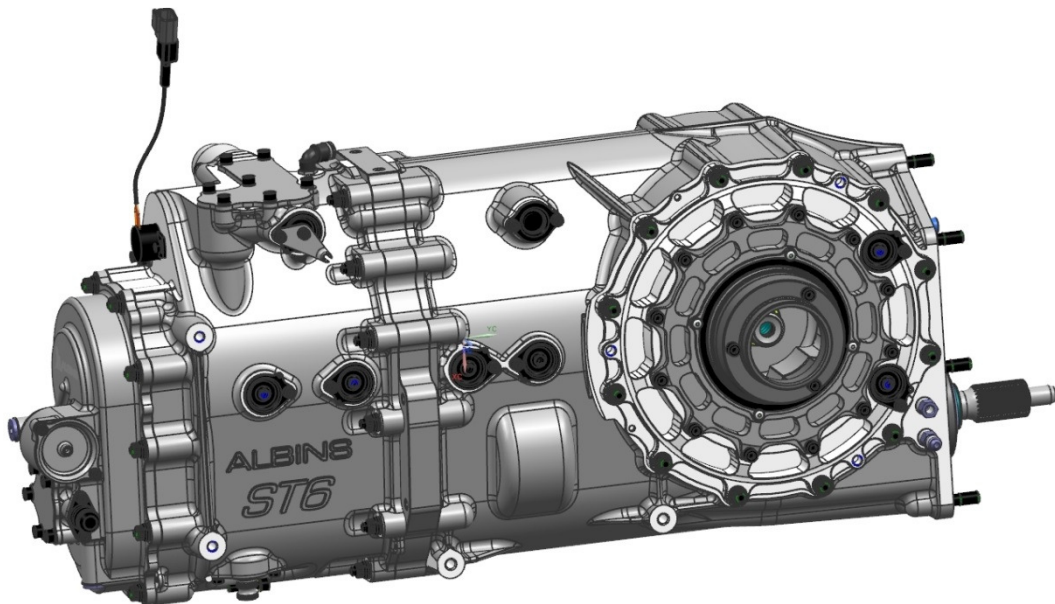


Albins ST6-M Servicing and Technical Information



Albins ST6-M

6 Speed Sequential Mid Mount Transaxle

Servicing and Technical Information

Contents

<u>Page</u>	
3	- Technical Specifications. Attachments.
4	- Overview. Selector / Shift direction.
5	- Gear Ratios.
6	- Servicing. - Service Intervals. Lubrication.
7	Oil Filter. Changing Drop Gears.
8	Recommended Torque Settings Clearance Settings.

Illustrations

<u>Sheet</u>	
1	- Gear Stack.
2	- Selector Mechanism.
3	- Oil pump / Drop gear.
4	- Housing.
5	- Parts List.
6	- Install.

Technical Specifications

- Gears - 6 forward and 1 reverse. (refer to page 4 for ratios)
Shift pattern - R - N - 1 - 2 - 3 - 4 - 5 - 6
- Lubrication - Quantity - Approximately 2.5L plus cooling lines.
(*Dependant on installation. Refer page 6*)
Oil filter - Albins P/N 20707
- Torque - 1000Nm (input)
4500Nm (output nominal)
6500Nm (output peak)

Standard Attachments

- Gear position sensor - Albins P/N 20850
- Temperature sensor - Albins P/N 13097
- Wheel speed sensor mount

Optional Attachments

- Sequential shifter - Albins P/N 14472

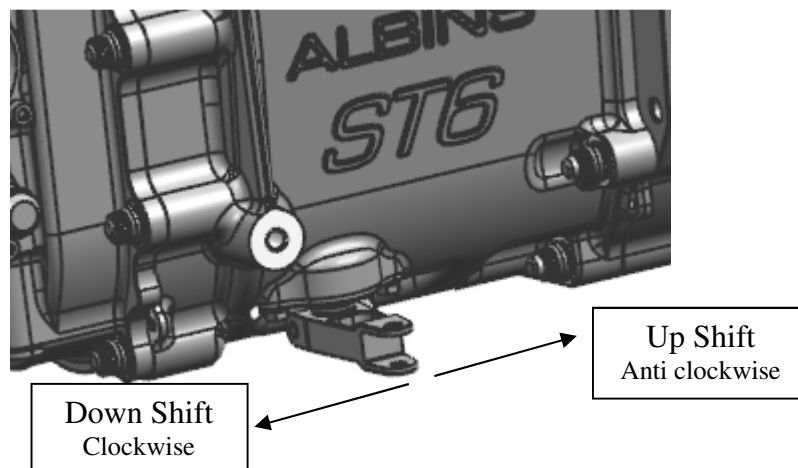
Notes

- Shifter mechanism - It is recommended that the Albins sequential shifter mechanism is used as it has been custom designed for use with the ST6.
If the Albins shifter is not used it is highly recommended that the shifter mechanism have adjustable travel stops at the gear lever. Although the ST6 transmission has internal travel limit stops additional stops on the gear lever prevent overloading the connecting rod and parts.
- Gear position sensor wiring - 1 – Ground – Brown
2 – Signal – White
3 – 5V – Green
- Shift linkage detail - Rod end ART 4 E (or equivalent)
- Breather line - 5/16 push on line with 100 – 150mm of vertical run as close to the transmission as practicable.
The line should not drop below the fitting before the vertical section.
The catch can inlet should not be lower than the transmission breather.

Overview

- The Albins ST6 M was designed for use with mid engine rear wheel drive layout vehicles specifically used for the purpose of motor sport.
- The ST6 M uses a sequential shift pattern with 6 forward gears and 1 constant mesh reverse gear with a mechanical reverse lockout.
Due to the unique Albins selector barrel profile gear changes are very smooth during the shift, the common ‘gritty’ feel experienced when changing with conventional sequential transmissions is eliminated.
The shift pattern is R - N - 1 - 2 - 3 - 4 - 5 - 6.
Gear engagement is affected by 5 pent roof dogs.
- The ST6 M has been designed for an input torque of 1000Nm with a nominal output torque of 4500Nm and can withstand periodic bursts of up to 6500Nm.
- The internals of the ST6 M are lubricated & cooled through the transmission oil, the oil is moved around the box via the internal oil pump which has an inbuilt pressure relief valve. The oil flows from the pump to the cooler and is then returned to the transmission through the distribution ports. The ports are situated throughout the transmission with each gear having its own oil jet.
There are oil holes along the length of the shafts which supply oil to the bores of the gear
- All bearings are either Roller or Ball bearings for low friction and ease of service.
A three bearing layout is incorporated into the design, a sandwich plate supporting the centre bearings has been added midway along the shafts to increase rigidity.
- Inspection ports are positioned at critical points throughout the transmission, these ports allow for the quick inspection of the gears and dogs without the need to disassemble the transmission.
- The gears & shafts of the ST6 M are heat treated, profile gear ground, shot peened and isotropically polished as standard allowing for tight tolerances to be achieved producing a very high quality product.
The crown wheel and pinion are cut using a Klingelberg Palloid gear form that are lapped in sets post heat treatment and isotropically polished.

Selector / Shift direction



Gear Ratios

All gears are constant mesh with 1st, 2nd, 3rd, 4th and 5th being change gears, the overall ratios of the change gears are influenced by the constant gear ratio.

Various drop gears are available and if changed will affect the overall ratio.

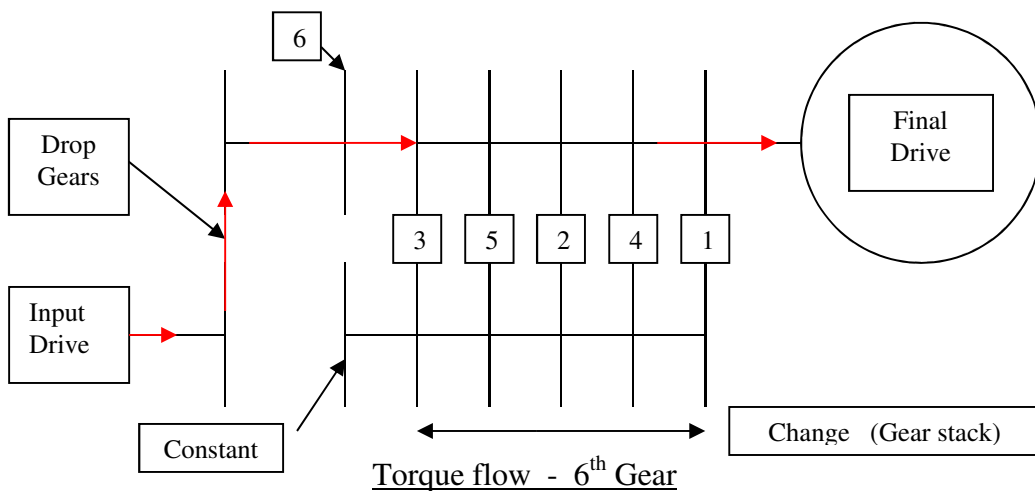
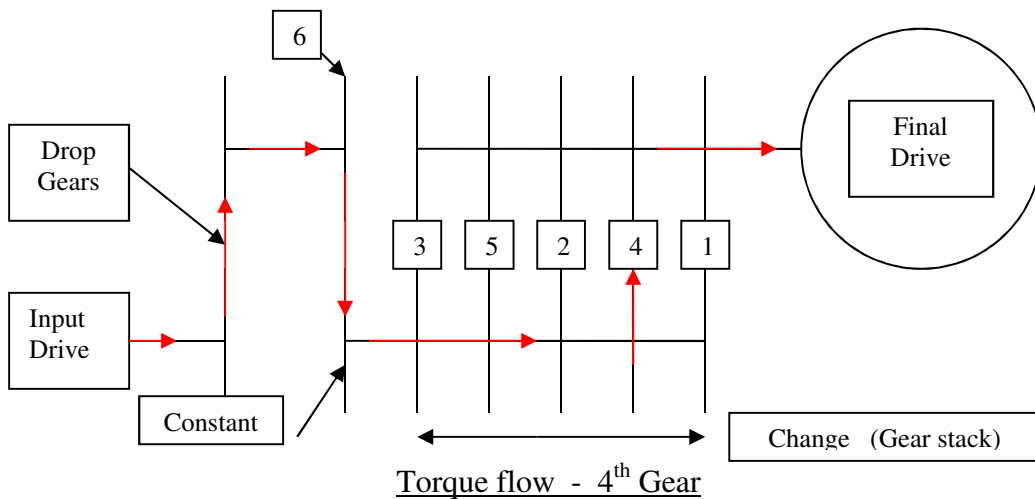
To calculate the overall ratio of the gear train.

- 1st - 5th - Drop gear x Constant gear ratio x Gear ratio x Final drive.
- 6th - Drop gear x 1 (direct) x Final drive.

Drop gear - 0.96:1 1.00:1 1.07:1 1.13:1

- Constant gear - 1.091:1
- 1st - 2.357:1
- 2nd - 1.824:1
- 3rd - 1.474:1
- 4th - 1.238:1
- 5th - 1.043:1
- 6th - 1.000:1 (direct)
- Final Drive - 3.273:1

Drop gear		Final Drive ratio	Overall ratio
Tooth count	Ratio		
25:24	0.96	3.273	3.142
23:23	1.00	3.273	3.273
27:29	1.07	3.273	3.502
23:26	1.13	3.273	3.698



Servicing

- Use only genuine Albins components as all parts have been carefully selected to ensure constant supply of quality product.
- Always use new Oil Seals, O-rings, Compression Springs and Circlip's when re-assembling.
- Thoroughly clean and inspect all parts before re-assembly, replace all worn / damaged components.

Albins recommend that all Gears & Shafts are crack tested as a part of any major overhaul.

Service Intervals

- Oil filter - The oil filter should be inspected after each round / event and be replaced as required or every 1500 km.
- Oil - Oil should be replaced after each round / event.
Never re-use oil as it may be contaminated.
- Major overhaul - 5000 km. Replace any worn / damaged components.
Periodic inspection is required for any components not replaced during the overhaul.

Note: Service intervals will vary depending on application
The above intervals are to be used as a guide only.

Lubrication

Caution! *If the car has been running prior to changing the oil it may be very hot.*

To fill the transmission with oil, remove the -8 line connected to the oil pump outlet fitting. Attach the oil drum line to this hose so oil is pumped through the cooler lines prior to filling the transmission.

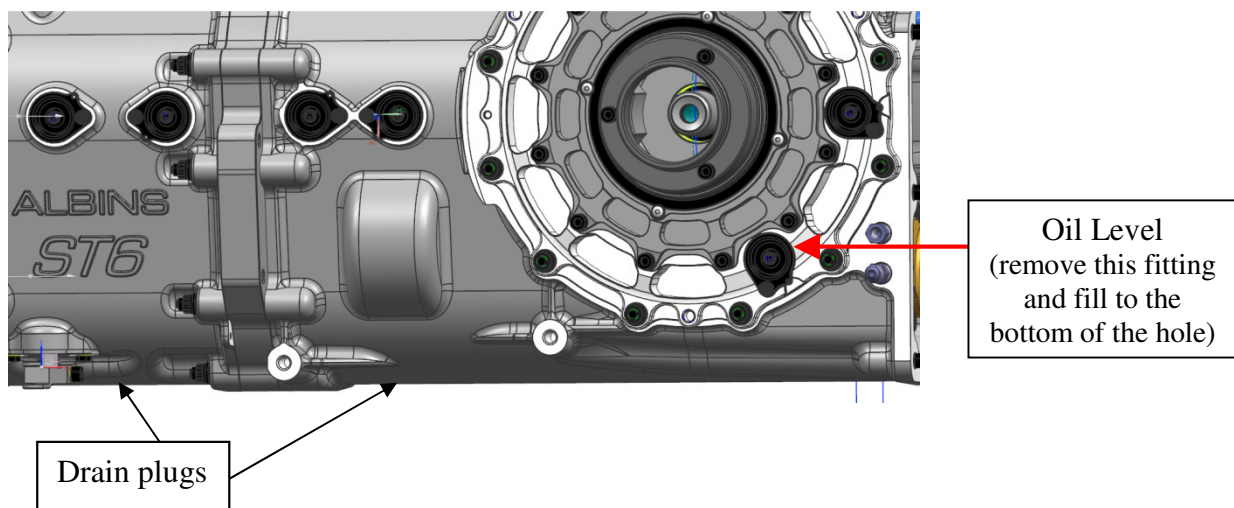
Remove the fitting from the side of the transmission and fill to the lower portion of this hole while the vehicle is on a level surface.

By filling the transmission in this way oil is pumped through all of the lines and then into the transmission, this allows all of the lines to be bled.

Optimal operating level is achieved without running the transmission.

Refer to Technical Specifications for recommended Oil Specification.

To drain the oil remove the drain plugs at the bottom of the transmission.

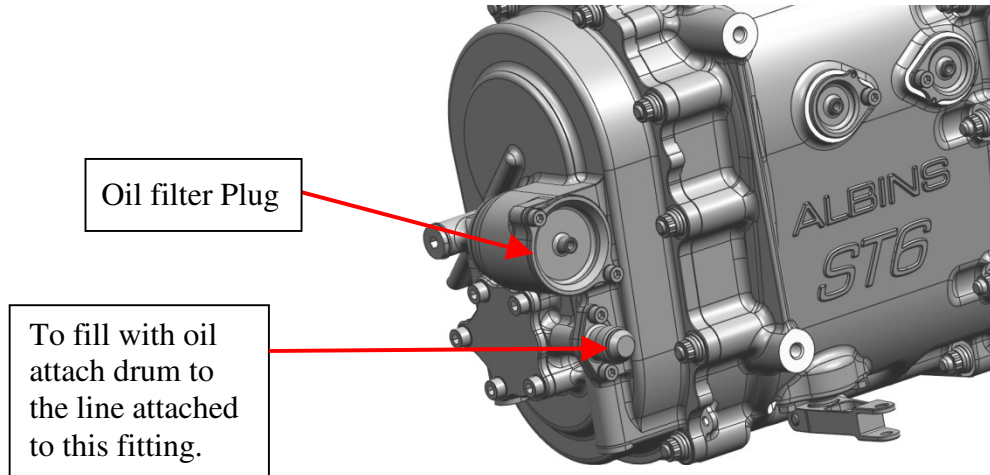


Oil Filter

To check / change the oil filter remove the plug from the transmission by un-doing the 2 M5 cap screws. Once the plug has been removed the oil filter can be removed from the transmission, inspect the filter and clean / replace as required. Once the filter is re-fitted replace the plug and tighten the M5 cap screws as per Torque settings on page 7.

Note: Oil must be drained from the transmission prior to changing the filter.

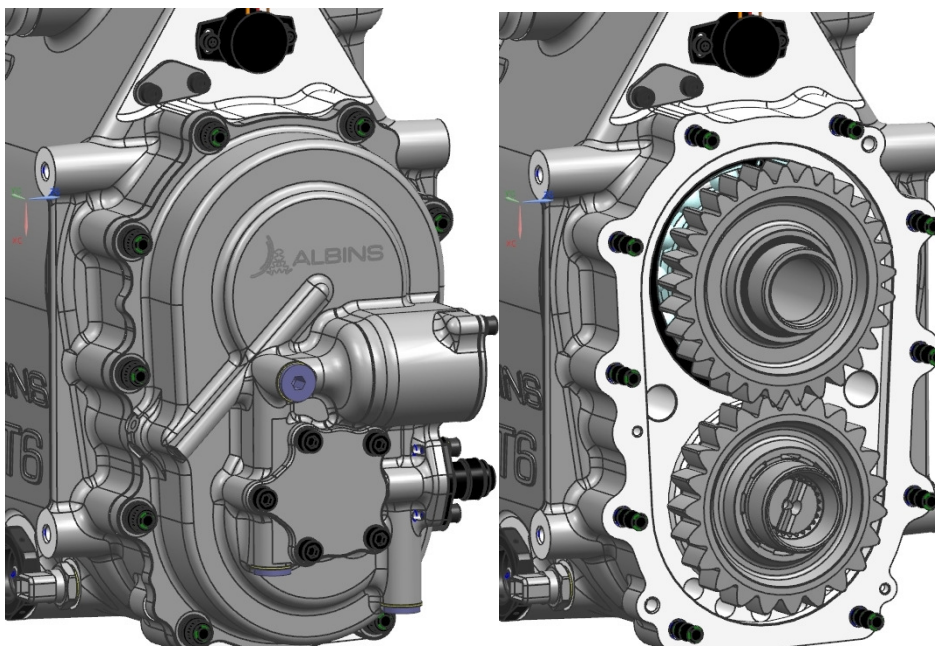
M5 cap screw can be screwed into the centre of plug to aid with removal of the plug.



Changing Drop Gears

To change the drop gear ratios remove the cover from the transmission by un-doing the 10 M8 nuts. Remove the gears and replace them with the desired ratio and replace the front cover, tighten nuts as per Torque settings on page 7.

Note: Oil must be drained from the transmission prior to changing the drop gears.



Recommended Torque Settings

Fastener	lb-ft	Nm	Compound
Crown wheel Bolts	- 80	- 108	- Moly
M8 nuts	- 18	- 24	- n/a
M10 nuts (internal)	- 40	- 54	- Loctite 243
Cap screws M4 (internal)	- 2	- 3	- Loctite 243
(external)	- 2	- 3	- n/a
Cap screws M5 (internal)	- 4	- 5	- Loctite 243
(external)	- 4	- 5	- n/a
Cap screws M6 (internal)	- 7	- 9	- Loctite 243
(external)	- 7	- 9	- n/a
Cap screws 1/4" UNF	- 8	- 11	- Loctite 243
Cap screws M8	- 16	- 22	- n/a
Cap screws M10	- 40	- 54	- Loctite 243
Drain Plug	- 40	- 54	- Oil
Studs M8	- Fit by hand		- Loctite 277
Studs M10	- Fit by hand		- Loctite 277
Pinion shaft nut	- 250	- 339	- Loctite 277
Selector barrel nut	- 200	- 271	- Loctite 277
Shuttle spring cap	- 50	- 68	- n/a

Loctite 7649 primer is recommended for all fasteners that require Loctite.

Clearance Settings (@ 20°C)

- Pinion shaft gear stack end float. - 0.05 - 0.15mm
- Lay shaft gear stack end float. - 0.05 - 0.40mm
- Drop gear end float. - 0.05 - 0.40mm
- Min Crown wheel & Pinion Backlash. - 0.08 - 0.125mm
variation up to 0.15mm
- Crown wheel carrier bearing pre-load. - 0.00mm ± 0.05mm
- Pinion bearing outer race crush. - 0.075mm ± 0.025mm