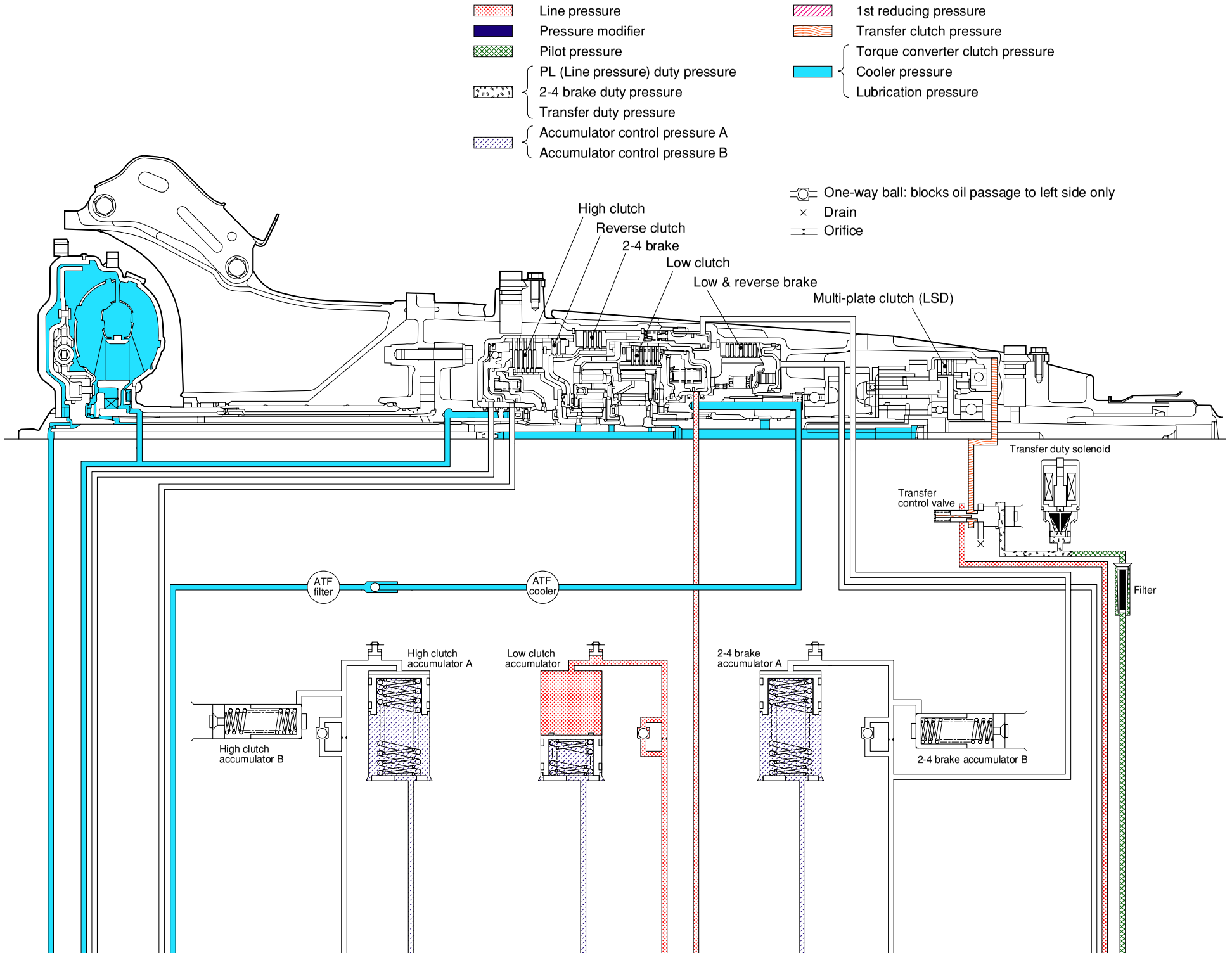
1. MPT MODELS

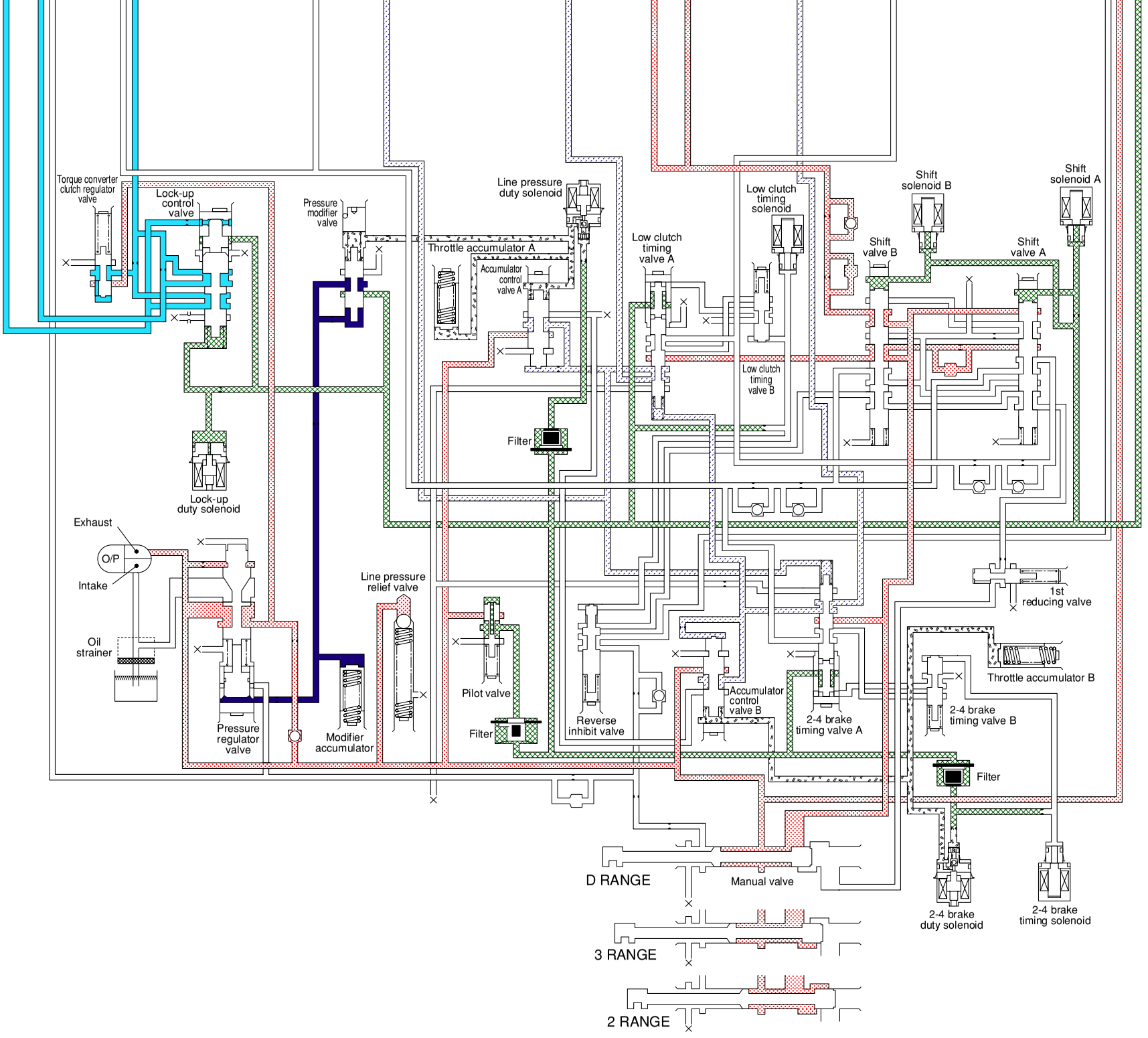



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pressure regulator valve
Modifier accumulator
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2105A

2. VTD MODELS

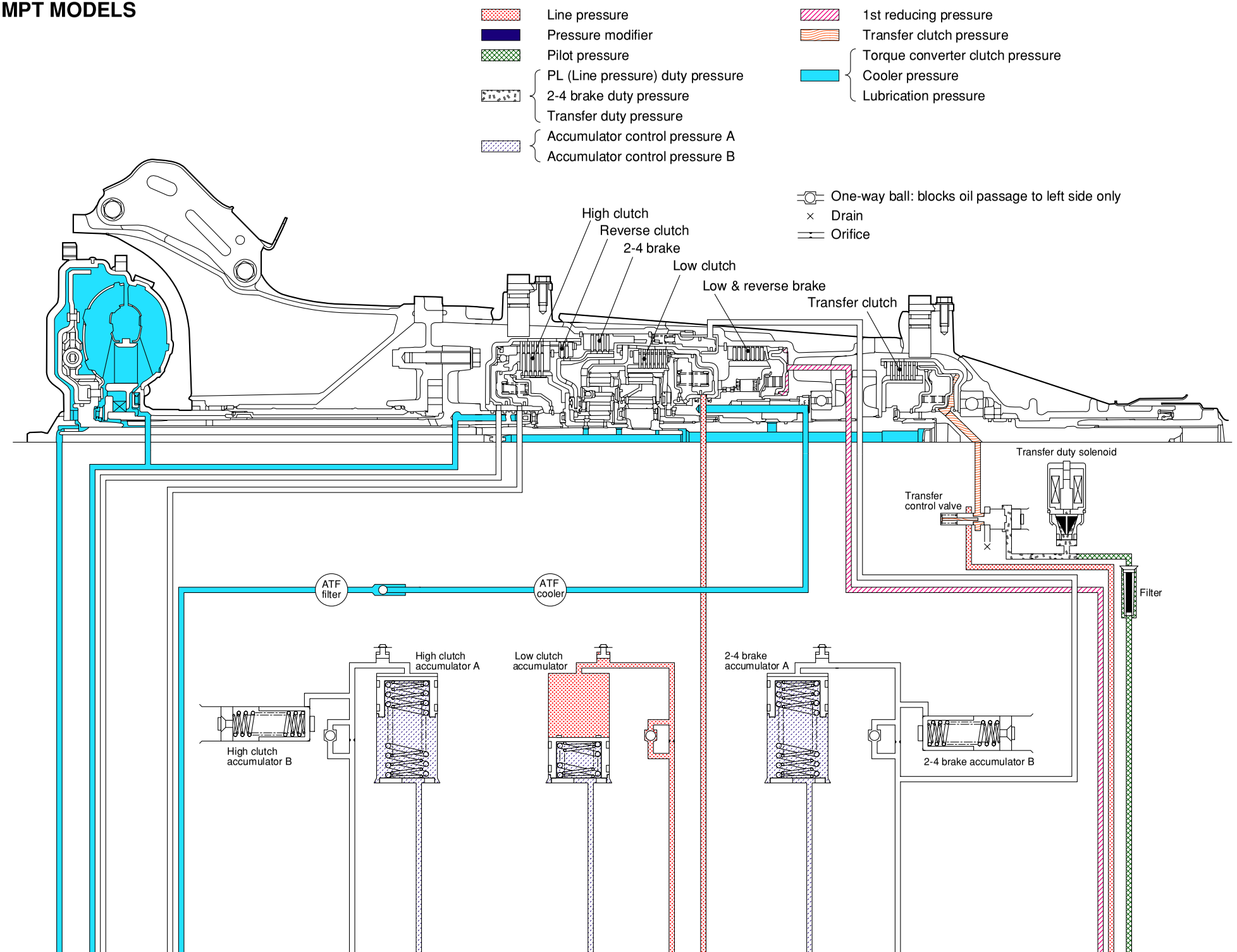

Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
Filter
ATF filter
ATF cooler
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B

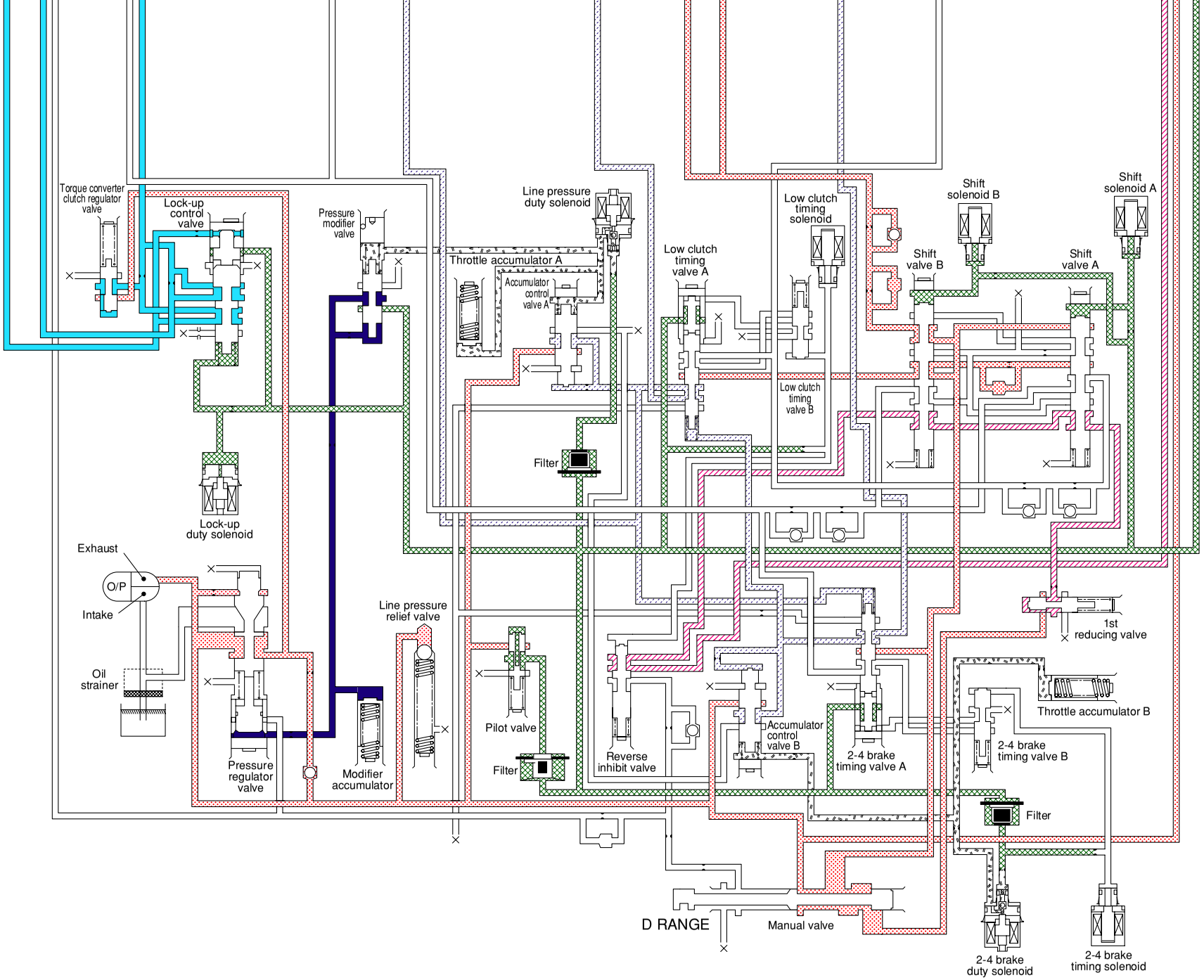

Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
3 RANGE
2 RANGE
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2106A

H: 1ST GEAR OF 1 RANGE

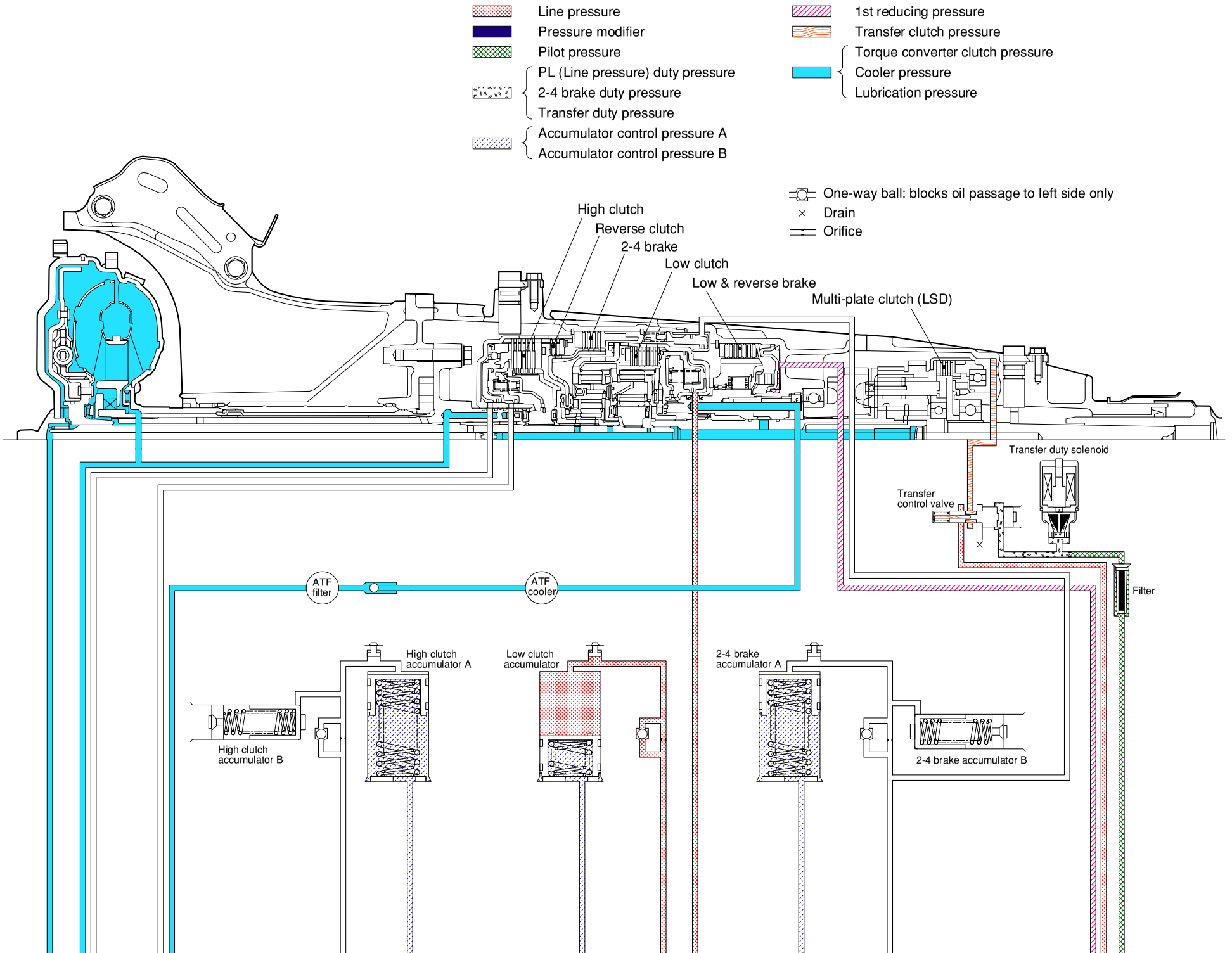
1. MPT MODELS

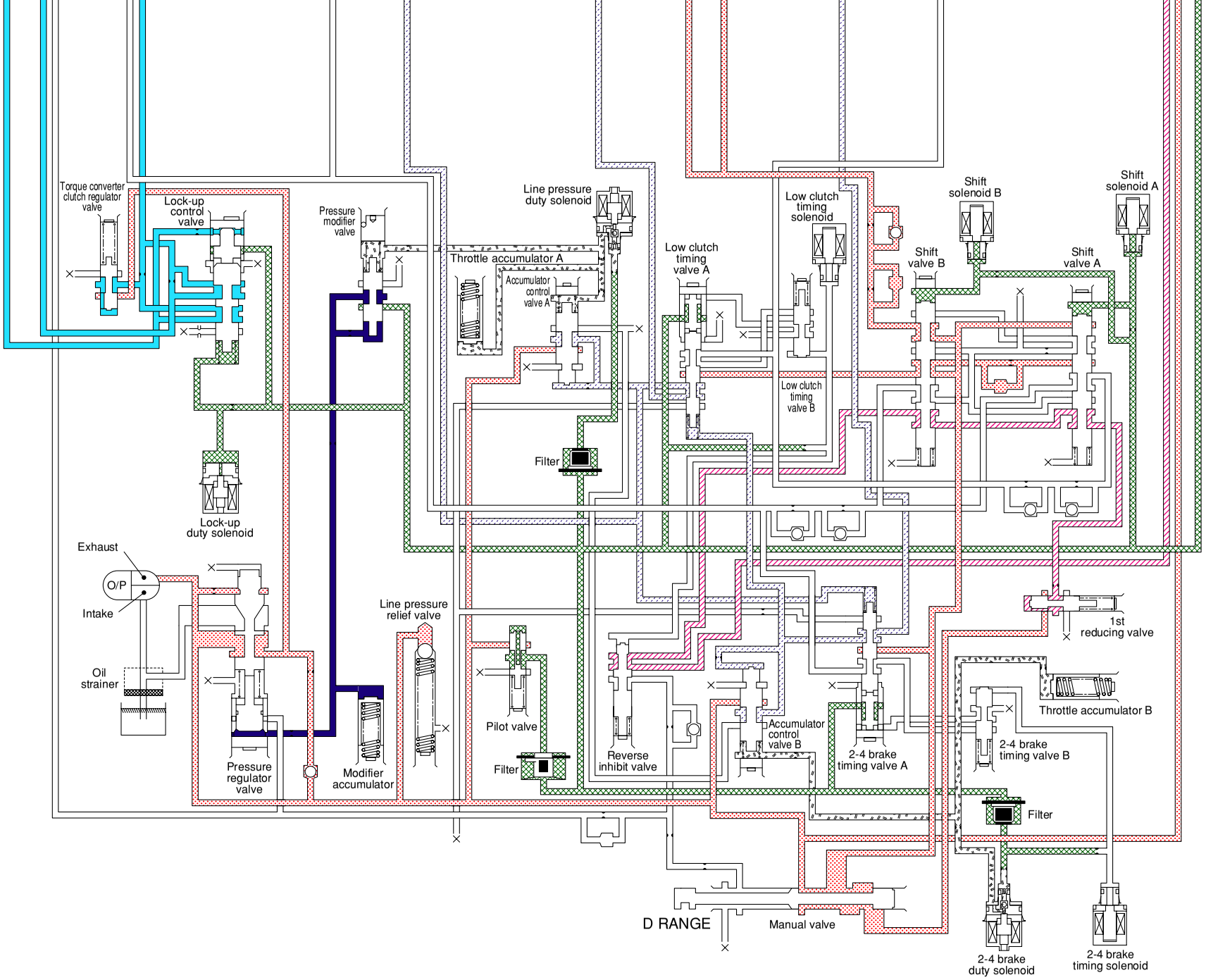



Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Low clutch timing valve B
Shift valve B
Shift solenoid B
Shift valve A
Shift solenoid A
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
Pilot valve
Filter
Pressure regulator valve
Modifier accumulator
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
1st reducing valve
Throttle accumulator B
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2107A

2. VTD MODELS


Line pressure
Pressure modifier
Pilot pressure
PL (Line pressure) duty pressure
2-4 brake duty pressure
Transfer duty pressure
Accumulator control pressure A
Accumulator control pressure B
1st reducing pressure
Transfer clutch pressure
Torque converter clutch pressure
Cooler pressure
Lubrication pressure
One-way ball: blocks oil passage to left side only
Drain
Orifice
High clutch
Reverse clutch
2-4 brake
Low clutch
Low & reverse brake
Multi-plate clutch (LSD)
Transfer duty solenoid
Transfer control valve
ATF filter
ATF cooler
Filter
High clutch accumulator A
High clutch accumulator B
Low clutch accumulator
2-4 brake accumulator A
2-4 brake accumulator B


Torque converter clutch regulator valve
Lock-up control valve
Pressure modifier valve
Line pressure duty solenoid
Throttle accumulator A
Accumulator control valve A
Low clutch timing valve A
Low clutch timing solenoid
Shift solenoid B
Shift solenoid A
Shift valve B
Shift valve A
Low clutch timing valve B
Filter
Lock-up duty solenoid
Exhaust
O/P
Intake
Oil strainer
Line pressure relief valve
1st reducing valve
Throttle accumulator B
Pressure regulator valve
Modifier accumulator
Pilot valve
Filter
Reverse inhibit valve
Accumulator control valve B
2-4 brake timing valve A
2-4 brake timing valve B
Filter
D RANGE
Manual valve
2-4 brake duty solenoid
2-4 brake timing solenoid

B3H2108A

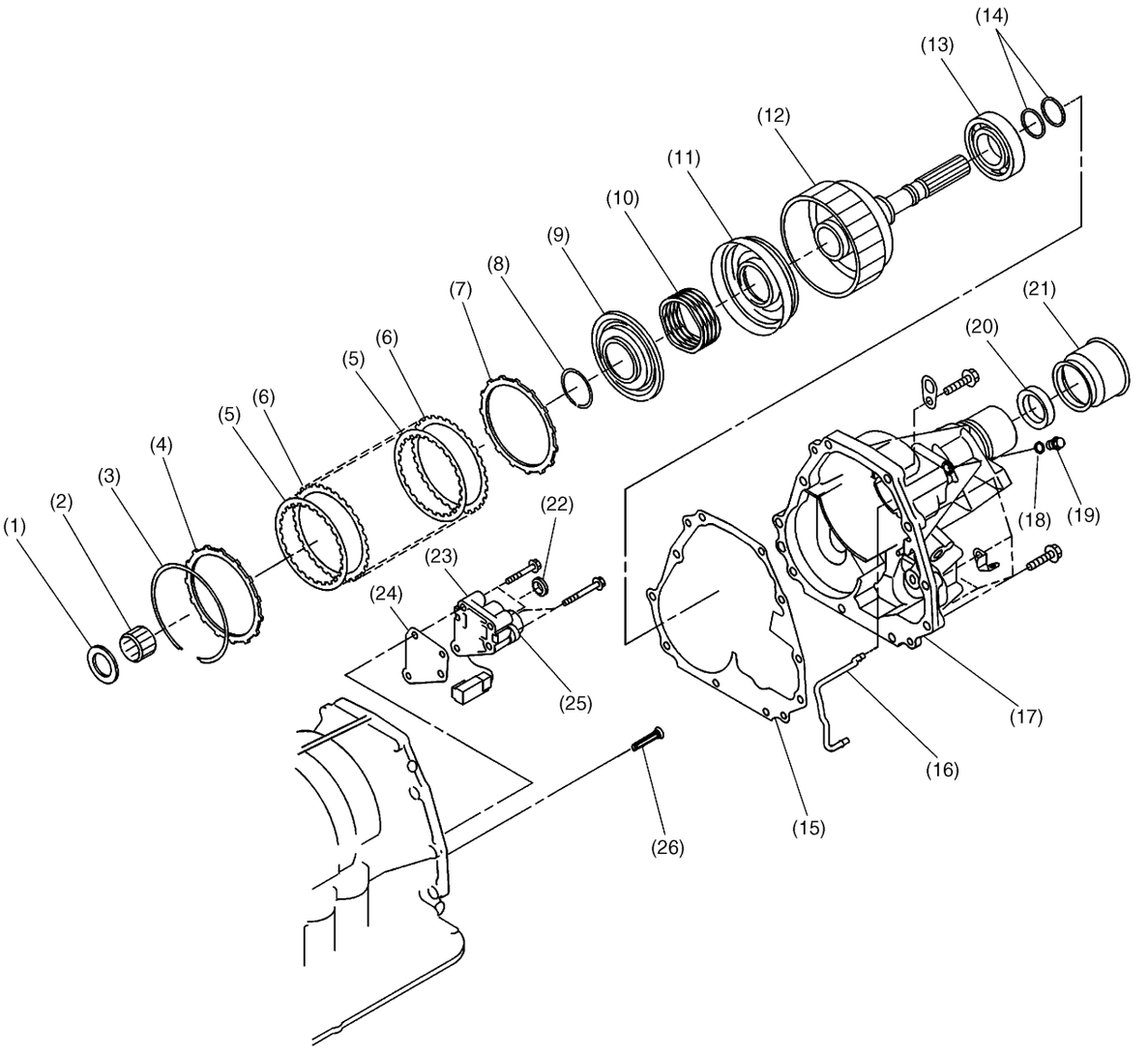
11. AWD Transfer System

A: MPT MODELS

1. OUTLINE

This all-wheel-drive (AWD) transfer system uses an electronically controlled multi-plate type transfer clutch. The clutch is controlled by the TCM through the transfer hydraulic pressure control unit which consists of a duty-cycle-controlled solenoid valve and is located at the rear of the automatic transmission section together with the vehicle speed sensor.

The TCM has in its memory a set of duty ratio data, each defining at what ratio the transfer clutch should transmit the torque for a particular driving condition. Based on the driving condition information it receives from the corresponding sensors (vehicle speed, throttle opening, gear range, slip of wheels, etc.), the TCM selects an appropriate duty ratio from the memory and uses it to control the solenoid valve. The solenoid valve then regulates the pilot pressure of the transfer control valve which creates the pressure to the clutch from the line pressure. The clutch is engaged to a degree determined by the transfer clutch pressure thus created. Through this process, the torque from the engine is distributed to the rear wheels optimally according to driving conditions.

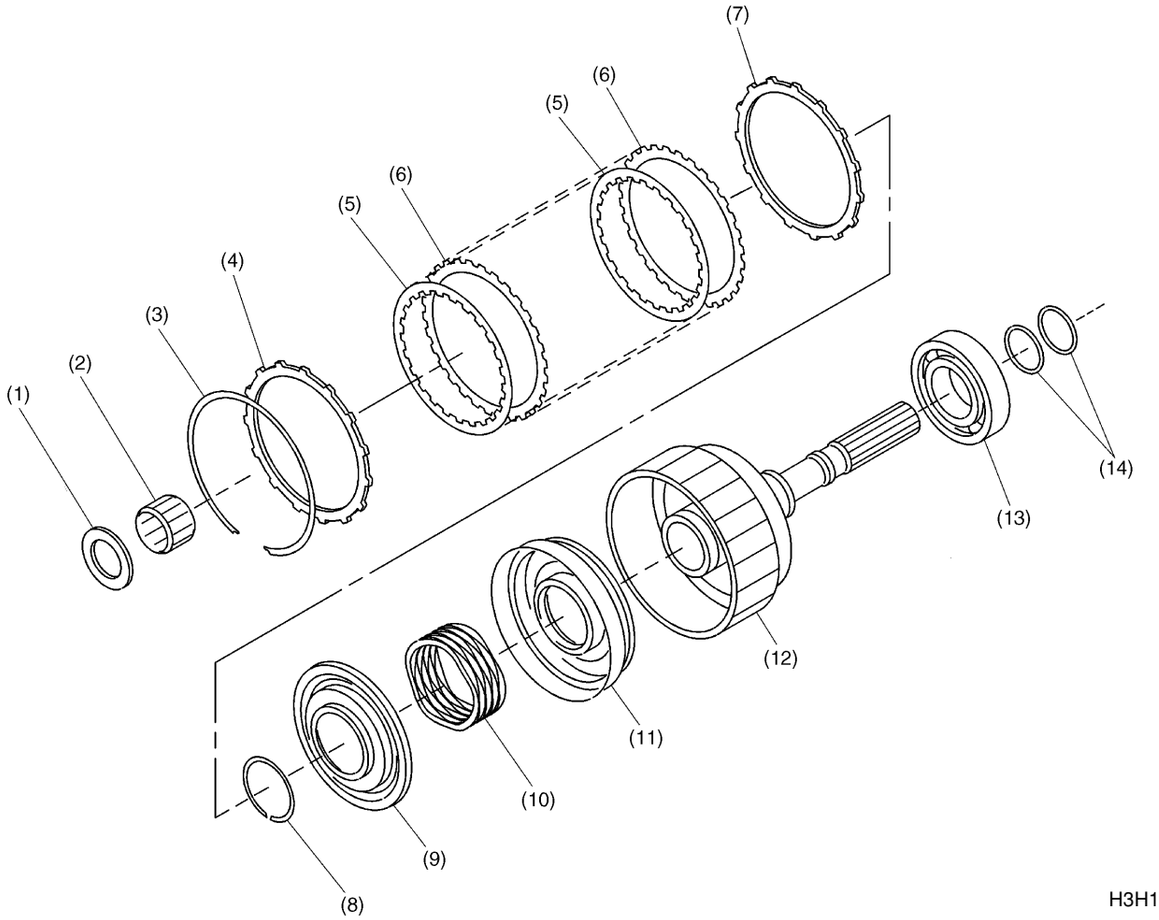


B3H2109A

(1) Thrust bearing
(2) Needle bearing
(3) Snap ring
(4) Pressure plate
(5) Drive plate
(6) Driven plate
(7) Pressure plate
(8) Snap ring
(9) Transfer piston seal
(10) Return spring
(11) Transfer clutch piston
(12) Rear drive shaft
(13) Ball bearing
(14) Seal ring
(15) Gasket
(16) Transfer clutch pipe
(17) Extension case
(18) O-ring
(19) Plug
(20) Oil seal
(21) Dust cover
(22) Transfer clutch seal
(23) Transfer control valve
(24) Transfer valve plate
(25) Transfer duty solenoid
(26) Inlet filter

2. TRANSFER CLUTCH

The transfer clutch drum and rear drive shaft are joined to each other by welding. The rear drive shaft has drilled oil passages for transfer clutch control and also for lubrication of extension bushing and ball bearing in it.

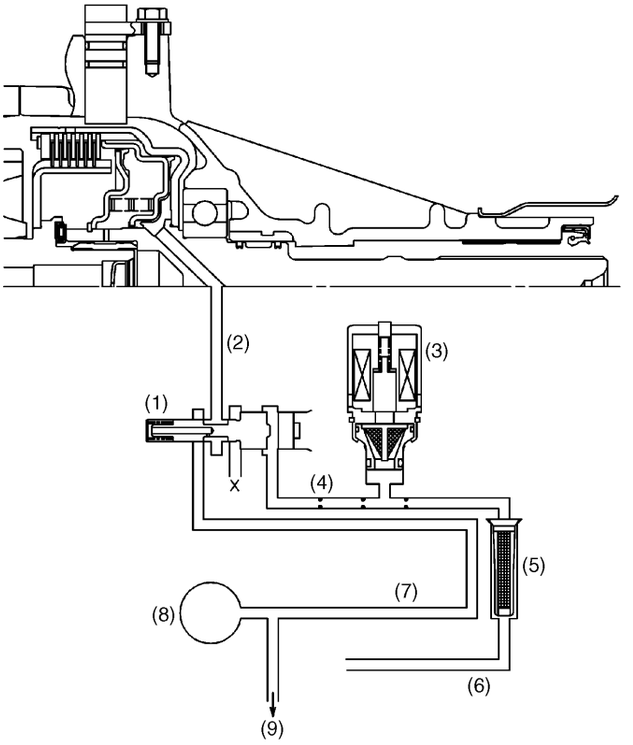


(1) Thrust bearing
(2) Needle bearing
(3) Snap ring
(4) Pressure plate
(5) Drive plate
(6) Driven plate
(7) Pressure plate
(8) Snap ring
(9) Transfer piston seal
(10) Return spring
(11) Transfer clutch piston
(12) Rear drive shaft
(13) Ball bearing
(14) Seal ring

3. TRANSFER HYDRAULIC PRESSURE CONTROL UNIT

The transfer hydraulic pressure control unit is bolted at the rear end of transmission case through the transfer valve plate.
The hydraulic pressures used for the transfer hydraulic pressure control unit (line pressure and pilot pressure) are supplied from the transmission's hydraulic control valve assembly through the passages formed in the transmission case.

The transfer duty solenoid adjusts the pilot pressure of the transfer clutch valve depending on the signals from the TCM. The transfer clutch valve in turn modulates the line pressure into the transfer clutch pressure before it is applied to the clutch piston.
The transfer clutch pressure adjusted in this way engages the clutch to different degrees according to driving conditions so that the optimum torque is distributed to the rear wheels.



B3H0912A

(1) Transfer control valve
(2) Transfer clutch pressure
(3) Transfer duty solenoid
(4) Transfer pressure
(5) Filter
(6) Pilot pressure
(7) Line pressure
(8) Oil pump
(9) Transmission hydraulic control valve assembly

B: VTD MODELS

1. OUTLINE

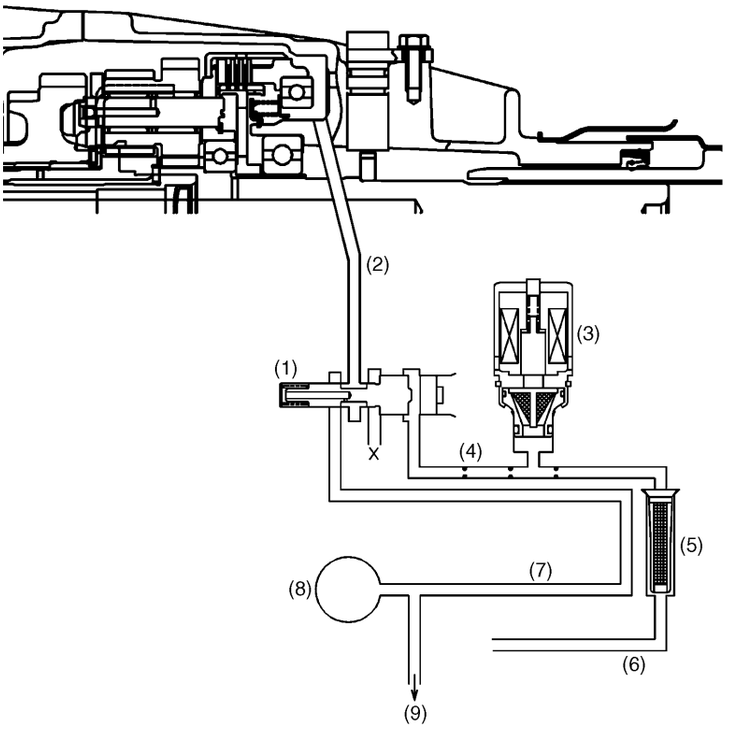
Used in the transfer of the VTD models is the SUBARU drive power distribution system which combines a compound planetary gear type center differential installed in the transfer case behind the transmission and a hydraulically operated multi-plate differential action limiting device (LSD) located between the output components of the center differential. Differential action limiting control is performed by the TCM according to driving and road surface conditions. This system allows combining stability provided by the AWD design with good operability.

The input torque is transmitted to the 1st sun gear of the center differential through the intermediate shaft. From the 1st sun gear, the torque is transmitted through the 1st pinion to the output carrier in the front wheel output components, and through the 2nd pinion to the 2nd sun gear in the rear wheel output components.

The center differential performs the differential functions of absorbing the speed difference between the front and rear wheels and also distributes drive forces to the front and rear wheels at a predetermined ratio. In normal conditions (when there is almost no difference in the speed between the front and rear wheels), the drive force distribution ratio is 45.5 % to the front wheels and 54,5 % to the rear wheels. The hydraulic multi-plate clutch connected in parallel with the center differential between the carrier and 2nd sun gear functions as a differential action limiting device (LSD) and also as a device that controls torque distribution according to driving conditions.

The differential action limiting control is based on the parameters that include the throttle angle, engine speed, vehicle speed, and speed ratio of front and rear wheels. The LSD clutch piston is operated by the fluid whose pressure is adjusted by the duty solenoid and the transfer control valve in the transfer case. According to the pressure applied to the piston, the torque distribution ratio changes from the ratio set for the center differential to the direct AWD ratio.

The speed of the front and rear wheels determine the basic signals for the differential action limiting control. The rear wheel speed is detected by sensor installed above the rear drive shaft and the front wheel speed is detected by the sensor on the parking gear above the reduction drive shaft gear.



H3H0759A

(1) Transfer control valve
(2) Transfer clutch pressure
(3) Transfer duty solenoid
(4) Transfer pressure
(5) Filter
(6) Pilot pressure
(7) Line pressure
(8) Oil pump
(9) Transmission hydraulic control valve assembly

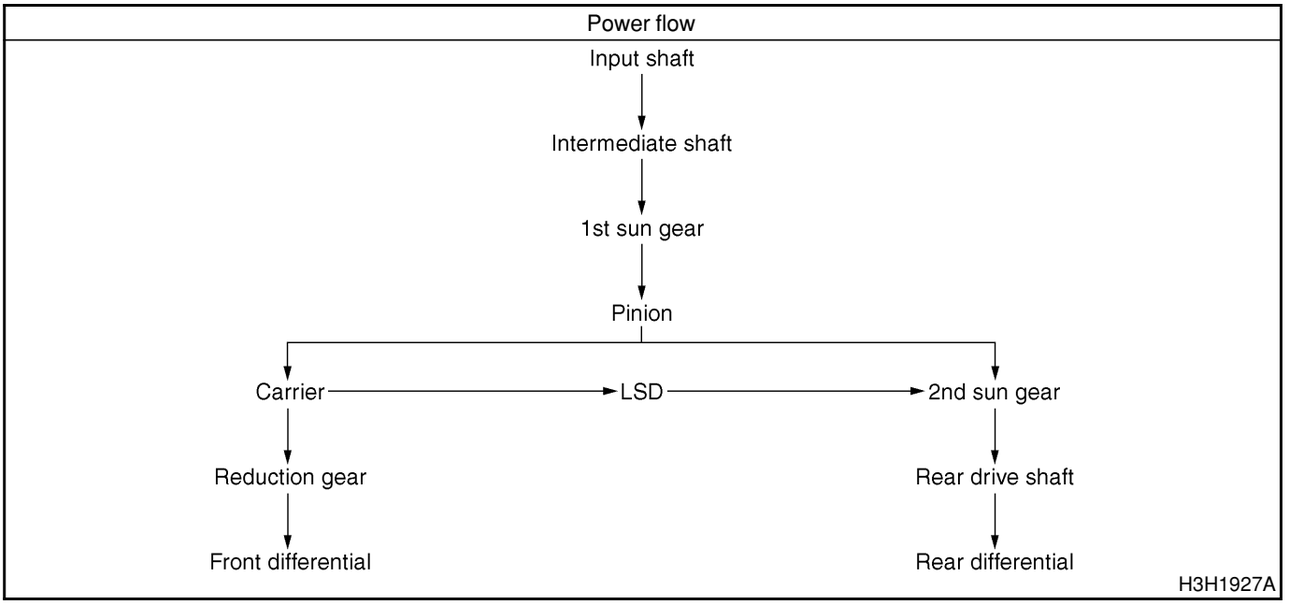
2. VARIABLE TORQUE DISTRIBUTION CENTER DIFFERENTIAL

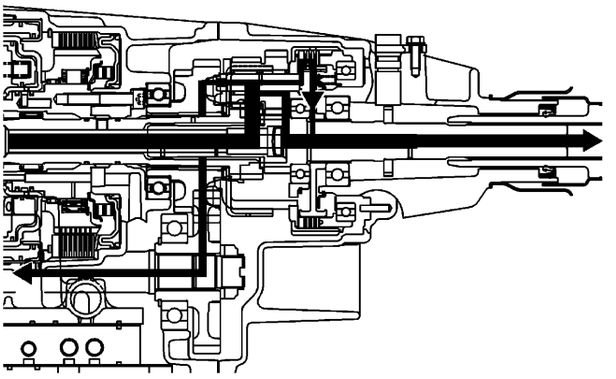
The front-rear torque distribution ratio is basically determined by the gear tooth ratio of center differential's compound planetary gears and varied by changing the degree of engagement of the hydraulically operated multi-plate clutch that connects the center differential output elements according to driving conditions and road surface conditions. The torque distribution ratio is calculated using the following equations which include torque distribution coefficients (determined by number of gear teeth), input torque to the center differential, and torque capacity of the multi-plate clutch as factors.

1) When the front wheel speed is higher than the rear wheel speed:

$T_R = 0.545 \times T_i + T_C$
$T_F = 0.455 \times T_i - T_C$

where
T_R: Rear wheel output torque
T_i: Input torque to center differential
T_C: Torque capacity of multi-plate clutch
T_F: Front wheel output torque
0.545: Coefficient of rear wheel torque determined by number of gear teeth
0.455: Coefficient of front wheel torque determined by number of gear teeth

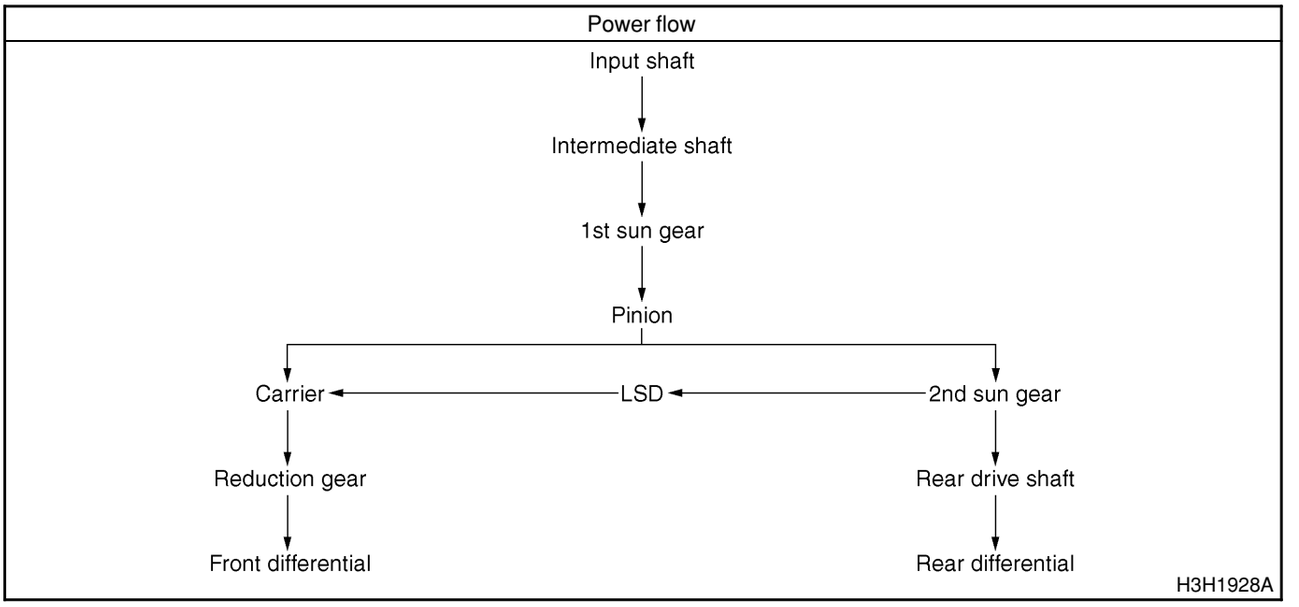


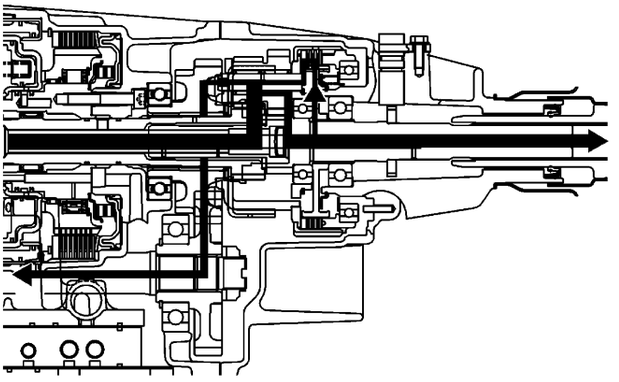


H3H0760

2) When the rear wheel speed is greater than the front wheel speed:

$T_R = 0.545 \times T_i - T_C$
$T_F = 0.455 \times T_i + T_C$





H3H0761

<Calculation of front and rear wheel torques>
If the frictional resistance resulting from meshing of the planetary gears and sliding of rotational components are ignored, the torques distributed to the front and rear wheels are expressed by the following equations:

$T_R = [(Z_{P1} \times Z_{S2}) \div (Z_{S1} \times Z_{P2})] \times T_i$
$T_F = [1 - (Z_{P1} \times Z_{S2}) \div (Z_{S1} \times Z_{P2})] \times T_i$

where
Z_{P1}: Number of teeth of 1st planetary gear
Z_{P2}: Number of teeth of 2nd planetary gear
Z_{S1}: Number of teeth of 1st sun gear
Z_{S2}: Number of teeth of 2nd sun gear
T_i: Input torque

If the number of teeth in each component is the same as that assumed in the equations on the previous page, the following ratios are the calculation results of the equations shown above.

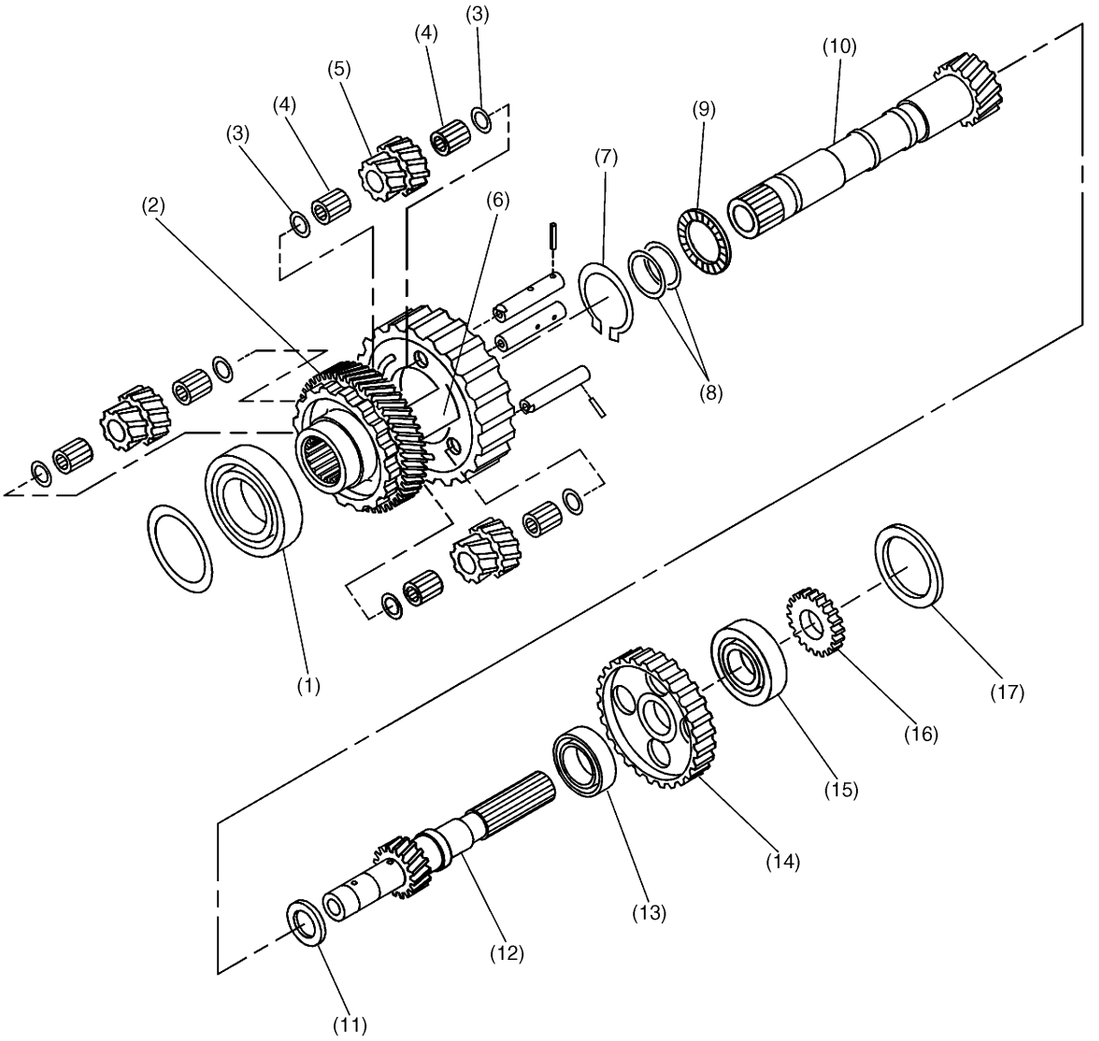
$T_R = 0.545 \times T_i$
$T_F = 0.455 \times T_i$

As a result, the front-rear torque distribution ratio of the compound planetary gear set without an adjustment by the multi-plate clutch is 45.5 : 54.5.

3. CENTER DIFFERENTIAL ASSEMBLY

The center differential is a compound planetary gear set without internally-toothed gears. The input torque from the automatic transmission is transmitted to the input element of the center differential (1st sun gear). The front wheel output elements of the center differential are connected to the carrier and the rear wheel output elements are connected to the 2nd sun gear.

The compound planetary gears uses helical gears for quiet operation and strength. The three pinion are arranged to ensure the best motion balance during operation.



B3H2075A

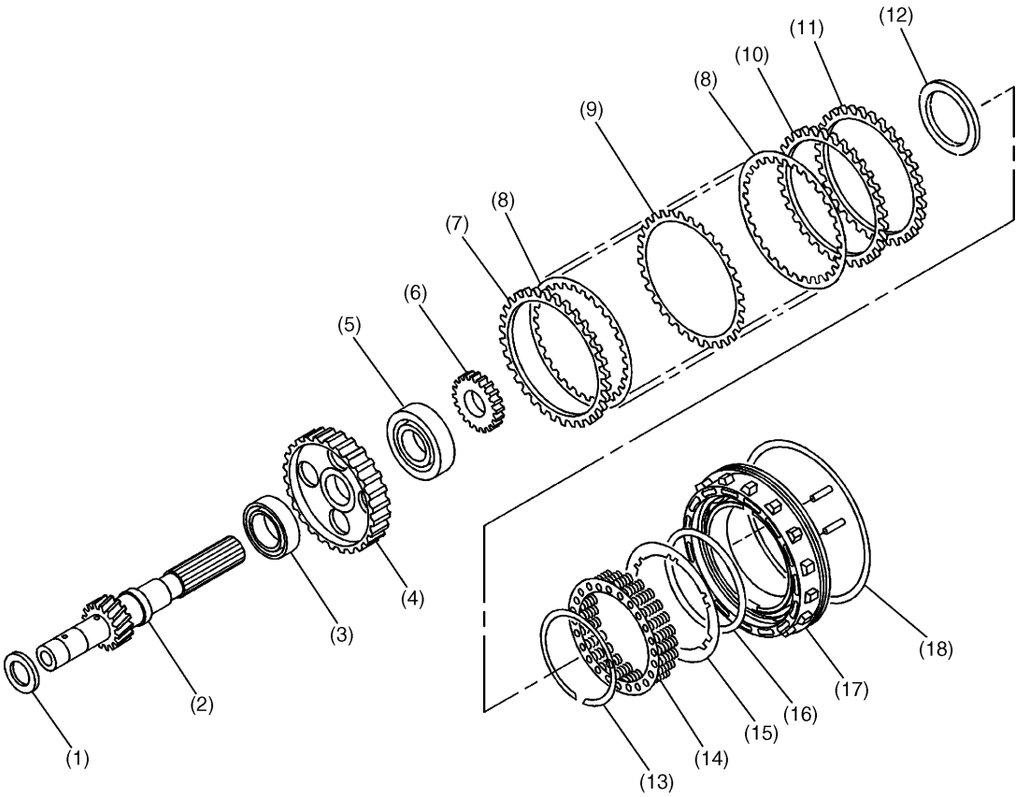
(1) Ball bearing
(2) Reduction drive gear
(3) Washer
(4) Needle bearing
(5) Pinion gear
(6) Carrier
(7) Snap ring
(8) Seal ring
(9) Thrust needle bearing
(10) Intermediate shaft
(11) Thrust washer
(12) Rear drive shaft
(13) Ball bearing
(14) Multi-plate clutch hub
(15) Ball bearing
(16) Revolution gear
(17) Rear drive shaft shim

4. MULTI-PLATE CLUTCH (LSD)

The transfer's differential action limiting device (LSD) consists of a multi-plate clutch and a transfer hydraulic pressure control unit incorporating a transfer duty solenoid.

The transfer duty solenoid is an electromagnetic valve which is controlled by the TCM using various duty ratios stored in its memory as explained in 1. General.

The rear drive shaft has drilled oil passages for lubrication of multi-plate clutch and extension bushing and ball bearing in it.



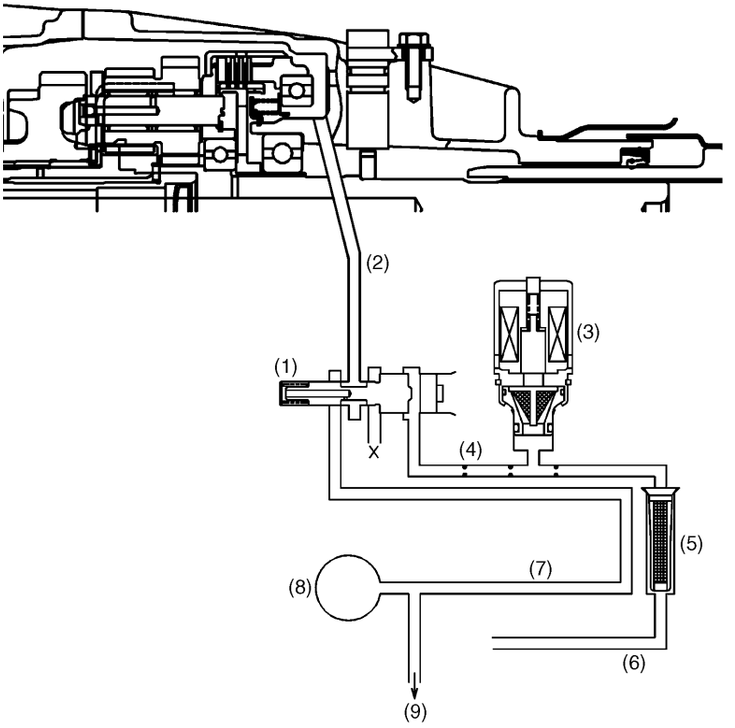
B3H1843A

(1) Thrust washer
(2) Rear drive shaft
(3) Ball bearing
(4) Multi-plate clutch hub
(5) Ball bearing
(6) Revolution gear
(7) Driven plate (Thicker)
(8) Drive plate
(9) Driven plate (Thinner)
(10) Driven plate (Thicker)
(11) Adjust plate
(12) Rear drive shaft shim
(13) Snap ring
(14) Spring retainer
(15) Plate
(16) Lathe cut seal ring
(17) Multi-plate clutch piston
(18) Lathe cut seal ring

5. TRANSFER HYDRAULIC PRESSURE CONTROL UNIT

The transfer hydraulic pressure control unit is bolted at the rear end of transmission case through the transfer valve plate.
The hydraulic pressures used for the transfer hydraulic pressure control unit (line pressure and pilot pressure) are supplied from the transmission's hydraulic control valve assembly through the passages formed in the transmission case.

The transfer duty solenoid adjusts the pilot pressure of the transfer control valve depending on the signals from the TCM. The transfer control valve in turn modulates the line pressure into the transfer clutch pressure before it is applied to the clutch piston.
The transfer clutch pressure adjusted in this way engages the clutch to different degrees according to driving conditions so that the optimum torque is distributed to the rear wheels.



H3H0759A

(1) Transfer control valve
(2) Transfer clutch pressure
(3) Transfer duty solenoid
(4) Transfer pressure
(5) Filter
(6) Pilot pressure
(7) Line pressure
(8) Oil pump
(9) Transmission hydraulic control valve assembly

MEMO

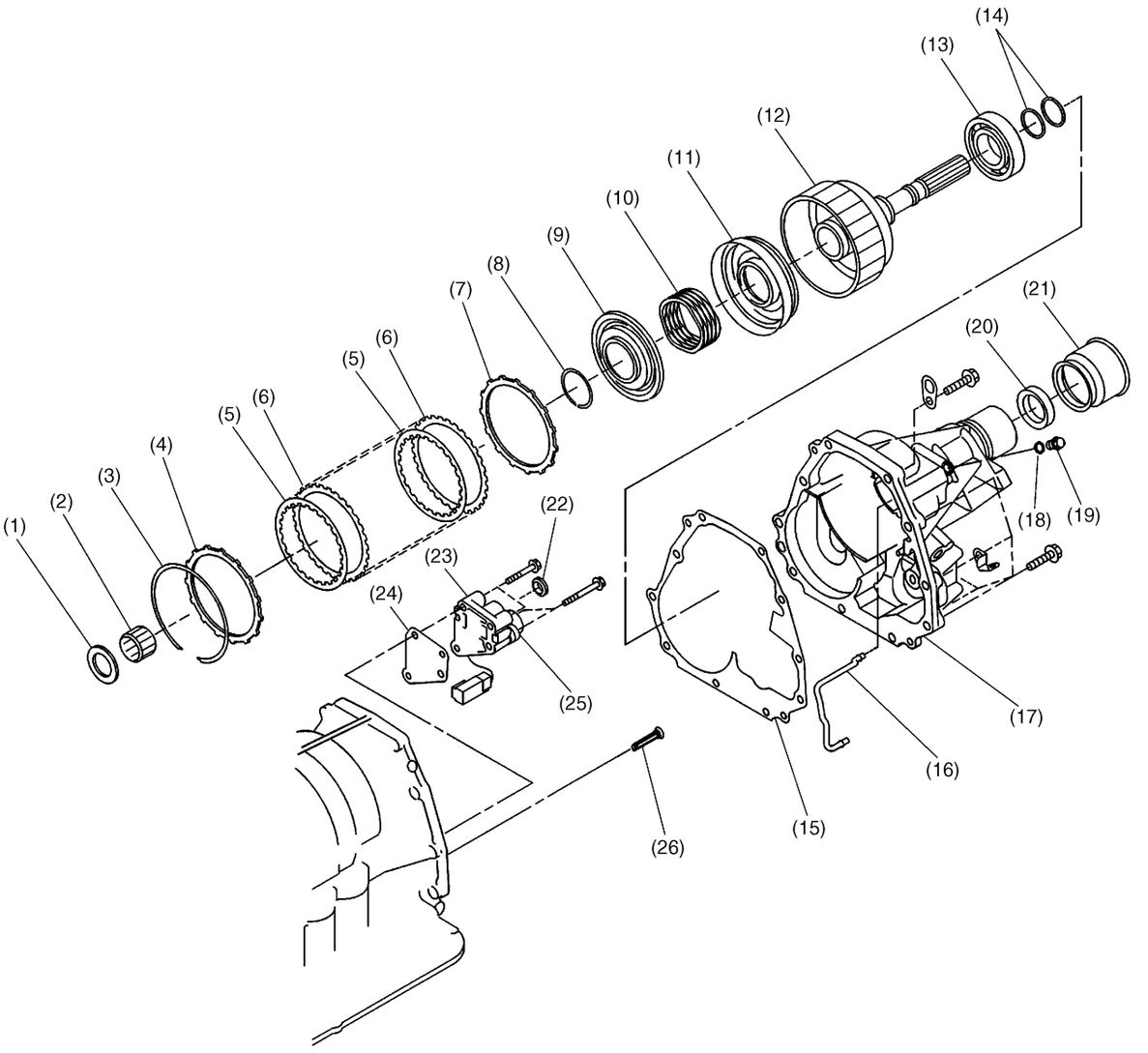
11. AWD Transfer System

A: MPT MODELS

1. OUTLINE

This all-wheel-drive (AWD) transfer system uses an electronically controlled multi-plate type transfer clutch. The clutch is controlled by the TCM through the transfer hydraulic pressure control unit which consists of a duty-cycle-controlled solenoid valve and is located at the rear of the automatic transmission section together with the vehicle speed sensor.

The TCM has in its memory a set of duty ratio data, each defining at what ratio the transfer clutch should transmit the torque for a particular driving condition. Based on the driving condition information it receives from the corresponding sensors (vehicle speed, throttle opening, gear range, slip of wheels, etc.), the TCM selects an appropriate duty ratio from the memory and uses it to control the solenoid valve. The solenoid valve then regulates the pilot pressure of the transfer control valve which creates the pressure to the clutch from the line pressure. The clutch is engaged to a degree determined by the transfer clutch pressure thus created. Through this process, the torque from the engine is distributed to the rear wheels optimally according to driving conditions.

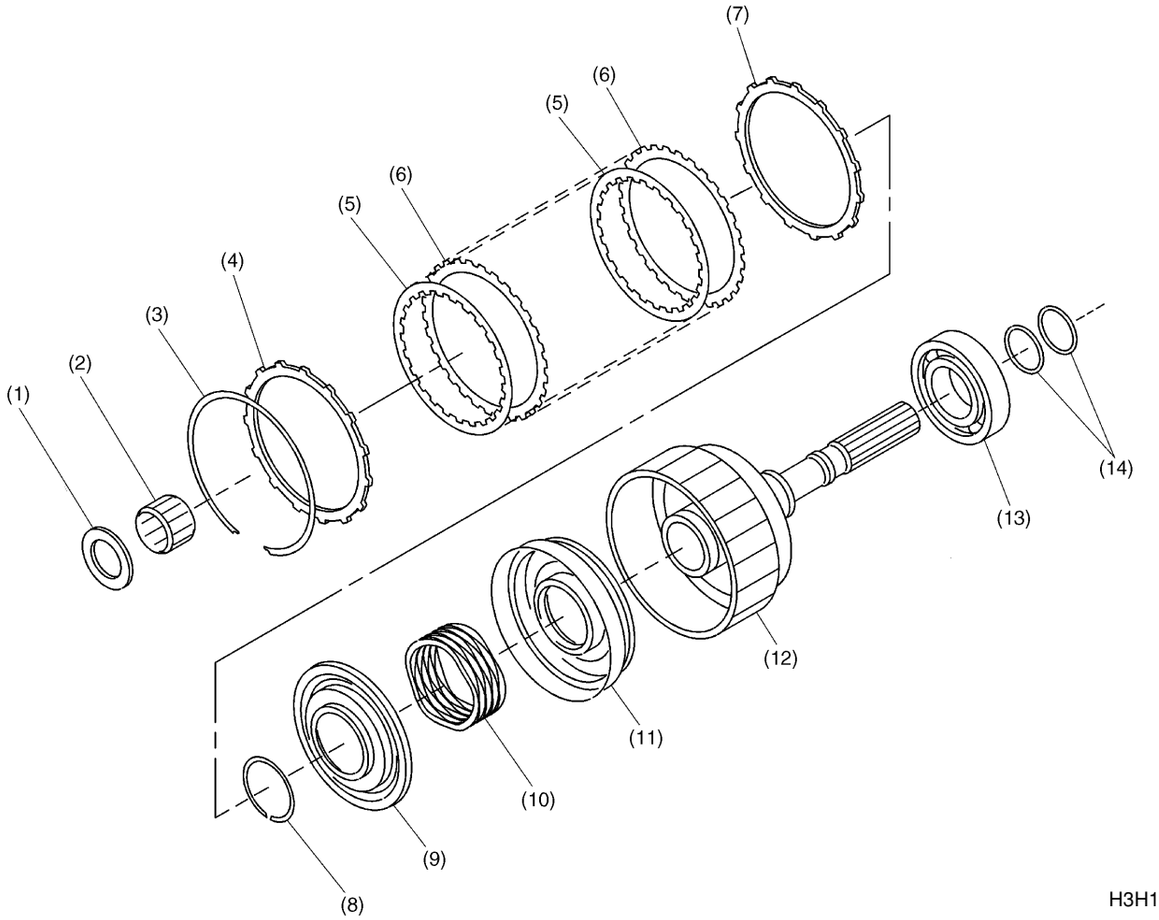


B3H2109A

(1) Thrust bearing
(2) Needle bearing
(3) Snap ring
(4) Pressure plate
(5) Drive plate
(6) Driven plate
(7) Pressure plate
(8) Snap ring
(9) Transfer piston seal
(10) Return spring
(11) Transfer clutch piston
(12) Rear drive shaft
(13) Ball bearing
(14) Seal ring
(15) Gasket
(16) Transfer clutch pipe
(17) Extension case
(18) O-ring
(19) Plug
(20) Oil seal
(21) Dust cover
(22) Transfer clutch seal
(23) Transfer control valve
(24) Transfer valve plate
(25) Transfer duty solenoid
(26) Inlet filter

2. TRANSFER CLUTCH

The transfer clutch drum and rear drive shaft are joined to each other by welding. The rear drive shaft has drilled oil passages for transfer clutch control and also for lubrication of extension bushing and ball bearing in it.

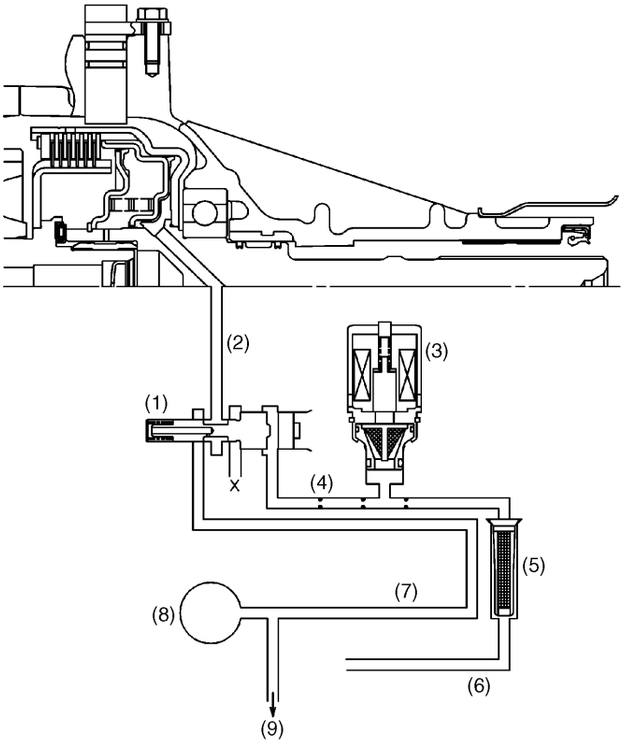


(1) Thrust bearing
(2) Needle bearing
(3) Snap ring
(4) Pressure plate
(5) Drive plate
(6) Driven plate
(7) Pressure plate
(8) Snap ring
(9) Transfer piston seal
(10) Return spring
(11) Transfer clutch piston
(12) Rear drive shaft
(13) Ball bearing
(14) Seal ring

3. TRANSFER HYDRAULIC PRESSURE CONTROL UNIT

The transfer hydraulic pressure control unit is bolted at the rear end of transmission case through the transfer valve plate.
The hydraulic pressures used for the transfer hydraulic pressure control unit (line pressure and pilot pressure) are supplied from the transmission's hydraulic control valve assembly through the passages formed in the transmission case.

The transfer duty solenoid adjusts the pilot pressure of the transfer clutch valve depending on the signals from the TCM. The transfer clutch valve in turn modulates the line pressure into the transfer clutch pressure before it is applied to the clutch piston.
The transfer clutch pressure adjusted in this way engages the clutch to different degrees according to driving conditions so that the optimum torque is distributed to the rear wheels.



B3H0912A

(1) Transfer control valve
(2) Transfer clutch pressure
(3) Transfer duty solenoid
(4) Transfer pressure
(5) Filter
(6) Pilot pressure
(7) Line pressure
(8) Oil pump
(9) Transmission hydraulic control valve assembly

B: VTD MODELS

1. OUTLINE

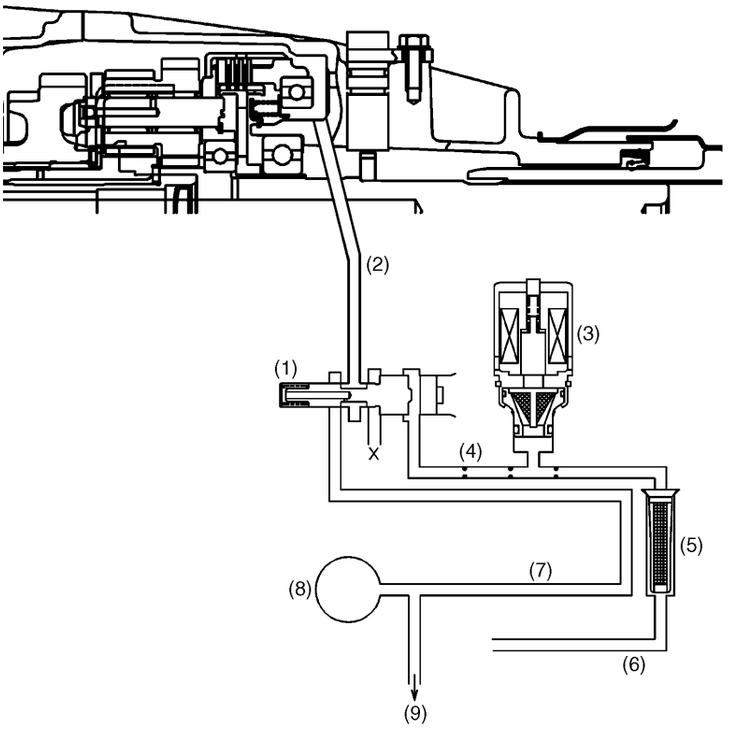
Used in the transfer of the VTD models is the SUBARU drive power distribution system which combines a compound planetary gear type center differential installed in the transfer case behind the transmission and a hydraulically operated multi-plate differential action limiting device (LSD) located between the output components of the center differential. Differential action limiting control is performed by the TCM according to driving and road surface conditions. This system allows combining stability provided by the AWD design with good operability.

The input torque is transmitted to the 1st sun gear of the center differential through the intermediate shaft. From the 1st sun gear, the torque is transmitted through the 1st pinion to the output carrier in the front wheel output components, and through the 2nd pinion to the 2nd sun gear in the rear wheel output components.

The center differential performs the differential functions of absorbing the speed difference between the front and rear wheels and also distributes drive forces to the front and rear wheels at a predetermined ratio. In normal conditions (when there is almost no difference in the speed between the front and rear wheels), the drive force distribution ratio is 45.5 % to the front wheels and 54,5 % to the rear wheels. The hydraulic multi-plate clutch connected in parallel with the center differential between the carrier and 2nd sun gear functions as a differential action limiting device (LSD) and also as a device that controls torque distribution according to driving conditions.

The differential action limiting control is based on the parameters that include the throttle angle, engine speed, vehicle speed, and speed ratio of front and rear wheels. The LSD clutch piston is operated by the fluid whose pressure is adjusted by the duty solenoid and the transfer control valve in the transfer case. According to the pressure applied to the piston, the torque distribution ratio changes from the ratio set for the center differential to the direct AWD ratio.

The speed of the front and rear wheels determine the basic signals for the differential action limiting control. The rear wheel speed is detected by sensor installed above the rear drive shaft and the front wheel speed is detected by the sensor on the parking gear above the reduction drive shaft gear.



H3H0759A

(1) Transfer control valve
(2) Transfer clutch pressure
(3) Transfer duty solenoid
(4) Transfer pressure
(5) Filter
(6) Pilot pressure
(7) Line pressure
(8) Oil pump
(9) Transmission hydraulic control valve assembly

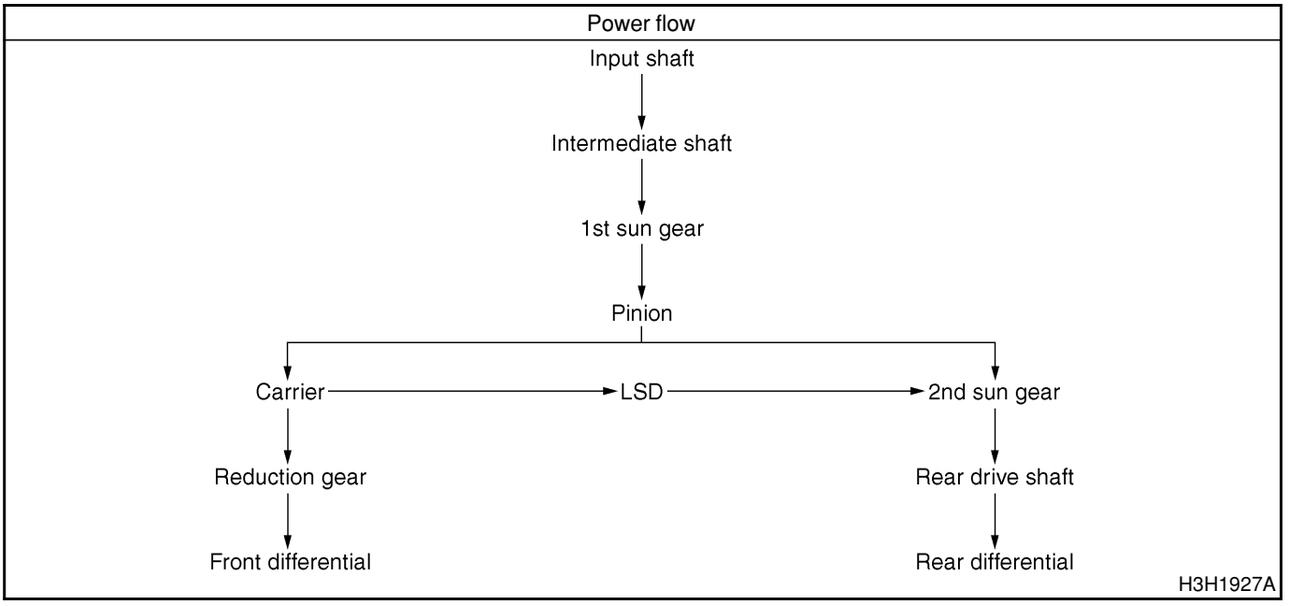
2. VARIABLE TORQUE DISTRIBUTION CENTER DIFFERENTIAL

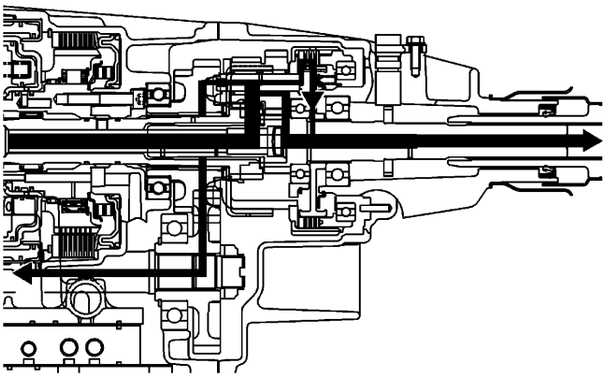
The front-rear torque distribution ratio is basically determined by the gear tooth ratio of center differential's compound planetary gears and varied by changing the degree of engagement of the hydraulically operated multi-plate clutch that connects the center differential output elements according to driving conditions and road surface conditions. The torque distribution ratio is calculated using the following equations which include torque distribution coefficients (determined by number of gear teeth), input torque to the center differential, and torque capacity of the multi-plate clutch as factors.

1) When the front wheel speed is higher than the rear wheel speed:

$T_R = 0.545 \times T_i + T_C$
$T_F = 0.455 \times T_i - T_C$

where
T_R: Rear wheel output torque
T_i: Input torque to center differential
T_C: Torque capacity of multi-plate clutch
T_F: Front wheel output torque
0.545: Coefficient of rear wheel torque determined by number of gear teeth
0.455: Coefficient of front wheel torque determined by number of gear teeth

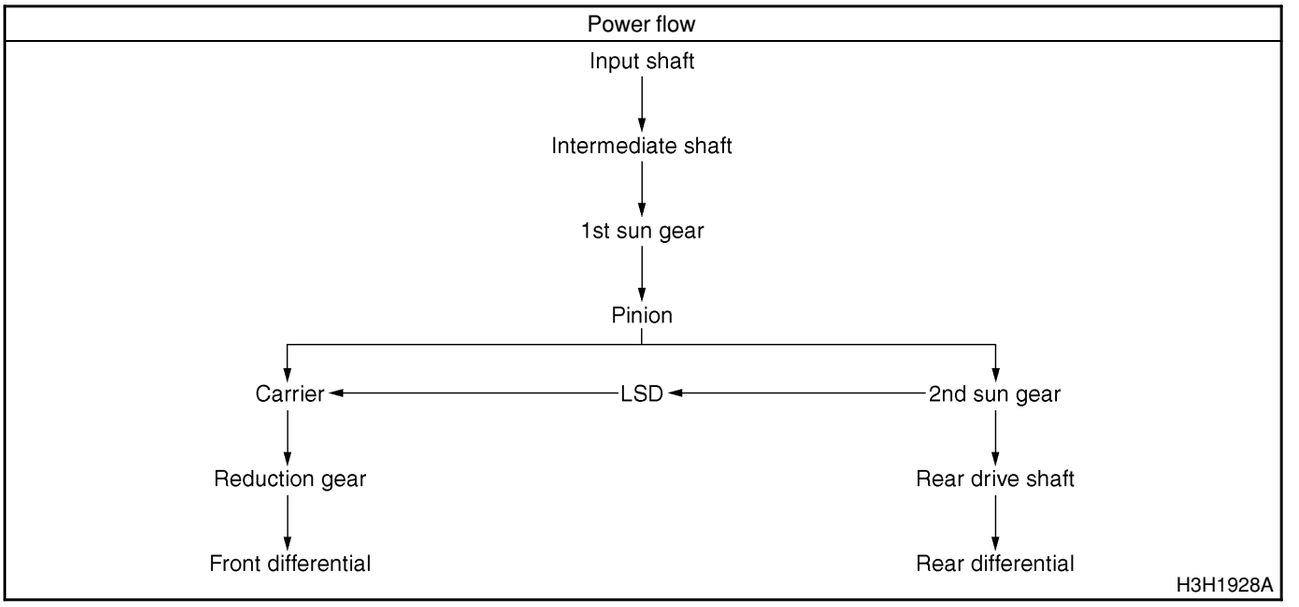


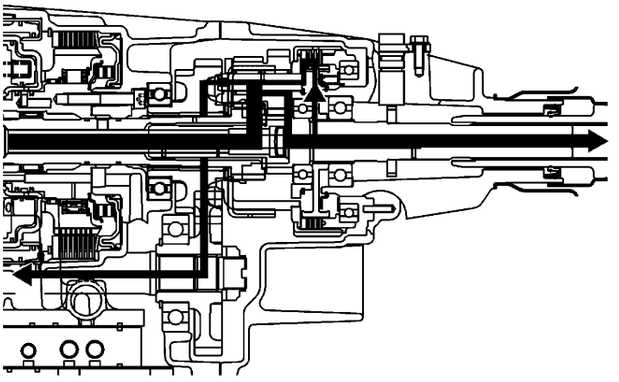


H3H0760

2) When the rear wheel speed is greater than the front wheel speed:

$T_R = 0.545 \times T_i - T_C$
$T_F = 0.455 \times T_i + T_C$





H3H0761

<Calculation of front and rear wheel torques>
If the frictional resistance resulting from meshing of the planetary gears and sliding of rotational components are ignored, the torques distributed to the front and rear wheels are expressed by the following equations:

$T_R = [(Z_{P1} \times Z_{S2}) \div (Z_{S1} \times Z_{P2})] \times T_i$
$T_F = [1 - (Z_{P1} \times Z_{S2}) \div (Z_{S1} \times Z_{P2})] \times T_i$

where
Z_{P1}: Number of teeth of 1st planetary gear
Z_{P2}: Number of teeth of 2nd planetary gear
Z_{S1}: Number of teeth of 1st sun gear
Z_{S2}: Number of teeth of 2nd sun gear
T_i: Input torque

If the number of teeth in each component is the same as that assumed in the equations on the previous page, the following ratios are the calculation results of the equations shown above.

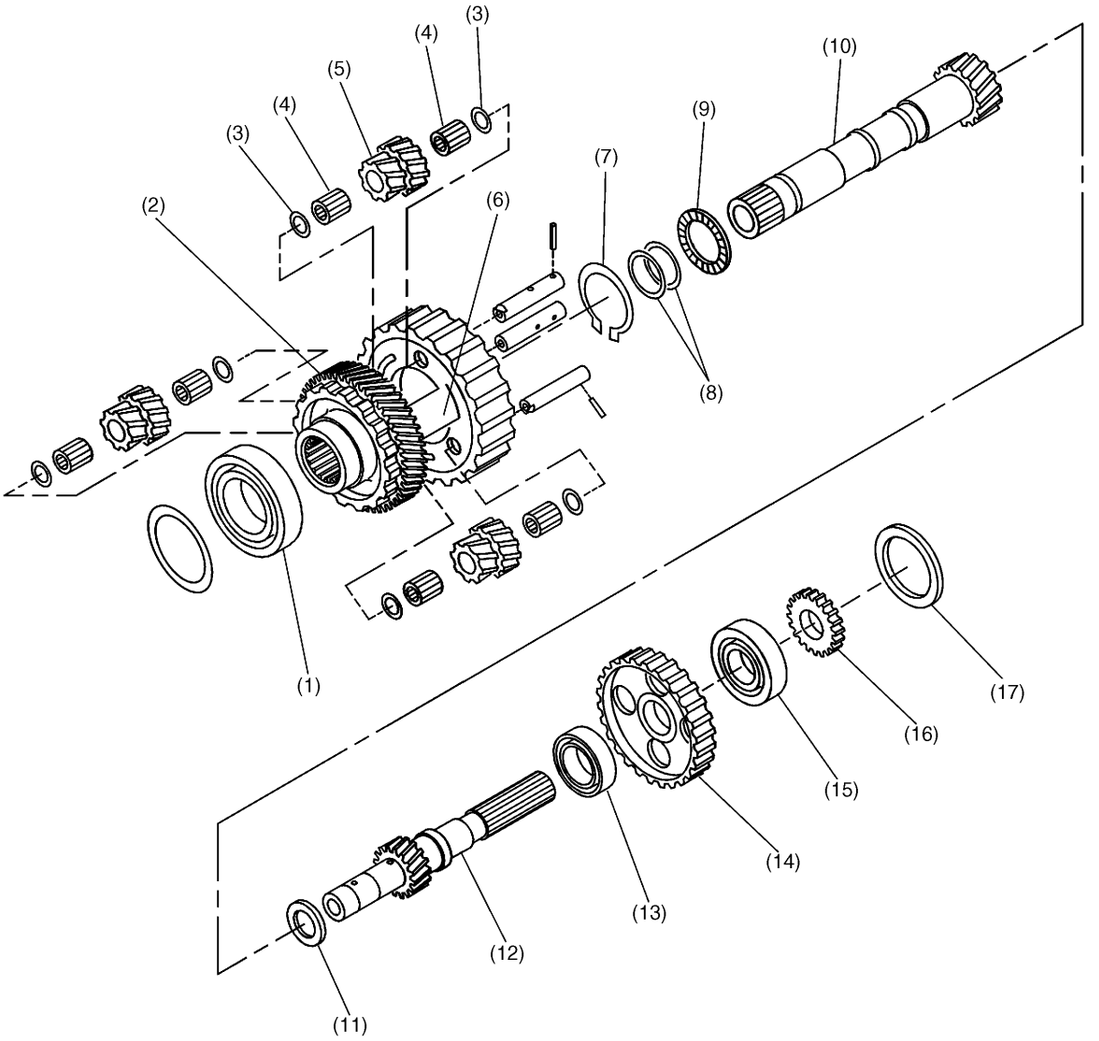
$T_R = 0.545 \times T_i$
$T_F = 0.455 \times T_i$

As a result, the front-rear torque distribution ratio of the compound planetary gear set without an adjustment by the multi-plate clutch is 45.5 : 54.5.

3. CENTER DIFFERENTIAL ASSEMBLY

The center differential is a compound planetary gear set without internally-toothed gears. The input torque from the automatic transmission is transmitted to the input element of the center differential (1st sun gear). The front wheel output elements of the center differential are connected to the carrier and the rear wheel output elements are connected to the 2nd sun gear.

The compound planetary gears uses helical gears for quiet operation and strength. The three pinion are arranged to ensure the best motion balance during operation.



B3H2075A

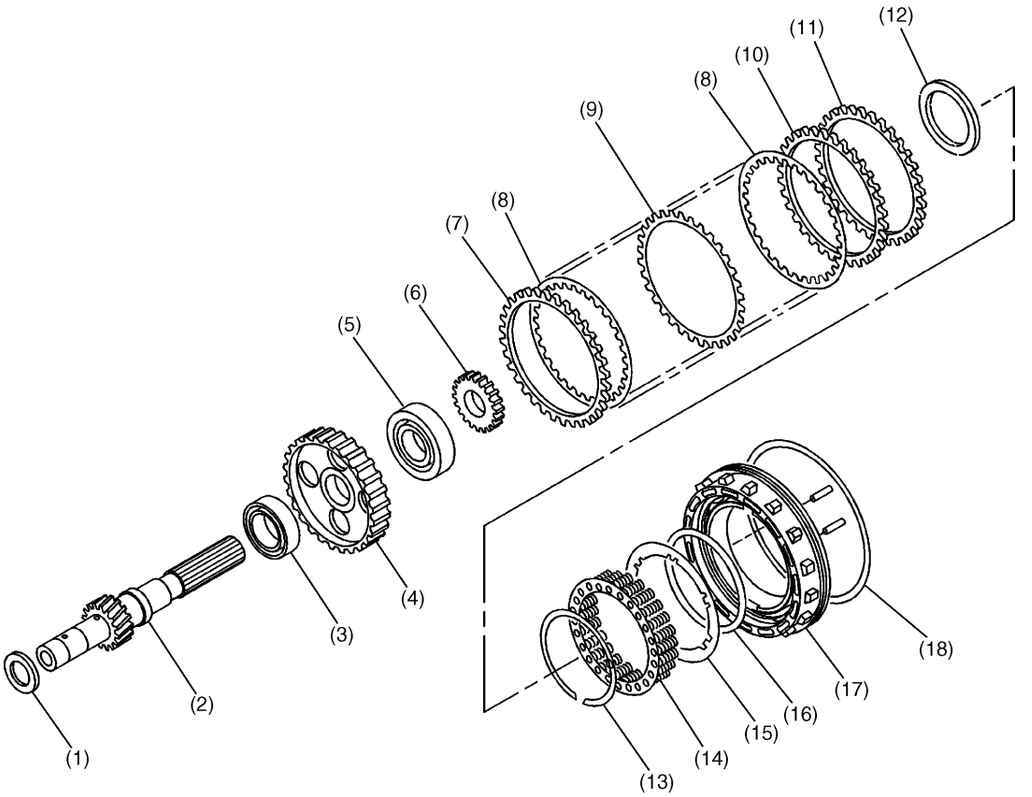
(1) Ball bearing
(2) Reduction drive gear
(3) Washer
(4) Needle bearing
(5) Pinion gear
(6) Carrier
(7) Snap ring
(8) Seal ring
(9) Thrust needle bearing
(10) Intermediate shaft
(11) Thrust washer
(12) Rear drive shaft
(13) Ball bearing
(14) Multi-plate clutch hub
(15) Ball bearing
(16) Revolution gear
(17) Rear drive shaft shim

4. MULTI-PLATE CLUTCH (LSD)

The transfer's differential action limiting device (LSD) consists of a multi-plate clutch and a transfer hydraulic pressure control unit incorporating a transfer duty solenoid.

The transfer duty solenoid is an electromagnetic valve which is controlled by the TCM using various duty ratios stored in its memory as explained in 1. General.

The rear drive shaft has drilled oil passages for lubrication of multi-plate clutch and extension bushing and ball bearing in it.



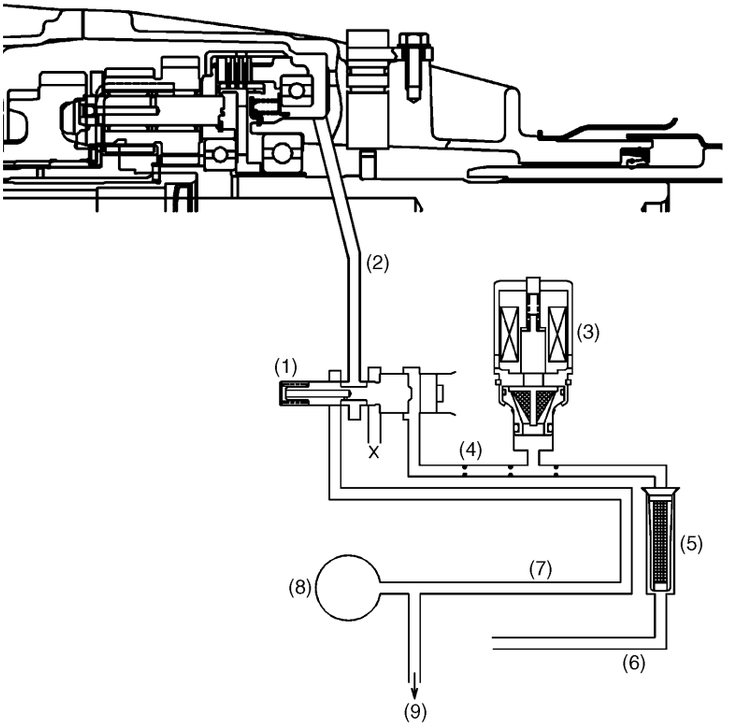
B3H1843A

(1) Thrust washer
(2) Rear drive shaft
(3) Ball bearing
(4) Multi-plate clutch hub
(5) Ball bearing
(6) Revolution gear
(7) Driven plate (Thicker)
(8) Drive plate
(9) Driven plate (Thinner)
(10) Driven plate (Thicker)
(11) Adjust plate
(12) Rear drive shaft shim
(13) Snap ring
(14) Spring retainer
(15) Plate
(16) Lathe cut seal ring
(17) Multi-plate clutch piston
(18) Lathe cut seal ring

5. TRANSFER HYDRAULIC PRESSURE CONTROL UNIT

The transfer hydraulic pressure control unit is bolted at the rear end of transmission case through the transfer valve plate.
The hydraulic pressures used for the transfer hydraulic pressure control unit (line pressure and pilot pressure) are supplied from the transmission's hydraulic control valve assembly through the passages formed in the transmission case.

The transfer duty solenoid adjusts the pilot pressure of the transfer control valve depending on the signals from the TCM. The transfer control valve in turn modulates the line pressure into the transfer clutch pressure before it is applied to the clutch piston.
The transfer clutch pressure adjusted in this way engages the clutch to different degrees according to driving conditions so that the optimum torque is distributed to the rear wheels.



H3H0759A

(1) Transfer control valve
(2) Transfer clutch pressure
(3) Transfer duty solenoid
(4) Transfer pressure
(5) Filter
(6) Pilot pressure
(7) Line pressure
(8) Oil pump
(9) Transmission hydraulic control valve assembly

MEMO