

**Profit
Proven
Performance**



MT Series

for GASOLINE AND DIESEL POWERED

medium trucks

heavy duty trucks

highway tractors

special purpose vehicles

school buses

charter • suburban • transit buses



OF COURSE YOU WANT



longer engine life



longer drive line life



less down time



less trip time



less driver recruitment



simplified driver training

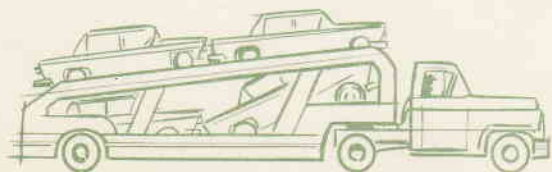


safer operation

**THEN
YOU WILL SPECIFY—**

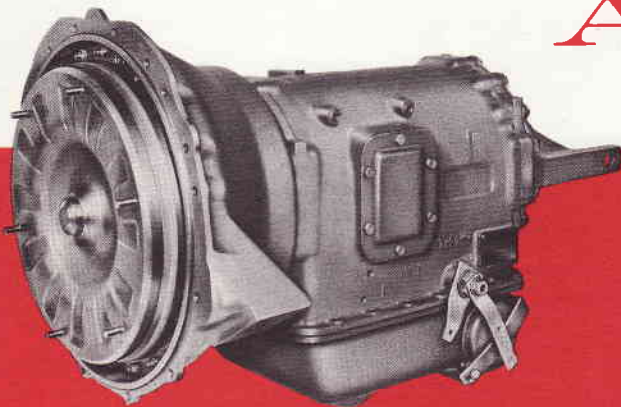
Allison *fully* **AUTOMATIC**

for PROFIT PROVEN PERFORMANCE



WHY YOU WILL SPECIFY

Allison *fully* AUTOMATIC



Being specifically matched to the engine, the ALLISON *fully* AUTOMATIC enables the engine to operate at its most effective output under all drive conditions. This permits the shift points to be established at the power peak for all speeds. The transmission valve body, or "brain box," automatically senses and co-ordinates engine speed and vehicle speed, thus providing full-power, and smooth, full-torque shifts.

The built-in vehicle retarder in front of the gear train hydraulically relieves the service brakes of "snubbing" on downgrades. The hydraulic vehicle retarder is simple, safe, effective.

Provision is made for a power takeoff driven by the hydraulic torque converter for smooth, *shockless* operation of auxiliary equipment.

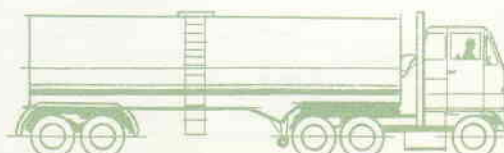
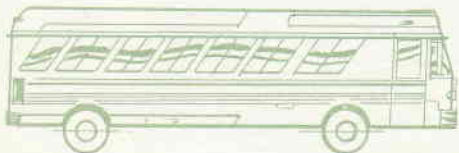
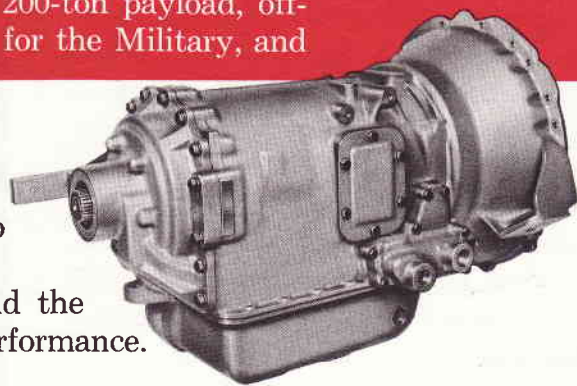
Yes, the ALLISON *fully* AUTOMATIC has been *proven* in user operation in all types of vocational equipment.

And its principles were proven long before they were adapted to on-highway trucks. The ALLISON *fully* AUTOMATIC has behind its development *more than one quarter million* Allison Powershifts—with *millions of hours of operation* in 50-ton tanks, 200-ton payload, off-highway trucks and other giant-size equipment for the Military, and

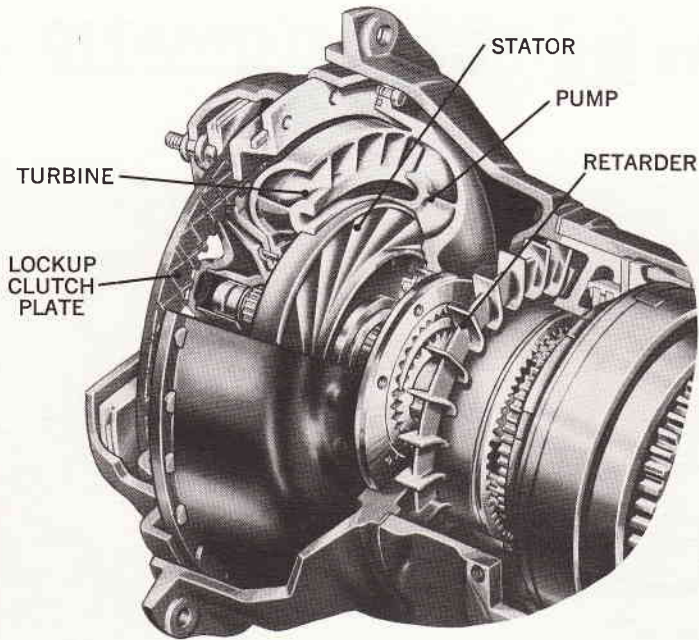
for the earth-moving, mining, logging, and oil field industries.

The ALLISON *fully* AUTOMATIC's performance stands as *proven* fact—ready and eager to go to work for you.

These pages will further tell you the how and the why of the Allison AUTOMATIC's profit proven performance.



How THESE PROVEN Allison COMP



torque converter and lockup clutch

The torque converter is a 3-element, single-stage, multiphase type. It is constantly charged with the same oil that is used to operate the hydraulic valves, clutches, and hydraulic retarder, and to lubricate and cool the transmission. The converter takes the place of an engine disconnect clutch, and performs as a hydraulic torque multiplier and fluid coupling.

Hydraulic torque multiplication automatically provides infinite ratios within the converter's range. Combined with gearing, it gives perfect engine speed control over the entire operating range. This enables it to provide high "breakaway" torque ratios to get a load under way smoothly and quickly. And most important, it permits the engine to deliver peak performance free from lugging and stalling. At vehicle stall—such as starting on steep grades—it provides maximum torque at 0 miles per hour.

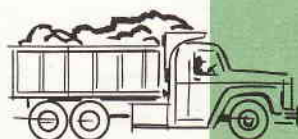
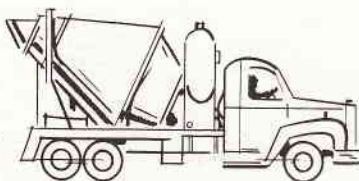
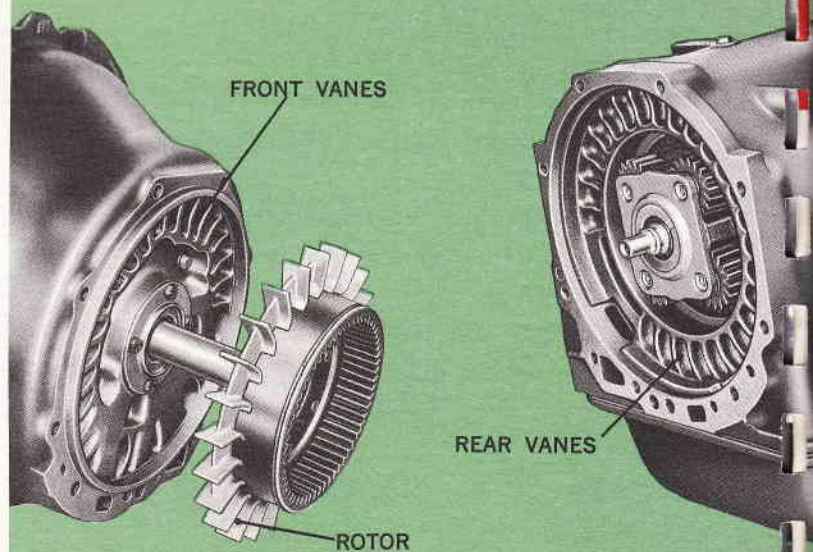
Lockup automatically provides direct mechanical drive from the engine to the gear train. When the lockup clutch is applied, the torque converter pump and turbine elements are positively locked together—

eliminating any slippage. This provides maximum fuel economy in any range.

The lockup clutch automatically releases when any change from one gear ratio to another occurs. This provides a brief interval of hydraulic drive. Thus shock loads are absorbed by the hydraulic fluid instead of by the drive-line components.

hydraulic retarder

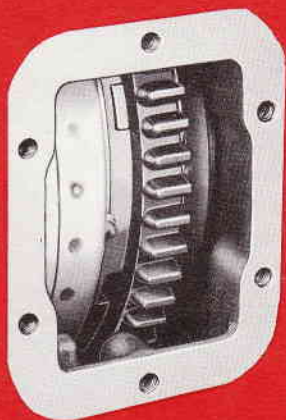
The hydraulic retarder is a most simple device—only one moving part: a vaned rotor. A touch of the toe on the retarder foot pedal sends a surge of oil into action. The rotor, driven by the truck wheels through the drive line, throws the oil against the fixed stator vanes which resist the oil flow. This makes it harder for the rotor to turn and correspondingly makes it harder for the truck wheels to turn—thus slowing the vehicle. The oil does all the retarding work, absorbing the heat generated by the retarder action. The oil is circulated to the heat exchanger. When retarder action is not called for, the valve is closed. The oil is then evacuated from the cavity, and there is no power absorption in the retarder. See the Hydraulic Retarder Chart on page 8.



COMPONENTS PERFORM FOR YOUR PROFIT

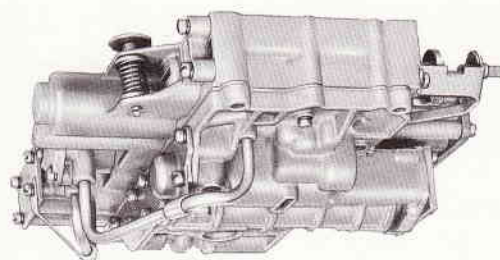
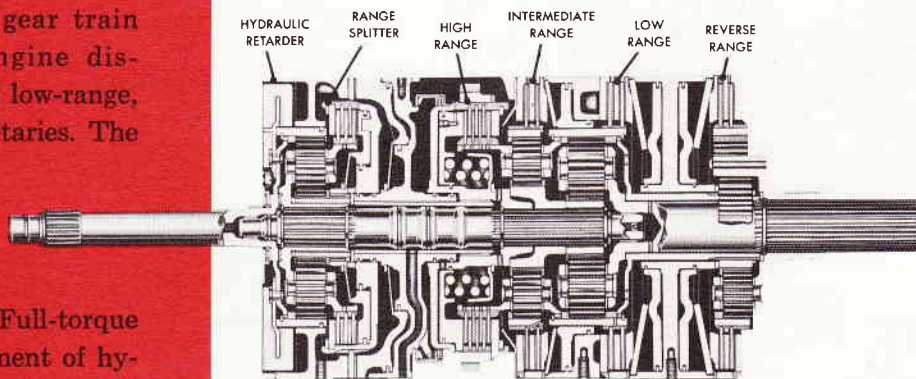
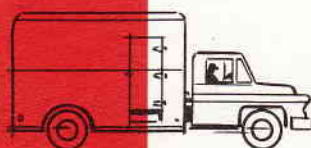
planetary gear train

The illustration right shows the planetary gear train, which provides 6 speeds forward and 1 reverse. Driven by the torque converter, the planetary gear train is in constant mesh and needs no engine disconnect clutch. The train includes splitter, low-range, intermediate-range and reverse-range planetaries. The splitter planetary provides two ratios in each forward range. In planetary gearing, gear-tooth loading is divided among several gears. There are no side-thrust forces on the main shafts and transmission housing. Full-torque shifting is accomplished by smooth engagement of hydraulic-actuated disk clutches. Clutches are oil cooled and require no adjustment. The concentric arrangement of clutches and planetary gearing allows the space for built-in ruggedness.



converter-driven PTO

Power takeoffs may be mounted on either or both sides of the transmission. Loads can be smoothly started, inched, held, raised or lowered by *throttle action alone*. Torque converter smoothness and flexibility protect the driven equipment from sudden shock. The ALLISON AUTOMATIC satisfies PTO requirements for normal and heavy duty applications (p. 6).



valve body

This is where *horsepower sense* begins—the “brain box” of the transmission. Here the speed and load conditions of the vehicle and engine are instantly and automatically translated into proper hydraulic pressures, clutch action and required gear ratios. Upshifts, downshifts, and converter lockup occur at the precise moment of demand.

Allison *fully* **AUTOMATIC WITH CON**

SPECIFICATIONS FOR PROFIT PERFORMANCE

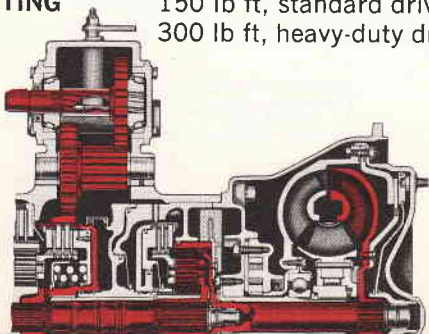
BASIC MODELS • RATING	Model	Max. net engine Torque (lb. ft.) Nominal rating	Engine gov speed		Weight	Length (basic) inches
			max	min		
	MT 30	300	4000	3200	512	29.75
	MT 31	300	3150	2500	514	29.75
	MT 40	400	3800	3200	514	29.75
	MT 41	400	3150	2500	504*	29.75
MT 42	480	3600	3200	504*	32.05	

*aluminum converter housing

CONVERTER	Allison • Single stage • 3 element
LOCKUP CLUTCH	Automatic—engaged above 4 to 12 mph—disengaged during shift action
GEARS	Planetary • involute spur Arrangement 3-speed range set with reverse 2-speed splitter ahead of range set
CLUTCHES	Hydraulic actuated • multidisc • oil cooled • self adjusting
HYDRAULIC RETARDER	Torque absorption (approx)— 206 lb ft @ 2500 rpm 320 lb ft @ 3200 rpm 485 lb ft @ 4000 rpm See Hydraulic Retarder Chart—page 8
CONVERTER HOUSING	SAE 3 (cast iron)—SAE 2 or 3 (aluminum)
OIL SYSTEM	Type—hydraulic transmission fluid type C-1 or type A, suffix A Capacity—20 qt approx (depends upon cooler size) Filter—full flow • integral • disposable element

PTO SPECS AND DATA

OPENINGS 2 SAE • 6 bolt
DRIVE GEAR 57 teeth • 6-8 pitch • 20° pressure angle
ROTATION enginewise
RATING 150 lb ft, standard drive gear
 300 lb ft, heavy-duty drive gear



PTO DRIVE GEAR SPEED

VEHICLE STATIONARY

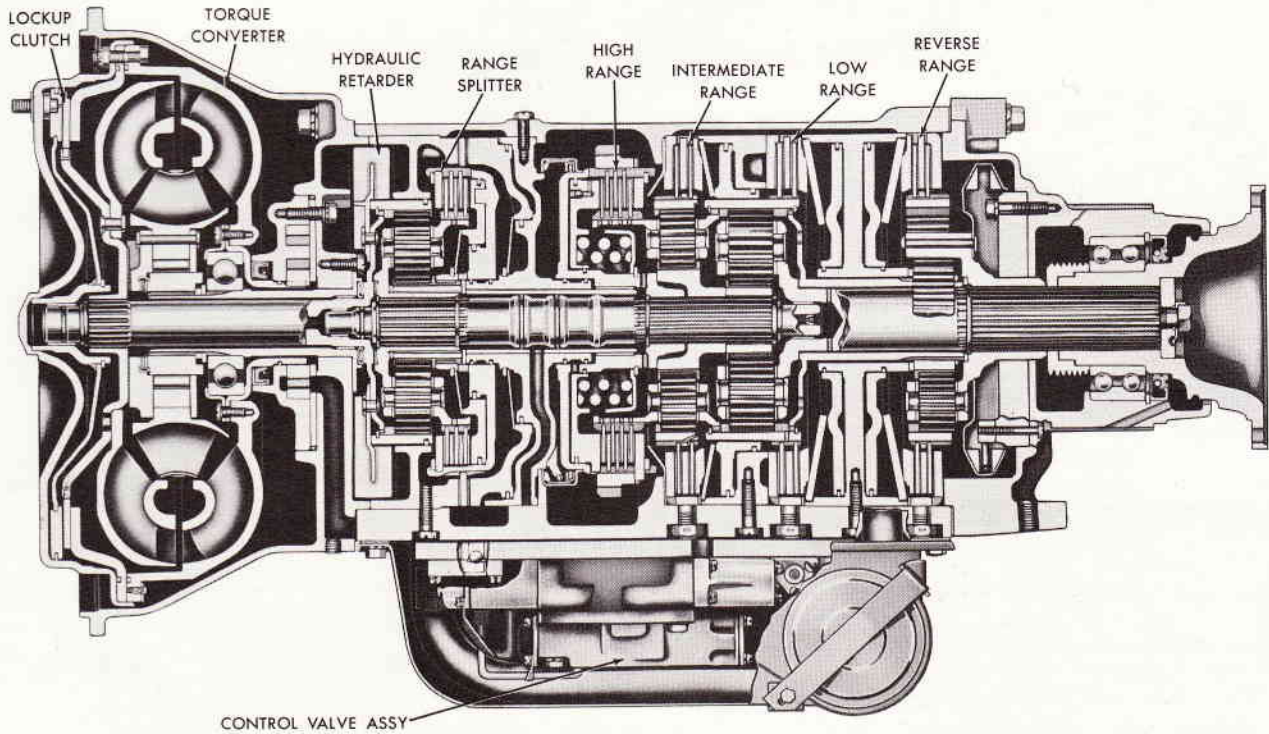
with selector in neutral, drive gear rotates at 72% of engine speed at no load. With load, PTO speed drops. (See PTO manufacturer's hp vs speed charts)

VEHICLE IN MOTION

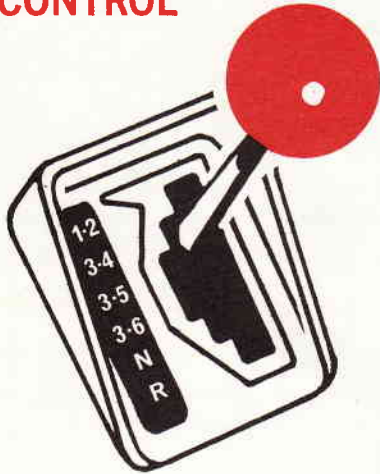
- R, 1st, 3rd, 5th gears—PTO drive gear runs 72% of turbine speed*
- 2nd, 4th, & 6th gears—PTO drive operates at turbine speed*

* turbine speed = engine speed in lockup

VERTER-DRIVEN POWER TAKEOFF



CONTROL



SEQUENCE

R	reverse converter
N	neutral (start)
3-6	3rd converter: 3-4-5-6 lockup (0 - 60 mph)
3-5	3rd converter: 3-4-5 lockup (0-45 mph)
3-4	3rd converter: 3-4 lockup (0-30 mph)
(CREEPER) 1-2	1st converter: 1-2 lockup (0-15 mph)

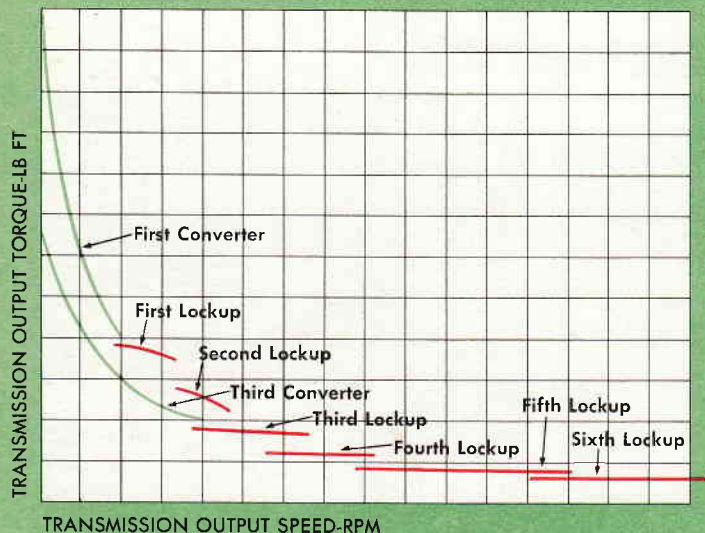
RATIOS

CONVERTER	Models * - - - - -	TC 340	TC 350	TC 360	TC 370
	Stall torque ratios - - - -	2.8:1	3.5:1	3.0:1	2.5:1
Gears	Ratios	Total gear & converter ratios at 0 mph			
6th	1.00:1	---	---	---	---
5th	1.39:1	---	---	---	---
4th	1.94:1	---	---	---	---
3rd	2.69:1	7.5:1	9.4:1	8.1:1	6.7:1
2nd	3.81:1	---	---	---	---
1st	5.29:1	14.8:1	18.5:1	15.9:1	13.2:1
rev	6.04:1	16.9:1	21.1:1	18.1:1	15.1:1

*Converter choice depends upon proper engine-transmission match

Allison fully AUTOMATIC PERFORMANCE

-PROVEN DATA



HIGH-START TORQUE, EVENLY-SPACED GEAR STEPS

The output torque curve, above, schematically illustrates high-start torque and the six evenly-spaced gear ratios.

Basic to the ALLISON fully AUTOMATIC is the hydraulic torque converter, for smooth high torque starting.

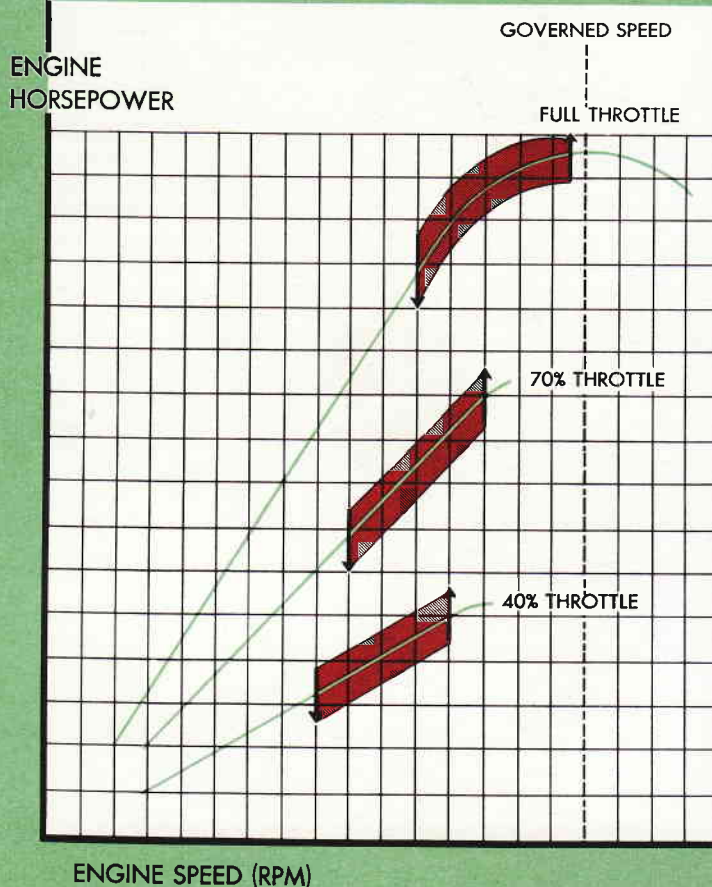
Next, and most important, are the six evenly-spaced 1.39 to 1 gear steps—gear ratios. (Note that first and third gear ratios are augmented by the hydraulic torque converter.) The maximum torque multiplication is at 0 mph—this is most desirable when starting—especially on an upgrade.

As the speed of the truck increases, the torque automatically adjusts to meet the demand from the load at the wheels. The converter multiplication gradually decreases until its torque ratio becomes 1 to 1. Then the lockup clutch automatically engages to provide a no-slip drive through the planetary gear train.

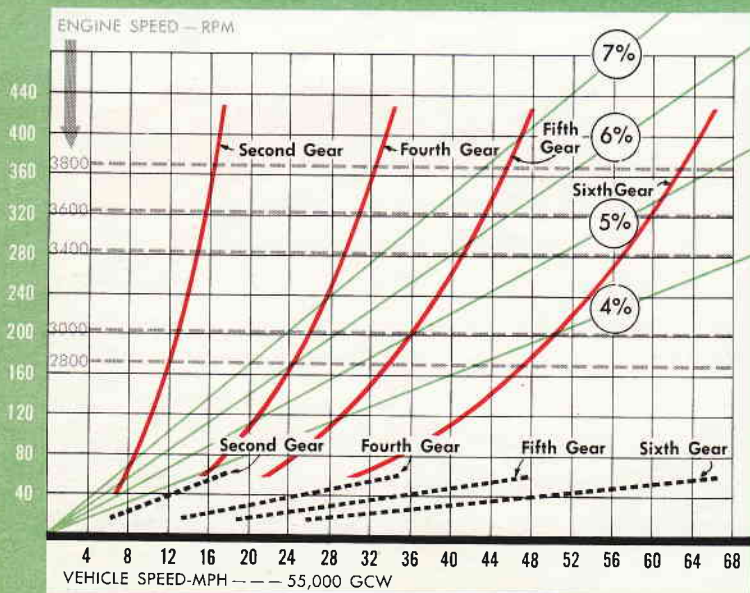
During torque converter operation, the engine operates at speeds up to approximately 55 to 85 percent of governed speed—depending on engine size and converter selection.

MAXIMUM POWER

The engine-transmission output curve chart, below, shows the value of the ALLISON fully AUTOMATIC matched to the engine with the engine-transmission functioning as an integral unit. The operational range of the transmission overlaps the engine power peak curve even at part throttle. The engine is governed at its most effective output. The transmission valve body (brain box) automatically upshifts the transmission just under the governed rpm. The automatic downshift point is set at 72 percent of the governed rpm. The engine cannot overspeed nor can it be subjected to harmful lugging.



BRAKING HORSEPOWER Hydraulic Retarder Chart



HYDRAULIC RETARDER

The red curves on the Hydraulic Retarder Chart, left, show the total horsepower absorbed by the hydraulic retarder and engine in the various gears which can be used for retarding. The black broken lines show the braking horsepower of the engine alone. The green lines indicate the amount of energy developed by a 55,000-pound gcw vehicle going down a 4, 5, 6, or 7 percent grade. The point where the red retarder curve crosses the green grade line indicates the top vehicle speed on that particular grade. For example, in fourth gear with the hydraulic retarder in use on a 7 percent grade, the vehicle will travel at 27 mph, without using the service brakes.

DRIVING FOR GREATER PERFORMANCE



SELECTIVE DRIVE RANGES

The Allison fully AUTOMATIC has a range for every road and any load condition—from starting uphill with the heaviest cargo, keeping up with traffic flow in congested areas, cruising the open road, or downhill under safe retarder control. The operator selects the range he wants—the transmission automatically selects the right gear for speed and load.

Selective-drive includes four shift selective positions (exclusive of reverse and neutral) for six speed forward. 3-6 includes 3rd gear through sixth. 3-5 includes 3rd, fourth and fifth gears. 3-4 includes 3rd and fourth gears. 1-2 is creeper and includes 1st and 2nd gears. (See chart page 7.)

In all drive ranges the power of the engine is multiplied by the torque converter ratio to start the load. In the powerful creeper range (1st and 2nd), the power is further boosted by first gear ratio.

SELECTING THE RIGHT DRIVE

3-6 is a good range for normal load, grade and traffic conditions.

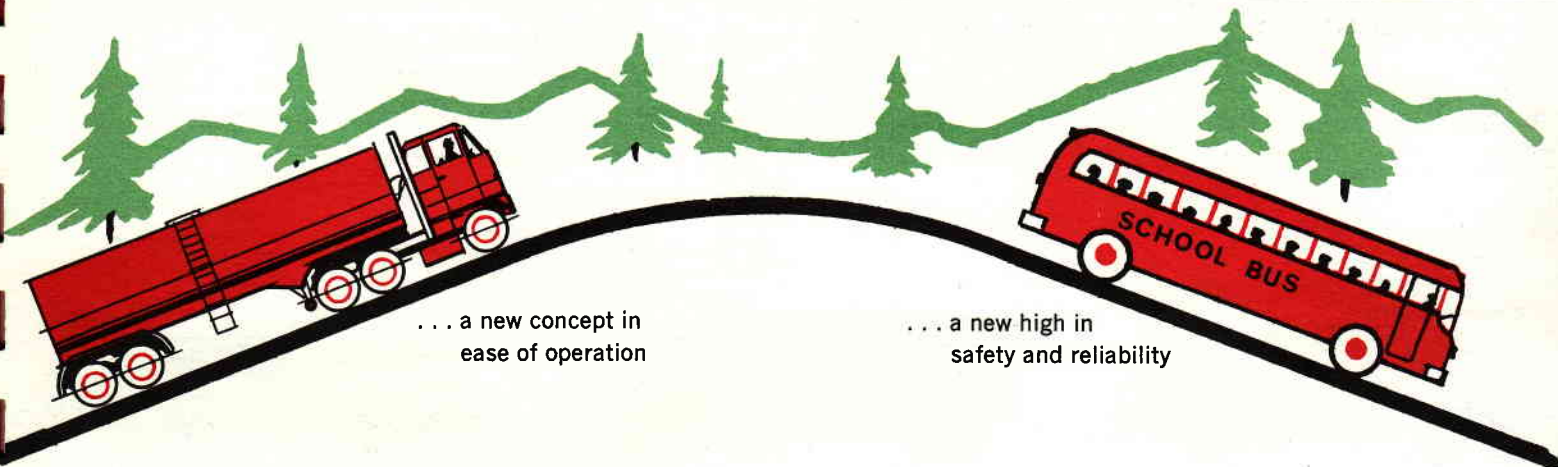
3-5 is ideal for moderate traffic and moderate grades as well as over-the-road operation with restrictive speeds. Hydraulic retarder action is good.

3-4 is for heavy traffic and for descending steep grades where excellent hydraulic performance is required.

1-2 (creeper range) is for extra heavy loads—or extra steep grades, and off-highway driving.

THROTTLE OVERCONTROL

On variable upgrades, the driver can override automatic upshifts by simply flooring the accelerator pedal. This will engage the throttle overcontrol detent and prevent "hunting." Concurrently the automatic down-shift point has been raised higher on the power peak of the engine. The transmission can downshift if the grade is steep but will not continually shift between lower and higher gears when the grade is long and considerably varied. A slight added pressure on the accelerator pedal at full throttle will engage the detent. Releasing this added pressure will allow return to normal operation.

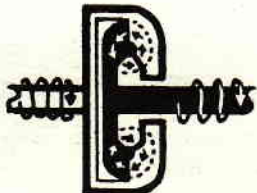


... a new concept in ease of operation

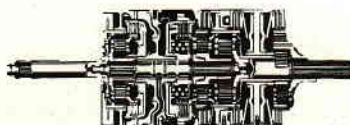
... a new high in safety and reliability

TORQUE CONVERTER

Maximum power for starting on steep grades

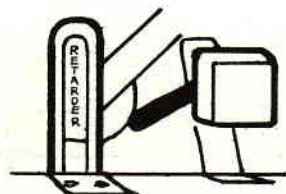


PLANETARY GEAR TRAIN



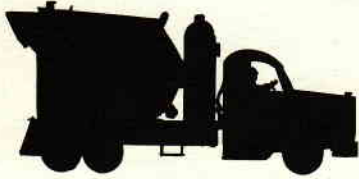
HYDRAULIC RETARDER

Safely speeds up downgrade operation—extends service brake life

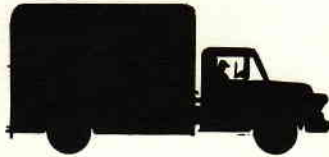


MORE THAN 50,000 *Allison fully* AUTOMATICS IN COMMERCIAL AND MILITARY USE!

CONSTRUCTION



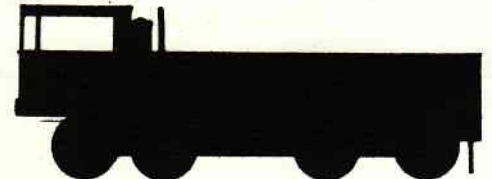
PICKUP and DELIVERY



MILITARY



RUBBISH REMOVAL



... AND THE DEMAND IS RAPIDLY GROWING!

Because once a vehicle equipped with the ALLISON *fully* AUTOMATIC is acquired, you, the owner, can check out its value better than anyone else. For whatever your particular requirements and problems are—whether it be severe duty cycle, driver skill—training and safety, or greater maneuverability and productivity, the Allison AUTOMATIC will fit your need.

For example: an asphalt paving company started with 2 Allison-equipped vehicles in 1961: in three years they acquired 13 more; a school bus operator acquired 2 in '59, since he has added 32 more; in '58 a utility purchased 1 vehicle equipped with Allison AUTOMATIC—now it has 500 in service—and so the record grows! You, too, can have the benefit of their profit proven performance in your kind of service with the ALLISON *fully* AUTOMATICS. Prove the value to yourself as outlined on the opposite page! For wherever there is a need for profitable performance—there is a need for the ALLISON *fully* AUTOMATIC!

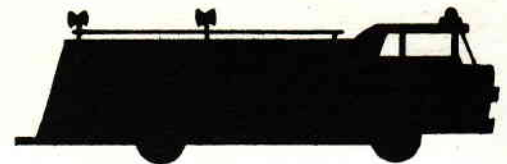
UTILITY



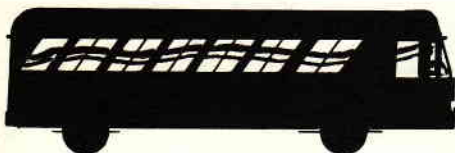
SHORT HAUL



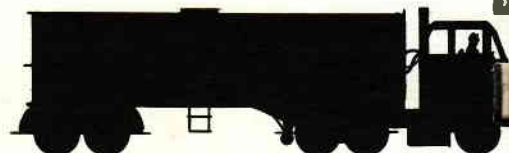
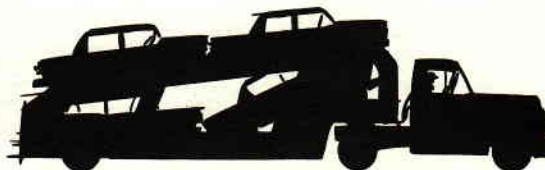
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TRANSIT



SPECIAL PURPOSE



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Performance**

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