

Identifying Toyota Hilux & Hiace Differentials

The Toyota Hilux has ID plates fitted in the engine bay, while the Hiace has them fitted near the base of the front seats. In each case one of the plates will have the 'Axle' code originally fitted to the vehicle.

As an example a RN25 Hilux manufactured during the 2/74 has the 'Axle' code "G142".

The letter "G" signifies it has a "G" series differential and therefore an 8" diametre crownwheel.

The next two digits, "14", nominate the ratio, which according the ratio table below is 4.875:1. Many of the ratios have not been fitted to Australian vehicles nor are they all sold here as an aftermarket item. The 4.875 and above ratio centres have a slightly different crownwheel position on the centre. So if ratios below 4.875 are to be fitted then select a diff with a ratio below 4.875 or vice verca if shorter ratios are to be used.

Two suppliers who have crownwheel & pinion sets are Sunstate 4WD & Jack McNamarra Diffs.

The last digit, "2", is for the type of centre, in this case 2 Pinion & Open centre as per the centre table below. The factory LSD is a clutch pack type, while aftermarket suppliers offer these, plus a wide range of other types.

RATIO TABLE

Code	Ratio	Code	Ratio	Code	Ratio	Code	Ratio
01	3.300	13	4.790	25	4.556	37	3.583
02	3.360	14	4.875	26	5.571	38	3.417
03	3.545	15	5.125	27	3.364	39	3.154
04	3.556	16	5.286	28	4.300	40	5.375
05	3.700	17	5.600	29	4.100	41	3.308
06	3.889	18	5.714	30	3.727		
07	3.900	19	5.833	31	3.909		
08	4.110	20	6.167	32	6.591 or 4.807		
09	4.222	21	6.667	33	7.503 or 5.583		
10	4.375	22	6.780	34	6.781 or 4.786		
11	4.444	23	6.833	35	7.636 or 5.600		
12	4.625	24	7.640	36	4.778		

CENTRE TABLE

Code	Centre Type
2	2 pinion open centre
3	2 pinion limited slip centre
4	4 pinion open centre
5	4 pinion limited slip centre

The Toyota Hilux & Hiace Differentials

The Toyota Hilux and Hiace differentials are all similar in design. They feature an 8" crownwheel, 31 spline axles and large bearings. They have ample capacity for an Escort and a converted Hilux diff will weigh about 60kg.

Common ratios to be found at wreckers in Australia are from 4.110:1 to 4.875:1. The taller ratio of 3.7:1 was delivered with V6 vehicles in the USA. Aftermarket suppliers in Australia have gear sets of 3.5:1, 3.7:1 etc. available new.

The closest fit for an Escort is the Hilux 2WD diff from RN10, RN15, RN20 & RN25 models manufactured during the first half of the 70's. Each of these has the same spring centres (940mm) and overall width (1350mm) as an Escort. The spring platform width is equal to the MkII Escort at 60mm but wider than a MkI which has 50mm width springs.

What needs to be modified ?

Axle Shafts and Flanges

These axles have five M12x1.5mm studs on a 4.5" PCD and will require restudding to match the MkII Escort pattern of four M12x1.5mm studs on a 4.25" PCD. The Hilux studs are longer than Escort studs. The MkI Escort has 7/16"UNF studs on a 4.25" PCD.

The drum/wheel location boss on the Hilux axle is Ø67mm compared to the Escorts Ø63mm. If Escort drum brakes are to be used then the boss must be machined down. If an upgrade to larger drums or disc brakes is chosen then the boss may need changing in size to suit the alternate drum or disc centre hole.

Some Escort mag wheels may fit over the Hilux boss but standard wheels and some mags will require the boss to be Ø63mm where it protrudes out further than the drum or disc and into the wheel.

If alternate discs are fitted over the axle flange this will increase the overall width of the diff by the thickness of the disc bell on each side of the diff. So if discs with a bell thickness 7.5mm are fitted then the overall diff width will be $1350 + 7.5 + 7.5 = 1365\text{mm}$. Check your tire clearance to the guards and track width requirements. Most of the axle shaft fitted to the RN10-25 models have sufficient spline length for the axle to be shortened a small without the need for re-splining, but work out what you need and measure the axles before purchase.

Brakes

The Escort drum brake backing plates will need the centre hole size and bolt pattern changed to fit over the Hilux bearing carrier. The backing plate will need a spacer behind it so that the drum properly covers the brake shoes.

Upgrading the brakes to discs has been done and reuse of the Hilux drum system may be possible.

Differential Centre

The ratio and type of the centre that is factory fitted to RN10-25 Hilux may not be suitable or serviceable considering the age. Options are to fit a diff centre from another later model Hilux or Hiace that has a suitable ratio or Limited Slip centre for example.

Other options are to fit aftermarket ratios or Limited Slip Differential centres and new bearing and seals.

If the chosen ratio is different to standard and an accurate speedo is required, the speedo accuracy will need checking and correcting.

Differential Housing

If Escort drum brakes are retained the handbrake linkage brackets and hydraulic line bracket will need fitting to the Hilux housing.

If the factory style anti tramp rods are to fitted then these will need fitting to the Hilux housing at the correct angle relative to the spring platforms.

For originality sway brackets would also need fitting to the Hilux housing at the correct angle relative to the spring platforms.

If discs, tyre clearance etc. dictate shorter axles then the housing will also have to be shortened by an equal amount on each side.

With the exception of tramp rods, the brackets can normally be cut from a donor Escort housing.

Shackles and Shackle Plates

The RN10 - 25 Hilux housing axle tubes are Ø65mm and 5.5mm thick compared to an Escort axle tube at Ø63mm and 3.2mm thick. The Escort shackles fit over this housing, alternatively the slightly larger diameter Hilux shackles will fit through the Escort shackle plate.

The MkII Escort shackle plates will not require modification to use this Hilux diff housing.

Spring Platforms

To prevent rapid universal joint wear and tailshaft vibration, the operating angles of front and rear universal joints need to be similar, eg: less than 1° difference in operating angle.

The angle required will vary depending on whether anti tramp rods are fitted and the curvature/rating/ride height of the leaf springs. Anti tramp rods and stiffer leaf springs reduce the amount the diff nose lifts under power where as leaf spring curvature and ride height alter the static position of the diff nose.

The angle of the spring platform to the pinion needs to be checked and altered, if necessary, by relocating the spring platforms around the axle.

If this diff is fitted to MkI leaf springs, the 50mm wide MkI Escort spring platforms will need to be fitted to the Hilux Diff.

Tailshaft

The 1 piece Escort tailshaft that has replaceable universals has the same universal as most of the Hilux/Hiace units, but the tailshaft will need shortening and a Hilux flange fitted to the universal.

Other Hilux & Hiace Diffs

Later Model Hilux 2WD

The later model, particularly 80's on, 2WD hilux diffs are too wide to be useful in an Escort fitted with wider tyres. The axles do not suit re-splining as they are machined down behind the existing spline for too great a distance.

They may provide the ratio you are looking for though.

Hilux 4WD

The Hilux 4WD diffs are generally 20mm narrower than an equivalent year 2WD diff. Some of the axles have an extra length spline that may be shortened without the need for re-splining, in particular check out the RN46 manufactured around 4/83. All 4WD axles have 6 wheel studs and can be re-drilled for an Escort stud pattern without the need for welding up the old stud holes.

The 4WD housings are the least suitable as they are step up in diameter toward the centre and will cause mounting hassles for brackets and shackles.

The 4WD centres will in some cases be Limited slip units and may contain suitable ratios.

Hiace

The Hiace diffs are all too wide for an Escort. The housings are the same style as the 2WD Hilux but the axle tube dimension is 68mm x 62mm oval and 4.5mm wall thickness. Use of this housing represents a small weight saving which may be cost effective if the 2WD housing for your application requires shortening and other alterations.

The Hiace centres may also have the ratio you are looking for.

The mid 90's Hiace is fitted with a wheel stud that has extra spline length. These may prove useful for a disc brake setup.

www.rsmotorsport.com.au