

DIRECTORATE GENERAL BORDER ROADS
AMENDMENT NO. 01
TO
GENERAL MAINTENANCE INSTRUCTION NO. 38
ON
CAR 5 CWT 4X4 NISSAN PETROL – INSTRUCTION TO USERS ON
MAINTENANCE

1. The following amendment are made to General Maintenance Instruction No. 38 are as under :-

In Page 8 against reference 'A'

- (a) Under Column 'Above 32°C'
For " 50 HD "
Read " SAE – 30"
- (b) Under Column ' 32°C to 0°C'
For " 30 HD"
Read " SAE – 20 or 20 w"
- (c) Under Column ' 0°C to 18°C'
For " 10 HD"
Read " SAE – 20 "
- (d) Under Column ' 18°C to 26°C'
For " 10 HD"
Read " SAE – 10 W"

2. Star mark on page 8 and note on page 9 are hereby deleted.

E N D

Amdt No. 1/ to GMI No. 38/Dated 17 Dec 1973

Registered
Director General Border Roads
Kashmir House
DHQ PO New Delhi-II

No 67721/DGBR/ E4 /T

21 Oct 1971

To

Chief Engineers
Project BEACON
“ **DEEPAK**
“ **VARTAK**
“ **SEWAK**
“ **PUSHPAK**
“ **SWASTIK**
“ **DANTAK**
“ **YATRIK**

AMENDMENT NO I TO GENERAL MAINTENANCE INSTRUCTIONS
NO 39 ON CAR 5 CWT 4X4 NISSAN (PATROL) INSTRUCTION TO
USERS ON MAINTENANCE

1. Reference this HQ letter No 67721/DGBR/E4/T dated 06 Aug 1971
2. The following amendments to GMI No 39 issued under our aforesaid letter be made:-
Page 7 Para 12 (a) Wheels and Tyres
 - (i) Front tyres For 2.5 Kg/CM²
‘Read’ 22 Lbs/Sq in”
 - (ii) Rear Tyre For 3.2 Kg/CM²
Read’ “ 30 Lbs/Sq in”
3. Project VARTAK only :- This dispose off your letter No 1415/EME dated 26 Sep 1971.

(KR Gupta)
Major
For Director General Border

Roads

Copy To:-

Comdr GREF Centre Roorkee
Commanders
Eastern Base Workshop Tezpur
Western Base Workshop, Pathankot
OC Store Division EBW, Tezpur
OC Store Division WBW, Pathankot
OIC Inspection Cell EBW & WBW

INTERNAL

Col EM - for circulation folder
E4 (Repairs), E4 (INV), E3 (ES)

CAR 5 CWT 4X4 NISSAN PATROL
INSTRUCTION TO SURES ON MAINTENANCE

Summary

1. This instruction is to guide the users for the regular attention which the vehicle should receive to keep in good mechanical condition and must be closely followed.

Running –in-instruction

2. a) When operating a new vehicle or an old vehicle with a new or an overhauled engine for the first time, take utmost care during the first 1000 Kms. During the first 500 Km, do not drive in veh beyond 50 Km per hour in top gear. Reduce the speed proportionately in low gears avoiding over running of the engine. Then increase the speed gradually driving up to full speed on completion of 1000 Km. Avoid towing trailer during the running –in period.

b) On completion of the first 500 Kms:-

- (i) Change engine oil (see clause (iv) below)
- (ii) Check oil level in gear box transfer case, differential (front and rear axles) and top up if necessary
- (iii) Check engine mounting for tightness.
- (iv) Check steering gear mountings and brackets for the tightness.
- (v) Tighten 'U' bolts and 'U' dips on front and rear springs (preferably when the veh is laden).
- (vi) Tighten, if necessary, the body holding down bolts.
- (vii) Check wheel nuts on all wheels for tightness.
- (viii) Check tightness of 'U' bolts of universal joints on all propeller shafts.
- (ix) The veh after completion of running –in-period will be sent to Field "Wksp on which dependent for Field repairs for draining out oil from the engine sump. Unit will not drain out oil from the selves in the unit lines. The field Wksp will examine the drained oil to see any trace of metal due to excessive wear. The workshop will also carry out adjustments and tune up the engine as considered necessary.

Lubrication:-

3. A lubrication chart, as applicable to this vehicle indicating all lubricating points, the frequency of lubrication and the type of lubricating to be used is attached at Appx 'A'. the chart is self explanatory and must be followed correctly for efficient maintenance. Select the correct type of lubricant according to the ambient temperature prevailing. General maintenance of all assembling temperature prevailing. General maintenance of all assemblies on the veh is detailed in the following paragraphs.

Engine:-

4. (a) Engine Assembly :-
Engine assembly on this veh is basically the same as fitted on Truck Nissan 1 Ton 4x4.

(b) Checking, changing and replacement of engine oil:-

(i) Check oil level daily in the oil pan with the help of the dipstick provided. The oil level must be maintained between 'MAX' and 'MIN' marks stamped on the dipstick. It is advantageous to keep the oil up to this mark of the gauge.

(ii) The engine oil is fitted from a filler hole on the valve rocker cover.

(iii) After the running –in period is completed and engine oil replaced as mentioned in para 2 (b) above, the oil must be changed regularly after every 1.600 Km.

(iv) Once in six months, during oil change, remove the sump, clean all the sludge and dirt, refit and fill it with oil. Always use correct grade of oil as specified in the lubrication chart. The capacity of the engine including the air cleaner is 7 liters.

(c) Oil Pressure:-

After starting the engine, immediately check the oil pressure on the oil pressure gauge on the instrument board. The oil pressure will vary according to the temperatures of the engine. Minimum pressure sliding speed of the engine at normal working temperature (i.e., between 75°C and 90° C) should not fall below 0.5 Kg/Cm². The normal pressure at working temperature and at 2000 RPM of the engine is 3 to 4 Kg/ Cm². Any fall or rise of pressure in the aforesaid figures must be attended to immediately.

(d) Oil filter:-

(i) A by –pass type oil filter is located at the left side of the engine. A paper element is used in this filter for filtration of oil.

(ii) At every engine oil change, clean the inside of the filter with petrol or any other cleaning fluid. After every 4000 Km (2500 Miles) replace the filter element at the time of changing the oil in the sump.

(iii) After refilling the element, run the engine for a few minutes, recheck the oil level in the sump and replenish if necessary.

(e) Air Cleaner:-

(i) Air cleaner is of oil bath type. This should be cleaned at every change of oil in the sump, earlier if veh is operated in a dusty area. Inspection of oil in the air cleaner should be done every week.

(ii) To clean the air cleaner, remove cover and take out the filter element. Clean the interior and the element with petrol. Pour upto the indicated oil level in the tour casing. Re-assemble the element after it has been thoroughly dried.

Cooling System:-

5. a) Check water level in the radiator daily and if necessary, fill up to radiator neck. always use fresh and clean drinking water. Poor or hard water will clog the radiator and jackets resulting in insufficient cooling.
b) Every 6 months drain out water and flush out the cooling system with clean running water open both the cocks, one located at the right side of the engine and the other at the bottom tank of the radiator.

© Radiator cap is of the pressure type, therefore, be careful while opening it. Do not remove it immediately after a run because hot water that will come out with force will hurt you.

(d) When changing or topping up the water, inspect the rubber packing on the inside of the cap and replace it if it is damaged. (Always use a rubber packing).

(e) Centrifugal type water pump is provided for circulation of water and is driven by a 'V' belt from crankshaft pulley. Lubricate the water pump bearing monthly or every 3200 Km (2000 miles) with grease.

(f) Check the fan belt every week for correct free movement which should be approximately 15 mm when felt between generator and water pump pulleys.

(g) A below type thermostat is installed in the water out-let of the cylinder head. It brings the water out –let of the cylinder head. It brings the engine to working temperature very fast during cold weather. It should not be removed from the cooling efficiently in low temperatures.

Fuel System:-

6. (a) Always fill the fuel tank with clean petrol using a funnel with fine meshed wire strainer.

(b) From the fuel tank the petrol passes through a fuel strainer located in the engine compartment. Inspect the glass bowl of the strainer every day and if there are signs of water or sediment in the bowl, open it and clean it. Before re-filling the glass bowl, check the cork washer for good condition. Clean the strainer every 4,800 Km (3,0000 miles)

© Once a year remove the tank after draining the fuel, wash the tank thoroughly and refit.

Ignition and Electrical System.

7. (a) Ignition System:-

The ignition system on NISSAN engine is of the high voltage type utilizing a 12 Volts battery and an ignition coil. All parts of the system should be checked at least once a week. Check the wire connection on ignition coil, distributor cap and spark plug. See that the system is free from moisture and oil which are liable to cause fast deterioration of wire insulation causing misfiring of the engine.

(b) Spark Plug:-

After every 1,600 Km, Clean the spark plugs and adjust the gap to 0.25 to 0.75 mm (0.244 to 0.028") (To be done by Wksp personnel only)

(c) Distributor

(i) Every 500 Km, lubricate distributor with engine oil. To do so, remove the distributor cap and rotor and apply one or two drops of oil on the felt under the rotor. Apply the same oil to the cam lobes on the shaft with a finger. (To be done by Workshop personnel only).

(ii) Every 500 Km, grease the distributor shaft by turning one turn of the grease cup located at the lower part of the distributor. Keep the cup fitted with grease.

(iii) Every 1,600 Kms check CP points and adjust the gap if necessary. The correct gap is 0.6 to 0.7 mm (0.025" to 0.029").

(d) Starter Motor:-

Every 1,600 km, lubricate starter motor bearing (Oil nipple provided) with 5 or 6 drops of engine oil. Clean the commutator surface if found dirty by fine sand paper. (Cleaning to be done by workshop personnel only).

(e) Generator:-

Pre-lubricated (i.e., grease packed) bearings are used on both ends of the generator and do not require any attention by the driver. However, when the generator is opened up for overhaul or at least once a year these bearing will be repacked with grease by Workshop personnel.

(f) Battery:-

Every month, check battery for the correct electrolyte level. Add distilled water if necessary. The level should be 10 mm (3/8") above the surface of the plates. Check specific gravity which should be between 1,200 and 1,300. Recharge battery if the gravity has fallen below 1,200. Always ensure that the battery is secured on the cradle, its top is clean and dry, and terminals are tight and positive (+ VE) terminal is earthed.

Power transmission:-

8. (a) Clutch

Always ensure correct free play of clutch pedal which should be between 15-25 mm (3/4" to 1"). Adjust the play, when necessary by loosening or tightening the adjustment on the intermediate rod on the clutch pedal adjustment on the intermediate rod on the clutch pedal linkage. The perpendicular height of the clutch pedal from the tow board should not be less than 205 mm (.8, 1/6"), otherwise the full release of th clutch pressure plate will be affected. Every 1,600 Km, lubricate the clutch pedal shaft, links and release yoke shaft with grease.

(b) Check gear box and transfer case oil level with every change of engine oil and replenish if necessary. Drain and refill the assemblies with fresh oil Drain and refill the assemblies with fresh oil regularly after every 8,000 Km. A combined filled plug and dipstick is provided on the top of the gear box which can be approached after removing the rubber cover on the gear box covering. The right level of oil in the transfer case is up to the level of the filter hole.

© Propeller shafts and universal joints

Every 1,600 Km lubricate the universal joints with grease, Do not use heavy pressure grease gun for this purpose as the pressure may damage the seals in the needle bearings.

(d) Front and Rear Axles

(i) Check oil level in differentials with every change of engine oil and replenish if necessary change oil in differentials after every 8,000 Km. When draining old oil, remove the drain plug soon after the veh has been driven for a while. The oil will flow out by itself. Refit plug, after the oil has drained completely. Refill the casing with new oil up to the lower rim of the filler hole.

(ii) Every 8,000 Km or at least once a year replace the grease in front hubs (To be done by workshop personnel only).

(iii) Every 8,000 Km or at least once a year remove rear axle shaft and hubs to replace grease for lubrication of rear wheel bearings (To be done by Workshop personnel only).

Steering Gear

9. Check for excessive play in steering gear components. The play of the steering wheel when measured at the rim should not exceed 30 mm. Keep the gear box filled with oil as shown in the lubrication chart. Every 1,600 Km or at least once a month lubricate all points on steering linkage i.e., drag link,

Breaks

- 10 (a) Two independent braking systems exist on the veh. Foot brake is hydraulic and works on all the four wheels hand brake works mechanically acting on a drum located behind the transfer case on the output shaft.
- (b) Free movement of foot brake pedal is 10 mm to 20 mm (7/16" to 3/4").
- © Hand brake lever should act positively when lever is pulled to 6th or 7th the notch of the ratchet.
- (d) Always ensure that the brake master cylinder is filled up with hydraulic brake fluid No 3. Check the level every 1,600 Km or at least once every month and replenish where necessary and lubricate the following at the same time
- (i) Foot brake pedal shaft
 - (ii) Hand brake linkage

Spring and shock absorbers

- 11 (a) Springs

Every Week inspect the springs, retighten the 'U' bolts of the springs and at the same time check for broken or damaged parts. Every 500 Kms pass grease through grease nipples provided on each shackle pin of all springs. Ensure that while passing grease, the old grease in the bushes is (extracted) out by the new grease.

- (b) Shock Absorbers

The shock absorbers are sealed and are non refillable. They are not adjustable. If there is any doubt amount their satisfactory action, report to dependent Fd Wksp for a check. Do not clean the shock absorbers rubber mountings in dry cleaning solvent like petrol but use soap water for the purpose.

Wheels and Tyres

- 12 (a) Tyres used on the veh are of 6.50x 16.6 ply specification. Always ensure that pressure as given below is maintained in the Tyres.
- i) Front Tyres - 22 Lbs/sq in"
 - ii) Rear Tyres - 30 Lbs/sq in"
- (b) Every day before starting for a journey, check the tightness of the wheel nuts. All nuts are with right hand threads.
- © Every six months, change the position of tyres.
- (d) Tyres will be removed from the rims every 6 months and rims cleaned and painted with paint PFU Black Anti-corrosive Acid and Alkali Resisting (Pt No 61A 0204).

Body Work

- 13 (a) Once a month oil the following with engine oil:-
- (i) Hinges on bonnet, side and rear doors, ventilator and wind screen.
 - (ii) Front and rear tow hook pins.

INSTRUCTIONS

S/N	Description	Frequency in KMs				Lubricants to be used				Remarks
		500	1600	3200	8000	Ambient temp				
						Above 32° C	32° C to 0° C	00C to 18 o C	18°C to 26°C	
1	2	3	4	5	6	7	8		9	10
A	Engine oil (drain and refill) First change only on new or reconditioned engines. Includes air cleaner also	0				50 HD	30 HD	10 HD	10 HD	* Mix 5% of 70/80 MT Gas with 95% of 10 HD by volume (see also the note below.
	Subsequent changes		0							
	Water pump bearings			0		Grease No 4	Grease No 4	Grease No 0	Grease No 0	
C	Distributor shaft	0				Grease No 1	Grease No 1	Grease No 0	Grease No 0	
D	Starter Motor Bearings		0			30 HD	30 HD	10 HD	10HD	
E	Generator armature shaft bearings		0			Grease No 1	Grease No 1	Grease No 0	Grease No 0	
-	Clutch pedal shaft and clutch release yoke shaft	0				HD 30	HD 30	HD 10	HD 10	
F	Main transmission and transfer case (drain refill).				0	90 HYP	90 HYP	90 HYP	75 HYP	@ change effective at -10°C
G	Front and rear axle differential housing (drain and refill)				0			75 HYP		
H	Propeller shaft 'U'	0				Grease No 1	Grease No 1	Grease No 0	Grease No 0	
J	Front and rear axle hubs (renew grease)	0				Grease No 3	Grease No 3	Grease Temp		
K	Spring shackle pins, drag links and other lub, points on chassis	0				Grease No 1	Grease No 1	Grease No 0	Grease No 0	
L	Steering gear housing (Top-up)		0			HYP 90	HYP 90	HYP 90 & 75	HYP 75	Changing effective at -10°C
M	CV joints (lubricate)		0			Grease No 1	Grease No 1	Grease No 0	Grease No 0	
	Other oil can points		0			30 HD	30 HD	10 HD	10HD	

Notes:- Use this mixture in engine sump only. The required qty of 70/80 MT gas should be added to the engine sump immediately after garaging the veh after each days work and when oil in sump has cooled down to 270 C followed by at least 2 minutes running of the engine at idle speed.