

Registered/SDS
Dte General Border Roads
Kashmir House
DHQ PO- New Delhi -110 001

55021/Tech Instr/DGBR/E4 Tech

22 Jun 89

All Projects HQ CE (P) Sewak, C/o 99 APO

Commander GREF Centre, Dighi Camp, Pune-15

- “ Eastern Base Workshop (GREF)
- “ Western Base Workshop (GREF)
- “ Eastern Store Division (GREF)
- “ Western Store Division (GREF)

TECHNICAL INSTRUCTION : FORWARDING OF

1. The undermentioned Technical Instruction (s) is/are forwarded herewith for your necessary action and further distribution to your field Workshops and Units under Command :-

- (a) _____
- (b) _____
- (c) _____

2. Please acknowledge receipt.

(AJS Khalsa)
SE (SG)
Director Technical
For Dir Gen Border Roads

Encls : As Above.

Copy to :-

Internal

1. DGBR/E4 (Rep)
2. DGBR/E4 (Inv)
3. DGBR/E3 ES
4. DGBR/Vigilance
5. DGBR/MT Sec
6. DGBR/Tech Plg
7. DGBR/E2 (Res)
8. DGBR/E2 Works

DIRECTORATE GENERAL BORDER ROADS
GENERAL REPAIR INSTRUCTION NO. 141
ON
MODIFICATION OF OM NO 312 ENGINE
FOR FITMENT ON NISSAN 1 TON

INTRODUCTION

1. With the.....shortage in the supply of Nissan Engine EX VFJ Jabalpur and availabilities of overhauled engines Ex Base Workshops, a large fleet of Nissan 1 Ton is off road due to engines.
2. A pool of TMB OM 312 engine are available at WSD Pathankot and ESD Tezpur. These engines can be fitted in the NSN 1 Ton vehicles by carrying out modification as given in these instructions. This modification will help in upgradation of NSN 1 Ton vehicles which are off road for engine in the projects and dieselisation will ensure petrol economy and cost per Km run.

MODIFICATION

2. The details of modification are given in the following sections:-

- | | | | |
|-----|--|---|--------------|
| (a) | Material requirement | - | SECTION I. |
| (b) | reparation of vehicles | - | SECTION II. |
| (c) | Modification on the chassis/
Components as per drawings
No NSN-TMB/01, 02,03, 04, 05
and 06 enclosed. | - | SECTION III. |

4. The demand for engines TMB OM 312 be placed on ESD Tezpur and WSD Pathankot for the NSN 1 Ton BA No wise. The performance of the vehicles fitted with Tata Engine will be monitored for 5000 Km and any advrse effect noticed subsequently on occurrence be intimated to this HQ.

Sd/XXXX

(AJS Khalsa)
SE (E&M) SG
Dir Tech

For Dir General Borer Roads

Dated : 30 Jul 90

SECTION I TO GRI NO 141
MATERIAL REQUIREMENT

1. Before undertaking modification, the following materials are required and should be kept readily available :-

- (i) Tata pt No 2573.312.00107 engine cross member rear- 2 Nos.
- (ii) Tata pt No. 252324100101 rubber mounting LH & RH front engine suspension – 2 Nos
- (iii) Tata pt No. 252324100102 rubber mounting for rear engine suspension – 2 Nos.
- (iv) Seamless metal tube of 565 mm length ; OD-88mm & ID 68 mm for modification front axle – 1 No.
- (v) Metal tube of 100 mm length, OD – 68 mm and ID – 51 mm for modification front axle- 1 No.
- (vi) Tata pt No. 2523501100115 radiator core – 1 No.
- (vii) Tata pt No. 141345580 reduction nipple – 2 Nos.
- (viii) Hollow serew and washer – 2 Nos.
- (ix) Suction pipe with stainer be manufactured suitably which remains 38 mm above bottom of fuel tank – 1 No.
- (x) Suction and over flow return fuel lines of Tata vehicle.
- (xi) Tata pt No. 257325605106 clutch from – 1 No
- (xii) Yoke for mounting modified clutch fork – 1 No (see drawing No 04).
- (xiii) TMB OM – 312 engine clutch housing -1 No.
- (xiv) Tata drive shaft – 1 No.
- (xv) Intermediate plate clutch housing and gear box 1 No (see drawing No 06).
- (xvi) Tata exhaust pipe from manifold to to muffler – 1 No.
- (xvii) Tata clutch plate –1 No.
- (xviii) Tata pilot bearing crank shaft – 1 No.
- (xix) Tata fuel steel pipes.
- (xx) Tata water hoses.
- (xxi) Tata starting switch -1 No.
- (xxii) Metal sheet for making floor plate on clutch housing and gear box- 1 No.
- (xxiii) Suitable round plate of 70 mm dia – 1 No.
- (xxiv) Suitable metal pipe of 129 mm length, dia and thickness same as gear box retainer – 1 No (see drawing No 05).

.....2.

SECTION II TO GRI NO 141

PREPARATION OF VEHICLES

1. Prepare NSN vehicles for modification as per details given below :-
 - (a) Drain petrol fuel tank and disconnect.
 - (b) Disconnect battery and put on charging.
 - (c) Disconnect wiring of alternator/dynamo, voltage regulator, coil, starter motor and earthing cable. Ignition coil be used on other veh.
 - (d) Remove air cleaner and be used, on other veh
 - (e) Drain water from radiator and engine block and disconnect water connections.
 - (f) Disconnect and remove radiator after removing the front grill and top bracket. Radiator be used on other veh.
 - (g) Remove radiator mounting frame.
 - (h) Disconnect throttle cable and may be used on other veh.
 - (J) Disconnect exhaust pipe at manifold and remove exhaust pipe upto silencer for modification.
 - (k) Disconnect clutch operating arm and remove gear box after disconnecting propeller shafts front and rear. Propeller shaft rear should be disconnected from rear tail pinion flange for modification.
 - (l) Remove nuts of engine mounting front and rear.
 - (m) Sling engine and remove.
 - (n) Remove fuel tank, exhaust muffler and clutch pedal with linkages for Modification.
 - (o) Engine mounting brackets front and rear, 2nd cross member and plate for starting handle guide be removed as per DRG No NSN-TMB ENG/01.

SECTION III TO FRI NO 141

MODIFICATION ON THE CHASSIS/COMPONENTS

1. Modify chassis to fit Tata Pt No 2573.312.00107 engine cross member rear 2 Nos as per drawing No NSN –TMB Eng/01. Engine mounting pads of Tata to be used at front and rear. Cable mounting pads – 4 Nos should be raised to 45 mm by using additional suitable rubber pads.

2. front axle of the vehicle be modified as dead axle as per DRG No NSN-TMB ENG/02. This has been done due to less space available between front axle differential housing and TMB engine sump and oil filter and to avoid chances of damages to engine during up/down movements of engine alongwith chassis due to road spring action.

3. Refer DRG No. NSN-TMB/03

(a) Tata pt No 2523501001 radiator core (top water filling) be drilled holes as per DRG- ... for fitment in place of original NSN radiator core. Top cover shield provided on grill be cut and removed as per DRG 'A' Cut and remove starting handle bracket as per DRG 'B'.

Ref DRG 'D' (NSN-TMB/03)

(b) Fuel tank be modified by locking original outlet (Suction Nipple) with dome nut. Sction pipe with stainer be manufactured suitably so that is remains 38mm above bottom of tank when fitted. Suitable round plate of 70mm dia be taken. A Hole in centre be drilled to fit Tata Pt No. 141345580 reducing nipple, 8 holes of suitable size be drilled radically on plate and fuel tank for its fitments. Reducing nipple be gas welded with plate. Modified suction pipe be welded with reducing nipple. This modified suction pipe assy be screwed on the tank by providing a packing in between. Hollow screw and washer be used to connect suction fuel line as per DRG 'D'.

(c) To make overflow return fuel line connection fitting on tank, weld Tata pt No 1413455080 reducing nipple on tank, use hollow screw and washers to fit overflow return fuel line as per DRG 'D'.

(d) Suction and overflow return fuel lines of Tata be modified/aligned alongwith the chassis and be clamped.

3. Ref DRG No NSN-TMB/04

(a) Tata pt No 257325605106 clutch fork be modified as per dimension given In drawing.

(b) Yoke for mounting modified clutch fork be manufactured as per dimension given in drawing.

SECTION III TO GRI NO 141 (Contd.)

- (c) A hole 16 mm dia be drilled in clutch housing of TMB OM 312 engine as per dimension/loc given in drawing to fit yoke.
- (d) Yoke be fitted on clutch housing from inside and tighten the nut.
- (e) Fit modified clutch fork inside clutch housing on yoke and tighten nut/bolt for locking it with yoke.
- (f) Remove clutch pedal and linkages from original position modify/manufacture linkages assy as per drawing and weld the pin on chassis with a modified clamp. Location on longitudinal member of chassis inline with hanger step front. RH Fig No. 132 pt No. 96117-43700. The distance between the chassis and clutch pedal is 18 mm.

4. Ref DRG No. NSN-TMB ENG/05

- (a) Take drive shafts of Nissan Carrier and Tata Vehs to modify as per drawing. Drive shaft of Nissan carrier is cut so that its length remains 165 mm, 13 mm dia 25 mm long hole is drilled on its end and edge tapered. Tata drive shaft piece is cut to 85 mm in length to use its splined portion for original Tata clutch plate and pilot bearing in crank shaft. Then 25 mm long portion is reduced to 12 mm dia so that this portion fits tight in Nissan carrier drive shaft piece. After press fitting both pieces welding is done at point 'C' Subsequently turn on lathe to make the diameter of modified shaft uniform and smooth. The length of this modified shaft is 325 mm,.
- (b) Remove and clean gear box retainer from gear box of Nissan carrier veh. Cut it from point 'A' and discard pipe. Take suitable pipe piece of same dia and thickness 129 mm long and weld at point 'A' . Turn the welded portion on lathe to bring joint in original shape. Fit this modified gear box retainer on the gear box.
- (c) Pt No 37330-41400 assy gear propeller shaft be cut from point 'A' shown in the drawing reducing the tubler portion by 38 mm. Fit and align the splined portion in the tube and weld the joint.

5. Ref DRG No. NSN-TMB ENG/06

- (a) Intermediate plate is to be fitted on clutch housing with four bolts to allow to fit original gear box assy of Nissan carrier on TMB OM 312 model engine. The dimensions/details of this intermediate plate are given in the drawing.
- (b) The Intermediate plate is being manufactured locally in civil market and is readily available in Delhi market.

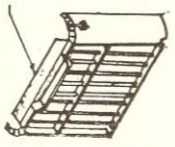
SECTION III TO GRI NO 141 (CONTD)

7. Accelerator linkages – Remove lever accelerator and fit it in downward position as shown in DRG No. NSH-TMB ENG/05.
8. Exhaust system - Tata exhaust pipe is modified and used from exhaust manifold to muffler.
9. Battery compartment - A bracket for battery 12 volt 180 AH be modified suitably in the co-driver seat and place battery. The positive and earth leads passed through after drilling a hole in the bottom of co-driver seat.
10. Fuel, water connections be given to the engine using Tata pipes/houses.
11. Elect connections be given after fitting starting switch of Tata and modifying the circuit as per requirement.
12. All gauges be fitted suitably after realigning the oil pressure and temp gauge pipes.
13. engine stop linkages are provided by using the choke control wire and knob.
14. Floor plate on clutch housing and gear box in the cabin be modified suitably by adding metal sheet piece.

CONCLUDING REMARKS

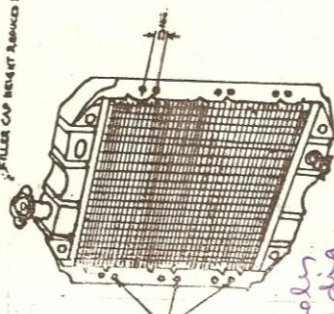
The above modification has been successfully tried out at 1059 Fd Wksp in 38 BRTF under Project Deepak. Any clarifications required may be referred to them for amplification. The dieselisation of Nissan 1 ton will save the operation cost of veh by 60 to 66 percent and will reduce to off road of vehs due to non availability of Nissan engines.

CUT & REMOVE TOP COVER, WELD TO GULL



DRG-A

FILLER CAP HEIGHT REDUCED BY 1"



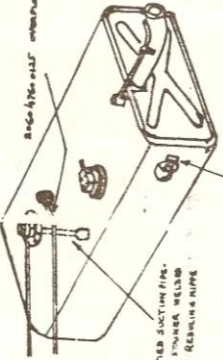
CUT WALKING
KILL WALKING
CUT WALKING
CUT WALKING

New hole
10 mm dia
drilled 23 mm
below orig. hole
on both sides

MODIFICATION DETAILS
1. REMOVE ORIGINAL RADIATOR
2. CUT & REMOVE THE OVERHUNG AT FRONT IN DRG. A
3. CUT & REMOVE STARTING HOLES RADIATOR AT FRONT IN DRG. B
4. MODIFY TANK RADIATOR AS SHOWN IN DRG. C & FIT ON VEH ON ORIGINAL BATTERY

REMOVE ORIGINAL FUEL TANK
BLACK SECTION NIPPLE ON FUEL TANK WITH SUITABLE DOWNWAY & STAMPER.
USE PARTS AS GIVEN IN DRG. D & FIT ON FUEL TANK, ON REAR BATTERY OR OTHER SUITABLE PARTS. ADD ADJUSTABLE FUEL REGULATOR TO MAIN SECTION & WELD FROM BEHIND LINE B. WELDING REGULATING NIPPLE ON TANK, DETACHABLE TYPE PUMP PLATE BE USED FOR REMOVAL/INSTALLATION OF PIPE & STAMPER.
FUEL LINES ROUTED AS SHOWN ON ALL FOUR ORIGINAL MEMBERS OF CHASSIS.

- 1. CUT AND REMOVE STARTING HOLES RADIATOR
- 2. 1653-1999049 Hollow screw A 8 DIN 7623
- 3. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 4. 206047600124 Assy diesel line 7603 AL
- 5. 1413455-080 Reducing nipple 2916 710609 Wash (H-958 7603 AL)
- 6. 206047600125 Washer (H-958 7603 AL)
- 7. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 8. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 9. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 10. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 11. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 12. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 13. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 14. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 15. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 16. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 17. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 18. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 19. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL
- 20. 1622-0510224 Scaling ring A 14 X 10 DIN 7603 AL



MODIFIED JUNCTION PIPE WITH FINGER WELDED WITH REGULATING NIPPLE

SLACK ORIGINAL SECTION NIPPLE WITH 206-47600125

DRG-D

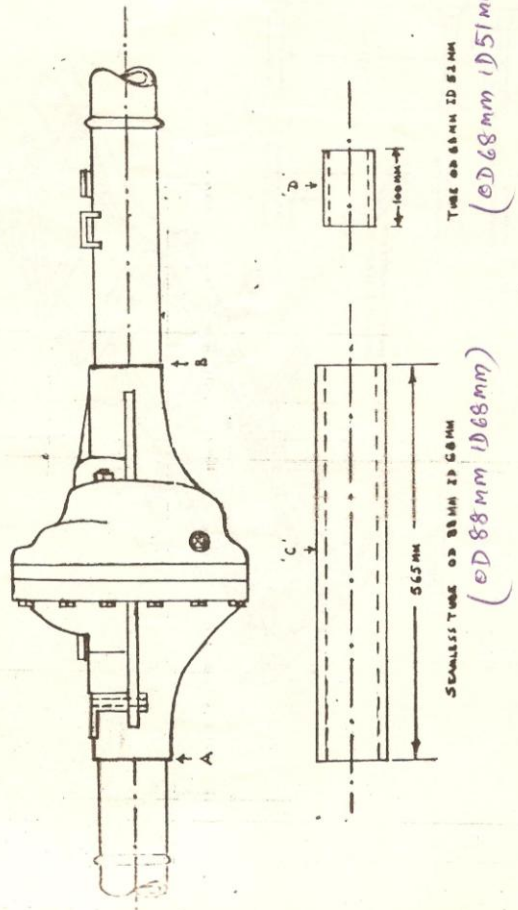
MODIFICATION RADIATOR & MOUNTING AND FUEL TANK WITH LINES

DRAWING No.	NSH-TMB 810/03
SCALE	NOT TO SCALE
MODIFICATION DONE BY	1089 FIELD NICK
DATE OF MODIFICATION	JAN '60
ISSUED BY	SURNAME (NAME)
APPROVED BY	(NAME) (RANK) (UNIT)

1039 Field Workshop (11/60)

REMOVAL OF DIFFERENTIAL HOUSING/FITMENT OF TUBE

1. REMOVE FRONT AXLE SHAFTS L.H. & R.H.
2. CUT FROM POINT 'A' & 'B' TO REMOVE DIFFERENTIAL HOUSING. REMOVE BUSHES FROM AXLE TUBES.
3. FIT TUBE 'D' IMMEDIATELY.
4. FIT TUBE 'C' TO JAM AXLE TUBE
5. WELD TUBE 'C' AND AXLE TUBES AT POINT 'A' & 'B'



MODIFICATION FRONT AXLE

APPROVED BY

[Signature]
 (P. K. ANAND) ~~CHAND~~
 BE (U & M)
 Officer Commanding
 1059 FIELD WORKSHOP

DRAWING NO.	NSN-TMB DMC/02
SCALE	NOT TO SCALE
MODIFICATION DINED BY	1059 FIELD WORKSHOP
MODIFICATION DATE	JAN 90
DRAWN BY	SUPDT (L) AMERIK SW 4 H

REMOVE FOLLOWING PARTS DRG-A:

1. SUPPORT ENGINE FRONT, RU, FIG No. 39
2. SUPPORT ENGINE FRONT, LN, FIG No. 44
3. SUPPORT ENGINE REAR, RA, REF No. 98
4. SUPPORT ENGINE REAR, LB, FIG No. 144
5. MEMBER CROSS 2nd, FIG No. 83
6. PLATE STARTING HANDLE GUIDE FIG No. 35

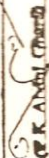
FIT FOLLOWING PARTS OF TATA 1210SE VEH

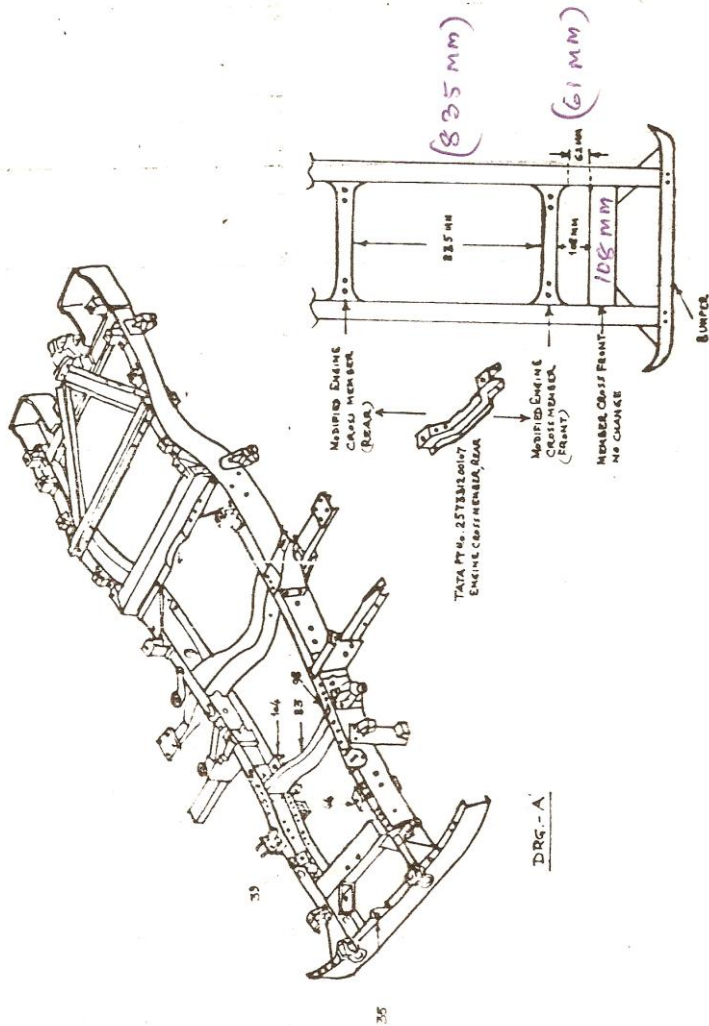
1. PT No. 2578 310107 ENGINE CROSS MEMBER REAR-2ND BY WELDING AS PER SPACING GIVEN IN DRG-B. IN PLACE OF SUPPORTS ENGINE FRONT & REAR, RH & LH.

2. PT No. 2523 2410101 RUBBER MOUNTING LHM FOR FRONT ENGINE SUSPENSION - 2 Nos.

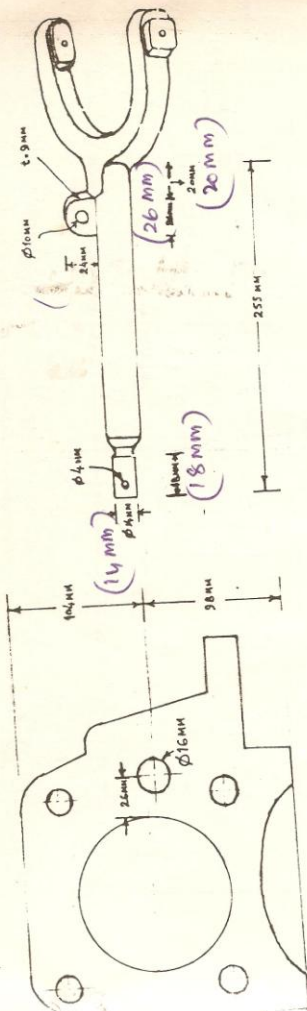
3. PT No. 2523 2410102 RUBBER MOUNTING FOR REAR ENGINE SUSPENSION - 2 Nos.

NOTE - CABIN MOUNTING PADS - 4 Nos READ TO BE GAUGED TO 45MM, RADIATOR BKT MOUNTING TO BE RAISED BY 10MM BY USING SUITABLE RUBBER PADS ADDITIONALLY.

DRAWING No.	NSN-TMB 846/01
SCALE	NPT TO SCALE
MODIFICATION DONE BY	1059 FIELD WORKSHOP (GRUP)
DATE OF MODIFICATION	JAN '90
DRAWN BY	SUDHAKAR ANUR SHAM
APPROVED BY	 K. ANAND CHOUDHARY BE (E & M) Officer Commanding

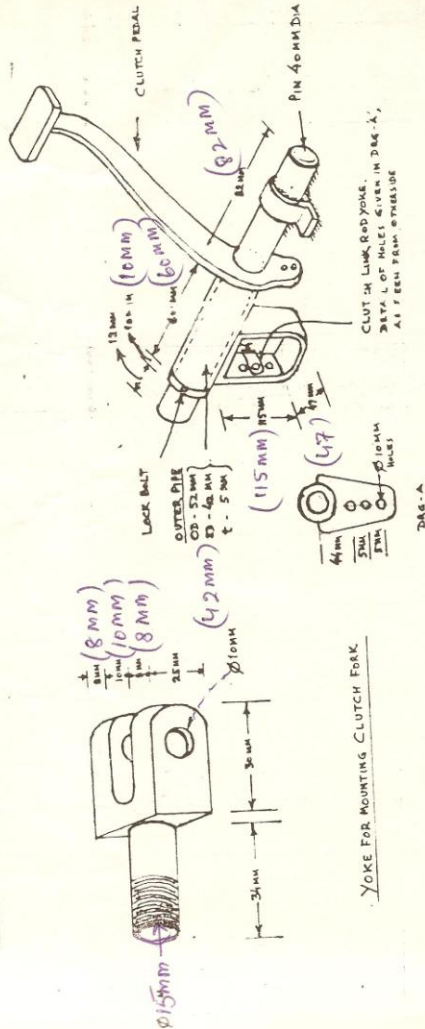


PREPARATION & MODIFICATION OF CHASSIS FOR FITMENT OF TMB OM-312 ENGINE ON NISSAN CARRIER TRUCK, 1-TON, 4X4, D-4W73N



MODIFIED CLUTCH FORK OF TATA

1. DRILLING HOLE IN THE ENGINE CLUTCH HOUSING TO FIT YOKE FOR MOUNTING CLUTCH FORK



MODIFIED CLUTCH LINKAGES

YOKE FOR MOUNTING CLUTCH FORK

MODIFICATION CLUTCH FORK ITS MOUNTING ON CLUTCH HOUSING & CLUTCH LINKAGES

APPROVED BY:
G. K. ANANDI CHANDI
EP (P & M)
M. S. SUNDARARAJAN

DETAILS

1. CLUTCH LINKAGES AND CLUTCH FORK NEED TO BE MODIFIED DUE TO LACK SPACE AVAILABLE WITH EXISTING LINKAGES.
2. CLUTCH FORK BE MODIFIED AS PER DIAG.
3. A HOLE 10MM DIA BE DRILLED ON CLUTCH HOUSING AS PER DIMENSIONS GIVEN IN DIAG.
4. A YOKE AS PER DIAG BE MANUFACTURED TO FIT CLUTCH FORK. THIS YOKE WILL BE FITTED INSIDE CLUTCH HOUSING THROUGH 10MM DIA HOLE WITH NUT. (ORIGINAL CLUTCH FORK MOUNTING/ BE DISCARDED)
5. CLUTCH MOUNTING BOWSET & PIN FITTED ON CHASSIS ORIGINALLY SHOULD BE ABANDONED.
6. MODIFIED CLUTCH LINKAGES PIN BE WELDED ON CHASSIS WITH CLAMP. LOC - ON LOWER TUBULAR MEMBER IN LINE TO HANGS STEP PIN 84, F & No 733, P/No 56177-45700
7. CLUTCH LINK ROD BE MODIFIED AS PER REQUIREMENT.

DRAWING NO.	NSN-TMB D16 / 04
SCALE	NET TO SCALE
DESIGNATION/DRAWN BY	1059 ED MKTP
DATE OF MODIFICATION	JAN'90
DRAWN BY	SOMRAJIT MOHILIA

Delhi Tele : 602341

Headquarters
Directorate Gen Border Roads
Kashmir House
DHQ PO NEW DELHI- 110011
30 Nov 89

54109/MISC/DGBR/E4 INV (P&P)

HQ CE (P) Sewak
C/o 99 APO
(All Projects)

**REBUILDING /RECLAMATION OF TRACK CHAINS AND
UNDERCARRIAGE PARTS DOZER D 50-A15 AND D80-A12**

1. The track chains and other undercarriage components like track rollers, sprockets, idlers etc are very costly items and take a major portion of our budget available for provisioning of spares for the dozers. At the same time these items can be rebuilt/reclaimed at a very reasonable cost. The rebuilt/reclaimed items normally give 60% of the new assys/parts.

2. It is been observed that so far our Base Wksp Fd Wksp have not been giving due emphasis on rebuilding/reclamation of undercarriage components of the dozers as the new assys/items were readily available for replacement. But , now due to steep increase in the cost of undercarriage assys /parts by the Bharat Earth Movers Ltd, we have to restrict our provisioning of track chains and other undercarriage items to the barest minimum and depend more on the rebuilding/reclamation of the old track chains and other components. It is , therefore requested that Fd ksp under command be directed to make all out efforts to rebuild/reclaim the old track chains and other undercarriage components to extract maximum life out of them.

2. Please ack receipt.

Sd/xxx

(Hans Raj)
SE (E&M)
Director/E4-Inv
For Dir gen Border Roads

Copy to :-

1. Eastern Base Wksp (GREF)
C/o 99 APO
2. Western store Division (GREF)
C/o 56 APO
3. Eastern store Division (GREF)
C/o 99 APO
4. Western store Division (GREF)
C/o 56 APO
5. Fd Wksp.....
C/o 56 /99APO

For similar action please.

for info please

for info and necessary action.