

Simpson Gear-set

Matthew Whitten
Brookhaven College

Input shaft



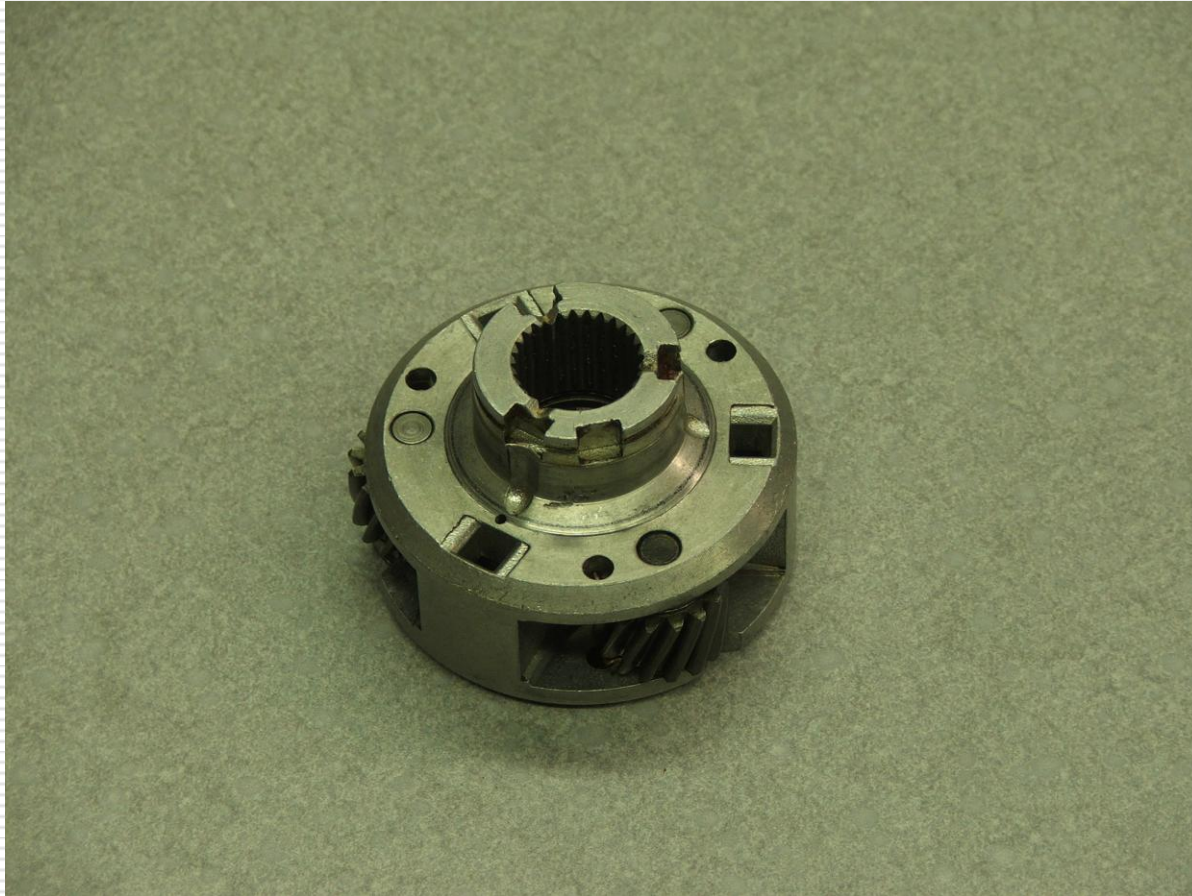
Forward clutch drum/ Forward clutches



Forward clutch hub/ Front ring gear



Front planet carrier/
Front planet pinions/
Front planet pinion pins



Common Sun Gear



AUMT 2325 Automatic
Transmissions

Sun Shell



AUMT 2325 Automatic
Transmissions

Direct (High & Rev.) clutch drum/
Direct(High & Rev.) clutch drum lugs/
Direct (High & Rev.) clutches



Direct(High & Rev.) clutch hub

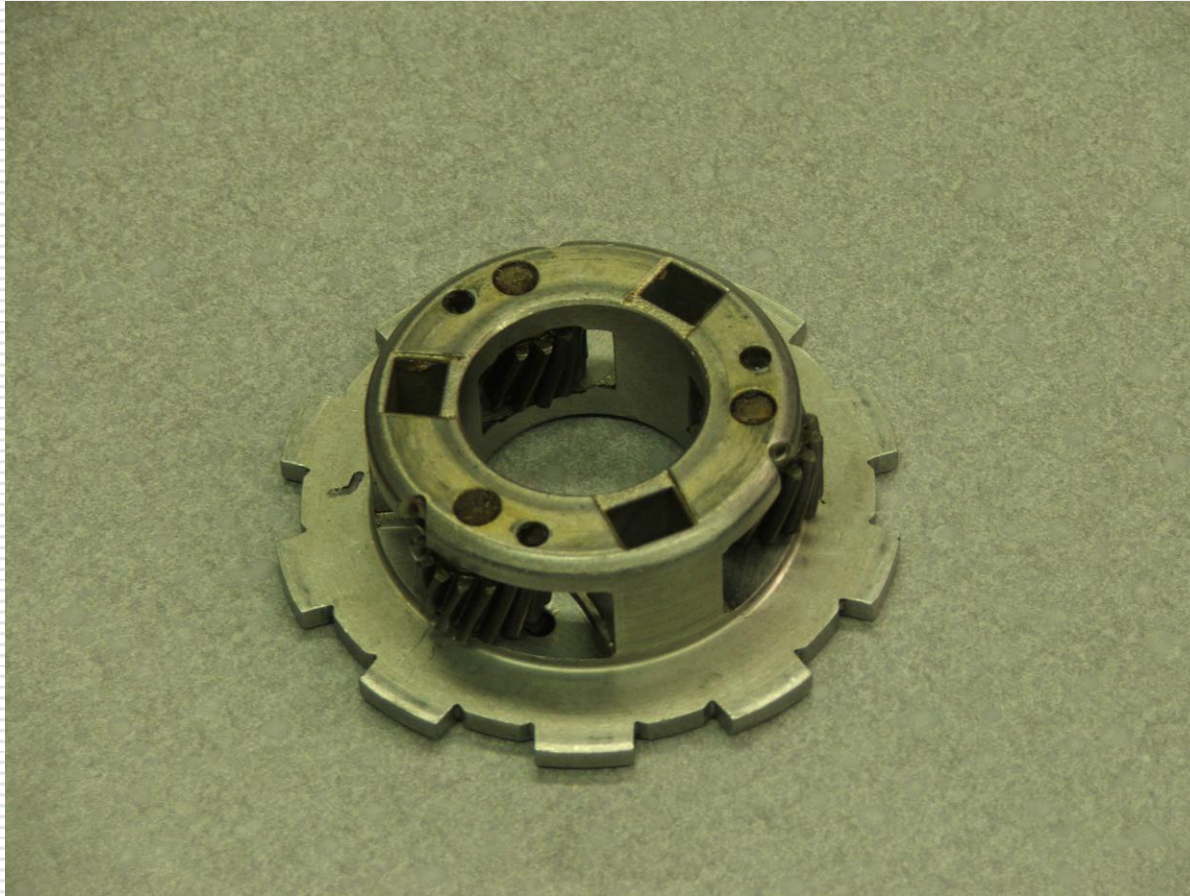


Intermediate Band



AUMT 2325 Automatic
Transmissions

Rear planet carrier/
Rear planet pinions
Rear planet pinion pins



Low & Rev. brake drum/ Low one-way



Low & Rev. band



AUMT 2325 Automatic
Transmissions

Output ring gear



Output shaft



AUMT 2325 Automatic
Transmissions



AUMT 2325 Automatic
Transmissions

Input shaft





AUMT 2325 Automatic
Transmissions

Forward clutch drum/ Forward clutches



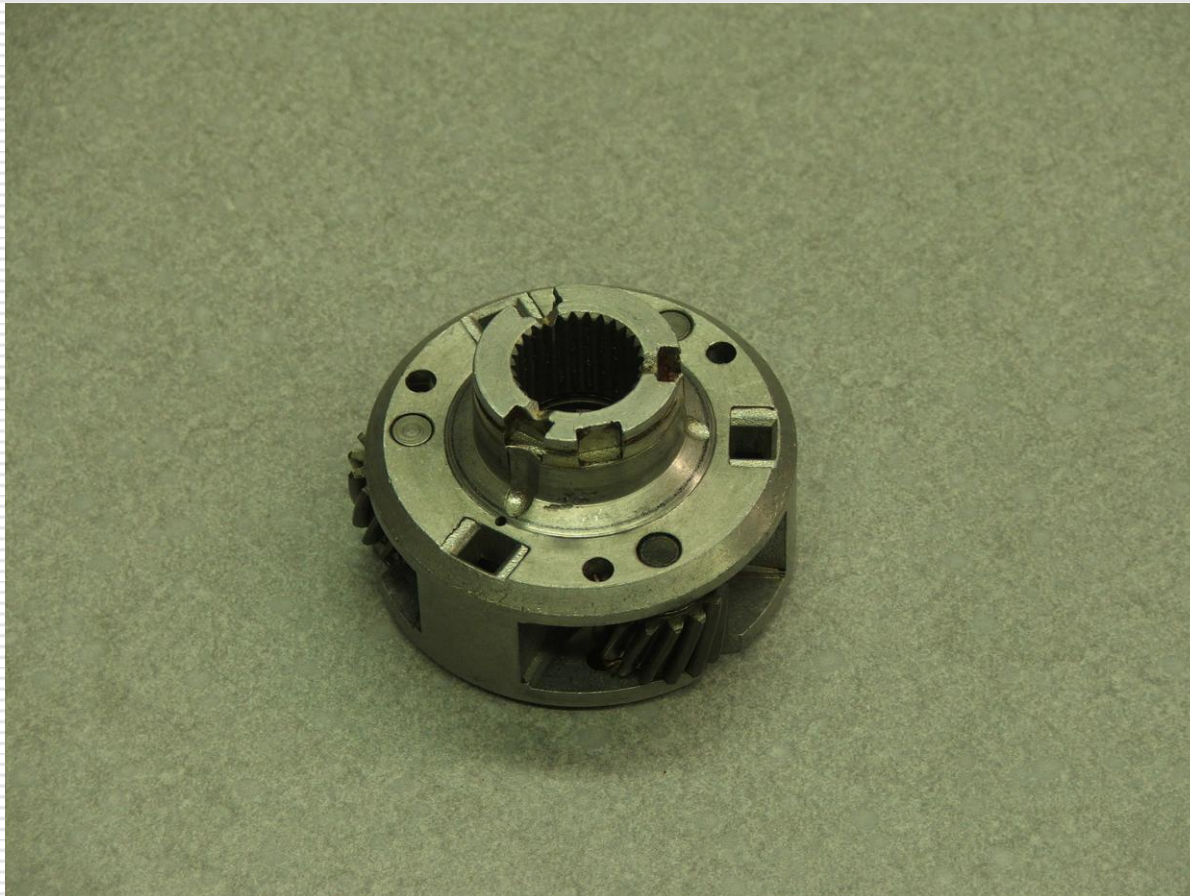
AUMT 2325 Automatic
Transmissions



AUMT 2325 Automatic
Transmissions

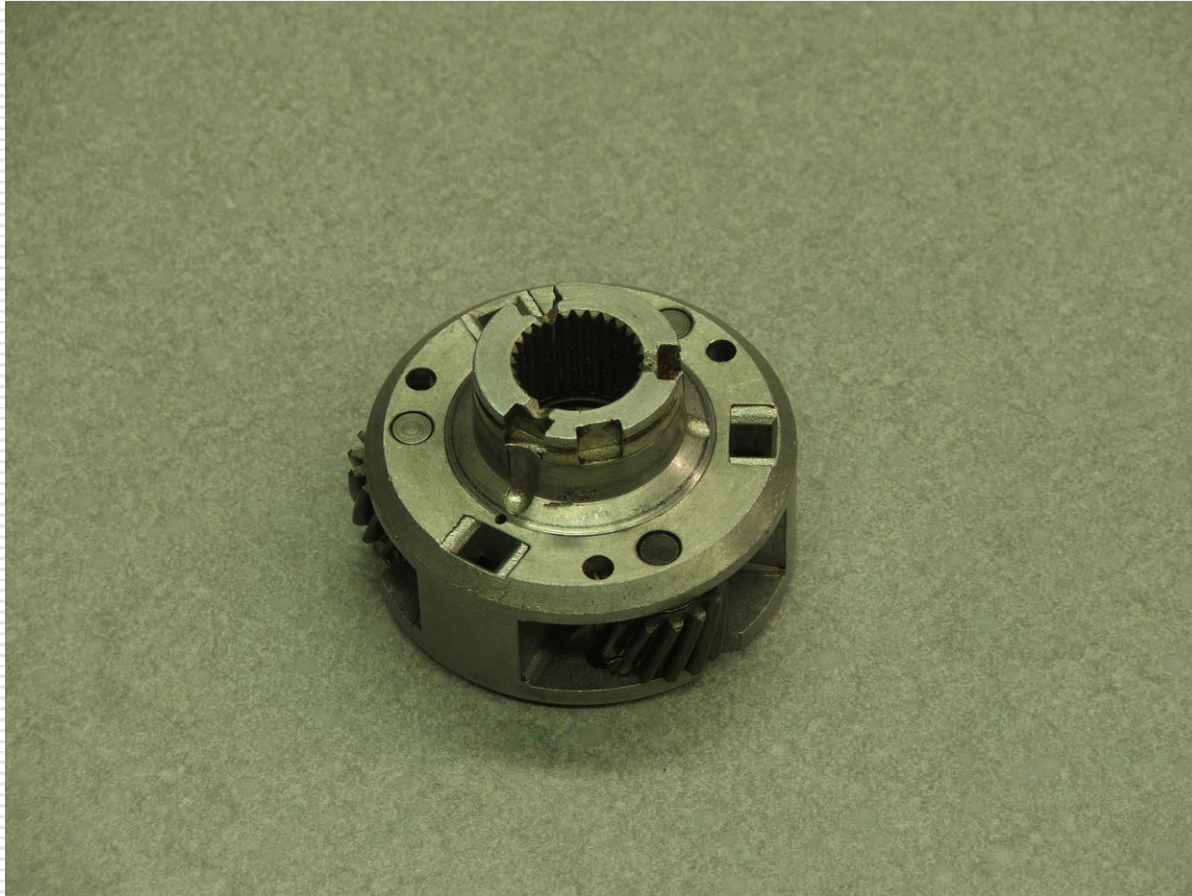
Forward clutch hub/ Front ring gear





AUMT 2325 Automatic
Transmissions

Front planet carrier/
Front planet pinions/
Front planet pinion pins



AUMT 2325 Automatic
Transmissions



AUMT 2325 Automatic
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Common Sun Gear



AUMT 2325 Automatic
Transmissions



AUMT 2325 Automatic
Transmissions

Sun Shell



AUMT 2325 Automatic
Transmissions



AUMT 2325 Automatic
Transmissions

Direct (High & Rev.) clutch drum/
Direct (High & Rev.) clutch drum lugs/
Direct (High & Rev.) clutches





AUMT 2325 Automatic
Transmissions

Direct (High & Rev.) clutch hub



AUMT 2325 Automatic
Transmissions

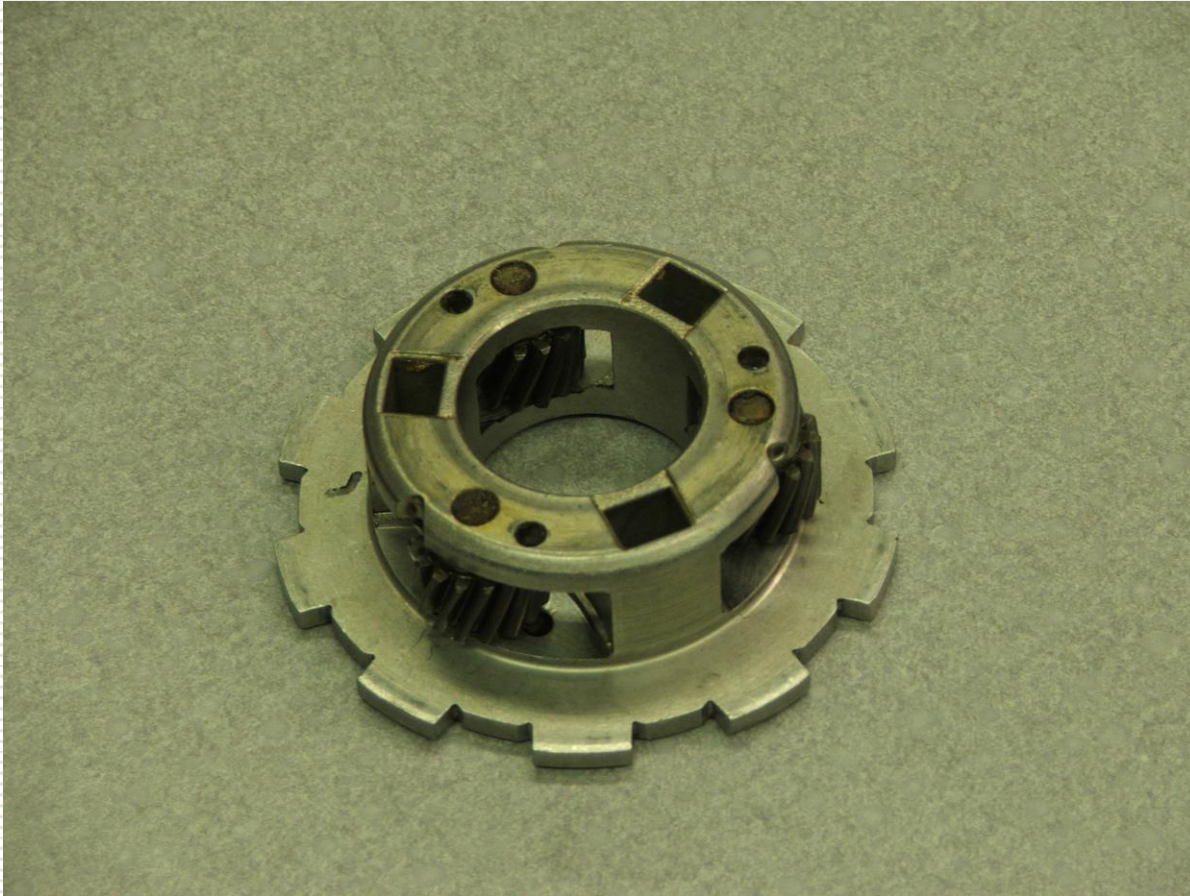


AUMT 2325 Automatic
Transmissions

Intermediate Band

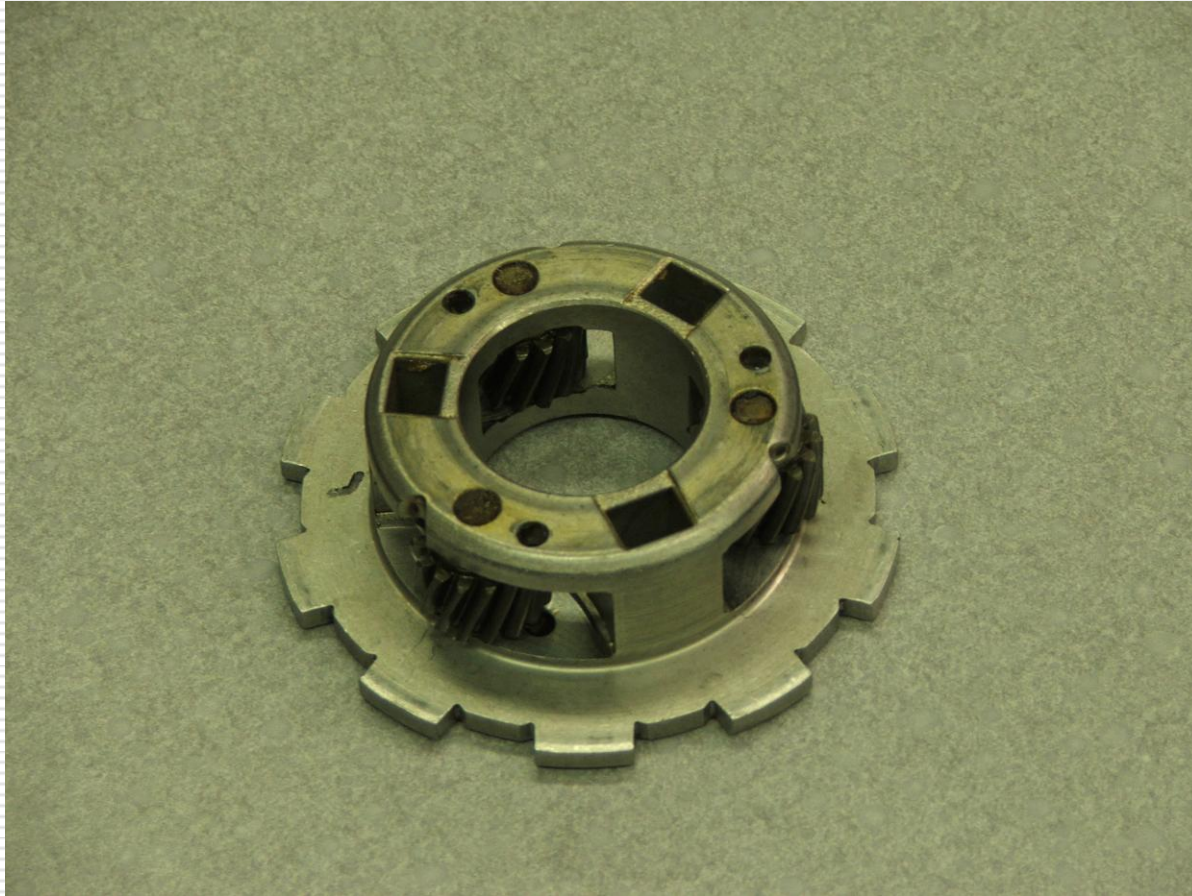


AUMT 2325 Automatic
Transmissions



AUMT 2325 Automatic
Transmissions

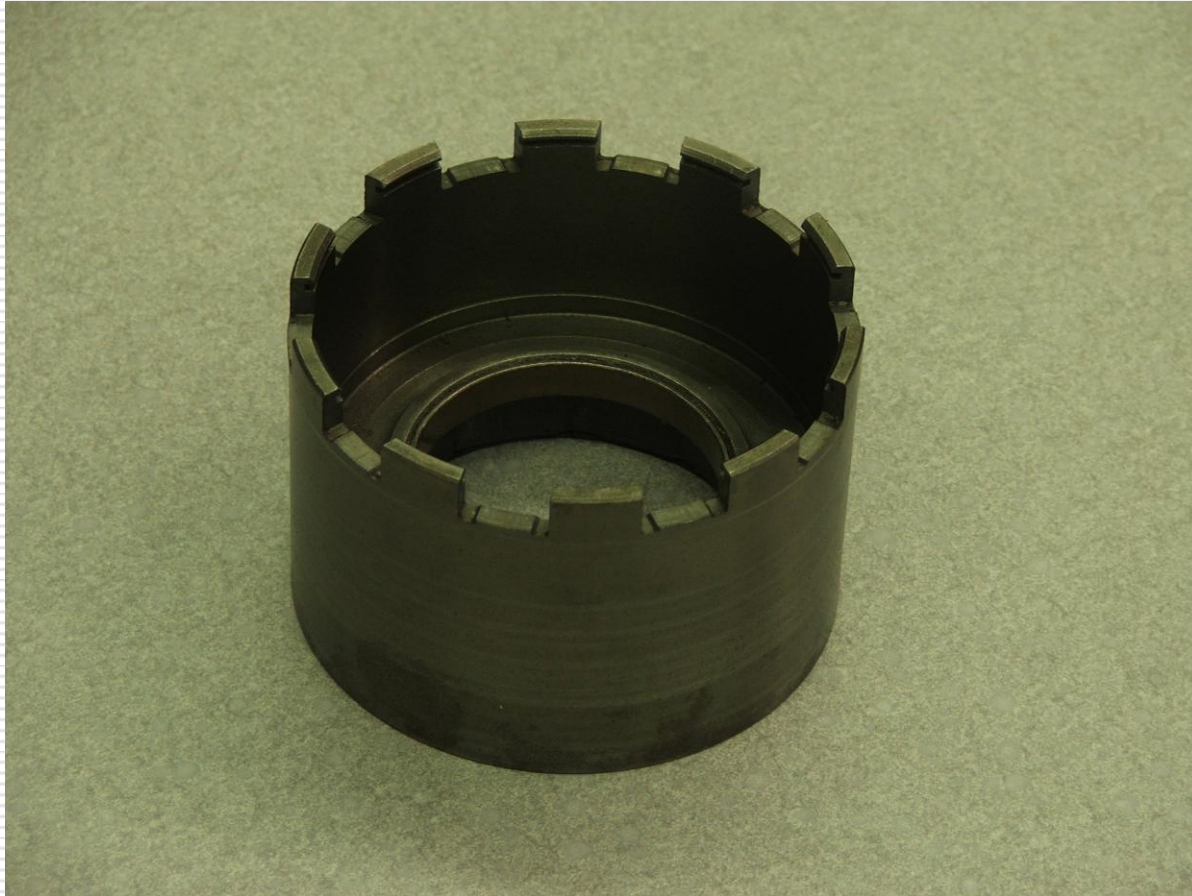
Rear planet carrier/
Rear planet pinions
Rear planet pinion pins





AUMT 2325 Automatic
Transmissions

Low & Rev. brake drum/ Low one-way



AUMT 2325 Automatic
Transmissions



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Low & Rev. band



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Output ring gear



AUMT 2325 Automatic
Transmissions



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Output shaft



AUMT 2325 Automatic
Transmissions

1st gear

Hydraulic. Forward Clutch

Mechanical: O/D One-way clutch + Low One-way

- ❑ Forward Clutch drives front ring gear
 - ❑ O/d one-way drives OD ring gear(inter shaft)
 - ❑ Low one-way holds Rear Planet carrier
 - 1. Input shaft
 - 2. OD planet carrier
 - 3. OD one-way
 - 4. OD ring gear/ inter shaft
 - 5. Fwd clutch drum
 - 6. Fwd clutches
 - 7. Fwd hub Front/fwd ring gear
 - 8. Front planet held by weight of vehicle via OS
 - 9. Front pinions
 - 10. Common sun gear
 - 11. Rear pinions
 - 12. Rear carrier is held stationary via Low One-way clutch
 - 13. Rear ring gear
 - 14. Output shaft
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2nd gear

Hydraulic. Forward Clutch + OD Band
Mechanical: Low One-way

- ❑ Forward Clutch drives front ring gear
- ❑ OD band holding the OD sun gear
- ❑ Low One-way clutch holding the rear planet carrier
- 1. Input shaft
- 2. OD carrier – driving pinions
- 3. OD band wraps around Coast clutch drum which is lugged to OD sun gear
- 4. OD pinions are forced to walk around stationary OD sun gear
- 5. As pinion walk they drive OD ring gear/inter shaft
- 6. Forward clutch – forward clutches – forward hub/Front ring gear
- 7. Front planet held by weight of vehicle via OS
- 8. Front pinions
- 9. Common sun gear
- 10. Rear pinions
- 11. Rear carrier is held stationary via Low One-way clutch
- 12. Rear ring gear
- 13. Output shaft

3rd gear

Hydraulic. Forward Clutch + Intermediate Band
Mechanical: OD One-way clutch

- ❑ OD one way drives OD ring/inter shaft
 - ❑ Forward Clutch drives front ring gear
 - ❑ Intermediate band holds direct clutch drum which lugs to sun shell/ Common sun
1. Input shaft
 2. OD carrier
 3. OD one-way clutch
 4. OD Ring gear/ inter shaft
 5. Intermediate band applied holding Common sun gear
 6. Forward clutch – forward hub – front ring gear
 7. Front planet pinions forced to walk around stationary common sun gear
 8. As they walk they drive their pins and the front carrier which is splined to the output shaft.

4rd gear

Hydraulic. Forward Clutch Direct Clutch
Mechanical: OD One-way clutch

- OD one way drives OD ring/inter shaft
- Forward Clutch drives front ring gear
- Direct clutch drives the Common sun gear
- 1. Input shaft
- 2. OD carrier
- 3. OD one-way clutch
- 4. OD Ring gear/ inter shaft
- 5. Forward clutch – forward hub – front ring gear
- 6. Forward drum – Direct clutch hub – Direct clutches- Direct drum
- 7. Direct drum lugs to common sun shell – common sun gear
- 8. With Two components driven the remainder must follow at same speed which creates 1:1 ratio
- 9. Front planet and rear ring gear
- 10. Output shaft

5th gear

Hydraulic. OD Band + Forward Clutch + Direct Clutch Mechanical:

- ❑ OD band is holding OD sun gear stationary
- ❑ Forward Clutch drives front ring gear
- ❑ Direct clutch drives the Common sun gear
- 1. Input shaft
- 2. OD carrier – driving pinions
- 3. OD band wraps around Coast clutch drum which is lugged to OD sun gear
- 4. OD pinions are forced to walk around stationary OD sun gear
- 5. Forward clutch – forward hub – front ring gear
- 6. Forward drum – Direct clutch hub – Direct clutches- Direct drum
- 7. Direct drum lugs to common sun shell – common sun gear
- 8. With Two components driven the remainder must follow at same speed which creates 1:1 ratio
- 9. Front planet and rear ring gear
- 10. Output shaft

Reversest gear

Hydraulic. Coast Clutch + Direct Clutch+ Low/rev band
Mechanical: OD one-way

- ❑ OD one way drives OD ring/inter shaft
 - ❑ Coast clutch is applied driving OD sun gear
 - ❑ Direct clutch drives the Common sun gear
 - ❑ Low reverse band applied holding rear planet carrier
1. Input shaft
 2. OD carrier (driving two components to create 1:1 and coast clutch prevents OD one-way from over-running.
 3. Coast clutch hub – coast clutches – Coast clutch drum – OD sun gear
 4. OD one-way clutch
 5. OD Ring gear/inter shaft
 6. Forward Clutch drum
 7. Direct clutch hub – direct clutches – direct clutch drum lugged to sun shell
 8. Common sun gear
 9. Low/reverse band applied on low/reverse brake drum lugged to rear carrier
 10. Rear planet pinions spin on their pins and drive the rear ring gear.
 11. Output shaft